

RS Series Round USDA/FDA SS Series NFPA Tie Rod SS-MS Series Multi-Stage Stainless Steel Cylinders 1.50" to 8.00" Bore



RS Series

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SS Series Single Rod End

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SS Series Double Rod End

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SS-MS Series

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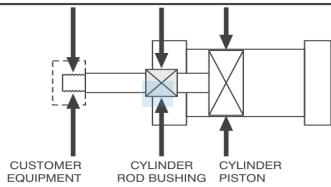
**95% OF OUR CYLINDERS SHIP IN 2-3 DAYS!
ONE DAY RUSH SERVICE AVAILABLE ON ALL CATALOGED CYLINDER MODELS!**

HEAVY DUTY 'SS' STAINLESS STEEL: CONSTRUCTION

Floating Rod Bushing

SELF ALIGNMENT FEATURE

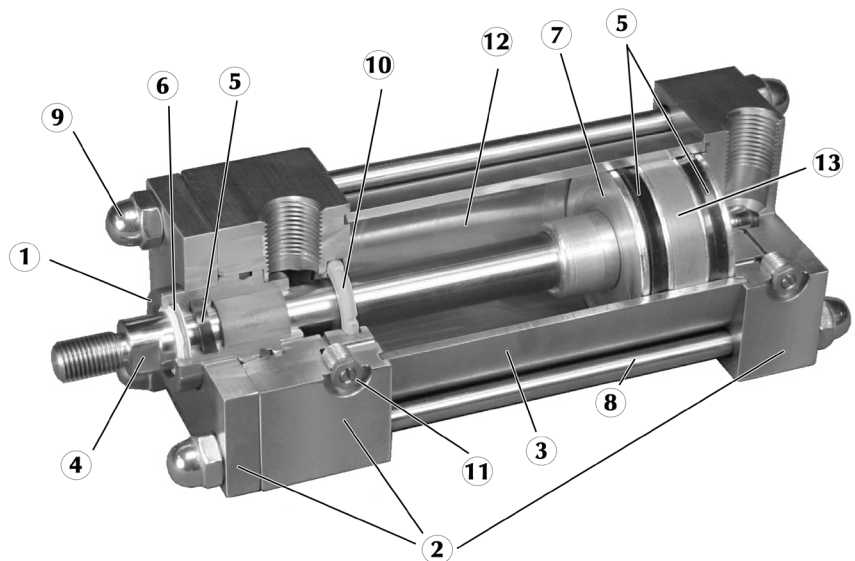
Rod Bushing is designed to float .002" to improve bearing surface alignment.



- Reduces cylinder drag and erratic operation
- Reduces cylinder wear
- Provides a minimum of 25% longer life than fixed Rod Bushing designs

Ideal for:

- Food Processing Applications
- Chemical, Medical or Pharmaceutical
- Offshore or Marine Equipment
- Energy Production or Waste Treatment



- FLOATING ROD BUSHING** – Precision machined from 303 stainless steel, extra-long PTFE composite wear band for extended service.
- HEAD, CAP & RETAINER** – 100% Precision machined from highly corrosion resistant 303 stainless steel bar for tough and corrosive environments.
- CYLINDER TUBE** – Precision machined and honed from 304 stainless steel, providing smooth consistent operation.
- PISTON ROD** – Drawn, ground and polished high yield 303 stainless steel, hard chrome plated.
- PISTON & ROD SEALS** – Heavy lip design Carboxylated Nitrile construction. Seals are pressure activated and wear compensating for long life.
- ROD WIPER** – PTFE scraper design for maximum compatibility with wash-down and chemical solutions (FDA approved material).
- PISTON** – Precision machined from 6061-T651 alloy aluminum for excellent bearing surface to extend life (Optional: Stainless Steel with PTFE wear band).
- TIE RODS** – Drawn and ground 303 high strength stainless steel, rolled threads for maximum strength.
- ACORN NUTS** – 304 Stainless steel, eliminates exposed threads for food grade applications.
- CUSHIONS** – (Options H & C) Floating cushion seal designed for maximum cushion performance, quick return stroke break-away and extended life.
- CUSHION ADJUSTMENT NEEDLE** - 303 stainless steel design has fine thread metering and is positively captured to prevent needle ejection during adjustment.
- LUBRICATION** - Permanently lubricated with Magnalube-G PTFE based grease on all internal components. This lubricant is a non-migratory type high performance grease, providing outstanding service for life (no additional lubrication is required).
- PISTON WEAR BAND** - 90% Virgin PTFE and 10% Polyphenylene Sulfide filled wear band; extremely low wear rate.

OPERATING PRESSURE

250 PSI AIR (17 BAR)
400 PSI Hydraulic (27 BAR)
("TH" Option)

OPERATING TEMPERATURE

Carboxylated Nitrile: -20°F to 200°F (-29°C to 93°C)
Fluorocarbon: 0°F to 400°F (-18°C to 204°C)

Performance options:

- **FDAL** – FDA approved lubricant, rated for 0°F to 300°F (-18°C to 149°C).
- **DRB** – Solid Delrin® Rod Bushing (FDA approved) for extra long life under "high pressure" wash-down applications. This bearing material requires ZERO lubrication due to self lubricating properties.
- **VS** – Fluorocarbon seals provide a higher chemical resistance to most wash-down solutions.
- **SSP** – Solid Stainless Steel Piston provides maximum corrosion resistance and FDA approval for food contact (PTFE wear band standard).

SERIES 'SS': HOW TO ORDER

SS - MX0 - 1.50 X 1.00 - H1C5 - BP - KK3 - MPR - OP = PORTS AT 3 & 7

SERIES
SS 250 PSI AIR

NFPA MOUNTS	
MX0	NO MOUNT (1.50" - 8".00 BORE)
MP1	REAR PIVOT CLEVIS (1.50" - 8.00" BORE)
MP4	REAR PIVOT EYE (1.50" - 6.00" BORE)
MT1	FRONT TRUNNION (1.50" - 8.00" BORE)
MT2	REAR TRUNNION (1.50" - 8.00" BORE)
MX1	EXTENDED TIE-RODS (HEAD & CAP) (1.50" - 8.00" BORE)
MX2	EXTENDED TIE-RODS (CAP) (1.50" - 8.00" BORE)
MX3	EXTENDED TIE-RODS (HEAD) (1.50" - 8.00" BORE)
MF1	FRONT FLANGE (1.50" - 6.00" BORE)
MF2	REAR FLANGE (1.50" - 6.00" BORE)
ME3	FRONT MOUNTING HOLES (8.00" BORE)
ME4	REAR MOUNTING HOLES (8.00" BORE)
MS2	SIDE LUG (1.50" - 8.00" BORE)
MS4	BOTTOM TAPPED HOLES (1.50" - 8.00" BORE)

STYLE	BORE	STROKE	CUSHIONS
SINGLE ROD (LEAVE BLANK)	1.50	0" TO 120"	H = HEAD CUSHION POSITION 2 STANDARD SPECIFY FOR POSITIONS 1, 3 OR 4
D = DOUBLE ROD END	2.00	CONSULT FACTORY FOR OTHER STROKES	C = CAP CUSHION POSITION 6 STANDARD SPECIFY FOR POSITIONS 5, 7 OR 8
	2.50		
	3.25		
	4.00		
	5.00		
	6.00		
	8.00		

OPTIONS	
A/O	AIR / OIL PISTON
X	B** .25" URETHANE BUMPER BOTH ENDS
X	BH** .25" URETHANE BUMPER HEAD ONLY
X	BC** .25" URETHANE BUMPER CAP ONLY
	BP BUMPER PISTON SEAL (1.50" - 5.00" BORE)
	"A"- EXTENDED PISTON ROD THREAD (SPECIFY)
	"C"- EXTENDED PISTON ROD (SPECIFY)
	DRB DELRIN® ROD BUSHING
	FDAL FDA APPROVED LUBRICANT
	KK2 INTERMEDIATE MALE ROD THREAD
	KK3 FEMALE ROD THREAD
	KK3S STUDDER PISTON ROD (WITH KK3)
	KK4 FULL DIAMETER MALE ROD THREAD
	LF LOW FRICTION, 250 PSI AIR
X	MPR MAGNETIC PISTON FOR REED SWITCHES
	MPH MAGNETIC PISTON FOR HALL SWITCHES
	MS METALLIC ROD SCRAPER (BRASS)
X	NR NON-ROTATING
	OP OPTIONAL PORT LOCATION
	OS OVERSIZED ROD DIAMETER (SPECIFY SIZE)
	SE SPRING EXTEND (CONSULT FACTORY)
	SR SPRING RETURN (CONSULT FACTORY)
	SSP STAINLESS STEEL PISTON (WITH WEAR-BAND)
X	ST STOP TUBE - SPECIFY STOP TUBE LENGTH (INCHES) SPECIFY STROKE AS ES (EFFECTIVE STROKE) EXAMPLE: SS MS4 2X24ES-ST=3
	TH 400 PSI HYDRAULIC, NON-SHOCK
	VS FLUOROCARBON SEALS
	AS ADJUSTABLE STROKE (RETRACT)
	XX SPECIAL VARIATION (SPECIFY)
	BSP, SAE PORTS (SPECIFY SIZE)

About Our Part Number System

- Simple, easy to understand
- No excessive codes!
- Eliminates mistakes when ordering

Example: A 2.50" Bore by 10" Stroke, Front Flange Mount, Head & Cap Cushions

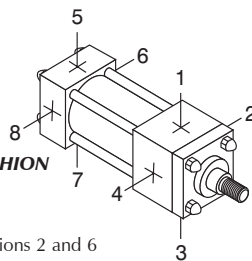
Part Number: SS-MF1-2.50 x 10-HC

OPTION LENGTH ADDER						
(ADD TO CATALOG BASIC OVERALL LENGTH DIMENSIONS)						
BORE	OPTION					
	B	BC	BH	MPR or MPH	NR	ST*
1.50	0.500	0.250	0.250	0.625	0.625	2
2.00	0.500	0.250	0.250	0.625	0.625	2
2.50	0.500	0.250	0.250	0.750	0.750	2
3.25	0.500	0.250	0.250	0.625	0.625	2
4.00	0.500	0.250	0.250	0.625	0.625	2
5.00	0.500	0.250	0.250	0.875	0.875	2
6.00	0.500	0.250	0.250	0.750	0.750	2
8.00	0.500	0.250	0.250	0.875	0.875	2

*Note: The desired stop tube length adds directly to the overall cylinder length. Specify stop tube location.

Example: Stop tube on rear stage only.

** BUMPERS ADD .25" PER END TO CYLINDER LENGTH



STANDARD PORT AND CUSHION ADJUSTMENT POSITIONS

- Ports - Positions 1 and 5
- Cushion Adjustment - Positions 2 and 6
- Specify Non-Standard Positions When Ordering

NFPA MOUNTS

<p>1.50"-8.00" Bores</p>	<p>1.50"-8.00" Bores</p>	<p>1.50"-8.00" Bores</p>	<p>1.50"-6.00" Bores</p>	<p>1.50"-8.00" Bores</p>
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<p>1.50"-6.00" Bores</p>	<p>8.00" Bore</p>	<p>8.00" Bore</p>	<p>1.50"-8.00" Bores</p>	<p>1.50"-8.00" Bores</p>

SERIES 'SS' DIMENSIONS: BASIC CYLINDER (NO MOUNT)

EASY FLIP OUT PAGE FOR REFERENCE

About Rod End Styles

Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (see chart).

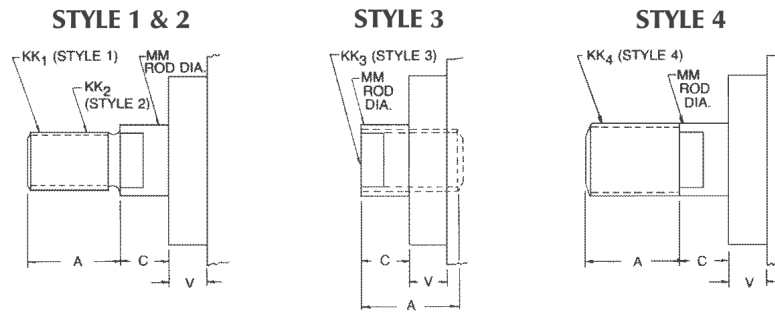
Need a rod end not listed? NO PROBLEM! Each Piston Rod is made-to-order and does not delay shipment. Coarse UNC threads, Metric threads or just plain rod ends are common. Thread lengths are also made-to-order (Specify: "A"=Length).

NEED SOMETHING NOT LISTED?

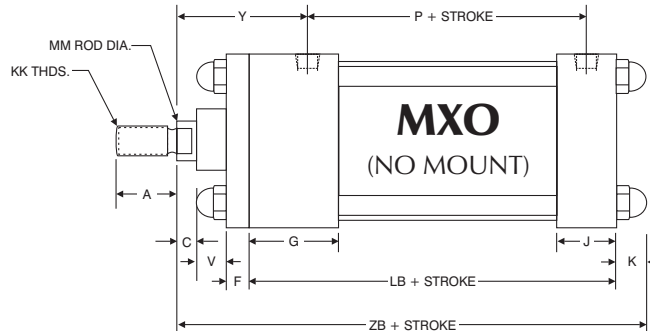
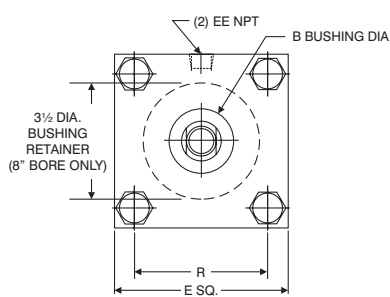
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PISTON ROD END STYLES



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL						C	V
		STYLE 1 - MALE		STYLE 2 - MALE		STYLE 3 - FEMALE		STYLE 4 - MALE			
		KK1	A	KK2	A	KK3	A	KK4	A		
1.50, 2.00, 2.50	0.625 Standard	7/16-20	0.750	1/2-20	0.750	7/16-20	0.750	5/8-18	0.750	0.375	0.250
	1.000 Oversize	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.500
3.25, 4.00, 5.00	1.000 Standard	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.250
	1.375 Oversize	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
6.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.250
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.375
8.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.500



BASIC DIMENSIONS 'MXO' STANDARD & OVERSIZED RODS

BORE	ROD DIAMETER	A	B	C	E	EE	F	G	J	K	KK	LB	MM	P	R	V	Y	ZB
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	1.000	0.438	7/16-20	3.625	0.625	2.375	1.430	0.250	1.875	5.063
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.438
2.00	0.625 Standard	0.750	1.125	0.375	2.500	0.375	0.375	1.500	1.000	0.563	7/16-20	3.625	0.625	2.375	1.840	0.250	1.875	5.188
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.563
2.50	0.625 Standard	0.750	1.125	0.375	3.000	0.375	0.375	1.500	1.000	0.563	7/16-20	3.750	0.625	2.500	2.190	0.250	1.875	5.313
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.688
3.25	1.000 Standard	1.125	1.500	0.500	3.750	0.500	0.625	1.750	1.250	0.625	3/4-16	4.250	1.000	2.750	2.760	0.250	2.375	6.250
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.500
4.00	1.000 Standard	1.125	1.500	0.500	4.500	0.500	0.625	1.750	1.250	0.625	3/4-16	4.250	1.000	2.750	3.320	0.250	2.375	6.250
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.500
5.00	1.000 Standard	1.125	1.500	0.500	5.500	0.500	0.625	1.750	1.250	0.813	3/4-16	4.500	1.000	3.000	4.100	0.250	2.375	6.625
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.875
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.750	2.000	1.500	0.813	1-14	5.000	1.375	3.250	4.880	0.250	2.750	7.375
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12		1.750			0.375	3.000	7.625
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	1.500	1.000	1-14	5.125	1.375	3.375	6.440	0.375	2.750	7.750
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12		1.750			0.500	3.000	8.000

SS - How to Order

SS - Base Dimensions

SS - Single Rod Mounts

SS - Double Rod Mounts

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Accessories Page 227

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Technical Data Page 277

SERIES 'SS' DIMENSIONS: BASIC CYLINDER (NO MOUNT)

About Rod End Styles

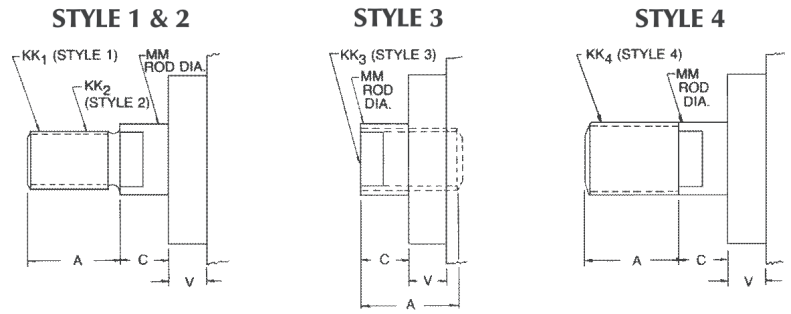
Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (see chart).

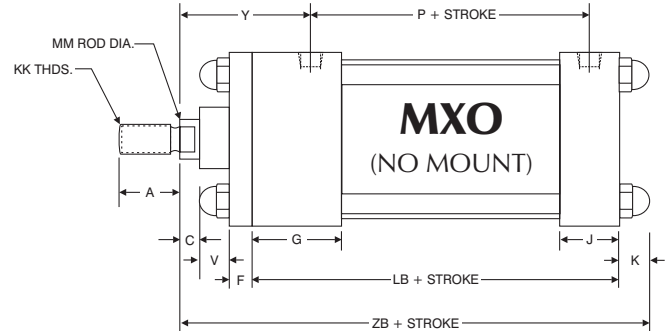
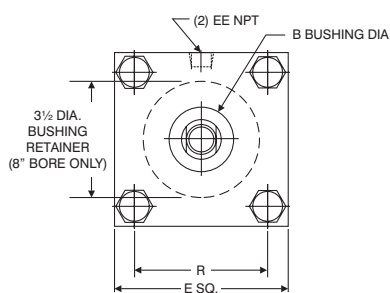
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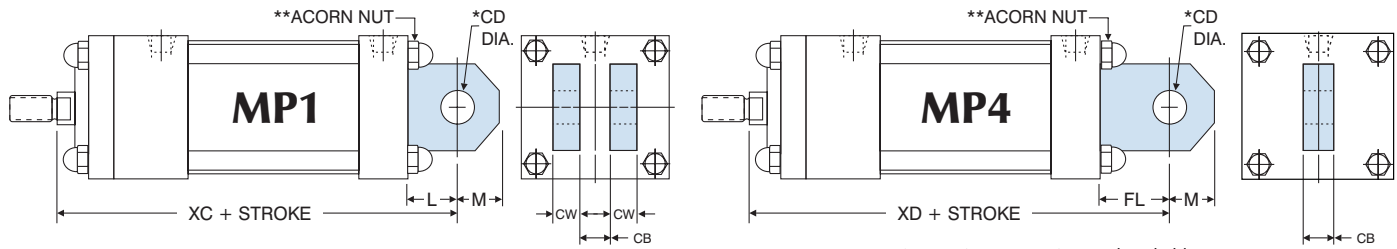


BORE	MM ROD DIAMETER	STANDARD		OPTIONAL						C	V
		STYLE 1 - MALE		STYLE 2 - MALE		STYLE 3 - FEMALE		STYLE 4 - MALE			
		KK1	A	KK2	A	KK3	A	KK4	A		
1.50, 2.00, 2.50	0.625 Standard	7/16-20	0.750	1/2-20	0.750	7/16-20	0.750	5/8-18	0.750	0.375	0.250
	1.000 Oversize	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.500
3.25, 4.00, 5.00	1.000 Standard	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.250
	1.375 Oversize	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
6.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.250
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.375
8.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.500



BASIC DIMENSIONS 'MXO' STANDARD & OVERSIZED RODS																		
BORE	ROD DIAMETER	A	B	C	E	EE	F	G	J	K	KK	LB	MM	P	R	V	Y	ZB
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	1.000	0.438	7/16-20	3.625	0.625	2.375	1.430	0.250	1.875	5.063
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.438
2.00	0.625 Standard	0.750	1.125	0.375	2.500	0.375	0.375	1.500	1.000	0.563	7/16-20	3.625	0.625	2.375	1.840	0.250	1.875	5.188
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.563
2.50	0.625 Standard	0.750	1.125	0.375	3.000	0.375	0.375	1.500	1.000	0.563	7/16-20	3.750	0.625	2.500	2.190	0.250	1.875	5.313
	1.000 Oversize	1.125	1.500	0.500							3/4-16		1.000			0.500	2.250	5.688
3.25	1.000 Standard	1.125	1.500	0.500	3.750	0.500	0.625	1.750	1.250	0.625	3/4-16	4.250	1.000	2.750	2.760	0.250	2.375	6.250
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.500
4.00	1.000 Standard	1.125	1.500	0.500	4.500	0.500	0.625	1.750	1.250	0.625	3/4-16	4.250	1.000	2.750	3.320	0.250	2.375	6.250
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.500
5.00	1.000 Standard	1.125	1.500	0.500	5.500	0.500	0.625	1.750	1.250	0.813	3/4-16	4.500	1.000	3.000	4.100	0.250	2.375	6.625
	1.375 Oversize	1.625	2.000	0.625							1-14		1.375			0.375	2.625	6.875
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.750	2.000	1.500	0.813	1-14	5.000	1.375	3.250	4.880	0.250	2.750	7.375
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12		1.750			0.375	3.000	7.625
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	1.500	1.000	1-14	5.125	1.375	3.375	6.440	0.375	2.750	7.750
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12		1.750			0.500	3.000	8.000

SERIES 'SS' DIMENSIONS: PIVOT MOUNTS



Note: Pivot Mount is non-detachable.
Contact factory for detachable mount options.

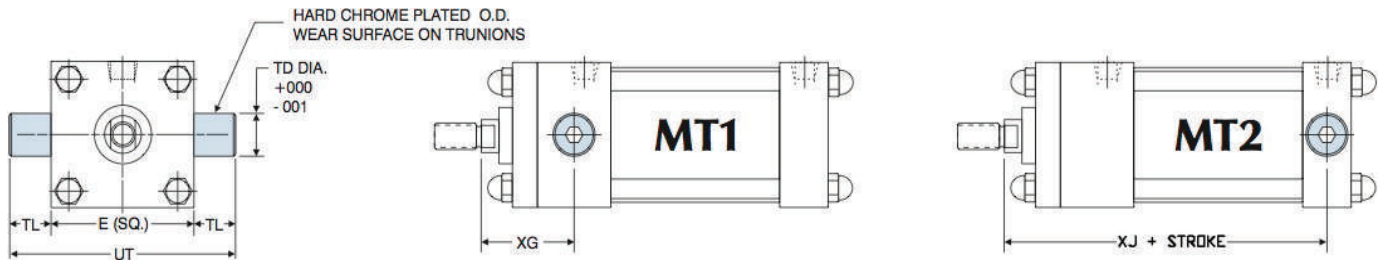
'MP1' CLEVIS AND 'MP4' EYE MOUNT DIMENSIONS								ACCESSORIES (SEE PAGE 210 FOR DIMENSIONS)					
BORE	ROD DIAMETER	CB	CD	CW	FL	L	M	XC	XD	ROD CLEVIS	ROD EYE	CLEVIS PIN	EYE BRACKET (FOR MP1)
1.50	0.625 Standard	0.750	0.500	0.500	1.125	0.750	0.625	5.375	5.750	SS-RC437	SS-RE437	SS-CP500	SS-EB500
	1.000 Oversize							5.750	6.125	SS-RC750	SS-RE750	SS-CP750	
2.00	0.625 Standard	0.750	0.500	0.500	1.125	0.750	0.625	5.375	5.750	SS-RC437	SS-RE437	SS-CP500	SS-EB500
	1.000 Oversize							5.750	6.125	SS-RC750	SS-RE750	SS-CP750	
2.50	0.625 Standard	0.750	0.500	0.500	1.125	0.750	0.625	5.500	5.875	SS-RC437	SS-RE437	SS-CP500	SS-EB500
	1.000 Oversize							5.875	6.250	SS-RC750	SS-RE750	SS-CP750	
3.25	1.000 Standard	1.250	0.750	0.625	1.875	1.250	0.875	6.875	7.500	SS-RC750	SS-RE750	SS-CP750	SS-EB750
	1.375 Oversize							7.125	7.750	SS-RC1000	SS-RE1000	SS-CP1000	
4.00	1.000 Standard	1.250	0.750	0.625	1.875	1.250	0.875	6.875	7.500	SS-RC750	SS-RE750	SS-CP750	SS-EB750
	1.375 Oversize							7.125	7.750	SS-RC1000	SS-RE1000	SS-CP1000	
5.00	1.000 Standard	1.250	0.750	0.625	1.875	1.250	0.875	7.125	7.750	SS-RC750	SS-RE750	SS-CP750	SS-EB750
	1.375 Oversize							7.375	8.000	SS-RC1000	SS-RE1000	SS-CP1000	
6.00	1.375 Standard	1.500	1.000	0.750	2.250	1.500	1.000	8.125	8.875	SS-RC1000	SS-RE1000	SS-CP1000	SS-EB1000
	1.750 Oversize							8.375	9.125	SS-RC1250	SS-RE1250	SS-CP1375	
8.00	1.375 Standard	1.500	1.000	0.750	N/A	1.500	1.000	8.250	N/A	SS-RC1000	SS-RE1000	SS-CP1000	SS-EB1000
	1.750 Oversize							8.500	N/A	SS-RC1250	SS-RE1250	SS-CP1375	

For dimensions not shown, see page 141.

*Clevis pin provided with MP1 and MP4 mounts.

**Acorn nuts are located on cap end (4.00"-8.00" bores).

Note: MP4 8.00" bore not available.



MT1 / MT2

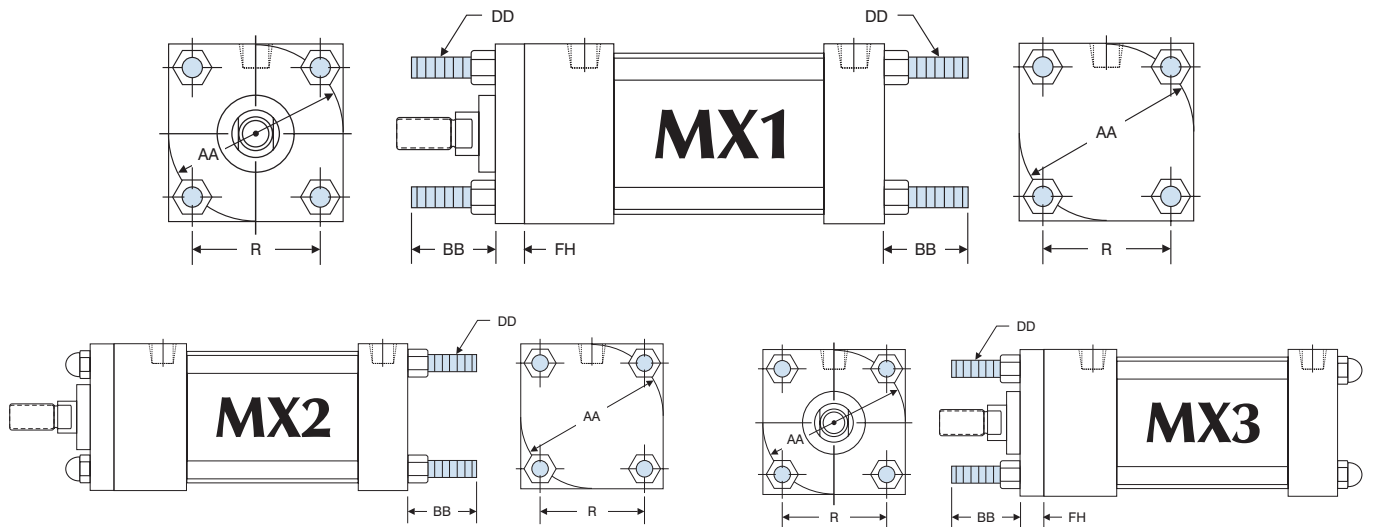
Note: Trunnions are bolt on, non-removable design.

'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS								ACCESSORIES (SEE PAGE 210 FOR DIMENSIONS)		
BORE	ROD DIAMETER	E	TD	TL	UT	XG	XJ	ROD CLEVIS	ROD EYE	CLEVIS PIN
1.50	0.625 Standard	2.000	1.000	1.000	4.000	1.750	4.125	SS-RC437	SS-RE437	SS-CP500
	1.000 Oversize*					N/A	4.500	SS-RC750	SS-RE750	SS-CP750
2.00	0.625 Standard	2.500	1.000	1.000	4.500	1.750	4.125	SS-RC437	SS-RE437	SS-CP500
	1.000 Oversize					2.125	4.500	SS-RC750	SS-RE750	SS-CP750
2.50	0.625 Standard	3.000	1.000	1.000	5.000	1.750	4.250	SS-RC437	SS-RE437	SS-CP500
	1.000 Oversize					2.125	4.625	SS-RC750	SS-RE750	SS-CP750
3.25	1.000 Standard	3.750	1.000	1.000	5.750	2.250	5.000	SS-RC750	SS-RE750	SS-CP750
	1.375 Oversize					2.500	5.250	SS-RC1000	SS-RE1000	SS-CP1000
4.00	1.000 Standard	4.500	1.000	1.000	6.500	2.250	5.000	SS-RC750	SS-RE750	SS-CP750
	1.375 Oversize					2.500	5.250	SS-RC1000	SS-RE1000	SS-CP1000
5.00	1.000 Standard	5.500	1.000	1.000	7.500	2.250	5.250	SS-RC750	SS-RE750	SS-CP750
	1.375 Oversize					2.500	5.500	SS-RC1000	SS-RE1000	SS-CP1000
6.00	1.375 Standard	6.500	1.375	1.375	9.250	2.625	5.875	SS-RC1000	SS-RE1000	SS-CP1000
	1.750 Oversize					2.875	6.125	SS-RC1250	SS-RE1250	SS-CP1375
8.00	1.375 Standard	8.500	1.375	1.375	11.250	2.625	6.000	SS-RC1000	SS-RE1000	SS-CP1000
	1.750 Oversize					2.875	6.250	SS-RC1250	SS-RE1250	SS-CP1375

*No Oversize rod on 1.50" bore on MT1 mount.

For dimensions not shown, see page 141.

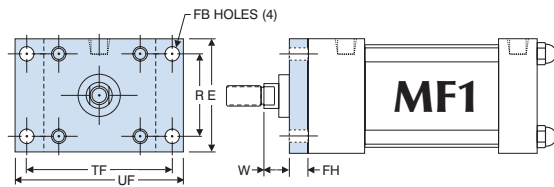
SERIES 'SS' DIMENSIONS: TIE ROD & FLANGE MOUNTS



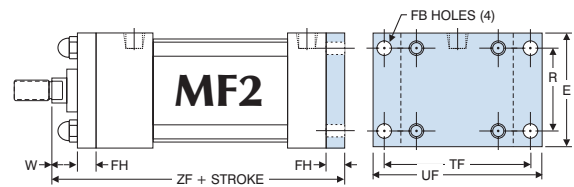
TIE ROD EXTENDED 'MX1', 'MX2' & 'MX3' MOUNT DIMENSIONS						
BORE	ROD DIAMETER	AA	BB	DD	FH	R
1.50	0.625 Standard	2.020	1.000	1/4-28	0.375	1.430
	1.000 Oversize					
2.00	0.625 Standard	2.600	1.125	5/16-24	0.375	1.840
	1.000 Oversize					
2.50	0.625 Standard	3.100	1.125	5/16-24	0.375	2.190
	1.000 Oversize					
3.25	1.000 Standard	3.900	1.375	3/8-24	0.625	2.760
	1.375 Oversize					

TIE ROD EXTENDED 'MX1', 'MX2' & 'MX3' MOUNT DIMENSIONS						
BORE	ROD DIAMETER	AA	BB	DD	FH	R
4.00	1.000 Standard	4.700	1.375	3/8-24	0.625	3.320
	1.375 Oversize					
5.00	1.000 Standard	5.800	1.813	1/2-20	0.625	4.100
	1.375 Oversize					
6.00	1.375 Standard	6.900	1.813	1/2-20	0.750	4.880
	1.750 Oversize					
8.00	1.375 Standard	9.100	2.313	5/8-18	0.625*	6.440
	1.750 Oversize					

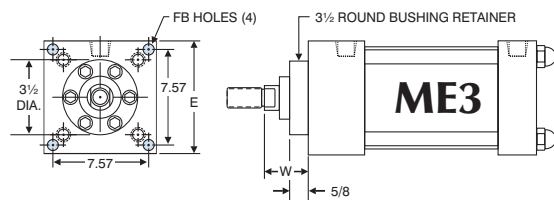
Full square bushing retainer on 1.50" through 6.00" bore.
 *Round retainer on 8.00" bore. BB dimension from face of head.
 For dimensions not shown, see page 141.



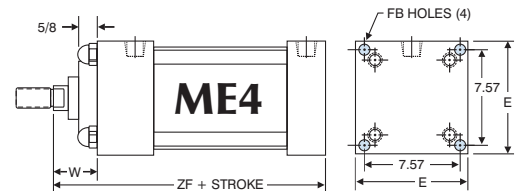
1.50" - 6.00" BORES



1.50" - 6.00" BORES



8.00" BORE ONLY



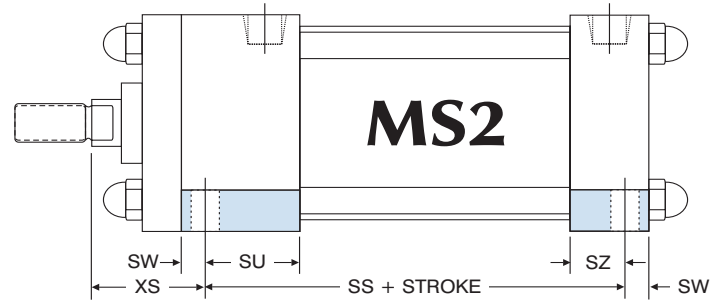
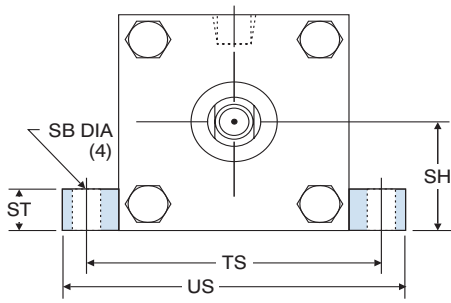
8.00" BORE ONLY

'MF1', 'MF2' FLANGE & 'ME3', 'ME4' CAP MOUNT DIMENSIONS									
BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	W	ZF
1.50	0.625 Standard	2.000	0.313	0.375	1.430	2.750	3.375	0.625	5.000
	1.000 Oversize							1.000	5.375
2.00	0.625 Standard	2.500	0.375	0.375	1.840	3.375	4.125	0.625	5.000
	1.000 Oversize							1.000	5.375
2.50	0.625 Standard	3.000	0.375	0.375	2.190	3.875	4.625	0.625	5.125
	1.000 Oversize							1.000	5.500
3.25	1.000 Standard	3.750	0.438	0.625	2.760	4.688	5.500	0.750	6.250
	1.375 Oversize							1.000	6.500

'MF1', 'MF2' FLANGE & 'ME3', 'ME4' CAP MOUNT DIMENSIONS									
BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	W	ZF
4.00	1.000 Standard	4.500	0.438	0.625	3.320	5.438	6.250	0.750	6.250
	1.375 Oversize							1.000	6.500
5.00	1.000 Standard	5.500	0.563	0.625	4.100	6.625	7.625	0.750	6.500
	1.375 Oversize							1.000	6.750
6.00	1.375 Standard	6.500	0.563	0.750	4.880	7.625	8.625	0.875	7.375
	1.750 Oversize							1.125	7.625
8.00	1.375 Standard	8.500	0.688	N/A	N/A	N/A	N/A	1.625	6.750
	1.750 Oversize							1.875	7.000

Full square bushing retainer on 1.50" through 6.00" bore.
 *Round retainer on 8.00" bore.
 For dimensions not shown, see page 141.

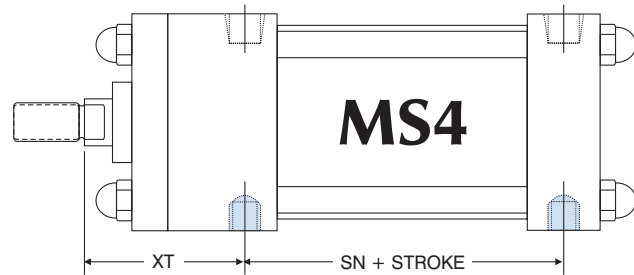
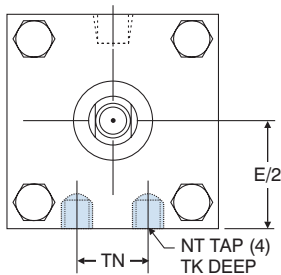
SERIES 'SS' DIMENSIONS: BASE MOUNTS



'MS2' SIDE LUG MOUNT DIMENSIONS

BORE	ROD DIAMETER	SB	SH	ST	SU	SW	SZ	TS	US	XS	SS ADD STROKE
1.50	0.625 Standard	0.438	1.000	0.500	1.125	0.375	0.625	2.750	3.500	1.375	2.875
	1.000 Oversize									1.750	
2.00	0.625 Standard	0.438	1.250	0.500	1.125	0.375	0.625	3.250	4.000	1.375	2.875
	1.000 Oversize									1.750	
2.50	0.625 Standard	0.438	1.500	0.500	1.125	0.375	0.625	3.750	4.500	1.375	3.000
	1.000 Oversize									1.750	
3.25	1.000 Standard	0.563	1.875	0.750	1.250	0.500	0.750	4.750	5.750	1.875	3.250
	1.375 Oversize									2.125	
4.00	1.000 Standard	0.563	2.250	0.750	1.250	0.500	0.750	5.500	6.500	1.875	3.250
	1.375 Oversize									2.125	
5.00	1.000 Standard	0.813	2.750	1.000	1.063	0.688	0.563	6.875	8.250	2.063	3.125
	1.375 Oversize									2.313	
6.00	1.375 Standard	0.813	3.250	1.000	1.313	0.688	0.813	7.875	9.250	2.313	3.625
	1.750 Oversize									2.563	
8.00	1.375 Standard	0.813	4.250	1.000	1.563	0.688	0.813	9.875	11.250	2.313	3.750
	1.750 Oversize									2.563	

Full square bushing retainer on 1.50" through 6.00" bore.
Round retainer on 8.00" bore.
For dimensions not shown, see page 141.



'MS4' BOTTOM TAP MOUNT DIMENSIONS

BORE	ROD DIAMETER	E/2	NT	TK	TN	XT	SN ADD STROKE
1.50	0.625 Standard	1.000	1/4 -20	0.375	0.625	1.938	2.250
	1.000 Oversize					2.313	
2.00	0.625 Standard	1.250	5/16 -18	0.500	0.875	1.938	2.250
	1.000 Oversize					2.313	
2.50	0.625 Standard	1.500	3/8 -16	0.625	1.250	1.938	2.375
	1.000 Oversize					2.313	
3.25	1.000 Standard	1.875	1/2 -13	0.750	1.500	2.438	2.625
	1.375 Oversize					2.688	
4.00	1.000 Standard	2.250	1/2 -13	0.750	2.063	2.438	2.625
	1.375 Oversize					2.688	
5.00	1.000 Standard	2.750	5/8 -11	1.000	2.688	2.438	2.875
	1.375 Oversize					2.688	
6.00	1.375 Standard	3.250	3/4 -10	1.125	3.250	2.813	3.125
	1.750 Oversize					3.063	
8.00	1.375 Standard	4.250	3/4 -10	1.125	4.500	2.813	3.250
	1.750 Oversize					3.063	

Full square bushing retainer on 1.50" through 6.00" bore
Round retainer on 8.00" bore.
For dimensions not shown, see page 141.

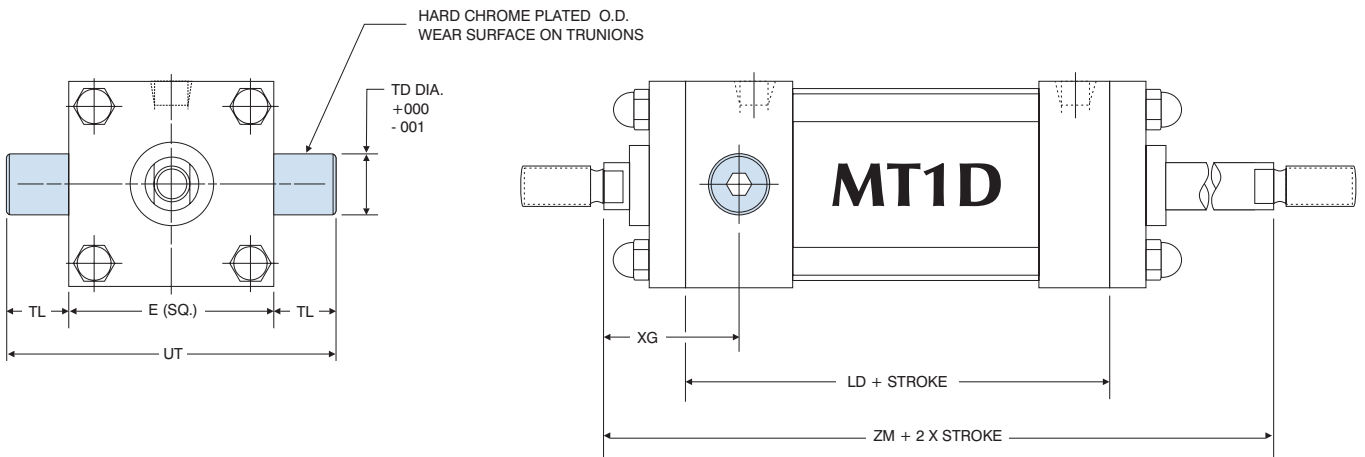
SERIES 'SS' DIMENSIONS: DOUBLE ROD END

Benefits

- Standard and Oversized Piston Rods available.
- Full range of Standard Options.
- Durable design. Full Rod Bearing at each end of cylinder.
- Can be provided with Hollow Piston Rods (gun-drilled through, to your size requirements).
- Can be used in adjustable extend stroke applications (by adding a stop collar on one rod end).



(MT1D MOUNT SHOWN)



Note: Trunnions are bolt on, non-removable design.

'SS-MT1D' HEAD TRUNNION MOUNT DIMENSIONS								
BORE	ROD DIAMETER	E	LD	TD	TL	UT	XG	ZM
1.50	0.625 Standard	2.000	4.125	1.000	1.000	4.000	1.750	6.125
	N/A*						N/A	
2.00	0.625 Standard	2.500	4.125	1.000	1.000	4.500	1.750	6.125
	1.000 Oversize						2.125	6.875
2.50	0.625 Standard	3.000	4.250	1.000	1.000	5.000	1.750	6.250
	1.000 Oversize						2.125	7.000
3.25	1.000 Standard	3.750	4.750	1.000	1.000	5.750	2.250	7.500
	1.375 Oversize						2.500	8.000
4.00	1.000 Standard	4.500	4.750	1.000	1.000	6.500	2.250	7.500
	1.375 Oversize						2.500	8.000
5.00	1.000 Standard	5.500	5.000	1.000	1.000	7.500	2.250	7.750
	1.375 Oversize						2.500	8.250
6.00	1.375 Standard	6.500	5.500	1.375	1.375	9.250	2.625	8.750
	1.750 Oversize						2.875	9.250
8.00	1.375 Standard	8.500	5.625	1.375	1.375	11.250	2.625	8.875
	1.750 Oversize						2.875	9.375

* No oversized rod available on 1.50" bore.

SERIES 'SS' DIMENSIONS: DOUBLE ROD END

EASY FLIP OUT PAGE FOR REFERENCE

About Rod End Styles

Style 1 Male Rod End is STANDARD

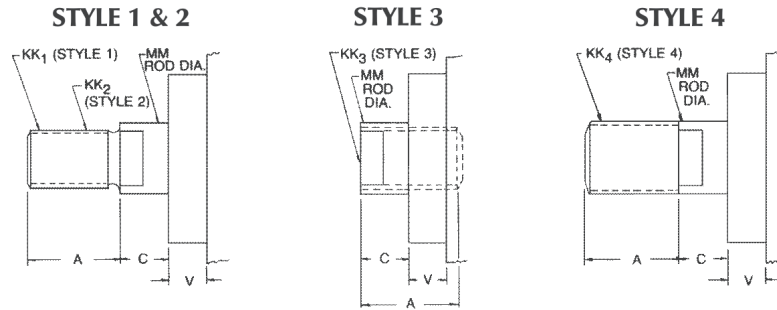
Other NFPA Styles can be specified (see chart).

Need a rod end not listed?
NO PROBLEM! Each Piston Rod is made-to-order and does not delay shipment. Coarse UNC threads, Metric threads or just plain rod ends are common. Thread lengths are also made-to-order (Specify: "A"=Length).

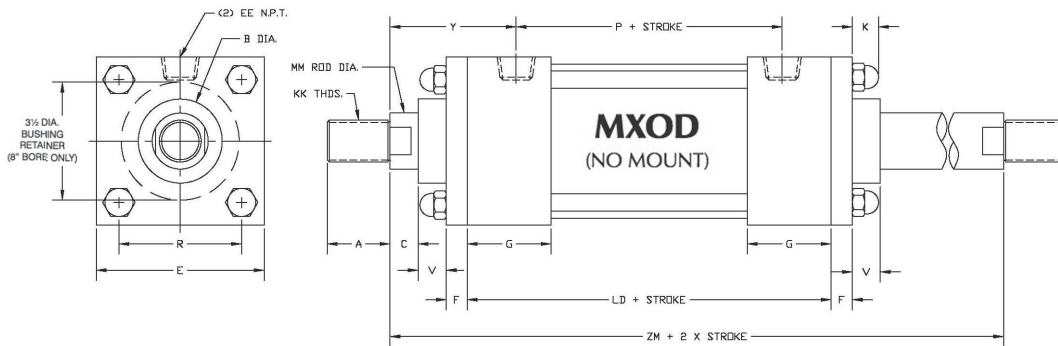
NEED SOMETHING NOT LISTED?
Just send us a sketch.

In most cases, quotes are turned around in one day!

PISTON ROD END STYLES



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL						C	V
		STYLE 1 - MALE		STYLE 2 - MALE		STYLE 3 - FEMALE		STYLE 4 - MALE			
		KK1	A	KK2	A	KK3	A	KK4	A		
1.50, 2.00, 2.50	0.625 Standard	7/16-20	0.750	1/2-20	0.750	7/16-20	0.750	5/8-18	0.750	0.375	0.250
	1.000 Oversize	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.500
3.25, 4.00, 5.00	1.000 Standard	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.250
	1.375 Oversize	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
6.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.250
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.375
8.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.500



DOUBLE ROD 'MX0D' DIMENSIONS STANDARD & OVERSIZED RODS																	
BORE	ROD DIAMETER	A	B	C	E	EE	F	G	K	KK	LD	MM	P	R	V	Y	ZM
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	0.438	7/16-20	4.125	0.625	2.375	1.430	0.250	1.875	6.125
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000					
2.00	0.625 Standard	0.750	1.125	0.375	2.500	0.375	0.375	1.500	0.563	7/16-20	4.125	0.625	2.375	1.840	0.250	1.875	6.125
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000					
2.50	0.625 Standard	0.750	1.125	0.375	3.000	0.375	0.375	1.500	0.563	7/16-20	4.250	0.625	2.500	2.190	0.250	1.875	6.250
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000					
3.25	1.000 Standard	1.125	1.500	0.500	3.750	0.500	0.625	1.750	0.625	3/4-16	4.750	1.000	2.750	2.760	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375					
4.00	1.000 Standard	1.125	1.500	0.500	4.500	0.500	0.625	1.750	0.625	3/4-16	4.750	1.000	2.750	3.320	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375					
5.00	1.000 Standard	1.125	1.500	0.500	5.500	0.500	0.625	1.750	0.813	3/4-16	5.000	1.000	3.000	4.100	0.250	2.375	7.750
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375					
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.750	2.000	0.813	1-14	5.500	1.375	3.250	4.880	0.250	2.750	8.750
	1.750 Oversize	2.000	2.375	0.750						1 1/4-12		1.750					
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	1.000	1-14	5.625	1.375	3.375	6.440	0.375	2.750	8.875
	1.750 Oversize	2.000	2.375	0.750						1 1/4-12		1.750					

SS - How to Order
SS - Base Dimensions
SS - Single Rod Mounts
SS - Double Rod Mounts
Options Page 189
Accessories Page 227
Switches Page 241
Technical Data Page 277

SERIES 'SS' DIMENSIONS: DOUBLE ROD END

About Rod End Styles

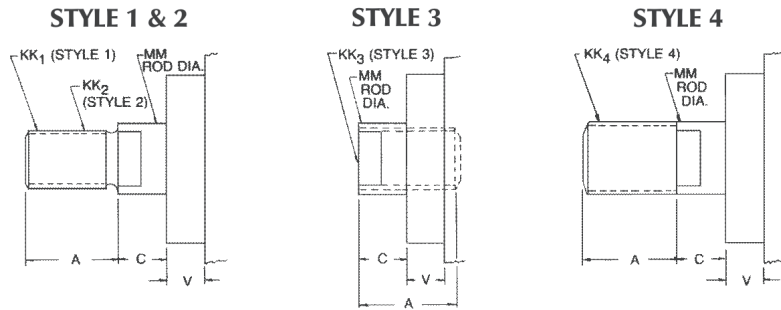
Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (see chart).

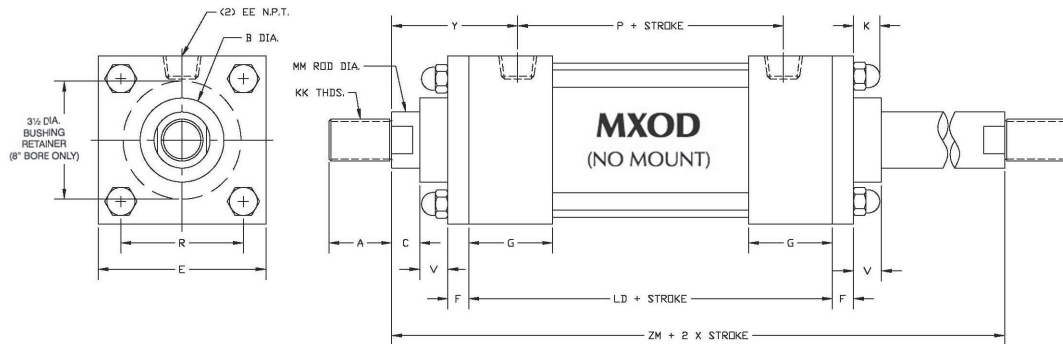
Need a rod end not listed?
NO PROBLEM! Each Piston Rod is made-to-order and does not delay shipment. Coarse UNC threads, Metric threads or just plain rod ends are common. Thread lengths are also made-to-order (Specify: "A"=Length).

NEED SOMETHING NOT LISTED?
Just send us a sketch.
In most cases, quotes are turned around in one day!

PISTON ROD END STYLES



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL						C	V
		STYLE 1 - MALE		STYLE 2 - MALE		STYLE 3 - FEMALE		STYLE 4 - MALE			
		KK1	A	KK2	A	KK3	A	KK4	A		
1.50, 2.00, 2.50	0.625 Standard	7/16-20	0.750	1/2-20	0.750	7/16-20	0.750	5/8-18	0.750	0.375	0.250
	1.000 Oversize	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.500
3.25, 4.00, 5.00	1.000 Standard	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	0.500	0.250
	1.375 Oversize	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
6.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.250
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.375
8.00	1.375 Standard	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	0.625	0.375
	1.750 Oversize	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	0.750	0.500

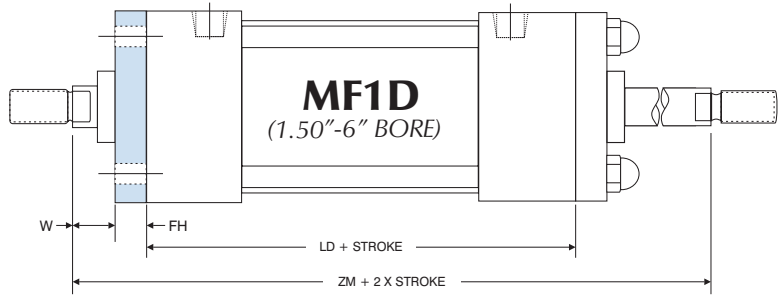
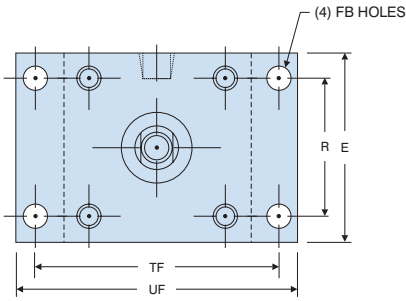


DOUBLE ROD 'MXOD' DIMENSIONS STANDARD & OVERSIZED RODS																	
BORE	ROD DIAMETER	A	B	C	E	EE	F	G	K	KK	LD	MM	P	R	V	Y	ZM
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	0.438	7/16-20	4.125	0.625	2.375	1.430	0.250	1.875	6.125
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000			0.500	2.250	6.875
2.00	0.625 Standard	0.750	1.125	0.375	2.500	0.375	0.375	1.500	0.563	7/16-20	4.125	0.625	2.375	1.840	0.250	1.875	6.125
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000			0.500	2.250	6.875
2.50	0.625 Standard	0.750	1.125	0.375	3.000	0.375	0.375	1.500	0.563	7/16-20	4.250	0.625	2.500	2.190	0.250	1.875	6.250
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000			0.500	2.250	7.000
3.25	1.000 Standard	1.125	1.500	0.500	3.750	0.500	0.625	1.750	0.625	3/4-16	4.750	1.000	2.750	2.760	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			0.375	2.625	8.000
4.00	1.000 Standard	1.125	1.500	0.500	4.500	0.500	0.625	1.750	0.625	3/4-16	4.750	1.000	2.750	3.320	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			0.375	2.625	8.000
5.00	1.000 Standard	1.125	1.500	0.500	5.500	0.500	0.625	1.750	0.813	3/4-16	5.000	1.000	3.000	4.100	0.250	2.375	7.750
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			0.375	2.625	8.250
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.750	2.000	0.813	1-14	5.500	1.375	3.250	4.880	0.250	2.750	8.750
	1.750 Oversize	2.000	2.375	0.750						1 1/4-12		1.750			0.375	3.000	9.250
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	1.000	1-14	5.625	1.375	3.375	6.440	0.375	2.750	8.875
	1.750 Oversize	2.000	2.375	0.750						1 1/4-12		1.750			0.500	3.000	9.375

SERIES 'SS' DIMENSIONS: DOUBLE ROD END FLANGE MOUNTS

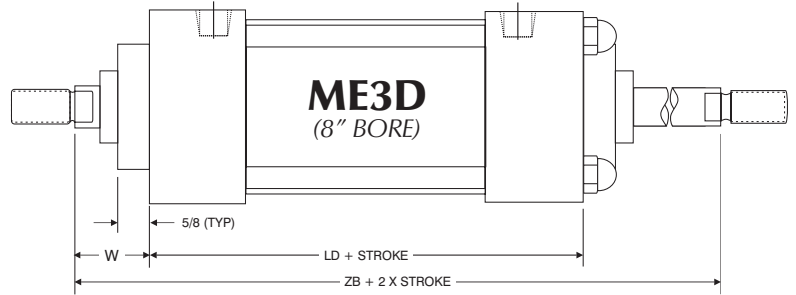
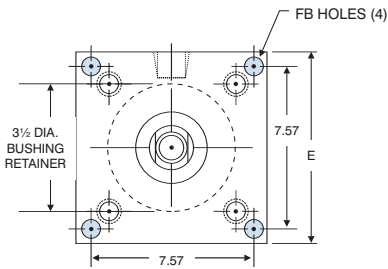
SS - How to Order

SS - Base Dimensions



SS - Single Rod Mounts

SS - Double Rod Mounts



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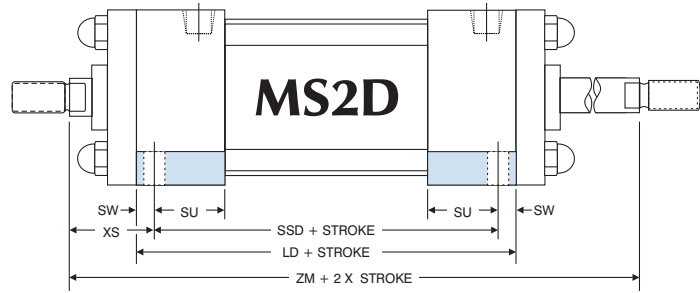
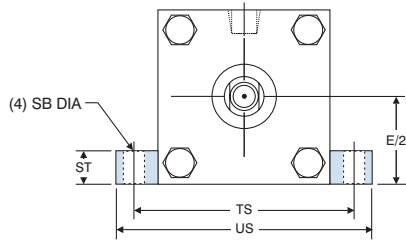
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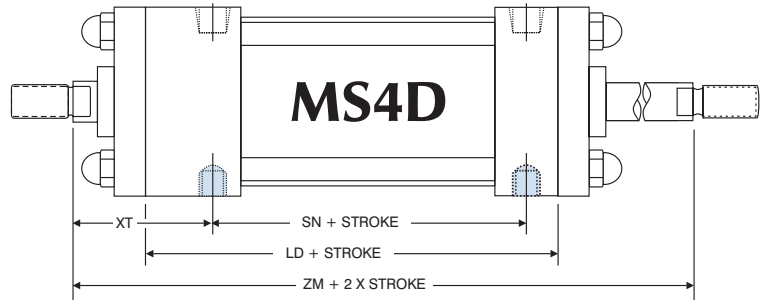
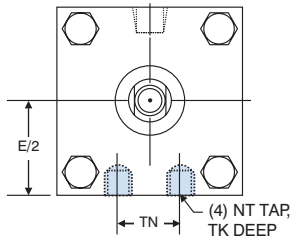
'SS-MF1D' FLANGE & 'SS-ME3D' HEAD MOUNT DIMENSIONS										
BORE	ROD DIAMETER	E	FB	FH	LD	R	TF	UF	W	ZM
1.50	0.625 Standard	2.000	0.313	0.375	4.125	1.430	2.750	3.375	0.625	6.125
	1.000 Oversize								1.000	6.875
2.00	0.625 Standard	2.500	0.375	0.375	4.125	1.840	3.375	4.125	0.625	6.125
	1.000 Oversize								1.000	6.875
2.50	0.625 Standard	3.000	0.375	0.375	4.250	2.190	3.875	4.625	0.625	6.250
	1.000 Oversize								1.000	7.000
3.25	1.000 Standard	3.750	0.438	0.625	4.750	2.760	4.688	5.500	0.750	7.500
	1.375 Oversize								1.000	8.000
4.00	1.000 Standard	4.500	0.438	0.625	4.750	3.320	5.438	6.250	0.750	7.500
	1.375 Oversize								1.000	8.000
5.00	1.000 Standard	5.500	0.563	0.625	5.000	4.100	6.625	7.625	0.750	7.750
	1.375 Oversize								1.000	8.250
6.00	1.375 Standard	6.500	0.563	0.750	5.500	4.880	7.625	8.625	0.875	8.750
	1.750 Oversize								1.125	9.250
8.00	1.375 Standard	8.500	0.688	N/A	5.625	N/A	N/A	N/A	1.625	8.875
	1.750 Oversize								1.875	9.375

SERIES 'SS' DIMENSIONS: DOUBLE ROD END BASE MOUNTS



'SS-MS2D' SIDE LUG MOUNT DIMENSIONS												
BORE	ROD DIAMETER	E/2	LD	SB	ST	SU	SW	TS	US	XS	ZM	SSD
1.50	0.625 Standard	1.000	4.125	0.438	0.500	1.125	0.375	2.750	3.500	1.375	6.125	3.375
	1.000 Oversize									1.750	6.875	
2.00	0.625 Standard	1.250	4.125	0.438	0.500	1.125	0.375	3.250	4.000	1.375	6.125	3.375
	1.000 Oversize									1.750	6.875	
2.50	0.625 Standard	1.500	4.250	0.438	0.500	1.125	0.375	3.750	4.500	1.375	6.250	3.500
	1.000 Oversize									1.750	7.000	
3.25	1.000 Standard	1.875	4.750	0.563	0.750	1.250	0.500	4.750	5.750	1.875	7.500	3.750
	1.375 Oversize									2.125	8.000	
4.00	1.000 Standard	2.250	4.750	0.563	0.750	1.250	0.500	5.500	6.500	1.875	7.500	3.750
	1.375 Oversize									2.125	8.000	
5.00	1.000 Standard	2.750	5.000	0.813	1.000	1.063	0.688	6.875	8.250	2.063	7.750	3.625
	1.375 Oversize									2.313	8.250	
6.00	1.375 Standard	3.250	5.500	0.813	1.000	1.313	0.688	7.875	9.250	2.313	8.750	4.125
	1.750 Oversize									2.563	9.250	
8.00	1.375 Standard	4.250	5.625	0.813	1.000	1.313	0.688	9.875	11.250	2.313	8.875	4.250
	1.750 Oversize									2.563	9.375	

Note: Round retainer on 8.00" bore only.



'SS-MS4D' BOTTOM TAPPED MOUNT DIMENSIONS									
BORE	ROD DIAMETER	E/2	LD	NT	TK	TN	XT	SN	ZM
1.50	0.625 Standard	1.000	4.125	1/4-20	0.375	0.625	1.938	2.250	6.125
	1.000 Oversize						2.313		6.875
2.00	0.625 Standard	1.250	4.125	5/16-18	0.500	0.875	1.938	2.250	6.125
	1.000 Oversize						2.313		6.875
2.50	0.625 Standard	1.500	4.250	3/8-16	0.625	1.250	1.938	2.375	6.250
	1.000 Oversize						2.313		7.000
3.25	1.000 Standard	1.875	4.750	1/2-13	0.750	1.500	2.438	2.625	7.500
	1.375 Oversize						2.688		8.000
4.00	1.000 Standard	2.250	4.750	1/2-13	0.750	2.063	2.438	2.625	7.500
	1.375 Oversize						2.688		8.000
5.00	1.000 Standard	2.750	5.000	5/8-11	1.000	2.688	2.438	2.875	7.750
	1.375 Oversize						2.688		8.125
6.00	1.375 Standard	3.250	5.500	3/4-10	1.125	3.250	2.813	3.125	8.750
	1.750 Oversize						3.063		9.250
8.00	1.375 Standard	4.250	5.625	3/4-10	1.125	4.500	2.813	3.250	8.875
	1.750 Oversize						3.063		9.375

Note: Round retainer on 8.00" bore only.