

Series B Cylinder

Design Features

NFPA Interchangeable Cylinders

The Series B is a high-quality cylinder for heavy-duty air service, or medium, pressure hydraulic service, up to 1,500 psi depending on bore size.

Piston Rod

High strength, chrome-plated alloy steel and is ground and polished to a 6 to 10 micro-inch finish

Tubing

Seal life is highly dependent on the finish on which the seal rides. Steel tubing is hard chrome plated and honed to a 10 to 15 micro-inch finish to provide a proper sealing surface, resist corrosion, and provide a wearing surface which resists scoring.

Seals

Self-adjusting dynamic seals (Buna N). Back-up rings prevent extrusion at higher hydraulic pressures. Optional Viton seals are available for unusual temperature and fluid applications.

The static O-ring tubing seals with pressure and are backed up by tubing and head metal-to-metal end contact of leak-free operation.

Piston

Motion Controls unique piston design prolongs service life and reduces maintenance. The piston itself is only a carrier for the piston seals and the actual bearing, which is a Teflon wear strip.

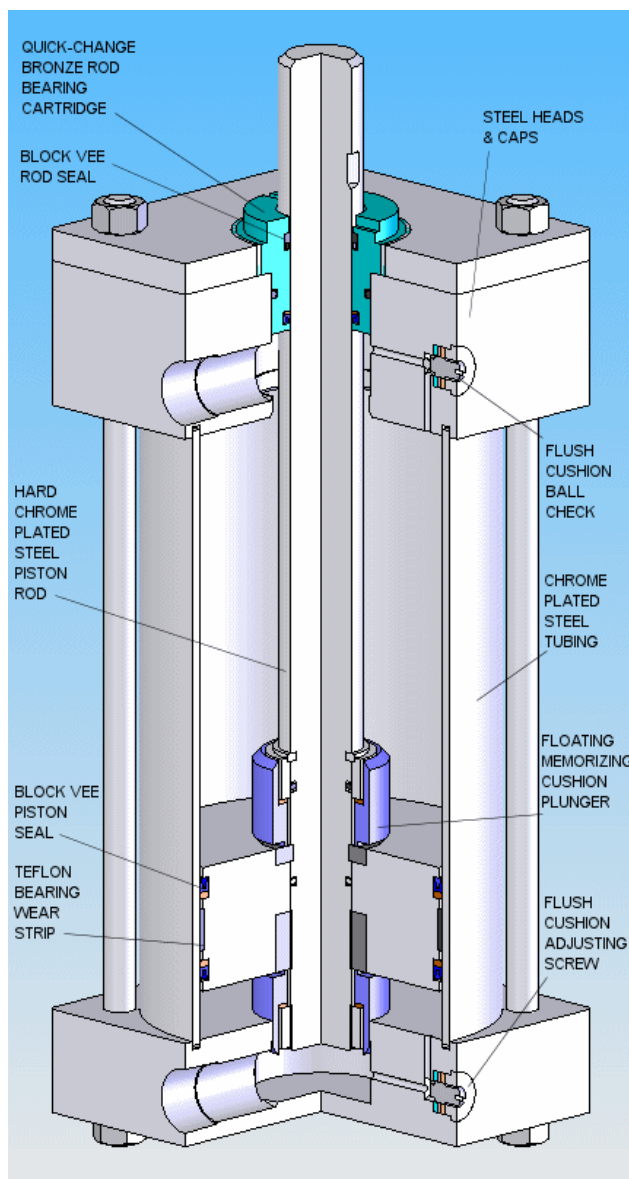
Rod Bearing

The complete bronze rod bearing cartridge can be removed and replaced without removing the cylinder tie rods. The cartridge threads into the cylinder bearing plate, but pilots into a machined bore in the cylinder head for accurate alignment.

Cushions

The Motion Control floating, "memorizing" cushion design (Patent #3,247,767) solves traditional cushioning problems by enabling the cushion plunger to adjust to the eccentricity of the cushion plunger bore...and remembering the adjustment on succeeding cycles.

It accomplishes this by axially loading the floating plunger so that when it shifts in response to the location of the cushion bore, it stays shifted under pressure of the loading.



SERIES "B" PRESSURE RATINGS AND POWER FACTORS

Pressure ratings of the Series B Cylinder vary with the bore size. Explicit definition on "non-shock," "heavy duty," and "4:1" pressure ratings is difficult, since the terms are general. The most severe applications, however, would fall under the 4:1 rating, since it offers maximum protection against shock loading, which may reach four times line pressure. The difference between "non-shock" and "heavy duty" is often marginal, and system velocity, quick valve shifting, cylinder acceleration and deceleration, etc., should be considered.

BORE	ROD DIA.	PRESSURE RATINGS (PSI)		POWER FACTOR		APPROXIMATE	
		MAX OPER. PRESS.	4:1	PUSH	PULL	BASE WT. LBS.	PER INCH OF STROKE
1-1/2	5/8	1500	1500	1.76	1.46	3.60	0.30
	1				0.97		
2	5/8	1000	900	3.14	2.84	6.50	0.35
	1				2.35		
2-1/2	5/8	750	500	4.90	4.60	10.50	0.40
	1				4.12		
3-1/4	1	1000	950	8.29	7.50	18.00	0.60
	1-3/8				6.80		
4	1	750	600	12.56	11.77	34.00	0.70
	1-3/8				11.07		
5	1	600	425	19.62	18.83	48.00	0.80
	1-3/8				18.13		
6	1-3/8	600	500	28.26	26.77	63.00	1.50
	1-3/4				25.51		

BORE	ROD DIA.	ROD DIA.	A	-.001	C			CC	KK
	MM	CODE*	AD	B	CD	D	(FM)	(SM + SF)	
1-1/2	5/8	1	3/4	1.125	3/8	9/16	5/8-18	7/16-20	
	1 ^a	2	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
2	5/8	1	3/4	1.125	3/8	9/16	5/8-18	7/16-20	
	1 ^a	2	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
	1-3/8 ^a	3	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	
2-1/2	5/8	1	3/4	1.125	3/8	9/16	5/8-18	7/16-20	
	1	2	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
	1-3/8 ^a	3	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	
3-1/4	1	1	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
	1-3/8	2	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	
4	1	1	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
	1-3/8	2	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	
5	1	1	1-1/8	1.500	1/2	7/8	1-14	3/4-16	
	1-3/8	2	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	
6	1-3/8	1	1-5/8	2.000	5/8	1-3/16	1-3/8-12	1-14	

* 1 refers to standard rod diameter, 2 to first oversize, 3 to second oversize.

^a MS4 mount not available in these dimensions.

^o A) Rod end cushion available without ball check or cushion adjusting screw in these dimensions.

B) Welded half pipe coupling should be considered on cushion housing to eliminate damage from under sized pipe fittings.

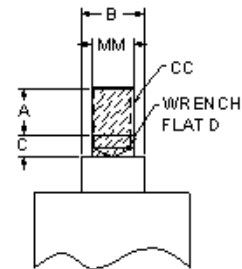
C) Because of marginal piston area, piston rod motion should be stopped externally.

D) Because of small net area, air cushion action is marginal and, whenever possible, a smaller rod size should be considered. If full rod must be used consult factory for longer cushions.

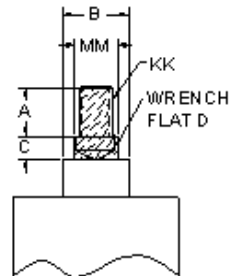
³ AF refers to depth of female thread. AD and CD should be used to differentiate one end of a double-rod-cylinder from the other, where A and C are used.

Rod Ends

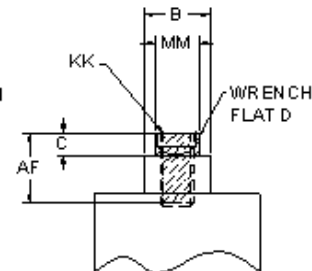
SMALL MALE (SM)
STYLE NO.2



FULL MALE (FM)
STYLE NO.1



SHORT FEMALE (SF)
STYLE NO.3



Series **B** Cylinder

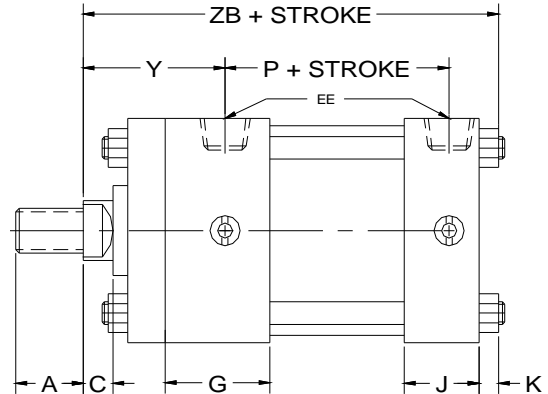
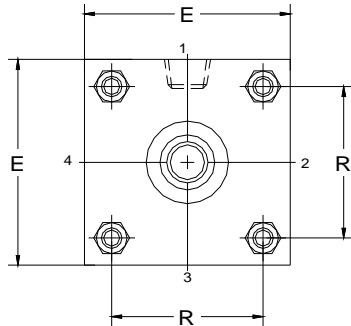


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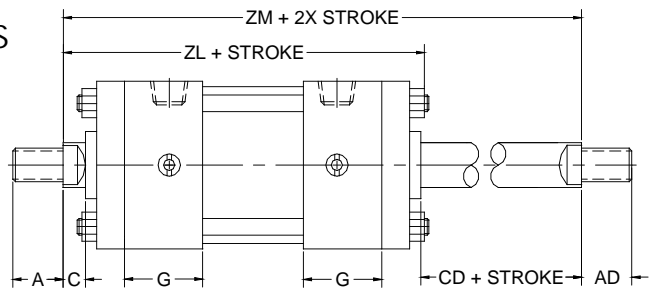
BASIC SINGLE END CYLINDER DIMENSIONS

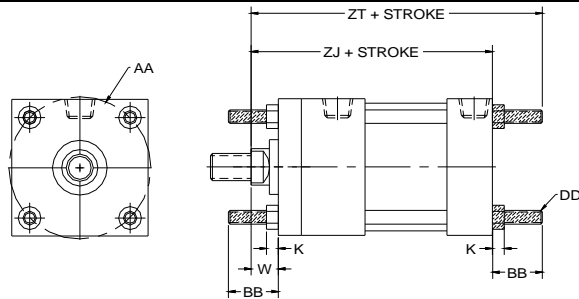


BORE	ROD DIAM.	A AD AF	E	F	G	J	K	P	R	W	Y	NPTF	
												EE	ZB
1-1/2	5/8	3/4	2	3/8	1-1/2	1	1/4	2-3/16	1-7/16	5/8	1-31/32	3/8	4-7/8
	1	1-1/8								1	2-11/32		5-1/4
2	5/8	3/4	2-1/2	3/8	1-1/2	1	5/16	2-3/16	1-27/32	5/8	1-31/32	3/8*	4-15/16
	1	1-1/8								1	2-11/32		5-5/16
	1-3/8	1-5/8								1	2-19/32		5-9/16
2-1/2	5/8	3/4	3	3/8	1-1/2	1	5/16	2-5/16	2-3/16	5/8	1-31/32	3/8	5-1/16
	1	1-1/8								1	2-11/32		5-7/16
	1-3/8	1-5/8								1	2-19/32		5-11/16
3-1/4	1	1-1/8	3-3/4	5/8	1-3/4	1-1/4	3/8	2-5/8	2-49/64	3/4	2-7/16	1/2	6
	1-3/8	1-5/8								1	2-11/16		6-1/4
4	1	1-1/8	4-1/2	5/8	1-3/4	1-1/4	3/8	2-5/8	3-21/64	3/4	2-7/16	1/2	6
	1-3/8	1-5/8								1	2-11/16		6-1/4
5	1	1-1/8	5-1/2	5/8	1-3/4	1-1/4	7/16	2-7/8	4-7/64	3/4	2-7/16	1/2	6-5/16
	1-3/8	1-5/8								1	2-11/16		6-9/16
6	1-3/8	1-5/8	6-1/2	3/4	2	1-1/2	7/16	3-1/8	4-7/8	7/8	2-13/16	3/4	7-5/16
	1-3/4	2								1-1/4	3-1/16		7-9/16

BASIC DOUBLE END CYLINDER DIMENSIONS

BORE	DIAM.	AF	CD	G	ZL	ZM
1-1/2	5/8	3/4	2	1-1/2	5-3/4	6-1/8
	1	1-1/8			6-1/8	6-7/8
2	5/8	3/4	2-1/2	1-1/2	5-13/16	6-1/8
	1	1-1/8			6-3/16	6-7/8
	1-3/8	1-5/8			6-7/16	7-3/8
2-1/2	5/8	3/4	3	1-1/2	5-15/16	6-1/8
	1	1-1/8			6-5/16	6-7/8
	1-3/8	1-5/8			6-9/16	7-3/8
3-1/4	1	1-1/8	3-3/4	1-3/4	7-1/8	7-1/2
	1-3/8	1-5/8			7-3/8	8
4	1	1-1/8	4-1/2	1-3/4	7-1/8	7-1/2
	1-3/8	1-5/8			7-3/8	8
5	1	1-1/8	5-1/2	1-3/4	7-7/16	7-3/4
	1-3/8	1-5/8			7-11/16	8-1/4
6	1-3/8	1-5/8	6-1/2	2	8-5/16	8-3/4
	1-3/4	2			8-9/16	9-1/4





TIE ROD EXTENDED MOUNTING

BMX1

Both ends, 4 tie rods extended mounting. (Shown)

BMX2

Cap tie rods extended.

BMX3

Head tie rods extended.

BMX4

Both ends 2 tie rods extended mounting. (pos.3 unless specified.)

BMX5

No tie rods extended.

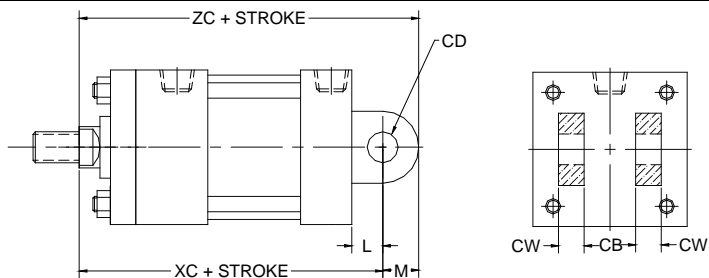
ROD								
BORE	DIA.	K	AA	BB	W	DD	ZB	ZT
1-1/2	5/8	1/4	2.032	1	5/8	1/4-28	4-7/8	5-5/8
	1				5-3/8		6	
2	5/8	5/16	2.598	1-1/8	5/8	5/16-24	4-15/16	5-3/4
	1				5-5/16		6-1/8	
	1-3/8				5-9/16		6-3/8	
2-1/2	5/8	5/16	3.092	1-1/8	5/8	5/16-24	5-1/16	5-7/8
	1				5-7/16		6-1/4	
	1-3/8				5-11/16		6-1/2	
3-1/4	1	3/8	3.911	1-3/8	3/4	3/8-24	6	7
	1-3/8				6-1/4		7-1/4	
4	1	3/8	4.706	1-3/8	3/4	3/8-24	6	7
	1-3/8				6-1/4		7-1/4	
5	1	7/16	5.810	1-13/16	3/4	1/2-20	6-5/16	7-11/16
	1-3/8				6-9/16		7-15/16	
6	1-3/8	7/16	6.893	1-13/16	7/8	1/2-20	7-1/16	8-7/16

FIXED CLEVIS MOUNTING MODEL BMP1

*

Model BMP2

A detachable clevis mounting is available. Dimensions "XC" and "ZC" are increased 3/8" for 1-1/2" to 2-1/2" bores, 5/8" for 3-1/4" to 5" bores, and 3/4" for 6" bores

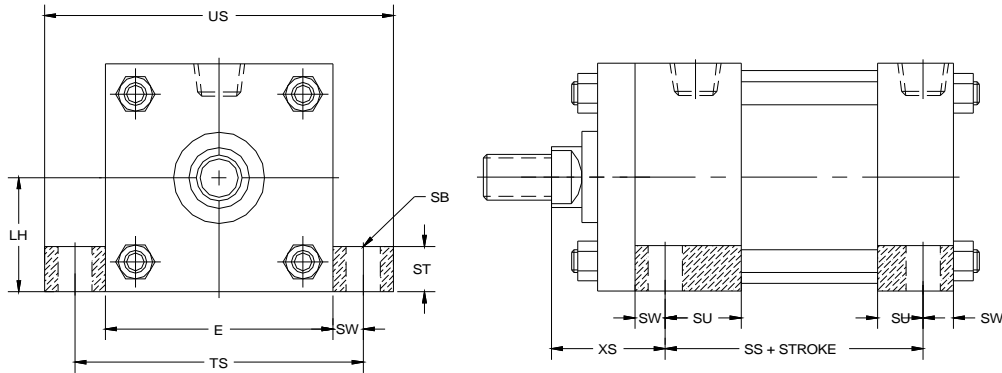


ROD				CD				
BORE	DIA.	L	M	CB	±.001	CW	XC	ZC
1-1/2	5/8	3/4	1/2	3/4	.500	1/2	5-3/8	5-7/8
	1						5-3/4	6-1/4
2	5/8	3/4	1/2	3/4	.500	1/2	5-3/8	5-7/8
	1						5-3/4	6-1/4
	1-3/8						6	6-1/2
2-1/2	5/8	3/4	1/2	3/4	.500	1/2	5-3/8	5-7/8
	1						5-3/4	6-1/4
	1-3/8						6	6-1/2
3-1/4	1	1-1/4	3/4	1-1/4	.750	5/8	6-7/8	7-5/8
	1-3/8						7-1/8	7-7/8
4	1	1-1/4	3/4	1-1/4	.750	5/8	6-7/8	7-5/8
	1-3/8						7-1/8	7-7/8
5	1	1-1/4	3/4	1-1/4	.750	5/8	7-1/8	7-7/8
	1-3/8						7-3/8	8-1/8
6	1-3/8	1-1/2	1	1-1/2	1.000	3/4	8-1/8	9-1/8

Series **B** Cylinder



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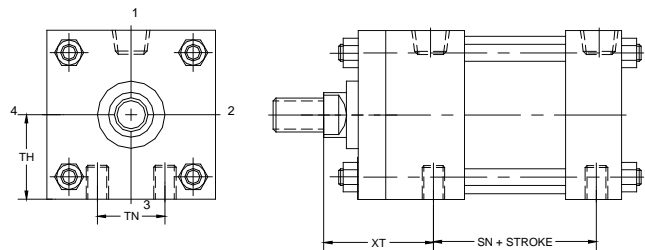


BORE	ROD DIA	E	SB	SS	ST	SU	SW	LH	TS	US
1-1/2	5/8	2	7/16	2-7/8	1/2	15/16	3/8	1	2-3/4	3-1/2
	1									
2	5/8	2-1/2	7/16	2-7/8	1/2	15/16	3/8	1-1/4	3-1/4	4
	1									
	1 3/8									
2-1/2	5/8	3	7/16	3	1/2	15/16	3/8	1-1/2	3-3/4	4-1/2
	1									
	1 3/8									
3-1/4	1	3-3/4	9/16	3-1/4	3/4	1-1/4	1/2	1-7/8	4-3/4	5-3/4
	1 3/8									
4	1	4-1/2	9/16	3-1/4	3/4	1-1/4	1/2	2-1/4	5-1/2	6-1/2
	1 3/8									
5	1	5-1/2	13/16	3-1/8	1	1-9/16	11/16	2-3/4	6-7/8	8-1/4
	1 3/8									
6	1 3/8	6-1/2	13/16	3-5/8	1	1-9/16	11/16	3-1/4	7-7/8	9-1/4

LUGS MOUNTING MODEL BMS2

① Add 1/2" to "SS" dimension on Double-rod-end cylinders.

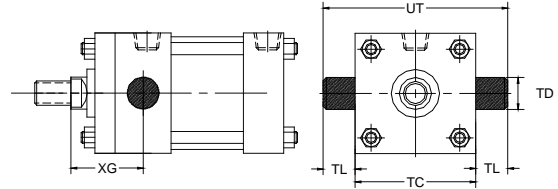
BORE	ROD DIA	TH	NT	SN	TN	XT
1-1/2	5/8	1	1/4-20 X 3/8	2-1/4	5/8	1-15/16
	1					2-5/16
2	5/8	1-1/4	5/16-18 X 1/2	2-1/4	7/8	1-15/16
	1					2-5/16
	1 3/8					2-9/16
2-1/2	5/8	1-1/2	3/8-16 X 5/8	2-3/8	1-1/4	1-15/16
	1					2-5/16
	1 3/8					2-9/16
3-1/4	1	1-7/8	1/2-13 X 3/4	2-5/8	1-1/2	2-7/16
	1 3/8					2-11/16
4	1	2-1/4	1/2-13 X 3/4	2-5/8	2-1/16	2-7/16
	1 3/8					2-11/16
5	1 1/8	2-3/4	5/8-11 X 1	2-7/8	2-11/16	2-7/16
	1 3/8					2-11/16
6	1 3/8	3-1/4	3/4-10 X 1-1/8	3-1/8	3-1/4	2 13/16



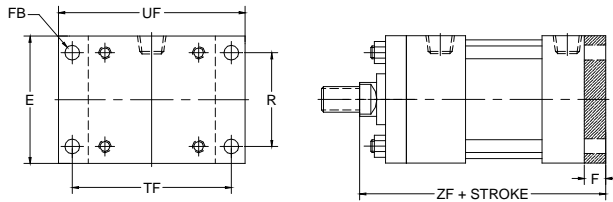
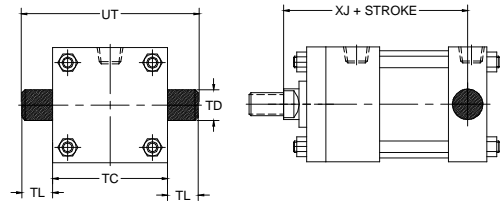
SIDE TAPPED MOUNTING MODEL BMS4

MODEL BMT1 HEAD TRUNNION MOUNTING

BORE	TC	±.001		UT	XG	XJ
		TD	TL			
1-1/2	2	1.000	1	4	1-15/16	4-3/16
					2-5/16	4-9/16
2	2-1/2	1.000	1	4-1/2	1-15/16	4-5/16
					2-5/16	4-11/16
					2-9/16	4-15/16
2-1/2	3	1.000	1	5	1-15/16	4-5/16
					2-5/16	4-11/16
					2-9/16	4-15/16
3-1/4	3-3/4	1.000	1	5-3/4	2-7/16	5-1/16
					2-11/16	5-5/16
4	4-1/2	1.000	1	6-1/2	2-7/16	5-1/16
					2-11/16	5-5/16
5	5-1/2	1.000	1	7-1/2	2-7/16	5-5/16
					2-11/16	5-9/16
6	6-1/2	1.375	1-3/8	9-1/4	2-13/16	5-15/16
					3-1/16	6-3/16

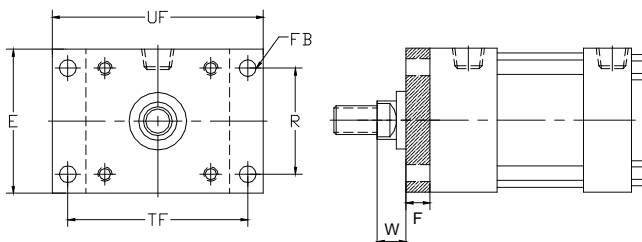


MODEL BMT2 CAP TRUNNION MOUNTING



MODEL BMF1
Head Rectangular
Flange Mounting.

BORE	ROD								
	DIA.	E	F	R	W	FB	TF	UF	ZF
1-1/2	5/8	2	3/8	1.437	5/8	5/16	2-3/4	3-3/8	5
	1				1				5-3/8
2	5/8	2-1/2	3/8	1.843	5/8	3/8	3-3/8	4-1/8	5
	1				1				5-3/8
	1-3/8				1-1/4				5-5/8
2-1/2	5/8	3	3/8	2.187	5/8	3/8	3-7/8	4-5/8	5
	1				1				5-3/8
	1-3/8				1-1/4				5-5/8
3-1/4	1	3-3/4	5/8	2.765	3/4	7/16	4-11/16	5-1/2	6-1/4
	1-3/8				1				6-1/2
4	1	4-1/2	5/8	3.328	3/4	7/16	5-7/16	6-1/4	6-1/4
	1-3/8				1				6-1/2
5	1	5-1/2	5/8	4.109	3/4	9/16	6-5/8	7-5/8	6-1/2
	1-3/8				1				6-3/4
6	1-3/8	6-1/2	3/4	4.875	7/8	9/16	7-5/8	7-3/8	7-3/8

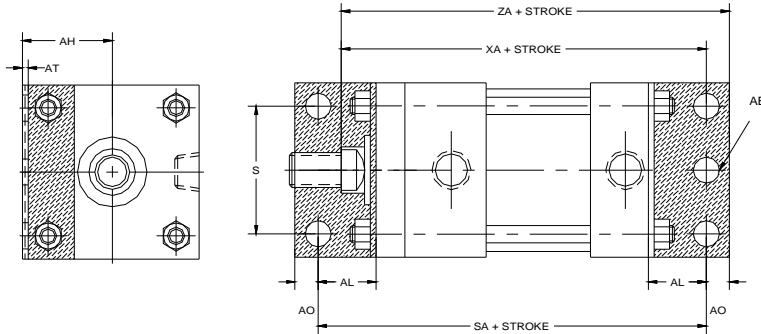


MODEL BMF2
Cap Rectangular
Flange Mounting

Series **B** Cylinder



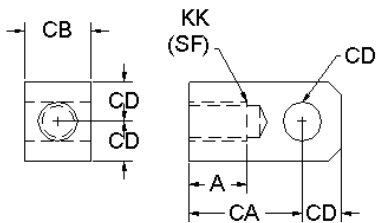
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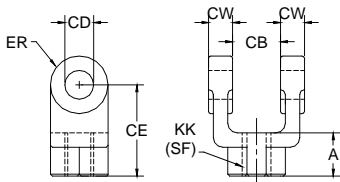
SIDE END ANGLE MOUNTING MODEL BMS1

BORE	AB	①						②		③	
		S	AH	AL	AO	AT	SA	XA	ZA		
1 1/2	7/16	1 1/4	1 3/16	1	3/8	1/8	6	5 5/8	6	7/8	
2	7/16	1 3/4	1 7/16	1	3/8	1/8	6	5 5/8	6	7/8	
2 1/2	7/16	2 1/4	1 5/8	1	3/8	1/8	6 1/8	5 3/4	6 1/8	7/8	
3 1/4	9/16	2 3/4	1 15/16	1 1/4	1/2	1/8	7 3/8	6 7/8	6 3/8	1 1/8	
4	9/16	3 1/2	2 1/4	1 1/4	1/2	1/8	7 3/8	6 7/8	6 3/8	1 1/8	
5	11/16	4 1/4	2 3/4	1 3/8	5/8	3/16	7 3/8	7 1/4	7 7/8	1 1/8	
6	13/16	5 1/4	3 1/4	1 3/8	5/8	3/16	8 1/2	8	8 5/8	1 1/4	

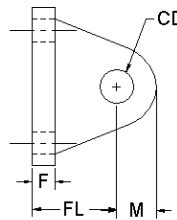
- ① Center of mounting holes.
- ② To dimensions for oversize rod cylinders, add "H" from rod end dimension chart.
- ③ Add to "SA," "XA," and "ZA" dimensions on Double-rod-end cylinders.



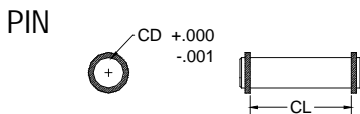
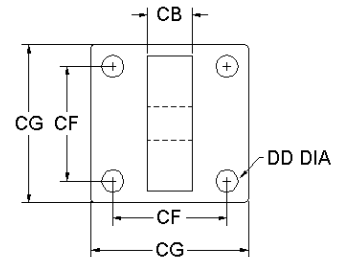
ROD EYE
 Rod eye available only in KK (SF) threading shown. Select Style 2(SM) rod thread to match.



ROD CLEVIS
 Rod Clevis available only in KK(SF) threading shown. Select Style 2 (SM) rod thread to match.



EYE BRACKET



CYLINDER BORE	KK(SF) ROD & EYE BRACKET					
	ROD DIA	EYE THREAD	ROD EYE P/N	ROD CLEVIS P/N	PIN P/N	
1-1/2, 2, 2-1/2	5/8	7/16-20	6830	6799	8402	6843
3-1/4, 4, 5	1	3/4-16	6996	6995	8403	6994
6	1-3/8	1-14	7641	7555	8404	7643

CYLINDER BORE	ROD DIA	A	F	M	CA	CB	CD	CE	CF	CG	CL	CW	DD	ER	FL
1-1/2, 2, 2-1/2	5/8	3/4	3/8	1/2	1-1/2	3/4	1/2	1-1/2	1-5/8	2-1/2	1-3/4	1/2	3/8	9/16	1-1/8
3-1/4, 4, 5	1	1-1/8	5/8	3/4	2-1/16	1-1/4	3/4	2-3/8	2-35/64	3-1/2	2-1/2	5/8	1/2	13/16	1-7/8
6	1-3/8	1-5/8	3/4	1	2-13/16	1-1/2	1	3-1/8	3-1/4	4-1/2	3	3/4	5/8	1-3/32	2-1/4

SERIES B ORDERING INFORMATION

SPECIFIC INFORMATION		CODE	B	X1	0625	150	SE	SL1	RA2	Options
SERIES	B SERIES CYLINDER	B								
MOUNTING STYLE	TIE ROD EXTENSIONS	X1,X2,X3,X4,X5								
	SINGLE ANGLE MOUNTS	S1								
	SIDE LUGS	S2								
	SIDE TAP MOUNTING HOLES	S4								
	FRONT (HEAD) FLANGE	F1								
	REAR (CAP) FLANGE	F2								
	FRONT (HEAD) TRUNNIONS	T1								
	REAR (CAP) TRUNNIONS	T2								
	REAR (CAP) FIXED CLEVIS	P1								
	REAR (CAP) DETACHABLE CLEVIS	P2								
	REAR (CAP) EYE BRACKET DETACHABLE	P4 (Up to 4" Bore)								
ROD SIZE	5/8" ROD	0625								
	1" ROD	1000								
	1 3/8" ROD	1375								
BORE SIZE	1.5" BORE	150								
	2.0" BORE	200								
	2.5" BORE	250								
	3.25" BORE	325								
	4.0" BORE	400								
	5.0" BORE	500								
END STYLE	6.0" BORE	600								
	SINGLE END	SE								
	DOUBLE END	DE								
STROKE	SPECIFY STROKE LENGTH IN DECIMALS	SL								
ROD END STYLE	SINGLE END									
	FULL MALE THREAD "A" END	RA1								
	REDUCED MALE THREAD "A" END (STANDARD)	RA2								
	FEMALE THREAD "A" END	RA3								
	DOUBLE END (SUPPLY BOTH FOR DE)									
	FULL MALE THREAD "D" END	RD1								
	REDUCED MALE THREAD "D" END (STANDARD)	RD2								
FEMALE THREAD "D" END	RD3									
ADDITIONAL OPTIONS	FRONT CUSHION	FC								
	REAR CUSHION	RC								
	STOP TUBE (SPECIFY LENGTH)	ST								
	STAINLESS STEEL ROD	SS								
	VITON SEALS	VS								
	ROD MODIFICATION	RM								
	(INCLUDE SPECIFIC DETAILS) SPELL OUT ALL OTHER DETAILS AND PROVIDE DRAWING IF POSSIBLE									