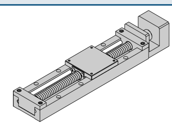
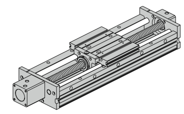
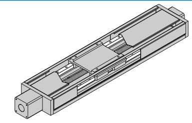
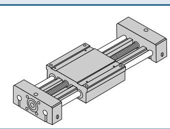
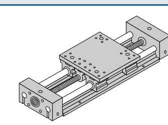
Linear Slide Tables / Systems

Product Selection

Quick Reference Guide

	Microstage* MS		SuperSlide* 2RB		AccuSlide* 2HB	
						
Size	25	33	12	16	10	20
Dimension Std.	Metric	Metric	Metric	Metric	Metric	Metric
Drive Type	lead screw	lead screw	ball screw	ball screw	ball screw	ball screw
Guide Type	segmented ball bushing	segmented ball bushing	ball bushing	ball bushing	profile rail	profile rail
Max. Load Fy (N)	100	150	550	1500	2000	8500
Max. Thrust Fa (N)*	44	89	2000	2500	2000	4500
Max. Roll Moment Mx (N-m)	1	2.25	20.6	75	70	616
Max. Pitch/Yaw Ma (N-m)	1.12	2.38	30.3	107	60	510
Max. Speed (mm/sec)*	102	102	467	700	467	750
Max. Stroke Length (mm)	660	909	1951	2815	1375	2760
Repeatability (mm)	+/- 0.005	+/- 0.005	+/- 0.005	+/- 0.005	+/- 0.005	+/- 0.005
Accuracy (mm/300mm)	0.2	0.2	0.025	0.025	0.025	0.025
Attributes	Compact/Low Cost	Compact/Low Cost	All Purpose	All Purpose	Heavy Load/ High Rigidity	Heavy Load/ High Rigidity
Catalog Page	**B-14**	**B-14**	**B-16**	**B-16**	**B-18**	**B-18**

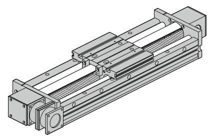
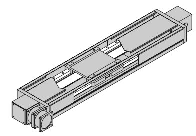
* Maximum value based on shortest standard length. Value decreases as screw length increases due to critical speed restrictions.

	SuperSlide* 2DB			SuperSlide* 2EB			
							
Size	08	12	16	08	12	16	24
Dimension Std.	English	English	English	English	English	English	English
Drive Type	lead screw	ball screw	ball screw	ball screw	ball screw	ball screw	ball screw
Guide Type	ball bushing	ball bushing	ball bushing	ball bushing	ball bushing	ball bushing	ball bushing
Max. Load Fy (lbs)	100	650	1000	100	650	1000	2100
Max. Thrust Fa (lbs)*	20	180	350	180	350	750	3200
Max. Roll Moment Mx (lbf-in)	150	1300	2500	163	1463	2750	8400
Max. Pitch/Yaw Ma (lbf-in)	140	1281	2345	191	1768	3095	9450
Max. Speed (in/sec)*	4	11.7	7	29.2	35	30	34.4
Max. Stroke Length (in)	41	63	84.5	63.5	84.5	130.6	157.
Repeatability (in)	+/- 0.0002	+/- 0.0002	+/- 0.0002	+/- 0.0002	+/- 0.0002	+/- 0.0002	+/- 0.0002
Accuracy (in/ft)	0.008	0.002	0.002	0.002	0.002	0.002	0.002
Attributes	Low Profile	Low Profile	Low Profile	High Speed/ Heavy Payload	High Speed/ Heavy Payload	High Speed/ Heavy Payload	High Speed/ Heavy Payload
Catalog Page	**B-20**	**B-20**	**B-20**	**B-22**	**B-22**	**B-22**	**B-22**

* Maximum value based on shortest standard length. Value decreases as screw length increases due to critical speed restrictions.

Note: Linear Guides are also available as 'building blocks' for Linear Slide Tables / Systems (found on p. B-31 thru B-47). When combined with stand-alone Ballscrew Assemblies (found on p. B-48 thru B-49), they offer the flexibility to customize for envelope considerations (i.e. space constraints) and / or performance considerations (i.e. increased moment capacity through increased bearing separation).

Quick Reference Guide

	SuperSlide* 2RE		AccuSlide* 2HE	
				
Size	12	16	10	20
Dimension Std.	Metric	Metric	Metric	Metric
Drive Type	belt	belt	belt	belt
Guide Type	ball bushing	ball bushing	profile rail	profile rail
Max. Load Fy (N)	550	1500	2000	8500
Max. Thrust Fa (N)*	225	780	225	1260
Max. Roll Moment Mx (N-m)	20.6	75	70	616
Max. Pitch/Yaw Ma (N-m)	30.3	107	60	510
Max. Speed (mm/sec)*	3000	3000	3000	3000
Max. Stroke Length (mm)	660	909	1951	2815
Accuracy (mm/300mm)	1951	2815	1375	2760
Attributes	All Purpose	All Purpose	Heavy Load/ High Rigidity	Heavy Load/ High Rigidity
Catalog Page	**B-26**	**B-26**	**B-28**	**B-28**

*Maximum value based on belt pretension
Note: Linear Guides are also available as 'building blocks' for Linear Slide Tables / Systems (found on p. B-31 thru B-47). When combined with stand-alone Ballscrew Assemblies (found on p. B-47 thru B-49), they offer the flexibility to customize for envelope considerations (i.e. space constraints) and / or performance considerations (i.e. increased moment capacity through increased bearing separation).

Ball Screw and Belt Driven Selection Criteria

In order to determine the Ball Screw or Belt Actuated SuperSlide System that meets the needs of your application, it is first necessary to evaluate the following detail design criteria:

- System support requirements
- System stroke length
- Maximum allowable shaft deflection
- Required travel life
- Force on the most heavily loaded bearing
- Load correction factor

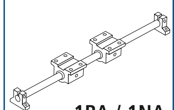
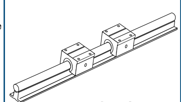
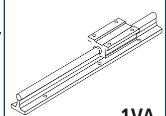
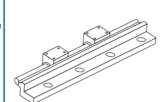
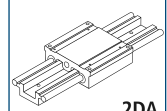
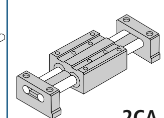
A detailed explanation of the procedure for selecting a Belt Actuated Linear Motion System is given on page B-67 in the Engineering Support Section.

- **For Accessories, see page B-51**
- **For Motor Reference Table, See page B-66**
- **For Engineering Support, See page B-67**

Linear Guides are the non-driven building blocks for linear slide tables. They offer the end user flexiblity to fit specific envelopes by allowing customized separations between shafts and between bearings on shafts to produce higher moment capacity. When combined with ballscrew assemblies, they become a driven slide table.

Because Linear Guides are offered in a wide range of sizes, bearing types, and mounting configurations, they are typically selected by the qualitative attributes that are most appropriate for a given application (i.e. environmental considerations, mounting footprint). For this reason, we are providing the following selection chart and selection criteria for consideration:

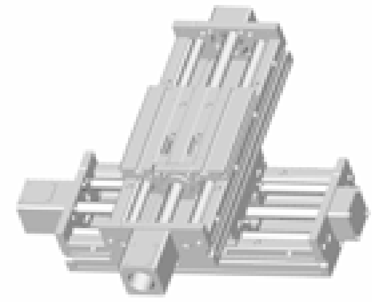
Linear Guide Quick Reference Guide

Application Criteria	End Support	Continuous Support	FluoroNyliner*	Side Mounted	Dual Shaft Rail	Twin Shaft Web
	 1BA / 1NA	 1CA / 1PA	 1VA	 1DA	 2DA	 2CA
High Loads		x	x		x	
Equivalent Loads in All Directions	x					x
Ultra Compactness	x			x		x
Extreme Smoothness	x	x			x	x
End Supported	x					x
Single Rail						
Harsh Environment			x	x		
Low Cost Installation (multiple rail)	x	x	x			x
Complete Axis Solution				x	x	
Available Sizes: Inch	04 thru 24	08 thru 24	08 thru 24	08 thru 16	08 thru 16	08 thru 16
Metric	08 thru 40	12 thru 40				
Page No.	**B-32**	**B-36**	**B-40**	**B-42**	**B-44**	**B-46**

Linear Guide Selection Criteria:

- Load/Life
- Travel Accuracy
- Rigidity
- Smoothness of Travel
- Speed & Acceleration
- Envelope
- Environment
- Cost of Product
- Cost of Installation
- Cost of Replacement

Generating Multi-Axis Systems



X-Y Configuration

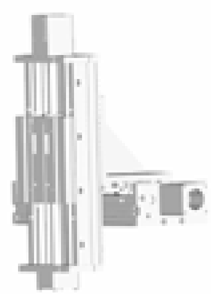
Primary Axis Prefix	Secondary Axis Prefix	XY Adapter Plate Part Number	Plate Thickness	Typical Usage
MS33	MS33	MSXYP33-33	12.70mm +/-0.08	Light Duty
2DB12	2DB08	2DBXYP12-08	0.750in +/-0.003	Moderate Duty - Low Profile
2RBM16 or 2REM16	2RBM12 or 2REM12	2RXYP16-12	12.70mm +/-0.08	Moderate Duty
2HBM20 or 2HEM20	2HBM10 or 2HEM10	2HXYP20-10	22.00mm +/-0.08	Heavy Duty

Plate Specifications

- Flatness 0.025mm
- Surface parallelism 0.025mm
- Mounting hole locations centralized

Ordering Information

1. Specify Primary Axis P/N, Secondary Axis P/N and Adaptor Bracket P/N as separate items on an inquiry or order.
2. Orders will be shipped unassembled due to shipping complications unless formally quoted in mounted configuration.
3. Inquiries for mounted configurations must include: Perpendicularity requirement and Position requirement for Secondary Axis with respect to Primary Axis (dictates 'Y' dimensions for Secondary Axis).



X-Z Configuration

Primary Axis Prefix	Secondary Axis Prefix	XZ Bracket Part Number	Bracket Thickness (both legs)	Typical Usage
MS33	MS33	MSXZB33-33	12.70mm +/-0.08	Light Duty
2DB12	2DB08	2DBXZB12-08	0.750in +/-0.003	Moderate Duty - Low Profile
2RBM16 or 2REM16	2RBM12 or 2REM12	2RXZB16-12	12.7mm +/-0.08	Moderate Duty
2HBM20 or 2HEM20	2HBM10 or 2HEM10	2HXZB20-10	22mm +/-0.08	Heavy Duty

Bracket Specifications

- Flatness (both legs) 0.025mm
- Surface perpendicularity 0.127mm
- Mounting hole locations centralized

Ordering Information

1. Specify Primary Axis P/N, Secondary Axis P/N and Adaptor Bracket P/N as separate items on an inquiry or order.
2. Orders will be shipped unassembled due to shipping complications unless formally quoted in mounted configuration.
3. Inquiries for mounted configurations must include: Perpendicularity requirement and Position requirement for Secondary Axis with respect to Primary Axis (dictates 'Y' dimensions for Secondary Axis).

Application Analysis Worksheet

Phone: 1-800-554-8466
Website: www.linearactuators.com

Determining the system which best meets the demands of your application and provides optimum performance requires the evaluation of a number of variables. The accompanying form establishes basic criteria to initiate the analysis of your application. In addition, the Engineering Support Appendix has been designed with pertinent data and formulas used to specify the proper system for your application. If you have questions or special needs a Danaher Motion systems engineer can assist you in evaluating your application and recommending a system solution.

Simply call 1-800-554-8466 or fax this completed form to 1-631-467-9814.

Application Description: ❑ Horizontal ❑ Vertical

System Part Number:

Quantity Required

Weight of Load (N):

Space Requirements (LxHxW):

Stroke Length Requirements (mm):

Support Requirements: ❑ End Supported ❑ Full Support

Maximum Velocity Requirements (m/s):

Maximum Acceleration Requirements (m/s^2):

Required Straightness of Travel Accuracy (mm/m):

Required Positioning Accuracy (mm):

Required Repeatability (mm):

Life Requirement (km):

Cycle (km/yr):

Environmental Considerations:

Other Design Criteria:

Production Time Frame:

Company:

Name:

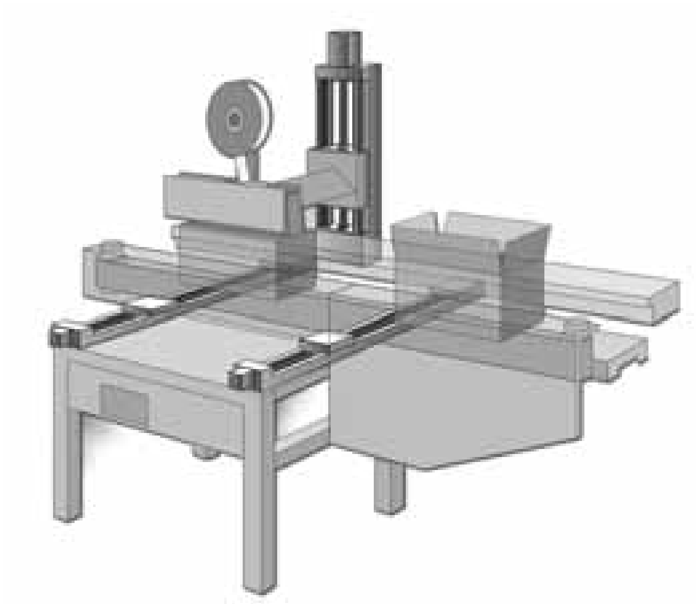
Title:

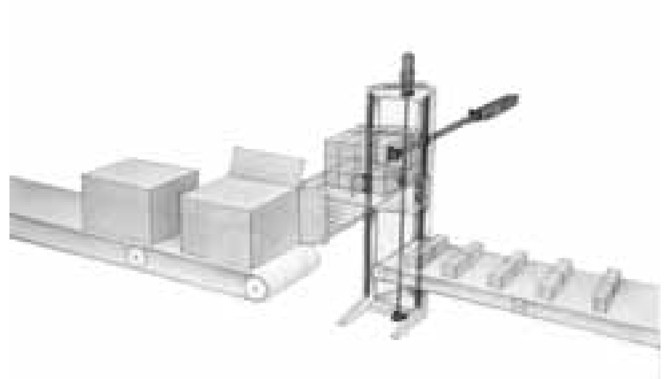
Address:

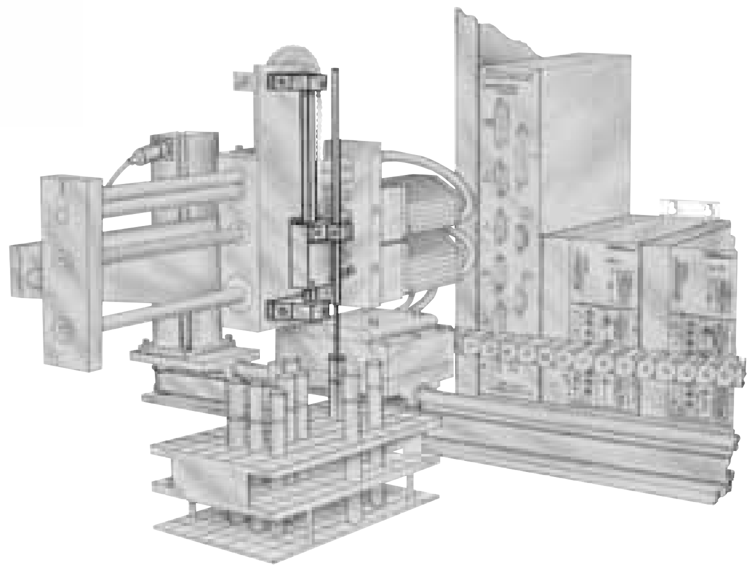
City: State: Zip:

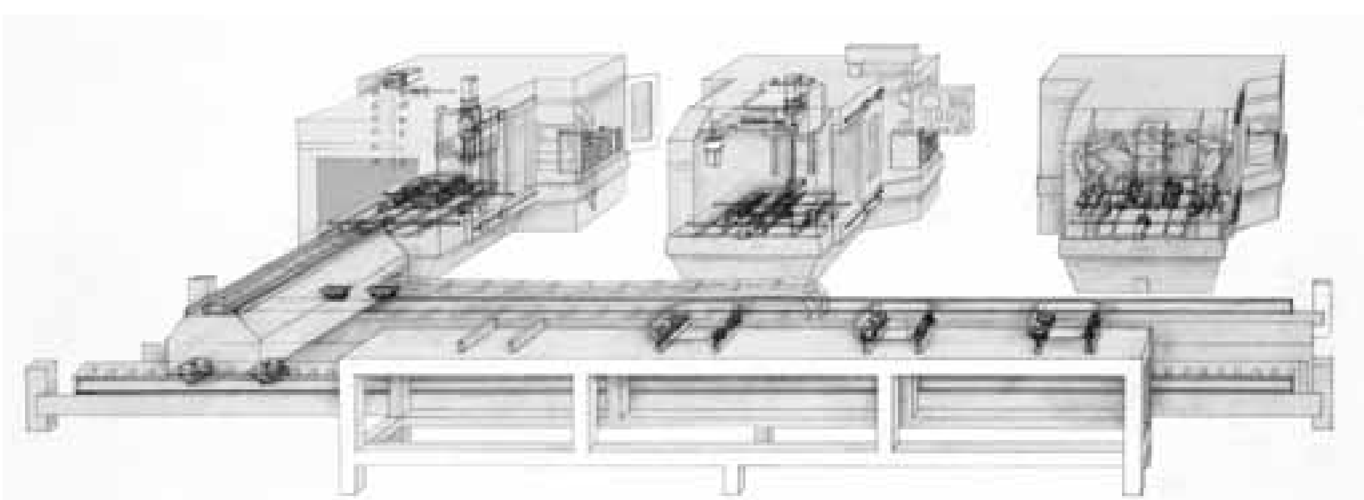
Telephone: Fax:

E-mail:









Single Rail Part Numbering

Example:	1	P	A	M	20	M	W	O	L600

Field	Description	Code
System	single rail	1
Guide Type	Inch - Unsupported	A
	Inch - End supported	B
	Inch - Fully supported	C
	Inch - Side supported	D
	Metric - Unsupported	M
	Metric - End supported	N
	Metric - Fully supported	P
	Inch-FluoroNyliner	V
Level of Guide Integration	Single Rail	A
Version	Inch	(blank)
	Metric	M
Shaft Size	**Inch**	
	1/4 inch diameter	04
	3/8 inch diameter	06
	1/2 inch diameter	08
	5/8 inch diameter	10
	3/4 inch diameter	12
	1 inch diameter	16
	1 1/4 inch diameter	20
	1 1/2 inch diameter	24
	Metric	
	8 mm diameter	08
	12 mm diameter	12
	16 mm diameter	16
	20 mm diameter	20
	25 mm diameter	25
	30 mm diameter	30
	40 mm diameter	40
Type of Bearing Block	Inch Closed Single Pillow Block (includes Fluoro)	A
	Inch Closed Twin Pillow Block (includes Fluoro)	D
	Inch Open Single Pillow Block	G
	Inch Open Twin Pillow Block	J
	Inch Side Mounted Open Single Pillow Block	L
	Inch Side Mounted Open Twin Pillow Block	M
	Metric Open Single Pillow Block	N
	Metric Open Twin Pillow Block	O
	Metric Closed Single Pillow Block	P
	Metric Closed Twin Pillow Block	Q
Type of Support	Continuous support - Inch - Aluminum (SRA)	A
	End supported - Inch - Aluminum (ASB)	H
	End supported - Inch - Steel (SB)	J
	Low Continuous support - Metric - Aluminum (LSRM)	L
	End supported - Metric - Aluminum (ASBM)	M
	End supported - Metric - Steel (SBM)	N
	Unsupported (exception - 1DA/1DB/1DC)	O
	Continuous support - Metric - Aluminum (SRAM)	W
Carriage	No top plate	O
Length	Inch - Inches (where XX is a numerical value)	LXX
	Special modifications - Inch	-SLXX
	Metric - Millimeters	LXXX
	Special modifications - Metric	-SLXXX

See individual product specifications sections for more details on standard product offering.

Having Trouble Specifying a Slide Table?

Fill out an application analysis form on page B-6 and fax it to our Application Engineering Group.

Have a Custom Requirement?

See our custom capabilities section for ideas or contact our Application Engineering Group with your specific needs.

THOMSON

Dual Rail Part Numbering

Example:	2	H	B	M	20	O	Y	P	N				L805

System	
Integrated Dual Rail	2

Guide Type	
Dual Shaft Rail - Full support	D
Double continuous support	E
TurboModule - Square Rail	G
Accuslide - Square Rail	H
Metric Double Contin Support	R

Driving Type	
Non-Driven	A
Ball screw	B
Belt	E

Version	
Inch	(blank)
Metric	M
European (mfr'd in Kristianstad, Sweden-Tollo)	E

Size	
INCH (SHAFT)	
1/2 inch diameter	08
3/4 inch diameter	12
1 inch diameter	16
1 1/2 inch diameter	24
METRIC (SHAFT)	
12 mm diameter	12
16 mm diameter	16
METRIC (SQUARE RAIL)	
10 mm	10
20 mm	20

Type of Bearing Block	
All configurations	O

Type of Support	
Double Continuous Support-Metric (2RB)	D
Double Continuous Support-Metric (2RE)	E
Vertical End Support-Inch (2CA)	K
Horizontal End Support-Inch (2CA)	M
Fully Supported Inch (2DA)	O
Square Rail Continuous Support-Metric (2GE)	Q
Dual Shaft Rail support - Inch/Metric (2DB)	U
Square Rail Continuous support - Metric (2HB)	Y
Square Rail Continuous support - Metric (2HE)	Z

Carriage	
Short top plate - Inch (All)	A
Square top plate - Inch (All) &	B
Compact extruded - Inch (2C	E
Square extruded - Metric (2RB/2RE)	M
Elongated extruded - Metric (2GE)	N
No top plate (used for single rail Linear Guides)	O
Square extruded - Metric (2HB/2HE)	P
Square extruded, long version (2RB/2RE)	Q
Square extruded, long version (2HB/2HE))	R
Square extruded double (2RB/2RE)	S
Square extruded double (2HB/2HE)	T

Ball Screw Driven. Screw Size:	
.375x.1 P Leadscrew	AA
.375x.25 P Leadscrew	AB
.375x.5 P Leadscrew	AC
.375x.75 P Leadscrew	AD
.375x1 P Leadscrew	AE
12x5 NP	B
16x5 NP	C
20x5 NP	E
.5x.2 NP	F
16x5 P or .75x.2 NP	G
16x10 P or 1x.25 P	H
20x5 P or 1.5x.25 P	I
20x10 P or 1.5x1 P	J
20x20 P	K
25x5 P or .631x1 P	L
25x10 P	M
25x25 P	P
.5x.5 P	Q
.75x.5 P	S
1x1 P	T
20x20 NP	U
.5x.2 P	V
.75x.2 P	W
1.5x1.875 P	Z
Belt Driven - Gear box Size and Ratio	
Micron Gear NEMA 23, ratio:	
1:1	A
3:1	B
5:1	C
10:1	D
Micron Gear NEMA 34, ratio:	
1:1	E
3:1	F
5:1	G
10:1	H
Micron Gear AT14, ratio:	
1:1	N
6:1	P
10:1	Q
EU std interface, without gearhead	U
Non-Driven	W

Saddle Option	
Used on "European Manufactured" models only	

Actuation options	
Used on "European Manufactured" models only	

Cover options	
Used on "European Manufactured" models onlySpecial hole pattern for X-Y-tables -	

Length	
Inch - Inches (where XX is a numerical value)	LXX
Special modifications - Inch	-SLXX
Metric - Millimeters	LXXX
Special modifications - Metric	-SLXXX

See individual product specifications sections for more details on standard product offering.

Having Trouble Specifying a Slide Table?

Fill out an application analysis form on page B-6 and fax it to our Application Engineering Group.

Have a Custom Requirement?

See our custom capabilities section for ideas or contact our Application Engineering Group with your specific needs.

TABLES/ SYSTEMS

THOMSON

Phone: 1-800-554-8466
Website: www.linearactuators.com

Microstage and Ball Screw Assembly Part Numbering

Example:	MS		25	L	B	B	L120

Field	Option	Code
System	Ball Screw Assembly	BSA
	MicroStage	MS
Version	Inch (MS or BSA)	(blank)
	Metric (BSA only)	M
Size – **Inch (BSA)**	1/2 inch diameter	08
	3/4 inch diameter	12
	1 inch diameter	16
	1 1/2 inch diameter	24
Metric (BSA)	12 mm diameter	12
	20 mm diameter	20
Metric (MS)	25 mm (based on carriage height)	25
	33 mm (based on carriage height)	33
Actuator Type	All BSAs	(blank)
	All MicroStages	L
Screw Size (MS=Leadscrew, BSA=Ballscrew)	1/4x.025 P (MS25) & 3/8x.0625 P (MS33)	A
	1/4x.05 P (MS25) & 3/8x.1 P (MS33)	B
	12x5 mm NP (BSAM)	B
	1/4x.0625 P (MS25) & 3/8x.125 P (MS33)	C
	1/4x.2 P (MS25) & 3/8x.2 P (MS33)	D
	20x5 mm NP (BSAM)	D
	1/4x.25 P (MS25) & 3/8x.25 P (MS33)	E
	1/4x.5 P (MS25) & 3/8x.375 P (MS33)	F
	.5x.2 NP (BSA)	F
	1/4x1 P (MS25) & 3/8x.5 P (MS33)	G
	.75x.2 NP (BSA)	G
	1/4x1.5mm P (MS25) & 3/8x1 P (MS33)	H
	1x.25 P (BSA)	H
	1/4x2 mm P (MS25) & 3/8x1.2" P (MS33)	I
	1.5x.25 P (BSA)	I
	1/4x3 mm P (MS25) & 3/8x2 mm P (MS33)	J
	1.5 x 1 P (BSA)	J
	.631x1 P (BSA)	L
	.5x.5 P (BSA)	Q
	1x1 P (BSA)	T
	1.5x1.875 P (BSA)	Z
Coupling & Motor Adaptor Combination	All BSAs	(blank)
	22mm Round frame (MS25) & NEMA 17 Square frame (MS33)	A
	NEMA 17 Square Stepper (MS25) & NEMA 23 Square (MS33)	B
	NEMA 17 Square Servo (MS25)	C
Length	Inch - Inches (BSA only) (where XX is a numerical value)	LXX
	Special modifications - Inch	-SLXX
	Metric - Millimeters (MS or BSA)	LXXX
	Special modifications - Metric	-SLXXX

See individual product specifications sections for more details on standard product offering.

Having Trouble Specifying a Slide Table?

Fill out an application analysis form on page B-6 and fax it to our Application Engineering Group.

Have a Custom Requirement?

See our custom capabilities section for ideas or contact our Application Engineering Group with your specific needs.

Extreme application requirements which exceed the performance specifications of the standard product can be satisfied by the broad range of capabilities for customization provided by Danaher Motion.

The following special options are proposed for consideration when such application extremes exist:

Extreme Temperature / Humidity Requirements
- Shafting: S/S, chrome plate, Armoloy* plate, nickel plate
- Bearings: Chrome-plated bearing-plates and S/S balls (-CR option)
- Square rails: Chrome-plated screw, Armoloy* plated screw

Extreme Travel Lengths
- Shafting: Butt joints
- Square Rail: Butt joints
- Base: Butt joints, welded joints

Heavy or Special Contamination Conditions
- Bearings: Double seals, polymer sleeve
- Actuation: Leadscrew & leadnut
- Accessories: Bellows, Shroud
- Lubricants: Oils, Dry lubricants, Clean room compatible greases

Extreme Positional Accuracy Requirements
- Actuation: Ground ballscrew and ballnut, special end mounting for ball screws
- Accessories: Rotary Encoder, resolver, potentiometer, proximity switches, linear encoder

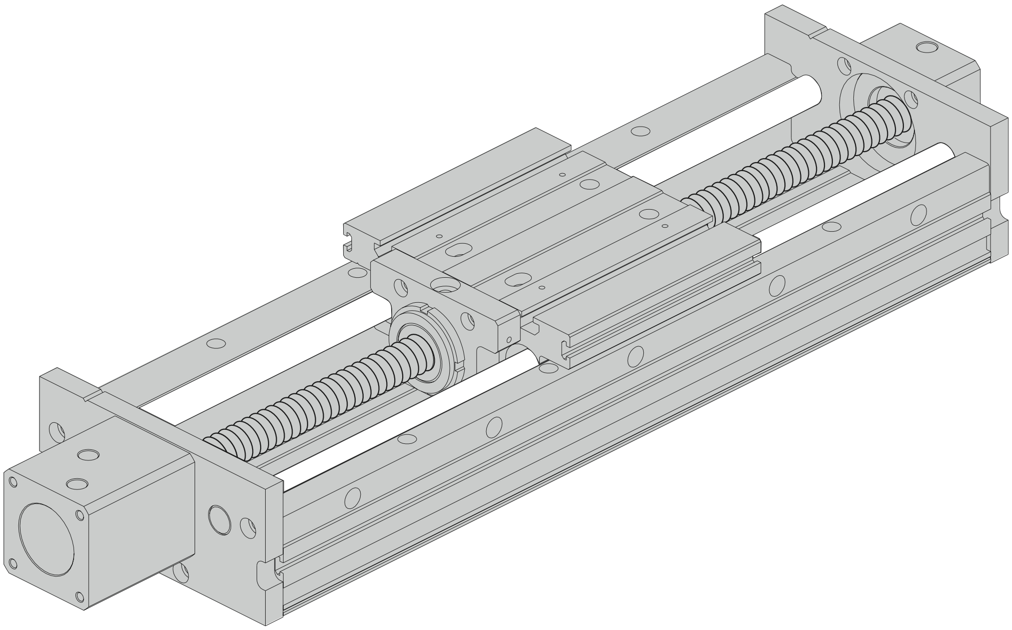
Extreme Deflection Requirements
- Square Rails/Bearings: Heavy preloaded bearings
- Accessories: Rotary Encoder, resolver, potentiometer, proximity switches, linear encoder
- Carriage/Base: Steel carriage top plate, steel base plate

Extreme Smoothness Requirements
- Bearings: Polymer sleeve
- Actuators: Leadscrew and leadnut, ground ball screw and ballnut

Special Non-Backdriving Requirements for vertical/inclined configurations
- Actuation: High-pitch leadscrew and leadnut
- Accessories: Electric brake

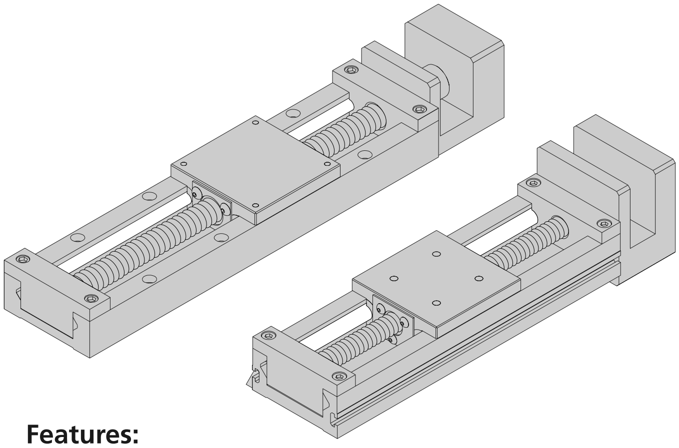
Phone: 1-800-554-8466
Website: www.linearactuators.com

NOTES:



Linear Slide Tables

Ball Screw and Lead Screw Driven



Thomson Microstage* MS

Actuated Linear Motion System

Metric

Specifying a Thomson Linear Motion System:

1. Determine the proper system for your load and life requirements.

2. Select the part number.

3. Place your order with your local authorized Thomson distributor.

Part Numbering System

MS33-LFB-L400

System Designation — Actuator Type — Screw Lead — Coupling and Motor Adaptor Combination — Overall Length

Features:

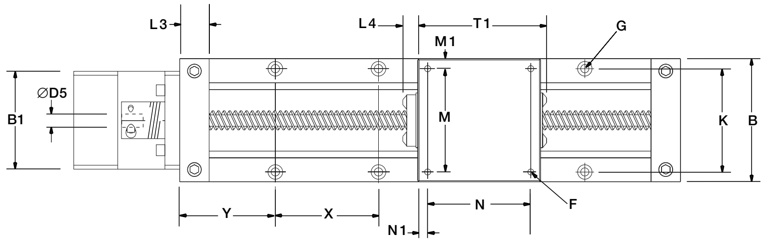
- Compact, lightweight channel extrusion
- Pre-aligned and pre-assembled for immediate installation and use
- Designed for light loads

Components:

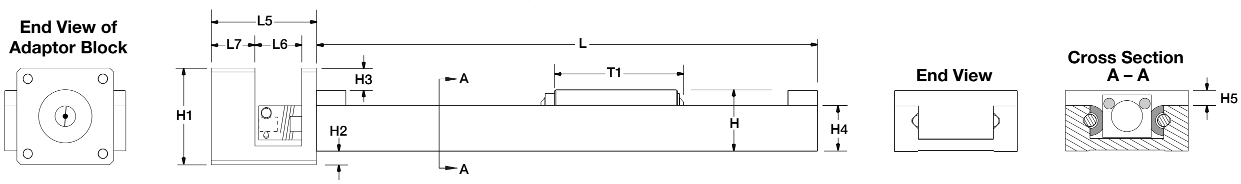
- 4 segmented-technology Super Ball Bushing bearings
- 1 double LinearRace* rail assembly
- 1 Integrated lead screw assembly
- 1 Aircraft-grade aluminum base extrusion

Dimensions (Metric)

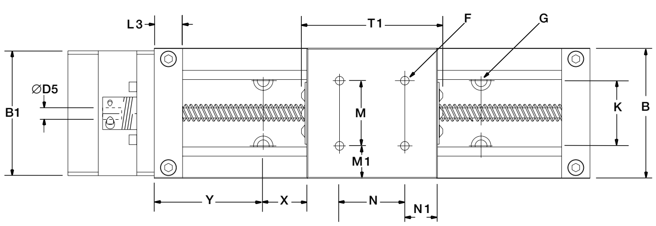
MS25



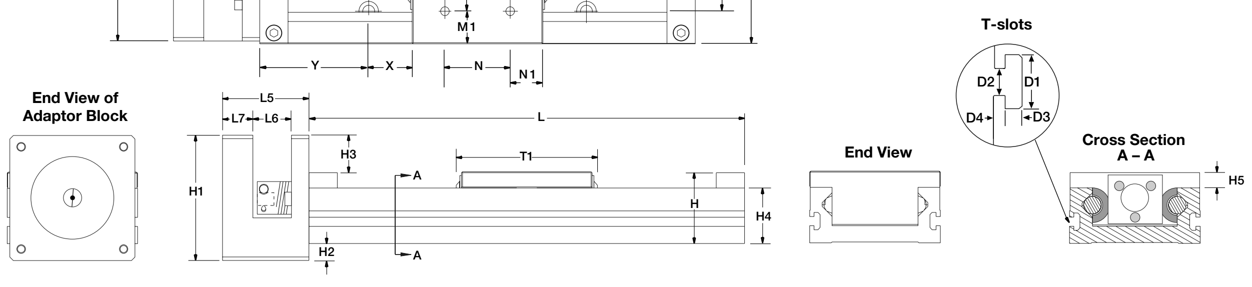
Maximum Stroke Length is determined by subtracting the carriage length (T1), 2x the end block length (L3) and the nut extension (L4) from the total System length (L).



MS33



Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2x the end block length **(L3)** from the total Linear Guide length **(L)**.



MicroStage MS25 Lead Screw Actuated Linear Motion System													(Dimensions in mm)
Part Number	B	B1	D5	F	G	H	H1	H2	H3	H4	H5	K	L3
MS25-LXA-LXXX	50	32,0	3,0	M3 x 0,5	M3 Screw	25	22,0	3,25	0,45	18,6	6	42	12
MS25-LXB-LXXX	50	39,9	6,35	M3 x 0,5	M3 Screw	25	39,9	5,7†	9,4	18,6	6	42	12
MS25-LXC-LXXX	50	39,9	5	M3 x 0,5	M3 Screw	25	39,9	0	9,4	18,6	6	42	12

MicroStage MS25 Lead Screw Actuated Linear Motion System											(Dimensions in mm)
Part Number	L4	L5	L6	L7	N	N1	M	M1	T1	Base Mounting Hole		Load Capacity
										X	Y	
MS25-LXA-LXXX	12	27,75	18,75	3,0	42	4	42	4	52,5	42	39	100N
MS25-LXB-LXXX	12	43,25	19,25	18,0	42	4	42	4	52,5	42	39	100N
MS25-LXC-LXXX	12	35,0	20,0	9,0	42	4	42	4	52,5	42	39	100N

MicroStage MS25 System			
Part Number	Length (L) (mm)	Stroke (mm)	Weight (kg)
MS25-LXA-L120	120	31,5	0,42
MS25-LXA-L204	204	115,5	0,56
MS25-LXA-L288	288	199,5	0,71
MS25-LXA-L372	372	283,5	0,86
MS25-LXB-L120	120	31,5	0,45
MS25-LXB-L204	204	115,5	0,60
MS25-LXB-L288	288	199,5	0,75
MS25-LXB-L372	372	283,5	0,89
MS25-LXC-L120	120	31,5	0,42
MS25-LXC-L204	204	115,5	0,56
MS25-LXC-L288	288	194,5	0,71
MS25-LXC-L372	372	283,5	0,86

MicroStage MS25 System		
Part Number	Screw Lead	Screw Diameter
MS25-LAX-LXXX	0,025"	0,250"
MS25-LBX-LXXX	0,050"	0,250"
MS25-LCX-LXXX	0,062"	0,250"
MS25-LDX-LXXX	0,200"	0,250"
MS25-LEX-LXXX	0,250"	0,250"
MS25-LFX-LXXX	0,500"	0,250"
MS25-LGX-LXXX	1,000"	0,250"
MS25-LHX-LXXX	1,5mm	0,250"
MS25-LIX-LXXX	2mm	0,250"
MS25-LJX-LXXX	3mm	0,250"

† Adaptor Block extends below the mounting surface of the System Rail Assembly.

Motor Adaptor block and Coupling dimensions are shown on page B-57.

Custom Lengths

Custom lengths are available. For special requirements, please contact the Thomson Systems Application Engineering Department.

MicroStage MS33 Lead Screw Actuated Linear Motion System														(Dimensions in mm)
Part Number	B	B1	D1	D2	D3	D4	D5	F	G	H	H1	H2	H3	H4	H5
MS33-LXA-LXXX	60	39,9	8,0	4,2	2,75	2	6,35	M5 x 0,8	M5 Screw	33	39,9	1,05	8,45	25,5	7
MS33-LXB-LXXX	60	57,66	8,0	4,2	2,75	2	6,35	M5 x 0,8	M5 Screw	33	57,66	7,83†	17,33	25,5	7

MicroStage MS33 Lead Screw Actuated Linear Motion System												(Dimensions in mm)
Part Number	K	L3	L5	L6	L7	N	N1	M	M1	T1	Base Mounting HoleLoad		
											X	Y	Capacity
MS33-LXA-LXXX	30	13	43,25	19,25	18,0	30	15	30	15	65	100	50	150N
MS33-LXB-LXXX	30	13	39,75	17,75	14,0	30	15	30	15	65	100	50	150N

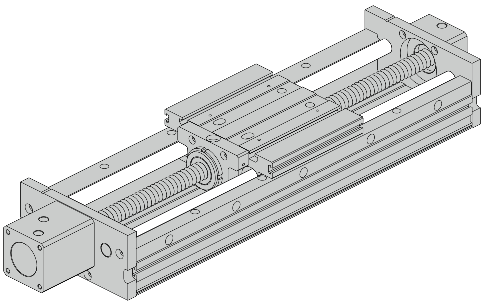
MicroStage MS33 System			
Part Number	Length (L) (mm)	Stroke (mm)	Weight (kg)
MS33-LXA-L200	200	100	0,95
MS33-LXA-L300	300	200	1,25
MS33-LXA-L400	400	300	1,56
MS33-LXB-L200	200	100	1,07
MS33-LXB-L300	300	200	1,37
MS33-LXB-L400	400	300	1,68

MicroStage MS33 System		
Part Number	Screw Lead	Screw Diameter
MS33-LAX-LXXX	0,0625"	0,375"
MS33-LBX-LXXX	0,100"	0,375"
MS33-LCX-LXXX	0,125"	0,375"
MS33-LDX-LXXX	0,200"	0,375"
MS33-LEX-LXXX	0,250"	0,375"
MS33-LFX-LXXX	0,375"	0,375"
MS33-LGX-LXXX	0,500"	0,375"
MS33-LHX-LXXX	1,000"	0,375"
MS33-LIX-LXXX	1,200"	0,375"
MS33-LJX-LXXX	2mm	0,375"

† Adaptor Block extends below the mounting surface of the System Rail Assembly.

Custom Lengths and Delivery Information

Custom lengths are available. For special requirements, please contact the Thomson Systems Application Engineering Department.



SuperSlide* 2RB

Continuously Supported System
with Integral Ball Screw Assembly
and T-Slot Carriage
Metric

Features

- Used in continuously supported applications when moderate stiffness and rigidity is required
- Single part number is all that is required
- T-Slot in carriage provides quick and easy mounting and removal of the workpiece

Components

- 1 double LinearRace* rail assembly with T-Slots for mounting ease
- 1 T-Slot integrated carriage with 4 open type Super Smart Ball Bushing* bearing
- 1 Ball screw assembly

Specifying this Thomson System:

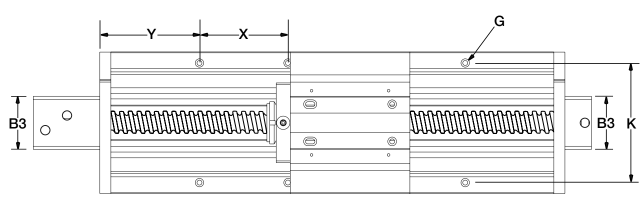
1. Determine the proper system for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in millimeters, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).
4. Place your order with your local authorized Danaher Motion distributor.

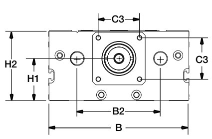
Part Numbering System

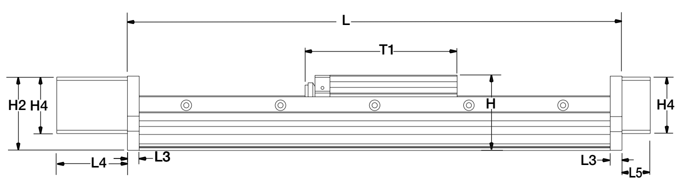
2RB-M16-ODM-I L600

System Designation
Nominal Diameter
System Length
Type of Ball Screw
Type of Carriage
Type of Support

Dimensions (Metric)

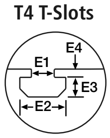




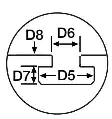


Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2x end block length **(L3)** from the total system length.

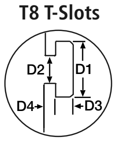
T4 T-Slots

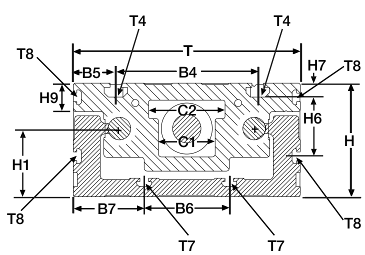


T7 T-Slots



T8 T-Slots





Carriage X-Section

THOMSON

SuperSlide 2RB System with Integral Ball Screw Assembly and T-Slot Carriage										(Dimensions in mm)
Part Number	Nominal Dia.	Ball Screw (Dia. x Lead)	Accuracy mm/300 mm	Repeatability	B	B2	B3	C3	G	H1
2RB-M12-ODM-G	12	16x5 P	0,025	± 0,005	130	75	60	47,15	M4	40
2RB-M12-ODM-H	12	16x10 P	0,025	± 0,005	130	75	60	47,15	M4	40
2RB-M16-ODM-I	16	20x5 P	0,025	± 0,005	160	95	60	47,15	M5	48
2RB-M16-ODM-J	16	20x10 P	0,025	± 0,005	160	95	60	47,15	M4	48
2RB-M16-ODM-K	16	20x20 P	0,025	± 0,005	160	95	60	47,15	M4`	48

SuperSlide 2RB System with Integral Ball Screw Assembly and T-Slot Carriage											(Dimensions in mm)
Part Number	Nominal Diameter	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6
2RB-M12-ODM	12	75	27,5	65	32,5	8,0	4,2	2,75	2	8,0	4,2
2RB-M16-ODM	16	100	30	80	40	10,5	6	3,5	2,5	10,5	6

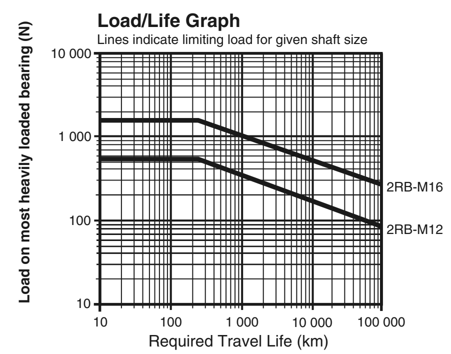
SuperSlide 2RB System with Integral Ball Screw Assembly and T-Slot Carriage											(Dimensions in mm)
Part Number	D7	D8	E1	E2	E3	E4	H	H1	H6	H7	H9	T
2RB-M12-ODM	2,75	2	7,5	13	4	3	65	40	35	7	14	130
2RB-M16-ODM	3,5	2,5	8,1	16,5	6,8	3	80	48	41,5	10	20	160

SuperSlide 2RB System with Integral Ball Screw Assembly and T-Slot Carriage										(Dimensions in mm)
Part Number	H2	H4	K	L3	L4	L5	T1	Base Mounting Holes		Max. Stroke Length
								X	Y	
2RB-M12-ODM	75	60	110	9,5	70	26,5	130	75	75	L-149
2RB-M16-ODM	79	60	135	12,5	75	31,5	160	100	100	L-185

System 2RB Standard Lengths (Lengths in mm)

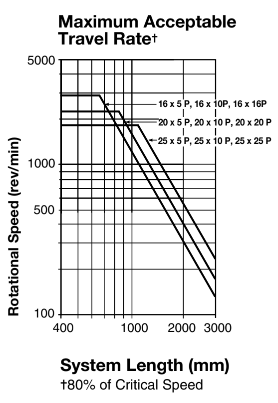
System	300	375	400	450	500	525	600	675	700	750	800	825	900	975	1000	1050	1100	1125	1200	1275	1300	1350	1400	1425	1500	X	MAX
2RB-M12	■	■		■		■	■	■		■		■	■	■		■		■	■	■		■		■	■	75	2100
2RB-M16	■		■		■		■		■		■		■		■		■		■		■		■		■	100	3000

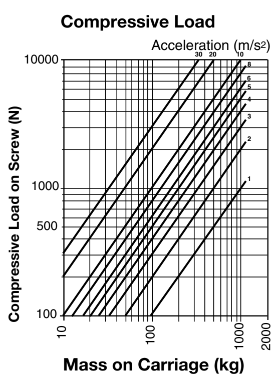
For Motor Coupling specifications, see page B-56.
For Bellows Way Covers, see page B-52.
For Limit Switch Packages, see pages B-65.
For Radial Mount Ball Screw Shaft Extenders, see page B-58.
For Spring Set electric brakes, see page B-62.
For TNUT mounting hardware, see page B-59.

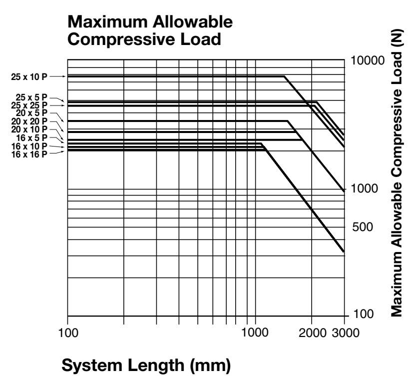


Custom Lengths

Custom length systems are also available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Danaher Motion Systems application engineering department.



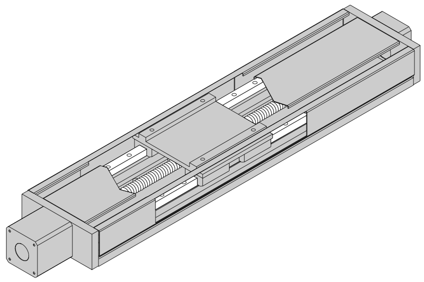




The SuperSlide has a pre-designed **Maximum Acceptable Travel Rate**. Calculate maximum rotational speed (rpm) by dividing your required-maximum linear speed (m/s) by the corresponding system ball screw lead (m/rev). Enter the chart with the required system length and your maximum acceptable travel rate curve above the plotted line.

Compressive load on the ball screw is a key factor in selecting the proper System. Using maximum load and acceleration requirements, plot compressive load on the left side of the chart.Using System length and compressive load. plot the maximum allowable compressive force on the right chart. Select the System with a rated maximum compressive force above your plotted point. If you have questions concerning your system requirements, contact the Thomson **Systems** application engineering department.

Note: Ball screw should never exceed recommended critical speed.



AccuSlide* 2HB

Continuously Supported ProfileRail*System,
with Carriage and Integral Ball Screw Assembly

Metric

Features

- Used in continuously supported applications that require **high** stiffness and rigidity
- Single part number is all that is required
- Equipped with high load and moment capacity AccuGlide* ProfileRail* System
- Protective shroud available with no reduction of stroke length

Components

- 1 double ProfileRail Assembly with T-Slots for mounting ease
- 1 carriage with 4 mounting holes
- 1 Integral Ball Screw Assembly

Specifying this Thomson System:

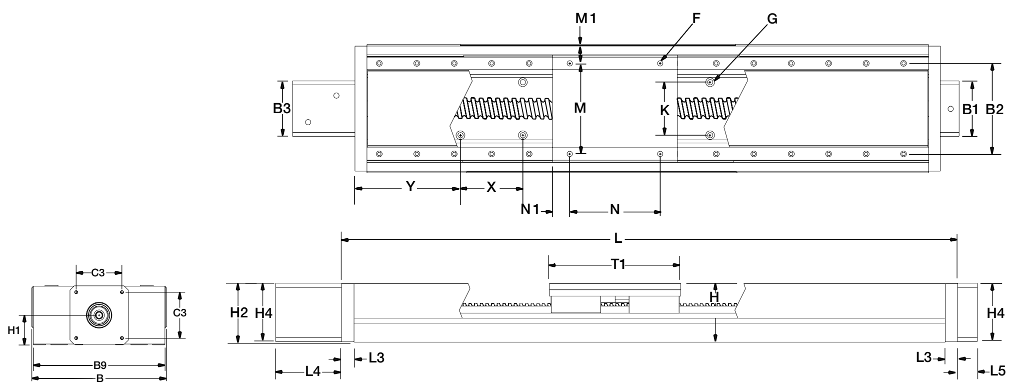
1. Determine the proper system for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in millimeters, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).
4. Place your order with your local authorized Danaher Motion distributor.

Part Numbering System

2HB-M20-OYP L L685

- System Designation
- Nominal Diameter
- Type of Support
- Type of Carriage
- Type of Ball Screw
- System Length

Dimensions (Metric)



Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2 times the end block length **(L3)** from the total system length **(L)**.

Image depicts **optional** shroud cover.

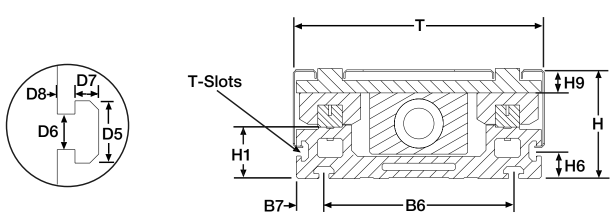


Image depicts **optional** shroud cover.

Metric AccuSlide 2HB ProfileRail System with Integral Ball Screw Assembly and Carriage												(Dimensions in mm)	
Part Number	Ball Screw (Dia. x Lead)	Accuracy mm/300mm	Repeatability	B	B1	B2	B3	B9	C3	F	G	H	H1
2HBM10OYPG	16 x 5 P	0,025	± 0,005	100	60	70	60	105	47,15	M5	M5	60	31
2HBM10OYPH	16 x 10 P	0,025	± 0,005	100	60	70	60	105	47,15	M5	M5	60	31
2HBM20OYPL	25 x 5 P	0,025	± 0,005	200	88	145	88	205	69,6	M10	M8	90	45
2HBM20OYPM	25 x 10 P	0,025	± 0,005	200	88	145	88	205	69,6	M10	M8	90	45
2HBM20OYPN	25 x 25 P	0,025	± 0,005	200	88	145	88	205	69,6	M10	M8	90	45

Metric AccuSlide 2HB ProfileRail System with Integral Ball Screw Assembly and Carriage												(Dimensions in mm)
Part NumberDiameter	Nominal	D5	D6	D7	D8	B6	B7	H	H1	H6	H9	T
2HB-M10	10	10,5	6	3	2,5	70	15	60	31	15	13	100
2HB-M20	20	16,5	8,1	6	4	155	22,5	90	45	22,5	20	200

Appropriate mounting holes can be added for mounting the base of one system to the carriage of another for x–y configurations.

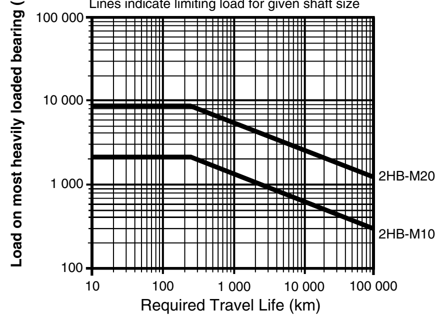
Metric AccuSlide 2HB ProfileRail System with Integral Ball Screw Assembly and Carriage													(Dimensions in mm)
Part Number	H2	H4	K Central	M	M1	N	N1	L3	L4	L5	T1	X	Y	Max. Stroke Length Without Bellows
2HB-M10	61	60	35	70	15	70	15	12,5	70	26,5	100	75	37,5	L-125
2HB-M20	89	88	85	145	27,5	145	27,5	20	105	40	200	120	42,5	L-240

Metric System 2HB Standard Lengths																					(Lengths in mm)
System	300	325	375	450	445	525	565	600	675	685	750	825	805	900	925	975	1045	1165	1285	1405	X	MAX
2HB-M10	■		■	■		■		■	■		■	■		■		■					75	1500
2HB-M20		■			■		■			■			■		■		■	■	■	■	120	3000

For Motion Control Options refer to the Motion Control Section on page B-66.
For Motor Coupling specifications, see page B-56.
For Bellows Way Covers, see page B-52.
For Limit Switch Packages, see pages B-63.
For Radial Mount Ball Screw Shaft Extenders, see page B-58.
For Spring Set electric brakes, see page B-62.
For TNUT mounting hardware, see page B-59.

Load/Life Graph

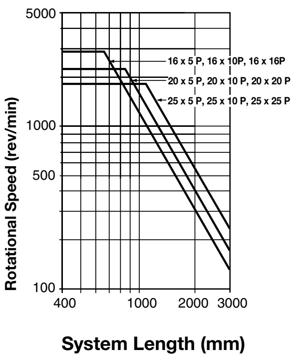
Lines indicate limiting load for given shaft size



Custom Lengths

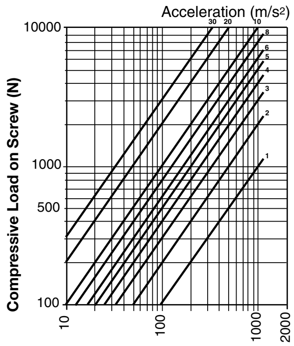
Custom length systems are available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Danaher Motion Systems application engineering department.

Maximum Acceptable Travel Rate†

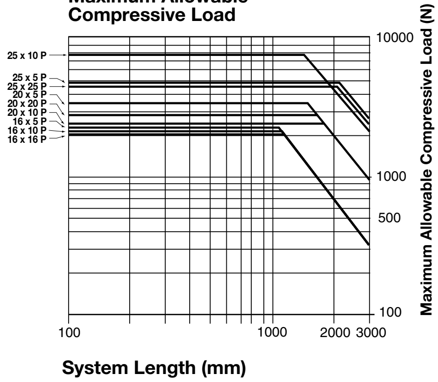


†80% of Critical Speed

Compressive Load



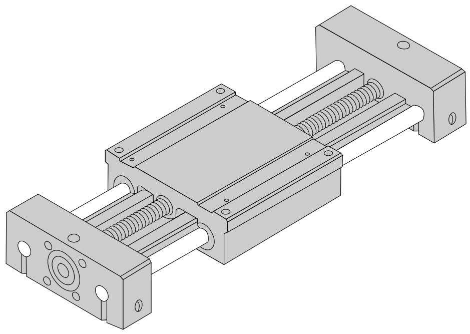
Maximum Allowable Compressive Load



The AccuSlide has a pre-designed **Maximum Acceptable Travel Rate**. Calculate maximum rotational speed (rpm) by dividing your required maximum linear speed (m/s) by the corresponding system ball screw lead (m/rev). Enter the chart with the required system length and your maximum rotational speed. Select the system with a maximum acceptable travel rate curve above the plotted line.

Compressive load on the ball screw is a key factor in selecting the proper System. Using maximum load and acceleration requirements, plot compressive load on the left side of the chart.Using System length and compressive load. plot the maximum allowable compressive force on the right chart. Select the System with a rated maximum compressive force above your plotted point.If you have questions concerning your system requirements, contact the Thomson **Systems** application engineering department.

Note: Ball screw should never exceed recommended critical speed.



SuperSlide* 2DB

Continuously Supported System

with Carriage and Integral Ball Screw Assembly

Inch

Features

- Used in continuously supported applications when rigidity is required
- Pre-aligned and preassembled for immediate installation and use
- Designed for medium to heavy loads
- Integrated ball screw assembly with standard NEMA motor mounting

Components

- 1 Dual LinearRace* Rail Assembly
- 1 modular carriage with 4 open type Super Smart Ball Bushing* Pillow blocks
- 1 integrated ball screw or lead screw assembly

Specifying a Thomson System:

1. Determine the proper system for your load and life requirements.

2. Select the part number.

3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).

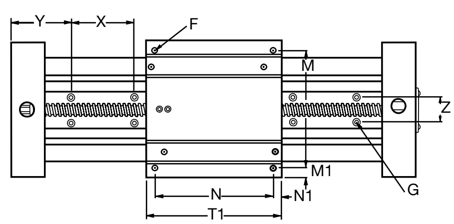
4. Place your order with your local authorized Thomson distributor.

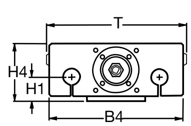
Part Numbering System

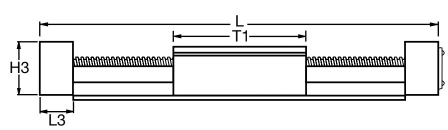
2DB-12-OUB-F L24

System Designation — 2DB
Nominal Diameter — 12
Type of Bearing Block — O
Type of Support — U
Type of Carriage — B
Ball Screw — F
System Length — L24

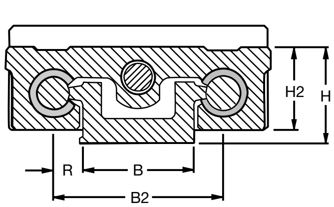
Dimensions (Inch)

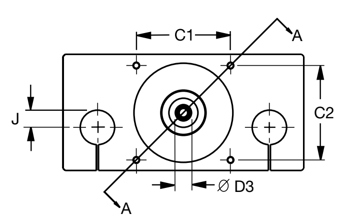


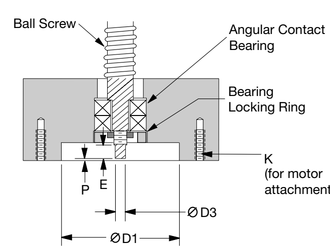




Maximum Stroke Length (without Bellows) is determined by subtracting the carriage length **(T1)** and 2x the end support length **(L3)** from the total system length.







SuperSlide 2DB with Carriage and Integral Ball Screw Assembly														(Dimensions in inches)
Part Number	Nominal Diameter	Ball or Lead Screw (Dia. x Lead)	Accuracy in/ft	Repeatability in	T1	L3	H	H1	H2	H3	H4	B	R	T
2DB-08-OUB-AA	.50	L .375 x .10 P	<.008	±.0002	4.5	1.25	1.625	.875	1.43	1.90	2.02	2.00	.500	4.600
2DB-08-OUB-AB		L .375 x .25 P												
2DB-08-OUB-AC		L .375 x .50 P												
2DB-08-OUB-AD		L .375 x .75 P												
2DB-08-OUB-AE		L .375 x 1.0 P												
2DB-12-OUB-B	.75	B 12mm x 5mm NP	<.002	<.002	6.0	1.50	2.125	1.125	1.93	2.37	2.62	2.63	.688	6.100
2DB-12-OUB-F		B .500 x .200 NP	<.002	<.002										
2DB-12-OUB-V		B .500 x .200 P	<.002	±.0002										
2DB-16-OUB-D	1.00	B 20mm x 5mm NP	<.002	<.002	7.5	2.00	2.625	1.375	2.45	3.37	3.49	3.25	.875	7.600
2DB-16-OUB-G		B .750 x .200 NP	<.002	<.002										
2DB-16-OUB-W		B .750 x .200 P	<.002	±.0002										

P- Indicates preloaded ball or lead screw. **NP-** Indicates non-preloaded ball screw. **B** - Indicates ball screw **L** - indicates lead screw
To determine system **Torque Requirements** or Ball Screw travel life refer to the Engineering Support Appendix, see page B-67.

SuperSlide 2DB with Carriage and Integral Ball Screw Assembly												(Dimensions in inches)
Part Number	B2	B4	N	N1	M	M1	X	Y	Z	F	G		Max. Stroke Length
											Bolt	Hole	
2DB-08-OUB	3.0	4.5	4.00	.25	4.00	.31	4.0	2.0	.75	#10-32	1/4	.28	L-(7.0)
2DB-12-OUB	4.0	6.0	5.25	.37	5.25	.42	6.0	3.0	1.00	1/4-20	5/16	.34	L-(9.0)
2DB-16-OUB	5.0	7.0	6.75	.37	6.75	.42	6.0	3.0	1.25	5/16-18	3/8	.41	L-(11.5)

SuperSlide 2DB with Carriage and Integral Ball Screw Assembly (Dimensions in inches)								
Part Number	C1	C2	D1	D3	E	J	K	P	Motor Size
2DB-08-OUB	1.75	1.25	1.50	.188	.300	.275	10-32	.05	NEMA 23
2DB-12-OUB	1.86	1.86	2.150	.250	.335	.300	10-32	.05	NEMA 23
2DB-16-OUB	2.74	2.74	2.876	.375	.560	.425	10-32	.05	NEMA 23 or 34

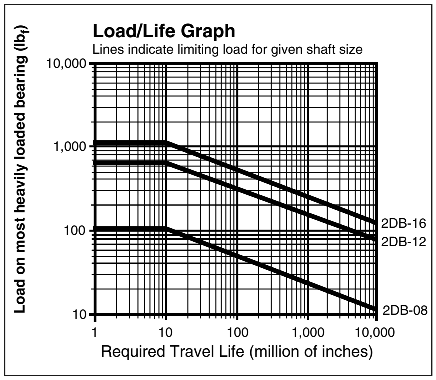
SuperSlide System 2DB Standard Lengths																(Lengths in inches)		
System	12	16	18	20	24	28	30	32	36	40	42	44	48	54	60	72	X	MAX
2DB-08	■	■		■	■	■		■	■	■		■	■				4	48
2DB-12			■		■		■		■		■		■				6	72
2DB-16			■		■		■			■		■		■	■	■	■	6

Maximum continuous length of support rails is 24". If longer continuous shaft support rails are required, contact the Danaher Motion Systems application engineering department.

Custom Lengths and Delivery Information

Custom length systems are also available. For special requirements, please contact the Danaher Motion application engineering department.

For Motor Adaptor and Motor Coupling information, see page B-55.
For Bellows Way Covers, see page B-52.
For Radial Mount Ball Screw Shaft Extenders, see page B-58.
For Spring Set electric brakes, see page B-62.
For Handwheels, see page B-59.

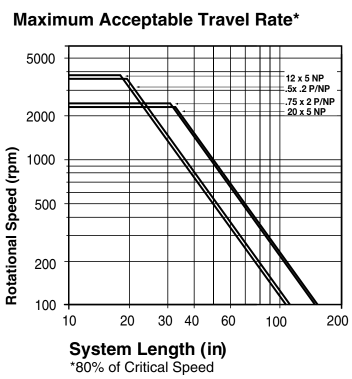


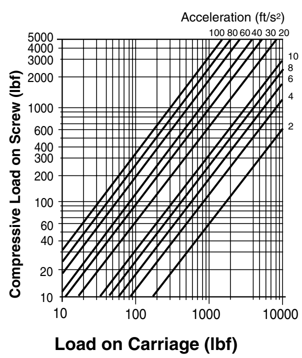
The SuperSlide has a pre-designed **Maximum Acceptable Travel Rate**. Calculate maximum rotational speed (rpm) by dividing your required maximum linear speed (in/min) by the corresponding system ball screw lead (in/rev.). Enter the chart with the required system length and your maximum rotational speed. Select the system with a maximum acceptable travel rate curve above the plotted line.

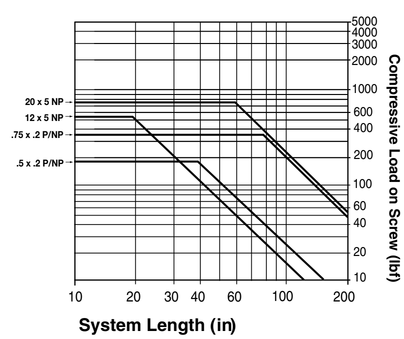
Compressive load on the ball screw is a key factor in selecting the proper System. Using maximum load and acceleration requirements, plot compressive load on the left side of the graph. Using System length and compressive load, plot the maximum allowable compressive force on the right chart. Select the System with a rated maximum compressive force above your plotted point.

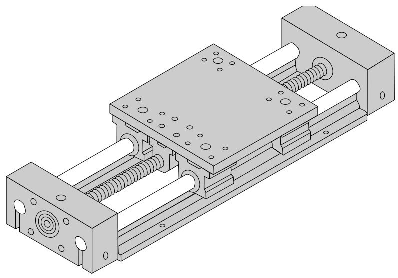
If you have questions concerning your system requirements, contact the Thomson **Systems** application engineering department.

Note: Ball screw should never exceed recommended critical speed.









SuperSlide* 2EB

Double Continuously Supported System

with Carriage and Integral Ball Screw Assembly

Inch

Features

- Used in continuously supported applications when rigidity is required
- Pre-aligned and preassembled for immediate installation and use
- Designed for medium to heavy loads
- Integrated ball screw assembly with standard NEMA motor mounting

Components

- 4 open type Super Smart Ball Bushing* pillow blocks
- 2 60 Case* LinearRace* Assemblies
- 2 integrated double end supports
- 1 mounting carriage top
- 1 integrated ball screw assembly

Specifying a Thomson System:

1. Determine the proper system for your load and life requirements.

2. Select the part number.

3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).

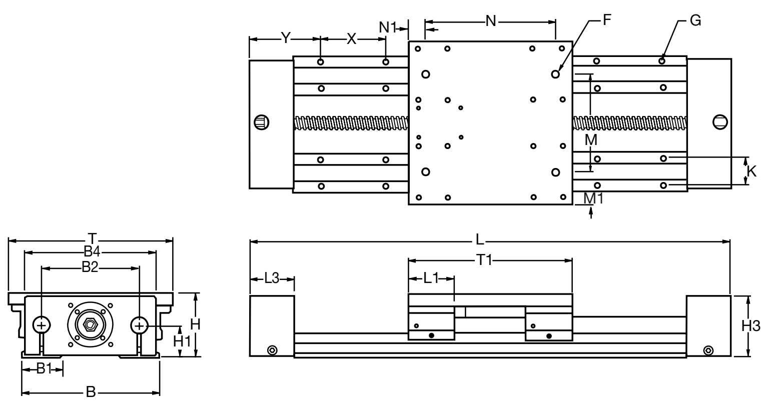
4. Place your order with your local authorized Thomson distributor.

Part Numbering System

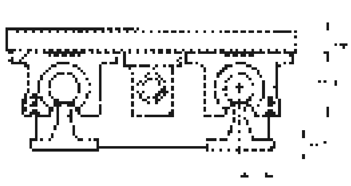
2EB-12-FTB-G L24

System Designation
Nominal Diameter
Type of Bearing Block
Type of Support
Type of Carriage
Ball Screw
System Length

Dimensions (Inch)



Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2x the end support length **(L3)** from the total system length.



SuperSlide 2EB with Carriage and Integral Ball Screw Assembly														(Dimensions in inches)
Part Number	Nom. Dia.	Ball Screw	Accuracy in /ft	Repeatability	L1	L3	T1	K	H	H1	H3	H6	H7	H9
2EB-08-FTB-B	.50	12mm x 5mm NP	<.002	<.002	1.50	1.5	5.5	1.00	2.187	1.125	2.38	.38	.19	1.12
2EB-08-FTB-F		.500 x .200 NP	<.002	<.002										
2EB-08-FTB-V		.500 x .200 P	<.002	±.0002										
2EB-08-FTB-Q		.500 x .500 P	<.002	±.0002										
2EB-12-FTB-D	.75	20mm x 5mm NP	<.002	<.002	1.88	2.0	7.5	1.25	2.937	1.500	2.75	.50	.25	1.56
2EB-12-FTB-G		.750 x .200 NP	<.002	<.002										
2EB-12-FTB-W		.750 x .200 P	<.002	±.0002										
2EB-12-FTB-L		.631 x 1.00 P	<.002	±.0002										
2EB-12-FTB-U		20mm x 20mm NP	<.002	<.002										
2EB-16-FTB-H		1.00 x .250 P	<.002	±.0002										
2EB-16-FTB-T	1.00	1.00 x 1.00 P	<.002	±.0002	2.63	2.2	9.0	1.50	3.437	1.750	3.37	.50	.25	2.00
2EB-24-FTB-I		1.50 x .250 P	<.002	±.0002										
2EB-24-FTB-J	1.50	1.50 x 1.00 P	<.002	±.0002	3.75	2.8	13.0	2.25	5.000	2.500	4.87	.75	.38	2.94
2EB-24-FTB-Z		1.50 x 1.875 P	<.002	±.0002										

< Indicates Less Than ± Indicates Plus or Minus
P- Indicates preloaded ball screw.
NP- Indicates non-preloaded ball screw.
To determine system **Torque Requirements** or Ball Screw travel life refer to the Engineering Support Appendix, see page B-67.

Maximum continuous length of support rails is 24". If longer continuous shaft support rails are required, contact the Danaher Motion Systems application engineering department.

For Bellows Way Covers, see page B-52
For Radial Mount Ball Screw Shaft Extenders, see page B-58
For Spring Set electric brakes, see page B-62
For Handwheels, see page B-59
For motor coupling and motor mounting block specifications see the accessories section, page B-55

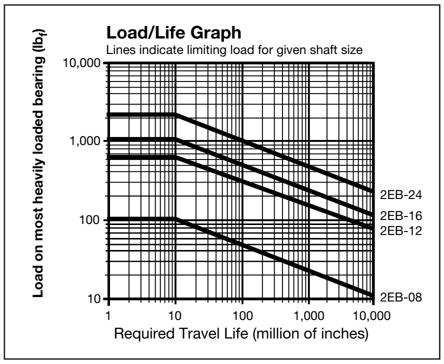
SuperSlide 2EB with Carriage and Integral Ball Screw Assembly																(Dimensions in inches)
Part Number	T	B	R	B1	B2	B4	N	N1	M	M1	X	Y	F	G		Max. Stroke Length	Motor Size
														Bolt	Hole		
2EB-08	5.5	4.75	.750	1.50	3.25	4.25	4.5	.50	3.25	1.13	4.0	2.0	1/4-20	#8	.19	L-(8.5)	NEMA 23
2EB-12	7.5	6.25	.875	1.75	4.50	6.00	6.0	.75	4.50	1.50	6.0	3.0	5/16-18	#10	.22	L-(11.5)	NEMA 23
2EB-16	9.0	7.63	1.062	2.12	5.50	7.25	7.0	1.00	5.50	1.75	6.0	3.0	3/8-16	1/4	.28	L-(13.4)	NEMA 34
2EB-24	13.0	11.00	1.500	3.00	8.00	10.75	10.0	1.50	8.00	2.50	8.0	4.0	1/2-13	5/16	.34	L-(18.6)	NEMA 42

SuperSlide 2EB Standard Lengths																(Lengths in inches)
System	18	24	30	32	36	40	42	48	54	56	60	64	66	72	X	MAX
2EB-08	■	■	■		■		■	■							6	72
2EB-12	■	■	■		■		■	■							6	96
2EB-16	■	■	■		■		■	■	■		■		■	■	6	144
2EB-24		■		■		■		■		■		■		■	8	176

Custom Lengths

Custom length systems are available. For special requirements, please contact the Danaher Motion Systems application engineering department.

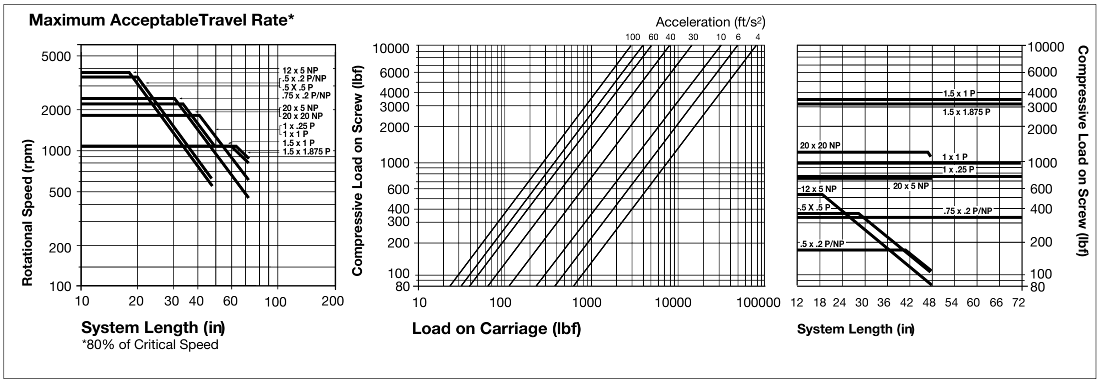
Determining the SuperSlide System for your application:
To determine the System which best meets your needs, calculate **travel life vs. load** based on your application criteria. Calculate the load on the most heavily loaded bearing and total travel life requirements from stroke length and duty cycle. Select the system witha rated load life above your plotted point.



The SuperSlide has a pre-designed **Maximum Acceptable Travel Rate.** Calculate maximumrotational speed (rpm) by dividing your required maximum linear speed (in/min) by the corresponding system ball screw lead (in/rev.). Enter the chartwith the required system length and your maximum rotational speed. Select the system with a maximum acceptable travel rate curve above the plotted line.

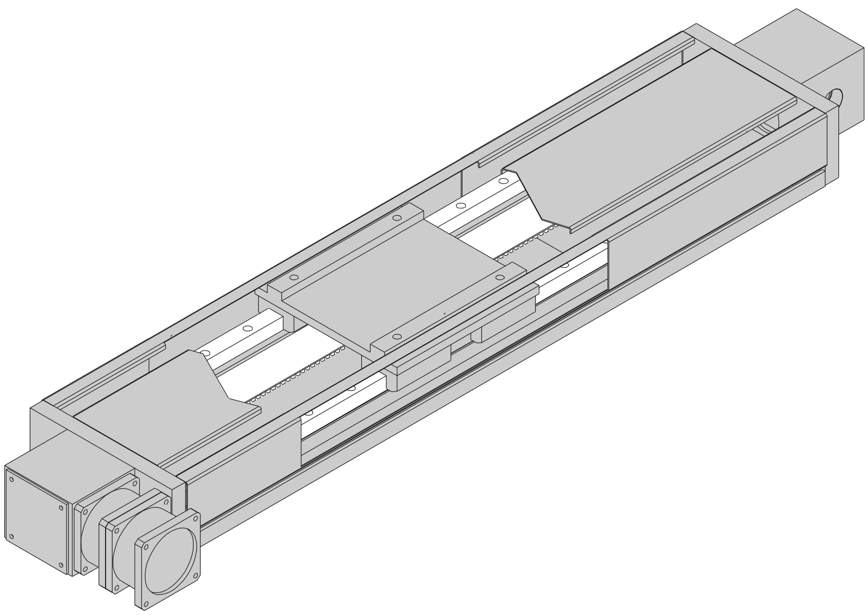
Compressive load on the ball screw is a key factor in selecting the proper System. Using maximum load and acceleration requirements, plot compressive load on the left side of the chart. Using System length and compressive load. plot the maximum allowable compressive force on the right chart. Select the System with a rated maximum compressive force above your plotted point. If you have questions concerning your system requirements, contact the Thomson **Systems** application engineering department.

Note: Ball screw should never exceed recommended critical speed.



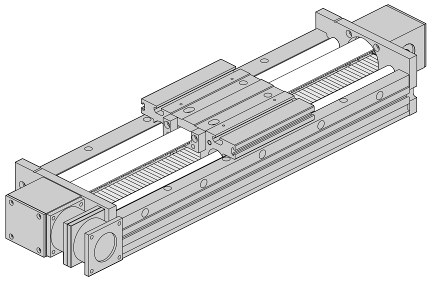
Phone: 1-800-554-8466
Website: www.linearactuators.com

NOTES:



Linear Slide Tables

Belt Driven



SuperSlide* 2RE

Continuously Supported System
with Integral Belt Drive Assembly
and T-Slot Carriage
Metric

Features

- Used in continuously supported applications when moderate rigidity is required
- High speed and acceleration
- T-Slot in carriage provides quick and easy mounting and removal of the workpiece

Components

- 1 double LinearRace* Rail Assembly with T-Slots for mounting ease
- 1 T-Slot integrated carriage with 4 open type Super Smart Ball Bushing* bearings
- 1 Integral Belt Actuated Assembly
- 1 integral NemaTRUE* Planetary* Precision gearhead

Specifying this Thomson System:

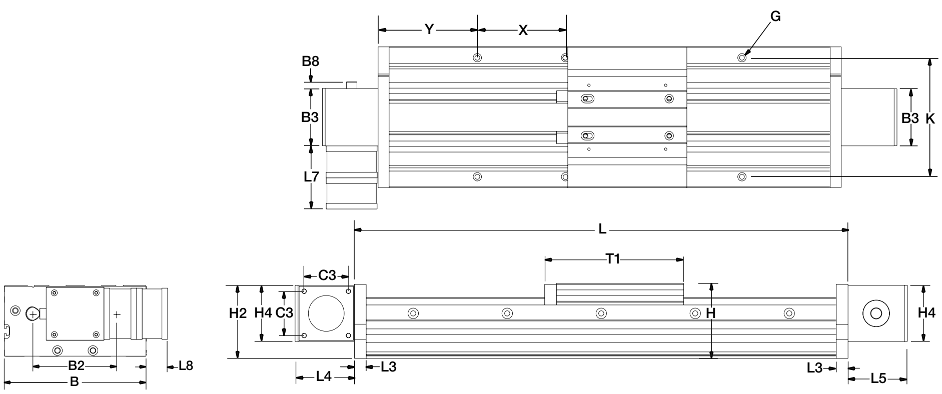
1. Determine the proper system for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in millimeters, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).
4. Place your order with your local authorized Danaher Motion distributor.

Part Numbering System

2RE-M16-OEM-A-L600

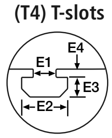
System Designation
Nominal Diameter
Type of Support
Type of Carriage
Type of Gearbox
System Length

Dimensions (Metric)

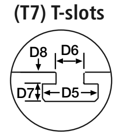


Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2X end block length **(L3)** from the total system length.

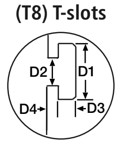
(T4) T-slots

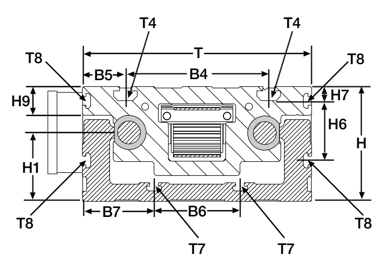


(T7) T-slots



(T8) T-slots





(T9) T-slots

SuperSlide 2RE System with Integral Belt Actuated Assembly and T-Slot Carriage										(Dimensions in mm)
Part Number	Nominal Dia.	B	B2	B3	C3	G	H	H2	H4	K
2RE-M12-OEM	12	130	75	65	47,15	M4	65	75	60	110
2RE-M16-OEM	16	160	95	65	47,15	M5	80	79	60	135

SuperSlide 2RE System with Integral Belt Actuated Assembly and T-Slot Carriage										(Dimensions in mm)
Part Number	Nominal Diameter	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6
2RE-M12-OEM	12	75	27,5	65	32,5	8,0	4,2	2,75	2	8,0	4,2
2RE-M16-OEM	16	100	30	80	40	10,5	6	3,5	2,5	10,5	6

SuperSlide 2RE System with Integral Belt Actuated Assembly and T-Slot Carriage												(Dimensions in mm)
Part Number	D7	D8	E1	E2	E3	E4	H	H1	H6	H7	H9	T
2RE-M12-OEM	2,75	2	7,5	13	4	3	65	40	35	7	14	130
2RE-M16-OEM	3,5	2,5	8,1	16,5	6,8	3	80	48	41,5	10	20	160

SuperSlide 2RE System with Integral Belt Actuated Assembly and T-Slot Carriage								(Dimensions in mm)
Part Number	L3	L4	L5	L7	T1	Base Mounting Hole		Max. Stroke Length
						X	Y	
2RE-M12-OEM	9,5	61,5	61,5	71,6	130	75	75	L-149
2RE-M16-OEM	12,5	61,5	61,5	71,6	160	100	100	L-185

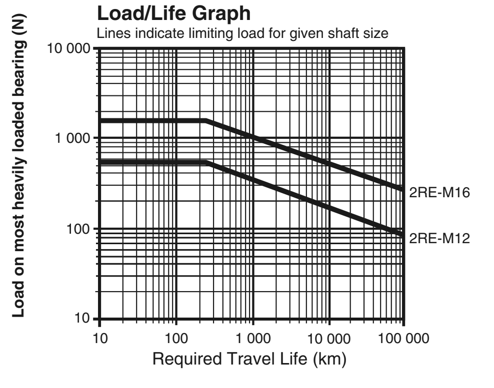
System 2RE Standard Lengths																										(Lengths in mm)
System	300	375	400	450	500	525	600	675	700	750	800	825	900	975	1000	1050	1100	1125	1200	1275	1300	1350	1400	1425	1500	X	MAX
2RE-M12	■	■		■		■	■	■		■		■	■	■		■		■	■	■		■		■	■	75	3000
2RE-M16	■		■		■		■		■		■		■		■		■		■		■		■		■	100	3000

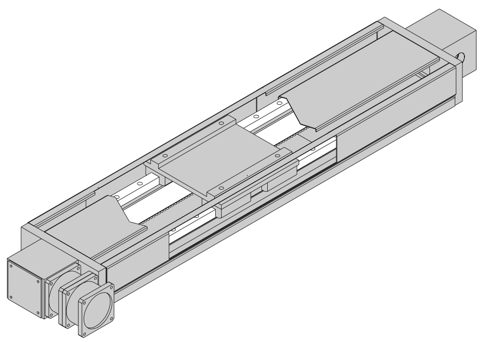
For Bellows Way Covers, see page B-52.
For Limit Switch Packages, see pages B-65.
For Radial Mount Ball Screw Shaft Extenders, see page B-58.
For Spring Set electric brakes, see page B-62.
For TNUT mounting hardware, see page B-59.

Custom Lengths

Custom length systems are available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Danaher Motion Systems application engineering department.

SuperSlide 2RE Belt Actuated System			
System Part Number	Gear Ratio	Motor Frame Size	Gearbox Part Number
2RE-M12-OEM-A	1:1	NEMA23	NT-23-1
2RE-M12-OEM-B	3:1	NEMA23	NT-23-3
2RE-M12-OEM-C	5:1	NEMA23	NT-23-5
2RE-M12-OEM-D	10:1	NEMA23	NT-23-10
2RE-M16-OEM-A	1:1	NEMA23	NT-23-1
2RE-M16-OEM-B	3:1	NEMA23	NT-23-3
2RE-M16-OEM-C	5:1	NEMA23	NT-23-5
2RE-M16-OEM-D	10:1	NEMA23	NT-23-10





AccuSlide* 2HE

Continuously Supported ProfileRail* System
with Integral Belt Drive Assembly and Carriage
Metric

Features

- Used in continuously supported applications that require **high** rigidity
- Single part number is all that is required
- Equipped with high load and moment capacity AccuGlide* ProfileRail* System
- Protective shroud available with no reduction of stroke length

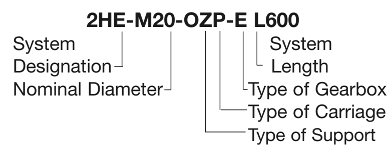
Components

- 1 double ProfileRail System Assembly
- 1 carriage with 4 mounting holes
- 1 Integral Belt Actuated Assembly
- 1 integral NemaTRUE* Planetary* Precision gearhead

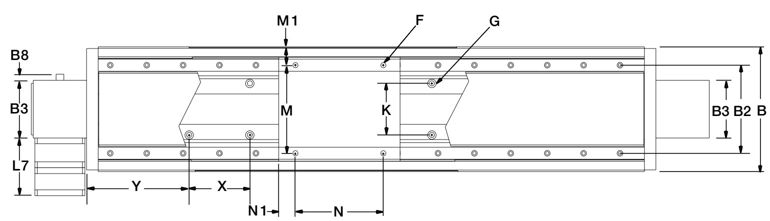
Specifying this Thomson System:

1. Determine the proper system for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in millimeters, as a suffix to the part number (choosing a standard length will reduce costs and speed delivery).
4. Place your order with your local authorized Danaher Motion distributor.

Part Numbering System



Dimensions (Metric)



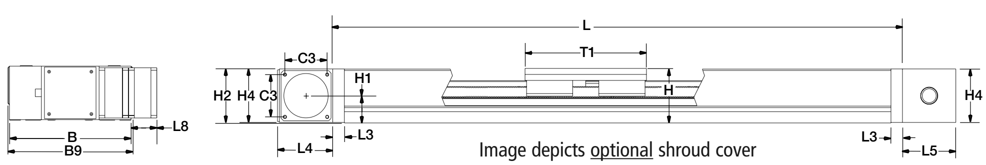


Image depicts optional shroud cover

Maximum Stroke Length is determined by subtracting the carriage length **(T1)** and 2X end block length **(L3)** from the total system length **(L).**

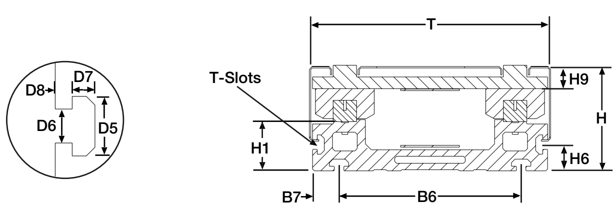


Image depicts optional shroud cover

Metric AccuSlide 2HE ProfileRail System with Integral Belt Actuated Assembly and Carriage													(Dimensions in mm)
Part Number	Nominal Size	B	B2	B3	B8	B9	C3	F	G	H	H1	H2	H4
2HE-M10-OZP	10	100	70	65	6,6	105	47,15	M5	M5	60	31	61	60
2HE-M20-OZP	20	200	145	95	10	205	69,6	M10	M8	90	45	89	88

Metric AccuSlide 2HE ProfileRail System with Integral Belt Actuated Assembly and Carriage														(Dimensions in mm)
Part Number	Nominal Size	K Central	L3	L4	L5	L7	L8	M	M1	N	N1	T1	X	Y
2HE-M10-OZP	10	35	12,5	61,5	61,5	71,6	54,1	70	15	70	15	100	75	37,5
2HE-M20-OZP	20	85	20	101,5	101,5	95	42,5	145	27,5	145	27,5	200	120	42,5

Metric AccuSlide 2HE ProfileRail System with Integral Belt Actuated Assembly and Carriage												(Dimensions in mm)
Part	Nominal Number	B6 Diameter	B7	D5	D6	D7	D8	H	H1	H6	H9	T
2HE-M10-OZP	10	70	15	10,5	6	3,0	2,5	60	31	15	13	100
2HE-M20-OZP	20	155	22,5	16,5	8,1	6	4	90	45	22,5	20	200

Appropriate mounting holes can be added for mounting the base of one system to the carriage of another for x–y configurations.

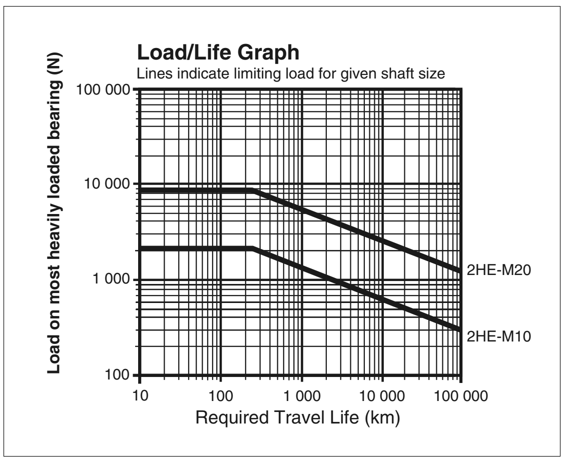
Metric System 2HE Standard Lengths																						(Lengths in mm)
System	300	325	375	450	445	525	565	600	675	685	750	825	805	900	925	975	1045	1165	1285	1405	X	MAX
2HE-M10	■		■	■		■		■	■		■	■		■		■					75	1500
2HE-M20		■			■		■			■			■		■		■	■	■	■	120	3000

For Bellows Way Covers, see page B-52.
For Limit Switch Packages, see pages B-64.
For Radial Mount Ball Screw Shaft Extenders, see page B-58.
For Spring Set electric brakes, see page B-62.
For TNUT mounting hardware, see page B-59.

Custom Lengths

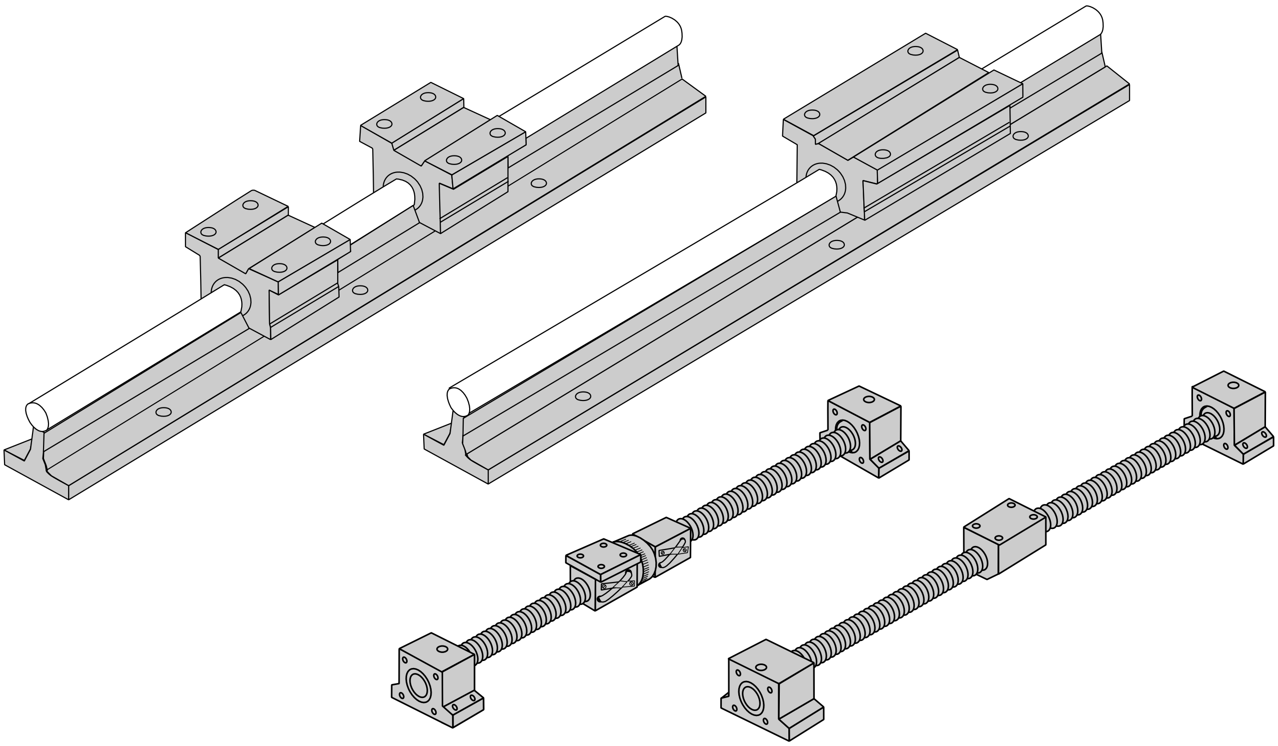
Custom length systems are available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Danaher Motion application engineering department.

Metric AccuSlide 2HE Belt Actuated System			
System Part Number	Gear Ratio	Motor Frame Size	Gearbox Part Number
2HE-M10-OZP-A	1:1	NEMA23	NT-23-1
2HE-M10-OZP-B	3:1	NEMA23	NT-23-3
2HE-M10-OZP-C	5:1	NEMA23	NT-23-5
2HE-M10-OZP-D	10:1	NEMA23	NT-23-10
2HE-M20-OZP-E	1:1	NEMA34	NT-34-1
2HE-M20-OZP-F	3:1	NEMA34	NT-34-3
2HE-M20-OZP-G	5:1	NEMA34	NT-34-5
2HE-M20-OZP-H	10:1	NEMA34	NT-34-10



Phone: 1-800-554-8466
Website: www.linearactuators.com

NOTES:



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Undriven Building Blocks for Customized Applications
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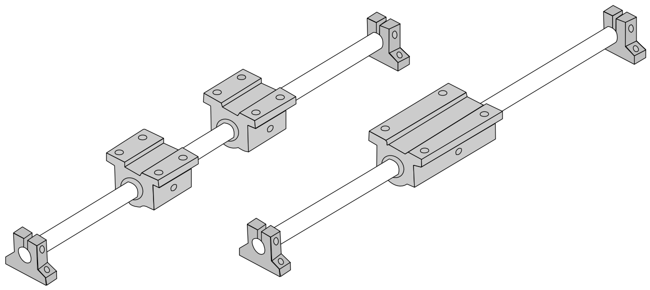


End Support 1BA

End Supported, Industry Standard Dimension

Inch

Features

- Requires only one part number to specify entire linear guide.
- Available with 60 Case* LinearRace* Shaft end support blocks in either light weight aluminum or rigid iron materials
- Used to provide increased stability or torque resistance in linear system applications

Components

- 2 Super Smart Ball Bushing* pillow blocks or 1 Super Smart Ball Bushing twin pillow block.
- 1 60 Case* LinearRace* shaft
- 2 shaft end support blocks

Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

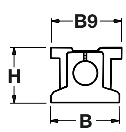
Part Numbering System

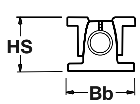
1BA-12-AHO L24

- Linear Guide Designation
- Nominal Diameter
- Type of Bearing Block
- Type of Support
- Linear Guide Length

Dimensions (Inch)

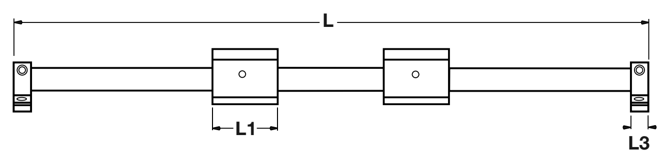
Type ASB
End Support Block



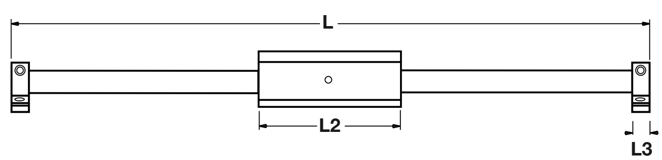


Type SB
End Support Block

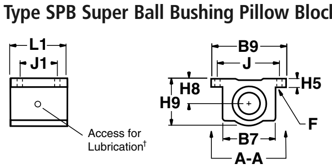
Single End Supported Linear Guide with 2 Pillow Blocks



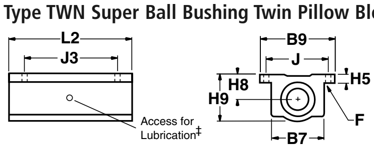
Single End Supported Linear Guide with 1 Twin Pillow Block



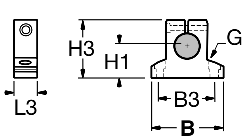
Type SSUPB Super Smart Ball Bushing Pillow Block
Type SPB Super Ball Bushing Pillow Block



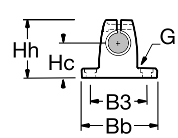
Type SSUTWN Super Smart Ball Bushing Twin Pillow Block
Type TWN Super Ball Bushing Twin Pillow Block



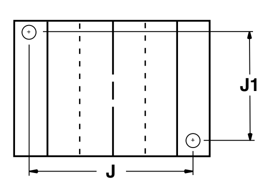
ALUMINUM
Type ASB LinearRace Shaft End Support Block



STEEL
Type SB LinearRace Shaft End Support Block



Type SPB Super Ball Bushing Pillow Block Mounting Hole Position for Sizes .250 and .375



View A-A

‡ Sizes .250, .375 and .500 have oil lubricant fitting.
Sizes .625 and above have ¼-28 access for lubrication.

End Support Linear Guide 1BA with 2 Pillow Blocks (Dimensions in inches)

Part Number		Nominal Diameter	L1	L3	H	HS	B	Bb	B9	Pillow Block	Shaft Support	
W/ Type ASB Shaft Supports	W/ Type SB Shaft Supports										Type ASB or	Type SB
1BA-04-AHO	–	.250	1.19	.50	.937	–	1.50	–	1.63	SPB-4-XS	ASB-4-XS	–
1BA-06-AHO	–	.375	1.31	.56	1.062	–	1.63	–	1.75	SPB-6-XS	ASB-6-XS	–
1BA-08-AHO	1BA-08-AJO	.500	1.69	.63	1.562	1.687	2.00	2.00	2.00	SSUPB-8-XS	ASB-8-XS	SB-8-XS
1BA-12-AHO	1BA-12-AJO	.750	2.06	.75	2.062	2.187	2.50	2.75	2.75	SSUPB-12-XS	ASB-12-XS	SB-12-XS
1BA-16-AHO	1BA-16-AJO	1.000	2.81	1.00	2.562	2.687	3.25	3.25	3.25	SSUPB-16-XS	ASB-16-XS	SB-16-XS
–	1BA-20-AJO	1.250	3.63	1.13	–	3.250	–	–	4.00	SSUPB-20-XS	–	SB-20-XS
1BA-24-AHO	1BA-24-AJO	1.500	4.00	1.25	3.750	3.750	4.75	4.75	4.75	SSUPB-24-XS	ASB-24-XS	SB-24-XS

End Support Linear Guide 1BA with 1 Twin Pillow Block (Dimensions in inches)

Part Number		Nom. Dia.	L2	L3	H	HS	B	Bb	B9	Max. Stroke Length	Pillow Block	Shaft Support	
W/ Type ASB Shaft Supports	W/ Type SB Shaft Supports											Type ASB	Type SB
1BA-04-BHO	–	.250	2.50	.50	.937	–	1.50	–	1.63	L-(3.50)	TWN-4-XS	ASB-4-XS	–
1BA-06-BHO	–	.375	2.75	.56	1.062	–	1.63	–	1.75	L-(3.88)	TWN-6-XS	ASB-6-XS	–
1BA-08-BHO	1BA-08-BJO	.500	3.50	.63	1.562	1.687	2.00	2.00	2.00	L-(4.75)	SSUTWN-8-XS	ASB-8-XS	SB-8-XS
1BA-12-BHO	1BA-12-BJO	.750	4.50	.75	2.062	2.187	2.50	2.75	2.50	L-(6.00)	SSUTWN-12-XS	ASB-12-XS	SB-12-XS
1BA-16-BHO	1BA-16-BJO	1.000	6.00	1.00	2.562	2.687	3.25	3.25	3.25	L-(8.00)	SSUTWN-16-XS	ASB-16-XS	SB-16-XS
–	1BA-20-BJO	1.250	7.50	1.13	–	3.250	–	4.00	4.00	L-(9.75)	SSUTWN-20-XS	–	SB-20-XS
1BA-24-BHO	1BA-24-BJO	1.500	9.00	1.25	3.750	3.750	4.75	4.75	4.75	L-(11.50)	SSUTWN-24-XS	ASB-24-XS	SB-24-XS

Shaft Deflection Note: Load limit may be below the dynamic load rating due to shaft deflection. Bearings can accommodate up to 1/2° deflection. See Engineering Section (pg B-67) for Deflection calculations.

Dynamic Load Capacity Matrix (4 million inches travel)

Linear Guide Assembly Part No.		Dynamic Load Capacity (lb_f) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Capacity (lb_f)
1BA-04-AHO	–	100	SPB-4-XS	50
1BA-06-AHO	–	160	SPB-6-XS	80
1BA-08-AHO	1BA-08-AJO	800	SSUPB-8-XS	400
1BA-12-AHO	1BA-12-AJO	1800	SSUPB-12-XS	900
1BA-16-AHO	1BA-16-AJO	3000	SPSUB-16-XS	1500
–	1BA-20-AJO	3730	SSUPB-20-XS	1865
1BA-24-AHO	1BA-24-AJO	6160	SSUPB-24-XS	3080

Dynamic Load Capacity Matrix (4 million inches travel)

Linear Guide Assembly Part No.		Dynamic Load Capacity (lb_f) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Capacity (lb_f)
1BA-04-BHO	–	100	TWN-4-XS	100
1BA-06-BHO	–	160	TWN-6-XS	160
1BA-08-BHO	1BA-08-BJO	800	SSUTWN-8-XS	800
1BA-12-BHO	1BA-12-BJO	1800	SSUTWN-12-XS	1800
1BA-16-BHO	1BA-16-BJO	3000	SPSTWN-16-XS	3020
–	1BA-20-BJO	3730	SSUTWN-20-XS	1865
1BA-24-BHO	1BA-24-BJO	6160	SSUTWN-24-XS	6160

† Super Ball Bushing* bearings are used in .250 and .375 inch size pillow blocks.

Replacement Component Dimensions

Type SPB and SSUPB Pillow Blocks (Dimensions in Inches)

Part Number	Nom. Dia.	L1	H9	H8	H5	B9	B7	J	J1	F		Wt. lb
										Bolt	Hole	
SPB-4-XS	.250	1.19	.81	.437	.19	1.63	1.00	1.31	.75[2]	#6	.16	.10
SPB-6-XS	.375	1.31	.94	.500	.19	1.75	1.12	1.44	.88[2]	#6	.16	.13
SSUPB-8-XS	.500	1.69	1.25	.687	.25	2.00	1.38	1.69	1.00	#6	.16	.20
SSUPB-12-XS	.750	2.06	1.75	.937	.31	2.75	1.88	2.38	1.25	#8	.19	.62
SSUPB-16-XS	1.000	2.81	2.19	1.187	.38	3.25	2.38	2.88	1.75	#10	.22	1.24
SSUPB-20-XS	1.250	3.63	2.81	1.500	.43	4.00	3.00	3.50	2.00	#10	.22	2.57
SSUPB-24-XS	1.500	4.00	3.25	1.750	.50	4.75	3.50	4.12	2.50	1/4	.28	3.94

Housing Material: Aluminum Alloy Black Anodized (2)Two mounting holes as shown in view A-A for sizes .250 and .375
Top plates are sold separately. Please refer to page B-60 under Accessories for P/N and dimensions.

Type TWN and SSUTWN Pillow Blocks

Part Number	Nom. Dia.	L2	J3	Wt. lb
TWN-4-XS	.250	2.50	2.00	.19
TWN-6-XS	.375	2.75	2.25	.25
SSUTWN-8-XS	.500	3.50	2.50	.40
SSUTWN-12-XS	.750	4.50	3.50	1.24
SSUTWN-16-XS	1.000	6.00	4.50	2.48
SSUTWN-20-XS	1.250	7.50	5.50	5.14
SSUTWN-24-XS	1.500	9.00	6.50	8.08

Housing Material: Aluminum Alloy Black Anodized

Type ASB LinearRace Shaft End Support Block

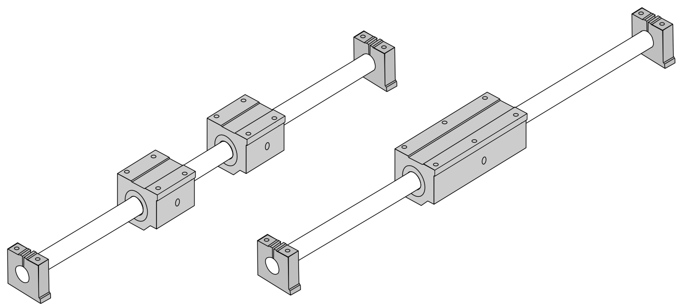
Part Number	Nom. Dia.	L3	H3	H1	B	B3	G		Wt. lb
							Bolt	Hole	
ASB-04-XS	.250	.50	.88	.500	1.50	1.12	#6	.16	.06
ASB-06-XS	.375	.56	1.00	.562	1.62	1.25	#6	.16	.08
ASB-08-XS	.500	.63	1.48	.875	2.00	1.50	#8	.19	.11
ASB-12-XS	.750	.75	1.95	1.125	2.50	2.00	#10	.22	.22
ASB-16-XS	1.000	1.00	2.48	1.375	3.25	2.50	1/4	.28	.44
ASB-24-XS	1.500	1.250	3.50	2.000	4.75	3.50	5/16	.34	1.16

End Support Material: Aluminum Alloy Black Anodized

Type SB LinearRace Shaft End Support Block

Part Number	Nom. Dia.	L3	Hh	Hc	Bb	B3	G		Wt. lb
							Bolt	Hole	
SB-8-XS	.500	.63	1.62	1.000	2.00	1.50	#8	.19	.3
SB-12-XS	.750	.75	2.12	1.250	2.75	2.00	#10	.22	.5
SB-16-XS	1.000	1.00	2.56	1.500	3.25	2.50	1/4	.28	1.0
SB-20-XS	1.250	1.13	3.00	1.750	4.00	3.00	5/16	.34	2.0
SB-24-XS	1.500	1.25	3.50	2.000	4.75	3.50	5/16	.34	2.6

Material: Iron



End Support 1NA

End Supported, Industry Standard Dimension

Metric

Features

- Requires only one part number to specify entire linear guide.
- Available with 60 Case* LinearRace* Shaft end support blocks in either light weight aluminum or rigid iron materials
- Used to provide increased stability or torque resistance in linear system applications

Components

- 2 Super Smart Ball Bushing* pillow blocks or 1 Super Smart Ball Bushing twin pillow block.
- 1 60 Case* LinearRace* shaft
- 2 shaft end support blocks

Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

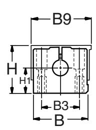
Part Numbering System

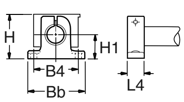
1NA-M12-NMO L600

- Linear Guide Designation
- Nominal Diameter
- Type of Bearing Block
- Type of Support
- Linear Guide Length

Dimensions (Metric)

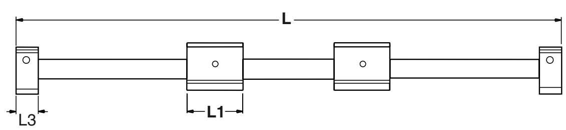
Type ASB
End Support Block



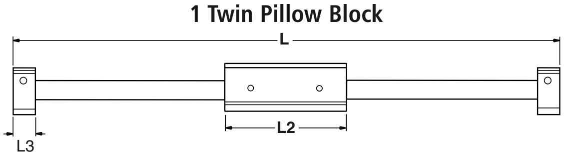


Type SB
End Support Block

Supported Linear Guide with 2 Pillow Blocks

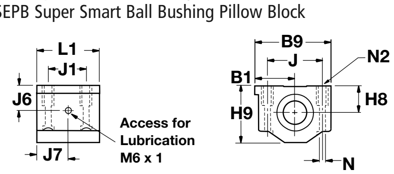


Supported Linear Guide with 1 Twin Pillow Block

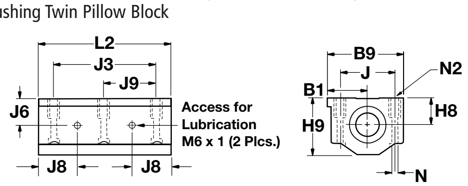


Maximum Stroke Length is determined by subtracting pillow block length (L2) and 2x support block length (L3) or (L4) from total Linear Guide length (L).

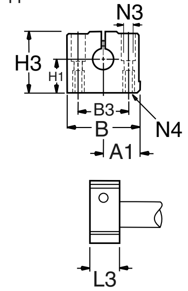
Type SPPB Super Plus Ball Bushing Pillow Block
Type SSEPB Super Smart Ball Bushing Pillow Block



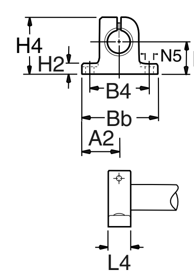
Type SPTWN Super Plus Ball Bushing Twin Pillow Block Type SSETWN Super Smart Ball Bushing Twin Pillow Block



ALUMINUM
Type ASB LinearRace Shaft End Support Block



STEEL
Type SB LinearRace Shaft End Support Block



End Support Linear Guide 1NA with 2 Pillow Blocks

(Dimensions in mm)

Part Number W/ Type ASB Shaft Supports	Part Number W/ Type SB Shaft Supports	Nom. Dia.	L1	L3	L4	H	H1	B	Bb	B9	Pillow Block	Shaft Support Type ASB	Shaft Support Type SB
1NA-M08-NMO	1NA-M08-NNO	8	32	18	10	30	15	32	32	35	SPPB-M08-XS	ASB-M08-XS	SB-M08-XS
1NA-M12-NMO	1NA-M12-NNO	12	39	20	12	38	20	43	42	43	SSEPB-M12-XS	ASB-M12-XS	SB-M12-XS
1NA-M16-NMO	1NA-M16-NNO	16	43	24	16	47	25	53	50	53	SSEPB-M16-XS	ASB-M16-XS	SB-M16-XS
1NA-M20-NMO	1NA-M20-NNO	20	54	30	20	55	30	60	60	60	SSEPB-M20-XS	ASB-M20-XS	SB-M20-XS
1NA-M25-NMO	1NA-M25-NNO	25	67	38	25	65	35	78	74	78	SSEPB-M25-XS	ASB-M25-XS	SB-M25-XS
1NA-M30-NMO	1NA-M30-NNO	30	79	40	28	75	40	87	84	87	SSEPB-M30-XS	ASB-M30-XS	SB-M30-XS
1NA-M40-NMO	1NA-M40-NNO	40	91	48	32	95	50	108	108	108	SSEPB-M40-XS	ASB-M40-XS	SB-M40-XS

End Support Linear Guide 1NA with 1 Twin Pillow Block

(Dimensions in mm)

Part Number W/ Type ASB Shaft Supports	Part Number W/ Type SB Shaft Supports	Nom. Dia.	L2	L3	L4	H	H1	B	Bb	B9	Pillow Block	Shaft Support Type ASB	Shaft Support Type SB
1NA-M08-PMO	1NA-M08-PNO	8	62	18	10	30	15	32	32	35	SPTWN-M08-XS	ASB-M08-XS	SB-M08-XS
1NA-M12-PMO	1NA-M12-PNO	12	76	20	12	38	20	43	42	43	SSETWN-M12-XS	ASB-M12-XS	SB-M12-XS
1NA-M16-PMO	1NA-M16-PNO	16	84	24	16	47	25	53	50	53	SSETWN-M16-XS	ASB-M16-XS	SB-M16-XS
1NA-M20-PMO	1NA-M20-PNO	20	104	30	20	55	30	60	60	60	SSETWN-M20-XS	ASB-M20-XS	SB-M20-XS
1NA-M25-PMO	1NA-M25-PNO	25	130	38	25	65	35	78	74	78	SSETWN-M25-XS	ASB-M25-XS	SB-M25-XS
1NA-M30-PMO	1NA-M30-PNO	30	152	40	28	75	40	87	84	87	SSETWN-M30-XS	ASB-M30-XS	SB-M30-XS
1NA-M40-PMO	1NA-M40-PNO	40	176	48	32	95	50	108	108	108	SSETWN-M40-XS	ASB-M40-XS	SB-M40-XS

Shaft Deflection Note: Load limit may be below the dynamic load rating due to shaft deflection. Bearings can accommodate up to 1/2° deflection.
See Engineering Section (pg B-67) for Deflection calculations.

Dynamic Load Capacity Matrix

(100 km travel)

Linear Guide Assembly Part No.		Dynamic Load Capacity (N) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Capacity (N)
1NA-M08-NMO	1NA-M08-NNO	620	SPPB-M08-XS	310
1NA-M12-NMO	1NA-M12-NNO	1300	SSEPB-M12-XS	650
1NA-M16-NMO	1NA-M16-NNO	4400	SSEPB-M16-XS	2200
1NA-M20-NMO	1NA-M20-NNO	8000	SSEPB-M20-XS	4000
1NA-M25-NMO	1NA-M25-NNO	13400	SSEPB-M25-XS	6700
1NA-M30-NMO	1NA-M30-NNO	16600	SSEPB-M30-XS	8300
1NA-M40-NMO	1NA-M40-NNO	27400	SSEPB-M40-XS	13700

Dynamic Load Capacity Matrix

(100 km travel)

Linear Guide Assembly Part No.		Dynamic Load Capacity (N) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Capacity (N)
1NA-M08-PMO	1NA-M08-PNO	500	SPTWN-M08-XS	500
1NA-M12-PMO	1NA-M12-PNO	1060	SSETWN-M12-XS	1060
1NA-M16-PMO	1NA-M16-PNO	4400	SSETWN-M16-XS	4400
1NA-M20-PMO	1NA-M20-PNO	8000	SSETWN-M20-XS	8000
1NA-M25-PMO	1NA-M25-PNO	13400	SSETWN-M25-XS	13400
1NA-M30-PMO	1NA-M30-PNO	16600	SSETWN-M30-XS	16600
1NA-M40-PMO	1NA-M40-PNO	27400	SSETWN-M40-XS	27400

† Super Plus Ball Bushing* bearings are used in 8 mm size pillow blocks.

Replacement Component Dimensions

Type SPPB and SSEPB Pillow Blocks

(Dimensions in mm)

Part Number	Nom. Dia.	L1	H8	H9	B1	B9	J	J1	J6	J7	N Dia.	N2	Mass kg
SPPB-M08-XS	8	32	15	28	17,5	35	25	20	15	19,5	3,3	M4	0,07
SSEPB-M12-XS	12	39	18	35	21,5	43	32	23	18	23,0	4,3	M5	0,13
SSEPB-M16-XS	16	43	22	42	26,5	53	40	26	22	25,0	5,3	M6	0,20
SSEPB-M20-XS	20	54	25	50	30,0	60	45	32	25	30,5	6,6	M8	0,35
SSEPB-M25-XS	25	67	30	60	39,0	78	60	40	30	37,0	8,4	M10	0,66
SSEPB-M30-XS	30	79	35	70	43,5	87	68	45	35	43,0	8,4	M10	0,99
SSEPB-M40-XS	40	91	45	90	54,0	108	86	58	45	49,0	10,5	M12	1,83

Housing Material: Aluminum Alloy Grey Anodized. Top plates are sold separately. Please refer to page B-60 under Accessories for P/N and dimensions.

Type SPTWN and SSETWN Pillow Blocks

Part Number	Nom. Dia.	L2	J3	J8	J9	Mass kg
SPTWN-M08-XS	8	62	50	19,5	25	0,15
SSETWN-M12-XS	12	76	56	23,0	28	0,27
SSETWN-M16-XS	16	84	64	25,0	32	0,41
SSETWN-M20-XS	20	104	76	30,5	38	0,73
SSETWN-M25-XS	25	130	94	37,0	47	1,37
SSETWN-M30-XS	30	152	106	43,0	53	2,04
SSETWN-M40-XS	40	176	124	49,0	62	3,73

Housing Material: Aluminum Alloy Grey Anodized

Type ASB LinearRace Shaft End Support Block

Part Number	Nom. Dia.	A1	B	B3	H1	H3	L3	N3 Dia.	N4	Mass kg
ASB-M08-XS	8	16,0	32	22	15	28	18	3,5	M4	0,04
ASB-M12-XS	12	21,5	43	30	20	36	20	5,3	M6	0,10
ASB-M16-XS	16	26,5	53	38	25	43	24	6,6	M8	0,15
ASB-M20-XS	20	30,0	60	42	30	51	30	8,4	M10	0,23
ASB-M25-XS	25	39,0	78	56	35	61	38	10,5	M12	0,41
ASB-M30-XS	30	43,5	87	64	40	71	40	10,5	M12	0,53
ASB-M40-XS	40	54,0	108	82	50	88	48	13,5	M16	0,99

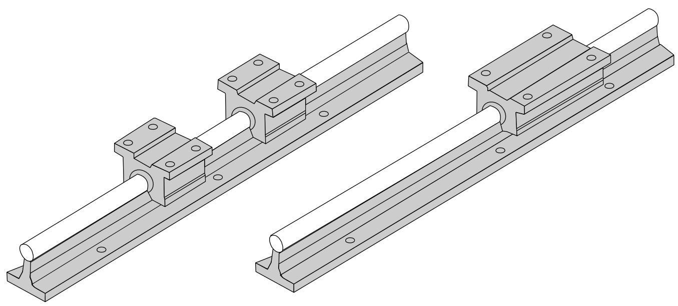
End Support Material: Aluminum Alloy Grey Anodized

Type SB LinearRace Shaft End Support Block

Part Number	Nom. Dia.	A2	B4	Bb	H1	H2	H4	L4	N5 Dia.	Mass kg
SB-M08-XS	8	16	25	32	15	5,2	27	10	4,5	0,03
SB-M12-XS	12	21	32	42	20	5,5	35	12	5,5	0,06
SB-M16-XS	16	25	40	50	25	6,5	42	16	5,5	0,11
SB-M20-XS	20	30	45	60	30	8,0	50	20	5,5	0,21
SB-M25-XS	25	37	60	74	35	9,0	58	25	6,6	0,35
SB-M30-XS	30	42	68	84	40	10,0	68	28	9,0	0,52
SB-M40-XS	40	54	86	108	50	12,0	86	32	11,0	0,92

End Support Material: Iron

Phone: 1-800-554-8466
Website: www.linearactuators.com



Continuous Support 1CA

Fully Supported, Highest Performance Industry Standard Dimensions

Inch

Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

Part Numbering System

1CA-12-FAO L24

- Linear Guide Designation
- Nominal Diameter
- Type of Bearing Block
- Type of Support
- Linear Guide Length

Features

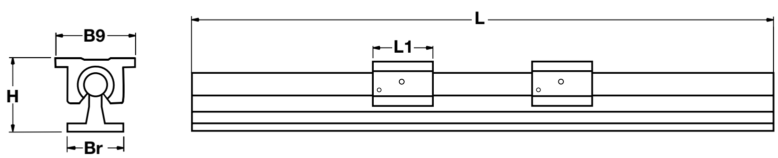
- Requires only one part number to specify the entire linear guide
- Used as a load support, transport, and guidance solution
- Used in continuously supported applications when rigidity is required

Components

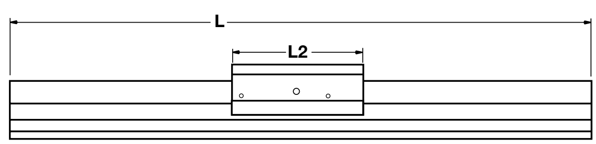
- 2 Super Smart Ball Bushing* opentype pillow blocks or 1 Super Smart Ball Bushing open twin pillow blocks
- 1 60 Case* LinearRace* shaft support rail assembly

Dimensions (Inch)

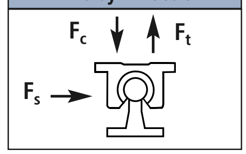
Single Continuously Supported Linear Guide with 2 Pillow Blocks



Single Continuously Supported Linear Guide with 1 Twin Pillow Block



Load Rating and Limit by Direction

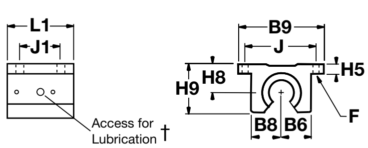


	Dynamic Load Rating	Load Limit
F_c	C	C
F_t	0.5C	0.5C
F_s	C	0.5C

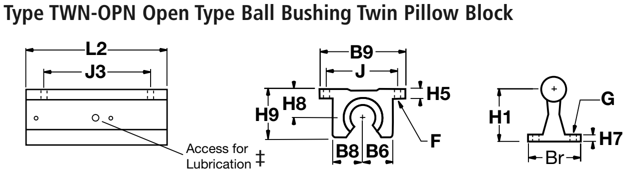
Dynamic Load Rating
Load value used in life calculation.

Load Limit
Maximum allowable load applied to bearing.

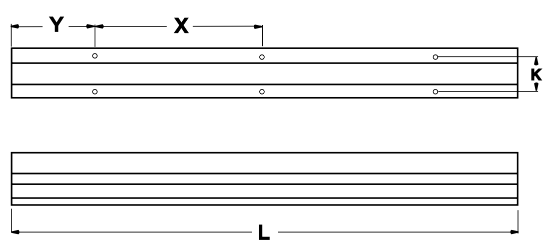
Type SSUPBO Open Type Super Smart Ball Bushing Pillow Block
Type SPB-OPN Open Type Ball Bushing Pillow Block



Type SSUTWN Open Type Super Smart Ball Bushing Twin Pillow Block
Type TWN-OPN Open Type Ball Bushing Twin Pillow Block



Type SRA LinearRace Shaft Support Rail Assembly



‡ Size .500 inch has oil lubricant fitting.
Sizes .625 and above have 1/4-28 access for lubrication.

Phone: 1-800-554-8466
Website: www.linearactuators.com

Continuously Supported Linear Guide 1CA Single with 2 Pillow Blocks (Dimensions in inches)

Part Number	Nominal Diameter	L1	H	Br	B9	Pillow Block	Shaft Support Rail Assembly
1CA-08-FAO	.50	1.50	1.812	1.50	2.00	SPB-8-OPN-XS	SRA-8-XS
1CA-12-FAO	.75	1.88	2.437	1.75	2.75	SSUPBO-12-XS	SRA-12-XS
1CA-16-FAO	1.00	2.63	2.937	2.13	3.25	SSUPBO-16-XS	SRA-16-XS
1CA-20-FAO	1.25	3.38	3.625	2.50	4.00	SSUPBO-20-XS	SRA-20-XS
1CA-24-FAO	1.50	3.75	4.250	3.00	4.75	SSUPBO-24-XS	SRA-24-XS

Continuously Supported Linear Guide 1CA Single with 1 Twin Pillow Block (Dimensions in inches)

Part Number	Nominal Diameter	L2	H	Br	B9	Maximum Stroke Length	Pillow Block	Shaft Support Rail Assembly
1CA-08-HAO	.50	3.5	1.812	1.50	2.00	L-(3.5)	TWN-8-OPN-XS	SRA-8-XS
1CA-12-HAO	.75	4.5	2.437	1.75	2.75	L-(4.5)	SSUTWNO-12-XS	SRA-12-XS
1CA-16-HAO	1.00	6.0	2.937	2.13	3.25	L-(6.0)	SSUTWNO-16-XS	SRA-16-XS
1CA-20-HAO	1.25	7.5	3.625	2.50	4.00	L-(7.5)	SSUTWNO-20-XS	SRA-20-XS
1CA-24-HAO	1.50	9.0	4.250	3.00	4.75	L-(9.0)	SSUTWNO-24-XS	SRA-24-XS

Dynamic Load Rating (C) Matrix (4 million inches travel)

Linear Guide Assembly Part No.	Dynamic Load Rating, C (lbf) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Rating, C (lbf)
1CA-08-FAO	290	SPB-8-OPN-XS	145
1CA-12-FAO	1800	SSUPBO-12-XS	900
1CA-16-FAO	3000	SSUPBO-16-XS	1500
1CA-20-FAO	3730	SSUPBO-20-XS	1865
1CA-24-FAO	6160	SSUPBO-24-XS	3080

Dynamic Load Rating (C) Matrix (4 million inches travel)

Linear Guide Assembly Part No.	Dynamic Load Rating, C (lbf) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Rating, C (lbf)
1CA-08-HAO	290	TWN-8-OPN-XS	290
1CA-12-HAO	1800	SSUTWNO-12-XS	1800
1CA-16-HAO	3000	SSUTWNO-16-XS	3000
1CA-20-HAO	3730	SSUTWNO-20-XS	3730
1CA-24-HAO	6160	SSUTWNO-24-XS	6160

† Super Ball Bushing* bearings are used in .500 inch size pillow blocks.

Replacement Component Dimensions

Type SPB-OPN and SSUPBO Pillow Blocks (Dimensions in Inches)

Part Number	Nom. Dia.	L1	H9	H8	H5	B9	B8	B6	J	J1	F		Wt. lb
											Bolt	Hole	
SPB-8-OPN-XS	.50		1.50	1.12		.687	.25	2.00		.75	.69		1.69
SSUPBO-12-XS	.75	1.88	1.56	.937	.31	2.75	1.00	.94	2.38	1.25	#8	.19	.51
SSUPBO-16-XS	1.00	2.63	2.00	1.187	.38	3.25	1.25	1.19	2.88	1.75	#10	.22	1.03
SSUPBO-20-XS	1.25	3.38	2.56	1.500	.43	4.00	1.63	1.50	3.50	2.00	#10	.22	2.15
SSUPBO-24-XS	1.50	3.75	2.94	1.750	.50	4.75	1.88	1.75	4.12	2.50	1/4	.28	3.29

Top plates are sold separately. Please refer to page B-60 under Accessories for P/N and dimensions.

Type TWN-OPN and SSUTWNO Pillow Blocks

Part Number	Nom. Dia.	L2	J3	Wt. lb
TWN-8-OPN-XS	.50	3.5	2.5	.40
SSUTWNO-12-XS	.75	4.5	3.5	1.02
SSUTWNO-16-XS	1.00	6.0	4.5	2.06
SSUTWNO-20-XS	1.25	7.5	5.5	4.30
SSUTWNO-24-XS	1.50	9.0	6.5	6.88

Housing Material: Aluminum Alloy Black Anodized

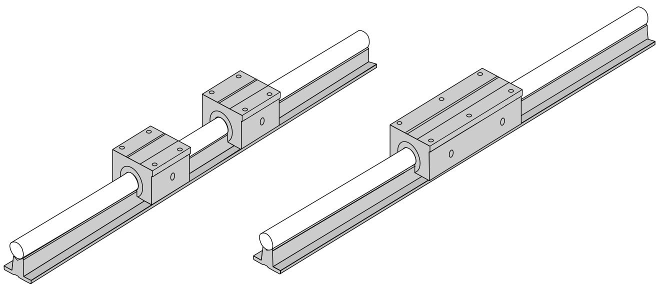
Type SRA LinearRace Shaft Support Rail Assembly (Dimensions in Inches)

Part Number	Nom. Dia.	H1	H7	Br	K	X	Y	G		Wt. lb/ft
								Bolt	Hole	
SRA-8-XS	.50	1.125	.19	1.50	1.00	4	2	#6	.17	1.26
SRA-12-XS	.75	1.500	.25	1.75	1.25	6	3	#10	.22	2.50
SRA-16-XS	1.00	1.750	.25	2.13	1.50	6	3	1/4	.28	4.06
SRA-20-XS	1.25	2.125	.31	2.50	1.88	6	3	5/16	.34	6.30
SRA-24-XS	1.50	2.500	.38	3.00	2.25	8	4	5/16	.34	8.60

LinearRace Shaft Support Rail Material:
Aluminum Alloy Black Anodized

Support rails are supplied in 24 inch lengths unless quoted otherwise.
Maximum length of LinearRace Shaft Support Rail is 72 inches. If longer continuous one-piece LinearRace Shaft Support Rails are required, contact the Thomson Linear Guides Application Engineering department.

THOMSON*



Continuous Support 1PA

Fully Supported, Highest Performance Industry Standard Dimensions

Metric

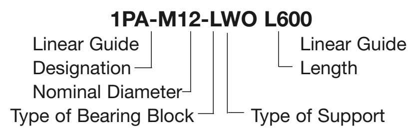
Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter “L” followed by the overall length in inches, as a suffix to the part number.

Features

- Requires only one part number to specify the entire linear guide
- Used as a load support, transport, and guidance solution
- Used in continuously supported applications when rigidity is required

Part Numbering System

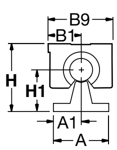


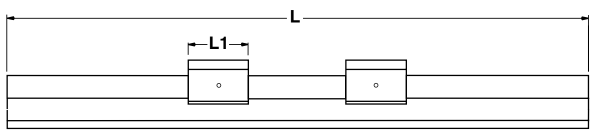
Components

- 2 Super Smart Ball Bushing* opentype pillow blocks or 1 Super Smart Ball Bushing open twin pillow blocks
- 1 60 Case* LinearRace* shaft support rail assembly

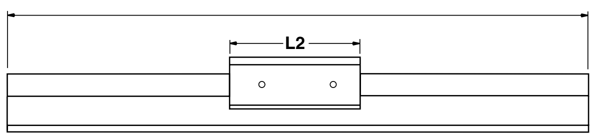
Dimensions (Metric)

Single Continuously Supported Linear Guide with 2 Pillow Blocks

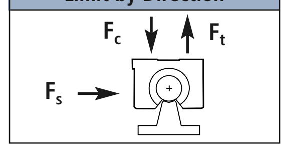




Single Continuously Supported Linear Guide with 1 Twin Pillow Block



Load Rating and Limit by Direction

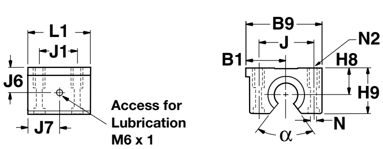


	Dynamic Load Rating	Load Limit
F_c	C	C
F_t	0.5C	0.5C
F_s	C	0.5C

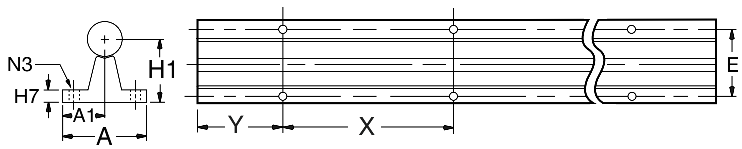
Dynamic Load Rating
Load value used in life calculation.

Load Limit
Maximum allowable load applied to bearing.

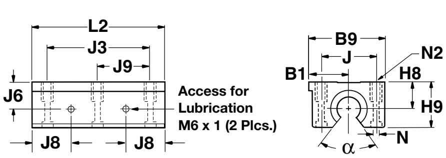
Type SSEPBO Open Type Super Smart Ball Bushing Pillow Block



Type SRA LinearRace Shaft Support Rail Assembly



Type SSETWNO Open Type Super Smart Ball Bushing Twin Pillow Block



Continuously Supported Linear Guide 1PA Single with 2 Pillow Blocks									(Dimensions in mm)	
Part Number	Nominal Diameter	L1	H	H1	A	A1	B1	B9	Includes	
									Pillow Block	Shaft Support Rail Assembly
1PA-M12-LWO	12	39	46	28	43	21,5	21,5	43	SPPBO-M12-XS[†]	SRA-M12-XS
1PA-M16-LWO	16	43	52	30	48	24,0	26,5	53	SSEPBO-M16-XS	SRA-M16-XS
1PA-M20-LWO	20	54	63	38	56	28,0	30,0	60	SSEPBO-M20-XS	SRA-M20-XS
1PA-M25-LWO	25	67	72	42	60	30,0	39,0	78	SSEPBO-M25-XS	SRA-M25-XS
1PA-M30-LWO	30	79	88	53	74	37,0	43,5	87	SSEPBO-M30-XS	SRA-M30-XS
1PA-M40-LWO	40	91	105	60	78	39,0	54,0	108	SSEPBO-M40-XS	SRA-M40-XS

Continuously Supported Linear Guide 1PA Single with 1 Twin Pillow Block										(Dimensions in mm)	
Part Number	Nominal Diameter	L2	H	H1	A	A1	B1	B9	Maximum Stroke Length	Includes	
										Pillow Block	Shaft Support Rail Assembly
1PA-M12-MWO	12	76	46	28	43	21,5	21,5	43	L-(76)	SPTWNO-M12-XS[†]	SRA-M12-XS
1PA-M16-MWO	16	84	52	30	48	24,0	26,5	53	L-(84)	SSETWNO-M16-XS	SRA-M16-XS
1PA-M20-MWO	20	104	63	38	56	28,0	30,0	60	L-(104)	SSETWNO-M20-XS	SRA-M20-XS
1PA-M25-MWO	25	130	72	42	60	30,0	39,0	78	L-(130)	SSETWNO-M25-XS	SRA-M25-XS
1PA-M30-MWO	30	152	88	53	74	37,0	43,5	87	L-(152)	SSETWNO-M30-XS	SRA-M30-XS
1PA-M40-MWO	40	176	105	60	78	39,0	54,0	108	L-(176)	SSETWNO-M40-XS	SRA-M40-XS

Dynamic Load Rating (C) Matrix			(100 km travel)
Linear Guide Assembly Part No.	Dynamic Load Rating, C (N) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Rating, C (N)
1PA-M12-LWO	1500	SPPBO-M12-XS	750
1PA-M16-LWO	4400	SSEPBO-M16-XS	2200
1PA-M20-LWO	8000	SSEPBO-M20-XS	4000
1PA-M25-LWO	13400	SSEPBO-M25-XS	6700
1PA-M30-LWO	16600	SSEPBO-M30-XS	8300
1PA-M40-LWO	27400	SSEPBO-M40-XS	13700

Dynamic Load Rating (C) Matrix			(100 km travel)
Linear Guide Assembly Part No.	Dynamic Load Rating, C (N) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Rating, C (N)
1PA-M12-MWO	1220	SPTWNO-M12-XS	1500
1PA-M16-MWO	4400	SSETWNO-M16-XS	4400
1PA-M20-MWO	8000	SSETWNO-M20-XS	8000
1PA-M25-MWO	13400	SSETWNO-M25-XS	13400
1PA-M30-MWO	16600	SSETWNO-M30-XS	16600
1PA-M40-MWO	27400	SSETWNO-M40-XS	27400

† Super Plus Ball Bushing* bearings are used in 12 mm size pillow blocks.

Replacement Component Dimensions

Type SSEPBO Pillow Blocks														(Dimensions in mm)
Part Number	Nom. Dia.	L1	H8	H9	B1	B9	J6	J7	J	J1	N Dia.	N2	a Deg	Mass kg
SPPBO-M12-XS	12	39	18	28	21,5	43	16,7	19,5	32	23	4,3	M5	66	0,11
SSEPBO-M16-XS	16	43	22	35	26,5	53	22,0	21,5	40	26	5,3	M6	66	0,17
SSEPBO-M20-XS	20	54	25	41	30,0	60	25,0	27,0	45	32	6,6	M8	60	0,30
SSEPBO-M25-XS	25	67	30	50	39,0	78	31,5	33,5	60	40	8,4	M10	60	0,57
SSEPBO-M30-XS	30	79	35	60	43,5	87	33,0	39,5	68	45	8,4	M10	60	0,87
SSEPBO-M40-XS	40	91	45	77	54,0	108	43,5	45,5	86	58	10,5	M12	60	1,62

Housing Material: Aluminum Alloy Grey Anodized
Top plates are sold separately. Please refer to page B-60 under Accessories for P/N and dimensions.

Type SSETWNO Pillow Blocks						
Part Number	Nom. Dia.	L2	J3	J8	J9	Mass kg
SPTWNO-M12-XS	12	76	56	19,5	28	0,22
SSETWNO-M16-XS	16	84	64	21,5	32	0,34
SSETWNO-M20-XS	20	104	76	27,0	38	0,63
SSETWNO-M25-XS	25	130	94	33,6	47	1,18
SSETWNO-M30-XS	30	152	106	39,5	53	1,70
SSETWNO-M40-XS	40	176	124	45,5	62	3,18

Housing Material: Aluminum Alloy Grey Anodized

Type SRA LinearRace Shaft Support Rail Assembly										(Dimensions in mm)
Part Number	Nom. Dia.	H1	H7	A	A1	E	X	Y	N3 Dia.	Mass kg/m
SRA-M12-XS	12	28	5	43	21,5	29	75	37,5	4,5	4,1
SRA-M16-XS	16	30	5	48	24,0	33	100	50	5,5	6,2
SRA-M20-XS	20	38	6	56	28,0	37	100	50	6,6	9,5
SRA-M25-XS	25	42	6	60	30,0	42	120	60	6,6	13,7
SRA-M30-XS	30	53	8	74	37,0	51	150	75	8,6	20,0
SRA-M40-XS	40	60	8	78	39,0	55	200	100	8,6	32,5

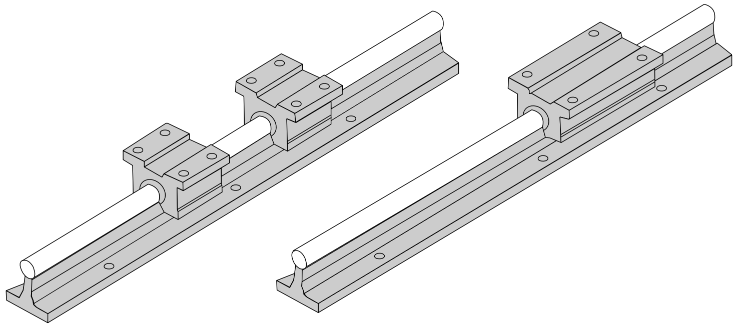
LinearRace Shaft Support Rail Material:
Aluminum Alloy Grey Anodized

Support rails are supplied in 600mm lengths unless quoted otherwise.
Maximum length of LinearRace Shaft Support Rail is 600mm. If longer continuous one-piece LinearRace Shaft Support Rails are required, contact the Thomson Linear Guides Application Engineering department.

FluoroNyliner 1VA

Corrosive/Contaminated Environments

Inch



Features

- Requires only one part number to specify the entire linear guide
- Used as a load support, transport, and guidance solution
- Used in continuously supported applications when rigidity is required

Components

- 2 self-aligning FluoroNyliner* Bushing bearing open pillow blocks or 1 self-aligning FluoroNyliner Bushing bearing open twin pillow block
- 1 stainless steel 60 Case* LinearRace* shaft support rail assembly

Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

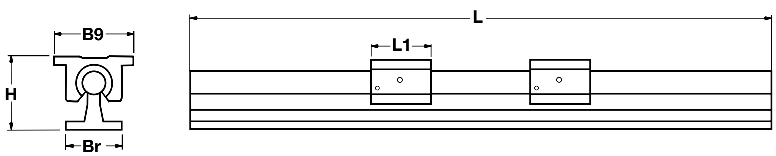
Part Numbering System

1VA-12-FAO L24

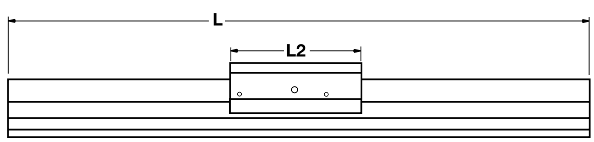
- Linear Guide Designation
- Nominal Diameter
- Type of Bearing Block
- Type of Support
- Linear Guide Length

Dimensions (Inch)

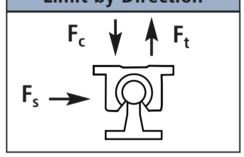
Single Continuously Supported Linear Guide with 2 Pillow Blocks



Single Continuously Supported System with 1 Twin Pillow Block



Load Rating and Limit by Direction

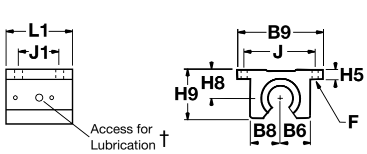


	Dynamic Load Rating	Load Limit
F_c	PV	PV
F_t	0.3PV	0.3PV
F_s	0.6PV	0.6PV

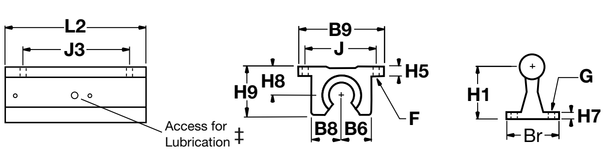
Dynamic Load Rating
PV value used in life calculation.

Load Limit
Maximum allowable PV applied to bearing.

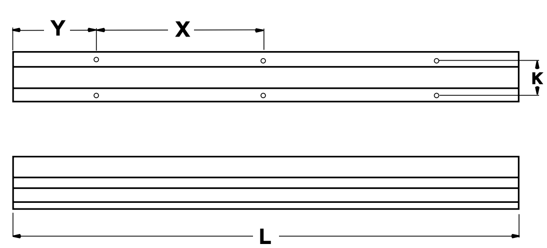
FluoroNyliner Linear Guide Pillow Block Dimensions



FluoroNyliner Linear Guide Twin Pillow Block Dimensions



Type SRA LinearRace Shaft Support Rail Assembly



FluoroNyliner* Linear Guide 1VA Single Continuously Supported with 2 Pillow Blocks (Dimensions in inches)

Part Number	Nominal Diameter	L1	H	Br	B9	Pillow Block	Shaft Support Rail Assembly
1VA-08-FAO	.50	1.50	1.812	1.50	2.00	FNYBUPBO08A-XS	SRA-8-XS-SS
1VA-12-FAO	.75	1.88	2.437	1.75	2.75	FNYBUPBO12A-XS	SRA-12-XS-SS
1VA-16-FAO	1.00	2.63	2.937	2.13	3.25	FNYBUPBO16A-XS	SRA-16-XS-SS
1VA-20-FAO	1.25	3.38	3.625	2.50	4.00	FNYBUPBO20A-XS	SRA-20-XS-SS
1VA-24-FAO	1.50	3.75	4.250	3.00	4.75	FNYBUPBO24A-XS	SRA-24-XS-SS

FluoroNyliner Linear Guide 1VA Single Continuously Supported with 1 Twin Pillow Block (Dimensions in inches)

Part Number	Nominal Diameter	L2	H	Br	B9	Maximum Stroke Length	Pillow Block	Shaft Support Rail Assembly
1VA-08-HAO	.50	3.5	1.812	1.50	2.00	L-(3.5)	FNYBUTWNO08A-XS	SRA-8-XS-SS
1VA-12-HAO	.75	4.5	2.437	1.75	2.75	L-(4.5)	FNYBUTWNO10A-XS	SRA-12-XS-SS
1VA-16-HAO	1.00	6.0	2.937	2.13	3.25	L-(6.0)	FNYBUTWNO16A-XS	SRA-16-XS-SS
1VA-20-HAO	1.25	7.5	3.625	2.50	4.00	L-(7.5)	FNYBUTWNO20A-XS	SRA-20-XS-SS
1VA-24-HAO	1.50	9.0	4.250	3.00	4.75	L-(9.0)	FNYBUTWNO24A-XS	SRA-24-XS-SS

Maximum Operating Parameters per Bearing

Characteristic	Limit
Liner Temperature Range	-240˚ C to 288˚ C (-400˚ F to 550˚ F)
Velocity, dry	42.7 m/min. Continuous
Velocity, dry	122 m/min. Intermittent
Velocity, lubricated	122 m/min. Continuous
Pressure	10.35 MPa
PV	21 MPa/m/min

Replacement Component Dimensions

Self-Aligning Pillow Blocks (Dimensions in inches)

Part Number	Nom. Dia.	L1	H9	H8	H5	B9	B8	B7	J	J1	F Bolt	F Hole	Wt. lb
FNYBUPBO08A-XS	.50	1.50	1.12	.687	.25	2.00	.75	.69	1.69	1.00	#6	.16	.20
FNYBUPBO12A-XS	.75	1.88	1.56	.937	.31	2.75	1.00	.94	2.38	1.25	#8	.19	.51
FNYBUPBO16A-XS	1.00	2.63	2.00	1.187	.38	3.25	1.25	1.19	2.88	1.75	#10	.22	1.03
FNYBUPBO20A-XS	1.25	3.38	2.56	1.500	.43	4.00	1.63	1.50	3.50	2.00	#10	.22	2.15
FNYBUPBO24A-XS	1.50	3.75	2.94	1.750	.50	4.75	1.88	1.75	4.12	2.50	1/4	.28	3.29

Housing Material: Aluminum Alloy Black Anodized

Self-Aligning Twin Pillow Blocks

Part Number	Nom. Dia.	L2	J3	Wt. lb.
FNYBUTWNO08A-XS	.500	3.50	2.50	.40
FNYBUTWNO12A-XS	.750	4.50	3.50	1.02
FNYBUTWNO16A-XS	1.00	6.00	4.50	2.06
FNYBUTWNO20A-XS	1.25	7.50	5.50	4.30
FNYBUTWNO24A-XS	1.50	9.00	6.50	6.88

Housing Material: Aluminum Alloy Black Anodized

Performance Note: For detailed explanations of FluoroNyliner Linear Guide Dynamic and Static Load Capacities, Frictional Characteristics, Wear Rates, Speeds, and Life Expectancy please contact the Danaher Motion Linear Guides Applications Engineering department.

Product Note: FluoroNyliner linear guides are shipped free of all lubricants. It is the responsibility of the product user to determine lubricant compatibility with the FluoroNyliner bearing material.

Product Options: FluoroNyliner linear guides are available with variousinner race materials and platings to accommodate different environments.

Top plates are sold separately. Please refer to p. B-60 under accessories for P/N and dimensions.

Type SRA LinearRace Shaft Support Rail Assembly (Dimensions in Inches)

Part Number	Nom. Dia.	H1	H7	Br	K	X	Y	G Bolt	G Hole	Wt. lb/ft
SRA-8-XS-SS	.50	1.125	.19	1.50	1.00	4	2	#6	.17	1.26
SRA-12-XS-SS	.75	1.500	.25	1.75	1.25	6	3	#10	.22	2.50
SRA-16-XS-SS	1.00	1.750	.25	2.13	1.50	6	3	1/4	.28	4.06
SRA-20-XS-SS	1.25	2.125	.31	2.50	1.88	6	3	5/16	.34	6.30
SRA-24-XS-SS	1.50	2.500	.38	3.00	2.25	8	4	5/16	.34	8.60

LinearRace Support Rail Material: Aluminum Alloy Black Anodized

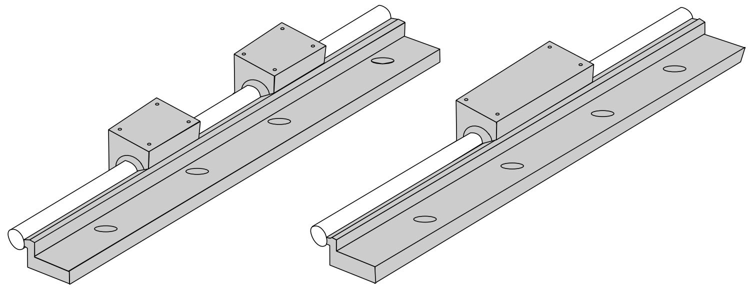
Support rails are supplied in 24 inch lengths unless quoted otherwise.
Maximum length of LinearRace Shaft Support Rail is 72 inches. If longer continuous one-piece LinearRace Shaft Support Rails are required, contact the Danaher Motion Linear Guide Application Engineering department.

Phone: 1-800-554-8466
Website: www.linearactuators.com

Side Mounted 1DA

Side Mounted for Low Profile

Inch



Features

- Continuously supported design increases rigidity and provides for unlimited linear guide travel lengths
- Versatile Side Support Rail Assembly geometry for optimizing mounting ability
- Side mounted design provides an increase in pull-off load capacity

Components

- 2 Super Smart Ball Bushing* modified open type pillow blocks or 1 Super Smart Ball Bushing modified open type twin pillow block.
- 1 60 Case* LinearRace* shaft side mounted support rail assembly

Specifying this Thomson Linear Guide:

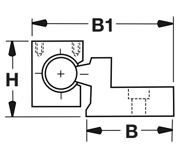
1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

Part Numbering System

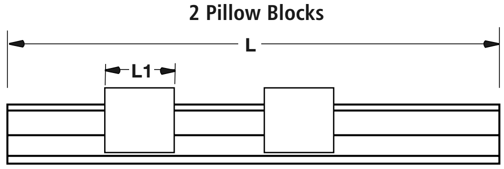
1DA-12-JOO L24

Linear Guide Designation
Nominal Diameter
Type of Bearing Block
Type of Support
Linear Guide Length

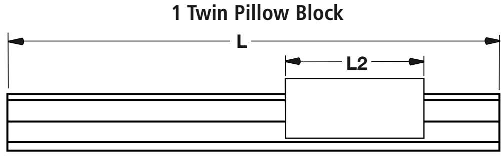
Dimensions (Inch)



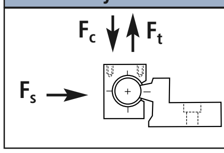
Single Side Mounted Linear Guide with 2 Pillow Blocks



Single Side Mounted Linear Guide with 1 Twin Pillow Block



Load Rating and Limit by Direction

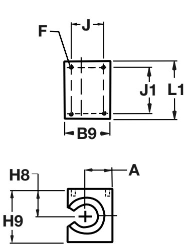


	Dynamic Load Rating	Load Limit
F_c	C	0.5C
F_t	0.5C	0.5C
F_s	C	C

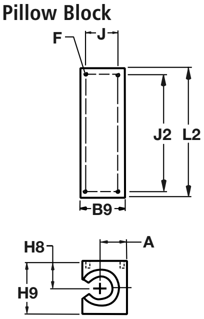
Dynamic Load Rating
Load value used in life calculation.

Load Limit
Maximum allowable load applied to bearing.

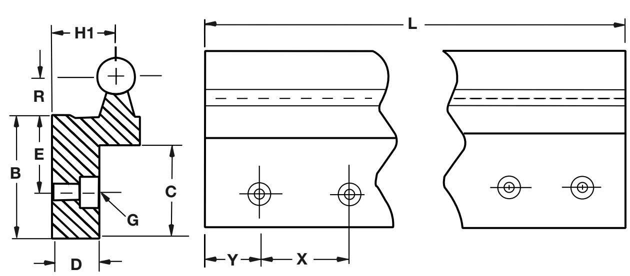
Type SSUPBO-MOD Open Type Pillow Block
Type SPB-OPN-MOD Open Type Pillow Block



Type SSUTWNO-MOD Pillow Block
Type TWN-OPN-MOD Pillow Block



Type SSRA Side Mounted LinearRace Shaft Support Rail Assembly

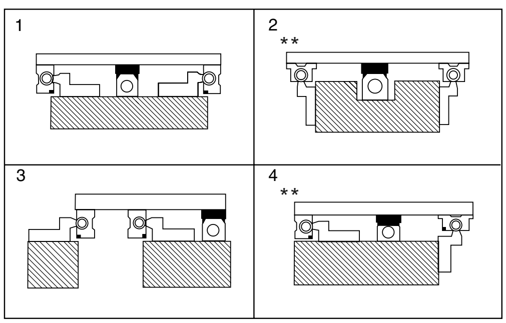


Side Mounted Linear Guide 1DA Single Side Mounted with 2 Pillow Blocks							(Dimensions in inches)
Part Number	Nominal Diameter	H	B	B1	L1	Pillow Block	Shaft Support Rail Assembly
1DA-08-JOO	.50	1.562	1.44	2.61	1.50	**SPB-8-OPN-MOD**	**SSRA-8**
1DA-12-JOO	.75	2.062	1.94	3.55	1.88	**SSUPBO-12-MOD**	**SSRA-12**
1DA-16-JOO	1.00	2.562	2.44	4.49	2.63	**SSUPBO-16-MOD**	**SSRA-16**

Side Mounted Linear Guide 1DA Single Side Mounted with 1 Twin Pillow Block								(Dimensions in inches)
Part Number	Nominal Diameter	H	B	B1	L2	Maximum Stroke Length	Pillow Block	Shaft Support Rail Assembly
1DA-08-KOO	.50	1.562	1.44	2.61	3.5	L-(3.5)	**TWN-8-OPN-MOD**	**SSRA-8**
1DA-12-KOO	.75	2.062	1.94	3.55	4.5	L-(4.5)	**SSUTWNO-12-MOD**	**SSRA-12**
1DA-16-KOO	1.00	2.562	2.44	4.49	6.0	L-(6.0)	**SSUTWNO-16-MOD**	**SSRA-16**

Mounting Configurations

The following mounting configurations depict ideas for combining the Side Mounted Continuously Supported Linear Guides into your linear motion application. If you need further information, contact the Danaher Motion Application Engineering Department.



**Pillow blocks shown are the standard SSUPBO or SPB-OPN style. To order System 1DA with standard pillow blocks, order the Side Mounted Shaft Rail Assembly (SSRA) and the SSUPBO or SPB-OPN separately.

Dynamic Load Rating (C) Matrix			(4 million inches travel)
Linear Guide Assembly Part No.	Dynamic Load Rating, C (lbf) (Even Distribution)	Pillow Block Part No.	Pillow Block Dynamic Load Rating, C (lbf)
1DA-08-JOO	240	SPB-8-OPN-MOD	120
1DA-12-JOO	1600	SSUPBO-12-MOD	800
1DA-16-JOO	2700	SSUPBO-16-MOD	1350
1DA-08-KOO	240	TWN-8-OPN-MOD	240
1DA-12-KOO	1600	SSUTWNO-12-MOD	1600
1DA-16-KOO	2700	SSUTWNO-16-MOD	2700

† Super Ball Bushing* bearings are used in .500 inch size pillow blocks.

Replacement Component Dimensions

Type SPB-OPN-MOD and SSUPBO-MOD Pillow Block										(Dimensions in inches)
Part Number	Nom. Dia.	H8	H9	A	B9	L1	J	J1	F	Wt. lb
SPB-08-OPN-MOD	.50	.687	1.44	.67	1.12	1.50	.812	1.250	#8-32	.18
SSUPBO-12-MOD	.75	.937	1.94	.92	1.56	1.88	1.187	1.562	#10-32	.45
SSUPBO-16-MOD	1.00	1.187	2.44	1.17	2.00	2.63	1.438	2.250	1/4-20	.98

Housing Material: Aluminum Alloy Black Anodized
Top plates are sold separately. Please refer to p. B-51 under accessories for P/N and dimensions.

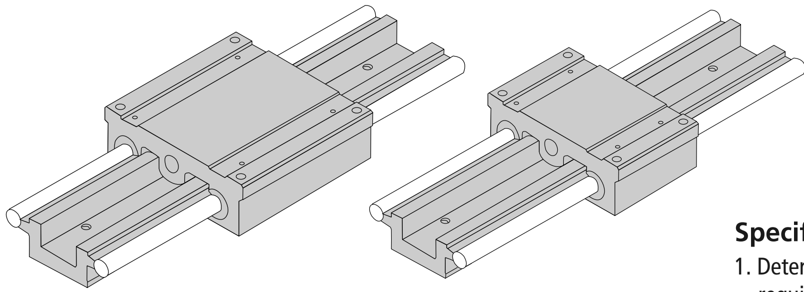
Type TWN-OPN-MOD and SSUTWNO-MOD Pillow Blocks				
Part Number	Nom. Dia.	L2	J2	Wt. lb
TWN-8-OPN-MOD	.50	3.5	3.00	.39
SSUTWNO-12-MOD	.75	4.5	4.00	1.00
SSUTWNO-16-MOD	1.00	6.0	5.25	2.11

Housing Material: Aluminum Alloy Black Anodized

Type SSRA Side Mounted LinearRace Shaft Support Rail Assembly											(Dimensions in Inches)
Part Number	Nom. Dia.	H1	B	R	E	D	C	X	Y(1)	G	Wt. lb/ft
										Bolt	Hole	
SSRA-08	.500	.875	1.44	.500	1.00	.49	1.06	4	2	1/4	.28	2.05
SSRA-12	.750	1.125	1.94	.688	1.31	.75	1.44	6	3	5/16	.34	4.00
SSRA-16	1.000	1.375	2.44	.875	1.63	.88	1.81	6	3	3/8	.41	6.25

(1) For standard lengths
LinearRace Shaft Support Rail Material: Aluminum Black Anodized

Support rails are supplied in 24 inch lengths unless quoted otherwise.
Maximum length of LinearRace Shaft Support Rail is 72 inches. If longer continuous one-piece LinearRace Shaft Support Rails are required, contact the Danaher Motion Linear Guides Application Engineering department.



Dual Shaft Rail* 2DA

with Integrated Carriage
Unpack and Install
Inch

Specifying this Thomson Linear Guide:

1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

Features

- Used in continuously supported applications when rigidity is required
- Adaptable to any drive system
- Pre-aligned and preassembled for immediate installation and use
- Designed for medium to heavy loads

Components

- 1 Dual LinearRace* shaft rail assembly
- 1 integrated carriage with 4 open type Super Smart Ball Bushing* bearings

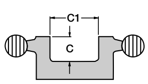
Part Numbering System

2DA-12-OOB L24

- Linear Guide Designation
- Nominal Diameter
- Type of Carriage
- Linear Guide Length

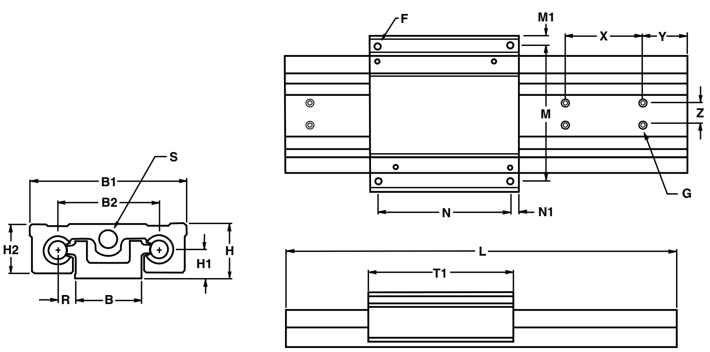
Dimensions (Inch)

2DA XX 00B

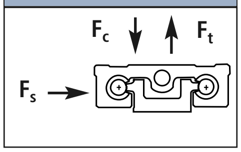


Rail Cross Section

Dual Shaft Rail Linear Guide with Integrated full length Carriage



Load Rating and Limit by Direction

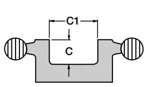


	Dynamic Load Rating	Load Limit
F_c	C	0.5C
F_t	C	0.5C
F_s	0.5C	0.5C

Dynamic Load Rating
Load value used in life calculation.

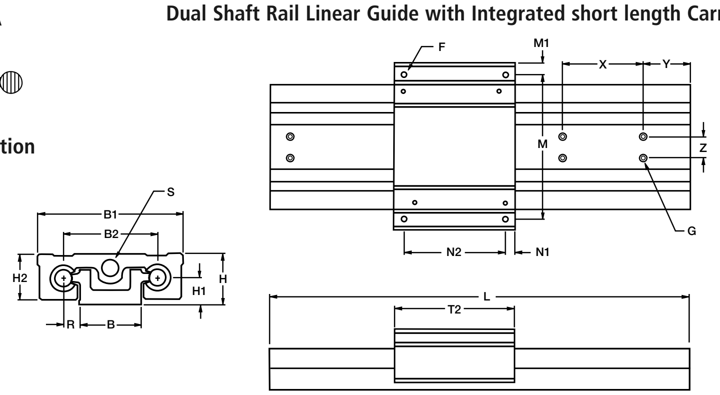
Load Limit
Maximum allowable load applied to bearing.

2DA XX 00A

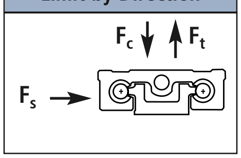


Rail Cross Section

Dual Shaft Rail Linear Guide with Integrated short length Carriage



Load Rating and Limit by Direction



	Dynamic Load Rating	Load Limit
F_c	C	0.5C
F_t	C	0.5C
F_s	0.5C	0.5C

Dynamic Load Rating
Load value used in life calculation.

Load Limit
Maximum allowable load applied to bearing.

Phone: 1-800-554-8466
Website: www.linearactuators.com

Dual Shaft Rail Linear Guide 2DA with Integrated Carriage (Dimensions in inches)

Part Number	Nominal Diameter	T1	H	H1	H2	B	R	B1	B2	C	C1
2DA-08-OOB	.50	4.5	1.625	.875	1.43	2.00	.500	4.6	3.0	.64	1.25
2DA-12-OOB	.75	6.0	2.125	1.125	1.93	2.63	.688	6.1	4.0	.75	1.62
2DA-16-OOB	1.00	7.5	2.625	1.375	2.44	3.25	.875	7.6	5.0	.99	2.00

Dual Shaft Rail Linear Guide 2DA with Integrated Carriage (Dimensions in inches)

Part Number	N	N1	M	M1	X	Y	Z	S As Extruded	F	G		Max. Stroke Length	Includes	
										Bolt	Hole		Carriage Part Number	Dual Shaft Rail Asmbly. Part No.
2DA-08-OOB	4.00	.25	4.00	.30	4.0	2.0	.75	.50	#10-32	1/4	.28	L-(4.5)	DSRC-08-SB	DSRA-08
2DA-12-OOB	5.25	.37	5.25	.42	6.0	3.0	1.00	.70	1/4-20	5/16	.34	L-(6.0)	DSRC-12-SB	DSRA-12
2DA-16-OOB	6.75	.37	6.75	.42	6.0	3.0	1.25	.90	5/16-18	3/8	.41	L-(7.5)	DSRC-16-SB	DSRA-16

Support rails are supplied in 24 inch lengths unless quoted otherwise.
Dual Shaft Rail Support Material: Black Anodized Aluminum Alloy
Maximum continuous length of support rails is 72”. If longer continuous shaft support rails are required, please contact the Danaher Motion Linear Guides Application Engineering department.

Dynamic Load Rating (C) Matrix (4 million inches travel)

Linear Guide Assembly Part No.	Dynamic Load Rating, C (lbf) (Even Distribution)	Dynamic Roll Moment Rating, C (in - lbf)
2DA-08-OOB	480	720
2DA-12-OOB	3200	6400
2DA-16-OOB	5400	13500

Note: Above load ratings used for life calculations. Load limit of assembly 50%.

Dual Shaft Rail Linear Guide 2DA with Integrated Carriage (Dimensions in inches)

Part Number	Nominal Diameter	T2	H	H1	H2	B	R	B1	B2	C	C1
2DA-08-OOA	.500	3.5	1.625	.875	1.43	2.00	.500	4.60	3.0	.64	1.25
2DA-12-OOA	.750	4.5	2.125	1.125	1.93	2.63	.688	6.10	4.0	.75	1.62
2DA-16-OOA	1.000	6.0	2.625	1.375	2.44	3.25	.875	7.60	5.0	.99	2.00

Dual Shaft Rail Linear Guide 2DA with Integrated Carriage (Dimensions in inches)

Part Number	N	N2	M	M1	X	Y	Z	S As Extruded	F	G		Max. Stroke Length	Includes	
										Bolt	Hole		Carriage Part Number	Dual Shaft Rail Asmbly. Part No.
2DA-08-OOA	.25	3.00	4.00	.30	4.0	2.0	.75	.50	#10-32	1/4	.28	L-(3.5)	DSRC-08-SA	DSRA-08
2DA-12-OOA	.37	3.75	5.25	.42	6.0	3.0	1.00	.70	1/4-20	5/16	.34	L-(4.5)	DSRC-12-SA	DSRA-12
2DA-16-OOA	.37	5.25	6.75	.42	6.0	3.0	1.25	.90	5/16-18	3/8	.41	L-(6.0)	DSRC-16-SA	DSRA-16

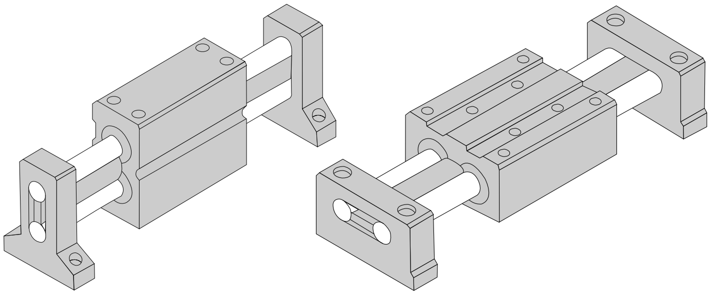
Support rails are supplied in 24 inch lengths unless quoted otherwise.
Dual Shaft Rail Support Material: Black Anodized Aluminum Alloy Maximum continuous length of support rails is 72”. If longer continuous shaft support rails are required, please contact the Danaher Motion Linear Guides Application Engineering department.

† Super Ball Bushing* bearings are used in 500 inch size carriages

Dynamic Load Rating (C) Matrix (4 million inches travel)

Linear Guide Assembly Part No.	Dynamic Load Rating, C (lbf) (Even Distribution)	Dynamic Roll Moment Rating, C (in - lbf)
2DA-08-OOA	480	720
2DA-12-OOA	3200	6400
2DA-16-OOA	5400	13500

Note: Above load ratings used for life calculations. Load limit of assembly 50%.



Twin Shaft Web* 2CA

with Universal Carriage

Unpack and Install

Inch

Features

- Used when spanning or bridging a gap
- Double LinearRace* shaft and welded integral web design maximizes torque and dramatically improves deflection characteristics
- Pre-aligned for quick and easy installation
- Designed to move medium loads with virtually frictionless travel

Components

- Universal integrated, carriage with 4 open type Super Smart Ball Bushing* bearings
- Twin welded 60 Case* LinearRace shafts with integral web
- 2 vertical or horizontal double end supports

Specifying this Thomson Linear Guide:

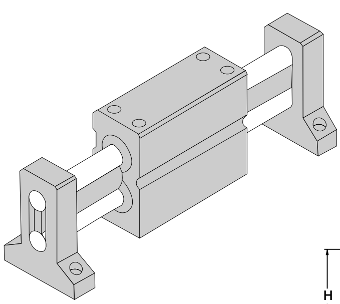
1. Determine the proper Linear Guide for your load and life requirements.
2. Select the part number.
3. Add the letter "L" followed by the overall length in inches, as a suffix to the part number.

Part Numbering System

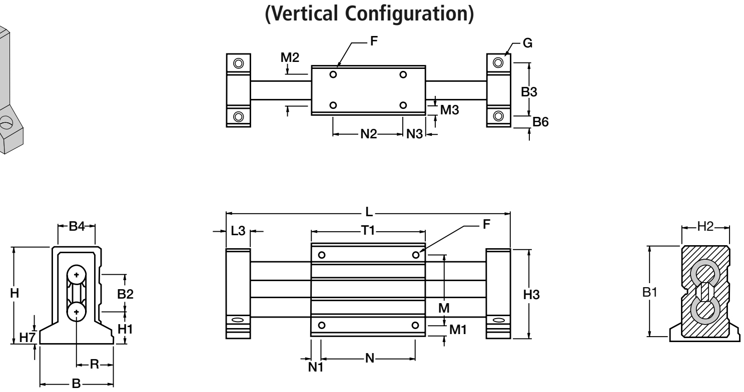
2CA-12-OME L24

- Linear Guide Designation
- Nominal Diameter
- Type of Support
- Type of Carriage
- Linear Guide Length

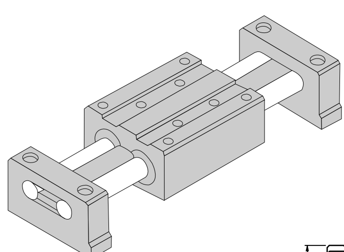
Dimensions (Inch)

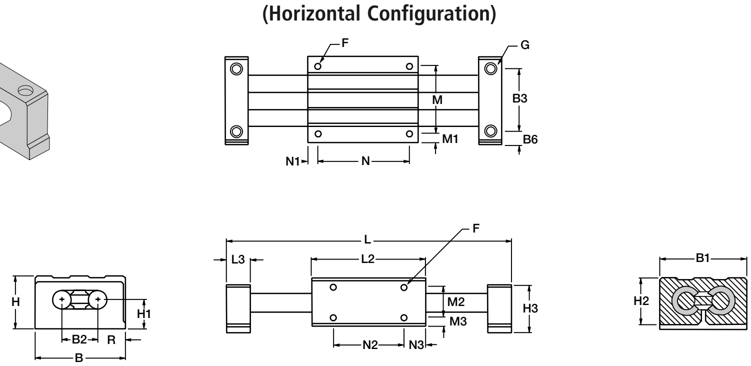


Twin Shaft Web Linear Guide with Universal Carriage
(Vertical Configuration)



Twin Shaft Web Linear Guide with Universal Carriage
(Horizontal Configuration)





Twin Shaft Web Linear Guide End Supported 2CA (Vertical Configuration)													(Dimensions in inches)
Part Number	Nominal Diameter	L3	H	H1	H3	H7	B	R	B2	B3	B4	B6	T1	N
2CA-08-OKE	.50	.63	2.750	.875	2.56	.38	2.25	1.125	1.13	1.63	1.12	.31	3.5	3.00
2CA-12-OKE	.75	.75	3.625	1.125	3.44	.56	3.00	1.500	1.50	2.25	1.63	.38	4.5	4.00
2CA-16-OKE	1.00	1.00	4.625	1.375	4.50	.75	4.00	2.000	2.00	3.00	2.25	.50	6.0	5.25

Twin Shaft Web Linear Guide End Supported 2CA (Vertical Configuration)													(Dimensions in inches)
Part Number	N1	N2	N3	H2	B1	M	M1	M2	M3	F	G		Max. Stroke Length	Twin Shaft Web Part Number
											Bolt	Hole		
2CA-08-OKE	.25	2.5	.50	1.5	2.62	2.00	.31	.88	.31	#10-32	#10	.22	L-(4.75)	TSW-08
2CA-12-OKE	.25	3.5	.50	2.0	3.50	2.87	.31	1.38	.31	1/4-20	1/4	.28	L-(6.00)	TSW-12
2CA-16-OKE	.38	4.5	.75	2.5	4.50	3.62	.44	1.62	.44	5/16-18	5/16	.34	L-(8.00)	TSW-16

Maximum Length is 72 inches.

2CA (Vertical Configuration) Carriage and End Support Part No.		
Linear Guide Part Number	Carriage Part Number	End Support Part Number
2CA-08-OKE	WC-08	WSB-08-V
2CA-12-OKE	WC-12	WSB-12-V
2CA-16-OKE	WC-16	WSB-16-V

Shaft Deflection Note:
Load limit may be below the dynamic load rating due to shaft deflection.
Bearings can accommodate up to 1/2° deflection.
See Engineering Section (pg B-67) for Deflection calculations.

Dynamic Load Capacity Matrix		(4 million inches travel)
Linear Guide Assembly Part No.	Dynamic Load Capacity (lbf) (Even Distribution)	Dynamic Roll Moment Capacity (in - lbf)
2CA-08-OKE	290	165
2CA-12-OKE	1800	1350
2CA-16-OKE	3000	3000

† Super Ball Bushing* bearings are used in .500 inch size carriages.

Twin Shaft Web Linear Guide End Supported 2CA (Horizontal Configuration)											(Dimensions in inches)
Part Number	Nominal Diameter	L3	H	H1	H3	B	R	B2	B3	B6	T1	N
2CA-08-OME	.50	.63	1.625	.875	1.5	2.62	.750	1.13	2.00	.31	3.5	3.00
2CA-12-OME	.75	.75	2.125	1.125	2.0	3.50	1.000	1.50	2.75	.37	4.5	4.00
2CA-16-OME	1.00	1.00	2.625	1.375	2.5	4.50	1.250	2.00	3.62	.50	6.0	5.25

Twin Shaft Web Linear Guide End Supported 2CA (Horizontal Configuration)													(Dimensions in inches)
Part Number	N1	N2	N3	H2	B1	M	M1	M2	M3	F	G		Max. Stroke Length	Twin Shaft Web Part Number
											Bolt	Hole		
2CA-08-OME	.25	2.5	.50	1.5	2.62	2.00	.31	.88	.31	#10-32	#10	.22	L-(4.75)	TSW-08
2CA-12-OME	.25	3.5	.50	2.0	3.50	2.87	.31	1.38	.31	1/4-20	1/4	.28	L-(6.00)	TSW-12
2CA-16-OME	.38	4.5	.75	2.5	4.50	3.62	.44	1.62	.44	5/16-18	5/16	.34	L-(8.00)	TSW-16

Maximum Length is 72 inches.

2CA (Horizontal Configuration) Carriage and End Support Part No.		
Linear Guide Part Number	Carriage Part Number	End Support Part Number
2CA-08-OME	WC-08	WSB-08-H
2CA-12-OME	WC-12	WSB-12-H
2CA-16-OME	WC-16	WSB-16-H

Shaft Deflection Note:
Load limit may be below the dynamic load rating due to shaft deflection.
Bearings can accommodate up to 1/2° deflection.
See Engineering Section (pg B-67) for Deflection calculations.

Dynamic Load Capacity Matrix		(4 million inches travel)
Linear Guide Assembly Part No.	Dynamic Load Capacity (lbf) (Even Distribution)	Dynamic Roll Moment Capacity (in - lbf)
2CA-08-OME	290	165
2CA-12-OME	1800	1350
2CA-16-OME	3000	3000

† Super Ball Bushing* bearings are used in .500 inch size carriages.

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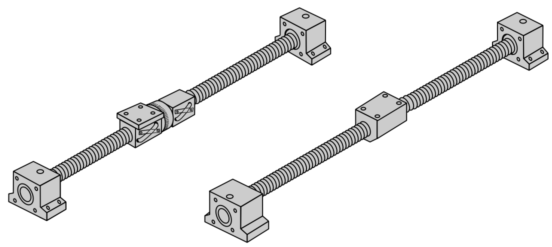
Website: www.linearactuators.com



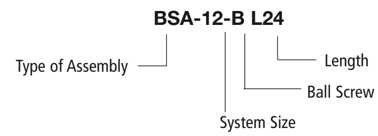
Ball Screw Assemblies

Inch and Metric

Specifying a Ball Screw Assembly:

1. Determine your drive requirements (torque, speed, acceleration, etc.)
2. Select the part number of the ball screw you have chosen.
3. Place your order with your local authorized distributor.

Part Numbering System



Features

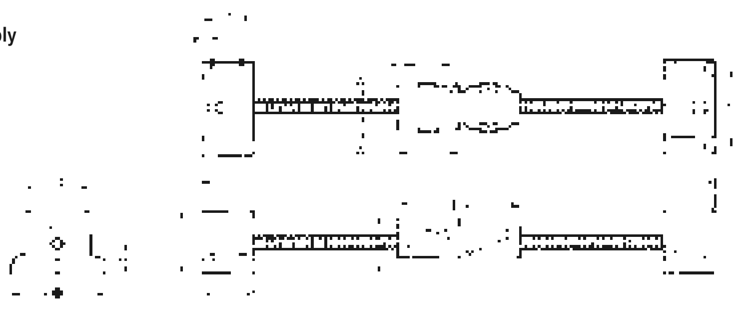
- Integrated ball screw and supports with motor-ready mounting
- Designed to fit appropriately sized linear guides for custom configurations
- Pre-engineered to meet your system needs

Components

- 1 Ball Screw Assembly with Ball Nut Mounting Surface (Preloaded or Non-Loaded)
- 2 Integrated End Supports with Angular Contact Bearings
- 1 Motor and Controller with integrated indexer (optional)

Dimensions (Inch)

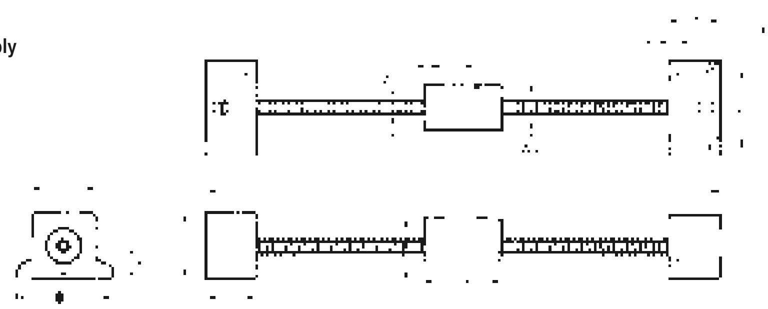
Ball Screw Assembly Preloaded

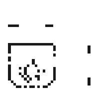


Ball Screw Nut Mounting Block Cross-Section

Preloaded Ball Screw Assemblies are predesigned to match the base to pillow block height of 1BA, 1CA and 1VA linear guides. To utilize Ball Screw Assemblies with other linear guides contact the Thomson Systems application engineering department.

Ball Screw Assembly Non-Preloaded





Ball Screw Nut Mounting Block Cross-Section

Non-Preloaded Ball Screw Assemblies are predesigned to match the base to pillow block height of 1BA, 1CA and 1VA linear guides. To utilize Ball Screw Assemblies with other linear guides contact the Thomson Systems application engineering department.

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Website: www.linearactuators.com

Ball Screw Assemblies - (Preloaded)											(Dimensions in inches)
Part Number	Ball Screw Dia. x Lead	L3	L5	L6	L8	H	H3	H1	B	B3	B4	R	G
BSA-08-Q	.500 x .500	1.50	0.75	0.38	2.25	1.812	2.35	1.200	3.80	3.20	2.50	1.900	0.19
BSA-12-L	.631 x 1.00	2.00	1.00	0.50	–	2.437	2.70	1.500	3.80	3.20	2.50	1.900	0.22
BSA-16-H	1.00 x .250	2.20	1.20	0.50	2.40	2.937	3.45	1.750	5.00	4.20	3.50	2.500	0.28
BSA-16-T	1.00 x 1.00												
BSA-24-I	1.50 x .250												
BSA-24-J	1.50 x 1.00	2.80	1.50	0.65	2.82	4.250	5.000	2.500	7.25	6.20	5.00	3.625	0.34
BSA-24-Z	1.50 x 1.875												

Ball Screw Assemblies - (Preloaded)											(Dimensions in inches)
Part Number	Ball Screw Dia. x Lead	Y	V1	W	W1	F3	L9	A	A1	A5	A7	Motor Frame Size
BSA-08-Q	.500 x .500	1.00	0.25	0.95	0.14	#6-32	4.50	1.23	1.20	0.23	0.76	NEMA 23
BSA-12-L	.631 x 1.00	1.93	0.25	1.33	0.18	#8-32	3.44	1.69	1.80	-	-	NEMA 23
BSA-16-H	1.00 x .250	1.90	0.25	1.63	0.26	#10-32	4.85	2.15	2.03	0.44	2.12	NEMA 34
BSA-16-T	1.00 x 1.00						5.70					NEMA 34
BSA-24-I	1.50 x .250						6.38					NEMA 42
BSA-24-J	1.50 x 1.00	2.00	0.41	2.00	0.37	1/4-20	7.34	2.75	3.25	0.63	2.25	NEMA 42
BSA-24-Z	1.50 x 1.875						10.63					NEMA 42

Ball Screw Assemblies (Non-Preloaded)											(Dimension in inches)
Part Number	Ball Screw Dia. x Lead	L3	L5	L6	L9	H	H3	H1	B	B3	B4	R	G
BSA-08-F	.500 x .200	1.50	0.75	0.38	2.25	1.812	2.35	1.200	3.80	3.20	2.50	1.90	0.19
BSA-12-G	.750 x .200	2.00	1.00	0.50	1.80	2.437	2.70	1.500	3.80	3.20	2.50	1.90	0.22
BSA-M12-B	12mm x 5mm	1.50	0.75	0.38	2.25	1.812	2.35	1.200	3.80	3.20	2.50	1.90	0.19
BSA-M20-D	20mm x 5mm	2.00	1.00	0.50	2.46	2.437	2.70	1.500	3.80	3.20	2.50	1.90	0.22

Ball Screw Assemblies (Non-Preloaded)									(Dimension in inches)
Part Number	Ball Screw Dia. x Lead	A2	A3	A8	V2	V3	W2	W3	W4	F3
BSA-08-F	.500 x .200	1.19	1.23	0.48	1.00	0.25	0.95	0.12	1.19	#6-32
BSA-12-G	.750 x .200	1.69	1.80	0.72	1.93	0.25	1.33	0.18	1.69	#8-32
BSA-M12-B	12mm x 5mm	1.19	1.23	0.48	1.00	0.25	0.95	0.12	1.19	#6-32
BSA-M20-D	20mm x 5mm	1.69	1.80	0.72	1.93	0.25	1.33	0.18	1.69	#8-32

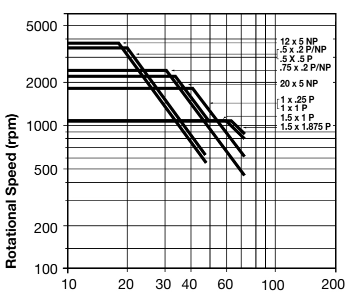
Ball Screw Assembly Standard Lengths													(Lengths in inches)				
Part No.	18	24	30	32	36	40	42	48	54	60	64	66	72	80	84	88	96
BSA-08-Q	■	■	■		■		■	■									
BSA-12-L	■	■	■		■		■	■	■	■		■	■				
BSA-16-H	■	■	■		■		■	■	■	■		■	■		■		■
BSA-16-T	■	■	■		■		■	■	■	■		■	■		■		■
BSA-24-I		■		■		■		■			■		■	■		■	■
BSA-24-J		■		■		■		■			■		■	■		■	■
BSA-24-Z		■		■		■		■			■		■	■		■	■

Custom Lengths

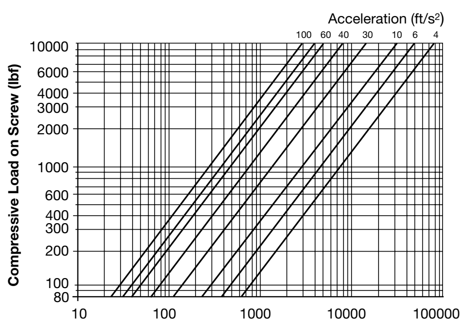
Custom lengths are also available. For special requirements, please contact the Danaher Motion application engineering department.

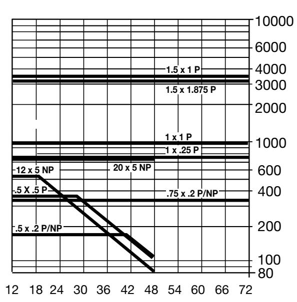
For Motion Control Options, see page B-66. To determine system Torque Requirements of Ball Screw travel life refer to the Engineering Support Appendix, page B-67. For Motor Adaptor and Motor Coupling information, see page B-55.

Maximum AcceptableTravel Rate*



*80% of Critical Speed





The SuperSlide has a pre-designed **Maximum Acceptable Travel Rate**. Calculate maximum rotational speed (rpm) by dividing your required maximum linear speed (in/min) by the corresponding system ball screw lead (in/rev.). Enter the chartwith the required system length and your maximum rotational speed. Select the system with a maximum acceptable travel rate curve above the plotted line. **Compressive load** on the ball screw is a key factor in selecting the proper System. Using maximum load and acceleration requirements, plot compressive load on the left side of the chart. Using System length and compressive load. plot the maximum allowable compressive force on the right chart. Select the System with a rated maximum compressive force above your plotted point.

If you have questions concerning your system requirements, contact the Thomson **Systems** application engineering department.

Note: Ball screw should never exceed recommended critical speed.

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NOTES:

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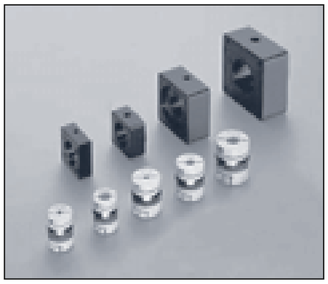
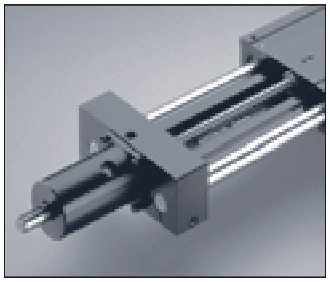
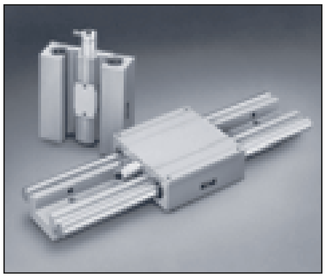
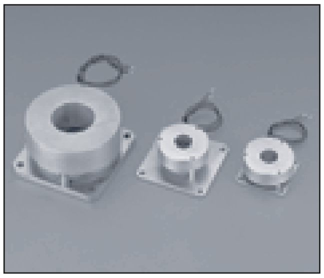








Accessories

Collapsable Bellows

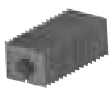
Bellows will reduce available stroke length of slide by approximately 28%.

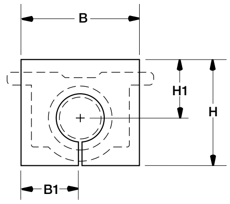
Bellows P/N should be succeeded by a length when ordering

Bellows Materials:
- Polyester Cover
- PVC Stiffeners

BEL-1B†

For Systems 1AA, 1AB, 1AC, 1BA, 1BB, 1BC, 2AA, 2AB





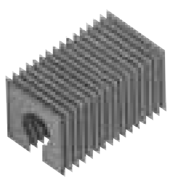
BEL-1B Moveable Protective Bellows

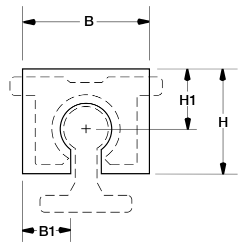
Part Number	Nom. Shaft Dia.	Dimension (in.)			CR
		H	H1	B	
BEL-1B-04	1/4	1.187	.906	1.812	.163
BEL-1B-06	3/8	1.312	.968	1.937	.108
BEL-1B-08	1/2	1.687	1.156	2.062	.163
BEL-1B-12	3/4	2.000	1.156	2.312	.108
BEL-1B-16	1	2.375	1.281	2.625	.163
BEL-1B-24	11/2	3.062	1.531	3.125	.108

†Each moveable bellows comes with 1 section of bellows and 2 pairs of Velcro® Fasteners.

BEL-1C†

For Systems 1CA, 1CB, 1CC, 2EA, 2EB





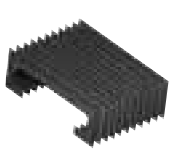
BEL-1C Moveable Protective Bellows

Part Number	Nom. Shaft Dia.	Dimension (in.)			CR
		H	H1	B	
BEL-1C-08	1/2	1.375	.968	2.062	.088
BEL-1C-12	3/4	1.812	1.062	2.312	.120
BEL-1C-16	1	2.375	1.218	2.625	.088
BEL-1C-24	11/2	3.125	1.531	3.125	.088

† Each moveable bellows comes with 1 section of bellows and 2 pairs of Velcro® Fasteners.

BEL-2AE

For QuickSlide* Systems 2AA, 2EA and SuperSlide* Systems 2AB, 2EB



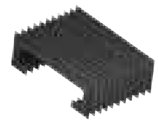
BEL-2AE Moveable Protective Bellows

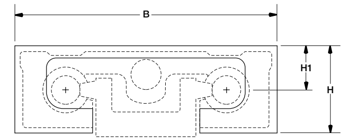
Part Number	Nom. Shaft Dia.	Dimension (in.)		
		H	H1	B
BEL-2AE-08	1/2	1.4	1.24	5.25
BEL-2AE-12	3/4	2.1	1.35	6.85
BEL-2AE-16	1	2.8	1.68	8.10
BEL-2AE-24	11/2	4.2	2.44	11.18

Each moveable bellows comes with 1 section of bellows and 2 pairs of Velcro® fasteners.

BEL-2D

For Dual Shaft Rail QuickSlide System 2DA† and SuperSlide System 2DB





BEL-2D Dual Shaft Rail Bellows

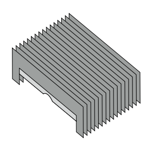
Part Number	Nom. Shaft Dia.	Dimension (in.)		
		H	H1	B
BEL-2DA-08	1/2	1.50	0.85	4.60
BEL-2DB-08	1/2	1.89	1.34	5.13
BEL-2D-12	3/4	2.406	1.437	6.000
BEL-2D-16	1	2.875	1.687	7.500

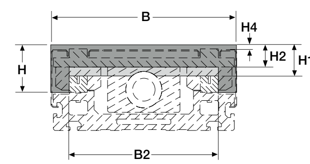
Each moveable bellows comes with 1 section of bellows and 2 mounting brackets and mounting screws.

†Appropriate arrangements for afixing the Bellows at each end of the QuickSlide 2DA System are required.

BEL-2H

For SuperSlide Systems 2HB, 2HE





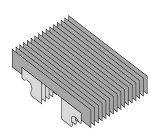
BEL-2H Moveable Protective Bellows

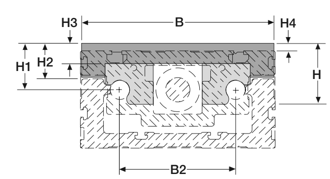
Part Number	Nom. Sys. size	Dimension (mm)					
		B	B2	H	H1	H2	H4
BEL-2H-10	10	103	81	26	11	10	0
BEL-2H-20	20	199	167	48	30	15	5

Each moveable bellows comes with 1 section of bellows and 2 mounting brackets and mounting screws.

BEL-2R

For SuperSlide Systems 2RB, 2RE





BEL-2R Moveable Protective Bellows

Part Number	Nom. Shaft Dia.	Dimension (mm)						
		B	B2	H	H1	H2	H3	H4
BEL-2R-12	12	128	75	48	37	29	15	12
BEL-2R-16	16	158	95	52	426	30	150	10

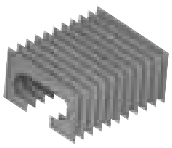
Each moveable bellows comes with 1 section of bellows and 2 mounting brackets and mounting screws.

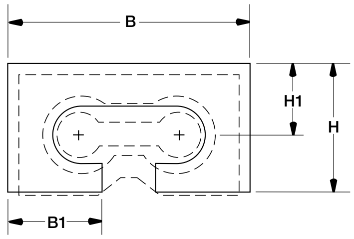
Collapsable Bellows

Bellows will reduce available stroke length of slide by approimately 28%.

BEL-2C-H

For Horizontal Twin Shaft Web Quickslide* System 2CA





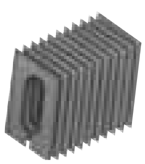
BEL-2C-H Moveable Protective Bellows

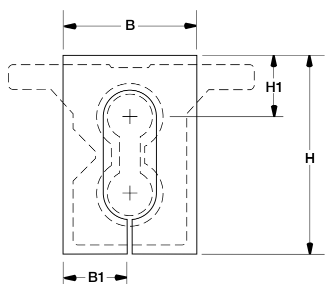
Part Number	Nom. Shaft Dia.	Dimension (in.)			CR
		H	H1	B	
BEL-2C-08-H	1/2	1.688	1.031	3.250	.108
BEL-2C-12-H	3/4	2.062	1.156	3.812	.108
BEL-2C-16-H	1	2.437	1.281	4.62	.108

Each moveable bellows comes with 1 section of bellows and 2 pairs of Velcro® Fasteners.

BEL-2C-V

For Vertical Twin Shaft Web Quickslide System 2CA





BEL-2C-V Moveable Protective Bellows

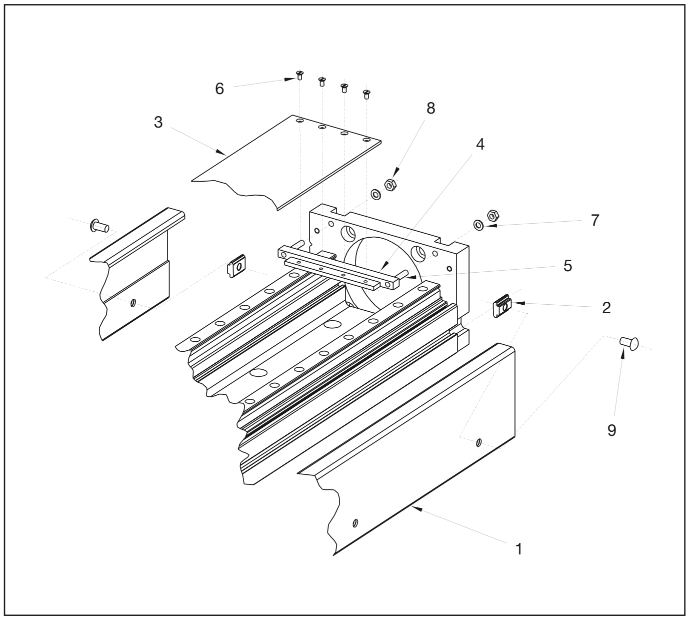
Part Number	Nom. Shaft Dia.	Dimension (in.)			CR
		H	H1	B	
BEL-2C-08-V	1/2	2.750	1.000	2.125	.163
BEL-2C-12-V	3/4	3.750	1.125	2.375	.163
BEL-2C-16-V	1	4.375	1.250	2.625	.108

Each moveable bellows comes with 1 section of bellows and 2 pairs of Velcro® Fasteners.

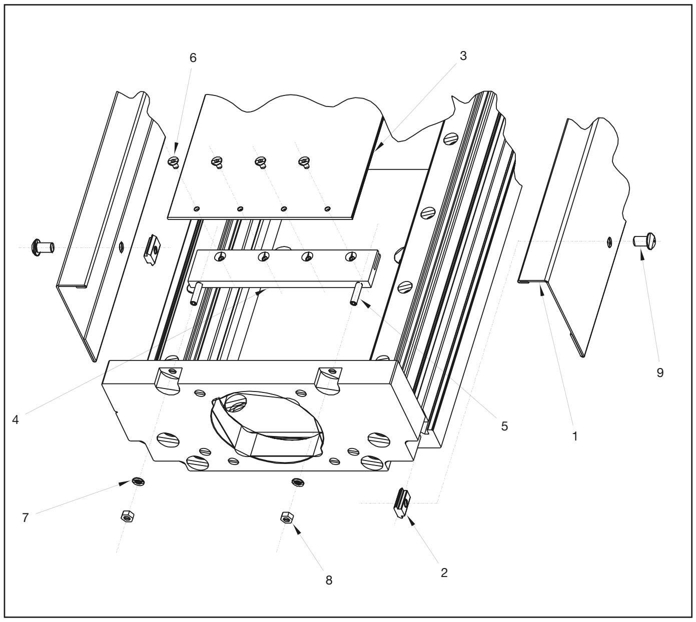
Shroud Covers for AccuSlide*

The AccuSlide Shroud Cover is designed to protect the AccuSlide system from contaminants and particulate matter with a minimal reduction in system stroke length. The shroud cover is a three-piece design, consisting of two side shrouds and one top shroud, each made of grey anodized aluminum. The AccuSlide system carriage top is designed with pedestal mounts so as to allow the passage of the carriage assembly without interference with the cover. This arrangement leaves two uncovered slots that run the length of the stroke. Bellows way covers are also available for full coverage of the AccuSlide system (see page B-52).

2HBM10 and 2HEM10



2HBM20 and 2HEM20



Part No. ASC2HM10 x (length in mm) includes the following components:

Item	Quantity	Description
1	2	Side Shroud
2	as req'd	TNUT02-M4
3	1	Top Shroud
4	2	Top Shroud Bracket
5	4	Set Screw M3
6	8	Flat Head Screw M2
7	4	Washer
8	4	Hexagonal Nut M3
9	as req'd	Button Head Cap Screw M4

Each shroud cover for the 2HBM10 and 2HEM10 AccuSlide systems is provided with all of the necessary hardware to mount the covers. On the top shroud this includes an end mounting bracket at each end of the system with set-screws and associated nuts and washers. These set screws pull the brackets outboard in the axial direction, thus tensioning the top shroud and removing most of the sag in the cover on long axis systems. The side shrouds are attached to the system via tee nuts and button head cap screws. The screw/nut assemblies on the side shrouds are spaced every 75 mm.

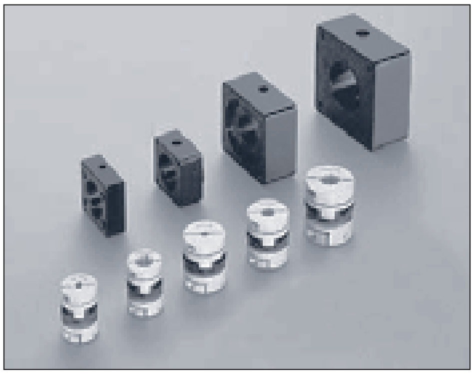
Part No. ASC2HM20 x (length in mm) includes the following components:

Item	Quantity	Description
1	2	Side Shroud
2	as req'd	TNUT04-M6
3	1	Top Shroud
4	2	Top Shroud Bracket
5	4	Set Screw M4
6	8	Flat Head Screw M3
7	4	Washer
8	4	Hexagonal Nut M4
9	as req'd	Button Head Cap Screw M6

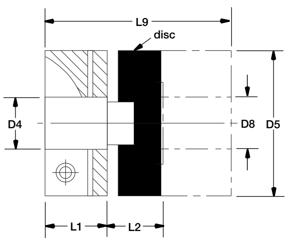
Each shroud cover for the 2HBM20 and 2HEM20 AccuSlide systems is provided with all of the necessary hardware to mount the covers. On the top shroud this includes an end mounting bracket at each end of the system with set-screws and associated nuts and washers. These set screws pull the brackets outboard in the axial direction, thus tensioning the top shroud and removing most of the sag in the cover on long axis systems. The side shrouds are attached to the system via tee nuts and button head cap screws. The screw/nut assemblies on the side shrouds are spaced every 120 mm.

Phone: 1-800-554-8466
Website: www.linearactuators.com

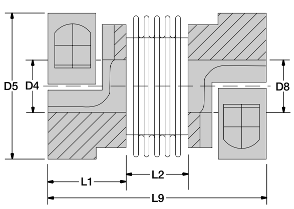
Couplings and Motor Adaptor Blocks - Inch



Motor Couplings for Mounting NEMA frame size motors to Inch Size Systems



Aluminum Oldham Type with Clamp Attachment (Acetal Disc)								
Part Number	Motor Size	Dimensions (in.)						Maximum Torque (lbf-in)
		D5	D4	D8	L1	L2	L9	
MC-OLD-12-23	NEMA 23	1.00	.250	.250	.46	.36	1.28	30.1
MC-OLD-16-23	NEMA 23	1.00	.250	.375	.46	.36	1.28	30.1
MC-OLD-16-34	NEMA 34	1.31	.375	.375	.59	.71	1.89	79.6
MC-OLD-16-34 AE	NEMA 34	1.31	.375	.500	.59	.71	1.89	79.6
MC-OLD-24-42	NEMA 42	1.63	.625	.625	.70	.60	2.00	159.3

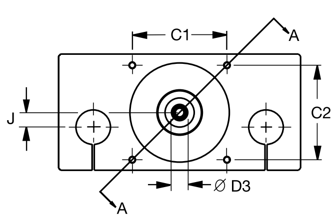


Stainless Steel Bellows Type with Clamp Attachment								
Part Number	Motor Size	Dimensions (in.)						Maximum Torque (lbf-in)
		D5	D4	D8	L1	L2	L9	
MC-BEL-12-23	NEMA 23	.98	.250	.250	.51	.24	1.26	17.7
MC-BEL-16-23	NEMA 23	.98	.250	.375	.51	.24	1.26	17.7
MC-BEL-16-34	NEMA 34	1.57	.375	.375	.67	.51	1.85	88.5
MC-BEL-16-34 AE	NEMA 34	1.57	.375	.500	.67	.51	1.85	88.5
MC-BEL-24-42	NEMA 42	1.77	.625	.625	.47	1.54	2.48	159.3

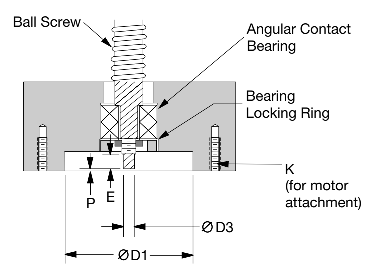
Motor Mounting Dimensions

Dimensional Information for mounting motors to Inch size Ball Screw Actuated SuperSlide* Systems.

SuperSlide End Block End View



Section A-A



Ball Screw Actuated SuperSlide									
Part Number Prefix	Motor Size Size	Dimensions (in.)							
		C1	C2	D1	D3	E	J	K	P
2DB08†	NEMA 23	1.75	1.25	1.50	.188	.30	.275	10-32	.05
2DB12, 2EB08	NEMA 23	1.86	1.86	2.15	.250	.34	.300	10-32	.05
2EB12	NEMA 23	1.86	1.86	2.15	.375	.56	0	10-32	.05
2DB16	NEMA 34	2.74	2.74	2.88	.375	.56	.425	10-32	.05
2EB16	NEMA 34	2.74	2.74	2.88	.500	.42	0	10-32	.05
2EB24	NEMA 42	3.50	3.50	4.10	.625	.59	0	¼-20	.05

† Dimensions for the 2DB08 SuperSlide system are for lead screw actuation only.

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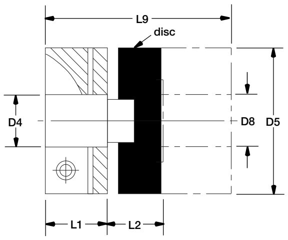
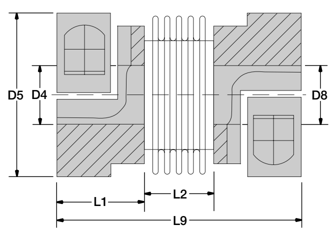
Couplings and Motor Adaptor Blocks - Metric

Motor Couplings for Mounting NEMA frame size motors to Metric Size Systems



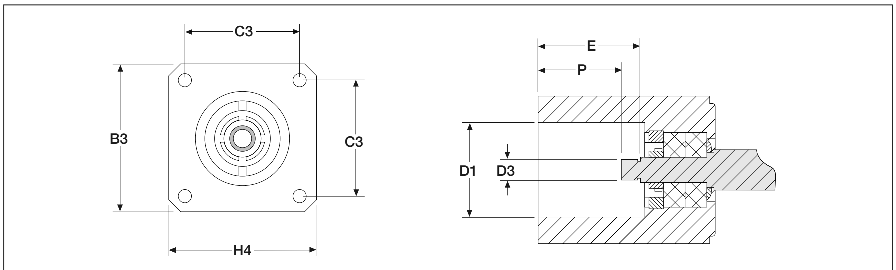
Aluminum Oldham Type with Clamp Attachment (Acetal Disc)								
Part Number	Motor Size	Dimension (mm)						Maximum Torque (N • m)
		D5	D4	D8	L1	L2	L9	
MCM-OLD-08-23	NEMA 23	25,4	6,35	8	11,6	9,2	32,4	3,4
MCM-OLD-10-23	NEMA 23	25,4	6,35	10	11,6	9,2	32,4	3,4
MCM-OLD-14-34	NEMA 34	41,3	9,53	14	15,0	18,0	48,0	9,0



Stainless Steel Bellows Type with Clamp Attachment								
Part Number	Motor Size	Dimension (mm)						Maximum Torque (N • m)
		D5	D4	D8	L1	L2	L9	
MCM-BEL-08-23	NEMA 23	25	6,35	8	13	6	32	2,0
MCM-BEL-10-23	NEMA 23	25	6,35	10	13	6	32	2,0
MCM-BEL-14-34	NEMA 34	40	9,53	14	17	13	47	10,0

Motor Mounting Dimensions

Dimensional Information for mounting of NEMA frame size motors to Metric size Ball Screw Actuated SuperSlide* Systems



Ball Screw Actuated SuperSlide								
Part Number	Motor Size	Dimension (mm)						
		B3	C3	H4	D1	D3	E	P
2RB M12	NEMA 23	60,0	47,15	60,0	38,2	8,0	42,0	34,0
2RB M16	NEMA 23	60,0	47,15	60,0	38,2	10,0	42,5	32,5
2HB M10	NEMA 23	60,0	47,15	60,0	38,2	8,0	42,0	34,0
2HB M20	NEMA 34	88,9	69,6	88,9	73,10†	14,0	66,0	52,0

† ∅ DI is for the first 5mm only; remainder is ∅ 50.8mm

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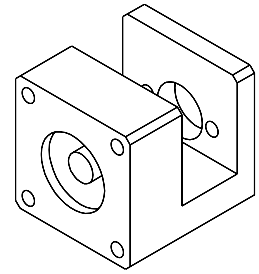
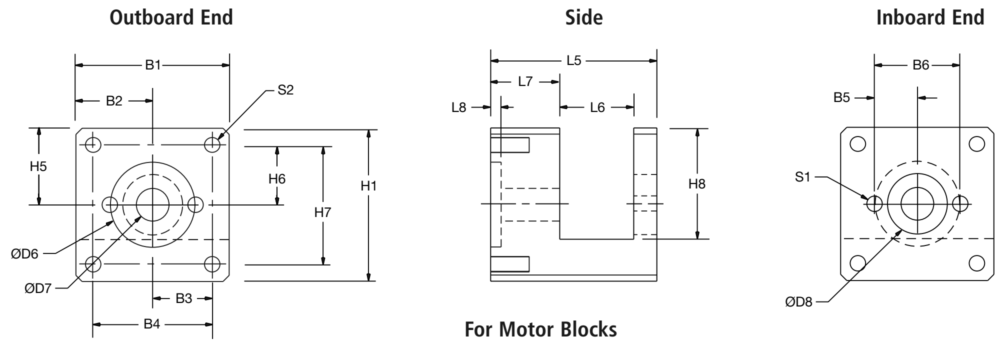
* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

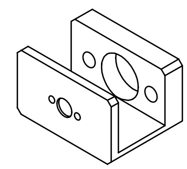
Motor Adaptor Blocks and Couplings – Microstage*



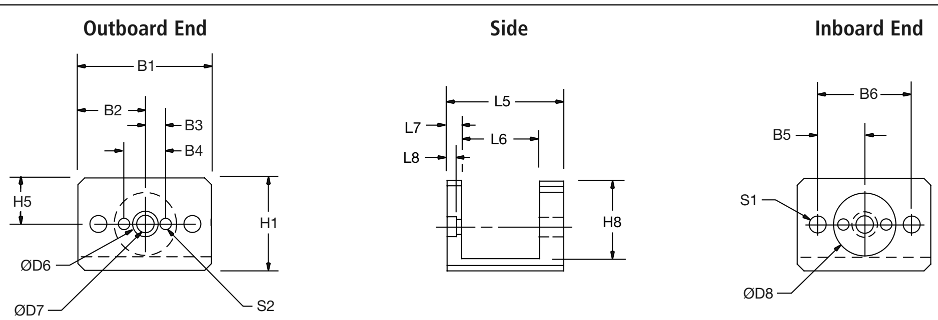
Motor Mount Block with Four Bolt Hole Pattern



For Motor Blocks
Part Number MMBMS25-17, MMBMS33-17, MMBMS25-17 (Stepper), MMBMS33-23

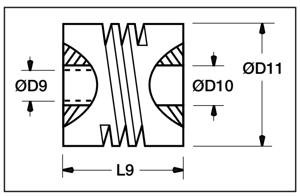


Motor Mount Block with Two Bolt Hole Pattern



Motor Mount Blocks								(Dimensions in mm)														
Part Number	B1	B2	B3	B4	B5	B6	ØD6	ØD7	ØD8	H1	H5	H6	H7	H8	L5	L6	L7	L8	S1	S2	Used w/System	Used w/Coupling
MMBMS25-22	32	16	5	10	11,38	22,75	6,02	4,0	14,5	22	11	–	–	18,75	27,75	18,75	3,0	1,7	4,60	2,40	**MS25-LXA-LXXX**	**MCMS25-22**
MMBMS25-17	39,9	19,95	15,5	31	11,38	22,75	22,03	8,5	16,4	39,9	19,95	15,5	31	29	43,25	19,25	18,0	2,75	4,60	M4	**MS25-LXB-LXXX**	**MCMS25-17**
MMBMS25-17 (Stepper)	39,9	19.95	15.5	31	11.33	22,75	22	7	14	39,4	19,95	15,5	31	29	35	20	9	2,75	4,60	3,45	**MS25-LXC-LXXX**	**MCMS25-17 (Stepper)**
MMBMS33-17	39,9	19,95	15,5	31	11,15	22,3	22,03	8,5	16,4	39,9	19,95	15,5	31	29	43,25	19,25	18,0	2,75	M4	M4	**MS33-LXA-LXXX**	**MCMS33-17**
MMBMS33-23	57,7	28,83	23,57	47,14	11,15	22,3	38,18	8,5	16,4	57,7	28,83	23,57	47,14	38	39,75	17,75	14,0	4,0	M4	M4	**MS33-LXB-LXXX**	**MCMS33-23**

Motor Couplings

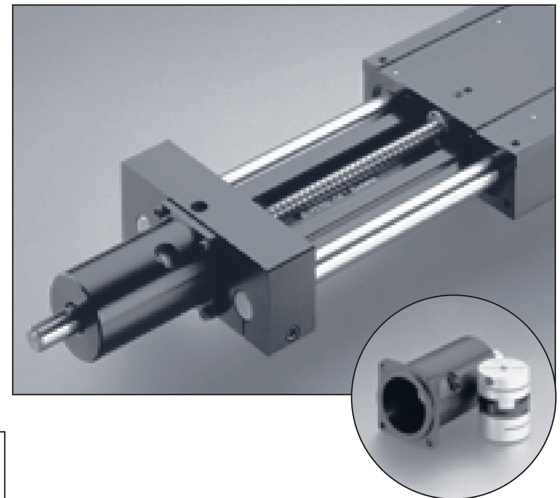


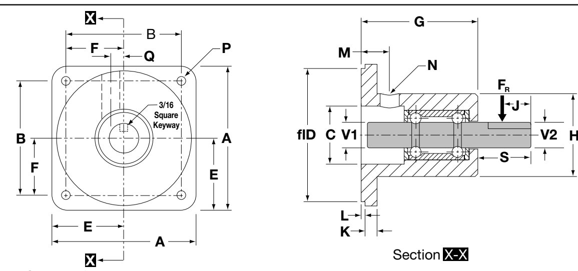
Motor Couplings	(Dimensions in mm)					
Part Number	ØD9	ØD10	ØD11	L9	Used w/System	Used w/Motor Adaptor Block
MCMS25-22	M5	3,0	12	19	**MS25-LXA-LXXX**	**MMBMS25-22**
MCMS25-17	M5	6,35	15	22	**MS25-LXB-LXXX**	**MMBMS25-17**
MCMS25-17 (Stepper)	5m	5m	12.7	19	**MS25-LXCLXXX**	**MMBMS25-17 (Stepper)**
MCMS33-17	M5	6,35	15	22	**MS33-LXA-LXXX**	**MMBMS33-17**
MCMS33-23	M5	6,35	15	22	**MS33-LXB-LXXX**	**MMBMS33-23**

Radial Mount

Ball Screw Shaft Extenders for SuperSlide* Systems

- Allows for the mounting of actuating devices that will impart a cantilever load to the ball screw shaft extension
- May be used with:
  – Pulley and Belt Drives
  – Hand Cranks
  – Pinion Gears
- Radial Mount* couplings provide attachment of ball screw and extender shafts without the need for painstaking alignment procedures
- The heavy duty cantilever torque capacity of the Radial Mount shaft extender resists ball screw stub shaft fatigue and failure





Output shaft is a non-hardened steel.

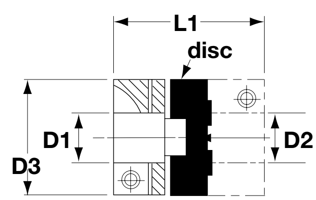
Radial Mount* Shaft Extender Technical Information

Part Number	F_R† Max. (lbf.)	J (in.)	Frame Size	Dimensions (in.) A	B	C	D	E	F	G	H	K	L	M	N	P	S	V1	V2	Q
RADMO-23A†††	120	.5	NEMA-23	2.24	1.86	1.75	2.15	1.12	.93	3.625	2.15	.25	.16	1.15	.62	.22	1.26	.626	.626	.43
RADMO-23B	120	.5	NEMA-23	2.24	1.86	1.75	2.15	1.12	.93	3.625	2.15	.25	.16	1.15	.62	.22	1.26	.626	.626	.43
RADMO-23C	120	.5	NEMA-23	2.24	1.86	1.75	2.15	1.12	.93	3.625	2.15	.25	.16	1.15	.62	.22	1.26	.626	.626	.43
RADMO-23D	120	.5	NEMA-23	2.24	1.86	1.75	1.50	1.12	.93	3.625	2.15	.25	.16	1.15	.62	.22	1.26	.375	.626	.43
RADMO-23E	120	.5	NEMA-23	2.24	1.86	1.75	1.50	1.12	.93	3.625	2.15	.25	.16	1.15	.62	.22	1.26	.375	.626	.43
RADMO-34A	120	.5	NEMA-34	3.26	2.74	1.75	2.88	1.63	1.37	3.625	3.0	.25	.16	1.2	.50	.22	1.26	.626	.626	.48
RADMO-34B	120	.5	NEMA-34	3.26	2.74	1.75	2.88	1.63	1.37	3.625	3.0	.25	.16	1.2	.50	.22	1.26	.626	.626	.48
RADMO-34C	120	.5	NEMA-34	3.26	2.74	1.75	2.88	1.63	1.37	3.625	3.0	.25	.16	1.2	.50	.22	1.26	.626	.626	.48
RADMO-42A	210	1.0	NEMA-42	4.19	3.50	2.37	4.10	2.09	1.75	4.225	3.5	.38	.16	1.43	.50	.27	2.19	.747	.747	.68

† Based on a bearing life of 2 x 10^8 revolutions.
††Radial Mount shaft extenders are supplied with their corresponding Radial Mount Coupling.

Radial Mount Couplings

Couples the SuperSlide Ball Screw shaft to the Smart Mount Shaft Extender

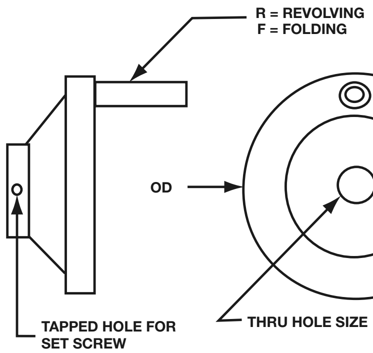


Radial Mount Coupling Technical Information

Part Number	Max. Torque in-lbf.	Dimensions (in.) L1	D1	D2	D3	Used with System	Supplied with Smart Mount Extender
RMC-23A†††	80	1.89	.188	.626	1.31	2DB08	RADMO-23A
RMC-23B	80	1.89	.250	.626	1.31	2DB12, 2EB08, BSA08, BSAM12	RADMO-23B
RMC-23C	80	1.89	.375	.626	1.31	2EB12, BSA12, BSAM20	RADMO-23C
RMC-23D	80	1.89	.394	.375	1.31	2RBM16	RADMO-23D
RMC-23E	80	1.89	.315	.375	1.31	2RBM12, 2HBM10	RADMO-23E
RMC-34A	80	1.89	.375	.626	1.31	2DB16	RADMO-34A
RMC-34B	160	2.00	.500	.626	1.63	2EB16, BSA16	RADMO-34B
RMC-34C	160	2.00	.551	.626	1.63	2HBM20	RADMO-34C
RMC-42A	230	2.35	.625	.748	1.97	2EB24, BSA24	RADMO-42A

††† The RADMO-23A shaft extender is supplied with an adaptor block part number MB08-23.

Handwheels for Manual Actuation of SuperSlide* Systems



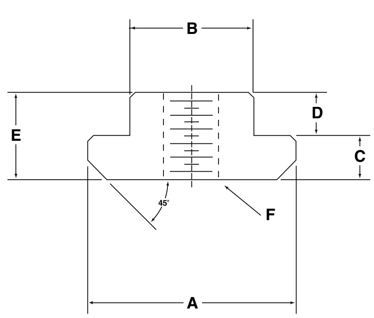
Part No.	O.D.	Thru Hole	Handle
HW4R-188	4.0 inch	0.188 in	Revolving
HW4R-250	4.0 inch	0.250 in	Revolving
HW4R-375	4.0 inch	0.375 in	Revolving
HW4R-500	4.0 inch	0.500 in	Revolving
HW4R-625	4.0 inch	0.625 in	Revolving
HW4R-M8	4.0 inch	8 mm	Revolving
HW4R-M10	4.0 inch	10 mm	Revolving
HW4R-M14	4.0 inch	14 mm	Revolving
HW4R-747	4.0 inch	0.747 in	Revolving

Part No.	O.D.	Thru Hole	Handle
HW5R-188	5.0 inch	0.188 in	Revolving
HW5R-250	5.0 inch	0.250 in	Revolving
HW5R-375	5.0 inch	0.375 in	Revolving
HW5R-500	5.0 inch	0.500 in	Revolving
HW5R-625	5.0 inch	0.625 in	Revolving
HW5R-M8	5.0 inch	8 mm	Revolving
HW5R-M10	5.0 inch	10 mm	Revolving
HW5R-M14	5.0 inch	14 mm	Revolving
HW5R-747	5.0 inch	0.747 in	Revolving

Part No.	O.D.	Thru Hole	Handle
HW4F-188	4.0 inch	0.188 in	Folding
HW4F-250	4.0 inch	0.250 in	Folding
HW4F-375	4.0 inch	0.375 in	Folding
HW4F-500	4.0 inch	0.500 in	Folding
HW4F-625	4.0 inch	0.625 in	Folding
HW4F-M8	4.0 inch	8 mm	Folding
HW4F-M10	4.0 inch	10 mm	Folding
HW4F-M14	4.0 inch	14 mm	Folding
HW4F-747	4.0 inch	0.747 in	Folding

Part No.	O.D.	Thru Hole	Handle
HW5F-188	5.0 inch	0.188 in	Folding
HW5F-250	5.0 inch	0.250 in	Folding
HW5F-375	5.0 inch	0.375 in	Folding
HW5F-500	5.0 inch	0.500 in	Folding
HW5F-625	5.0 inch	0.625 in	Folding
HW5F-M8	5.0 inch	8 mm	Folding
HW5F-M10	5.0 inch	10 mm	Folding
HW5F-M14	5.0 inch	14 mm	Folding
HW5F-747	5.0 inch	0.747 in	Folding

T-Nuts for Mounting

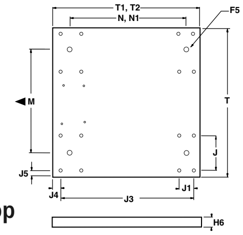


Standard T-Nut Dimensions							(Dimensions in mm)
Part Number	Dimensions						Used in conjunction with Systems
	A	B	C	D	E	F	
TNUT-01-M3	7	4	1,75	1,25	3	M3	2RxM12, 2HxM10, 2HxM20
TNUT-02-M4	9,5	5,5	2,25	1,75	4	M4	2RxM16, 2HxM10
TNUT-03-M4	12	7	2,5	2,5	5	M4	2RxM12
TNUT-03-M5	12	7	2,5	2,5	5	M5	2RxM12
TNUT-04-M4	16,5	7,9	4,8	1,2	6	M4	2RxM16, 2HxM20
TNUT-04-M5						M5	
TNUT-04-M6						M6	
TNUT-05-M4	19,5	9,8	5,8	2,8	8,6	M4	2GEM35
TNUT-05-M5						M5	
TNUT-05-M6						M6	
TNUT-05-M8						M8	

* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

Table Tops

Carriage Top plates for Linear Guides



Mounting Table Top

1BA Mounting Table Top (Dimensions in inches)

Nominal	All Table Tops					Table Top Size B					Table Top Size A				
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	N1
.250	4.0	2.25	1.31	.250	#8-32	4.0	.75(2)	.22	.22	3.50	2.50	2.00	.25	.22	2.0
.375	4.5	2.50	1.44	.250	#10-32	4.5	.88(2)	.22	.28	3.75	2.75	2.25	.25	.28	2.0
.500	5.5	3.25	1.69	.375	1/4-20	5.5	1.00	.34	.28	4.50	3.50	2.50	.50	.31	2.5
.750	7.5	4.50	2.38	.500	5/16-18	7.5	1.25	.41	.31	6.00	4.50	3.50	.50	.31	3.0
1.000	9.0	5.50	2.88	.500	3/8-16	9.0	1.75	.53	.31	7.00	6.00	4.50	.75	.31	4.0
1.250	11.0	6.75	3.50	.750	1/2-13	11.0	2.00	.82	.38	8.50	7.50	5.50	1.00	.38	5.0
1.500	13.0	8.00	4.12	.750	1/2-13	13.0	2.50	.75	.44	10.00	9.00	6.50	1.25	.44	6.0

Carriage Material: Aluminum Alloy Black Anodized (2)Two mounting holes as shown in view A-A for sizes .250 and .375

1NA Mounting Table Top (Dimensions in mm)

Nominal	All Table Tops					Table Top Size B					Table Top Size A					
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	J9	M2
1NC-M08	85	50	25	10	M6	85	20	6,0	5,0	50	62	50	6	5,0	25	35
1NC-M12	100	55	32	10	M6	100	23	8,0	6,5	55	76	56	10	6,5	28	40
1NC-M16	125	70	40	13	M6	125	26	10,0	7,5	70	84	64	10	7,5	32	45
1NC-M20	175	110	45	16	M8	175	32	11,0	10,0	110	104	76	14	10,0	38	55
1NC-M25	225	140	60	20	M8	225	40	13,5	12,5	140	130	94	18	12,5	47	65
1NC-M30	275	180	68	20	M8	275	45	17,0	13,5	180	152	106	23	13,5	53	75
1NC-M40	325	210	86	25	M10	325	58	16,5	14,5	210	176	124	26	14,5	62	85

Carriage Material: Aluminum Alloy Grey Anodized (2)Custom Mounting Hole

1CA Mounting Table Top (Dimensions in inches)

Nominal	All Table Tops					Table Top Size B					Table Top Size A				
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	N1
50	5.5	3.25	1.69	.375	1/4-20	5.5	1.00	.34	.28	4.5	3.5	2.5	.50	.31	2.5
.75	7.5	4.50	2.38	.500	5/16-18	7.5	1.25	.41	.31	6.0	4.5	3.5	.50	.31	3.0
1.00	9.0	5.50	2.88	.500	3/8-16	9.0	1.75	.53	.31	7.0	6.0	4.5	.75	.31	4.0
1.25	11.0	6.75	3.50	.750	1/2-13	11.0	2.00	.82	.38	8.5	7.5	5.5	1.00	.38	5.0
1.50	13.0	8.00	4.12	.750	1/2-13	13.0	2.50	.75	.44	10.0	9.0	6.5	1.25	.44	6.0

Material: Aluminum Alloy Black Anodized

1PA Mounting Table Top (Dimensions in mm)

Nominal	All Table Tops					Table Top Size B					Table Top Size A					
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	J9	N1
PC-M12	100	55	32	10	M6	100	23	8,0	6,5	55	76	56	10	6,5	28	40
1PC-M16	125	70	40	13	M6	125	26	10,0	7,5	70	84	64	10	7,5	32	45
1PC-M20	175	110	45	16	M8	175	32	11,0	10,0	110	104	76	14	10,0	38	55
1PC-M25	225	140	60	20	M8	225	40	13,5	12,5	140	130	94	18	12,5	47	65
1PC-M30	275	180	68	20	M8	275	45	17,0	13,5	180	152	106	23	13,5	53	75
1PC-M40	325	210	86	25	M10	325	58	16,5	14,5	210	176	124	26	14,5	62	85

Material: Aluminum Alloy Grey Anodized

1VA Mounting Table Top (Dimensions in inches)

Nominal	All Table Tops					Table Top Size B					Table Top Size A				
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	N1
.375	4.5	2.50	1.44	.250	#10-32	4.5	.88(2)	.22	.28	3.75	2.75	2.25	.25	.28	2.0
.500	5.5	3.25	1.69	.375	1/4-20	5.5	1.00	.34	.28	4.50	3.50	2.50	.50	.31	2.5
.625	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
.750	7.5	4.50	2.38	.500	5/16-18	7.5	1.25	.41	.31	6.00	4.50	3.50	.50	.31	3.0
1.000	9.0	5.50	2.88	.500	3/8-16	9.0	1.75	.53	.31	7.00	6.00	4.50	.75	.31	4.0
1.250	11.0	6.75	3.50	.750	1/2-13	11.0	2.00	.82	.38	8.50	7.50	5.50	1.00	.38	5.0
1.500	13.0	8.00	4.12	.750	1/2-13	13.0	2.50	.75	.44	10.00	9.00	6.50	1.25	.44	6.0

Carriage Material: Aluminum Alloy Black Anodized (2)Two mounting holes as shown in view A-A for size .375

1DA Mounting Table Top (Dimensions in inches)

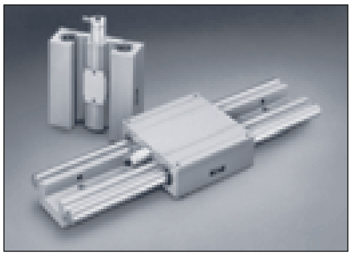
Nominal	All Table Tops					Table Top Size D					Table Top Size C				
Diameter	T	M	J	H6	F5	T1	J1	J4	J5	N	T2	J3	J4	J5	N1 (2)
.50	7.25	4.0	.81	.50	1/4-20	5.5	1.25	.25	.28	2.63	3.5	3.00	.25	.28	.75
.75	9.75	6.0	1.19	.50	5/16-18	7.5	1.56	.25	.38	3.50	4.5	4.00	.25	.38	1.00
1.00	12.00	6.0	1.44	.50	3/8-16	9.0	2.25	.34	.40	4.38	6.0	5.25	.38	.40	1.25

(2) Mounting hole spacing facilitates attachment of Dual Shaft Rail 2DA Linear Guide in an X-Y orientation.

Phone: 1-800-554-8466
Website: www.linearactuators.com

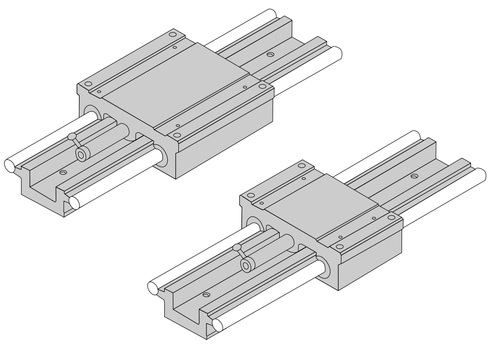
2DA QuickSlide System with Brake

A manual locking mechanism for the Dual Shaft Rail System

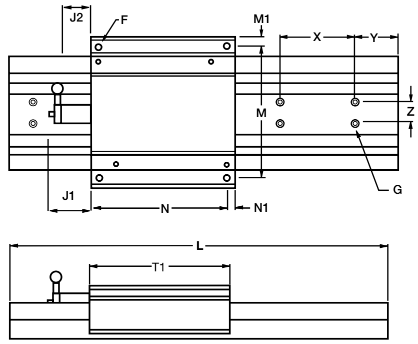


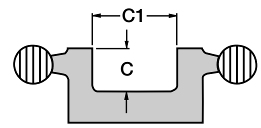
2DA QuickSlide* System with Brake offers:

- A manual locking mechanism with infinite positioning capability.
- No carriage mounting surface deflection when the locking mechanism is activated.
- Immediate off-the-shelf availability in 1/2, 3/4 and 1 inch sizes.
- A locking mechanism that, when activated, will not apply an increase in load on the system's Ball Bushing* bearing.
- Zero axial movement during the activation of the locking mechanism.
- A fully supported Dual Shaft assembly for maximum rigidity and unlimited travel.
- High load capacity in any direction.

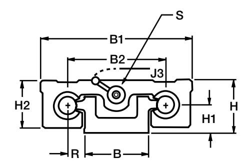


Dual Shaft Rail Fully Supported System with Integrated Carriage





Dual Shaft Rail Supported Cross-Section



Maximum Stroke Length is determined by subtracting the carriage length **(T1 or T2)** plus the brake handle length **(J1)** from the total system length.

Dual Shaft Rail Fully Supported System with Integrated Carriage (Long Style) (Dimensions in inches)

Part Number	Nom. Shaft Dia.	Max.Load on System(1) (lbf)	Max.Load on One Bearing(1) (lbf)	T1	H	H1	H2	B	R	B1	B2	C	C1
2DA-08-OOL	½	600	150	4.50	1.625	0.875	1.43	2.00	0.500	4.60	3.00	0.64	1.25
2DA-12-OOL	¾	1880	470	6.00	2.125	1.125	1.93	2.63	0.688	6.10	4.00	0.75	1.62
2DA-16-OOL	1	3120	780	7.50	2.625	1.375	2.44	3.25	0.875	7.60	5.00	0.99	2.00

(1) For rated travel life of 2 million inches.

Note: Manual Brake can be adjusted in order to position handle to any radial location.
Dual Shaft Rail Support Material: Aluminum Alloy Black Anodized. Standard length of one-piece Aluminum Dual Shaft Rails is 72".

Dual Shaft Rail Fully Supported System with Integrated Carriage (Long Style) (Dimensions in inches)

Part Number	N	N1	M	M1	X	Y	Z	J1	J2	J3	F	G Bolt	G Hole	Max. Stroke Length	Carriage Part No.
2DA-08-OOL	4.00	0.25	4.00	0.30	4.00	2.00	0.75	1.63	1.19	0.88	#10-23	¼	0.28	L-(6.13)	DSRC-08-SL
2DA-12-OOL	5.25	0.37	5.25	0.42	6.00	3.00	1.00	1.63	1.19	1.00	¼-20	5/16	0.34	L-(7.63)	DSRC-12-SL
2DA-16-OOL	6.75	0.37	6.75	0.42	6.00	3.00	1.25	1.63	1.19	1.00	5/16-18	⅜	0.41	L-(9.13)	DSRC-16-SL

Dual Shaft Rail Fully Supported System with Integrated Carriage (Short Style)

Part Number	Nom. Shaft Dia.	T2	N2	Max. Stroke Length	Carriage Part No.
2DA-08-OOM	½	3.50	3.00	L-(5.13)	DSRC-08-SM
2DA-12-OOM	¾	4.50	3.75	L-(6.13)	DSRC-12-SM
2DA-16-OOM	1	6.00	5.25	L-(7.63)	DSRC-16-SM

QuickSlide Brake Holding Force

System	Axial Holding Force (lbf.)
2DA-08	125
2DA-12	130
2DA-16	140

System 2DA Standard Lengths (Lengths in inches)

System	8"	12"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"	44"	48"
2DA-08	■	■	■		■	■	■		■	■	■		■	■
2DA-12		■		■		■		■		■		■		■

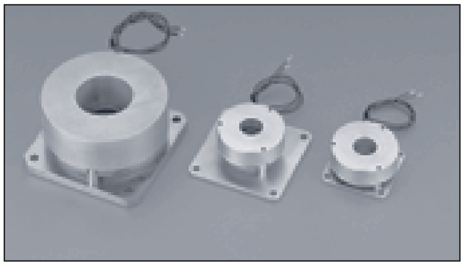
Custom Lengths and Delivery Information

Custom length systems are available. For special requirements, please contact the Thomson Systems application engineering department.

THOMSON

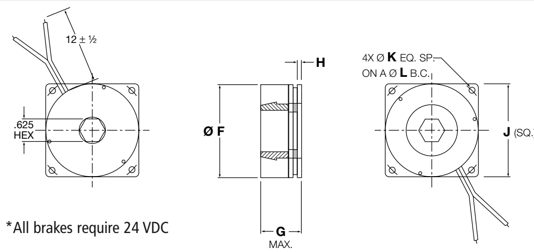
Phone: 1-800-554-8466
Website: www.linearactuators.com

Spring Set Electric Brakes



Electric Brake:

- Mounts to support end of all SuperSlide*, and Ball Screw assembly systems
- Engages upon loss of a 24-VDC Power Supply
- Provides resistance to back drive rotation of ball screws due to gravitational force when power is interrupted to the brake unit
- Pre-burnished for maximum torque capacity
- Standard NEMA 23, 34 and 42 mounting patterns for easy field retrofit
- Compact size minimizes change to overall system envelope

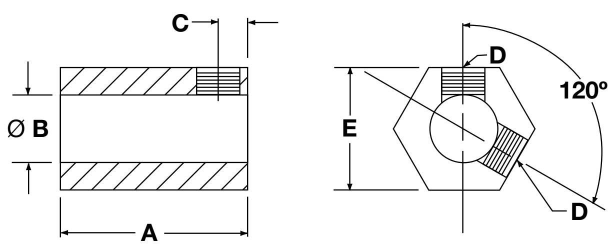


*All brakes require 24 VDC

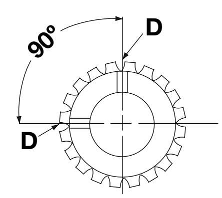
Spring Set Brake Data

Electric Brake Part No.	Frame Size	Static Torque (lbf-in.)	Dimensions (in.) F	G	H	J	K	L	HEX	Brake Hub Part No	Brake Adaptor Part No	Used with System Part Number
TEB23A	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	5/8	HEXHUB23A	MB08-23	2DB08
TEB23B	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	5/8	HEXHUB23B	None Required	2DB12, 2EB08, BSA08, BSAM12
TEB23C	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	5/8	HEXHUB23C	None Required	2EB12, BSA12, BSAM20
TEB23D	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	5/8	HEXHUB23D	None Required	2HBM10, 2RBM12
TEB23E	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	5/8	HEXHUB23E	None Required	2RBM16
TEB23F	NEMA 23	NEMA 23	2.25	1.10	0.11	2.25	0.22	2.625	7/8	HEXHUB23F	EBA23F	2HEM10, 2REM12, 2REM16
TEB34A	NEMA 34	NEMA 34	2.25	1.10	0.11	3.25	0.22	3.875	5/8	HEXHUB34A	None Required	2DB16
TEB34B	NEMA 34	NEMA 34	2.25	1.31	0.11	3.25	0.22	3.875	7/8	HEXHUB34B	None Required	2EB16, BSA16
TEB34C	NEMA 34	NEMA 34	2.25	1.31	0.11	3.25	0.22	3.875	7/8	HEXHUB34C	None Required	2HBM20
TEB34D	NEMA 34	NEMA 34	2.25	1.31	0.11	3.25	0.22	3.875	7/8	HEXHUB34D	EBA34D	2HEM20
TEB42A	NEMA 42	NEMA 42	4.19	2.38	0.36	4.25	0.27	4.950	Splined	SPLHUB42A	None Required	2EB24, BSA24

Hex-Hubs for all NEMA 23 and 34 Size Brakes



Splined Hub Part No. SPLHUB42A
For Brake Part No. TEB-42A



Brake Hub Data

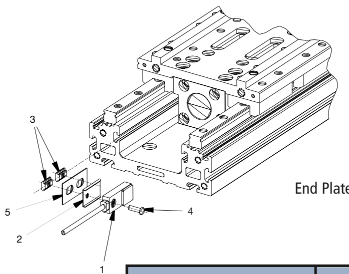
Brake Hub Part No.	Dimensions A	B	C	D(1)	E	Used with System Part Number	Used with Spring Set Brake
HEXHUB23A	1.53 in.	3/16 in.	0.15 in.	#10-32	5/8 in.	2DB08	TEB23A
HEXHUB23B	1.31 in.	1/4 in.	0.26 in.	#10-32	5/8 in.	2DB12, 2EB08, BSA08, BSDAM12	TEB23B
HEXHUB23C	1.67 in.	3/8 in.	0.44 in.	#10-32.	5/8 in.	2EB12, BSA12, BSAM20	TEB23C
HEXHUB23D	20 mm	8 mm	5 mm	M4	5/8 in.	2HBM10, 2RBM12	TEB23D
HEXHUB23E	20 mm	10 mm	5 mm	M4	5/8 in.	2RBM16	TEB23E
HEXHUB23F	15.6 mm	12 mm	10.8 mm	M4	7/8 in.	2HEM10, 2REM12, 2REM16	TEB23F
HEXHUB34A	1.67 in.	3/8 in.	0.44 in.	#10-32	5/8 in.	2DB16	TEB34A
HEXHUB34B	0.82 in.	1/2 in.	0.21 in.	#10-32	7/8 in.	2EB16, BSA16	TEB34B
HEXHUB34C	32 mm	14 mm	6 mm	M5	7/8 in.	2HBM20	TEB34C
HEXHUB34D	22 mm	15 mm	6 mm	M5	7/8 in.	2HEM20	TEB34D
SPLHUB42A	1.66 in.	5/8 in.	0.50 in.	1/4 20	-	2EB24, BSA24	TEB42A

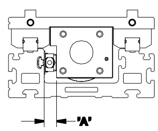
NOTE 1: Suggested torque for hub set screws are 36 in-lb for #10-32, M4, M5, and 87 in-lb for 1/4-20.
Additionally, it is suggested a serviceable thread locking compound be used.

Limit Switch/Sensor Package for AccuSlide* 2HBM10

An inductive proximity sensorfor end of travel limit and home position sensing. Standard part numbers are packages for either home positioning, end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations, and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.

Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2HBM10-N-1 LSP2HBM10-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2HBM10-N-2 LSP2HBM10-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2HBM10-N-3 LSP2HBM10-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std





End Plates not shown for clarity

Dimension "A" (mm)	Dimension "A" (in.)	Shim Part No.	Shim Thickness
up to 8.15	up to .320	none	0
8.16-8.65	.321-.340	22723A-02	.51mm (0.20")
8.66-9.15	.341-.360	22723A-04	1.02mm (0.40")
9.16-9.65	.361-.380	22723A-02+ 22723A-04	1.52mm (0.60")

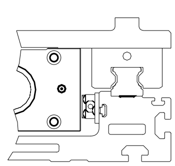
Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Bracket
3	2	Tee Nut (TNUT01-M3)
4	1	Button Head Cap Screw
5	1	Shim Kit

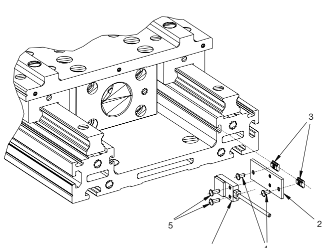
Each 2HBM10 and AccuSlide system is provided with access holes on each side of each end plate for passage of the sensor cable. Normal orientation of the sensor package will detract approximately 30mm from the effective stroke of the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor Packages are ordered together with their respective Linear Motion System, the package is assembled to the system with their appropriate shim packs at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensor will be located between the Limit Sensors on the Linear Motion System.

Limit Switch/Sensor Package for AccuSlide* 2HBM20

An inductive proximity sensor for end of travel limit and home position sensing. Standard part numbers are packages for either home positioning, end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations, and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.

Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2HBM20-N-1 LSP2HBM20-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2HBM20-N-2 LSP2HBM20-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2HBM20-N-3 LSP2HBM20-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std





End Plates not shown for clarity

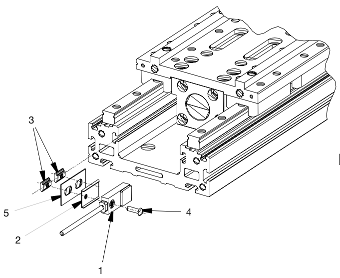
Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Mounting Plate
3	2	Tee Nut (TNUT01-M3)
4	2	Button Head Cap Screw (M3)
5	2	Button Head Cap Screw (M3)

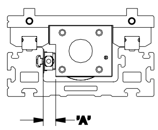
Each 2HBM20 AccuSlide system is provided with access holes on each side of each endplate for passage of the sensor cable. Normal orientation of the sensor package will detract approximately 30mm from the effective strokeof the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor/ Packages are ordered together with their respective Linear Motion System, the package is assembled to the system with theirappropriate shim packs at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensor willbe located between the Limit Sensors on the Linear Motion System.

Phone: 1-800-554-8466
Website: www.linearactuators.com

Limit Switch/Sensor Package for AccuSlide* 2HEM10

An inductive proximity sensor for end of travel limit and home position sensing. Standard part numbers are packages for either home positioning,end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations,and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.





End Plates not shown for clarity

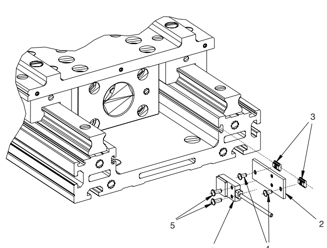
Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2HEM10-N-1 LSP2HEM10-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2HEM10-N-2 LSP2HEM10-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2HEM10-N-3 LSP2HEM10-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std

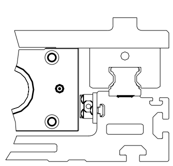
Each 2HEM10 AccuSlide system is provided with access holes on each side of each end plate for passage of the sensor cable. Normal orientation of the sensor package will detract approximately 30mm from the effective stroke of the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor Packages are ordered together withtheir respective Linear Motion System, the package is assembled to the system at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensorwill be located between the Limit Sensors on the Linear Motion System

Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Bracket
3	2	Tee Nut (TNUT01-M3)
4	1	Button Head Cap Screw
5	1	Sensor Flag
6	1	Sensor Flag Nutplate
7	2	Low Head Cap Screw (M5)

Limit Switch/Sensor Package for AccuSlide* 2HEM20

An inductive proximity sensor for end of travel limit and home position sensing. Standard part numbers are packages for either home positioning, end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations, and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.





End Plates not shown for clarity

Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2HEM20-N-1 LSP2HEM20-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2HEM20-N-2 LSP2HEM20-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2HEM20-N-3 LSP2HEM20-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std

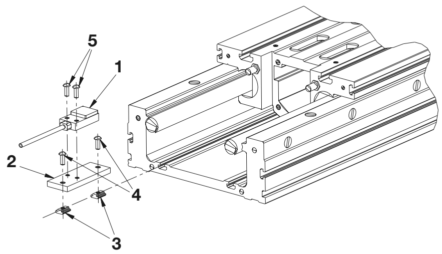
Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Mounting Plate
3	2	Tee Nut (TNUT01-M3)
4	2	Button Head Cap Screw (M3)
5	2	Button Head Cap Screw (M3)
6	1	Sensor Flag
7	2	Hat Washer
8	2	Low Head Cap Screw (M4)

Each 2HEM20 AccuSlide system is provided with access holes on each side of each endplate for passage of the sensor cable. Normal orientation of the sensor package will detract approximately 30mm from the effective strokeof the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor\ Packages are ordered together with their respective Linear Motion System, the package is assembled to the system with theirappropriate shim packs at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensor willbe located between the Limit Sensors on the Linear Motion System.

Limit Switch/Sensor Package for SuperSlide* 2RBM12 and 2REM12

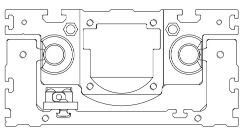
An inductive proximity sensor for end of travel limit and home position sensing. Standard part numbers are packages for either home positioning, end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations, and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.

Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2RM12-N-1 LSP2RM12-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2RM12-N-2 LSP2RM12-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2RM12-N-3 LSP2RM12-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std



End Plates not shown for clarity

Each 2RBM12 and 2REM12 SuperSlide system is provided with access holes on each side of eachend plate for passage of the sensor cable. Normal orientation of the sensor package will detract approximately 35mm from the effective stroke of the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor Packages are ordered together with their respective Linear Motion System, the package is assembled to the system at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensor will be located between the Limit Sensors on the Linear Motion System.



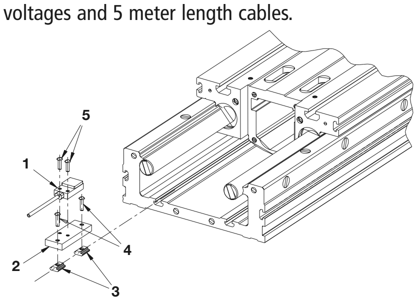
End Plates not shown for clarity

Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Mounting Plate
3	2	Tee Nut (TNUT01-M3)
4	2	Button Head Cap Screw (M3)
5	2	Button Head Cap Screw (M3)

Limit Switch/Sensor Package for SuperSlide* 2RBM16 and 2REM16

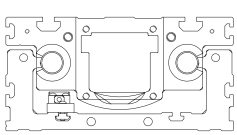
An inductive proximity sensor for end of travel limit and home position sensing. Standard part numbers are packages for either home positioning, end of travel limits or both home and end of travel limit sensing together. Options include NPN or PNP output types, normally closed or normally open output operations, and standard or varied frequencies. All sensors include 12-24 VDC supply voltages and 5 meter length cables.

Part Number	Output Type	Output Operation	Frequency
Home Sensor			
LSP2RM16-N-1 LSP2RM16-P-1	(1) NPN (1) PNP	(1) Normally Open (1) Normally Open	(1) Varied (1) Varied
End of Travel Sensors			
LSP2RM16-N-2 LSP2RM16-P-2	(2) NPN (2) PNP	(1) Normally Closed (1) Normally Closed	(1) Standard (1) Standard
Home Sensor & End of Travel Sensors			
LSP2RM16-N-3 LSP2RM16-P-3	(3) NPN (3) PNP	(1) N.O., (2) N.C. (1) N.O., (2) N.C.	(1) Var. (2) Std (1) Var. (2) Std



End Plates not shown for clarity

Each 2RBM16 and 2REM16 SuperSlide system is provided with access holes on each side of each end plate for passageof the sensor cable. Normal orientation of the sensor package will detract approximately 35mm from the effective stroke of the system at each end. Orientation of the sensor can be reversed so as to retain full system stroke. When Limit and Home Sensor Packages are ordered together with their respective Linear Motion System, the package is assembled to the system at no extra charge. When the End of Travel Limit Sensors are ordered in conjunction with the Home Position Sensor (the -3 option) the Home Sensor will be located between the Limit Sensors on the Linear Motion System.



Item	Quantity	Description
1	1	Proximity Sensor
2	1	Sensor Mounting Plate
3	2	Tee Nut (TNUT01-M3)
4	2	Button Head Cap Screw (M3)
5	2	Button Head Cap Screw (M3)

Phone: 1-800-554-8466
Website: www.linearactuators.com

Typical motor/control packages for the different systems are listed below. Contact Application Engineering with your load and speed data for assistance in selecting a motor/drive package. **Telephone (704) 588-5693, fax (704) 588-5695, e-mail sales2@danahermotion.com**

Series	Style	Motor/Drive Type	Motor Brand	Motor Type	Control Brand	Control Type	Package
SCREW DRIVEN							
Superslide	2DB	Stepper	Superior	NEMA 23, 34	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34	Superior	B8961	EMP-B8961
Superslide	2EB	Stepper	Superior	NEMA 23, 34, 42	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34, 42	Superior	B8961	EMP-B8961
BSA	BSA	Stepper	Superior	NEMA 23, 34, 42	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34, 42	Superior	B8961	EMP-B8961
MicroStage	MS	Stepper	Superior	NEMA 17, 23	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 17, 23	Superior	B8961	EMP-B8961
AccuSlide	2HB	Stepper	Superior	NEMA 23, 34	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34	Superior	B8961	EMP-B8961
SuperSlide	2RB	Stepper	Superior	NEMA 23, 34	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34	Superior	B8961	EMP-B8961
BELT DRIVEN							
MicroStage	MS	Stepper	Superior	NEMA 17, 23	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 17, 23	Superior	B8961	EMP-B8961
AccuSlide	2HE	Stepper	Superior	NEMA 23, 34	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23, 34	Superior	B8961	EMP-B8961
SuperSlide	2RE	Stepper	Superior	NEMA 23	Superior	SmartStep	EMP-SmartStep
		Servo	Superior	NEMA 23	Superior	B8961	EMP-B8961

Contact Application Engineering with your load and speed data for assistance in selecting a motor/drive package.

Control options for Linear Slide Table / Systems

Stepper Motor driven

The **SmartStep** is a complete, packaged, micro-stepping drive/control that provides a user-friendly system. Optional keypad front-panel (FP) allows programming of the drive without the use of a laptop computer, and also functions as an operator interface/readout. Also available as Engineered Motion Package in industrial enclosure for stand-alone applications.

Power requirement – 90 – 120 VAC (SmartStep) or 100 – 240 VAC (SmartStep-240), 50/60 Hz.
Motor output – 0-7.9 amps max, adjustable in 0.1 amp increments
System resolution – 36,000 steps/motor revolution
Inputs – 8 programmable, limits, home
Outputs – 8 programmable
Memory – 60k for up to 400 user programs.
Options – FP keypad, OPTO44 I/O expansion board, OPTO88 I/O expansion board, OPTO22 modules, DB25 external wiring card, programming cables.
Consult website for complete specifications and wiring diagrams.

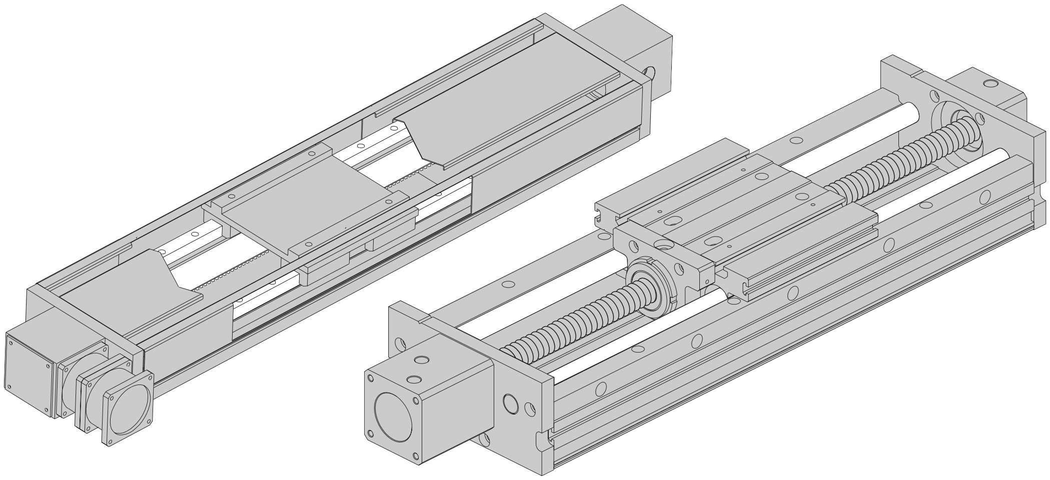
Servo Motor driven

The **B8961** is a value oriented integrated servo amplifier, controller, and power supply with optional keypad front panel that allows programming without the use of a laptop computer, and functions as an operator interface/readout. Provides maximum performance for velocity, position, or force control applications.

Power requirement – 90 – 240 VAC, 50/60 Hz.
Motor output – 5 amps continuous, 10 amps peak
System resolution – 8000 counts/motor revolution
Inputs – 8 programmable, limits, home (optional analog input)
Outputs – 8 programmable (optional analog output)
Additional I/O – accepts up to 8 OPTO22 modules on-board
Memory – 6k for up to 199 user programs.
Options – OPTO22 modules, fan kit, expansion memory – 30k, regen module, wiring card, programming cables.

For more details on Motor/Drive offerings for Slide Tables, see page A-153.

Consult website for complete specifications and wiring diagrams. "Package" drive provides an easy to install pre-engineered unit, and includes industrial enclosure, AC line fuse protection, optional operator interface, disconnect, and operator devices. Additional motor/control packages are available. Please consult factory with your specific requirements. **Telephone (704) 588-5693, fax (704) 588-5695, e-mail sales2@danahermotion.com**



Engineering Support

SuperSlide* Ball Screw Driven Slide Tables

System Selection

To determine the system that fits your SuperSlide Ball Screw Actuated System application requirements the following design criteria needs to be evaluated:

- System Support Requirements
- System Stroke Length
- Maximum Allowable Shaft Deflection
- Required Travel Life
- Force on the Most Heavily Loaded Bearing
- Load Correction Factor
- Load/Life Requirements – Linear Bearings
- Load/Life Requirements – Ball Screws
- Motion (Move) Profile (Velocity, Acceleration)
- Maximum Acceptable Travel Rate
- Maximum Compressive (Column) Load
- Torque Calculations
- Size Motor Using Torque/Speed Curves

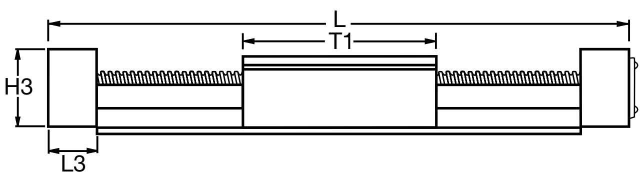
After each criteria is determined, system selection will become quick and easy. The following procedure will guide you through the proper system selection.

Step 1. Based on your application needs determine the mounting support requirements.

System Stroke Length

Step 2. Determine the **Stroke Length** (LS) required. The maximum Stroke Length (LS) is determined by subtracting the carriage length (T1) and twice end block lengths (L3) from the total system length (L). The application or required stroke length should not exceed this number.

$$L_S = L - (T1 + 2\ L3)$$



Should your application require the use of bellows way covers, it is important to recognize that the bellows will detract from the available stroke of the system. The bellows will retract to approximately 14% of the available stroke at each end of the system. The stroke length with bellows (LS/B) is calculated by subtracting 2 times the stroke (LS) times .14 from the stroke (LS).

$$L_{S/B} = L_S - (2 \times L_S \times .14)$$

Standard Length and Delivery. For each SuperSlide Ball Screw Actuated System there is a standard length chart and delivery information that also includes the standard length increment and the maximum system length. Selecting a standard system length will minimize shipment time. Once you have selected a length that best fits your application requirements, simply determine the maximum stroke length. The required stroke length should not exceed this number. Refer to the product specification section for the standard length charts not shown.

SuperSlide System 2DB Standard Lengths (Lengths in inches)

System	12	16	18	20	24	28	30	32	36	40	42	44	48	54	60	72	X	MAX
2DB-08	■	■		■	■	■		■	■	■		■	■				4	48
2DB-12			■		■		■		■		■		■				6	72
2DB-16			■		■		■		■		■		■	■	■	■	6	96

Custom Lengths

Custom length systems are available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Thomson Systems application engineering department.

System 2RB Standard Lengths (Lengths in mm)

System	300	375	400	450	500	525	600	675	700	750	800	825	900	975	1000	1050	1100	1125	1200	1275	1300	1350	1400	1425	1500	X	MAX
2RB-M12	■	■		■		■	■	■		■		■	■	■		■		■	■	■		■		■	■	75	2100
2RB-M16	■		■		■		■		■		■		■		■		■		■		■		■		■	100	3000

Travel Life

Step 4. Determine the Required Travel Life (km).

$$Lt = 2 \bullet s \bullet f \bullet Lh \bullet 60$$

Lt = required travel life (km)
s = stroke (mm)
f = frequency (cycles/minute)
Lh = service life (hrs)

SuperSlide* Ball Screw Driven Slide Table

End Supported System
Maximum Allowable Deflection

Step 3. Determine if the system selected meets the **Maximum Allowable Deflection** criteria.

Travel Life

Step 4. Determine the **Required Application Travel Life**

(Inch)

$$L_t = 2 \cdot s \cdot f \cdot L_h \cdot 60$$

L_t = required travel life (in)
s = stroke (in)
f = frequency (cycles/minute)
L_h = service life (hrs)

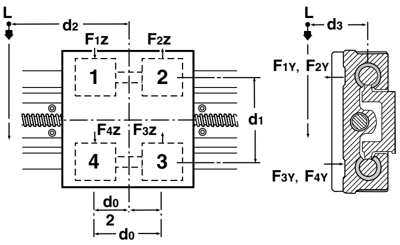
(Metric)

$$L_t = \frac{2 \cdot s \cdot f \cdot L_h \cdot 60}{10^6}$$

L_t = required travel life (km)
s = stroke (mm)
f = frequency (cycles/minute)
L_h = service life (hrs)

System Loading

Step 5. Determine the Force on the Most Heavily Loaded Bearing. When selecting a SuperSlide Ball Screw Driven Slide Table, it is necessary to evaluate the bearing forces that are generated based on the position of the load and its movement during application. The free body diagram (SBSU 6.1) is an example of the type of calculations that are required when determining resultant bearing forces. For other free body diagram examples see Load Considerations in the Engineering Support Appendix, page B-94. The determination of the force on the most heavily loaded bearing allows you to enter the load life graph and select the system that best fits your application needs.



$$F_{1Y} \sim F_{4Y} = \left(\frac{L}{2} \times \frac{d_3}{d_1}\right) \qquad F_{2Z} = F_{3Z} = \frac{L}{4} - \left(\frac{L}{2} \times \frac{d_2}{d_0}\right)$$

$$F_{1Z} = F_{4Z} = \frac{L}{4} + \left(\frac{L}{2} \times \frac{d_2}{d_0}\right)$$

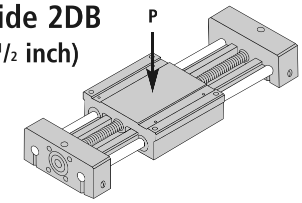
(SBSU 6.1)

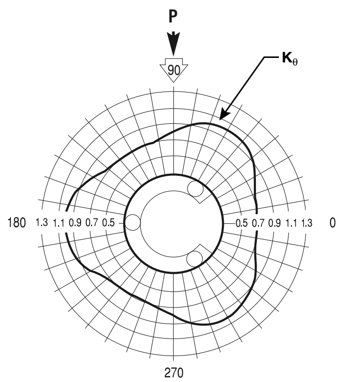
Step 6. Determine the Load Correction Factor (Kμ). The dynamic load capacity of SuperSlide Ball Screw Driven Slide Table is determined by the orientation of the system and the direction of the resultant bearing load. To determine the load correction factor, simply enter the polar graph with the applied or resultant load direction until it intersects the polar curve. If the load correction factor is 1,0 the resultant force (Presultant) is equal to the Force on the Most Heavily Loaded Bearing (Pmax). If the direction of the resultant bearing load cannot be determined, then use the minimum Kμ value (0,7 for closed bearings and 0,5 for open bearings).

SuperSlide* Ball Screw Driven Slide Table

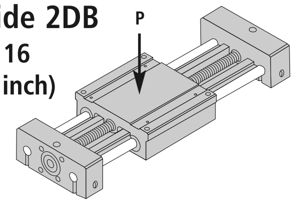
Load Correction Factor Polar Charts

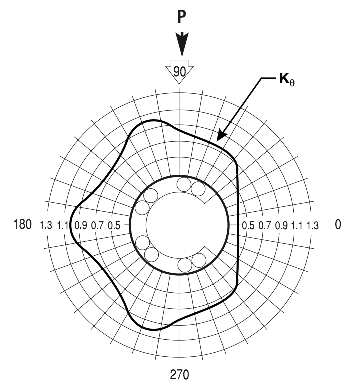
SuperSlide 2DB
Size: 08 (1/2 inch)



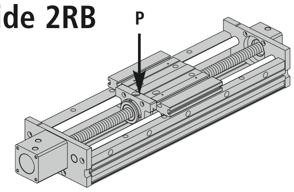


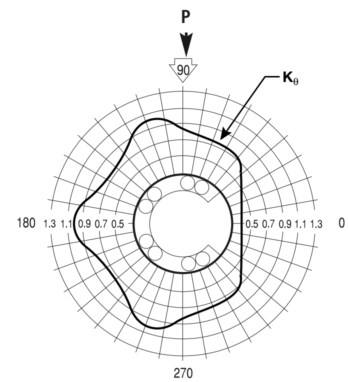
SuperSlide 2DB
Sizes: 12, 16
(3/4 and 1 inch)



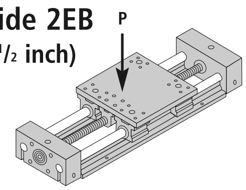


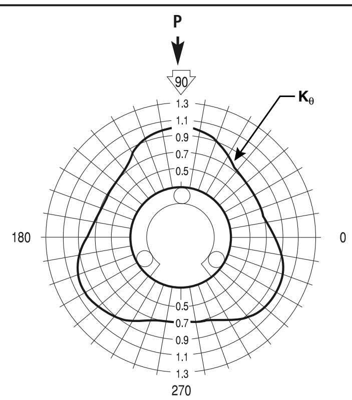
SuperSlide 2RB



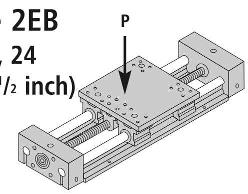


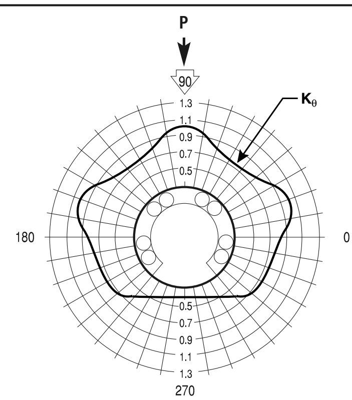
SuperSlide 2EB
Size: 08 (1/2 inch)





SuperSlide 2EB
Sizes: 12, 16, 24
(3/4, 1, and 1 1/2 inch)





These Load Correction Factor Polar charts show values of Kμ for load orientations on a single Ball Bushing* bearing. Appropriate load orientation should be considered for the most heavily loaded Ball Bushing bearing.

If the Load Correction Factor is less than 1.0 the following formula should be used to determine the Corrected Force on the Most Heavily Loaded Bearing.

$$P_{max} = \frac{P_{resultant}}{K_\theta}$$

P_{max} = Force on the Most Heavily Loaded Bearing (N) or (lb)

$P_{resultant}$ = Resultant of Externally Applied loads (N) or (lb)

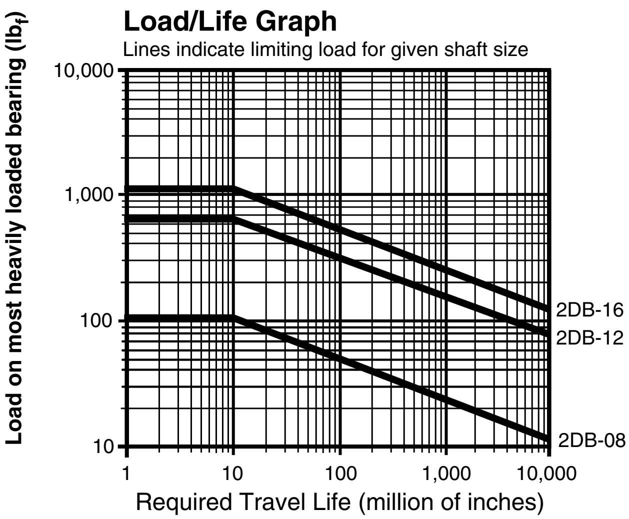
K_θ = Load Correction Factor

NOTE: AccuSlide* 2HB has a load correction factor in all directions of 1.0

SuperSlide* Ball Screw Driven Slide Table

System Loading (continued)

Step 7. Select the system that meets the application **load and life requirements**.



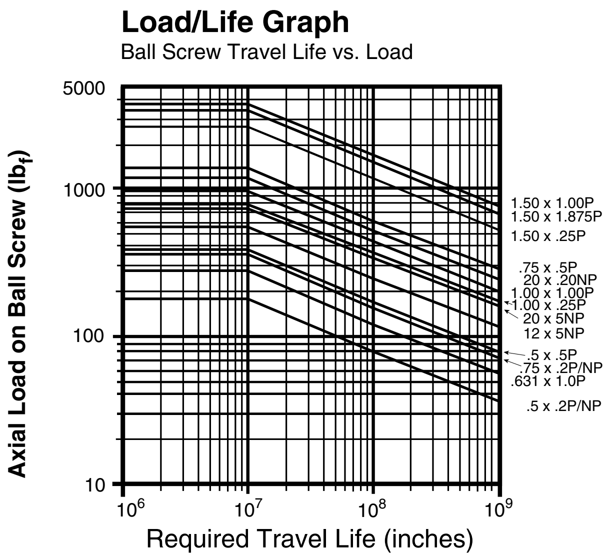
(SBSU 9.1)

For each SuperSlide Ball screw Driven Slide Table there is a graph (e.g. graph SBSU 9.1) that allows for system selection based on the Required Travel Life and the Force on the Most Heavily Loaded Bearing. To determine the system which best meets your application requirements, simply enter the graph with your Required Travel Life from step 4 and the Corrected Force on the Most Heavily Loaded Bearing from step 6. Select a system characteristic curve that is above or to the right of the plotted point.

Note: Use Corrected Force on the Most Heavily Loaded Bearing if load correction factor is less than 1.0.

Ball Screw Load/Life

Step 8. Confirm that the **Ball Screw** in the SuperSlide selected will achieve **Load and Life requirements**. Once the SuperSlide Ball Screw Driven Slide Table is selected refer to the Ball Screw Compatibility charts on the next two pages and select a ball screw that meets your application needs. With the ball screw axial load and the required travel life enter the graph (SBSU 9.2) below.



(SBSU 9.2)

To use the Ball Screw Load/Life graph (e.g. graph SBSU 9.2), simply enter the graph with the axial load on the ball screw and the required travel life. Select a SuperSlide Slide Table characteristic curve to the right or above of where the two lines intersect.

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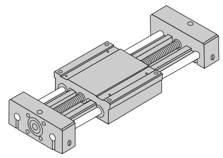
Website: www.linearactuators.com

SuperSlide* Ball Screw Driven Slide Table

Ball Screw and System Compatibility (To see the avialability of Ball screw diameters and leads for each SuperSlide Slide Table, see the Ball screw compatability charts below.

SuperSlide 2DB
Continuously Supported System

P-Preload
NP- Non-Preload

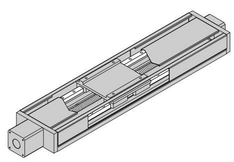


SuperSlide 2DB Ball Screw Compatibility Chart

Part Number	Ball Screw Diameter and Lead									
	12 x 5	12 x10	16 x 5	16 x10	20 x 5	20 x 10	20 x 20	25 x 5	25 x10	25 x 25
Preload	**NP**	**P**	**P**	**P**	**NP**	**P**	**P**	**P**	**P**	**P**
2DB-12	■									
2DB-16					■					

AccuSlide* 2HB
Continuously Supported System

P-Preload
NP- Non-Preload

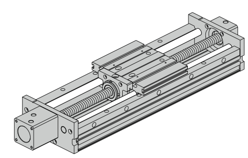


AccuSlide 2HB Ball Screw Compatibility Chart

Part Number	Ball Screw Diameter and Lead									
	12 x 5	12 x10	16 x 5	16 x10	20 x 5	20 x 10	20 x 20	25 x 5	25 x10	25 x 25
Preload	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**
2HB-M10			■	■						
2HB-M20								■	■	■

SuperSlide 2RB
Continuously Supported System

P-Preload
NP- Non-Preload



SuperSlide 2RB Ball Screw Compatibility Chart

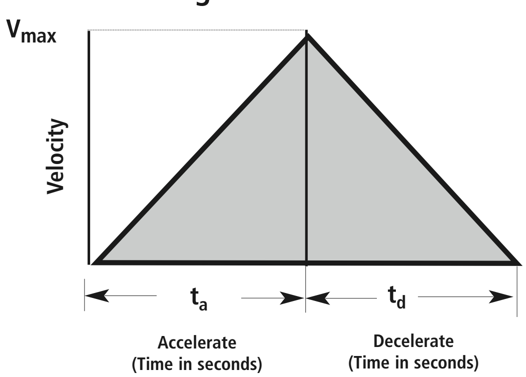
Part Number	Ball Screw Diameter and Lead									
	12 x 5	12 x10	16 x 5	16 x10	20 x 5	20 x 10	20 x 20	25 x 5	25 x10	25 x 25
Preload	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**
2RB-M12			■	■						
2RB-M16					■	■	■			

Motion Profile

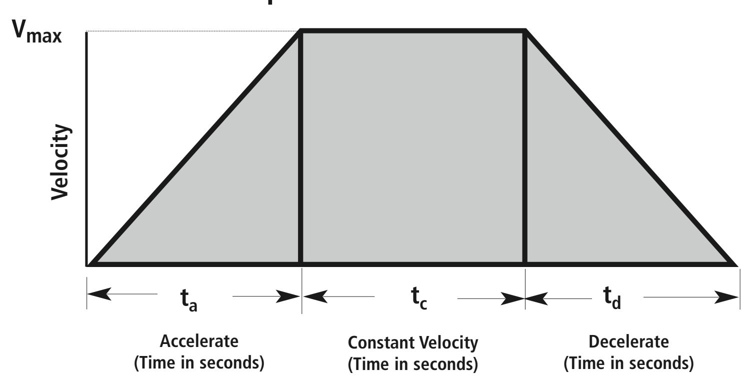
A typical linear ball screw actuated application normally consists of a series of motion profiles. The drive torque required to move the system should be evaluated for each motion profile. There are two basic motion profile types. The first and most simple move is a triangular motion profile which consists of two legs. The first leg is for acceleration and the second is for deceleration. The second motion profile type is trapezoidal which consists of an acceleration leg; a leg of constant velocity and a deceleration leg.

Step 9. Determine the **Motion Profile** that fits your application requirements. Calculate V_{max} and a.

Triangular Motion Profile



Trapezoidal Motion Profile



SuperSlide* Ball Screw Driven Slide Table

Ball Screw and System Compatibility

Step 10. Determine the Ball Screw and Motor Rotational Speed required to move at Vmax for the selected SuperSlide Ball Screw Actuated system.

SuperSlide Ball Screw Driven Slide Tables are equipped with a ball screw assembly already mounted. In Some SuperSlide sizes there are multiple ball screw leads available. To determine the availability of ball screw leads for each Superslide system see the Ball Screw Compatibility charts on this page. To calculate the rotational speed (rpm) required to achieve Vmax, simply divide the linear speed (in/s) by the corresponding ball screw lead (in/rev).

$$RPM = \left(\frac{V_{max}}{P}\right) \times 60 \text{ sec/min}$$

P = Ball Screw Lead (in/rev)

V_{max} = Maximum Linear Speed (in/s)

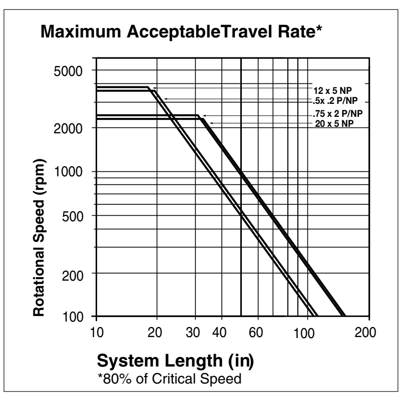
$$RPM = \left(\frac{Vmax}{P}\right) \times 1000 \text{ mm/m} \times 60 \text{ sec/min}$$

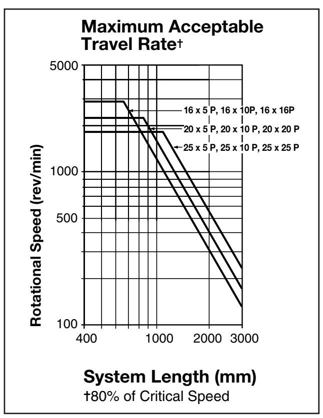
P = Ball Screw Lead (mm/rev)

Maximum Acceptable Travel Rate

Step 11. Confirm the system application **Ball Screw Rotational Speed** is below the **Maximum Acceptable Travel Rate**.

Each SuperSlide Ball Screw Driven Slide Table has a **Maximum Acceptable Travel Rate** based on the natural frequency of the whirling vibration of the ball screw. To determine the SuperSlidesystem that is capable of achieving the applications speeds, simply enter the graph with the Maximum Ball Screw Rotational Speed from step 10 and the required system length. Select the SuperSlide system characteristic curve to the right or above the plotted point.



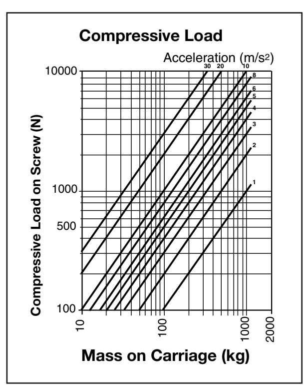


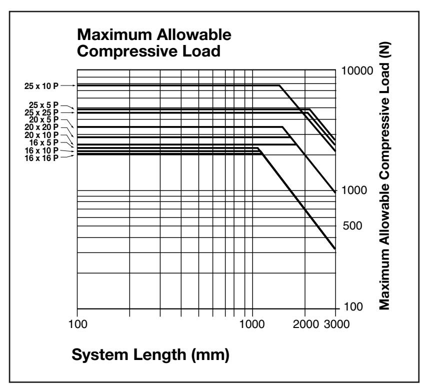
Maximum Compressive Load

Step 12. Determine if the application loads on the SuperSlide exceed the maximum compressive load limits of the ball screw. Determine the **Actual Compressive Load** and the Maximum Allowable Compressive Load.

Graph SBSU 13.1 is used to determine the Actual Compressive Load on the system ball screw caused by the load on the carriage and the system acceleration. To determine the Actual Compressive Load, enter the graph with the load on the carriage and intersect this line with the system acceleration and locate the compressive load on the ball screw.

Graph SBSM13.2 is used to determine the Maximum Allowable Compressive Load for each Superslide Ball Screw Driven Slide Table. To determine the Maximum Allowable Compressive Load, enter the graph with the actual compressive load from (Graph 13.1) and intersect this line with the system length. Select a system with a rated maximum compressive load characteristic curve above or to the right of your plotted point.





SuperSlide* Ball Screw Driven Slide Table

Torque Calculations

Step 13. In order to size a motor for your SuperSlide system it is important to calculate the torque required to meet your application requirements with all of the parameters in mind. If you are actuating your system with a stepping motor, then a maximum or peak torque (Tpeak) calculation is required. Peak torque is usually seen at the time of maximum acceleration, however, other factors such as torque due to external forces can affect when peak torque occurs. It is important to calculate for all torque conditions (Torque due to acceleration (TA), Torque at constant velocity (Tcv), Torque due to deceleration (TD), and Torque required to hold at rest (TH)), and take that torque with the largest magnitude as the Peak Torque (Tpeak).

INCH

$$T_A = T_J + T_F + T_g + T_e \quad (oz \bullet in)$$
$$T_{cv} = T_F + T_g + T_e \quad (oz \bullet in)$$
$$T_D = T_J - T_F - T_g - T_e \quad (oz \bullet in)$$
$$T_H = -T_F + T_g + T_e \quad (oz \bullet in)$$

where:
- T_J = Torque due to system inertia (oz • in)
- T_F = Torque due to friction (oz • in)
- T_g = Torque due to gravity (oz • in)
- T_e = Torque due to external forces (oz • in)

Should you be actuating your SuperSlide system with a servo motor system then it is also necessary to calculate a **Root-Mean-Square Torque (TRMS) or Continuous Torque**.

$$T_{RMS} = \sqrt{\frac{t_a (T_A)^2 + t_{cv} (T_{cv})^2 + t_d (T_D)^2 + t_h (T_H)^2}{t_a + t_{cv} + t_d + t_h}} \quad (oz \bullet in)$$

where:
- t_a = time to accelerate (s)
- t_{cv} = time at constant velocity (s)
- t_d = time to decelerate (s)
- t_h = time at rest (s)

Step 13a. Calculate **Torque due to system inertia (TJ)**:

$$T_J = \frac{\omega}{g \bullet t_a} \left[\frac{J_L + J_B + J_M}{\xi_{screw}} \right] \quad (oz \bullet in)$$

where:
- ω = angular velocity (rad/s)
- J_L = Load inertia ($oz \bullet in^2$)
- J_B = Ball or Lead Screw inertia ($oz \bullet in^2$)
- J_M = Motor inertia ($oz \bullet in^2$)(1) ($1\ oz \bullet in^2 = 386\ oz \bullet in \bullet s^2$)
- t_a = Time for acceleration (s) (from step 9)
- g = Acceleration due to gravity = 386 in/s^2
- ξ_{screw} = Efficiency of screw (from table on page B-76)

(1) For motor inertia data see the Motion Control Section, page A-153

Calculate **Load inertia (JL)**:

$$J_L = \frac{(W_c + W_p) P^2}{(2\pi)^2} \quad (oz \bullet in^2)$$

where:
- W_c = Weight of the Carriage (oz) (from table on next page)
- W_p = Weight of Payload (oz) (from Application Data)
- P = Lead of Ball or Lead Screw (in/rev) (from table on page B-76)
- π = 3.1416

METRIC

$$T_A = T_J + T_F + T_g + T_e \quad (N \bullet m)$$
$$T_{cv} = T_F + T_g + T_e \quad (N \bullet m)$$
$$T_D = T_J - T_F - T_g - T_e \quad (N \bullet m)$$
$$T_H = -T_F + T_g + T_e \quad (N \bullet m)$$

where:
- T_J = Torque due to system inertia (N • m)
- T_F = Torque due to friction (N • m)
- T_g = Torque due to gravity (N • m)
- T_e = Torque due to external forces (N • m)

Should you be actuating your SuperSlide system with a servo motor system then it is also necessary to calculate a **Root-Mean-Square Torque (TRMS) or Continuous Torque**.

$$T_{RMS} = \sqrt{\frac{t_a (T_A)^2 + t_{cv} (T_{cv})^2 + t_d (T_D)^2 + t_h (T_H)^2}{t_a + t_{cv} + t_d + t_h}} \quad (N \bullet m)$$

where:
- t_a = time to accelerate (s)
- t_{cv} = time at constant velocity (s)
- t_d = time to decelerate (s)
- t_h = time at rest (s)

Step 13a. Calculate **Torque due to system inertia (TJ)**:

$$T_J = \frac{\omega}{g \bullet t_a} \left[\frac{J_L + J_B + J_M}{\xi_{screw}} \right] \quad (N \bullet m)$$

where:
- ω = angular velocity (rad/s)
- J_L = Load inertia ($oz \bullet in^2$)
- J_B = Ball or Lead Screw inertia ($oz \bullet in^2$)
- J_M = Motor inertia ($oz \bullet in^2$)(1) ($1\ oz \bullet in^2 = 386\ oz \bullet in \bullet s^2$)
- t_a = Time for acceleration (s) (from step 9)
- g = Acceleration due to gravity = 386 in/s^2
- ξ_{screw} = Efficiency of screw (from table on page B-76)

(1) For motor inertia data see the Motion Control Section, page A-153

Calculate **Load inertia (JL)**:

$$J_L = \frac{(W_c + W_p) P^2}{(2\pi)^2} \quad (N \bullet m^2)$$

where:
- W_c = Weight of the Carriage (oz) (from table on next page)
- W_p = Weight of Payload (oz) (from Application Data)
- P = Lead of Ball or Lead Screw (in/rev) (from table on page B-76)
- π = 3.1416

SuperSlide* Ball Screw Driven Slide Table

Calculate Ball or Lead Screw inertia (Jb):

INCH

$$J_B = \frac{\pi \; L \rho d^4}{32} \quad (oz \bullet in^2)$$

L = Length of Ball or Lead Screw (in)
ρ = Density of Ball or Lead Screw = 4.48 $^{oz}/in^3$
d = Diameter of Ball or Lead Screw (in)
(from table on next page)

Calculate angular velocity (ω):

$$\omega = \frac{2\pi \; Vmax}{P} \quad (^{rad}/S)$$

where: Vmax = Maximum Linear Speed (in/s) (from step 9)
P = Lead of Ball or Lead Screw (^{in}/rev)
(from table on next page)

METRIC

$$J_B = \frac{\pi \; L \rho (d/1000)^4}{32} \quad (N \bullet m^2)$$

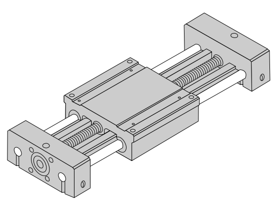
L = Length of Ball or Lead Screw (m)
ρ = Density of Ball or Lead Screw = 76,4000 N/m^3
d = Diameter of Ball or Lead Screw (in)
(from table on next page)

Calculate angular velocity (ω):

$$\omega = \frac{2\pi \; Vmax}{(P/1000)} \quad (^{rad}/S)$$

where: V_{max} = Maximum Linear Speed (in/s) (from step 9)
P = Lead of Ball or Lead Screw (mm)
(from table on next page)

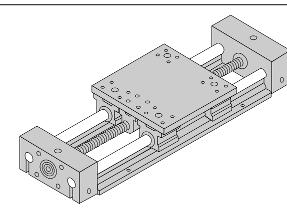
SuperSlide 2DB



SuperSlide 2DB Ball Screw Driven Slide Table Data

Part Number	Nominal Dia.	Carriage Weight (oz)	Coefficient Friction Carriage	Number of Seals	Seal Drag (oz)
2DB-08-OUB	.50	24.5	.002	4	1.6
2DB-12-OUB	.75	63.5	.002	4	2.4
2DB-16-OUB	1.0	120.5	.002	4	4.8

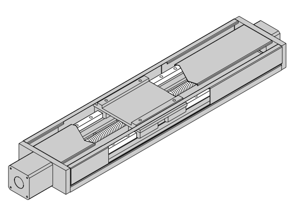
SuperSlide 2EB



SuperSlide 2EB Ball Screw Driven Slide Table Data

Part Number	Nominal Dia.	Carriage Weight (oz)	Coefficient Friction Carriage	Number of Seals	Seal Drag (oz)
2EB-08	.50	30.4	.002	8	1.6
2EB-12	.75	76.8	.002	8	2.4
2EB-16	1.0	128.0	.002	8	4.8
2EB-24	1.5	403.2	.002	8	6.4

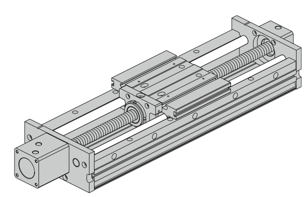
AccuSlide 2HB



AccuSlide 2NB Ball Screw Driven Slide Table Data

Part Number	System Size	Carriage Weight (N)	Carriage Friction Coefficient	Number of Seals	Seal Drag (N)
2HB-M10	10	3,9	0,003	4	0,9
2HB-M20	20	26,5	0,003	4	7,0

SuperSlide 2RB



SuperSlide 2RB Ball Screw Driven Slide Table Data

Part Number	System size	Carriage Weight (N)	Carriage Friction Coefficient	Number of Seals	Seal Drag (N)
2RB-M12	12	8,8	0,002	8	0,5
2RB-M16	16	16,7	0,002	8	0,7

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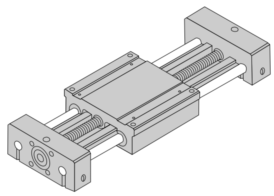
SuperSlide* Ball Screw Driven Slide

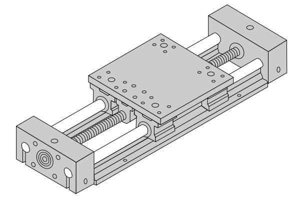
SuperSlide 2DB



SuperSlide 2DB Lead Screw or Ball Screw Act. System Data

Part Number	System Nom. Dia.	Ball Screw Dia. x lead	Preload Condition	Frictional Torque oz-in T_r †	Screw Efficiency ξ_{screw}
2DB-08-OUB-AA	.50	.375 x .1	P	3 to 6	0.53
2DB-08-OUB-AB	.50	.375 x .25	P	3 to 6	0.60
2DB-08-OUB-AC	.50	.375 x .50	P	3 to 6	0.81
2DB-08-OUB-AD	.50	.375 x .75	P	3 to 6	0.84
2DB-08-OUB-AE	.50	.375 x 1.0	P	3 to 6	0.84
2DB-12-OUB-B	.75	12 mm x 5 mm	NP	6.4	0.90
2DB-12-OUB-F	.75	.50 x .20	NP	6.4	0.90
2DB-12-OUB-V	.75	.50 x .20	P	9.6	0.90
2DB-16-OUB-D	1.0	20 mm x 5 mm	NP	9.6	0.90
2DB-16-OUB-G	1.0	.75 x .20	NP	9.6	0.90
2DB-16-OUB-W	1.0	.75 x .20	P	12.4	0.90

SuperSlide 2EB



SuperSlide 2EB Ball Screw Actuated System Data

Part Number	System Nom. Dia.	Ball Screw Dia. x lead	Preload Condition	Frictional Torque oz-in T_r †	Screw Efficiency ξ_{screw}
2EB-08-FTB-B	.50	12 mm x 5 mm	NP	6.4	0.90
2EB-08-FTB-F	.50	.50 x .20	NP	6.4	0.90
2EB-08-FTB-Q	.50	.50 x .50	P	7.2	0.90
2EB-12-FTB-D	.75	20 mm x 5 mm	NP	9.6	0.90
2EB-12-FTB-G	.75	.75 x .20	NP	9.6	0.90
2EB-12-FTB-L	.75	.631 x 1.0	P	7.2	0.90
2EB-12-FTB-U	.75	20 mm x 20 mm	NP	10.0	0.90
2EB-16-FTB-T	1.0	1.0 x 1.0	P	12.8	0.90
2EB-16-FTB-H	1.0	1.0 x .25	P	16.0	0.90
2EB-24-FTB-J	1.5	1.5 x 1.0	P	19.2	0.90
2EB-24-FTB-I	1.5	1.5 x .25	P	24.0	0.90
2EB-24-FTB-Z	1.5	1.5 x 1.875	P	16.0	0.90

† Values of T_r are provided for calculation purposes. Measured values of T_r will vary with radial bearing and ball nut preload.

With the calculated values of Load inertia (JL), Ball or Lead Screw inertia (JB), and Angular Velocity (v) you can now calculate Torque due to system inertia (TJ):

$$T_J = \frac{\omega}{g \bullet t_a} \left[\frac{J_L + J_B + J_M}{\xi_{screw}} \right] \quad (oz \bullet in)$$

Step 13b. Calculate **Torque due to friction (TF)**

INCH

$$T_F = \frac{P \bullet P_f}{2\pi\ \xi_{screw}} + T_r \quad (oz \bullet in)$$

where: P = Lead of Ball or Lead Screw (in/rev) (from table on previous page)
π = 3.1416
ξ_{screw} = Efficiency of Ball or Lead Screw (from table on previous page)

METRIC

$$T_F = \frac{P/1000 \bullet P_f}{2\pi\ \xi_{screw}} + T_r \quad (N \bullet m)$$

where: P = Lead of Ball Screw (mm) (from table on previous page)
π = 3.1416
ξ_{screw} = Efficiency of Ball Screw = 90%

Calculate **Friction Force (Pf)**:

INCH

$$P_f = (W_c + W_p) \bullet \mu_{sys} + n \bullet D_s \quad (oz)$$

where: W_c = Weight of Carriage (oz) (from table on previous page)
W_p = Weight of Payload (oz) (from Application Data)
μ_{sys} = Coefficient of friction of carriage (from table on previous page)
n = number of seals (from table on previous page)
D_s = Seal Drag (oz) (from table on previous page)

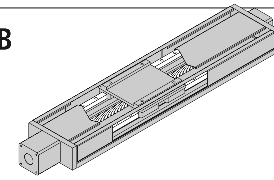
METRIC

$$P_f = (W_c + W_p) \bullet \mu_{sys} + n \bullet D_s \quad (N)$$

where: W_c = Weight of Carriage (N) (from table on previous page)
W_p = Weight of Payload (N) (from Application Data)
μ_{sys} = Coefficient of friction of carriage (from table on previous page)
n = number of seals (from table on previous page)
D_s = Seal Drag (N) (from table on previous page)

With the calculated value of **Frictional Force (PF)**, locate **Frictional Torque (Tr)** (oz • in) in the appropriate table on previous page and calculate **Torque due to friction (TF)** using the formula, above.

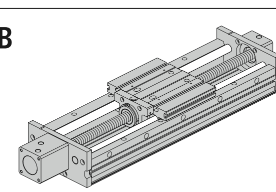
AccuSlide* 2HB



AccuSlide 2HB Ball Screw Act. System Data

Part Number	Nominal Size	Ball Screw Dia.x lead (mm)	Frictional Torque N-m T_r †
2HB-M10-OYP-G	10	16 x 5	0,09
2HB-M10-OYP-H	10	16 x 10	0,09
2HB-M20-OYP-L	20	25 x 5	0,1
2HB-M20-OYP-M	20	25 x 10	0,1
2HB-M10-OYP-N	20	25 x 25	0,1

SuperSlide 2RB



SuperSlide 2RB Ball Screw Act. System Data

Part Number	Nominal Dia.	Ball Screw Dia.x lead (mm)	Frictional Torque N-m T_r †
2RB-M12-ODM-G	12	16 x 5	0,09
2RB-M12-ODM-H	12	16 x 10	0,09
2RB-M16-ODM-I	16	20 x 5	0,1
2RB-M16-ODM-J	16	20 x 10	0,1
2RB-M16-ODM-K	16	20 x 20	0,1

SuperSlide* Ball Screw Driven Slide Table

Step 13c. Calculate **Torque due to gravity (Tg)**:

INCH

$$Tg = \frac{P \bullet Pg}{2\pi\ \xi screw} \quad (oz \bullet in)$$

where:
- P = Lead of Ball or Lead Screw (in/rev) (from table on previous page)
- π = 3.1416
- $\xi screw$ = Efficiency of Ball or Lead Screw (from table on previous page)

Calculate **Gravity Force (Pg)**:

$$P_g = (W_c + W_p)\ SIN\ \theta \quad (oz)$$

where:
- W_c = Weight of Carriage (oz) (from table on page B-75)
- W_p = Weight of Payload (oz) (from Application Data)
- θ = Angle from horizontal (for horizontal θ = 0°; vertical θ = 90° for upstroke, θ = 270° for downstroke)

With the calculated value of **Gravity Force (Pg)**, the **torque due to gravity (Tg)** can be calculated using the formula, above.

METRIC

$$Tg = \frac{(P/1000)}{2\pi\ \xi screw} \quad (N \bullet m)$$

where:
- P = Lead of Ball or Lead Screw (in/rev) (from table on previous page)
- π = 3.1416
- $\xi screw$ = Efficiency of Ball screw = 90%

$$P_g = (W_c + W_p)\ SIN\ \theta \quad (oz)$$

where:
- W_c = Weight of Carriage (oz) (from table on page B-75)
- W_p = Weight of Payload (oz) (from Application Data)
- θ = Angle from horizontal (for horizontal θ = 0°; vertical θ = 90° for upstroke, θ = 270° for downstroke)

Step 13d. Calculate Torque due to external forces (Te):

INCH

$$T_e = \frac{P \bullet P_e}{2\pi\ \xi_{screw}} \quad (oz \bullet in)$$

where:
- P = Lead of Ball or Lead Screw (in/rev) (from table on previous page)
- π = 3.1416
- ξ_{screw} = Efficiency of Ball or Lead Screw (from table on previous page)

The value of external force(s) (Pe) (oz) must be calculated or estimated from the application specifications. Any outside forces that have a component that acts along the axis of the Superslide system should be included as an **external force (Pe)** (oz).

With the calculated or estimated value of **external force (Pe)** the **Torque due to external forces (Te)** can be calculated using the formula, above.

METRIC

$$T_e = \frac{(P/1000)}{2\pi\ \xi_{screw}} \quad (N \bullet m)$$

where:
- P = Lead of Ball or Lead Screw (mm/rev) (from table on previous page)
- π = 3.1416
- ξ_{screw} = Efficiency of Ball Screw = 90% (from table on previous page)

Step 13e. Calculate **Peak Torque (Tpeak)**, the largest of the following:

Torque due to acceleration (TA):

INCH

$$T_A = T_J + T_F + T_g + T_e \quad (oz \bullet in)$$

where:
- T_J = Torque due to system inertia (oz • in) (from step 13a)
- T_F = Torque due to friction (oz • in) (from step 13b)
- T_g = Torque due to gravity (oz • in) (from step 13c)
- T_e = Torque due to external forces (oz • in) (from step 13d)

Torque at constant velocity (Tcv):

$$T_{cv} = T_F + T_g + T_e \quad (oz \bullet in)$$

Torque due to deceleration (TD):

$$T_D = T_J - T_F - T_g - T_e \quad (oz \bullet in)$$

Torque required to hold at rest (TH):

$$T_H = -T_F + T_g + T_e \quad (oz \bullet in)$$

METRIC

$$T_A = T_J + T_F + T_g + T_e \quad (N \bullet m)$$

where:
- T_J = Torque due to system inertia (N • m) (from step 13a)
- T_F = Torque due to friction (N • m) (from step 13b)
- T_g = Torque due to gravity (N • m) (from step 13c)
- T_e = Torque due to external forces (N • m) (from step 13d)

Torque at constant velocity (Tcv):

$$T_{cv} = T_F + T_g + T_e \quad (N \bullet m)$$

Torque due to deceleration (TD):

$$T_D = T_J - T_F - T_g - T_e \quad (N \bullet m)$$

Torque required to hold at rest (TH):

$$T_H = -T_F + T_g + T_e \quad (N \bullet m)$$

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SuperSlide* Ball Screw Driven Slide Table

Step 13f. Calculate Root-Mean-Square Torque (Trms) or Continuous Torque:

$$T_{RMS} = \frac{t_a\,(T_A)^2 + t_{cv}\,(T_{cv})^2 + t_d\,(T_D)^2 + t_h\,(T_H)^2}{t_a + t_{cv} + t_d + t_h} \quad \text{(oz•in)}$$

where: T_A, T_{cv}, T_D, and T_H are from step 13e.

t_a = time to accelerate (s)
t_{cv} = time at constant velocity (s)
t_d = time to decelerate (s)
t_h = time at rest (s)

Speed vs Torque

Step 14. Determine the proper motor selection. Plot Peak Torque (Tpeak) against the Required Motor Speed from step 10 and enter the Motor Speed vs. Torque graph (Graph SBSU 19.1). If the plotted point is below the curve for intermittent duty, then you have made a proper selection. Now plot Continuous Torque (TRMS) against the Required Motor Speed from step 10 and enter the graph again. If the plotted point is below the curve for continuous duty, then you have made a proper selection. If either of the plotted points fall above their respective curve then either a larger frame motor or a speed reducing gearhead must be employed. Check mounting flange availability when increasing the motor frame size. See the example at the bottom of the next page if you choose to employ a speed reducing gearhead.

Motor Speed vs. Torque Curve

Graph SBSU 19.1 is an example of a speed vs. torque curve for a NEMA 23 motor. Motors are available in standard NEMA frame sizes 23, 34 and 42.
To determine the motor speed vs. torque curve that best suits the application and for a continuation of features and specifications refer to the Motor Data Table, page B-76.

Speed vs. Torque Curve with Gearhead

There is an increased torque capability when using a gearhead. The use of a gearhead also requires the motor to run at a higher speed. Gearheads are available in standard NEMA frame sizes 23, 34 and 42 and in ratios 1:1, 3:1; 5:1 and 10:1 (other ratios are available).

Graph SBSU 19.1

To determine motor speed, use the following formula:

$$RPM = \frac{V_{max} \bullet 60 \bullet i}{P}$$

where: V_{max} = maximum linear speed (in/s) (from step 9)
P = lead of Ball or Lead screw (in/rev)
i = gearhead ratio

SuperSlide* Ball Screw Driven Slide Tables

Maximum Acceptable Travel Rate

The SuperSlide 2RB Ball Screw Actuated Systems can be mounted using the T-nuts and T-slots from above with clamping fixtures as shown below. In addition, SuperSlide Ball Screw Actuated Systems 2RB can be mounted using the bolt down attachment holes found in system support base (System 2RB). For other mounting fixity contact Thomson Systems Application Engineering.

SuperSlide 2RB

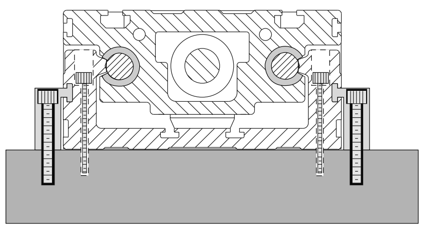
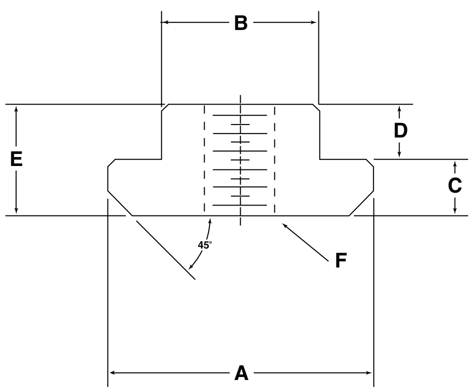


Figure 1: Mounting from above using T-slots or from above through mounting holes.

T-Nuts for Mounting

Standard T-Nut Dimensions



Standard T-Nut Dimensions						(Dimensions in mm)
Part Number	A	B	C	D	E	F
TNUT-01-M3	7	4	1,75	1,25	3	M3
TNUT-02-M4	9,5	5,5	2,25	1,75	4	M4
TNUT-03-M4	12	7	2,5	2,5	5	M4
TNUT-03-M5	12	7	2,5	2,5	5	M5
TNUT-04-M4	16,5	7,9	4,8	1,2	6	M4
TNUT-04-M5						M5
TNUT-04-M6						M6
TNUT-05-M4	19,5	9,8	5,8	2,8	8,6	M4
TNUT-05-M5						M5
TNUT-05-M6						M6
TNUT-05-M8						M8

SuperSlide* Belt Driven Slide Tables

System Travel Lengths

To determine the system that fits your SuperSlide Belt Actuated System application requirements the following design criteria needs to be evaluated:

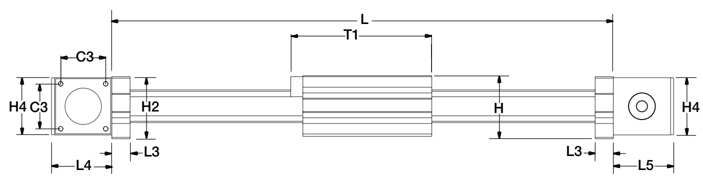
- **System Support Requirements**
- **System Stroke Length**
- **Maximum Allowable Shaft Deflection**
- **Required Travel Life**
- **Force on the Most Heavily Loaded Bearing**
- **Load Correction Factor**
- **Load/Life Requirements – Linear Bearings**
- **Motion (Move) Profile (Velocity, Acceleration)**
- **Maximum Belt Tooth Shear Strength**
- **Gear Motor Rotational Speed (Gear Reduction)**
- **Torque Calculations**
- **Size Motor using Torque/Speed Curves**

After the above are determined, the system selection will become quick and easy. The following procedure will guide you through the proper system selection.

Step 1. Based on your application needs, determine the **Mounting Support Requirements**. Will the application require end or continuous support?

Step 2. Determine the Stroke Length (Ls). For each SuperSlide Belt Actuated System, the maximum **Stroke Length (L_s)** can easily be determined. By subtracting the carriage length **(T1)** and two times end block **(L3)** from the total system length **(L)**, the maximum stroke length is determined.

$$L_S = L - (T1 + 2\ L3)$$



Should your application require the use of bellows way covers, it is important to recognize that the bellows will detract from the available stroke of the system. The bellows will retract to approximately 14% of the available stroke at each end of the system. The stroke length with bellows (LS/B) is calculated by subtracting 2 times the stroke (LS) times .14 from the stroke (LS).

$$L_{S/B} = L_S - (2 \times L_S \times .14)$$

Standard Length and Delivery. For each SuperSlide Belt Driven Slide Tables there is a standard length chart and delivery information that also includes the standard length increment and the maximum system length. Selecting a standard system length will minimize shipment time. Once you have selected a length that best fits your application requirements, simply determine the maximum stroke length. The required stroke length should not exceed this number.

System 2RE Standard Lengths (Lengths in mm)

System	300	375	400	450	500	525	600	675	700	750	800	825	900	975	1000	1050	1100	1125	1200	1275	1300	1350	1400	1425	1500	X	MAX
2RE-M12	■	■		■		■	■	■		■		■	■	■		■		■	■	■		■		■	■	75	3000
2RE-M16	■		■		■		■		■		■		■		■		■		■		■		■		■	100	3000

Custom Lengths

Custom length systems are available. Lengths exceeding MAX length will require butt joints. For special requirements, please contact the Danaher Motion Systems application engineering department.

SuperSlide* Belt Driven Slide Tables

System Deflection

Step 3. For end supported systems, determine if the system selected meets the Maximum Allowable Deflection criteria.

Travel Life

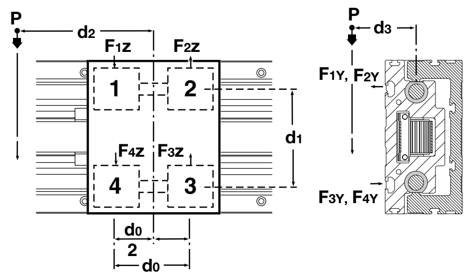
Step 4. Determine the Required Travel Life (km).

$$L_t = \frac{2 \bullet s \bullet f \bullet L_h \bullet 60}{10^6}$$

L_t = required travel life (km)
s = stroke (mm)
f = frequency (cycles/minute)
L_h = service life (hrs)

System Loading

Step 5. Determine the Force on the Most Heavily Loaded Bearing. When selecting a SuperSlide Belt Driven Slide Tables, it is necessary to evaluate the bearing forces that are generated based on the position of the load and its movement during application. The free body diagram (SBM 10.1) is an example of the type of calculations that are required when determining resultant bearing forces. For other free body diagram examples see Load Considerations in the Engineering Support Appendix, page B-94. The determination of the force on the most heavily loaded bearing allows you to enter the load life graph and select the system that best fits your application needs.



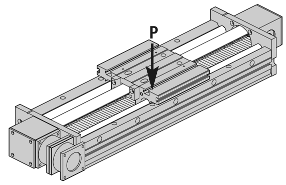
$$F_{1Y} \sim F_{4Y} = \left(\frac{P}{2} \times \frac{d_3}{d_1}\right) \qquad F_{2Z} = F_{3Z} = \frac{P}{4} - \left(\frac{P}{2} \times \frac{d_2}{d_0}\right)$$

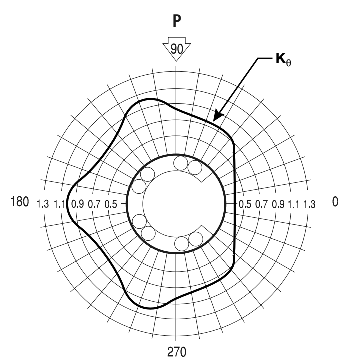
$$F_{1Z} = F_{4Z} = \frac{P}{4} + \left(\frac{P}{2} \times \frac{d_2}{d_0}\right)$$

(SBM 10.1)

Step 6. Determine the Load Correction Factor (Kq). The dynamic load capacity of SuperSlide Belt Driven Slide Table is determined by the orientation of the system and the direction of the resultant bearing load.To determine the load correction factor, simply enter the polar graph with the applied or resultant load direction until it intersects the polar curve. If the load correction factor is 1,0 the resultant force ($P_{resultant}$) is equal to the Force on the Most Heavily Loaded Bearing (Pmax). If the direction of the resultant bearing load cannot be determined, then use the minimum Kq value (0,7 for closed bearings and 0,5 for open bearings.)

Superslide 2RE





These Load Correction Factor Polar charts show values of Kq for load orientations on a single Ball Bushing* bearing. Appropriate load orientation should be considered for the most heavily loaded Ball Bushing bearing..

SuperSlide* Belt Driven Slide Table

If the Load Correction Factor is less than 1,0 the following formula should be used to determine the Corrected Force on the Most Heavily Loaded Bearing.

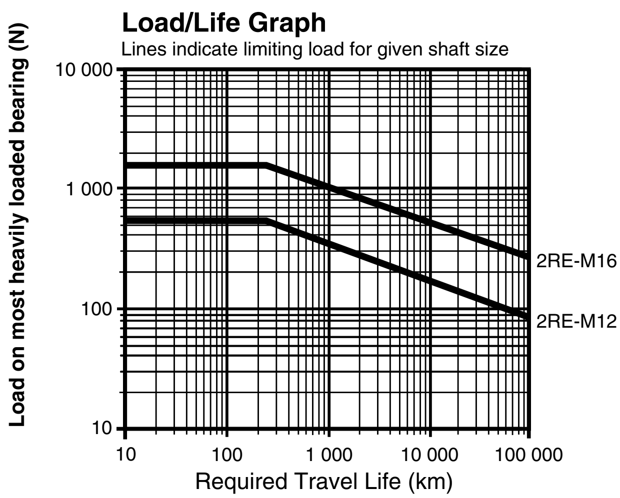
$$P_{max} = \frac{P_{resultant}}{K_\theta}$$

P_{max} = Force on the Most Heavily Loaded Bearing (N)
$P_{resultant}$ = Resultant of Externally Applied loads (N)
K_θ = Load Correction Factor

Note: AccuSlide* 2HE has a load correction factor in all directions of 1,0.

Load and Life Requirements

Step 7. Select the system that meets the application load and life requirements.



(SBM 11.1)

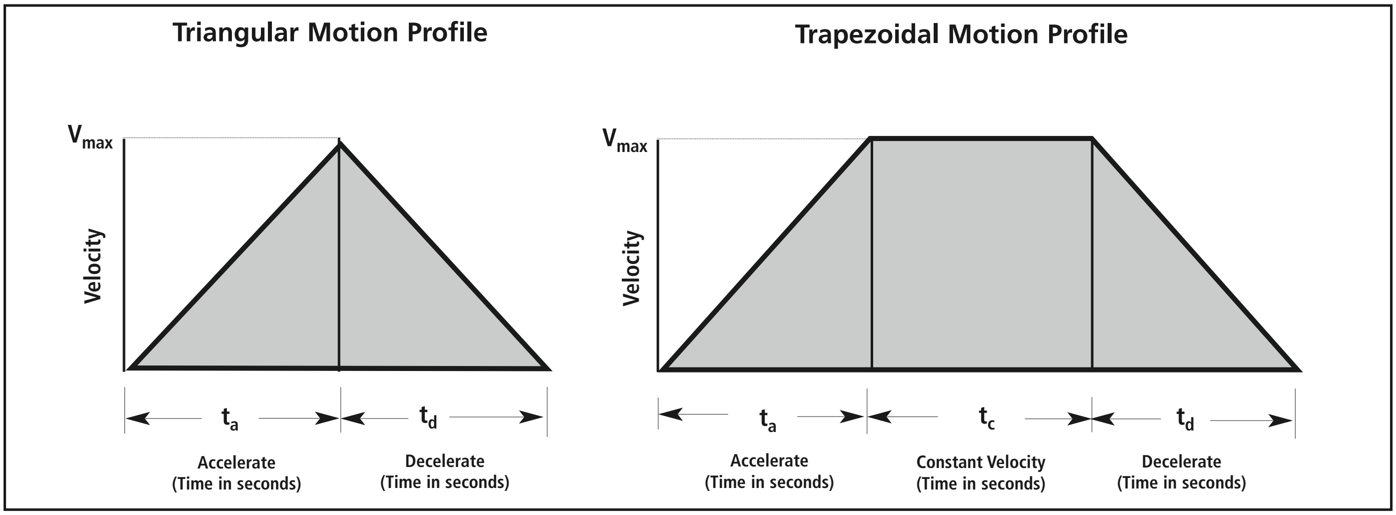
For each SuperSlide Belt Driven Slide Table there is a graph (SBM 11.1) that allows for system selection based on the Required Travel Life and the Force on the Most Heavily Loaded Bearing. To determine the system which best meets your application requirements, simply enter the graph with your Required Travel Life from step 4 and the Corrected Force on the Most Heavily Loaded Bearing from step 6. Select a system characteristic curve that is above or to the right of the plotted point.

Note: Use Corrected Force on the Most Heavily Loaded Bearing if load correction factor is less than 1,0.

SuperSlide* Belt Driven Slide Table

A typical linear belt actuated application normally consists of a series of motion profiles. The actuated torque required to move the system should be evaluated for each motion profile. There are two basic motion profile types. The first and most simple move is a triangular motion profile which consists of two legs. The first leg is for acceleration and the second is for deceleration. The second motion profile type is trapezoidal which consists of an acceleration leg, a leg of constant velocity and a deceleration leg.

Step 8. Determine the Motion Profile that fits your application requirements. Calculate V_{max} and a.



Triangular Motion Profile:

Assume: $t_a = t_d = t/2$ and $x_a = x_d = x/2$

Then:

$V_{avg} = x/t$

$V_{max} = 2 \bullet V_{avg} = 2x/t$

$a = V_{max} / t_a = 4\,x/t^2$

Where:

a = acceleration (m/s²)

d = deceleration (m/s²)

x = total Distance (m)

x_a = distance to Accelerate (m)

x_c = distance at Constant Velocity (m)

x_d = distance to Decelerate (m)

Trapezoidal Motion Profile:

Assume: $t_a = t_c = t_d = t/3$ and $x_a = x_d = x/4,\ x_c = x/2$

Then:

$V_{avg} = x/t$

$V_{max} = 1.5 \bullet V_{avg}$

$a = -d = V_{max} / t_a = 4.5x/t^2$

t = total Move Time (s)

t_a = acceleration Time (s)

t_c = time at Constant Velocity (s)

t_d = deceleration Time (s)

V_{avg} = average Velocity (m/s)

V_{max} = maximum Velocity (m/s)

Maximum Belt Tooth Shear Strength

Step 9. Calculate the Total Axial Forces on the system belt and determine whether they are within the limits of the Belt Pre-Tension Force and Maximum Allowable Tooth Shear of the belt. The Total Axial System Belt Force (Ps) is the summation of External Force (Pe), Acceleration Force (Pa) and Frictional Force (Pf).

$$P_s = P_e + P_a + P_f$$

Step 9a. Determine the External Axial Forces (Pe). External axial forces seen by the Superslide Belt Driven Slide Table can be the result of application forces such as stretching fabric in a textile application or compressing boxing in a packaging application. In a vertical application, the external force is the addition of gravity acting on the payload. In those vertical applications the motor must be mounted above the load on the carriage.

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SuperSlide* Belt Driven Slide Table

Maximum Belt Tooth Shear Strength

Step 9b. Determine the Acceleration force (Pa). To overcome the inertia generated by the payload, the carriage assembly and the belt force due to acceleration must be evaluated.

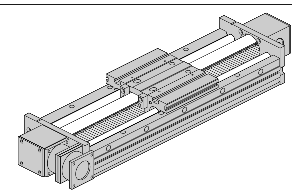
$$P_a = a \bullet \frac{(W_c + W_p + (W_b \bullet L \bullet 2))}{g}$$

$$a = V_{max} / t_a = \frac{4.5 \bullet x}{t^2} = \text{linear acceleration (m/s}^2\text{) (from step 8)}$$

W_c = carriage Weight (N) (from table below)
W_p = weight of Payload (N) (from Application Data)
W_b = weight of Belt (N/m) (from table below)
g = acceleration due to gravity = 9,81 m/s²

V_{max} = maximum velocity (m/s) (from Step 8)
t_a = acceleration time (s)
x_a = distance to accelerate (m)
L = overall length of system (m)
x = total distance (m)
t = total move time (s)

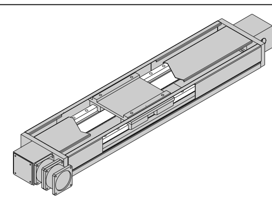
SuperSlide 2RE



SuperSlide 2RE Belt Actuated System Data

Part Number	Nominal Dia.	Carriage Weight (N)	Belt Weight (N/m)	Coefficient Friction Carriage	Number of Seals	Seal Drag (N)	Belt Pre-Tension Force (N)	Maximum Axial Force, Belt (N)
2RE-M12	12	8,8	0,4	0,002	8	0,5	225	485
2RE-M16	16	16,7	1,12	0,002	8	0,7	780	817

AccuSlide* 2HE



AccuSlide 2HE Belt Actuated System Data

Part Number	Nominal Size	Carriage Weight (N)	Belt Weight (N/m)	Coefficient Friction Carriage	Number of Seals	Seal Drag (N)	Belt Pre-Tension Force (N)	Maximum Axial Force, Belt (N)
2HE-M10	10	3,9	0,4	0,003	4	0,9	225	485
2HE-M20	20	26,5	1,75	0,003	4	7,0	1260	1488

Step 9c. Determine the Frictional Force (Pf). The total Frictional force is the sum of the payload and carriage weight times the system coefficient of friction plus the additional seal drag.

$$P_f = [\, \mu_{sys} \bullet (W_p + W_c) + n \bullet D_s]$$

W_p = payload weight (N)

W_c = carriage weight (N) (see table at left)

μ_{sys} = system coefficient of friction (see table at left)

D_S = seal Drag (N) (see table at left)

n = number of seals (see table at left)

In the case of vertical axis orientation, this Pf term may be omitted.

Step 9d. Calculate Total Axial System Belt Force (Ps):

$$P_s = P_e + P_a + P_f$$

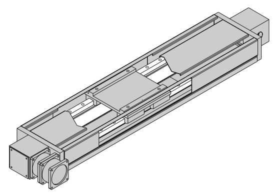
Step 9e. Compare the calculated Total Axial System Belt Force (PS) with the Belt Pre-Tension Force in the tables on the previous page. If the calculated value exceeds the Pre-Tension Force in the table then the application parameters or the size of the system should be reconsidered, as the possibility exists that the belt could go into a slackened condition causing slippage on the pulley. In no case should the Total Axial Belt Force (PS) ever exceed the Maximum Axial Force for the belt in the tables on the previous page.

SuperSlide* Belt Driven Slide Table

Maximum Belt Tooth Shear Capacity

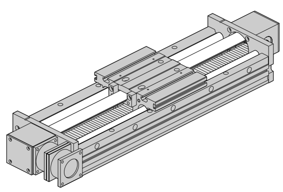
Step 10. It is also important to check that the application parameters are within the limits of the Belt Tooth Shear Capacity.

AccuSlide* 2HE



AccuSlide 2HE Belt Actuated System Data								
Part Number	Nominal Size	Pitch Circle Diameter (mm)	Lead (mm/rev.)	Number of Effective Teeth	Belt Width (mm)	Belt Pitch (mm)	Standard Gear Ratios	Maximum Axial Force (N)
2HE-M10	10	26,74	84	12	20	3	1:1, 3:1, 5:1, 10:1	485
2HE-M20	20	47,75	150	12	50	5	1:1, 3:1, 5:1, 10:1	1488

SuperSlide 2RE



SuperSlide 2RE Belt Actuated System Data								
Part Number	Nominal Dia.	Pitch Circle Diameter (mm)	Lead (mm/rev.)	Number of Effective Teeth	Belt Width (mm)	Belt Pitch (mm)	Standard Gear Ratios	Maximum Axial Force (N)
2RE-M12	12	26,74	84	12	20	3	1:1, 3:1, 5:1, 10:1	485
2RE-M16	16	35,01	110	11	32	5	1:1, 3:1, 5:1, 10:1	817

The formula for calculating Belt Tooth Shear Capacity (Cts) is as follows:

$$C_{ts} = C_{sp} \bullet Z_e \bullet W$$

C_{sp} = Specific Axial Force Capacity (N/mm)
Z_e = Number of Effective Belt Teeth (from previous page)
W = Belt Width (mm) (from previous page)

Step 10a. The Csp value is taken from the above graphs. Enter the graph for the appropriate Belt Pitch with the Pulley Speed (Np) calculated as follows:

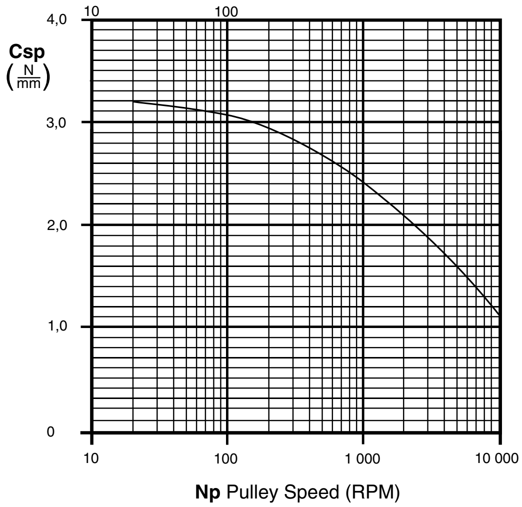
$$N_p = \frac{V_{max} \bullet 60000}{p_b} = \frac{V_{max} \bullet 60000}{\pi\, d_0}$$

N_p = Pulley Speed (RPM)
V_{max} = Maximum Linear Speed (m/s)(from Step 8)
P_b = πd_0 = Lead (mm/rev.) (from previous page)
d_0 = Pitch Circle Diameter (mm)(from previous page)
π = 3,1416

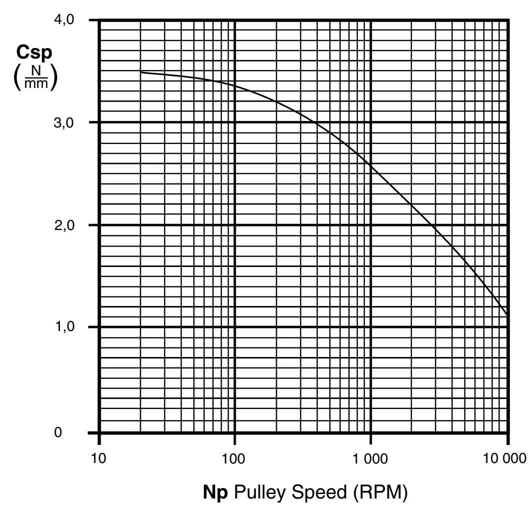
SuperSlide* Belt Driven Slide Table

Speed Requirements

Specific Axial Force Capacity vs. Pulley Speed for 3mm pitch belt



Specific Axial Force Capacity vs. Pulley Speed for 5mm pitch belt



Step 10b. Once Pulley Speed (Np) is calculated, and the Specific Axial Force Capacity (Csp) is determined from the above graph, locate the number of Effective Belt Teeth (Ze) and the Belt Width (W) from the tables on the previous page and calculate the Belt Tooth Shear Capacity (Cts):

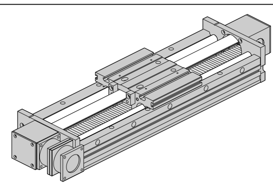
$$C_{ts} = C_{sp} \cdot Z_e \cdot W$$

Step 10c. Compare the Belt Tooth Shear Force Capacity (Cts) with the calculated Maximum Axial System Belt Force (Ps) from step 9d. If the calculated value for Ps exceeds the maximum allowable capacity from step 10b, the application parameters or the size of the system must be reconsidered.

$$C_{ts} > P_s$$

Step 11. Determine the Motor Rotational Speed required to move at V_{max} for all system ratios.
The SuperSlide Belt Actuated System is equipped with a Thomson Micron True Planetary* Precision Gearhead already mounted. Each gearhead ratio (greater than 1:1) provides an increase in output torque and requires the motor to operate at a higher speed.

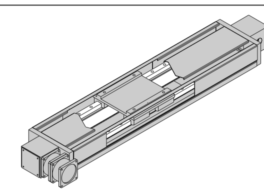
SuperSlide 2RE



SuperSlide 2RE Belt Actuated System Data

Part Number	Nominal Dia.	Pitch Circle Dia. (mm)	Lead (mm/rev)	Motor Frame Size	Standard Gear Ratios
2RE-M12	12	26,74	84	NEMA 23	1:1, 3:1, 5:1, 10:1
2RE-M16	16	35,01	110	NEMA 23	1:1, 3:1, 5:1, 10:1

AccuSlide* 2HE



AccuSlide 2HE Belt Actuated System Data

Part Number	Nominal Size	Pitch Circle Dia. (mm)	Lead (mm/rev)	Motor Frame Size	Standard Gear Ratios
2HE-M10	10	26,74	84	NEMA 23	1:1, 3:1, 5:1, 10:1
2HE-M20	20	47,75	150	NEMA 34	1:1, 3:1, 5:1, 10:1

Calculate the Maximum Motor Speed (Nmax) at the system Maximum Linear Speed (Vmax) from Step 8 using the following formula:

$$N_{max} = \frac{V_{max}\, i}{p_b}$$

V_{max} = Maximum Linear Speed (m/s)
i = Gear Ratio
d_0 = Pitch Circle Diameter (mm) (from tables above)
$p_b = \pi d_0$ = Lead (mm/rev.) (from tables above)
$\pi = 3{,}1416$

or with unit conversions and constants:

$$N_{max} = \frac{V_{max} \cdot i \cdot (1000\text{mm/m}) \cdot (60\text{ sec/min})}{\pi d_0} = \frac{V_{max} \cdot i \cdot (19\,100)}{d_0}\ (\text{RPM})$$

SuperSlide* Belt Driven Slide Table

Torque Calculations

Step 12. In order to size a motor for your SuperSlide Belt Driven Slide Table it is important to calculate the torque required to meet your application requirements with all of the parameters in mind. If you are actuating your system with a stepping motor, then a maximum or peak torque (Tpeak) calculation is required. Peak torque is usually seen at the time of maximum acceleration, however, other factors such as torque due to external forces can affect when peak torque occurs. It is important to calculate for all torque conditions (Torque due to acceleration (TA), Torque at constant velocity (Tcv), Torque due to deceleration (TD), and Torque required to hold at rest (TH)), and take that torque with the largest magnitude as the Peak Torque (Tpeak).

$$T_A = T_J + T_F + T_g + T_e \quad (N \bullet m)$$
$$T_{cv} = T_F + T_g + T_e \quad (N \bullet m)$$
$$T_D = T_J - T_F - T_g - T_e \quad (N \bullet m)$$
$$T_H = -T_F + T_g + T_e \quad (N \bullet m)$$

where:
- T_J = Torque due to system inertia $(N \bullet m)$
- T_F = Torque due to friction $(N \bullet m)$
- T_g = Torque due to gravity $(N \bullet m)$
- T_e = Torque due to external forces $(N \bullet m)$

Should you be actuating your SuperSlide system with a servo motor system then it is also necessary to calculate a Root-Mean-Square Torque (TRMS) or Continuous Torque.

$$T_{RMS} = \sqrt{\frac{t_a (T_A)^2 + t_{cv} (T_{cv})^2 + t_d (T_D)^2 + t_h (T_H)^2}{t_a + t_{cv} + t_d + t_h}} \quad (N \bullet m)$$

where:
- t_a = time to accelerate (s)
- t_{cv} = time at constant velocity (s)
- t_d = time to decelerate (s)
- t_h = time at rest (s)

Step 12a. Calculate Torque due to system inertia (TJ):

$$T_J = \left[\frac{1000 \bullet 2 \bullet a}{d_0}\right] \bullet \left[\frac{J_p}{i^2 \bullet \xi_g} + J_M \bullet i + J_g \bullet i\right] + T_L \quad (N \bullet m)$$

and

$$T_L = \frac{P_a \bullet d_0}{1000 \bullet 2 \bullet i \bullet \xi_g \bullet \xi_b} \quad (N \bullet m)$$

where:
- T_L = Torque due to payload $(N \bullet m)$
- a = required linear acceleration (m/s^2) (from step 8)
- d_0 = pulley pitch circle diameter (mm) (from table on next page)
- J_p = drive pulley inertia $(Kg \bullet m^2)$ (from table on next page)
- J_M = motor inertia $(Kg \bullet m^2)$(1) $(g \bullet cm^2 = Kg \bullet m^2 \times 10^{-7})$
- J_g = gearbox inertia $(Kg \bullet m^2)$ (from table on next page)
- i = gearbox ratio (from Application Data)
- ξ_g = gearbox efficiency = 90%
- ξ_b = belt efficiency = 90%
- P_a = acceleration force (N)

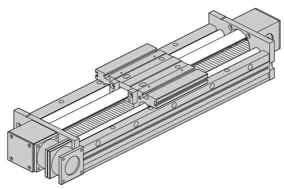
SuperSlide* Belt Driven Slide Table

Calculate acceleration force (Pa) (N)

$$P_a = \frac{a \bullet (W_c + W_p + W_B \bullet L \bullet 2)}{g} \qquad (N)$$

W_c = weight of carriage (N) (from table below)
W_p= weight of payload (N) (from application data)
W_B= weight of belt (N/m) (from table below)
L= overall system length (m)
a= required linear acceleration (m/s²) (from step 8)
g= acceleration due to gravity = 9,81 m/s²

SuperSlide 2RE



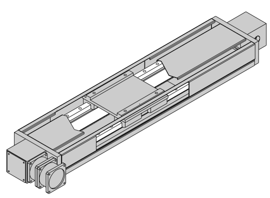
SuperSlide 2RE Belt Actuated System Data

Part Number	System Size	Pitch Circle Diameter (mm)	Pulley inertia (kg • m²)	Carriage Weight (N)	Belt Weight (N/m)
2RE-M12	12	26,74	$7,3 \times 10^{-6}$	8,8	0,4
2RE-M16	16	35,01	$3,02 \times 10^{-5}$	16,7	1,12

SuperSlide 2RE

System Part Number	Gear Ratio	Motor Frame Size	Gearbox Part Number	Gearbox inertia (Kg•m²)
2RE-M12-OEM-A	1:1	NEMA23	NT-23-1	$8,14 \times 10^{-4}$
2RE-M12-OEM-B	3:1	NEMA23	NT-23-3	$7,82 \times 10^{-4}$
2RE-M12-OEM-C	5:1	NEMA23	NT-23-5	$2,58 \times 10^{-4}$
2RE-M12-OEM-D	10:1	NEMA23	NT-23-10	$1,61 \times 10^{-4}$
2RE-M16-OEM-A	1:1	NEMA23	NT-23-1	$8,14 \times 10^{-4}$
2RE-M16-OEM-B	3:1	NEMA23	NT-23-3	$7,82 \times 10^{-4}$
2RE-M16-OEM-C	5:1	NEMA23	NT-23-5	$2,58 \times 10^{-4}$
2RE-M16-OEM-D	10:1	NEMA23	NT-23-10	$1,61 \times 10^{-4}$

AccuSlide* 2HE



AccuSlide 2HE Belt Actuated System Data

Part Number	System Size	Pitch Circle Diameter (mm)	Pulley inertia (kg • m²)	Carriage Weight (N)	Belt Weight (N/m)
2HE-M10	10	26,74	$7,3 \times 10^{-6}$	3,9	0,4
2HE-M20	20	47,75	$1,54 \times 10^{-4}$	26,5	1,75

AccuSlide 2HE

System Part Number	Gear Ratio	Motor Frame Size	Gearbox Part Number	Gearbox inertia (Kg•m²)
2HE-M10-OZP-A	1:1	NEMA23	NT-23-1	$8,14 \times 10^{-4}$
2HE-M10-OZP-B	3:1	NEMA23	NT-23-3	$7,82 \times 10^{-4}$
2HE-M10-OZP-C	5:1	NEMA23	NT-23-5	$2,58 \times 10^{-4}$
2HE-M10-OZP-D	10:1	NEMA23	NT-23-10	$1,61 \times 10^{-4}$
2HE-M20-OZP-E	1:1	NEMA34	NT-34-1	$4,9 \times 10^{-3}$
2HE-M20-OZP-F	3:1	NEMA34	NT-34-3	$4,51 \times 10^{-3}$
2HE-M20-OZP-G	5:1	NEMA34	NT-34-5	$1,39 \times 10^{-3}$
2HE-M20-OZP-H	10:1	NEMA34	NT-34-10	$7,56 \times 10^{-4}$

SuperSlide* Belt Driven Slide Table

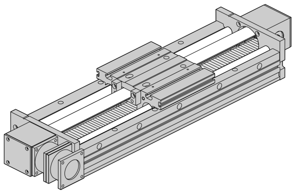
Calculate Torque due to payload (TL):

$$T_L = \frac{P_a \bullet d_0}{1000 \bullet 2 \bullet i \bullet \xi_g \bullet \xi_b} \quad (N \bullet m)$$

Calculate Torque due to system inertia (TJ) :

$$T_J = \left[\frac{1000 \bullet 2 \bullet a}{d_0}\right] \bullet \left[\frac{J_p}{i^2 \bullet \xi_g} + J_M \bullet i + J_g \bullet i\right] + T_L \quad (N \bullet m)$$

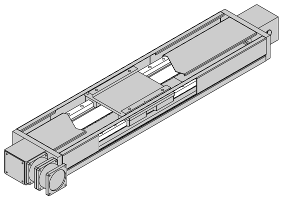
SuperSlide 2RE



SuperSlide 2RE Belt Actuated System Data

Part Number	Nominal Dia.	Carriage Weight (N)	Belt Weight (N/m)	Coefficient Friction Carriage	Number of Seals	Seal Drag (N)
2RE-M12	12	8,8	0,4	0,002	8	0,5
2RE-M16	16	16,7	1,12	0,002	8	0,7

AccuSlide* 2HE



AccuSlide 2HE Belt Actuated System Data

Part Number	Nominal Size	Carriage Weight (N)	Belt Weight (N/m)	Coefficient Friction Carriage	Number of Seals	Seal Drag (N)
2HE-M10	10	3,9	0,4	0,003	4	0,9
2HE-M20	20	26,5	1,75	0,003	4	7,0

SuperSlide* Belt Driven Slide Table

Step 12b. Calculate Torque due to Friction (TF) :

$$T_F = \left[\frac{d_0}{1000 \bullet 2}\right] \bullet \left[\frac{P_f}{i \bullet \xi_g \bullet \xi_b}\right]$$

and

$$P_f = (W_p + W_c) \bullet \mu_{sys} + n \bullet D_s$$

where:
- P_f = Force due to Friction (N)
- W_p = Weight of Payload (N) (from Application Data)
- W_c = Weight of Carriage (N) (from table on previous page)
- μ_{sys} = Coefficient of friction of carriage (from table on previous page)
- n = Number of seals (from table on previous page)
- D_s = Seal Drag (N) (from table on previous page)
- d_0 = Pulley pitch circle diameter (mm) (from table on page B-88)
- i = Gearbox ratio (from Application Data)
- ξ_g = Gearbox efficiency = 90%
- ξ_b = Belt efficiency = 90%

First calculate Force due to friction (Pf) and with this value calculate Torque due to friction (Tf) using the formula, above.

Step 12c. Calculate Torque due to gravity (Tg):

$$T_g = \left[\frac{d_0}{1000 \bullet 2}\right] \bullet \left[\frac{P_g}{i \bullet \xi_g \bullet \xi_b}\right] \qquad (N \bullet m)$$

and

$$P_g = (W_p + W_c)\ \mathrm{SIN}\theta \qquad (N)$$

where:
- P_g = Force due to Gravity (N)
- W_p = Weight of Payload (N) (from Application Data)
- W_c = Weight of Carriage (N) (from table on previous page)
- θ = Angle from horizontal (for horizontal $\theta = 0°$, vertical $\theta = 90°$ for upstroke $\theta = 270°$ for downstroke)
- d_0 = Pulley pitch circle diameter (mm) (from table on page B-88)
- i = Gearbox ratio (from Application Data)
- ξ_g = Gearbox efficiency = 90%
- ξ_b = Belt efficiency = 90%

First calculate Force due to gravity (Pg) and with this value calculate Torque due to gravity (Tg) using the formula, above.

Step 12d. Calculate Torque due to external forces (Te):

$$T_e = \left[\frac{d_0}{1000 \bullet 2}\right] \bullet \left[\frac{P_e}{i \bullet \xi_g \bullet \xi_b}\right] \qquad (N \bullet m)$$

where:
- d_0 = Pulley pitch circle diameter (mm) (from table on page B-88)
- i = Gearbox ratio (from Application Data)
- ξ_g = Gearbox efficiency = 90%
- ξ_b = Belt efficiency = 90%

SuperSlide* Belt Driven Slide Table

The value of external force(s) (Pe) (N) must be calculated or estimated from the application specifications. Any outside forces that have a component that acts along the axis of the Superslide system should be included as an external force (Pe) (N).

With the calculated or estimated value of external force (Pe), the Torque due to external force (Te) can be calculated from the formula on the previous page.

Step 12e. Calculate Peak Torque (Tpeak), the largest of the following:

Torque due to acceleration (TA):

$$T_A = T_J + T_F + T_g + T_e \quad (N \bullet m)$$

where:

T_J = Torque due to system inertia (N • m) (from step 12a)
T_F = Torque due to friction (N • m) (from step 12b)
T_g = Torque due to gravity (N • m) (from step 12c)
T_e = Torque due to external forces (N • m) (from step 12d)

Torque at constant velocity (T_{cv}):

$$T_{cv} = T_F + T_g + T_e \quad (N \bullet m)$$

Torque due to deceleration (T_D):

$$T_D = T_J - T_F - T_g - T_e \quad (N \bullet m)$$

Torque required to hold at rest (T_H):

$$T_H = -T_F + T_g + T_e \quad (N \bullet m)$$

Step 12f. Calculate Root-Mean-Square Torque (Trms) or Continuous Torque:

$$T_{RMS} = \sqrt{\frac{t_a (T_A)^2 + t_{cv} (T_{cv})^2 + t_d (T_D)^2 + t_h (T_H)^2}{t_a + t_{cv} + t_d + t_h}} \quad (N \bullet m)$$

where: T_A, T_{cv}, T_D, and T_H are from step 12e.

t_a = time to accelerate (s)
t_{cv} = time at constant velocity (s)
t_d = time to decelerate (s)
t_h = time at rest (s)

* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

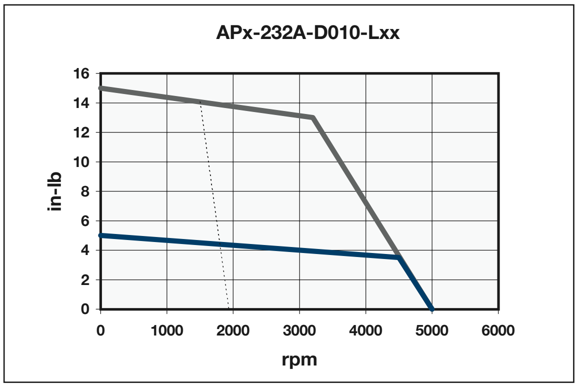
SuperSlide* Belt Driven Slide Table

Speed vs Torque

Step 13. Determine the proper motor selection. Plot Peak Torque (Tpeak) against the Required Motor Speed from step 11 and enter the Motor Speed vs. Torque graph. (See the Motion Control Section, A-153). If the plotted point is below the curve for intermittent duty, then you have made a proper selection. Now plot Continuous Torque (TRMS) against the Required Motor Speed from step 11 and enter the graph again. If the plotted point is below the curve for continuous duty, then you have made a proper selection. If either of the plotted points fall above their respective curve then either a larger frame motor or a different gear ratio gearbox must be employed. Check mounting flange availability when increasing the motor frame size. Use of a system with a gearbox with a different gear ratio entails recalculating steps 11 and 12 with the new gear ratio in mind.

Motor Speed vs. Torque Curve

Graph SBSM22.1 is an example of a Speed vs. Torque curve for a NEMA 23 motor from the Motion Control section. To determine the motor speed vs. torque curve that best suits the application and for a continuation of features and specifications refer to the Motion Control section, page A-153.



Graph SBSM22.1

To determine motor speed, use the following formula:

$$\text{Motor RPM} = \frac{V_{max} \bullet 60 \bullet i}{(P_B/1000)}$$

where: V_{max} = maximum linear speed ($^{m}/_{s}$) (from step 8)
i = gearhead ratio (from Application Data)

P_B = belt lead (mm) (from table in step 10)

SuperSlide* Belt Driven Slide Table

System Mounting

The SuperSlide Belt Driven Slide Table can be mounted using the T-nuts and T-slots from above with clamping fixtures and below as shown below. In addition, SuperSlide Belt Actuated System can also be mounted using the bolt down attachment holes found in each end block (System 2NE) or system support base (System 2RE). For other mounting fixity contact Thomson Systems Application Engineering.

SuperSlide 2RE

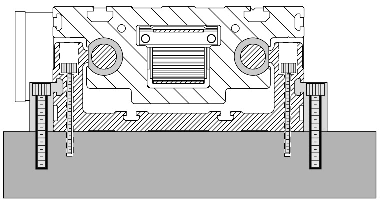
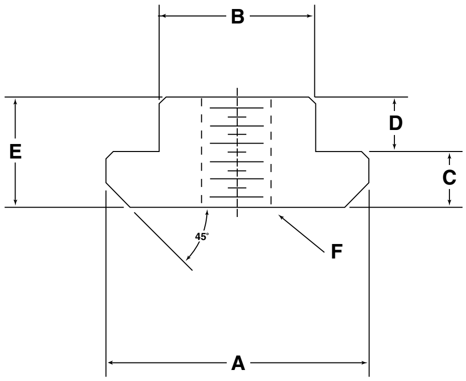


Figure 2: Mounting from above using T-slots or from above through mounting holes.

T-Nuts for Mounting



Standard T-Nut Dimensions						(Dimensions in mm)
Part Number	A	B	C	D	E	F
TNUT-01-M3	7	4	1,75	1,25	3	M3
TNUT-02-M4	9,5	5,5	2,25	1,75	4	M4
TNUT-03-M4	12	7	2,5	2,5	5	M4
TNUT-03-M5	12	7	2,5	2,5	5	M5
TNUT-04-M4	16,5	7,9	4,8	1,2	6	M4
TNUT-04-M5						M5
TNUT-04-M6						M6
TNUT-05-M4	19,5	9,8	5,8	2,8	8,6	M4
TNUT-05-M5						M5
TNUT-05-M6						M6
TNUT-05-M8						M8

Lubrication, Materials and Part Number Specifications

Thomson Linear Motion Systems are pre-lubricated with a rust preventative oil. This process is designed to inhibit the corrosion of the steel components within the system during transport.

Available upon special request, LinearLube* lubricant can be applied to the ball tracks of the Ball Bushing* bearings. This specially formulated lubricant provides optimum performance for most applications. LinearLube is a synthetic lubricant utilizing suspended Teflon® in a specially formulated base compound.

LinearLube provides excellent performance characteristics in a wide range of applications. It is FDA listed, non-polluting, non-corrosive. LinearLube will not stain and adheres tightly to parts, forming a water resistant barrier and airtight seal against contaminant's.

LinearLube reduces overall maintenance and extends service intervals, which helps decrease your maintenance costs.

- Maintains properties in operating temperatures from -65˚F to 450˚F
- U.S.D.A. Rated H1 (Non-Toxic)
- Inhibits wear, rust, and corrosion
- Will not oxidize in use
- 100% water resistant

*LinearLube is an NLGI Grade II class material which contains PTFE (Teflon®) particles suspended in a specially compounded base.

All Thomson Ball Bushing bearings require a small amount of grease or oil to operate. For most applications, lubricant is recommended to prevent wearing and rusting of the bearing surfaces. When linear speeds are high, a light oil should be used and the bearing should be prevented from running dry for a prolonged period of time.

A medium to heavy oil or light grease has greater adhesion properties that afford longer bearing protection and minimize sealing problems. The numerous built-in pockets in the Ball Bushing bearing retainer allow grease to be stored for an extended period of time. Though not generally recommended, in some lightly loaded, low speed and highly contaminated applications, Ball Bushing bearings have been used without lubrication. For these types of applications contact Thomson application engineering.

Specifying a Thomson linear motion system. Thomson linear motion systems are specified quickly and easily with a single part number. When you have evaluated your linear motion requirements and selected a System which best meets your criteria, review the System part number, System length, and any special options to generate a single order number.

Custom lengths or special requirements should be reviewed with the Thomson systems application engineering department.

System Replacement Components

Replacement components for systems are available from Thomson. Assure the accuracy and repeatability of your system by specifying a -XS after the component part number.

Thomson Linear Motion systems are designed and manufactured through advanced processes with high grade materials chosen for their strength, durability, and hardness. The following is a comprehensive list of the materials utilized throughout Thomson systems.

System Maintenance and Service

Prior to lubrication, all ball screw assemblies should run smoothly throughout the entire stroke. If the torque is not uniform over the entire stroke:

- Visually inspect the screw shaft for accumulations of foreign matter.
- Using cleaning fluid or solvent, remove dirt from the ball grooves. Be sure to flush the ball nut assembly thoroughly.
- Cycle the ball nut along the screw shaft several times. Wipe with a dry, lintless cloth and lubricate immediately.
- If the assembly continues to operate erratically after cleaning, contact Thomson Industries for further instructions.

The operating environment primarily determines the frequency and type of lubrication required by ball screws. The screw shaft should be inspected frequently and lubricated as required by the environmental conditions present. Lubricants can vary from instrument grade oil for dirty and heavy-dust environments to good grade ball bearing grease for protected or clean environments. For most applications, good 10W30 oil periodically wiped on the screw shaft with a damp cloth or applied by a drip or mist lubricator will suffice.

CAUTION: Where the screw is unprotected from airborne dirt, dust, etc., do not leave a heavy film of lubricant on the screw. Keep the screw shaft barely damp with lubricant. Inspect at regular intervals to be certain lubricating film is present. Where the application requires operation below 0F, instrument grade oil is recommended. Operating environments from 0F to 180F will require a good grade 10W30 oil.

All Thomson ball-bushing bearings require a small amount of grease or oil to operate. For general applications, EP2 (extreme pressure NLGI grade2) lubricant is recommended to prevent wearing and rusting of the bearing surfaces. For food grade applications, Linear Lube (teflon-based synthetic grease) is recommended. When linear speeds are high, light oil should be used and the bearing should be prevented from running dry for a prolonged period of time. A medium to heavy oil or light grease has greater adhesion properties that afford longer bearing protection and minimize sealing problems.

All Thomson ball-bushing bearings are shipped with rust preventative oil. It is recommended that you lubricate the ball bushing prior to installation and periodically during operation to assure that the ball bushing does not run dry. Bearing lube cycle not to exceed 1 year or 100km of travel (whichever comes first), but more frequent application may be required based on duty cycle, usage, environment and level of contamination.

Ball Bushing Bearing

Components	Material
Super Smart Ball Bushing* bearings	
• Sleeve and Retainers	Thomson Engineered Plastic††
• Bearing Plates	Hardened Bearing Steel
• Balls	Chrome Alloy Steel
• Seals	Synthetic Rubber
• Pillow Block Housing	Aluminum Alloy†
Supports	
• Type ASB End Support	Aluminum Alloy†
• Type SB End Support	Iron
• Type SRA Rail Support	Aluminum Alloy†
• Twin Shaft End Support	Aluminum Alloy†
• Twin Shaft Web End Support	Aluminum Alloy†
• Integrated End Support	Aluminum Alloy†
• Dual Shaft Support Rail	Aluminum Alloy†
• Inner Race (60 Case™ Shafting)	Case Hardened High Carbon Steel
Carriage	
• Universal Carriage	Aluminum Alloy†
• Twin Shaft Carriage	Aluminum Alloy†
• Twin Shaft Web Carriage	Aluminum Alloy†
• Modular Dual Shaft Carriage	Aluminum Alloy†
• Integrated Dual Shaft Carriage	Aluminum Alloy†

†Custom Black Anodized for inch size systems
Custom Grey Anodized for metric size systems
Custom system lengths may require black paint to protect machine cut-off ends on Dual shaft Rail Assemblies and Shaft support Rails.
If a specific surface finish is required contact the Thomson Systems application engineering department.

††Limited to a Max. Temperature of 185˚F (85˚C)

Coefficient of Friction and Seal Drag

Coefficient of Friction

The coefficient of friction of Thomson Ball Bushing* bearings ranges from 0.001 to 0.004. There are two components of the coefficient of friction, the rolling or operating friction and the static or breakaway friction.

Coefficient of Rolling Friction

The rolling coefficient of friction is measured by the force required to operate the Ball Bushing at a constant rate of travel. The formula for determining frictional resistance during operation is as follows:

Pf = P x fr

where: Pf = Frictional resistance (lbf)
P = Resultant of externally applied loads (lbf)
fr = Coefficient of rolling friction

The following table describes the coefficient of rolling friction of Ball Bushing bearings operating on Thomson 60 Case* LinearRace*. These values are grouped according to the number of ball circuits in each bearing. Friction coefficients are constant among bearings having three and four ball circuits, but slightly less for bearings with five or six ball circuits. A dry Ball Bushing bearing has the lowest coefficient of friction due to the complete absence of lubricant surface tension effects. Values for grease lubrication ranges from 100% greater in the smaller sizes to 20% to 50% greater in the larger sizes. Oil lubrication (medium/heavy, viscosity 64 cs @ 100˚F) achieves frictional values slightly higher than those for grease lubrication.

Ball bushing Bearing coefficients of rolling friction (fr)

Bearing I.D.	Number of Ball Circuits	Condition of Lubrication	Load in % of Rolling Load Rating (for 2,000,000 inches of travel)				
			125%	100%	75%	50%	25%
1/4", 3/8"		No Lube	.0011	.0011	.0012	.0016	.0025
1/2", 5/8"	3 & 4	Grease Lube	.0019	.0021	.0024	.0029	.0044
8 mm		Oil Lube	.0022	.0023	.0027	.0032	.0045
3/4", 1"		No Lube	.0011	.0011	.0012	.0024	.0033
12, 16 mm	5	Grease Lube	.0018	.0019	.0021	.0024	.0033
		Oil Lube	.0020	.0021	.0023	.0027	.0036
1 1/4"		No Lube	.0011	.0011	.0012	.0014	.0019
thru 4"	6	Grease Lube	.0016	.0016	.0017	.0018	.0022
20 thru 40 mm		Oil Lube	.0011	.0011	.0012	.0013	.0018
5/8" thru		No Lube	.0011	.0011	.0012	.0013	.0019
1 1/2"	10	Grease Lube	.0014	.0014	.0015	.0016	.0019
12 thru 40 mm		Oil Lube	.0016	.0016	.0017	.0019	.0025

Coefficient of Static Friction

The coefficient of static or breakaway friction is measured by the force required to initiate Ball Bushing bearing movement. The formula used to determine static frictional resistance is:

Pf = P x fo

where: fo = Coefficient of static friction

Ball bushing Bearing coefficients of static friction (f0)

Load in % of Rolling Load Rating				
125%	100%	75%	50%	25%
.0028	.0030	.0033	.0036	.0040

The values for the coefficient of static friction or breakaway friction are not measurably affected by the number of ball circuits in the bearing or by the lubrication condition.

Seal Drag

Another variable that affects the frictional resistance in a Ball Bushing bearing system is seal drag. When seals are used to retain lubricant or to prevent entry of foreign particles, frictional resistance must be taken into account for determining total frictional drag. In applications where contamination is minimal, the seals can be removed to reduce frictional drag. In highly contaminated applications, seals, wipers and or scrapers are used to minimize the ingress of contamination into the bearing. This protective measure adds to the frictional drag of the bearing system. There is a fine line between minimizing frictional drag and maximizing contaminant protection which is controlled by the addition or removal of seals, wipers or scrapers.
In applications that require low frictional drag in highly contaminated environments, contact Thomson application engineering.

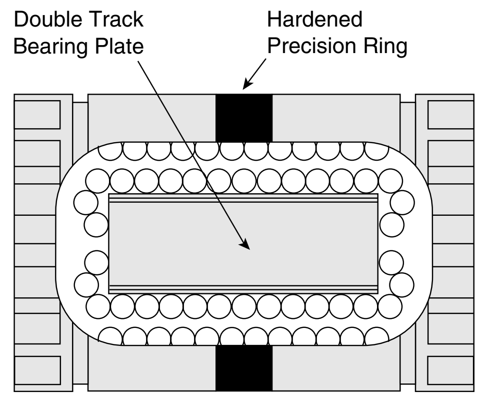
Super Smart Ball Bushing Bearing

The new Super Smart Ball Bushing* bearing represents a major advancement in linear bearing technology worldwide. The Super Smart Ball Bushing bearing offers twice the load capacity or eight times the travel life of the industry standard Thomson Super Ball Bushing bearing. An enormous technological breakthrough, considering the Super Ball Bushing Bearing already offers three times the load capacity or twenty-seven times the travel life of conventional linear bearings.

Technologically Advanced Design

The load carrying component of the Super Smart Ball Bushing bearing is the combination four hardened and precision ground, bearing quality steel components (Figures 1 & 2).

The first component is the steel outer ring, which allows the bearing to maintain its diametrical fit-up even when installed in a housing that is slightly out-of-round. The unique ring design also allows for bearing adjustment and the removal of diametrical clearance. The second component is the precision ground double track bearing plate that provides twice the load capacity and features universal self-alignment.

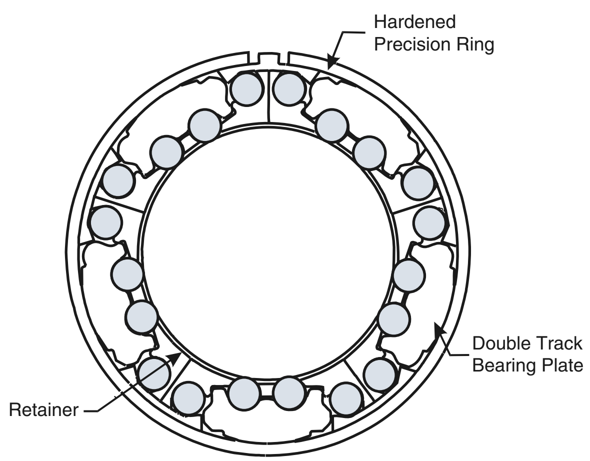


Cut-away view of the Super Smart Ball Bushing Bearing

Figure 2

The third component is the rolling element. Each Super Smart Ball Bushing utilizes precision ground balls manufactured to the highest quality standards for roundness and sphericity. The result is maximum load capacity, travel life and performance.

The last component is the 60 Case* LinearRace* that acts as the inner race to the Super Smart Ball Bushing Bearing. Each 60 Case LinearRace is manufactured to the highest quality standards for roundness, straightness, surface finish and hardness. Roundness is held under eighty millionths of an inch (2mm); straightness to .002 inches per foot (0,050mm per 0,3m); surface finish under twelve microinch and hardness between 60-65 HRC. The combination of inner and outer race or 60 Case LinearRace and Super Smart Ball Bushing bearing provides the basis for the RoundRail Advantage.



Cross-section of Super Smart Ball Bushing Bearing

Figure 1

The RoundRail Advantage

The RoundRail Advantage is the inherent ability of Super Smart Ball Bushing bearing system to accommodate torsional misalignment (caused by inaccuracies in carriage or base machining or by machine deflection) with little increase in stress to bearing components. Installation time and cost are minimized and system performance is maximized.

Super Smart Ball Bushing Bearing

Universal Self-Alignment

The bearing plate of the Super Smart Ball Bushing* Bearing is designed with many unique and technologically advanced features. The Universal Self-Alignment feature assures that the Super Smart Ball Bushing Bearing will achieve maximum performance regarding load capacity, travel life, smooth operation and coefficient of friction. The three components that make up universal self-alignment are Rock, Roll and Yaw.

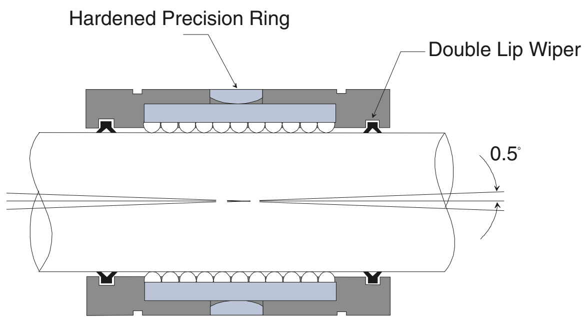
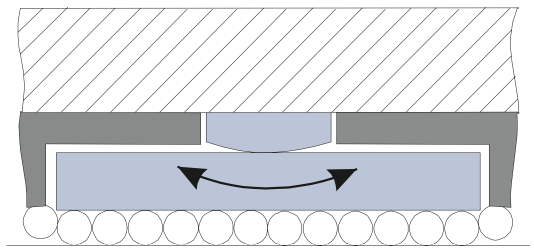


Figure 3

Rock

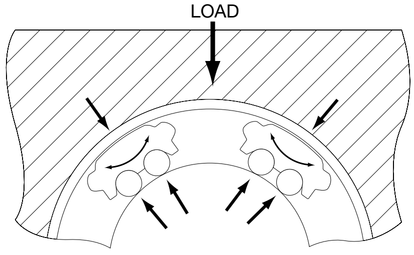
The bearing plate is designed to rock 0.5˚ about the hardened precision ground outer ring (Figures 3 & 4). This self-aligning feature allows the Super Smart Ball Bushing bearing to absorb misalignment caused by inaccuracies in housing bore alignment or 60 Case LinearRace deflection.

This rocking capability provides smooth entry and exit of the precision balls into and out of the load zone assuring a constant low coefficient of friction. By compensation for misalignment, each bearing ball in the load carrying area is uniformly loaded providing maximum load capacity.



Close-up of hardened precision ring, showing how the bearing plate self-aligns (rocks) about the curved surface of the ring.

Figure 4

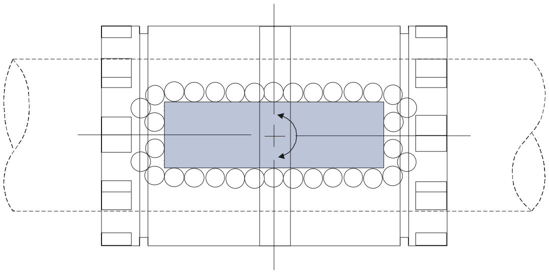


Close-up of double track bearing plates showing how they self-align (roll) to evenly distribute the load on each of their two ball tracks.

Figure 5

Roll

The second key design feature of the Super Smart Ball Bushing bearing plate is its ability to Roll. The bearing plate is designed with the radius of its outer surface smaller than the inside radius of the precision outer ring (Figure 5). This allows the bearing plate to compensate for torsional misalignment and evenly distribute the load on each of its two ball tracks. The roll component assures maximum load capacity and travel life.



Bearing plates rotate about their center to prevent skewing relative to the 60 Case LinearRace.

Figure 6

Yaw

The shape formed by the Rock and Roll features allows the Super Smart Ball Bushing bearing plate to rotate about its center (Figure 6). This allows the Super Smart Ball Bushing bearing to absorb skew caused by misalignment. The result is a constant low coefficient of friction and maximum bearing performance.

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Load Considerations

When designing a linear motion system, it is necessary to consider the effect the variables of operation will have on performance.

The following examples demonstrate how the position of the load and the center of gravity can influence the system selection. When evaluating your application, review each of the forces acting on your system and determine the System best for your needs.

Terms

d_0 = distance between centerlines of pillow blocks (in) or (mm)

d_1 = distance between centerlines of shafts (in) or (mm)

d_2 = distance from centerline of carriage to load action point (in) or (mm)

d_3 = distance from centerline of carriage to load action point (in) or (mm)

F_{NX}= Force in the X-axis direction (lb_f) or (N)

F_{NY}= Force in the Y-axis direction (lb_f) or (N)

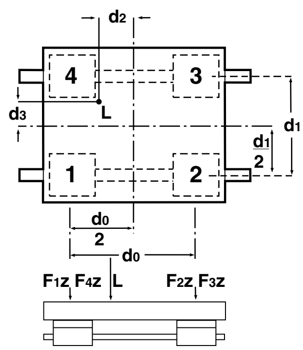
F_{NZ}= Force in the Z-axis direction (lb_f) or (N)

$$F_{1Z} = \frac{L}{4} + \left(\frac{L}{2} x \frac{d_2}{d_0}\right) - \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

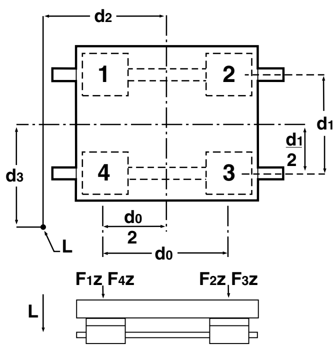
$$F_{2Z} = \frac{L}{4} - \left(\frac{L}{2} x \frac{d_2}{d_0}\right) - \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{3Z} = \frac{L}{4} - \left(\frac{L}{2} x \frac{d_2}{d_0}\right) + \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{4Z} = \frac{L}{4} + \left(\frac{L}{2} x \frac{d_2}{d_0}\right) + \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$



Horizontal Application I
At the time of movement with uniform velocity or at the time of stop.



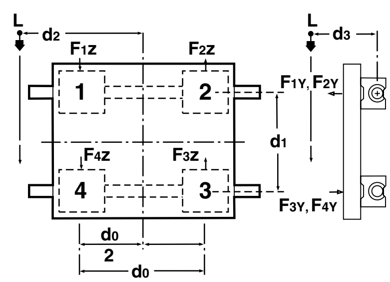
$$F_{1Z} = \frac{L}{4} + \left(\frac{L}{2} x \frac{d_2}{d_0}\right) - \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{2Z} = \frac{L}{4} - \left(\frac{L}{2} x \frac{d_2}{d_0}\right) - \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{3Z} = \frac{L}{4} - \left(\frac{L}{2} x \frac{d_2}{d_0}\right) + \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{4Z} = \frac{L}{4} + \left(\frac{L}{2} x \frac{d_2}{d_0}\right) + \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

Horizontal Application II
At the time of movement with uniform velocity or at the time of stop.

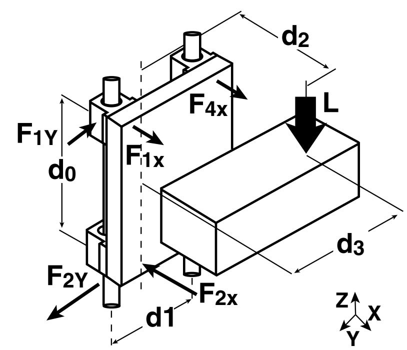


$$F_{1Y} \sim F_{4Y} = \left(\frac{L}{2} x \frac{d_3}{d_1}\right)$$

$$F_{1Z} = F_{4Z} = \frac{L}{4} + \left(\frac{L}{2} x \frac{d_2}{d_0}\right)$$

$$F_{2Z} = F_{3Z} = \frac{L}{4} - \left(\frac{L}{2} x \frac{d_2}{d_0}\right)$$

Side Mounted Application
At the time of movement with uniform velocity or at the time of stop.



$$F_{1X} \sim F_{4X} = \frac{L}{2} x \frac{d_2}{d_0}$$

$$F_{1Y} \sim F_{4Y} = \frac{L}{2} x \frac{d_3}{d_0}$$

$$F_{1X} + F_{4X} \sim F_{2X} + F_{3X}$$

$$F_{1Y} + F_{4Y} \sim F_{2Y} + F_{3Y}$$

Vertical Application
At the time of movement with uniform velocity or at the time of stop.
At the time of start and stop, the load varies because of inertia.

System LinearRace Deflection

When a Linear Motion System is used in an end supported configuration it is important to ensure that system deflections at the bearing locations are kept within performance limitations.

These equations give the deflection at the center of an end supported system. Systems with continuous 60 Case* LinearRace* support are not subject to the same types of deflection.

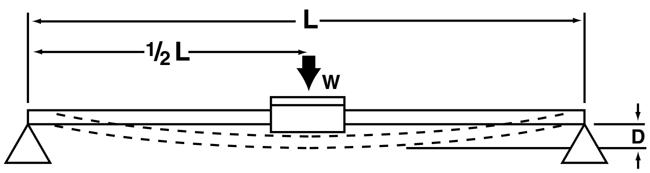
For more detailed information of the deflection characteristics of Thomson linear motion products contact application engineering.

60 Case LinearRace Stiffness and Weights

Inch Size			Metric Size		
Diameter (in)	EI ($lb_f \bullet in^2$)	Weight (lb_f / in)	Diameter (mm)	EI (N • mm^2)	Weight (N/mm)
$^1/_4$	5.8×10^3	0.014	8	$3{,}83 \times 10^7$	0,0038
$^3/_8$	2.9×10^4	0.031	12	$1{,}94 \times 10^8$	0,0087
$^1/_2$	9.2×10^4	0.055	16	$6{,}12 \times 10^8$	0,0154
$^5/_8$	2.3×10^5	0.086	20	$1{,}50 \times 10^9$	0,0240
$^3/_4$	4.7×10^5	0.125	25	$3{,}65 \times 10^9$	0,0379
1	1.5×10^6	0.222	30	$7{,}57 \times 10^9$	0,0542
$1^1/_4$	3.6×10^6	0.348	40	$2{,}39 \times 10^{10}$	0,0968
$1^1/_2$	7.5×10^6	0.500			

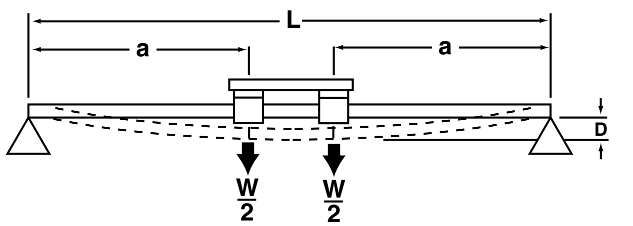
Simply Supported 60 Case LinearRace with One Block

DEFLECTION AT CENTER (D)



$$D = \frac{WL^3}{48EI} + \frac{5SL^4}{384EI}$$

Simply Supported 60 Case LinearRace with Two Blocks



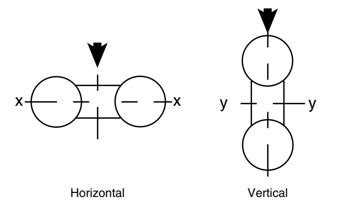
$$D = \frac{Wa(3L^2-4a^2)}{48EI} + \frac{5SL^4}{384EI}$$

Deflection for Twin Shaft Web System

Since the Twin Shaft Web rail has different stiffness depending on its orientation, an appropriate EI value must be used based upon the direction of loading. Select the orientation of your load from the figure below and then use the appropriate EI value in the deflection equation.

Values of EI

Shaft Dia. (in)	EI Horizontal (lbf in^2)	EI Vertical (lbf in^2)
$^1/_2$	1.9×10^5	3.7×10^6
$^3/_4$	9.4×10^5	1.5×10^7
1	3.0×10^6	4.7×10^7



LEGEND

- D = Deflection (in) or (mm)
- W = Load (lbf) or (mm)
- L = Length of unsupported 60 Case LinearRace (in) or (mm)
- a = Distance to first bearing with carriage at center position (in) or (mm)
- S = Unit weight of LinearRace (lbf/in) or (N/mm)
- E = Modulus of Elasticity (lbf/in2) or (N/mm2)
- I = Moment of inertia of area through diameter of LinearRace (in4) or (mm4)

60 Case LinearRace Specifications

Thomson 60 Case* LinearRace* provides the inner race for Thomson Ball bushing bearings. All 60 Case LinearRace is manufactured to extremely close tolerances for surface finish, roundness, hardness and straightness to provide long service life with reduced maintenance.

Specifications:

Hardness:	HRC 60-65
Surface Finish:	12Ra microinch (Ra 0,30 mm)
Roundness:	80 millionths of an inch (2mm)
Straightness:	Standard–.001 inch per foot (0,050mm per 0,3m) (.002 in or 0,050mm TIR) Special–.0005 inch per foot (0,025mm per 0,3m) cumulative (.001 in or 0,025mm TIR)
Length Tolerance	Standard +/-.030 (+/-0,75mm) for diameters up to 1 1/2 inch or 40mm. Special length tolerances available.
Chamfer:	Standard chamfer on diameters up to 1 inch or 25mm is .030 x 45° or 0.8mm x 45° and .060 x 45° or 1,6mm x 45° for diameters larger than 1 inch or 25mm.
Tensile Strength:	Case: 335,000 psi, Core: 100,000 psi 2,31 GPa 0,69 GPa
Yield Strength:	Case: 250,000 psi, Core: 75,000 psi 1,72 GPa 0,52 GPa

Short Stroke Applications

In applications when the stroke length is short, the life of the shaft is shorter than that of the Ball Bushing bearing. In short stroke applications, the required dynamic load capacity must be multiplied by the factor KC found on Figure ESA 9.1.

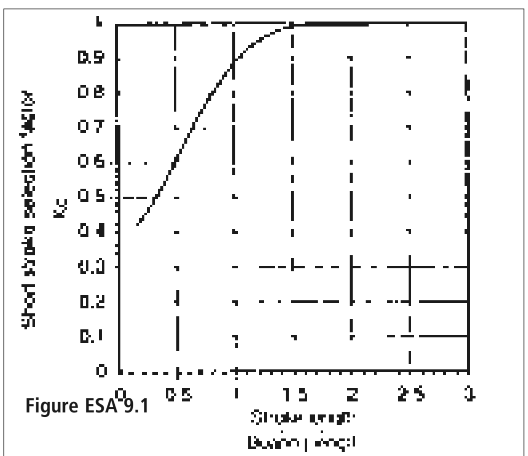


Figure ESA 9.1

Application Tips

Two Ball Bushing Bearings per 60 Case LinearRace
When using the Super Smart, Super or Precision Steel Ball Bushing bearing it is recommended that two Ball Bushings bearings be used on each 60 Case Linear Race. This will assure system stability as well optimum performance. If envelope constraints prohibit the use of two Ball Bushing bearings per 60 Case LinearRace contact application engineering.

Ball Bushing Bearing Spacing v. 60 Case LinearRace Spacing
In parallel 60 Case LinearRace applications, the ratio of 60 Case LinearRace spacing to Ball Bushing bearing spacing should always be less than three to one. This will assure a constant breakaway and operating friction.

60 Case LinearRace Parallelism
In most applications the maximum acceptable out of parallelism condition is .001 inch (0,025 mm) over the entire full system length. In applications where preload is present a closer 60 Case LinearRace parallelism is recommended.

Measuring 60 Case LinearRace Alignment
Methods for establishing or checking 60 Case LinearRace straightness and parallelism depends on the accuracy required. Lasers, collimator or alignment telescopes can be used for very precise applications, while accurate levels, straight edges, micrometers and indicators will suffice for the majority of applications which have less stringent accuracy requirements.

Access for Lubrication
Thomson Super Smart and Super Ball Bushing Pillow blocks in inch sizes are equipped with either an oil lubrication fitting or a 1/4-28 access hole for lubrication. To use the oil fitting simply insert a lubrication device into the oil nipple by depressing the spring loaded ball. The 1/4-28 tapped hole is a standard size for most grease and lubrication fittings. Simply install the lubrication fitting of your choice and it is ready for immediate use. super Ball Bushing Pillow blocks in sizes .250 through .500 inch diameter are equipped with oil lubrication fittings. Super Ball Bushing pillow blocks in sizes .625 inch and above and all Super smart Ball Bushing Pillow Blocks are equipped with a 1/4-28 access for lubrication.

Super smart Ball Bushing Bearing pillow blocks in metric sizes are provided with an M6 x 0,1 access for lubrication. Simply install the appropriate lubrication fitting and it is ready for immediate use.