

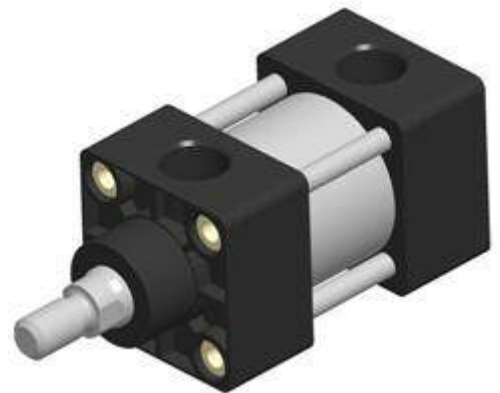
QA Series

Light Duty Cylinders

NFPA Pneumatic Service

1-1/2" to 4" Bores

Series Catalog



Document No. CAT2010-QA-A

2010 Edition

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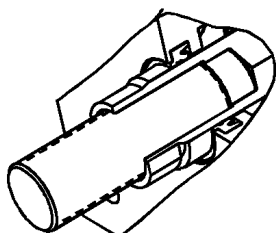
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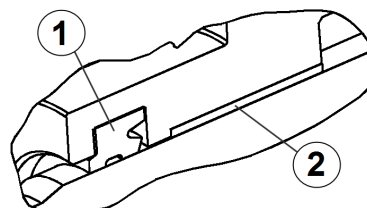
Studded Rod Ends: The studded rod ends offers great benefits for applications that are held in high tension where it may be possible to break or shear standard machined rod ends. For rod size 5/8" to 2" diameters, a rolled thread stud can be threaded into a standard female rod end. Studded rod ends offer higher resistance to thread shear and are more economical to replace in case of fracture. - QOC Style 8.



ROD BEARING

The QA rod bearing is incorporated into the head end cover casting to limit the number of cylinder components to keep the QA affordable.

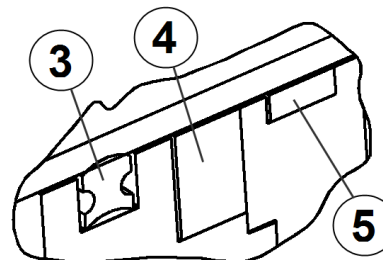
The wear surface is controlled with a quality **bearing liner²** that gives the QA cylinders it's maximum life. The **double lip type wiper¹** is designed to protect the piston rod and bearing liner surface while it is performing with great results against rod seal leakage.



PISTON

The QA piston incorporates many other features that benefits the abilities that this cylinder can do. The **bi-directional piston seal³** controls any by-pass and allows more space on the piston surface. With this space, the QA

is able to come standard with the **magnetic band⁴** and a **wear band⁵** wear surface that will maximize the life of the cylinder. The added **magnet band⁴** is for the applications that require electronic feedback for cylinder cycle location.

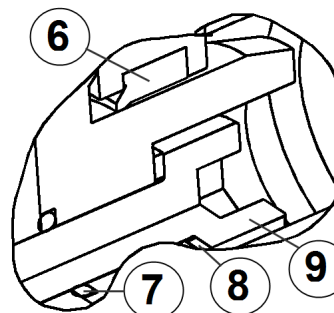


CUSHIONED READY

The QA cylinders are supplied as "**cushioned ready.**"

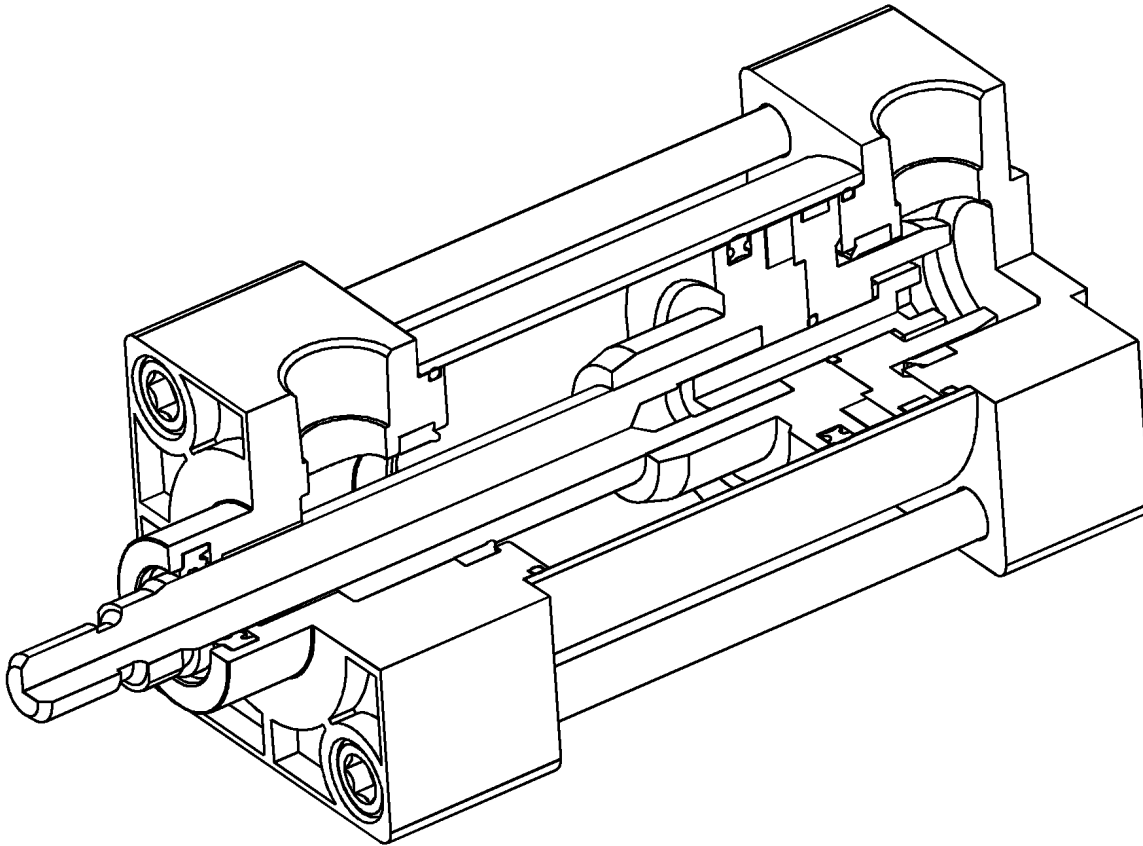
All cylinders include a piston with machined cushion noses and an installed cushion adjustment screw within the cover. The difference between the cushioned and non-cushioned cylinder is that the **cushion/ball check seal⁶** is not installed. The fewer


assembly changes and higher quantity part runs keeps the QA series affordable even with the added cushion screw. This also allows the customer to change the cylinder from non-cushioned to cushioned without ordering a new cylinder, just install the cushion seal kit. The piston rod connection is design with maximum strength using a **socket head cap screw⁹** and **locking washer⁸**. For extra locking performance, all piston screws are assembled with Loctite[®]. To control air leakage and performance lose, the piston connection and cushion adjustment screw are sealed with an o'ring.



Features QA Series

Up to 150 psi Pressure Rating



Piston Rod: Medium carbon steel with 100,000 psi minimum yield with a chrome plate and highly polished to resist nicks and wear. The piston rod can be requested from a material listing of 17-4ph, 316, 303, or 304 stainless steel. Quincy  has a standard to use stainless steel rod stock that is non-chromed that has been turned, ground, and polished, but if chromed stock is required. The chromed stock can be supplied upon request. The double ended construction cylinder design the piston rods are pilot fitted to assure perfect alignment and are locked together with Loctite.[®]

Head/Cap End Cover: Die casted aluminum cover allows the overall cylinder weight to be reduced and controls corrosion. Heads and caps pilot on the cylinder bore to prevent "breathing" and provide additional insurance against leakage.

Seals: All seals throughout the cylinder, are made of a buna compound for leak-proof performance and offers a low breakaway pressure. The buna packing can be used with many different type of gases. Other seal material, as of viton compound, can be requested. Some of the requested packing material can increase the lead time of delivery. The bi-directional piston seal arrangement allows for a low cost cylinder, but yet, great cylinder performance. The individual service kits will contain all the soft seal to repair the entire cylinder.

Tie rod: Medium carbon steel with 100,000 psi minimum yield material. At assembly, the each tie rod is pre-stressed with a high strength alloy nut to minimize the possibility of tie rod elongation.

Rod Bearing: The rod bearing as been incorporated in the head end cover. The wear surface is controlled with a quality bearing liner that insures low fraction, high load capabilities, and long life of service.

Piston: The pistons are of an aluminum material to reduce the overall cylinder weight, but yet, offers a long life of service. The pistons are stacked design that is pilot fitted to assure perfect alignment. All pistons are o'ring sealed and are locked on the piston rod by a socket head cap screw that assembled with a lock washer and Loctite[®] retaining component.

Tubing: Aluminum precision anodized bore for light weight, high strength, with excellent corrosion-resisting characteristics.

Porting: Unrestricted ports to permit maximum flow with minimum pressure drops. The standard porting is NPTF porting and optional porting is not available with the QA series. The cylinder port positioning will be controlled with the assembly position of the mounting kits.

Needle Valves: Flush type needle valves are supplied. Large drilled passages provide maximum control of cushioning effect. The o'ring seal supplied with the needle valve assures leak free operation.

Wrench Flats: Large wrench flats are chamfered to protect the rod liner and double lip wiper seal during rod installation. All standard piston rod are furnished with two wrench flats. Additional flats are available upon request.

JIC: These cylinders are designed to conform to JIC standards.

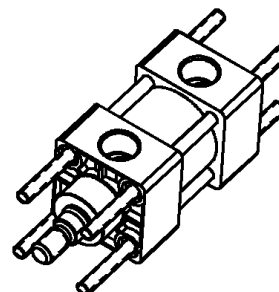
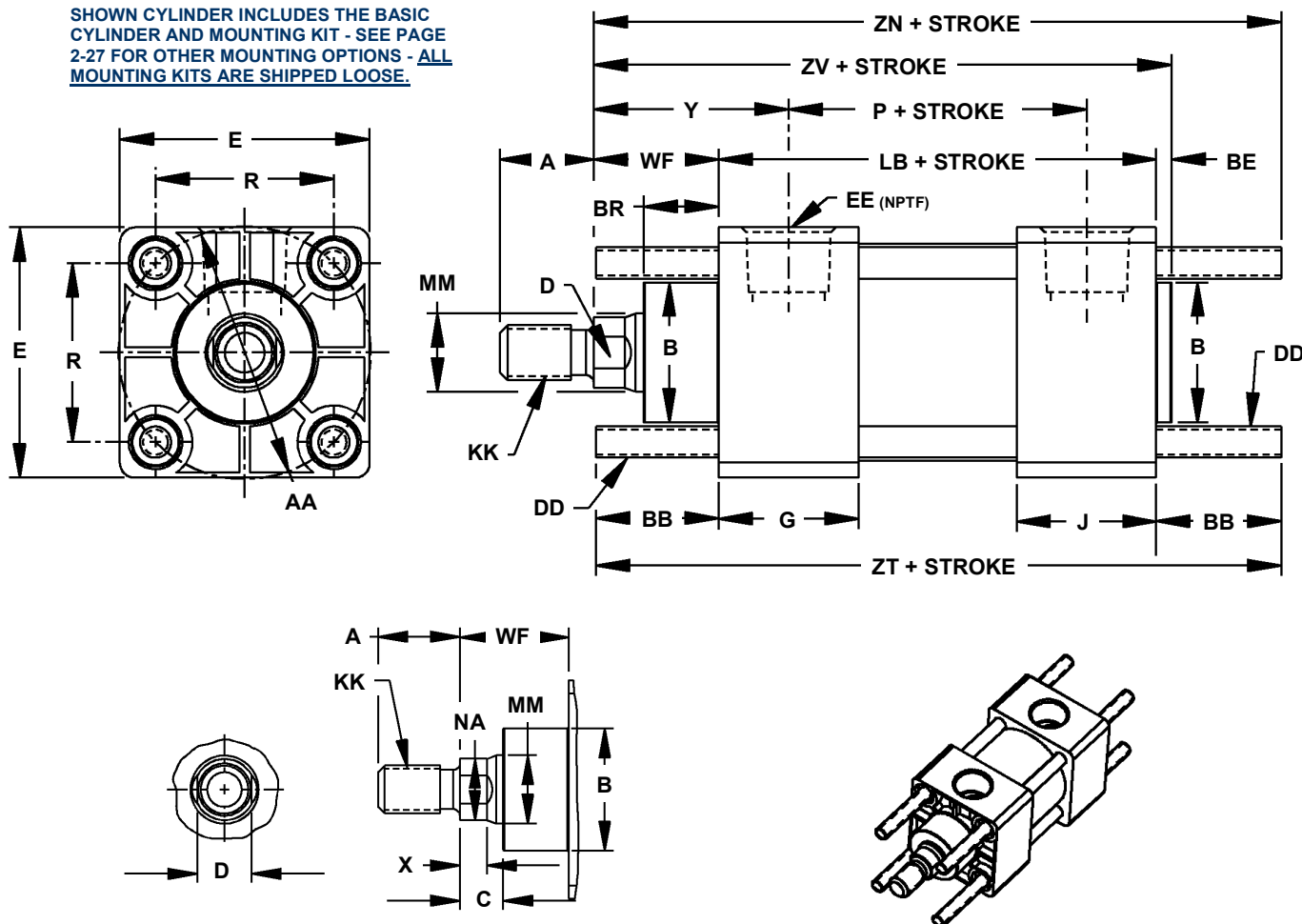
NFPA: The dimensioning and identification of the cylinders in this catalog are in accordance with the NFPA recommended dimension code for fluid power cylinders.

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "L" Mount (MX1)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | | | Plus stroke | | |
|-----------------------------|------|------|------|------|------|----------|----------|------|------|------|-------------|------|------|
| Bore | AA | BB | BE | BR | E | DD | EE | G | J | R | P | LB | ZT |
| 1-1/2 | 2.02 | 1.00 | .125 | 0.62 | 2.00 | 0.25"-28 | 0.38"-18 | 1.26 | 1.01 | 1.43 | 2.36 | 3.62 | 5.62 |
| 2 | 2.60 | 1.12 | .125 | 0.62 | 2.50 | 0.31"-24 | 0.38"-18 | 1.26 | 1.06 | 1.84 | 2.40 | 3.62 | 5.88 |
| 2-1/2 | 3.10 | 1.12 | .125 | 0.62 | 3.00 | 0.31"-24 | 0.38"-18 | 1.30 | 1.06 | 2.19 | 2.48 | 3.75 | 6.00 |
| 3-1/4 | 3.90 | 1.38 | .201 | 0.88 | 3.75 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 2.76 | 2.72 | 4.25 | 7.00 |
| 4 | 4.70 | 1.38 | .201 | 0.88 | 4.50 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 3.32 | 2.72 | 4.25 | 7.00 |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-L-0150 |
| 2 | QA-L-0200 |
| 2-1/2 | QA-L-0250 |
| 3-1/4 | QA-L-0325 |
| 4 | QA-L-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | ZV | ZN |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.62 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 | 5.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

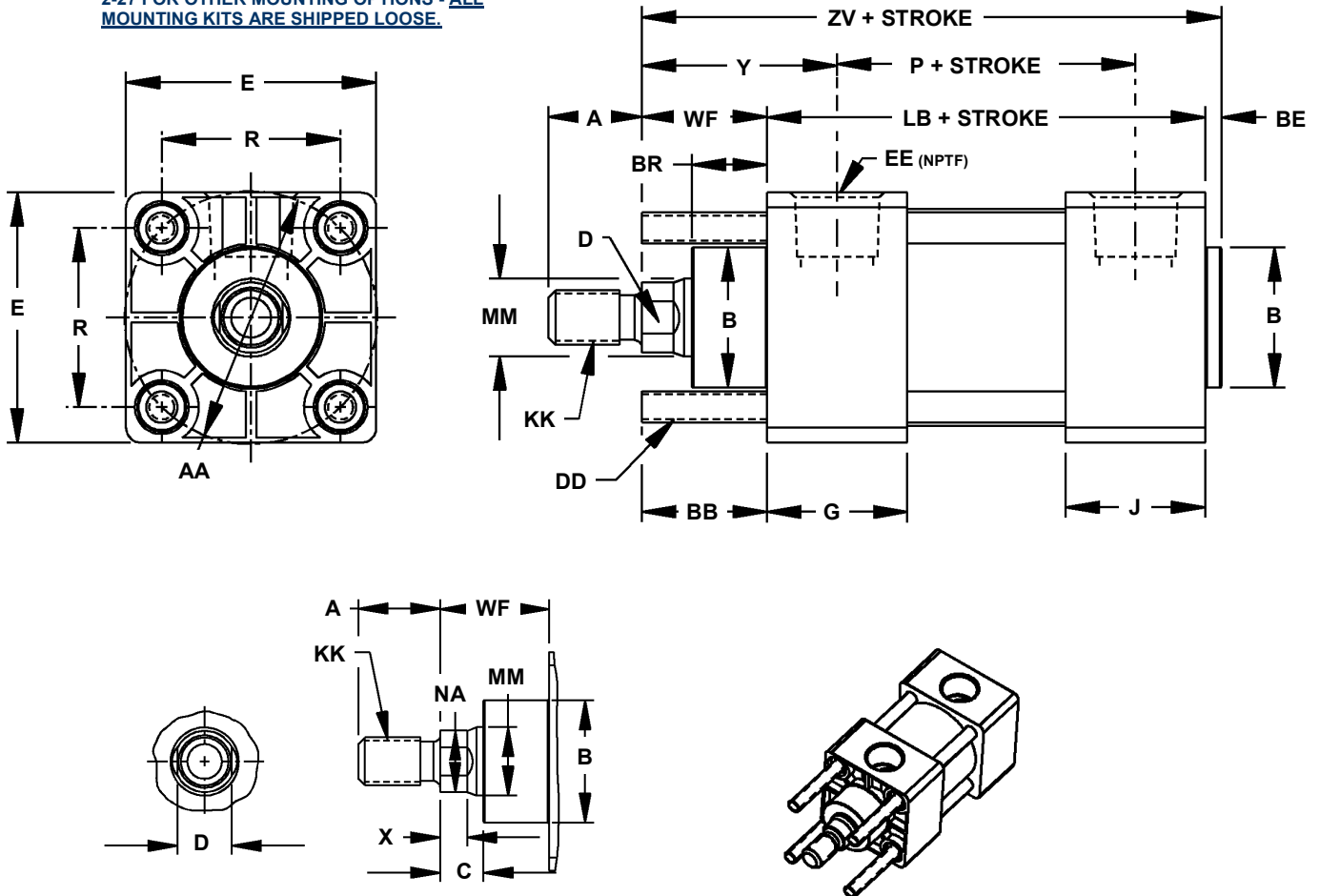
For 1A Series Direct Replacement - Use "L-1A" mount p. 2-22

Cylinder Dimension

QA Series - 1-1/2 to 4 Bore

Style "M" Mount (MX3)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | | | Plus stroke | | Needed Mounting Kit | |
|-----------------------------|------|------|------|------|------|----------|----------|------|------|------|-------------|------|---------------------|------------|
| Bore | AA | BB | BE | BR | E | DD | EE | G | J | R | P | LB | Bore | Part No. |
| 1-1/2 | 2.02 | 1.00 | .125 | 0.62 | 2.00 | 0.25"-28 | 0.38"-18 | 1.26 | 1.01 | 1.43 | 2.36 | 3.62 | 1-1/2 | QA-MN-0150 |
| 2 | 2.60 | 1.12 | .125 | 0.62 | 2.50 | 0.31"-24 | 0.38"-18 | 1.26 | 1.06 | 1.84 | 2.40 | 3.62 | 2 | QA-MN-0200 |
| 2-1/2 | 3.10 | 1.12 | .125 | 0.62 | 3.00 | 0.31"-24 | 0.38"-18 | 1.30 | 1.06 | 2.19 | 2.48 | 3.75 | 2-1/2 | QA-MN-0250 |
| 3-1/4 | 3.90 | 1.38 | .201 | 0.88 | 3.75 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 2.76 | 2.72 | 4.25 | 3-1/4 | QA-MN-0325 |
| 4 | 4.70 | 1.38 | .201 | 0.88 | 4.50 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 3.32 | 2.72 | 4.25 | 4 | QA-MN-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|---------------------------------------|------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-0.002} | C | D | NA | WF | X | Y | ZV | |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 | |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | |

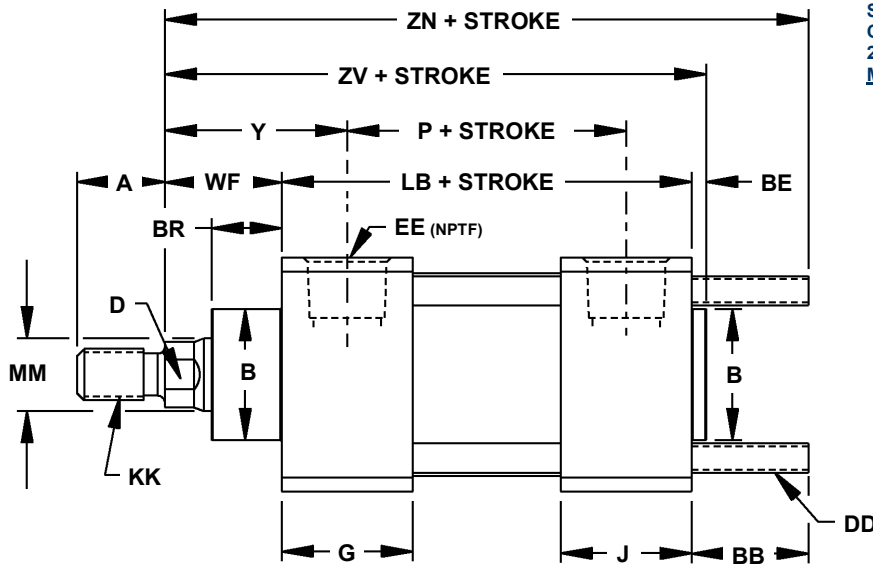
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

For 1A Series Direct Replacement - Use "M-1A" mount p. 2-23

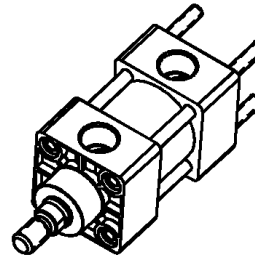
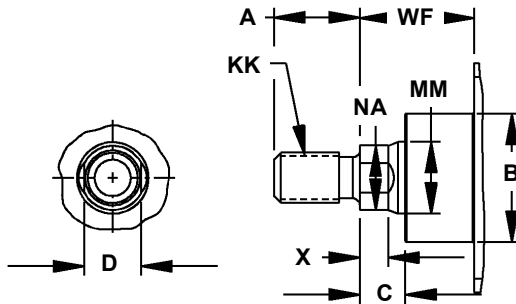
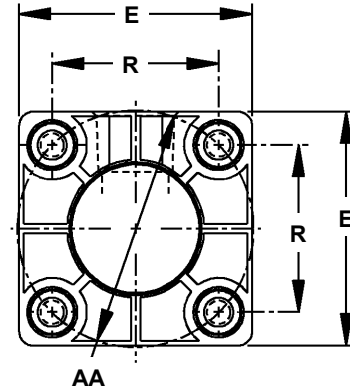
Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "N" Mount (MX2)



SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | | | Plus stroke | |
|-----------------------------|------|------|------|------|------|----------|----------|------|------|------|-------------|------|
| Bore | AA | BB | BE | BR | E | DD | EE | G | J | R | P | LB |
| 1-1/2 | 2.02 | 1.00 | .125 | 0.62 | 2.00 | 0.25"-28 | 0.38"-18 | 1.26 | 1.01 | 1.43 | 2.36 | 3.62 |
| 2 | 2.60 | 1.12 | .125 | 0.62 | 2.50 | 0.31"-24 | 0.38"-18 | 1.26 | 1.06 | 1.84 | 2.40 | 3.62 |
| 2-1/2 | 3.10 | 1.12 | .125 | 0.62 | 3.00 | 0.31"-24 | 0.38"-18 | 1.30 | 1.06 | 2.19 | 2.48 | 3.75 |
| 3-1/4 | 3.90 | 1.38 | .201 | 0.88 | 3.75 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 2.76 | 2.72 | 4.25 |
| 4 | 4.70 | 1.38 | .201 | 0.88 | 4.50 | 0.38"-24 | 0.50"-14 | 1.57 | 1.18 | 3.32 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-MN-0150 |
| 2 | QA-MN-0200 |
| 2-1/2 | QA-MN-0250 |
| 3-1/4 | QA-MN-0325 |
| 4 | QA-MN-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|-------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.00} _{-.002} | C | D | NA | WF | X | Y | ZV | ZN |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.62 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 | 5.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

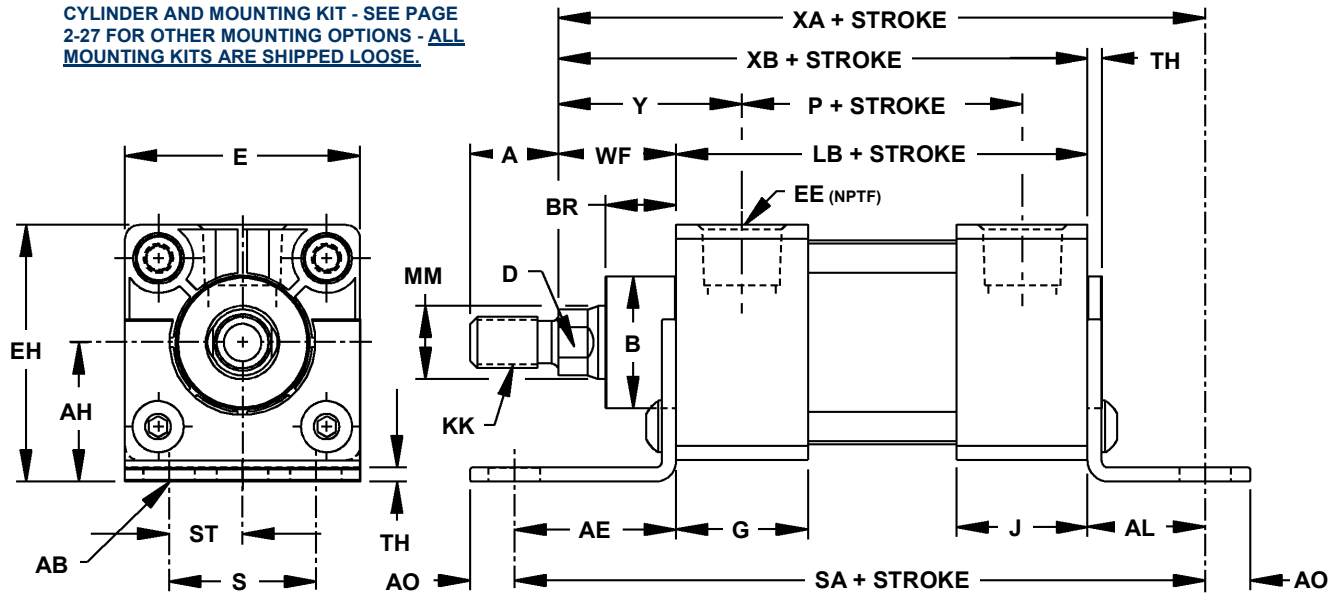
1A Series Direct Replacement

Cylinder Dimensions

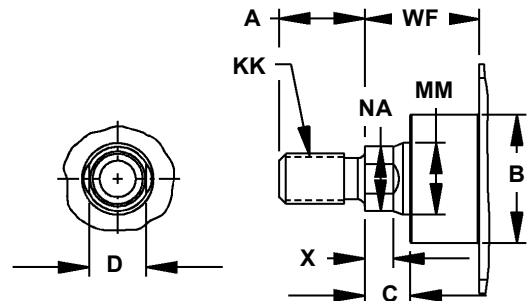
QA Series - 1-1/2 to 4 Bore

Style "C" Mount (MS1)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

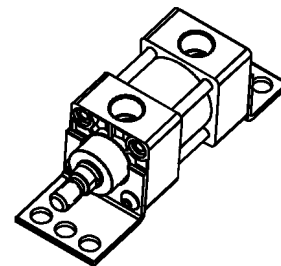


| Mounting Dimensions | | | | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|------|------|------|-------------|
| Bore | AB* | AE | AH | AL | AO | EH | S | ST | TH | SA |
| 1-1/2 | .375 | 1.38 | 1.19 | 1.00 | .375 | 2.19 | 1.25 | .625 | .125 | 6.00 |
| 2 | .375 | 1.38 | 1.44 | 1.00 | .375 | 2.69 | 1.75 | .875 | .125 | 6.00 |
| 2-1/2 | .375 | 1.38 | 1.63 | 1.00 | .375 | 3.12 | 2.25 | 1.12 | .125 | 6.12 |
| 3-1/4 | .500 | 1.88 | 1.94 | 1.25 | .500 | 3.81 | 2.75 | 1.38 | .125 | 7.38 |
| 4 | .500 | 1.88 | 2.25 | 1.25 | .500 | 4.50 | 3.50 | 1.75 | .125 | 7.38 |



| Basic Dimensions | | | | | | | | Plus stroke | |
|------------------|------|------|----------|------|------|------|------|-------------|--|
| Bore | BR | E | EE | G | J | P | LB | | |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 | | |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 | | |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 | | |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 | | |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 | | |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-C-0150 |
| 2 | QA-C-0200 |
| 2-1/2 | QA-C-0250 |
| 3-1/4 | QA-C-0325 |
| 4 | QA-C-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|---------------------|-------------------|-------------------|-------|--------------------------------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | | MM | KK ^(1/3) | FF ⁽²⁾ | CC ⁽⁵⁾ | A | B ^{+0.000 -0.002} | C | D | NA | WF | X | Y | XA |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.62 | 4.62 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.62 | 4.62 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.62 | 4.75 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.88 | 5.62 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.88 | 5.62 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

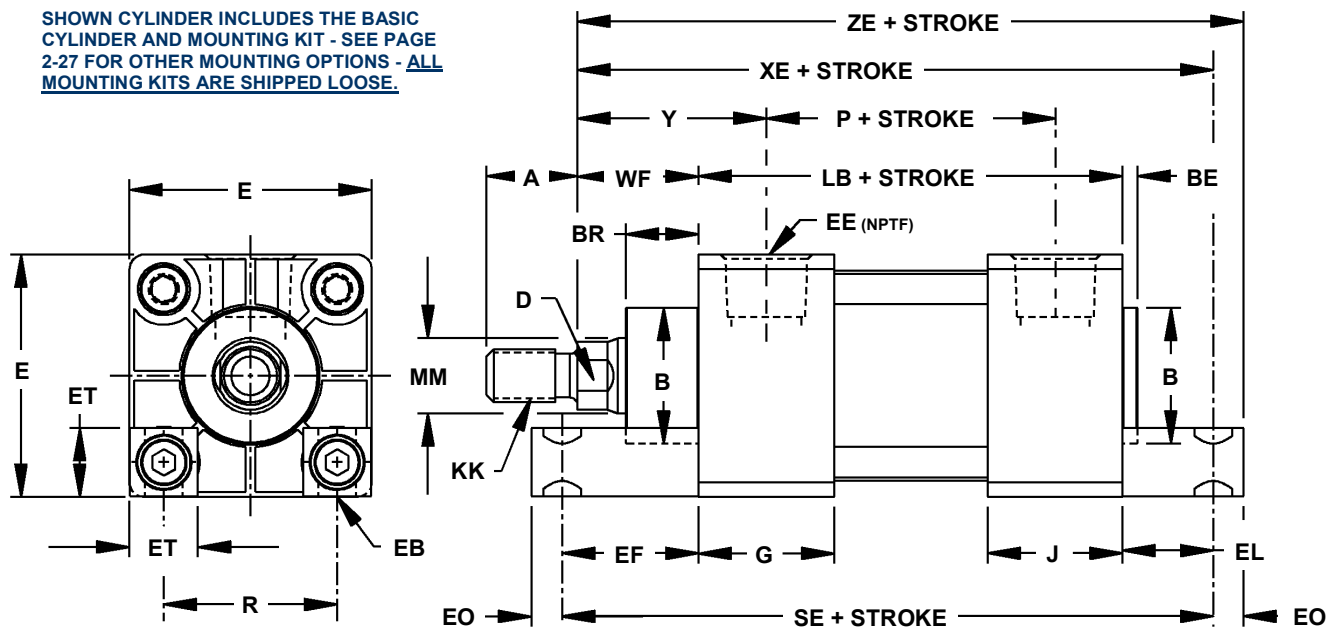
Ortman reserves the right to change or modify any or all published information and dimensions without notice.

Cylinder Dimensions

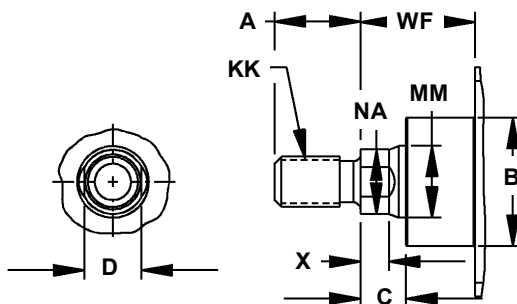
QA Series - 1-1/2 to 4 Bore

Style "CC" Mount (MS7)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

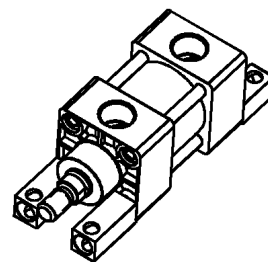


| Mounting Dimensions | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|-------------|
| Bore | EB* | EF | EO | EL | ET | R | SE |
| 1-1/2 | .250 | 1.12 | .250 | .750 | .562 | 1.43 | 5.50 |
| 2 | .312 | 1.31 | .312 | .938 | .688 | 1.84 | 5.88 |
| 2-1/2 | .312 | 1.44 | .312 | 1.06 | .812 | 2.19 | 6.25 |
| 3-1/4 | .375 | 1.50 | .375 | .875 | 1.00 | 2.76 | 6.62 |
| 4 | .375 | 1.62 | .375 | 1.12 | 1.19 | 3.32 | 7.00 |



| Basic Dimensions | | | | | | | | Plus stroke |
|------------------|------|------|------|----------|------|------|------|-------------|
| Bore | BE | BR | E | EE | G | J | P | LB |
| 1-1/2 | .125 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | .125 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | .125 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | .201 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | .201 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-CC-0150 |
| 2 | QA-CC-0200 |
| 2-1/2 | QA-CC-0250 |
| 3-1/4 | QA-CC-0325 |
| 4 | QA-CC-0400 |



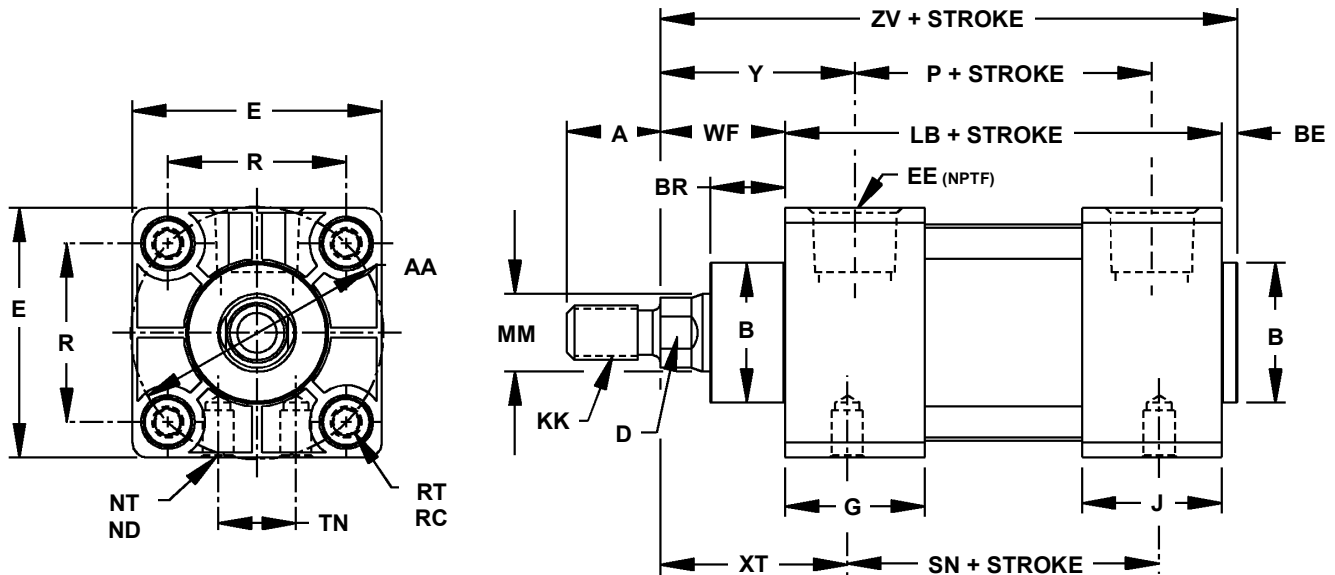
| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|--|------------------|--------------------------------------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | XE ZE |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.38 5.62 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.56 5.88 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.81 6.12 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.50 6.88 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.75 7.12 |

*Mounting holes are 1/16" larger than bolt size shown.
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

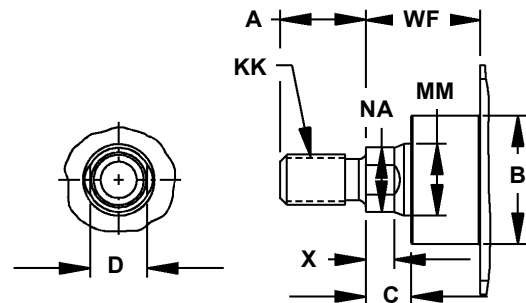
Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

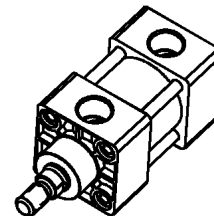
Style "F" Mount (MX0) & Style "H" Mount (MS4)



| Mounting Dimensions | | | | | | | | | Plus stroke |
|---------------------|-----------------|------|------|-----------------|------|------|------|------|-------------|
| Bore | Style "F" (MX0) | | | Style "H" (MS4) | | | | | |
| | RT | RC | R | NT | ND | TN | XT | SN | |
| 1-1/2 | 0.31"-24 | .500 | 1.43 | 0.31"-24 | .375 | .625 | 1.94 | 2.25 | |
| 2 | 0.38"-24 | .500 | 1.84 | 0.38"-24 | .438 | .875 | 1.94 | 2.25 | |
| 2-1/2 | 0.38"-24 | .500 | 2.19 | 0.38"-24 | .562 | 1.25 | 1.94 | 2.38 | |
| 3-1/4 | 0.50"-20 | .625 | 2.76 | 0.50"-20 | .750 | 1.50 | 2.44 | 2.62 | |
| 4 | 0.50"-20 | .625 | 3.32 | 0.50"-20 | .750 | 2.06 | 2.44 | 2.62 | |



| Basic Dimensions | | | | | | | | Plus stroke | |
|------------------|------|------|------|------|----------|------|------|-------------|------|
| Bore | AA | BE | BR | E | EE | G | J | P | LB |
| 1-1/2 | 2.02 | .125 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | 2.60 | .125 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | 3.10 | .125 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | 3.90 | .201 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | 4.70 | .201 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |



| Rod End Dimensions | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|---------------------------------------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-0.002} | C | D | NA | WF | X | Y | ZV |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

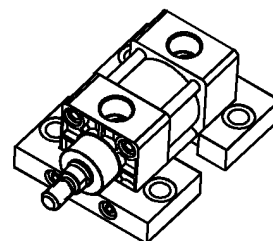
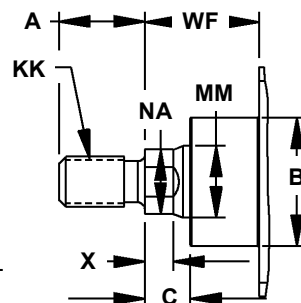
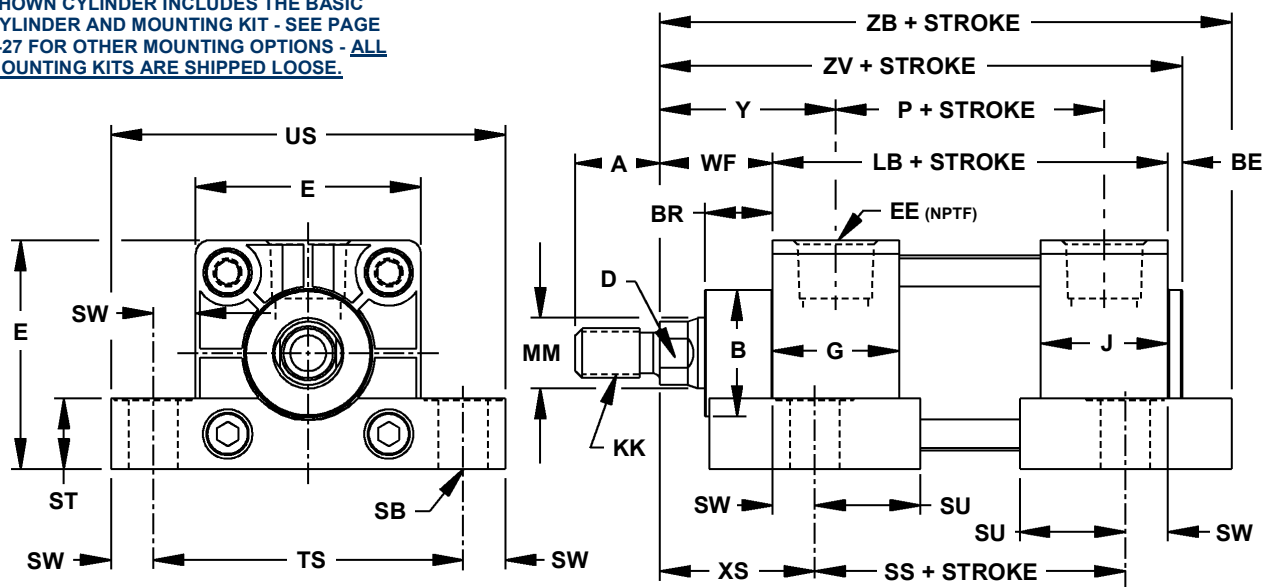
Ortman reserves the right to change or modify any or all published information and dimensions without notice.

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "J" Mount (MS2)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Mounting Dimensions | | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|------|-------------|
| Bore | SB* | ST | SU | SW | TS | US | XS | SS |
| 1-1/2 | .375 | .625 | .938 | .375 | 2.75 | 3.50 | 1.38 | 2.88 |
| 2 | .375 | .625 | .938 | .375 | 3.25 | 4.00 | 1.38 | 2.88 |
| 2-1/2 | .375 | .750 | .938 | .375 | 3.75 | 4.50 | 1.38 | 3.00 |
| 3-1/4 | .500 | 1.00 | 1.25 | .500 | 4.75 | 5.75 | 1.88 | 3.25 |
| 4 | .500 | 1.00 | 1.25 | .500 | 5.50 | 6.50 | 1.88 | 3.25 |

| Basic Dimensions | | | | | | | | Plus stroke |
|------------------|------|------|------|----------|------|------|------|-------------|
| Bore | BE | BR | E | EE | G | J | P | LB |
| 1-1/2 | .125 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | .125 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | .125 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | .201 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | .201 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-J-0150 |
| 2 | QA-J-0200 |
| 2-1/2 | QA-J-0250 |
| 3-1/4 | QA-J-0325 |
| 4 | QA-J-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | ZV | ZB |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.19 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.19 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 | 5.31 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 6.38 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 6.38 |

*Mounting holes are 1/16" larger than bolt size shown.

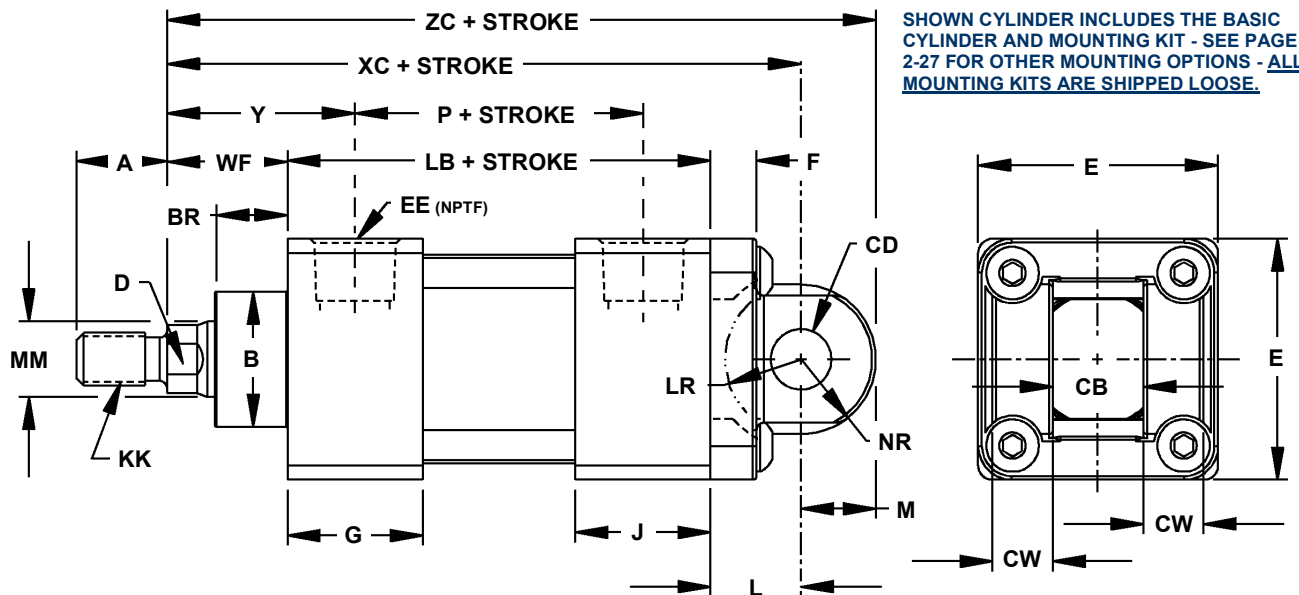
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

For 1A Series Direct Replacement - Use "J-1A" mount p. 2-24

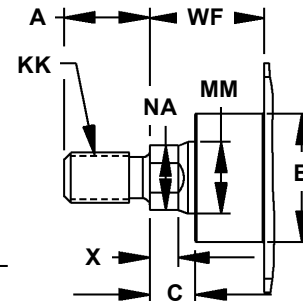
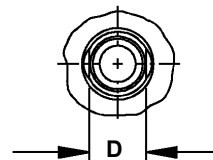
Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

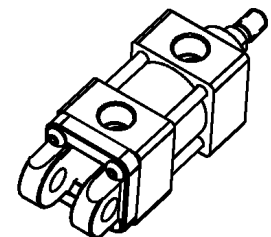
Style "G" Mount (MP1)



| Mounting Dimensions | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|
| Bore | CB | CD | CW | F | L | LR | NR | M |
| 1-1/2 | .750 | .500 | .500 | .375 | .750 | .625 | .625 | .625 |
| 2 | .750 | .500 | .500 | .375 | .750 | .625 | .625 | .625 |
| 2-1/2 | .750 | .500 | .500 | .375 | .750 | .625 | .625 | .625 |
| 3-1/4 | 1.25 | .750 | .625 | .625 | 1.25 | .938 | .875 | .875 |
| 4 | 1.25 | .750 | .625 | .625 | 1.25 | .938 | .875 | .875 |



| Basic Dimensions | | | | | | | Plus stroke | Needed Mounting Kit | |
|------------------|------|------|----------|------|------|------|-------------|---------------------|-----------|
| Bore | BR | E | EE | G | J | P | LB | Bore | Part No. |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 | 1-1/2 | QA-G-0150 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 | 2 | QA-G-0200 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 | 2-1/2 | QA-G-0250 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 | 3-1/4 | QA-G-0325 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 | 4 | QA-G-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | XC | ZC |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.38 | 6.00 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.38 | 6.00 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.50 | 6.12 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.88 | 7.75 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 6.88 | 7.75 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

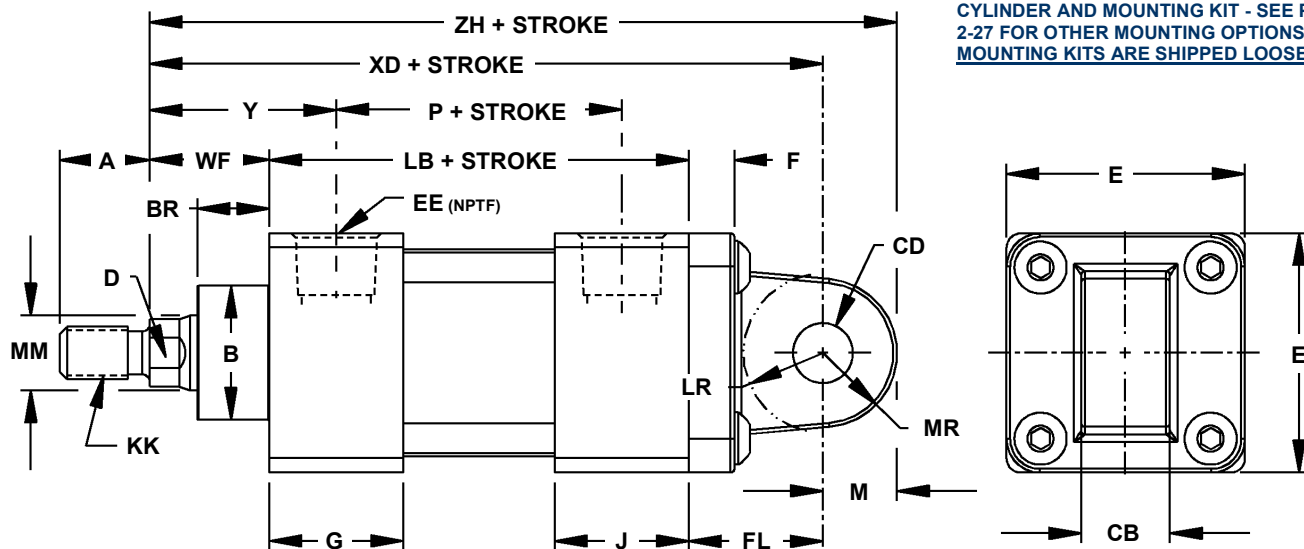
For 1A Series Direct Replacement - Use "Z" (MP2) mount p. 2-12

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "R" Mount (MP4)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



Ortman Cenforces a \$25.00 net minimum order charge.

Mounting Dimensions

| Bore | CB | CD | F | FL | LR | MR | M |
|-------|------|------|------|------|------|------|------|
| 1-1/2 | .750 | .500 | .375 | 1.12 | .625 | .500 | .500 |
| 2 | .750 | .500 | .375 | 1.12 | .625 | .500 | .500 |
| 2-1/2 | .750 | .500 | .375 | 1.12 | .625 | .500 | .500 |
| 3-1/4 | 1.25 | .750 | .625 | 1.88 | .938 | .750 | .750 |
| 4 | 1.25 | .750 | .625 | 1.88 | .938 | .750 | .750 |

Basic Dimensions

| Bore | BR | E | EE | G | J | P | LB |
|-------|------|------|----------|------|------|------|------|
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

Plus stroke

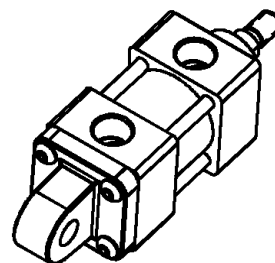
Needed Mounting Kit

| Bore | Part No. |
|-------|-----------|
| 1-1/2 | QA-R-0150 |
| 2 | QA-R-0200 |
| 2-1/2 | QA-R-0250 |
| 3-1/4 | QA-R-0325 |
| 4 | QA-R-0400 |

Rod End Dimensions

| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
|-------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|-------------|------|
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | XD | ZH |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.75 | 6.25 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.75 | 6.25 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.88 | 6.38 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.50 | 8.25 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.50 | 8.25 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

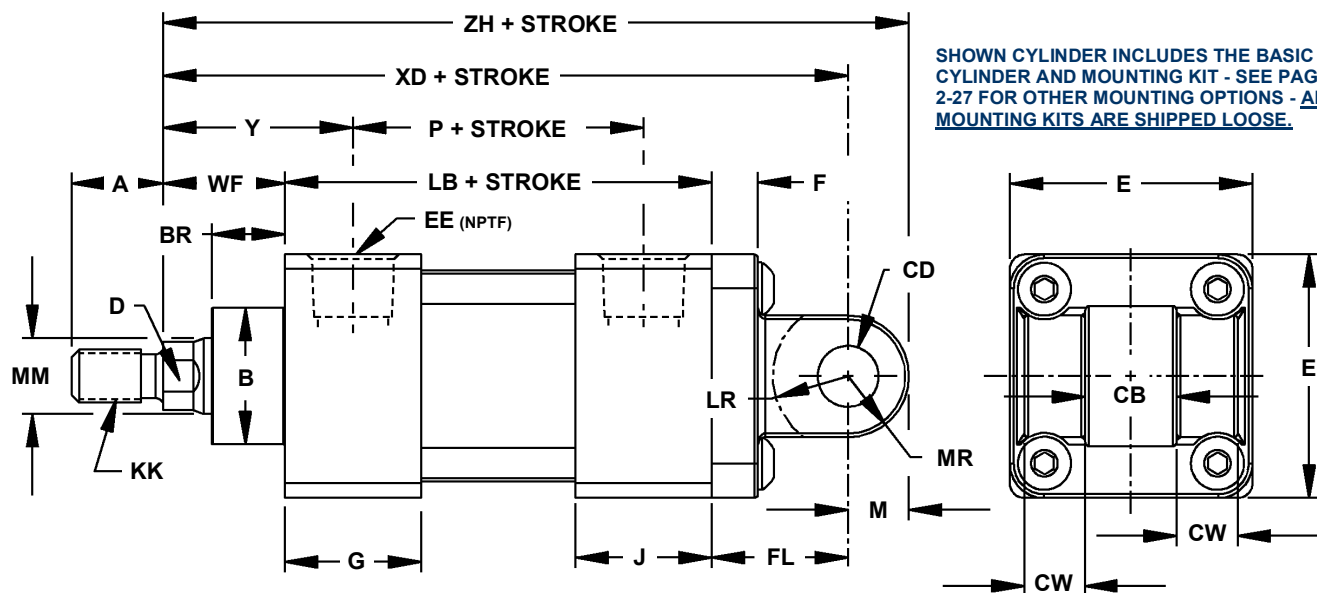


1A Series Direct Replacement

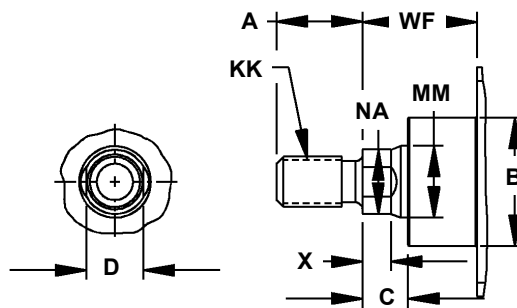
Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "Z" Mount (MP2)

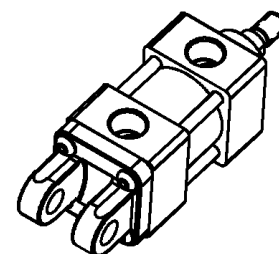


| Mounting Dimensions | | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|--|
| Bore | CB | CD | CW | F | FL | LR | MR | M | |
| 1-1/2 | .750 | .500 | .500 | .375 | 1.12 | .625 | .500 | .500 | |
| 2 | .750 | .500 | .500 | .375 | 1.12 | .625 | .500 | .500 | |
| 2-1/2 | .750 | .500 | .500 | .375 | 1.12 | .625 | .500 | .500 | |
| 3-1/4 | 1.25 | .750 | .625 | .625 | 1.88 | .938 | .750 | .750 | |
| 4 | 1.25 | .750 | .625 | .625 | 1.88 | .938 | .750 | .750 | |



| Basic Dimensions | | | | | | | Plus stroke |
|------------------|------|------|----------|------|------|------|-------------|
| Bore | BR | E | EE | G | J | P | LB |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-Z-0150 |
| 2 | QA-Z-0200 |
| 2-1/2 | QA-Z-0250 |
| 3-1/4 | QA-Z-0325 |
| 4 | QA-Z-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|-------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000 -.002} | C | D | NA | WF | X | Y | XD | ZH |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.75 | 6.25 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.75 | 6.25 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.88 | 6.38 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.50 | 8.25 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.50 | 8.25 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

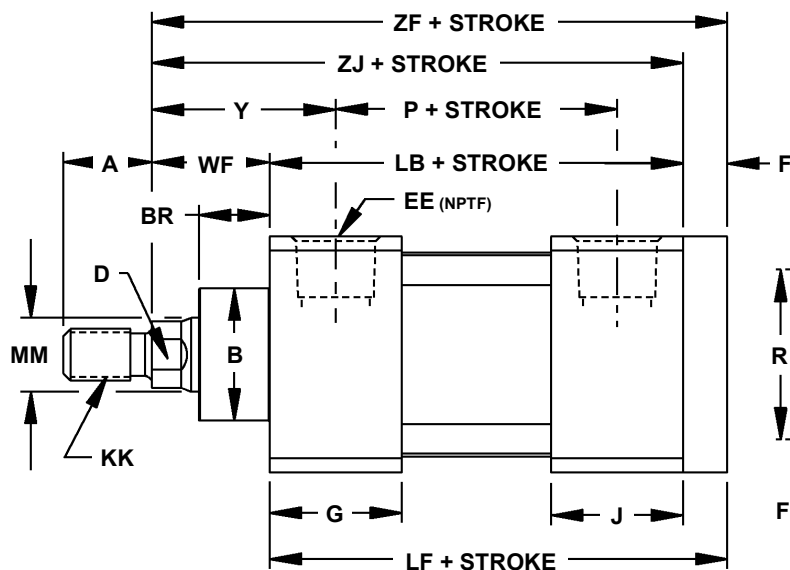
1A Series Direct Replacement

Cylinder Dimensions

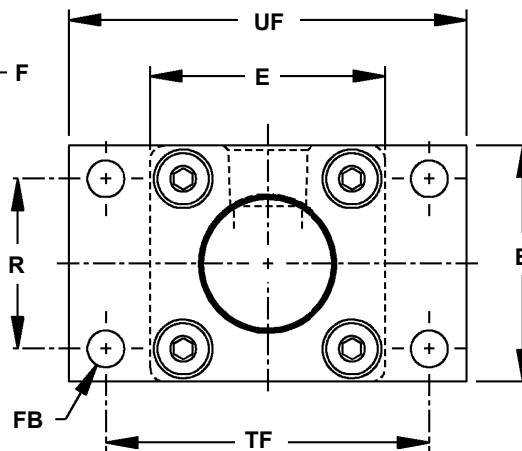
QA Series - 1-1/2 to 4 Bore

Style "A" Mount (MF2)

Ortman enforces a \$25.00 net minimum order charge.



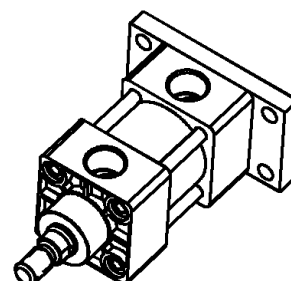
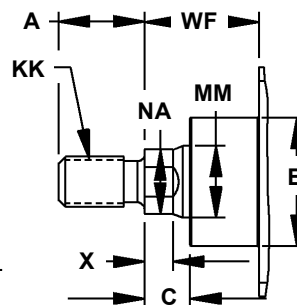
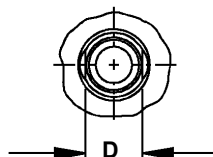
SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Mounting Dimensions | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|-------------|
| Bore | FB* | F | R | TF | UF | LF |
| 1-1/2 | .250 | .375 | 1.43 | 2.75 | 3.38 | 4.00 |
| 2 | .312 | .375 | 1.84 | 3.38 | 4.12 | 4.00 |
| 2-1/2 | .312 | .375 | 2.19 | 3.88 | 4.62 | 4.12 |
| 3-1/4 | .375 | .625 | 2.76 | 4.69 | 5.50 | 4.88 |
| 4 | .375 | .625 | 3.32 | 5.44 | 6.25 | 4.88 |

| Basic Dimensions | | | | | | Plus stroke | |
|------------------|------|------|----------|------|------|-------------|------|
| Bore | BR | E | EE | G | J | P | LB |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-AB-0150 |
| 2 | QA-AB-0200 |
| 2-1/2 | QA-AB-0250 |
| 3-1/4 | QA-AB-0325 |
| 4 | QA-AB-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | ZJ | ZF |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.62 | 5.00 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.62 | 5.00 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.75 | 5.12 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.62 | 6.25 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.62 | 6.25 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

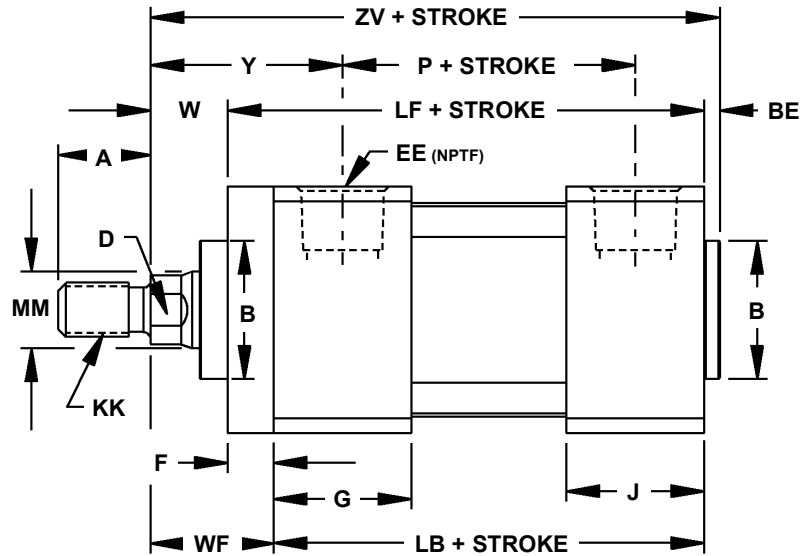
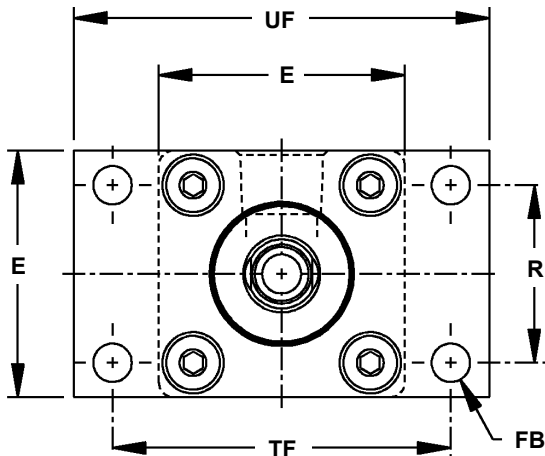
1A Series Direct Replacement

Cylinder Dimensions

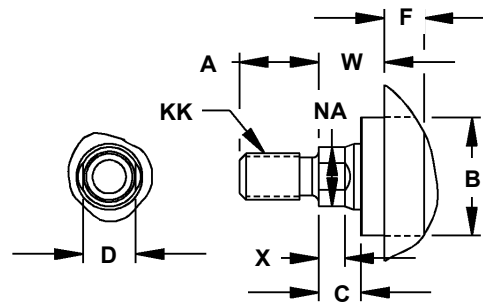
QA Series - 1-1/2 to 4 Bore

Style "B" Mount (MF1)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

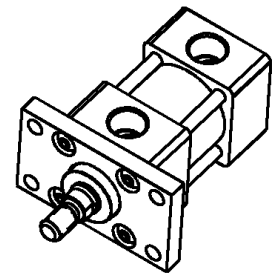


| Mounting Dimensions | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|-------------|
| Bore | FB* | F | R | TF | UF | LF |
| 1-1/2 | .250 | .375 | 1.43 | 2.75 | 3.38 | 4.00 |
| 2 | .312 | .375 | 1.84 | 3.38 | 4.12 | 4.00 |
| 2-1/2 | .312 | .375 | 2.19 | 3.88 | 4.62 | 4.12 |
| 3-1/4 | .375 | .625 | 2.76 | 4.69 | 5.50 | 4.88 |
| 4 | .375 | .625 | 3.32 | 5.44 | 6.25 | 4.88 |



| Basic Dimensions | | | | | | Plus stroke | |
|------------------|------|------|----------|------|------|-------------|------|
| Bore | BE | E | EE | G | J | P | LB |
| 1-1/2 | .125 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | .125 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | .125 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | .201 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | .201 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-AB-0150 |
| 2 | QA-AB-0200 |
| 2-1/2 | QA-AB-0250 |
| 3-1/4 | QA-AB-0325 |
| 4 | QA-AB-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+ .000} _{-.002} | C | D | NA | W | WF | X | Y | ZV |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.75 | 4.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

For 1A Series Direct Replacement - Use "B-1A" mount p. 2-25

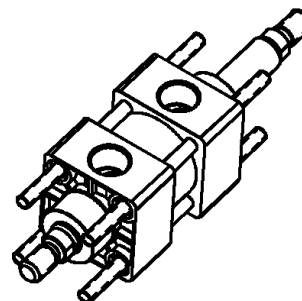
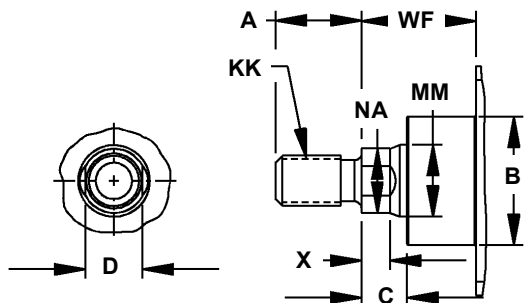
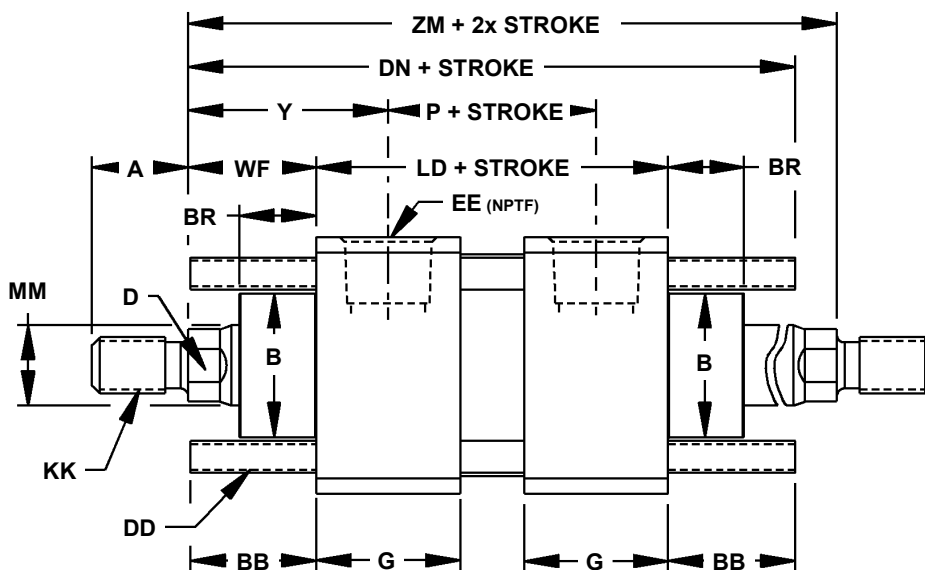
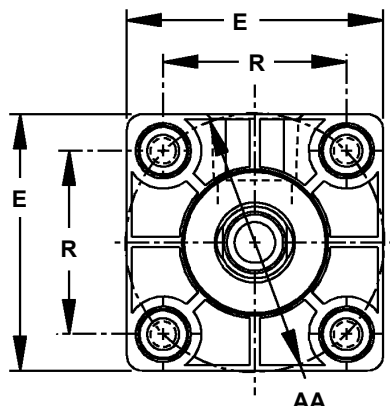
Ortman reserves the right to change or modify any or all published information and dimensions without notice.

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "DL" Mount (MDX1)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | Plus stroke | |
|-----------------------------|------|------|------|------|----------|----------|------|------|-------------|------|
| Bore | AA | BB | BR | E | DD | EE | G | R | P | LD |
| 1-1/2 | 2.02 | 1.00 | 0.62 | 2.00 | 0.25"-28 | 0.38"-18 | 1.26 | 1.43 | 2.36 | 3.87 |
| 2 | 2.60 | 1.12 | 0.62 | 2.50 | 0.31"-24 | 0.38"-18 | 1.26 | 1.84 | 2.40 | 3.82 |
| 2-1/2 | 3.10 | 1.12 | 0.62 | 3.00 | 0.31"-24 | 0.38"-18 | 1.30 | 2.19 | 2.48 | 3.98 |
| 3-1/4 | 3.90 | 1.38 | 0.88 | 3.75 | 0.38"-24 | 0.50"-14 | 1.57 | 2.76 | 2.72 | 4.64 |
| 4 | 4.70 | 1.38 | 0.88 | 4.50 | 0.38"-24 | 0.50"-14 | 1.57 | 3.32 | 2.72 | 4.64 |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-L-0150 |
| 2 | QA-L-0200 |
| 2-1/2 | QA-L-0250 |
| 3-1/4 | QA-L-0325 |
| 4 | QA-L-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|---------------------------------------|------|------|------|------|------|------|-------------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-0.002} | C | D | NA | WF | X | Y | DN | ZM |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.88 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.94 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 6.10 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.40 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.40 | 7.40 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

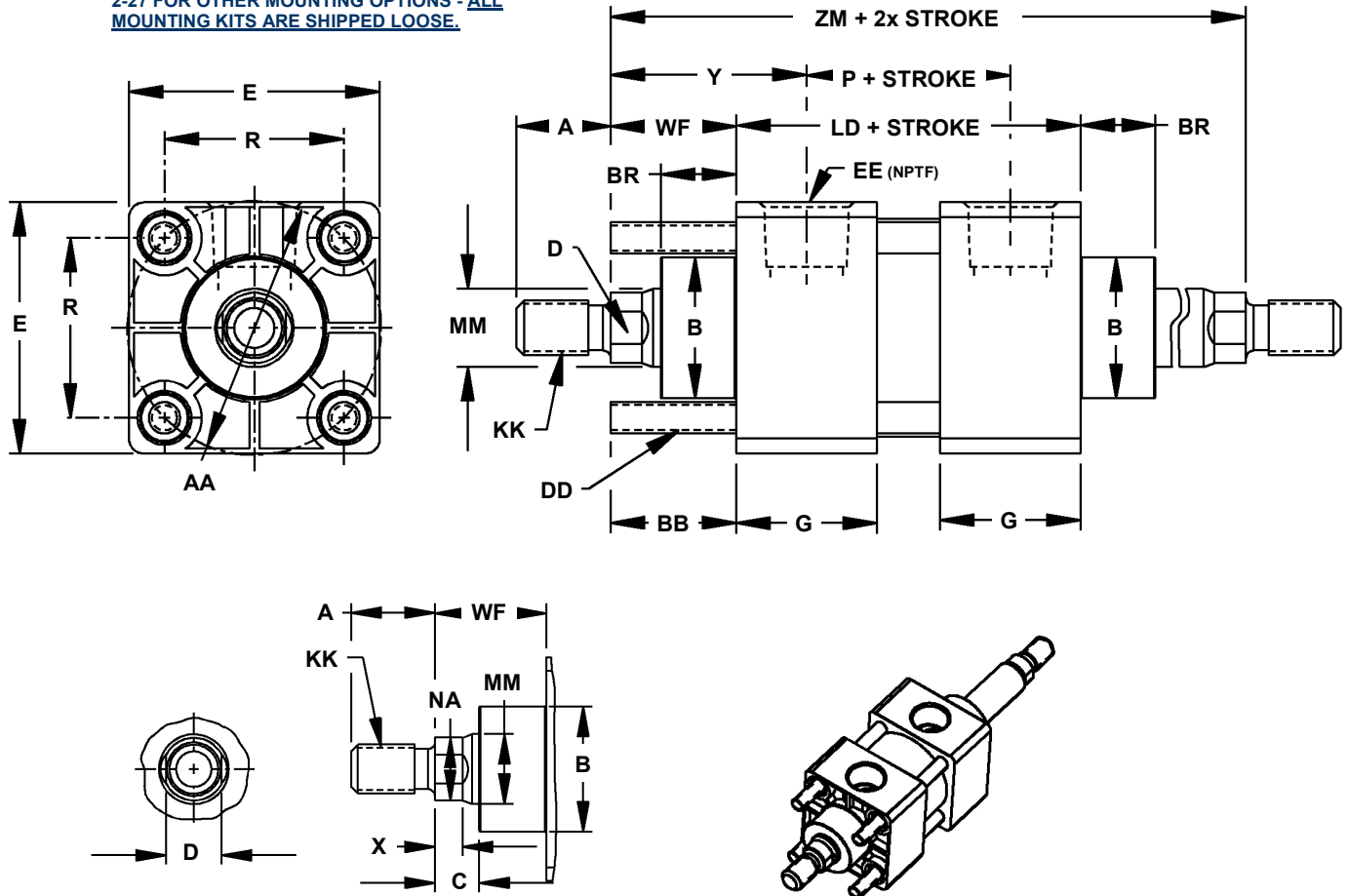
1A Series Direct Replacement

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "DM" Mount (MDX3)

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | Plus stroke | |
|-----------------------------|------|------|------|------|----------|----------|------|------|-------------|------|
| Bore | AA | BB | BR | E | DD | EE | G | R | P | LD |
| 1-1/2 | 2.02 | 1.00 | 0.62 | 2.00 | 0.25"-28 | 0.38"-18 | 1.26 | 1.43 | 2.36 | 3.87 |
| 2 | 2.60 | 1.12 | 0.62 | 2.50 | 0.31"-24 | 0.38"-18 | 1.26 | 1.84 | 2.40 | 3.82 |
| 2-1/2 | 3.10 | 1.12 | 0.62 | 3.00 | 0.31"-24 | 0.38"-18 | 1.30 | 2.19 | 2.48 | 3.98 |
| 3-1/4 | 3.90 | 1.38 | 0.88 | 3.75 | 0.38"-24 | 0.50"-14 | 1.57 | 2.76 | 2.72 | 4.64 |
| 4 | 4.70 | 1.38 | 0.88 | 4.50 | 0.38"-24 | 0.50"-14 | 1.57 | 3.32 | 2.72 | 4.64 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-MN-0150 |
| 2 | QA-MN-0200 |
| 2-1/2 | QA-MN-0250 |
| 3-1/4 | QA-MN-0325 |
| 4 | QA-MN-0400 |

| Rod End Dimensions | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------|------|------|------|------|------|------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000 -0.002} | C | D | NA | WF | X | Y | |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.40 |

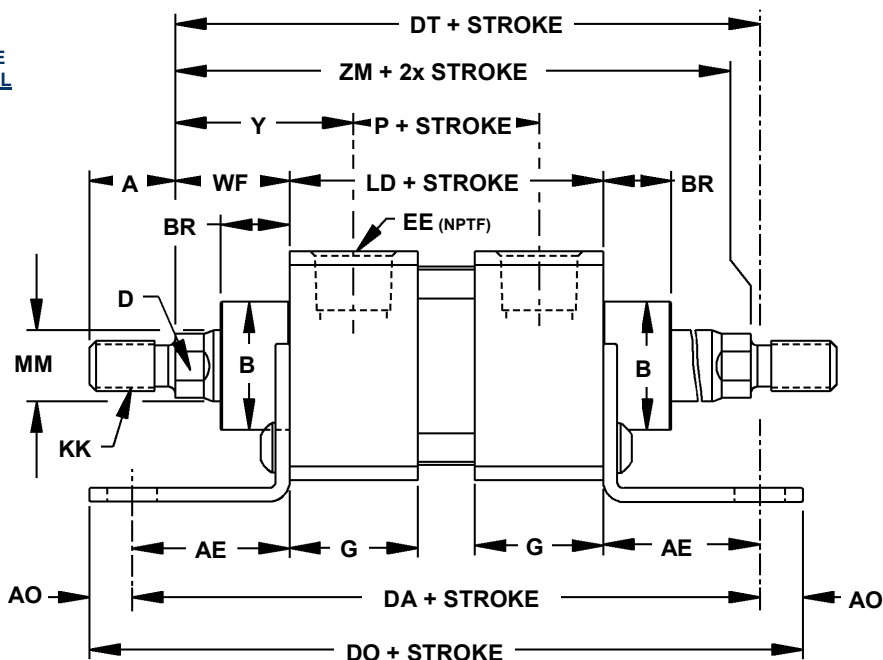
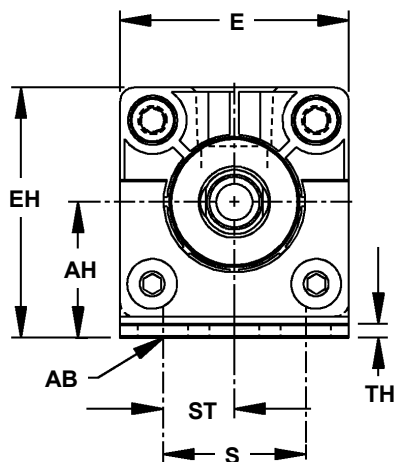
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

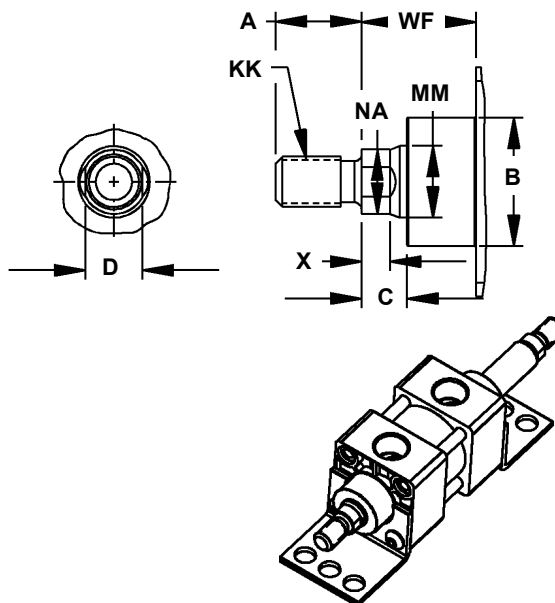
Style "DC" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Mounting Dimensions | | | | | | | | | Plus stroke | |
|---------------------|------|------|------|------|------|------|------|------|-------------|------|
| Bore | AB* | AE | AH | AO | EH | S | ST | TH | DA | DO |
| 1-1/2 | .438 | 1.38 | 1.19 | .375 | 2.19 | 1.25 | .625 | .125 | 6.62 | 7.38 |
| 2 | .438 | 1.38 | 1.44 | .375 | 2.69 | 1.75 | .875 | .125 | 6.58 | 7.33 |
| 2-1/2 | .438 | 1.38 | 1.63 | .375 | 3.12 | 2.25 | 1.12 | .125 | 6.74 | 7.49 |
| 3-1/4 | .562 | 1.88 | 1.94 | .500 | 3.81 | 2.75 | 1.38 | .125 | 8.40 | 9.40 |
| 4 | .562 | 1.88 | 2.25 | .500 | 4.50 | 3.50 | 1.75 | .125 | 8.40 | 9.40 |

| Basic Dimensions | | | | | | | Plus stroke | | Needed Mounting Kit | |
|------------------|------|------|----------|------|------|------|-------------|--|---------------------|------------|
| Bore | BR | E | EE | G | P | LD | | | Bore | Part No. |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 2.36 | 3.87 | | | 1-1/2 | QA-DC-0150 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 2.40 | 3.82 | | | 2 | QA-DC-0200 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 2.48 | 3.98 | | | 2-1/2 | QA-DC-0250 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 2.72 | 4.64 | | | 3-1/4 | QA-DC-0325 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 2.72 | 4.64 | | | 4 | QA-DC-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|-------------------------------|------|------|------|------|------|------|-------------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} -0.002 | C | D | NA | WF | X | Y | DT | ZM |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 6.25 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 6.20 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 6.36 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.90 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.90 | 7.40 |

*Mounting holes are 1/16" larger than bolt size shown.

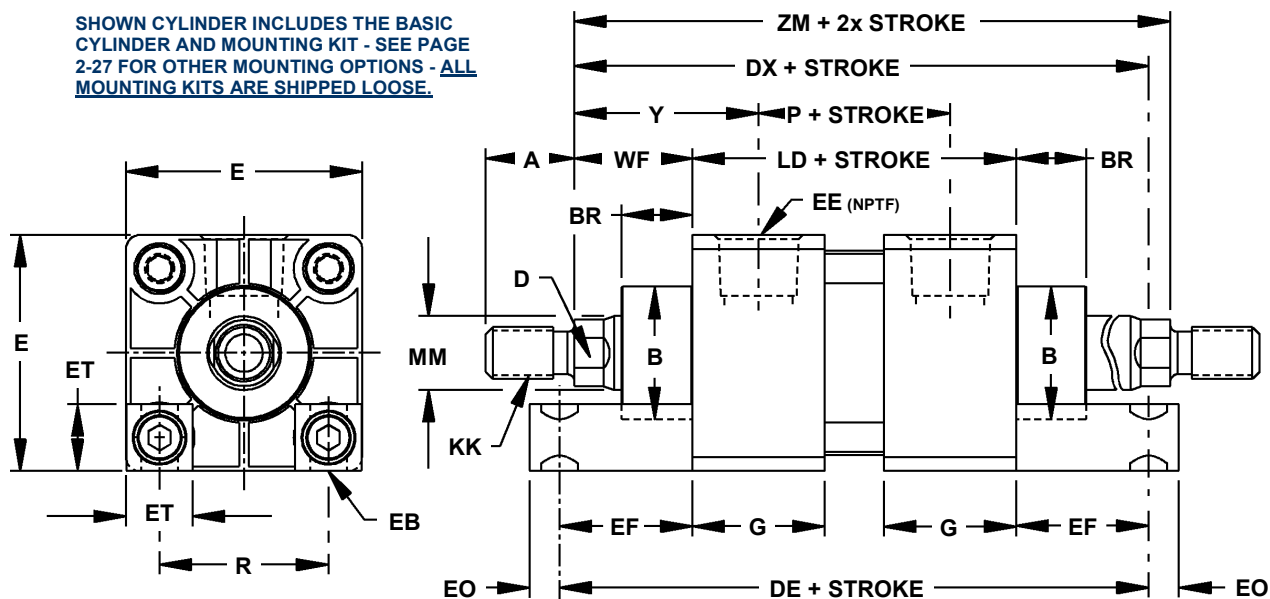
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

Cylinder Dimensions

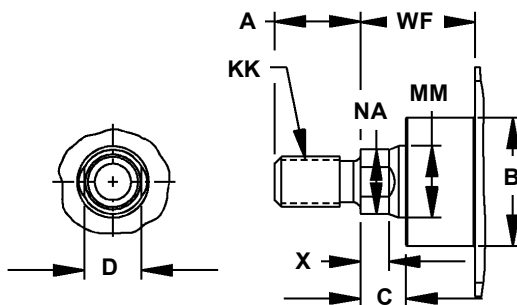
QA Series - 1-1/2 to 4 Bore

Style "DCC" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

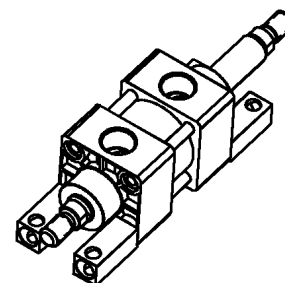


| Mounting Dimensions | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|-------------|
| Bore | EB* | EF | EO | ET | R | DE |
| 1-1/2 | .250 | 1.12 | .250 | .562 | 1.43 | 6.12 |
| 2 | .312 | 1.31 | .312 | .688 | 1.84 | 6.44 |
| 2-1/2 | .312 | 1.44 | .312 | .812 | 2.19 | 6.86 |
| 3-1/4 | .375 | 1.50 | .375 | 1.00 | 2.76 | 7.64 |
| 4 | .375 | 1.62 | .375 | 1.19 | 3.32 | 7.88 |



| Basic Dimensions | | | | | Plus stroke | |
|------------------|------|------|----------|------|-------------|------|
| Bore | BR | E | EE | G | P | LD |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 2.36 | 3.87 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 2.40 | 3.82 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 2.48 | 3.98 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 2.72 | 4.64 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 2.72 | 4.64 |

| Needed Mounting Kit | |
|---------------------|-------------|
| Bore | Part No. |
| 1-1/2 | QA-DCC-0150 |
| 2 | QA-DCC-0200 |
| 2-1/2 | QA-DCC-0250 |
| 3-1/4 | QA-DCC-0325 |
| 4 | QA-DCC-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------------|------|------|------|------|------|------|-------------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | Plus stroke | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | DX | ZM |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 6.00 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 6.12 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 6.42 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.52 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.64 | 7.40 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

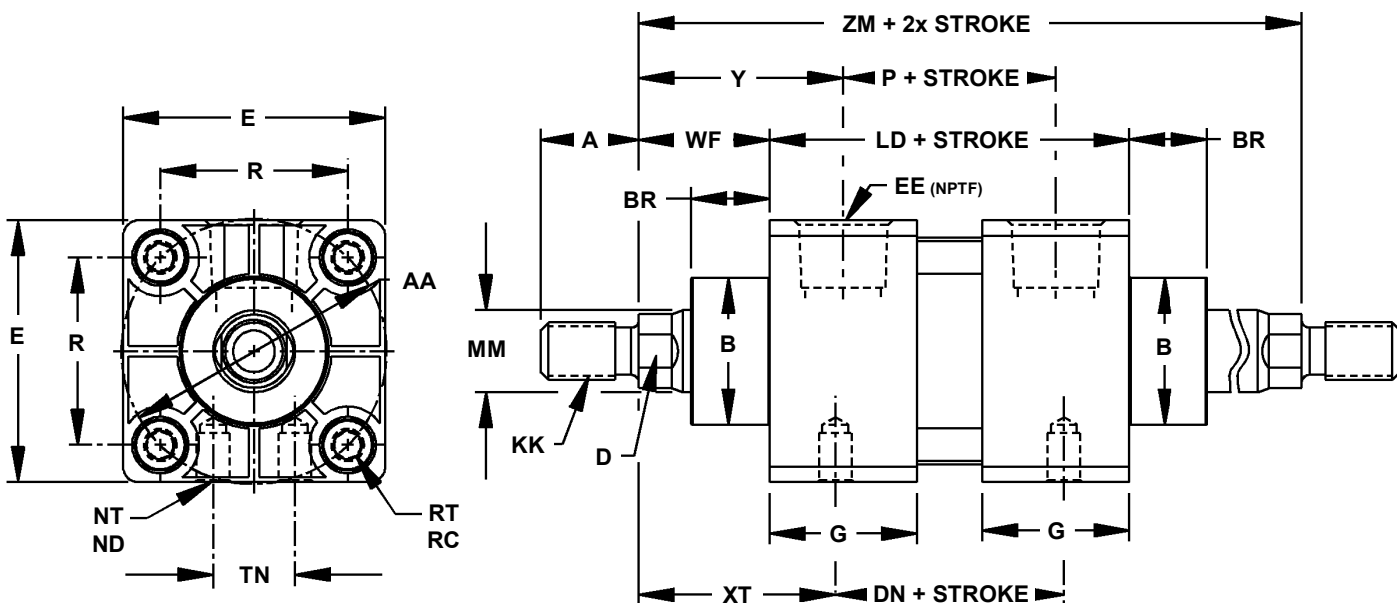
Ortman reserves the right to change or modify any or all published information and dimensions without notice.

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "DF" Mount & Style "DH" Mount

Ortman enforces a \$25.00 net minimum order charge.



| Mounting Dimensions | | | | | | | | Plus stroke | |
|---------------------|------------------|------|------|------------------|----------|------|------|-------------|------|
| Bore | Style "F" (MDX0) | | | Style "H" (MDS4) | | | | | |
| | RT | RC | R | | NT | ND | TN | XT | DN |
| 1-1/2 | 0.31"-24 | .500 | 1.43 | | 0.31"-24 | .375 | .625 | 1.94 | 2.00 |
| 2 | 0.38"-24 | .500 | 1.84 | | 0.38"-24 | .438 | .875 | 1.94 | 1.94 |
| 2-1/2 | 0.38"-24 | .500 | 2.19 | | 0.38"-24 | .562 | 1.25 | 1.94 | 2.10 |
| 3-1/4 | 0.50"-20 | .625 | 2.76 | | 0.50"-20 | .750 | 1.50 | 2.44 | 2.52 |
| 4 | 0.50"-20 | .625 | 3.32 | | 0.50"-20 | .750 | 2.06 | 2.44 | 2.52 |

| Basic Dimensions | | | | | | | Plus stroke |
|------------------|------|------|------|----------|------|------|-------------|
| Bore | AA | BR | E | EE | G | P | |
| 1-1/2 | 2.02 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 2.36 | 3.87 |
| 2 | 2.60 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 2.40 | 3.82 |
| 2-1/2 | 3.10 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 2.48 | 3.98 |
| 3-1/4 | 3.90 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 2.72 | 4.64 |
| 4 | 4.70 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 2.72 | 4.64 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|-------------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | X | Y | ZT | ZM |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.62 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 5.75 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 5.88 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.00 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 7.00 | 7.40 |

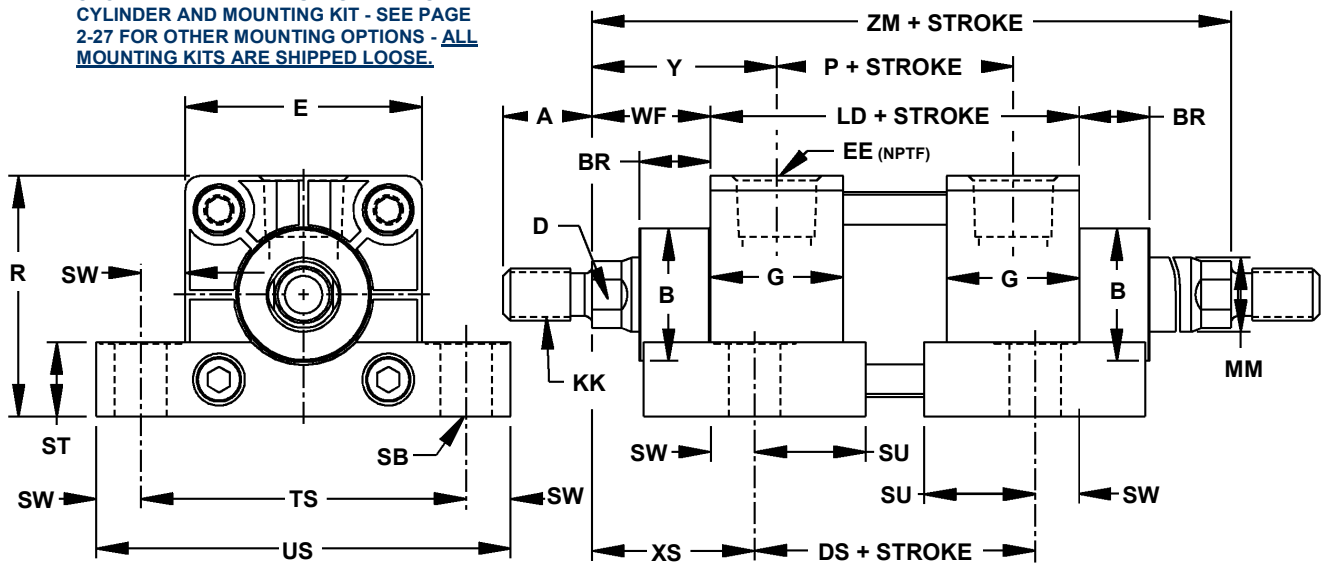
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

Style "DJ" Mount

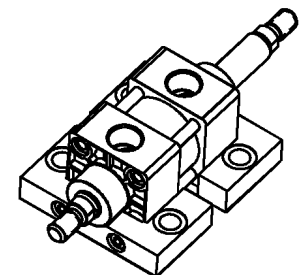
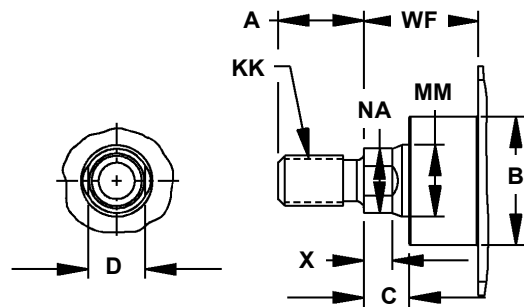
SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Mounting Dimensions | | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|------|-------------|
| Bore | SB* | ST | SU | SW | TS | US | XS | DS |
| 1-1/2 | .375 | .625 | .938 | .375 | 2.75 | 3.50 | 1.38 | 3.12 |
| 2 | .375 | .625 | .938 | .375 | 3.25 | 4.00 | 1.38 | 3.07 |
| 2-1/2 | .375 | .750 | .938 | .375 | 3.75 | 4.50 | 1.38 | 3.23 |
| 3-1/4 | .500 | 1.00 | 1.25 | .500 | 4.75 | 5.75 | 1.88 | 3.64 |
| 4 | .500 | 1.00 | 1.25 | .500 | 5.50 | 6.50 | 1.88 | 3.64 |

| Basic Dimensions | | | | | | Plus stroke |
|------------------|------|------|----------|------|------|-------------|
| Bore | BR | E | EE | G | P | LD |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 2.36 | 3.87 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 2.40 | 3.82 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 2.48 | 3.98 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 2.72 | 4.64 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 2.72 | 4.64 |

| Needed Mounting Kit | |
|---------------------|-----------|
| Bore | Part No. |
| 1-1/2 | QA-J-0150 |
| 2 | QA-J-0200 |
| 2-1/2 | QA-J-0250 |
| 3-1/4 | QA-J-0325 |
| 4 | QA-J-0400 |



| Rod End Dimensions | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|--------|------------------|---------------------------------------|------|------|------|------|------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | |
| | | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-0.002} | C | D | NA | WF | X |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

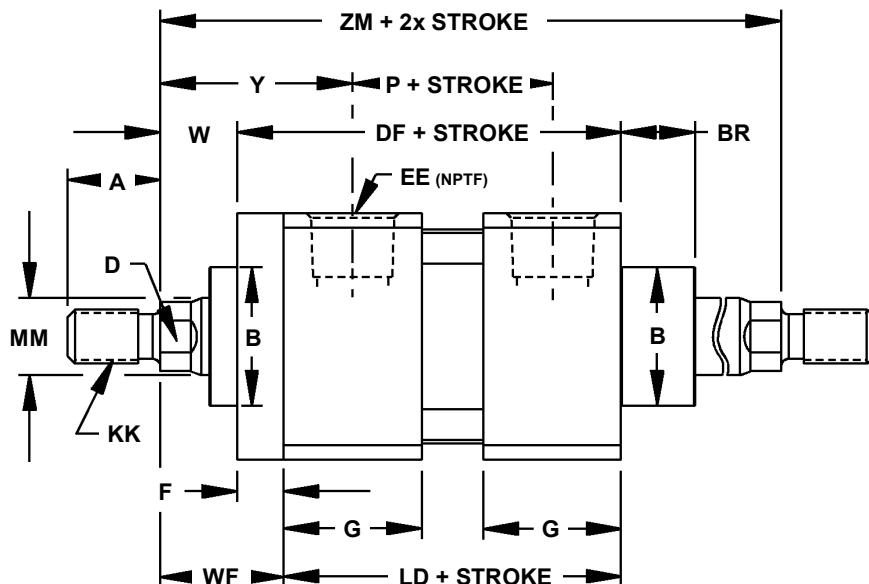
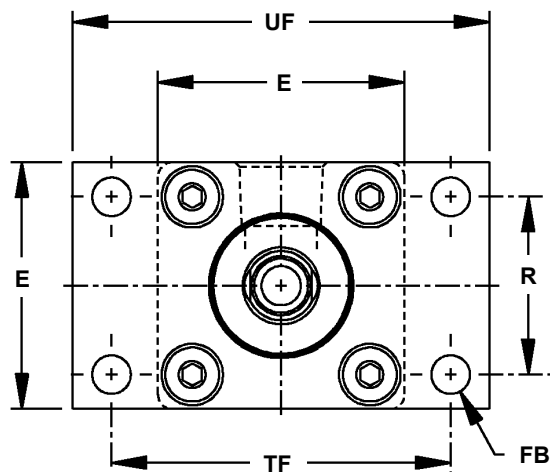
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Cylinder Dimensions

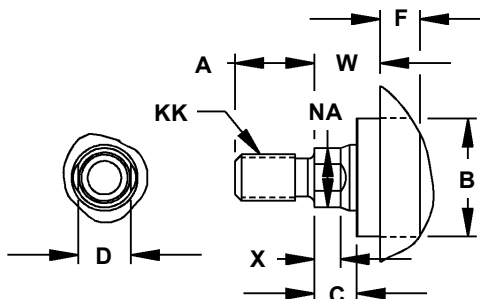
QA Series - 1-1/2 to 4 Bore

Style "DB" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

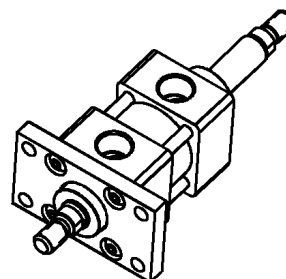


| Mounting Dimensions | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|-------------|
| Bore | FB* | F | R | TF | UF | DF |
| 1-1/2 | .250 | .375 | 1.43 | 2.75 | 3.38 | 4.25 |
| 2 | .312 | .375 | 1.84 | 3.38 | 4.12 | 4.19 |
| 2-1/2 | .312 | .375 | 2.19 | 3.88 | 4.62 | 4.50 |
| 3-1/4 | .375 | .625 | 2.76 | 4.69 | 5.50 | 5.26 |
| 4 | .375 | .625 | 3.32 | 5.44 | 6.25 | 5.26 |



| Basic Dimensions | | | | | | Plus stroke | |
|------------------|------|------|----------|------|------|-------------|------|
| Bore | BR | E | EE | G | J | P | LD |
| 1-1/2 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.87 |
| 2 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.82 |
| 2-1/2 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.98 |
| 3-1/4 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.64 |
| 4 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.64 |

| Needed Mounting Kit | |
|---------------------|------------|
| Bore | Part No. |
| 1-1/2 | QA-AB-0150 |
| 2 | QA-AB-0200 |
| 2-1/2 | QA-AB-0250 |
| 3-1/4 | QA-AB-0325 |
| 4 | QA-AB-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|--------------------------------------|------|------|------|------|------|------|------|----------------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | | Plus 2x stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | W | WF | X | Y | ZM |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 5.78 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 5.82 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.75 | 5.98 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 7.40 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 7.40 |

*Mounting holes are 1/16" larger than bolt size shown.

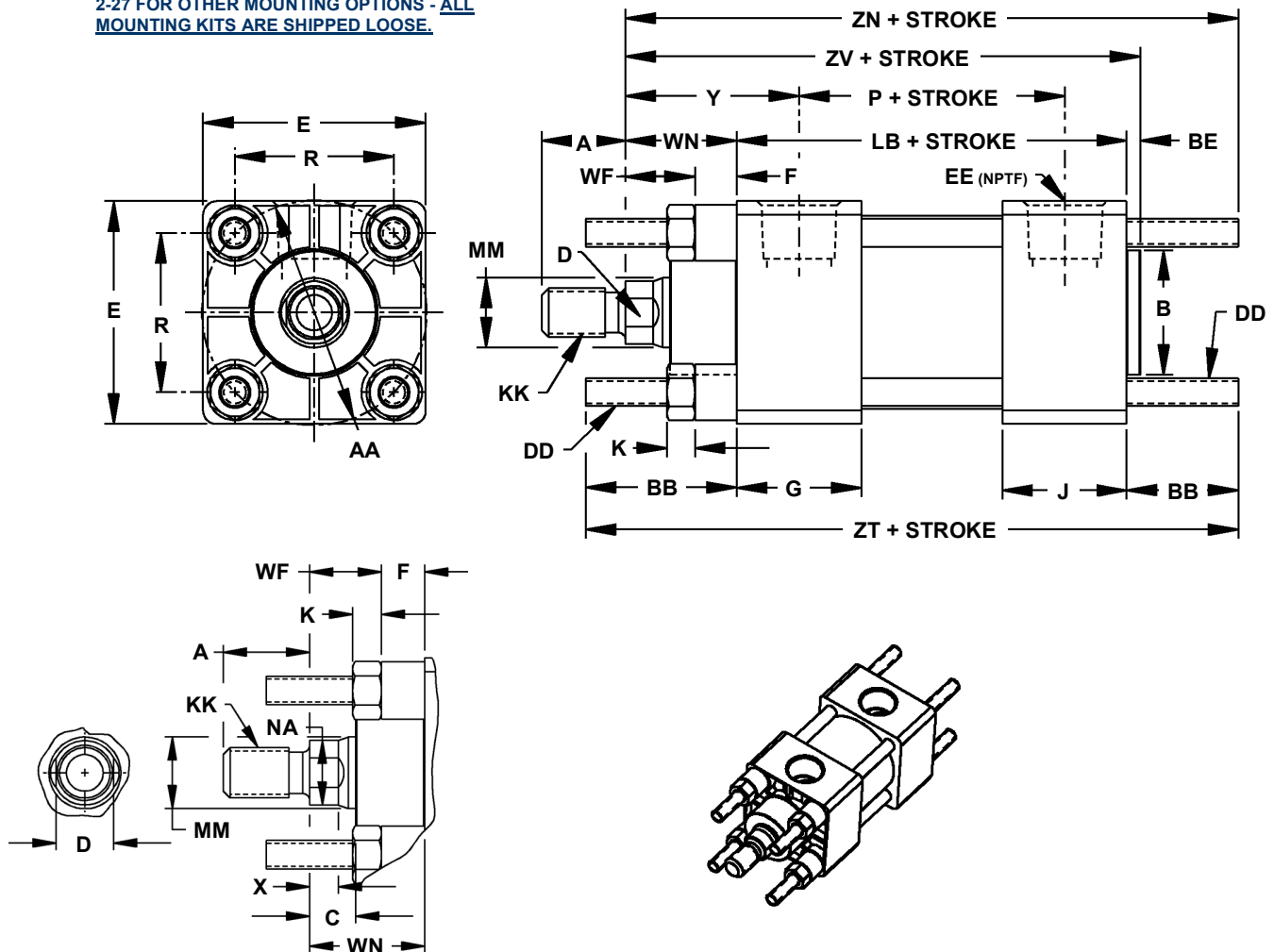
Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

1A Series Direct Replacement- Style "L-1A" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | | | | Plus stroke | | |
|-----------------------------|------|------|------|------|----------|----------|------|------|------|------|------|-------------|------|------|
| Bore | AA | BB | BE | E | DD | EE | F | G | J | K | R | P | LB | ZT |
| 1-1/2 | 2.02 | 1.00 | .125 | 2.00 | 0.25"-28 | 0.38"-18 | .375 | 1.26 | 1.01 | .250 | 1.43 | 2.36 | 3.62 | 5.62 |
| 2 | 2.60 | 1.12 | .125 | 2.50 | 0.31"-24 | 0.38"-18 | .375 | 1.26 | 1.06 | .312 | 1.84 | 2.40 | 3.62 | 5.88 |
| 2-1/2 | 3.10 | 1.12 | .125 | 3.00 | 0.31"-24 | 0.38"-18 | .375 | 1.30 | 1.06 | .312 | 2.19 | 2.48 | 3.75 | 6.00 |
| 3-1/4 | 3.90 | 1.38 | .201 | 3.75 | 0.38"-24 | 0.50"-14 | .625 | 1.57 | 1.18 | .375 | 2.76 | 2.72 | 4.25 | 7.00 |
| 4 | 4.70 | 1.38 | .201 | 4.50 | 0.38"-24 | 0.50"-14 | .625 | 1.57 | 1.18 | .375 | 3.32 | 2.72 | 4.25 | 7.00 |

| Needed Mounting Kit | |
|---------------------|-------------|
| Bore | Part No. |
| 1-1/2 | QA-L1A-0150 |
| 2 | QA-L1A-0200 |
| 2-1/2 | QA-L1A-0250 |
| 3-1/4 | QA-L1A-0325 |
| 4 | QA-L1A-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------------|------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | WN | X | Y | ZV | ZN |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 | 5.62 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 | 5.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.75 | 4.88 | 5.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 | 7.00 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

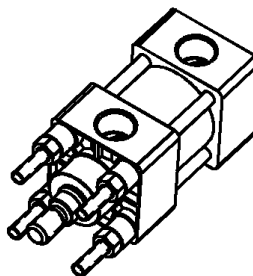
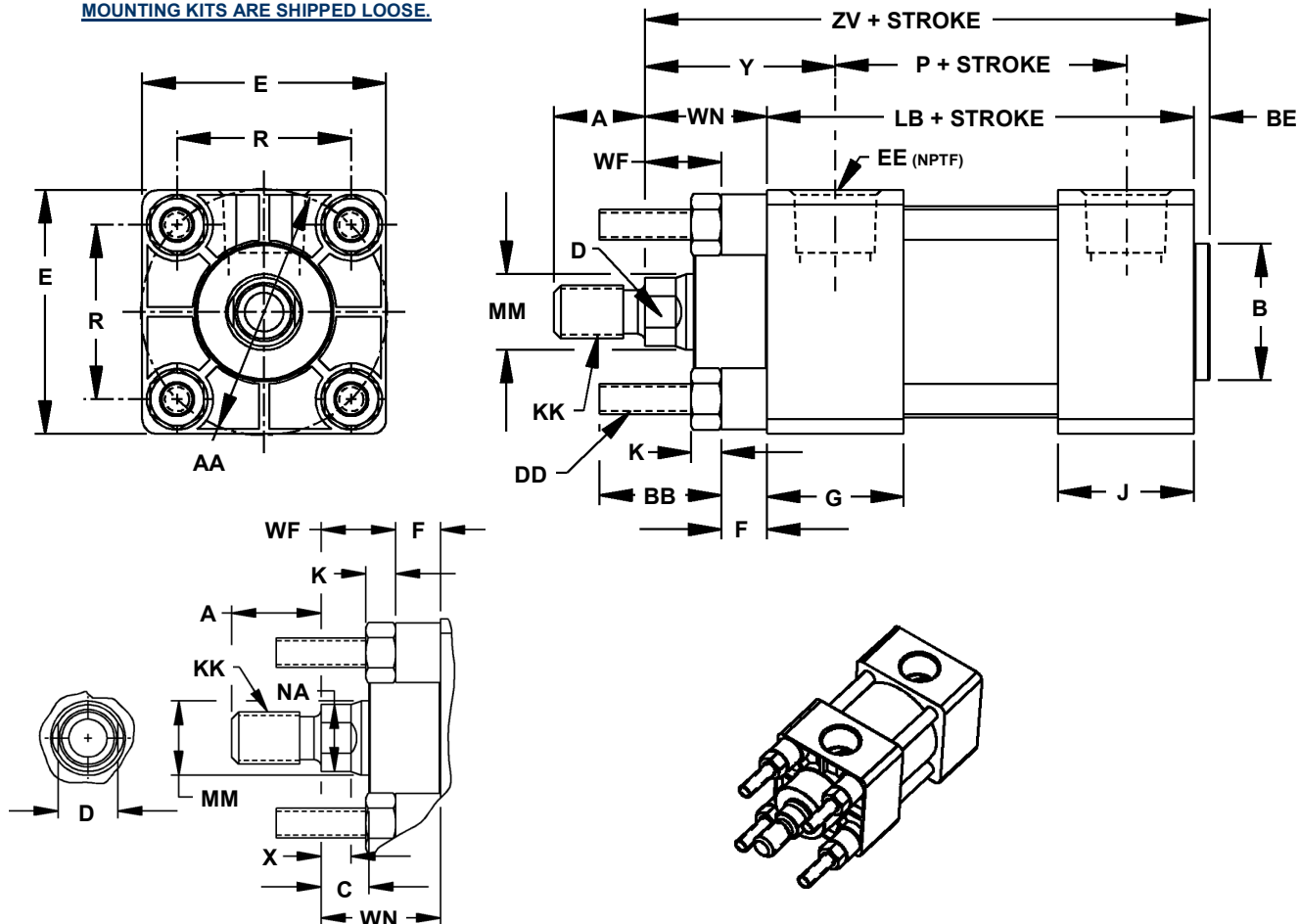
1A Series Direct Replacement

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

1A Series Direct Replacement- Style "M-1A" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.



| Basic & Mounting Dimensions | | | | | | | | | | | | Plus stroke | |
|-----------------------------|------|------|------|------|----------|----------|------|------|------|------|------|-------------|------|
| Bore | AA | BB | BE | E | DD | EE | F | G | J | K | R | P | LB |
| 1-1/2 | 2.02 | 1.00 | .125 | 2.00 | 0.25"-28 | 0.38"-18 | .375 | 1.26 | 1.01 | .250 | 1.43 | 2.36 | 3.62 |
| 2 | 2.60 | 1.12 | .125 | 2.50 | 0.31"-24 | 0.38"-18 | .375 | 1.26 | 1.06 | .312 | 1.84 | 2.40 | 3.62 |
| 2-1/2 | 3.10 | 1.12 | .125 | 3.00 | 0.31"-24 | 0.38"-18 | .375 | 1.30 | 1.06 | .312 | 2.19 | 2.48 | 3.75 |
| 3-1/4 | 3.90 | 1.38 | .201 | 3.75 | 0.38"-24 | 0.50"-14 | .625 | 1.57 | 1.18 | .375 | 2.76 | 2.72 | 4.25 |
| 4 | 4.70 | 1.38 | .201 | 4.50 | 0.38"-24 | 0.50"-14 | .625 | 1.57 | 1.18 | .375 | 3.32 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|-------------|
| Bore | Part No. |
| 1-1/2 | QA-M1A-0150 |
| 2 | QA-M1A-0200 |
| 2-1/2 | QA-M1A-0250 |
| 3-1/4 | QA-M1A-0325 |
| 4 | QA-M1A-0400 |

| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------------|------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | C | D | NA | WF | WN | X | Y | ZV |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.71 | 4.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | .625 | 1.00 | 1.00 | 1.75 | 4.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | .750 | 1.38 | 1.38 | 2.34 | 5.82 |

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

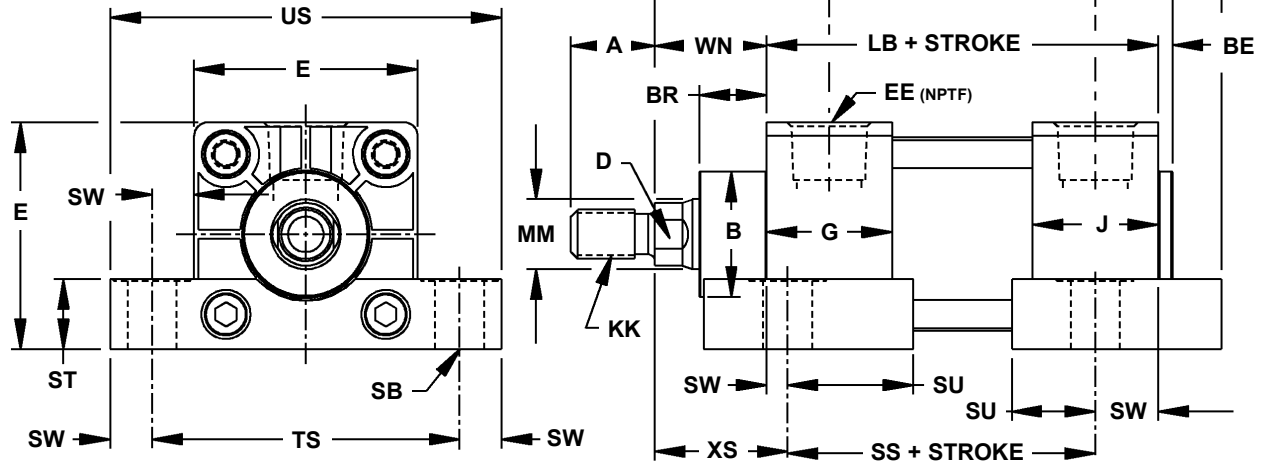
1A Series Direct Replacement

Cylinder Dimensions

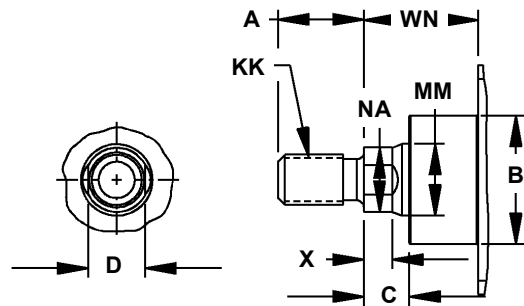
QA Series - 1-1/2 to 4 Bore

1A Series Direct Replacement- Style "J-A1" Mount

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

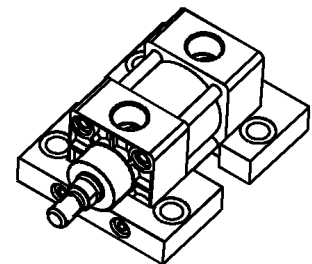


| Mounting Dimensions | | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|------|-------------|
| Bore | SB* | ST | SU | SW | TS | US | XS | SS |
| 1-1/2 | .375 | .625 | .938 | .375 | 2.75 | 3.50 | 1.38 | 2.88 |
| 2 | .375 | .625 | .938 | .375 | 3.25 | 4.00 | 1.38 | 2.88 |
| 2-1/2 | .375 | .750 | .938 | .375 | 3.75 | 4.50 | 1.38 | 3.00 |
| 3-1/4 | .500 | 1.00 | 1.25 | .500 | 4.75 | 5.75 | 1.88 | 3.25 |
| 4 | .500 | 1.00 | 1.25 | .500 | 5.50 | 6.50 | 1.88 | 3.25 |



| Basic Dimensions | | | | | | | Plus stroke | |
|------------------|------|------|------|----------|------|------|-------------|------|
| Bore | BE | BR | E | EE | G | J | P | LB |
| 1-1/2 | .125 | 0.62 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | .125 | 0.62 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | .125 | 0.62 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | .201 | 0.88 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | .201 | 0.88 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|-------------|
| Bore | Part No. |
| 1-1/2 | QA-J1A-0150 |
| 2 | QA-J1A-0200 |
| 2-1/2 | QA-J1A-0250 |
| 3-1/4 | QA-J1A-0325 |
| 4 | QA-J1A-0400 |



| Rod End Dimensions | | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------------------|---------------------------------------|------|------|------|------|------|------|-------------|------|
| Bore | Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | | | Plus stroke | |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-0.002} | C | D | NA | WN | X | Y | ZV | ZB |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.19 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.71 | 4.75 | 5.19 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 | 1.75 | 4.88 | 5.31 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 6.38 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 | 2.34 | 5.82 | 6.38 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

1A Series Direct Replacement

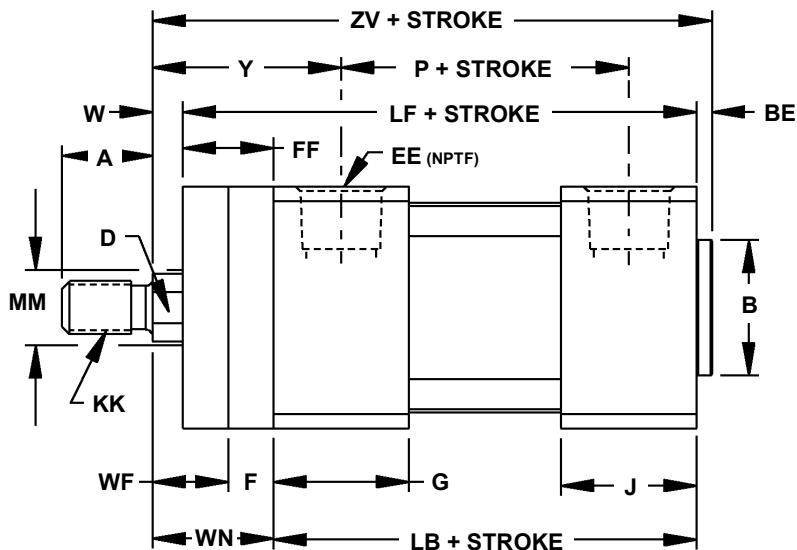
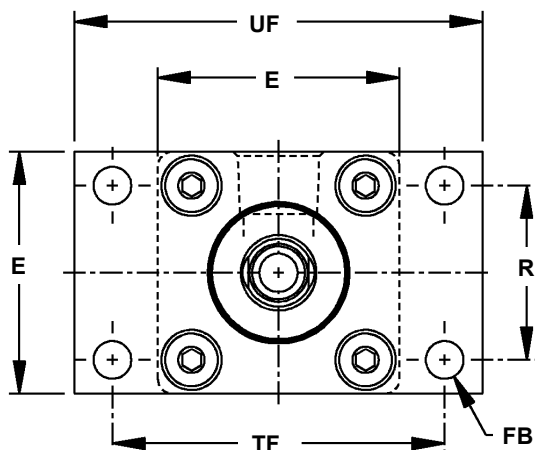
Ortman reserves the right to change or modify any or all published information and dimensions without notice.

Cylinder Dimensions

QA Series - 1-1/2 to 4 Bore

1A Series Direct Replacement- Style "B-1A" Moun

SHOWN CYLINDER INCLUDES THE BASIC CYLINDER AND MOUNTING KIT - SEE PAGE 2-27 FOR OTHER MOUNTING OPTIONS - ALL MOUNTING KITS ARE SHIPPED LOOSE.

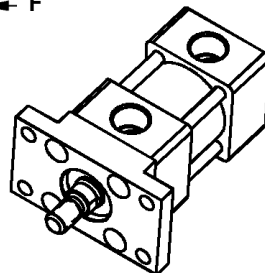
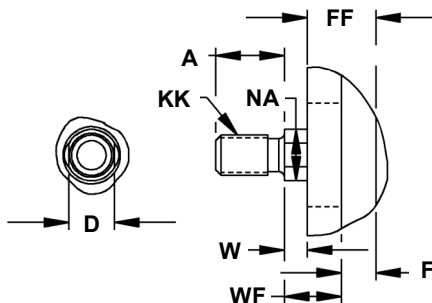


Ortman enforces a \$25.00 net minimum order charge.

| Mounting Dimensions | | | | | | | Plus stroke |
|---------------------|------|------|------|------|------|------|-------------|
| Bore | FB* | F | FF | R | TF | UF | LF |
| 1-1/2 | .250 | .375 | .750 | 1.43 | 2.75 | 3.38 | 4.00 |
| 2 | .312 | .375 | .750 | 1.84 | 3.38 | 4.12 | 4.00 |
| 2-1/2 | .312 | .375 | .750 | 2.19 | 3.88 | 4.62 | 4.12 |
| 3-1/4 | .375 | .625 | 1.25 | 2.76 | 4.69 | 5.50 | 4.88 |
| 4 | .375 | .625 | 1.25 | 3.32 | 5.44 | 6.25 | 4.88 |

| Basic Dimensions | | | | | | | Plus stroke |
|------------------|------|------|----------|------|------|------|-------------|
| Bore | BE | E | EE | G | J | P | LB |
| 1-1/2 | .125 | 2.00 | 0.38"-18 | 1.26 | 1.01 | 2.36 | 3.62 |
| 2 | .125 | 2.50 | 0.38"-18 | 1.26 | 1.06 | 2.40 | 3.62 |
| 2-1/2 | .125 | 3.00 | 0.38"-18 | 1.30 | 1.06 | 2.48 | 3.75 |
| 3-1/4 | .201 | 3.75 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |
| 4 | .201 | 4.50 | 0.50"-14 | 1.57 | 1.18 | 2.72 | 4.25 |

| Needed Mounting Kit | |
|---------------------|-------------|
| Bore | Part No. |
| 1-1/2 | QA-B1A-0150 |
| 2 | QA-B1A-0200 |
| 2-1/2 | QA-B1A-0250 |
| 3-1/4 | QA-B1A-0325 |
| 4 | QA-B1A-0400 |



| Rod End Dimensions | | | | | | | | | | | | | |
|--------------------|----------|--------------|----------|----------|------|--------------------------------------|------|------|------|------|------|------|-------------|
| Bore | Rod Dia. | Thread Sizes | | | | Basic Dimensions | | | | | | | Plus stroke |
| | MM | KK (1/3) | FF (2) | CC (5) | A | B ^{+0.000} _{-.002} | D | NA | W | WF | WN | Y | ZV |
| 1-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .500 | .563 | .250 | .625 | 1.00 | 1.71 | 4.75 |
| 2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .500 | .563 | .250 | .625 | 1.00 | 1.71 | 4.75 |
| 2-1/2 | 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .500 | .563 | .250 | .625 | 1.00 | 1.75 | 4.88 |
| 3-1/4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .875 | .938 | .125 | .750 | 1.38 | 2.34 | 5.82 |
| 4 | 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .875 | .938 | .125 | .750 | 1.38 | 2.34 | 5.82 |

*Mounting holes are 1/16" larger than bolt size shown.

Thread Sizes - "KK" (1/3) used for "SM" and "SF", "FF" (2) used for "IM", and "CC" (5) used for "FM" rod ends. - See page 2-26 for all rod ends

Cylinder Constructions

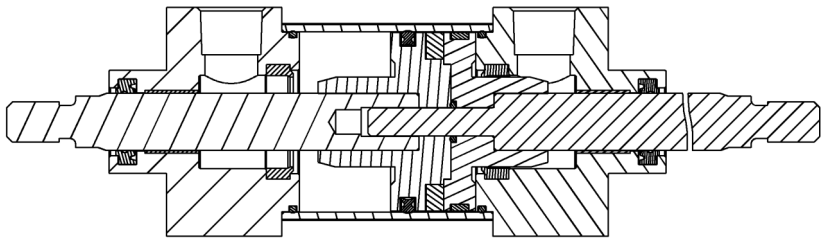
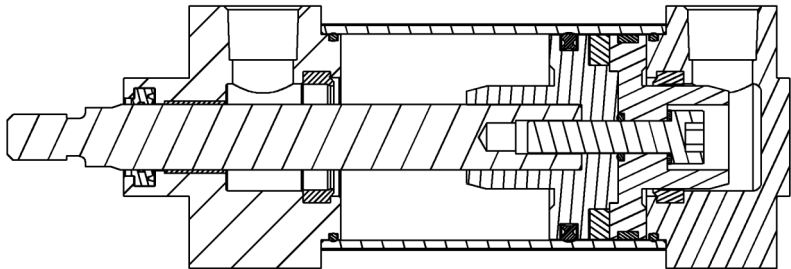
QA Series

SRE

Single Rod End Cylinder

The single rod end construction can be used in a single acting or a double acting operation.

Available with the 1-1/2" thru 4" bores



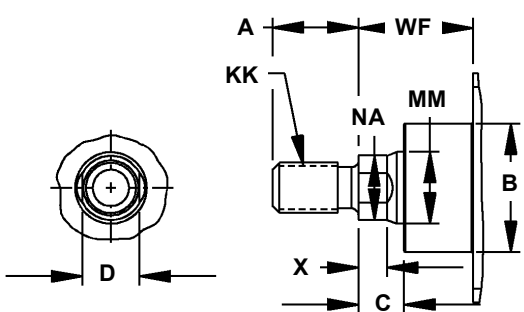
DRE

Double Rod Ended Cylinder

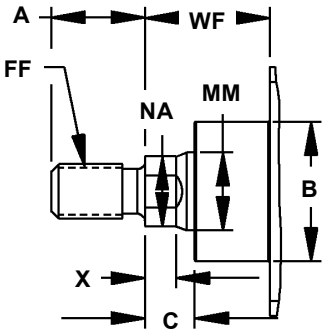
The double rod ended construction can be used in a single acting or a double acting operation.

Available with the 1-1/2" thru 4" bores

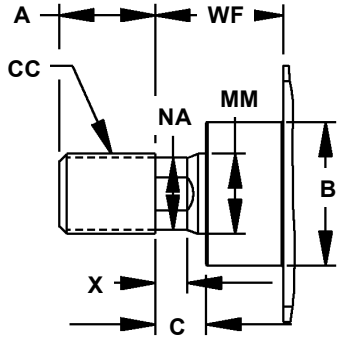
PISTON ROD ENDS



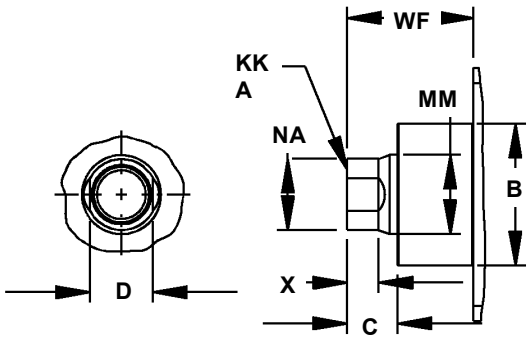
NFPA Style SM - QOC Style 1
(Furnished unless otherwise specified)



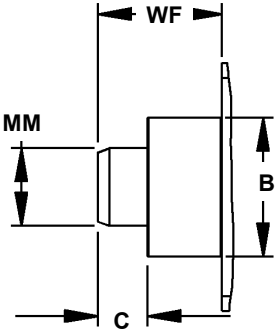
NFPA Style IM - QOC Style 2



NFPA Style FM - QOC Style 5
(Full Male Rod End)



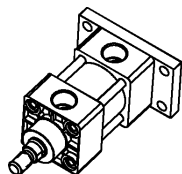
NFPA Style SF - QOC Style 3
(Female Thread Rod End)



NFPA Style PL - QOC Style 6
(Plain Rod End - No Wrench Flats)

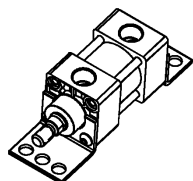
| Rod End Dimensions | | | | | | | | | | |
|--------------------|--------------|----------|----------|------------------|-------|------|------|------|------|------|
| Rod Dia. | Thread Sizes | | | Basic Dimensions | | | | | | |
| | KK (1/3) | FF (2) | CC (5) | A | B | C | D | NA | WF | X |
| 0.62 | 0.44"-20 | 0.50"-20 | 0.62"-18 | .750 | 1.124 | .375 | .500 | .563 | 1.00 | 1.00 |
| 1.00 | 0.75"-16 | 0.88"-14 | 1.00"-14 | 1.12 | 1.499 | .500 | .875 | .938 | 1.38 | 1.38 |

Single Rod End Construction (SRE)



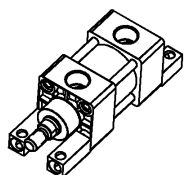
A - Rectangular Flange Cap End NFPA Style - MF2

Mounting Kit - QA-AB-0150, QA-AB-0200,
QA-AB-0250, QA-AB-0325, or QA-AB-0400



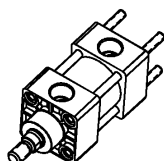
C - End Angle Bracket NFPA Style - MS1

Mounting Kit - QA-C-0150, QA-C-0200,
QA-C-0250, QA-C-0325, or QA-C-0400



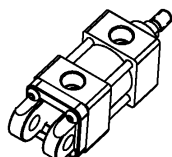
CC - Foot Mount NFPA Style - MS7

Mounting Kit - QA-CC-0150, QA-CC-0200,
QA-CC-0250, QA-CC-0325, or QA-CC-0400



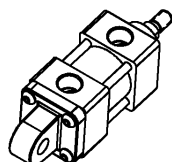
N - Tie Rod Extended Cap End NFPA Style - MX2

Mounting Kit - QA-MN-0150, QA-MN-0200,
QA-MN-0250, QA-MN-0325, or QA-MN-0400



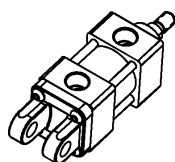
G - Clevis Mount NFPA Style - MP2

Mounting Kit - QA-G-0150, QA-G-0200,
QA-G-0250, QA-G-0325, or QA-G-0400
(Kit includes pin and retainer rings)



R - Detachable Pivot Mount NFPA Style - MP4

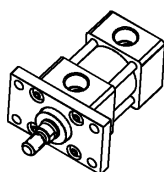
Mounting Kit - QA-R-0150, QA-R-0200,
QA-R-0250, QA-R-0325, or QA-R-0400



Z - Detachable Clevis Mount NFPA Style - MP1

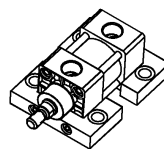
Mounting Kit - QA-Z-0150, QA-Z-0200,
QA-Z-0250, QA-Z-0325, or QA-Z-0400
(Kit includes pin and retainer rings)

Both Constructions (SRE & DRE)



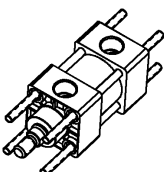
B - Rectangular Flange Head End NFPA Style - MF1 & MDF1

Mounting Kit - QA-AB-0150, QA-AB-0200,
QA-AB-0250, QA-AB-0325, or QA-AB-0400



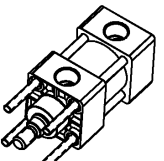
J - Side Lug Mount NFPA Style - MS2 & MDS2

Mounting Kit - QA-J-0150, QA-J-0200,
QA-J-0250, QA-J-0325, or QA-J-0400



L - Tie Rod Extended Both Ends NFPA Style - MX1 & MDX1

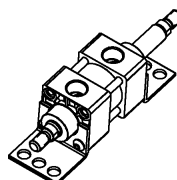
Mounting Kit - QA-L-0150, QA-L-0200,
QA-L-0250, QA-L-0325, or QA-L-0400



M - Tie Rod Extended Head End NFPA Style - MX3 & MDX3

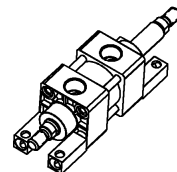
Mounting Kit - QA-MN-0150, QA-MN-0200,
QA-MN-0250, QA-MN-0325, or QA-MN-0400

Double Rod End Construction (DRE)



C - End Angle Bracket NFPA Style - MDS1

Mounting Kit - QA-DC-0150, QA-DC-0200,
QA-DC-0250, QA-DC-0325, or QA-DC-0400

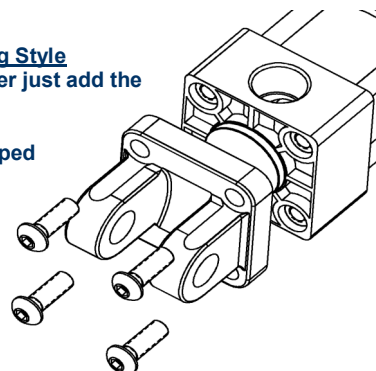


CC - Foot Mount NFPA Style - MDS7

Mounting Kit - QA-DCC-0150, QA-DCC-0200,
QA-DCC-0250, QA-DCC-0325, or
QA-DCC-0400

Inter-changeable Mounting Style
Stock the standard cylinder just add the
needed mounting kit.

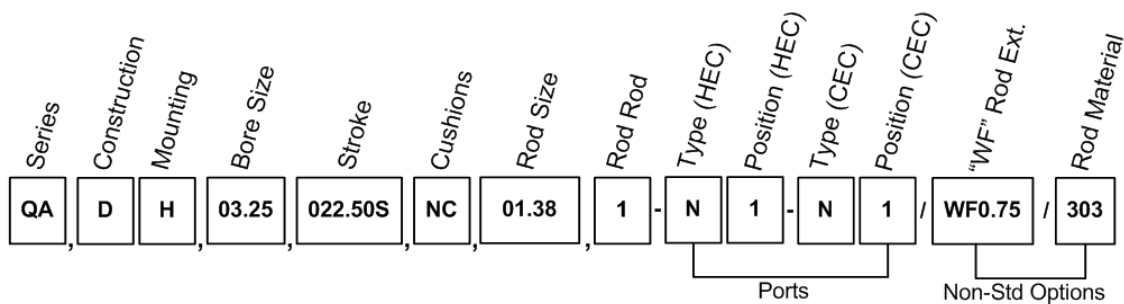
All mounting kits are shipped
loose with the cylinder.



| Mounting Bolt Torque Chart | | |
|----------------------------|--------------|--------|
| Bore | Thread (unf) | lbf-ft |
| 1-1/2 | .250"-28 | 6.75 |
| 2 thru 2-1/2 | .312"-24 | 14 |
| 3-1/4 thru 4 | .375"-24 | 29 |

Ordering Information

QA Series



Series:

QA - Light Duty Pneumatic Cylinder

Construction:

D - Double Rod End

Mounting Option:

A - Rectangular Flange Mount Cap End (MF2)
B - Rectangular Flange Mount Head End (MF1)
C - Foot Mount (MS7)
CC - End Angle Bracket (MS1)
F - Rabbet Mount (MX0) - Included
H - Side Flush Mount (MS4) - Included
J - Side Lug Mount (MS2)
L - Tie Rods Extended Both Ends (MX1)
M - Tie Rods Head End (MX3)
N - Tie Rods Cap Ends (MX2)
G - Clevis Mount (MP1)
R - Detachable Pivot Mount (MP4)
Z - Detachable Clevis Mount (MP2)

Bore:

01.50 - 2.50" dia.
02.00 - 3.25" dia.
02.50 - 2.50" dia.
03.25 - 3.25" dia.
04.00 - 4.00" dia.

Stroke:

xxx.xxS - Stroke format (ex. 001.50S)

The stroke is always followed by the letter "S". The stroke length should equal the actual stroke length unless the cylinder contains a internal stop. At that time, the stroke should equal the nominal stroke length.

Cushions:

NC - Non-Cushioned
CHE - Cushioned Head End
CCE - Cushioned Cap End
C2E - Cushioned Both Ends
CME - Cushioned Mount End (DRE)
CNME - Cushioned Non-Mount End (DRE)

Rod:

00.62 - 0.62" dia.
01.00 - 1.00" dia.

Rod Ends:

1 - SM-Standard Male
2 - IM-Optional Male
3 - SF-Standard Female
4 - OM-Special Male
4 - OF-Special Female
5 - FM-Full Male
6 - PL-Full Male
8 - Studded Male Rod End

Port-Type (HEC):

N - NPTF Port

Port-Position (HEC):

1 - Pos #1 - 12 o'clock

Port-Type (CEC):

N - NPTF Port

Port-Position (CEC):

1 - Pos #1 - 12 o'clock

Non-Std Options:

Rod End Options

WFx.xx - Actual "WF" dimension (ex. WF2.00)
Wx.xx - Actual "W" dimension (ex. W1.62)
Ax.xx - Actual "A" dimension (ex. A3.00)
FLx - Wrench Flats (ex. FL2, FL4, or FL6)

Rod Packing Options

RSV - Viton®

Piston Packing Options

PSV - Viton®

Piston Rod Material Options

174 - 17-4 Stainless Steel
303 - 303 Stainless Steel
304 - 304 Stainless Steel
316 - 316 Stainless Steel

Painting Options

NON - Non-Coated

- Each non-standard option is separated with a "/".
- (HEC) = Rod End, Head End Cover (CEC) = Blind End, Cap End Cover

Standard Terms and Conditions

LEGAL EFFECT: Except as expressly otherwise agreed to in writing by an authorized representative of Seller, the following terms and conditions shall apply to and form a part of this order and any additional and/or different terms of Buyer's purchase order or other form of acceptance are rejected in advance and shall not become a part of this order.

The rights of Buyer hereunder shall be neither assignable nor transferable except with the written consent of Seller.

This order may not be canceled or altered except with the written consent of Seller and upon terms which will indemnify Seller against all loss occasioned thereby. All additional costs incurred by Seller due to changes in design or specifications, modification of this order or revision of product must be paid for by Buyer.

In addition to the rights and remedies conferred upon Seller by this order, Seller shall have all rights and remedies conferred at law and in equity and shall not be required to proceed with the performance of this order if Buyer is in default in the performance of such order or of any other contract or order with seller.

TERMS OF PAYMENT: Unless otherwise specified in this order, the terms of payment shall be net cast within thirty (30) days after shipment. These terms shall apply to partial as well as complete shipments. If any proceeding be initiated by or against Buyer under any bankruptcy or insolvency law, or in the judgment of Seller the financial condition of Buyer, at the time the equipment is ready for shipment, does not justify the terms of payment specified, Seller reserves the right to require full payment in cast prior to making shipment. If such payment is not received within fifteen (15) days after notification of readiness for shipment, Seller may cancel the order as to any unshipped item and require payment of its reasonable cancellation charges.

If Buyer delays shipment, payments based on date of shipment shall become due as of the date when ready for shipment. If Buyer delays completion of manufacture, Seller may elect to require payment according to percentage of completion. Equipment held for Buyer shall be at Buyer's risk and storage charges may be applied at the discretion of Seller.

Accounts past due shall bear interest at the highest rate lawful to contract for but if there is no limit set by law, such interest shall be eighteen percent (18%). Buyer shall pay all cost and expenses, including reasonable attorney's fees, incurred in collecting the same, and no claim, except claims within Seller's warranty of material or workmanship, as stated below, will be recognized unless delivered in writing to Seller within thirty (30) days after date of shipment.

TAXES: All prices exclude present and future sales, use, occupation, license, excise, and other taxes in respect of manufacture, sales or delivery, all of which shall be paid by Buyer unless include in the purchase price at the proper rate or a proper exemption certificate is furnished.

ACCEPTANCE: All offers to purchase, quotations and contracts of sales are subject to final acceptance by an authorized representative at Seller's plant.

DELIVERY: Except as otherwise specified in this quotation, delivery will be F. O. B. cars point of shipment. In the absence of exact shipping instruction, Seller will use its discretion regarding best means of insured shipment. No liability will be accepted by Seller for so doing. All transportation charges are at Buyer's expense. Time of delivery is an estimate only and is based upon the receipt of all information and necessary approvals. The shipping schedule shall not be construed to limit seller in making commitments for materials or in fabricating articles under this order in accordance with Seller's normal and reasonable production schedules.

Seller shall in no event be liable for delays caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control. No provision for liquidated damages for any cause shall apply under this order. Buyer shall accept delivery within thirty (30) days after receipt of notification of readiness for shipment. Claims for shortages will be deemed to have been waived if not made in writing with ten (10) days after the receipt of the material in respect of which any such shortage is claimed. Seller is not responsible for loss or damage in transit after having received "In Good Order" receipt from the carrier. All claims for loss or damage in transit should be made to the carrier.

TITLE & LIEN RIGHTS: The equipment shall remain personal property, regardless of how affixed to any realty or structure. Until the price (including any notes given therefore) of the equipment has been fully paid in cash, Seller shall, in the event of Buyer's default, have the right to repossess such equipment.

PATENT INFRINGEMENT: If properly notified and given an opportunity to do so with friendly assistance, Seller will defend Buyer and the ultimate user of the equipment from any actual or alleged infringement of any published United States patent by the equipment or any part thereof furnished pursuant hereto (other than parts of special design, construction, or manufacture specified by and originating with Buyer), and will pay all damages and costs awarded by competent court in any suit thus defended or of which it may have had notice and opportunity to defend as aforesaid.

STANDARD WARRANTY: Seller warrants that products of its own manufacture will be free from defects in workmanship and materials under normal use and service for the period specified in the product instruction manual. Warranty for service parts will be Ninety (90) days from date of factory shipment. Electric Motors, gasoline and diesel engines, electrical apparatus and all other accessories, components and parts not manufactured by Seller are warranted only to the extent of the original Notice of the alleged defect must be given to the Seller, in writing with all identifying details including serial number, type of equipment and date of purchase within thirty (30) days of the discovery of the same during the warranty period.

Seller's sole obligation on this warranty shall be, at its option, to repair or replace or refund the purchase price of any product or part thereof which proves to be defective. If requested by Seller, such product or part thereof must be promptly returned to seller, freight prepaid, for inspection.

Seller warrants repaired or replaced parts of its own manufacture against defects in materials and workmanship under normal use and service for ninety (90) days or for the remainder of the warranty on the product being repaired.

This warranty shall not apply and Seller shall not be responsible or liable for:

- (a) Consequential, collateral or special losses or damages;
- (b) Equipment conditions caused by fair wear and tear, abnormal conditions of use, accident, neglect or misuse of equipment, improper storage or damage resulting during shipping;
- (c) Deviation from operating instructions, specifications or other special terms of sale;
- (d) Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than Seller or Seller's authorized service station.

In no event shall Seller be liable for any claims whether arising from breach of contract or warranty or claims of negligence or negligent manufacture in excess of the purchase price.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLERS AND ANY OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE ARE HEREBY SPECIFICALLY EXCLUDED.

LIABILITY LIMITATIONS: Under no circumstances shall the Seller have any liability for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, whether resulting from delays in delivery or performance, breach of warranty, negligent manufacture or otherwise.

ENVIRONMENTAL AND OSHA REQUIREMENTS: At the time of shipment of the equipment from the factory, Ortman will comply with the various Federal, State and local laws and regulations concerning occupational health and safety and pollution. However, in the installation and operation of the equipment and other matters over which the seller has no control, the Seller assumes no responsibility for compliance with those laws and regulations, whether by the way of indemnity, warranty or otherwise.

QA SERIES WARRANTY

Seller warrants that any product of its manufacture, which upon examination is found by a Seller's representative to be defective in either workmanship or material under normal use and service, will, at Sellers' option, be repaired or replaced free of charge including lowest transportation charges but not cost of installation or removal or have the purchase price refunded, provided that the SELLER receives written claim specifying the defect within one (2) year or 4,000 hours of use in normal service applications, whichever arrives first after Seller ships the product. Modified or special products shall be subject to special written warranty depending on application of products. In no event shall Seller be liable for any claims, whether arising from breach of contract or warranty or claims of negligence or negligent manufacture, in excess of the purchase price. **ALL OTHER WARRANTIES EXPRESSED AND IMPLIED INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE ARE HEREBY DISCLAIMED.** The foregoing expresses all of Seller's obligations and liabilities with respect to the quality of items furnished by it and it shall under no circumstances be liable for consequential, collateral or special losses or damages.

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