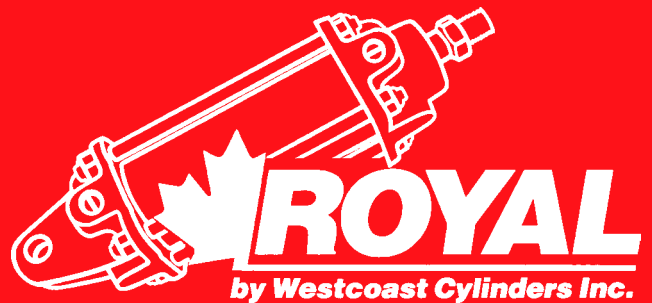
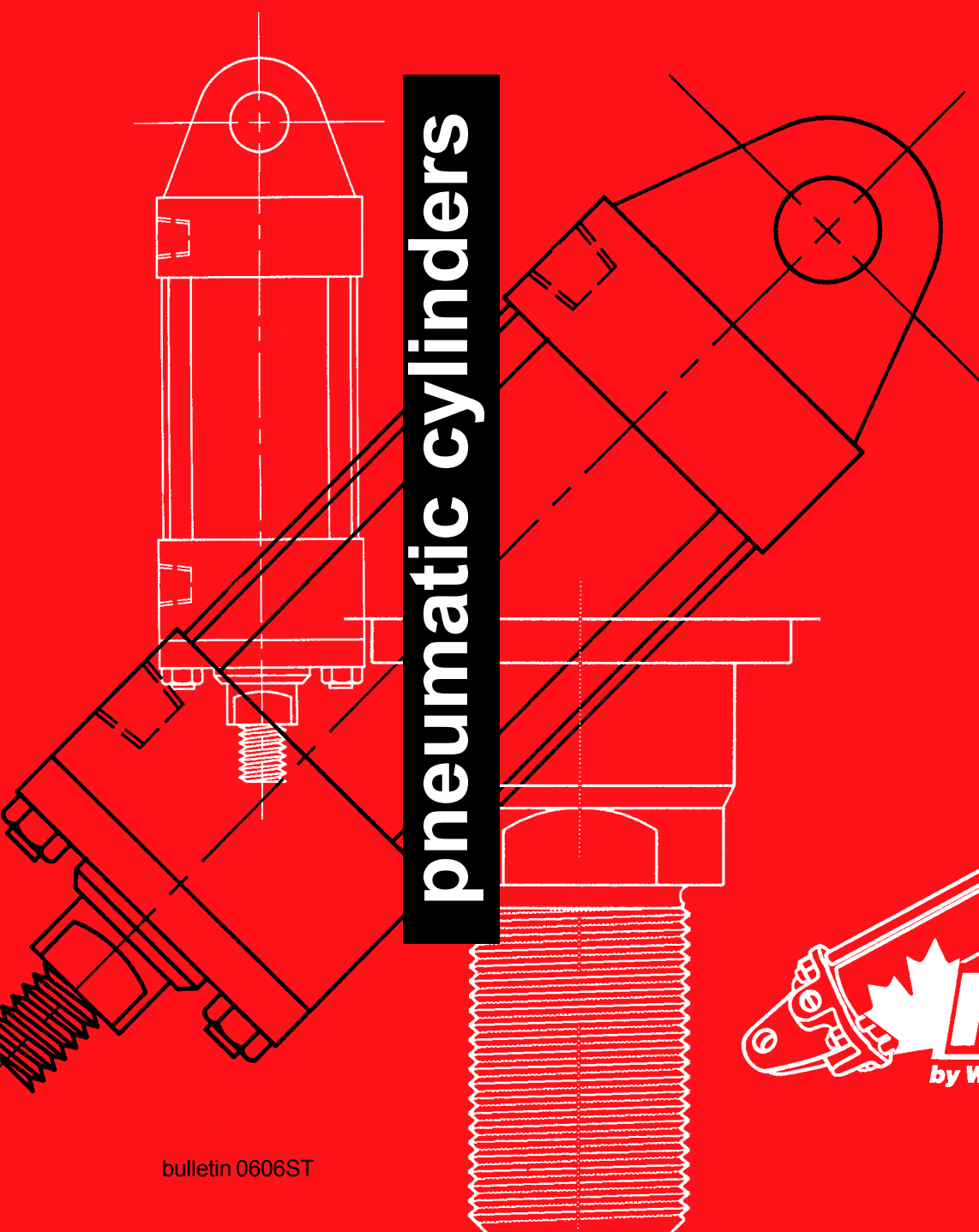


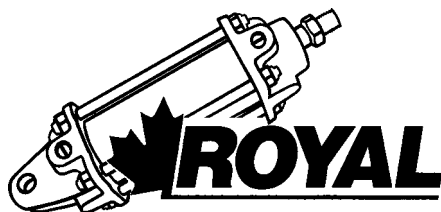
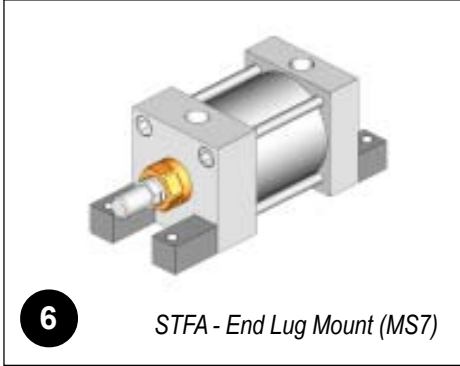
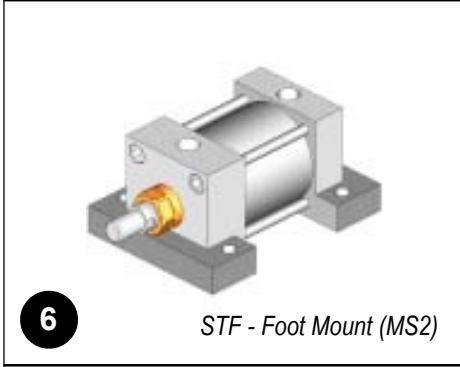
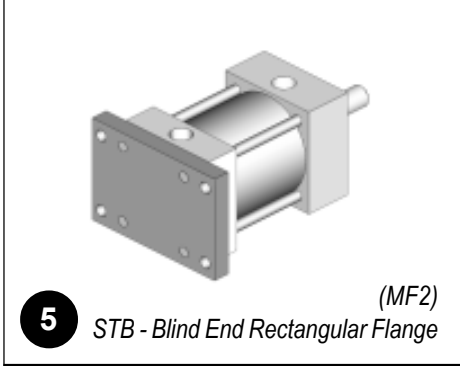
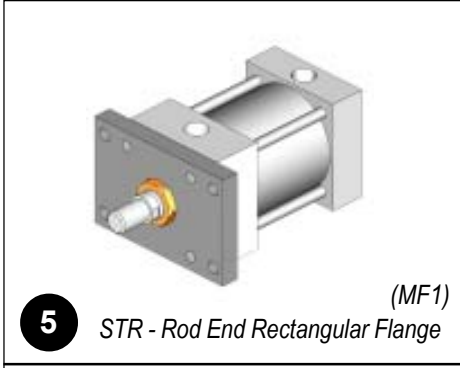
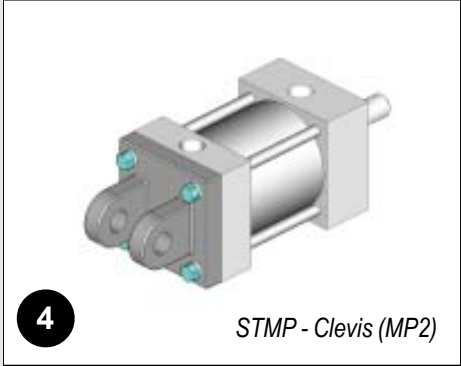
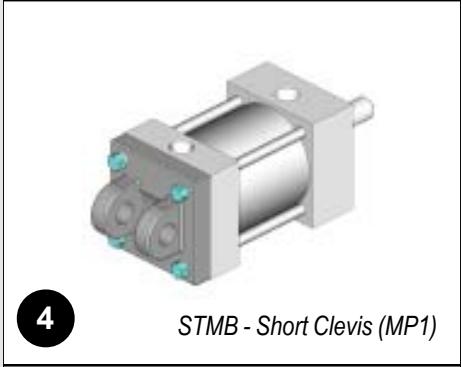
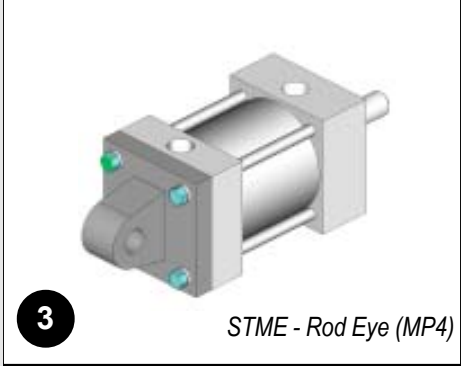
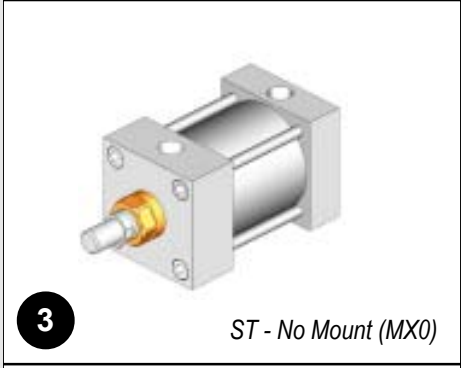
250  
psi rating

# series **ST**

**pneumatic cylinders**



<b>Page</b>	<b>Description</b>
1	Mounting Styles
2	Features Description
<b>Mounting dimensions</b>	
3	<b>ST</b> No Mount (MX0)
3	<b>STME</b> Rod Eye (MP4)
4	<b>STMB</b> Short Clevis (MP1)
4	<b>STMP</b> Clevis (MP2)
5	<b>STR</b> Rod End Rectangular Flange (MF1)
5	<b>STB</b> Blind End Rectangular Flange (MF2)
6	<b>STF</b> Foot Mount (MS2)
6	<b>STFA</b> End Lug Mount (MS7)
7	<b>STA</b> End Angles (MS1)
7	<b>STS</b> Side-Tapped (MS4)
8	<b>STNC</b> Extended Tie-rods Gland End (MX3)
8	<b>STNB</b> Extended Tie-rods Blind End (MX2)
9	<b>STNA</b> Extended Tie-rods Both Ends (MX1)
9	<b>STD</b> Double Rod Mount (MD)
10	<b>STTR</b> Rod End Trunnion (MT1)
10	<b>STTB</b> Blind End Trunnion (MT2)
11	<b>STG</b> Square Head Gland End (ME3)
11	<b>STH</b> Square Head Blind End (ME4)
12-15	Rod End Styles, Accessories
16	Technical Data
17	Technical Data, Warranty
Cover	Cylinder Nomenclature

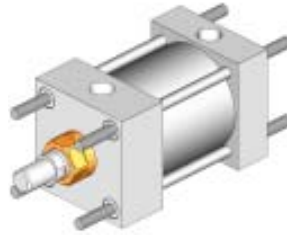


**Westcoast Cylinders Inc.**

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 New Westminster BC  
 Canada V3L 5G4  
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 Phone Toll Free: 1 877 637 6925  
 Fax Toll Free: 1 866 527 1170  
 email: sales@royalcylinders.com  
 website: www.royalcylinders.com



7 STA - End Angles (MS1)



9 STNA - Extended Tie-rods Both Ends (MX1)



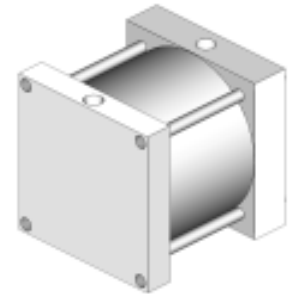
11 STG - Square Head Gland End (ME3)



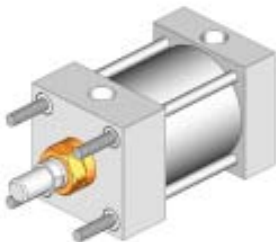
7 STS - Side-Tapped (MS4)



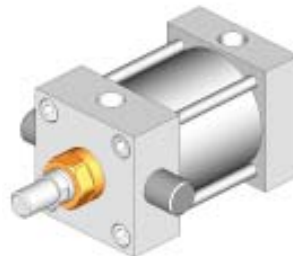
9 STD - Double Rod Mount (MD)



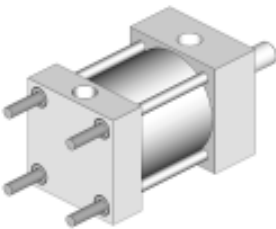
11 STH - Square Head Blind End (ME4)



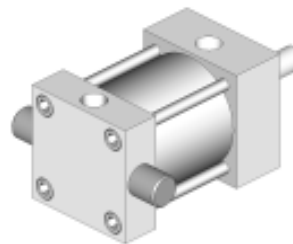
8 STNC - Extended Tie-rods Gland End (MX3)



10 STTR - Rod End Trunnion (MT1)



8 STNB - Extended Tie-rods Blind End (MX2)



10 STTB - Blind End Trunnion (MT2)

bulletin 1005ST

**Westcoast Cylinders Inc.:**

The company has been manufacturing high quality, reliable ROYAL cylinders for over 40 years. Production started with a single cylinder design and expanded to a full range of multi-use, hydraulic, pneumatic cylinders and accessories.

**Quality:**

WCI is a leader in the design and manufacture of custom heavy duty cylinders. The materials, machinery and tools used to produce our products are continuously being updated. Our cylinders are built to the highest standards utilizing the latest technology and processes.

**Delivery:**

WCI maintains a large range of stock parts which gives us the flexibility to respond to your needs in emergency situations. Please contact our factory to expedite your special requirements.

**A - SOLID ALUMINUM GLAND AND BLIND HEADS**

Machined from solid aluminum bar stock (6061 T6) and black anodized for corrosion resistance (also available in stainless steel).

**B - PISTON**

Machined from solid aluminum bar stock (6061 T6). Offers long bearing support.

**C - HARD ANODIZED I.D. ALUMINUM TUBE**

Tube I.D. is hardened to 60 Rc. Provides superior wear resistance and lower friction coefficient for maximum seal life.

**D - PISTON SEAL**

Lip-typ low friction urethane piston seals are pressure energized and wear compensated for low friction and long life. (Temperature rating: -50 deg to 200 deg F). (Viton™ also available up to 400 deg F).

**E - O-RING TUBE END SEALS**

Nitrile O-ring design is pressure compensated and reusable.

**F - ROD LIPS SEAL**

Our **new design** with a rod u-cup is completely self-compensating for zero leakage at all pressures (all seals can be used in a non-lube application).

**G - WIPER**

The **new wiper** wipes dirt out for less maintenance and longer life of the cylinder (urethane).

**H - PISTON WEAR RING**

Nylon material is designed for low friction, and to ensure maximum wear in the cylinder in side-load applications. Eliminates metal to metal contact.

**I - ROD GLAND**

The Bronze Gland is externally removable, without cylinder disassembly, for easy maintenance. Designed to provide maximum rod bearing. (Also available in Acetal).

**J - PISTON ROD**

High Strength steel. Nitrocarburizing treatment on the rod gives better corrosion resistant properties. It outperforms 12-micron standard (0.0005 in) chromium electroplating by ratio of up to 20:1. Has improved wear resistance, better lubrication retention, and dent resistance (60 Rc) without need for induction hardening. Nitrocarburizing is also environmentally friendly, with no surface pitting, flaking or hydrogen embrittlement. The finish created by the process is a lustrous black. (Also available in stainless steel).

**K - TIE RODS**

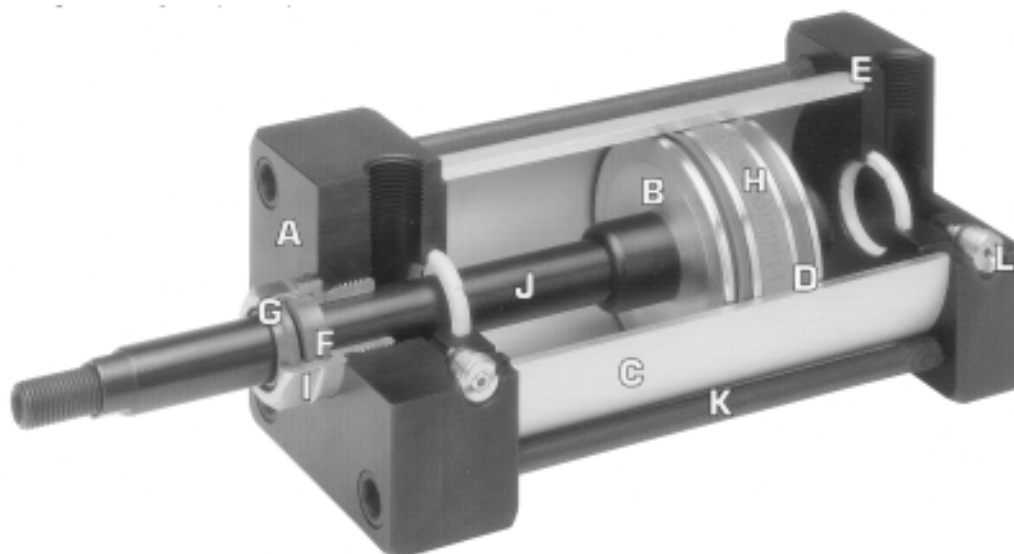
Corrosion resistant (Nitro-carburizing), stress proof steel maintains uniform compression on tube end seals. (Stainless steel may also be used).

**L - CHECK SEAL CUSHION AND NEEDLE VALVES**

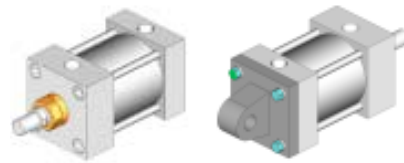
Precision Custom spuds combined with a new style of floating cushion seal provide smooth deceleration at end of stroke. Needle valves make adjustments easy and the standard location is at Position 2. Made in brass (also available in stainless steel).

No charge adders - Standard on 1 1/2" to 5" bores.

Viton™ is a registered trademark of Dupont Dow Elastomers.



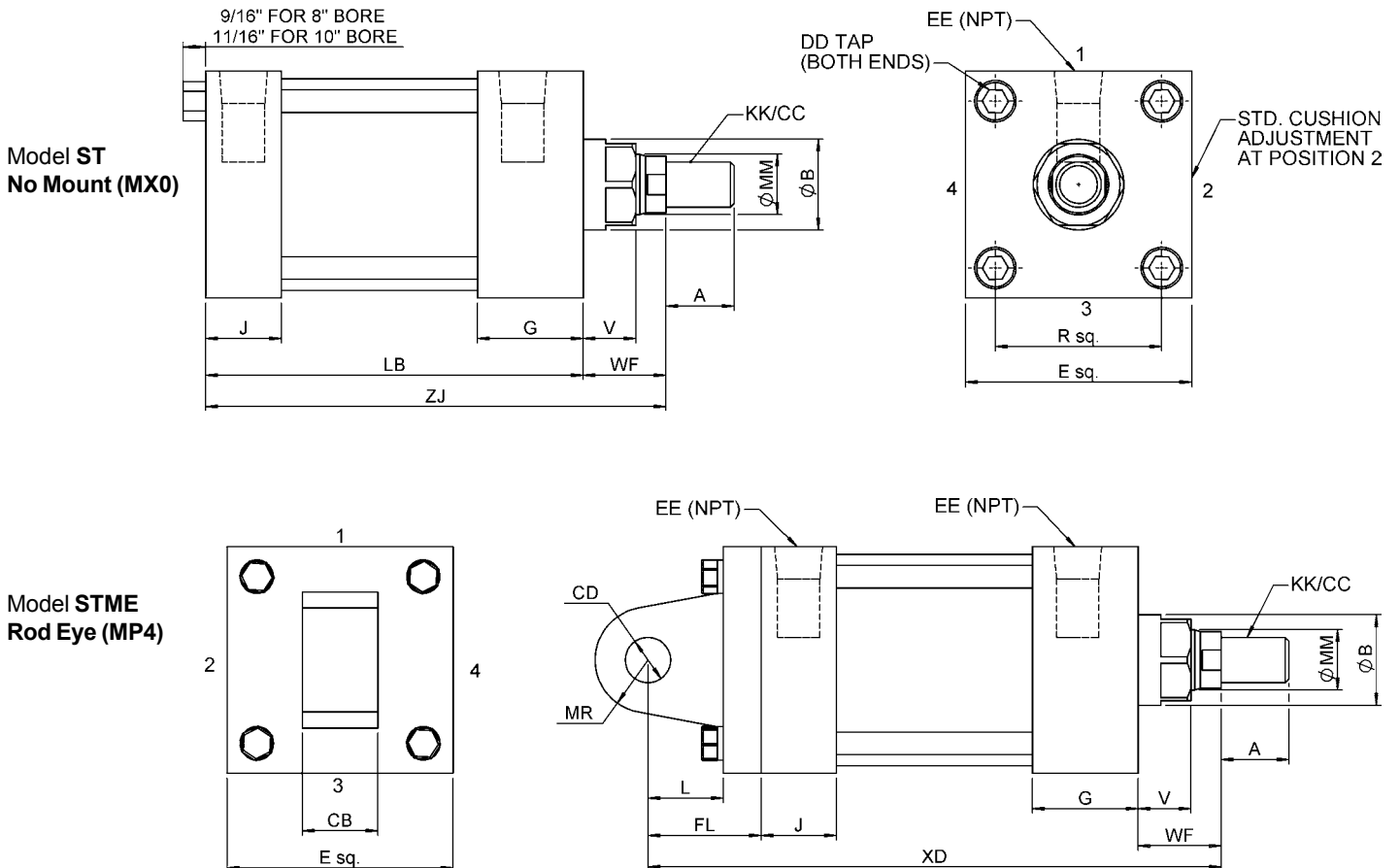
# model ST, STME

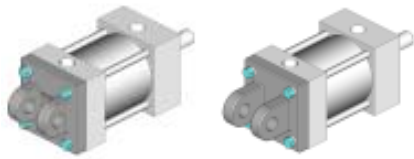


3

		ROD DIA.													+STR							
BORE	ROD	MM	KK	CC	A	WF	V	B	E	G	J	EE	DD	R	LB	ZJ	XD	L	FL	CD	MR	CB
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	1/4-28	1.43	3 5/8	4 5/8	5 3/4	3/4	1 1/8	1/2	5/8	3/4
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	1/4-28	1.43	3 5/8	5	6 1/8	3/4	1 1/8	1/2	5/8	3/4
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	5/16-24	1.84	3 5/8	4 5/8	5 3/4	3/4	1 1/8	1/2	5/8	3/4
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	5/16-24	1.84	3 5/8	5	6 1/8	3/4	1 1/8	1/2	5/8	3/4
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	5/16-24	2.19	3 3/4	4 3/4	5 7/8	3/4	1 1/8	1/2	5/8	3/4
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	5/16-24	2.19	3 3/4	5 1/8	6 1/4	3/4	1 1/8	1/2	5/8	3/4
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	3/8-24	2.78	4 1/4	5 5/8	7 1/2	1 1/4	1 7/8	3/4	7/8	1 1/4
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	3/8-24	2.78	4 1/4	5 7/8	7 3/4	1 1/4	1 7/8	3/4	7/8	1 1/4
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	3/8-24	3.32	4 1/4	5 5/8	7 1/2	1 1/4	1 7/8	3/4	7/8	1 1/4
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	3/8-24	3.32	4 1/4	5 7/8	7 3/4	1 1/4	1 7/8	3/4	7/8	1 1/4
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	1/2-20	4.12	4 1/2	5 7/8	7 3/4	1 1/4	1 7/8	3/4	7/8	1 1/4
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	1/2-20	4.12	4 1/2	6 1/8	8	1 1/4	1 7/8	3/4	7/8	1 1/4
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	1/2-20	4.88	5	6 5/8	8 7/8	1 1/2	2 1/4	1	1 1/8	1 1/2
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	1/2-20	4.88	5	6 7/8	9 1/8	1 1/2	2 1/4	1	1 1/8	1 1/2
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	8 1/2	2	1 1/2	3/4	5/8-18	6.44	5 1/8	6 3/4	9	1 1/2	2 1/4	1	1 1/8	1 1/2
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	8 1/2	2	1 1/2	3/4	5/8-18	6.44	5 1/8	7	9 1/4	1 1/2	2 1/4	1	1 1/8	1 1/2
10	1	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	10 5/8	2 1/4	2	1	3/4-16	7.92	6 3/8	8 1/4	N/A	N/A	N/A	N/A	N/A	N/A
	2	2	1 1/2-12	1 3/4-12	2 1/4	2	1 1/8	2 5/8	10 5/8	2 1/4	2	1	3/4-16	7.92	6 3/8	8 3/8	N/A	N/A	N/A	N/A	N/A	N/A

Model ST below can also be referred to for **Basic Cylinder Dimensions**.

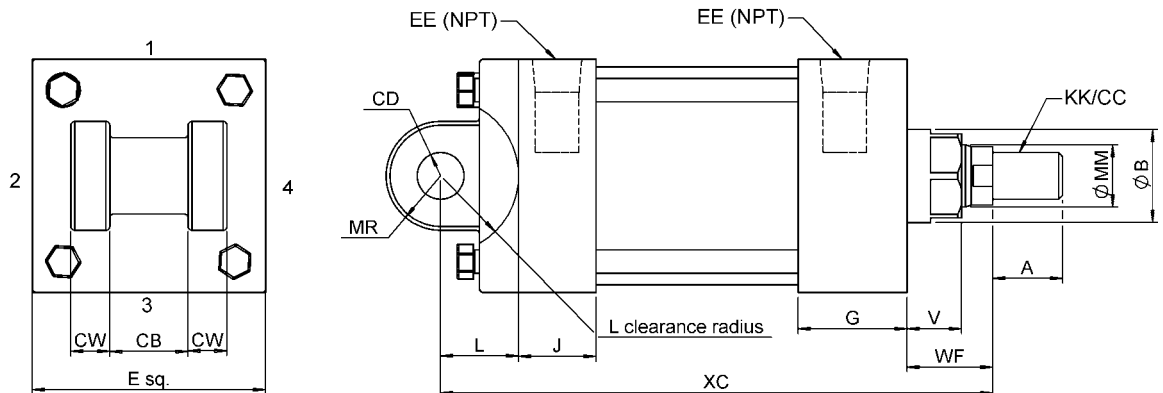




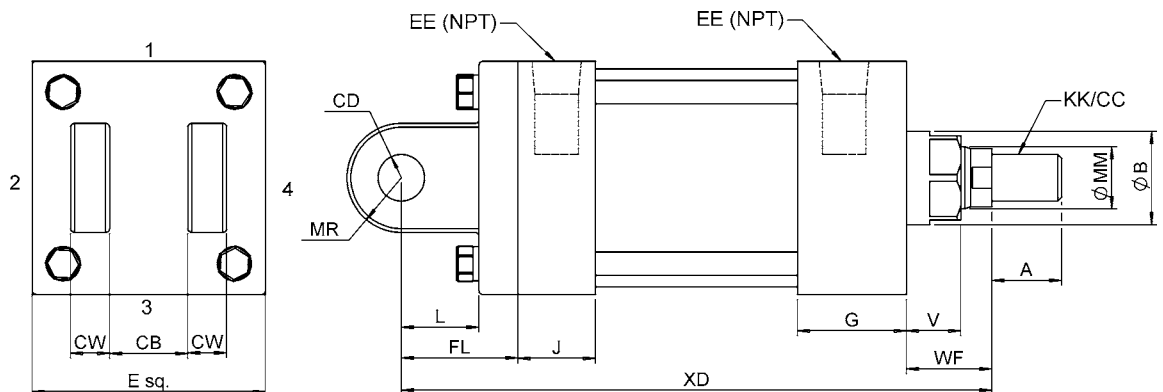
model **STMB, STMP**

BORE	ROD	ROD DIA.																		+ STR		FL
		MM	KK	CC	A	WF	V	B	E	G	J	EE	XC	CD	CB	CW	MR	L	XD			
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	5 3/8	1/2	3/4	1/2	5/8	3/4	5 3/4	1 1/8		
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	5 3/4	1/2	3/4	1/2	5/8	3/4	6 1/8	1 1/8		
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	5 3/8	1/2	3/4	1/2	5/8	3/4	5 3/4	1 1/8		
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	5 3/4	1/2	3/4	1/2	5/8	3/4	6 1/8	1 1/8		
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	5 1/2	1/2	3/4	1/2	5/8	3/4	5 7/8	1 1/8		
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	5 7/8	1/2	3/4	1/2	5/8	3/4	6 1/4	1 1/8		
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	6 7/8	3/4	1 1/4	5/8	7/8	1 1/4	7 1/2	1 7/8		
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	7 1/8	3/4	1 1/4	5/8	7/8	1 1/4	7 3/4	1 7/8		
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	6 7/8	3/4	1 1/4	5/8	7/8	1 1/4	7 1/2	1 7/8		
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	7 1/8	3/4	1 1/4	5/8	7/8	1 1/4	7 3/4	1 7/8		
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	7 1/8	3/4	1 1/4	5/8	7/8	1 1/4	7 3/4	1 7/8		
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	7 3/8	3/4	1 1/4	5/8	7/8	1 1/4	8	1 7/8		
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	8 1/8	1	1 1/2	3/4	1 1/8	1 1/2	8 7/8	2 1/4		
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	8 3/8	1	1 1/2	3/4	1 1/8	1 1/2	9 1/8	2 1/4		
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	8 1/2	2	1 1/2	3/4	8 1/4	1	1 1/2	1	1 1/8	1 1/2	9	2 1/4		
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	8 1/2	2	1 1/2	3/4	8 1/2	1	1 1/2	1	1 1/8	1 1/2	9 1/4	2 1/4		
10	1	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	10 5/8	2 1/4	2	1	10 3/8	1 3/8	2	1	NA	2 1/8	N/A	N/A		
	2	2	1 1/2-12	1 3/4-12	2 1/4	2	1 1/8	2 5/8	10 5/8	2 1/4	2	1	10 1/2	1 3/8	2	1	NA	2 1/8	N/A	N/A		

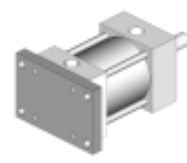
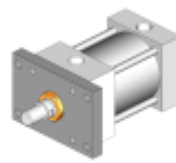
Model **STMB**  
Short Clevis (MP1)



Model **STMP**  
Clevis (MP2)

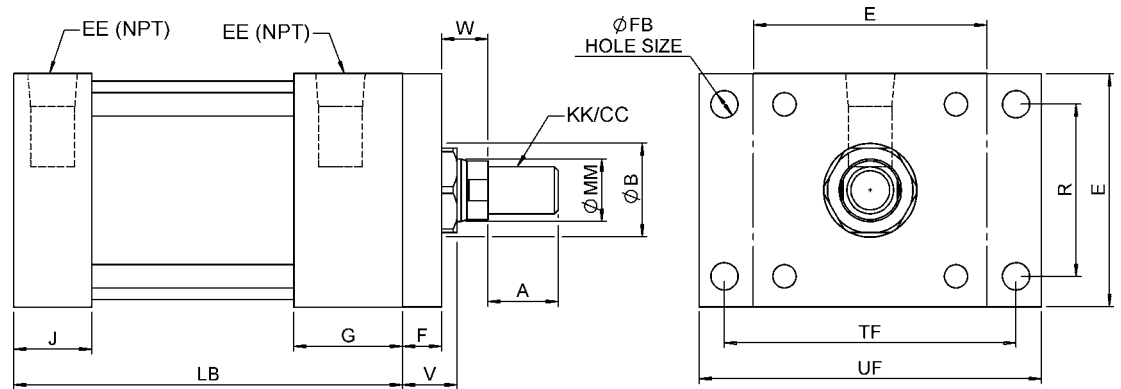


# model STR, STB

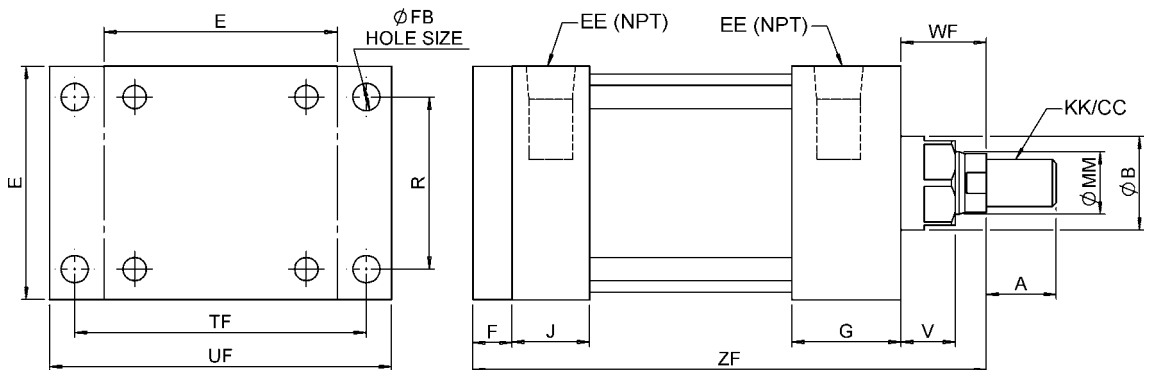


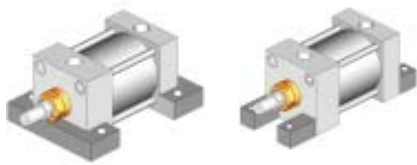
ROD DIA.												+ STR								+ STR
BORE	ROD	MM	KK	CC	A	WF	V	B	E	G	J	EE	LB	F	FB	TF	UF	W	R	ZF
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	3 5/8	3/8	5/16	2 3/4	3 3/8	5/8	1.43	5
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	3 5/8	3/8	5/16	2 3/4	3 3/8	1	1.43	5 3/8
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	3 5/8	3/8	3/8	3 3/8	4 1/8	5/8	1.84	5
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	3 5/8	3/8	3/8	3 3/8	4 1/8	1	1.84	5 3/8
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	3 3/4	3/8	3/8	3 7/8	4 5/8	5/8	2.19	5 1/8
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	3 3/4	3/8	3/8	3 7/8	4 5/8	1	2.19	5 1/2
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	5/8	7/16	4 11/16	5 1/2	3/4	2.76	6 1/4
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	5/8	7/16	4 11/16	5 1/2	1	2.76	6 1/2
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	5/8	7/16	5 7/16	6 1/4	3/4	3.32	6 1/4
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	5/8	7/16	5 7/16	6 1/4	1	3.32	6 1/2
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5/8	9/16	6 5/8	7 5/8	3/4	4.10	6 1/2
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5/8	9/16	6 5/8	7 5/8	1	4.10	6 3/4
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	5	3/4	9/16	7 5/8	8 5/8	7/8	4.88	7 3/8
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	5	3/4	9/16	7 5/8	8 5/8	1 1/8	4.88	7 5/8

Model STR  
Rod End Rectangular  
Flange (MF1)



Model STB  
Blind End  
Rectangular  
Flange (MF2)



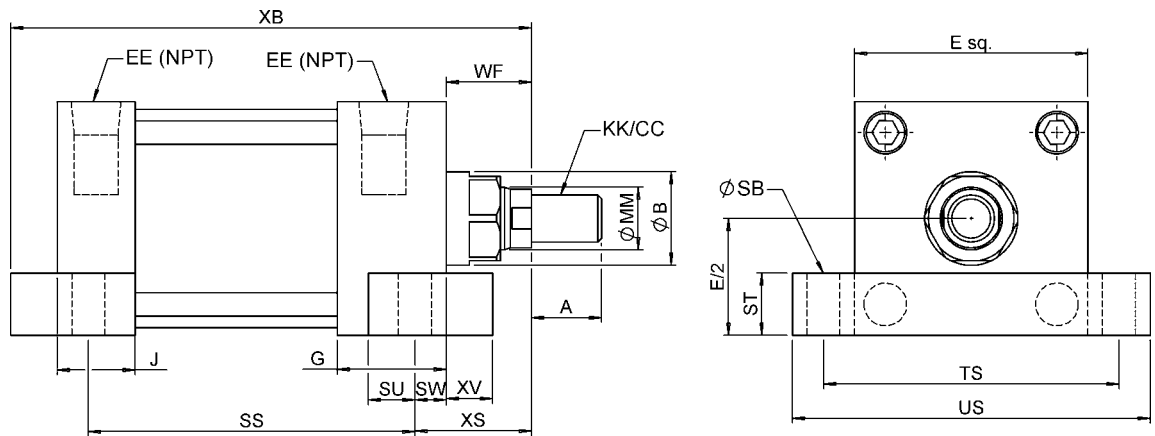


model **STF, STFA**

BORE	ROD	ROD DIA.		CC	A	WF	+STR		XS	XV	SU	SW	SB	ST	TS	US	+STR		EL	EM	EO	EB	ET
		MM	KK				SS	XB									SE	ZE					
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	2 7/8	5 1/8	1 3/8	1/2	5/8	3/8	13/32	9/16	2 3/4	3 1/2	5 1/2	5 5/8	3/4	1 1/8	1/4	9/32	9/16
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	2 7/8	5 1/2	1 3/8	1/2	5/8	3/8	13/32	9/16	2 3/4	3 1/2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	1	5/8	7/16-20	1/2-20	3/4	1	2 7/8	5 1/4	1 3/8	5/8	5/8	3/8	13/32	5/8	3 1/4	4	5 7/8	5 7/8	15/16	1 5/16	5/16	11/32	5/8
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	2 7/8	5 5/8	1 3/4	5/8	5/8	3/8	13/32	5/8	3 1/4	4	5 7/8	6 1/4	15/16	1 5/16	5/16	11/32	5/8
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	3	5 3/8	1 3/8	5/8	5/8	3/8	13/32	3/4	3 3/4	4 1/2	6 1/4	6 1/8	1 1/16	1 7/16	5/16	11/32	3/4
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	3	5 3/4	1 3/4	5/8	5/8	3/8	13/32	3/4	3 3/4	4 1/2	6 1/4	6 1/2	1 1/16	1 7/16	5/16	11/32	3/4
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	3 1/4	6 3/8	1 7/8	3/4	3/4	1/2	17/32	1	4 3/4	5 3/4	6 5/8	6 7/8	7/8	1 1/2	3/8	13/32	1
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	3 1/4	6 5/8	2 1/8	3/4	1/2	17/32	1	4 3/4	5 3/4	6 5/8	7 1/8	7/8	1 1/2	3/8	13/32	1	
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	3 1/4	6 3/8	1 7/8	3/4	1/2	17/32	1	5 1/2	6 1/2	6 7/8	7	1	1 5/8	3/8	13/32	1 3/16	
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	3 1/4	6 5/8	2 1/8	3/4	1/2	17/32	1	5 1/2	6 1/2	6 7/8	7 1/4	1	1 5/8	3/8	13/32	1 3/16	
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	3 1/8	6 13/16	2 1/16	15/16	9/16	11/16	25/32	1 1/4	6 7/8	8 1/4	7 1/4	7 1/2	1 1/16	1 11/16	9/16	17/32	1 3/8
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	3 1/8	7 1/16	2 5/16	15/16	9/16	11/16	25/32	1 1/4	6 7/8	8 1/4	7 1/4	7 1/2	1 1/16	1 11/16	9/16	17/32	1 3/8
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	3 5/8	7 9/16	2 5/16	15/16	7/8	11/16	25/32	1 1/2	7 7/8	9 1/4	7 3/4	8 1/4	1	1 3/4	5/8	17/32	1 5/8
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	3 5/8	7 13/16	2 9/16	15/16	7/8	11/16	25/32	1 1/2	7 7/8	9 1/4	7 3/4	8 1/4	1	1 3/4	5/8	17/32	1 5/8
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	3 3/4	7 13/16	2 5/16	15/16	7/8	11/16	25/32	1 3/4	9 7/8	11 1/4	7 3/8	8 3/4	1 1/8	1 1/8	3/4	21/32	2
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	3 3/4	8 1/16	2 9/16	15/16	7/8	11/16	25/32	1 3/4	9 7/8	11 1/4	7 3/8	8 3/4	1 1/8	1 1/8	3/4	21/32	2

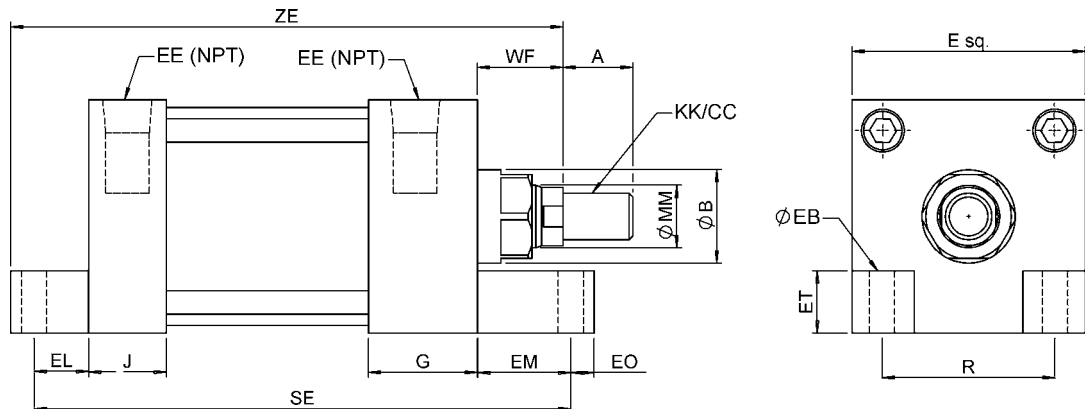
For dimensions not shown in above table, see basic cylinder dimensions on page 3.

Model **STF**  
Foot Mount (MS2)



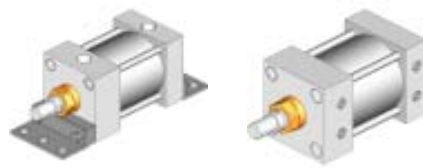
**Note:**  
For Double-rod cylinders add 1/2" to **SS** dimension except on 5" bore add 1/4".  
For 6 and 8" bores, mounting lugs will be in 4 pieces instead of 2.

Model **STFA**  
Foot Mount (MS7)





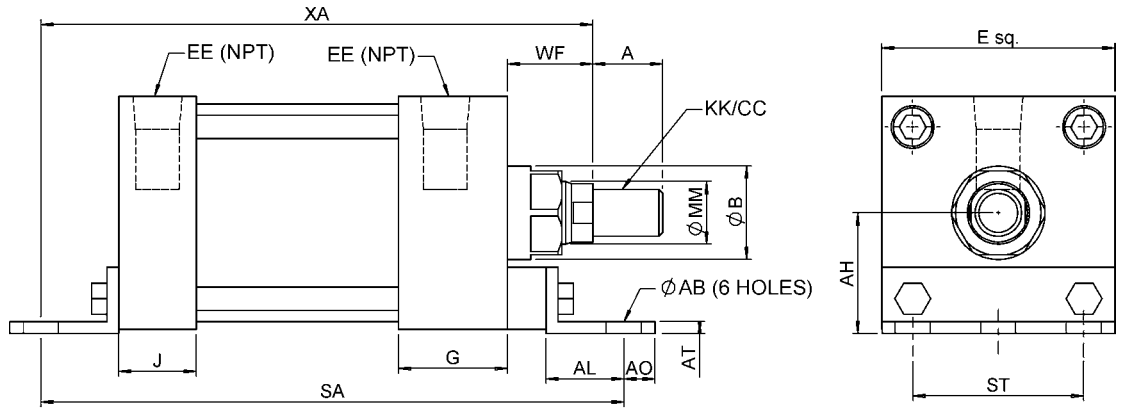
# model STA, STS



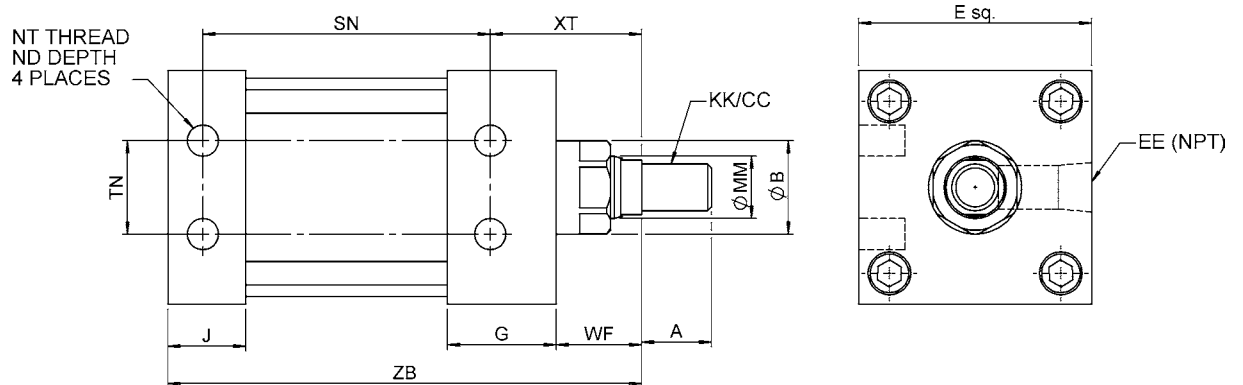
BORE	ROD	ROD DIA.					+ STR		AB	AH	AL	AO	AT	ST	+ STR		XT	NT	ND	TN
		MM	KK	CC	A	WF	SA	XA							SN	ZB				
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	6	5 5/8	7/16	1 3/16	1	3/8	1/8	1 1/4	2 1/4	4 5/8	1 15/16	1/4-20	3/8	5/8
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	6	6	7/16	1 3/16	1	3/8	1/8	1 1/4	2 1/4	5	2 5/16	1/4-20	3/8	5/8
2	1	5/8	7/16-20	1/2-20	3/4	1	6	5 5/8	7/16	1 7/16	1	3/8	1/8	1 3/4	2 1/4	4 5/8	1 15/16	5/16-18	1/2	7/8
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	6	6	7/16	1 7/16	1	3/8	1/8	1 3/4	2 1/4	5	2 5/16	5/16-18	1/2	7/8
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	6 1/8	5 3/4	7/16	1 5/8	1	3/8	1/8	2 1/4	2 3/8	4 3/4	1 15/16	3/8-16	5/8	1 1/4
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	6 1/8	6 1/8	7/16	1 5/8	1	3/8	1/8	2 1/4	2 3/8	5 1/8	2 5/16	3/8-16	5/8	1 1/4
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7 3/8	6 7/8	9/16	1 15/16	1 1/4	1/2	3/16	2 3/4	2 5/8	5 5/8	2 7/16	1/2-13	3/4	1 1/2
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	7 3/8	7 1/8	9/16	1 15/16	1 1/4	1/2	3/16	2 3/4	2 5/8	5 7/8	2 11/16	1/2-13	3/4	1 1/2
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7 3/8	6 7/8	9/16	2 1/4	1 1/4	1/2	3/16	3 1/2	2 5/8	5 5/8	2 7/16	1/2-13	3/4	2 1/16
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	7 3/8	7 1/8	9/16	2 1/4	1 1/4	1/2	3/16	3 1/2	2 5/8	5 7/8	2 11/16	1/2-13	3/4	2 1/16
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7 7/8	7 1/4	11/16	2 3/4	1 3/8	5/8	3/16	4 1/4	2 7/8	5 7/8	2 7/16	5/8-11	1	2 11/16
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	7 7/8	7 1/2	11/16	2 3/4	1 3/8	5/8	3/16	4 1/4	2 7/8	6 1/8	2 11/16	5/8-11	1	2 11/16
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	8 1/2	8	13/16	3 1/4	1 3/8	5/8	1/4	5 1/4	3 1/8	6 5/8	2 13/16	3/4-10	1 1/8	3 1/4
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	8 1/2	8 1/4	13/16	3 1/4	1 3/8	5/8	1/4	5 1/4	3 1/8	6 7/8	3 1/16	3/4-10	1 1/8	3 1/4
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3 1/4	6 3/4	2 13/16	3/4-10	1 1/8	4 1/2	
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3 1/4	7	3 1/16	3/4-10	1 1/8	4 1/2	

For dimensions not shown in above table, see basic cylinder dimensions on page 3.

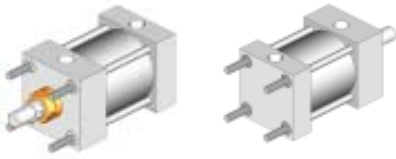
Model STA  
Foot Mount (MS1)



Model STS  
Side-Tapped  
Mount (MS4)



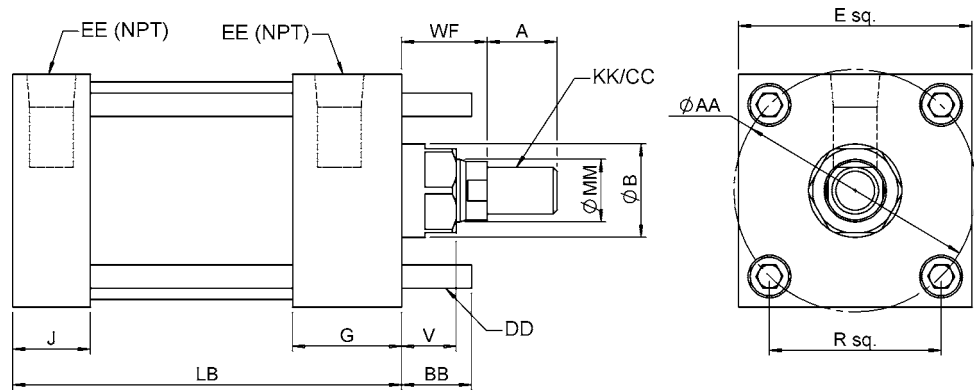
SN will decrease 1/4" on STD (double-rod) 5" bore only.



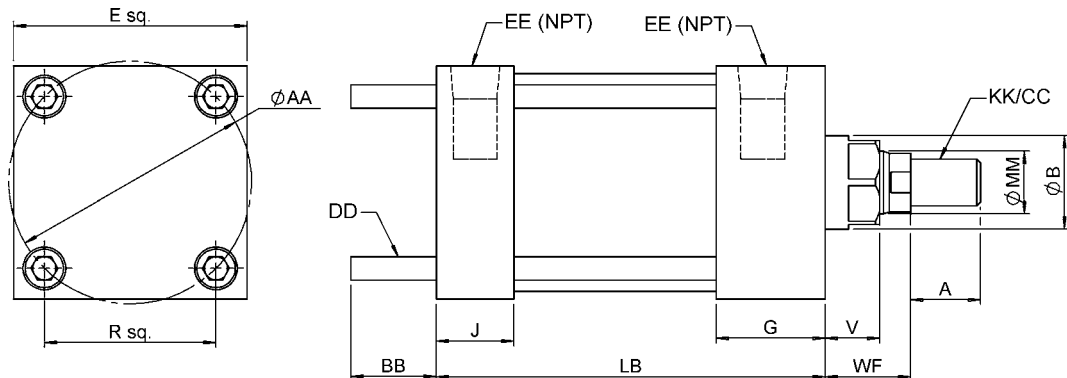
## model STNC, STNB

BORE	ROD	ROD DIA.		CC	A	WF	V	B	E	G	J	EE	+STR		AA	BB	DD	R
		MM	KK										LB	LB				
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	3 5/8	2.02	1	1/4-28	1.43	
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	3 5/8	2.02	1	1/4-28	1.43	
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	3 5/8	2.60	1 1/8	5/16-24	1.84	
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	3 5/8	2.60	1 1/8	5/16-24	1.84	
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	3 3/4	3.10	1 1/8	5/16-24	2.19	
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	3 3/4	3.10	1 1/8	5/16-24	2.19	
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	3.90	1 3/8	3/8-24	2.78	
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	3.90	1 3/8	3/8-24	2.78	
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	4.70	1 3/8	3/8-24	3.32	
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	4.70	1 3/8	3/8-24	3.32	
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5.80	1 13/16	1/2-20	4.12	
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5.80	1 13/16	1/2-20	4.12	
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	5	6.90	1 13/16	1/2-20	4.88	
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	5	6.90	1 13/16	1/2-20	4.88	
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	8 1/2	2	1 1/2	3/4	5 1/8	9.10	2 5/16	5/8-18	6.44	
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	8 1/2	2	1 1/2	3/4	5 1/8	9.10	2 5/16	5/8-18	6.44	
10	1	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	10 5/8	2 1/4	2	1	6 3/8	11.20	2 11/16	3/4-16	7.92	
	2	2	1 1/2-12	1 3/4-12	2 1/4	2	1 1/8	2 5/8	10 5/8	2 1/4	2	1	6 3/8	11.20	2 11/16	3/4-16	7.92	

Model STNC  
Extended Tie-rod  
Gland End (MX3)



Model STNB  
Extended Tie-rod  
Blind End (MX2)

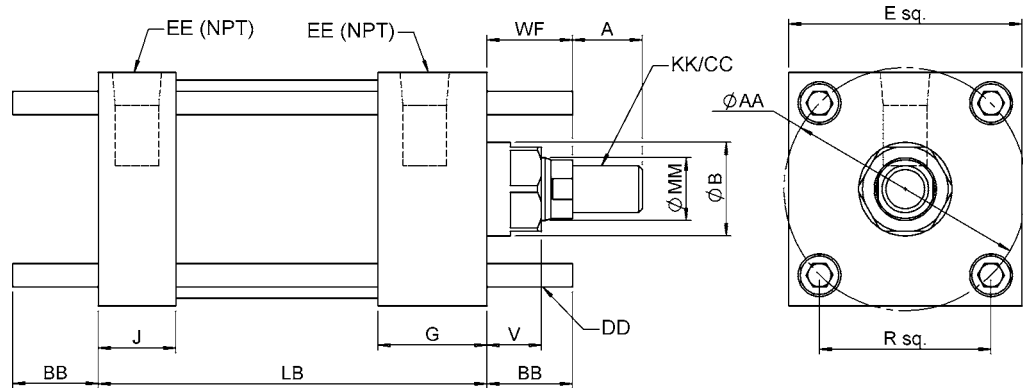


# model STNA, STD

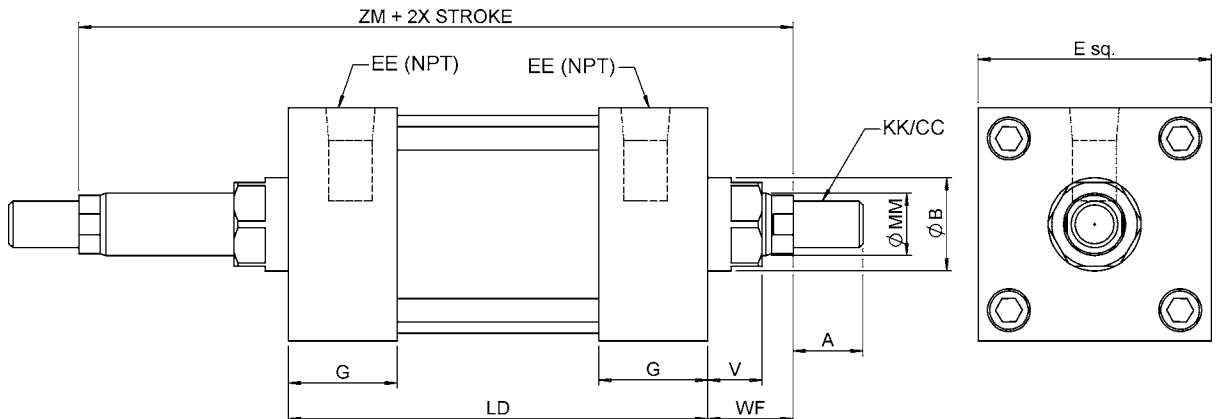


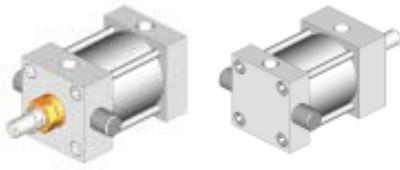
ROD DIA.																			+ STR		+ 2X STR	
BORE	ROD	MM	KK	CC	A	WF	V	B	E	G	J	EE	LB	AA	BB	DD	R	LD	ZM			
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	3 5/8	2.02	1	1/4-28	1.43	4 1/8	6 1/8			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	3 5/8	2.02	1	1/4-28	1.43	4 1/8	6 7/8			
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	3 5/8	2.60	1 1/8	5/16-24	1.84	4 1/8	6 1/8			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	3 5/8	2.60	1 1/8	5/16-24	1.84	4 1/8	6 7/8			
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	3 3/4	3.10	1 1/8	5/16-24	2.19	4 1/4	6 1/4			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	3 3/4	3.10	1 1/8	5/16-24	2.19	4 1/4	7			
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	3.90	1 3/8	3/8-24	2.78	4 3/4	7 1/2			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	4 1/4	3.90	1 3/8	3/8-24	2.78	4 3/4	8			
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	4.70	1 3/8	3/8-24	3.32	4 3/4	7 1/2			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	4 1/4	4.70	1 3/8	3/8-24	3.32	4 3/4	8			
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5.80	1 13/16	1/2-20	4.12	5	7 3/4			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	4 1/2	5.80	1 13/16	1/2-20	4.12	5	8 1/4			
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	5	6.90	1 13/16	1/2-20	4.88	5 1/2	8 3/4			
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	5	6.90	1 13/16	1/2-20	4.88	5 1/2	9 1/4			
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	8 1/2	2	1 1/2	3/4	5 1/8	9.10	2 5/16	5/8-18	6.44	5 5/8	8 7/8			
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	8 1/2	2	1 1/2	3/4	5 1/8	9.10	2 5/16	5/8-18	6.44	5 5/8	9 3/8			
10	1	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	10 5/8	2 1/4	2	1	6 3/8	11.20	2 11/16	3/4-16	7.92	6 5/8	10 3/8			
	2	2	1 1/2-12	1 3/4-12	2 1/4	2	1 1/8	2 5/8	10 5/8	2 1/4	2	1	6 3/8	11.20	2 11/16	3/4-16	7.92	6 5/8	10 5/8			

Model STNA  
Extended Tie-rod  
Both Ends (MX1)



Model STD  
Double Rod Mount  
(MD)

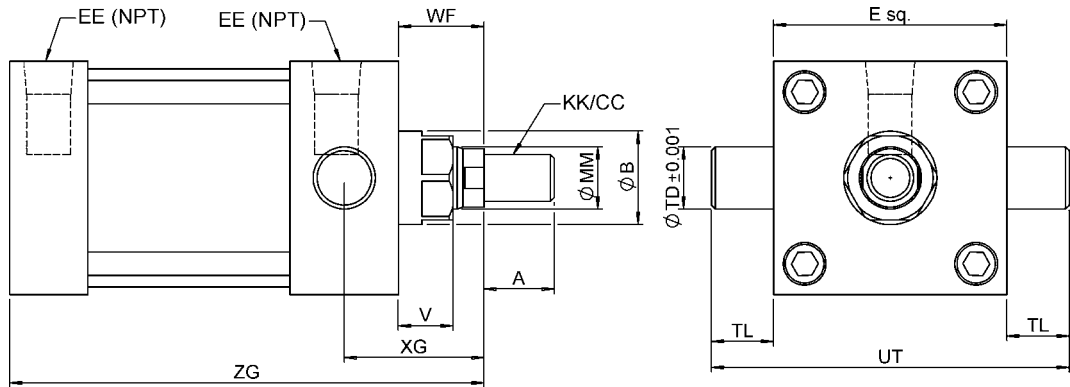




model **STTR, STTB**

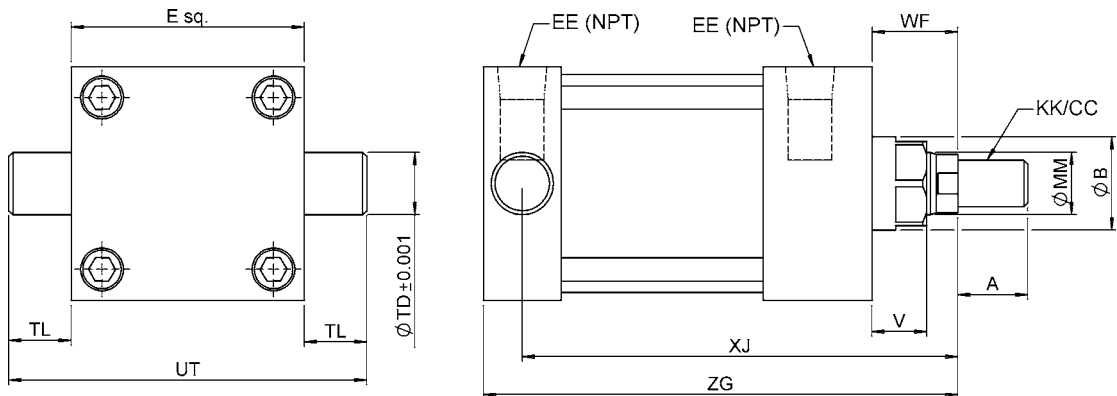
ROD DIA.													+ STR							+ STR	
BORE	ROD	MM	KK	CC	A	WF	V	B	E	G	J	EE	ZG	XG	TD	TL	UT	XJ			
1 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2	1 1/2	1	3/8	4 5/8	1 3/4	1	1	4	4 1/8			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2	1 1/2	1	3/8	5	N/A	1	1	4	4 1/2			
2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	2 1/2	1 1/2	1	3/8	4 5/8	1 3/4	1	1	4 1/2	4 1/8			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	2 1/2	1 1/2	1	3/8	5	2 1/8	1	1	4 1/2	4 1/2			
2 1/2	1	5/8	7/16-20	1/2-20	3/4	1	5/8	1 1/8	3	1 1/2	1	3/8	4 3/4	1 3/4	1	1	5	4 1/4			
	2	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3	1 1/2	1	3/8	5 1/8	2 1/8	1	1	5	4 5/8			
3 1/4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	3 3/4	1 3/4	1 1/4	1/2	5 5/8	2 1/4	1	1	5 3/4	5			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	3 3/4	1 3/4	1 1/4	1/2	5 7/8	2 1/2	1	1	5 3/4	5 1/4			
4	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	4 1/2	1 3/4	1 1/4	1/2	5 5/8	2 1/4	1	1	6 1/2	5			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	4 1/2	1 3/4	1 1/4	1/2	5 7/8	2 1/2	1	1	6 1/2	5 1/4			
5	1	1	3/4-16	7/8-14	1 1/8	1 3/8	7/8	1 1/2	5 1/2	1 3/4	1 1/4	1/2	5 7/8	2 1/4	1	1	7 1/2	5 1/4			
	2	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	5 1/2	1 3/4	1 1/4	1/2	6 1/8	2 1/2	1	1	7 1/2	5 1/2			
6	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	6 1/2	2	1 1/2	3/4	6 5/8	2 5/8	1 3/8	1 3/8	9 1/4	5 7/8			
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	6 1/2	2	1 1/2	3/4	6 7/8	2 7/8	1 3/8	1 3/8	9 1/4	6 1/8			
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	1	2	8 1/2	2	1 1/2	3/4	6 3/4	2 5/8	1 3/8	1 3/8	11 1/4	6			
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	1 1/8	2 3/8	8 1/2	2	1 1/2	3/4	7	2 7/8	1 3/8	1 3/8	11 1/4	6 1/4			

Model **STTR**  
Rod End Trunnion  
(MT1)



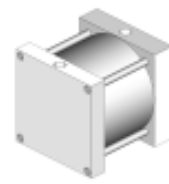
No oversize rod on 1 1/2" bore only (STTR).  
Also available in one-piece steel head

Model **STTB**  
Blind End Trunnion  
(MT2)



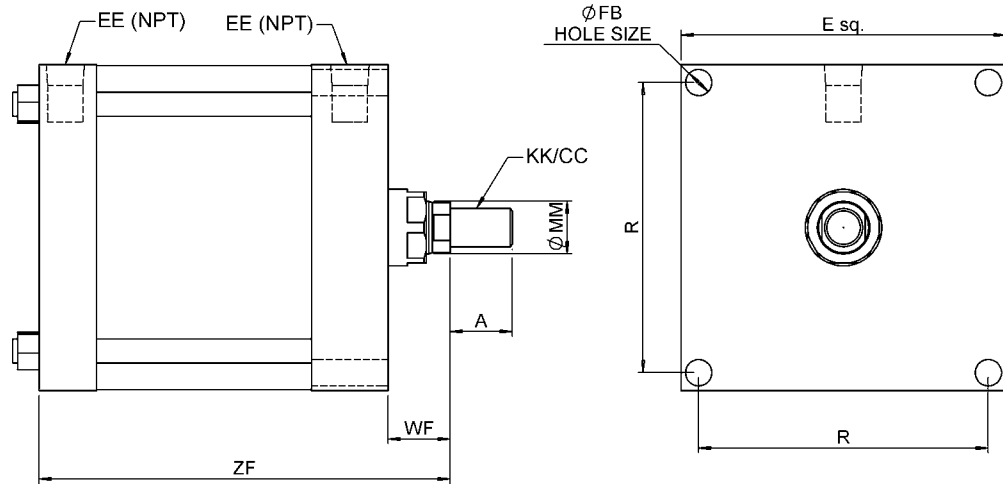
Also available in one-piece steel head

# model **STG, STH**

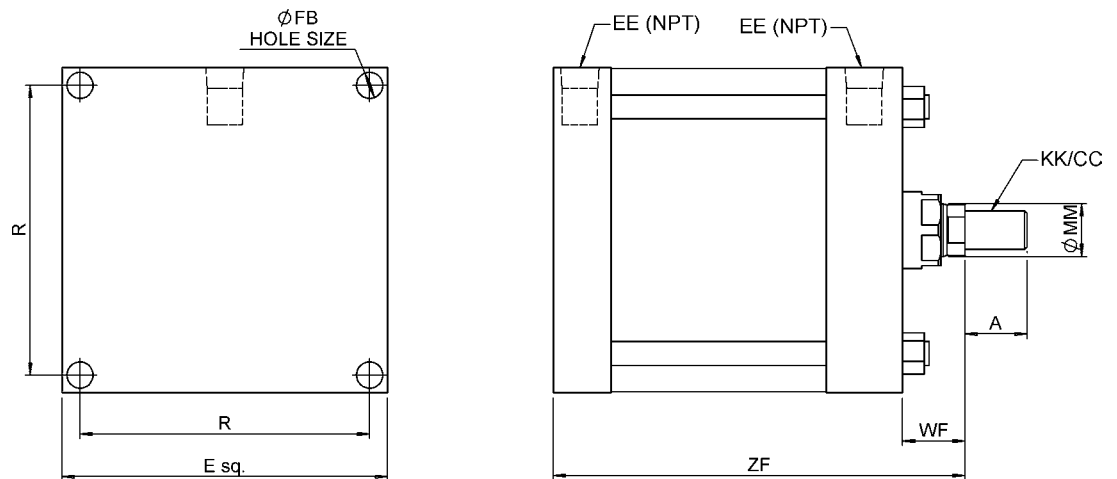


BORE	ROD	ROD DIA.		CC	A	WF	E	EE	+ STR		
		MM	KK						ZF	FB	R
8	1	1 3/8	1-14	1 1/4-12	1 5/8	1 5/8	8 1/2	3/4	6 3/4	11/16	7.57
	2	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	8 1/2	3/4	7	11/16	7.57
10	1	1 3/4	1 1/4-12	1 1/2-12	2	1 7/8	10 5/8	1	8 1/4	13/16	9.40
	2	2	1 1/2-12	1 3/4-12	2 1/4	2	10 5/8	1	8 3/8	13/16	9.40

Model **STG**  
Square Head Gland  
End (ME3)

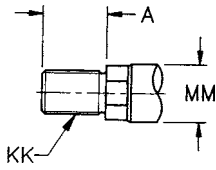


Model **STH**  
Square Head Blind  
End (ME4)

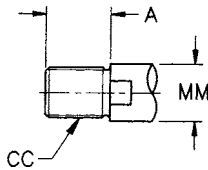


# 12 Rod End Styles, Accessories

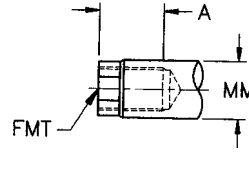
## Rod End Styles



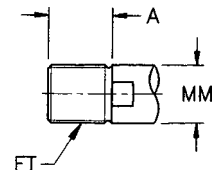
Standard Male Thread  
NFFA Style SM



Oversize Male Thread  
NFFA Style IM



Female Thread  
NFFA Style SF



Full Thread  
NFFA Style FM

Note: A Rod Stud is Standard on 1 1/2" - 5" bores (for Standard Male Thread only).

## Accessories for Rod End

BORE	ROD DIA. MM	THREAD SIZE	ROD CLEVIS	LUG		ROD EYE	CLEVIS		SELF ALIGNING					
				MOUNTING BRACKET	PIVOT PIN		MOUNTING BRACKET	ROD EYE	MOUNTING BRACKET	PIVOT PIN				
1 1/2	3 1/4	2	5/8	7/16-20	HC15	HM15	P3	HE15	HCM15	HWE15	HWM15	HWP15		
			5/8	1/2-20	HC15C	HM15	P3	HE15C	HCM15	N/A	N/A	N/A		
6	4	2 1/2	1	3/4-16	HC2	HM25	P4	HE2	HCM2	HWE2	HWM2	HWP2		
			1	7/8-14	HC2C	HM32	P6	HE2C	HCM32	N/A	N/A	N/A		
		1	3/8	1-14	HC32	HM32	P6	HE32	HCM32	HWE32	HWM32	HWP32		
		1	3/8	1 1/4-12	HC4	HM4	HP4	HE4	HCM4	HWE4	HWM4	HWP4		
	5	2 1/2	2 1/2	1	3/4	1 1/4-12	HC4	HM4	HP4	HCM4	HWE4	HWM4	HWP4	
				1	3/4	1 1/2-12	HC5	HM5	P12	HE5	HCM5	HWE5	HWM5	HWP5
		2	2 1/2	2 1/2	2	1 1/2-12	HC5	HM5	P12	HE5	HCM5	HWE5	HWM5	HWP5
					2	1 3/4-12	HC5C	HM6	HP6	HE5C	HCM6	N/A	N/A	N/A

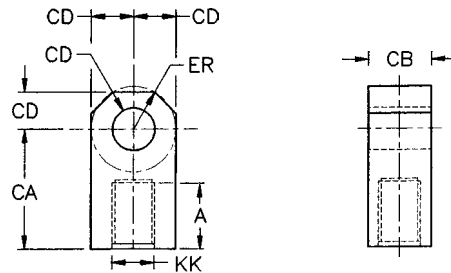
## Accessories for Blind End

BORE	MOUNTING BRACKET		PIVOT PIN	SELF ALIGNING				
	model LC	model LE		MOUNTING BRACKET	PIVOT PIN			
1 1/2	2	2 1/2	HM15	HCM15	P3	HWM15	HWP15	
3 1/4	4	5	HM25	HCM2	P4	HWM2	HWP2	
		6	8	HM32	HCM32	P6	HWM32	HWP32
			10	HM4	HCM4	HP4	HWM4	HWP4
			12	HM5	HCM5	P12	HWM5	HWP5

## Rod Eye

Adapts to HCM clevis-type mounting bracket

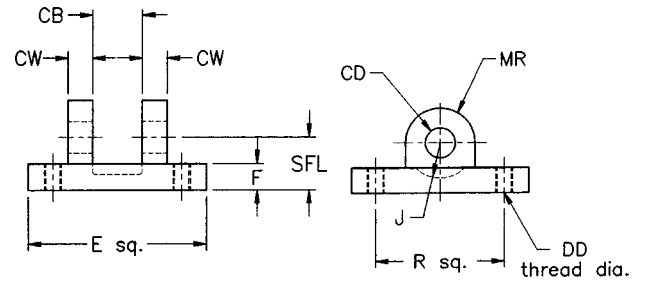
PART	HE15	HE15C	HE2	HE2C	HE32	HE4	HE5	HE5C	HE6	HE7	HE7C	HE8
A	3/4	3/4	1 1/8	1 1/8	1 5/8	2	2 1/4	2 1/4	3	3 1/2	3 5/8	3 1/2
CA	1 1/2	1 1/2	2 1/16	2 3/8	2 13/16	3 7/16	4	4 3/8	5	5 13/16	6 1/2	6 1/8
CB	3/4	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	3	3 1/2	3
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	3	3
ER	5/8	5/8	7/8	1 1/8	1 3/16	1 9/16	2	2 7/8	2 1/2	2 13/16	3 1/4	3 1/4
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 3/4-12	1 7/8-12	2 1/4-12	2 3/4-12	2 1/2-12



### Detachable Clevis - MP-1 Mount (NFPA)

Mounts on cylinder and adapts to HM eye-type mounting bracket

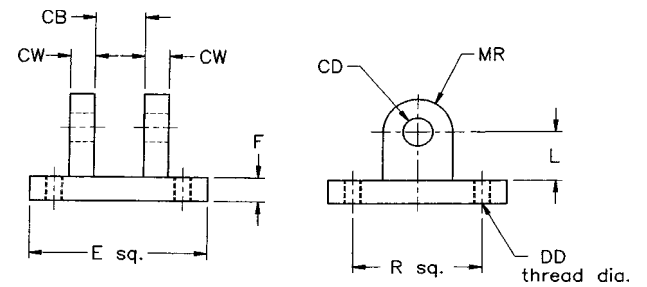
PART	LMP1-15	LMP1-2	LMP1-25	LMP1-32	LMP1-4	LMP1-5	LMP1-6
CB	0.76	0.76	0.76	1.26	1.26	1.26	1.51
CD	1/2	1/2	1/2	3/4	3/4	3/4	1
CW	1/2	1/2	1/2	5/8	5/8	5/8	3/4
DD	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24	1/2-20	1/2-20
E	2	2 1/2	3	3 3/4	4 1/2	5 1/2	6 1/2
F	3/8	3/8	3/8	5/8	5/8	5/8	3/4
J	5/8	5/8	5/8	7/8	7/8	7/8	1 1/8
SFL	3/4	3/4	3/4	1 1/4	1 1/4	1 1/4	1 1/2
MR	5/8	5/8	5/8	7/8	7/8	7/8	1 1/8
R	1.43	1.84	2.19	2.76	3.32	4.10	4.88



### Detachable Clevis - MP-2 Mount (NFPA)

Mounts on cylinder and adapts to HM eye-type mounting bracket

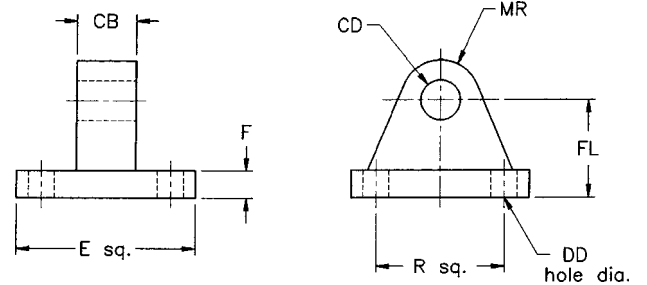
PART	LMP2-15	LMP2-2	LMP2-25	LMP2-32	LMP2-4	LMP2-5	LMP2-6
CB	0.76	0.76	0.76	1.26	1.26	1.26	1.51
CD	1/2	1/2	1/2	3/4	3/4	3/4	1
CW	1/2	1/2	1/2	5/8	5/8	5/8	3/4
DD	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24	1/2-20	1/2-20
E	2	2 1/2	3	3 3/4	4 1/2	5 1/2	6 1/2
F	3/8	3/8	3/8	5/8	5/8	5/8	3/4
L	3/4	3/4	3/4	1 1/4	1 1/4	1 1/4	1 1/2
MR	5/8	5/8	5/8	7/8	7/8	7/8	1 1/8
R	1.43	1.84	2.19	2.76	3.32	4.10	4.88



### Eye Type Mounting Bracket

Adapts to LC mount cylinder or HC rod clevis

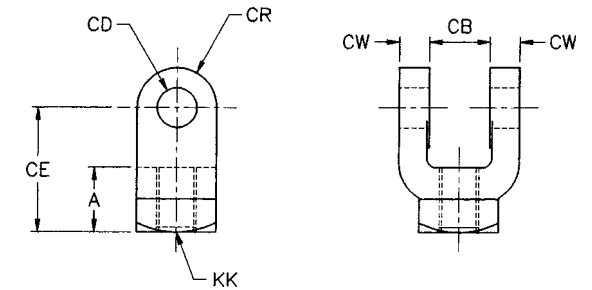
PART	HM15	HM25	HM32	HM4	HM5	HM6
CB	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2
CD	1/2	3/4	1	1 3/8	1 3/4	2
DD	13/32	17/32	21/32	21/32	29/32	1 1/16
E	2 1/2	3 1/2	4 1/2	5	6 1/2	7 1/2
F	3/8	5/8	3/4	7/8	7/8	1
FL	1 1/8	1 7/8	2 1/4	3	3 1/8	3 1/2
MR	1/2	3/4	1	1 3/8	1 3/4	2
R	1.63	2.56	3.25	3.81	4.95	5.75



### Rod Clevis

Adapts to male thread on piston rod

PART	HC15	HC15C	HC2	HC2C	HC32	HC4	HC5	HC5C
A	3/4	3/4	1 1/8	1 5/8	1 5/8	2	2 1/4	3
CB	0.765	0.765	1.265	1.515	1.515	2.032	2.531	2.531
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2
CE	1 1/2	1 1/2	2 3/8	3 1/8	3 1/8	4 1/8	4 1/2	5 1/2
CW	1/2	1/2	5/8	3/4	3/4	1	1 1/4	1 1/4
CR	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 3/4-12

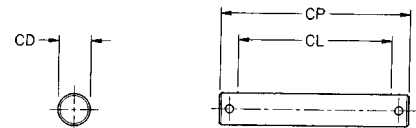


### Pivot Pin

Comes complete with cotter pins

Adapts to HC rod clevis or HCM clevis-type mounting bracket

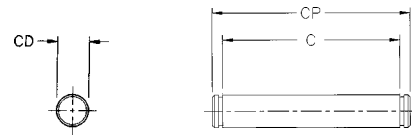
PART	P3	P4	P6	HP4	P12	HP6
CD	1/2	3/4	1	1 3/8	1 3/4	2
CL	1 3/4	2 1/2	3	4	4 7/8	5 1/8
CP	2 5/16	3 1/8	3 3/4	4 13/16	6 1/8	6



**Pivot Pin**

Comes complete with circlips  
Adapts to HC rod clevis or HCM clevis-type mounting bracket

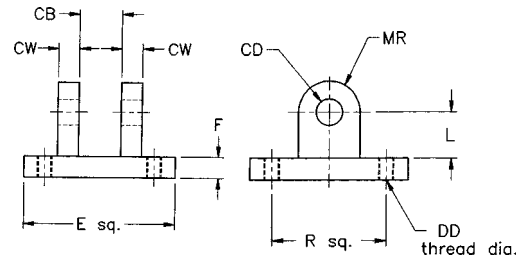
PART	P3-C	P4-C	P6-C	HP4-C	P12-C	HP6-C
CD	1/2	3/4	1	1 3/8	1 3/4	2
C	1 7/8	2 5/8	3 1/8	4 3/16	5 3/16	5 3/16
CP	2 3/32	2 7/8	3 3/8	4 1/2	5 9/16	5 9/16



**Clevis Type Mounting Bracket**

Adapts to STME mount cylinder or HM eye-type mounting bracket

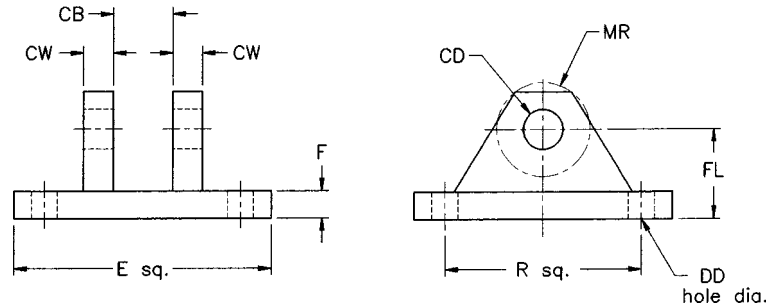
PART	HMP2-15T	HMP2-25T	HMP2-32T	HMP2-4T	HMP2-5T	HMP2-6T	HMP2-7T	HMP2-8T
CB	0.76	0.76	1.51	2.03	2.53	2.53	3.03	3.03
CD	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3
CW	1/2	5/8	3/4	1	1 1/4	1 1/4	1 1/2	1 1/2
DD	3/8-24	1/2-20	5/8-18	5/8-18	7/8-14	1-14	1 1/8-12	1 1/4-12
E	2 1/2	3 1/2	4 1/2	5	6 1/2	7 1/2	8 1/2	9 1/2
F	3/8	5/8	3/4	7/8	7/8	1	1	1
L	3/4	1 1/4	1 1/2	2 1/8	2 1/4	2 1/2	3	3 1/4
MR	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3
R	1.63	2.56	3.25	3.81	4.94	5.75	6.59	7.50



**Clevis Type Mounting Bracket**

Adapts to STME mount cylinder or HE rod eye

PART	HCM15	HCM2	HCM32	HCM4	HCM5	HCM6
CB	25/32	1 9/32	1 17/32	2 1/32	2 9/16	2 9/16
CD	1/2	3/4	1	1 3/8	1 3/4	2
CW	1/2	5/8	3/4	1	1 1/4	1 1/4
DD	13/32	17/32	21/32	21/32	15/16	1 1/16
E	3 1/2	5	6 1/2	7 1/2	9 1/2	12 3/4
F	1/2	5/8	3/4	7/8	7/8	1
FL	1 1/2	1 7/8	2 1/4	3	3 5/8	4 1/4
MR	1/2	3/4	1	1 3/8	1 3/4	2
R	2.55	3.82	4.95	5.73	7.50	9.40



**Pivot Pin for Self-Aligning Rod Eye**

Comes complete with cotter pins  
Adapts to HWM mounting bracket

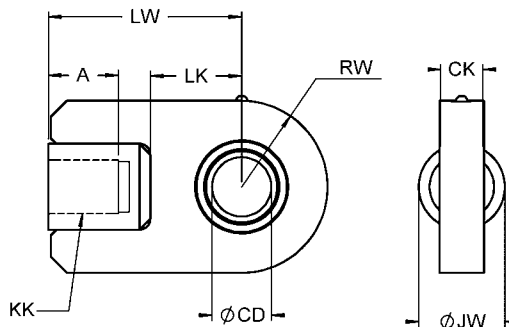
PART	HWP15	HWP2	HWP32	HWP4	HWP5
CD	1/2	3/4	1	1 3/8	1 3/4
CL	1 5/16	2	2 17/32	3 3/32	3 7/16
CP	1 7/8	2 9/16	3 3/16	3 3/4	4 3/16



**Self-Aligning Rod Eye - Female**

Adapts to male thread on piston rod

PART	HWE15	HWE2	HWE32	HWE4	HWE5
A	3/4	1 1/8	1 5/8	2	2 1/4
CD	1/2	3/4	1	1 3/8	1 3/4
CK	7/16	21/32	7/8	1 3/16	1 17/32
JW	3/4	1 3/8	1 1/2	2	2 1/2
KK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12
LW	1 3/4	2 3/4	3 5/8	4 1/2	5 5/8
RW	7/8	1 1/4	1 1/2	2	2 3/4
LK	5/8	1 1/4	1 5/8	2 1/8	2 5/8

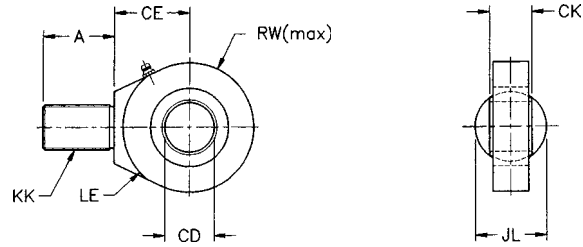




**Self-Aligning Rod Eye - Male**

Adapts to female thread on piston rod

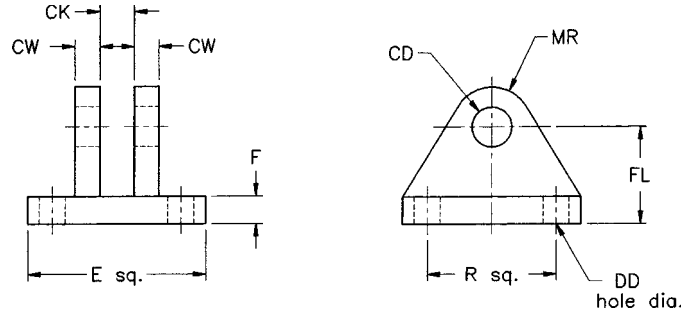
PART	HRES-1	HRES-2	HRES-3	HRES-4	HRES-5	HRES-6
A	11/16	1	1 1/2	2	2 1/8	2 7/8
CD	1/2	3/4	1	1 3/8	1 3/4	2
CE	7/8	1 1/4	1 7/8	2 1/8	2 1/2	2 3/4
CK	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4
JL	7/8	1 5/16	1 1/2	2	2 1/4	2 3/4
KK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12
LE	3/4	1 1/16	1 7/16	1 7/8	2 1/8	2 1/2
RW	7/8	1 1/4	1 3/8	1 13/16	2 3/16	2 5/8



**Mounting Bracket for Self-Aligning Rod Eye**

Adapts to LW mount cylinder, HWE and HRES rod eye

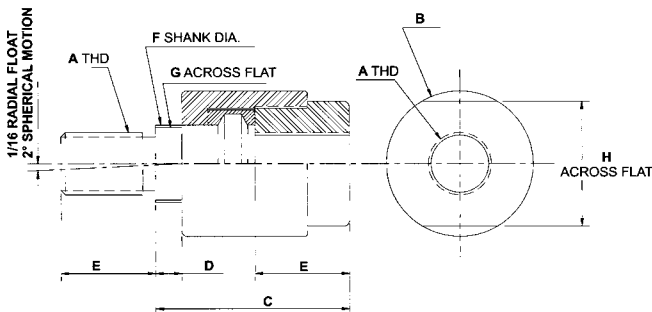
PART	HWM15	HWM2	HWM32	HWM4	HWM5	HWM6
CD	1/2	3/4	1	1 3/8	1 3/4	2
CK	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4
CW	5/16	1/2	5/8	3/4	3/4	7/8
DD	13/32	17/32	21/32	21/32	15/16	1 1/16
E	2 1/2	3 1/2	4 1/2	5	6 1/2	7 1/2
F	3/8	9/16	11/16	13/16	15/16	15/16
FL	1 1/2	2 1/16	2 7/16	3 1/16	3 15/16	4 3/16
MR	1/2	3/4	1	1 3/8	1 3/4	2
R	1.63	2.55	3.25	3.82	4.95	5.73



**LINEAR ALIGNMENT COUPLERS - Choose from 19 sizes**

Royal's linear alignment couplers extend the bearing and seal life of your cylinders. Our couplers prevent binding and Erratic movement that misalignment causes, which eventually wears down your cylinders.

Not only do Royal couplers work equally well in "push" and "pull" applications, but they allow a greater tolerance between the cylinder centerline and the mating member.



Use jam nut to lock coupler to rod when used with full diameter threads.

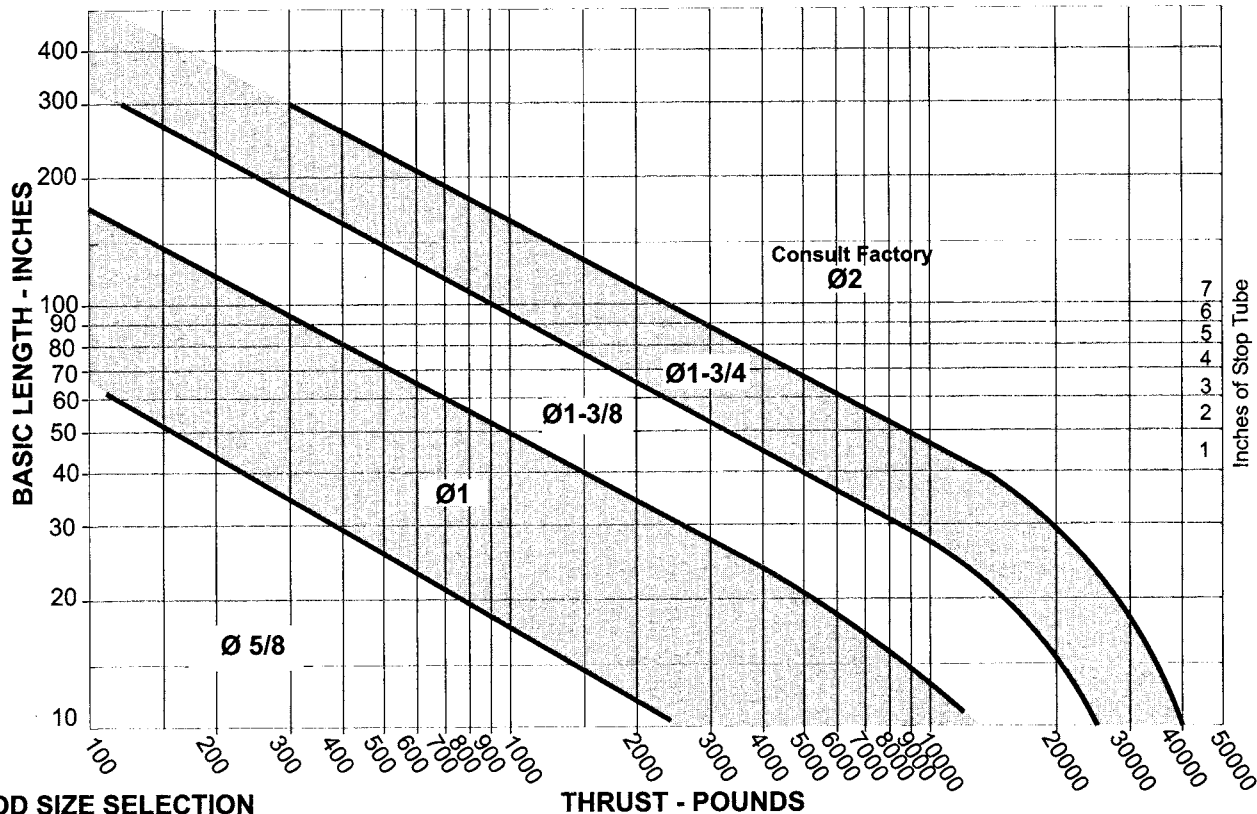
PART #	A	B	C	D	E	F	G	H	MAX PULL AT YIELD**
AC-250F	1/4-28	7/8	1 1/4	1/4	5/8	0.245	3/16	13/16	6000
AC-312F	5/16-24	7/8	1 1/4	1/4	5/8	0.308	1/4	13/16	8300
AC-375C	3/8-16	7/8	1 1/4	1/4	5/8	0.369	5/16	13/16	5000
AC-375F	3/8-24	7/8	1 1/4	1/4	5/8	0.370	5/16	13/16	8300
AC-437F	7/16-20	1 1/4	2	1/2	3/4	5/8	9/16	1 1/8	10000
AC-500C	1/2-13	1 1/4	2	1/2	3/4	5/8	9/16	1 1/8	14000
AC-500F	1/2-20	1 1/4	2	1/2	3/4	5/8	9/16	1 1/8	14000
AC-625F	5/8-18	1 1/4	2	1/2	3/4	5/8	1/2	1 1/8	14000
AC-750C	3/4-10	1 3/4	2 5/16	5/16	1 1/8	31/32	7/8	1 1/2	34000
AC-750F	3/4-16	1 3/4	2 5/16	5/16	1 1/8	31/32	7/8	1 1/2	34000
AC-875F	7/8-14	1 3/4	2 5/16	5/16	1 1/8	31/32	7/8	1 1/2	34000
AC-1000F	1-14	2 1/2	2 15/16	1/2	1 5/8	1 3/8	1 1/4	2 1/4	64000
AC-1000C	1-8	2 1/2	2 15/16	1/2	1 5/8	1 3/8	1 1/4	2 1/4	64000
AC-1250F	1-1/4-12	2 1/2	2 15/16	1/2	1 5/8	1 3/8	1 1/4	2 1/4	64000
AC-1375F	1-3/8-12	2 1/2	2 15/16	1/2	1 5/8	1 3/8	1 1/4	2 1/4	64000
AC-1500F	1-1/2-12	3 1/4	4 3/8	13/16	2 1/4	1 3/4	1 1/2	3	134000
AC-1750F	1-3/4-12	3 1/4	4 3/8	13/16	2 1/4	1 3/4	1 1/2	3	134000
AC-1875F	1-7/8-12	3 3/4	5 7/16	11/16	3	2 1/4	1 7/8	3 1/2	240000
AC-2000F	2-12	3 3/4	5 7/16	11/16	3	2 1/4	1 7/8	3 1/2	240000

Part numbers AC-250F through AC-1250F in UNF are stock items

\*\*4:1 safety factor included

Rod and Stop Tube Selection

ROD DIAMETER CHART



ROD SIZE SELECTION

THRUST - POUNDS

To determine the minimum recommended piston rod dia for your application, first determine the cylinder thrust using the force volume chart. (Page 2) (Thrust equals bore area multiplied by the operating pressure.)

Next select from the diagram below the type of mounting you will use. Then determine the basic length by multiplying the real stroke by the stroke factor. Enter the graph along the values of "basic length" and "Thrust". The stripe within which these lines intersect represents the minimum recommended piston rod diameter.

STOP TUBE SELECTION

Stop tubes are installed between the piston and the head on long stroke cylinders to reduce the load on the bearing. That, in turn, reduces bearing wear and tendency to buckle.

To determine if a stop tube is required and, if so, its length, first determine the "basic length" from the diagram ⇔⇔⇔. If the "basic length" is less than 40", no stop tube is needed. If its over than 40", a one-inch stop tube is recommended for every 10" (or fraction thereof) over 40"

Royal supplies two types of stop tubes for air cylinders. A cylinder with over two inches of stop tube, cushioned or not, utilizes dual piston construction for added bearing surface as well increasing distance between bearings. A cylinder requiring a stop tube under two inches uses a spacer only

MOUNTING STYLE		ROD END CONNECTION	STROKE FACTOR
<p><b>Center line Mounting</b> Centerline mounting places the mounting bolts in simple shear or simple tension so that the mechanism is protected from compound forces. Centerline mounting is a rigid mounting style and this requires accurate cylinder alignment to prevent damage to the cylinder working parts. Mountings are : MX1, MX2, MX3, MF1, MF2, ME3, ME4.</p> <p><b>Foot Mounting</b> Foot mounting secures the cylinder along its side. Since the mounting surface plane is thus not centered directly on the line of force, the mounting bolts are subjected to a significant amount of shear stress. Because foot mounts are rigid, they require accurate cylinder alignment. Mountings are : MS1, MS2, MS4, MS7.</p>			0.50
			0.70
			2.00
			4.00
<p><b>Pivot Mounting</b> Pivot mounting is used when the cylinder must pivot during piston motion. Clevis and Trunnion mounts are two methods used to allow this motion. The Clevis end design locates the pivot point at the cap end of the cylinder. Trunnion mounting uses the head or the cap of the cylinder to allow it to pivot at any of the two locations. The Mountings are: MP1, MP2, MP4, MT1, MT2, MT4.</p>	MT1 TRUNNION ON HEAD		1.00
	MT4 INTERMEDIATE TRUNNION		1.50
	MT2 TRUNNION ON CAP		2.00
	MP1, MP2, MP4 CLEVIS ON CAP		2.00

**EFFECT OF BUMPER SEAL ON TOTAL STROKE OF CYLINDERS:**

Extra Impact and Noise Reduction can be obtained by ordering the B option (see nomenclature page on back cover). If the operating pressure is below 100 psi, there will be a small reduction in effective stroke due to the Bumper Seal not fully compressing.

**REDUCTION OF TOTAL STROKE DUE TO BUMPER SEAL**

PSI	CYLINDER BORE					
	1.5	2	2.5	3.25	4	5
0	0.14	0.15	0.17	0.19	0.22	0.25
20	0.10	0.10	0.12	0.14	0.16	0.18
40	0.07	0.07	0.08	0.09	0.10	0.12
60	0.04	0.04	0.05	0.05	0.06	0.07
80	0.02	0.02	0.02	0.02	0.03	0.03
100	0.00	0.00	0.00	0.00	0.00	0.00

**CYLINDER WARRANTY:**

All cylinders are warranted, for a period of two years from date of shipment from our plant, to be free from defects in workmanship and material under correct use, normal operating conditions and proper applications. This warranty does not extend to goods damaged, subjected to accident, abuse or misuse after shipment from our factory, nor to goods altered or repaired by anyone other than authorized Royal representatives.

**CONTACT THE FACTORY FOR ANY OPTIONS NOT SHOWN**

**SPECIFYING AN "X" IN ANY FIELD REQUIRES AN EXPLANATION IN THE SPECIAL NOTES FIELD.**

ST														SPECIAL NOTES:		
SERIES	BORE	STYLE	STROKE	ROD MATERIAL	ROD SIZE	THREAD	CUSHIONS	BARREL	PORT LOC'N	PORT SIZE	OPTIONS	CUSTOM				
EXAMPLE	4	MP	12.188	A	1	A	1	A	1	A						
	1 1/2"															
	2"															
	2 1/2"															
	3 1/4"															
	4"															
	5"															
	6"															
	8"															
	10"															
	12"															

- BORE
- 1 1/2"
- 2"
- 2 1/2"
- 3 1/4"
- 4"
- 5"
- 6"
- 8"
- 10"
- 12"
- STYLE
- A
- B
- D
- E
- F
- FA
- G
- H
- MB
- MP
- NA
- NB
- NC
- R
- S
- TB
- TR
- END ANGLES (MS1)
- BLIND END RECT. FLANGE (MF2)
- DOUBLE ROD (MD)
- DETACHABLE B/E PIVOT EYE (MP4)
- FOOT MOUNT (MS2)
- END LUG FOOT MOUNT (MS7)
- GLAND END SQUARE MOUNTING (ME-3)
- BLIND END SQUARE MOUNTING (ME-4)
- DETACHABLE B/E CLEVIS (MP-1)
- EXTENDABLE B/E CLEVIS (MP-2)
- EXTENDED THE RODS BOTH ENDS (MX1)
- EXTENDED THE RODS BLIND END (MX2)
- EXTENDED THE RODS GLAND END (MX3)
- ROD END RECTANGULAR FLANGE (MF-1)
- SIDE TAPPED (MS4)
- BLIND END TRUNNION (MT2)
- ROD END TRUNNION (MT1)
- STROKE
- Inches
- ROD MATERIAL
- A
- E
- ROD SIZE
- 1
- 2
- 3
- ROD SIZE THREAD
- A
- B
- C
- D
- G
- X
- CUSHIONS
- 1
- 2
- 3
- 4
- BOTH ENDS (STANDARD ON 1 1/2"-5" BORES)
- NON CUSHIONED
- BLIND END ONLY
- ROD END ONLY
- BARREL
- A
- E
- ALUMINIUM (STANDARD)
- STAINLESS STEEL
- PORT LOC'N
- 1
- 2
- 3
- 4
- POS #1 (STANDARD)
- POS #2
- POS #3
- POS #4
- PORT SIZE
- A
- NPT PIPE (STANDARD)
- OPTIONS
- A
- B
- B1
- B2
- M
- N
- N1
- N3
- N4
- PS
- S
- V
- WF
- X
- THREAD LENGTH
- BUMPER SEAL BOTH ENDS
- BUMPER SEAL ROD END
- BUMPER SEAL BLIND END
- MAGNET IN PISTON
- MANIFOLD FOR MANUR VALVE
- NEEDLE VALVE @ POS. #1
- NEEDLE VALVE @ POS. #3
- NEEDLE VALVE @ POS. #4
- PISTON STOP
- STAINLESS STEEL THE RODS AND LOCK NUTS
- HIGH TEMPERATURE SEALS
- ROD EXTENSION
- OTHER OPTIONS-SPECIFY
- CUSTOM
- X
- ASSIGNED BY WESTCOAST CYLINDERS

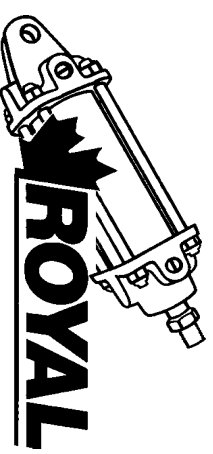
- NITROTEC TREATED
- CHROME PLATED STAINLESS STEEL
- (STANDARD) ROD #1
- (OVERSIZE) ROD #2
- (DOUBLE OVERSIZE) ROD #3
- STANDARD THREAD
- OVERSIZE THREAD, CC
- FULL THREAD
- FEMALE THREAD
- ROD STUD (KK ONLY)
- OTHER-SPECIFY

**EXAMPLE "ST4F12.188A1D1A1A"**

\*Contact Factory for mounting dimensions

An "X" in any field requires an explanation in special notes.

Consult factory for options not shown.



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