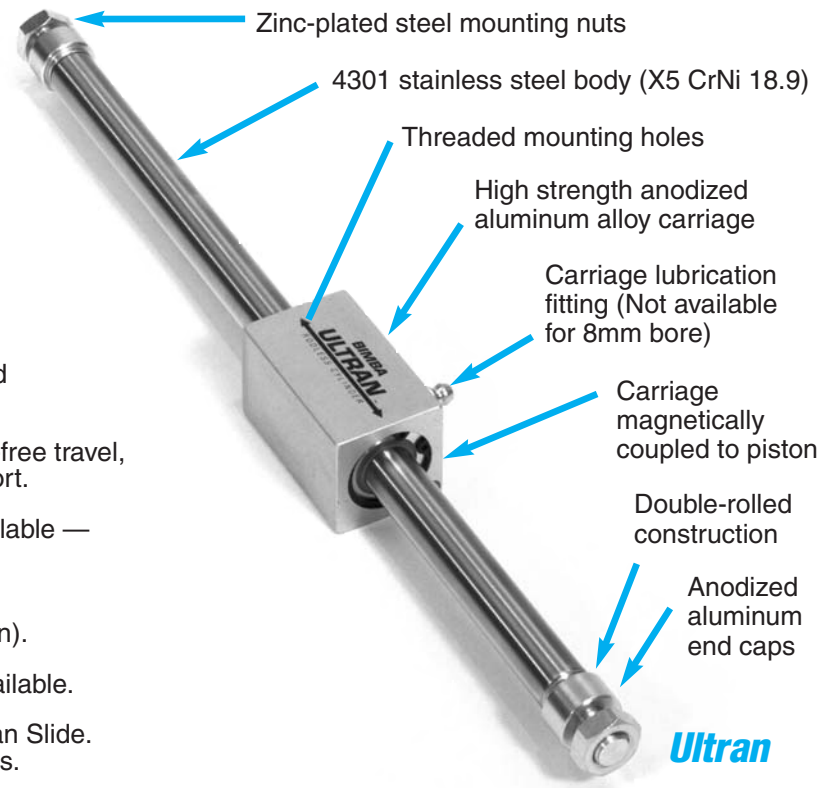
Bimba Metric Ultran Rodless Cylinders

SPACE SAVINGS OF ALMOST 50% IN MOST MODELS

Two Models:

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

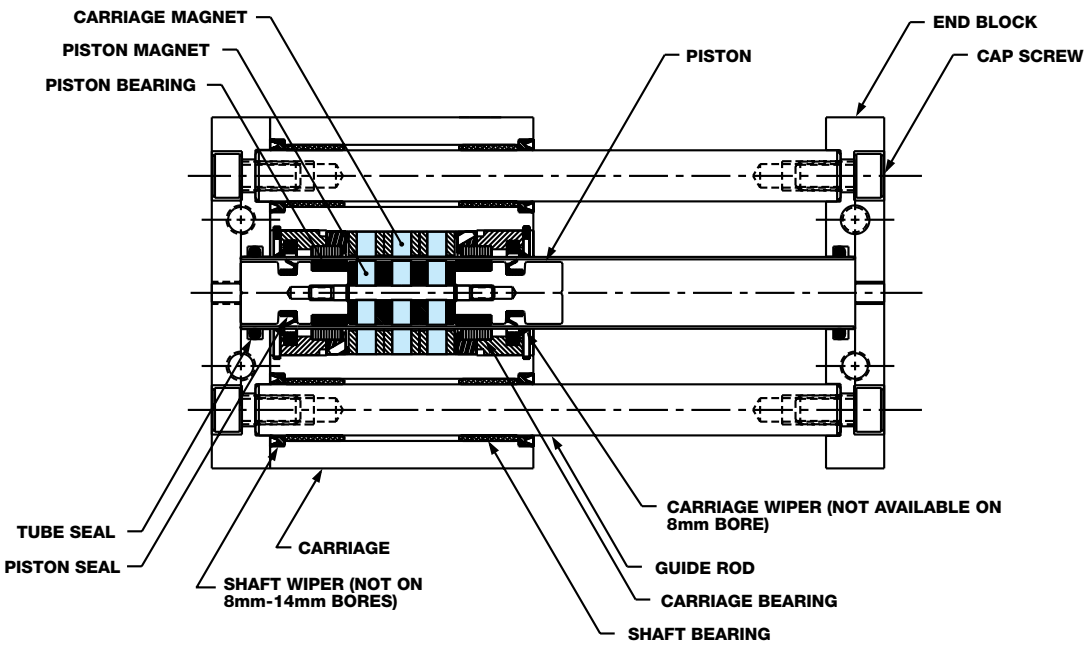
Ultran Slide



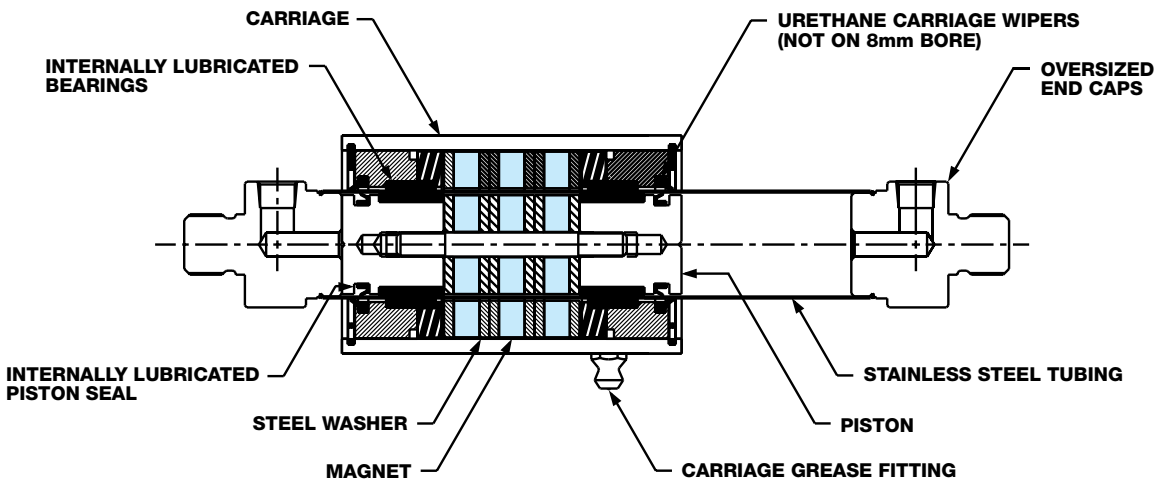
Ultran

ADVANTAGES

- Leak-free construction.
- Lightweight.
- Piston seals are internally lubricated for long life.
- Special rare earth magnet configuration for high magnetic coupling strengths.
- 4301 stainless steel body (X5 CrNi 18.9) and "U" cup seals for lower dynamic friction.
- Prelubricated for kilometers 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 8mm and 11mm bore Ultran).
- Optional 25mm 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 8mm or 11mm bore, 14mm bore has fixed cushion).



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 8mm 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.

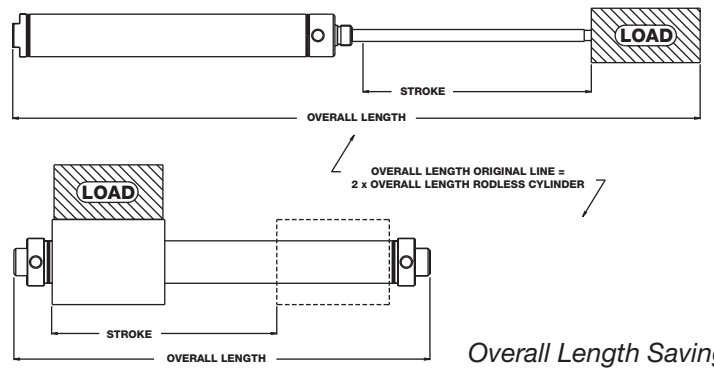
The magnetic attraction between the magnets determines a cylinder's magnetic coupling strength.

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 8mm bore, four sets of magnets are used.)

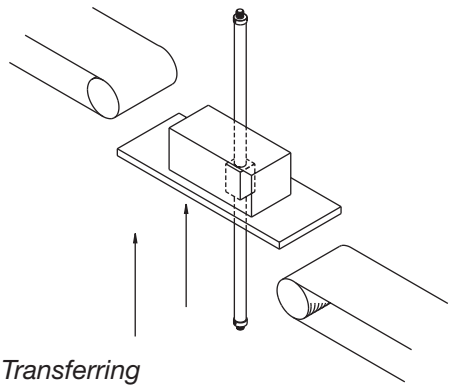
Bimba offers a model with built-in guides (Ultran Slide) and an unguided unit (Ultran).

Application Possibilities

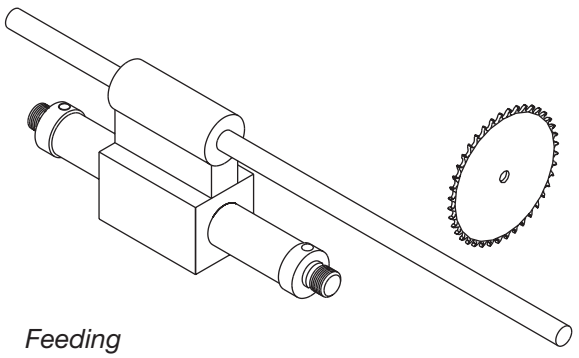
Save space and streamline your design with the Bimba Ultran rodless cylinder.



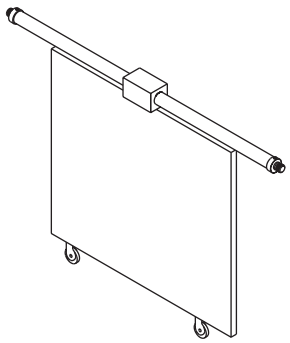
Overall Length Savings

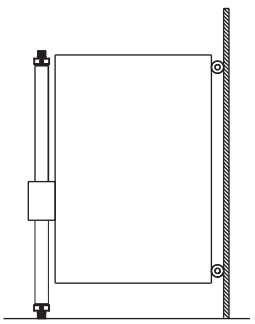


Transferring

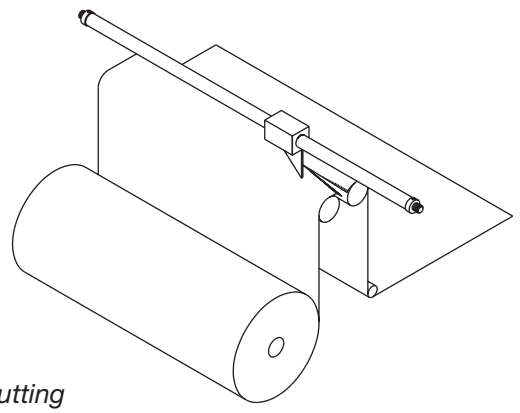


Feeding

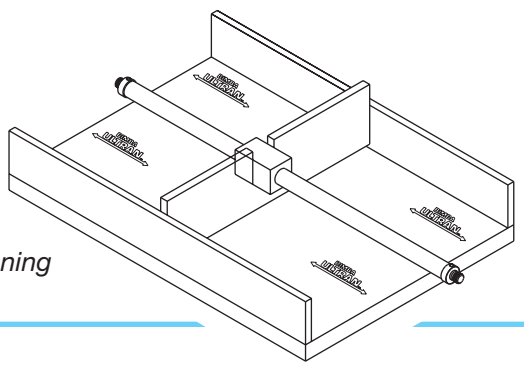




Door Opening



Cutting



Silk Screening

How to Order

The model number of all Ultran Slide 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 UGSM-381275-A1T.

This is a 38mm bore, 1275mm stroke Ultran Slide rodless cylinder with Ultran Gold coupling strength, with stroke adjustment on one end, and a track for mounting switches.

UGSM - 381275 - A1T

TYPE

UGSM-Ultran Slide, Gold coupling strength

USSM-Ultran Slide, Silver coupling strength

BORE SIZE

8mm
11mm
14mm
19mm
22mm
27mm
32mm
38mm
50mm

STROKE LENGTH

STANDARD	MAXIMUM
5mm to 375mm	625mm
5mm to 500mm	750mm
5mm to 750mm	1000mm
5mm to 750mm	1000mm
5mm to 1000mm	1250mm
5mm to 1500mm	1775mm
5mm to 1500mm	1775mm
5mm to 1500mm	2150mm
5mm to 1500mm	2500mm

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)
I - M8x1mm- Mounting hole for inductive prox sensor.
L - Remove guide rod wipers in 19mm-50mm bore size
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)

[1]Bumpers option adds overall length. See page 5.6 for details

Combination Availability

SIZES \ OPTIONS	A	B	S	T	Y
FOR ALL SIZES	S,T,Y	T,Y	A,T,Y	A,B,S,Y	A,B,S,T

Location

See diagram on page 5.5 for location of end 1 and end 2.

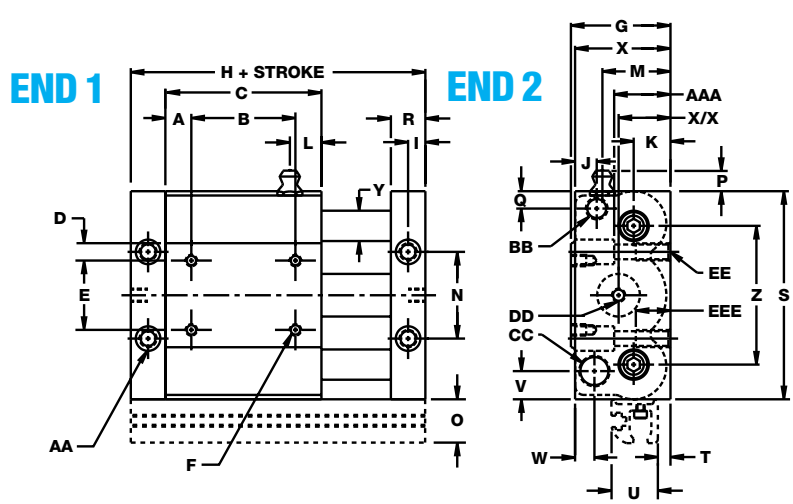
Dimensions

Bore	A	B	C	D	E	F	G	H	I	J	K
8mm	8.7	27.0	44.5	3.5	12.0	M3 x 0.5	27.0	69.9	6.4	4.8	11.1
11mm	8.8	30.0	47.6	3.2	19.0	M3 x 0.5	27.0	73.0	6.4	4.8	10.3
14mm	9.5	38.0	57.2	4.7	25.0	M4 x 0.7	36.5	82.6	6.4	7.9	13.5
19mm	14.3	44.5	73.0	4.7	35.0	M5 x 0.8	46.5	104.8	7.9	7.9	16.9
22mm	12.7	54.0	79.4	4.9	41.0	M5 x 0.8	52.4	117.5	9.5	9.5	17.5
27mm	12.7	63.5	88.9	9.5	44.5	M6 x 1.0	58.7	127.0	9.5	6.4	19.1
32mm	14.2	70.0	98.4	6.3	54.0	M6 x 1.0	68.2	149.2	12.7	12.7	19.1
38mm	12.7	89.0	114.3	12.7	63.5	M8 x 1.25	81.0	165.1	12.7	19.1	23.0
50mm	30.2	127.0	187.3	12.7	82.5	M12 x 1.75	109.5	263.5	19.1	20.7	33.3

Bore	L	M	N	O	P	Q	R	S	T	U	V	W	X	X/X
8mm	N/A	N/A	20.0	15.9	N/A	4.8	12.7	50.8	0.0	16.9	5.5	5.5	25.4	14.3
11mm	10.0	20.0	24.0	15.9	7.3	5.6	12.7	58.7	0.0	16.9	5.5	5.6	25.4	14.3
14mm	11.6	24.9	31.0	15.9	7.5	6.4	12.7	76.2	4.8	16.9	10.3	7.1	34.9	19.0
19mm	14.5	31.5	38.0	15.9	5.9	7.9	15.9	85.7	14.3	16.9	10.3	7.9	44.5	24.3
22mm	16.1	36.5	40.0	15.9	5.7	7.9	19.1	95.3	19.9	16.9	12.7	11.1	50.8	27.0
27mm	17.9	39.3	47.0	15.9	4.4	9.5	19.1	108.0	28.6	16.9	15.1	9.5	57.2	30.2
32mm	19.1	39.7	52.0	15.9	4.1	9.5	25.4	122.2	31.8	16.9	16.7	14.3	66.7	34.9
38mm	19.2	44.1	63.0	15.9	2.8	11.1	25.4	152.4	38.1	16.9	25.4	23.0	79.4	41.3
50mm	38.1	68.3	84.0	15.9	0.0	6.4	38.1	203.2	65.9	16.9	28.6	23.8	108.0	55.6

Bore	Y	Z	AA	BB*	CC	DD	EE	AAA	EEE
8mm	7.9	33.3	3MM	M8 x 1.25	M10 x 1.0	M5 x 0.8	M4 x 0.7	19.1	8.0
11mm	9.5	39.7	4MM	M8 x 1.25	M10 x 1.0	M5 x 0.8	M5 x 0.8	19.1	8.2
14mm	11.1	50.8	6MM	M8 x 1.25	M12 x 1.0	M5 x 0.8	M8 x 1.25	25.4	12.7
19mm	12.7	64.0	8MM	M8 x 1.25	M12 x 1.0	G-1/8	M10 x 1.5	34.9	15.9
22mm	15.9	69.9	8MM	M8 x 1.25	M14 x 1.0	G-1/8	M10 x 1.5	38.1	15.9
27mm	19.1	77.8	8MM	M8 x 1.25	M14 x 1.0	G-1/8	M10 x 1.5	38.1	19.1
32mm	20.6	88.9	8MM	M8 x 1.25	M20 x 1.0	G-1/8	M10 x 1.5	44.5	19.1
38mm	25.4	114.3	10MM	M8 x 1.25	M20 x 1.0	G-1/8	M12 x 1.75	60.3	19.1
50mm	38.1	146.1	20MM	M8 x 1.25	M25 x 1.5	G-1/4	M24 x 3.0	79.8	25.4

*M8 x 1 for option I

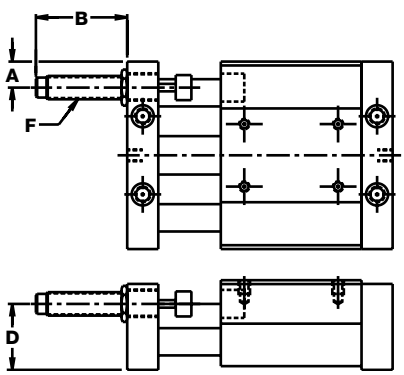


Options

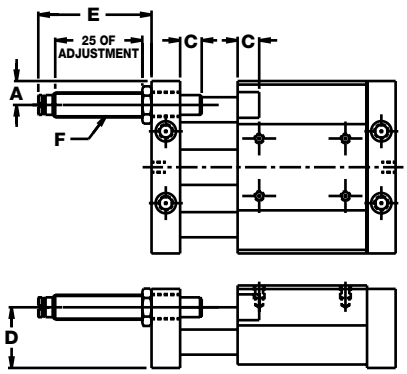
Shock Absorber/Stroke Adjustment

Bore	A	B	C	D	E	F
8mm	5.5	19.1	0.0	19.9	27.8	M10 x 1.0
11mm	5.5	19.1	0.0	19.8	27.8	M10 x 1.0
14mm	10.3	37.1	9.5	27.8	37.3	M12 x 1.0
19mm	10.3	33.9	9.5	36.5	37.3	M12 x 1.0
22mm	12.7	63.2	9.5	39.7	36.5	M14 x 1.0
27mm	15.1	63.2	9.5	47.6	36.5	M14 x 1.0
32mm	16.7	73.4	12.7	52.4	38.1	M20 x 1.0
38mm	25.4	73.4	12.7	56.4	38.1	M20 x 1.0
50mm	28.6	88.9	14.3	84.1	39.7	M25 x 1.5

Shock Absorber



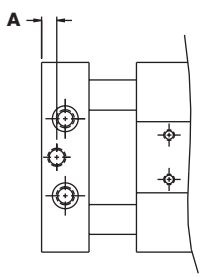
Stroke Adjustment



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.

Alternate Port

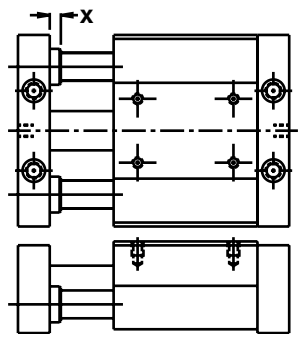
Bore	A
8mm	3.8
11mm	3.8
14mm	4.1
19mm	4.8
22mm	7.9
27mm	7.9
32mm	12.7
38mm	12.7
50mm	19.1



Note: 19mm port size is M5 x 0.8, all other sizes are same as standard.

Bumper Adder *(per end)*

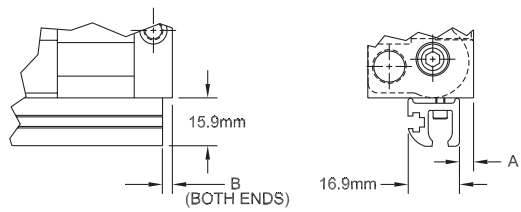
Bore	X
8mm	4.0
11mm	4.0
14mm	7.1
19mm	7.1
22mm	7.9
27mm	7.9
32mm	7.9
38mm	7.9
50mm	7.9



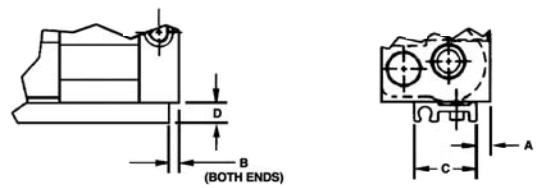
Accessory Model Numbers

Cylinder Bore Size	Shock Absorbers			Stroke Adjustment
	Model			
	Light	Standard	Heavy	Model
8mm	LSM-14	SSM-14	HSM-14	USAM-14
11mm				
14mm	LSM-19	SSM-19	HSM-19	USAM-19
19mm				
22mm	LSM-27	SSM-27	HSM-27	USAM-27
27mm				
32mm	LSM-38	SSM-38	HSM-38	USAM-38
38mm				
50mm	LSM-50	SSM-50	HSM-50	USAM-50

Option T



Option U



Bore	A	B	C	D
5/16" (007)	0.0	0.61	20.0	7.6
7/16" (01)	0.0	0.58	20.0	6.3
9/16" (02)	4.7	15.9	20.0	6.3
3/4" (04)	14.3	3.2	20.0	6.3
7/8" (06)	19.9	3.0	20.0	6.3
1-1/16" (09)	28.6	3.2	16.6	9.3
1-1/4" (12)	31.8	6.1	16.6	9.3
1-1/2" (17)	38.1	6.4	16.6	9.3
2" (31)	65.9	12.5	16.6	9.3

Engineering Specifications

Pressure Rating: 7 bar (Air or Hydraulic)
Temperature Range: -18°C to 76°C
Breakaway: Ultran Slide Gold Coupling Strength - Less than 1.7 bar
Ultran Slide Silver Coupling Strength - Less than 1.4 bar

Magnetic Coupling Strength (N)

Bore	Ultran Gold (UGSM)	Ultran Silver (USSM)
8mm	57	35
11mm	89	44
14mm	129	71
19mm	271	146
22mm	453	244
27mm	564	329
32mm	845	489
38mm	1200	667
50mm	2482	1476

Weight

Bore	Base Weight (0mm Stroke) (kilograms)		Adder per mm (grams)
	(UGSM)	(USSM)	
8mm	0.109	0.104	0.9
11mm	0.236	0.231	1.4
14mm	0.652	0.625	1.7
19mm	1.2	1.2	2.4
22mm	1.6	1.6	3.8
27mm	2.5	2.5	4.9
32mm	3.4	3.7	6.3
38mm	6.6	6.3	8.8
50mm	17.5	16.9	20.2

Lubrication

The Ultran rodless cylinder is prelubricated at the factory for extensive, maintenance-free operation. 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 160 linear km of travel. Recommended oils are medium to heavy.
The carriage should also be lubricated every 160 linear km with a high grade of bearing grease. Other types of prelubrication are available upon request.

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								
	8mm (007)	11mm (01)	14mm (02)	19mm (04)	22mm (06)	27mm (09)	32mm (12)	38mm (17)	50mm (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	RD-50654	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-51438
Carriage bearing	RD-51006	RD-51007	RD-41631	RD-41633	RD-51433	RD-41635	RD-51434	RD-41637	RD-49786
Carriage wiper	N/A	RD-49806	RD-47191	RD-47192	RD-49805	RD-47193	RD-49804	RD-47194	RD-49803
Piston bearing	RD-81278	RD-81280	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	KUB-007	KUB-01	KUB-02	KUB-04	KUB-06	KUB-09	KUB-12	KUB-17	KUB-31
Guide Rods	KUG-007	KUG-01	KUG-02	KUG-04	KUG-06	KUG-09	KUG-12	KUG-17	KUG-31
Switch Track	KUT-007	KUT-01	KUT-02	KUT-04	KUT-06	KUT-09	KUT-12	KUT-17	KUT-31
Repair kit	KU-007	KU-01	KU-02	KU-04	KU-06	KU-09	KU-12	KU-17	KU-31
Assembly Cone	RD-51306	RD-51307	RD-49526	RD-29507	RD-51308	RD-49508	RD-51309	RD-49509	RD-51310

** Includes required quantity of all except bumpers and oil service piston seals, which are options and 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.

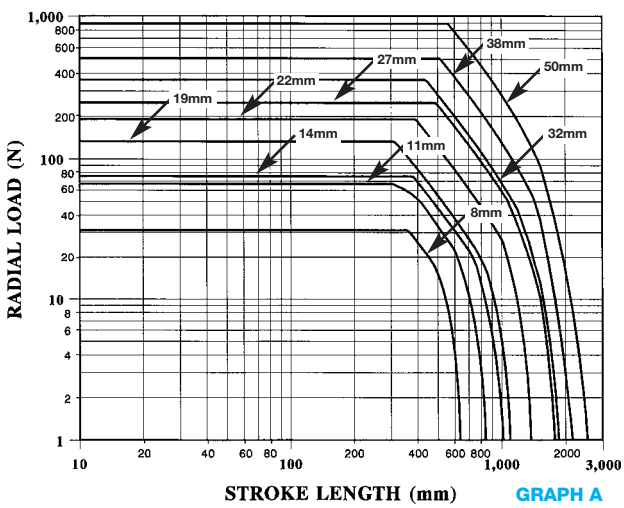
1. *Check side load or radial load requirements.* Graph A, Side Load/Radial Load vs. Stroke Length, shows the maximum load the cylinder will support for a specific bore size and stroke length.

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 Shock Absorbers,* pages 5.22 - 5.28 for your bore size.

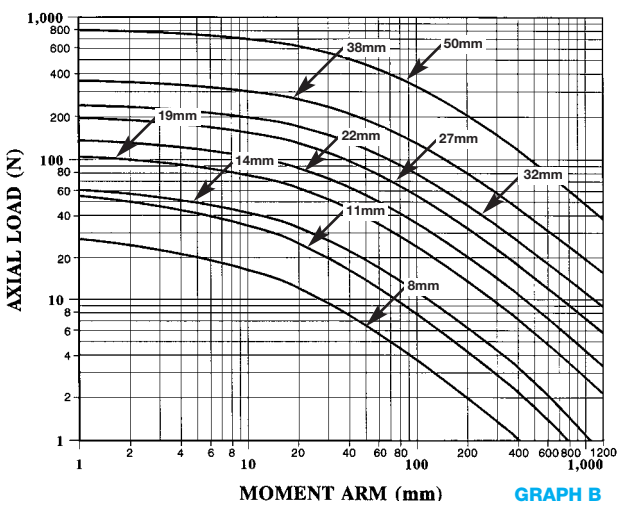
4. Maximum Velocity. If cylinder speed will exceed .5m/sec. or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.

SIDE/RADIAL LOAD vs STROKE LENGTH



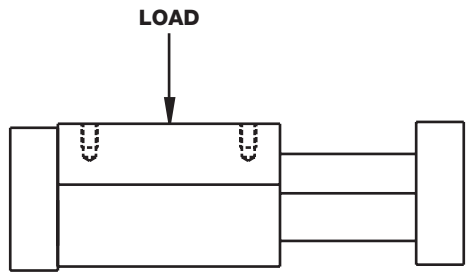
GRAPH A

AXIAL LOAD vs MOMENT ARM



GRAPH B

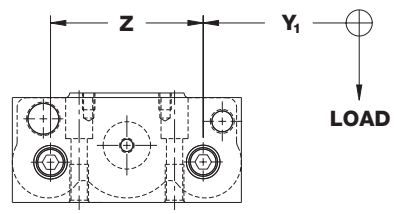
RADIAL LOAD



SEE GRAPH A

SIDE LOAD

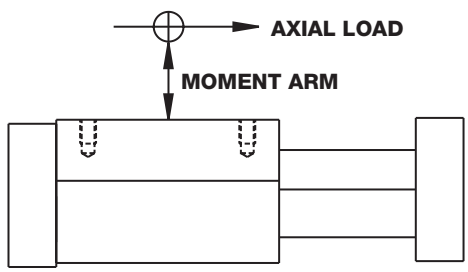
SIDE LOAD = 2 x LOAD($\frac{Y_1}{Z}$ + 1)



Cylinder Bore	Z
8mm	33.3
11mm	39.7
14mm	50.8
19mm	64.0
22mm	69.9
27mm	77.8
32mm	88.9
38mm	114.3
50mm	146.1

SEE GRAPH A

AXIAL LOAD



SEE GRAPH B

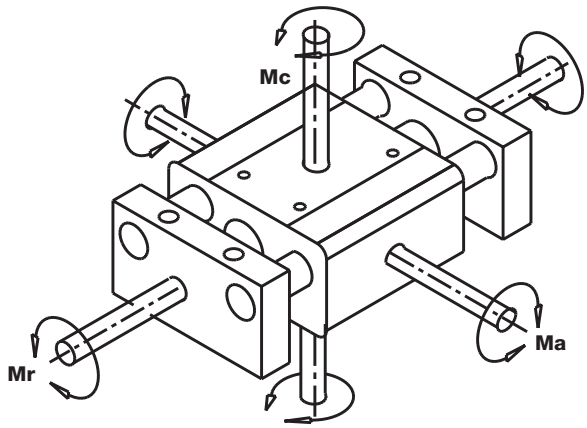
Size/Application Considerations

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).

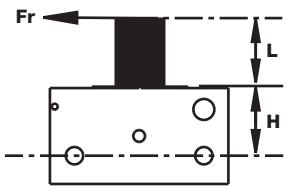
Maximum Allowable Moment (Nm)

Bore	Radial	Axial	Cross	H
	Mr max.	Ma max.	Mc max.	
8mm	.26	.59	.59	15.90
11mm	.55	1.06	1.06	16.70
14mm	.75	1.94	1.94	23.00
19mm	1.25	4.24	4.24	29.60
22mm	1.62	7.73	7.73	34.90
27mm	2.20	10.07	10.07	39.60
32mm	2.99	18.08	18.08	49.10
38mm	4.57	28.25	28.25	58.00
50mm	7.57	90.40	90.40	76.20



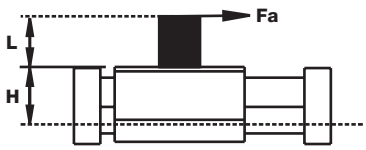
SKETCH A

Radial Moment



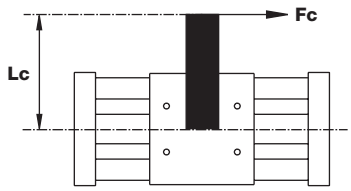
SKETCH B

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.)

$$\text{Radial Moment} = Mr = Fr \times (L+H)$$
$$\text{Axial Moment} = Ma = Fa \times (L+H)$$
$$\text{Cross Moment} = Mc = Fc \times (Lc)$$

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.)

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

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 USM-381875-A1B1F.

This is a 38mm bore, 1875mm stroke Ultran rodless cylinder with Ultran Silver coupling strength, with stroke adjustment on one end, bumpers on one end, and a floating mount bracket.

USM - 381875 - A1B1F

TYPE

UGM-Ultran Gold coupling strength

USM-Ultran Silver coupling strength

BORE SIZE

8mm
11mm
14mm
19mm
22mm
27mm
32mm
38mm
50mm

STROKE LENGTH STANDARD	MAXIMUM
5mm to 1000mm	1000mm
5mm to 1000mm	1250mm
5mm to 1000mm	2250mm
5mm to 2000mm	3000mm
5mm to 2000mm	3000mm
5mm to 2000mm	3000mm
5mm to 2000mm	3000mm
5mm to 2000mm	3000mm
5mm to 2000mm	3000mm

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)
C - Cushions (both ends)[2]
C1 - Cushions (on end 1)[2]
C2 - Cushions (on end 2)[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 ports (on end 1)
P2 - Axial ports (on end 2)
S - Seals – oil service (low pressure hydraulic service)

[1] Six bar required to reach full stroke, adds overall length-see page 5.14

[2] Not available for 8mm and 11mm bores. 14mm bore has fixed cushions, other sizes have adjustable cushions. The 14mm 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 2.8 bars 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 4.8mm.

[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 5.15 for angular, radial and side float dimensions.

See left column for option combination availability and location.

Combination Availability

SIZES \ OPTIONS	A	B	C	F	K	P	S
8mm 11mm	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

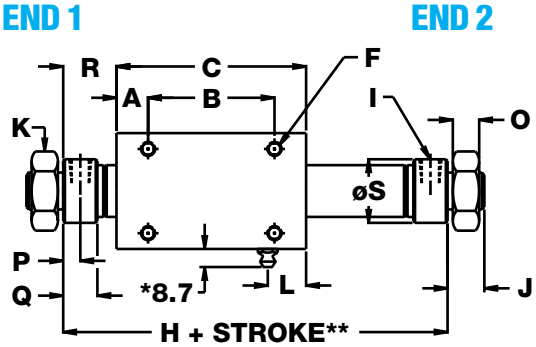
See diagram on page 5.12 for location of end 1 and end 2. Incompatible options cannot be ordered on the same end (see combination availability chart above).

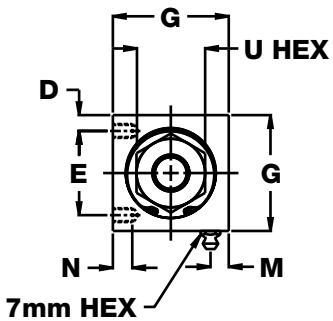
Dimensions

Bore	A	B	C	D	E	F	G	H	I	J
8mm	8.7	27.0	44.5	3.5	12.0	M3 x 0.5	19.1	76.6	M5 x 0.8	9.3
11mm	8.8	30.0	47.6	3.2	19.0	M3 x 0.5	25.4	79.7	M5 x 0.8	11.1
14mm	9.6	38.0	57.2	4.7	25.0	M4 x 0.7	34.9	89.3	M5 x 0.8	11.1
19mm	14.3	44.5	73.0	4.7	35.0	M5 x 0.8	44.5	123.8	G-1/8	15.9
22mm	12.7	54.0	79.4	4.9	41.0	M5 x 0.8	50.8	130.2	G-1/8	15.9
27mm	12.7	63.5	88.9	6.3	44.5	M6 x 1.0	57.2	139.7	G-1/8	15.9
32mm	14.2	70.0	98.4	6.3	54.0	M6 x 1.0	66.7	149.2	G-1/8	22.2
38mm	12.7	89.0	114.3	7.9	63.5	M8 x 1.25	79.4	165.1	G-1/8	22.2
50mm	30.2	127.0	187.3	12.7	82.5	M12 x1.75	108.0	254.0	G-1/4	25.4

Bore	K	L	M	N	O	P	Q	R	S	U
8mm	M8 x 1.25 NUT	N/A	N/A	3.8	4.0	5.2	10.3	16.1	15.9	13.0
11mm	M10 x 1.5 NUT	10.0	4.4	3.2	5.0	5.2	10.3	16.1	17.9	17.0
14mm	M12 x 1.25 NUT	11.6	7.9	5.6	6.0	5.2	10.3	16.1	19.2	19.0
19mm	M16 x 1.5 NUT	14.5	9.5	7.9	8.0	8.0	16.0	25.4	25.0	24.0
22mm	M16 x 1.5 NUT	16.1	9.5	10.4	8.0	8.0	16.0	25.4	28.2	24.0
27mm	M16 x 1.5 NUT	17.9	12.7	9.5	8.0	8.0	16.0	25.4	32.9	24.0
32mm	M22x 1.5 NUT	19.1	9.5	12.7	11.0	8.0	16.0	25.4	39.2	32.0
38mm	M22 x 1.5 NUT	19.2	19.1	12.7	11.0	8.0	16.0	25.4	44.1	32.0
50mm	M36 x 4.0 NUT	38.1	19.1	19.1	18.0	11.1	22.2	33.3	58.7	55.0

END 1 END 2





** Grease fitting on 50mm bore is recessed.*
The thread on the grease fitting conforms to DIN 71412

*** See page 5.14 for option length adders.*

Mounting Block

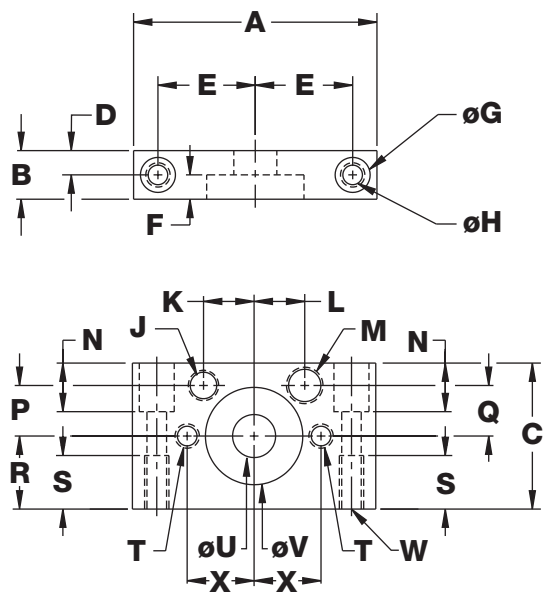
Bore	A	B	C	D	E	F	G	H	J	K	L
8mm	50.8	9.5	22.2	4.8	21.0	6.7	6.5	3.3	M8 x 1.25	12.7	N/A
11mm	63.5	12.7	28.6	6.4	25.0	8.1	8.3	4.3	M8 x 1.25	14.3	N/A
14mm	63.5	12.7	39.0	6.4	25.0	6.4	11.3	6.9	M8 x 1.25	13.2	13.5
19mm	88.9	19.1	48.0	9.5	34.0	9.5	14.2	8.6	M8 x 1.25	17.0	17.0
22mm	88.9	19.1	54.0	9.5	35.0	9.5	14.2	8.6	M8 x 1.25	20.0	19.5
27mm	101.6	19.1	64.0	9.5	40.0	9.5	14.2	8.6	M8 x 1.25	22.7	22.7
32mm	127.0	25.4	73.0	12.7	51.0	12.7	17.0	10.4	M8 x 1.25	27.0	25.8
38mm	127.0	25.4	86.0	12.7	51.0	12.7	17.0	10.4	M8 x 1.25	31.5	31.5
50mm	215.9	38.1	114.3	19.1	82.5	19.1	31.1	21.0	M8 x 1.25	41.3	40.8

J - Hole for Switch

M- Hole for Shock Absorber

Bore	M	N	P	Q	R	S	T	U	V	W	X
8mm	N/A	7.9	6.4	N/A	11.1	7.9	M4 x 0.7	8.1	19.7	M4 x 0.7	15.0
11mm	N/A	9.5	9.5	N/A	14.3	9.5	M5 x 0.5	10.2	25.3	M5 x 0.5	18.0
14mm	M10 x 1.0	14.0	13.2	13.5	19.5	14.0	M6 x 1.0	12.1	26.8	M8 x 1.25	17.5
19mm	M12 x 1.0	16.0	17.0	17.0	24.0	14.0	M8 x 1.25	16.1	34.9	M10 x 1.5	24.0
22mm	M14 x 1.0	15.9	20.0	19.3	27.0	19.1	M10 x 1.5	16.1	34.9	M10 x 1.5	24.0
27mm	M14 x 1.0	24.0	22.7	22.7	32.0	20.0	M10 x 1.5	16.1	34.9	M10 x 1.5	29.0
32mm	M20 x 1.0	28.6	27.0	25.8	36.5	28.6	M12 x 1.75	22.1	41.3	M12 x 1.75	34.0
38mm	M20 x 1.0	35.0	31.5	31.5	43.0	26.0	M12 x 1.75	22.1	50.8	M12 x 1.75	34.0
50mm	M25 x 1.5	41.3	41.3	40.8	57.2	38.1	M24 x 3.0	36.2	74.6	M24 x 3.0	54.0

Mounting Block

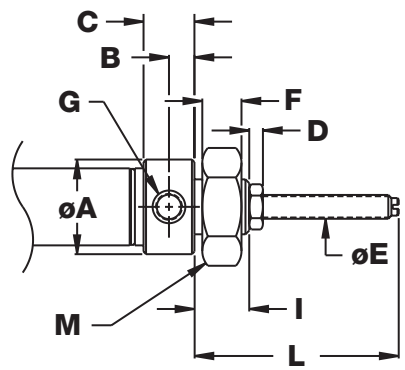


Options

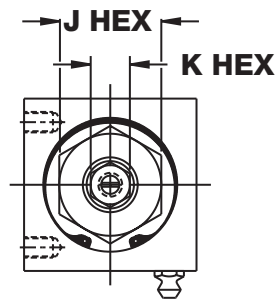
Stroke Adjustment Dimensions

Bore	A	B	C	D	F
8mm	15.9	5.2	10.3	2.4	4.0
11mm	17.9	5.2	10.3	2.4	5.0
14mm	19.2	5.2	10.3	2.8	6.0
19mm	25.0	8.0	16.0	4.0	8.0
22mm	28.2	8.0	16.0	4.8	8.0
27mm	39.2	8.0	16.0	4.8	8.0
32mm	32.9	8.0	16.0	5.6	11.0
38mm	44.1	8.0	16.0	5.6	11.0
50mm	58.7	11.1	22.2	6.4	18.0

Stroke Adjustment



Bore	G	I	J	K	L	M
8mm	M5 x 0.8	9.3	13.0	5.5	45.6	M8 x 1.25 NUT
11mm	M5 x 0.8	11.1	17.0	7.0	37.3	M10 x 1.5 NUT
14mm	M5 x 0.8	11.1	19.0	8.0	37.3	M12 x 1.25 NUT
19mm	G 1/8	15.9	24.0	11.0	48.4	M16 x 1.5 NUT
22mm	G 1/8	15.9	24.0	11.0	49.4	M16 x 1.5 NUT
27mm	G 1/8	15.9	24.0	11.0	49.4	M16 x 1.5 NUT
32mm	G 1/8	22.2	32.0	14.0	53.7	M22x 1.5 NUT
38mm	G 1/8	22.2	32.0	14.0	53.7	M22 x 1.5 NUT
50mm	G 1/4	25.4	55.0	18.0	57.9	M36 x 4.0 NUT



Stroke Adjustment Length Adder

Bore	8mm	11mm	14mm	19mm	22mm	27mm	32mm	38mm	50mm
Add to overall length: (per end)	1.1	1.5	1.5	1.5	2.0	2.0	2.8	2.8	3.0

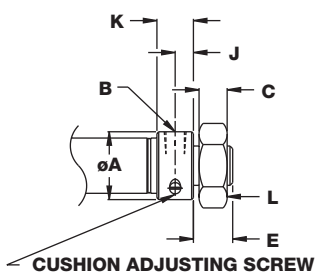
Bumper Length Adder

Bore	8mm	11mm	14mm	19mm	22mm	27mm	32mm	38mm	50mm
Add to overall length: (per end)	2.4	3.0	3.0	3.6	3.6	3.8	3.8	3.8	5.1

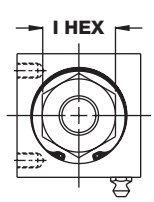
Cushions *(Not available for 8mm and 11mm bores)*

Bore	A	B	C	E	I	J	K	L
14mm	19.2	M5 x 0.8	6.0	11.1	19.0	5.2	10.3	M12 x 1.25 NUT
19mm	25.0	G 1/8	8.0	15.9	24.0	8.0	16.0	M16 x 1.5 NUT
22mm	28.2	G 1/8	8.0	15.9	24.0	8.0	16.0	M16 x 1.5 NUT
27mm	32.9	G 1/8	8.0	15.9	24.0	8.0	16.0	M16 x 1.5 NUT
32mm	39.2	G 1/8	11.0	22.2	32.0	8.0	16.0	M22x 1.5 NUT
38mm	44.1	G 1/8	11.0	22.2	32.0	8.0	16.0	M22 x 1.5 NUT
50mm	58.7	G 1/4	18.0	25.4	32.0	11.1	22.2	M36 x 4.0 NUT

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



CUSHION ADJUSTING SCREW
(OMIT ON 8mm, 11mm and 14mm BORE)

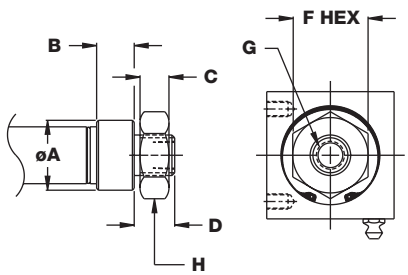


Options

Axial Ports

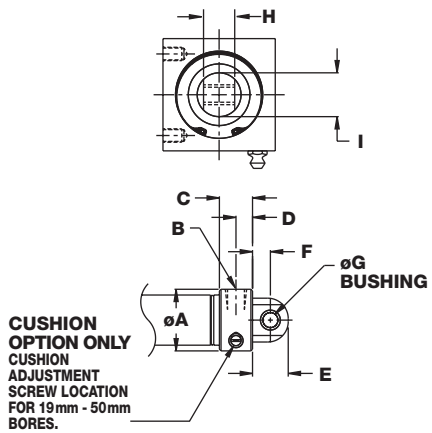
Bore	A	B	C	D	F	G	H
8mm	15.9	10.3	4.0	9.3	13.0	M5 x 0.8	M8 x 1.25 NUT
11mm	17.9	10.3	5.0	11.1	17.0	M5 x 0.8	M10 x 1.5 NUT
14mm	19.2	10.3	6.0	11.1	19.0	M5 x 0.8	M12 x 1.25 NUT
19mm	25.0	16.0	8.0	15.9	24.0	G 1/8	M16 x 1.5 NUT
22mm	28.2	16.0	8.0	15.9	24.0	G 1/8	M16 x 1.5 NUT
27mm	32.9	16.0	8.0	15.9	24.0	G 1/8	M16 x 1.5 NUT
32mm	39.2	16.0	11.0	22.2	32.0	G 1/8	M22x 1.5 NUT
38mm	44.1	16.0	11.0	22.2	32.0	G 1/8	M22 x 1.5 NUT
50mm	58.7	22.2	18.0	25.4	55.0	G 1/4	M36 x 4.0 NUT

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



Pivot Option

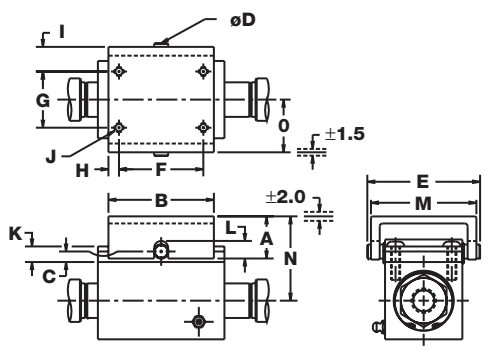
Bore	A	B	C	D	E	F	G	H	I
8mm	15.9	M5 x 0.8	10.3	5.2	9.3	5.4	3.0	4.9	9.5
11mm	17.9	M5 x 0.8	10.3	5.2	11.1	6.4	4.0	7.9	12.7
14mm	19.2	M5 x 0.8	10.3	5.2	11.1	6.4	4.0	7.9	12.7
19mm	25.0	G 1/8	16.0	8.0	15.9	8.7	6.0	11.9	19.1
22mm	28.2	G 1/8	16.0	8.0	15.9	8.7	6.0	11.9	19.1
27mm	32.9	G 1/8	16.0	8.0	15.9	8.7	6.0	11.9	22.2
32mm	39.2	G 1/8	16.0	8.0	22.2	12.7	8.0	15.9	25.4
38mm	44.1	G 1/8	16.0	8.0	22.2	12.7	8.0	15.9	28.6
50mm	58.7	G 1/4	22.2	11.1	25.4	12.7	12.0	23.9	34.9



Floating Mount Bracket

Bore	A	B	C	D	E	F	G	H	I	J	K
8mm	13.5	36.5	4.8	4.7	33.5	27.0	12.0	4.8	9.1	M3 x 0.5	6.0
11mm	15.9	42.9	4.8	6.3	41.8	30.0	19.0	6.5	9.5	M3 x 0.5	6.3
14mm	19.1	47.6	4.8	6.3	50.9	38.0	25.0	4.8	11.3	M4 x 0.7	7.1
19mm	22.2	60.3	6.4	7.9	62.0	44.5	35.0	7.9	11.6	M5 x 0.8	8.6
22mm	23.8	69.9	7.9	9.5	72.4	54.0	41.0	7.9	14.0	M5 x 0.8	10.7
27mm	27.0	76.2	7.9	9.5	77.9	63.5	44.5	6.4	15.1	M6 x 1.0	10.7
32mm	28.6	90.5	9.5	11.1	91.4	70.0	54.0	10.2	17.0	M6 x 1.0	12.3
38mm	30.2	108.0	9.5	11.1	103.3	89.0	63.5	9.5	18.3	M8 x 1.25	12.3
50mm	49.2	165.1	12.7	15.8	152.4	127.0	82.5	19.1	31.8	M12 x 1.75	16.1

Bore	L	M	N	O
8mm	6.4	30.2	25.9	15.1
11mm	7.9	38.5	30.6	19.3
14mm	7.9	47.6	38.6	23.8
19mm	9.5	58.7	47.3	29.4
22mm	11.1	69.1	52.8	34.5
27mm	11.1	74.6	59.2	37.3
32mm	12.7	88.1	66.3	44.0
38mm	12.7	100.0	74.3	50.0
50mm	17.5	142.9	108.4	71.5



Accessories

Shock Absorber/Switch Bracket *(Not available for 8mm and 11mm bores)*

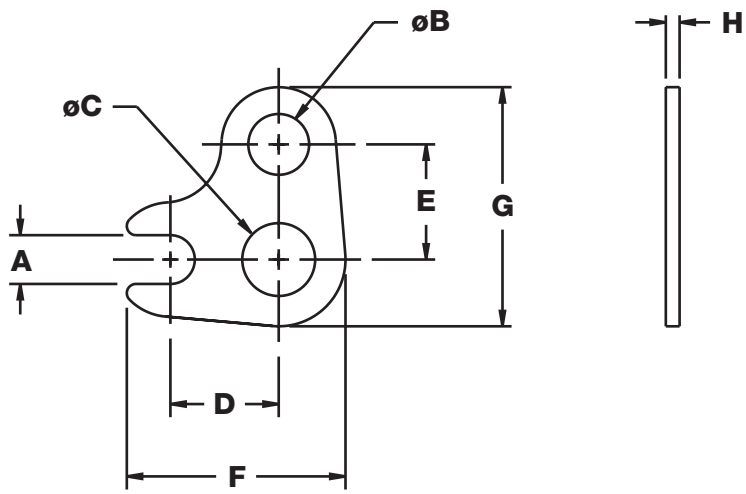
Bore	A	B	C	D	E	F	G	H
14mm	8.1	10.1	12.1	18.0	19.2	36.4	39.8	2.3
19mm	8.1	12.1	16.1	23.1	22.9	46.2	48.3	3.0
22mm	8.1	14.1	16.1	22.2	28.3	45.3	55.3	3.0
27mm	8.1	14.1	16.1	23.1	26.6	46.2	53.6	3.0
32mm	8.1	20.1	22.1	34.9	36.5	61.2	71.4	3.0
38mm	8.1	20.1	22.1	36.5	36.9	63.1	71.8	3.0
50mm	8.1	25.5	36.1	56.6	58.2	92.5	105.8	5.7

A - Slot for Switch

B - Hole for Shock Absorber

C - Hole for Cylinder

Shock Absorber/ Switch Bracket (For 14mm bore and larger only)



Accessory Model Numbers

Cylinder Bore Size	Shock Absorbers			Shock Absorber Switch Brackets
	Model			Model
	Light	Standard	Heavy	
8mm	N/A	N/A	N/A	N/A
11mm				N/A
14mm	LSM-14	SSM-14	HSM-14	BUM-14
19mm	LSM-19	SSM-19	HSM-19	BUM-19
22mm	LSM-27	SSM-27	HSM-27	BUM-22
27mm				BUM-27
32mm	LSM-38	SSM-38	HSM-38	BUM-32
38mm				BUM-38
50mm	LSM-50	SSM-50	HSM-50	BUM-50

Cylinder Bore Size	Mounting Block	Floating Mount Bracket
	Model	Model
8mm	MBM-8	FMM-8
11mm	MBM-11	FMM-11
14mm	MBM-14	FMM-14
19mm	MBM-19	FMM-19
22mm	MBM-22	FMM-22
27mm	MBM-27	FMM-27
32mm	MBM-32	FMM-32
38mm	MBM-38	FMM-38
50mm	MBM-50	FMM-50

Engineering Specifications

Pressure Rating: 7 bar (Air or Hydraulic)
Temperature Range: -18°C to +76°C
Breakaway: Ultran Gold Coupling Strength - Less than 1.4 bar
Ultran Silver Coupling Strength - Less than 1.0 bar

Magnetic Coupling Strength (N)

Bore	Ultran Gold	Ultran Silver
8mm	57	35
11mm	89	44
14mm	129	71
19mm	271	146
22mm	453	244
27mm	564	329
32mm	845	489
38mm	1200	667
50mm	2482	1476

Lubrication

The Ultran rodless cylinder is prelubricated at the factory for extensive, maintenance-free operation. 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 160 linear km of travel. Recommended oils are medium to heavy. The carriage should also be lubricated every 160 linear km with a high grade of bearing grease. Other types of prelubrication are available upon request.

Repairs

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

Weight

Bore	Base Weight (0mm Stroke) (kilograms)		Adder per mm (grams)
	(UGM)	(USM)	
8mm	0.045	0.041	0.11
11mm	0.100	0.095	0.18
14mm	0.25	0.23	0.18
19mm	0.54	0.50	0.36
22mm	0.70	0.64	0.36
27mm	1.15	1.10	0.54
32mm	1.43	1.31	0.54
38mm	2.88	2.61	0.89
50mm	7.5	6.87	1.25

Size/Application Considerations

Each bore size for the Bimba Ultran 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.

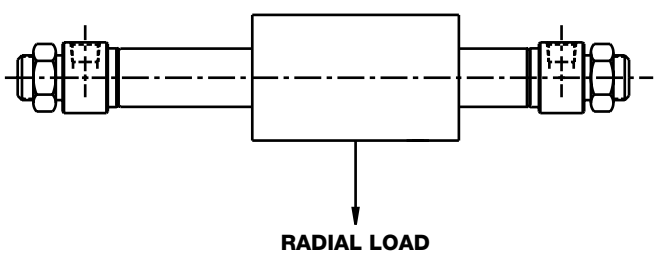
2. *Check axial load requirements.* Graph D, *Axial Load vs. Moment Arm,* shows the maximum axial load the cylinder will support for a specific bore size and moment arm length. If your axial load requirements fall above the curve for the specific bore size, the load must be externally supported.

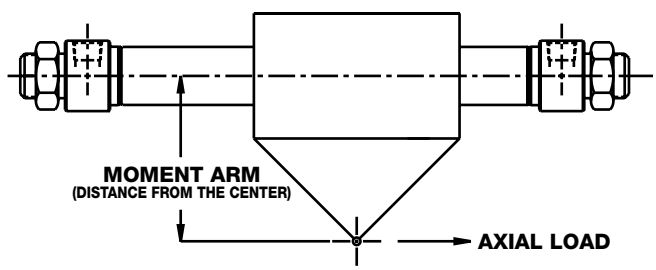
3. *Check End-of-Stroke Velocity and Load Requirements.* From Graphs E through H, *Velocity vs. Load,* choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need internal cushions or external shock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

4. Maximum Velocity. If cylinder speed will exceed .5m/sec. or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.

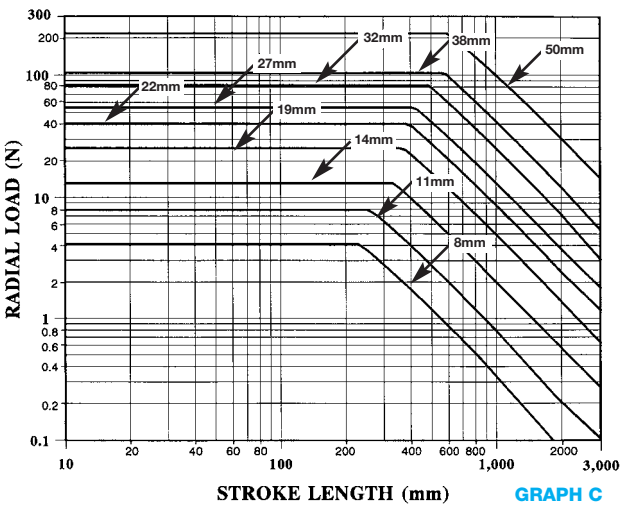
Internal Cushions. From Graphs I through L, *Velocity vs. Load for Cushions,* choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need external shock absorbers to decelerate the load.

External Shock Absorbers. Choose from Graphs EE through RR (Pages 5.22-5.28), *Velocity vs. Load for Shock Absorbers*, for your bore size. Choose model LSM, SSM or HSM based on your velocity and load.





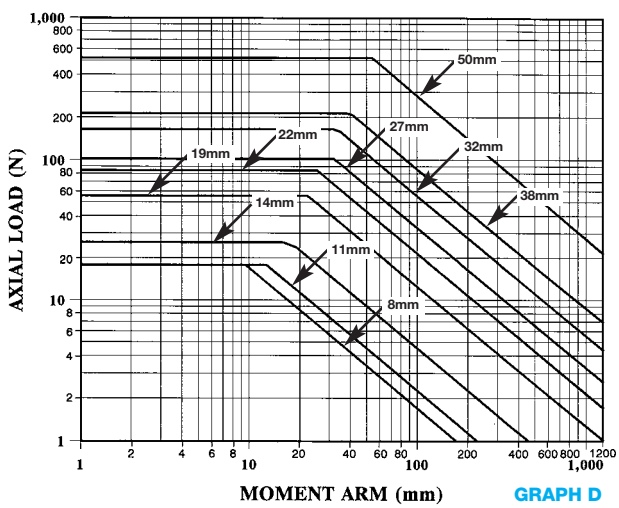
RADIAL LOAD vs **STROKE LENGTH***



GRAPH C

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

AXIAL LOAD vs **MOMENT ARM**

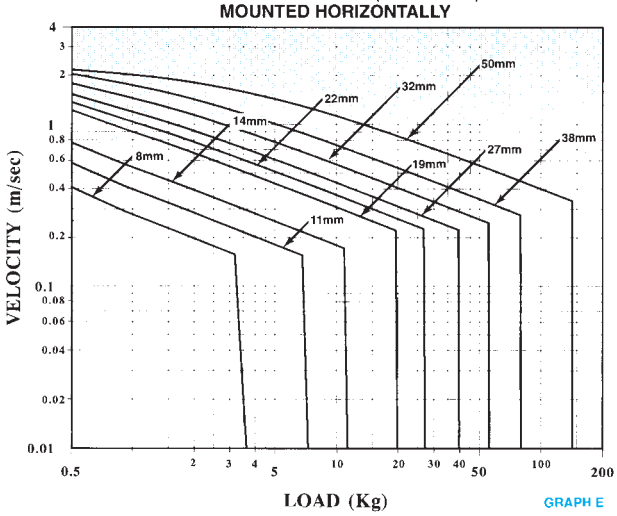


GRAPH D

Velocity vs. Load for Basic Ultran Models

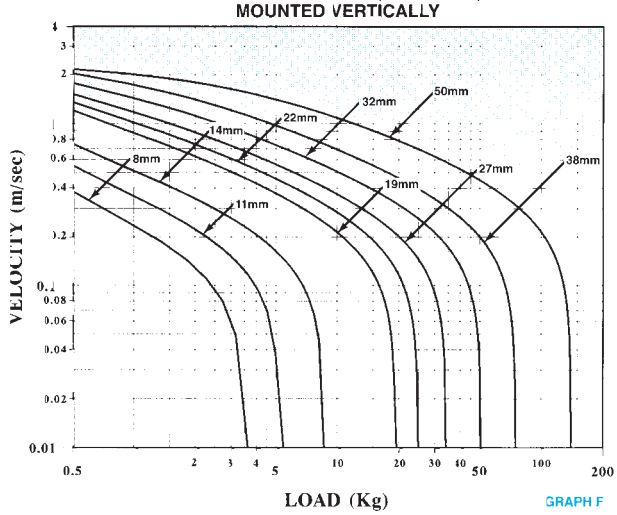
Note: Velocities in excess of 0.5m/sec. require application review by Bimba.

VELOCITY VS LOAD (ULTRAN GOLD) MOUNTED HORIZONTALLY



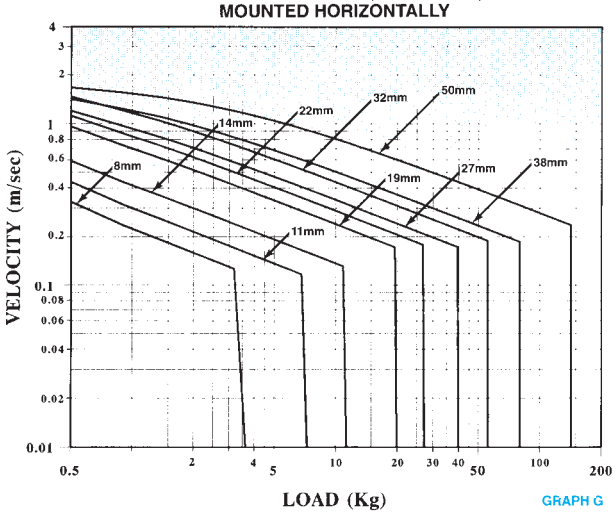
GRAPH E

VELOCITY VS LOAD (ULTRAN GOLD) MOUNTED VERTICALLY



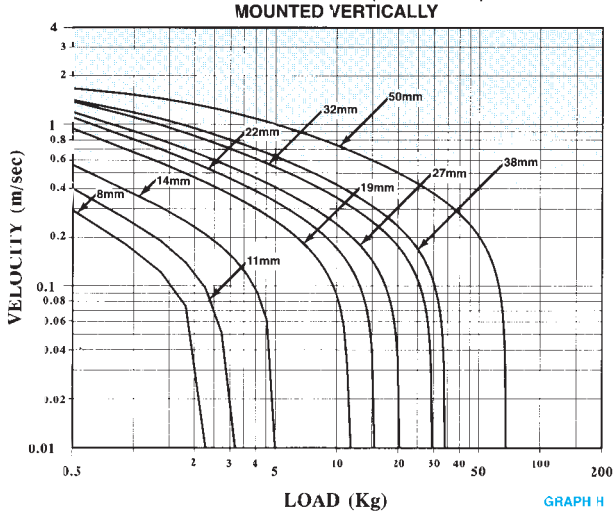
GRAPH F

VELOCITY VS LOAD (ULTRAN SILVER) MOUNTED HORIZONTALLY



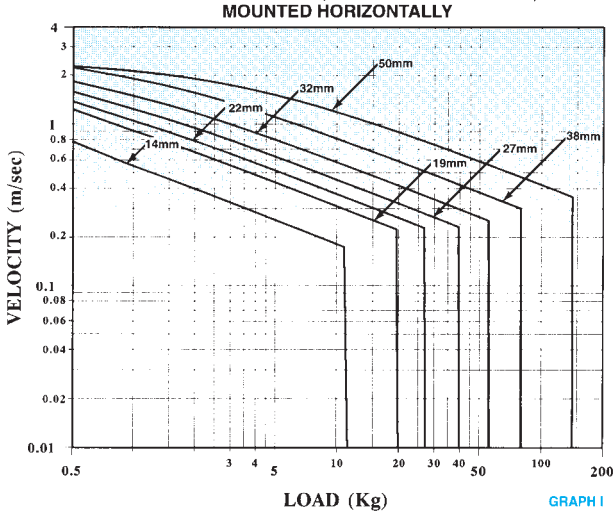
GRAPH G

VELOCITY VS LOAD (ULTRAN SILVER) MOUNTED VERTICALLY



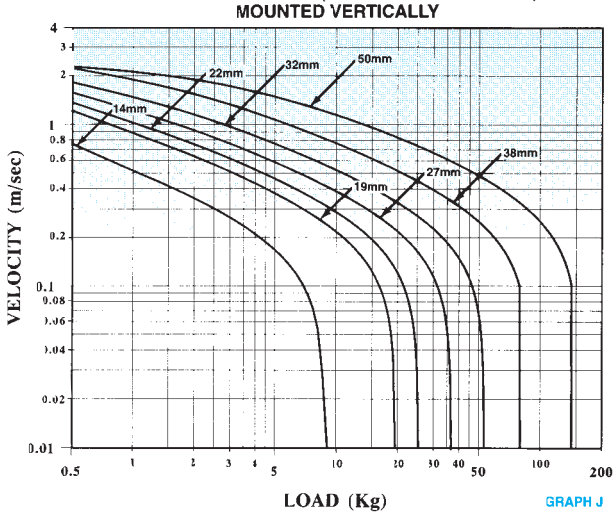
GRAPH H

VELOCITY VS LOAD (ULTRAN GOLD WITH CUSHIONS) MOUNTED HORIZONTALLY



GRAPH I

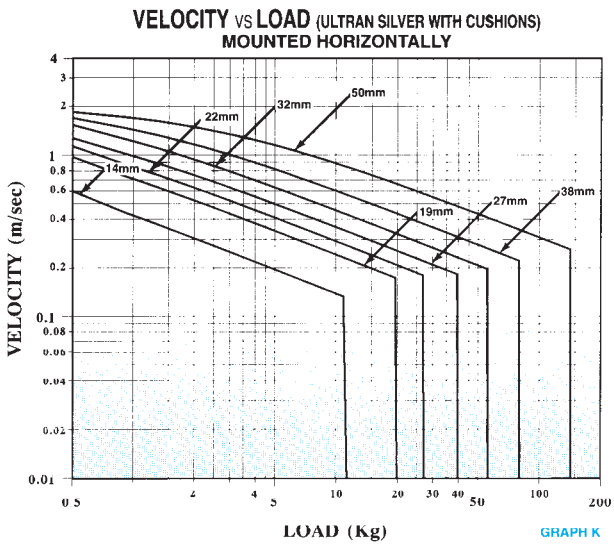
VELOCITY VS LOAD (ULTRAN GOLD WITH CUSHIONS) MOUNTED VERTICALLY

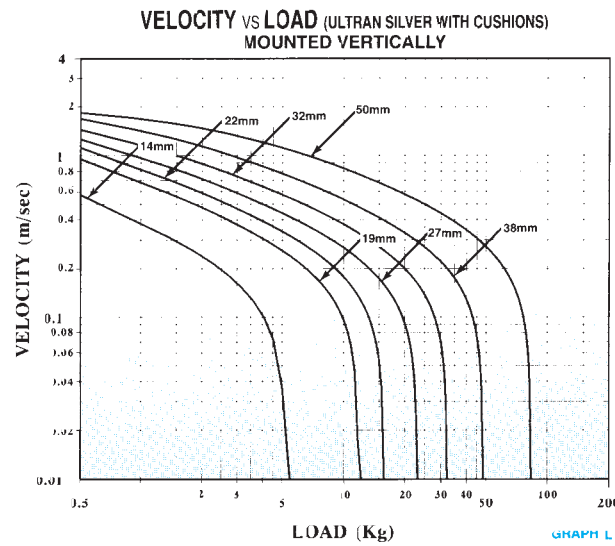


GRAPH J

Velocity vs. Load for Basic Ultran Models

Note: Velocities in excess of 0.5m/sec. require application review by Bimba.





Shock Absorbers

For each model, dimensions and engineering specifications are the same for Light, Standard, and Heavy Duty Shock Absorbers. (LSM, SSM and HSM model numbers).

Shock Absorber Selection Guide

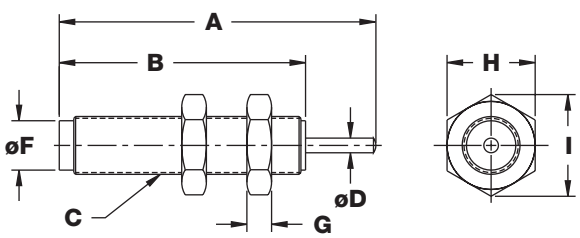
Bore	Ultran	Ultran Slide
8mm	N/A	☐ SM-14
11mm		
14mm	☐ SM-14	☐ SM-19
19mm	☐ SM-19	
22mm	☐ SM-27	☐ SM-27
27mm		
32mm	☐ SM-38	☐ SM-38
38mm		
50mm	☐ SM-50	☐ SM-50

Dimensions

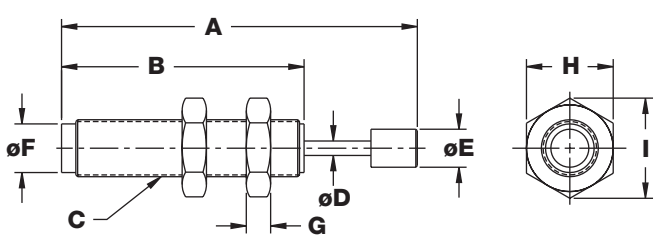
Model	A	B	C	D	E	F	G	H	I
☐ SM-14	35.4	28.7	M10 x 1.0	3.2	N/A	8.2	2.3	12.7	15.0
☐ SM-19	70.0	49.8	M12 x 1.0	3.2	10.2	9.9	4.1	15.0	17.3
☐ SM-27	108.0	82.2	M14 x 1.0	4.0	11.2	10.8	4.1	17.0	19.6
☐ SM-38	137.0	98.7	M20 x 1.0	4.8	12.7	16.3	4.6	24.1	27.7
☐ SM-50	195.0	128.0	M25 x 1.5	8.0	22.0	22.0	4.6	32.0	36.8

Model

☐ SM-14



☐ SM-19, ☐ SM-27, ☐ SM-38, ☐ SM-50

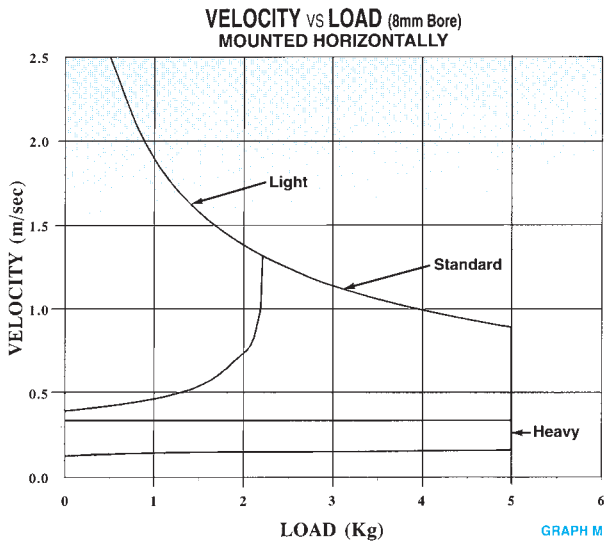


Engineering Specifications

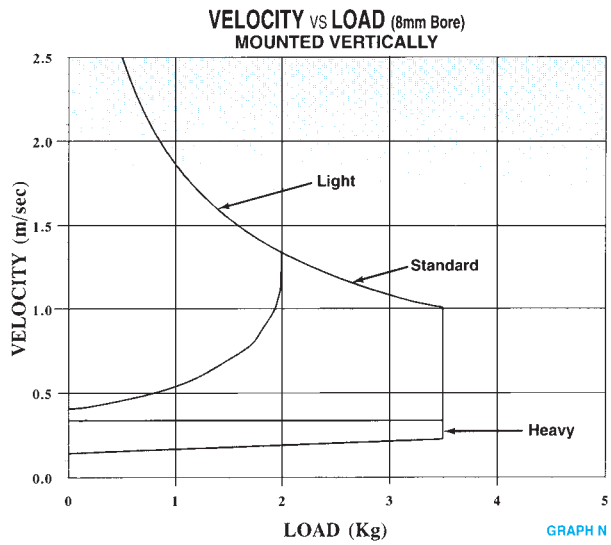
Model	Shock Absorber Bore	(S) Stroke mm	Thread Type	(E_T) Max. Nm Per Cycle	(E_T-C) Max. Nm Per Hour	(F_p) Max Shock Force N	Nominal Coil Spring Force		(F_D) Max. Propelling Force (N)	Model Weight (Grams)
							Extension (N)	Compression (N)		
☐ SM-14	7.1	6.4	M10 x 1.0	2.2	4,100	700	2.9	5.0	89	12
☐ SM-19	6.0	10.0	M12 x 1.0	5.0	14,125	1000	3.0	7.0	220	42
☐ SM-27	7.0	16.0	M14 x 1.0	21.5	34,000	2225	4.4	16.0	530	71
☐ SM-38	11.0	22.0	M20 x 1.0	45.0	53,700	3110	9.0	30.2	890	200
☐ SM-50	14.2	40.0	M25 x 1.5	190.0	75,000	7500	22.0	58.0	2200	454

Velocity vs. Load for Shock Absorbers *(Ultran Slide)*

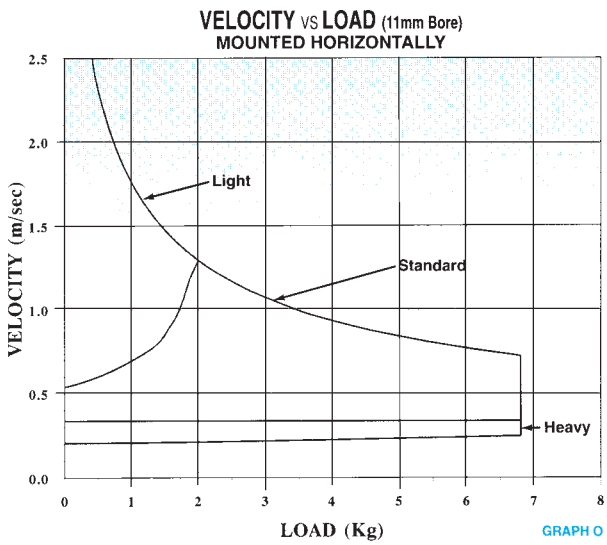
Note: Velocities in excess of 0.5m/sec. require application review by Bimba.



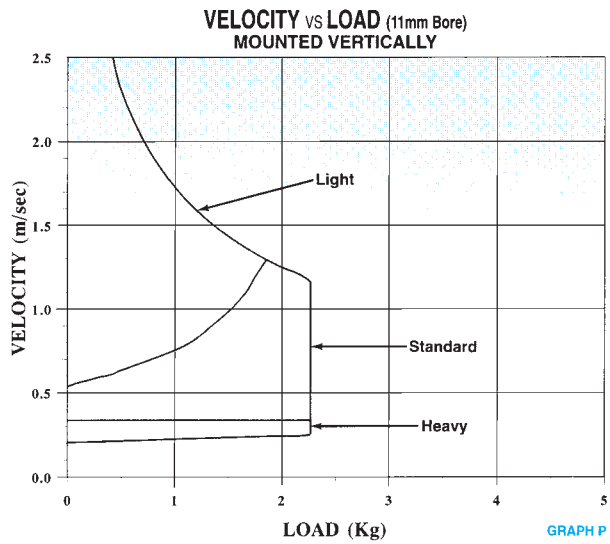
GRAPH M



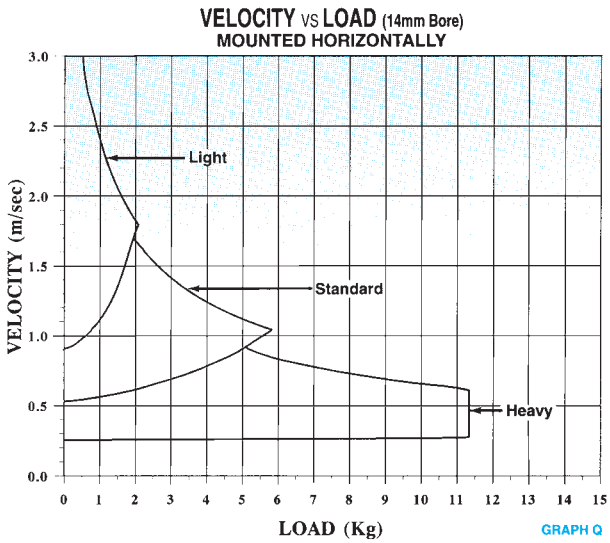
GRAPH N



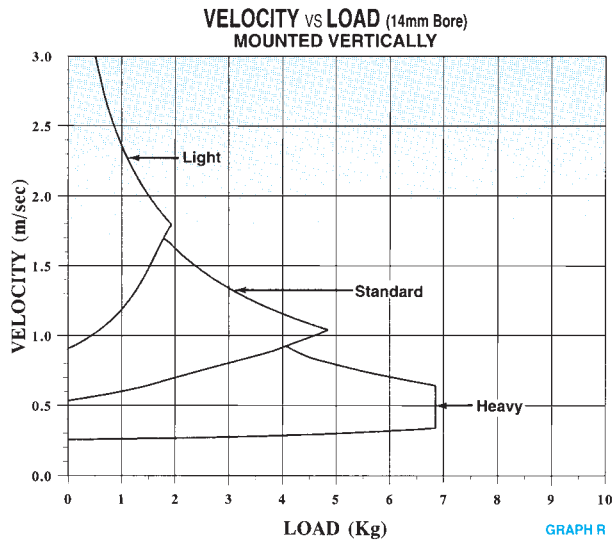
GRAPH O



GRAPH P



GRAPH Q

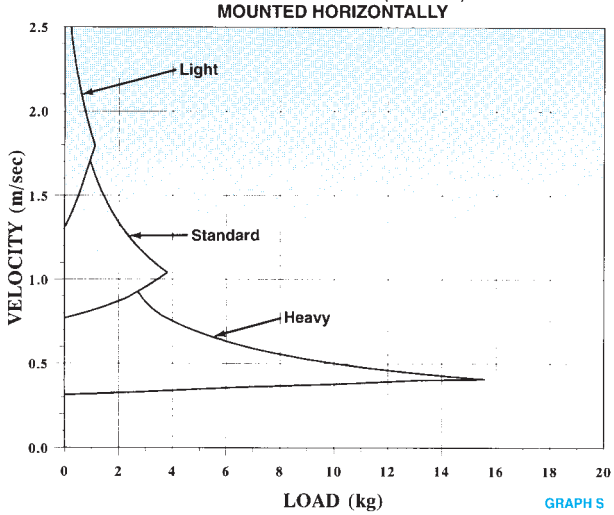


GRAPH R

Velocity vs. Load for Shock Absorbers *(Ultran Slide)*

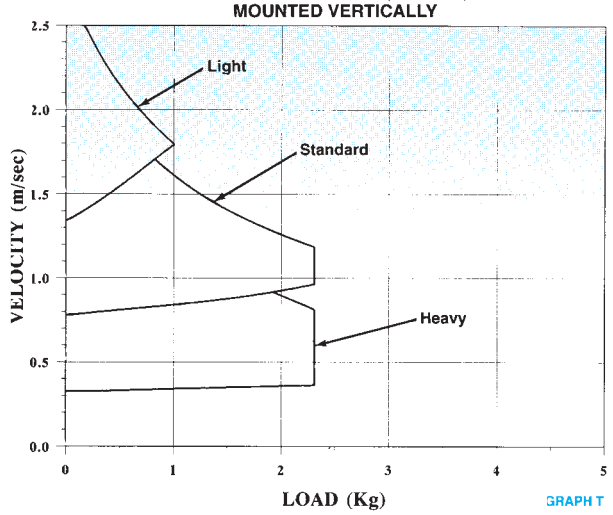
Note: Velocities in excess of 0.5m/sec. require application review by Bimba.

VELOCITY VS LOAD (19mm Bore)
MOUNTED HORIZONTALLY



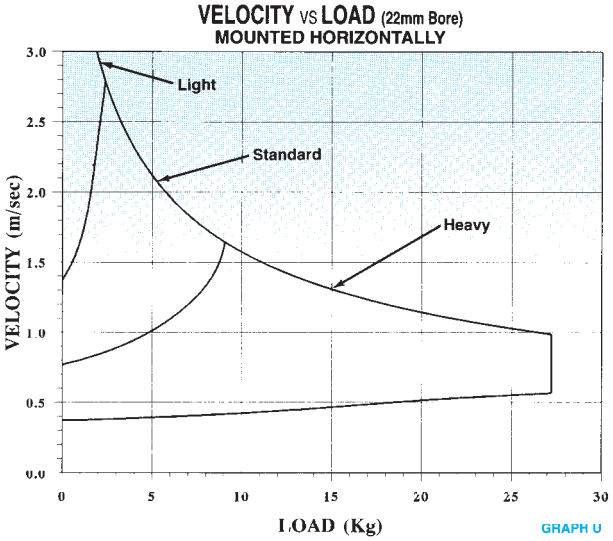
GRAPH S

VELOCITY VS LOAD (19mm Bore)
MOUNTED VERTICALLY



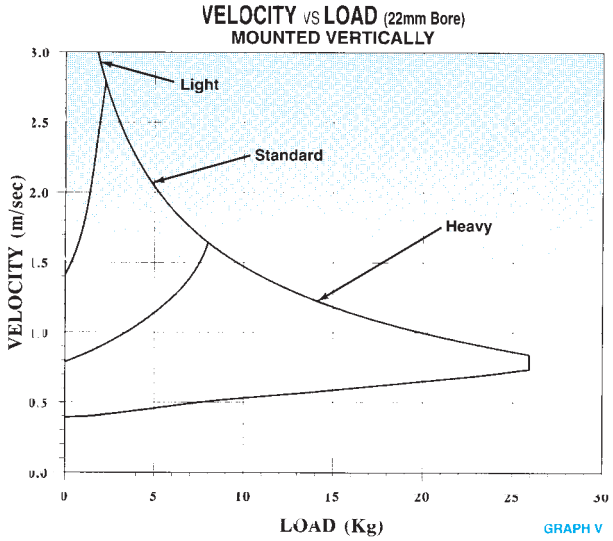
GRAPH T

VELOCITY VS LOAD (22mm Bore)
MOUNTED HORIZONTALLY



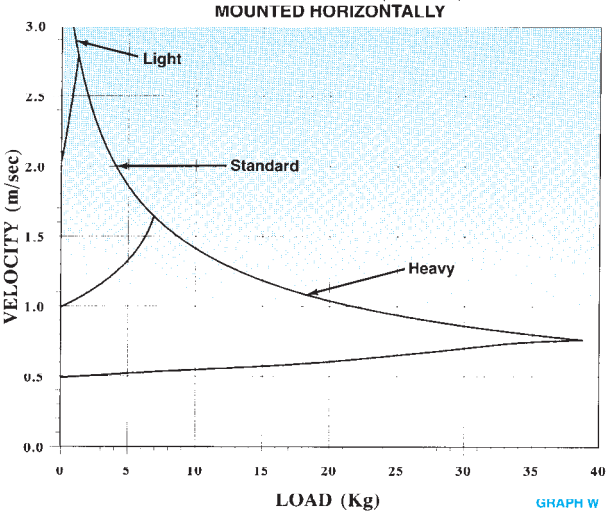
GRAPH U

VELOCITY VS LOAD (22mm Bore)
MOUNTED VERTICALLY



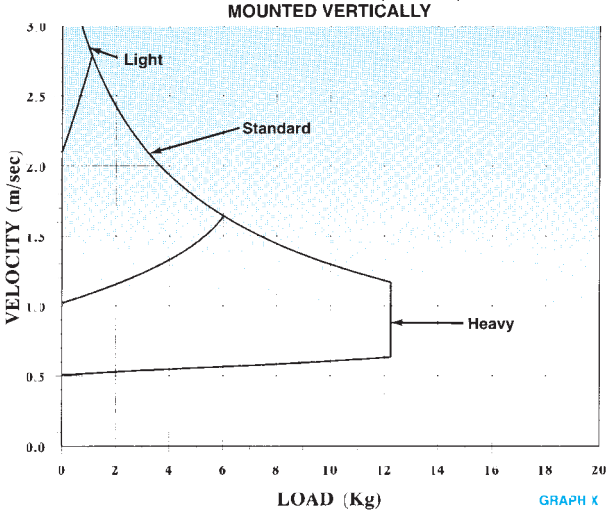
GRAPH V

VELOCITY VS LOAD (27mm Bore)
MOUNTED HORIZONTALLY



GRAPH W

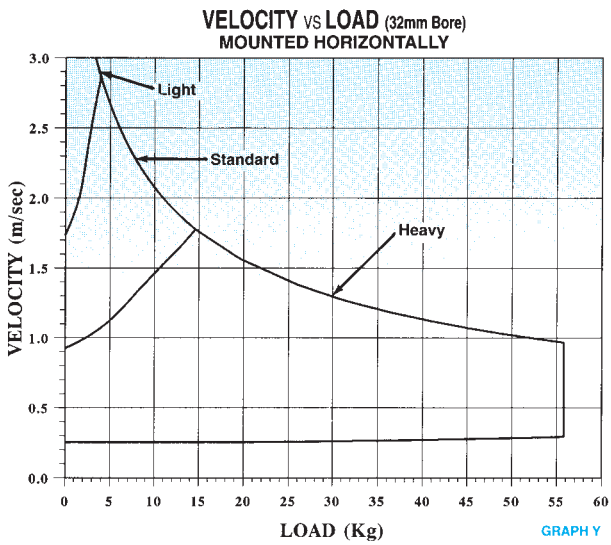
VELOCITY VS LOAD (27mm Bore)
MOUNTED VERTICALLY



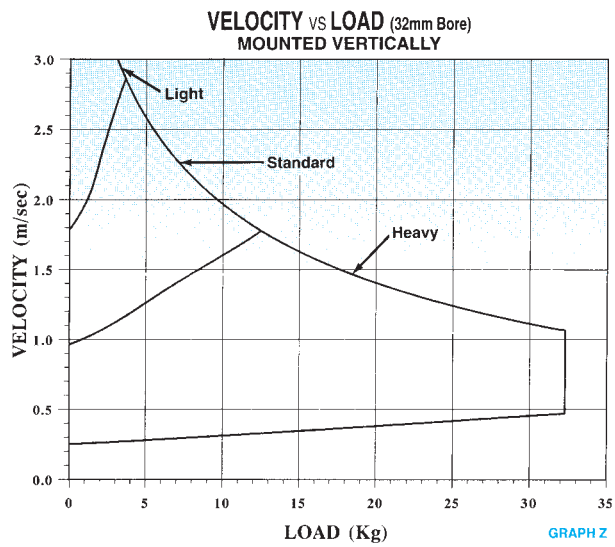
GRAPH X

Velocity vs. Load for Shock Absorbers *(Ultran Slide)*

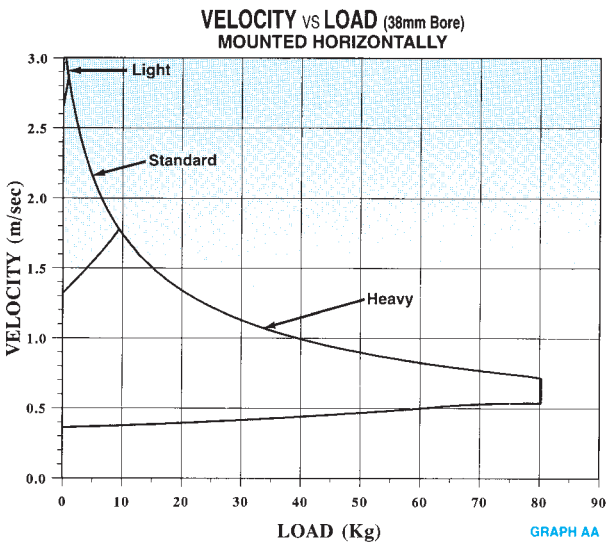
Note: Velocities in excess of 0.5m/sec. require application review by Bimba.



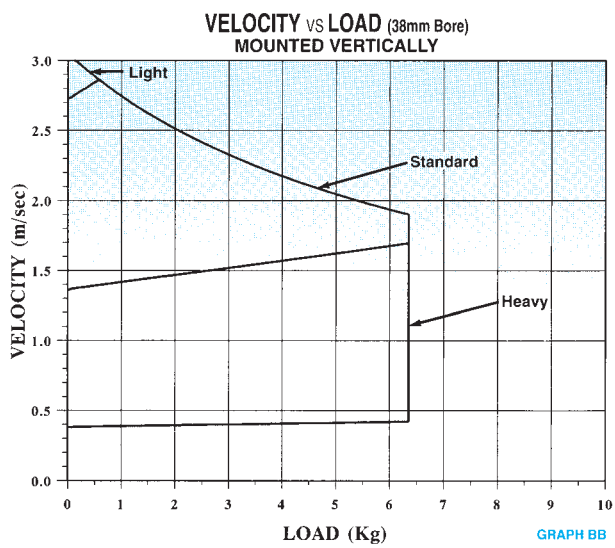
GRAPH Y



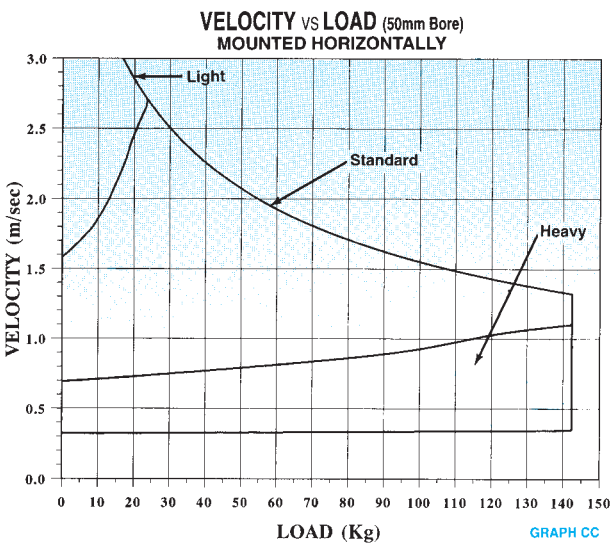
GRAPH Z



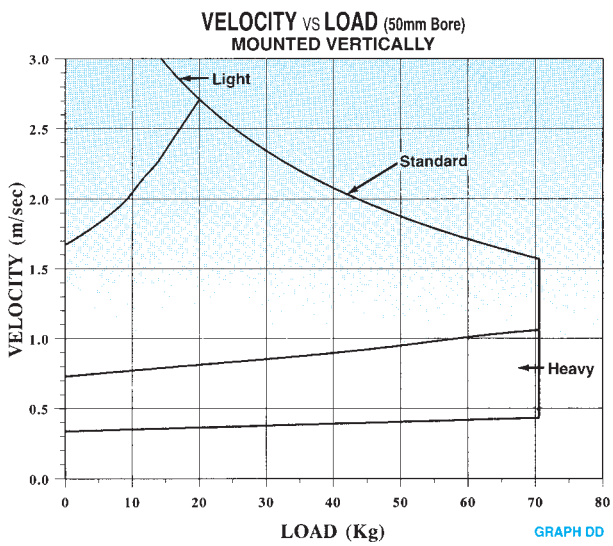
GRAPH AA



GRAPH BB



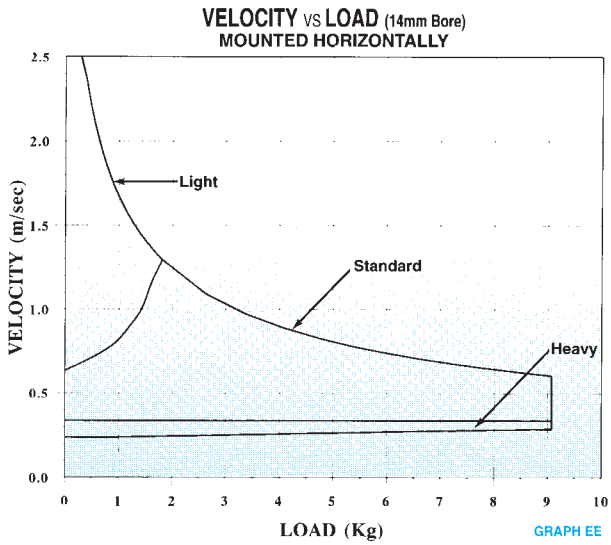
GRAPH CC



GRAPH DD

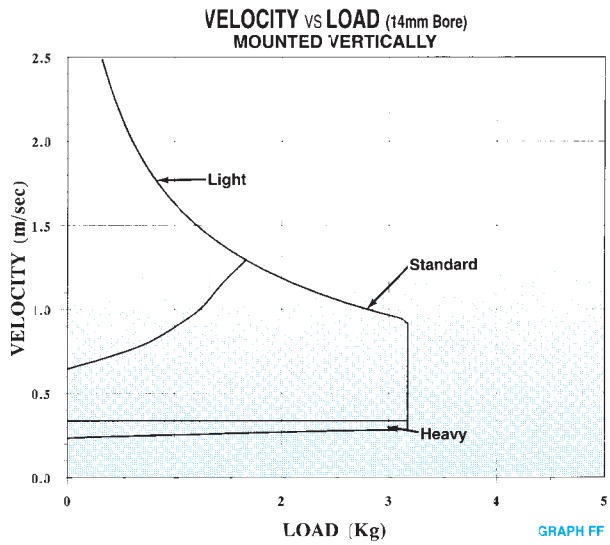
Velocity vs. Load for Shock Absorbers *(Ultran)*

Note: Velocities in excess of 0.5m/sec. require application review by Bimba.



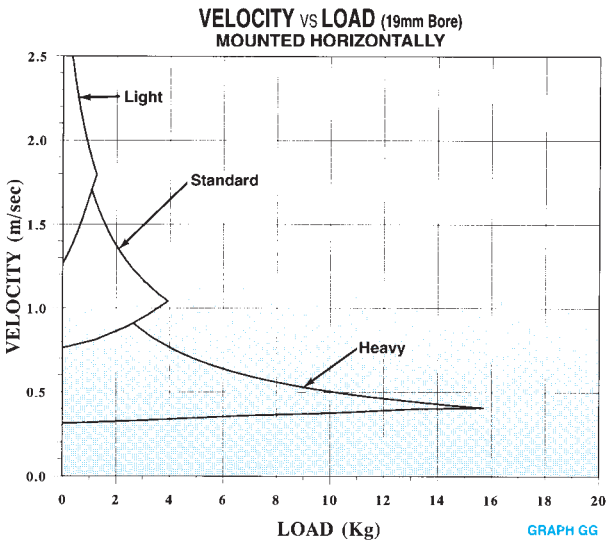
GRAPH EE

If cylinder pressure exceeds 5.5 bar, contact Bimba Manufacturing before using.

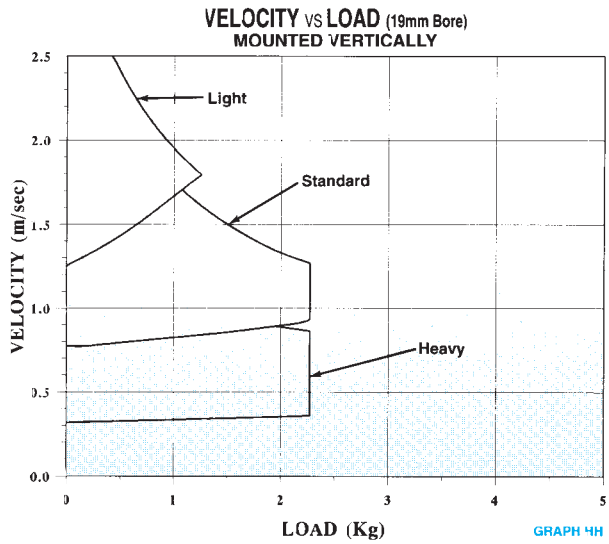


GRAPH FF

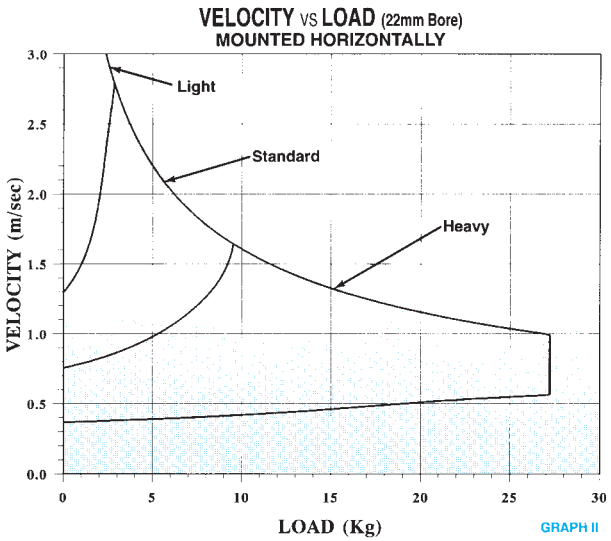
If cylinder pressure exceeds 3.4 bar, contact Bimba Manufacturing before using.



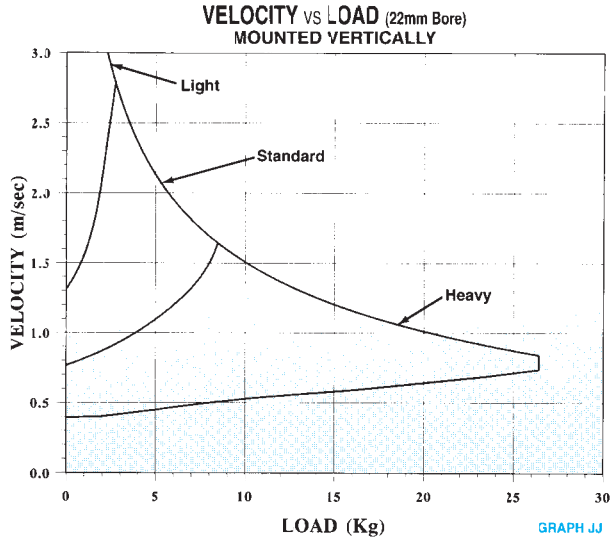
GRAPH GG



GRAPH HH



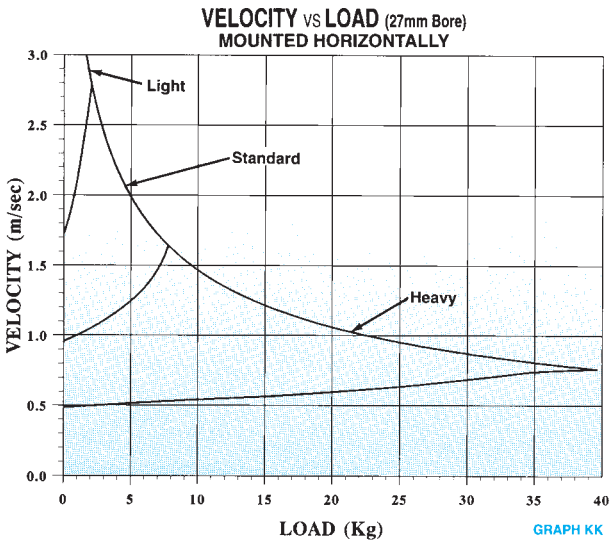
GRAPH II



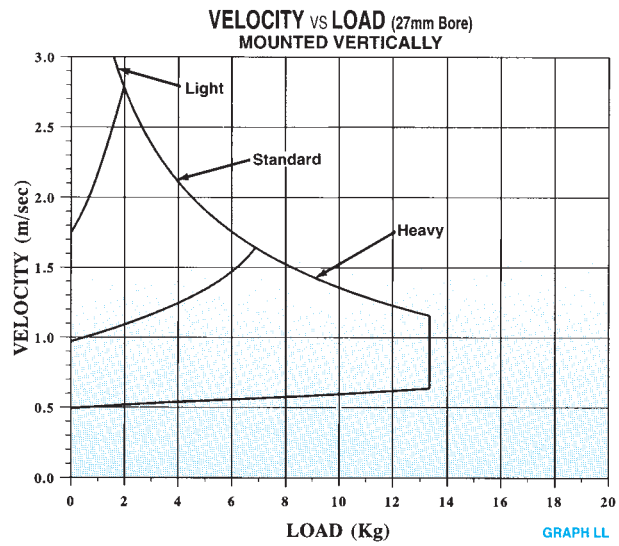
GRAPH JJ

Velocity vs. Load for Shock Absorbers *(Ultran)*

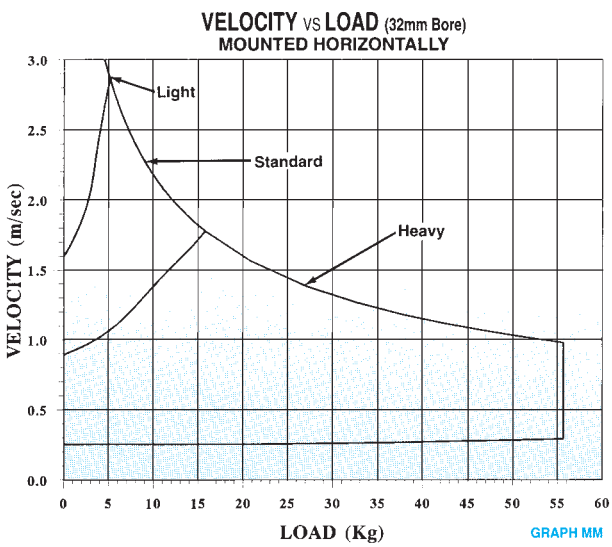
Note: Velocities in excess of 0.5m/sec. require application review by Bimba.



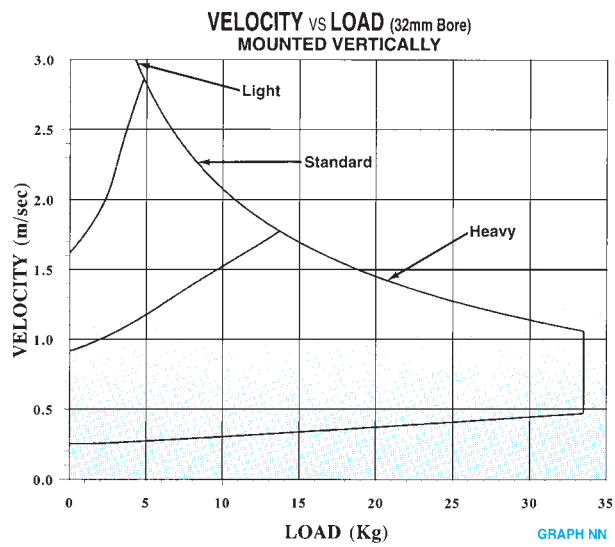
GRAPH KK



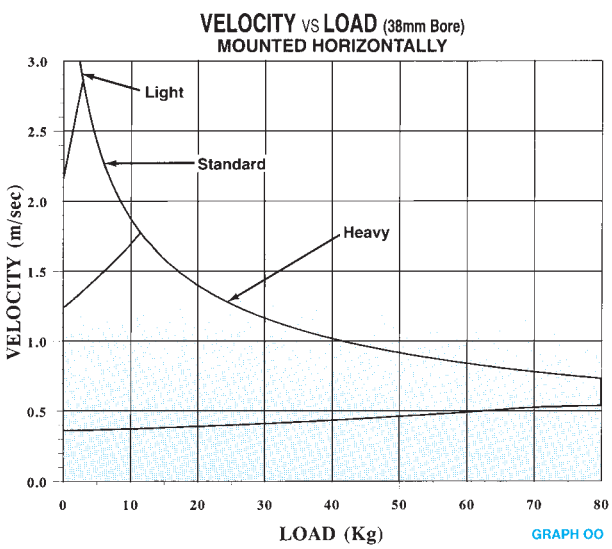
GRAPH LL



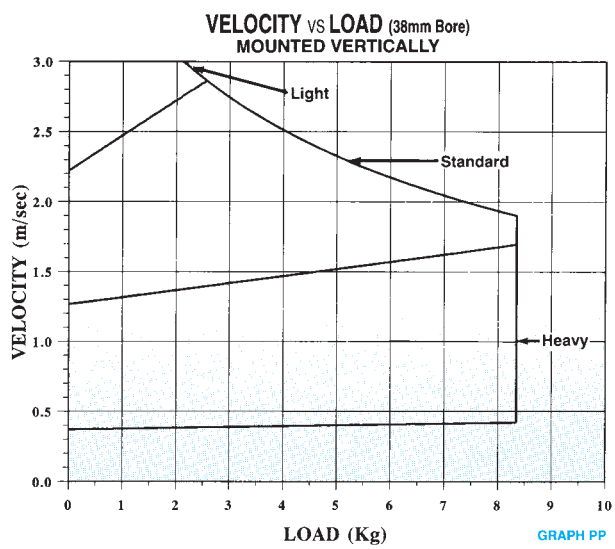
GRAPH MM



GRAPH NN



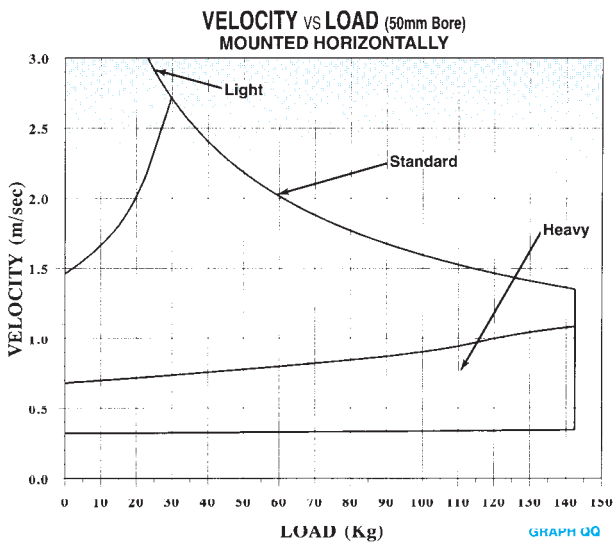
GRAPH OO

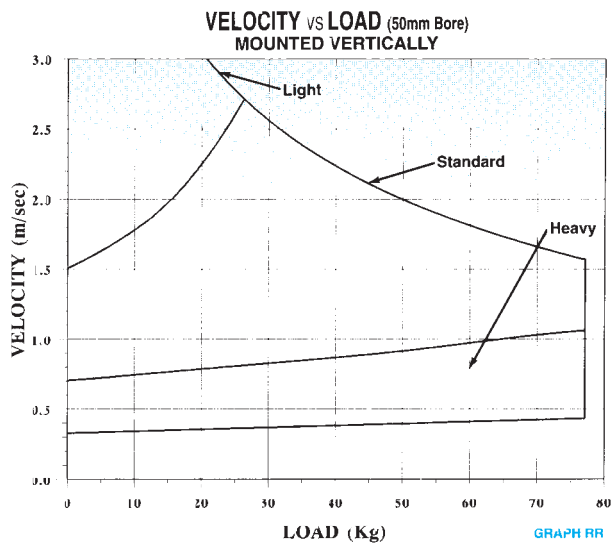


GRAPH PP

Velocity vs. Load for Shock Absorbers *(Ultran)*

Note: Velocities in excess of 0.5m/sec. require application review by Bimba.





Ultran Application Checklist

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?*

_____ (mm)

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

_____ (kg.)

4. *How fast will the cylinder be cycling?*

_____ (cycles/second)

5. *How far is the center of the load from the center of the cylinder?*

a. Ultran _____ (mm)

b. Ultran Slide _____ (mm)
(See page____ moment arm)

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

_____ (m/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 _____

Additional Notes: _____