cowan dynamics

Actuation Solutions and Systems for the
World's Most Challenging Environments

N SERIES

Medium Duty

NFPA Hydraulic Cylinder

Bore Sizes from 11/2" to 6"

- **Pressure Rating: up to 2,000 PSI**

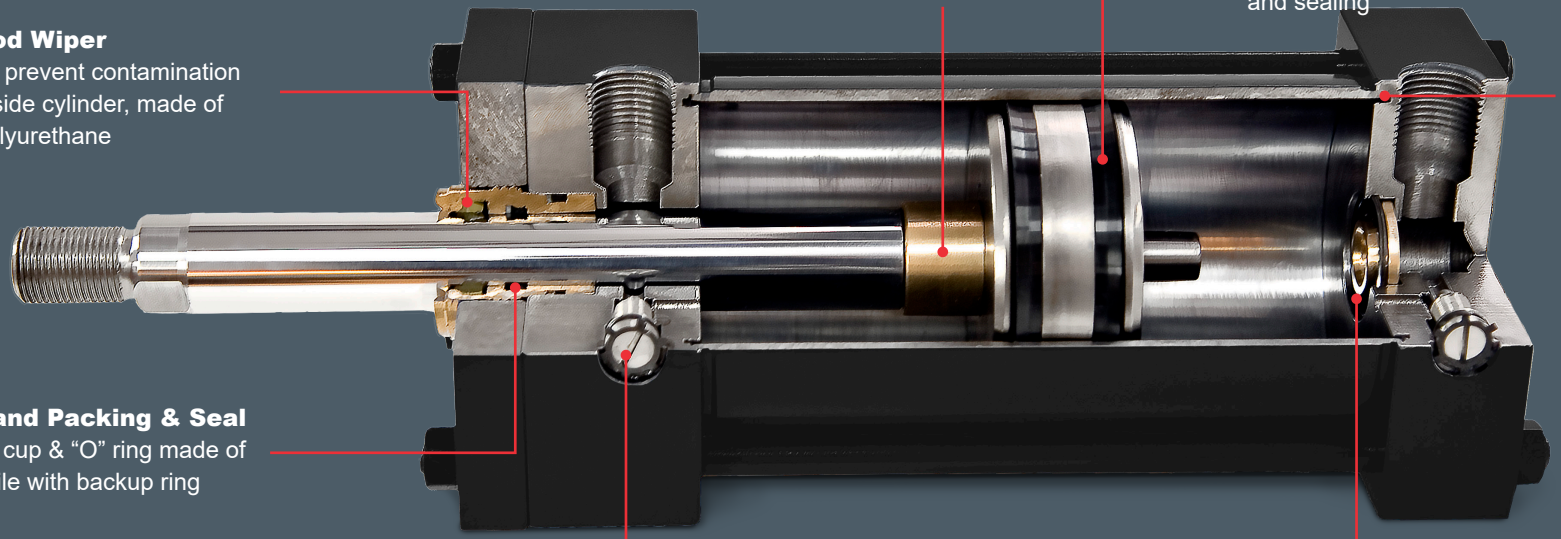
Design & Materials

Check Valve Assembly
(not shown) (N/A on 1½" & 2" Bore)
Integral to head for rapid acceleration at beginning of stroke

Cushion Plunger
Floating cushion plunger provides maximum cushioning effect combined with a quick start for optimum performance

Piston Packing
Polyurethane polypack for excellent wear resistance and sealing

Rod Wiper
To prevent contamination inside cylinder, made of polyurethane



Barrel Seal
Nitrile "O" Ring

Gland Packing & Seal
"U" cup & "O" ring made of nitrile with backup ring

Cushion Screw
(Optional) Fully adjustable

Cushion Seat
Proven cushion design, featuring a floating cushion seat. Provides maximum cushioning effect combined with quick starts

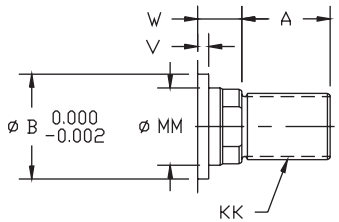
Material Breakdown	STANDARD
Head & cap	Machined Steel
Barrel	Honed Seamless Steel Tubing
Piston	Ductile Iron
Piston rod	Steel SAE 1045
Gland	SAE 660 Bronze
Tie Rod	Stress-proof Steel

For pressure ratings please see the Master Chart on page 4.

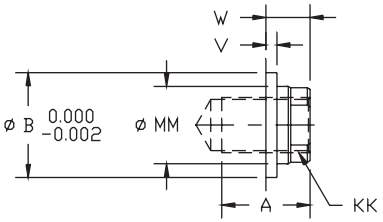
Rod Thread Sizes

1½”- 6” Bore

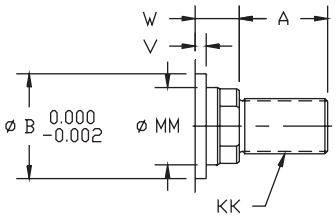
INTERMEDIATE MALE



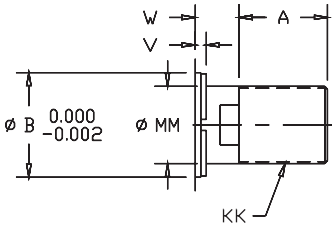
SMALL FEMALE



SMALL MALE



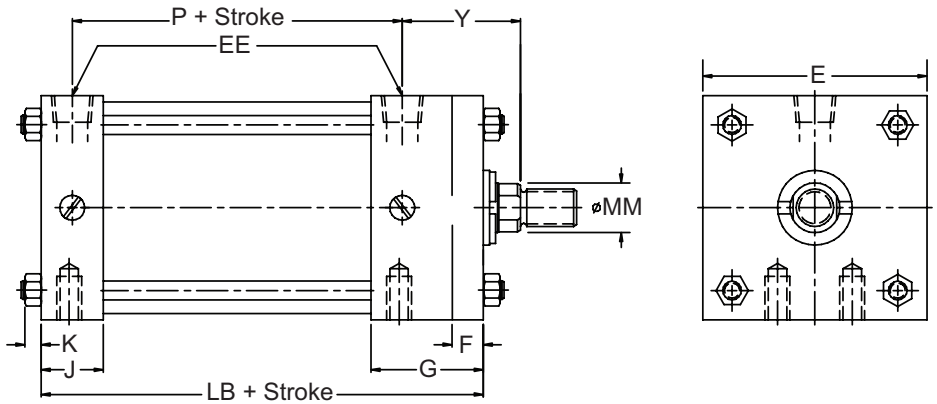
FULL MALE



Actuator Dimenstions (in)									
Bore	Rod Φ MM	Thread (KK)				A	B	V	W
		N2	N1 or N4	M2	M1 or M4				
1½	0.63	½-20	7/16-20	M12 x 1.5	M10 x 1.5	0.75	1.12	0.25	0.63
	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.50	1.00
2	0.63	½-20	7/16-20	M12 x 1.5	M10 x 1.5	0.75	1.12	0.25	0.63
	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.50	1.00
	1.38	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.63	1.25
2½	0.63	½-20	7/16-20	M12 x 1.5	M10 x 1.5	0.75	1.12	0.25	0.63
	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.50	1.00
	1.38	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.63	1.25
	1.75	1½-12	1¼-12	M39 x 2	M33 x 2	2.00	2.37	0.75	1.50
3 1/4	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.25	0.75
	1.38	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.38	1.00
	1.75	1½-12	1¼-12	M39 x 2	M33 x 2	2.00	2.37	0.50	1.25
	2.00	1¾-12	1½-12	M45 x 2	M39 x 2	2.25	2.62	0.50	1.38
4	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.25	0.75
	1.19	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.38	1.00
	1.75	1½-12	1¼-12	M39 x 2	M33 x 2	2.00	2.37	0.50	1.25
	2.00	1¾-12	1½-12	M45 x 2	M39 x 2	2.25	2.62	0.50	1.38
	2.50	2¼-12	1⅞-12	M56 x 2	M48 x 2	3.00	3.12	0.63	1.63
5	1.00	⅞-14	¾-16	M22 x 1.5	M20 x 1.5	1.13	1.50	0.25	0.75
	1.19	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.38	1.00
	1.75	1½-12	1¼-12	M39 x 2	M33 x 2	2.00	2.37	0.50	1.25
	2.00	1¾-12	1½-12	M45 x 2	M39 x 2	2.25	2.62	0.50	1.38
	2.50	2¼-12	1⅞-12	M56 x 2	M48 x 2	3.00	3.12	0.63	1.63
	3.00	1¾-12	2¼-12	M68 x 2	M56 x 2	3.50	3.75	0.63	1.63
	3.50	3¼-12	2½-12	M76 x 2	M64 x 2	3.50	4.25	0.63	1.63
6	1.19	1¼-12	1-14	M30 x 2	M26 x 1.5	1.63	2.00	0.25	0.88
	1.75	1½-12	1¼-12	M39 x 2	M33 x 2	2.00	2.37	0.38	1.13
	2.00	1¾-12	1½-12	M45 x 2	M39 x 2	2.25	2.62	0.38	1.25
	2.50	2¼-12	1⅞-12	M56 x 2	M48 x 2	3.00	3.12	0.50	1.50
	3.00	2¾-12	2¼-12	M68 x 2	M56 x 2	3.50	3.75	0.50	1.50
	3.50	3¼-12	2½-12	M76 x 2	M64 x 2	3.50	4.25	0.50	1.50
	4.00	3¾-12	3-12	M95 x 2	M76 x 2	4.00	4.75	0.50	1.50

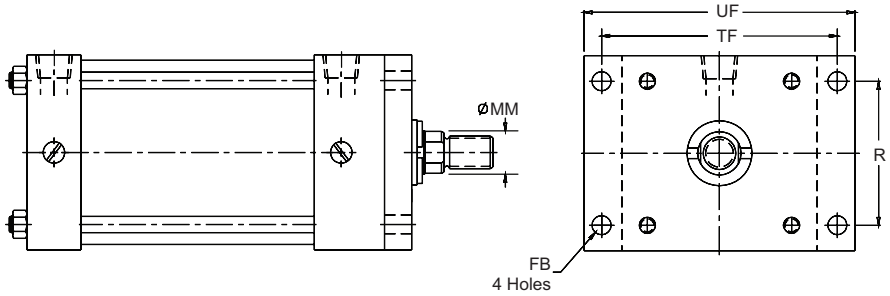
Master Chart

1½”- 6” Bore

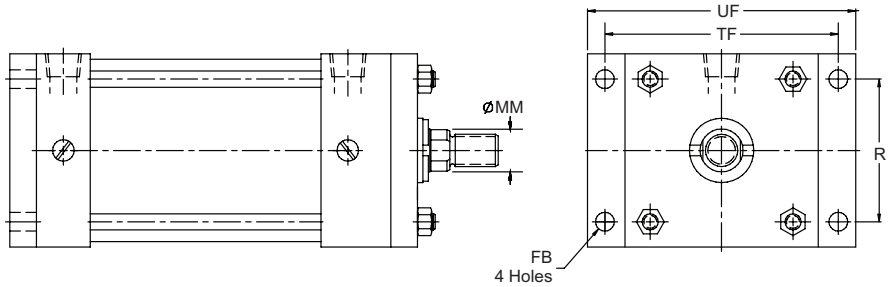


Actuator Dimenstions (in)											
Bore	Rod Φ MM	Pressure Rating	Y	E	EE (NPT)	F	G	J	K	LB	P
1½	0.63	2000	1.94	2.00	0.38	0.38	2.00	1.00	0.25	4.00	2.25
	1.00	2000	2.31								
2	0.63	1100	1.94	2.50	0.38	0.38	2.00	1.00	0.31	4.00	2.25
	1.00	2000	2.31								
	1.19	2000	2.56								
2½	0.63	700	1.94	3.00	0.38	0.38	2.00	1.13	0.31	4.13	2.38
	1.00	1400	2.31								
	1.19	1400	2.56								
	1.75	1400	2.81								
3 1/4	1.00	1300	2.44	3.75	0.50	0.63	2.25	1.25	0.38	4.88	2.63
	1.19	1300	2.69								
	1.75	1300	2.94								
	2.00	1300	3.06								
4	1.00	900	2.44	4.50	0.50	0.63	2.25	1.25	0.38	4.88	2.63
	1.19	900	2.69								
	1.75	900	2.94								
	2.00	900	3.06								
	2.50	900	3.31								
5	1.00	600	2.44	5.50	0.50	0.63	2.25	1.50	0.44	5.13	2.88
	1.19	950	2.69								
	1.75	950	2.94								
	2.00	950	3.06								
	2.50	950	3.31								
	3.00	950	3.31								
	3.50	950	3.31								
6	1.19	700	2.81	6.50	0.75	0.75	2.75	1.63	0.44	5.75	3.13
	1.75	700	3.06								
	2.00	700	3.19								
	2.50	700	3.44								
	3.00	700	3.44								
	3.50	700	3.44								
	4.00	700	3.44								

MF1



MF2



Dimensions (in)				
BORE	FB	TF	UF	R
1½	0.31	2.75	3.38	1.43
2	0.38	3.38	4.13	1.84
2½	0.38	3.88	4.63	2.19
3¼	0.44	4.69	5.50	2.76
4	0.44	5.44	6.25	3.32
5	0.56	6.63	7.63	4.10
6	0.56	7.63	8.63	4.88

For MF1 Mount

Max. PSI — Push*				
BORE	Rod Code			
	1,7,8	2	3,4	5,6
1½	650	375	–	–
2	500	200	350	–
2½	300	150	200	–
3¼	650	350	400	–
4	450	225	325	–
5	300	125	225	175
6	350	200	300	200

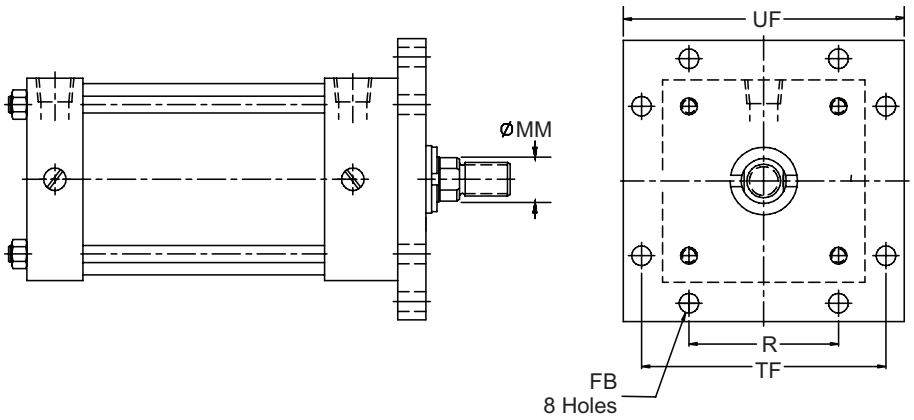
**Maximum pressure rating – push application*

Rod Thread Table

Dimenstions (in)		
Bore	Rod Φ MM	
1½	0.63	For other values please see the charts on pages 3 & 4
	1.00	
2	0.63	
	1.00	
	1.19	
2½	0.63	
	1.00	
	1.19	
	1.75	
3¼	1.00	
	1.19	
	1.75	
	2.00	
4	1.00	
	1.19	
	1.75	

Dimenstions (in)		
Bore	Rod Φ MM	
4	2.00	For other values please see the charts on pages 3 & 4
	2.50	
5	1.00	
	1.19	
	1.75	
	2.00	
	2.50	
	3.00	
	3.50	
6	1.19	
	1.75	
	2.00	
	2.50	
	3.00	
	3.50	
	4.00	

MF5



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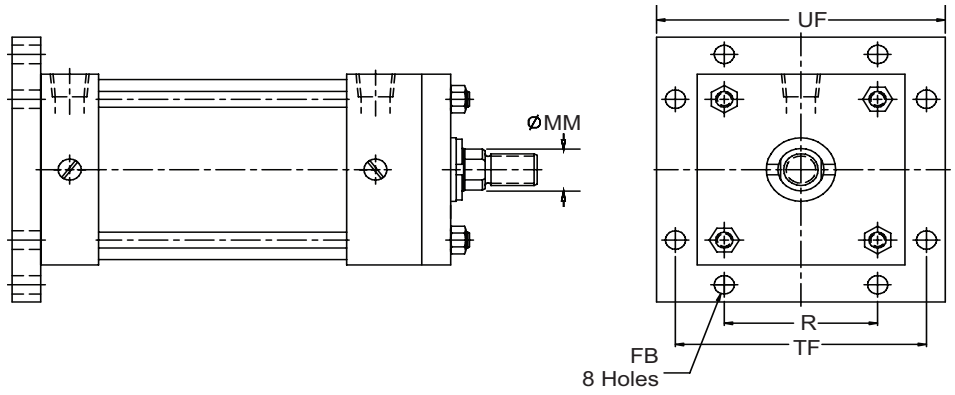
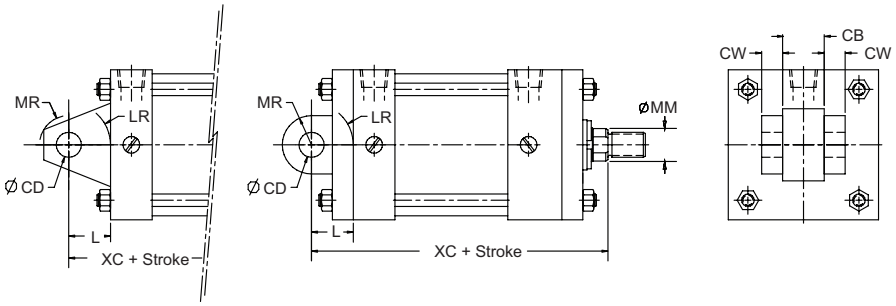
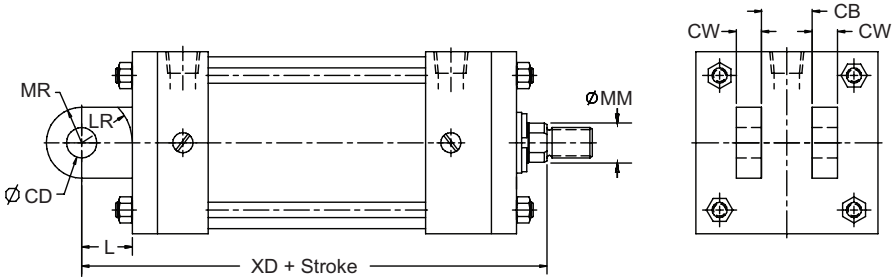


MP1



Dimensions (in)						
BORE	CB	CD	CW	L	LR	MR
1½	0.75	0.50	0.50	0.75	0.75	0.63
2	0.75	0.50	0.50	0.75	0.75	0.63
2½	0.75	0.50	0.50	0.75	0.75	0.63
3¼	1.25	0.75	0.64	1.25	1.25	0.88
4	1.25	0.75	0.64	1.25	1.25	0.88
5	1.25	0.75	0.64	1.25	1.25	0.88
6	1.50	1.00	0.75	1.50	1.50	1.25

MP2



Rod Thread Table

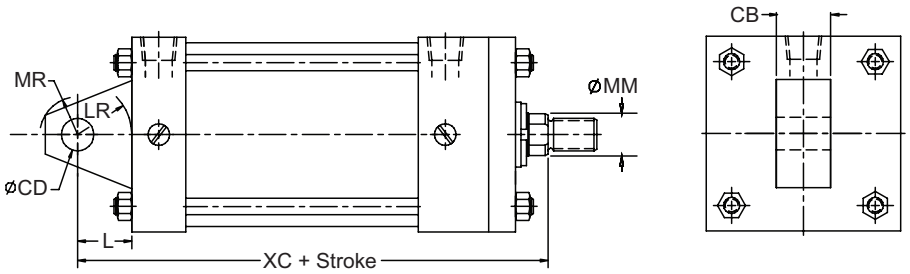
Dimenstions (in)			
Bore	Rod Φ MM	XC	XD
1½	0.63	5.38	5.75
	1.00	5.75	6.13
2	0.63	5.38	5.75
	1.00	6.00	6.38
	1.19	5.75	6.13
2½	0.63	5.88	6.25
	1.00	6.38	6.75
	1.19	6.13	6.50
	1.75	5.50	5.88
3¼	1.00	6.88	7.50
	1.19	7.50	8.13

Dimenstions (in)			
Bore	Rod Φ MM	XC	XD
3¼	1.75	7.13	7.75
	2.00	7.38	8.00
4	1.00	7.13	7.75
	1.19	7.75	8.38
	1.75	7.38	8.00
	2.00	7.50	8.13
	2.50	6.88	7.50
5	1.00	7.63	8.25
	1.19	8.00	8.63
	1.75	7.75	8.38
	2.00	8.00	8.63

Dimenstions (in)			
Bore	Rod Φ MM	XC	XD
5	2.50	8.00	8.63
	3.00	7.13	7.75
	3.50	7.38	8.00
6	1.19	8.38	9.13
	1.75	8.75	9.50
	2.00	8.50	9.25
	2.50	8.75	9.50
	3.00	8.75	9.50
	3.50	8.75	9.50
	4.00	8.13	8.88

For other values please see the charts on pages 3 & 4

MP3



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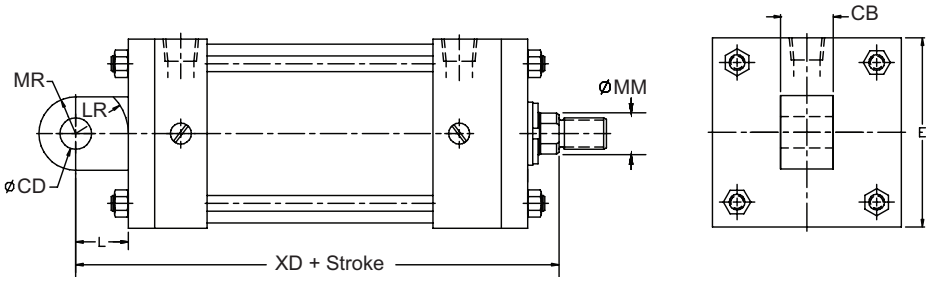
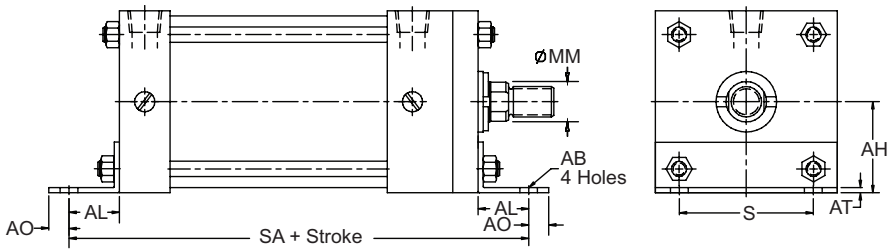
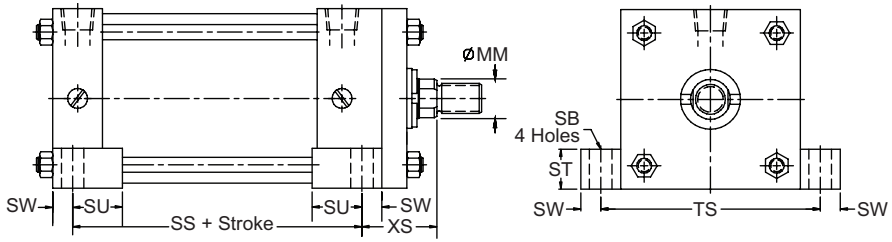


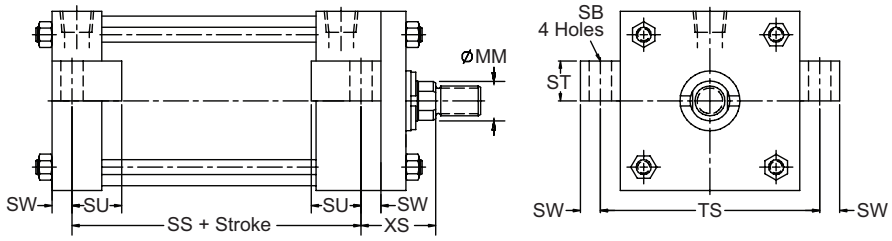
MS1



MS2



MS3



MS1

Dimensions (in)						
BORE	AB	AH	AL	AO	AT	S
1½	0.44	1.19	1.00	0.38	0.13	1.25
2	0.44	1.44	1.00	0.38	0.13	1.75
2½	0.44	1.63	1.00	0.38	0.13	1.25
3¼	0.56	1.94	1.25	0.50	0.13	2.75
4	0.56	2.25	1.25	0.50	0.13	3.50
5	0.69	2.75	1.38	0.63	0.19	4.25
6	0.81	3.25	1.38	0.63	0.19	5.25

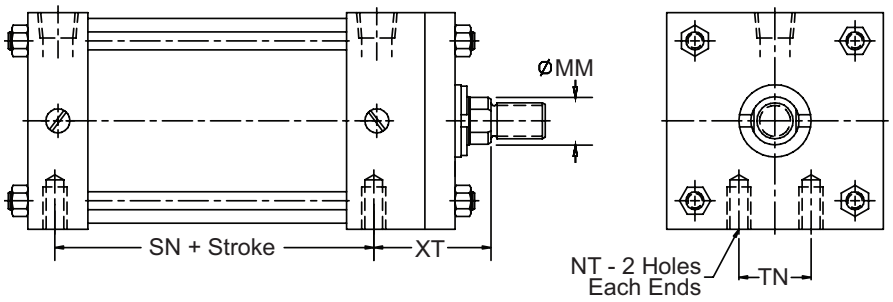
MS2, MS3

Dimensions (in)					
BORE	SB	ST	SU	SW	TS
1½	0.44	0.50	0.94	0.38	2.75
2	0.44	0.50	0.94	0.38	3.25
2½	0.44	0.50	0.94	0.38	3.75
3¼	0.56	0.75	1.25	0.50	4.75
4	0.56	0.75	1.25	0.50	5.50
5	0.81	1.00	1.56	0.69	6.88
6	0.81	1.00	1.56	0.69	7.88

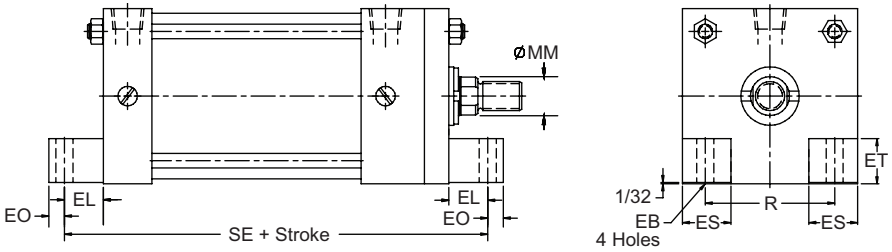
Rod Thread Table

Dimenstions (in)					
Bore	Rod Φ MM	SA	SS	XS	
1½	0.63	6.00	2.88	1.38	For other values please see the charts on pages 3 & 4
	1.00	6.00	2.88	1.75	
2	0.63	6.00	2.88	1.38	
	1.00	6.00	2.88	2.00	
	1.19	6.00	2.88	1.75	
2½	0.63	6.13	3.00	1.75	
	1.00	6.13	3.00	2.25	
	1.19	6.13	3.00	2.00	
	1.75	6.13	3.00	1.38	
3¼	1.00	7.38	3.25	1.88	
	1.19	7.38	3.25	2.50	
	1.75	7.38	3.25	2.13	
	2.00	7.38	3.25	2.38	
4	1.00	7.38	3.25	2.13	
	1.19	7.38	3.25	2.75	
	1.75	7.38	3.25	2.38	
	2.00	7.38	3.25	2.50	
	2.50	7.38	3.25	1.88	
5	1.00	7.88	3.13	2.56	
	1.19	7.88	3.13	2.94	
	1.75	7.88	3.13	2.69	
	2.00	7.88	3.13	2.94	
	2.50	7.88	3.13	2.94	
	3.00	7.88	3.13	2.06	
	3.50	7.88	3.13	2.31	
6	1.19	8.50	3.63	2.56	
	1.75	8.50	3.63	2.94	
	2.00	8.50	3.63	2.69	
	2.50	8.50	3.63	2.94	
	3.00	8.50	3.63	2.94	
	3.50	8.50	3.63	2.94	
	4.00	8.50	3.63	2.56	

MS4



MS7



MS4

Dimensions (in)		
BORE	NT	TN
1½	¼-20	0.63
2	5/16-18	0.88
2½	⅜-16	1.25
3¼	½-13	1.50
4	½-13	2.06
5	⅝-11	2.69
6	¾-10	3.25

MS7

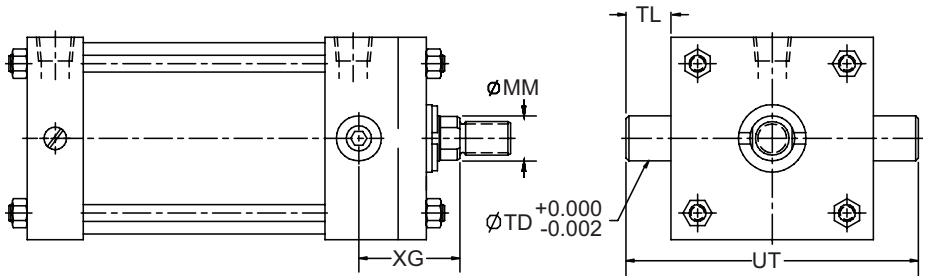
Dimensions (in)						
BORE	EB	EL	EO	ES	ET	R
1½	0.31	0.75	0.25	0.56	0.53	1.43
2	0.38	0.94	0.31	0.63	0.63	1.84
2½	0.38	1.06	0.31	0.81	0.78	2.19
3¼	0.44	0.88	0.38	1.00	0.94	2.76
4	0.44	1.00	0.38	1.25	1.16	3.32
5	0.56	1.06	0.50	1.38	1.38	4.10
6	0.56	1.00	0.50	1.75	0.59	4.88

Rod Thread Table

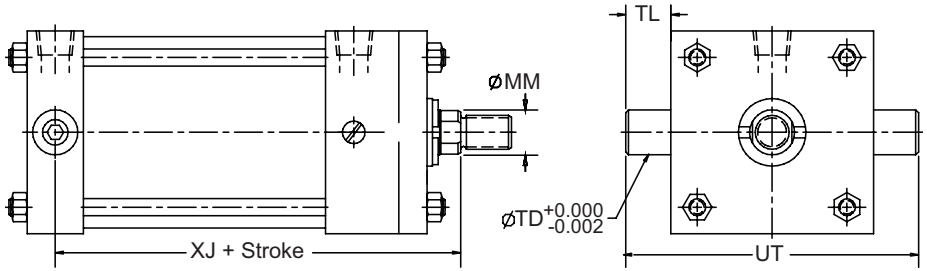
Dimenstions (in)				
Bore	Rod Φ MM	SN	XT	SE
1½	0.63	2.25	1.94	5.50
	1.00	2.25	2.31	5.50
2	0.63	2.25	1.94	5.88
	1.00	2.25	2.56	5.88
	1.19	2.25	2.31	5.88
2½	0.63	2.38	2.31	6.25
	1.00	2.38	2.81	6.25
	1.19	2.38	2.56	6.25
	1.75	2.38	1.94	6.25
3¼	1.00	2.63	2.44	6.63
	1.19	2.63	3.06	6.63
	1.75	2.63	2.69	6.63
	2.00	2.63	2.94	6.63
4	1.00	2.63	2.69	6.88
	1.19	2.63	3.31	6.88
	1.75	2.63	2.94	6.88
	2.00	2.63	3.06	6.88
	2.50	2.63	2.44	6.88
5	1.00	2.88	2.94	7.25
	1.19	2.88	3.31	7.25
	1.75	2.88	3.06	7.25
	2.00	2.88	3.31	7.25
	2.50	2.88	3.31	7.25
	3.00	2.88	2.44	7.25
	3.50	2.88	2.69	7.25
6	1.19	3.13	3.06	7.75
	1.75	3.13	3.44	7.75
	2.00	3.13	3.19	7.75
	2.50	3.13	3.44	7.75
	3.00	3.13	3.44	7.75
	3.50	3.13	3.44	7.75
	4.00	3.13	2.81	7.75

For other values please see the charts on pages 3 & 4

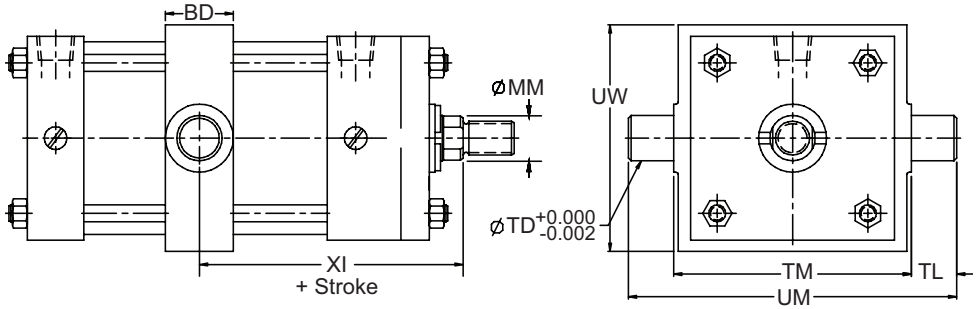
MT1



MT2



MT4



MT1, MT2

Dimensions (in)			
BORE	TD	TL	UT
1½	1.00	1.00	4.00
2	1.00	1.00	4.50
2½	1.00	1.00	5.00
3¼	1.00	1.00	5.75
4	1.00	1.00	6.50
5	1.00	1.00	7.50
6	1.38	1.38	9.25

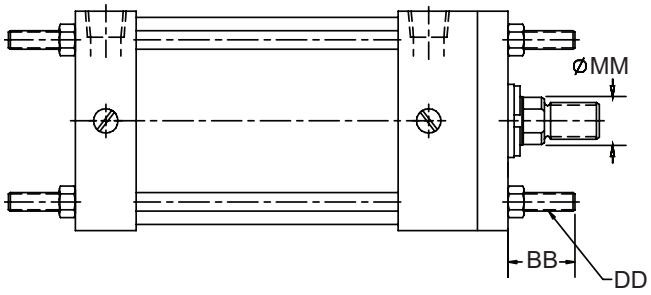
MT4

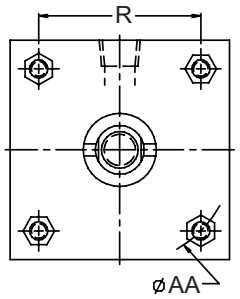
Dimensions (in)						
BORE	BD	TD	TL	TM	UM	UW
1½	1.25	1.00	1.00	2.50	4.50	2.50
2	1.25	1.00	1.00	3.00	5.00	3.00
2½	1.25	1.00	1.00	3.50	5.50	3.50
3¼	1.50	1.00	1.00	4.50	6.50	4.50
4	1.50	1.00	1.00	5.25	7.25	5.25
5	1.50	1.00	1.00	6.25	8.25	6.25
6	1.75	1.38	1.38	7.63	10.38	7.63

Rod Thread Table

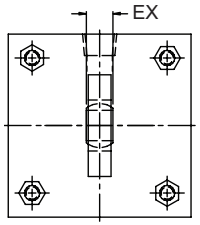
Dimenstions (in)					
Bore	Rod Φ MM	XG	XJ	Min XI	
1½	0.63	1.75	4.13	3.19	For other values please see the charts on pages 3 & 4
	1.00	2.13	4.50	3.56	
2	0.63	1.75	4.13	3.31	
	1.00	2.38	4.75	3.94	
	1.19	2.13	4.50	3.69	
2½	0.63	2.13	4.63	3.69	
	1.00	2.63	5.13	4.19	
	1.19	2.38	4.88	3.94	
	1.75	1.75	4.25	3.31	
3¼	1.00	2.25	5.00	4.19	
	1.19	2.88	5.63	4.81	
	1.75	2.50	5.25	4.44	
	2.00	2.75	5.50	4.69	
4	1.00	2.50	5.25	4.44	
	1.19	3.13	5.88	5.06	
	1.75	2.75	5.50	4.69	
	2.00	2.88	5.63	4.81	
	2.50	2.25	5.00	4.19	
5	1.00	2.75	5.75	4.69	
	1.19	3.13	6.13	5.06	
	1.75	2.88	5.88	4.81	
	2.00	3.13	6.13	5.06	
	2.50	3.13	6.13	5.06	
	3.00	2.25	5.25	4.19	
	3.50	2.50	5.50	4.44	
6	1.19	2.88	6.13	5.19	
	1.75	3.25	6.50	5.56	
	2.00	3.00	6.25	5.31	
	2.50	3.25	6.50	5.56	
	3.00	3.25	6.50	5.56	
	3.50	3.25	6.50	5.56	
	4.00	2.63	5.88	4.94	

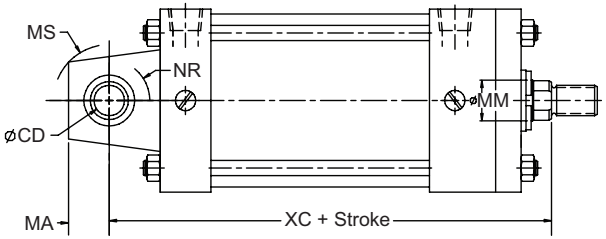
MX1, MX2, MX3



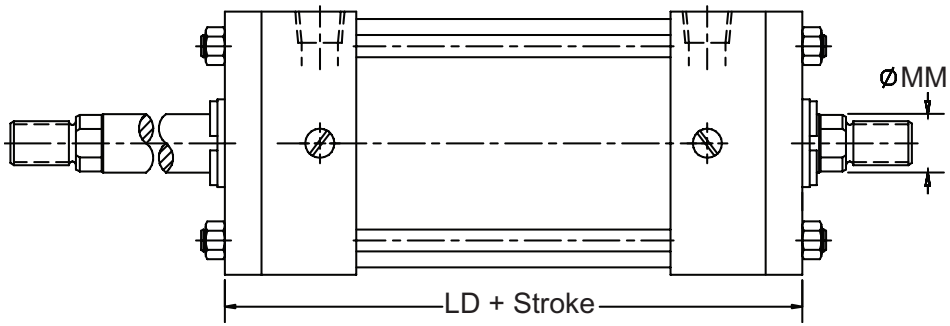


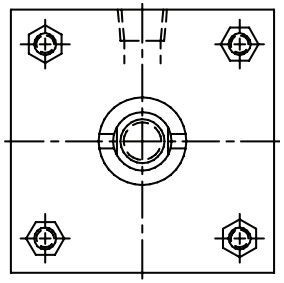
MP5





Double Rod Ended





MX1, MX2, MX3

Dimensions (in)				
BORE	AA	BB	DD	R
1½	2.02	1.00	¼-28	1.43
2	2.60	1.13	5⁄16-24	1.84
2½	3.10	1.13	5⁄16-24	2.19
3¼	3.90	1.13	⅜-24	2.76
4	4.70	1.38	⅜-24	3.32
5	5.80	1.81	½-20	4.10
6	6.90	1.81	½-20	4.88

MP5

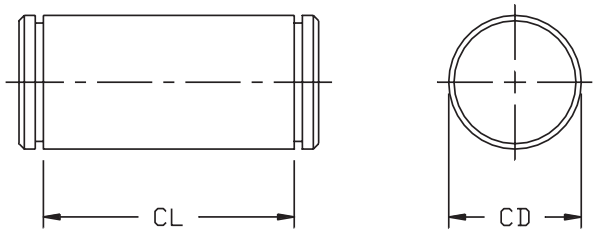
Dimensions (in)					
BORE	CD	EX	MA	MS	NR
1½	0.50	0.44	0.75	0.94	0.63
2	0.50	0.44	0.75	0.94	0.63
2½	0.50	0.44	0.75	0.94	0.63
3¼	0.75	0.66	1.00	1.38	1.00
4	0.75	0.66	1.00	1.38	1.00
5	0.75	0.66	1.00	1.38	1.00
6	1.00	0.88	1.25	1.69	1.25

Rod Thread Table

Dimenstions (in)				
Bore	Rod Φ MM	XC	LD	
1½	0.63	5.38	4.88	For other values please see the charts on pages 3 & 4
	1.00	5.75	4.88	
2	0.63	5.38	4.88	
	1.00	6.00	4.88	
	1.19	5.75	4.88	
2½	0.63	5.88	5.00	
	1.00	6.38	5.00	
	1.19	6.13	5.00	
	1.75	5.50	5.00	
3¼	1.00	6.88	6.00	
	1.19	7.50	6.00	
	1.75	7.13	6.00	
	2.00	7.38	6.00	
4	1.00	7.13	6.00	
	1.19	7.75	6.00	
	1.75	7.38	6.00	
	2.00	7.50	6.00	
	2.50	6.88	6.00	
5	1.00	7.63	6.25	
	1.19	8.00	6.25	
	1.75	7.75	6.25	
	2.00	8.00	6.25	
	2.50	8.00	6.25	
	3.00	7.13	6.25	
	3.50	7.38	6.25	
6	1.19	8.38	7.00	
	1.75	8.75	7.00	
	2.00	8.50	7.00	
	2.50	8.75	7.00	
	3.00	8.75	7.00	
	3.50	8.75	7.00	
	4.00	8.13	7.00	

Mounting Accessories

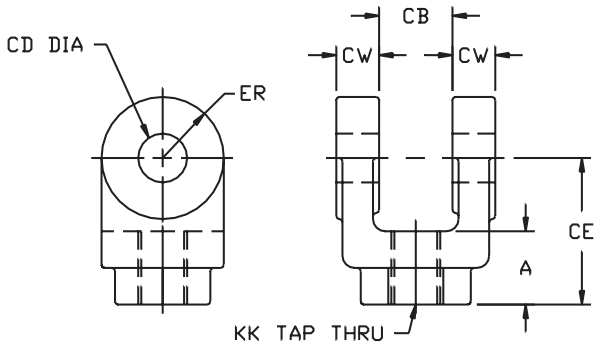
Pivot Pins



COMES WITH TWO RETAINING RINGS

Dimensions (in)		
Part #	CD	CL
81-001	0.50	1.88
81-002	0.75	2.63
81-003	1.00	3.13
81-004	1.34	4.19
81-005	1.75	5.19
81-006	2.00	5.19
81-007	2.50	6.19
81-008	3.00	6.25
81-009	3.50	8.13
81-010	4.00	9.13

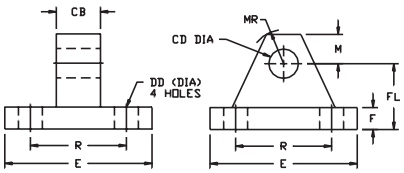
Rod Clevises



Dimensions (in)							
Part #	KK	A	CB	CD	CE	CW	ER
82-001	7/16-20	0.75	0.75	0.50	1.50	0.50	0.50
82-002	1/2-20	0.75	0.75	0.50	1.50	0.50	0.50
82-003	3/4-16	1.13	1.25	0.75	2.13	0.63	0.75
82-004	3/4-16	1.13	1.25	0.75	2.34	0.63	0.75
82-005	7/8-14	1.63	1.50	1.00	2.94	0.75	1.00
82-006	1-14	1.63	1.50	1.00	2.94	0.75	1.00
82-007	1-14	1.63	1.50	1.00	3.13	0.75	1.00
82-008	1 1/4-12	2.00	2.00	1.34	3.75	1.00	1.34
82-009	1 1/4-12	2.00	2.00	1.34	4.13	1.00	1.34
82-010	1 1/2-12	2.25	2.50	1.75	4.50	1.25	1.75
82-011	1 3/4-12	3.00	2.50	2.00	5.50	1.25	2.00
82-012	1 7/8-12	3.00	2.50	2.00	5.50	1.25	2.00
82-013	2 1/4-12	3.50	3.00	2.50	6.50	1.50	2.50
82-014	2 1/2-12	3.50	3.00	3.00	6.75	1.50	2.75
82-015	2 3/4-12	3.50	3.00	3.00	6.75	1.50	2.75
82-016	3 1/4-12	3.50	4.00	3.50	7.75	2.00	3.50
82-017	3 1/4-12	4.50	4.00	3.50	8.50	2.00	3.50
82-018	3 1/2-12	5.50	4.50	4.00	10.00	2.25	4.00
82-019	4-12	5.50	4.50	4.00	10.00	2.25	4.00

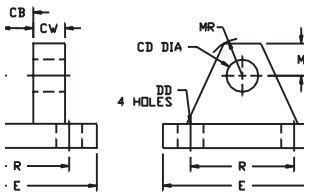
Mounting Accessories

Eye Brackets



Dimensions (in)									
Part #	CD	CB	DD	E	F	FL	M	MR	R
85-001	0.50	0.75	0.41	2.50	0.34	1.13	0.50	0.56	1.63
85-002	0.75	1.25	0.53	3.50	0.63	1.88	0.75	0.88	2.56
85-003	1.00	1.50	0.66	4.50	0.88	2.34	1.00	1.25	3.25
85-004	1.34	2.00	0.66	5.00	0.88	3.00	1.34	1.63	3.44
85-005	1.75	2.50	0.91	6.50	1.13	3.34	1.75	2.13	4.94
85-006	2.00	2.50	1.06	7.50	1.50	4.00	2.00	2.44	5.75
85-007	2.00	2.50	1.06	7.50	1.50	4.00	2.00	2.44	5.75
85-008	2.50	3.00	1.19	8.50	1.75	4.75	2.50	3.00	6.59
85-009	3.00	3.00	1.31	9.50	2.00	5.25	3.00	3.25	7.50
85-010	3.50	4.00	1.81	12.63	1.69	5.69	3.50	4.13	9.63
85-011	4.00	4.50	2.06	14.88	1.94	6.44	4.00	5.25	11.50

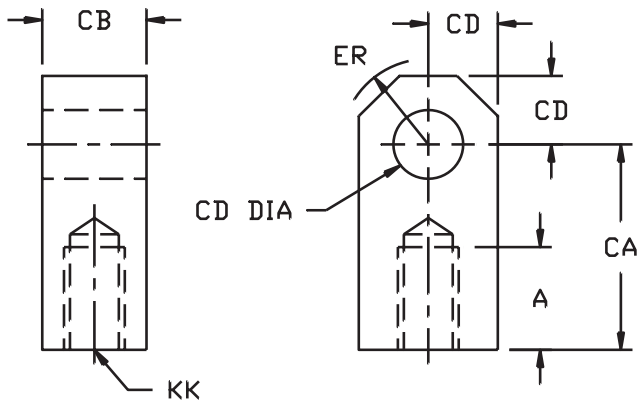
Clevis Brackets



Dimensions (in)										
Part #	CD	R	CB	CW	DD	E	F	FL	M	MR
86P-001	0.50	1.63	0.75	0.50	⅜-24	2.50	0.34	1.13	0.50	0.56
86P-002	0.75	2.56	1.25	0.63	½-20	3.50	0.63	1.88	0.75	1.06
86P-003	1.00	3.25	1.50	0.75	⅝-18	4.50	0.75	2.25	1.00	1.13
86P-004	1.34	3.44	2.00	1.00	⅝-18	5.00	0.88	3.00	1.34	1.75
86P-005	1.75	4.94	2.50	1.25	⅞-14	6.50	0.88	3.13	1.75	1.88
86P-006	2.00	5.75	2.50	1.25	1-14	7.50	1.00	3.50	2	2.13
86P-007	2.50	6.59	3.00	1.50	1⅛-12	8.50	1.00	4.00	2.50	2.50
86P-008	3.00	7.50	3.00	1.50	1¼-12	9.50	1.00	4.25	2.75	2.75
86P-009	3.50	9.63	4.00	2.00	1¾-12	12.63	1.69	5.69	3.50	3.50
86P-010	4.00	11.50	4.50	2.25	2-12	14.88	1.69	6.44	4.00	4.00

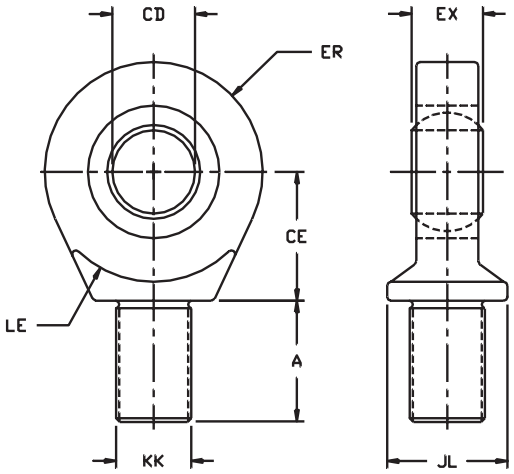
Mounting Accessories

Rod Eyes



Dimensions (in)						
Part #	KK	A	CB	CD	CA	ER
83-001	7/16-20	0.75	0.75	0.50	1.50	0.63
83-002	1/2-20	0.75	0.75	0.50	1.50	0.63
83-003	3/4-16	1.13	1.25	0.75	2.06	0.88
83-004	7/8-14	1.13	1.50	1.00	2.34	1.44
83-005	1-14	1.63	1.50	1.00	2.44	1.19
83-006	1 1/4-12	2.00	2.00	1.34	3.44	1.56
83-007	1 1/2-12	2.25	2.50	1.75	4.00	2.00
83-008	1 3/4-12	2.25	2.50	2.00	4.34	2.88
83-009	1 7/8-12	3.00	2.50	2.00	5.00	2.50
83-010	2 1/4-12	3.50	3.00	2.5	.631	2.81
83-011	2 1/2-12	3.50	3.00	3.00	6.13	3.25
83-012	2 3/4-12	3.63	3.50	3.00	6.50	3.25
83-013	3 1/4-12	4.50	4.00	3.50	7.63	3.88
83-014	3 1/2-12	5.00	4.00	3.50	7.63	3.88
83-015	4-12	5.50	4.50	4.00	9.13	4.44
83-016	4 1/2-12	5.75	5.00	4.00	9.13	4.44

Spherical Rod Eye

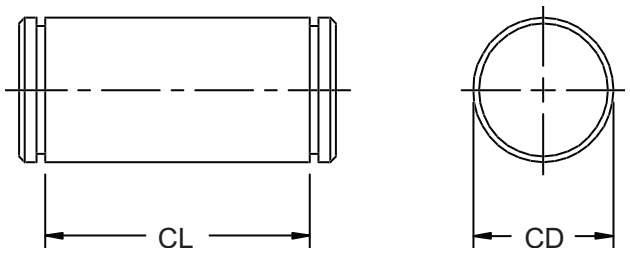


Dimensions (in)								
Part #	KK	A	CD	CE	ER	EX	JL	LE
83SP-001	7/16-20	0.69	0.50	0.88	0.88	0.44	0.88	0.75
83SP-002	3/4-16	1.00	0.75	1.25	1.25	0.66	1.31	1.06
83SP-003	1-14	1.50	1.00	1.88	1.34	0.88	1.50	1.44
83SP-004	1 1/4-12	2.00	1.34	2.13	1.44	1.19	2.00	1.88
83SP-005	1 1/2-12	2.13	1.75	2.50	2.19	1.53	2.25	2.13
83SP-006	7/8-14	2.88	2.00	2.75	2.63	1.75	2.75	2.50

* For larger dimensions consult factory

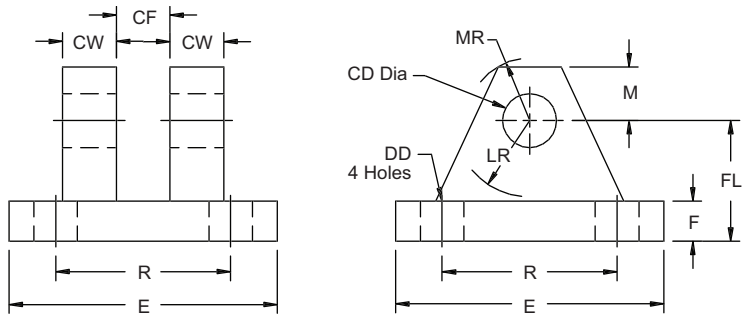
Mounting Accessories

Spherical Pivot Pin



Dimensions (in)		
Part #	CD	CL
81SP-001	0.50	1.56
81SP-002	0.75	2.03
81SP-003	1.00	2.50
81SP-004	1.38	3.31
81SP-005	1.75	4.22
81SP-006	2.00	4.94

Spherical Clevis Brackets



Dimensions (in)											
Part #	CD	CF	CW	DD	E	F	FL	M	LR	MR	R
86SP-001	0.50	0.44	0.50	0.41	3.00	0.50	1.50	0.50	0.94	0.63	2.05
86SP-002	0.75	0.66	0.63	0.53	3.75	0.63	2.00	0.88	1.38	1.00	2.76
86SP-003	1.00	0.88	0.75	0.53	5.50	0.75	2.50	1.00	1.69	1.19	4.10
86SP-004	1.38	1.19	1.00	2.03	6.50	0.88	3.50	1.38	2.44	1.63	4.95
86SP-005	1.75	1.53	1.25	0.91	8.50	1.25	4.50	1.75	2.88	2.06	6.58
86SP-006	2.00	1.75	1.50	0.91	10.63	1.50	5.00	2.00	3.31	2.38	7.92

How to Order

SERIES
N

BORE SIZE
C - 1 1/2" L - 6"
D - 2"
E - 2 1/2"
G - 3 1/4"
H - 4"
K - 5"

ROD DIAMETER
C - 5/8" K - 2 1/2"
E - 1" L - 3"
G - 1 3/8" M - 3 1/2"
H - 1 3/4" N - 4"
J - 2"

ROD THREAD STYLE
N - Standard Thread
M - Metric

ROD THREAD SIZE
1 - Small Male
2 - Intermediate Male
3 - Full Male
4 - Small Female
9 - Flange
P - Plain (Only for N thread)

CUSHIONS
5 - Adjustable both ends
6 - Adjustable head end
7 - Adjustable cap end
8 - None

CUSHIONS POS
- Omit if non Cushion
- Cushion on one end CX
  X denotes position
  ex: C1 = Pos 1
- Cushion on both ends CXX
  XX denotes position
  ex: C12 = Pos 1 head Pos 2 Cap

APPLICATION MODS
- - Omit if not required
G1 - Gland Drain
GR2 - Metallic rod scrapper
List application mods alpha numerically

SEALS
N - Standard Seals
F - High Temp
L - Low Temp
W - Water Content
E - EPDM

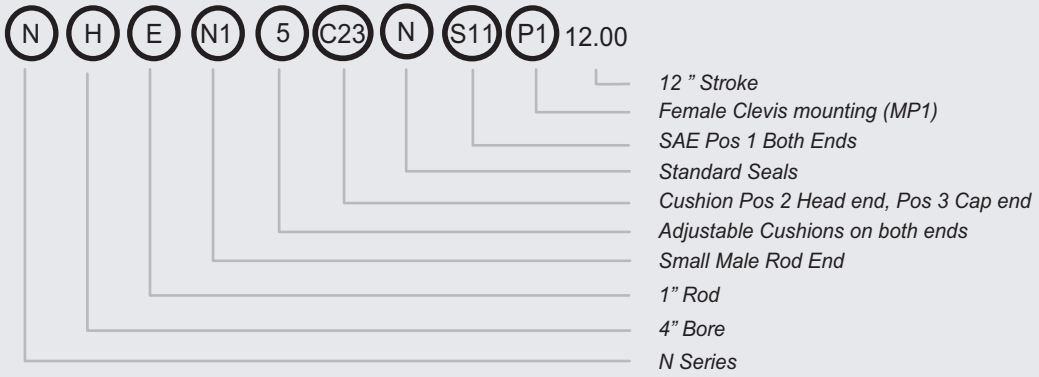
PORTS
SXX - SAE
NXX - NPT

XX denotes position
ex: 12 = Pos 1 head, Pos 2 Cap

SPECIAL OPTIONS
- - Omit if not required
A# - Thread extension ex:A2.50 = A = 2.50"
C1 - Polyurethane Paint
C2 - Nickel Plating
C3 - Melonite Treatment
M2 - Stainless Steel Tie Rods
M4 - 17-4 Stainless Steel Piston Rod
ST - Stop Tube
W# - Rod Extension ex: W2.50 = W = 2.50"
XI - For T4 mount only
Modifications to be listed alphanumerically after the stroke
ex:NHEN15C22NS11X012.0A2.5C1W5.5

MOUNTINGS
E5 ME5 mount: Head rectangular
P1 MP1 mount: Female clevis
P3 MP3 mount: Male clevis
F1 MF1 mount: Head rectangular flange
F2 MF2 mount: Cap rectangular flange
F5 MF5 mount: Head square flange
F6 MF6 mount: Cap square flange
X0 MX0 mount: No mount
X1 MX1 mount: Extended tie rod both ends
X3 MX3 mount: Extended tie rod head end
X2 MX2 mount: Extended tie rod cap end
S1 MS1 mount: Side end angles
S2 MS2 mount: Side lugs
SC2 MS2 mount: Side lugs, thrust key on cap end
SH2 MS2 mount: side lugs, thrust key on head end
S4 MS4 mount: Side tapped
S7 MS7 mount: Side end lugs
T4 MT4 moung: Intermediate trunnions
T1+ MT1 mount: Integral Head end trunnion
T2+ MT2 mount: Integral Cap end trunnion
(Specify XI at end of stroke)

EXAMPLE



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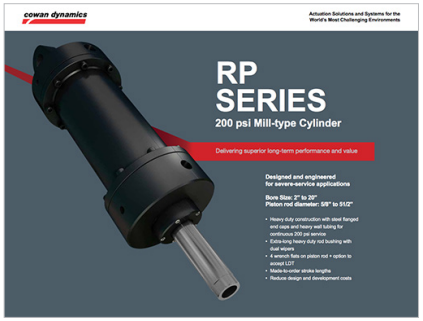

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