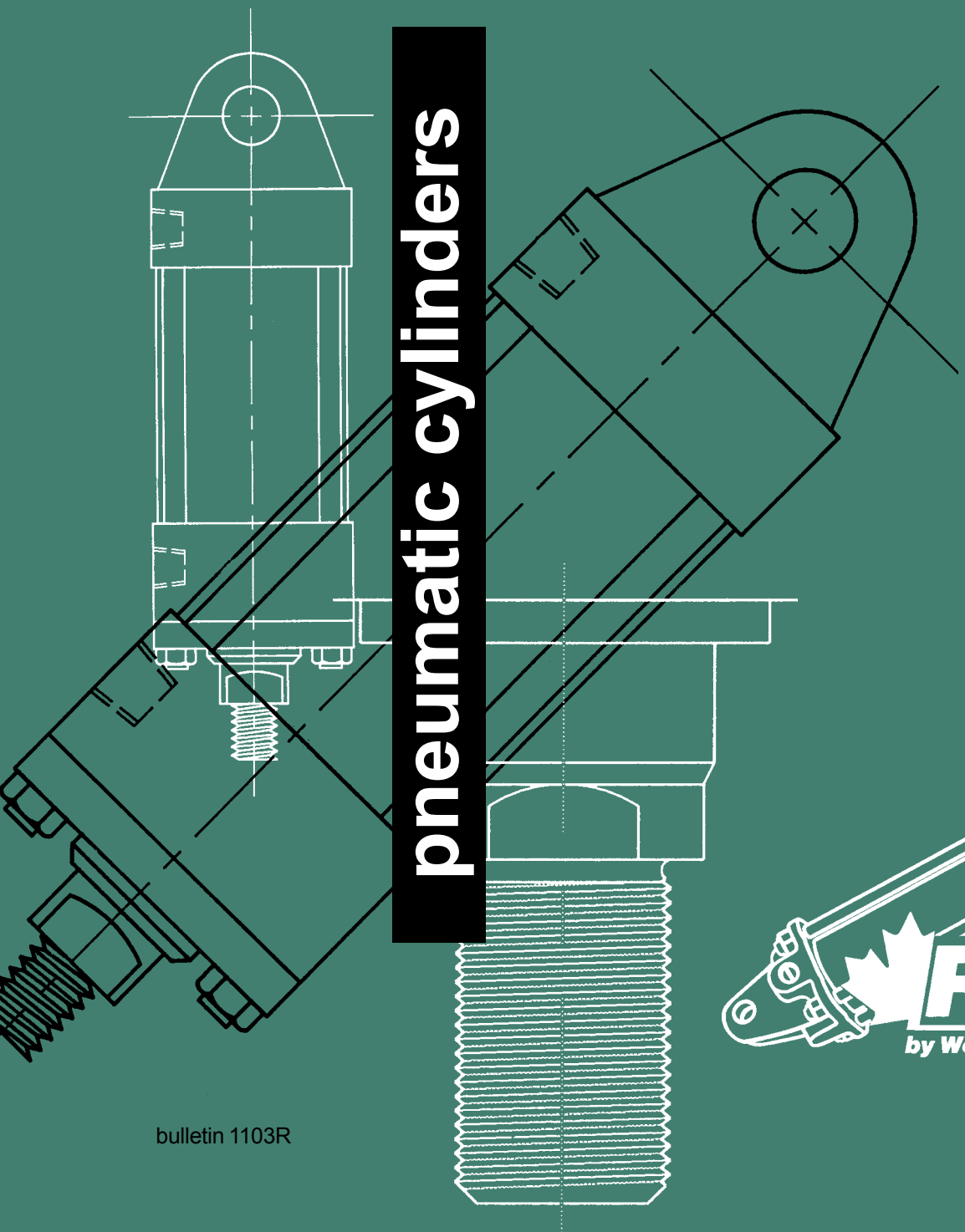
250
psi rating

series R

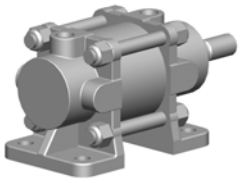


pneumatic cylinders

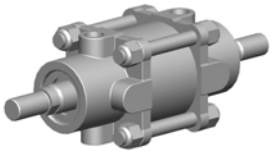
ROYAL
by Westcoast Cylinders Inc.

bulletin 1103R

www.royalcylinders.com

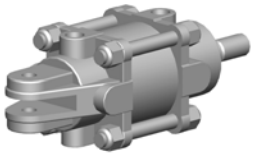


4 Foot Mount



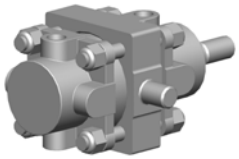
5 Double Rod

6 Clevis Mount

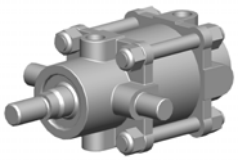


7 Heavy Duty Clevis

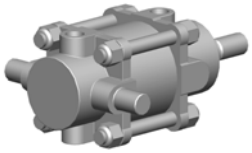
8 Mid Trunnion



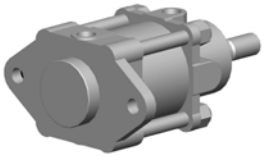
9 Heavy Duty Trunnion



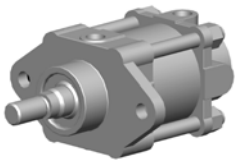
10 Rod End Trunnion



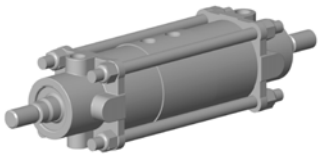
11 Blind End Trunnion



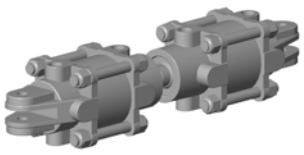
12 Blind End Flange



13 Rod End Flange



14 Common



14 Common Rod

Westcoast Cylinders Inc.

225 Edworthy Way
New Westminster BC
Canada V3L 5G4
Telephone: 604 527 1120
Facsimile: 604 527 1170
Phone Toll Free: 1 877 637 6925
Fax. Toll Free: 1 866-527-1170
email: sales@royalcylinders.com
website: www.royalcylinders.com

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.

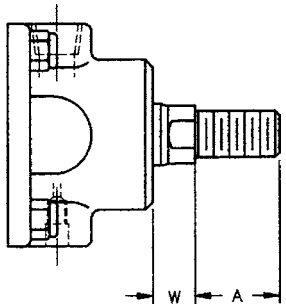
Delivery: WCI maintains a large range of stock parts which gives us the flexibility to respond to your needs in emergency situations. Please contact the factory to expedite your special requirements.

M-SERIES TO R-SERIES CROSS-OVER INFORMATION

All M-series cylinder mounting styles are available in the R-Series with some changes to the cylinder nomenclature (model code) as follows:

1. In the Rod Size field of the Cylinder Nomenclature specify Rod size #2.
2. All R-Series piston rods must have a Rod Extension to match the M-Series rods. To do this, specify "W" in the Options field of the Cylinder Nomenclature. Then specify what the "W" length should be; see conversion table below. Note: Not Required for MT Mid Trunnion Style.

Important R-Series Dimensions for M-Series cross-over.



Conversion to R-Series from M-Series, H1F1 piston rod thread:

R-Series H1F1 Conversion Table

BORE	3	4	5	6	8	10	12
W	7/8	7/8	13/16	1 1/16	1 1/16	1 1/8	1 3/8

3. The M-Series offered two different standard rod thread sizes: H1F1 and H2F2.

H1F1: This is equivalent to the standard R-Series thread on the Rod size #2.
H2F2: This is a full thread option with a longer thread length. If your existing cylinder features this thread you must specify the following:

a. Specify "C" in the Rod Thread field of the Cylinder Nomenclature for full thread.
b. Specify "A" along with "W" in the Options field of the Cylinder Nomenclature. Then specify what the thread length should be. See the Thread Length Table below for R-Series thread length specifications.

Conversion to R-Series from M-Series, H2F2 piston rod thread:

R-Series H2F2 Conversion Table

BORE	3	4	5	6	8	10	12
A	2 1/8	2 1/2	2 1/2	3 1/2	4	4 1/2	4 1/2
W	7/8	7/8	13/16	1 1/16	1 1/16	1 1/8	1 3/8

Example
H2F2 option
R4HC12A2**C**1A1A**AW,A=2.5,W=0.875**

Please contact the factory if you require assistance.

NITROTEC TREATED MATERIALS

Nitrotec is a patented furnace treatment process, which converts the steel surface into an extremely hard black iron nitride layer. It is superior to chrome plating in that the nitriding is diffused into the steel surface rendering the surface nonporous. ***Nitrotec*** delivers a superior case hardness of up to 71 Rc, improves corrosion resistance and minimizes friction loss for long seal and gland bushing life.

The ***Nitrotec*** process gives an extremely hard dent resistant finish to materials. The hardness varies from maximum at the surface to the material condition at a depth of 0.015", a vast improvement compared with a typical 0.0005" to 0.001" thick chrome plate. There is no flaking or lifting as with overlying chrome on a softer material.

Nitrotec Piston Rod

The piston rod is ***Nitrotec*** treated C1045 carbon steel. Other rod materials are available including chrome plated 316 stainless steel and chrome plated carbon steel. The piston shoulder diameter has been increased to obtain a higher service factor for this area.

Nitrotec Barrel

Nitrotec treated steel is the standard barrel material. Other materials include Amalgon and Brass.

IMPROVED CUSHIONS

- Floating Check Seals
- Adjustable Cushions are standard at both ends. The cushions have been redesigned with a new floating check seal that provides quick and reliable breakaway performance while improving cushion effect. Seals are made from long wearing ***Hythane***® material.
- Longer Effective Cushion
- Our cushion sleeves have been lengthened with a new profile to provide a more effective cushion. A steel sleeve pushes the seal against the head and traps escaping air between the piston and head. Adjusting the needle valve sets the cushion speed. On the return stroke, the cushion seal is forced away from the head by air pressure, allowing the air to flow back into the cylinder at full pressure for a fast break away.
- Normal position for needle valves are at position number 3 (opposite the port in position number 1) except for Foot Mount which is at position 2.

PISTON STOPS

Standard external or optional internal piston stops are available to reduce side load stress on the piston rod for all cylinder sizes.

ONE PIECE ALUMINUM PISTON

Piston is a one piece design, aluminum construction, incorporating a wear ring centered on the piston to avoid metal to metal contact, and increase the life of the cylinder. A piston is also available with a magnet for sensing piston position using a Reed Switch. Proximity switches can also be fitted to the R-Series. Contact our factory for more information.

HYTHANE PISTON SEAL

Hythane® K-Seals are the standard in the 3" bores and above. This design prevents rolling or extrusion, also providing less friction and longer life.

Optional seals are available upon request, including ***Viton***® ***Flouromite***, etc. Contact our factory for application information.

ROTO-CAST GLAND BUSHING

Gland bushing is manufactured from Roto-Cast Bronze. The ***Hythane***® rod seal is a high performance, high temperature seal compound having ultra low friction and long seal life. It's documented temperature range is from -40° to 230°F. The ***Hythane***® rod wiper, with internal ribs for extra stability and prevention of pressure trapping, cleans the rod on the return stroke. The static external seal is Buna-N material. Spiral Snap Ring retainer allows for easy removal of gland bushing for maintenance without dismantling the cylinder.

Optional gland bushings are also available with a wear ring, avoiding metal to metal contact and contributing to longer life for both the gland bushing and the piston rod. Vee-packing glands are also available. See Nomenclature for other options.

CAST DUCTILE IRON HEADS

Heads are cast of ductile iron and are accurately machined for perfect alignment of barrel and moving parts. Heads are now common for the different rod sizes, thus allowing the end user to stock a single head for both rod sizes. The common head design also enables customers to increase or decrease rod sizes with little effort or expense.

NPTF PORTS

NPTF Ports are standard at position 1. Specify if other port positions are required. SAE ports are available for an additional cost. There may be port restrictions on some models. Contact our factory for details.

Note: For faster delivery when specifying a non-standard port, try to choose an alternate port location for the port (port position #2 preferred). Contact our factory for confirmation on bore size constraints.

REDUCED PRESSURE REQUIREMENTS

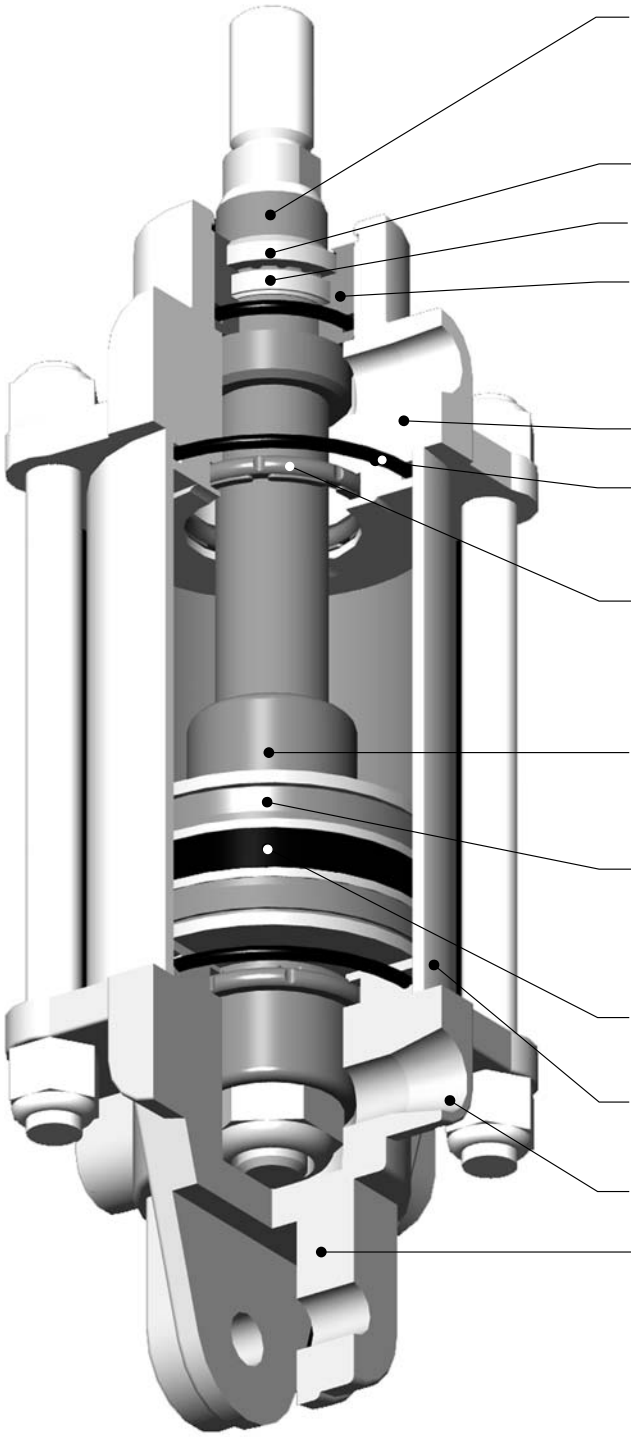
The combination of seals and materials used within Royal air cylinders reduces internal friction and thus has the ability to reduce air pressure requirements. Reducing air pressure reduces consumption costs. Testimonials from customers have reported a reduction in pressure from 10 to 30%.

CUSTOM CYLINDERS

If our standard product does not meet your requirements, WCI will manufacture custom cylinders to suit your application or design request. Please contact our factory with your requests.

SPARE PARTS

Genuine Royal seal kits include all seal components, wear rings and needle valves**. Please be sure to specify genuine Royal replacement parts to ensure you will receive all feature benefits**.



Nitrotec treated piston rod for:
• long life
• dent resistance
• corrosion resistance

Hythane rod wiper

Hythane rod seal

Roto-cast gland bushing
also available with a wear ring to avoid metal to metal contact. Good for poor lube applications.

Cast ductile iron heads

Buna-N O-ring seals
Others available.
Contact our factory for information.

Hythane floating check seal:
provides quick and reliable break-away performance while improving cushion effect

Longer effective cushion:
provides more adjustability and is able to absorb more kinetic energy

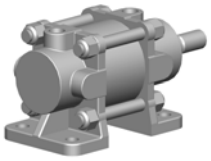
Hythane piston seals:
the K-seal design prevents rolling or extrusion, and the Hythane material provides less friction and longer life

Wear ring centred on piston
to avoid metal to metal contact

Nitrotec treated steel is the standard barrel material

NPTF ports are standard

Cast ductile iron heads



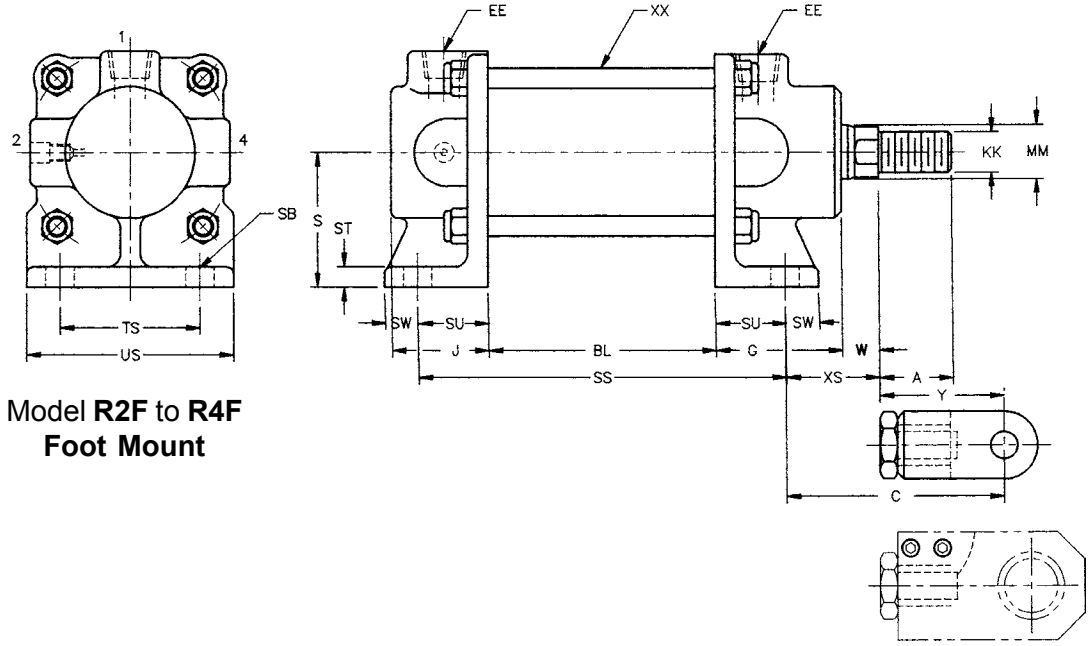
model **RF** Foot Mount

BORE	ROD	ROD DIA MM	KK	CC	A	C	W	ADD STROKE BL	ADD STROKE SS	S	SB	ST	SU	SW	TS	US	XS	EE	G	J	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3 1/2	3/8	2	4 3/8	2 1/8	3/8	5/16	1 3/16	1/2	2	2 7/8	1 1/8	3/8	1 15/16	1 3/8	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	3 11/16	1/2										1 1/4					2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	4	1/2	2 1/4	4 7/8	2 1/2	1/2	3/8	1 5/16	5/8	2 5/8	3 5/8	1 9/16	3/8	2 3/8	1 13/16	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	4 11/16	7/16										1 1/2					3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	4 15/16	7/16	2 3/8	5 3/8	3	1/2	1/2	1 1/2	5/8	3 7/8	4 5/8	1 3/4	1/2	2 13/16	2 1/16	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5 9/16	3/8										1 11/16					3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	4 7/8	3/8	2 3/8	5 1/2	3 11/16	1/2	1/2	1 9/16	5/8	4 3/8	6 3/8	1 11/16	1/2	2 7/8	2 5/16	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5 1/2	5/16										1 5/8					3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	6 5/16	7/16	2 5/8	5 5/8	4 3/8	1/2	9/16	1 1/2	7/8	5 7/8	7 3/4	2 7/16	3/4	3 1/2	3 1/8	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	7 1/16	1/2										2 1/2					4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	7 5/32	1/2	2 3/4	7 5/16	5 3/4	5/8	11/16	2 9/32	27/32	8 1/4	9 3/4	2 19/32	1	4 3/8	3 3/8	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	8 21/32	11/16										2 25/32					5 7/8

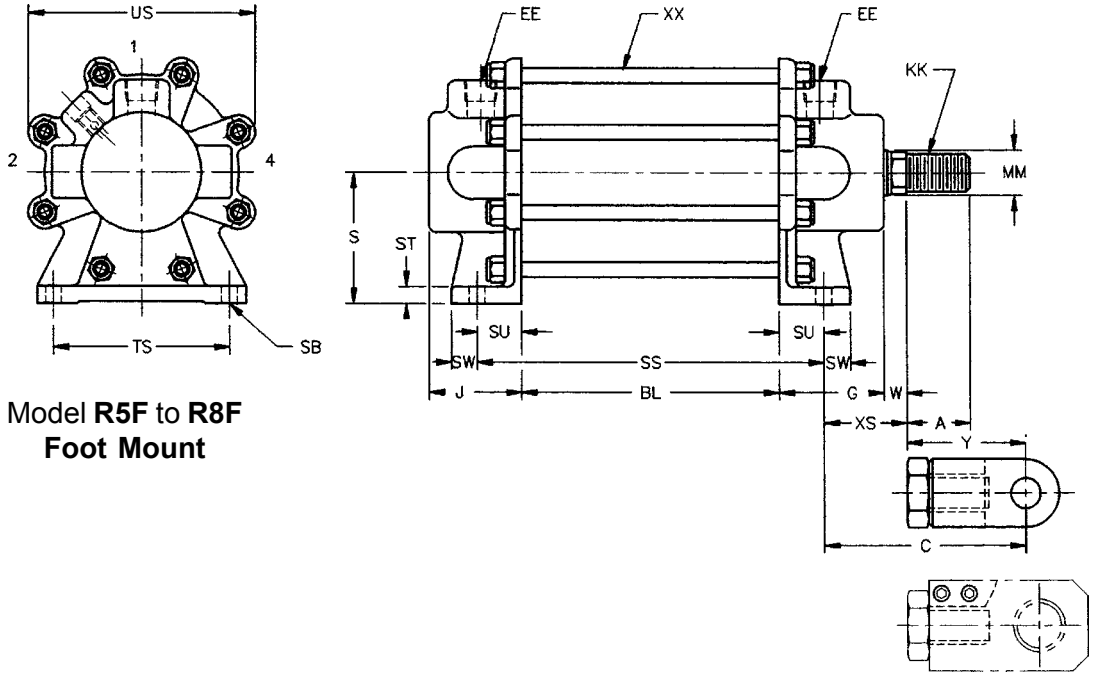
Notes:

1. All dimensions in inches.
2. EE dimension specifies NPTF port.
   Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

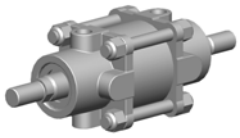
* For Female Thread, KK = 7/16-20, A = 3/4"



Model **R2F** to **R4F**
Foot Mount



Model **R5F** to **R8F**
Foot Mount

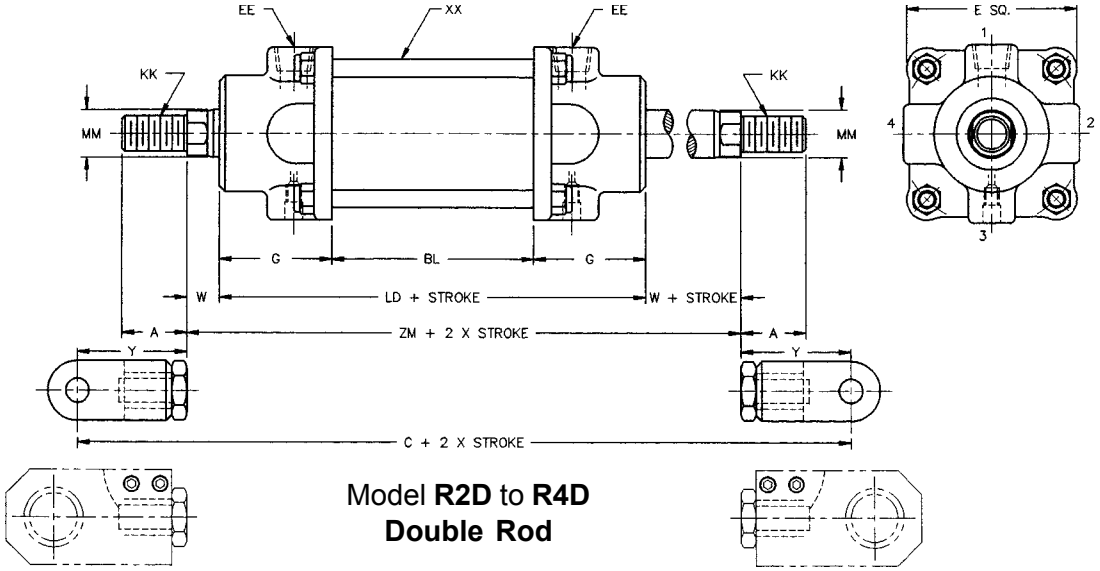


BORE	ROD	ROD DIA MM	KK	CC	A	W	ADD STROKE BL	ADD STROKE LD	STROKE x 2 C	STROKE x 2 ZM	E	EE	G	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3/8	2	5 7/8	11 3/8	6 5/8	2 7/8	3/8	1 15/16	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	1/2			11 3/4	6 7/8					2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	1/2	2 1/4	7	12 7/8	8	3 5/8	3/8	2 3/8	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16			14 1/4	7 7/8					3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	2 3/8	8	15 1/4	8 7/8	4 5/8	1/2	2 13/16	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8			16 1/2	8 3/4					3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	2 3/8	8 1/8	15 1/4	8 7/8	6 3/8	1/2	2 7/8	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16			16 1/2	8 3/4					3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	2 5/8	9 5/8	18 1/4	10 1/2	7 3/4	3/4	3 1/2	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2			19 3/4	10 5/8					4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	2 3/4	11 1/2	21 5/8	12 1/2	9 3/4	1	4 3/8	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16			24 5/8	12 7/8					5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	3 1/2	13 3/4	27	15 1/4	11 3/4	1 1/4	5 1/8	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	1			30 1/2	15 3/4					7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	1	4 1/4	17 1/2	34 1/4	19 1/2	14 1/4	1 1/2	6 5/8	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1			34 1/4	19 1/2					7 3/8

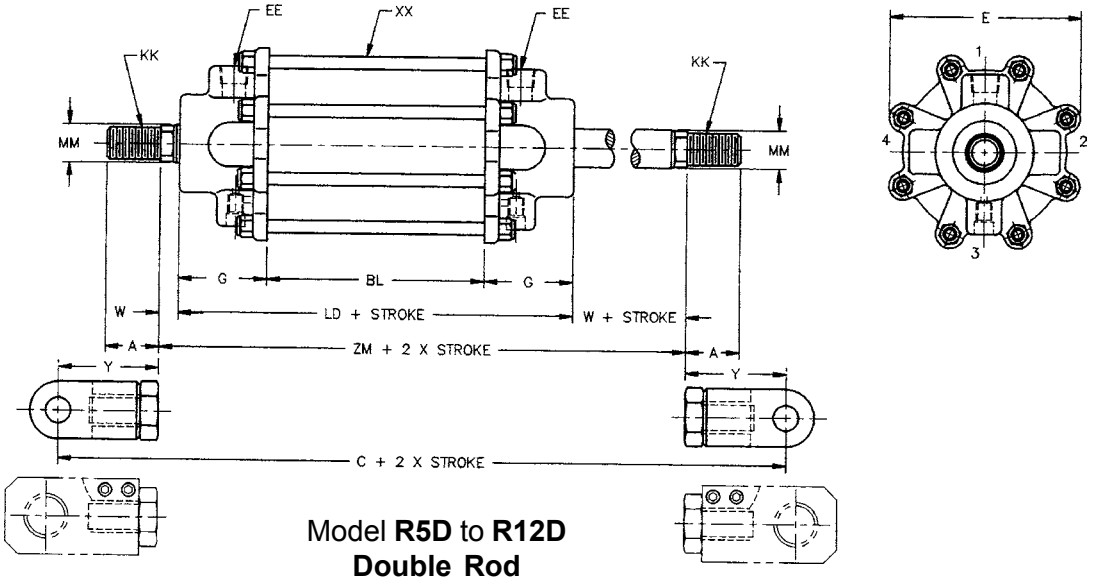
Notes:

1. All dimensions in inches.
2. EE dimension specifies NPTF port.
   Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

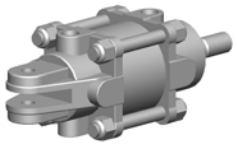
* For Female Thread, KK = 7/16-20, A = 3/4”



Model **R2D** to **R4D**
Double Rod



Model **R5D** to **R12D**
Double Rod



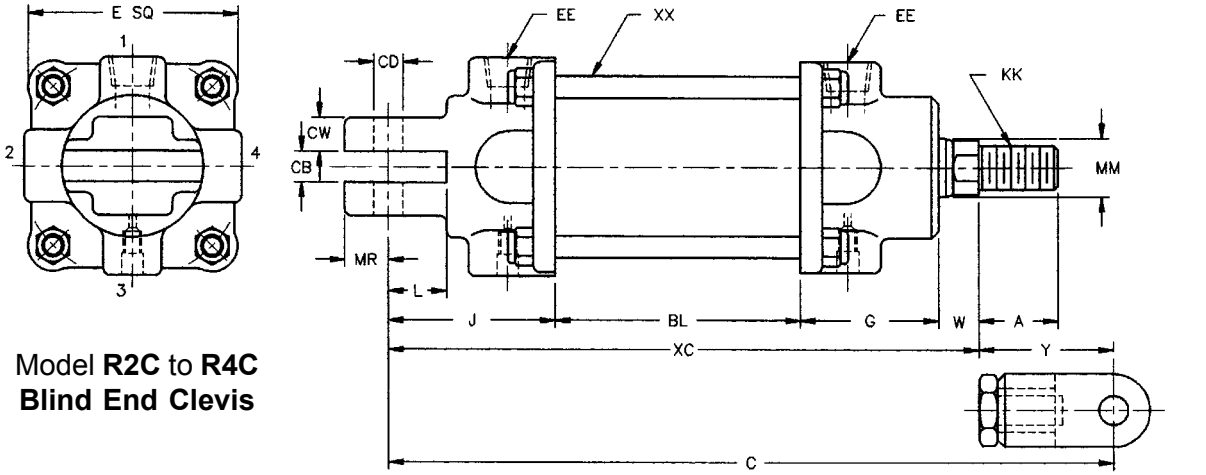
model **RC** Blind End Clevis

BORE	ROD	ROD DIA MM	KK	CC	A	W	ADD STROKE BL	ADD STROKE C	ADD STROKE XC	CB	CD	CW	E	EE	G	J	L	MR	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3/8	2	9	6 5/8	17/32	1/2	1/2	2 7/8	3/8	1 15/16	2 5/16	7/8	5/8	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	1/2		9 3/16	6 3/4											2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	1/2	2 1/4	10 7/16	8	17/32	1/2	5/8	3 5/8	3/8	2 3/8	2 7/8	1	3/4	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16		11 1/8	7 15/16											3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	2 3/8	12 3/16	9	25/32	3/4	3/4	4 5/8	1/2	2 13/16	3 3/8	1 3/16	1	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8		12 13/16	8 15/16											3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	2 3/8	12 5/16	9 1/8	25/32	3/4	7/8	6 3/8	1/2	2 7/8	3 1/2	1 3/16	1	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16		12 15/16	9 1/16											3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	2 5/8	14 13/16	10 15/16	1 1/32	1	15/16	7 3/4	3/4	3 1/2	4 3/8	1 1/4	1 1/4	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2		15 9/16	11											4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	2 3/4	17 5/16	12 3/4	1 5/16	1 1/4	1 1/4	9 3/4	1	4 3/8	5 1/8	1 3/4	1 1/2	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16		18 13/16	12 15/16											5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	3 1/2	21 1/8	15 1/4	1 9/16	1 1/2	1 7/16	11 3/4	1 1/4	5 1/8	5 7/8	2	1 3/4	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	1		22 7/8	15 1/2											7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	1	4 1/4	26 1/8	18 3/4	2 1/16	1 3/4	1 5/8	14 1/4	1 1/2	6 5/8	6 7/8	2 3/8	2 1/8	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1		26 1/8	18 3/4											7 3/8

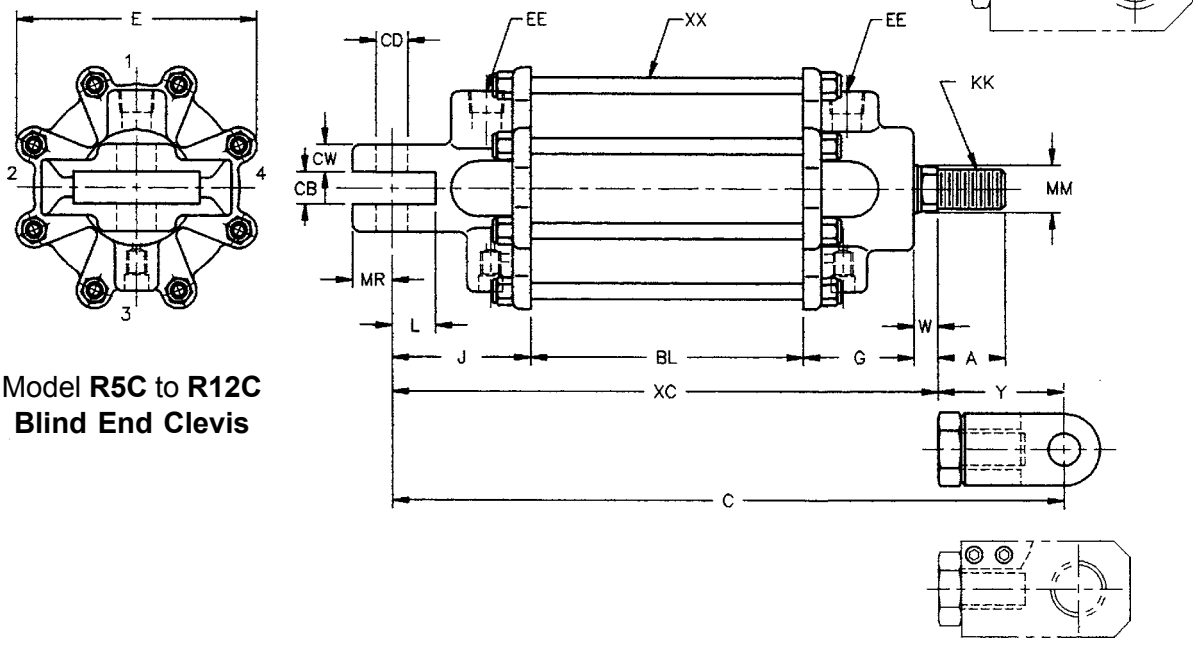
Notes:

1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

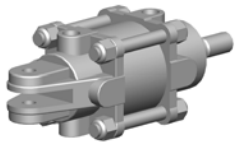
* For Female Thread, KK = 7/16-20, A = 3/4”



Model **R2C** to **R4C**
Blind End Clevis



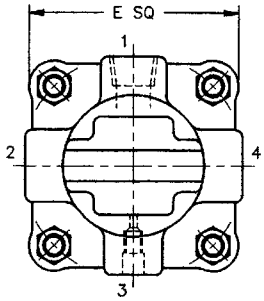
Model **R5C** to **R12C**
Blind End Clevis

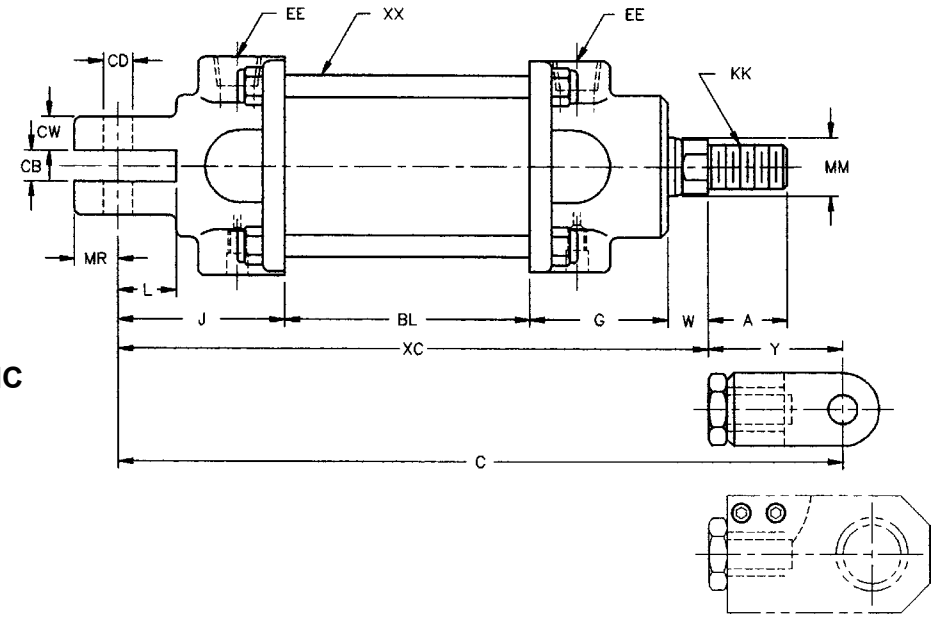


BORE	ROD	ROD DIA MM	KK	CC	A	W	ADD STROKE BL	ADD STROKE C	ADD STROKE XC	CB	CD	CW	E	EE	G	J	L	MR	XX	Y
3	1	1	3/4-16	7/8-14	1 3/8	1/2	2 1/4	10 11/16	8 1/4	25/32	3/4	13/16	3 5/8	3/8	2 3/8	3 1/8	1 1/4	1	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16		11 3/8	8 3/16											3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	2 3/8	12 7/8	9 11/16	1 1/32	1	15/16	4 5/8	1/2	2 13/16	4 1/16	1 7/8	1 1/8	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8		13 1/2	9 5/8											3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	2 3/8	12 7/8	9 11/16	1 1/32	1	15/16	6 3/8	1/2	2 7/8	4 1/16	1 7/8	1 1/8	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16		13 1/2	9 5/8											3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	2 5/8	15 5/16	11 7/16	1 5/16	1 1/4	1 7/32	7 3/4	3/4	3 1/2	4 7/8	1 3/4	1 1/2	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2		16 1/16	11 1/2											4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	2 3/4	17 13/16	13 1/4	1 9/16	1 1/2	1 7/16	9 3/4	1	4 3/8	5 5/8	2 1/4	1 7/8	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16		19 5/16	13 7/16											5 7/8

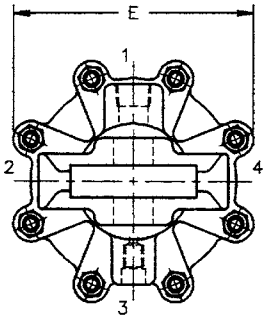
Notes:

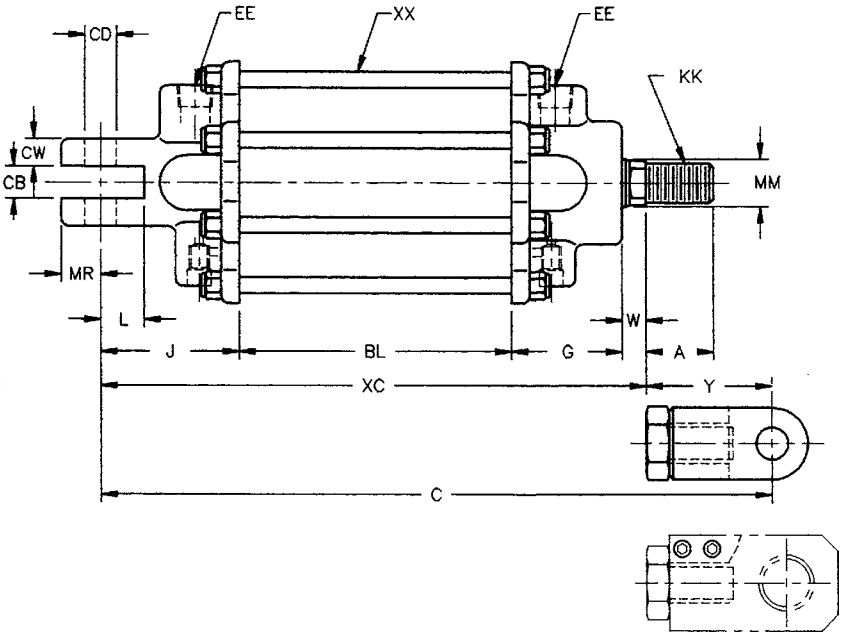
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. M-Series M2C Equivalent.
5. For Optional Rod Ends and dimensions see page16.



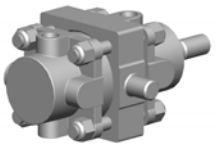


Model **R3HC** and **R4HC**
Heavy Blind Clevis





Model **R5HC** and **R8HC**
Heavy Blind Clevis



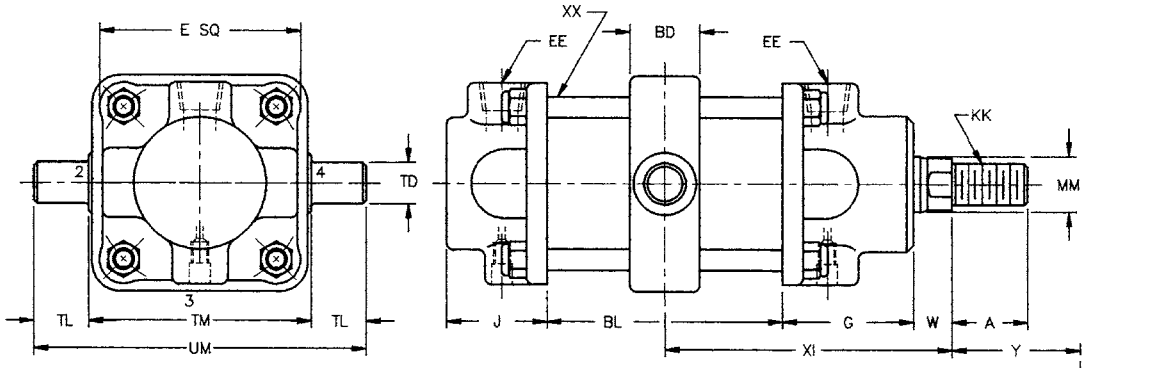
model **RT** Mid Trunnion

BORE	ROD	ROD DIA MM	KK	CC	A	W	Model T Dimensions																							
							XI min	ADD STROKE XI max	BL	BD	TD	TL	TM	UM	E	EE	G	J	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3/8	2 7/8	3 3/4	2	1	3/4	1	3	5	2 7/8	3/8	1 15/16	1 3/8	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	1/2	3	3 7/8												2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	1/2	3 9/16	4 7/16	2 1/4	1 1/4	3/4	1	4	6	3 5/8	3/8	2 3/8	1 13/16	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16	3 1/2	4 3/8												3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	4 1/16	4 13/16	2 3/8	1 1/2	1	1 1/4	5 1/4	7 3/4	4 5/8	1/2	2 13/16	2 1/16	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8	4	4 3/4												3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	4 1/16	4 13/16	2 3/8	1 1/2	1	1 1/4	6 1/2	9	6 3/8	1/2	2 7/8	2 5/16	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16	4	4 3/4												3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	4 7/8	5 5/8	2 5/8	1 3/4	1 1/4	1 1/2	8	11	7 3/4	3/4	3 1/2	3 1/8	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2	4 15/16	5 11/16												4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	6 3/16	6 5/16	2 3/4	2 1/2	1 3/4	2	10	14	9 3/4	1	4 3/8	3 3/8	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16	6 3/8	6 1/2												5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	7 9/16	7 11/16	3 1/2	3 1/4	2	2 3/8	13	17 3/4	11 3/4	1 1/4	5 1/8	3 7/8	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	1	7 13/16	7 15/16												7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	1	9 11/16	9 13/16	4 1/4	4	2 1/2	2 3/4	15 1/2	21	14 1/4	1 1/2	6 5/8	4 1/2	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1	9 11/16	9 13/16												7 3/8

Notes:

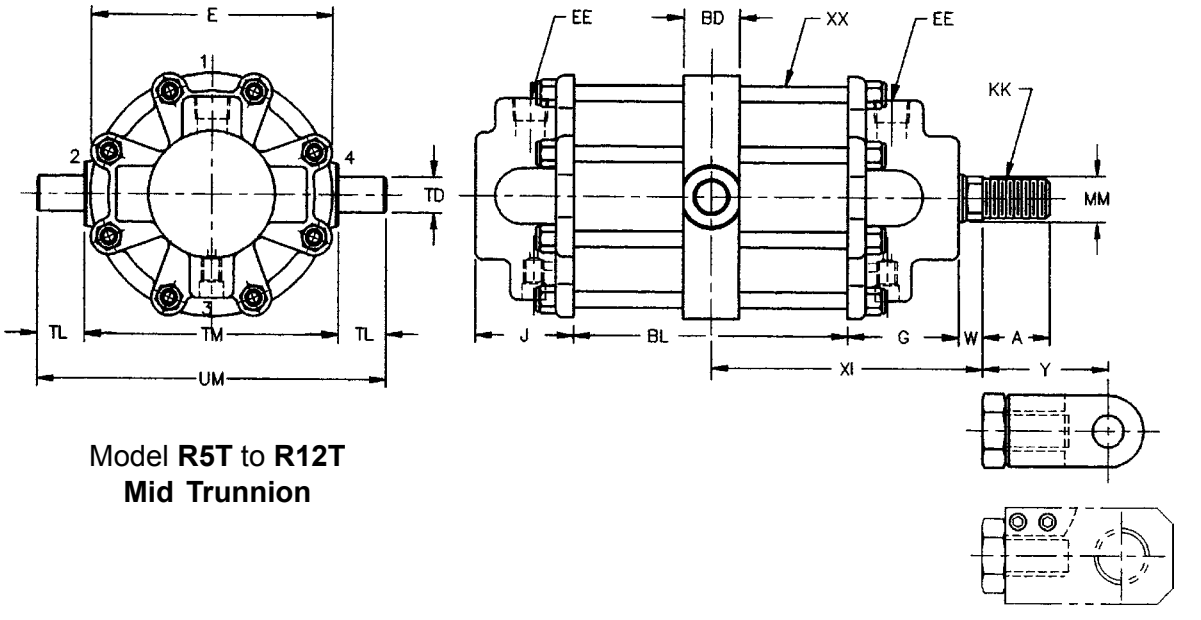
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

* For Female Thread, KK = 7/16-20, A=3/4"

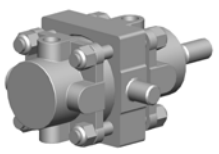


Model **R2T** to **R4T**
Mid Trunnion

Warning
Trunnion Mounted Cylinders swivel in one direction only and are designed to carry shear loads. Pins must be held rigidly and in accurate alignment. Improper mounting may result in premature failure.
Note: Specify XI value when ordering Mid Trunnion Mounted Cylinders.



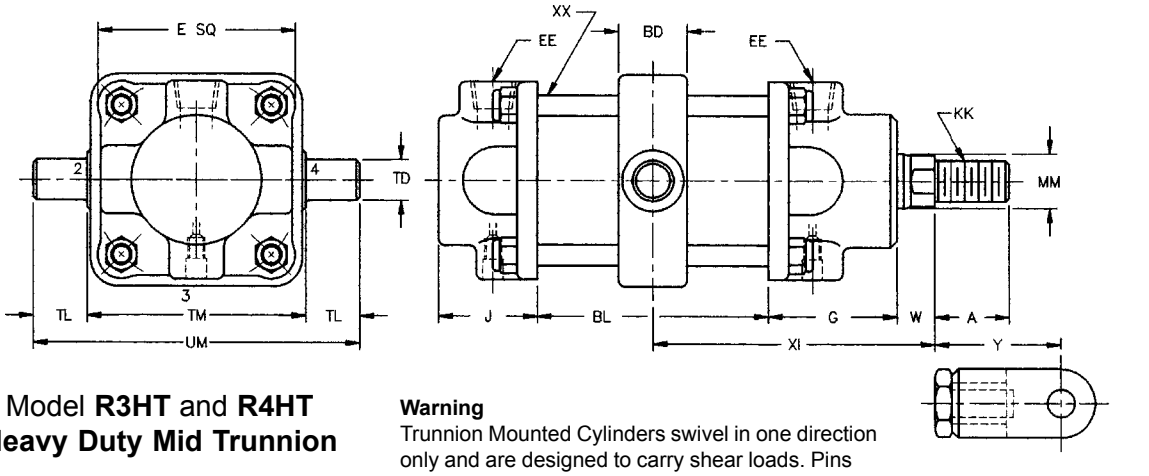
Model **R5T** to **R12T**
Mid Trunnion



								Model HT Dimensions																									
			ROD DIA						ADD STROKE																								
BORE	ROD		MM	KK	CC		A	W	XI min		XI max		BL		BD		TD		TL		TM		UM		E		EE		G		J		XX		Y	
3	1	1		3/4-16	7/8-14	1	3/8	1/2	3	9/16	4	7/16	2	1/4	1	1/4	1		1		4		6		3	5/8	3/8		2	3/8	1	13/16	3/8	2	7/16
	2	1	1/4	1-14	N/A	1	3/4	7/16	3	1/2	4	3/8																					3	3/16
4	1	1	1/4	1-14	N/A	1	3/4	7/16	4	1/16	4	13/16	2	3/8	1	1/2	1	1/4	1	1/4	5	1/4	7	3/4	4	5/8	1/2		2	13/16	2	1/16	1/2	3	3/16
	2	1	1/2	1 1/4-12	N/A	2	1/8	3/8	4		4	3/4																					3	7/8
5	1	1	1/4	1-14	N/A	1	3/4	3/8	4	1/16	4	13/16	2	3/8	1	1/2	1	3/8	1	3/8	6	1/2	9	1/4	6	3/8	1/2		2	7/8	2	5/16	3/8	3	3/16
	2	1	1/2	1 1/4-12	N/A	2	1/8	5/16	4		4	3/4																					3	7/8
6	1	1	1/2	1 1/4-12	N/A	2	1/8	7/16	4	7/8	5	5/8	2	5/8	1	3/4	1	1/2	1	1/2	8		11		7	3/4	3/4		3	1/2	3	1/8	1/2	3	7/8
	2	2		1 1/2-12	1 3/4-12	2	1/2	1/2	4	15/16	5	11/16																					4	9/16
8	1	2		1 1/2-12	1 3/4-12	2	1/2	1/2	6	3/16	6	5/16	2	3/4	2	1/2	2		2		10		14		9	3/4	1		4	3/8	3	3/8	1/2	4	9/16
	2	2	1/2	2-12	2 1/4-12	3	1/2	11/16	6	3/8	6	1/2																					5	7/8
10	1	2	1/2	2-12	2 1/4-12	3	1/2	3/4	7	9/16	7	11/16	3	1/2	3	1/4	2	1/2	2	1/2	13		18		11	3/4	1	1/4	5	1/8	3	7/8	5/8	5	7/8
	2	3		2 1/2-12	2 3/4-12	4	1/2	1	7	13/16	7	15/16																					7	3/8
12	1	3		2 1/2-12	2 3/4-12	4	1/2	1	9	11/16	9	13/16	4	1/4	4		3	1/4	3	1/4	15	1/2	22		14	1/4	1	1/2	6	5/8	4	1/2	3/4	7	3/8
	2	3	1/2	2 1/2-12	3 1/4-12	4	1/2	1	9	11/16	9	13/16																					7	3/8

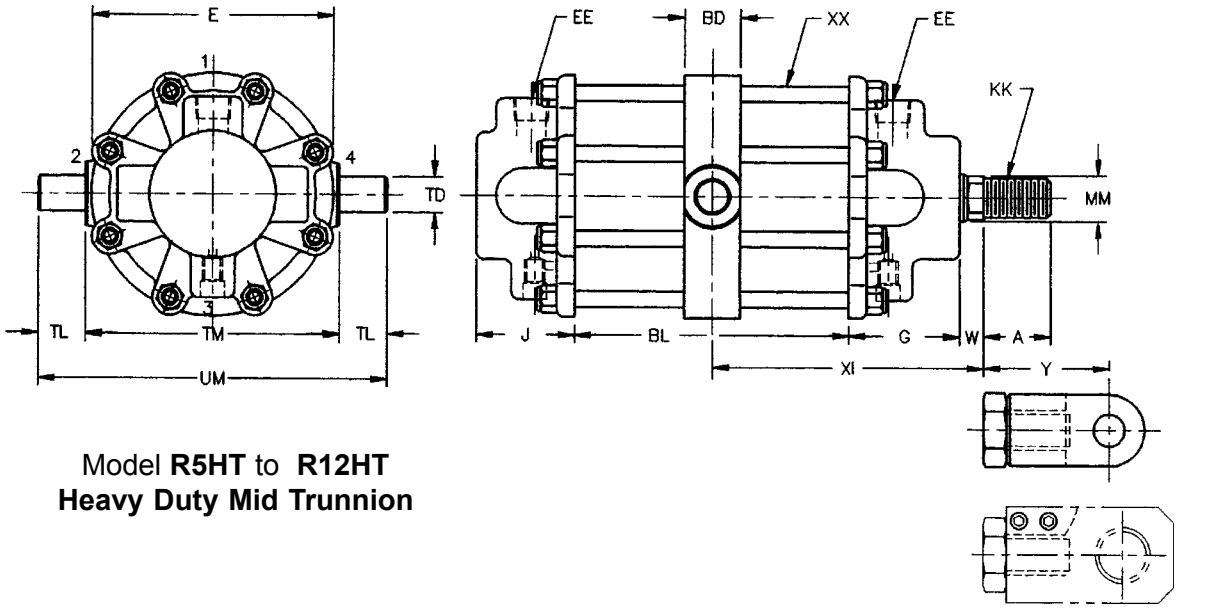
Notes:

1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. M-Series MT Equivalent.
5. For Optional Rod Ends and dimensions see page16.

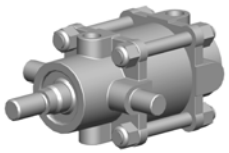


Model **R3HT** and **R4HT**
Heavy Duty Mid Trunnion

Warning
Trunnion Mounted Cylinders swivel in one direction only and are designed to carry shear loads. Pins must be held rigidly and in accurate alignment. Improper mounting may result in premature failure.
Note: Specify XI value when ordering Mid Trunnion Mounted Cylinders.



Model **R5HT** to **R12HT**
Heavy Duty Mid Trunnion



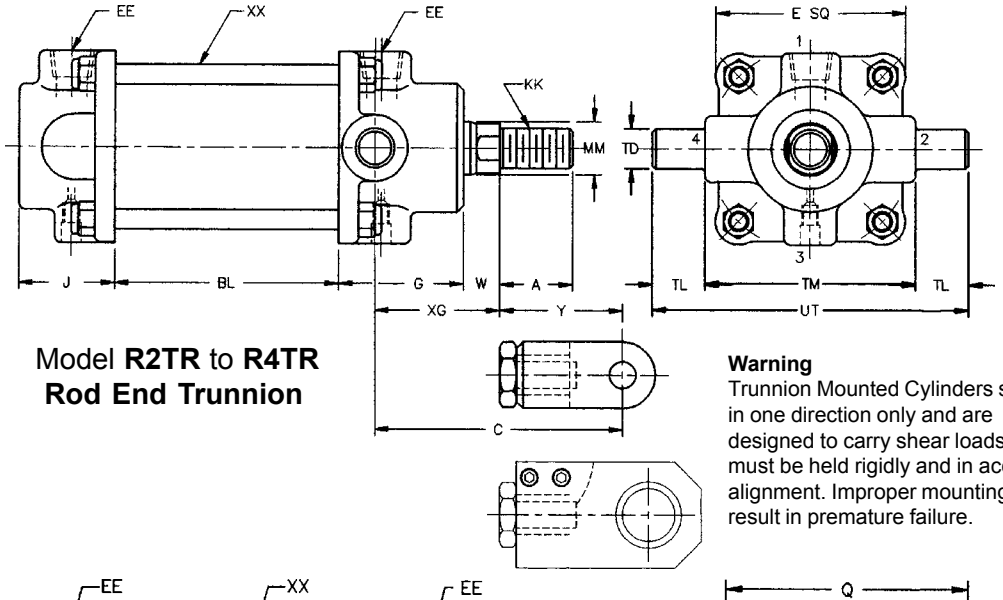
model **RTR** Rod End Trunnion

BORE	ROD	ROD DIA MM	KK	CC	A	C	W	XG	Model TR Dimensions ADD STROKE BL	TD	TL	TM	UT	E	EE	G	J	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	4 3/16	3/8	1 13/16	2	3/4	1	3	5	2 7/8	3/8	1 15/16	1 3/8	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	4 3/8	1/2	1 15/16											2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	4 5/8	1/2	2 3/16	2 1/4	3/4	1	4	6	3 5/8	3/8	2 3/8	1 13/16	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	5 5/16	7/16	2 1/8											3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	5 11/16	7/16	2 1/2	2 3/8	1	1 1/4	5 1/4	7 3/4	4 5/8	1/2	2 13/16	2 1/16	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	6 5/16	3/8	2 7/16											3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	5 3/4	3/8	2 9/16	2 3/8	1	1 1/4	6 1/2	9	6 3/8	1/2	2 7/8	2 5/16	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	6 3/8	5/16	2 1/2											3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	6 15/16	7/16	3 1/16	2 5/8	1 1/8	1 1/2	8	11	7 3/4	3/4	3 1/2	3 1/8	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	7 11/16	1/2	3 1/8											4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	8 7/16	1/2	3 7/8	2 3/4	1 3/4	2	10	14	9 3/4	1	4 3/8	3 3/8	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	9 15/16	11/16	4 1/16											5 7/8

Notes:

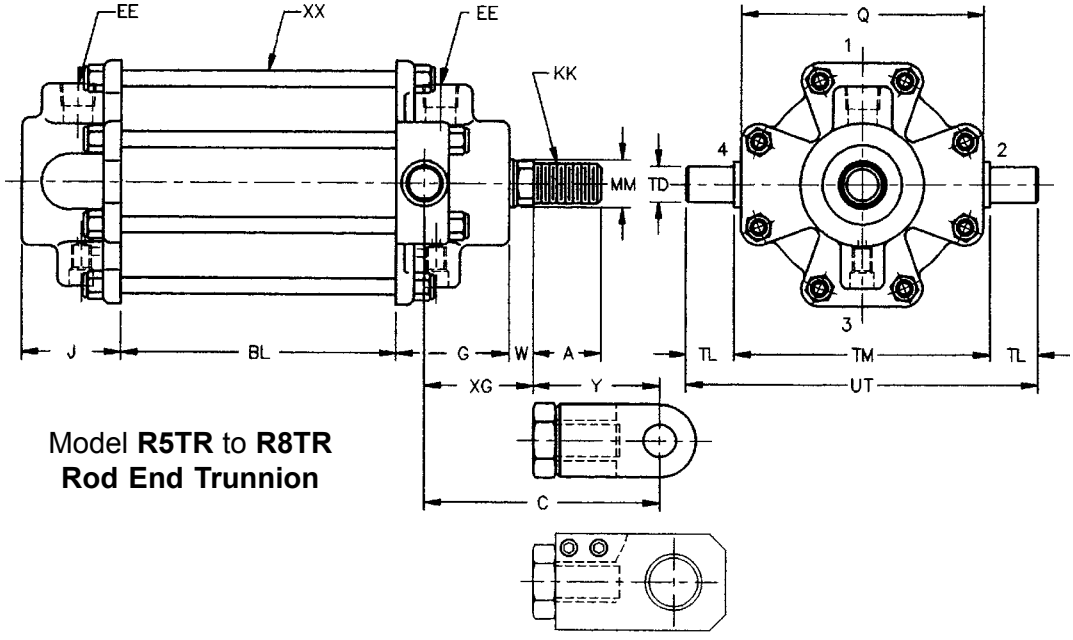
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

* For Female Thread, KK = 7/16-20, A=3/4”

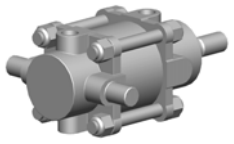


Model **R2TR** to **R4TR**
Rod End Trunnion

Warning
Trunnion Mounted Cylinders swivel in one direction only and are designed to carry shear loads. Pins must be held rigidly and in accurate alignment. Improper mounting may result in premature failure.



Model **R5TR** to **R8TR**
Rod End Trunnion

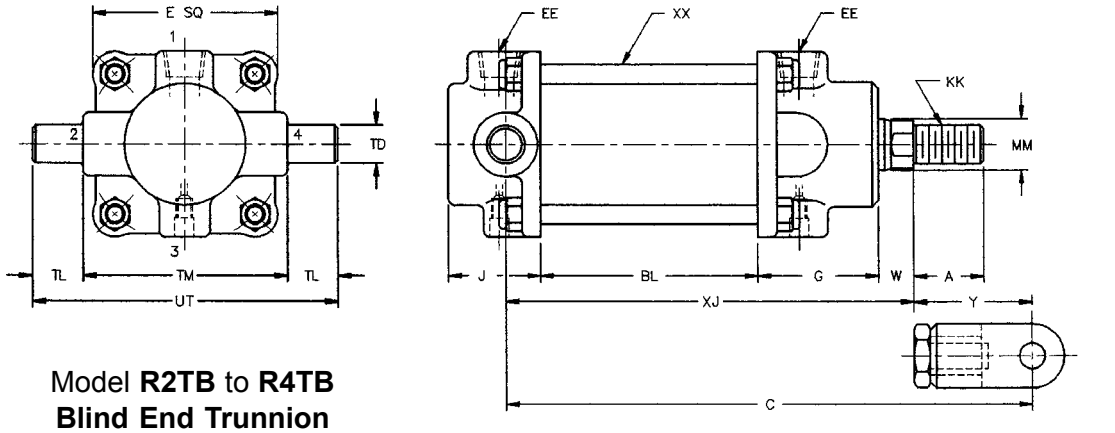


								Model TB Dimensions																							
								ADD STROKE																							
BORE	ROD	ROD DIA MM		KK	CC		A	W	XJ		BL		C	TD		TL		TM		UT		E		EE	G		J		XX		Y	
2	1		3/4	*5/8-18	N/A	*1	1/8	3/8	4	13/16	2		7	3/16	3/4	1		3		5		2	7/8	3/8	1	15/16	1	3/8	3/8	2	3/8
	2	1		3/4-16	7/8-14	1	3/8	1/2	4	15/16			7	3/8															2	7/16
3	1	1		3/4-16	7/8-14	1	3/8	1/2	5	3/4	2	1/4	8	3/16	3/4	1		4		6		3	5/8	3/8	2	3/8	1	13/16	3/8	2	7/16
	2	1	1/4	1-14	N/A	1	3/4	7/16	5	11/16			8	7/8																3	3/16
4	1	1	1/4	1-14	N/A	1	3/4	7/16	6	3/8	2	3/8	9	9/16	1		1	1/4	5	1/4	7	3/4	4	5/8	1/2	2	13/16	2	1/16	1/2	3	3/16
	2	1	1/2	1 1/4-12	N/A	2	1/8	3/8	6	5/16			10	3/16																3	7/8
5	1	1	1/4	1-14	N/A	1	3/4	3/8	6	7/16	2	3/8	9	5/8	1		1	1/4	6	1/2	9		6	3/8	1/2	2	7/8	2	5/16	3/8	3	3/16
	2	1	1/2	1 1/4-12	N/A	2	1/8	5/16	6	3/8			10	1/4																3	7/8
6	1	1	1/2	1 1/4-12	N/A	2	1/8	7/16	7	3/8	2	5/8	11	1/4	1	1/8	1	1/2	8		11		7	3/4	3/4	3	1/2	3	1/8	1/2	3	7/8
	2	2		1 1/2-12	1 3/4-12	2	1/2	1/2	7	1/2			12	1/16																4	9/16
8	1	2		1 1/2-12	1 3/4-12	2	1/2	1/2	8	3/4	2	3/4	13	5/16	1	3/4	2		10		14		9	3/4	1	4	3/8	3	3/8	1/2	4	9/16
	2	2	1/2	2-12	2 1/4-12	3	1/2	11/16	9				14	7/8																5	7/8

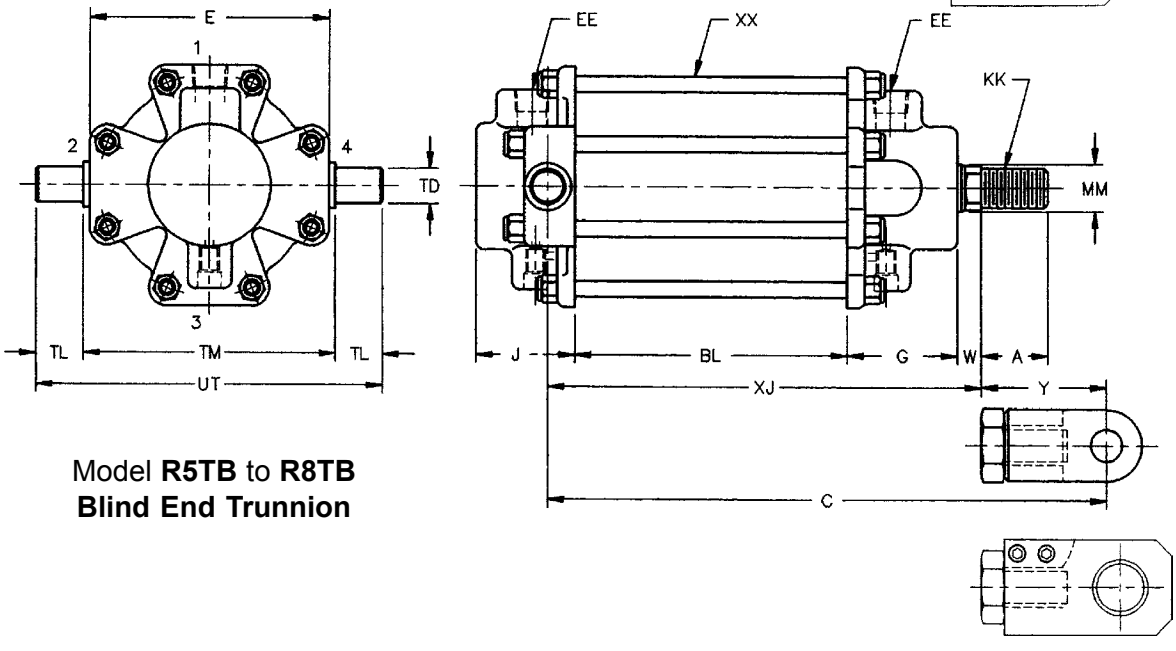
Notes:
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

* For Female Thread, KK = 7/16-20, A = 3/4"

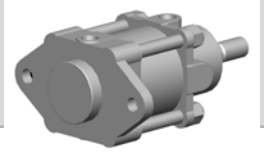
Warning
Trunnion Mounted Cylinders swivel in one direction only and are designed to carry shear loads. Pins must be held rigidly and in accurate alignment. Improper mounting may result in premature failure.



Model **R2TB** to **R4TB**
Blind End Trunnion



Model **R5TB** to **R8TB**
Blind End Trunnion



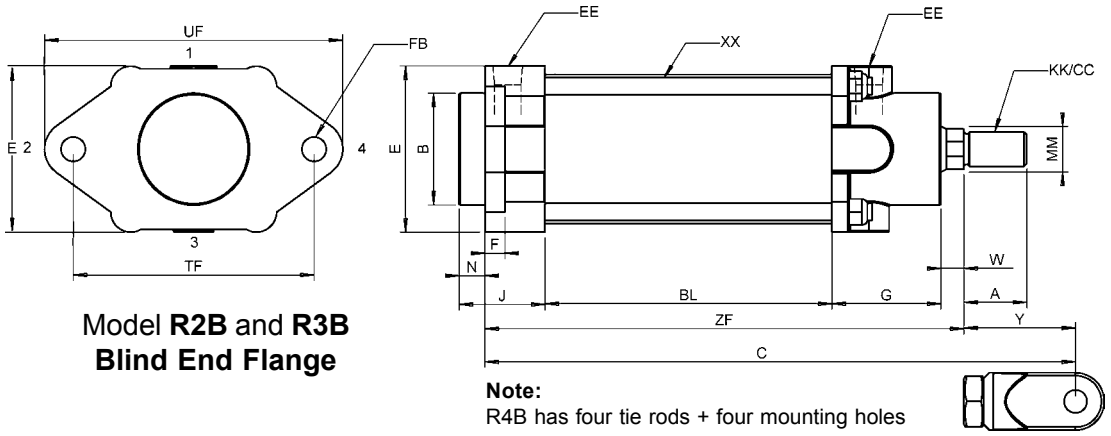
model **RB** Blind End Flange

BORE	ROD	ROD DIA MM	KK	CC	A	W	N	ADD STROKE BL	C	ZF	UF	TF	FB	F	E	EE	G	J	B	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3/8	1/4	2	7 13/16	5 7/16	4 3/4	3 3/4	1/2	3/8	2 7/8	3/8	1 15/16	1 3/8	2	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	1/2			8	5 9/16											2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	1/2	1/2	2 1/4	8 7/8	6 7/16	6 1/2	5 1/4	1/2	1/2	3 5/8	3/8	2 3/8	1 13/16	2 1/4	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16			9 9/16	6 3/8											3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	9/16	2 3/8	10 5/16	7 1/8	6 5/8	5 5/16	1/2	9/16	4 5/8	1/2	2 13/16	2 1/16	2 3/4	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8			10 15/16	7 1/16											3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	3/4	2 3/8	10 3/8	7 3/16	6 3/4	5 3/4	1/2	9/16	6 3/8	1/2	2 7/8	2 5/16	3	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16			11	7 1/8											3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	7/8	2 5/8	12 11/16	8 13/16	7 13/16	6 3/8	1/2	5/8	7 3/4	3/4	3 1/2	3 1/8	3 7/8	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2			13 7/16	8 7/8											4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	1/2	2 3/4	15 1/16	10 1/2	9 7/16	7 19/32	3/4	11/16	9 3/4	1	4 3/8	3 3/8	4 1/2	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16			16 9/16	10 11/16											5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	1	3 1/2	18 1/8	12 1/4	11 3/4	9 1/4	7/8	1	11 3/4	1 1/4	5 1/8	3 7/8	5	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	1			19 7/8	12 1/2											7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	1	3/4	4 1/4	23	15 5/8	14 1/4	11 1/4	1	1 1/4	14 1/4	1 1/2	6 5/8	4 1/2	6	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1			23	15 5/8											7 3/8

Notes:

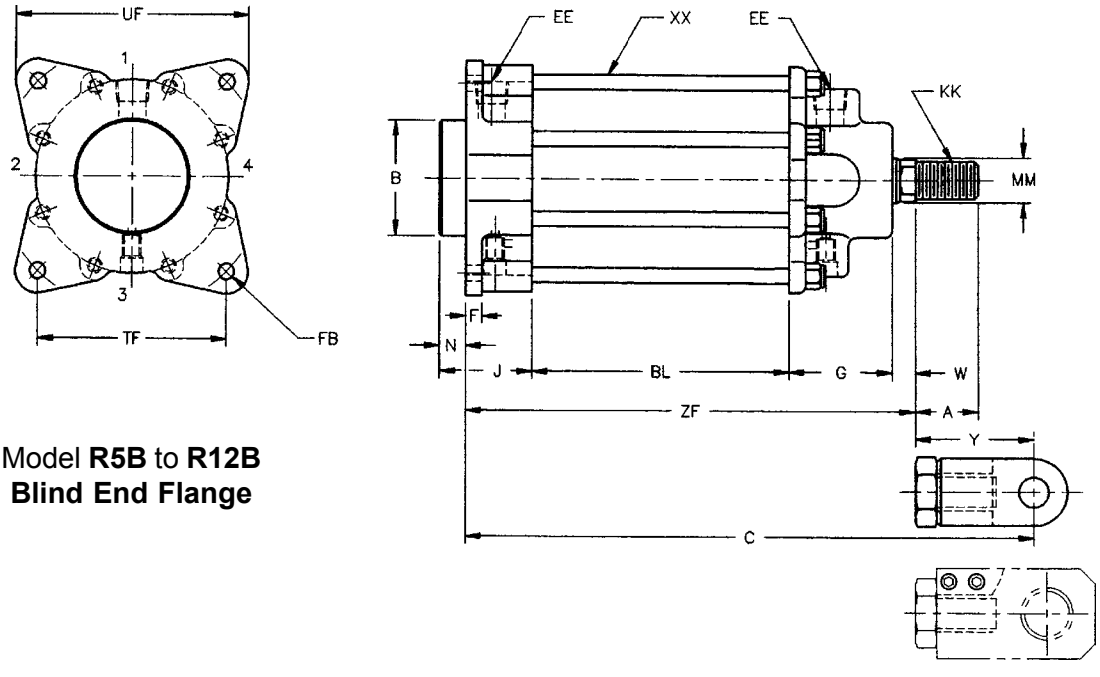
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

* For Female Thread, KK = 7/16-20, A = 3/4"



Model **R2B** and **R3B**
Blind End Flange

Note:
R4B has four tie rods + four mounting holes

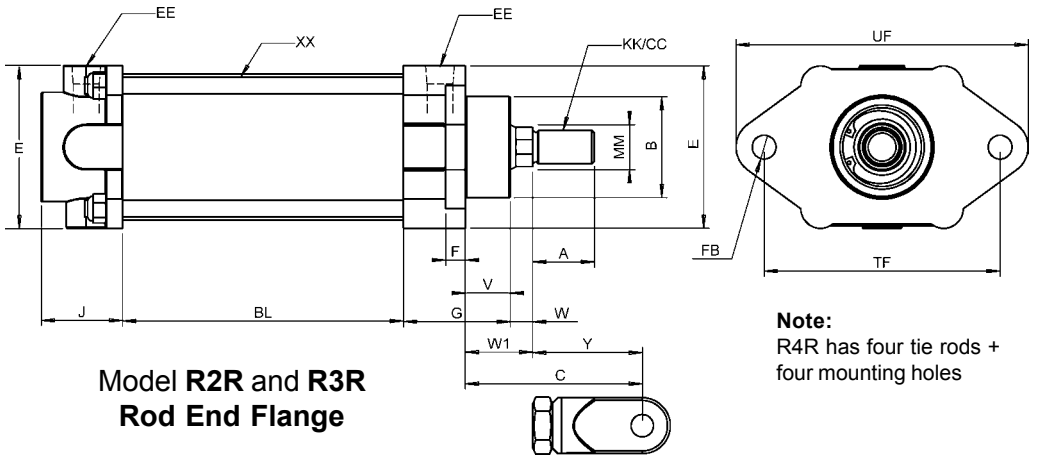


Model **R5B** to **R12B**
Blind End Flange

BORE	ROD	ROD DIA MM	KK	CC	A	C	W	W1	V	ADD STROKE BL	UF	TF	FB	F	E	EE	G	J	B	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3 1/4	3/8	7/8	1/2	2	4 3/4	3 3/4	1/2	3/8	2 7/8	3/8	1 15/16	1 3/8	2	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	3 7/16	1/2	1													2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	3 15/16	1/2	1 1/2	1	2 1/4	6 1/2	5 1/4	1/2	1/2	3 5/8	3/8	2 3/8	1 13/16	2 1/4	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	4 5/8	7/16	1 7/16													3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	4 11/16	7/16	1 1/2	1 1/16	2 3/8	6 5/8	5 5/16	1/2	9/16	4 5/8	1/2	2 13/16	2 1/16	2 3/4	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5 5/16	3/8	1 7/16													3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	4 5/8	3/8	1 7/16	1 1/16	2 3/8	6 3/4	5 3/4	1/2	11/16	6 3/8	1/2	2 7/8	2 5/16	3	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5 1/4	5/16	1 3/8													3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	5 9/16	7/16	1 11/16	1 1/4	2 5/8	7 13/16	6 3/8	1/2	5/8	7 3/4	3/4	3 1/2	3 1/8	3 7/8	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	6 5/16	1/2	1 3/4													4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	6 9/16	1/2	2	1 1/2	2 3/4	9 7/16	7 19/32	3/4	11/16	9 3/4	1	4 3/8	3 3/8	4 1/2	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	8 1/16	11/16	2 3/16													5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	8 7/8	3/4	3	2 1/4	3 1/2	11 3/4	9 1/4	7/8	1	11 3/4	1 1/4	5 1/8	3 7/8	5	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	10 5/8	1	3 1/4													7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	11	1	3 5/8	2 5/8	4 1/4	14 1/4	11 1/4	1	1 1/4	14 1/4	1 1/2	6 5/8	4 1/2	6	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	11	1	3 5/8													7 3/8

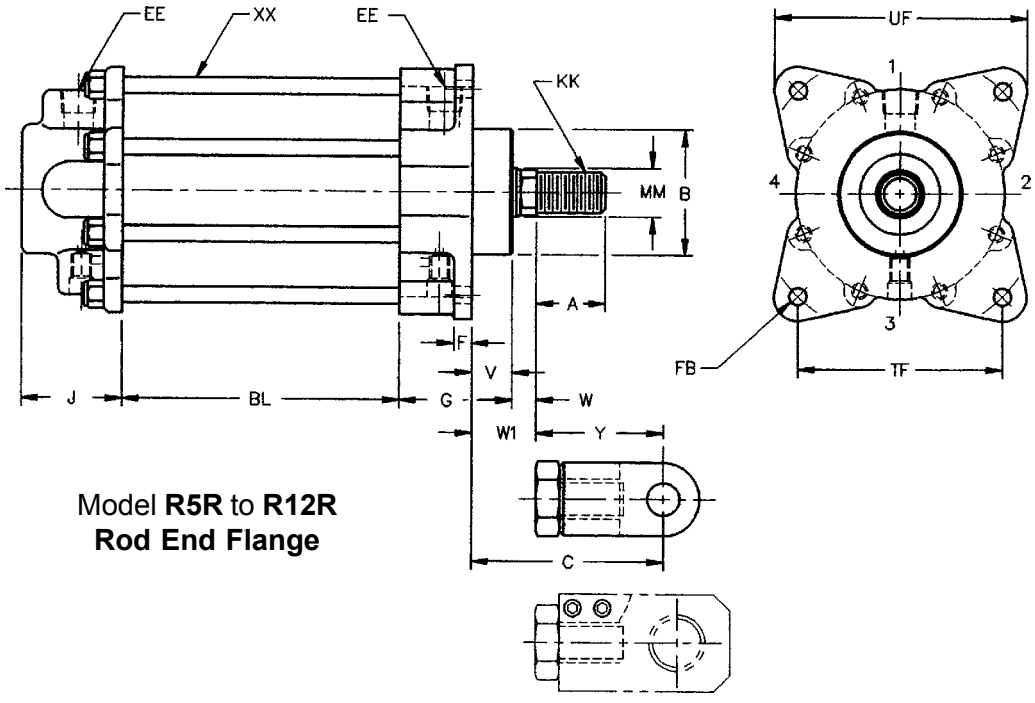
Notes:
1. All dimensions in inches.
2. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
3. See Cylinder Nomenclature for thread options.
4. For Optional Rod Ends and dimensions see page16.

* For Female Thread, KK = 7/16-20, A = 3/4"

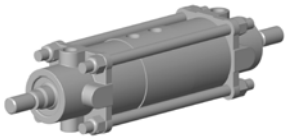


Model **R2R** and **R3R**
Rod End Flange

Note:
R4R has four tie rods + four mounting holes



Model **R5R** to **R12R**
Rod End Flange



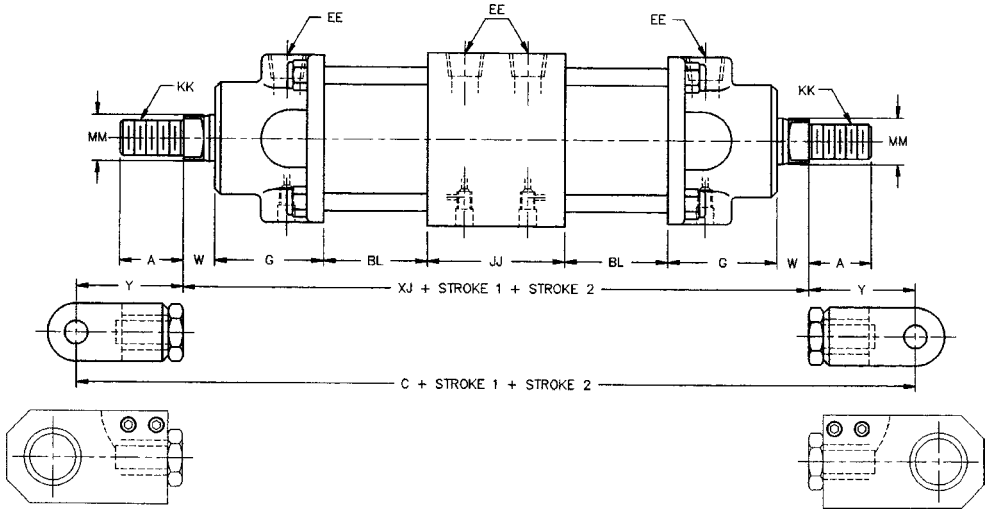
Model **RCH**
Common Head

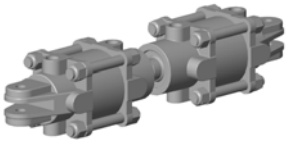
BORE	ROD	ROD DIA MM	KK	CC	A	W	ADD STROKES C	XJ	BL	E	EE	G	JJ	XX	Y
2	1	3/4	*5/8-18	N/A	*1 1/8	3/8	15 7/8	11 1/8	2	2 7/8	3/8	1 15/16	2 1/2	3/8	2 3/8
	2	1	3/4-16	7/8-14	1 3/8	1/2	16 1/4	11 3/8							2 7/16
3	1	1	3/4-16	7/8-14	1 3/8	1/2	18 1/8	13 1/4	2 1/4	3 5/8	3/8	2 3/8	3	3/8	2 7/16
	2	1 1/4	1-14	N/A	1 3/4	7/16	19 1/2	13 1/8							3 3/16
4	1	1 1/4	1-14	N/A	1 3/4	7/16	21 3/8	15	2 3/8	4 5/8	1/2	2 13/16	3 3/4	1/2	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8	22 5/8	14 7/8							3 7/8
5	1	1 1/4	1-14	N/A	1 3/4	3/8	21 3/8	15	2 3/8	6 3/8	1/2	2 7/8	3 3/4	3/8	3 3/16
	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16	22 5/8	14 7/8							3 7/8
6	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	26 1/8	18 3/8	2 5/8	7 3/4	3/4	3 1/2	5 1/4	1/2	3 7/8
	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2	27 5/8	18 1/2							4 9/16
8	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	30 5/8	21 1/2	2 3/4	9 3/4	1	4 3/8	6 1/4	1/2	4 9/16
	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16	33 5/8	21 7/8							5 7/8
10	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	38 1/4	26 1/2	3 1/2	11 3/4	1 1/4	5 1/8	7 3/4	5/8	5 7/8
	2	3	2 1/2-12	2 3/4-12	4 1/2	1	41 3/4	27							7 3/8
12	1	3	2 1/2-12	2 3/4-12	4 1/2	1	47 1/2	32 3/4	4 1/4	14 1/4	1 1/2	6 5/8	9	3/4	7 3/8
	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1	47 1/2	32 3/4							7 3/8

Note:

1. For common head cylinders with mounting styles other than No Mount add the mount style letter after the last “H” in the model code. example: Foot Mount “RCHF”

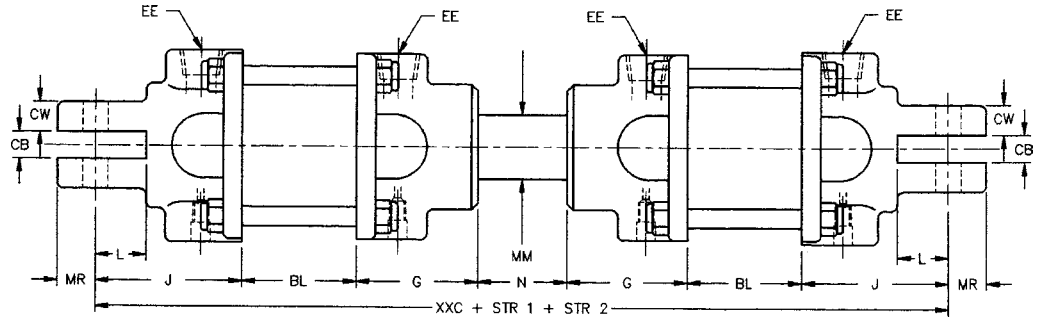
* For Female Thread, KK = 7/16-20, A = 3/4”





Model **RCR**
Common Rod

BORE	ROD	ROD DIA MM	N	ADD STROKE BL	XXC	CB	CD	CW	E	EE	G	J	L	MR	XX
2	1	3/4	1	2	13 1/2	17/32	1/2	1/2	2 7/8	3/8	1 15/16	2 5/16	7/8	5/8	3/8
	2	1													
3	1	1	1	2 1/4	16	17/32	1/2	5/8	3 5/8	3/8	2 3/8	2 7/8	1	3/4	3/8
	2	1 1/4													
4	1	1 1/4	1	2 3/8	18 1/8	25/32	3/4	3/4	4 5/8	1/2	2 13/16	3 3/8	1 3/16	1	1/2
	2	1 1/2													
5	1	1 1/4	7/8	2 3/8	18 3/8	25/32	3/4	7/8	6 3/8	1/2	2 7/8	3 1/2	1 3/16	1	3/8
	2	1 1/2													
6	1	1 1/2	1 1/8	2 5/8	22 1/8	1 1/32	1	15/16	7 3/4	3/4	3 1/2	4 3/8	1 1/4	1 1/4	1/2
	2	2													
8	1	2	1 1/4	2 3/4	25 3/4	1 5/16	1 1/4	1 1/4	9 3/4	1	4 3/8	5 1/8	1 3/4	1 1/2	1/2
	2	2 1/2													
10	1	2 1/2	1 1/2	3 1/2	30 1/2	1 9/16	1 1/2	1 7/16	11 3/4	1 1/4	5 1/8	5 7/8	2	1 3/4	5/8
	2	3													
12	1	3	2	4 1/4	37 1/2	2 1/16	1 3/4	1 5/8	14 1/4	1 1/2	6 5/8	6 7/8	2 3/8	2 1/8	3/4
	2	3 1/2													



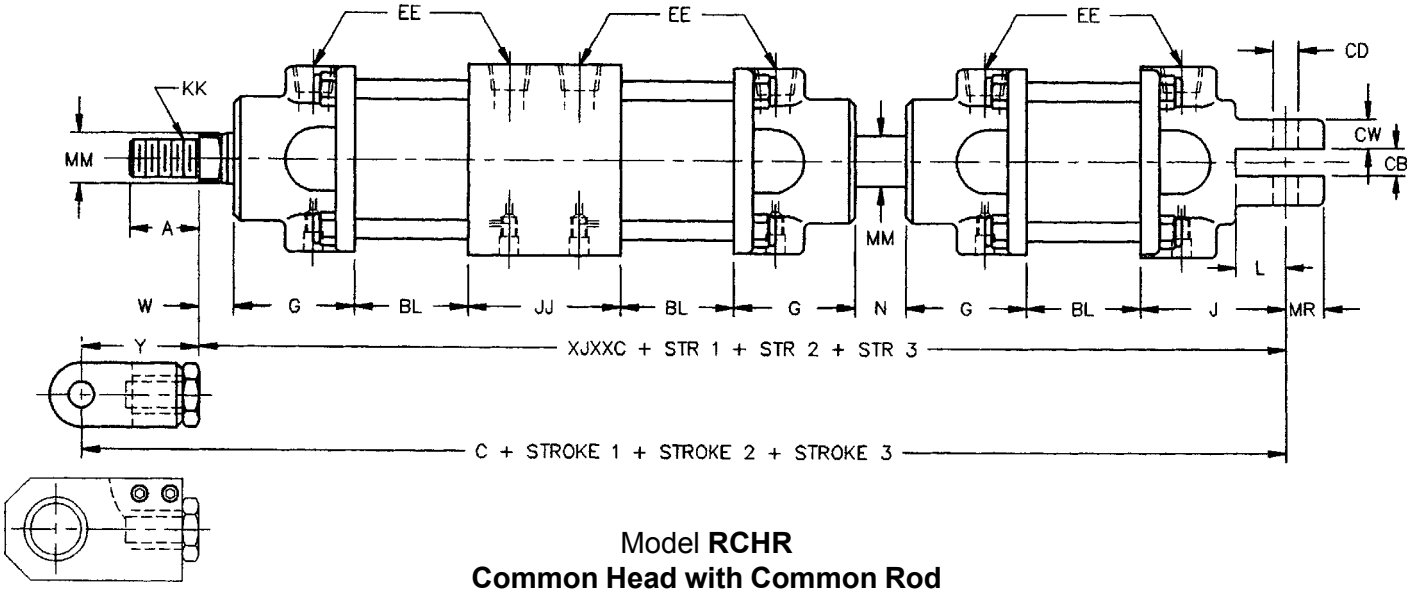
BORE	ROD	ROD DIA MM	KK	CC	A	W	N	ADD STROKE BL	C	XJXXC	CB	CD	CW	E	EE	G	J	L	MR	JJ	XX	Y
	1	3/4	*5/8-18	N/A	*1 1/8	3/8	1	2	20 3/8	18	17/32	1/2	1/2	2 7/8	3/8	1 15/16	2 5/16	7/8	5/8	2 1/2	3/8	2 3/8
2	2	1	3/4-16	7/8-14	1 3/8	1/2			20 9/16	18 1/8												2 7/16
	1	1	3/4-16	7/8-14	1 3/8	1/2	1	2 1/4	23 11/16	21 1/4	17/32	1/2	5/8	3 5/8	3/8	2 3/8	2 7/8	1	3/4	3	3/8	2 7/16
3	2	1 1/4	1-14	N/A	1 3/4	7/16			24 3/8	21 3/16												3 3/16
	1	1 1/4	1-14	N/A	1 3/4	7/16	1	2 3/8	27 5/16	24 1/8	25/32	3/4	3/4	4 5/8	1/2	2 13/16	3 3/8	1 3/16	1	3 3/4	1/2	3 3/16
4	2	1 1/2	1 1/4-12	N/A	2 1/8	3/8			27 15/16	24 1/16												3 7/8
	1	1 1/4	1-14	N/A	1 3/4	3/8	7/8	2 3/8	27 7/16	24 1/4	25/32	3/4	7/8	6 3/8	1/2	2 7/8	3 1/2	1 3/16	1	3 3/4	3/8	3 3/16
5	2	1 1/2	1 1/4-12	N/A	2 1/8	5/16			28 1/16	24 3/16												3 7/8
	1	1 1/2	1 1/4-12	N/A	2 1/8	7/16	1 1/8	2 5/8	33 7/16	29 9/16	1 1/32	1	15/16	7 3/4	3/4	3 1/2	4 3/8	1 1/4	1 1/4	5 1/4	1/2	3 7/8
6	2	2	1 1/2-12	1 3/4-12	2 1/2	1/2			34 3/16	29 5/8												4 9/16
	1	2	1 1/2-12	1 3/4-12	2 1/2	1/2	1 1/4	2 3/4	39 1/16	34 1/2	1 5/16	1 1/4	1 1/4	9 3/4	1	4 3/8	5 1/8	1 3/4	1 1/2	6 1/4	1/2	4 9/16
8	2	2 1/2	2-12	2 1/4-12	3 1/2	11/16			40 9/16	34 11/16												5 7/8
	1	2 1/2	2-12	2 1/4-12	3 1/2	3/4	1 1/2	3 1/2	47 5/8	41 3/4	1 9/16	1 1/2	1 7/16	11 3/4	1 1/4	5 1/8	5 7/8	2	1 3/4	7 3/4	5/8	5 7/8
10	2	3	2 1/2-12	2 3/4-12	4 1/2	1			49 3/8	42												7 3/8
	1	3	2 1/2-12	2 3/4-12	4 1/2	1	2	4 1/4	58 7/8	51 1/2	2 1/16	1 3/4	1 5/8	14 1/4	1 1/2	6 5/8	6 7/8	2 3/8	2 1/8	9	3/4	7 3/8
12	2	3 1/2	2 1/2-12	3 1/4-12	4 1/2	1			58 7/8	51 1/2												7 3/8

Notes:

* For Female Thread, KK = 7/16-20, A = 3/4"

1. EE dimension specifies NPTF port. Contact Factory if SAE or Alternate port size is required.
2. See Cylinder Nomenclature for thread options.
3. For Optional Rod Ends and dimensions see page16.
4. For Common Head Cylinders with Common Rod, in mounting styles other than Blind End Clevis add the mounting style after the last "R" in the the model code.

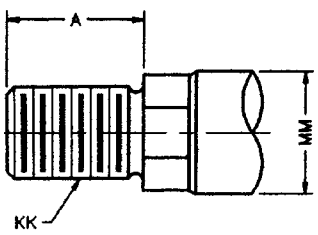
examples:
Mid Trunnion "RCHRT"
Rod End Flange "RCHRR"
Blind End Flange "RCHRB"



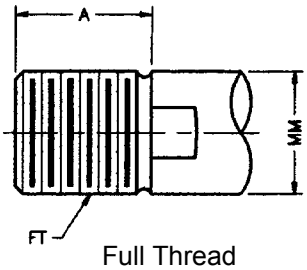
Model **RCHR**
Common Head with Common Rod

Available Rod End Styles

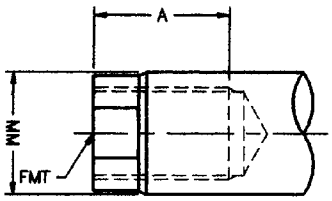
See Model Dimension Tables for Dimensions



KK Rod End
Style “A”



Full Thread
Style “C”

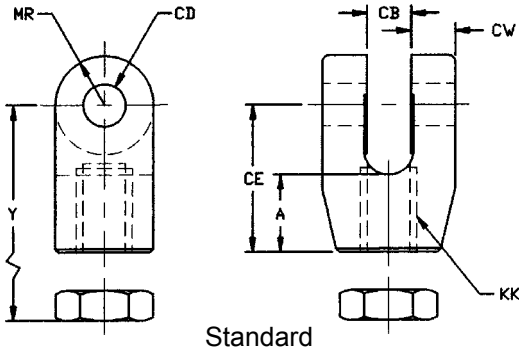


Female Thread
Style “D”

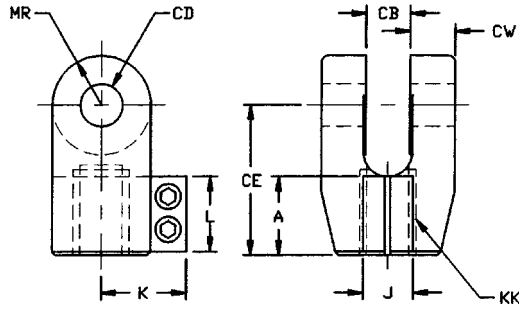
Mill Duty Clevis

Note - “C” denotes Clamping Style

PART	C2	C3	C4	C6	C8	C10	C12	C8-C	C10-C	C12-C
A	1	1	1 3/8	1 3/4	2	2 1/2	3	2	2 1/2	3
CB	1/2	1/2	3/4	1	1 1/4	1 1/2	2	1 1/4	1 1/2	2
CD	1/2	1/2	3/4	1	1 1/4	1 1/2	1 3/4	1 1/4	1 1/2	1 3/4
CE	2	2	2 5/8	3 1/4	3 3/4	4 3/4	5 7/8	3 3/4	4 3/4	5 7/8
CW	9/16	9/16	13/16	15/16	1 1/4	1 7/16	1 5/8	1 1/4	1 7/16	1 5/8
J	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 1/4	1 1/2	1 3/4
K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2 3/8	2 3/4	3 3/16
KK	5/8-18	3/4-16	1-14	1 1/4-12	1 1/2-12	2-12	2 1/2-12	1 1/2-12	2-12	2 1/2-12
L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	2 1/2	3
MR	5/8	5/8	7/8	1 1/8	1 3/8	1 3/4	2	1 3/8	1 3/4	2
Y	2 3/8	2 7/16	3 3/16	3 7/8	4 9/16	5 7/8	7 3/8	4 9/16	5 7/8	7 3/8



Standard



Clamping

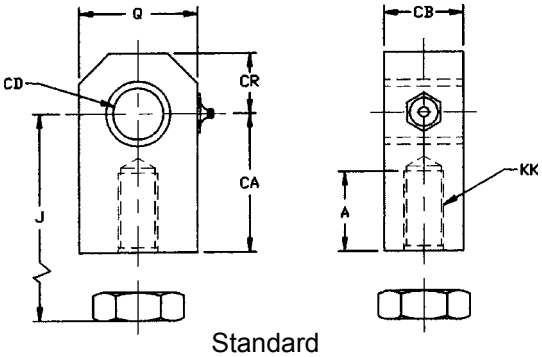
Clamping Style Accessories

If using a clamping Style Rod Eye or Clamping Style Clevis, a jam nut is not required. In this case it is recommended to order a piston rod thread length that matches that of the accessory.

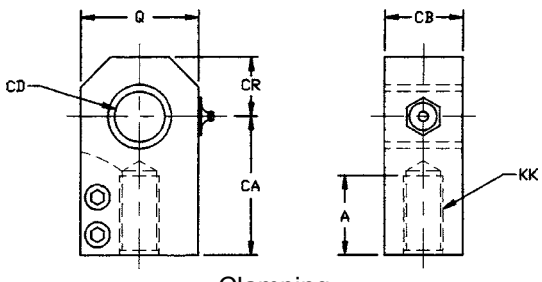
Urethane-bushed Mill Duty Rod Eye

Note - “C” denotes Clamping Style

PART	RE3	E3	RE4-C	E4	RE6-C	E6	RE8-C	E8	E10-C	E12-C	E14-C
A	1 1/2	1 3/4	1 1/2	2	2	2 3/8	2 1/4	2 3/4	3	3	3
CA	2 1/2	3 1/8	2 7/8	3 1/2	3 11/16	4	4 1/4	5	5 1/4	5 1/4	5 3/4
CB	1 3/4	2	1 3/4	2	2	2 1/4	2 1/4	3 1/2	3 1/2	3 1/2	4
CD	1	1	1 1/4	1 1/4	1 1/2	1 1/2	2	2	2	2 1/2	2 1/2
CR	1	1 3/8	1 1/8	1 1/2	1 5/8	1 3/4	1 3/4	2 1/4	2 1/4	2 3/4	2 3/4
J	2 15/16	3 9/16		4 1/16		4 5/8		5 13/16			
KK	3/4-16	3/4-16	1-14	1-14	1 1/4-12	1 1/4-12	1 1/2-12	1 1/2-12	2-12	2 1/2-12	3-12
Q	2	2 3/4	2 1/4	3	3	3 1/2	3 1/2	4 1/2	4 1/2	5 1/2	5 1/2



Standard

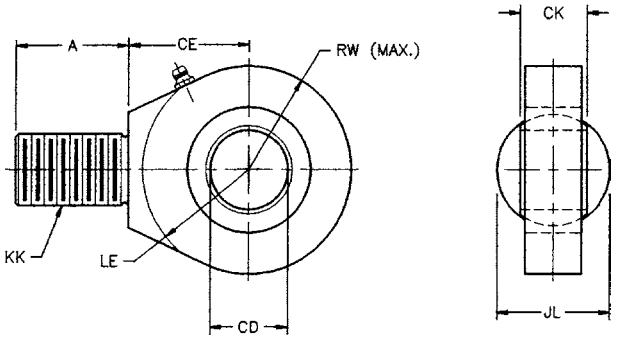


Clamping

Self-Aligning Rod Eye - Male

Adapts to female thread on piston rod

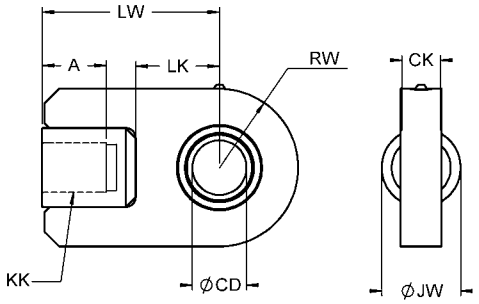
PART	HRES-1	HRES-2	HRES-3	HRES-4	HRES-5	HRES-6
A	11/16	1	1 1/2	2	2 1/8	2 7/8
CD	1/2	3/4	1	1 3/8	1 3/4	2
CE	7/8	1 1/4	1 7/8	2 1/8	2 1/2	2 3/4
CK	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4
JL	7/8	1 5/16	1 1/2	2	2 1/4	2 3/4
KK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12
LE	3/4	1 1/16	1 7/16	1 7/8	2 1/8	2 1/2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



Self-Aligning Rod Eye - Female

Adapts to male thread on piston rod

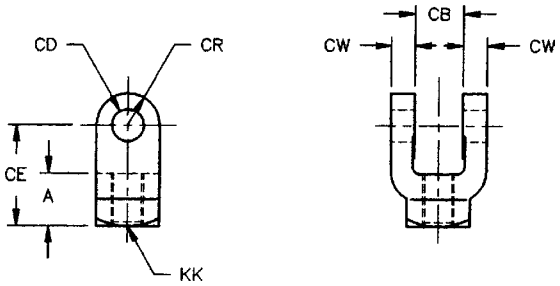
PART	HWE15	HWE2	HWE32	HWE4	HWE5	HWE6	HWE7	HWE8
A	3/4	1 1/8	1 5/8	2	2 1/4	3	3 1/2	3 1/2
CD	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3
CK	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4	2 3/16	2 5/8
JW	3/4	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
KK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12	2 1/4-12	2 1/2-12
LW	1 3/4	2 3/4	3 5/8	4 1/2	5 5/8	6 3/4	7	7 1/8
RW	7/8	1 1/4	1 1/2	2	2 3/4	3	3 1/8	4
LK	5/8	1 1/4	1 5/8	2 1/8	2 5/8	3 1/2	3 1/8	3 1/4



Rod Clevis

Adapts to male thread on piston rod

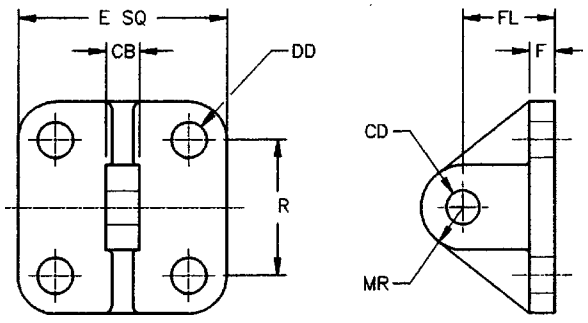
PART	HC15	HC15C	HC2	HC2C	HC32	HC4	HC5	HC5C
A	3/4	3/4	1 1/8	1 5/8	1 5/8	2	2 1/4	3
CB	0.765	0.765	1.265	1.515	1.515	2.032	2.531	2.531
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2
CE	1 1/2	1 1/2	2 3/8	3 1/8	3 1/8	4 1/8	4 1/2	5 1/2
CW	1/2	1/2	5/8	3/4	3/4	1	1 1/4	1 1/4
CR	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2
KK	7/16-20	1/2-20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



Eye Type Mounting Bracket

Adapts to clevis mount cylinder or Rod clevis

PART	M15	M3	M4	M6	M8	M10	M12
CB	3/8	1/2	3/4	1	1 1/4	1 1/2	2
CD	3/8	1/2	3/4	1	1 1/4	1 1/2	1 3/4
DD	5/16	1/2	1/2	5/8	5/8	7/8	1
E	2 3/4	3 1/8	4 3/8	5 1/2	6 1/2	7 3/4	9
F	3/8	7/16	9/16	5/8	3/4	1 1/4	1 3/8
FL	1 1/8	1 3/8	1 3/4	2	2 1/2	3 1/4	3 3/4
MR	1/2	5/8	7/8	1 1/16	1 1/4	1 5/8	2 1/8
R	1 3/4	2	3 1/4	4 1/4	5	6	6 3/4

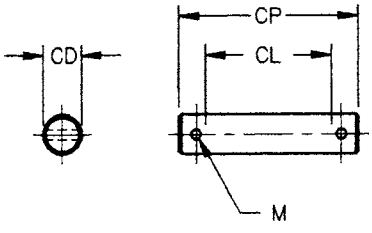


Pivot Pin

Comes complete with cotter pins

Adapts to clevis mount cylinder or Rod clevis

PART	P3	P4	P6	P8	P10	P12	P14	HP4	HP6	HP7
CD	1/2	3/4	1	1 1/4	1 1/2	1 3/4	1 3/4	1 3/8	2	2 1/2
CL	1 3/4	2 1/2	3	4	4 5/8	5 3/8	6 1/4	4	5 1/8	6 1/4
CP	2 5/16	3 1/8	3 3/4	4 7/8	5 1/2	6 1/8	7	4 13/16	6	7 1/8



Published Design Data

Westcoast Cylinders Inc reserves the right to change specifications and other information included in this catalogue without notice. All information, data and dimension tables in this catalogue have been carefully compiled and thoroughly checked. However, no responsibility for possible errors or omissions can be assumed.

Westcoast Cylinders Inc. warranties the material and workmanship of our cylinders for one full year when used under normal conditions, subject to factory inspection. WCI will repair or replace, at no cost for defective parts or cylinders. WCI will not incur expenses incurred in the field, pertaining to such repairs or replacements except upon written authority. For a complete statement of terms and warranty contact Westcoast Cylinders Inc.

Warning

These products are intended for industrial use only. Do not use these products in applications where the pressure and temperature exceeds the values listed below.

Through misuse, age or malfunction, components used in fluid power systems can fail. A designer utilizing these products must consider all modes of failure when designing machines and provide safeguards or warn the end user of possible modes of failure.

Cylinder Pressure and Temperature Ratings

R-Series cylinders are rated to 250 psig pneumatic pressure.

Temperature ratings for cylinders are limited to the maximum published temperature range of the least resistant seal component. In most cases that would be the standard Buna-N O-ring seals. For higher temperatures specify a “V” in the Options box of the Cylinder Nomenclature.

Buna-N temperature ratings: -30°F to 200°F (-34°C to 93°C).

Cylinder Developed Force

BORE	ROD DIA	Work Major Area	Work Minor Area	Developed Force (lb) @ Differential Pressure											
				60		80		100		150		200		250	
in	in	(in²)	(in²)	push	pull	push	pull	push	pull	push	pull	push	pull	push	pull
2	3/4	3.14	2.70	188	162	251	216	314	270	471	405	628	540	785	675
	1	3.14	2.36	188	141	251	188	314	236	471	353	628	471	785	589
3	1	7.07	6.28	424	377	565	503	707	628	1060	942	1414	1257	1767	1571
	1 1/4	7.07	5.84	424	350	565	467	707	584	1060	876	1414	1168	1767	1460
4	1 1/4	12.57	11.34	754	680	1005	907	1257	1134	1885	1701	2513	2268	3142	2835
	1 1/2	12.57	10.80	754	648	1005	864	1257	1080	1885	1620	2513	2160	3142	2700
5	1 1/4	19.63	18.41	1178	1104	1571	1473	1963	1841	2945	2761	3927	3682	4909	4602
	1 1/2	19.63	17.87	1178	1072	1571	1429	1963	1787	2945	2680	3927	3574	4909	4467
6	1 1/2	28.27	26.51	1696	1590	2262	2121	2827	2651	4241	3976	5655	5301	7069	6627
	2	28.27	25.13	1696	1508	2262	2011	2827	2513	4241	3770	5655	5027	7069	6283
8	2	50.27	47.12	3016	2827	4021	3770	5027	4712	7540	7069	10053	9425	12566	11781
	2 1/2	50.27	45.36	3016	2721	4021	3629	5027	4536	7540	6804	10053	9071	12566	11339
10	2 1/2	78.54	73.63	4712	4418	6283	5890	7854	7363	11781	11045	15708	14726	19635	18408
	3	78.54	71.47	4712	4288	6283	5718	7854	7147	11781	10721	15708	14294	19635	17868
12	3	113.10	106.03	6786	6362	9048	8482	11310	10603	16965	15904	22619	21206	28274	26507
	3 1/2	113.10	103.48	6786	6209	9048	8278	11310	10348	16965	15521	22619	20695	28274	25869

Cylinder Sizing

An air cylinder must generate sufficient force to move a load and overcome friction losses. System pressure losses must also be considered. The cylinder developed force table does not take into account friction or pressure losses. In addition, an air cylinder must be overpowered due to the compressibility of air. Therefore, the following general guideline applies for sizing an air cylinder when using theoretical cylinder developed force values:

Application	**Minimum force available** **Total load factor**
Normal Speed	1.25
Intermediate Speed	1.5
High Speed	2

Multiply your total load by one of the load factors above.
Load * Factor = Minimum load for cylinder at system pressure.

Typical pneumatic cylinder applications require flow controls to limit cylinder speeds. Flow control installation is typically done as metered out controlling the flow of air as it exits the cylinder. This is done to ensure accurate cylinder speeds under all loads. The flow controls however do affect cylinder performance by maintaining back pressure on the piston. As a general rule, allow 20 psi pressure loss through flow control for good speed regulation.

Please note the above issues if cylinder performance are critical and increase your load factor accordingly.

Cylinder Side Load

Mounting style and mounting position are very important considerations as well.

Side loads on the gland bushing should be avoided where possible to obtain maximum life from a cylinder. Cylinders can not support side load, they are designed for push-pull applications where the load is guided to ensure proper alignment.

Break-away Pressures

Cylinder break-away pressure varies between 5 and 10 psi depending on the bore size and mounting attitude. The following values were compiled using a new non-loaded cylinder mounted horizontally.

3” bore	Retract = 5.5 psi Extend = 3 psi.
4” bore	Retract = 8 psi Extend = 6 psi.

If low pressure break-away is required please contact the factory for more detailed information.

R-Series Generic Parts List

		Bore	2		3		4		5		6		8		10		12	
		Rod Size	3/4	1	1	1 1/4	1 1/4	1 1/2	1 1/4	1 1/2	1 1/2	2	2	2 1/2	2 1/2	3	3	3 1/2
	Description	QTY																
1	Piston	1	1R202		1M203W		1M204W		1M205W		1A206W		1A208W		1A2010W		1A2012W	
3	Cushion Sleeve	2	3R620		3R630		3R640		3R640		3R660		3R680		3R6100		3R6120	
4	Piston Rod - Male	1	4R2007-	4R2010-	4R3010-	4R3012-	4R4012-	4R4015-	4R4012-	4R4015-	4R6015-	4R6020-	4R8020-	4R8025-	4R1025-	4R1030-	4R1230-	4R1235-
	Piston Rod - Female	1	26R2007-	26R2010-	26R3010-	26R3012-	26R4012-	26R4015-	26R4012-	26R4015-	26R6015-	26R6020-	26R8020-	26R8025-	26R1025-	26R1030-	26R1230-	26R1235-
	Piston Rod-Common	1	44R2007-	44R2010-	44R3010-	44R3012-	44R4012-	44R4015-	44R4012-	44R4015-	44R6015-	44R6020-	44R8020-	44R8025-	44R1025-	44R1030-	44R1230-	44R1235-
5	Barrel (Steel Nitro-Tech)	1	5SB020-		5SB030-		5SB040-		5SB050-		5SB060-		5SB080-		5SB100-		5SB120-	
	Barrel (Brass)	1	5A020-		5A030-		5A040-		5A050-		5A060-		N/A		N/A		N/A	
6	Gland Bushing	1	6R207	6A210H-2	6R310	6A412H-2	6R412	6A415H-2	6R412	6A415H-2	6R615	6A620H-2	6R820	6A825H-2	6R1025	6A030H-2	6R1230	6A235H-2
	Gland Bushing Wearstrip	1	6R207W	6A210HW	6R310W	6A412HW	6R412W	6A415HW	6R412W	6A415HW	6R615W	6A620HW	6R820W	6A825HW	6R1025W	6A030HW	6R1230W	6A235HW
7	Needle Valve	2	7A907		7A907		7A907		7A912		7A912		7A912		7A916		7A916	
8	Tie Rods (EA) (See Note 1)	4 or 8	8A206-		8A306-		8A408-		8A506-		8A608-		8A808-		8A010-		8A212-	
9	Piston Seal (Internal)	1	9A112		9A115		9A212		9A212		9A214		9A216		9A222		9A223	
10	Piston Cup (See Note 2)	1 or 2	10A755-2		10A930H		10A940H		10A950H		10A960H		10A980H		10A9100H		10A9120H	
11	Cushion Seal	2	11J128		11J138		11J150		11J150		11J160		11J180		11J1100		11J1100	
12	Gland Bushing Seal	1	9A216		9A222		9A225		9A225		9A230		9A236		9A240		9A244	
13	Rod Seal	1	13A07H	13A10H	13A10H	13A12H	13A12H	13A15H	13A12H	13A15H	13A15H	13A20H	13A20H	13A25H	13A25H	13H30H	13H30H	13H35H
	Rod Seal (Vee Packing)	1	N/A	N/A	N/A	13A12V	N/A	13A15V	N/A	13A15V	N/A	13A20V	N/A	13A25V	N/A	13H30V	N/A	13H35V
14	Rod Wiper	1	N/A	N/A	14H10	14H12	14H12	14H15	14H12	14H15	14H15	14H20	14H20	14H25	14H25	14H30	14H30	14H35
15	Gland Retainer	1	15A137		15A175		15A212		15A212		15A275		15A350		15A400		15A450	
16	Needle Valve Seal	2	9A011		9A011		9A011		9A113		9A113		9A113		9A210		9A210	
17	Lock Nut Tie-Rod	4,8,16	19A006		19A006		19A008		19A006		19A008		19A008		19A010		19A012	
19	Lock Nut Piston	1	19A007		19A010		19A014		19A014		19A016		19A016		19A022		19A024	
20	Jam Nut (STD Thread)	1	20R010	20R012	20R012	20R016	20R016	20R020	20R016	20R020	20R020	20R024	20R024	20R032	20R032	20R040	20R040	20R040
21	Barrel Seal	2	9A033		9A232		9A240		9A248		9A256		9A265		9A273		9A452	
22	Head Blind End (See Note 3)	1	R_2B		R_3B		R_4B		R_5B		R_6B		R_8B		R_10B		R_12B	
23	Head Gland End (See Note 3)	1	R_2G		R_3G		R_4G		R_5G		R_6G		R_8G		R_10G		R_12G	
24	Head Common	1	RCC2		RCC3		RCC4		RCC5		RCC6		RCC8		RCC10		RCC12	
25	Trunnion	1	T2		T3		T4		T5		RT6		T8		T10		T12	
32	Piston Stop	1	32R20		32R30		32R40		32R50		32R60		32R80		32R10		32R10	
40	Piston Wear Strip (See Note 2)	1 or 2	40H2025		40H3037		40H4037		40H5037		40H6037		40H805		40H101		40H121	
41	Seal Kit	--	KR2007	KR2010	KR3010	KR3012	KR4012	KR4015	KR5012	KR5015	KR6015	KR6020	KR8020	KR8025	KR1025	KR1030	KR1230	KR1235
42	Universal Seal Kit R-A SERIES	--	KR2007U	KR2010U	KR3010U	KR3012U	KR4012U	KR4015U	KR5012U	KR5015U	KR6015U	KR6020U	KR8020U	KR8025U	KR1025U	KR1030U	KR1230U	KR1235U
43	Universal Seal Kit M-R-A SERIE	--	KR2007MU	KR2010MU	N/A	KR3012MU	N/A	KR4015MU	N/A	KR5015MU	N/A	KR6020MU	N/A	KR8025MU	N/A	KR1030MU	N/A	KR1235MU

Parts List Notes:

Note 1

2" bore cylinders use (1) Double Acting Seal and (2) Wearstrips.

Quantities stated are for all bores except 2".

Note 2

Universal seal kit contains seals for A-Series and R-Series cylinders (part 42) and A-Series, R-Series and M-Series cylinders (part 43).

Note 3

Head codes are constructed using:

1) The series letter "R"
2) The appropriate model letter from Table1
3) The cylinder bore 3" bore = "3"
4) The head location:
   "B" = Blind end head,
   "G" = Gland End

Example

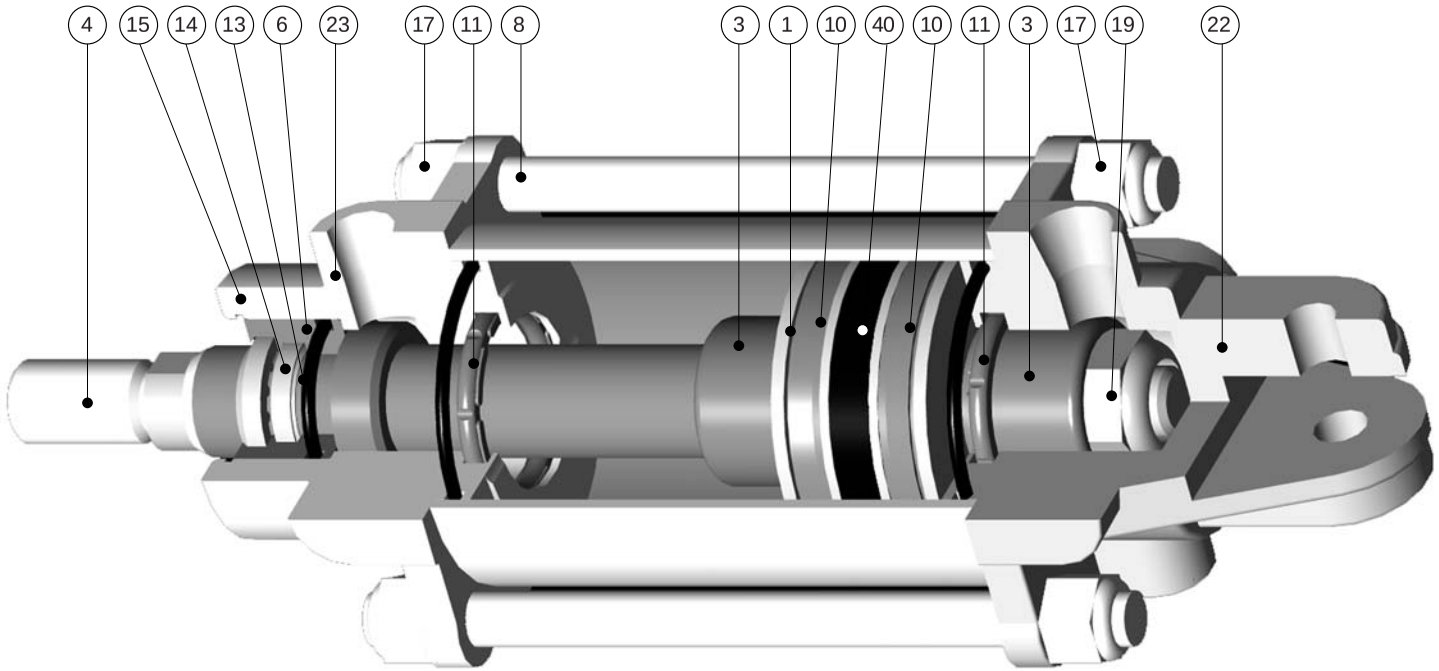
3" bore, Blind end head, clevis mount = RC3B

Table 1

Cyl. Model Letter	Gland Head	Blind Head
F	F	F
C	C	C
D	C	-
R	R	R
B	C	B
TB	C	T
TR	T	R
T	C	R

ROYAL

R-Series Parts Drawing



TieRod Part Numbers:
Note: For models not listed use Model "C"

		ROD #1	ROD #2	ROD #1	ROD #2			
Bore\Style	**C**	**T**	**T**	**HT**	**HT**	**B**	**R**	**CH**
2	8AC206-Stroke	8ATA206-Stroke-Xl=___	8ATB206-Stroke-Xl=___	8ATA206-Stroke-Xl=___	8ATB206-Stroke-Xl=___	8AR206-Stroke	8AR206-Stroke	8ACH206-Stroke1+Stroke2
3	8AC306-Stroke	8ATA306-Stroke-Xl=___	8ATB306-Stroke-Xl=___	8ATA306-Stroke-Xl=___	8ATB306-Stroke-Xl=___	8AR306-Stroke	8AR306-Stroke	8ACH306-Stroke1+Stroke2
4	8AC408-Stroke	8ATA408-Stroke-Xl=___	8ATB408-Stroke-Xl=___	8ATA408-Stroke-Xl=___	8ATB408-Stroke-Xl=___	8AR408-Stroke	8AR408-Stroke	8ACH408-Stroke1+Stroke2
5	8AC506-Stroke	8ATA506-Stroke-Xl=___	8ATB506-Stroke-Xl=___	8ATA506-Stroke-Xl=___	8ATB506-Stroke-Xl=___	8AR506-Stroke	8AR506-Stroke	8ACH506-Stroke1+Stroke2
6	8AC608-Stroke	8ATA608-Stroke-Xl=___	8ATB608-Stroke-Xl=___	8ATA608-Stroke-Xl=___	8ATB608-Stroke-Xl=___	8AR608-Stroke	8AR608-Stroke	8ACH608-Stroke1+Stroke2
8	8AC808-Stroke	8ATA808-Stroke-Xl=___	8ATB808-Stroke-Xl=___	8ATA808-Stroke-Xl=___	8ATB808-Stroke-Xl=___	8AR808-Stroke	8AR808-Stroke	8ACH808-Stroke1+Stroke2
10	8AC1010-Stroke	8ATA1010-Stroke-Xl=___	8ATB1010-Stroke-Xl=___	8ATA1010-Stroke-Xl=___	8ATB1010-Stroke-Xl=___	8AR1010-Stroke	8AR1010-Stroke	8ACH1010-Stroke1+Stroke2
12	8AC1212-Stroke	8ATA1212-Stroke-Xl=___	8ATB1212-Stroke-Xl=___	8ATA1212-Stroke-Xl=___	8ATB1212-Stroke-Xl=___	8AR1212-Stroke	8AR1212-Stroke	8ACH1212-Stroke1+Stroke2

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

	R											
	SERIES	BORE	STYLE	STROKE	ROD MATERIAL	ROD SIZE	THREAD	CUSHIONS	BARREL	PORT LOC'N	PORT SIZE	OPTIONS	CUSTOM
EXAMPLE	R	3	C	12.188	A	1	A	1	A	1	A		

SPECIFICATION NOTES:

SPECIFY OPTIONS REQUIRED BUT NOT LISTED IN NOMENCLATURE

BORE
2
3
4
5
6
8
10
12

STYLE	
BLIND END FLANGE	B
BLIND END CLEVIS	C
COMMON HEAD	CH
COMMON HEAD-COMMON ROD	CHR
COMMON ROD	CR
DOUBLE ROD	D
FOOT MOUNT	F
HEAVY BLIND CLEVIS	HC
HEAVY DUTY MID TRUNNION	HT
SINGLE LUG MOUNT	L
NO MOUNT	NM
ROD END FLANGE	R
MID-TRUNNION	T
BLIND END TRUNNION	TB
ROD END TRUNNION	TR

STROKE
INCHES

ROD MATERIAL	
NITRO-TEC TREATED	A
CHROME PLATED STEEL	C
CHROME PLATED STAINLESS STEEL	E

ROD SIZE	
ROD #1	1
ROD #2	2

THREAD	
STANDARD THREAD	A
CC THREAD	B
FULL THREAD	C
FEMALE THREAD	D
NO THREAD	E
NON STANDARD MALE THREAD	X
NON STANDARD FEMALE THREAD	Y
SPECIFY	S

CUSHIONS	
BOTH ENDS (STANDARD)	1
NON CUSH.	2
BLIND END ONLY	3
ROD END ONLY	4
EXTENDED CUSHION BOTH ENDS	5
EXTENDED CUSHION BLIND END	6
EXTENDED CUSHION GLAND END	7
SPECIFY	X

BARREL	
NITRO-TEC TREATED	A
CHROME ID STEEL	C
BRASS	D
STAINLESS	E
AMALGON	F
SPECIFY	X

PORT LOC'N	
1	POS #1 (STANDARD)
2	POS #2
3	POS #3
4	POS #4
X	SPECIFY

PORT SIZE	
A	STANDARD PORT
B	OVERSIZE PORT
X	SPECIFY

OPTIONS	
A	THREAD LENGTH
B	BUMPERS BOTH ENDS *
B1	BUMPER ROD END *
B2	BUMPER BLIND END *
D	ROD SCRAPER (BRASS)
G	WEAR-RING IN GLAND BUSHING
K	V-PACKING ROD SEAL
M	MAGNET IN PISTON
N1	NON STANDARD NEEDLE VALVE POSITION (POS #1)
N2	NON STANDARD NEEDLE VALVE POSITION (POS #2)
N4	NON STANDARD NEEDLE VALVE POSITION (POS #4)
PS	PISTON STOP
S	STAINLESS STEEL TIE RODS.
V	HIGH TEMPERATURE SEALS
W	ROD EXTENSION "W" DIMENSION
X	SPECIFY OPTIONS NOT LISTED

CUSTOM	
X	ASSIGNED BY WESTCOAST CYLINDERS.

* ALL BUMPER OPTIONS REDUCE EFFECTIVE STROKE. B AND B1 OPTIONS ALSO AFFECT ROD EXTENSION.

Westcoast Cylinders Inc.
225 Edworthy Way
New Westminster BC
Canada V3L 5G4
Telephone: 604 527 1120
Facsimile: 604 527 1170
Phone Toll Free: 1-877-637-6925
Fax Toll Free: 1-866-527-1170
email: sales@royalcylinders.com
website: www.royalcylinders.com