



TA Series Cylinders

The TA Series is Bimba's standard pneumatic NFPA cylinder line, offering self-aligning motion that can be customized to fit any application.



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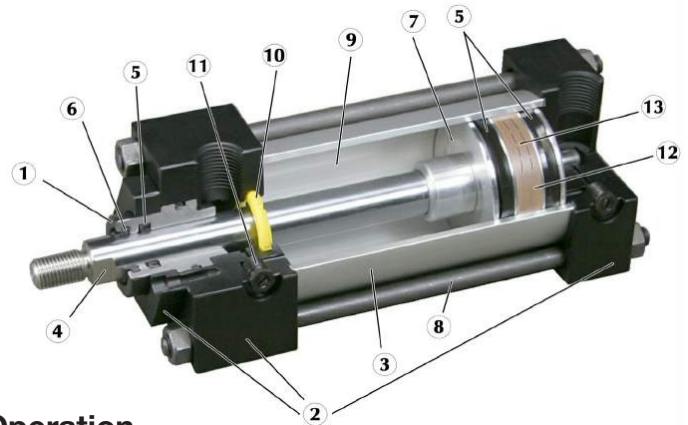
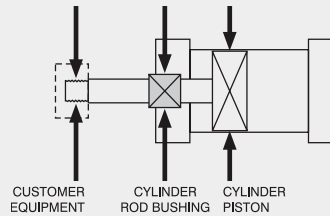
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Floating Rod Bushing

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



Heavy-Duty Design for Reliable, Consistent Operation

1. **Floating Rod Bushing** – Precision machined from 150,000 PSI rated graphite-filled cast iron and PTFE coated to reduce friction and extend cycle life. Bushing design traps lubrication in effective bearing area.
2. **Head, Cap & Retainer** – Precision machined from high strength 6061-T6 aluminum alloy. Black anodized for corrosion resistance
3. **Cylinder Tube** – Precision machined from 6063-T6832 high tensile aluminum alloy and hard coat to 60 Rc for wear resistance and extended cycle life.
4. **Piston Rod** – Precision machined from high yield, polished and hard chrome plated steel.
5. **Piston & Rod Seals** – Heavy lip design Carboxylated Nitrile construction. Seals are pressure activated and wear-compensating for long life (self-lubricating material).
6. **Rod Wiper** – Abrasion resistant urethane provides aggressive wiping action in all environments. External lip design prevents debris from entering cylinder.
7. **Piston** – Precision machined from 6061-T651 alloy aluminum, provides an excellent bearing surface for extended cylinder life.
8. **Tie Rods** – Pre-stressed high carbon steel tie rod construction eliminates axial loading of cylinder tube and maintains compression on tube and end seals.
9. **Permanent Lubrication** – Permanently lubricated with Magnalube-G PTFE based grease on all internal components. This is a non-migratory type high performance grease providing outstanding service life. No additional lubrication is required.
10. **Cushions** – Floating cushion seal designed for maximum cushion performance, quick return stroke break-away and extended life (Options H & C).
11. **Cushion Adjustment Needle** – Adjustable steel needle design has fine thread metering and is positively captured to prevent needle ejection during adjustment.
12. **Piston Wear Band** - 90% Virgin PTFE and 10% Polyphenylene Sulfide-filled wear band; extremely low wear rate.
13. **Piston Magnet** – For Bimba magnetically operated reed and solid state switches (Option MPR).

Operating Pressure

250 PSI Air (17 BAR)

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

ST – Stop tubes are used to reduce rod bearing and piston stress (refer to pages 234 for cylinder design guidance).

MA – Micro-Adjust provides a precision adjustment on the cylinder extend stroke, providing quick and accurate cylinder positioning to reduce set-up time.

SSA – Stainless steel piston rod, tie rods, nuts and fasteners provide corrosion resistance. Refer to Series 'SS' for a complete stainless steel solution.

LF – Low friction seals reduce breakaway and running friction. Effective at all operating pressures.

How to Order

TA - MF1 - 2.50 x 10 - HC - MPR

Series	
TA	250 PSI Air

NFPA Mounts	
MF1	Front Flange (1.50" - 6.00" Bore)
MF2	Rear Flange (1.50" - 6.00" Bore)
ME3	Front Mounting Holes (8.00" - 12.00" Bore)
ME4	Rear Mounting Holes (8.00" - 12.00" Bore)
MP1	Rear Pivot Clevis (1.50" - 12.00" Bore)
MP2	Rear Pivot Clevis (1.50" - 6.00" Bore)
MP4	Rear Pivot Eye (1.50" - 6.00" Bore)
MS1	Front & Rear End Angle (1.50" - 8.00" Bore)
MS2	Side Lug (1.50" - 8.00" Bore)
MS4	Bottom Tapped Holes (1.50" - 12.00" Bore)
MT1	Front Trunnion (1.50" - 8.00" Bore)
MT2	Rear Trunnion (1.50" - 8.00" Bore)
MT4	Intermediate Trunnion (1.50" - 8.00" Bore)
MX0	No Mount (1.50" - 12.00" Bore)
MX1	Extended Tie Rods - Head & Cap (1.50"-12.00" Bore)
MX2	Extended Tie Rods (Cap) (1.50" - 12.00" Bore)
MX3	Extended Tie Rods (Head) (1.50" - 12.00" Bore)

Style	
(Blank)	Single Rod
D	Double Rod End

Bore	Stroke
1.50	0" to 120" Made-To-Order
2.00	
2.50	
3.25	
4.00	
5.00	
6.00	
8.00	
10.00	
12.00	

Cushions	
H	Head Cushion Position 2 Is Standard Specify For Positions: 1, 3 & 4
LH	Long Head Cushion Position 2 Is Standard Specify For Positions: 1, 3 & 4
» ELH	Extra Long Head Cushion Position 2 Is Standard Specify For Positions: 1, 3 & 4
C	Cap Cushion Position 6 Is Standard Specify For Positions: 5, 7 & 8
LC	Long Cap Cushion Position 6 Is Standard Specify For H = Positions: 5, 7 & 8
» ELC	Extra Long Cap Cushion Position 6 Is Standard Specify For Positions: 5, 7 & 8

Fixed Cushions	
FCH	Fixed Head Cushion (Non-Adjustable, No Adjustment Needle)
FCC	Fixed Cap Cushion (Non-Adjustable, No Adjustment Needle)
FC	Fixed Head And Cap Cushion (Non-Adjustable, No Adjustment Needle)

Note: "L" and "EL" cushion options can be ordered as fixed cushions. Example: FCLH, FCELH

Options	
A	Extended Piston Rod Thread (Example: A = 2")
AS	Adjustable Stroke - Retract (Specify Length, Example: AS = 4")
AO	Air / Oil Piston
» B	.250" Urethane Bumper Both Ends
» BC	.250" Urethane Bumper Cap Only
» BH	.250" Urethane Bumper Head Only
BP	Bumper Piston Seals (1.50" - 8" Bore)
BSPP	British Standard Pipe Taper (Specify Size, Example: BSP = .250")
BSPT	British Standard Pipe Parallel (Specify Size, Example: BSP = .250")
C	Extended Piston Rod (Example: if C = 0.50", then 1" Rod Extension Is C = 1.50")
KK2	Large Male Rod Thread
KK3	Female Rod Thread
KK3S	Studded Piston Rod (KK3 With Stud, Loctite In Place)
KK4	Full Diameter Male Rod Thread
KK5	Blank Rod End (No Threads, "A" = 0")
LF	Low Friction Seals
LT	Low Temperature Seals (LT)
LTE	Low Temperature Extreme Seals (LTE)
MA	Micro-Adjust (12" Max Stroke) Available On Double Rod End Models
MAB	Micro-Adjust W/ Sound Dampening Bumper (12" Max Stroke)
MPR	Magnetic Piston for Reed or Solid State Switches (R10, R10P, RAC, RHT & MSS)
MS	Metallic Rod Scraper (Brass Construction)
NR	Non-Rotating
OP	Optional Port Location (Example: Ports @ 3 & 7)
OS	Oversize Rod Diameter (Specify Size, Example: OS = 1.375")
SAE	SAE Ports (Specify Size, Example: SAE #10)
» SE	Spring Extend (1.50, 2.00, 2.50 Bore)
» SR	Spring Return (1.50, 2.00, 2.50 Bore)
SSA	Stainless Steel Piston Rod, Tie Rods, Nuts & Fasteners
SSF	Stainless Steel Fasteners
SSN	Stainless Steel Tie Rod Nuts
SSR	Stainless Steel Piston Rod
SST	Stainless Steel Tie Rods & Nuts
» ST	Stop Tube - Specify Stop Tube Length (in Inches) Specify Stroke as ES (Effective Stroke) (Example: TA MS4 2 X 24 ES-ST=3)
TMS	Steel Cylinder Tube, Black Epoxy Paint Finish
TMSS	Stainless Steel Cylinder Tube (TMSS)
TH	400 PSI Hydraulic Non-Shock
VS	Fluorocarbon Seals
XX	Special Variation (Specify)

*: Refer to Options for specifications

» Refer to Option Length Adder

About our Part Number System

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

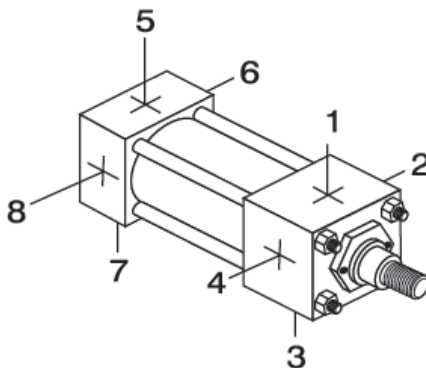
Example: A 2.50" Bore by 10" Stroke NFPA cylinder, Front Flange Mount, Head & Cap Cushions, Magnetic Piston for Switches.

Part Number:

TA-MF1-2.50 x 10-HC-MPR

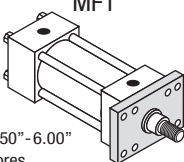
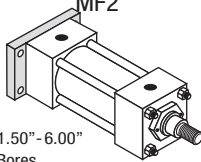
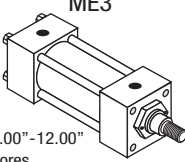
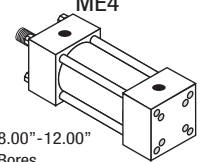
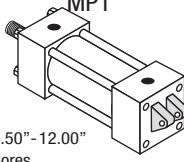
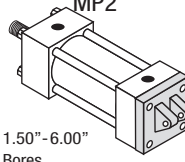
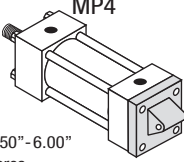
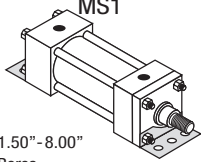
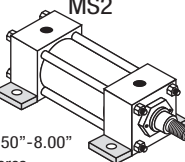
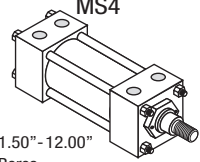
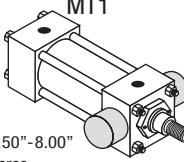
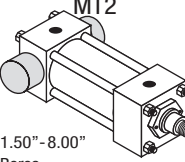
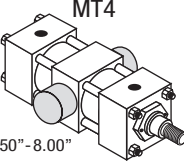
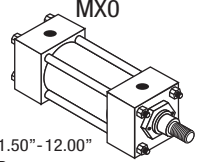
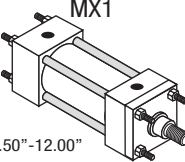
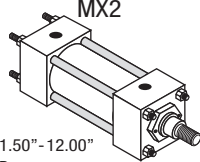
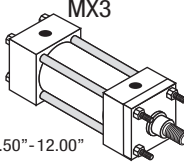
Standard Port and Cushion Adjustment Positions

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



Option Length Adder (Add to Catalog Basic Overall Length Dimensions)								
Bore	Option							
	B	BC	BH	ELC	ELH	SE	SR	ST* (Stop Tube) Example: ST=2
1.50	0.500	0.250	0.250	1.000	1.000	Refer to page 184 for length adders and available bore sizes and strokes		2
2.00	0.500	0.250	0.250	1.000	1.000			2
2.50	0.500	0.250	0.250	1.000	1.000			2
3.25	0.500	0.250	0.250	1.250	1.250			2
4.00	0.500	0.250	0.250	1.250	1.250			2
5.00	0.500	0.250	0.250	1.250	1.250			2
6.00	0.500	0.250	0.250	1.500	1.500			2
8.00	0.500	0.250	0.250	1.500	1.500			2
10.00	0.500	0.250	0.250	2.000	2.000			2
12.00	0.500	0.250	0.250	2.000	2.000			2

NFPA Mounts

 MF1 1.50"-6.00" Bores	 MF2 1.50"-6.00" Bores	 ME3 8.00"-12.00" Bores	 ME4 8.00"-12.00" Bores	 MP1 1.50"-12.00" Bores	 MP2 1.50"-6.00" Bores
 MP4 1.50"-6.00" Bores	 MS1 1.50"-8.00" Bores	 MS2 1.50"-8.00" Bores	 MS4 1.50"-12.00" Bores	 MT1 1.50"-8.00" Bores	 MT2 1.50"-8.00" Bores
 MT4 1.50"-8.00" Bores	 MX0 1.50"-12.00" Bores	 MX1 1.50"-12.00" Bores	 MX2 1.50"-12.00" Bores	 MX3 1.50"-12.00" Bores	

How To Specify

About Rod End Styles

Style 1 Male Rod End is Standard

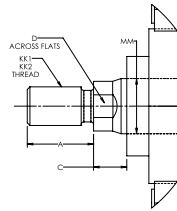
Other NFPA styles can be specified (see chart).

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).

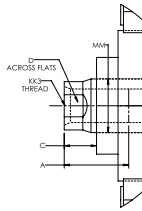
NEED SOMETHING NOT LISTED? Just send us a sketch. In most cases, quotes are turned around in one day!

Piston Rod End Styles

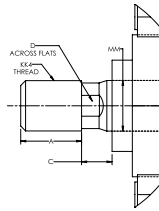
Style 1 & 2
KK1 & KK2



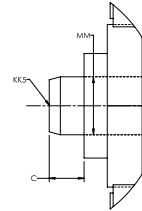
Style 3
KK3



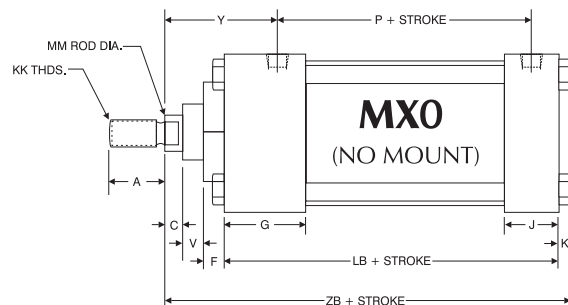
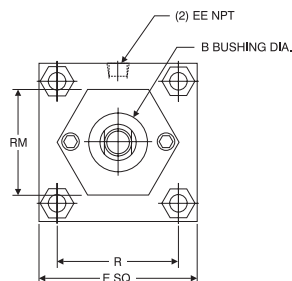
Style 4
KK4



Style 5
KK5

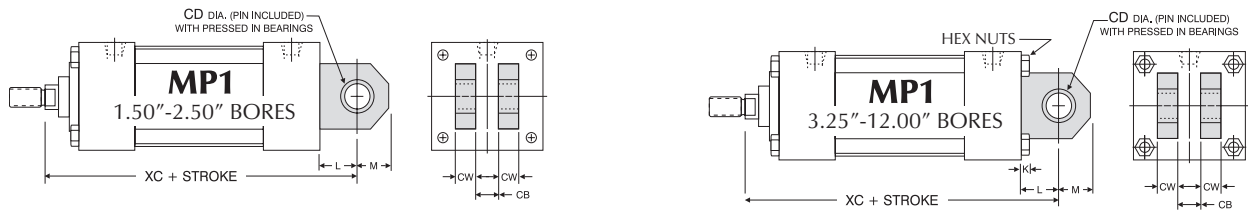


Bore	Rod Diameter (MM)	Standard		Optional							C	D
		Style 1 - Male		Style 2 - Male		Style 3 - Female		Style 4 - Male		Style 5 - Blank		
		KK1	A	KK2	A	KK3	A	KK4	A	KK5		
1.50,	0.625 Standard	7/16 -20	0.750	1/2 -20	0.750	7/16 -20	0.750	5/8 -18	0.750	No Threads	0.375	0.500
2.00, 2.50	1.000 Oversize	3/4 -16	1.125	7/8 -14	1.125	3/4 -16	1.125	1-14	1.125	No Threads	0.500	0.875
3.25,	1.000 Standard	3/4 -16	1.125	7/8 -14	1.125	3/4 -16	1.125	1-14	1.125	No Threads	0.500	0.875
4.00, 5.00	1.375 Oversize	1-14	1.625	1 1/4 -12	1.625	1-14	1.625	1 3/8 -12	1.625	No Threads	0.625	1.125
6.00 & 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	No Threads	0.625	1.125
	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	No Threads	0.750	1.500
10.00	1.750 Standard	1 1/4 -12	2.000	1 1/2 -12	2.000	1 1/4 -12	2.000	1 3/4 -12	2.000	No Threads	0.750	1.500
	2.000 Oversize	1 1/2 -12	2.250	1 3/4 -12	2.250	1 1/2 -12	2.250	2-12	2.250	No Threads	0.875	1.750
12.00	2.000 Standard	1 1/2 -12	2.250	1 3/4 -12	2.250	1 1/2 -12	2.250	2-12	2.250	No Threads	0.875	1.750
	2.500 Oversize	1 7/8 -12	3.000	2 1/4 -12	3.000	1 7/8 -12	3.000	2 1/2 -12	3.000	No Threads	1.000	2.125

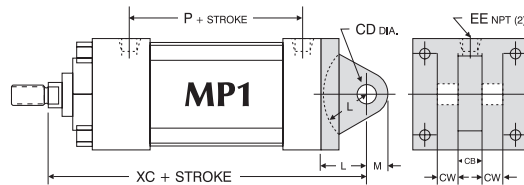


Basic Dimensions 'MX0' Standard & Oversize Rods

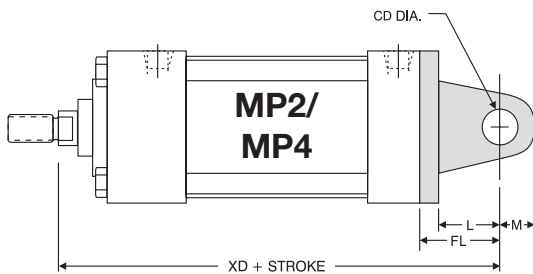
Bore	Rod Diameter (MM)	A	B	C	E	EE	F	G	J	K	KK	LB	P	R	RM	V	Y	ZB
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	1.000	0.250	7/16-20	3.625	2.375	1.438	2.00 SQ.	0.250	1.875	4.875
	1.000 Oversize	1.125	1.500	0.500							3/4-16					0.500	2.250	5.250
2.00	0.625 Standard	0.750	1.125	0.375	2.500	0.375	0.375	1.500	1.000	0.313	7/16-20	3.625	2.375	1.844	1.75 HEX	0.250	1.875	4.938
	1.000 Oversize	1.125	1.500	0.500							3/4-16				2.50 SQ.	0.500	2.250	5.313
2.50	0.625 Standard	0.750	1.125	0.375	3.000	0.375	0.375	1.500	1.000	0.313	7/16-20	3.750	2.500	2.188	1.75 HEX	0.250	1.875	5.063
	1.000 Oversize	1.125	1.500	0.500							3/4-16				3.00 SQ.	0.500	2.250	5.438
3.25	1.000 Standard	1.125	1.500	0.500	3.750	0.500	0.625	1.750	1.250	0.375	3/4-16	4.250	2.750	2.766	2.75 DIA.	0.250	2.375	6.000
	1.375 Oversize	1.625	2.000	0.625							1-14				3.75 SQ.	0.375	2.625	6.250
4.00	1.000 Standard	1.125	1.500	0.500	4.500	0.500	0.625	1.750	1.250	0.375	3/4-16	4.250	2.750	3.320	2.75 DIA.	0.250	2.375	6.000
	1.375 Oversize	1.625	2.000	0.625							1-14				3.50 DIA.	0.375	2.625	6.250
5.00	1.000 Standard	1.125	1.500	0.500	5.500	0.500	0.625	1.750	1.250	0.438	3/4-16	4.500	3.000	4.100	2.75 DIA.	0.250	2.375	6.313
	1.375 Oversize	1.625	2.000	0.625							1-14				3.50 DIA.	0.375	2.625	6.563
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.625	2.000	1.500	0.438	1-14	5.000	3.250	4.875	3.50 DIA.	0.375	2.750	7.063
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12				0.500	3.000	7.313	
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	1.500	0.563	1-14	5.125	3.375	6.438	3.50 DIA.	0.375	2.750	7.313
	1.750 Oversize	2.000	2.375	0.750							1 1/4-12				0.500	3.000	7.563	
10.00	1.750 Standard	2.000	2.375	0.750	10.625	1.000	0.625	2.250	2.000	0.688	1 1/4-12	6.375	4.313	7.922	3.50 DIA.	0.500	3.063	8.938
	2.000 Oversize	2.250	2.625	0.875			0.750				1 1/2-12				5.00 DIA.	0.375	3.188	9.063
12.00	2.000 Standard	2.250	2.625	0.875	12.750	1.000	0.750	2.250	2.000	0.688	1 1/2-12	6.875	4.813	9.400	5.00 DIA.	0.375	3.188	9.563
	2.500 Oversize	3.000	3.125	1.000							1 7/8-12				0.500	3.438	9.813	



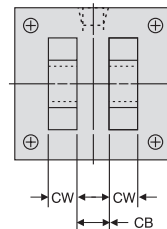
Extruded MP1 Mount
(Extruded: 1.50" - 8.00" Bores, Weldment: 10.00" & 12.00" Bores)



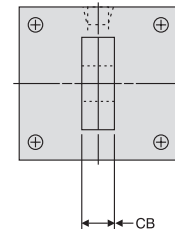
Iron Casting MP1 Mount
(Optional)**



MP2/MP4



MP2 Mount
Iron Casting:
1.50" - 6.00" Bores



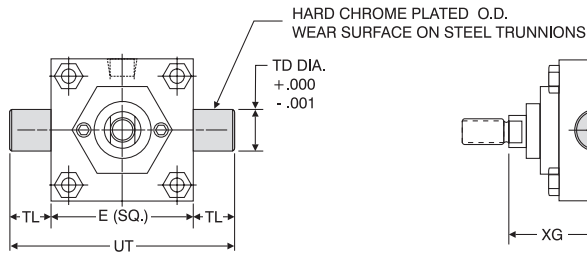
MP4 Mount
Iron Casting: 1.50" - 4.00" Bores
Weldment: 5.00" - 6.00" Bores*

'MP1', 'MP2' Clevis and 'MP4' Eye Mount Dimensions											Accessories				
Bore	Rod Diameter	CB	CD	CW	FL	K	L	M	XC	XD	Rod Clevis	Rod Eye	Clevis Pin	Eye Bracket (for MP1)	Clevis Brkt (for MP4)
1.50	0.625 Standard	0.750	0.500	0.500	1.125	N/A	0.750	0.625	5.375	5.750	RC437	RE437	CP500	EB500	CB500
	1.000 Oversize								5.750	6.125	RC750	RE750	CP750		
2.00	0.625 Standard	0.750	0.500	0.500	1.125	N/A	0.750	0.625	5.375	5.750	RC437	RE437	CP500	EB500	CB500
	1.000 Oversize								5.750	6.125	RC750	RE750	CP750		
2.50	0.625 Standard	0.750	0.500	0.500	1.125	N/A	0.750	0.625	5.500	5.875	RC437	RE437	CP500	EB500	CB500
	1.000 Oversize								5.875	6.250	RC750	RE750	CP750		
3.25	1.000 Standard	1.250	0.750	0.625	1.875	0.375	1.250	0.875	6.875	7.500	RC750	RE750	CP750	EB750	CB750
	1.375 Oversize								7.125	7.750	RC1000	RE1000	CP1000		
4.00	1.000 Standard	1.250	0.750	0.625	1.875	0.375	1.250	0.875	6.875	7.500	RC750	RE750	CP750	EB750	CB750
	1.375 Oversize								7.125	7.750	RC1000	RE1000	CP1000		
5.00*	1.000 Standard	1.250	0.750	0.625	1.875	0.438	1.250	0.875	7.125	7.750	RC750	RE750	CP750	EB750	CB750
	1.375 Oversize								7.375	8.000	RC1000	RE1000	CP1000		
6.00*	1.375 Standard	1.500	1.000	0.750	2.250	0.438	1.500	1.000	8.125	8.875	RC1000	RE1000	CP1000	EB1000	CB1000
	1.750 Oversize								8.375	9.125	RC1250	RE1250	CP1375		
8.00	1.375 Standard	1.500	1.000	0.750	N/A	0.563	1.500	1.000	8.250	N/A	RC1000	RE1000	CP1000	EB1000	CB1000
	1.750 Oversize								8.500	N/A	RC1250	RE1250	CP1375		
10.00	1.750 Standard	2.000	1.375	1.000	N/A	0.688	2.125	1.375	10.375	N/A	RC1250	RE1250	CP1375	EB1375	CB1375
	2.000 Oversize								10.500	N/A	RC1500	RE1500	CP1750		
12.00	2.000 Standard	2.500	1.750	1.250	N/A	0.688	2.250	1.750	11.125	N/A	RC1500	RE1500	CP1750	EB1750	CB1750
	2.500 Oversize								11.375	N/A	RC1875	N/A	CP2000		

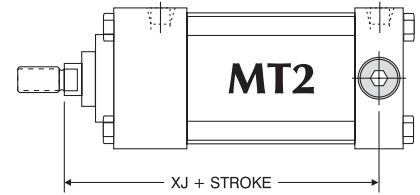
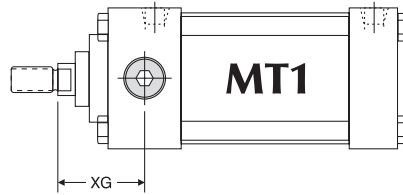
Clevis pins are provided with pivot mounts.
*MP4 5.00"-6.00" bores are 5-7 day delivery.
For dimensions not shown, see page 10.

**Extruded MP1 mounts are standard (1.50"-8.00" bores). Cast Iron removable mounts are optional, and must be requested when ordering (1.50"-6.00" bores). Specify "CAST MP1C" when ordering.

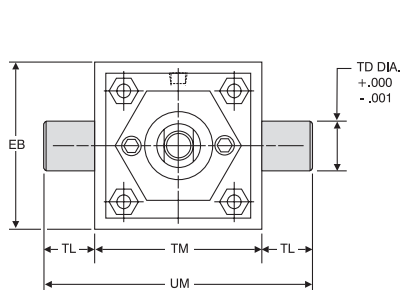
How To Specify



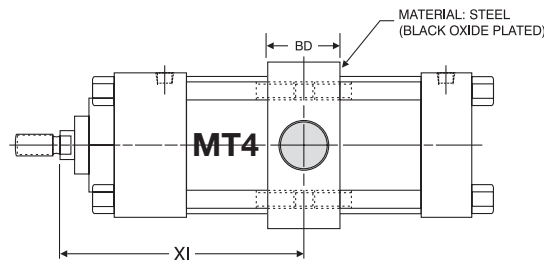
Note: MT1 and MT2 Trunnions are bolt on, non-removable design.
Optional: One-piece solid steel trunnion available; specify MT_S.



'MT1' Head Trunnion And 'MT2' Cap Trunnion Mount Dimensions								Accessories		
Bore	Rod Diameter	E	TD	TL	UT	XG	Add Stroke XJ	Rod Clevis	Rod Eye	Clevis Pin
1.50	0.625 Standard	2.000	1.000	1.000	4.000	1.750	4.125	RC437	RE437	CP500
	1.000 Oversize					N/A*	4.500	RC750	RE750	CP750
2.00	0.625 Standard	2.500	1.000	1.000	4.500	1.750	4.125	RC437	RE437	CP500
	1.000 Oversize					2.125	4.500	RC750	RE750	CP750
2.50	0.625 Standard	3.000	1.000	1.000	5.000	1.750	4.250	RC437	RE437	CP500
	1.000 Oversize					2.125	4.625	RC750	RE750	CP750
3.25	1.000 Standard	3.750	1.000	1.000	5.750	2.250	5.000	RC750	RE750	CP750
	1.375 Oversize					2.500	5.250	RC1000	RE1000	CP1000
4.00	1.000 Standard	4.500	1.000	1.000	6.500	2.250	5.000	RC750	RE750	CP750
	1.375 Oversize					2.500	5.250	RC1000	RE1000	CP1000
5.00	1.000 Standard	5.500	1.000	1.000	7.500	2.250	5.250	RC750	RE750	CP750
	1.375 Oversize					2.500	5.500	RC1000	RE1000	CP1000
6.00	1.375 Standard	6.500	1.375	1.375	9.250	2.625	5.875	RC1000	RE1000	CP1000
	1.750 Oversize					2.875	6.125	RC1250	RE1250	CP1375
8.00	1.375 Standard	8.500	1.375	1.375	11.250	2.625	6.000	RC1000	RE1000	CP1000
	1.750 Oversize					2.875	6.250	RC1250	RE1250	CP1375



MT4



(Customer to Specify)

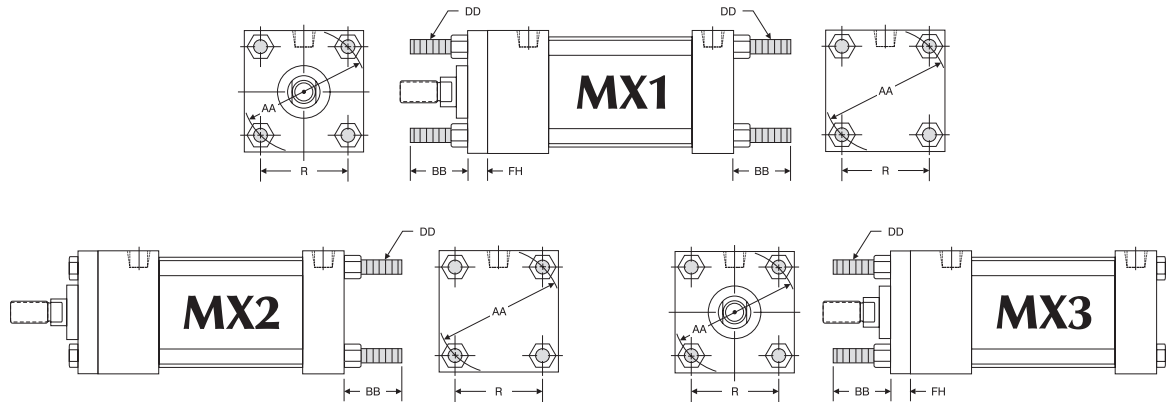
Example: TA - MT4 4 X 12
XI = 6"

Note: MT4 Trunnions and Intermediate Section are one-piece steel construction.

'MT4' Intermediate Trunnion Mount Dimensions							
Bore	BD	EB	TD	TL	TM	UM	XI
1.50	1.250	2.500	1.000	1.000	2.500	4.500	Customer To Specify
2.00	1.500	3.000	1.000	1.000	3.000	5.000	
2.50	1.500	3.500	1.000	1.000	3.500	5.500	
3.25	2.000	4.250	1.000	1.000	4.500	6.500	
4.00	2.000	5.000	1.000	1.000	5.250	7.250	
5.00	2.000	6.000	1.000	1.000	6.250	8.250	
6.00	2.000	7.000	1.375	1.375	7.625	10.375	
8.00	2.500	9.500	1.375	1.375	9.750	12.500	

'MT1', 'MT2', 'MT4' Standard Cushion Locations		
Mount	Head Cushion	Cap Cushion
MT1	3	6
MT2	2	7
MT4	2	6

Note: Ports or cushions cannot be on same side as MT1 & MT2 Trunnions.



Tie Rod Extended 'MX1', 'MX2' & 'MX3' Mount Dimensions

Bore	Rod Diameter	AA	BB	DD	FH	R
1.50	0.625 Standard 1.000 Oversize	2.020	1.000	1/4-28	0.375	1.430
2.00	0.625 Standard 1.000 Oversize	2.600	1.125	5/16-24	0.375	1.840
2.50	0.625 Standard 1.000 Oversize	3.100	1.125	5/16-24	0.375	2.190
3.25	1.000 Standard 1.375 Oversize	3.900	1.375	3/8-24	0.625	2.760
4.00	1.000 Standard 1.375 Oversize	4.700	1.375	3/8-24	0.625	3.320

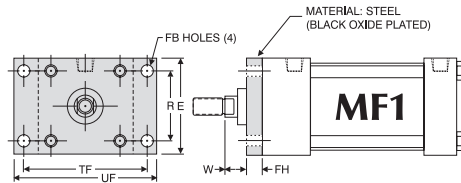
Tie Rod Extended 'MX1', 'MX2' & 'MX3' Mount Dimensions

Bore	Rod Diameter	AA	BB	DD	FH	R
5.00	1.000 Standard 1.375 Oversize	5.800	1.813	1/2-20	0.625	4.100
6.00	1.375 Standard 1.750 Oversize	6.900	1.813	1/2-20	0.750	4.880
8.00	1.375 Standard 1.750 Oversize	9.100	2.313**	5/8-18	0.625*	6.440
10.00	1.750 Oversize 2.000 Oversize	11.200	2.688**	3/4-16	0.625* 0.750*	7.920
12.00	2.000 Standard 2.500 Oversize	13.300	2.688**	3/4-16	0.750*	9.400

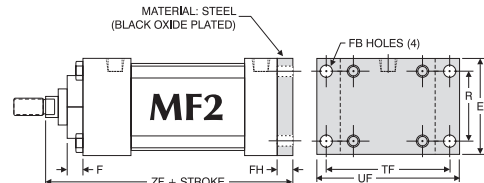
*MX1 & MX3 have full square bushing retainer on 1.50" - 6.00" bores, round retainers on 8.00" - 12.00" bores.

**BB dimension from face of head.

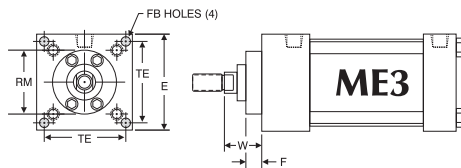
For dimensions not shown, see page 16.



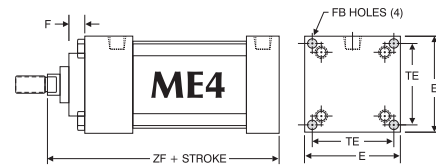
1.50" - 6.00" bores



1.50" - 6.00" bores



8.00" - 12.00" bores



8.00" - 12.00" bores

'MF1', 'MF2' Flange & 'ME3', 'ME4' Cap Mount Dimensions

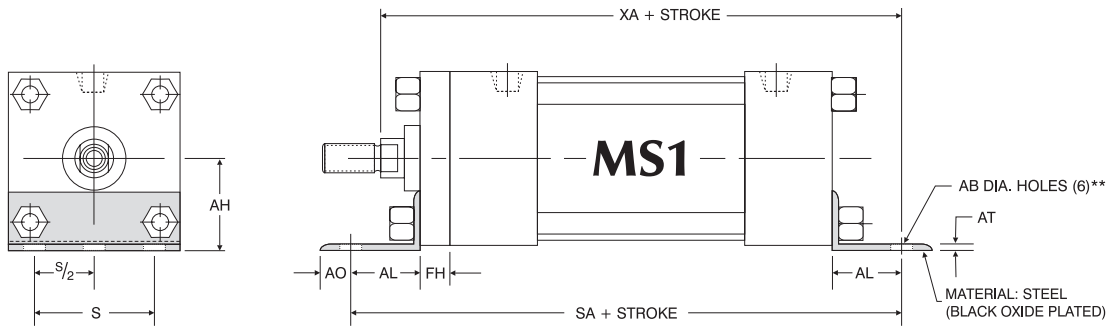
Bore	Rod Diameter	E	F	FB	FH	R	RM	TE	TF	UF	W	ZF
1.50	0.625 Standard 1.000 Oversize	2.000	0.375	0.313	0.375	1.438	N/A	N/A	2.750	3.375	0.625	5.000
2.00	0.625 Standard 1.000 Oversize	2.500	0.375	0.375	0.375	1.848	N/A	N/A	3.375	4.125	0.625	5.000
2.50	0.625 Standard 1.000 Oversize	3.000	0.375	0.375	0.375	2.188	N/A	N/A	3.875	4.625	0.625	5.125
3.25	1.000 Standard 1.375 Oversize	3.750	0.625	0.438	0.625	2.766	N/A	N/A	4.688	5.500	0.750	6.250
4.00	1.000 Standard 1.375 Oversize	4.500	0.625	0.438	0.625	3.328	N/A	N/A	5.438	6.250	0.750	6.500

'MF1', 'MF2' Flange & 'ME3', 'ME4' Cap Mount Dimensions

Bore	Rod Diameter	E	F	FB	FH	R	RM	TE	TF	UF	W	ZF
5.00	1.000 Standard 1.375 Oversize	5.500	0.625	0.563	0.625	4.100	N/A	N/A	6.625	7.625	0.750	6.500
6.00	1.375 Standard 1.750 Oversize	6.500	0.625	0.563	0.750	4.875	N/A	N/A	7.625	8.625	0.875	7.375
8.00	1.375 Standard 1.750 Oversize	8.500	0.625	0.688	N/A	N/A	3.500	7.570	N/A	N/A	1.125	7.625
10.00	1.750 Standard 2.000 Oversize	10.625	0.625 0.750	0.813	N/A	N/A	3.500 5.000	9.400	N/A	N/A	1.625	6.750
12.00	2.000 Standard 2.500 Oversize	12.750	0.750	0.813	N/A	N/A	5.000	11.100	N/A	N/A	1.875	7.000
											2.000	8.375
											2.250	9.125

For dimensions not shown, see page 16.

How To Specify

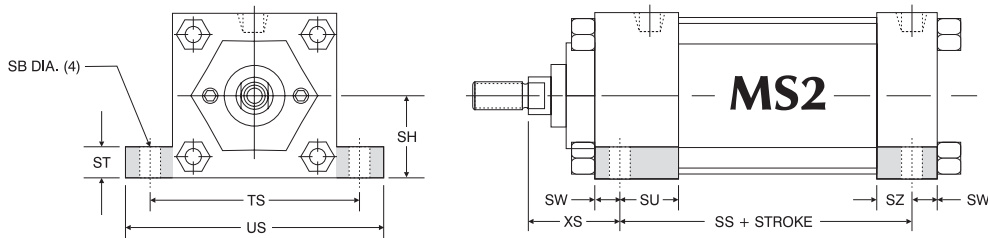


'MS1' Angle Mount Dimensions

Bore	Rod Diameter	AB	AH	AL	AO	AT	FH	S	Add Stroke	
									SA	XA
1.50	0.625 Standard	0.438	1.188	1.000	0.375	0.188	0.375	1.250	6.000	5.625
	1.000 Oversize									6.000
2.00	0.625 Standard	0.438	1.438	1.000	0.375	0.188	0.375	1.750	6.000	5.625
	1.000 Oversize									6.000
2.50	0.625 Standard	0.438	1.625	1.000	0.375	0.188	0.375	2.250	6.125	5.750
	1.000 Oversize									6.125
3.25	1.000 Standard	0.563	1.938	1.250	0.500	0.125	0.625	2.750	7.375	6.875
	1.375 Oversize									7.125
4.00	1.000 Standard	0.563	2.250	1.250	0.500	0.125	0.625	3.500	7.375	6.875
	1.375 Oversize									7.125
5.00	1.000 Standard	0.688	2.750	1.375	0.625	0.188	0.625	4.250	7.875	7.250
	1.375 Oversize									7.500
6.00	1.375 Standard	0.813	3.250	1.375	0.625	0.188	0.750	5.250	8.500	8.000
	1.750 Oversize									8.250
8.00	1.375 Standard	0.813	4.250	1.813	0.688	0.250	0.625*	7.125	8.750	8.563
	1.750 Oversize									8.813

*3.50" diameter round retainer on 8.00" bore (MS1 bracket bolted directly to head).

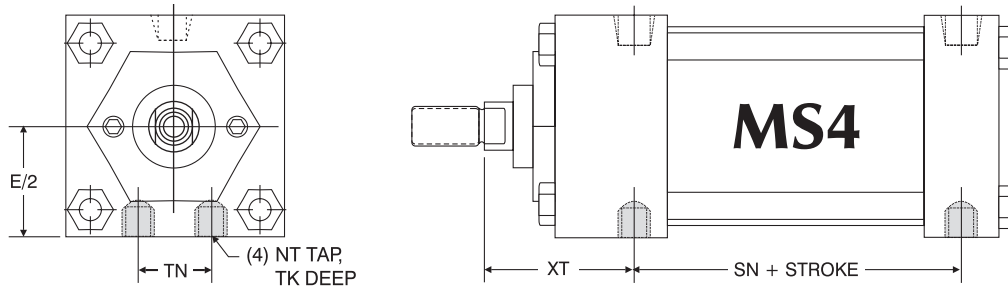
**1.50" bore has four (4) AB diameter holes.



'MS2' Side Lug Mount Dimensions

Bore	Rod Diameter	SB	SH	ST	SU	SW	SZ	TS	US	XS	Add Stroke
											SS
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										
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										
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										
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										
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										
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										
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										
8.00	1.375 Standard	0.813	4.250	1.000	1.313	0.688	0.813	9.875	11.250	2.313	3.750
	1.750 Oversize										

For dimensions not shown, see page 16.



'MS4' Bottom Tapped Mount Dimensions

Bore	Rod Diameter	E/2	NT	TK	TN	XT	Add Stroke
							SN
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	
10.00	1.750 Standard	5.313	1-8	1.500	5.500	3.125	4.125
	2.000 Oversize					3.250	
12.00	2.000 Standard	6.375	1-8	1.500	7.250	3.250	4.625
	2.500 Oversize					3.500	

Combination Mounts

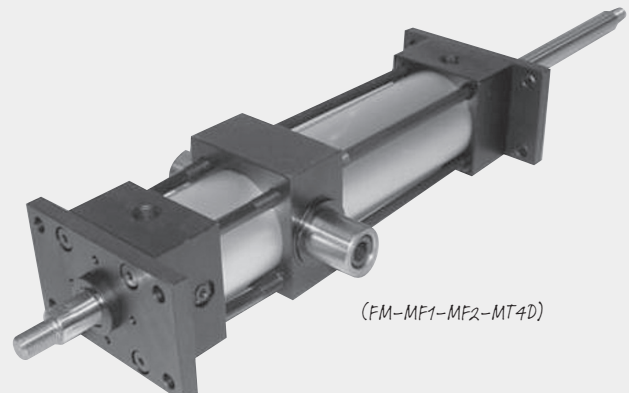
Cylinders can be ordered with a combination of mounts for added design flexibility.

How To Order

Combination mount part numbers can be constructed by adding a dash (-) in between the desired mounts in the part number.

Example: 5.00" Bore 'TA' Series cylinder with 12.00" Stroke, Head and Cap Cushions, Magnetic Piston for Reed Switches and having a MS4 and MF1 Mount.

Part Number: TA-MS4-MF1-5 x 12-HC-MPR

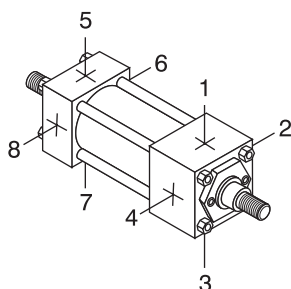
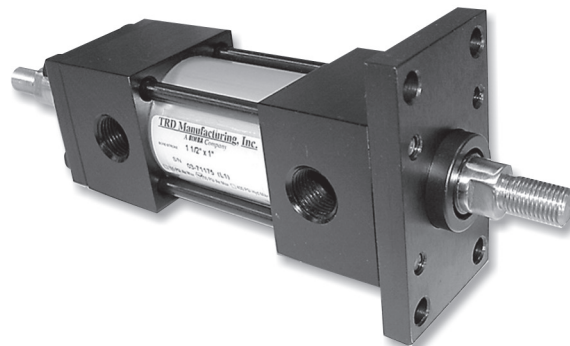


Product Features

TA Series - Double Rod End

Benefits

- > Standard and Oversize 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 or option "MA" (refer to Options).



Standard Port and Cushion Adjustment Positions

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

About Rod End Styles

Style 1 Male Rod End is Standard

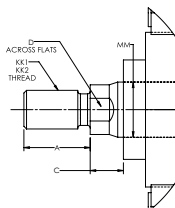
Other NFPA styles can be specified (see chart).

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).

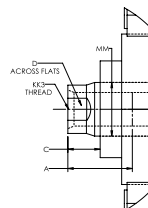
NEED SOMETHING NOT LISTED? Just send us a sketch. In most cases, quotes are turned around in one day!

Piston Rod End Styles

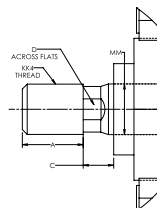
Style 1 & 2
KK1 & KK2



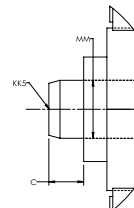
Style 3
KK3



Style 4
KK4

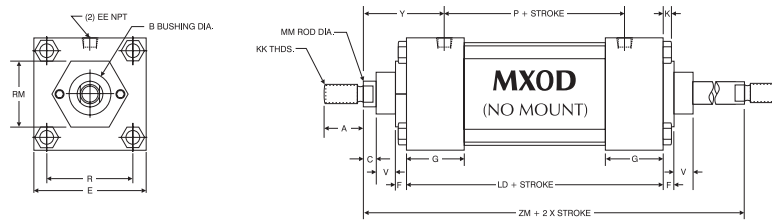


Style 5
KK5



Bore	Rod Diameter (MM)	Standard		Optional							C	D
		Style 1 - Male		Style 2 - Male		Style 3 - Female		Style 4 - Male		Style 5 - Blank		
		KK1	A	KK2	A	KK3	A	KK4	A	KK5		
1.50,	0.625 Standard	7/16-20	0.750	1/2-20	0.750	7/16-20	0.750	5/8-18	0.750	No Threads	0.375	0.500
2.00, 2.50	1.000 Oversize	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	No Threads	0.500	0.875
3.25,	1.000 Standard	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	No Threads	0.500	0.875
4.00, 5.00	1.375 Oversize	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	No Threads	0.625	1.125
6.00 & 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	No Threads	0.625	1.125
	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	No Threads	0.750	1.500
10.00	1.750 Standard	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	No Threads	0.750	1.500
	2.000 Oversize	1 1/2-12	2.250	1 3/4-12	2.250	1 1/2-12	2.250	2-12	2.250	No Threads	0.875	1.750
12.00	2.000 Standard	1 1/2-12	2.250	1 3/4-12	2.250	1 1/2-12	2.250	2-12	2.250	No Threads	0.875	1.750
	2.500 Oversize	1 7/8-12	3.000	2 1/4-12	3.000	1 7/8-12	3.000	2 1/2-12	3.000	No Threads	1.000	2.125

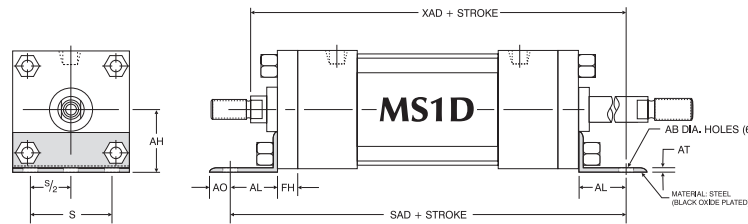
Double Rod End 'MX0D' (No Mount)



Double Rod End Basic Dimensions 'MX0D' Standard & Oversize Rods

Bore	Rod Diameter	A	B	C	E	EE	F	G	K	KK	LD	MM	P	R	RM	V	Y	ZM
1.50	0.625 Standard	0.750	1.125	0.375	2.000	0.375	0.375	1.500	0.250	7/16-20	4.125	0.625	2.375	1.430	2.00 SQ.	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	0.313	7/16-20	4.125	0.625	2.375	1.844	1.75 HEX	0.250	1.875	6.125
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000			2.50 SQ.	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	0.313	7/16-20	4.250	0.625	2.500	2.188	1.75 HEX	0.250	1.875	6.250
	1.000 Oversize	1.125	1.500	0.500						3/4-16		1.000			3.00 SQ.	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	0.375	3/4-16	4.750	1.000	2.750	2.760	2.75 DIA.	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			3.75 SQ.	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	0.375	3/4-16	4.750	1.000	2.750	3.320	2.75 DIA.	0.250	2.375	7.500
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			3.50 DIA.	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	0.438	3/4-16	5.000	1.000	3.000	4.100	2.75 DIA.	0.250	2.375	7.750
	1.375 Oversize	1.625	2.000	0.625						1-14		1.375			3.50 DIA.	0.375	2.625	8.250
6.00	1.375 Standard	1.625	2.000	0.625	6.500	0.750	0.625	2.000	0.438	1-14	5.500	1.375	3.250	4.875	3.50 DIA.	0.375	2.750	8.750
	1.750 Oversize	2.000	2.375	0.750						1 1/4-12		1.750				0.500	3.000	9.250
8.00	1.375 Standard	1.625	2.000	0.625	8.500	0.750	0.625	2.000	0.563	1-14	5.625	1.375	3.375	6.438	3.50 DIA.	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
10.00	1.750 Standard	2.000	2.375	0.750	10.625	1.000	0.625	2.250	0.688	1 1/4-12	6.625	1.750	4.313	7.922	3.50 DIA.	0.500	3.060	10.375
	2.000 Oversize	2.250	2.625	0.875			0.750			1 1/2-12		2.000			5.00 DIA.	0.375	3.188	10.625
12.00	2.000 Standard	2.250	2.625	0.875	12.750	1.000	0.750	2.250	0.688	1 1/2-12	7.125	2.000	4.813	9.400	5.00 DIA.	0.375	3.188	11.125
	2.500 Oversize	3.000	3.125	1.000						1 7/8-12		2.500				0.500	3.438	11.625

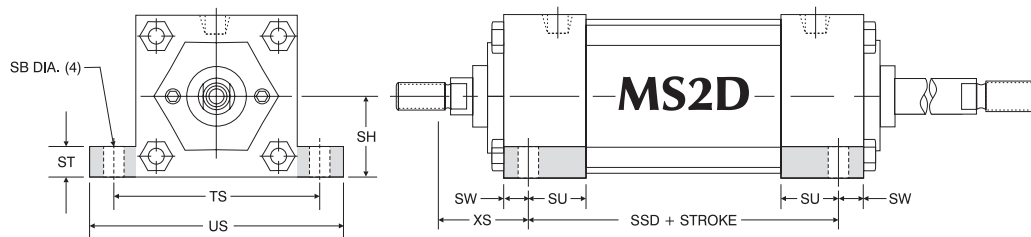
Double Rod End Base Mounts



'MS1D' Angle Mount Dimensions

Bore	Rod Diameter	AB	AH	AL	AO	AT	FH	S	Add Stroke	
									SAD	XAD
1.50	0.625 Standard	0.438	1.188	1.000	0.375	0.188	0.375	1.250	6.875	6.500
	1.000 Oversize									6.875
2.00	0.625 Standard	0.438	1.438	1.000	0.375	0.188	0.375	1.750	6.875	6.500
	1.000 Oversize									6.875
2.50	0.625 Standard	0.438	1.625	1.000	0.375	0.188	0.375	2.250	7.000	6.625
	1.000 Oversize									7.000
3.25	1.000 Standard	0.563	1.938	1.250	0.500	0.125	0.625	2.750	8.500	8.000
	1.375 Oversize									8.250
4.00	1.000 Standard	0.563	2.250	1.250	0.500	0.125	0.625	3.500	8.500	8.000
	1.375 Oversize									8.250
5.00	1.000 Standard	0.688	2.750	1.375	0.625	0.188	0.625	4.250	9.000	8.375
	1.375 Oversize									8.625
6.00	1.375 Standard	0.813	3.250	1.375	0.625	0.188	0.750	5.250	9.750	9.250
	1.750 Oversize									9.500
8.00	1.375 Standard	0.813	4.250	1.813	0.688	0.250	0.625*	7.125	9.250	9.063
	1.750 Oversize									9.313

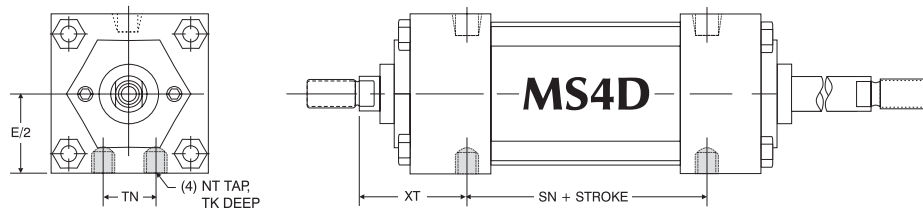
How To Specify



Double Rod End 'MS2D' Side Lug Mount Dimensions

Bore	Rod Diameter	SB	SH	ST	SU	SW	TS	US	XS	Add Stroke
										SSD
1.50	0.625 Standard	0.438	1.000	0.500	1.125	0.375	2.750	3.500	1.375	3.375
	1.000 Oversize									
2.00	0.625 Standard	0.438	1.250	0.500	1.125	0.375	3.250	4.000	1.375	3.375
	1.000 Oversize									
2.50	0.625 Standard	0.438	1.500	0.500	1.125	0.375	3.750	4.500	1.375	3.500
	1.000 Oversize									
3.25	1.000 Standard	0.563	1.875	0.750	1.250	0.500	4.750	5.750	1.875	3.750
	1.375 Oversize									
4.00	1.000 Standard	0.563	2.250	0.750	1.250	0.500	5.500	6.500	1.875	3.750
	1.375 Oversize									
5.00	1.000 Standard	0.813	2.750	1.000	1.063	0.688	6.875	8.250	2.063	3.625
	1.375 Oversize									
6.00	1.375 Standard	0.813	3.250	1.000	1.313	0.688	7.875	9.250	2.313	4.125
	1.750 Oversize									
8.00	1.375 Standard	0.813	4.250	1.000	1.563	0.688	9.875	11.250	2.313	4.250
	1.750 Oversize									

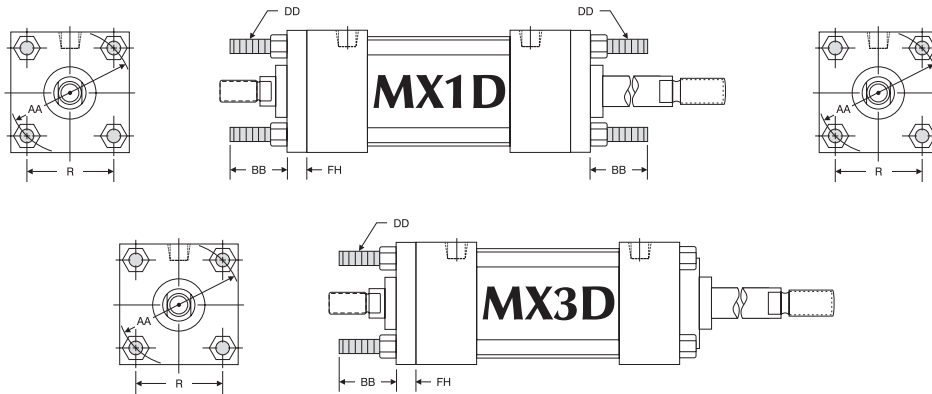
For dimensions not shown, see page 23.



Double Rod End 'MS4D' Bottom Tapped Mount Dimensions

Bore	Rod Diameter	E/2	NT	TK	TN	XT	Add Stroke
							SN
1.50	0.625 Standard	1.000	1/4-20	0.375	0.625	1.938	2.250
	1.000 Oversize						
2.00	0.625 Standard	1.250	5/16-18	0.500	0.875	1.938	2.250
	1.000 Oversize						
2.50	0.625 Standard	1.500	3/8-16	0.625	1.250	1.938	2.375
	1.000 Oversize						
3.25	1.000 Standard	1.875	1/2-13	0.750	1.500	2.438	2.625
	1.375 Oversize						
4.00	1.000 Standard	2.250	1/2-13	0.750	2.063	2.438	2.625
	1.375 Oversize						
5.00	1.000 Standard	2.750	5/8-11	1.000	2.688	2.438	2.875
	1.375 Oversize						
6.00	1.375 Standard	3.250	3/4-10	1.125	3.250	2.813	3.125
	1.750 Oversize						
8.00	1.375 Standard	4.250	3/4-10	1.125	4.500	2.813	3.250
	1.750 Oversize						
10.00	1.750 Standard	5.313	1-8	1.500	5.500	3.125	4.125
	2.000 Oversize						
12.00	2.000 Standard	6.375	1-8	1.500	7.250	3.250	4.625
	2.500 Oversize						

For dimensions not shown, see page 23.

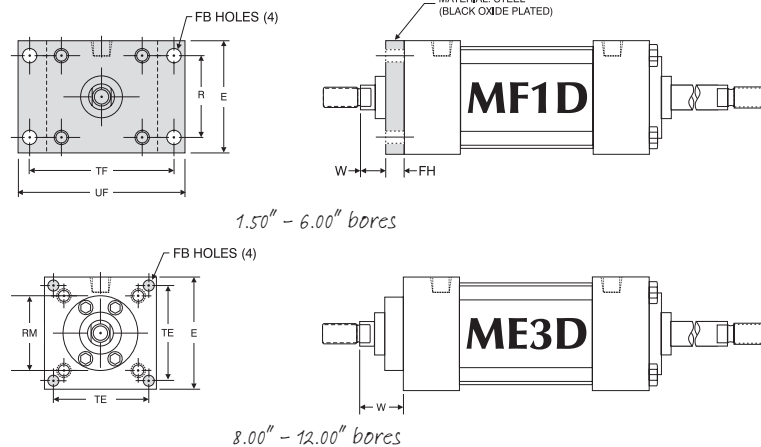


Tie Rod Extended 'MX1D' & 'MX3D' Mount Dimensions						
Bore	Rod Diameter	AA	BB	DD	FH	R
1.50	0.625 Standard 1.000 Oversize	2.020	1.000	1/4-28	0.375	1.438
2.00	0.625 Standard 1.000 Oversize	2.600	1.125	5/16-24	0.375	1.844
2.50	0.625 Standard 1.000 Oversize	3.100	1.125	5/16-24	0.375	2.188
3.25	1.000 Standard 1.375 Oversize	3.900	1.375	3/8-24	0.625	2.760
4.00	1.000 Standard 1.375 Oversize	4.700	1.375	3/8-24	0.625	3.320

*Full square bushing retainer on 1.50" - 6.00" bores, round retainers on 8.00" - 12.00" bores.

***BB" dimension from head on 8.00", 10.00" & 12.00" bores.

Tie Rod Extended 'MX1D' & 'MX3D' Mount Dimensions						
Bore	Rod Diameter	AA	BB	DD	FH	R
5.00	1.000 Standard 1.375 Oversize	5.800	1.813	1/2-20	0.625	4.100
6.00	1.375 Standard 1.750 Oversize	6.900	1.813	1/2-20	0.750	4.880
8.00	1.375 Standard 1.750 Oversize	9.100	2.313**	5/8-18	0.625*	6.440
10.00	1.750 Oversize 2.000 Oversize	11.200	2.688**	3/4-16	0.625* 0.750*	7.920
12.00	2.000 Standard 2.500 Oversize	13.300	2.688**	3/4-16	0.750*	9.400

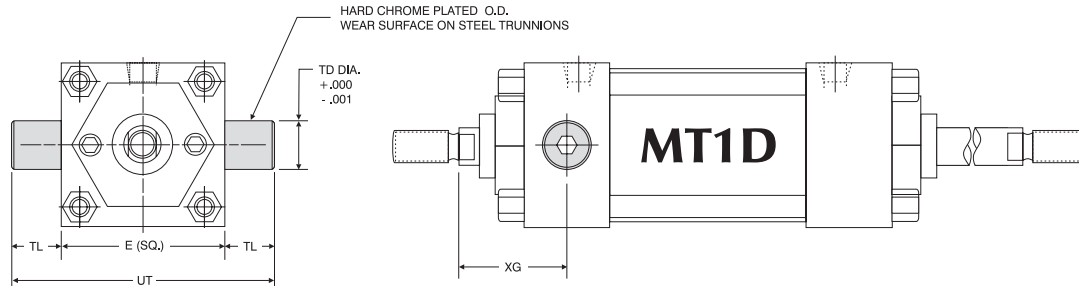


'MF1D' Flange & 'ME3D' Cap Mount Dimensions									
Bore	Rod Diameter	E	FB	FH	R	RM	TE	TF	UF
1.50	0.625 Standard 1.000 Oversize	2.000	0.313	0.375	1.438	N/A	N/A	2.750	3.375
2.00	0.625 Standard 1.000 Oversize	2.500	0.375	0.375	1.844	N/A	N/A	3.375	4.125
2.50	0.625 Standard 1.000 Oversize	3.000	0.375	0.375	2.188	N/A	N/A	3.875	4.625
3.25	1.000 Standard 1.375 Oversize	3.750	0.438	0.625	2.760	N/A	N/A	4.688	5.500
4.00	1.000 Standard 1.375 Oversize	4.500	0.438	0.625	3.320	N/A	N/A	5.438	6.250

'MF1D' Flange & 'ME3D' Cap Mount Dimensions									
Bore	Rod Diameter	E	FB	FH	R	RM	TE	TF	UF
5.00	1.000 Standard 1.375 Oversize	5.500	0.563	0.625	4.100	N/A	N/A	6.625	7.625
6.00	1.375 Standard 1.750 Oversize	6.500	0.563	0.750	4.875	N/A	N/A	7.625	8.625
8.00	1.375 Standard 1.750 Oversize	8.500	0.688	N/A	N/A	3.500	7.570	N/A	N/A
10.00	1.750 Standard 2.000 Oversize	10.625	0.813	N/A	N/A	3.500 5.000	9.400	N/A	N/A
12.00	2.000 Standard 2.500 Oversize	12.750	0.813	N/A	N/A	5	11.100	N/A	N/A

For dimensions not shown, see page 17.

How To Specify

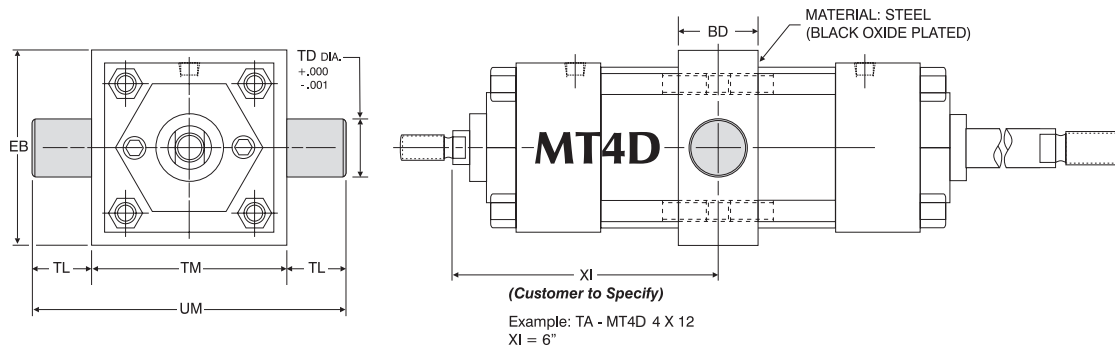


Note: MT1D Trunnions are bolt on, non-removable design.

Double Rod End 'MT1D' Head Trunnion Mount Dimensions

Bore	Rod Diameter	E	TD	TL	UT	XG
1.50	0.625 Standard N/A*	2.000	1.000	1.000	4.000	1.750 N/A
2.00	0.625 Standard 1.000 Oversize	2.500	1.000	1.000	4.500	1.750 2.125
2.50	0.625 Standard 1.000 Oversize	3.000	1.000	1.000	5.000	1.750 2.125
3.25	1.000 Standard 1.375 Oversize	3.750	1.000	1.000	5.750	2.250 2.500
4.00	1.000 Standard 1.375 Oversize	4.500	1.000	1.000	6.500	2.250 2.500
5.00	1.000 Standard 1.375 Oversize	5.500	1.000	1.000	7.500	2.250 2.500
6.00	1.375 Standard 1.750 Oversize	6.500	1.375	1.375	9.250	2.625 2.875
8.00	1.375 Standard 1.750 Oversize	8.500	1.375	1.375	11.250	2.625 2.875

*No oversize rod available on 1.50" bore MT1D.
For dimensions not shown, see page 23.



Note: MT4D Trunnions and Intermediate Section are one-piece steel construction.

Double Rod End 'MT4D' Intermediate Trunnion Mount Dimensions

Bore	BD	EB	TD	TL	TM	UM	XI
1.50	1.250	2.500	1.000	1.000	2.500	4.500	
2.00	1.500	3.000	1.000	1.000	3.000	5.000	
2.50	1.500	3.500	1.000	1.000	3.500	5.500	
3.25	2.000	4.250	1.000	1.000	4.500	6.500	
4.00	2.000	5.000	1.000	1.000	5.250	7.250	
5.00	2.000	6.000	1.000	1.000	6.250	8.250	
6.00	2.000	7.000	1.375	1.375	7.625	10.375	
8.00	2.500	9.500	1.375	1.375	9.750	12.500	

Customer to Specify

**'MT1D', 'MT4D'
Standard Cushion Locations**

Mount	Head Cushion	Cap Cushion
MT1D	3	6
MT4D	2	6

Note: Ports or cushions cannot be on same side as MT1D Trunnions.