P1X Series

Compact Rodless Air Cylinders

Contents

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Parker-Origa
Glendale Heights, Illinois
www.parker.com/pneu/rodless

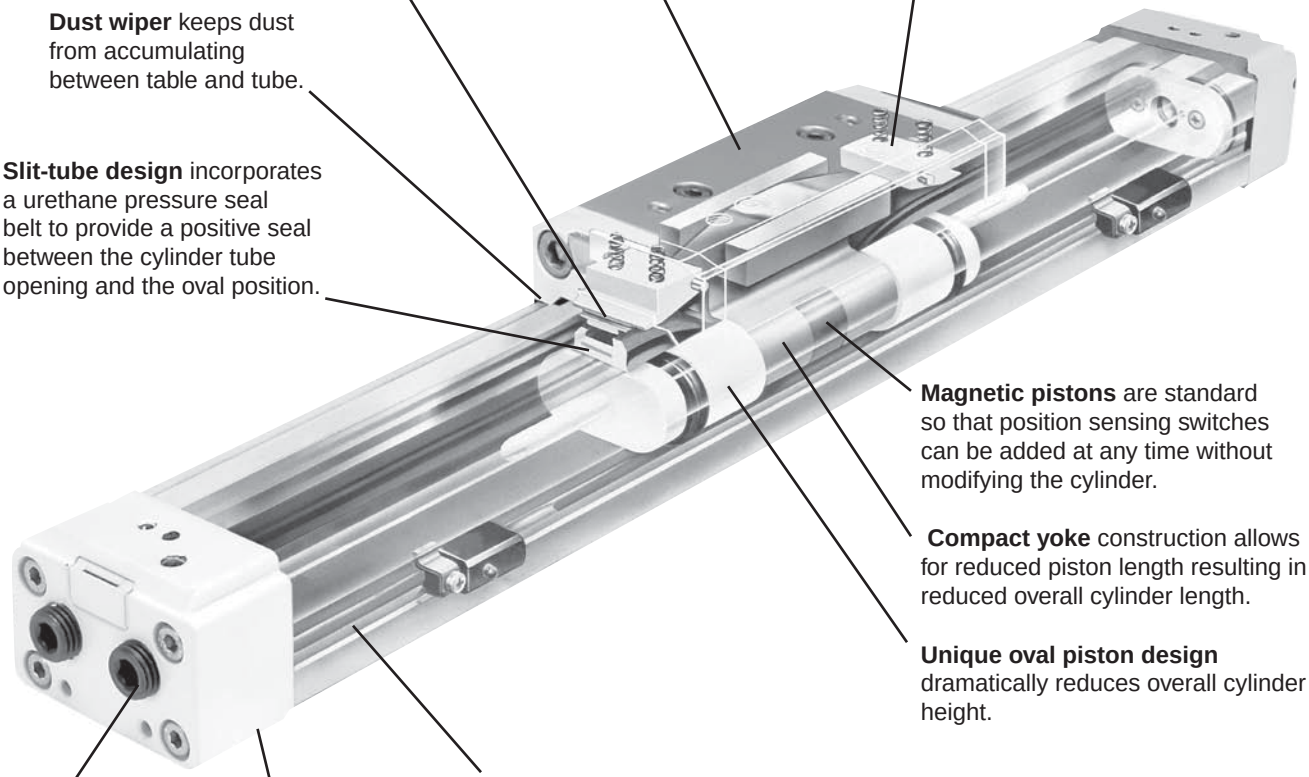
Large carriage with four strategically placed mounting holes ensures a high degree of stability and flexibility.

Spring-loaded tension arms located on the work table maintain constant pressure on the dust seal belt to ensure external sealing protection.

Dust-seal belt located above the pressure seal belt, prevents contamination from entering the cylinder tube.

Dust wiper keeps dust from accumulating between table and tube.

Slit-tube design incorporates a urethane pressure seal belt to provide a positive seal between the cylinder tube opening and the oval position.



Magnetic pistons are standard so that position sensing switches can be added at any time without modifying the cylinder.

Compact yoke construction allows for reduced piston length resulting in reduced overall cylinder length.

Unique oval piston design dramatically reduces overall cylinder height.

Integral switch mounting rail provides convenient mounting location for position sensing switches. Switches available include Solid State and Reed, AC or DC, with or without indicator lights. Bi-Color switches are available with 2 indicators to identify when maximum efficiency of contact is made.

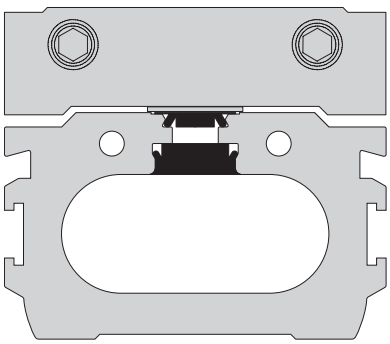
Additional ports in one end cap for optional piping location.

Note: End cap ports shown on this view are for representation only. Actual end ports are at other end of cylinder in relation to standard side ports and end ports are normally furnished plugged.

Adjustable cushions for deceleration at end of stroke are standard.

Oval Piston Design

Oval piston design provides greater load carrying capacity than typical rodless cylinders with round pistons.



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Model Code

P1X	N	032	D	A	N	0500	W	D	N	N	N	-B

Series

P1X	Global Rodless

Construction

N	Inch
M	Metric

Bore Size

016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm

Carriage

D	Double Acting

Piston/Shock Style

A	Cushions Both Ends (Standard)
R	Cushion Right End Only*
L	Cushion Left End Only*
N	No Cushions or Shock Absorbers
H	Shock Absorber Both Ends**
B	Shock Absorber Right End Only**
C	Shock Absorber Left End Only**

* As viewed from port side of cylinder
** Cannot be combined with inverted carriage

Seal Material

N	Standard

Stroke Length*

Basic or Options

B†	Standard
W†	With Options
/	Special (for factory use only)

Carriage Mounting Style

Standard	Inverted	Carriage Mounting
D (std)	**J**	Single, Basic Mount
A	**G**	Single, Swivel Mount

Mounting Options

No Foot Mount	End Mount Foot Bracket	Bottom Mount Foot Bracket	Intermediate Supports
N	**F**	**A**††	No Support
H	**M**	**B**††	One Support
K	**P**	**C**††	Two Supports
T	**R**	**D**††	Three Supports

Porting Options

N	NPTF
G	BSPP
Q	BSPT*

* Not available with N construction

Fastener Type

N	Standard - Zinc-Plated
S	Stainless Steel

* Stroke is ALWAYS in mm.

† When "B" is specified, the remaining digits in the part number are not necessary. If "W" is used, the remaining digits in the part number must be filled out.

†† Not available on 40, 50 and 63mm bore sizes.

Essential Information
Optional Features

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Specifications

Model	P1X (Standard w/Switch)			
Operating Medium	Compressed Air			
Maximum Pressure	100 PSI (7 BAR)			
Minimum Pressure	Ø16, Ø20 Bores 29 PSI (2 Bar) Ø25, Ø32, Ø40 Bores 14.5 PSI (1 Bar) Ø50, Ø63 Bores 7 PSI (0.5 Bar)			
Proof Pressure	152 PSI (10.5 Bar)			
Bore Size mm (inch nominal)	16 (5/8)	20 (3/4), 25 (1)	32 (1-1/4), 40 (1-1/2)	50 (2), 63 (21/2)
Port Size – N Series	M5 (10-32)	1/8 NPT	1/4 NPT	3/8 NPT
Port Size – M Series	M5 (10-32)	1/8 Rc	1/4 Rc	3/8 Rc
Ambient Temperature °F (°C)	40 to 140°F (5 to 60°C)			
Stroke Tolerance in.	±0.080 to 39"	±0.100 to 118"	±0.120 to 196"	
Piston Speed, *in./sec.	2-80 IPS with side ports on each end (Ø16 & Ø20 bores 2-40 IPS with single end porting with 39" stroke) (Ø25, Ø32, Ø40, Ø50 & Ø63 bores 2-40 IPS with single end porting with 78" stroke)			
Cushion	Air Cushion Standard			
Lubrication	Not Required (if you choose to lubricate your system, continuing lubrication will be required.)			

***Note:** Actual piston speed with one end ports will vary depending on stroke length.

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Weight & Theoretical Force Characteristics

Bore	Area In²	Weights								Theoretical Force (lbs)				
		Weight at Zero Stroke						Weight per 1" (25.4mm) Stroke		at Pressure (PSI)				
		M00		MLB		MLB1								
		lbs	kg	lbs	kg	lbs	kg	lbs	kg	30	40	60	80	100
16	0.31	0.70	0.3	0.73	0.3	0.77	0.4	0.07	0.03	9	12	19	25	31
20	0.49	1.15	0.5	1.19	0.5	1.28	0.6	0.10	0.04	15	20	29	39	49
25	0.84	2.21	1.0	2.43	1.1	2.43	1.1	0.15	0.07	23	30	46	61	76
32	1.26	3.31	1.5	3.53	1.6	3.75	1.7	0.20	0.09	38	50	69	100	125
40	1.96	5.29	2.4	5.51	2.5	—		0.27	0.12	59	78	117	156	195
50	3.08	7.94	3.6	8.16	3.7			0.40	0.18	91	122	182	243	304
63	4.86	13.67	6.2	14.33	6.5			0.63	0.28	145	193	290	386	483

Replacement Seal Kits

Bore (mm)	Part Number
16	L079020016
20	L079020020
25	L080100025
32	L080100032
40	L080100040
50	L080100050
63	L080100063

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Moments

Figure 5 shows the maximum allowable moments for each of the three types of loading: pitch, roll and yaw.

The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable (Figure 6) and factored into the equation.

Horizontal Mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical Mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

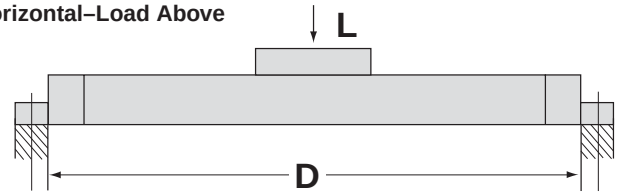
Figure 5

Maximum Allowable Moments N-m (lb-in)						
Bore	[M] Pitch Moment		[Ms] Roll Moment		[Mv] Yaw Moment	
	Std.	Inverted	Std.	Inverted	Std.	Inverted
16	5 (44)	3.5 (31)	1 (9)	0.5 (4)	1 (9)	1 (9)
20	10 (89)	7 (62)	1.5 (13)	0.7 (6)	3 (27)	3 (27)
25	17 (150)	12 (106)	5 (44)	2.5 (22)	10 (89)	10 (89)
32	36 (319)	25 (221)	10 (89)	5 (44)	21 (186)	21 (186)
40	77 (682)	54 (478)	23 (204)	11.5 (102)	26 (230)	26 (230)
50	154 (1363)	108 (956)	32 (283)	16 (142)	42 (372)	42 (372)
63	275 (2434)	193 (1708)	52 (460)	26 (230)	76 (673)	76 (673)

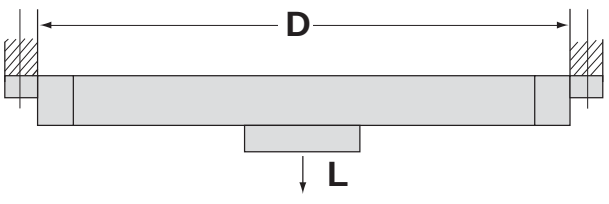
Load and Deflection

Figure 6 shows the maximum load [L] that the cylinder can accept, as well as the maximum length [D] between supports at the maximum load.

Horizontal–Load Above



Horizontal–Load Below



Horizontal–Tube Support

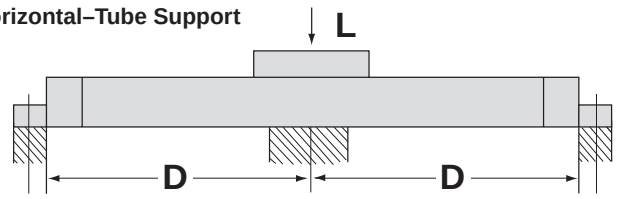
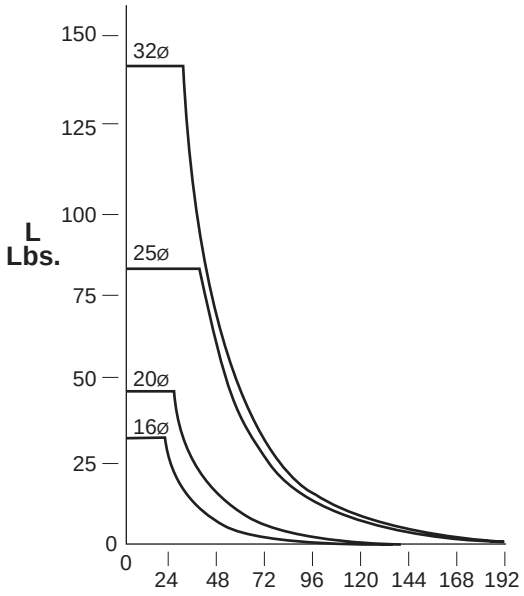


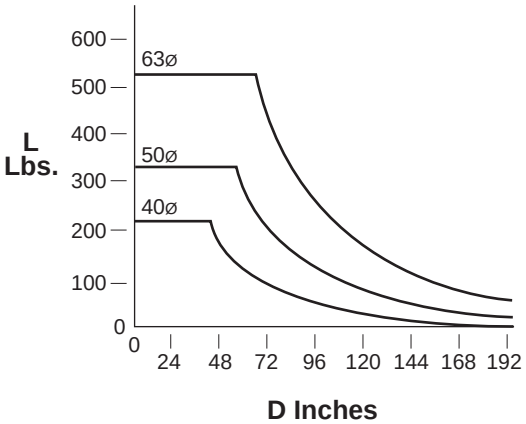
Figure 6

Bore Size	Max. Allowable Load [L] N (lbs)		Max. Unsupported Length mm (in) at Max. Load
	Std.	Inverted	
16	141 (32)	70 (16)	450 (17.7)
20	198 (45)	101 (23)	551 (21.7)
25	356 (81)	180 (41)	899 (35.4)
32	616 (140)	308 (70)	749 (29.5)
40	959 (218)	480 (109)	1000 (39.4)
50	1456 (331)	726 (165)	1300 (51.2)
63	2297 (522)	1148 (261)	1600 (63.0)

Acceptable length and load combinations for the various bore sizes can be determined from the charts in Figure 7.

Figure 7





To determine cylinder deflections under the load (or resistive force perpendicular to the piston table) without mid-support, see the graphs on page G135.

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Inertia Moment Consideration

When the weight is stopped at the end of the stroke by the cylinder cushion, inertial force is created. This inertial force (Fi) can be determined by using the formula:

Fi = LG

L = Load attached to the cylinder carriage (lbs.)

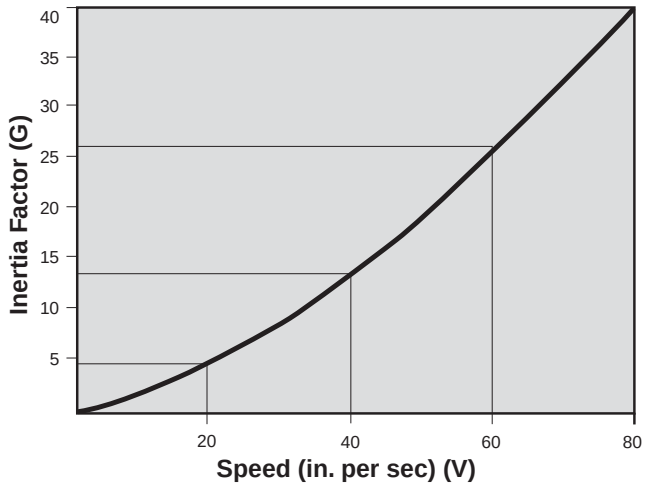
G = Inertia factor (Figure 8)

Example:
A speed of 40 in/sec corresponds to an inertia factor G of 13.

The inertial force calculated would then be multiplied by the distance from the center of gravity of the load to the centerline of the cylinder, and added to the previously calculated M and Mv moments. This will give an M Total and Mv Total. Ensure that the M Total and the Mv Total do not exceed the [M] and [Mv] values shown in Figure 5 (previous page). If they exceed these values, consult the factory.

See pages G144-G146 for additional information on shock absorbers.

Figure 8

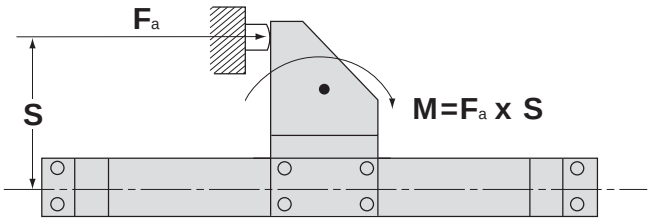


External Stops

When the load attached to the cylinder is stopped externally, it creates an additional moment equal to the cylinder force (Fa) times the distance (S). This additional moment, plus the previously calculated Load-Moment factor, should not exceed the allowable values. See previous page.

When reducing the stroke with external stops, remember that the cushion length and the energy absorption capacity are not directly proportional. Reducing the cushioning distance by 50% corresponds to a reduction of 60-70% in cushion effectiveness.

Figure 9



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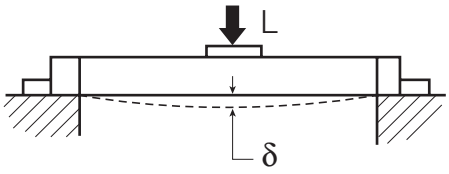
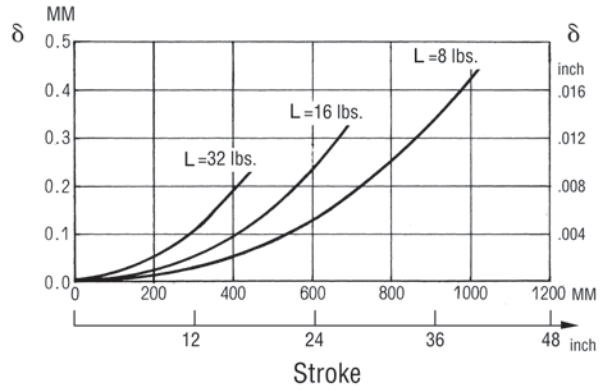
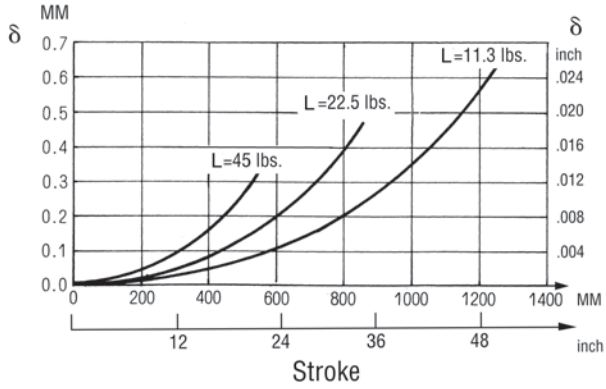


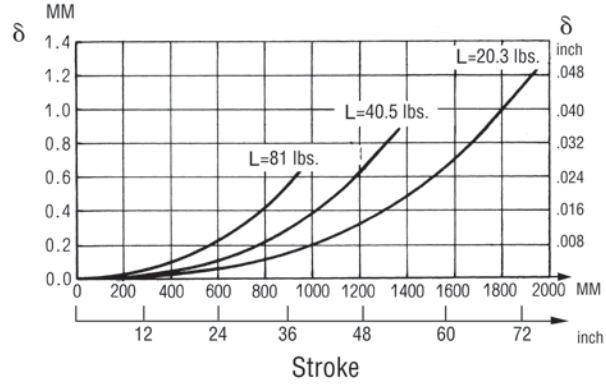
16 mm Bore



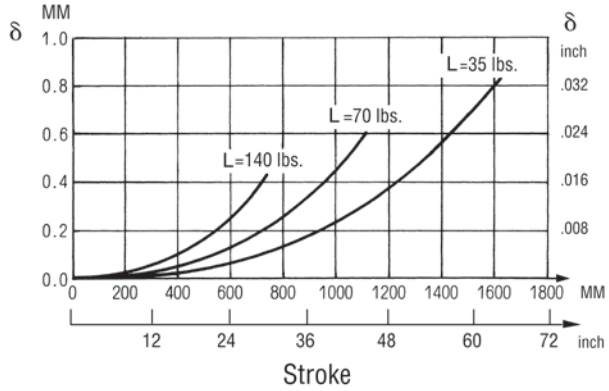
20 mm Bore



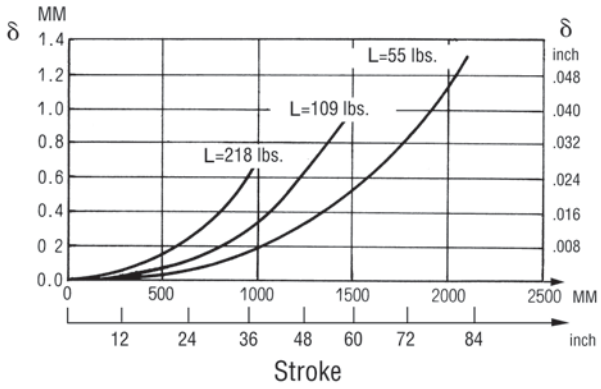
25 mm Bore



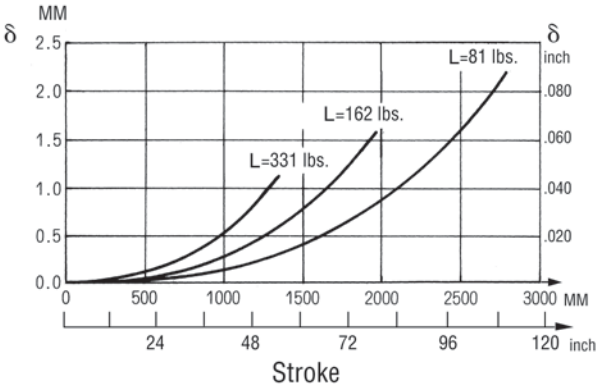
32 mm Bore



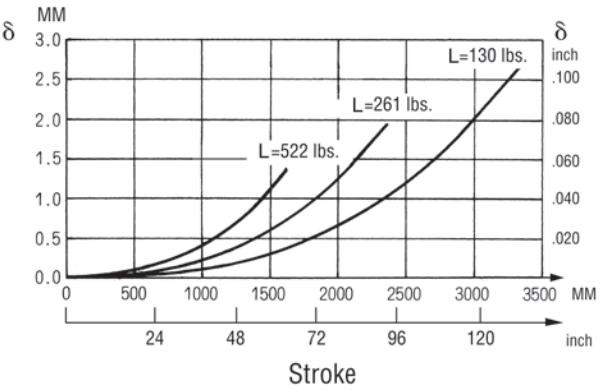
40 mm Bore



50 mm Bore



63 mm Bore



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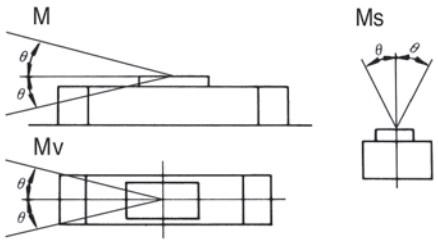
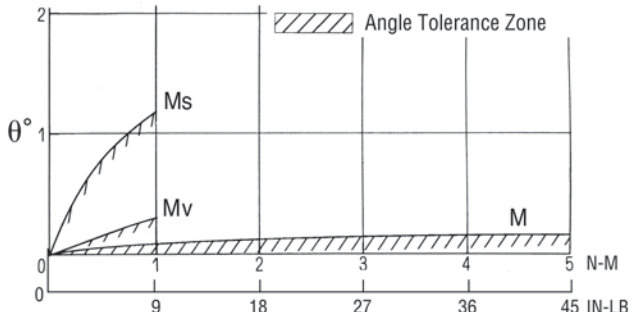
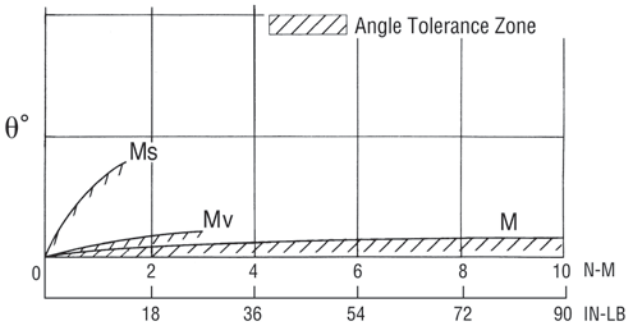
Piston Table Angular Deflection Due To Load Moments Applied



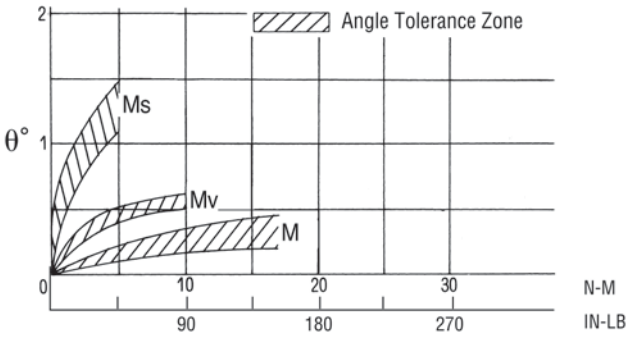
16 mm Bore



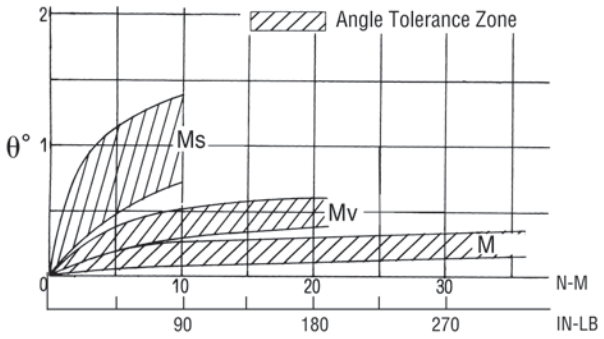
20 mm Bore



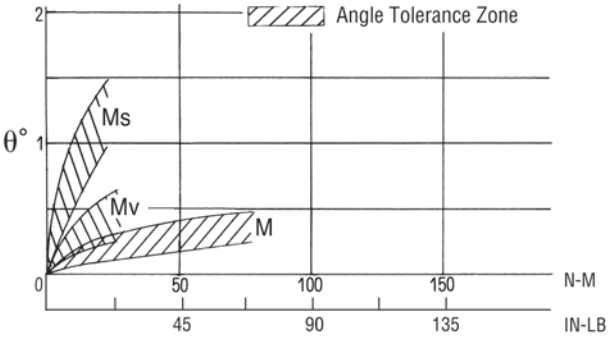
25 mm Bore



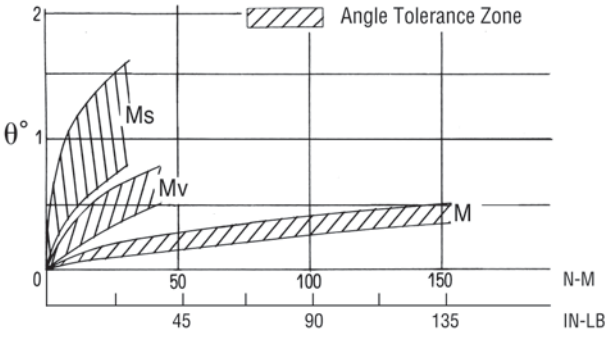
32 mm Bore



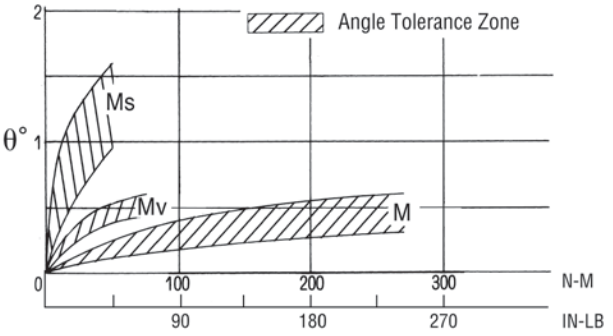
40 mm Bore



50 mm Bore



63 mm Bore



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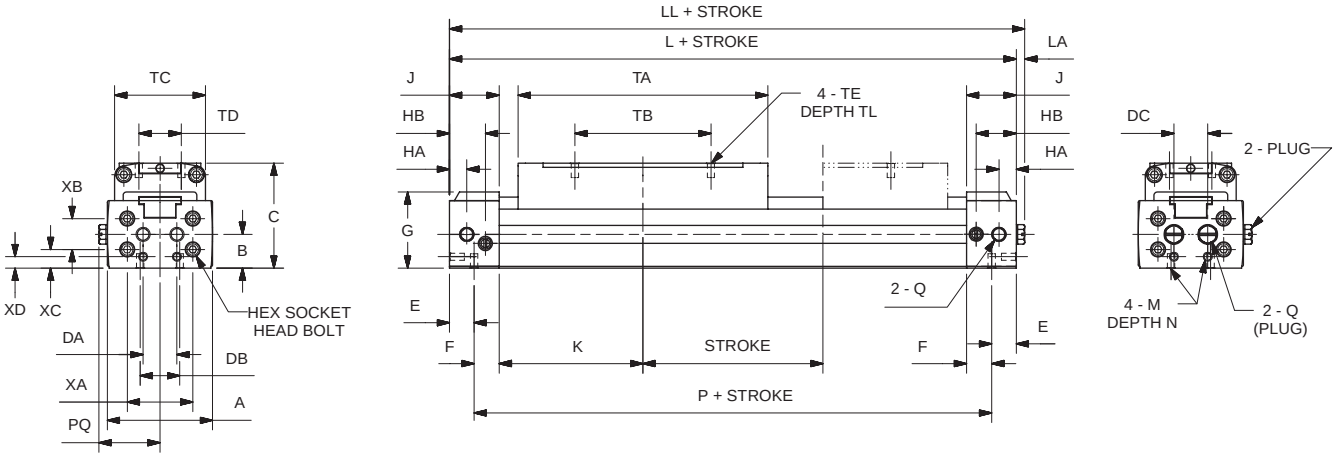
Basic Cylinder

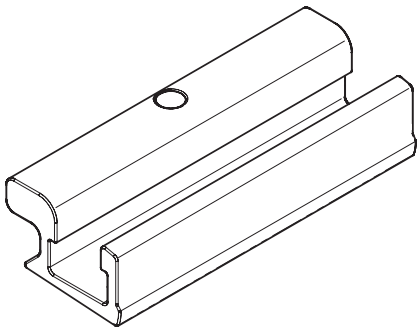


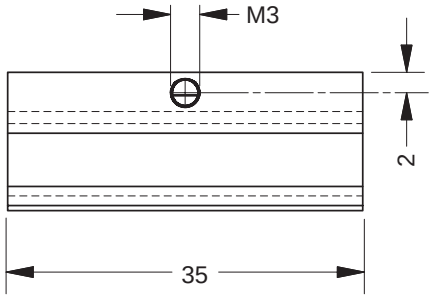
Bore (mm)		A	B	C	DA	DB	DC	E	F	G	HA	HB	J	K	L	LL	LA	M	N
16	inches	1.46	0.47	1.46	0.47	0.55	0.47	0.34	0.35	1.06	0.24	0.55	0.69	2.24	5.87	5.98	0.12	5-40	0.20
	mm	37	12	37	12	14	12	8.5	9	27	6	14	17.5	57	149	152	3	M3	5
20	inches	1.73	0.55	1.65	0.55	0.63	0.63	0.41	0.45	1.22	0.34	0.73	0.87	2.46	6.65	6.75	0.10	8-32	0.26
	mm	44	14	42	14	16	16	10.5	11.5	31	8.5	18.5	22	62.5	169	171.5	2.5	M4	6.5

Bore (mm)		P	PQ	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XD
16	inches	5.20	0.83	10-32 NPT	3.47	1.89	1.26	0.59	5-40	0.20	0.91	0.43	0.26	0.16
	mm	132	21	M5	88	48	32	15	M3	5	23	11	6.5	4
20	inches	5.83	0.97	1/8 NPT	3.94	2.36	1.50	0.71	8-32	0.24	1.10	0.63	0.24	0.20
	mm	148	24.5	1/8 Rc	100	60	38	18	M4	6	28	16	6	5

Sensor Adapter Bracket

Part Number P8S-TMA0Y
(Shown larger than actual size)





NOTE: Must be ordered separately when ordering sensors.
for sensor information, please see Section M.

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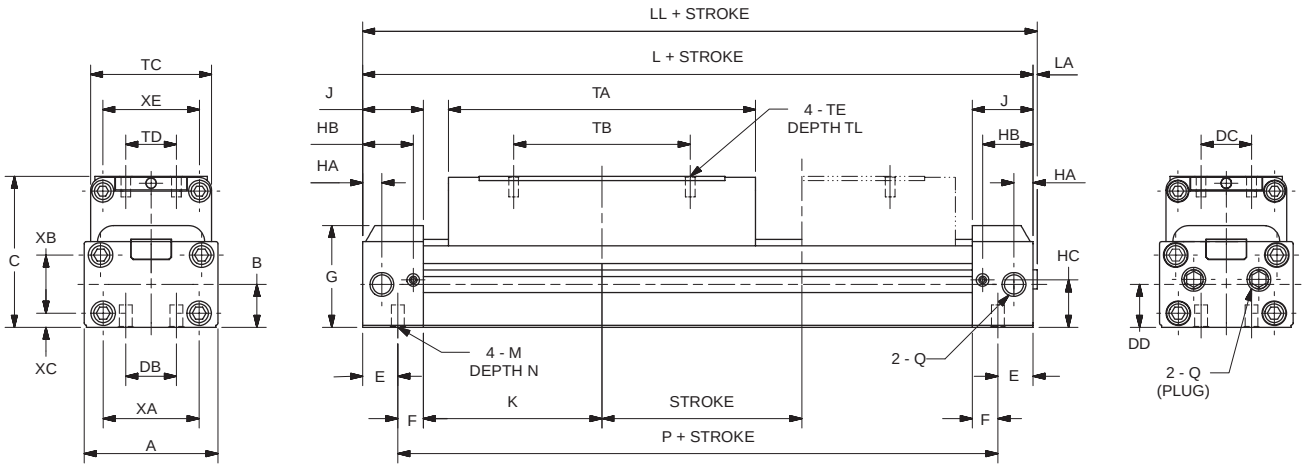
Basic Cylinder



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Bore (mm)		A	B	C	DB	DC	DD	E	F	G	HA	HB	HC	J	K	L	LL	LA	M	N
25	inches	2.09	0.67	2.09	0.79	1.02	0.75	0.55	0.39	1.59	0.30	0.79	0.74	0.95	2.80	7.48	7.56	0.08	1/4-20	0.35
	mm	53	17	53	20	26	19	14	10	40.5	7.5	20	18.9	24	71	190	192	2	M6	9
32	inches	2.60	0.73	2.24	1.26	1.06	0.83	0.59	0.51	1.71	0.39	0.93	0.85	1.10	3.35	8.90	9.00	0.10	1/4-20	0.35
	mm	66	18.5	57	32	27	21	15	13	43.5	10	23.5	21.5	28	85	226	228.5	2.5	M6	9
40	inches	3.15	0.87	2.64	1.42	1.38	1.10	0.67	0.55	2.03	0.51	1.02	1.06	1.22	3.58	9.61	9.71	0.10	5/16-18	0.47
	mm	80	22	67	36	35	28	17	14	51.5	13	26	27	31	91	244	246.5	2.5	M8	12
50	inches	3.78	1.10	3.23	1.77	1.38	1.38	0.91	0.63	2.40	0.59	1.30	1.39	1.54	3.54	10.16	10.26	0.10	5/16-18	0.47
	mm	96	28	82	45	35	35	23	16	61	15	33	35.3	39	90	258	260.5	2.5	M8	12
63	inches	4.65	1.38	3.74	1.97	1.54	1.65	0.75	0.79	2.91	0.59	1.26	1.69	1.54	4.29	11.65	11.75	0.10	3/8-16	0.59
	mm	118	35	95	50	39	42	19	20	74	15	32	43	39	109	296	298.5	2.5	M10	15

Bore (mm)		P	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XE
25	inches	6.38	1/8 NPT	4.80	2.76	1.89	0.79	10-24	0.32	1.50	0.91	0.22	1.58
	mm	162	1/8 Rc	122	70	48	20	M5	8	38	23	5.5	40
32	inches	7.72	1/4 NPT	5.28	3.15	2.21	0.79	1/4-20	0.35	1.89	0.98	0.24	1.85
	mm	196	1/4 Rc	134	80	56	20	M6	9	48	25	6	47
40	inches	8.27	1/4 NPT	5.83	3.54	2.68	1.18	1/4-20	0.43	2.36	1.18	0.28	2.28
	mm	210	1/4 Rc	148	90	68	30	M6	11	60	30	7	58
50	inches	8.35	3/8 NPT	5.98	3.94	3.15	1.18	5/16-18	0.51	2.91	1.42	0.39	2.76
	mm	212	3/8 Rc	152	100	80	30	M8	13	74	36	10	70
63	inches	10.16	3/8 NPT	6.61	4.33	4.02	1.58	5/16-18	0.51	3.78	1.65	0.55	3.54
	mm	258	3/8 Rc	168	110	102	40	M8	13	96	42	14	90

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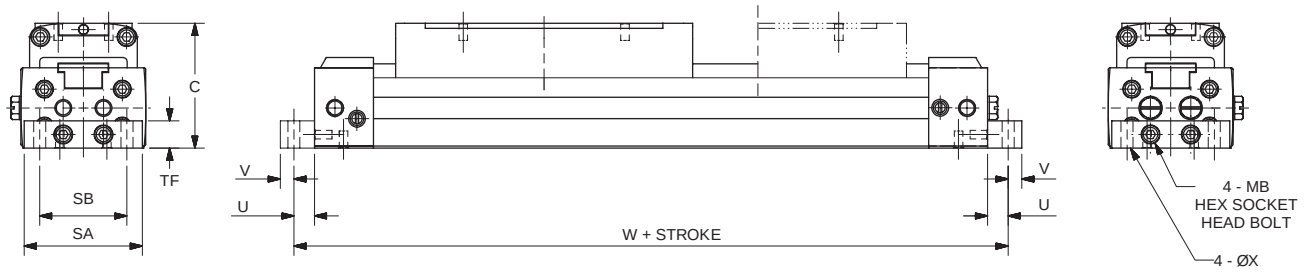
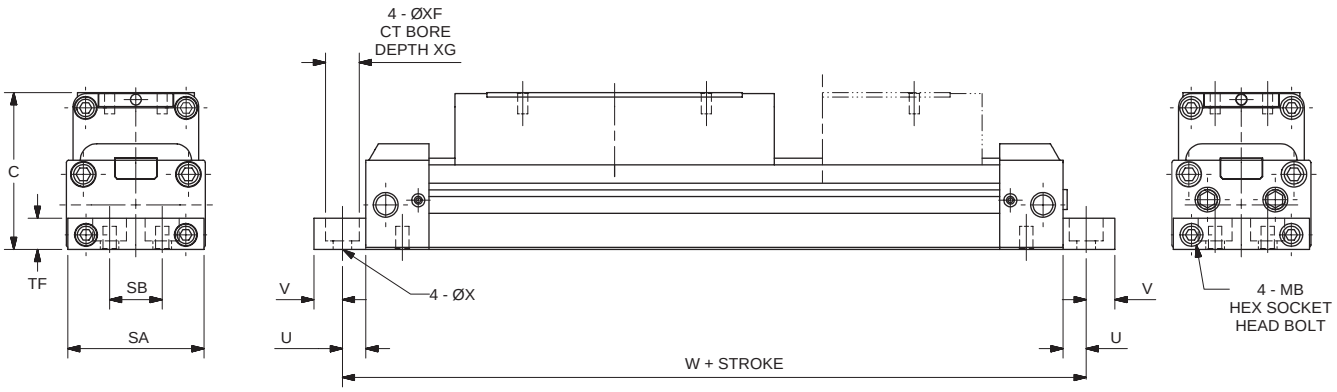
16-32 mm Bore Sizes



See page G133 for end port usage.

40-63 mm Bore Sizes



See page G133 for end port usage.

Bore (mm)		C	SA	SB	TF	U	V	W	X	XF	XG	MB
16	inches	1.46	1.38	1.02	0.32	0.24	0.16	6.34	0.14	—		–
	mm	37	35	26	8	6	4	161	3.6			M3x10
20	inches	1.65	1.69	1.30	0.39	0.24	0.24	7.13	0.19			–
	mm	42	43	33	10	6	6	181	4.7			M4x12
25	inches	2.09	2.05	0.79	0.47	0.35	0.43	8.19	0.28			
	mm	53	52	20	12	9	11	208	7			M5x50
32	inches	2.24	2.52	1.26	0.47	0.35	0.43	9.61	0.28			
	mm	57	64	32	12	9	11	244	7			M5x50
40	inches	2.64	3.15	1.18	0.59	0.49	0.45	10.60	0.35	0.51	0.34	
	mm	67	80	30	15	12.5	11.5	269	9	13	8.7	M6x55
50	inches	3.23	3.70	1.57	0.79	0.49	0.45	11.10	0.35	0.51	0.34	
	mm	82	94	40	20	12.5	11.5	283	9	13	8.7	M8x65
63	inches	3.74	4.57	1.89	0.98	0.59	0.59	12.80	0.43	0.61	0.41	
	mm	95	116	48	25	15	15	326	11	15.5	10.5	M8x70

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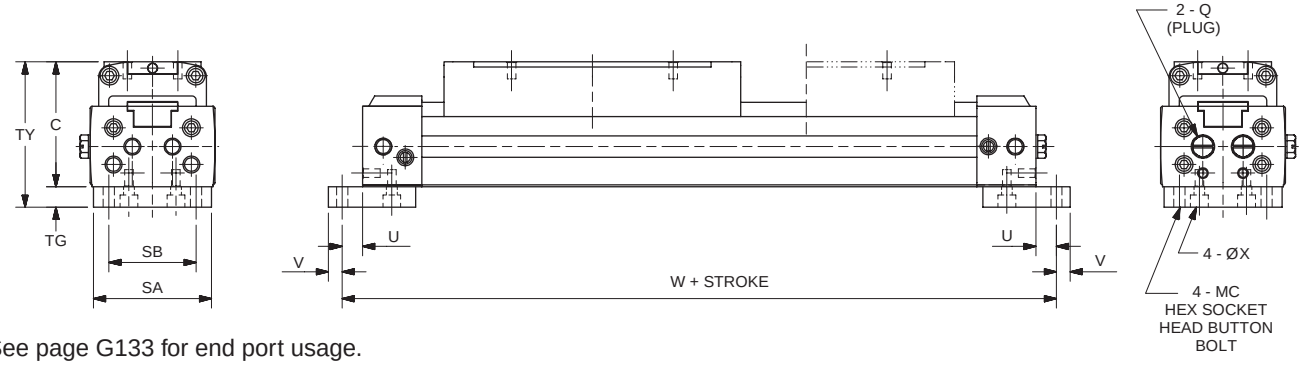
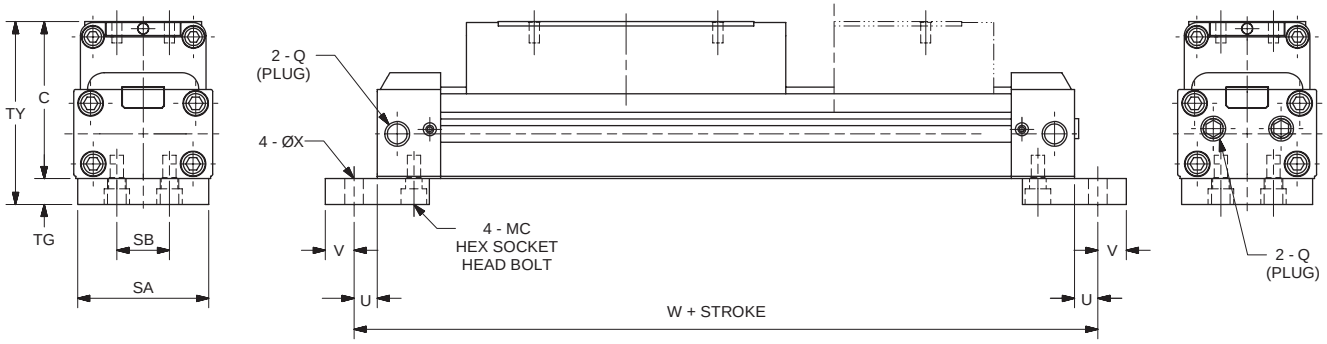
16-20 mm Bore Sizes



See page G133 for end port usage.

25-32 mm Bore Sizes



See page G133 for end port usage.

Bore (mm)		C	Q	SA	SB	TG	TY	U	V	W	X	MC
16	inches	1.46	10-32	1.38	1.02	0.24	1.69	0.24	0.16	6.34	0.13	5-40, 1/4 LG
	mm	37	M5	35	26	6	43	6	4	161	3.4	
20	inches	1.65	1/8 NPT	1.69	1.30	0.32	1.97	0.24	0.24	7.13	0.18	8-32, 3/8 LG
	mm	42	1/8 Rc	43	33	8	50	6	6	181	4.5	
25	inches	2.09	1/8 NPT	1.97	0.79	0.39	2.48	0.35	0.43	8.19	0.28	1/4-20 x 1/2 LG
	mm	53	1/8 Rc	50	20	10	63	9	11	208	7	
32	inches	2.24	1/4 NPT	2.52	1.26	0.39	2.64	0.35	0.43	9.61	0.28	1/4-20 x 1/2 LG
	mm	57	1/4 Rc	64	32	10	67	9	11	244	7	
40	inches	2.64	1/4 NPT	—								
	mm	67	1/4 Rc									
50	inches	3.23	3/8 NPT									
	mm	82	3/8 Rc									
63	inches	3.74	3/8 NPT									
	mm	95	3/8 Rc									

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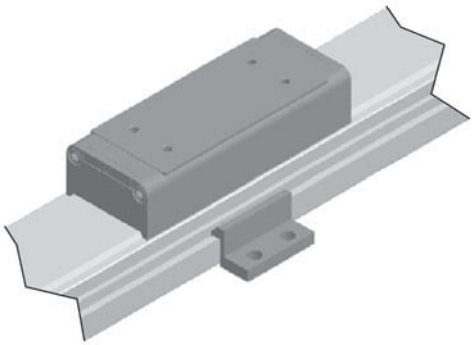
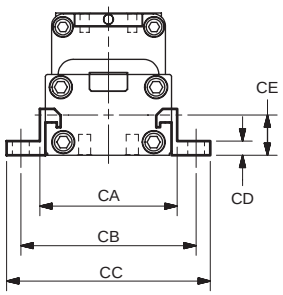
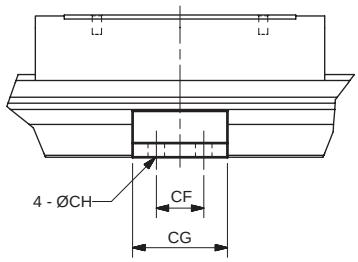
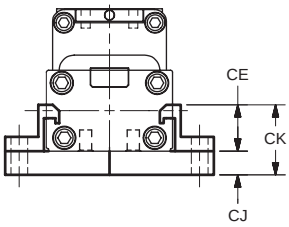
Intermediate Support Brackets

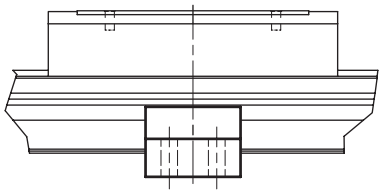
End Mount











Intermediate Support Brackets (2 per kit)

Bore		CA	CB	CC	CD	CE	CF	CG	CH
16 mm	inches	1.654	2.205	2.52	0.118	0.472	0.787	1.378	0.157
	mm	42	56	64	3	12	20	35	4
20 mm	inches	1.929	2.52	2.953	0.157	0.551	0.787	1.496	0.197
	mm	49	64	75	4	14	20	38	5
25 mm	inches	2.362	2.992	3.465	0.236	0.768	0.787	1.575	0.276
	mm	60	76	88	6	19.5	20	40	7
32 mm	inches	2.913	3.465	3.937	0.236	0.846	0.787	1.575	0.276
	mm	74	88	100	6	21.5	20	40	7
40 mm	inches	3.543	4.252	4.882	0.236	0.965	1.181	2.362	0.354
	mm	90	108	124	6	24.5	30	60	9
50 mm	inches	4.173	4.882	5.512	0.315	1.201	1.181	2.362	0.354
	mm	106	124	140	8	30.5	30	60	9
63 mm	inches	5.118	5.984	6.772	0.394	1.516	1.969	3.543	0.433
	mm	130	152	172	10	38.5	50	90	11

Bore		CJ	CK	Kit Part Number	
				End Mount or No Mount	Bottom Mount
16 mm	inches	0.236	0.709	L080180016	L080190016
	mm	6	18		
20 mm	inches	0.315	0.866	L080180020	L080190020
	mm	8	22		
25 mm	inches	0.394	1.161	L080180025	L080190025
	mm	10	29.5		
32 mm	inches	0.394	1.24	L080180032	L080190032
	mm	10	31.5		
40 mm	inches	—		L080180040	—
	mm				
50 mm	inches			L080180050	
	mm				
63 mm	inches			L080180063	
	mm				

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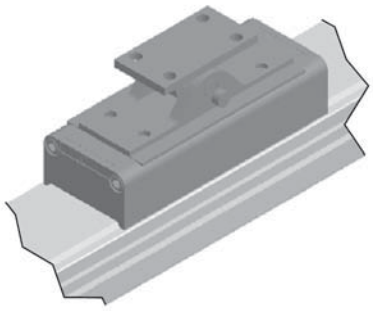
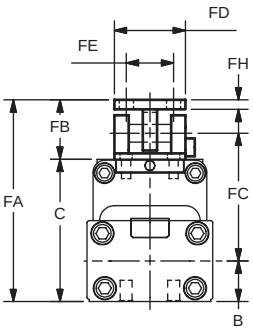
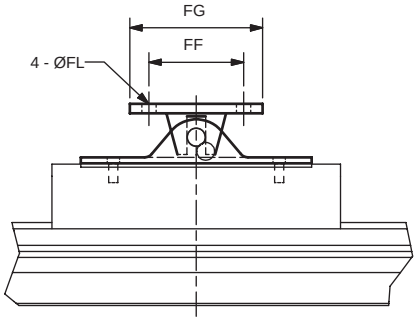
Swivel Mount

Absorbs misalignment between cylinder and load





FJ dimension is the maximum horizontal float



FK dimension is the maximum vertical float

Swivel Mounts

Bore		FA	FB	FC	FD	FE	FF	FG	FH
16 mm	inches	2.238	0.827	1.339	0.945	0.673	1.181	1.575	0.118
	mm	58	21	34	24	16	30	40	3
20 mm	inches	2.638	0.984	1.535	1.181	0.787	1.575	2.205	0.157
	mm	67	25	39	30	20	40	56	4
25 mm	inches	3.071	0.984	1.85	1.181	0.787	1.575	2.205	0.157
	mm	78	25	47	30	20	40	56	4
32 mm	inches	3.74	1.496	2.185	1.772	1.181	1.969	2.756	0.236
	mm	95	38	55.5	45	30	50	70	6
40 mm	inches	4.134	1.496	2.441	1.772	1.181	1.969	2.756	0.236
	mm	105	38	62	45	30	50	70	6
50 mm	inches	4.961	1.732	2.874	2.362	1.575	2.756	3.543	0.315
	mm	126	44	73	60	40	70	90	8
63 mm	inches	5.472	1.732	3.11	2.362	1.575	2.756	3.543	0.315
	mm	139	44	79	60	40	70	90	8

Bore		FJ	FK	FL	B	C	Part Number
16 mm	inches	0.118	0.118	0.134	0.472	1.457	L078930016
	mm	3	3	3.4	12	37	
20 mm	inches	0.118	0.118	0.177	0.551	1.654	L080160020
	mm	3	3	4.5	14	42	L08016M020
25 mm	inches	0.118	0.118	0.236	0.669	2.087	L080160025
	mm	3	3	6	17	53	L08016M025
32 mm	inches	0.197	0.197	0.276	0.728	2.244	L080160032
	mm	5	5	7	18.5	57	L08016M032
40 mm	inches	0.197	0.197	0.276	0.866	2.638	L080160040
	mm	5	5	7	22	67	L08016M040
50 mm	inches	0.197	0.197	0.354	1.102	3.228	L080160050
	mm	5	5	9	28	82	L08016M050
63 mm	inches	0.197	0.197	0.354	1.378	3.74	L080160063
	mm	5	5	9	35	95	L08016M063

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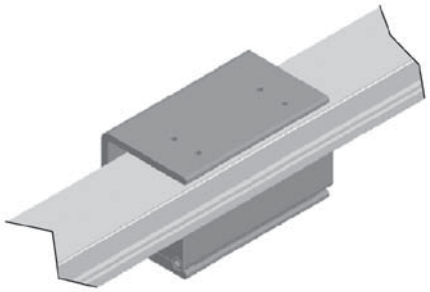
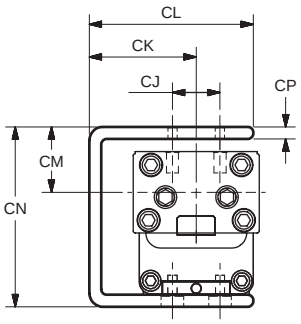
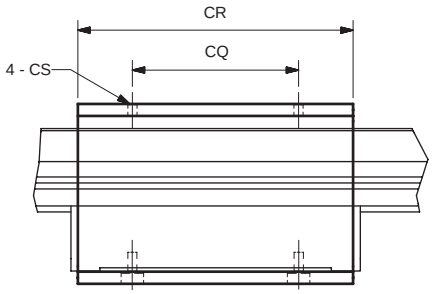
Inverted Mount

Provides mounting surface 180° from carriage







Inverted Mounts*

Bore		CJ	CK	CL	CM	CN	CP	CQ	CR	CS	Part Number**
16 mm	inches	0.591	1.398	1.969	1.142	2.362	0.236	1.89	3.465	5-40	L080170016
	mm	15	35.5	50	29	60	6	48	88		L08017M016
20 mm	inches	0.709	1.28	1.969	1.024	2.362	0.236	2.362	3.937	8-32	L080170020
	mm	18	32.5	50	26	60	6	60	100		L08017M020
25 mm	inches	0.787	1.772	2.717	1.102	2.795	0.197	2.756	4.567	10-24	L080170025
	mm	20	45	69	28	71	5	70	116		L08017M025
32 mm	inches	0.787	2.126	3.209	1.319	3.15	0.276	3.15	5.039	1/4-20	L080170032
	mm	20	54	81.5	33.5	80	7	80	128		L08017M032
40 mm	inches	1.181	2.48	3.76	1.496	3.602	0.315	3.543	5.433	1/4-20	L080170040
	mm	30	63	95.5	38	91.5	8	90	138		L08017M040
50 mm	inches	1.181	2.913	4.449	1.89	4.429	0.394	3.937	5.591	5/16-18	L080170050
	mm	30	74	113	48	112.5	10	100	142		L08017M050
63 mm	inches	1.575	3.465	5.433	2.283	5.157	0.512	4.331	6.22	5/16-18	L080170063
	mm	40	88	138	58	131	13	110	158		L08017M063

*Inverted mounts not available with adjustable stroke, shock absorber or tube center support bracket.

**Use this part number when ordering as a separate part. When ordering with cylinder, use “C” option as part of cylinder part number.

End Port Piping

Refer to Figure 10 to determine when end port piping can be used with various types of mountings relative to fitting clearance.

On all bore sizes with foot mounting, the end port pipe fittings will obstruct the mounting holes. To avoid this problem, mount the cylinder first and tighten the mounting bolts and then attach the pipe fittings to the cylinder ports.

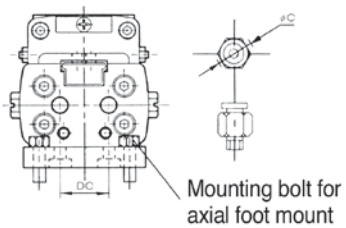


Figure 10

Bore Size (mm)	øC [O.D. of fittings - mm (in.)]		
	No Mount	End Mount	Bottom Mount
16	12 (0.472)	End Port Piping Not Available	12 (0.472)
20	16 (0.630)		16 (0.630)
25	26 (1.024)		26 (1.024)
32	27 (1.065)		27 (1.063)
40	35 (1.378)	26 (1.024)	
50	35 (1.378)	30 (1.181)	
63	39 (1.535)	34 (1.339)	

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Selection Criteria

The Shock Absorber Advantage

- Increase equipment throughput
- Smoother deceleration of loads
- Adjustable end of stroke positioning
- Prevents impact damage
- Minimize shock loads on equipment
- Improves product performance

Four Steps to Great Performance

Step 1. Gather the Application Parameters

- Total load weight (pounds)
- Final velocity at impact (inches/second)*
- Cycle rate (cycles per hour)

Step 2. Verify Shock Absorber Performance

- See charts on the following pages
- Determine that shock absorber will do the job

Step 3. Verify the Cycle Rate

- See shock specifications below and verify application is within cycle rate

Step 4. Choose the Appropriate Option in Model Code

*If final velocity cannot be easily calculated, double the average velocity.

G

Shock Absorber Specifications

Figure 11 Specifications

Cylinder	16mm	20mm	25mm	32mm	40mm	50, 63mm
Shock Absorber No.	**0887790016**	**0887790020**	**0887790025**	**0887790032**	**0887790040**	**0887790050**
Max. Energy Absorption - in-lbs (kgf·m)	26.0 (0.3)	60.8 (0.7)	104.2 (1.2)	226 (2.6)	608 (7.0)	1042 (12)
Stroke - inches	0.236	0.315	0.394	0.590	0.787	0.984
Energy Absorption/hour - in.-lbs/hour	54,700	109,380	187,510	338,560	729,200	750,000
Max. Impact Velocity - in./sec.	59	59	78.7	78.7	98.4	118.1
Max. Cycle Rate per Hour	2100	1800	1800	1500	1200	720
Ambient Temperature - °F (°C)	41-140 (5-60)					
Spring Return Force - lb. Extended Compressed	0.65 1.01	0.45 0.97	0.65 1.33	1.33 2.65	2.20 4.86	3.60 7.49
Return Time - Sec.	0.3	0.3	0.3	0.3	0.4	0.4

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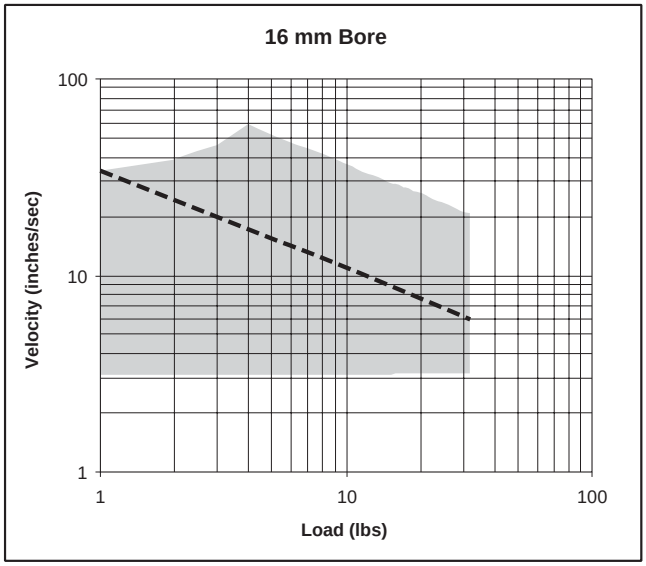
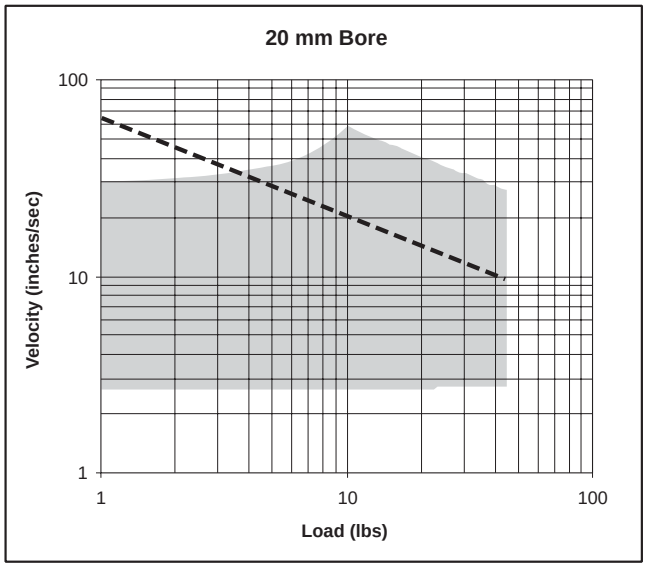
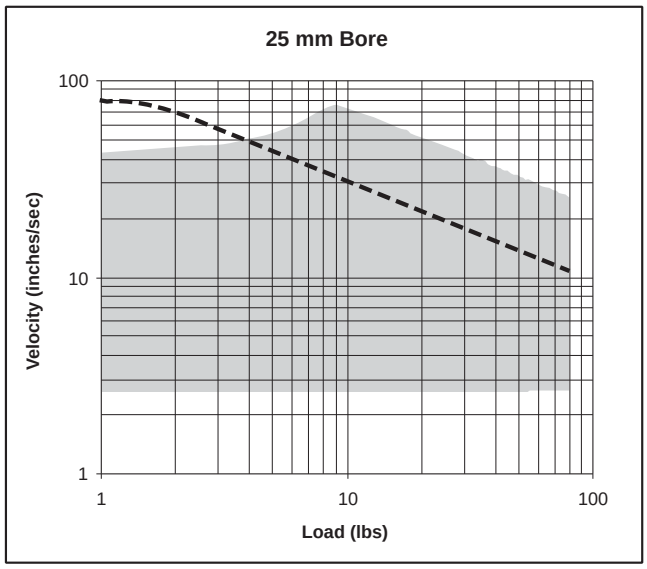
Performance Data (16 - 32mm Bores)

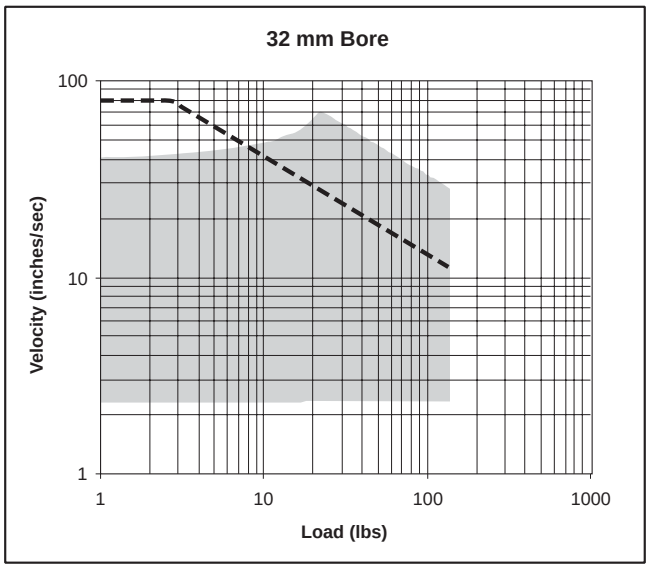
Air Cushion w/back pressure (flow controls or other meter out device)

Shock Absorber









Notes: 1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.

2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.

3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

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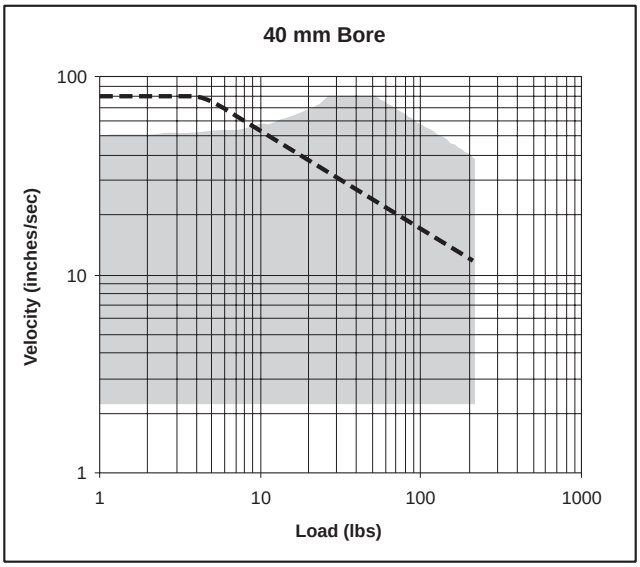
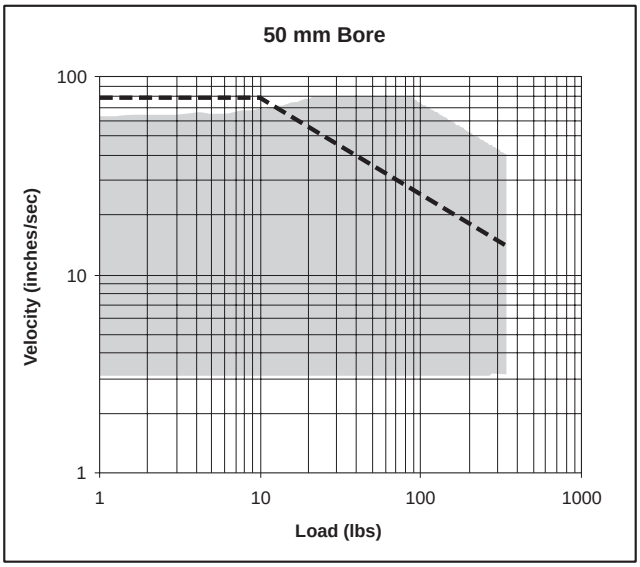
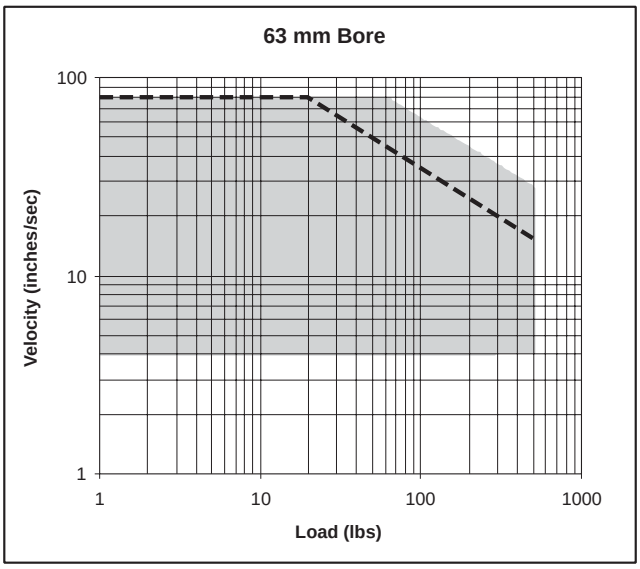
Performance Data (40 - 63mm Bores)

Air Cushion w/back pressure (flow controls or other meter out device)

Shock Absorber







G

Notes: 1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.

2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.

3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

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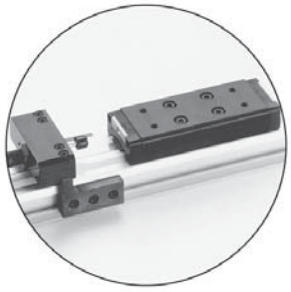
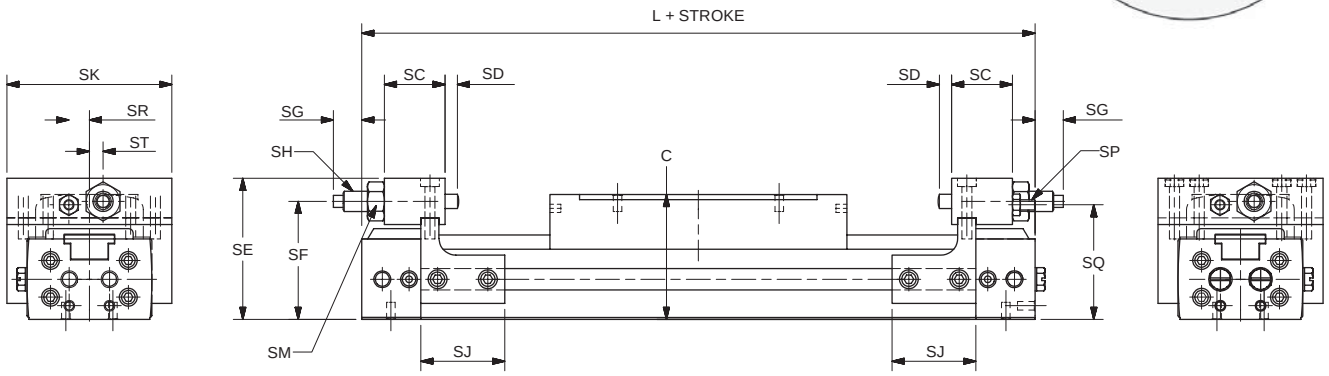
Stroke Adjustment and Shock Absorber Dimensions

16-25 mm Bore Sizes

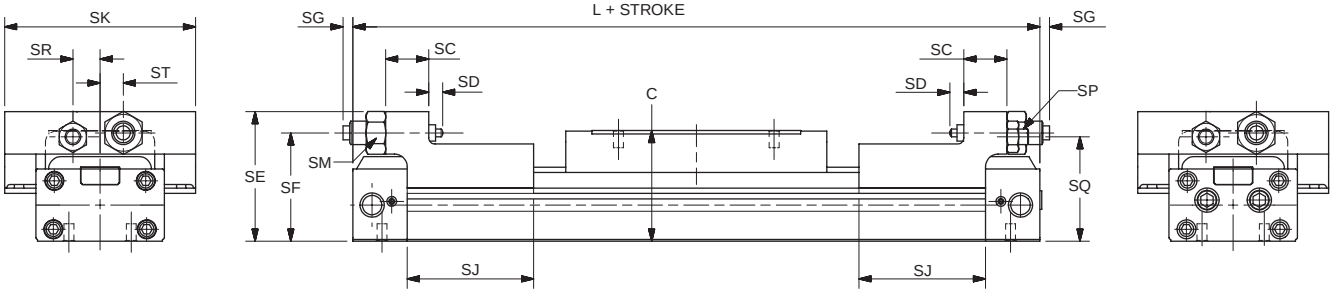




Bore (mm)		SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
						Max	Min									
16	in.	0.71	0.16	1.65	1.38	0.57	0.18	26	0.98	1.93	M3	1.34	0.24	0.16	1.46	5.87
	mm	18	4	42	35	14.5	4.5		25	49		34	6	4	37	149
20	in.	0.89	0.14	1.89	1.57	0.57	0.18	61	1.54	2.24	M4	1.50	0.32	0.20	1.65	6.65
	mm	22.5	3.5	48	40	14.5	4.5		39	57		38	8	5	42	169
25	in.	0.79	0.10	2.46	2.03	0.57	0.18	104	1.97	3.03	M6	1.97	0.47	0.39	2.09	7.48
	mm	20	2.5	62.5	51.5	14.5	4.5		50	77		50	12	10	53	190

SH = max. energy absorption

32-63 mm Bore Sizes



Bore (mm)		SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
						Max	Min									
32	in.	0.87	0.28	2.62	2.19	1.06	0.67	226	2.56	3.86	M8	2.11	0.55	0.47	2.24	8.90
	mm	22	7	66.5	55.5	27	17		65	98		53.5	14	12	57	226
40	in.	1.26	0.28	3.09	2.58	1.34	0.94	608	2.56	4.41	M10	2.50	0.67	0.47	2.64	9.61
	mm	32	7	78.5	65.5	34	24		65	112		63.5	17	12	67	244
50	in.	1.50	0.32	3.90	3.15	2.17	1.77	1042	2.76	5.35	M12	3.05	0.87	0.67	3.23	10.16
	mm	38	8	99	80	55	45		70	136		77.5	22	17	82	258
63	in.	1.50	0.32	4.41	3.68	1.73	1.34	1042	2.76	6.22	M16	3.50	0.98	0.79	3.74	11.65
	mm	38	8	112	93.5	44	34		70	158		89	25	20	95	296

SH = max. energy absorption

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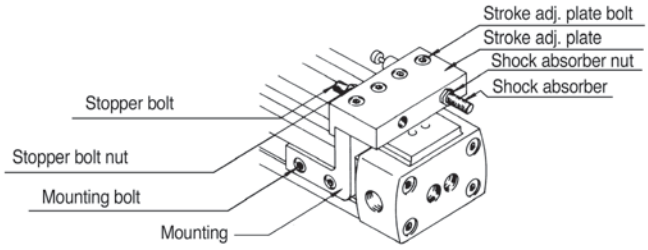
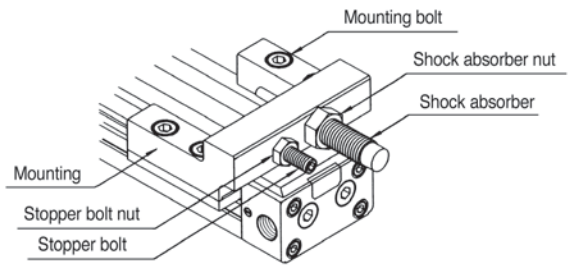
Positioning of Stroke Adjustment Unit



ø16~ø25



ø32~ø63

(1) Moving the stroke adjustment unit.
The stroke adjustment unit can be moved by loosening the mounting bolts.

(2) Locking of stroke adjustment unit.
After moving the stroke adjustment unit to the appropriate position, lock it there by tightening the mounting bolts to the torque values shown in Figure 12. Insufficient torque may cause the stroke adjustment unit to slip out of position.

Figure 12

Torque values for tightening stroke adjustment unit.

Bore Size	Tightening Torque	
	Mounting Bolt (lb-in)	Stroke Adj. Plate Bolt (lb-in)
16mm	9-11	4-6
20mm	22-24	
25mm	46-50	22-24
32mm	195-213	–
40mm	390-415	–
50, 63mm	682-735	–

(3) Stroke adjustment using the stopper bolt.
Adjust the stroke by loosening the stopper bolt nut and turning the stopper bolt. After adjusting the stroke, tighten the stopper bolt nut to the torque values shown in Figure 12a. When adjusting the 16-25 mm cylinders, due to the small amount of clearance between the table and the stroke adjustment plate, adjust the stroke by moving the complete stroke adjustment unit.

Figure 12a

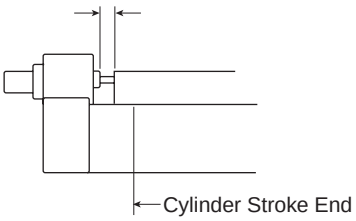
Torque values for tightening stopper bolt nut and shock absorber nut.

Bore Size	Tightening Torque	
	Stopper Bolt Nut (lb-in)	Shock Absorber Nut (lb-in)
16mm	10-11	12-16
20mm	22-24	26-35
25mm	73-84	40-53
32mm	195-213	66-89
40mm	390-425	195-266
50mm	682-735	487-620
63mm	1772-1914	487-620

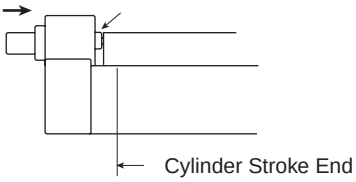
(4) Adjustment of shock absorber.
Adjust the absorption energy of the shock absorber by changing the operating stroke of the shock absorber. This is done by loosening the shock absorber nut and turning the unit. When adjustment is complete, tighten the shock absorber nut to the torque values shown in Figure 12a.

(5) Notes on usage.
The shock absorber absorbs rated energy with rated stroke. The factory setting allows a small amount of shock absorber stroke before it bottoms out. Readjust the location of the shock absorber so that the complete stroke of the absorber is utilized.

Absorption energy as set at factory:
Small margin with stroke of shock absorber.



Adjust the position of the shock absorber until the plunger of the shock absorber is fully depressed.



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