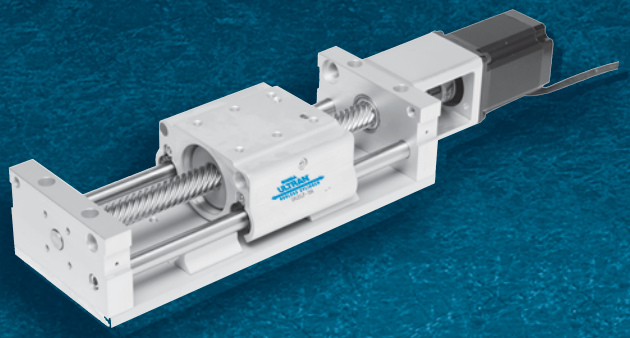
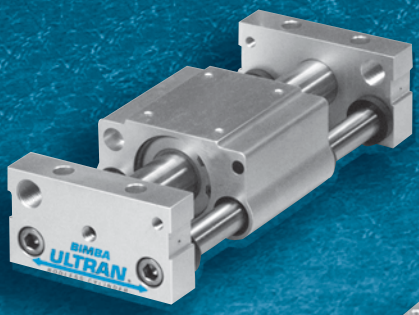
Ultran Cylinders



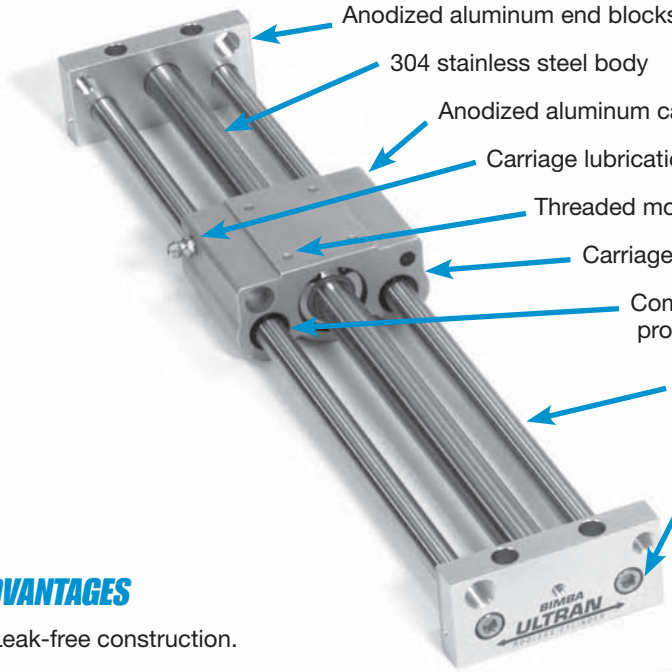


Bimba Ultran Cylinders

SPACE SAVINGS OF ALMOST 50% IN MOST MODELS

Two Models:

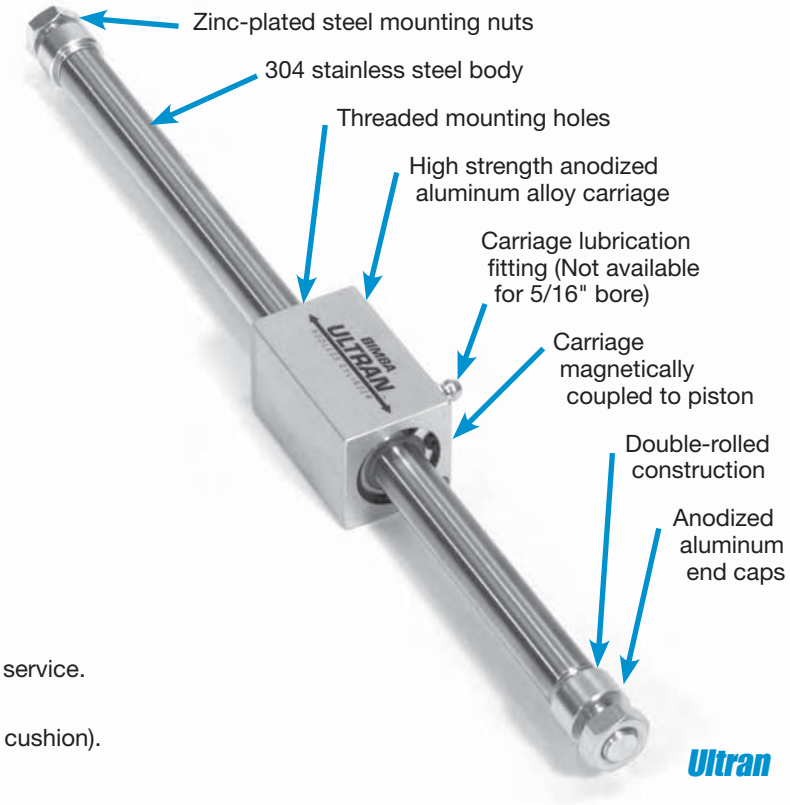
- **Ultran Slide for self-guided motion**
- **Ultran for unguided or externally guided applications.**



Ultran Slide

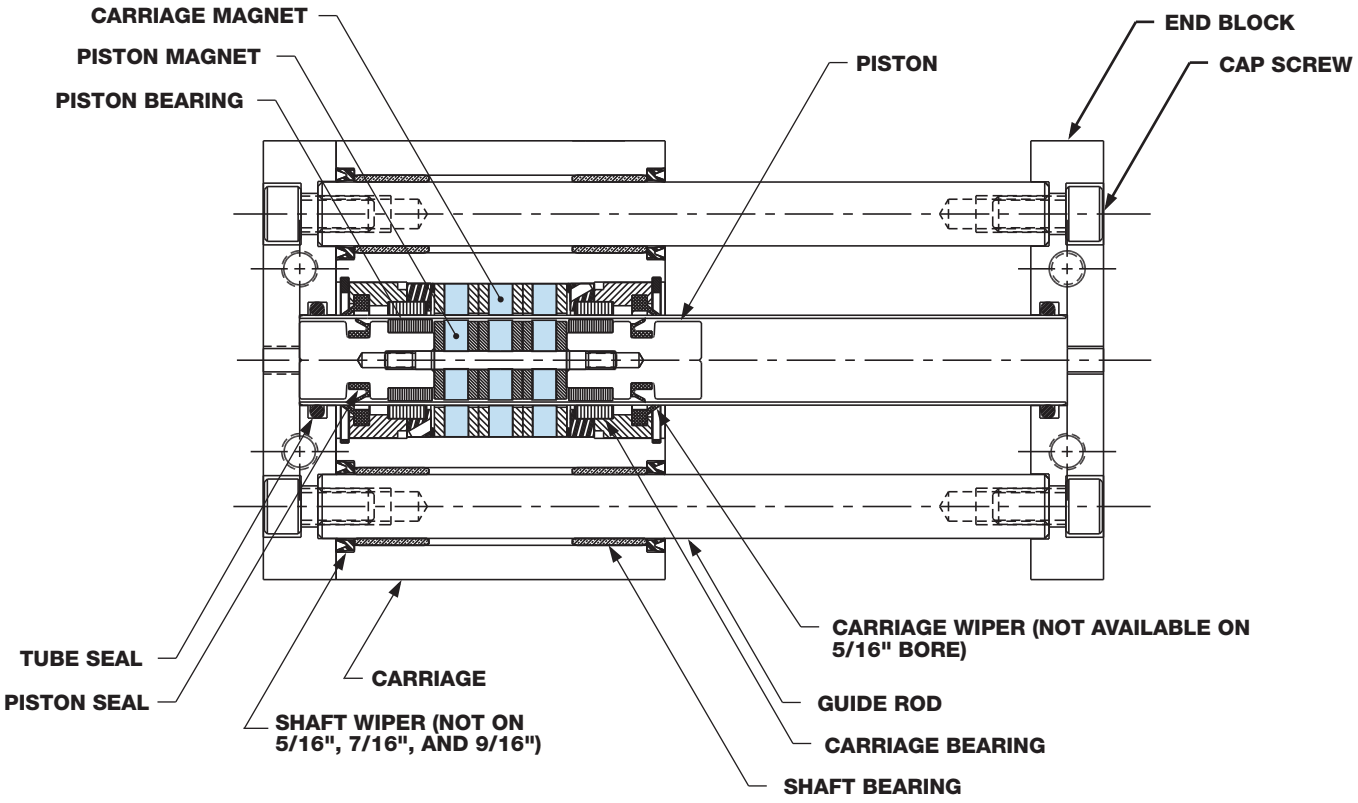
ADVANTAGES

- Leak-free construction.
- Lightweight.
- Piston seals are internally lubricated for long life.
- Special rare earth magnet configuration for high magnetic coupling strengths.
- 304 stainless steel body and “U” cup seals for lower dynamic friction.
- Prelubricated for miles of maintenance-free travel, with easily-accessible carriage lubrication port.
- Two magnetic coupling strength options available — Ultran Gold and Ultran Silver.
- Shock absorbers to decelerate loads (not available for 5/16" and 7/16" bore Ultran).
- Optional 1-inch stroke length adjustment available.
- Midstroke position sensing available for Ultran Slide. End-of-stroke sensing available for all models.
- Optional bumpers to reduce noise.
- Floating mount available for Ultran.
- Oil service seal option available for low pressure hydraulic service.
- Optional adjustable cushions or axial ports on Ultran (not available for 5/16" or 7/16" bore, 9/16" bore has fixed cushion).

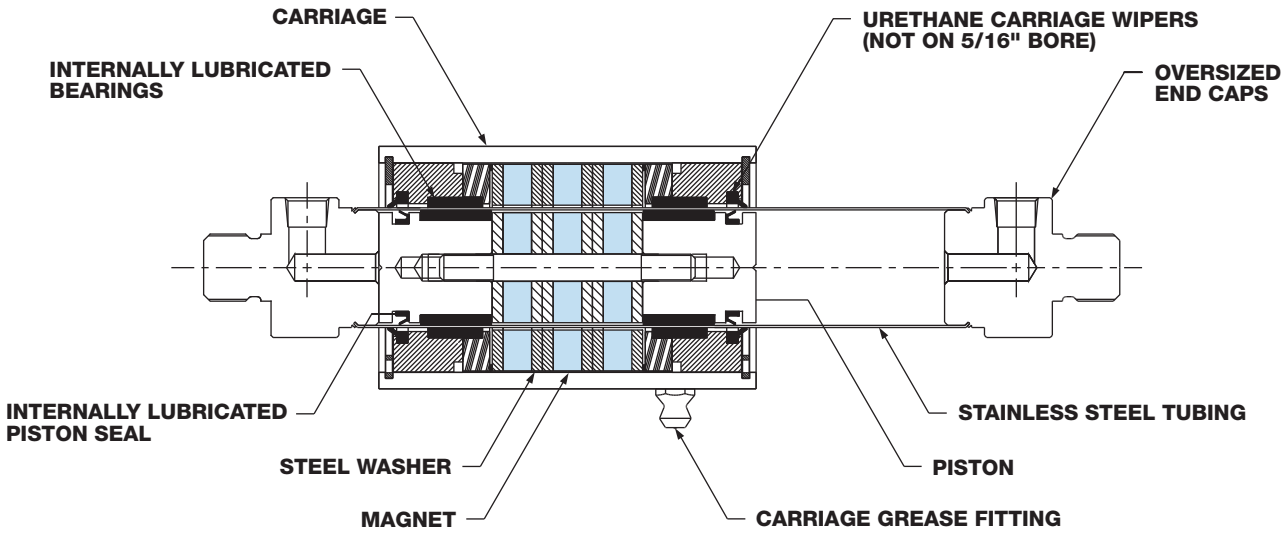


Ultran

Ultran Slide



Ultran



The cutaway drawings above show how the Bimba magnetically-coupled Ultran rodless cylinder works. Three magnets are located on the carriage. Three matching magnets are on the piston. (For 5⁄16" bore, five magnets are used.) These magnets form a strong bond that holds the carriage and piston together. When the cylinder is actuated, the piston and carriage move back and forth as one unit.

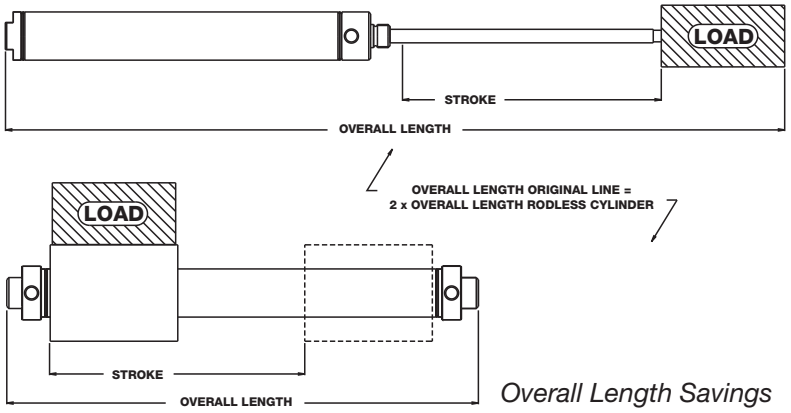
The magnetic attraction between the magnets determines a cylinder's magnetic coupling strength.

The Bimba Ultran rodless cylinder provides one of the highest coupling strengths available. This means it can carry higher loads without causing the piston to uncouple from the carriage. Bimba also offers two magnetic coupling strength options (Gold and Silver) to suit a wide variety of applications. The Silver option uses two sets of magnets instead of three. (For 5⁄16" bore, four sets of magnets are used.)

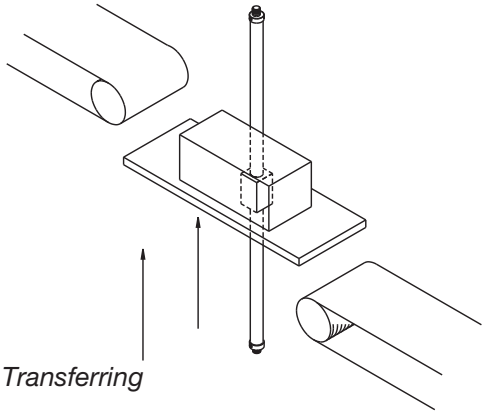
Bimba offers a model with built-in guides (Ultran Slide) and an unguided unit (Ultran).

Application Possibilities

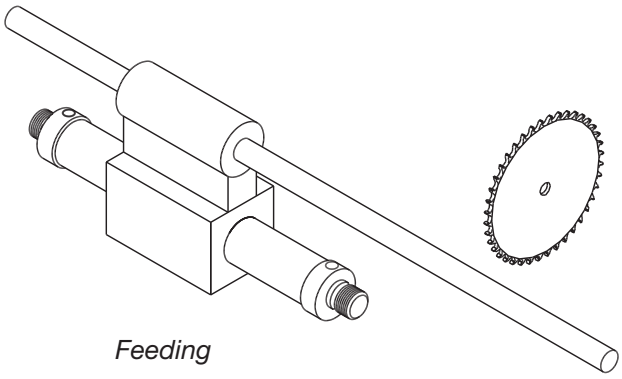
Save space and streamline your design with the Bimba Ultran rodless cylinder.



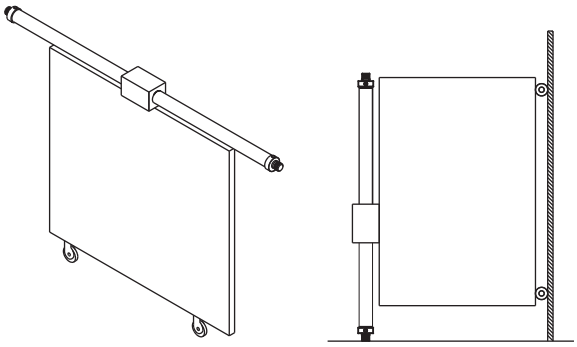
Overall Length Savings



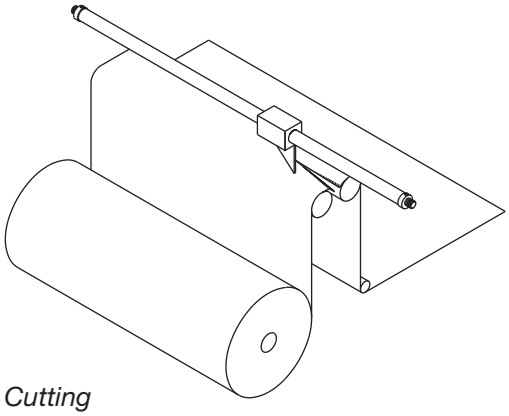
Transferring



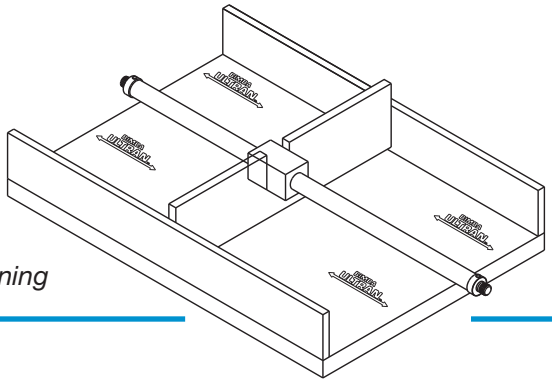
Feeding



Door Opening



Cutting



Silk Screening

How to Order

The model number of all Ultran Slide cylinders consists of three alphanumeric clusters. These designate product type, bore size and stroke length, and options. Please refer to the charts below for an example of model number UGS-1723.375-A1T. This is a 1-1/2" bore, 23.375" stroke Ultran Slide rodless cylinder with Ultran Gold coupling strength, with stroke adjustment on one end, and a track for mounting switches.

UGS - 1723.375-A1T

TYPE
UGS-Ultran Slide, Gold coupling strength
USS-Ultran Slide,* Silver coupling strength

BORE SIZE	
007	5/16"
01	7/16"
02	9/16"
04	3/4"
06	7/8"
09	1-1/16"
12	1-1/4"
17	1-1/2"
31	2"

STROKE LENGTH	
STANDARD	MAXIMUM
1/4" to 15" (007)	25"
1/4" to 20" (01)	30"
1/4" to 30" (02)	40"
1/4" to 30" (04)	40"
1/4" to 40" (06)	50"
1/4" to 60" (09)	70"
1/4" to 60" (12)	70"
1/4" to 60" (17)	85"
1/4" to 60" (31)	100"

**Specify silver coupling strengths for lower breakaway application requirements. Use caution as decoupling can occur at pressures less than 100 PSI. Refer to the engineering specifications on page 5.10 for details.*

OPTIONS

- A – Stroke adjustment (both ends)
- A1 – Stroke adjustment (on end 1)
- A2 – Stroke adjustment (on end 2)
- B – Bumpers (both ends)[1]
- B1 – Bumpers (on end 1)
- B2 – Bumpers (on end 2)
- D – Dowel pin holes for Transition Plates[2]
- L – Remove guide rod wipers in 3/4" - 2" bores
- S – Seals – oil service (low pressure hydraulic service)
- T – Switch track
- U – Switch track for miniature switch
- Y – Alternate port (both ends)
- Y1 – Alternate port (on end 1)
- Y2 – Alternate port (on end 2)

[1] Increases overall dimension. Internal bumpers reach full compression at 80 psi. External bumpers will not contact carriage until internal bumpers are fully compressed.

[2] Transition Plate Applications: Option -D must be ordered if dowel pin holes are required. Not available on all bore sizes. Refer to Related Products/Transition Plates, page 10.22-10.35 for details. Hole locations shown in Related Products/Appendix, page 10.39.

Combination Availability

OPTIONS / SIZES	A	B	D	S	T, U	Y
FOR ALL SIZES	D,S,T,Y	D,T,Y	A,B,D,S,T,Y	A,D,T,Y	A,B,D,S,Y	A,B,D,S,T

Note: Option -A can be ordered with option -B if they are ordered on different ends, i.e., A1B2 or A2B1.

Location

See diagram on page 5.7 for location of End 1 and End 2.

List Prices

Bore	Base Model		Adder per inch of stroke*	Options						
	UGS	USS		A Stroke Adjustment (per end)	B Bumpers (per end)	D Dowel Pin Holes	S Oil Service Seals	T Switch Track (Base)	T Adder per inch of stroke	Y Alternate Port (per end)
5/16" (007)	$251.30	$245.50	$ 1.90	$ 6.55	$ 24.50	N/A	$ 4.35	$ 11.55	$ 0.45	$ 2.10
7/16" (01)	268.20	265.80	2.10	6.55	26.80	N/A	4.65	11.55	0.45	2.35
9/16" (02)	336.55	328.15	2.45	8.75	29.20	11.05	5.40	11.55	0.45	2.65
3/4" (04)	491.65	457.70	4.20	8.75	30.70	12.85	6.10	11.55	0.45	3.05
7/8" (06)	514.75	476.60	4.45	9.35	31.65	N/A	6.45	11.55	0.45	3.40
1-1/16" (09)	651.95	604.30	6.60	9.35	33.40	14.85	6.75	11.55	0.45	3.90
1-1/4" (12)	706.35	669.30	6.80	11.15	36.65	N/A	7.25	11.55	0.45	4.45
1-1/2" (17)	934.65	890.40	8.90	11.15	39.50	17.55	7.80	11.55	0.45	5.05
2" (31)	3796.80	3243.80	10.30	13.15	39.70	N/A	8.20	11.55	0.45	5.40

**Longer than standard stroke lengths incur additional charge. Consult your distributor for details.*
No charge option - L

Accessories

Cylinder Bore Size	Shock Absorbers				Stroke Adjustment		*Stop Collar	
	Model			Price (each)	Model		Model	Price
	Light	Standard	Heavy					
5/16" (007)	LS-02	SS-02	HS-02	$ 31.65	USA-01	$ 6.50	N/A	N/A
7/16" (01)								
9/16" (02)	LS-04	SS-04	HS-04	59.30	USA-02	7.80	USC-04	$ 11.55
3/4" (04)					USA-04	8.80		
7/8" (06)	LS-09	SS-09	HS-09	72.60	USA-09	9.45	USC-09	11.55
1-1/16" (09)								
1-1/4" (12)	LS-17	SS-17	HS-17	90.55	USA-17	11.30	USC-17	16.50
1-1/2" (17)								
2" (31)	LS-31	SS-31	HS-31	177.75	USA-31	13.90	USC-31	33.30

**The Ultran Slide Cylinder needs to be increased by the B dimension in order to maintain intended stroke length. The overall length increases by the same amount. The A dimension indicates maximum amount of stroke adjustment attainable. See Related Products, page 10.20 for dimensions.*

Dimensions (in.)

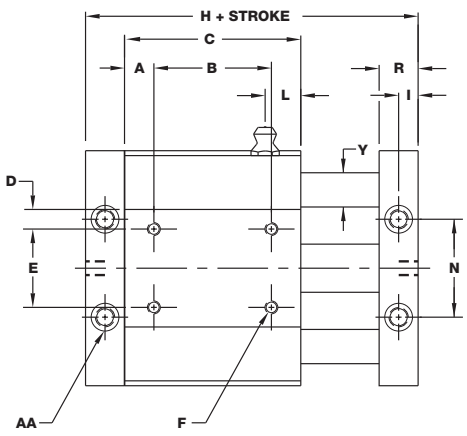
Bore	A	B	C	D	E	F	G	H	I	J	K
5/16" (007)	0.344	1.062	1.750	0.141	0.469	4-40-UNC	1.062	2.750	0.250	0.188	0.438
7/16" (01)	0.344	1.188	1.875	0.125	0.750	6-32 UNC	1.062	2.875	0.250	0.188	0.406
9/16" (02)	0.375	1.500	2.250	0.250	1.000	8-32 UNC	1.438	3.250	0.250	0.312	0.531
3/4" (04)	0.562	1.750	2.875	0.312	1.375	10-24 UNC	1.832	4.125	0.312	0.312	0.664
7/8" (06)	0.500	2.125	3.125	0.188	1.625	10-24 UNC	2.062	4.625	0.375	0.375	0.688
1-1/16" (09)	0.500	2.500	3.500	0.375	1.750	1/4-20 UNC	2.313	5.000	0.375	0.250	0.750
1-1/4" (12)	0.562	2.750	3.875	0.318	2.125	1/4-20 UNC	2.687	5.875	0.500	0.500	0.750
1-1/2" (17)	0.500	3.500	4.500	0.500	2.500	5/16-18 UNC	3.188	6.500	0.500	0.750	0.906
2" (31)	1.188	5.000	7.375	0.500	3.250	1/2-13 UNC	4.312	10.375	0.750	0.813	1.312

Bore	L	M	N	P	Q	R	S	V	W	X	X/X
5/16" (007)	N/A	N/A	0.750	N/A	0.188	0.500	2.000	0.215	0.215	1.000	0.562
7/16" (01)	0.395	0.788	0.938	0.288	0.219	0.500	2.312	0.218	0.220	1.000	0.562
9/16" (02)	0.455	0.982	1.250	0.297	0.250	0.500	3.000	0.406	0.281	1.375	0.749
3/4" (04)	0.572	1.239	1.625	0.234	0.313	0.625	3.375	0.406	0.313	1.750	0.957
7/8" (06)	0.635	1.438	1.625	0.225	0.375	0.750	3.750	0.500	0.438	2.000	1.063
1-1/16" (09)	0.706	1.549	1.875	0.172	0.375	0.750	4.250	0.594	0.375	2.250	1.188
1-1/4" (12)	0.750	1.562	2.125	0.162	0.375	1.000	4.812	0.656	0.562	2.625	1.375
1-1/2" (17)	0.756	1.736	2.500	0.109	0.438	1.000	6.000	1.000	0.906	3.125	1.625
2" (31)	1.500	2.688	3.250	0.000	0.250	1.500	8.000	1.125	0.938	4.250	2.188

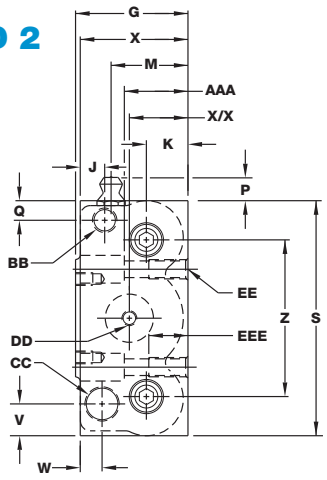
Bore	Y	Z	AA	BB	CC	DD	EE	AAA	EEE
5/16" (007)	0.312	1.312	#6	5/16-24 UNF	3/8-32 UNEF	10-32	10-32 UNF	0.750	0.315
7/16" (01)	0.375	1.562	#10	5/16-24 UNF	3/8-32 UNEF	10-32	1/4-28 UNF	0.750	0.322
9/16" (02)	0.438	2.000	#10	5/16-24 UNF	7/16-28 UNEF	10-32	1/4-28 UNF	0.750	0.500
3/4" (04)	0.500	2.518	1/4	5/16-24 UNF	7/16-28 UNEF	1/8 NPT	5/16-24 UNF	1.080	0.625
7/8" (06)	0.625	2.750	1/4	5/16-24 UNF	1/2-20 UNF	1/8 NPT	5/16-24 UNF	1.375	0.625
1-1/16" (09)	0.750	3.062	5/16	5/16-24 UNF	1/2-20 UNF	1/8 NPT	3/8-24 UNF	1.375	0.750
1-1/4" (12)	0.812	3.500	5/16	5/16-24 UNF	3/4-16 UNF	1/8 NPT	3/8-24 UNF	1.750	0.750
1-1/2" (17)	1.000	4.500	3/8	5/16-24 UNF	3/4-16 UNF	1/8 NPT	7/16-20 UNF	1.750	0.750
2" (31)	1.500	5.750	3/4	5/16-24 UNF	1-12 UNF	1/4 NPT	7/8-9 UNC	3.125	1.000

Note: H+ stroke tolerance for stroke lengths less than 42" is +/- 0.032"
For stroke lengths greater than 42" the tolerance is +0.104/-0.047".

END 1



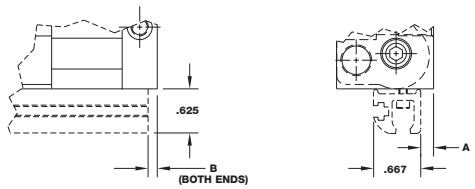
END 2



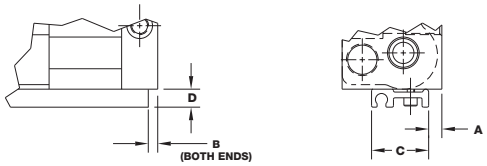
Options

Switch Track for Miniature Switches

Option T



Option U

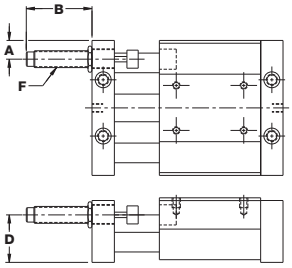


Bore	A	B	C	D
5/16" (007)	0.000	0.024	0.787	0.299
7/16" (01)	0.000	0.023	0.787	0.248
9/16" (02)	0.188	0.625	0.787	0.248
3/4" (04)	0.563	0.125	0.787	0.248
7/8" (06)	0.784	0.117	0.787	0.248
1-1/16" (09)	1.125	0.125	0.655	0.367
1-1/4" (12)	1.250	0.242	0.655	0.367
1-1/2" (17)	1.500	0.250	0.655	0.367
2" (31)	2.596	0.492	0.655	0.367

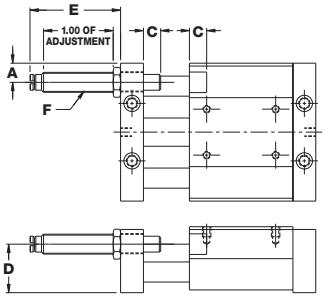
Shock Absorber/Stroke Adjustment (in.)

Bore	A	B	C	D	E	F
5/16" (007)	0.215	0.750	0.000	0.785	1.093	3/8-32 UNEF
7/16" (01)	0.218	0.750	0.000	0.780	1.093	3/8-32 UNEF
9/16" (02)	0.406	1.460	0.375	1.094	1.594	7/16-28 UNEF
3/4" (04)	0.406	1.335	0.375	1.438	1.469	7/16-28 UNEF
7/8" (06)	0.500	2.490	0.375	1.562	1.438	1/2-20 UNF
1-1/16" (09)	0.594	2.490	0.375	1.875	1.438	1/2-20 UNF
1-1/4" (12)	0.656	2.890	0.500	2.062	1.500	3/4-16 UNF
1-1/2" (17)	1.000	2.890	0.562	2.219	1.438	3/4-16 UNF
2" (31)	1.125	3.500	0.562	3.312	1.563	1-12 UNF

Shock Absorber



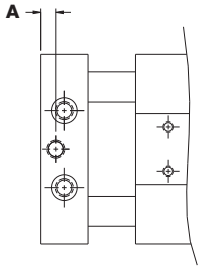
Stroke Adjustment



Note: Do not let the shock absorbers bottom out. The shock should not be used as a stroke adjuster. A stop collar is needed for the shock if stroke adjustment is required.

Bore	A
5/16" (007)	0.162
7/16" (01)	0.150
9/16" (02)	0.162
3/4" (04)	0.188
7/8" (06)	0.312
1-1/16" (09)	0.312
1-1/4" (12)	0.500
1-1/2" (17)	0.500
2" (31)	0.750

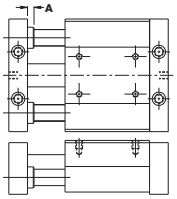
Alternate Port (in.)



Note: 3/4" port size is 10-32, all other sizes are same as standard.

Bore	A
5/16" (007)	0.157
7/16" (01)	0.157
9/16" (02)	0.281
3/4" (04)	0.281
7/8" (06)	0.312
1-1/16" (09)	0.312
1-1/4" (12)	0.312
1-1/2" (17)	0.312
2" (31)	0.312

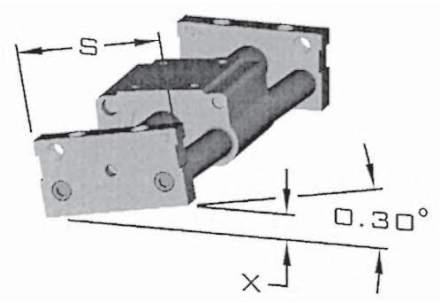
Bumper Adder (per end) (in.)



Note: Internal bumpers reach full compression at 80 psi. External bumpers will not contact carriage until internal bumpers are fully compressed.

Ultran Slide Mounting Instructions

Improper mounting of the Ultran slide could result in binding and/or excess breakaway. As a rule of thumb, the end blocks should be mounted flat with no more than 0.30˚ of differential misalignment end-to-end (including both end blocks, i.e., 0.30˚ on one end block if other end block is square. If both end blocks are out of square, the total between them cannot exceed 0.30˚. The x dimension represents how much displacement 0.30˚ represents using 0.0175" per inch per degree of misalignment.)



The following table shows the S dimension (End Block width dimension as found in the catalog) for all bore sizes:

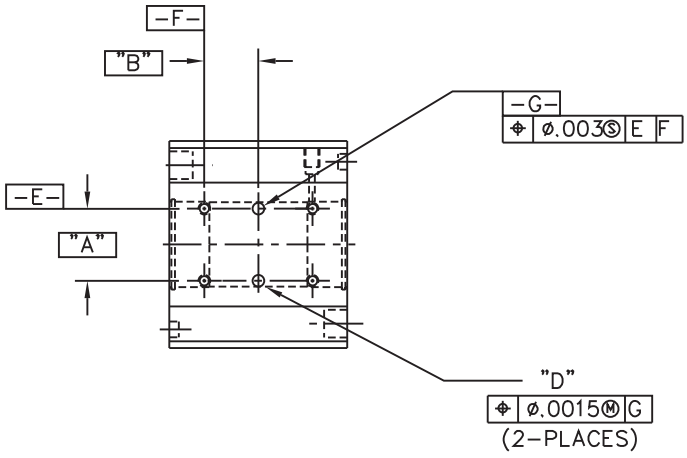
Model	S in (mm)	x in (mm)
007 (5/16" Bore)	2.000 (50.8)	0.010 (0.25)
01 (7/16" Bore)	2.312 (58.7)	0.012 (0.30)
02 (9/16" Bore)	3.000 (76.2)	0.016 (0.40)
04 (3/4" Bore)	3.375 (85.7)	0.018 (0.46)
06 (7/8" Bore)	3.750 (95.3)	0.020 (0.51)
09 (1-1/16" Bore)	4.250 (108.0)	0.022 (0.56)
12 (1-1/4" Bore)	4.812 (122.2)	0.025 (0.64)
17 (1-1/2" Bore)	6.000 (152.4)	0.031 (0.79)
31 (2" Bore)	8.000 (203.2)	0.042 (1.07)

For example:

- A Model 007 (5/16" Bore) has a S dimension of 2.00". 0.30˚ of misalignment would yield approximately 0.010" of differential misalignment from end-to-end before binding and/or excess breakaway would occur.

- A Model 17 (1-1/2" Bore) has a S dimension of 6.00". 0.30˚ of misalignment would yield approximately 0.031" of differential misalignment from end-to-end before binding and/or excess breakaway would occur.

Dowel Pin Hole Locations



Bore	A	B	D
020 (9/16")	1.000	.750	.1270/.1280 x .240/.260 DP.
040 (3/4")	1.375	.876	.1895/.1905 x .410/.430 DP.
090 (1-1/16")	1.750	1.250	.2520/.2530 x .410/.430 DP.
170 (1-1/2")	2.500	1.750	.3145/.3155 x .560/.580 DP.

Engineering Specifications

Pressure Rating: 100 psi (Air or Hydraulic)
Temperature Range: 0˚ to 170˚F
Breakaway: Ultran Slide Gold Coupling Strength - Less than 30 psi
Ultran Slide Silver Coupling Strength - Less than 25 psi

Magnetic Coupling Strength (lbs.)

Cylinder Bore	Ultran Gold (UGS)	Ultran Silver (USS)
5/16" (007)	13	8
7/16" (01)	20	10
9/16" (02)	29	16
3/4" (04)	61	33
7/8" (06)	102	55
1-1/16" (09)	127	74
1-1/4" (12)	190	110
1-1/2" (17)	270	150
2" (31)	552	332

Weight (lbs.)

Cylinder Bore	(0" Stroke)		Adder per 1"
	(UGS)	(USS)	
5/16" (007)	0.24	0.23	0.05
7/16" (01)	0.52	0.51	0.08
9/16" (02)	1.44	1.38	0.10
3/4" (04)	2.70	2.58	0.13
7/8" (06)	3.61	3.49	0.21
1-1/16" (09)	5.66	5.47	0.28
1-1/4" (12)	7.38	7.12	0.35
1-1/2" (17)	14.48	13.90	0.49
2" (31)	38.48	37.17	1.13

Lubrication

The Ultran rodless cylinder is prelubricated at the factory. The life of the cylinder can be greatly lengthened by providing additional lubrication with an air line mist lubricator or direct introduction of oil to the cylinder every 100 linear miles of travel. Recommended oils are medium to heavy (20 to 30 weight). The carriage should also be lubricated every 100 linear miles with a high grade of bearing grease. Other types of prelubrication are available upon request. Guide shafts are self lubricating and require no external lubricants. The lubricant used by the factory can be ordered as part number MS-2861-14OZ. The lubricant is packaged in a 14 OZ grease gun cartridge.

Repairs

Bimba recommends that the Ultran Slide be returned to the factory for repairs. However, the following parts and kits are available for the Ultran Slide rodless cylinder.

PART	Cylinder Bore Size								
	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Shaft bearing	RD-50644	RD-50645	RD-48996	RD-48997	RD-50646	RD-48998	RD-50647	RD-48999	RD-50648
Shaft wiper	N/A	N/A	RD-22720	RD-23079	RD-15679	RD-23086	RD-50656	RD-16174	RD-50657
Tube seal	RD-1476	RD-22653	RD-13012	RD-1078	RD-10050	RD-48874	RD-50769	RD-1147	RD-50770
Carriage bearing	RD-51006	RD-51007	RD-41631	RD-41633	RD-51433	RD-41635	RD-51434	RD-41637	RD-51438
Carriage wiper	N/A	RD-49806	RD-47191	RD-47192	RD-49805	RD-47193	RD-49804	RD-47194	RD-49803
Piston bearing	N/A	N/A	RD-41632	RD-41634	RD-51435	RD-41636	RD-51436	RD-41638	RD-51439
Piston seal	RD-13970-T	RD-13435-T	RD-45616	RD-45621	RD-50651	RD-45622	RD-50652	RD-45623	RD-50653
Piston bumper	RD-50468	RD-50469	RD-33072	RD-33073	RD-33073	RD-33071	RD-33071	RD-33076	RD-36326
Shaft bumper	RD-50802	RD-50803	RD-50279	RD-50280	RD-50804	RD-50281	RD-50805	RD-50282	RD-50806
Shaft washer	RD-50797	RD-50798	RD-50283	RD-50284	RD-50799	RD-50285	RD-50800	RD-50286	RD-50801
Body[1]	KUB-007	KUB-01	KUB-02	KUB-04	KUB-06	KUB-09	KUB-12	KUB-17	KUB-31
Guide Rods[1]	KUG-007	KUG-01	KUG-02	KUG-04	KUG-06	KUG-09	KUG-12	KUG-17	KUG-31
Switch Track[1]-T	KUT-007	KUT-01	KUT-02	KUT-04	KUT-06	KUT-09	KUT-12	KUT-17	KUT-31
Switch Track[1]-U	KUU-007	KUU-01	KUU-02	KUU-04	KUU-06	KUU-09	KUU-12	KUU-17	KUU-31
Repair kit[2]	KU-007	KU-01	KU-02	KU-04	KU-06	KU-09	KU-12	KU-17	KU-31

[1] *Option-B must be included at the end of part number if bumpers are being used with the Ultran Slide. (i.e., KUT-007-B)*

[2] *Includes required quantity of all except bumpers, oil service piston seals, bodies, guide rods and switch track, which are sold separately. Consult your local stocking Bimba distributor for prices.*

Size/Application Considerations

Each bore size of the Bimba Ultran Slide rodless cylinder has specific load carrying capabilities. These capabilities can be enhanced by ordering external shock absorbers. Shock absorbers will also increase cylinder life when used properly. Use the following procedures to determine the requirements for specific applications.
NOTE: Exceeding the load can cause the carriage and piston to decouple.

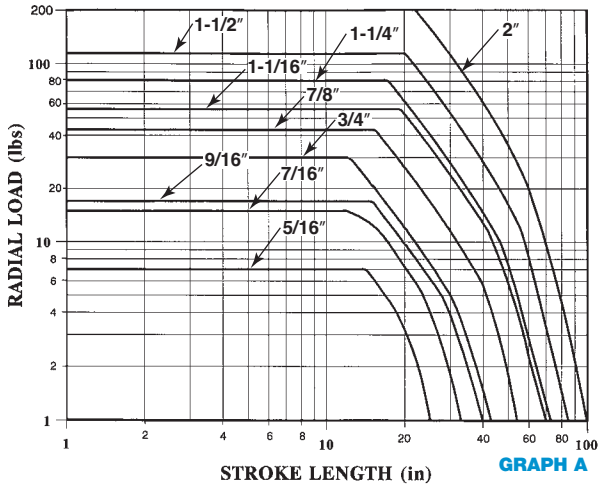
1. *Check side load or radial load requirements.* Graph A, Side Load/Radial Load vs. Stroke Length, shows the maximum load the cylinder will support for a specific bore size and stroke length.

2. *Check axial load requirements.* Graph B, Axial Load vs. Moment Arm, shows the maximum load the cylinder will support for a specific bore size and stroke length. Use the illustrations and formulas beside the graph to determine the load on the Ultran Slide.

3. *External Shock Absorbers.* If your load requirements fall above the curve for the specific bore size, external shock absorbers may allow you to decelerate the load. Choose from Graphs M through DD - *Velocity versus Load for Related Products, page 10.17-10.19* for your bore size.

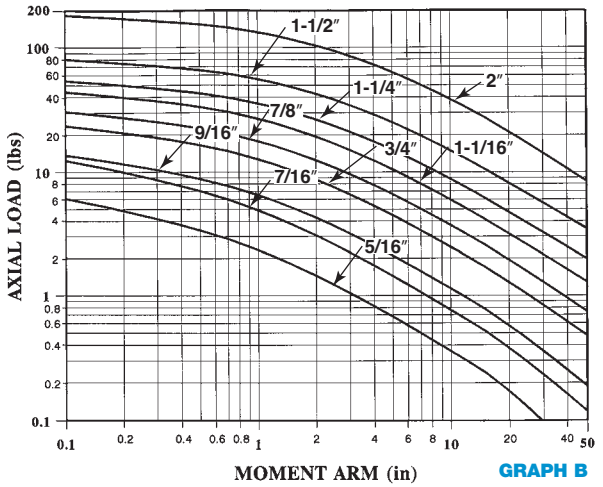
4. *Maximum Velocity.* If cylinder speed will exceed 20 in/sec or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.

SIDE/RADIAL LOAD vs STROKE LENGTH



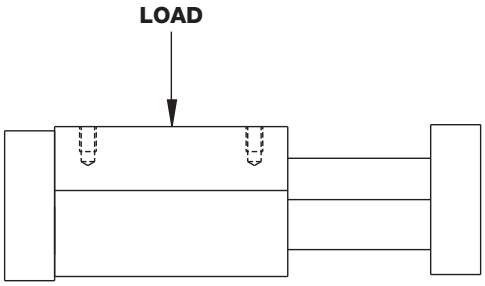
GRAPH A

AXIAL LOAD vs MOMENT ARM



GRAPH B

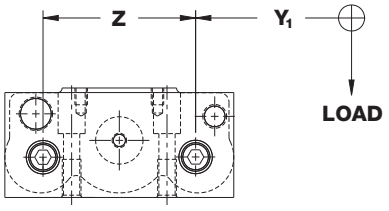
RADIAL LOAD



SEE GRAPH A

SIDE LOAD

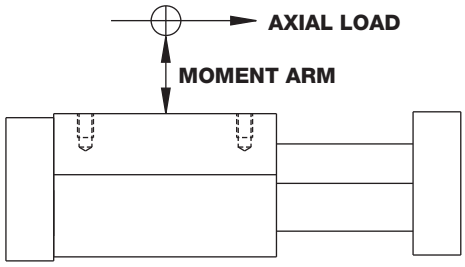
SIDE LOAD = 2 x LOAD $(\frac{Y_1}{Z} + 1)$



Cylinder Bore	Z
5/16" (007)	1.312
7/16" (01)	1.562
9/16" (02)	2.000
3/4" (04)	2.518
7/8" (06)	2.750
1-1/16" (09)	3.062
1-1/4" (12)	3.500
1-1/2" (17)	4.500
2" (31)	5.750

SEE GRAPH A

AXIAL LOAD



SEE GRAPH B

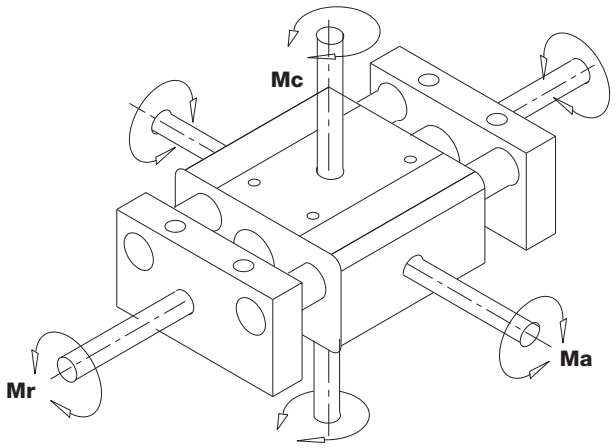
Size/Application Considerations

Moments About the Carriage:

The table below gives the maximum allowable moment an Ultran Slide will support. There are three different directions that the moment can be applied (see Sketch A).

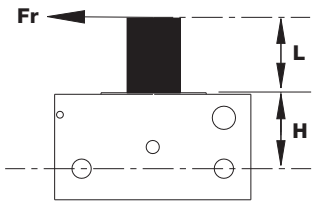
Maximum Allowable Moment (in-lb)

Bore	Radial	Axial	Cross	H
	Mr max.	Ma max.	Mc max.	
5/16" (007)	2.3	5.2	5.2	0.625
7/16" (01)	4.9	9.4	9.4	0.656
9/16" (02)	6.6	17.2	17.2	0.906
3/4" (04)	11.1	37.5	37.5	1.168
7/8" (06)	14.3	68.4	68.4	1.374
1-1/16" (09)	19.5	89.1	89.1	1.563
1-1/4" (12)	26.5	160	160	1.937
1-1/2" (17)	40.4	250	250	2.281
2" (31)	67.0	800	800	3.000



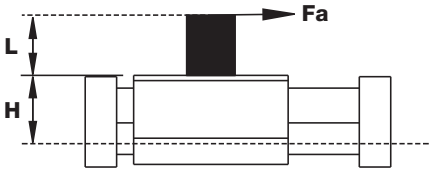
SKETCH A

Radial Moment



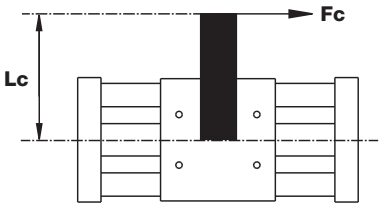
SKETCH B

Axial Moment



SKETCH C

Cross Moment



SKETCH D

Sketches B, C, and D demonstrate how a force is applied to a moment arm to produce the moments shown in Sketch A. Use the equations below to determine the actual moments created by your application. The results of each calculated moment should be compared to the maximums listed in the table. (If the actual moments are greater than the listed maximums, then the load and moments should be evaluated using the next larger Ultran Slide.)

Radial Moment	=	Mr	=	Fr x (L+H)
Axial Moment	=	Ma	=	Fa x (L+H)
Cross Moment	=	Mc	=	Fc x (Lc)

An Ultran Slide can withstand compound moments but the maximum allowable will be determined by the total percentage of the axial, radial and cross moments. The equation below will determine the compound moment percent based on the total moments. The compound moment percent must not be greater than 100. (If the compound moment percent is greater than 100, then the load and moments should be evaluated using the next larger Ultran Slide.)

$$M_{\text{compound }\%} = 100 \times \left(\frac{Mr}{Mr\ max} + \frac{Ma}{Ma\ max} + \frac{Mc}{Mc\ max} \right) \leq 100\%$$

How to Order

The model number of all Ultran rodless cylinders consists of three alphanumeric clusters. These designate product type, bore size and stroke length, and options. Please refer to the charts below for an example of model number US-1766.375-A1B1F. This is a 1-½" bore, 66.375" stroke, rodless cylinder with Ultran Silver coupling strength, with stroke adjustment on one end, bumpers on one end, and a floating mounting bracket.

US - 1766.375-A1B1F

TYPE

UG-Ultran Rodless, Gold coupling strength

US-Ultran Rodless, Silver coupling strength*

BORE SIZE

007	-	5/16"
01	-	7/16"
02	-	9/16"
04	-	3/4"
06	-	7/8"
09	-	1-1/16"
12	-	1-1/4"
17	-	1-1/2"
31	-	2"

STROKE LENGTH

STANDARD	MAXIMUM
1/4" to 30" (007)	30"
1/4" to 40" (01)	50"
1/4" to 40" (02)	90"
1/4" to 80" (04)	120"
1/4" to 80" (06)	120"
1/4" to 80" (09)	120"
1/4" to 80" (12)	120"
1/4" to 80" (17)	120"
1/4" to 80" (31)	100"

OPTIONS

A	–	Stroke adjustment (both ends)
A1	–	Stroke adjustment (on end 1)
A2	–	Stroke adjustment (on end 2)
B	–	Bumpers (both ends)
B1	–	Bumpers (on end 1)[1]
B2	–	Bumpers (on end 2)
C	–	Cushions (both ends)*[2]
C1	–	Cushions (on end 1)*
C2	–	Cushions (on end 2)*
F	–	Floating mount bracket[3]
K	–	Pivot (both ends)
K1	–	Pivot (on end 1)
K2	–	Pivot (on end 2)
P	–	Axial ports both ends
P1	–	Axial port (on end 1)
P2	–	Axial port (on end 2)
S	–	Seals – oil service (low pressure hydraulic service)

[1] 80 PSI required to reach full stroke due to bumper compression.

[2] Not available for 5/16" and 7/16" bores. 9/16" bore has fixed cushions, other sizes have adjustable cushions.

[3] For use when application requirements dictate a non-parallel or floating interface with the Ultran carriage to prevent binding between the Ultran and external guiding systems. Refer to page 5.16 for dimensions.

The 9/16" bore fixed cushion operates like an air spring. A small amount of air is trapped behind the piston to help slow it down. Since there is no air bleed-off, this air will remain trapped behind the piston until the cylinder is cycled. A minimum of 40 psi is needed to move the cylinder to full stroke. If air pressure is removed from the front side of the piston, the trapped air will act like a spring and move the piston away from the end cap about 3/16 of an inch.

See left column for option combination availability and location.

Combination Availability

SIZES \ OPTIONS	A	B	C	F	K	P	S
5/16"(007) 7/16"(01)	B,F,S	A,F,K,P	N/A	A,B,K,P,S	B,F,S	B,F,S	A,F,K,P
ALL OTHER SIZES	B,F,S	A,F,K,P	F,K	A,B,C,K,P,S	B,C,F,S	B,F,S	A,F,K,P

Location

See diagram on page 5.15 for location of End 1 and End 2. Incompatible options cannot be ordered on the same end (see combination availability chart above).

**Specify silver coupling strengths for lower breakaway application requirements. Use caution as decoupling can occur at pressures less than 100 PSI. Refer to the engineering specifications on page 5.20 for details.*

List Prices

Cylinder Bore Size	Base Model		Adder per inch of stroke*	Options						
	UG	US		A Stroke Adjustment (per end)	B Bumpers (per end)	C Cushions (per end)	F Floating Mount Bracket	K Pivot (per end)	P Axial Ports	S Oil Service Seals
5/16" (007)	$159.00	$153.20	$ 1.25	$ 8.20	$ 2.45	N/A	$ 28.25	$ 3.80	N/C	$ 4.35
7/16" (01)	188.60	181.15	1.35	9.35	2.45	N/A	30.35	4.35	N/C	4.65
9/16" (02)	220.95	212.10	1.60	9.35	2.45	6.10	32.90	4.95	N/C	5.40
3/4" (04)	293.20	271.75	2.90	10.75	3.15	7.90	39.80	5.60	N/C	6.10
7/8" (06)	364.80	351.45	3.65	11.15	3.80	9.05	41.30	6.10	N/C	6.45
1-1/16" (09)	429.80	382.10	4.45	11.15	4.35	9.35	43.30	6.30	N/C	6.75
1-1/4" (12)	503.10	481.75	5.15	12.00	4.85	12.00	45.70	6.95	N/C	7.25
1-1/2" (17)	626.45	582.25	6.05	12.00	5.40	12.40	47.40	7.35	N/C	7.80
2" (31)	2821.35	2272.85	6.50	15.25	5.60	13.35	73.75	8.10	N/C	8.20

**Longer than standard stroke lengths incur additional charge. Consult your distributor for details.*

Cylinder Bore Size	Shock Absorbers				Shock Absorber Switch Brackets		Stop Collar	
	Model			Price	Model	Price	Model	Price
	Light	Standard	Heavy					
5/16" (007)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7/16" (01)					N/A	N/A		
9/16" (02)	LS-02	SS-02	HS-02	$ 31.65	BU-02	$ 2.25	USC-04	$ 11.55
3/4" (04)	LS-04	SS-04	HS-04	59.30	BU-04	2.60		
7/8" (06)	LS-09	SS-09	HS-09	72.60	BU-06	2.75	USC-09	11.55
1-1/16" (09)					BU-09	3.10		
1-1/4" (12)	LS-17	SS-17	HS-17	90.55	BU-12	3.25	USC-17	16.50
1-1/2" (17)					BU-17	3.35		
2" (31)	LS-31	SS-31	HS-31	177.75	BU-31	57.60	USC-31	33.30

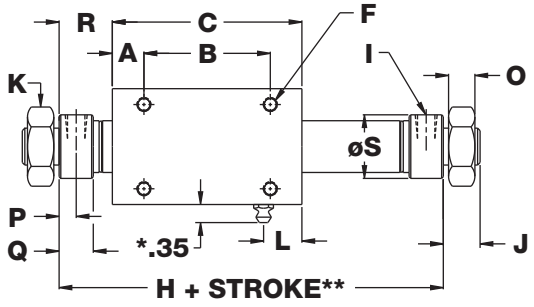
Cylinder Bore Size	Mounting Block		Floating Mount Bracket	
	Model	Price	Model	Price
5/16" (007)	MB-007	$ 24.30	FM-007	$ 34.40
7/16" (01)	MB-01	27.30	FM-01	36.90
9/16" (02)	MB-02	30.20	FM-02	40.10
3/4" (04)	MB-04	37.55	FM-04	48.55
7/8" (06)	MB-06	41.25	FM-06	50.15
1-1/16" (09)	MB-09	44.25	FM-09	52.50
1-1/4" (12)	MB-12	54.30	FM-12	55.35
1-1/2" (17)	MB-17	61.80	FM-17	57.85
2" (31)	MB-31	72.75	FM-31	89.10

Dimensions (in.)

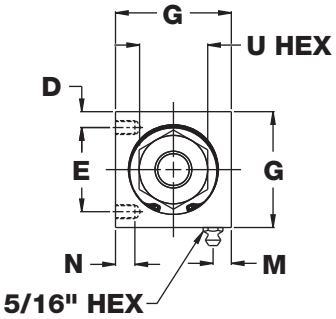
Bore	A	B	C	D	E	F	G	H	I	J
5/16" (007)	0.344	1.062	1.750	0.141	0.469	4-40-UNC	0.750	3.014	10-32	0.368
7/16" (01)	0.344	1.188	1.875	0.125	0.750	6-32 UNC	1.000	3.139	10-32	0.438
9/16" (02)	0.375	1.500	2.250	0.188	1.000	8-32 UNC	1.375	3.514	10-32	0.438
3/4" (04)	0.562	1.750	2.875	0.188	1.375	10-24 UNC	1.750	4.875	1/8 NPT	0.625
7/8" (06)	0.500	2.125	3.125	0.188	1.625	10-24 UNC	2.000	5.125	1/8 NPT	0.625
1-1/16" (09)	0.500	2.500	3.500	0.250	1.750	1/4-20 UNC	2.250	5.500	1/8 NPT	0.625
1-1/4" (12)	0.562	2.750	3.875	0.250	2.125	1/4-20 UNC	2.625	5.875	1/8 NPT	0.875
1-1/2" (17)	0.500	3.500	4.500	0.312	2.500	5/16-18 UNC	3.125	6.500	1/8 NPT	0.875
2" (31)	1.188	5.000	7.375	0.500	3.250	1/2-13 UNC	4.250	10.000	1/4 NPT	1.000

Bore	K	L	M	N	O	P	Q	R	S	U
5/16" (007)	5/16-24 NUT	N/A	N/A	0.125	0.188	0.203	0.406	0.632	0.625	0.500
7/16" (01)	7/16-20 NUT	0.395	0.312	0.125	0.250	0.203	0.406	0.632	0.704	0.688
9/16" (02)	7/16-20 NUT	0.455	0.312	0.220	0.250	0.203	0.406	0.632	0.755	0.688
3/4" (04)	5/8-18 NUT	0.572	0.375	0.312	0.375	0.315	0.630	1.000	0.985	0.938
7/8" (06)	5/8-18 NUT	0.635	0.375	0.375	0.375	0.315	0.630	1.000	1.110	0.938
1-1/16" (09)	5/8-18 NUT	0.706	0.500	0.375	0.375	0.315	0.630	1.000	1.297	0.938
1-1/4" (12)	3/4-16 NUT	0.750	0.375	0.500	0.420	0.315	0.630	1.000	1.545	1.125
1-1/2" (17)	3/4-16 NUT	0.756	0.750	0.520	0.420	0.315	0.630	1.000	1.735	1.125
2" (31)	1-1/4-12 NUT	1.500	0.750	0.750	0.500	0.438	0.875	1.312	2.312	1.875

END 1



END 2



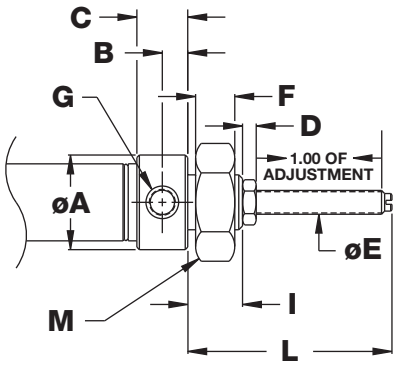
**Grease fitting on 2" bore is recessed.*
***See page 5.16 for option length adders.*

Options

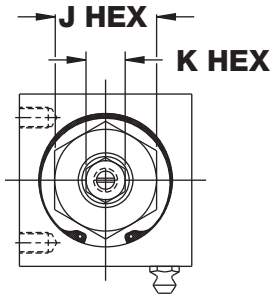
Stroke Adjustment Dimensions (in.)

Bore	A	B	C	D	E	F
5/16" (007)	0.625	0.203	0.406	0.094	6-40 UNF	0.188
7/16" (01)	0.704	0.203	0.406	0.109	10-32 UNF	0.250
9/16" (02)	0.755	0.203	0.406	0.109	10-32 UNF	0.250
3/4" (04)	0.985	0.315	0.630	0.156	1/4-28 UNF	0.375
7/8" (06)	1.110	0.315	0.630	0.188	5/16-24 UNF	0.375
1-1/16" (09)	1.297	0.315	0.630	0.188	5/16-24 UNF	0.375
1-1/4" (12)	1.545	0.315	0.630	0.220	3/8-24 UNF	0.420
1-1/2" (17)	1.735	0.315	0.630	0.220	3/8-24 UNF	0.420
2" (31)	2.312	0.438	0.875	0.250	7/16-20 UNF	0.500

Stroke Adjustment



Bore	G	I	J	K	L	M
5/16" (007)	10-32	0.368	0.500	0.188	1.795	5/16-24 NUT
7/16" (01)	10-32	0.438	0.688	0.313	1.469	7/16-20 NUT
9/16" (02)	10-32	0.438	0.688	0.313	1.469	7/16-20 NUT
3/4" (04)	1/8-NPT	0.625	0.938	0.438	1.905	5/8-18 NUT
7/8" (06)	1/8-NPT	0.625	0.938	0.438	1.943	5/8-18 NUT
1-1/16" (09)	1/8-NPT	0.625	0.938	0.438	1.943	5/8-18 NUT
1-1/4" (12)	1/8-NPT	0.875	1.125	0.563	2.115	3/4-16 NUT
1-1/2" (17)	1/8-NPT	0.875	1.125	0.563	2.115	3/4-16 NUT
2" (31)	1/4-NPT	1.000	1.875	0.688	2.278	1-1/4-12 NUT



Stroke Adjustment Length Adder (in.)

Bore	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Add to overall length: (per end)	0.044	0.060	0.060	0.060	0.080	0.080	0.110	0.110	0.120

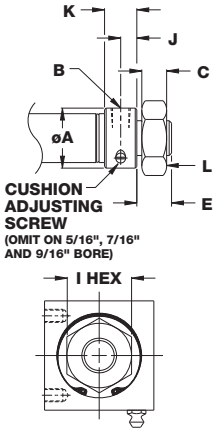
Bumper Length Adder (in.)

Bore	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Add to overall length: (per end)	0.095	0.120	0.120	0.140	0.140	0.150	0.150	0.150	0.200

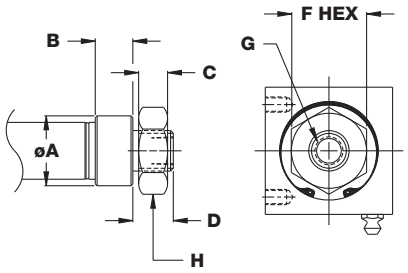
Cushions *(Not available for 5/16" and 7/16" bores)* (in.)

Bore	A	B	C	E	I	J	K	L
9/16" (02)	0.755	10-32	0.250	0.438	0.688	0.203	0.406	7/16-20 NUT
3/4" (04)	0.985	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
7/8" (06)	1.110	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
1-1/16" (09)	1.297	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
1-1/4" (12)	1.545	1/8 NPT	0.420	0.875	1.125	0.315	0.630	3/4-16 NUT
1-1/2" (17)	1.735	1/8 NPT	0.420	0.875	1.125	0.315	0.630	3/4-16 NUT
2" (31)	2.312	1/4 NPT	0.500	1.000	1.875	0.438	0.875	1-1/4-12 NUT

Note: There is no length adder for the cushion option.



Options



Axial Ports (in.)

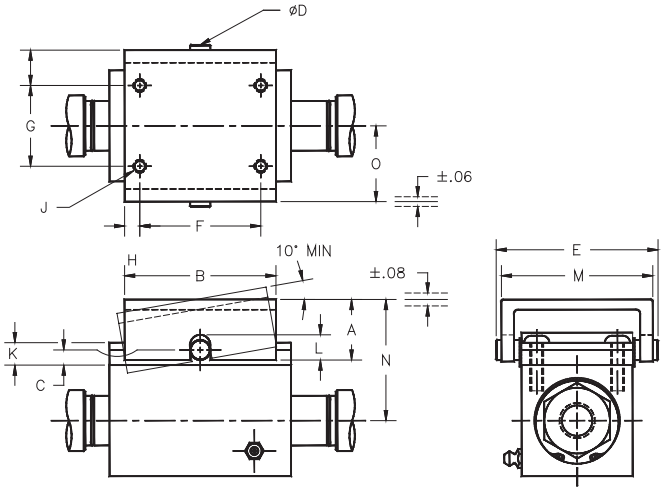
Bore	A	B	C	D	F	G	H
5/16" (007)	0.625	0.406	0.188	0.368	0.500	10-32	5/16-24 NUT
7/16" (01)	0.704	0.406	0.250	0.438	0.688	10-32	7/16-20 NUT
9/16" (02)	0.755	0.406	0.250	0.438	0.688	10-32	7/16-20 NUT
3/4" (04)	0.985	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
7/8" (06)	1.110	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
1-1/16" (09)	1.297	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
1-1/4" (12)	1.545	0.630	0.420	0.875	1.125	1/8 NPT	3/4-16 NUT
1-1/2" (17)	1.735	0.630	0.420	0.875	1.125	1/8 NPT	3/4-16 NUT
2" (31)	2.312	0.875	0.500	1.000	1.875	1/4 NPT	1-1/4-12 NUT

Note: There is no length adder for the Axial port option.

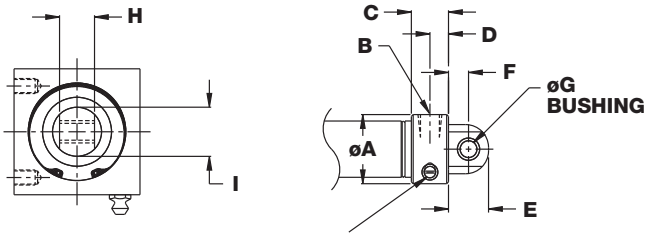
Floating Mount Bracket (in.)

Bore	A	B	C	D	E	F	G	H	I	J	K
5/16" (007)	0.532	1.438	0.188	0.187	1.317	1.062	0.469	0.188	0.360	4-40 UNC	0.236
7/16" (01)	0.625	1.688	0.188	0.249	1.646	1.188	0.750	0.250	0.383	6-32 UNC	0.248
9/16" (02)	0.750	1.875	0.188	0.249	2.005	1.500	1.000	0.188	0.437	8-32 UNC	0.278
3/4" (04)	0.875	2.375	0.250	0.312	2.442	1.750	1.375	0.312	0.459	10-24 UNC	0.340
7/8" (06)	0.938	2.750	0.312	0.374	2.849	2.125	1.625	0.312	0.547	10-24 UNC	0.421
1-1/16" (09)	1.062	3.000	0.312	0.374	3.068	2.500	1.750	0.250	0.594	1/4-20 UNC	0.421
1-1/4" (12)	1.125	3.562	0.375	0.437	3.599	2.750	2.125	0.406	0.672	1/4-20 UNC	0.484
1-1/2" (17)	1.188	4.250	0.375	0.437	4.068	3.500	2.500	0.375	0.719	5/16-18 UNC	0.484
2" (31)	1.938	6.500	0.500	0.624	6.000	5.000	3.250	0.750	1.250	1/2-13 UNC	0.634

Bore	L	M	N	O
5/16" (007)	0.250	1.188	1.019	1.019
7/16" (01)	0.312	1.516	1.206	1.206
9/16" (02)	0.312	1.875	1.518	0.938
3/4" (04)	0.375	2.312	1.861	1.156
7/8" (06)	0.438	2.719	2.080	1.359
1-1/16" (09)	0.438	2.937	2.330	1.469
1-1/4" (12)	0.500	3.469	2.612	1.734
1-1/2" (17)	0.500	3.937	2.924	1.969
2" (31)	0.688	5.750	4.268	2.875



Options



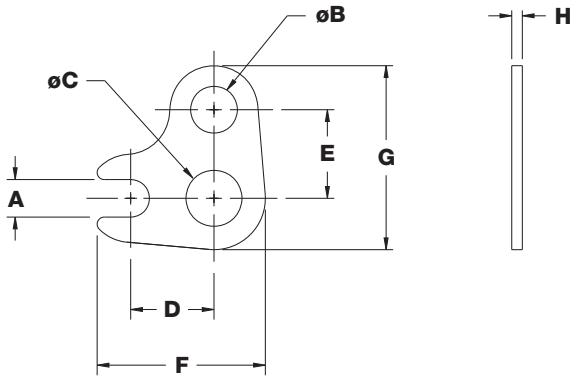
CUSHION OPTION ONLY CUSHION ADJUSTMENT SCREW LOCATION FOR 04, 06, 09, 12, 17, AND 31 BORES

Pivot Option (in.)

Bore	A	B	C	D	E	F	G	H	I
5/16" (007)	0.625	10-32	0.406	0.203	0.368	0.212	0.127	0.243	0.375
7/16" (01)	0.704	10-32	0.406	0.203	0.437	0.250	0.157	0.305	0.500
9/16" (02)	0.755	10-32	0.406	0.203	0.437	0.250	0.157	0.305	0.500
3/4" (04)	0.985	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.750
7/8" (06)	1.110	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.750
1-1/16" (09)	1.297	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.875
1-1/4" (12)	1.545	1/8-NPT	0.630	0.315	0.875	0.500	0.378	0.493	1.000
1-1/2" (17)	1.735	1/8-NPT	0.630	0.315	0.875	0.500	0.378	0.493	1.125
2" (31)	2.312	1/4-NPT	0.876	0.438	1.000	0.500	0.439	0.868	1.375

Accessories

Shock Absorber/Switch Bracket (For 9/16" bore and larger only)



Shock Absorber/Switch Bracket (Not available for 5/16" and 7/16" bores) *(in.)*

Bore	A	B	C	D	E	F	G	H
9/16" (02)	0.320	0.399	0.442	0.710	0.755	1.433	1.568	0.090
3/4" (04)	0.320	0.478	0.629	0.910	0.900	1.820	1.900	0.120
7/8" (06)	0.320	0.556	0.629	0.875	1.116	1.785	2.179	0.120
1-1/16" (09)	0.320	0.556	0.629	0.910	1.047	1.820	2.110	0.120
1-1/4" (12)	0.320	0.793	0.754	0.375	1.437	2.410	2.812	0.120
1-1/2" (17)	0.320	0.793	0.754	1.450	1.453	2.485	2.828	0.120
2" (31)	0.320	1.005	1.254	2.230	2.290	3.640	4.165	0.224

A - ***Slot for Switch***

B - ***Hole for Shock Absorber***

C - ***Hole for Cylinder***

Mounting Block (in.)

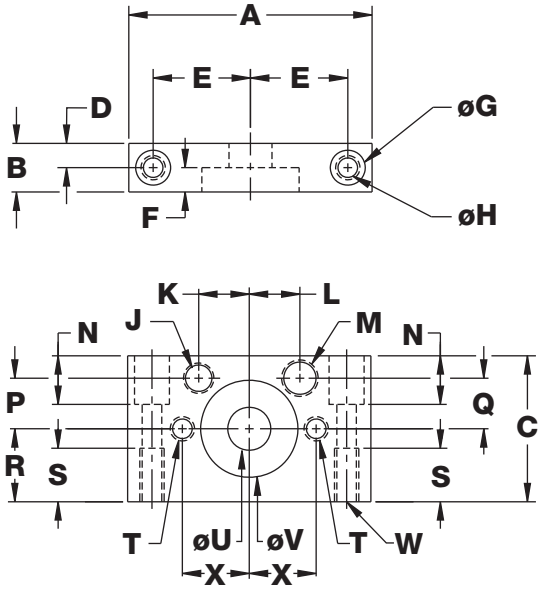
Bore	A	B	C	D	E	F	G	H	J	K	L
5/16" (007)	2.000	0.375	0.875	0.188	0.813	0.250	0.272	0.159	5/16-24 UNF	0.500	N/A
7/16" (01)	2.500	0.500	1.125	0.250	0.938	0.250	0.357	0.213	5/16-24 UNF	0.562	N/A
9/16" (02)	2.500	0.500	1.500	0.250	1.000	0.250	0.354	0.213	5/16-24 UNF	0.520	0.520
3/4" (04)	3.500	0.750	1.875	0.375	1.312	0.375	0.422	0.272	5/16-24 UNF	0.671	0.671
7/8" (06)	3.500	0.750	2.125	0.375	1.375	0.375	0.422	0.273	5/16-24 UNF	0.789	0.789
1-1/16" (09)	4.000	0.750	2.500	0.375	1.563	0.375	0.515	0.332	5/16-24 UNF	0.893	0.893
1-1/4" (12)	5.000	1.000	2.875	0.500	2.000	0.443	0.609	0.391	5/16-24 UNF	1.062	1.016
1-1/2" (17)	5.000	1.000	3.375	0.500	2.000	0.443	0.609	0.391	5/16-24 UNF	1.240	1.240
2" (31)	8.500	1.500	4.500	0.750	3.250	1.000	1.187	0.779	5/16-24 UNF	1.625	1.607

J - Hole for Switch

M - Hole for Shock Absorber

Bore	M	N	P	Q	R	S	T	U	V	W	X
5/16" (007)	N/A	0.312	0.250	N/A	0.438	0.315	6-40 UNF	0.318	0.776	6-40 UNF	0.594
7/16" (01)	N/A	0.380	0.375	N/A	0.563	0.380	1/4-28 UNF	0.442	0.995	1/4-28 UNF	0.688
9/16" (02)	3/8-32 UNEF	0.500	0.520	0.520	0.750	0.500	1/4-28 UNF	0.442	1.000	1/4-28 UNF	0.688
3/4" (04)	7/16-28 UNEF	0.625	0.671	0.671	0.938	0.500	5/16-24 UNF	0.629	1.375	5/16-24 UNF	0.938
7/8" (06)	1/2-20 UNF	0.625	0.789	0.789	1.063	0.750	5/16-24 UNF	0.629	1.375	5/16-24 UNF	0.938
1-1/16" (09)	1/2-20 UNF	0.875	0.893	0.893	1.250	0.750	3/8-24 UNF	0.629	1.375	3/8-24 UNF	1.125
1-1/4" (12)	3/4-16 UNF	1.125	1.062	1.016	1.438	1.125	7/16-20 UNF	0.754	1.625	7/16-20 UNF	1.375
1-1/2" (17)	3/4-16 UNF	1.375	1.240	1.240	1.688	1.000	7/16-20 UNF	0.753	1.625	7/16-20 UNF	1.375
2" (31)	1-12 UNF	1.625	1.625	1.607	2.250	1.500	7/8-9 UNC	1.380	2.750	7/8-9 UNC	2.125

Mounting Block



Engineering Specifications

Pressure Rating: 100 psi (Air or Hydraulic)
Temperature Range: 0˚ to 170˚F
Breakaway: Ultran Gold Coupling Strength - Less than 25 psi
Ultran Silver Coupling Strength - Less than 20 psi

Magnetic Coupling Strength (lbs.)

Cylinder Bore	Ultran Gold (UGS)	Ultran Silver (USS)
5/16" (007)	13	8
7/16" (01)	20	10
9/16" (02)	29	16
3/4" (04)	61	33
7/8" (06)	102	55
1-1/16" (09)	127	74
1-1/4" (12)	190	110
1-1/2" (17)	270	150
2" (31)	552	332

Lubrication

The Ultran rodless cylinder is prelubricated at the factory. The life of the cylinder can be greatly lengthened by providing additional lubrication with an air line mist lubricator or direct introduction of oil to the cylinder every 100 linear miles of travel. Recommended oils are medium to heavy.
The carriage should also be lubricated every 100 linear miles with a high grade of bearing grease. Other types of pre-lubrication are available upon request. The lubricant used by the factory can be ordered as part number MS-2861-14OZ. The lubricant is packaged in a 14 OZ grease gun cartridge.

Repairs

The Ultran rodless cylinder must be returned to the factory for repairs.

Weight (lbs.)

Cylinder Bore	Base Weight (0" Stroke)		Adder per 1"
	(UG)	(US)	
5/16" (007)	0.10	0.09	0.006
7/16" (01)	0.22	0.21	0.01
9/16" (02)	0.56	0.51	0.01
3/4" (04)	1.18	1.11	0.02
7/8" (06)	1.54	1.42	0.02
1-1/16" (09)	2.54	2.34	0.03
1-1/4" (12)	3.16	2.90	0.03
1-1/2" (17)	6.36	5.76	0.05
2" (31)	16.46	15.15	0.07

Size/Application Considerations

Each bore size of the Bimba Ultran Slide rodless cylinder has specific load carrying capabilities. These capabilities can be enhanced by externally supporting the load or by ordering the internal cushion option or external shock absorbers. The load should always be guided and supported for optimum life. Cushions or shock absorbers will also increase cylinder life when used properly. Use the following procedures to determine the requirements for specific applications.

NOTE: Exceeding the load can cause the carriage and piston to decouple.

1. *Check radial load requirements.* Graph C, *Radial Load vs. Stroke Length*, shows the maximum radial load the cylinder will support for a specific bore size and stroke length. If your radial load requirements fall above the curve, the load must be externally supported.

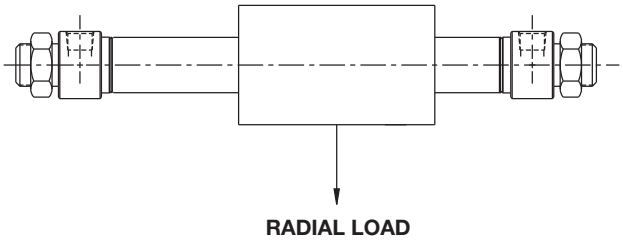
2. *Check axial load requirements.* Graph D, *Axial Load vs. Moment Arm*, shows the maximum axial load the cylinder will support for a specific bore size and moment arm length. If your axial load requirements fall above the curve for the specific bore size, the load must be externally supported.

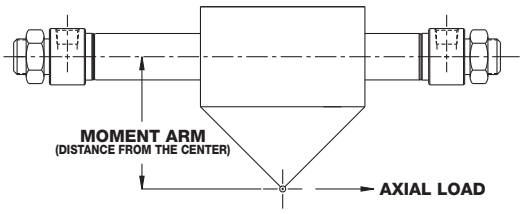
3. *Check End-of-Stroke Velocity and Load Requirements.* From Graphs E through H, *Velocity vs. Load*, choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need internal cushions or external shock absorbers to decelerate the load without causing the carriage and piston to decouple.

4. *Maximum Velocity.* If cylinder speed will exceed 20 in/sec or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.

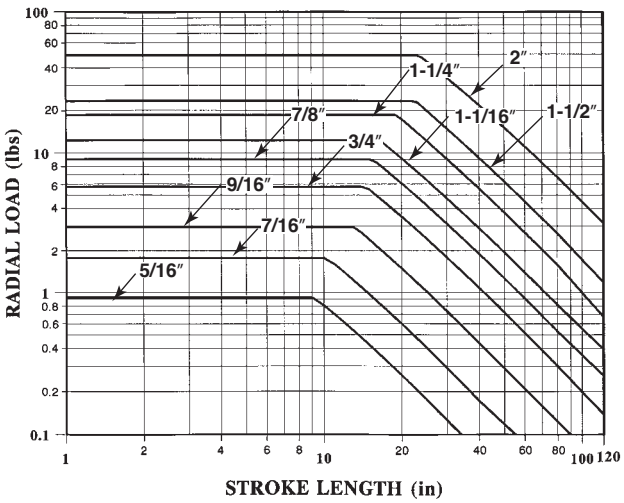
Internal Cushions. From Graphs I through L, *Velocity vs. Load for Cushions*, choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need external shock absorbers to decelerate the load.

External Shock Absorbers. Choose from Graphs EE through RR (Related Products, page 10.17-10.19), *Velocity vs. Load for Shock Absorbers*, for your bore size. Choose model LS, SS or HS based on your velocity and load.

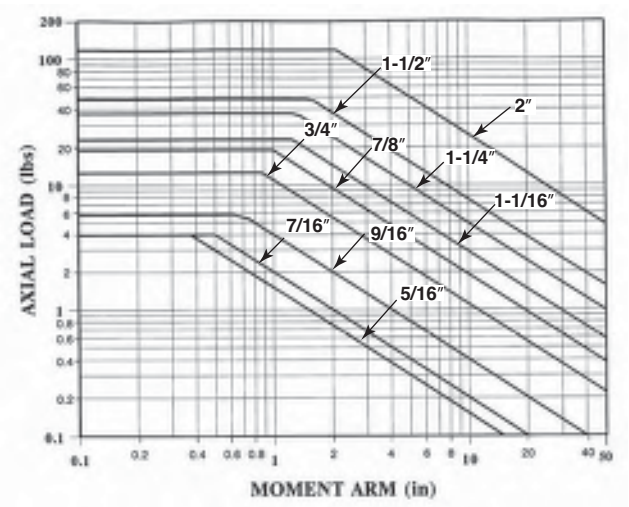




RADIAL LOAD vs STROKE LENGTH*



AXIAL LOAD vs MOMENT ARM

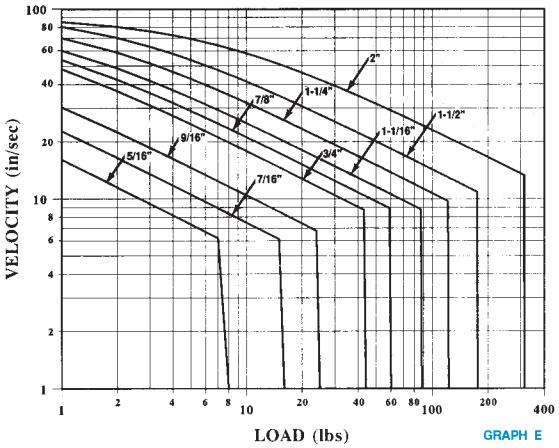


**Stud mount only. Consult factory if pivot mounted.*

Velocity vs. Load for Basic Ultran Models

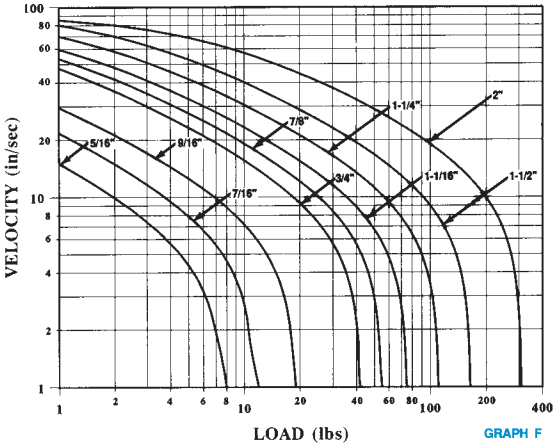
Note: Velocities in excess of 20 in./sec. require application review by Bimba.

VELOCITY vs LOAD (ULTRAN GOLD)
MOUNTED HORIZONTALLY



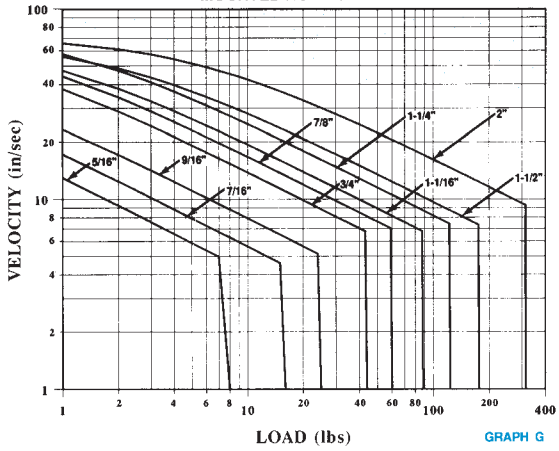
GRAPH E

VELOCITY vs LOAD (ULTRAN GOLD)
MOUNTED VERTICALLY



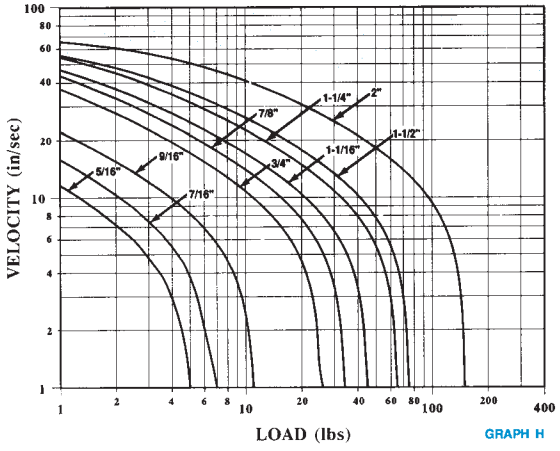
GRAPH F

VELOCITY vs LOAD (ULTRAN SILVER)
MOUNTED HORIZONTALLY



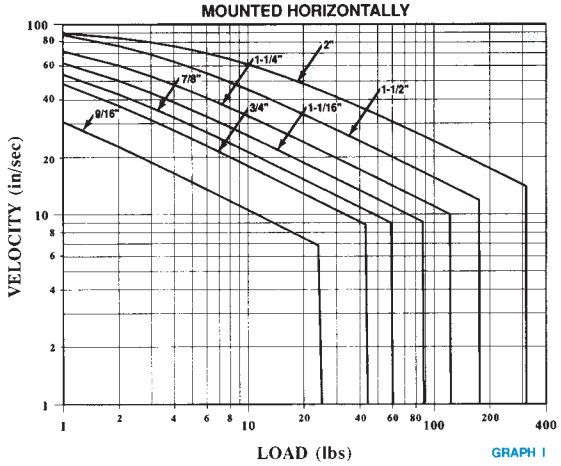
GRAPH G

VELOCITY vs LOAD (ULTRAN SILVER)
MOUNTED VERTICALLY



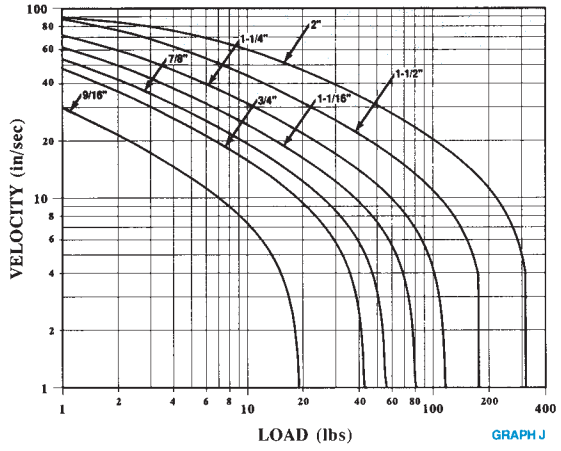
GRAPH H

VELOCITY vs LOAD (ULTRAN GOLD WITH CUSHIONS)
MOUNTED HORIZONTALLY



GRAPH I

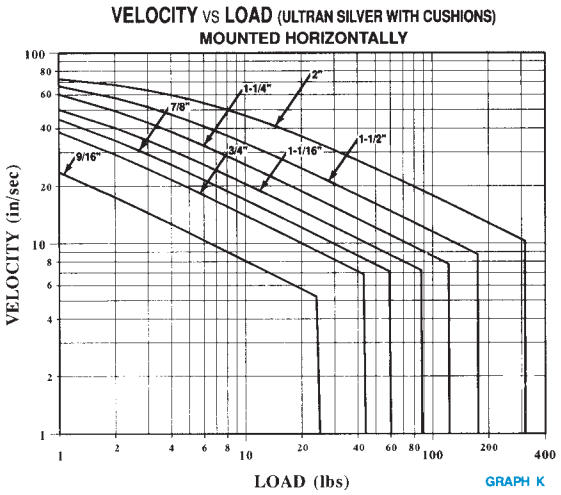
VELOCITY vs LOAD (ULTRAN GOLD WITH CUSHIONS)
MOUNTED VERTICALLY



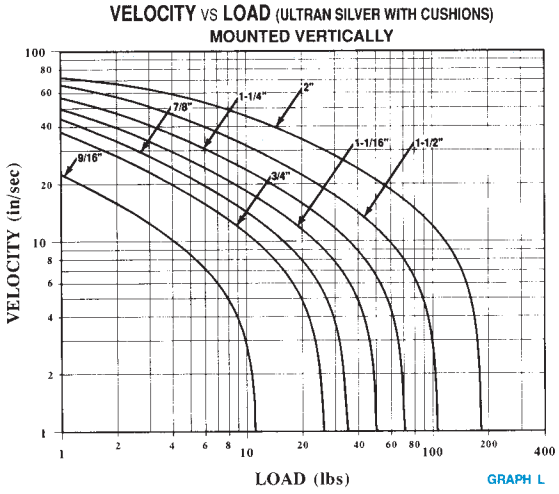
GRAPH J

Velocity vs. Load for Basic Ultran Models

Note: Velocities in excess of 20 in./sec. require application review by Bimba.



GRAPH K



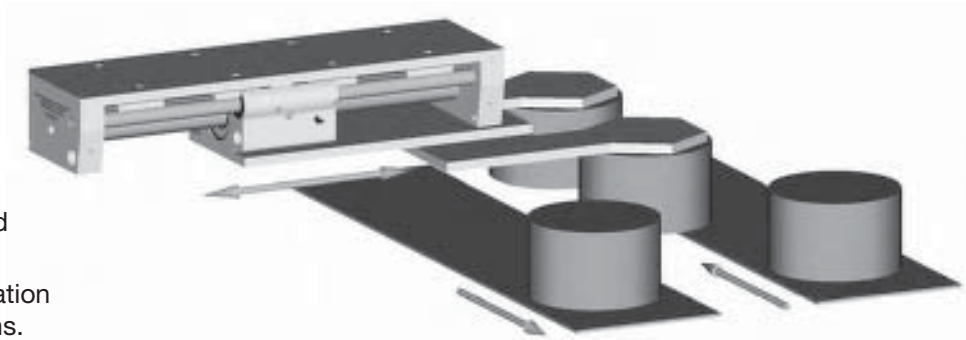
GRAPH L

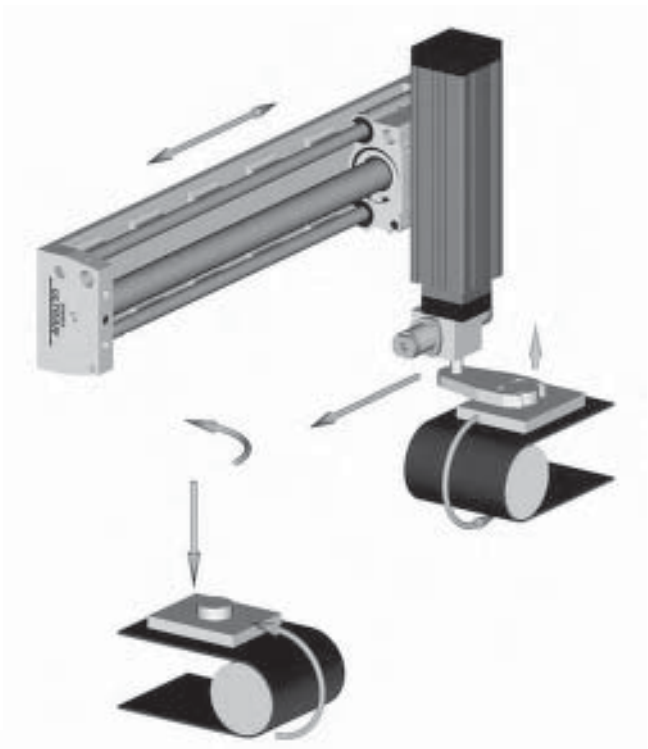
Bimba Ultran High Load Slides

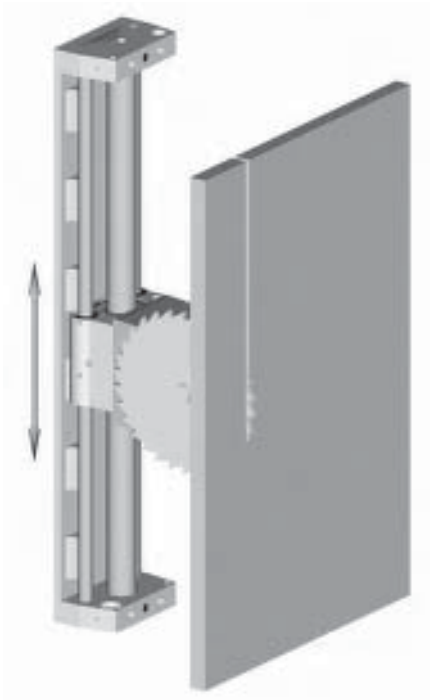
Provides high load carrying capability within an Ultran Slide Cylinder. The unit incorporates a ball bearing system offering large load bearing capabilities with greater carriage precision.

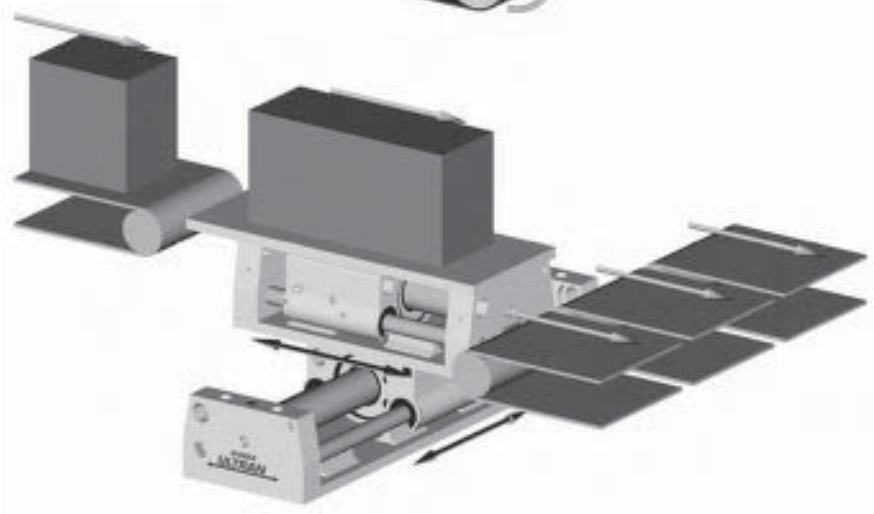
ADVANTAGES

- Large load bearing capabilities.
- Greater carriage precision.
- Leak-free construction.
- Piston seals are internally lubricated for long life.
- Special rare earth magnet configuration for high magnetic coupling strengths.
- 304 stainless steel body and “U” cup seals for lower dynamic friction.
- Prelubricated for miles of maintenance-free travel, with easily-accessible carriage lubrication port.
- Shock absorbers to decelerate loads.
- Optional 1-inch stroke length adjustment available.
- Midstroke position sensing available. End-of-stroke sensing available for all models.
- Optional bumpers to reduce noise.
- Oil service seal option available for low pressure hydraulic service.









How to Order

The model number for High Load Ultran cylinders consists of three alphanumeric clusters. These designate product type, bore size and stroke length, and options. Please refer to the charts below for an example of model number UHL-12 25.75-A1T. This is a 1-1/4" bore, 25.75" stroke High Load Ultran rodless cylinder with stroke adjustment on one end and a track for mounting switches.

PRODUCT TYPE
UHL - High Load Ultran Slide

BORE SIZE		
09	-	1-1/16"
12	-	1-1/4"
17	-	1-1/2"

STANDARD STROKE LENGTHS
6" to 132" Available in 1/4" increments[1]

UHL - 1225.75-A1T

OPTIONS		
A	–	Stroke adjustment (both ends)
A1	–	Stroke adjustment (on end 1)
A2	–	Stroke adjustment (on end 2)
B	–	Bumpers (both ends)
B1	–	Bumpers (on end 1)
B2	–	Bumpers (on end 2)
S	–	Seals – Oil service (low pressure hydraulic service)
T	–	Switch track
U	–	Switch track for miniature switches
Y	–	Alternate port (both ends)
Y1	–	Alternate port (on end 1)
Y2	–	Alternate port (on end 2)

Note: All options are compatible, except bumpers (option B) and oil service seals (option S) and T and U switch tracks.

Dowel pin holes are standard on 1-1/16" (09) and 1-1/2" (17) bore cylinder. Not available on 1-1/4" (12) bore cylinder.

[1] Contact your authorized Bimba distributor if smaller stroke increments are required for your application.

List Prices

Bore	Base Price	Adder per inch of stroke	Options					
			A Stroke Adjustment (per end)	B Bumpers (per end)	S Oil Service Seals	T & U		Y Alternate Port (per end)
						Switch Track (Base)	Adder per inch of stroke	
UHL-09	$1134.00	$ 19.85	$ 34.35	$ 33.50	$ 6.55	$ 11.55	$ 0.45	N/C
UHL-12	1166.45	19.85	34.35	33.50	6.95	11.55	0.45	N/C
UHL-17	1684.85	22.50	34.35	33.50	7.35	11.55	0.45	N/C

Dowel Pin holes are standard on 1-1/2" (17) bore cylinder and are not available on 1-1/4" (12) bore cylinder.

Accessories

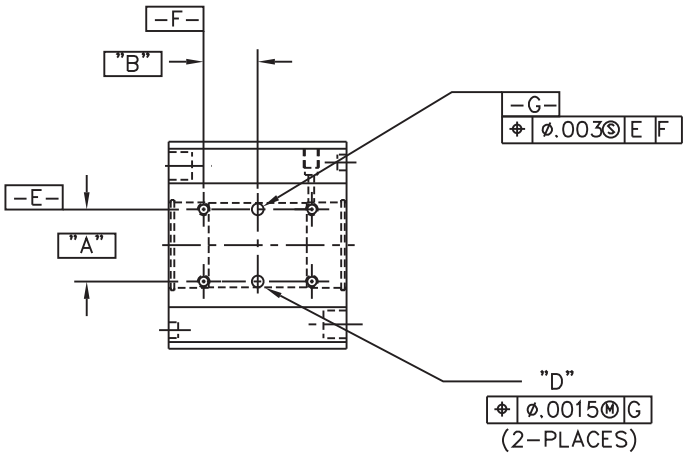
Bore	Shock Absorber		Stroke Adjustment	
	Model	Price	Model	Price
1-1/16" (09)	AS-09	$ 87.10	UHSA-09	$ 34.65
1-1/4" (12)	AS-17	87.10	UHSA-12	34.65
1-1/2" (17)	AS-17	87.10	UHSA-17	34.65

High Load Ultran Slides requiring shock absorbers with stop collars for stroke adjustment or a larger kinetic energy rating should use the following shock absorber.

Bore	Shock Absorber		Stop Collar*	
	Model	Price	Model	Price
1-1/16" (09)	HS-09	$ 72.60	USC-09	$ 11.55
1-1/4" (12)	HS-17	90.55	USC-17	16.50
1-1/2" (17)	HS-17	90.55	USC-17	16.50

**The Ultran Slide Cylinder needs to be increased by the B dimension in order to maintain intended stroke length. The overall length increases by the same amount. The A dimension indicates maximum amount of stroke adjustment attainable. See Related Products, page 10.20 for dimensions.*

Dowel Pin Hole Locations



Bore	A	B	D
020 (9/16")	1.000	.750	.1270/.1280 x .240/.260 DP.
040 (3/4")	1.375	.876	.1895/.1905 x .410/.430 DP.
090 (1-1/16")	1.750	1.250	.2520/.2530 x .410/.430 DP.
170 (1-1/2")	2.500	1.750	.3145/.3155 x .560/.580 DP.

Dimensions (in.)

Bore	A	B	C	D	E	F	G	H	I	J	K
1-1/16" (09)	0.500	0.706	2.500	3.500	5.000	0.375	1.750 *	1.750	1/4-20 UNC	0.375	0.750
1-1/4" (12)	0.562	0.750	2.750	3.875	5.875	0.318	2.125	1.938	1/4-20 UNC	0.500	1.000
1-1/2" (17)	0.500	0.756	3.500	4.500	6.500	0.500	2.500	2.250	5/16-18 UNC	0.520	1.000

Bore	L	M	N	O	P	Q	R	S	T	U	V
1-1/16" (09)	0.500	0.250	0.375	5/16-24 UNF	1/8 NPT	1/2-20 UNF	0.594	0.375	2.300	3.062	4.250
1-1/4" (12)	0.625	0.306	0.514	5/16-24 UNF	1/8 NPT	3/4-16 UNF	0.742	0.563	1.660	3.500	5.000
1-1/2" (17)	0.625	0.559	0.486	5/16-24 UNF	1/8 NPT	3/4-16 UNF	0.992	0.906	1.917	4.500	6.000

Bore	W	X	Y	Z	AA	BB	CC	II	DD	EE
1-1/16" (09)	0.172	0.375	1.125	1.563	1.922	2.625	2.688	#10	0.252	0.420
1-1/4" (12)	0.109	0.375	1.125	1.750	1.938	3.000	3.062	#10	—	—
1-1/2" (17)	0.140	0.375	1.281	2.000	2.109	3.500	3.562	1/4"	—	—

*Note: The 09 base plate mounting holes are 1.56" apart. Other bore sizes have carriage mounting holes and base plates mounting holes in line as shown.

Mounting Hole Calculation for 1-1/16" bore

$$JJ = \frac{KK - (INT(\frac{KK}{4}) \times 4)}{2}$$

If Result < 1.60, use:

$$JJ = \frac{KK - [(INT(\frac{KK}{4}) - 1) \times 4)]}{2}$$

Where KK = (E + Stroke) and INT is integer.

Mounting Hole Calculation for 1-1/4" and 1-1/2" bores

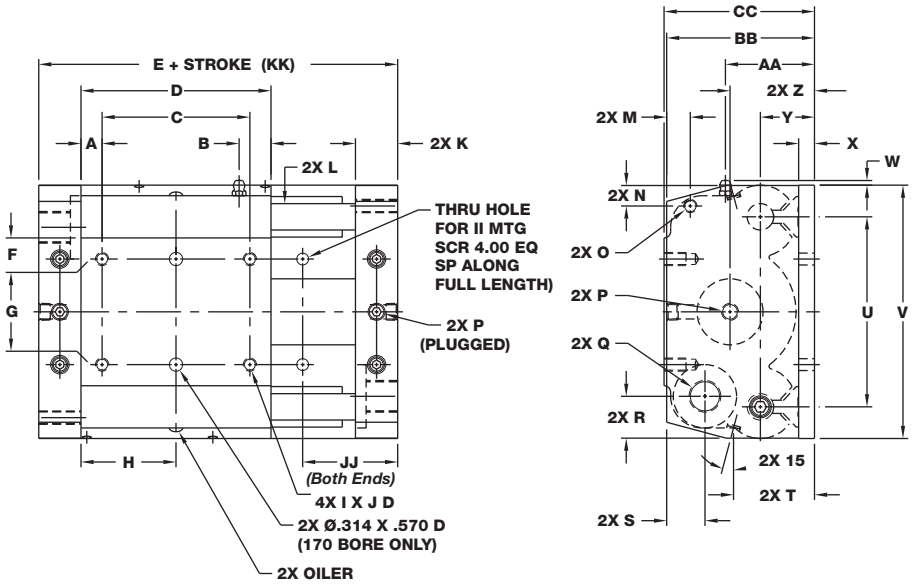
$$JJ = \frac{KK - (INT(\frac{KK}{4}) \times 4)}{2}$$

If Result < 1.85, use:

$$JJ = \frac{KK - [(INT(\frac{KK}{4}) - 1) \times 4)]}{2}$$

Where KK = (E + Stroke) and INT is integer.

END 1



Ports

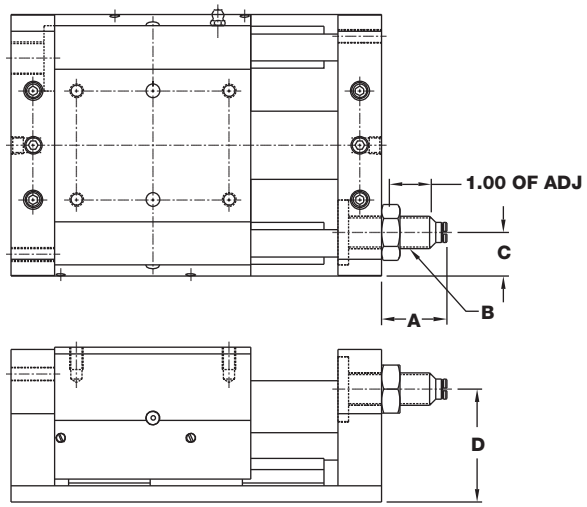
The Base Model High Load Ultran Slide offers both axial and alternate port locations. The base unit comes with flush surface plugs installed on top of the End Blocks unless the “Y” option is specified. This no charge option has the plugs installed on the side of the End Blocks.

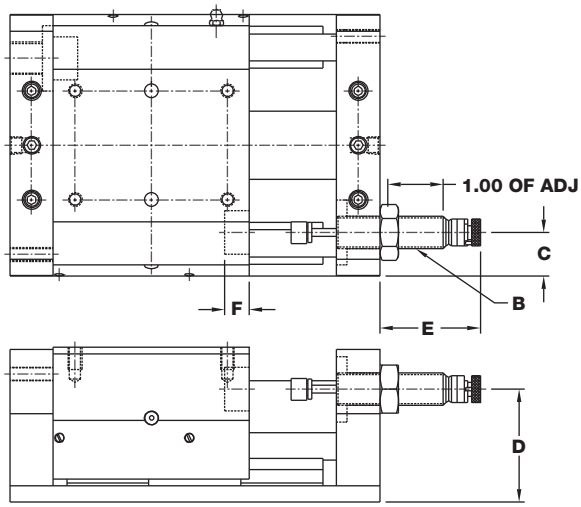
Options

Shock Absorber/Stroke Adjustment (in.)

Bore	A	B	C	D	E	F
1-1/16" (09)	1.562	1/2-20 UNF	0.594	2.250	2.060	0.465
1-1/4" (12)	1.750	3/4-16 UNF	0.742	2.438	2.312	0.550
1-1/2" (17)	1.750	3/4-16 UNF	0.992	2.594	2.312	0.550

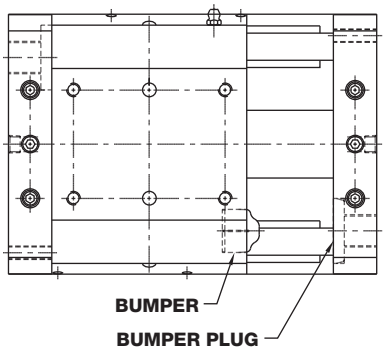
Note: Do not let the shock absorbers bottom out. The shock should not be used as a stroke adjuster. An optional stop collar is needed if stroke adjustment is required.





Bumper Compression

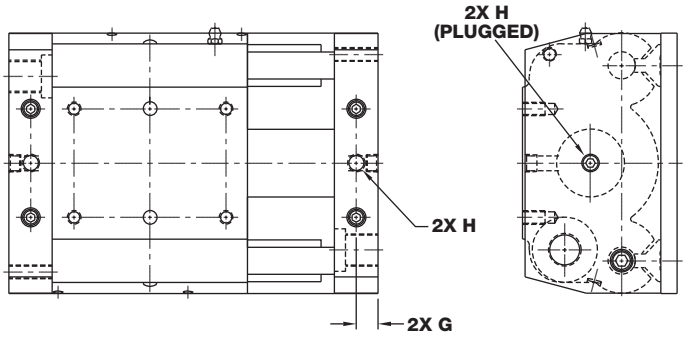
Bore	Pressure
1-1/16" (09)	80 psi
1-1/4" (12)	80 psi
1-1/2" (17)	60 psi



The Bumper option does not add overall length to the cylinder. However, the unit will not go full stroke until the specified pressure in table above is applied to the cylinder. If full stroke is required at a pressure less than that specified above, the stroke adjustment option may be utilized in combination with the bumper option to obtain full stroke. i.e., If 5 inches of stroke is required at 40 psi, order a 5.5 inch stroke unit with the Stroke Adjustment Option and adjust the stroke down to 5 inches.

Alternate Port (in.)

Bore	G	H
1-1/16" (09)	0.375	1/8 NPT
1-1/4" (12)	0.500	1/8 NPT
1-1/2" (17)	0.500	1/8 NPT

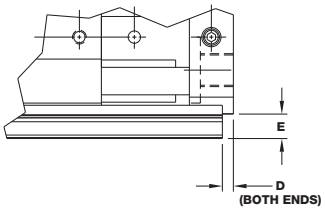


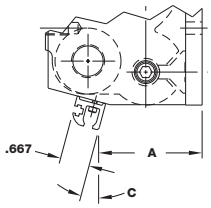
The Base Model High Load Ultran Slide offers both axial and alternate port locations. The base unit comes with flush surface plugs installed in the top ports of the End Blocks unless the “Y” option is specified. This no charge option has the plugs installed in the End Block side ports.

Options

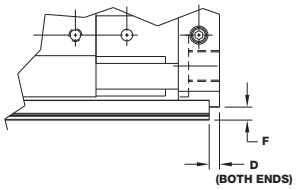
Switch Track for Miniature Switches

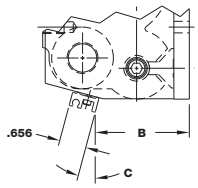
Option T





Option U





Bore	A	B	C	D	E	F
1-1/16" (09)	1.497	1.494	0°	0.125	0.531	0.272
1-1/4" (12)	1.999	1.954	10°	0.242	0.522	0.267
1-1/2" (17)	2.356	2.289	15°	0.250	0.577	0.327

Engineering Specifications

Operating Medium: Air or Hydraulic

Pressure Rating: 100 psi

Temperature Range: 0°F to +170°F

Breakaway: Less than 25 psi

Lubrication

All Bimba High Load Ultran Slide actuators are pre-lubricated internally and externally with our special bearing grade grease. The guide shafts are pre-lubricated with lightweight oil. The cylinder's life can be extended by providing additional lubrication with an air line mist lubricator and by lubricating the carriage every 100 miles with a high grade bearing grease. The guide shafts should be lubricated periodically with a lightweight oil. Do not over oil – there is an internal wick to retain the lightweight oil.

Repairs

The High Load Ultran Slide actuators must be returned to the factory for repairs.

Components

Carriage	Anodized aluminum
End Block	Anodized aluminum
Guide Shaft	Case-hardened steel
Base Plate	Anodized aluminum
Guide Shaft Support	Anodized aluminum
End Block Screws	Stainless steel
Guide Shaft Screws	Black oxide carbon steel
Carriage Retaining Rings	Plated carbon steel
Body Wiper	Urethane
Guide Shaft Bearing	Ball bearings in plastic housing
Port Plug	Carbon steel
Bearing Retaining Screw	Stainless steel

Options

Bumpers (Internal & External)	Urethane
Stroke Adjuster Screw	Stainless steel
Shock Absorbers	Anodized aluminum end plates, 303 stainless steel guide rods
Bumper Plug	Anodized aluminum
Stroke Adjuster Bumper Plate	Anodized aluminum
Switch Track	Anodized aluminum

Magnetic Coupling Strength (lbs.)

Bore Size	Strength
1-1/16" (09)	127
1-1/4" (12)	190
1-1/2" (17)	270

Weight (lbs.)

Bore Size	Base Weight (0° Stroke)	Adder per 1"
1-1/16" (09)	5.43	0.23
1-1/4" (12)	7.87	0.44
1-1/2" (17)	14.1	0.45
Option Adders for 1-1/16"		
A Option Adder	0.19	N/A
A1 Option Adder	0.1	N/A
A2 Option Adder	0.1	N/A
B Option Adder	0.01	N/A
Option Adders for 1-1/4" and 1-1/2"		
A Option Adder	2.67	N/A
A1 Option Adder	1.33	N/A
A2 Option Adder	1.33	N/A
B Option Adder	0.01	N/A

Size/Application Considerations

Each bore size of the High Load Ultran Slide has specific load-carrying capabilities. Shock absorbers can extend cylinder life when used properly. See subsequent section on shock absorbers to calculate maximum allowable kinetic energy before a shock absorber is required.

Use the following procedures to determine the requirements for specific applications.
NOTE: Exceeding the recommended loads can result in improper cylinder function: piston/carriage decoupling, unacceptable deflections, etc.

1. Check the loading condition requirements and find that condition below. See sketches A and B for illustration of loading conditions.
2. Depending on the loading condition, use the appropriate chart, graph or formula to help determine maximum allowable loads and/or moment arms.

Table 1. Maximum Allowable Loads and Moments*

Bore	Maximum Load			Maximum Moment		
	Radial (lbs.)	Pull Off (lbs.)	Side (lbs.)	Axial (Ma) (in-lbs.)	Radial (Mr) (in-lbs.)	Cross (Mc) (in-lbs.)
1-1/16" (09)	1440	992	1440	1111	435	1613
1-1/4" (12)	2480	220	992	261	385	1178
1-1/2" (17)	2480	992	1984	1488	2232	2976

**Dynamic Ratings*

The values shown in Table 1 are the maximum allowable loads for the load carrying system. To achieve these values, the base plate must be fully supported along its full length and the load must be equally distributed among all four bearings. For best results, your application analysis should determine maximum loading on each bearing. **Do not exceed 20 in./sec. velocity or 15 cycle/minute cycle rate; the internal piston bearings will heat up and cause sluggish motion.**

Radial Load and Pull-off Load

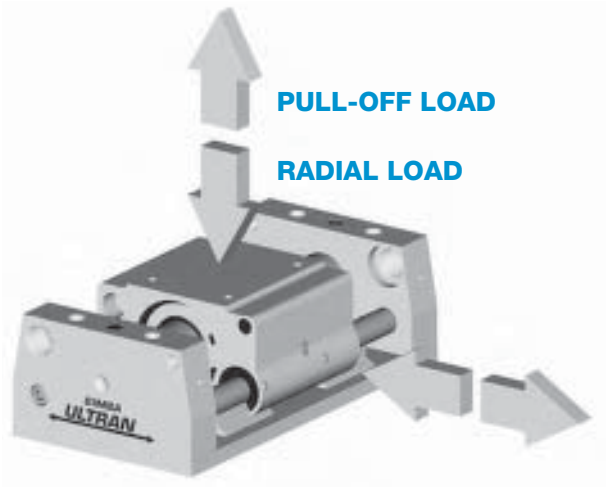
A load applied perpendicular to both the base plate and to the direction of actuation. Load directed toward the base plate represents the maximum loading capacity of the system. Load directed away from the base plate reduces the system's load rating to approximately 40% of maximum radial loading. This is what's called the “pull-off” capacity.

In this loading condition, the maximum radial load-carrying capability is 620 pounds per bearing. The maximum “pull-off” load in the same mounting condition is 248 pounds per bearing.

Side Load

A load that is applied parallel to the base plate, but perpendicular to the direction of actuation. Depending on bore size, the maximum side load will be at least 20% less than the maximum radial loading capacity.

In this loading condition, the maximum load carrying capability is 496 pounds per bearing. Only two bearings are used to calculate the load carrying capability of the 1-1/4" bore unit.



SKETCH A

Size/Application Considerations

Radial Moment Load (Mr)

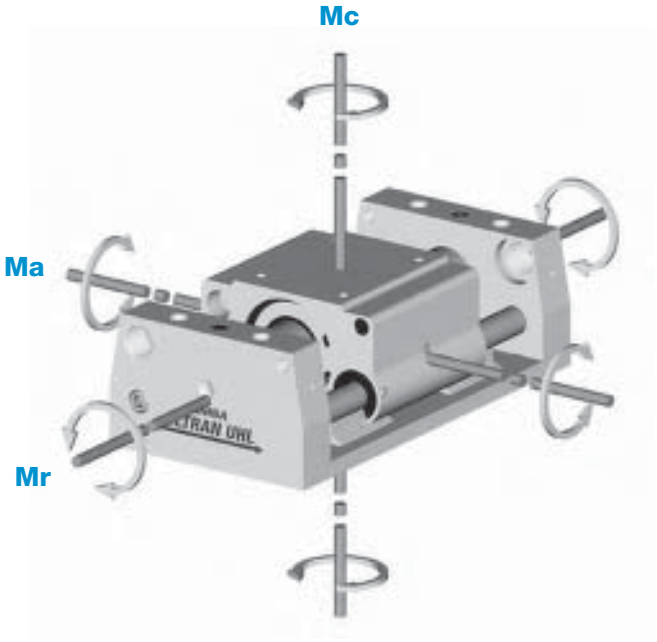
An unbalanced radial or side load applied to the system. The center of the radial load must be outside the span of the guide shafts, or the center of the side load must be at some point other than the center of the guide shafts to cause a radial moment loading condition.

Axial Moment Load (Ma)

An axial (same as the direction of actuation) load applied to the system, where the center of the load is at some point other than the center of the guide shafts. The load must also be between the span of the guide shafts to be a pure axial moment loading condition.

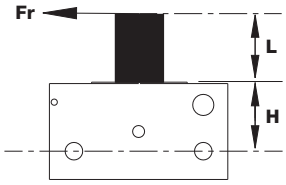
Cross Moment Load (Mc)

An axial load applied to the system, where the center of the load is at some point outside of the span of the guide shafts.



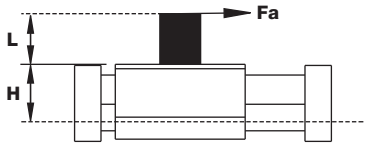
SKETCH B

Radial Moment



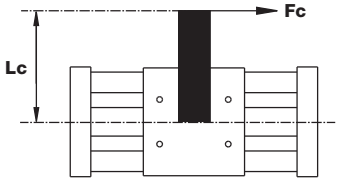
SKETCH C

Axial Moment



SKETCH D

Cross Moment



SKETCH E

Sketches C, D, and E demonstrate how a force is applied to a moment arm to produce the moments shown in Sketch B. Use the equations below to determine the actual moments created by your application. The results of each calculated moment should be compared to the maximums listed in the table. (If the actual moments are greater than the listed maximums, then the load and moments should be re-evaluated.)

Radial Moment	=	Mr	=	Fr x (L+H)
Axial Moment	=	Ma	=	Fa x (L+H)
Cross Moment	=	Mc	=	Fc x (Lc)

A High Load Ultran Slide can withstand compound moments but the maximum allowable will be determined by the total percentage of the axial, radial and cross moments. The equation below will determine the compound moment percent based on the total moments. The compound moment percent must not be greater than 100. (If the compound moment percent is greater than 100, then the load and moments should be re-evaluated.)

$$M_{\text{compound }\%} = 100 \times \left(\frac{Mr}{Mr\ max} + \frac{Ma}{Ma\ max} + \frac{Mc}{Mc\ max} \right) \leq 100\%$$

Size/Application Considerations

Unsupported Loads

If your application does not fully support the base plate, refer to Graphs 1-3. Graph 1, “Load vs. Span” displays the maximum load allowable with a maximum 0.005" deflection.

If your application allows for greater deflections, refer to Graphs 2 and 3, “Deflection vs. Span”. Use the following steps to determine resultant loads or deflections pertinent to your application.

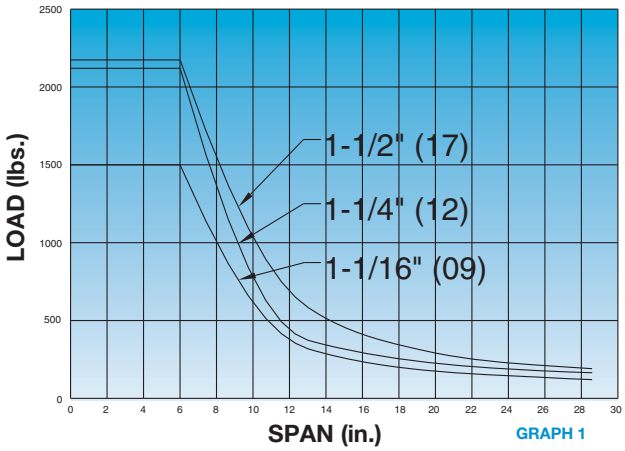
1. If you know the length (span) that the base plate will be supported, find that span on the X-Axis of the graph. From this point, go up to the approximate location that best represents your weight or load. Across to the left from this point where it intersects the Y-Axis identifies what deflection can be expected between the supported points.

2. If you know the maximum amount of deflection that your application can tolerate, find this deflection on the Y-Axis of the graph. Once you locate the desired deflection, go across to the approximate location that best represents your weight or load. Directly under this point on the X-Axis is the recommended span length.

If your application combines radial and moment loads, or exceeds the deflections from Graphs 2 and 3, consult your authorized Bimba distributor to determine if the application is feasible.

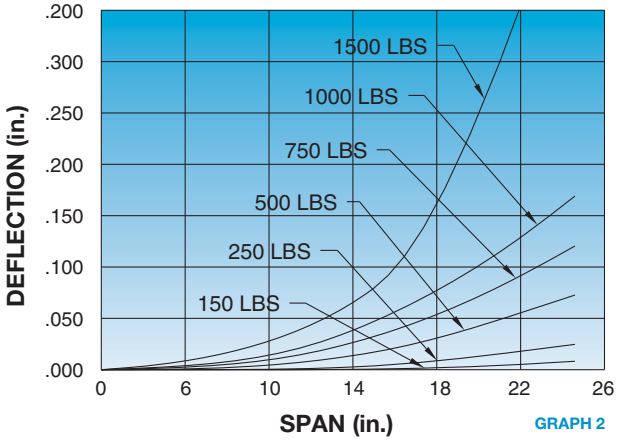
NOTE: Velocities exceeding 20 in./sec. or 15 cycle/minute require review by Bimba.

LOAD vs SPAN



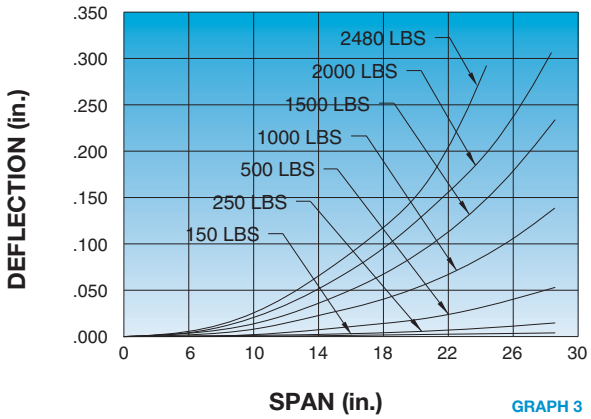
GRAPH 1

(1-1/16" Bore)
DEFLECTION vs SPAN



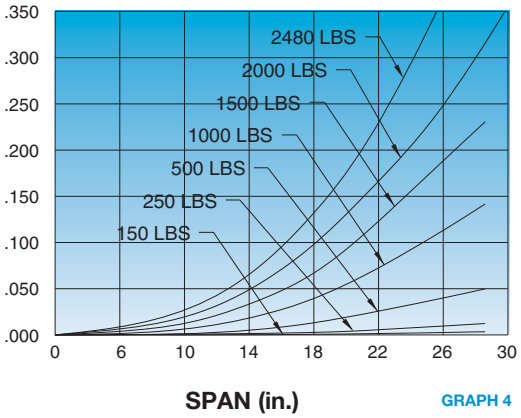
GRAPH 2

(1-1/4" Bore)
DEFLECTION vs SPAN



GRAPH 3

(1-1/2" Bore)
DEFLECTION vs SPAN

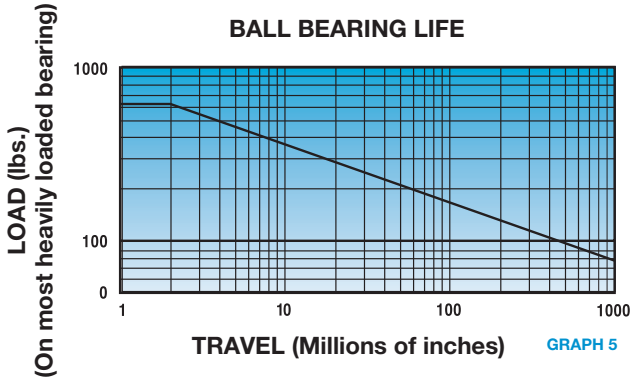


GRAPH 4

Bearing Life

The life of the ball bearing bushings are primarily affected by the amount of load it is required to carry. This can be best illustrated by Graph 4 below.

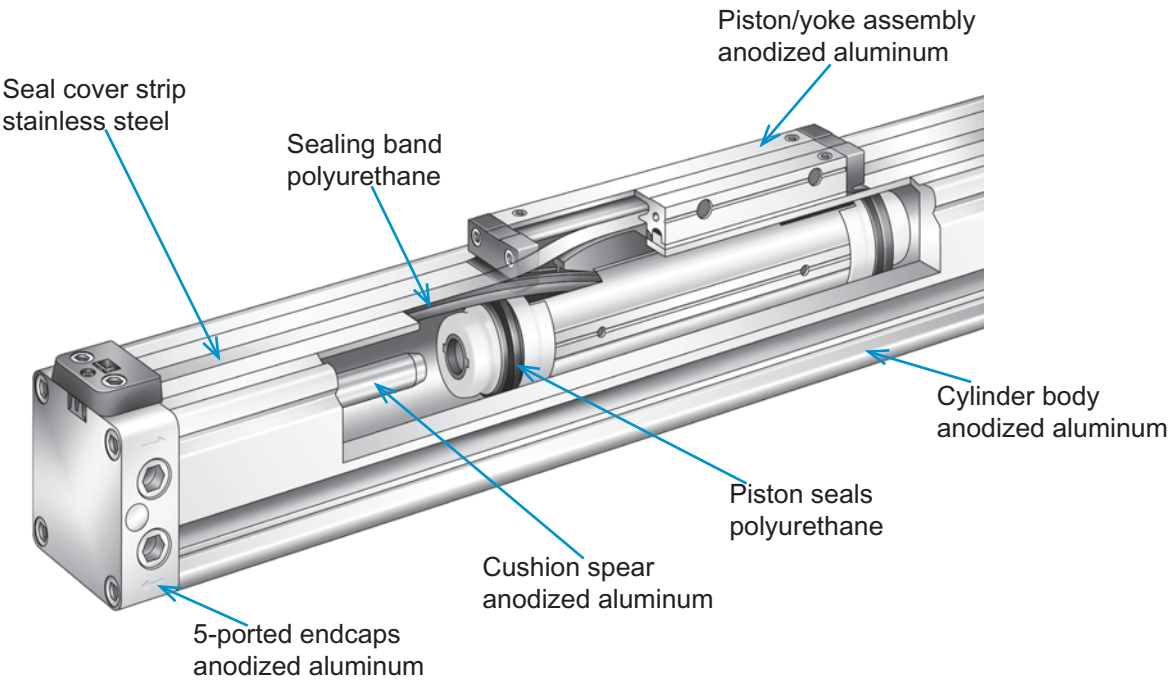
BALL BEARING LIFE



GRAPH 5

Bimba Ultran Band Rodless Cylinders

- The Bimba Ultran Band is a mechanically-coupled rodless cylinder, providing overall length savings in excess of 40% vs. traditional cylinders.
- Specially engineered sealing strip out performs all other band sealing systems on the market.
- Stainless steel cover strip protects the sealed area and prolongs band life.
- Bore sizes range from 18mm to 63mm in basic model as well as with additional guiding.
- All models are switch-ready and come standard with finely adjustable cushioning.
- Unique five-ported endcaps provide maximum plumbing flexibility.



How to Order

The model number for all Ultran Band cylinders consists of three alphanumeric clusters. These designate product type, bore size, stroke length, and options. Please refer to the charts below for an example of model number UB-2512-1XCM. This is a 25mm bore, 12" stroke UB with single-end porting on right end, ports on front side, cushions, and magnet.

UB - 2512 - 1XCM

Model Type
UB - Ultran Band
UBS - Ultran Band, Side Guide
UBM - Ultran Band, Metric
UBSM - Ultran Band, Metric, Side Guide

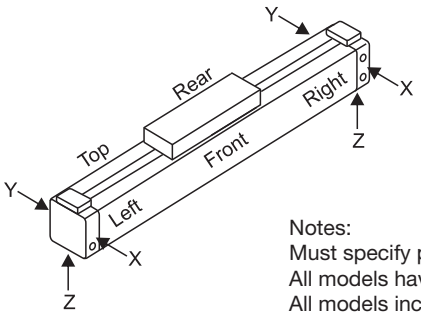
Bore Size
18 - 18mm
25 - 25mm
32 - 32mm
40 - 40mm
50 - 50mm
63 - 63mm

Stroke Length[1]
1" increments to 120" max.[1] (UB, UBS)
25mm increments to 3000mm max. (UBM, UBSM)

[1]Price adder applies to strokes over 48 inches (1220 mm). Contact Bimba Customer Service for more information.

Options
1 - Single End Porting (RH) (X, Y positions only)
2 - Single End Porting (LH) (X, Y positions only)
3 - Double End Porting (X, Y or Z positions)
F - Floating Mounting Bracket[2]
X - Side Front Port Position
Y - Side Rear Port Position
Z - Bottom Port Position
C - Adjustable Cushions
M - MRS Position Sensing

[2]Only available on UB models sized 25mm and larger. Not available on 18mm models, or on UBS, UBM, and UBSM. If a floating mounting bracket is required for these models, contact Bimba. For use when a non-parallel or floating interface with the carriage is required to prevent binding between the UB and external guiding systems. Refer to page 5.39 for dimensions.



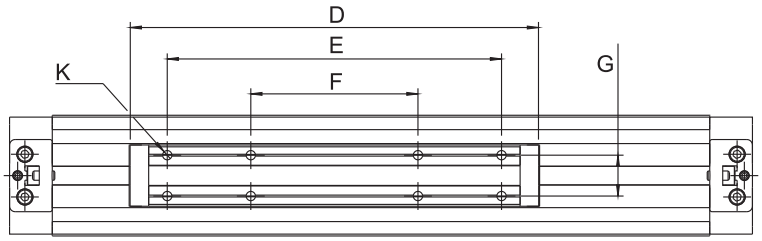
Notes:
Must specify port function and location.
All models have cushions; include “C” in all part numbers.
All models include magnet and are switch-ready; include “M” in all part numbers.
For port positioning, use diagram above.

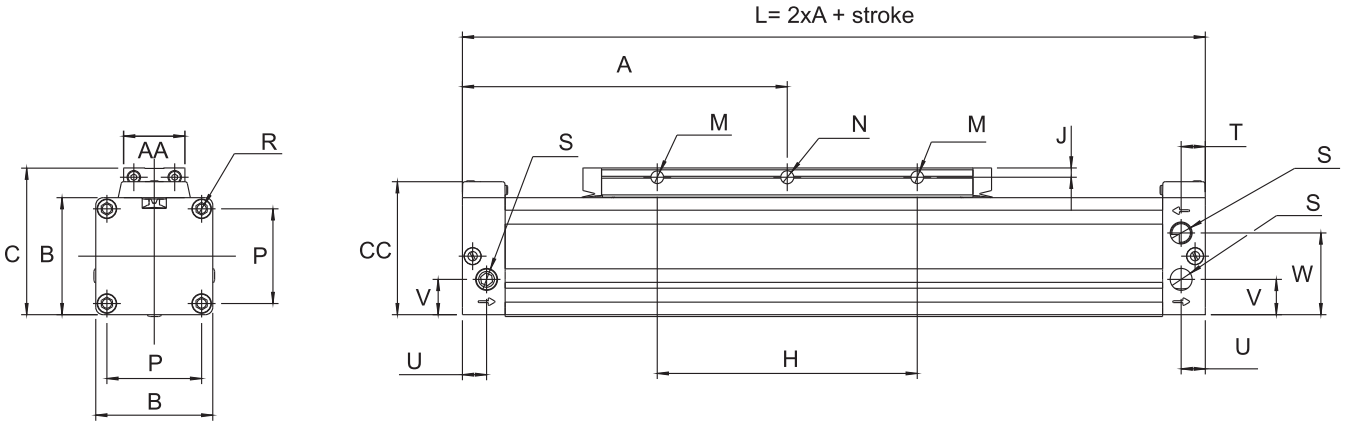
List Prices

Base Model	18mm	25mm	32mm	40mm	50mm	63mm
UB, UBM	$ 218.40	$ 240.25	$ 344.00	$ 420.45	$ 535.10	$ 649.75
UBS, UBSM	333.10	376.75	513.25	627.90	808.10	1037.40
Add per inch of stroke or per 25mm of stroke	4.10	5.15	8.55	11.45	12.85	16.10
Floating mount bracket	N/A	40.45	43.80	45.60	70.90	74.85

Cushions (C) and Magnet (M) are standard and must be included in all model numbers.
Port position must be specified on every model number.
No additional charge for C, M or port positioning.
Fractional strokes are priced to the next standard increment.

Basic Model (UB, UBM)





Active port positions are specified in model number. All other ports supplied with plugs.

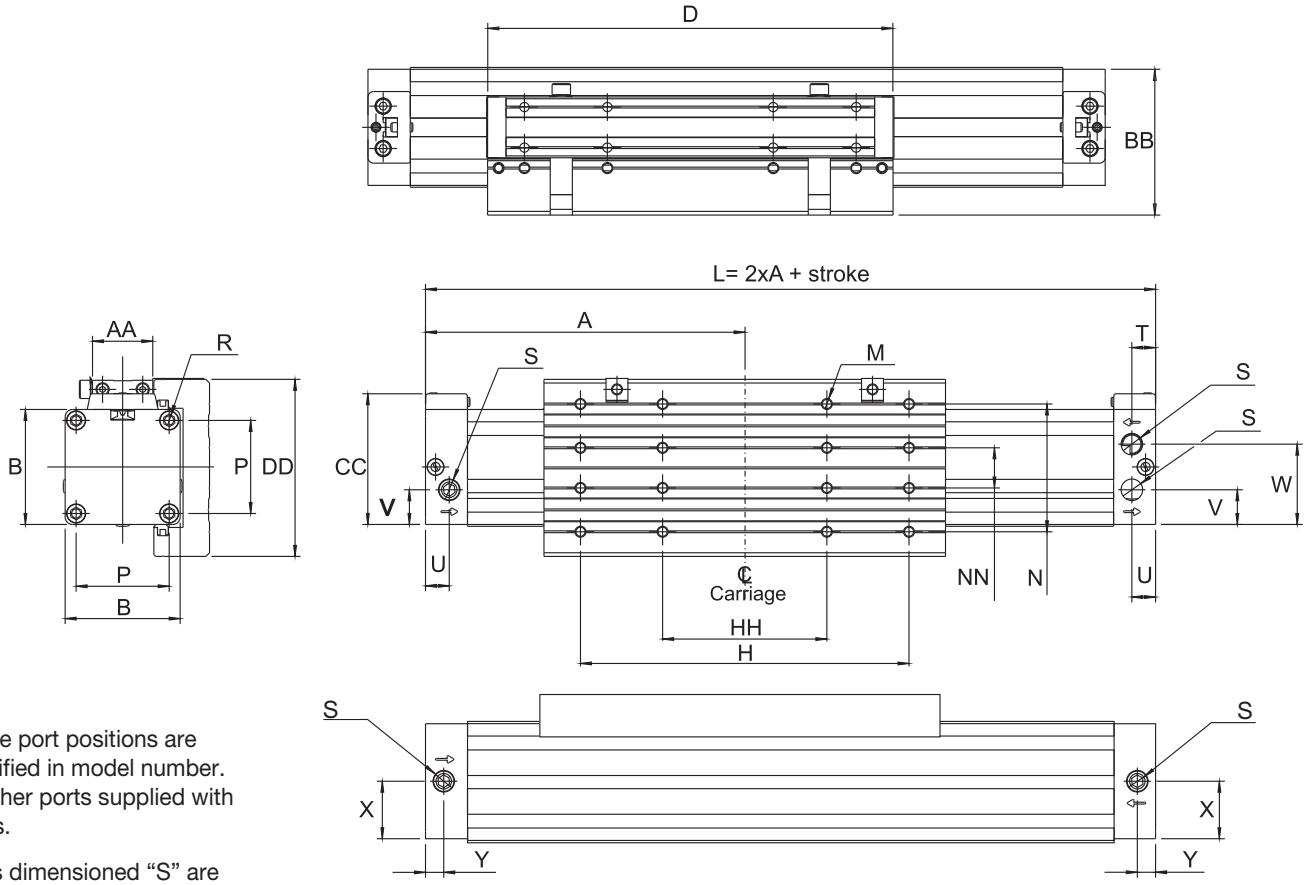
Ports dimensioned “S” are duplicated on opposite face.

Dimensions mm (in.)

Bore Size	A	AA	B	C	CC	D	E	F	G	H	J	K
18mm	80 (3.15)	15.5 (0.61)	30 (1.18)	39 (1.54)	36.5 (1.44)	103 (4.06)	75 (2.95)	-	10 (0.39)	50 (1.97)	3 (0.12)	M3x7 (#4-48x0.28)
25mm	100 (3.94)	20 (0.79)	42 (1.65)	53 (2.09)	50.2 (1.98)	131 (5.16)	100 (3.94)	50 (1.97)	13 (0.51)	70 (2.76)	3.5 (0.14)	M4X7 (#8-36x0.28)
32mm	120 (4.72)	25 (0.98)	52 (2.05)	65 (2.56)	60.2 (2.37)	171 (6.73)	140 (5.51)	70 (2.76)	16 (0.63)	100 (3.94)	4.5 (0.18)	M5X9 (#10-32x0.35)
40mm	150 (5.91)	33 (1.3)	63 (2.48)	79 (3.11)	71.6 (2.82)	220 (8.66)	180 (7.09)	90 (3.54)	22 (0.87)	140 (5.51)	5 (0.2)	M6X10 (1/4-28x0.39)
50mm	180 (7.09)	42 (1.65)	78 (3.07)	96 (3.78)	86.6 (3.41)	280 (11.02)	220 (8.66)	110 (4.33)	29 (1.14)	180 (7.09)	6.5 (0.26)	M8X12.5 (5/16-24x0.49)
63mm	215 (8.46)	54 (2.13)	93 (3.66)	113.5 (4.47)	101.6 (4)	333 (13.11)	280 (11.02)	140 (5.51)	40 (1.57)	230 (9.06)	8 (0.31)	M8X15 (5/16-24x0.59)

Bore Size	OM	ON	P	R	Port S	T	U	V	W	X	Y
18mm	3.4 (0.13)	3.5 (0.14)	23.5 (0.93)	M3x8 (#4-48x0.31)	M5 (10-32)	9.5 (0.37)	9.5 (0.37)	9.3 (0.37)	20.7 (0.81)	15 (0.59)	6.5 (0.26)
25mm	4.4 (0.17)	4.5 (0.18)	33 (1.3)	M4x10 (#8-36x0.39)	G1/8 (1/8 NPT)	7 (0.28)	13 (0.51)	13.5 (0.53)	28.5 (1.12)	21 (0.83)	7.0 (0.28)
32mm	5.3 (0.21)	5.5 (0.22)	41 (1.61)	M5x11 (#10-32x0.43)	G1/8 (1/8 NPT)	7 (0.28)	7 (0.28)	15.5 (0.61)	36.5 (1.44)	26 (1.02)	9.0 (0.35)
40mm	6.8 (0.27)	7 (0.28)	51 (2.01)	M6x13 (1/4-28x0.51)	G1/4 (1/4 NPT)	13 (0.51)	13 (0.51)	19 (0.75)	44 (1.73)	31.5 (1.24)	10 (0.39)
50mm	6.8 (0.27)	7 (0.28)	63 (2.48)	M8x13 (5/16-24x0.51)	G1/4 (1/4 NPT)	12 (0.47)	12 (0.47)	21 (0.83)	50 (1.97)	39 (1.54)	12 (0.47)
63mm	8.8 (0.35)	9 (0.35)	78 (3.07)	M8x13 (5/16-24x0.51)	G3/8 (3/8 NPT)	13 (0.51)	12 (0.47)	23 (0.91)	61.5 (2.42)	46.5 (1.83)	12 (0.47)

Side Guide Model (UBS, UBSM)



Active port positions are specified in model number. All other ports supplied with plugs.

Ports dimensioned “S” are duplicated on opposite face.

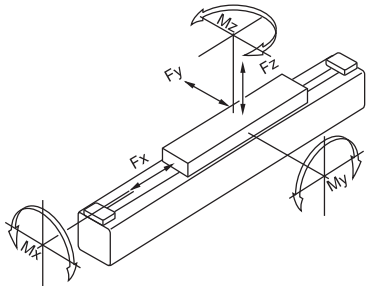
Dimensions mm (in.)

Bore Size	A	AA	B	BB	CC	D	DD	H	HH	M	N
18mm	80 (3.15)	15.5 (0.61)	30 (1.18)	39 (1.54)	36.5 (1.44)	103 (4.06)	50 (1.97)	75 (2.95)	-	M3x7 (#4-48x0.28)	35 (1.38)
25mm	100 (3.94)	20 (0.79)	42 (1.65)	53 (2.09)	50.2 (1.98)	131 (5.16)	66 (2.6)	100 (3.94)	50 (1.97)	M4x7 (#8-36x0.28)	45 (1.77)
32mm	120 (4.72)	25 (0.98)	52 (2.05)	65 (2.56)	60.2 (2.37)	171 (6.73)	80 (3.15)	140 (5.51)	70 (2.76)	M5x9 (#10-32x0.35)	55 (2.17)
40mm	150 (5.91)	33 (1.3)	63 (2.48)	79 (3.11)	71.6 (2.82)	220 (8.66)	97 (3.82)	180 (7.09)	90 (3.54)	M6x10 (1/4-28x0.39)	70 (2.76)
50mm	180 (7.09)	42 (1.65)	78 (3.07)	96 (3.78)	86.6 (3.41)	280 (11.02)	116 (4.57)	220 (8.66)	110 (4.33)	M8x12.5 (5/16-24x0.49)	85 (3.35)
63mm	215 (8.46)	54 (2.13)	93 (3.66)	113.5 (4.47)	101.6 (4)	333 (13.11)	136 (5.35)	280 (11.02)	140 (5.51)	M8x15 (5/16-24x0.59)	105 (4.13)

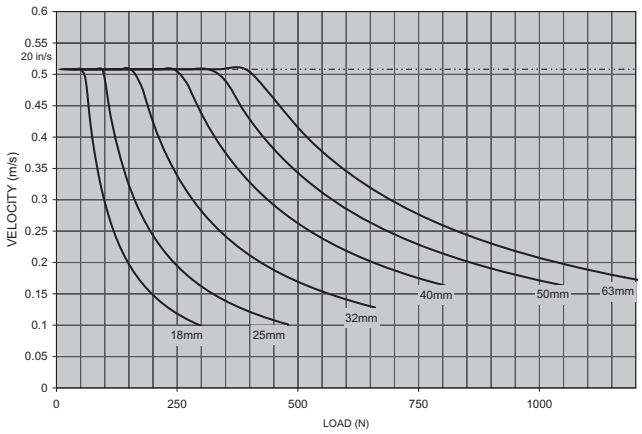
Bore Size	NN	P	R	Port S	T	U	V	W	X	Y
18mm	10 (0.39)	23.5 (0.93)	M3x8 (#4-48x0.31)	M5 (#10-32)	9.5 (0.37)	9.5 (0.37)	9.3 (0.37)	20.7 (0.81)	15 (0.59)	6.5 (0.26)
25mm	13 (0.51)	33 (1.30)	M4x10 (#8-36x0.39)	G1/8 (1/8 NPT)	7 (0.28)	13 (0.51)	13.5 (0.53)	28.5 (1.12)	21 (0.83)	7 (0.28)
32mm	16 (0.63)	41 (1.61)	M5x11 (#10-32x0.43)	G1/8 (1/8 NPT)	7 (0.28)	7 (0.28)	15.5 (0.61)	36.5 (1.44)	26 (1.02)	9 (0.35)
40mm	22 (0.87)	51 (2.01)	M6x13 (1/4-28x0.51)	G1/4 (1/4 NPT)	13 (0.51)	13 (0.51)	19 (0.75)	44 (1.73)	31.5 (1.24)	10 (0.39)
50mm	29 (1.14)	63 (2.48)	M8x13 (5/16-24x0.51)	G1/4 (1/4 NPT)	12 (0.47)	12 (0.47)	21 (0.83)	50 (1.97)	39 (1.54)	12 (0.47)
63mm	40 (1.57)	78 (3.07)	M8x13 (5/16-24x0.51)	G3/8 (3/8 NPT)	13 (0.51)	12 (0.47)	23 (0.91)	61.5 (2.42)	46.5 (1.83)	12 (0.47)

Engineering Data

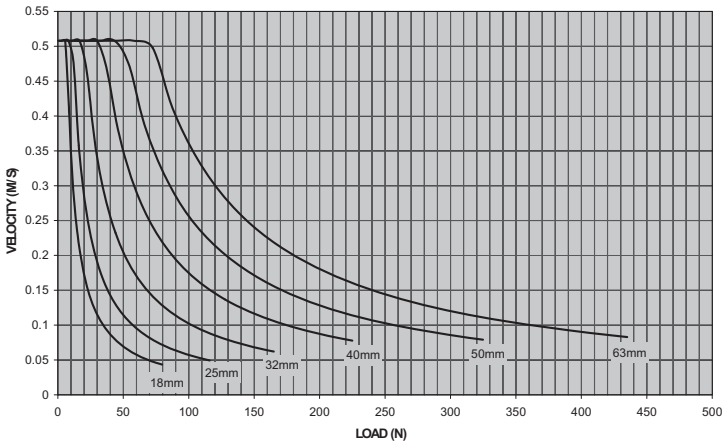
Basic Model (UB, UBM)



Load (Fz) vs. Velocity

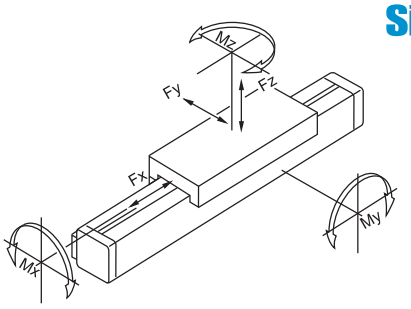


Load (Fy) vs. Velocity

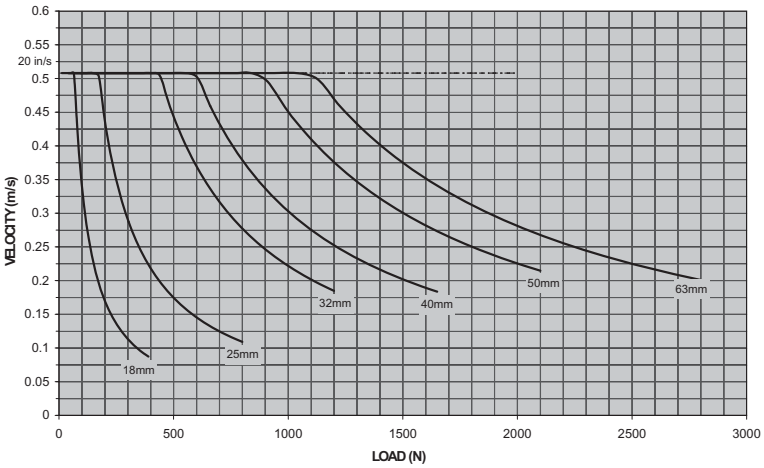


Bore Size	Maximum Moment, Nm (in-lb)		
	Mx	My	Mz
18mm	1 (8.8)	3 (26.5)	3 (26.5)
25mm	2 (17.7)	13 (115)	13 (115)
32mm	3.5 (31)	25 (221.2)	25 (221.2)
40mm	5.5 (48.7)	40 (354)	40 (354)
50mm	10 (88.5)	65 (575.2)	65 (575.2)
63mm	16 (141.6)	100 (885)	100 (885)

Side Guide Model (UBS, UBSM)



Load (Fy or Fz) vs. Velocity



Bore Size	Maximum Moment, Nm (in-lb)		
	Mx	My	Mz
18mm	3.5 (31)	6 (53.1)	6 (53.1)
25mm	10 (88.5)	20 (177)	20 (177)
32mm	25 (221.2)	45 (398.2)	45 (398.2)
40mm	40 (354)	75 (663.7)	75 (663.7)
50mm	80 (708)	150 (1327.4)	150 (1327.4)
63mm	110 (973.5)	250 (2212.4)	250 (2212.4)

Nx 0.225 = LB
m/sec x 39.4 = in/sec

Engineering Data

Kinetic Energy

Term	Description	S.I. Units	U.S. Units
KE	Kinetic energy	N-m	in-lb.
W	Weight of applied load	kg	lb.
k	Bore constant	kg	lb.
V	Maximum velocity*	M/sec	in/sec

*Note: Maximum velocity, or impact velocity, is typically = 2 x average velocity

Using S.I. Units

$KE = 1/2 \times (W + k) \times V^2$

Bore Size	UB, UBM	UBS, UBSM	UB, UBM UBS, UBSM	UBS, UBSM	
	Bore Constant (k) (kg)		Max KE no shocks* (N-m)	Max KE with shocks (N-m)	Max KE/hr with shocks (N-m/hr)
18mm	0.07	0.16	0.56	27	33894
25mm	0.15	0.33	1.70	27	33894
32mm	0.30	0.62	4.52	27	33894
40mm	0.55	1.15	8.20	192	75698
50mm	1.02	1.99	12.35	192	75698
63mm	1.73	3.09	15.46	192	75698

Using U.S. Units

$KE = 1/773 \times (W + k) \times V^2$

Bore Size	UB, UBM	UBS, UBSM	UB, UBM UBS, UBSM	UBS, UBSM	
	Bore Constant (k) (lb)		Max KE no shocks* (in-lb.)	Max KE with shocks (in-lb.)	Max KE/hr with shocks (in-lb./hr)
18mm	0.15	0.35	4.96	239	299947
25mm	0.33	0.73	15.04	239	299947
32mm	0.66	1.37	40.00	239	299947
40mm	1.21	2.53	72.57	1699	669894
50mm	2.25	4.38	109.29	1699	669894
63mm	3.81	6.81	136.81	1699	669894

*Note: Any application where velocity exceeds 0.5 m/sec (20 in/sec) requires shock absorbers

General Specifications

Pressure Rating: 2 to 8 bar (30 to 110 psi), dry filtered air
Breakaway: 15 psi or less (UB, UBM)
30 psi or less (UBS, UBSM)
Leakage: 100 sccm or less
Operating Temperature: 20˚C to 80˚C (-4˚F to 175˚F)
Expected Service Life: 1,000 linear miles
Lubrication: Silicone grease
Maximum Speed: 100 in./sec. (impact velocity)
50 in./sec. (average velocity)

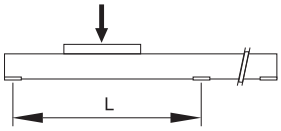
Accessories

Center Supports (UBCS-___)

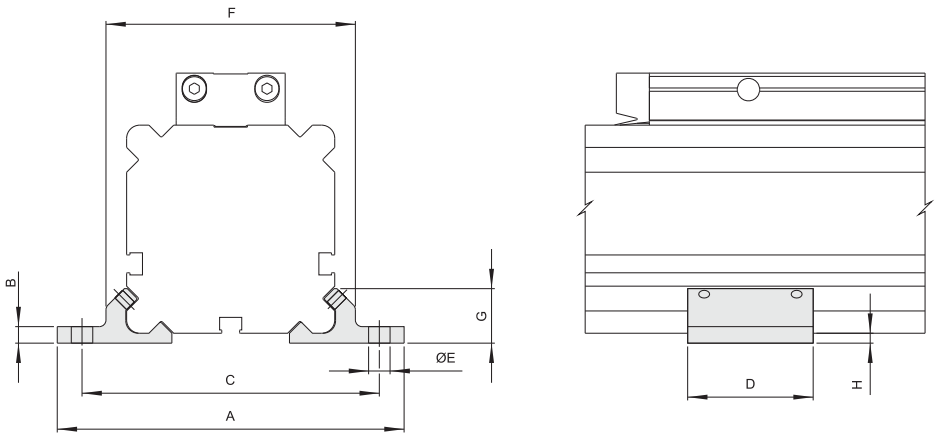
Kit includes: 2 supports and mounting hardware.

Additional cylinder support is needed for cylinder span and load combinations as shown in table.

Bore Size
18 - 18mm
25 - 25mm
32 - 32mm
40 - 40mm
50 - 50mm
63 - 63mm



Bore Size	Distance L mm (inch) with 0.5mm deflection						
	250 N (56 lb.)	500N (112 lb.)	750N (169 lb.)	1000N (225 lb.)	1500N (337 lb.)	2000N (450 lb.)	2500N (562 lb.)
18mm	700 (28)	-	-	-	-	-	-
25mm	1100 (43)	1350 (53)	700 (28)	-	-	-	-
32mm	1400 (55)	1100 (43)	950 (37)	850 (33)	-	-	-
40mm	1600 (63)	1300 (51)	1150 (45)	1050 (41)	900 (35)	-	-
50mm	2050 (81)	1700 (67)	1550 (61)	1350 (53)	1150 (45)	1050 (41)	-
63mm	2450 (96)	2050 (81)	1850 (73)	1700 (67)	1550 (61)	1350 (53)	1250 (49)



Dimensions mm (in.)

Bore Size	A	B	C	D	ØE	F	G	H
18mm	56 (2.20)	2.5 (0.10)	46 (1.81)	23 (0.91)	4.3 (0.17)	36.5 (1.44)	8.3 (0.33)	2.0 (0.08)
25mm	70 (2.76)	3.5 (0.14)	60 (2.36)	28 (1.10)	5.3 (0.21)	50.0 (1.97)	11.0 (0.43)	2.0 (0.08)
32mm	85 (3.35)	4.0 (0.16)	73 (2.87)	33 (1.30)	5.3 (0.21)	61.5 (2.42)	13.8 (0.54)	3.0 (0.12)
40mm	105 (4.13)	4.5 (0.18)	90 (3.54)	38 (1.50)	6.5 (0.26)	75.0 (2.95)	16.5 (0.65)	3.0 (0.12)
50mm	122 (4.80)	5.0 (0.20)	106 (4.17)	43 (1.69)	8.5 (0.33)	91.0 (3.58)	19.0 (0.75)	3.0 (0.12)
63mm	144 (5.67)	6.0 (0.22)	125 (4.92)	48 (1.89)	8.5 (0.33)	107 (4.21)	22.0 (0.87)	4.5 (0.18)

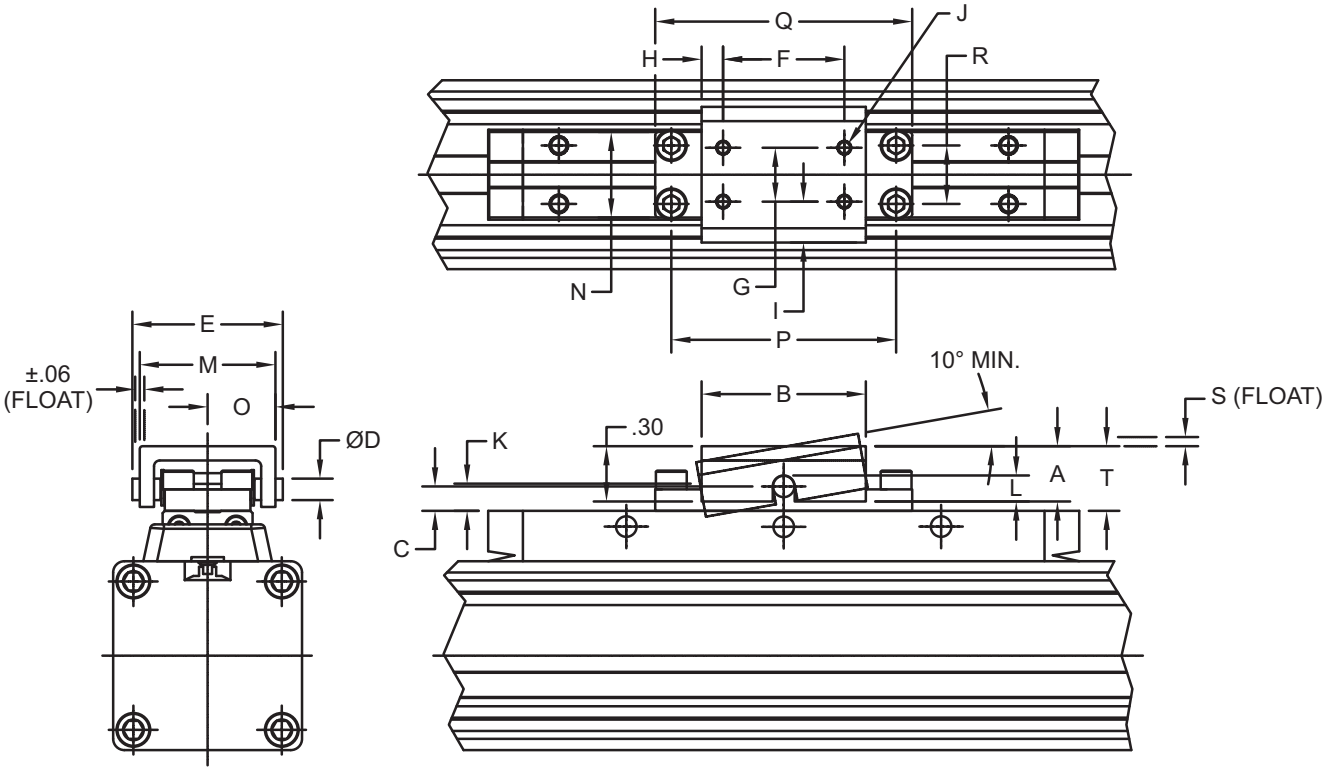
Accessories

Floating Mounting Bracket (UBFM-___)

Only suitable for use on UB models sized 25mm and larger. Not suitable for use on UBS, UBM, and UBSM models. If a floating mounting bracket is required for these models, contact Bimba.

Ideal when a non-parallel or floating interface is required for interfacing the carriage to an external guiding system. Prevents binding between the UB and the external guiding hardware.

Bore Size
25 - 25mm
32 - 32mm
40 - 40mm
50 - 50mm
63 - 63mm



Dimensions mm (in.)

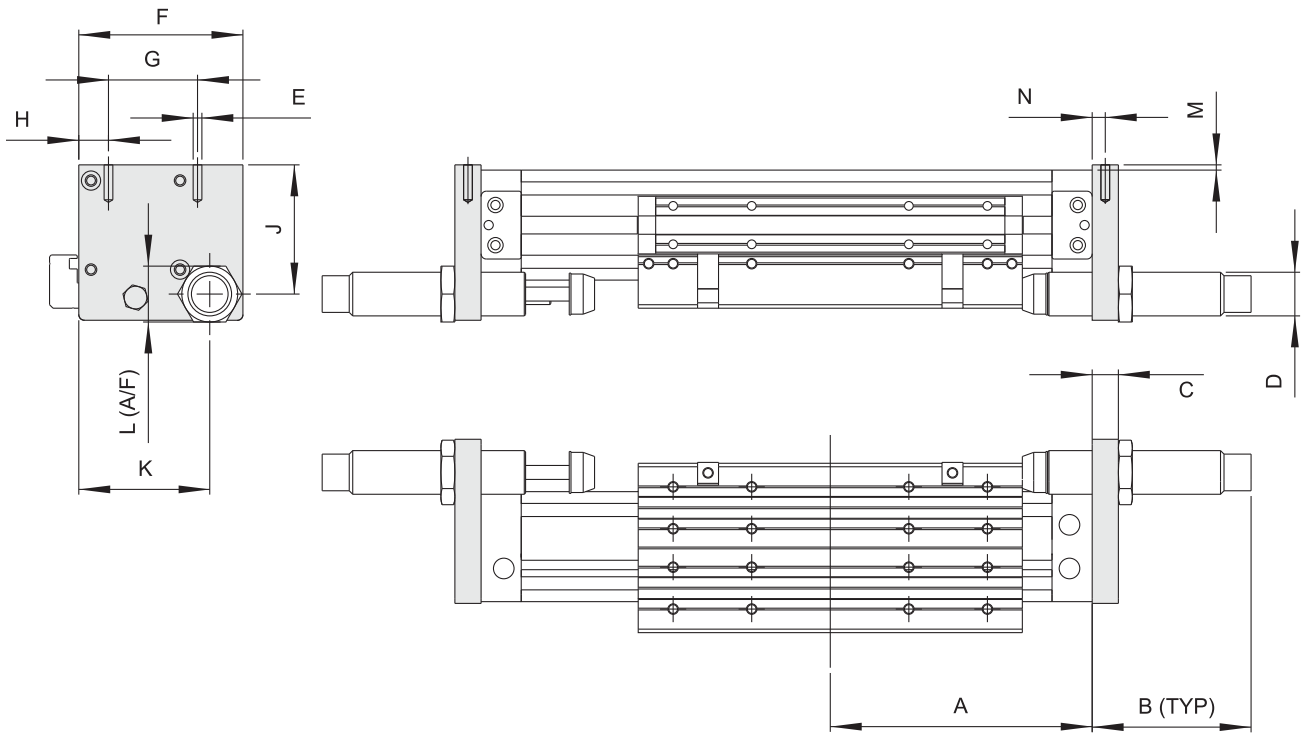
Bore Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
25mm	0.53	1.44	0.19	0.19	1.32	1.06	0.47	0.19	0.36	#4-40 UNC	0.24	0.25	1.19	0.75	0.59	1.97	2.25	0.51	0.15	0.56
32mm	0.63	1.69	0.19	0.25	1.65	1.19	0.75	0.25	0.38	#6-32 UNC	0.25	0.31	1.52	1.00	0.76	2.76	3.25	0.63	0.19	0.63
40mm	0.75	1.88	0.19	0.25	2.01	1.50	1.00	0.19	0.44	#8-32 UNC	0.28	0.31	1.88	1.30	0.94	3.54	4.13	0.87	0.19	0.75
50mm	0.75	1.88	0.25	0.25	2.01	1.50	1.00	0.19	0.44	#8-32 UNC	0.28	0.31	1.88	1.61	0.94	4.33	4.91	1.14	0.19	0.81
63mm	0.94	2.75	0.31	0.37	2.85	2.13	1.63	0.31	0.55	#10-24 UNC	0.42	0.44	2.72	2.04	1.36	5.51	6.25	1.58	0.25	1.00

Accessories

Shock Absorber Bracket (UBSB-___ ; UBMSB-___)

Kit includes: 2 brackets and mounting hardware.

Bore Size
18 - 18mm
25 - 25mm
32 - 32mm
40 - 40mm
50 - 50mm
63 - 63mm



Shock absorber shown fully compresed with cylinder at end of stroke

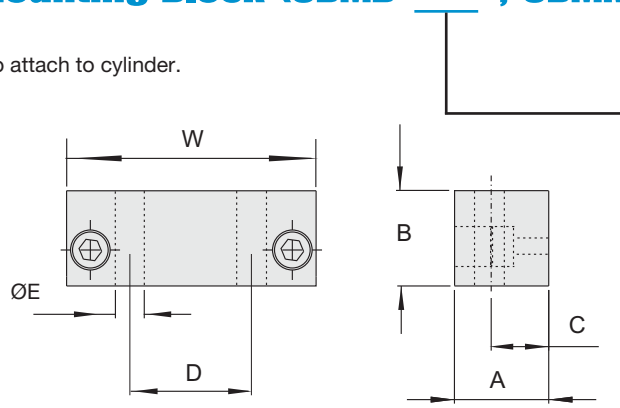
Dimensions (in.)

Bore Size	A	B	C	D	E	F	G	H	J	K	L	M	Shock Absorber PIN
18mm	80 (3.15)	62 (2.44)	8 (0.31)	M14x1.5 (1/2-20)	M3x10 (#4-40)	44.5 (1.75)	23.5 (0.93)	9 (0.35)	37 (1.46)	36.5 (1.44)	17 (0.67)	2 (0.08)	SSM-27 (SS-09)
25mm	100 (3.94)	56 (2.2)	10 (0.39)	M14x1.5 (1/2-20)	M4x10 (#8-32)	58 (2.28)	33 (1.3)	13.5 (0.53)	50 (1.97)	50 (1.97)	17 (0.67)	2 (0.08)	SSM-27 (SS-09)
32mm	120 (4.72)	56 (2.2)	12 (0.47)	M14x1.5 (1/2-20)	M5x12 (10-24)	71 (2.79)	41 (1.61)	15.5 (0.61)	61.5 (2.42)	61 (2.4)	17 (0.67)	2 (0.08)	SSM-27 (SS-09)
40mm	150 (5.91)	91 (3.58)	15 (0.59)	M25x1.5 (1-12)	M6x15 (1/4-20)	94 (3.70)	51 (2.01)	17 (0.67)	74 (2.91)	75 (2.95)	32 (1.26)	3 (0.12)	SSM-50 (SS-31)
50mm	180 (7.09)	91 (3.58)	15 (0.59)	M25x1.5 (1-12)	M8x20 (5/16-18)	103 (4.06)	63 (2.48)	23.5 (0.93)	90 (3.54)	89 (3.5)	32 (1.26)	3 (0.12)	SSM-50 (SS-31)
63mm	215 (8.46)	82.5 (3.25)	15 (0.59)	M25x1.5 (1-12)	M8x20 (5/16-18)	119.5 (4.7)	78 (3.07)	21 (0.83)	107 (4.21)	105.5 (4.15)	32 (1.26)	4.5 (0.18)	SSM-50 (SS-31)

Accessories

Mounting Block (UBMB-___ ; UBMMB-___)

Kit includes: 2 blocks, 4 bolts to attach to cylinder.



Bore Size
18 - 18mm
25 - 25mm
32 - 32mm
40 - 40mm
50 - 50mm
63 - 63mm

Dimensions mm (in.)

Bore Size	A	B	C	D	ØE	W
18mm	10 (0.39)	14.5 (0.57)	5 (0.2)	14 (0.55)	4.5 (0.18)	30 (1.18)
25mm	15 (0.59)	17 (0.67)	7.5 (0.3)	22 (0.87)	5.5 (0.22)	42 (1.65)
32mm	15 (0.59)	20 (0.79)	7.5 (0.3)	23.5 (0.93)	7 (0.28)	52 (2.05)
40mm	15 (0.59)	23 (0.91)	7.5 (0.3)	30 (1.18)	9 (0.35)	63 (2.48)
50mm	16 (0.63)	26 (1.02)	8 (0.31)	39 (1.54)	9 (0.35)	78 (3.07)
63mm	20 (0.79)	27.5 (1.08)	10 (0.39)	52 (2.05)	11 (0.43)	93 (3.66)

List Prices

Kits	18mm	25mm	32mm	40mm	50mm	63mm
UBMB-_ _	$ 56.85	$ 72.80	$ 76.15	$ 84.15	$ 89.80	$107.95
UBSB-___; UBMSB-_ _	101.20	104.55	107.95	113.65	122.70	132.95
UBCS-_ _	21.65	23.90	23.90	27.30	29.60	29.60
UBFM-_ _[1]	N/A	47.45	51.15	53.40	82.35	86.90
Shock Absorbers						
Metric	SSM-27 $ 72.60			SSM-50 $177.75		
Inch	SS-09 72.60			SS-31 177.75		

[1]Only available for UB models sized 25mm and larger.

Basic Repair Kits

Kits include: all seals, sealing band, cover strip, all assembly hardware.
Two kits are offered; one for strokes up to 3m stroke and one for strokes 3-6m.

Example: Basic repair kit for UB-2536-1XCM = RK9N0253

Bore Size	Kits for Stroke 0-3m (0-118")		Kits for Strokes 3-6m (118" +)	
	Seal Kit (3m) NPT (inch)	List	Seal Kit (6m) NPT (inch)	List
18mm	RK9N0183	$232.60	RK9N0186	$334.00
25mm	RK9N0253	232.60	RK9N0256	339.90
32mm	RK9N0323	232.60	RK9N0326	345.90
40mm	RK9N0403	238.55	RK9N0406	351.85
50mm	RK9N0503	244.55	RK9N0506	357.80
63mm	RK9N0633	262.40	RK9N0636	381.65

Bore Size	Kits for Stroke 0-3m (0-118")		Kits for Strokes 3-6m (118" +)	
	Seal Kit (3m) Metric	List	Seal Kit (6m) Metric	List
18mm	RK9Y0183	$232.60	RK9Y0186	$334.00
25mm	RK9Y0253	232.60	RK9Y0256	339.90
32mm	RK9Y0323	232.60	RK9Y0326	345.90
40mm	RK9Y0403	238.55	RK9Y0406	351.85
50mm	RK9Y0503	244.55	RK9Y0506	357.80
63mm	RK9Y0633	262.40	RK9Y0636	381.65

Position Sensing Switches

List Prices

Switch Model Numbers		Description	List Price
18mm bore only	25mm-63mm bores		
MSK	UBSK	GMR, Sinking, 3m cable (NPN)	$ 36.90
MSC	UBSC	GMR, Sourcing, 3m cable (PNP)	36.90
MR	UBR	Reed, 3m cable	22.50
MSKQ	UBSKQ	GMR, Sinking, M8 quick connect (NPN)	57.40
MSCQ	UBSCQ	GMR, Sourcing, M8 quick connect (PNP)	57.40
MRQ	UBRQ	Reed, M8 quick connect	42.95

All prices are F.O.B. Monee, Illinois and are subject to change without notice.

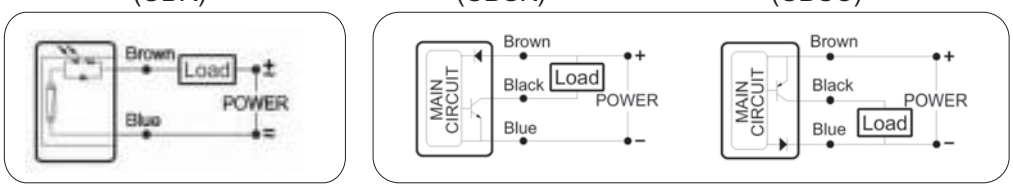
Switch Specifications (25mm-63mm Bores)*

Characteristic	UBR	UBSK	UBSC
Switching Logic	SPST N/O	Solid State Output Normally Open	
Sensor Type	Reed Switch	NPN Current Sinking	PNP Current Sourcing
Operating Voltage	5~240V DC/AC	5~28V DC	
Switching Current	100mA max	200mA max	
Switching Power	10W max	6W max	
Current consumption	- -	20mA max @ 24V (Active)	18mA max @ 24V (Active)
Voltage Drop	2.5V max @ 40mA DC	0.5V @ 200mA max (Resistive Load)	
Leakage Current	- -	0	.01mA max
Indicator	Red LED	Red LED	Green LED
Sensitivity	60 Gauss	40 Gauss	
Max Switching Frequency	1000 Hz	1000 Hz	
Temp Range	-10 ~ 70 deg C	-10 ~ 70 deg C	
Shock	30G	50G	
Vibration	9G	9G	
Enclosure Protection	IP67	IP67	
Circuit Protection	N one	Reverse Source Polarity; Surge suppression	

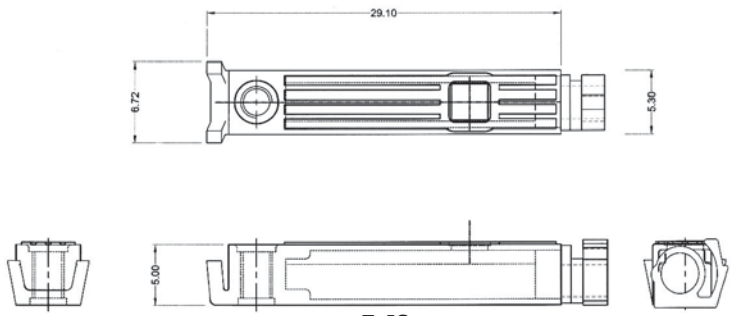
*For specifications on 18mm bore switches MS/MR, and Quick Connect mating cables, see Related Products Section.

Wiring Diagram

(UBR) (UBSK) (UBSC)



Magnetic Sensor Dimensional Data



Bimba Ultran Rodless Cylinders Checklist

Ultran, High Load Ultran, and Ultran Band

This checklist makes sizing and selecting Bimba actuators easier. Bimba's Engineering Department will assist you by providing a detailed analysis of your application and, based on the information in the application checklist, will help you choose the actuators best suited to your needs.

Step 1. Photocopy the sketch and checklist sheets.

Step 2. Complete the sketch and checklist.

Step 3. Mail or fax the sketch and checklist to your local stocking distributor.

Date: _____

Your Name: _____

Company: _____

Address: _____

Phone: _____

Fax: _____

Description of Application: _____

_____

_____

1. How will the cylinder be mounted?

☐ Horizontally ☐ Vertically

If horizontal, is load above or below the cylinder?

☐ Above ☐ Below

2. What is the required stroke length?

_____(in.)

3. What is the weight of the load being moved?

_____(lbs.)

4. How fast will the cylinder be cycling?

_____(cycles/second)

5. How far is the center of the load from the cylinder (moment arm per sketch)?

a. Ultran _____(in.)

b. Ultran Slide _____(in.)

c. High Load Ultran _____(in.)

d. Ultran Band _____(in.)

(See pages 5.11, 5.21, 5.31, 5.37 moment arm)

6. What is the cylinder's velocity at the end-of-stroke?

_____(in./second)

7. Do you need position sensing?

☐ Yes ☐ No

If yes:

☐ end of stroke (or) ☐ mid-stroke

8. Will the cylinder be used under harsh environmental conditions?

If yes, please explain _____

_____

_____

_____

_____

9. For High-Load Ultran Applications - Will the base plate be fully supported?

☐ Yes ☐ No

If not, what is the desired span length?

_____(in.)

Additional Notes: _____

_____

_____

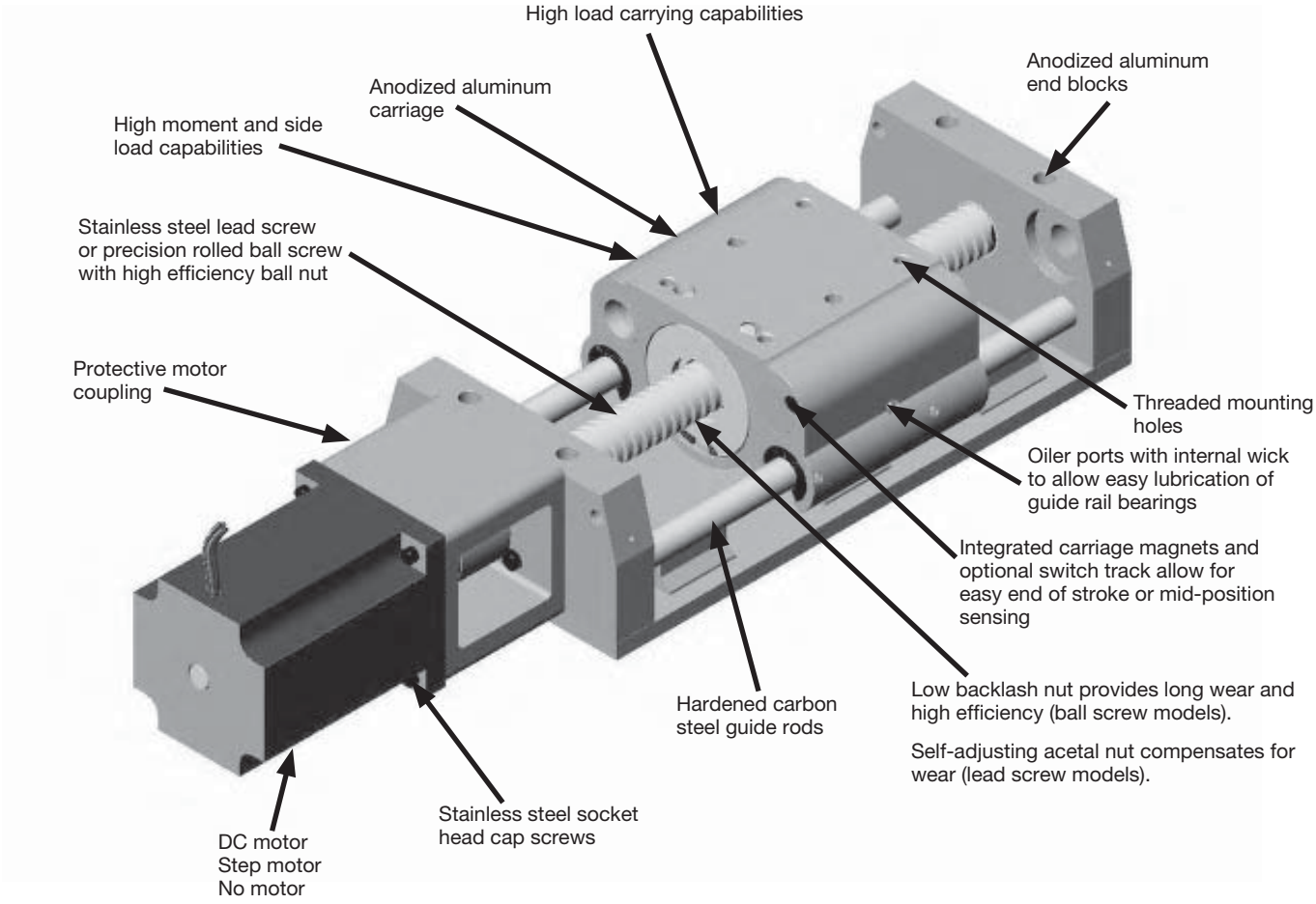
_____

_____

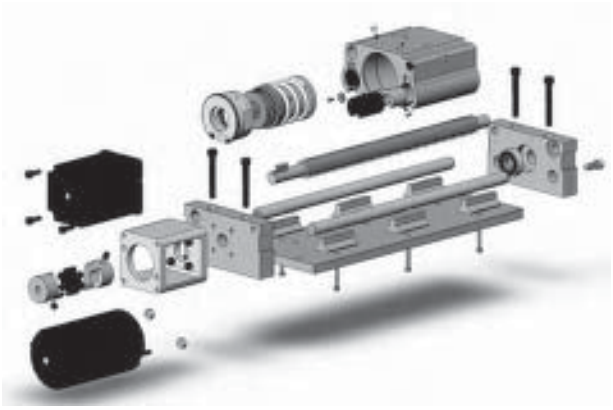
_____

_____

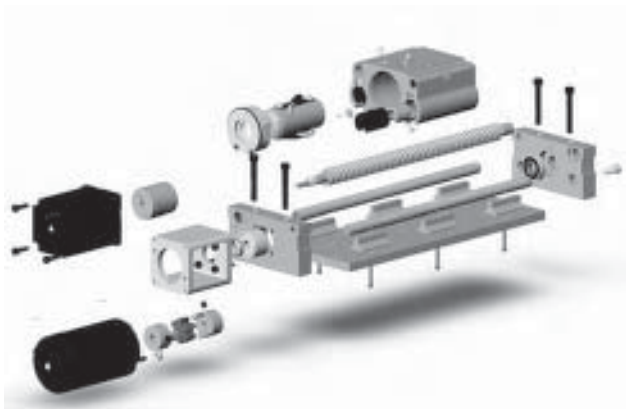
_____



Lead Screw and Coarse Frame



Ball Screw and Fine Frame



Select Coarse Position Accuracy if you require no more than 0.100 inch midstsroke position control. Select Fine Positioning Accuracy if you require better than 0.010 inch midstroke position control.

Bimba Electric Ultran High Load Slides are practical solutions for positioning applications. They are available without motors, with DC motors, or with step motors. The DC motor option provides thrust and speed suitable for a wide variety of applications. The step motor option provides similar capabilities but allows for more precise positioning. Contact Bimba for your custom requirements.

To select a motorized product, first determine the maximum thrust required for your application. Refer to the graphs on pages 5.49 and 5.50. Next determine the speed required. Higher speeds may require a more powerful motor and frame. After the motor and frame are selected, determine position accuracy. Select coarse if 0.100 inch midstroke position control is needed. Fine provides better than 0.010 inch control Finally select a ballscrew for highest efficiency and greatest load capacity, or select a lead screw for quietest operation and least end play.

How to Order

The model number of all Electric Ultran High Load slides consists of four alphanumeric clusters. Please refer to the table below for an example of a UHLECLN-098-ATW. This is a 09 frame UHLE slide with a coarse screw bearing, lead screw, no motor, 8-inch stroke length, stroke adjustment at both ends, switch track, and screw wiper.

Product Type
UHLE - Electric Ultran High Load

Positioning Accuracy[1]
C - Coarse
F - Fine

Screw Type[2]
B - Ball
L - Lead

Motor Option[4]
D - DC Motor
N - No Motor
P - Step Motor

UHLE C L N - 09 8 - ATW

Frame Size
09
17

Stroke Length
6" to 72" Available in 1/4" increments[1]

Options
A - Stroke adjustment both ends
A1 - Stroke adjustment on end 1
A2 - Stroke adjustment on end 2
B - Bumpers both ends
B1 - Bumper on end 1
B2 - Bumper on end 2
T - Switch Track (HC and HK)[3]
U - Switch Track (MR, MSC, and MSK)[3]
W - Screw Wiper[5]

[1]Select Fine for most accurate positioning and least end play.
[2]Select Ball for highest efficiency and greatest load capacity. Select Lead for quietest operation and least end play.
[3]See page 10 for switch selection table.
[4]The DC motor option provides thrust and speed suitable for a wide variety of applications. The step motor option provides similar capabilities but allows for more precise positioning.
[5]Select screw wiper to keep contamination out of drive nut.

List Prices

Base Part Number	Description	Base Price	Options					
			Stroke Adder	Stroke Adjuster A (per end)	Bumper B (per end)	Switch Track T and U Base Unit	Switch Track T and U Adder/ Inch	Screw Wiper W
No Motor, 09 Frame								
UHLECBN-09	Coarse Positioning, Ball Screw	$2754.75	$ 18.00	$ 27.10	$ 26.55	$ 9.45	$ 0.35	$ 18.00
UHLECLN-09	Coarse Positioning, Lead Screw	1963.45	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFBN-09	Fine Positioning, Ball Screw	2898.75	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFLN-09	Fine Positioning, Lead Screw	2107.45	18.00	27.10	26.55	9.45	0.35	18.00
No Motor, 17 Frame								
UHLECBN-17	Coarse Positioning, Ball Screw	3096.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLECLN-17	Coarse Positioning, Lead Screw	2299.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFBN-17	Fine Positioning, Ball Screw	3240.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFLN-17	Fine Positioning, Lead Screw	2443.00	21.60	27.10	26.55	9.45	0.35	27.00
DC Motor, 09 Frame								
UHLECBD-09	Coarse Positioning, Ball Screw	2995.20	18.00	27.10	26.55	9.45	0.35	18.00
UHLECLD-09	Coarse Positioning, Lead Screw	2203.20	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFBD-09	Fine Positioning, Ball Screw	3139.20	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFLD-09	Fine Positioning, Lead Screw	2347.20	18.00	27.10	26.55	9.45	0.35	18.00
DC Motor, 17 Frame								
UHLECBD-17	Coarse Positioning, Ball Screw	3335.80	21.60	27.10	26.55	9.45	0.35	27.00
UHLECLD-17	Coarse Positioning, Lead Screw	2538.75	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFBD-17	Fine Positioning, Ball Screw	3479.80	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFLD-17	Fine Positioning, Lead Screw	2682.75	21.60	27.10	26.55	9.45	0.35	27.00
Step Motor, 09 Frame								
UHLECBP-09	Coarse Positioning, Ball Screw	3115.45	18.00	27.10	26.55	9.45	0.35	18.00
UHLECLP-09	Coarse Positioning, Lead Screw	2323.45	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFBP-09	Fine Positioning, Ball Screw	3259.45	18.00	27.10	26.55	9.45	0.35	18.00
UHLEFLP-09	Fine Positioning, Lead Screw	2467.45	18.00	27.10	26.55	9.45	0.35	18.00
Step Motor, 17 Frame								
UHLECBP-17	Coarse Positioning, Ball Screw	3456.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLECLP-17	Coarse Positioning, Lead Screw	2659.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFBP-17	Fine Positioning, Ball Screw	3600.00	21.60	27.10	26.55	9.45	0.35	27.00
UHLEFLP-17	Fine Positioning, Lead Screw	2803.00	21.60	27.10	26.55	9.45	0.35	27.00

Size/Application Considerations

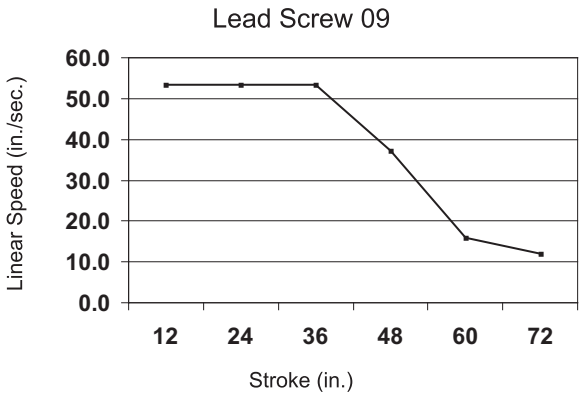
No Motor Provided

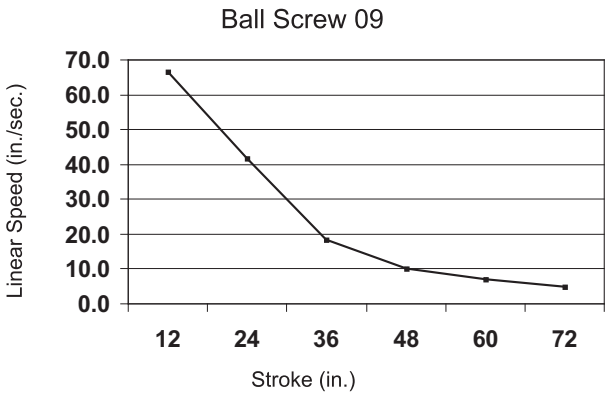
Base Part Number	Screw Diameter (inches)	Screw Type	Lead (inches[1])	Accuracy[2] (inches)	Repeatability[3] (inches)	Maximum Thrust (pounds)	Inertia[4] per inch (oz-in²)	Carriage Sub-Assembly Weights (lbs.)
09 Frame Slide, No Motor								
UHLECLN-09	0.75	Lead	2	0.015	0.008	175	0.11	**2.1**
UHLEFLN-09	0.75	Lead	2	0.015	0.008	175	0.11	**2.1**
UHLECBN-09	0.75	Ball	0.5	0.020	0.009	175	0.11	**1.9**
UHLEFBN-09	0.75	Ball	0.5	0.020	0.009	175	0.11	**1.9**
17 Frame Slide, No Motor								
UHLECLN-17	1	Lead	0.5	0.015	0.002	270	0.40	**4.1**
UHLEFLN-17	1	Lead	0.5	0.015	0.002	270	0.40	**4.1**
UHLECBN-17	1	Ball	1	0.020	0.002	270	0.40	**4.8**
UHLEFBN-17	1	Ball	1	0.020	0.002	270	0.40	**4.8**

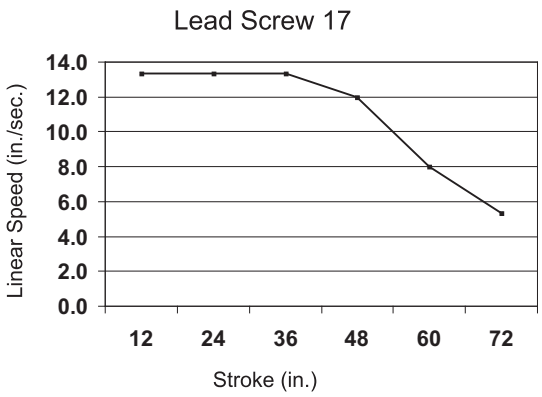
[1]Inches per revolution of screw.
[2]Amount of end play on carriage when screw is fixed.
[3]Ability to return to a zero position. Determined with a motor and control combination.
[4]Inertia is given per inch of stroke of cylinder.

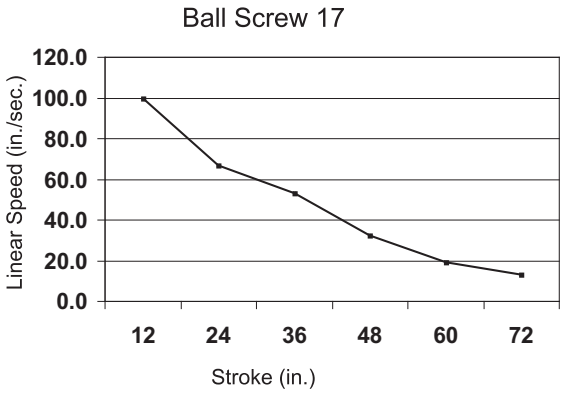
Note: Maximum allowable loads and moments, same as UHL, page 5.30.

Maximum Speed Curves (to avoid screw resonant frequency)









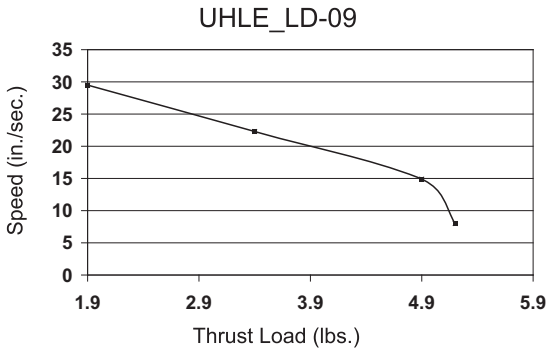
Size/Application Considerations

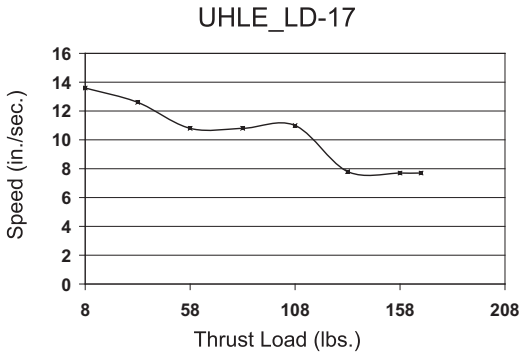
DC Motor Driven

Base Part Number	Maximum Thrust (lbs.)	Maximum Speed at no Load (in/s)	Lead[1] (inches)
24VDC 4200 RPM 60 oz.-in. DC Motor			
UHLECLD-09	5.2	40	2
UHLEFLD-09	5.2	40	2
UHLECBD-09	23.5	33	0.5
UHLEFBD-09	23.5	33	0.5
90VDC 6000 RPM 234 oz.-in. DC Motor			
UHLECLD-17	168	16.6	0.5
UHLEFLD-17	168	16.6	0.5
UHLECBD-17	168	33	1
UHLEFBD-17	168	33	1

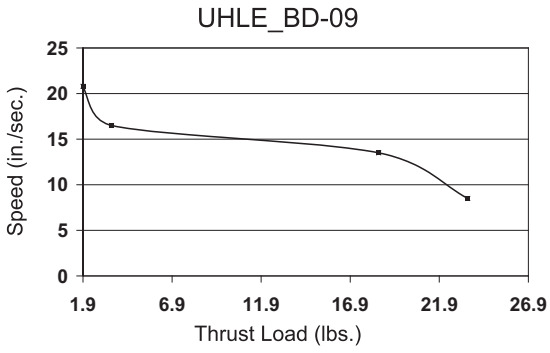
[1]Inches per revolution of screw

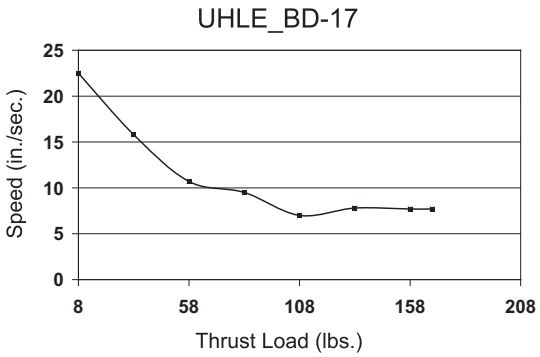
Lead Screw Speed/Load Curves





Ball Screw Speed/Load Curves





To use with Bimba position sensors, order Options T or U. Sensor selection is provided in the table on page 5.53 of this catalog.

Thrust refers to the available force to move a load. Use the speed/load curves to choose the right product for your application.

The graphs define the maximum speed at which the given thrust load can be moved (averaged over 6 inches of travel).

Select Coarse Position Accuracy if you require no more than 0.100 inch midstroke position control. Select Fine Positioning Accuracy if you require better than 0.010 inch midstroke position control.

DC Motor Specifications

	09 Series	17 Series
RPM (no load)	4200	3200
Voltage	24V DC	90V DC
Torque	60 oz.-in.	234 oz.-in.
Amps (full load)	9A DC	7.8A DC
Resistance	N/A	0.86 Ohms
Inductance	N/A	2.76 mH
Inertia	N/A	0.00394 lb.-in.-s^2

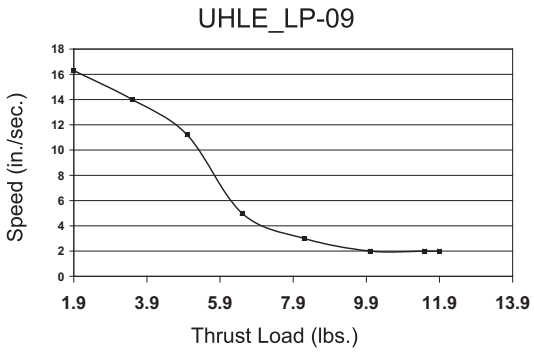
Size/Application Considerations

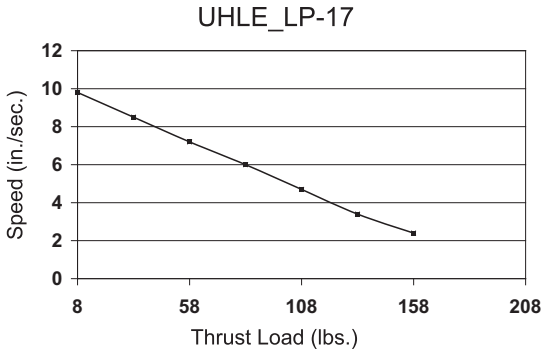
Step Motor Driven

Base Part Number	Maximum Thrust (lbs.)	Maximum Speed at no Load (in/s)	Lead[1] (inches)
NEMA 23 1.8° 24V 6.5A Step Motor			
UHLECLP-09	12	20	2
UHLEFLP-09	12	20	2
UHLECBP-09	71	19	0.5
UHLEFBP-09	71	19	0.5
NEMA 34 1.8° 48V 7.7A Step Motor			
UHLECLP-17	183	15	0.5
UHLEFLP-17	183	15	0.5
UHLECBP-17	200	25	1
UHLEFBP-17	200	25	1

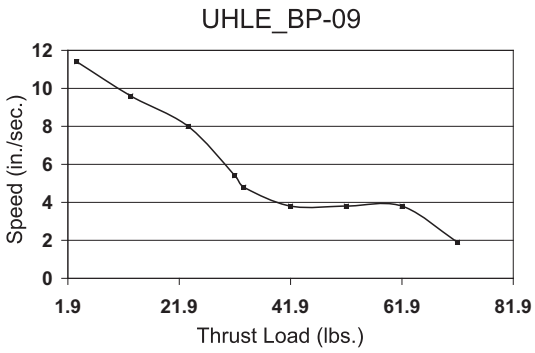
[1]Inches per revolution of screw

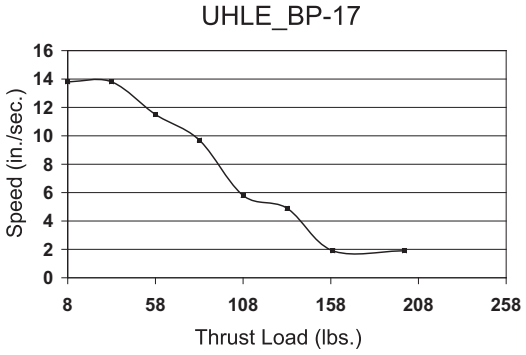
Lead Screw Speed/Load Curves





Ball Screw Speed/Load Curves





To use with Bimba position sensors, order Options T or U. Sensor selection is provided in the table on page 5.53 of this catalog.

Thrust refers to the available force to move a load. Use the speed/load curves to choose the right product for your application. Each point on the graph shows the maximum average speed to move a corresponding thrust load six inches.

The graphs define the maximum speed at which the given thrust load can be moved (averaged over 6 inches of travel).

Select Coarse Position Accuracy if you require no more than 0.100 inch midstroke position control. Select Fine Positioning Accuracy if you require better than 0.010 inch midstroke position control.

Step Motor Specifications

	09 Series	17 Series
Amps/Phase	6.50 A	7.70 A
Torque	294 oz.-in.	1288 oz.-in.
Resistance/phase	0.3 Ohms	0.3 Ohms
Inductance/phase	1.3 mH	2.7 mH
Inertia	2.60 oz.-in.	21.90 oz.-in.
Number of leads	4	4

Dimensions (inches)

For No Motor Option, motor mount for 09 Frame accepts 23 Frame motors, and motor mount for 17 Frame accepts 34 Frame motors. For complete data, see page 5.27. Other than where noted, dimensions are identical to UHL pneumatic slides.

Dowel Pin Hole Accuracy
09 Frame .2520/.2530 x .42 Dp and 0.10 on position
17 Frame .3145/.3155 x .57 Dp and 0.10 on position

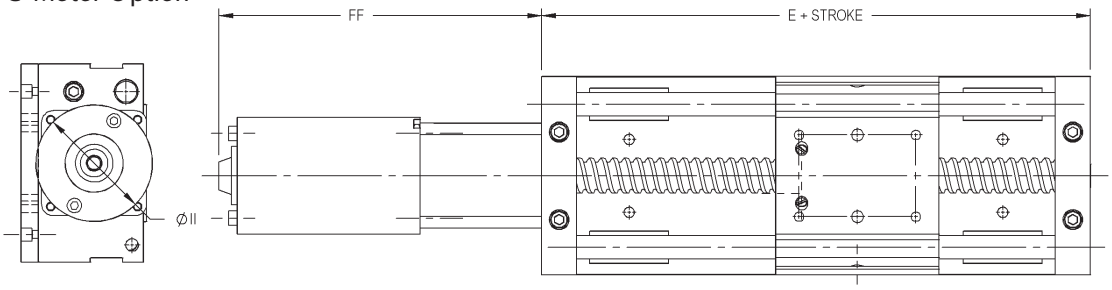
Fine Frame Dimensions

Frame Size	E	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
09	5.00	6.91	5.68	2.60	2.49	2.24	1.86	2.25	0.25	#10.-24	1.60
17	6.50	11.55	7.72	3.07	3.25	3.38	2.74	3.38	0.50	#10-24	1.91

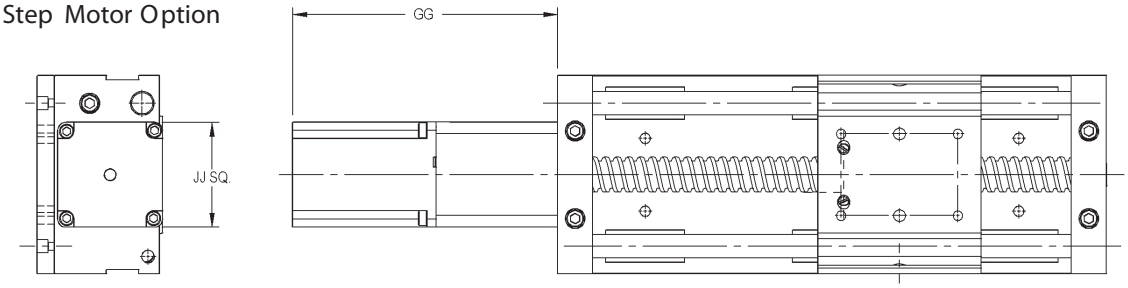
Coarse Frame Dimensions

Frame Size	E	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
09	5.00	6.91	5.68	2.60	2.49	2.24	1.86	2.25	0.50	#10.-24	1.60
17	6.50	11.55	7.72	3.07	3.25	3.38	2.74	3.38	0.50	#10-24	2.00

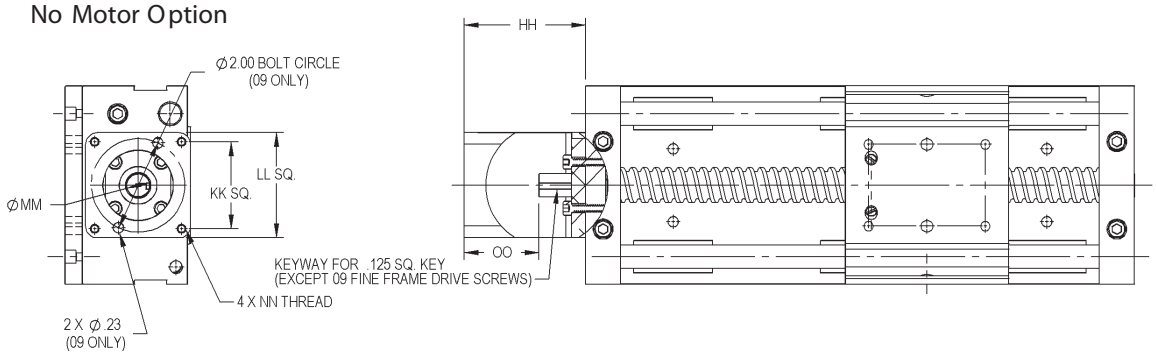
DC Motor Option



Step Motor Option



No Motor Option



DC Motor Lead Configuration

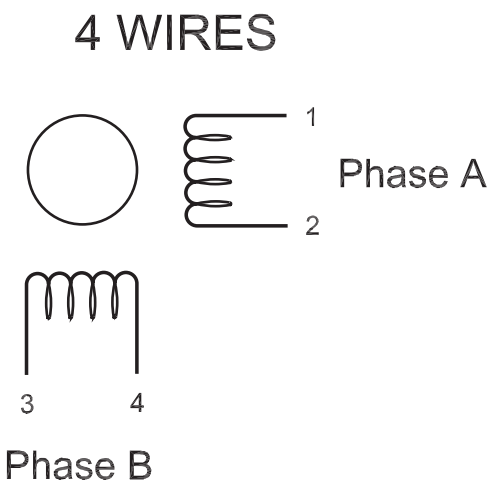
DC motors, 2 lead wires				
	Motor +	Motor -	Case Ground	Lead Type
09 Frame	Gray	Black	None	Flying leads, #14 AWG, 10" nominal length, UL style 1230 wire with PVC insulation
17 Frame	Red	Black	White	Corded flying leads, #16 AWG, 18" minimum length

Use the chart above to determine how to interface your DC motor to the DC motor control of your choice.

Step Motor Lead Configuration

Bipolar motors, 4 lead wires				
	1	2	3	4
09 Frame	Red	Blue	Green	Black
17 Frame	Red	Red / White	Green	Green / White
Bipolar Drive	**A**	**$\bar{A}$**	**B**	**$\bar{B}$**

Use the chart above and the schematic to the right to determine which wires correspond to which windings. Connect to your controller accordingly. Bipolar drive terminals will be labeled A, A-, B, B-.



Switch Specifications

Base Part Number	General Description	Sensor Type	Output Type	Operating Voltage (V)	Actuating Time	Maximum Load Current	Reverse Polarity Protection	Over-voltage Protection	Transient Protection	Temperature Rating	Enclosure
Track Mounted Switches, Option T											
HC	PNP, LED	GMR	Sourcing, PNP	4.5 to 30 VDC	0.001 mS	150 mA	Yes	Yes	Yes	-25°C to 85°C	IP67
HK	NPN, LED	GMR	Sinking, NPN	4.5 to 30 VDC	0.001 mS	150 mA	Yes	Yes	Yes	-25°C to 85°C	IP67
Track Mounted Switches, Option U											
MR	Reed, 4mm round, LED	Reed	Normally Open Contact	3 to 120 VAC, 3 to 24 VAC	1.0 mS	25 mA	No	No	No	-25°C to 85°C	IP67
MS	PNP or NPN, 4mm round, LED	GMR	Auto Configure, Sinking or Sourcing	5 to 24 VDC	1.0 mS	50 mA	Yes	Yes	Yes	-20°C to 85°C	IP67
MSC	PNP, 4mm round, LED	GMR	Sourcing, PNP	5 to 24 VDC	0.1 mS	50 mA	Yes	Yes	Yes	-25°C to 85°C	IP67
MSK	NPN, 4mm round, LED	GMR	Sinking, NPN	5 to 24 VDC	0.1 mS	50 mA	Yes	Yes	Yes	-25°C to 85°C	IP67
End of Stroke Switches											
RSU-1	Reed, 2 wire, no LED, 10 watts	Reed	Normally Open Contact	200 VDC	1.0 mS	500 mA	No	No	No	-25°C to 85°C	IP65
PCQ	PNP, Proximity, LED	Inductive	Sourcing, PNP	10 to 30 VDC	0.33 mS	100 mA	Yes	Yes	Yes	-25°C to 70°C	IP67
PKQ	NPN, Proximity, LED	Inductive	Sinking, NPN	10 to 30 VDC	0.33 mS	100 mA	Yes	Yes	Yes	-25°C to 70°C	IP67