# P1L Series

## High Performance Repairable Pneumatic Cylinder



**Contents**







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Pneumatic Division
Wadsworth, Ohio
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D

**Optional Piston Magnet**
Located under wear band, piston magnet is used for through-the-barrel sensors for electronic piston position indication. Does not add length to the piston.

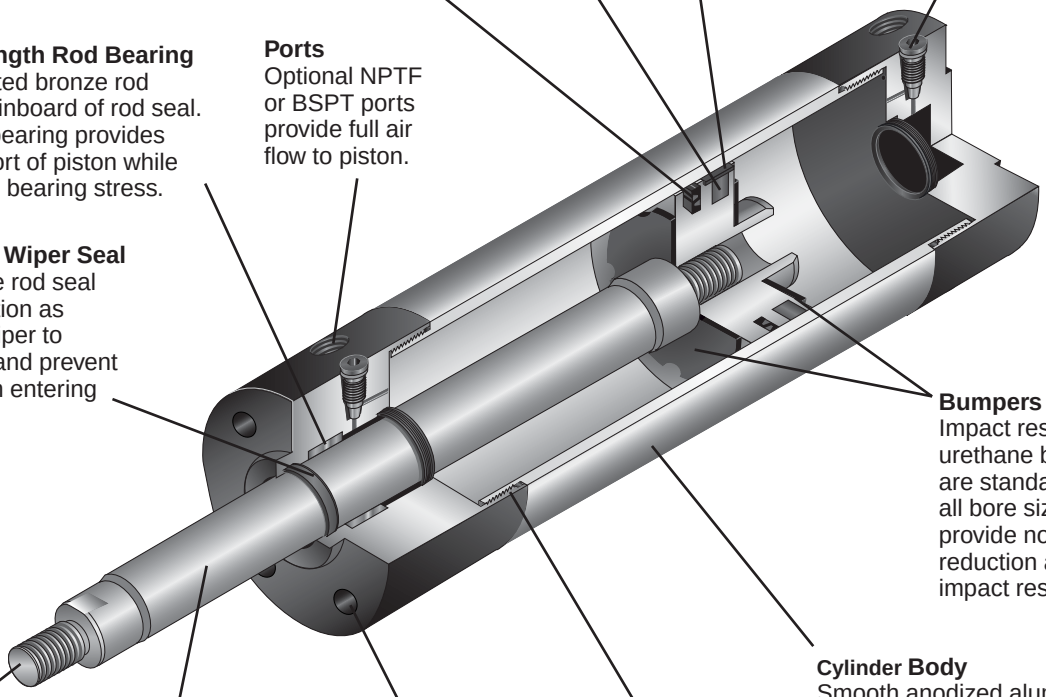
**Aluminum Piston with Ultra-Wide Nylon Wear Band**
Piston is permanently sealed and locked to rod with anaerobic adhesive. Ultra wide wear band prevents metal-to-metal contact and distributes piston loads across wide bearing area.

**Z-Profile Piston Seal**
Dynamic nitrile piston seal features two rounded micro sealing edges for maximum wear compensation and rounded grooves for retaining lubrication. Dual lipseal for 40mm to 100mm bore sizes.

**Adjustable Cushion Option**
Available for high speed applications, it features fine-thread, brass needle valves with a captive design.

**High Strength Rod Bearing**
PTFE-coated bronze rod bearing is inboard of rod seal. Long rod bearing provides rigid support of piston while minimizing bearing stress.

**Ports**
Optional NPTF or BSPT ports provide full air flow to piston.



**Rounded Lip Rod Wiper Seal**
Non-lube, urethane rod seal provides dual function as rod seal and rod wiper to eliminate leakage and prevent contamination from entering the cylinder.

**Bumpers**
Impact resistant urethane bumpers are standard for all bore sizes to provide noise reduction and impact resistance

**Cylinder Body**
Smooth anodized aluminum tube provides wear-resistant surface. Clean tubular design eliminates area where contamination can accumulate.

**Four Standard Piston Rod Ends**
Inch or metric with male or female to meet a variety of requirements.

**Tapped Mounting Holes**
Inch or metric holes provide flush mounting from the head or cap face. Standard mounting kits can be bolted-on for adapting to a wide range of applications.

**Threaded End Cap Construction**
Precision-machined, aluminum alloy end caps are black anodized and removable from either end for easy cylinder repair. Construction minimizes cylinder size and weight.

**Piston Rod**
Ground, polished hard chrome plated steel piston rod. Stainless steel is standard on 20 and 25mm bore. Smooth rod surface finish provides minimum friction and maximum seal life.





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| P1L | N | 032 | D | M | N | 0200 | W | B | N | N | N |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Construction[1]**

| | |
|---|---|
| **N** | Inch Mounting Threads |
| **M** | Metric Mounting Threads |

**Bores (mm)**

020, 025, 032, 040, 050, 063, 080, 100

**Function**

| | |
|---|---|
| **D** | Double Acting, Single Rod |
| **K** | Double Acting, Double Rod |

**Cushions/Magnetic Piston**

| | |
|---|---|
| **N** | No Cushion, No Magnetic Piston |
| **M** | No Cushion, Magnetic Piston[2] |
| **F** | Cushioned Both Ends, No Magnetic Piston |
| **Y** | Cushioned Both Ends, Magnetic Piston[2] |

**Seal Material**

| | |
|---|---|
| **N** | Standard Seals |
| **T** | Fluorocarbon |

**Stroke**

Specify in mm

**Version[3]**

| | |
|---|---|
| **B** | Basic |
| **W** | With Options |
| **/** | Special |

**Mounting Style**

| | |
|---|---|
| **N** | No Mountings Fitted (Std.) |
| **J** | Front Flange |
| **H** | Rear Flange |
| **B** | Single Rear Clevis |
| **A** | Double Rear Clevis |
| **F** | Foot, Front & Rear |
| **G** | Nose Mount |
| **E** | Front Trunnion |
| **D** | Rear Trunnion |

**Port Type[1]**

| | |
|---|---|
| **N** | NPT Threads[4] |
| **B** | BSPT Threads[5] |

**Rod End Style[1]**

| | |
|---|---|
| **N** | Inch Male[4] |
| **6** | Metric Female |
| **5** | Metric Male[5] |
| **9** | Inch Female |
| **3** | Special |

**Rod Material**

| | |
|---|---|
| **N** | Carbon Steel (std on 32-100mm bores) |
| **S** | Stainless (std on 20-25mm bores) |



## Minimum and Maximum Stroke Length for Standard P1L Cylinders

| Bore | Min. Stroke (mm) | Max. Stroke (mm)[6] |
|---|---|---|
| 20 | 2 | 1000 |
| 25 | 2 | 1000 |
| 32 | 2 | 1000 |
| 40 | 4 | 1000 |
| 50 | 5 | 1000 |
| 63 | 7 | 1000 |
| 80 | 4 | 1000 |
| 100 | 4 | 1000 |

**Notes:**

1 When selecting inch or metric construction, be advised that the piston rod end and porting thread will coincide with the mounting thread selected as the standard for the basic cylinder. For example, selecting "M" in the construction field will automatically provide a metric male piston rod end and BSPT ports as standard.

2 Not available with fluorocarbon seal option.

3 If cylinder contains no options, then use "B" as the last digit in the model code. The last 4 boxes are used only when "W" or "/" appears in this field.

4 Standard with Inch Construction

5 Standard with Metric Construction

6 Please consult factory for availability of stroke lengths longer than those listed.

For sensor part numbers and specifications, see the Electronic Sensors Section.





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## Specifications

- Bore Sizes: 20 to 100mm (3/4" to 4")
- Rod Diameters: 8 to 32mm (5/16" to 1-1/4")
- Rod Ends: Four Standard, specials to order
- Bumpers standard on both ends
- Adjustable Cushions provided at both ends as an option
- Single End or Double End Mounting
- Mounting Styles: 9 standard
- Rated Air Pressure: 10 bar (145 psi) Non-Lube
- Strokes available in any practical stroke length
- Standard Temperature: -23°C to + 74°C (- 10°F to + 165°F)
- Optional High Temp Service: -23°C to +121°C (-10°F to +250°F)*

*Option intended for limited exposure to temperatures over +80°C or +176°F. This option is primarily for applications which subject the cylinder to fluids that have an adverse effect on external seals.

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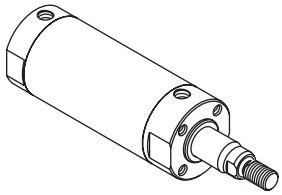
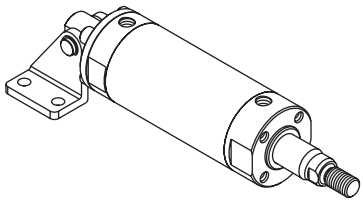
## Cylinder Weights

| Bore | Base (Lb) | Per 25mm of Stroke (Lb) |
|---|---|---|
| **20** | 0.24 | 0.06 |
| **25** | 0.35 | 0.08 |
| **32** | 0.55 | 0.11 |
| **40** | 0.9 | 0.17 |
| **50** | 1.58 | 0.25 |
| **63** | 2.19 | 0.28 |
| **80** | 4 | 0.41 |
| **100** | 6.75 | 0.59 |

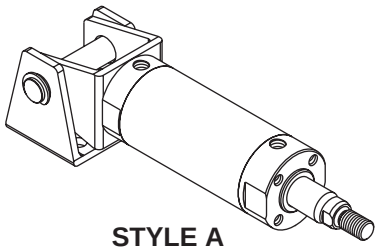
## Available Mountings



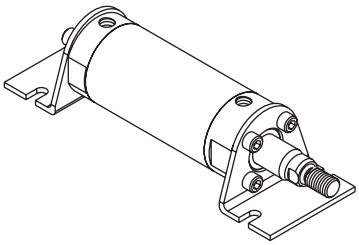
**STYLE N**
**Basic No Mounts**



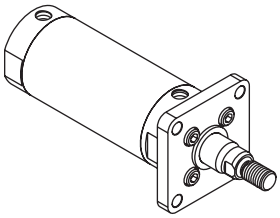
**STYLE B**
**Single Rear Clevis**



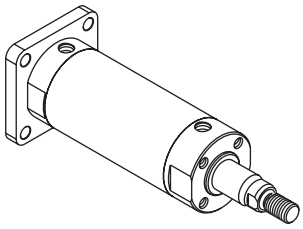
**STYLE A**
**Double Rear Clevis**



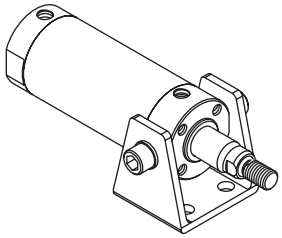
**STYLE F**
**Foot Mount**



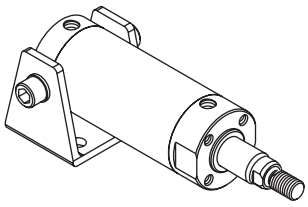
**STYLE J**
**Front Flange**



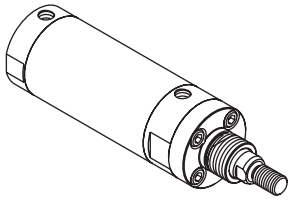
**STYLE H**
**Rear Flange**



**STYLE E**
**Front Trunnion**



**STYLE D**
**Rear Trunnion**



**STYLE G**
**Nose Mount**



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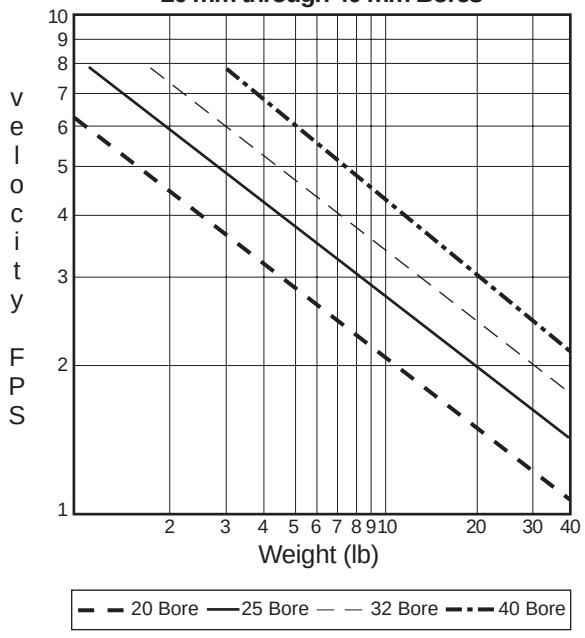
## Theoretical Push and Pull Forces in lbs.

| Bore mm | Rod Diameter mm | Action | Effective Area in² | Operating Pressure (PSI) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 40 | 60 | 80 | 100 | 125 |
| 20 | 0 | Extend | 0.5 | 19 | 29 | 39 | 49 | 61 |
| | 8 | Retract | 0.4 | 16 | 24 | 33 | 41 | 51 |
| 25 | 0 | Extend | 0.8 | 30 | 46 | 61 | 76 | 95 |
| | 10 | Retract | 0.6 | 26 | 38 | 51 | 64 | 80 |
| 32 | 0 | Extend | 1.2 | 50 | 75 | 100 | 125 | 156 |
| | 12 | Retract | 1.1 | 43 | 64 | 86 | 107 | 134 |
| 40 | 0 | Extend | 1.9 | 78 | 117 | 156 | 195 | 243 |
| | 16 | Retract | 1.6 | 65 | 98 | 131 | 164 | 204 |
| 50 | 0 | Extend | 3.0 | 122 | 183 | 243 | 304 | 380 |
| | 20 | Retract | 2.6 | 102 | 153 | 204 | 256 | 320 |
| 63 | 0 | Extend | 4.8 | 193 | 290 | 386 | 483 | 604 |
| | 20 | Retract | 4.3 | 174 | 261 | 348 | 434 | 543 |
| 80 | 0 | Extend | 7.8 | 312 | 467 | 623 | 779 | 974 |
| | 25 | Retract | 7.0 | 281 | 422 | 562 | 703 | 879 |
| 100 | 0 | Extend | 12.2 | 487 | 730 | 974 | 1217 | 1522 |
| | 32 | Retract | 10.93 | 437 | 656 | 874 | 1093 | 1366 |

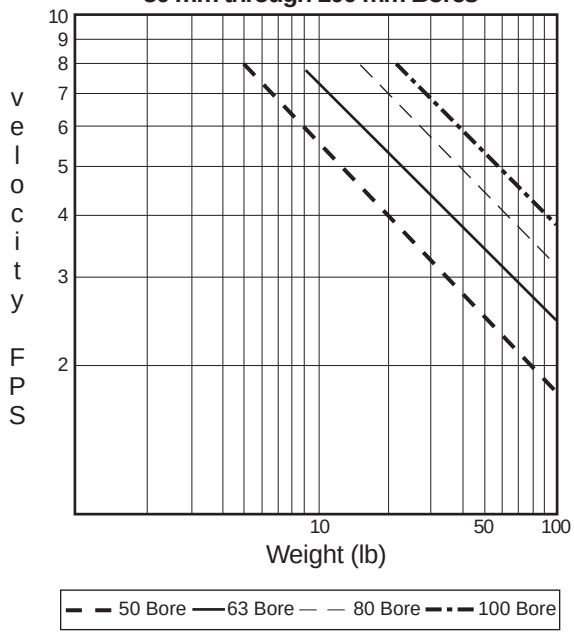
## Cushioning Capacity Charts

Use the graphs below to determine whether a cylinder will adequately decelerate a load without damage to the cylinder. Find the point on the graph where the piston rod speed intersects the weight of the load. Any cylinder bore size above the intersect point will adequately decelerate the load at that speed.

**20 mm through 40 mm Bores**




**50 mm through 100 mm Bores**




**Note:** Cushions are recommended for applications with cylinder velocities exceeding 1 ft/sec.







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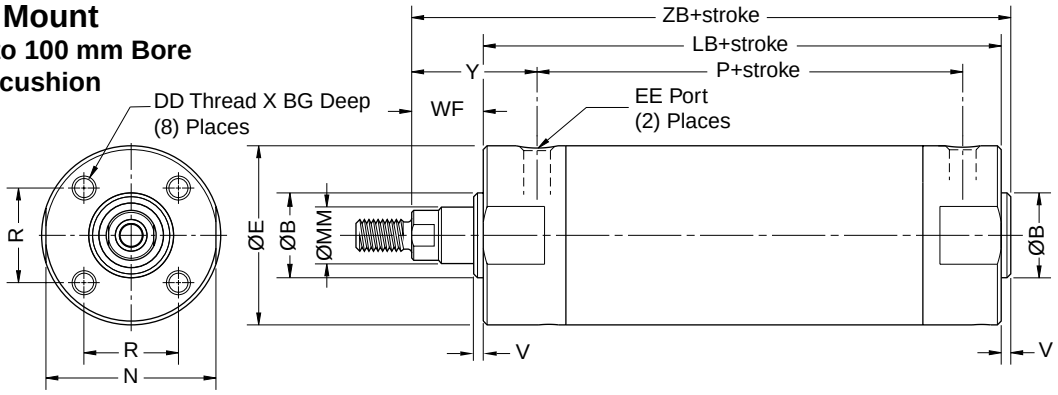
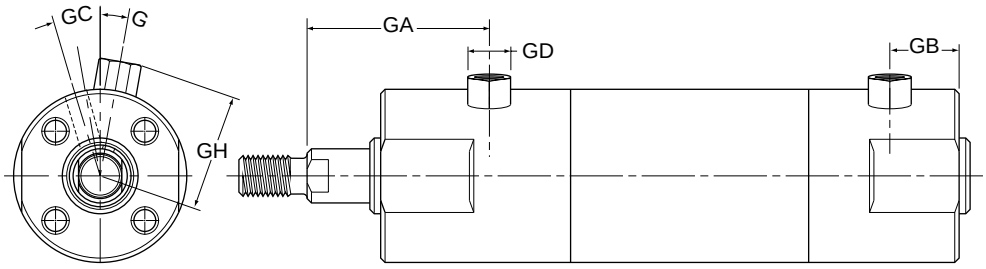
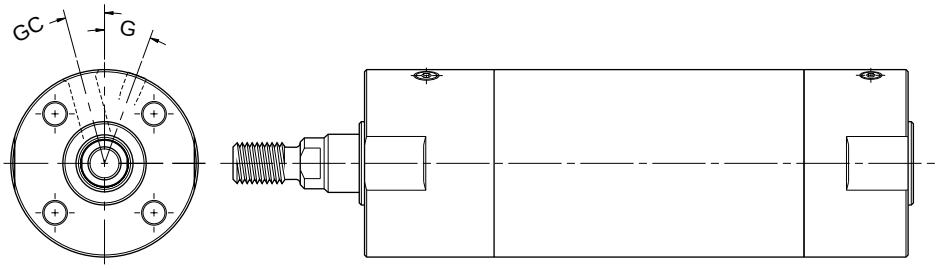
## Style N
## Basic No Mount
**Typical 20 to 100 mm Bore without air cushion**




**With adjustable air cushion - 20 to 25 mm bores**

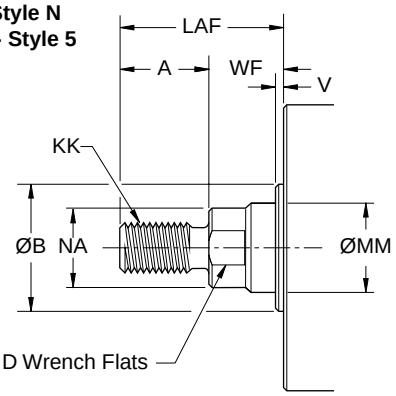



**With adjustable air cushion - 32 to 100 mm bores (feature a flush-fit cushion adjustment screw)**

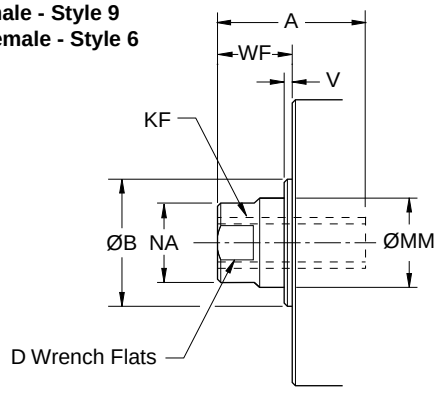



## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**

Special Metric or Inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | DD | BG (Depth) | D | ØE | EE | Thread KK Style 5 | Thread KF Style 6 | LAF | Ø MM Rod Dia. | N | NA | R | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | M4x0.7 | 7 | 6 | 27 | 1/8* | M8 x 1.25 | M5 x 0.80 | 26 | 8 | 24 | – | 14 | 2 | 13 | 28 |
| **25** | 13 | 14 | M5x0.8 | 7.6 | 8 | 32 | 1/8* | M10 x 1.25 | M6 x 1.00 | 29 | 10 | 29 | – | 16.5 | 2 | 16 | 30 |
| **32** | 19 | 18 | M5x0.8 | 7.6 | 10 | 39 | 1/8 | M10 x 1.25 | M8 x 1.25 | 41 | 12 | 36 | 11 | 20 | 2 | 22 | 40 |
| **40** | 19 | 25 | M6x1 | 12 | 12 | 48.5 | 1/8 | M14 x 1.5 | M8 x 1.25 | 41 | 16 | 44 | 14 | 26 | 2 | 22 | 42 |
| **50** | 22 | 30 | M8x1.25 | 16 | 16 | 59 | 1/4 | M18 x 1.5 | M10 x 1.25 | 52 | 20 | 55 | 18 | 32 | 2 | 30 | 53 |
| **63** | 22 | 32 | M10x1.5 | 16 | 16 | 72 | 1/4 | M18 x 1.5 | M10 x 1.25 | 52 | 20 | 69 | 18 | 38 | 2 | 30 | 53 |
| **80** | 38 | 40 | M10x1.5 | 22 | 20 | 90 | 3/8 | M22 x 1.5 | M16 x 1.5 | 69 | 25 | 86 | 23 | 50 | 3 | 31 | 59 |
| **100** | 48 | 50 | M12x1.75 | 22 | 26 | 110 | 1/2 | M26 x 1.5 | M20 x 1.5 | 79 | 32 | 106 | 30 | 60 | 3 | 31 | 57 |

*Ports are M5 for cushioned versions

| Bore | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZB |
| **20** | 69 | 45 | 83 |
| **25** | 69 | 46 | 86 |
| **32** | 71 | 43 | 95 |
| **40** | 78 | 49 | 102 |
| **50** | 90 | 53 | 122 |
| **63** | 90 | 52 | 122 |
| **80** | 108 | 64 | 142 |
| **100** | 108 | 66 | 142 |

| Bore | Adjustable Air Cushion | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | GA | GB | GD Hex | GC° | G° | GH | EE | Cushion Length |
| **20** | 33 | 14 | 8 | 13-1/2 | 25-1/2 | 20.5 | M5 x 0.8 | 9 |
| **25** | 35 | 14 | 8 | 15-1/2 | 20-1/2 | 23 | M5 x 0.8 | 9 |
| **32** | – | – | – | 10-1/2 | 30-1/2 | – | 1/8 | 10 |
| **40** | – | – | – | 10-1/2 | 22-1/2 | – | 1/8 | 12 |
| **50** | – | – | – | 10-1/2 | 23-1/2 | – | 1/4 | 15 |
| **63** | – | – | – | 15-1/2 | 20-1/2 | – | 1/4 | 15 |
| **80** | – | – | – | 15-1/2 | 25-1/2 | – | 3/8 | 15 |
| **100** | – | – | – | 15-1/2 | 25-1/2 | – | 1/2 | 15 |

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore Size | A | ØB +0 -0.001 | DD (UNF) | BG (Depth) | D | ØE | EE (NPTF) | Thread | | LAF | ØMM Rod Dia. | N | NA | R | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | KK (UNF) Style N | KF (UNF) Style 9 | | | | | | | | |
| **20** | 0.50 | 0.472 | 8-32 | 0.28 | 0.24 | 1.06 | 1/8† | 1/4-28 | #10-32 | 1.00 | 0.315 | 0.94 | – | 0.55 | 0.08 | 0.50 | 1.10 |
| **25** | 0.50 | 0.551 | 10-32 | 0.30 | 0.31 | 1.26 | 1/8† | 5/16-24 | 1/4-28 | 1.12 | 0.394 | 1.14 | – | 0.65 | 0.08 | 0.62 | 1.18 |
| **32** | 0.75 | 0.709 | 10-32 | 0.30 | 0.39 | 1.53 | 1/8 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 1.42 | 0.43 | 0.79 | 0.08 | 0.88 | 1.57 |
| **40** | 0.75 | 0.984 | 1/4-28 | 0.47 | 0.47 | 1.91 | 1/8 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 1.73 | 0.55 | 1.02 | 0.08 | 0.88 | 1.65 |
| **50** | 0.88 | 1.181 | 5/16-24 | 0.63 | 0.63 | 2.32 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 2.17 | 0.71 | 1.26 | 0.08 | 1.19 | 2.09 |
| **63** | 0.88 | 1.260 | 3/8-24 | 0.63 | 0.63 | 2.83 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 2.72 | 0.71 | 1.50 | 0.08 | 1.19 | 2.09 |
| **80** | 1.50 | 1.575 | 3/8-24 | 0.88 | 0.79 | 3.54 | 3/8 | 3/4-16 | 5/8-18 | 2.72 | 0.984 | 3.39 | 0.91 | 1.97 | 0.12 | 1.22 | 2.32 |
| **100** | 1.88 | 1.968 | 1/2-20 | 0.88 | 1.02 | 4.33 | 1/2 | 1-14 | 3/4-16 | 3.11 | 1.260 | 4.17 | 1.18 | 2.36 | 0.12 | 1.22 | 2.24 |

† Ports are 10-32 for cushioned versions

| Bore (mm) | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZB |
| **20** | 2.70 | 1.77 | 3.28 |
| **25** | 2.70 | 1.81 | 3.40 |
| **32** | 2.78 | 1.69 | 3.74 |
| **40** | 3.06 | 1.93 | 4.02 |
| **50** | 3.53 | 2.09 | 4.80 |
| **63** | 3.53 | 2.05 | 4.80 |
| **80** | 4.25 | 2.52 | 5.59 |
| **100** | 4.25 | 2.60 | 5.59 |

| Bore (mm) | Adjustable Air Cushion | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | GA | GB | GD Hex | GC° | G° | GH | EE | Cushion Length |
| **20** | 1.30 | 0.55 | 0.31 | 13-1/2 | 25-1/2 | 0.81 | 10-32 UNF | 0.35 |
| **25** | 1.38 | 0.55 | 0.31 | 15-1/2 | 20-1/2 | 0.91 | 10-32 UNF | 0.35 |
| **32** | – | – | – | 10-1/2 | 30-1/2 | – | 1/8 NPTF | 0.39 |
| **40** | – | – | – | 10-1/2 | 22-1/2 | – | 1/8 NPTF | 0.47 |
| **50** | – | – | – | 10-1/2 | 23-1/2 | – | 1/4 NPTF | 0.59 |
| **63** | – | – | – | 15-1/2 | 20-1/2 | – | 1/4 NPTF | 0.59 |
| **80** | – | – | – | 15-1/2 | 25-1/2 | – | 3/8 NPTF | 0.59 |
| **100** | – | – | – | 15-1/2 | 25-1/2 | – | 1/2 NPTF | 0.59 |







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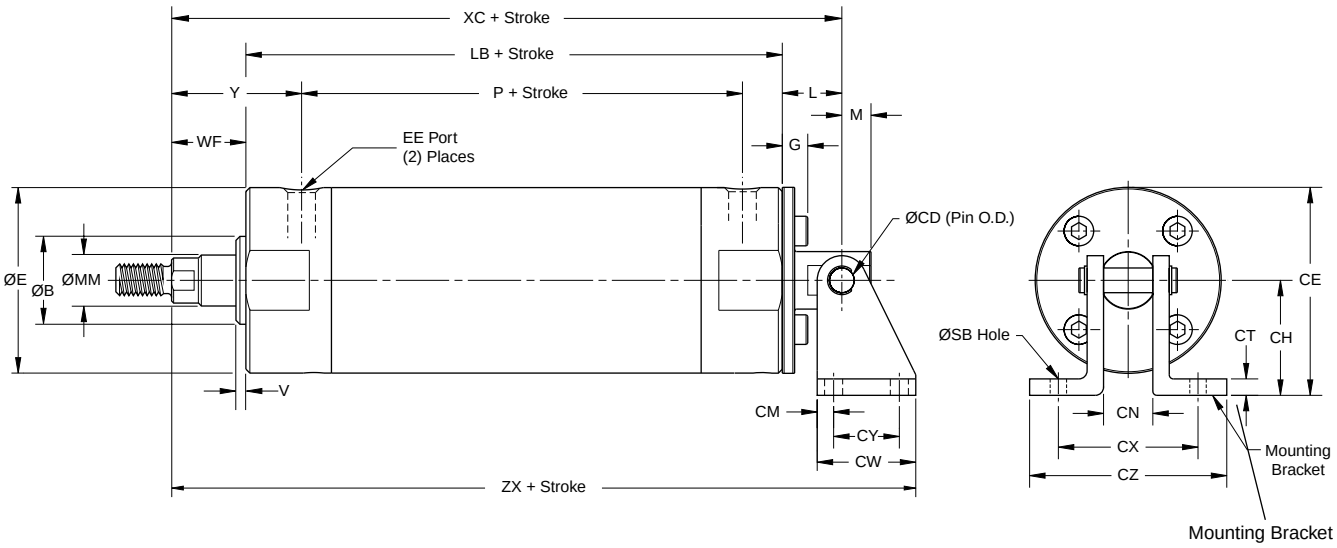
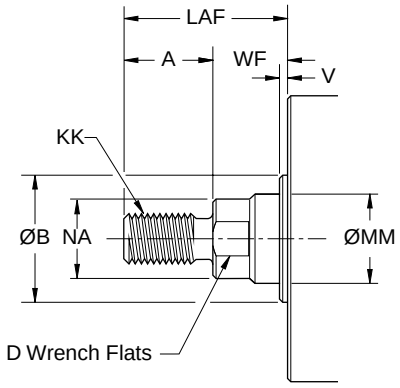
## Style B
## Single Rear Clevis
### Typical 20 to 100 mm Bore



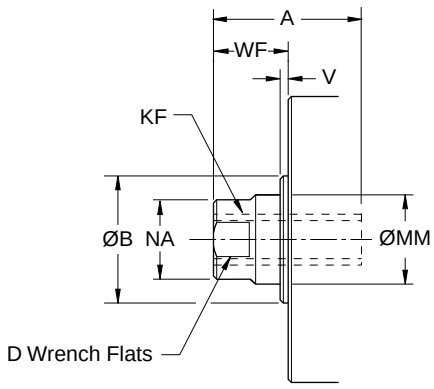

**Note:** Mating Mounting Bracket and Pin must be ordered as separate items

## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 - 0.02 | ØCD h9 | D | ØE | EE (BSPT) | G | Thread KK Style 5 | Thread KF Style 6 | L | LAF | M | ØMM Rod Dia. | NA | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | 6.35 | 6 | 27 | 1/8* | 7 | M8 x 1.25 | M5 x 0.80 | 18 | 26 | 7 | 8 | – | 2 | 13 | 28 |
| **25** | 13 | 14 | 6.35 | 8 | 32 | 1/8* | 8 | M10 x 1.25 | M6 x 1.00 | 17 | 29 | 7 | 10 | – | 2 | 16 | 30 |
| **32** | 19 | 18 | 6.35 | 10 | 39 | 1/8 | 15.5 | M10 x 1.25 | M8 x 1.25 | 27 | 41 | 10 | 12 | 11 | 2 | 22 | 40 |
| **40** | 19 | 25 | 9.52 | 12 | 48.5 | 1/8 | 10 | M14 x 1.5 | M8 x 1.25 | 22 | 41 | 10 | 16 | 14 | 2 | 22 | 42 |
| **50** | 22 | 30 | 9.52 | 16 | 59 | 1/4 | 12 | M18 x 1.5 | M10 x 1.25 | 23 | 52 | 11 | 20 | 18 | 2 | 30 | 53 |
| **63** | 22 | 32 | 9.52 | 16 | 72 | 1/4 | 13 | M18 x 1.5 | M10 x 1.25 | 23 | 52 | 11 | 20 | 18 | 2 | 30 | 53 |
| **80** | 38 | 40 | 19.07 | 20 | 90 | 3/8 | 15 | M22 x 1.5 | M16 x 1.5 | 35 | 69 | 19 | 25 | 23 | 3 | 31 | 59 |
| **100** | 48 | 50 | 19.07 | 26 | 110 | 1/2 | 17 | M26 x 1.5 | M20 x 1.5 | 43 | 79 | 19 | 32 | 30 | 3 | 31 | 57 |

| Bore | CE | CH | CM | CN | CT | CW | CX | CY | CZ | ØSB | Add Stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | LB | P | XC | ZX |
| **20** | 35.5 | 22 | 5 | 10 | 3 | 29 | 32 | 19 | 51 | 7 | 69 | 45 | 99 | 120 |
| **25** | 38 | 22 | 5 | 10 | 3 | 29 | 32 | 19 | 51 | 7 | 69 | 46 | 102 | 123 |
| **32** | 41.5 | 22 | 5 | 13 | 3 | 29 | 35 | 19 | 54 | 7 | 71 | 43 | 120 | 141 |
| **40** | 59 | 35 | 6 | 16 | 3 | 38 | 47 | 25 | 67 | 7 | 78 | 49 | 122 | 151 |
| **50** | 64.5 | 35 | 6 | 19 | 6 | 38 | 54 | 25 | 76 | 7 | 90 | 53 | 143 | 172 |
| **63** | 80 | 44 | 6 | 19 | 6 | 38 | 54 | 25 | 76 | 7 | 90 | 52 | 143 | 172 |
| **80** | 96 | 51 | 13 | 28 | 6 | 64 | 72 | 38 | 104 | 11 | 108 | 64 | 173 | 218 |
| **100** | 115 | 60 | 13 | 32 | 6 | 70 | 76 | 44 | 108 | 14 | 108 | 66 | 189 | 240 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 - 0.001 | ØCD +0 - 0.002 | D | ØE | EE (NTPF) | G | Thread KK Style N | Thread KF Style 9 | L | LAF | M | ØMM Rod Dia. | NA | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | 0.250 | 0.24 | 1.06 | 1/8† | 0.26 | 1/4-28 | #10-32 | 0.70 | 1.00 | 0.28 | 0.315 | – | 0.08 | 0.50 | 1.10 |
| **25** | 0.50 | 0.551 | 0.250 | 0.31 | 1.26 | 1/8† | 0.27 | 5/16-24 | 1/4-28 | 0.68 | 1.12 | 0.28 | 0.394 | – | 0.08 | 0.62 | 1.18 |
| **32** | 0.75 | 0.709 | 0.250 | 0.39 | 1.53 | 1/8 | 0.57 | 7/16-20 | 5/16-24 | 1.07 | 1.63 | 0.39 | 0.472 | 0.43 | 0.08 | 0.88 | 1.57 |
| **40** | 0.75 | 0.984 | 0.375 | 0.47 | 1.91 | 1/8 | 0.36 | 7/16-20 | 3/8-24 | 0.88 | 1.63 | 0.38 | 0.630 | 0.55 | 0.08 | 0.88 | 1.65 |
| **50** | 0.88 | 1.181 | 0.375 | 0.63 | 2.32 | 1/4 | 0.43 | 1/2-20 | 1/2-20 | 0.91 | 2.07 | 0.44 | 0.787 | 0.71 | 0.08 | 1.19 | 2.09 |
| **63** | 0.88 | 1.260 | 0.375 | 0.63 | 2.83 | 1/4 | 0.46 | 1/2-20 | 1/2-20 | 0.91 | 2.07 | 0.44 | 0.787 | 0.71 | 0.08 | 1.19 | 2.09 |
| **80** | 1.50 | 1.575 | 0.751 | 0.79 | 3.54 | 3/8 | 0.54 | 3/4-16 | 5/8-18 | 1.38 | 2.72 | 0.75 | 0.984 | 0.91 | 0.12 | 1.22 | 2.32 |
| **100** | 1.88 | 1.968 | 0.751 | 1.02 | 4.33 | 1/2 | 0.64 | 1-14 | 3/4-16 | 1.69 | 3.11 | 0.75 | 1.260 | 1.18 | 0.12 | 1.22 | 2.24 |

| Bore (mm) | CE | CH | CM | CN | CT | CW | CX | CY | CZ | ØSB | Add Stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | LB | P | XC | ZX |
| **20** | 1.39 | 0.87 | 0.19 | 0.38 | 0.12 | 1.13 | 1.25 | 0.75 | 2.00 | 0.27 | 2.70 | 1.77 | 3.91 | 4.74 |
| **25** | 1.49 | 0.87 | 0.19 | 0.38 | 0.12 | 1.13 | 1.25 | 0.75 | 2.00 | 0.27 | 2.70 | 1.81 | 4.00 | 4.83 |
| **32** | 1.63 | 0.87 | 0.19 | 0.50 | 0.12 | 1.13 | 1.38 | 0.75 | 2.12 | 0.27 | 2.78 | 1.69 | 4.72 | 5.55 |
| **40** | 2.31 | 1.38 | 0.25 | 0.62 | 0.12 | 1.50 | 1.86 | 1.00 | 2.62 | 0.27 | 3.06 | 1.93 | 4.81 | 5.94 |
| **50** | 2.52 | 1.38 | 0.25 | 0.75 | 0.25 | 1.50 | 2.12 | 1.00 | 3.00 | 0.27 | 3.53 | 2.09 | 5.63 | 6.76 |
| **63** | 3.17 | 1.75 | 0.25 | 0.75 | 0.25 | 1.50 | 2.12 | 1.00 | 3.00 | 0.27 | 3.53 | 2.05 | 5.63 | 6.76 |
| **80** | 3.77 | 2.00 | 0.50 | 1.09 | 0.25 | 2.50 | 2.84 | 1.50 | 4.09 | 0.42 | 4.25 | 2.52 | 6.82 | 8.57 |
| **100** | 4.54 | 2.37 | 0.50 | 1.25 | 0.25 | 2.75 | 3.00 | 1.75 | 4.25 | 0.55 | 4.25 | 2.60 | 7.44 | 9.44 |

† Ports are 10-32 for cushioned versions







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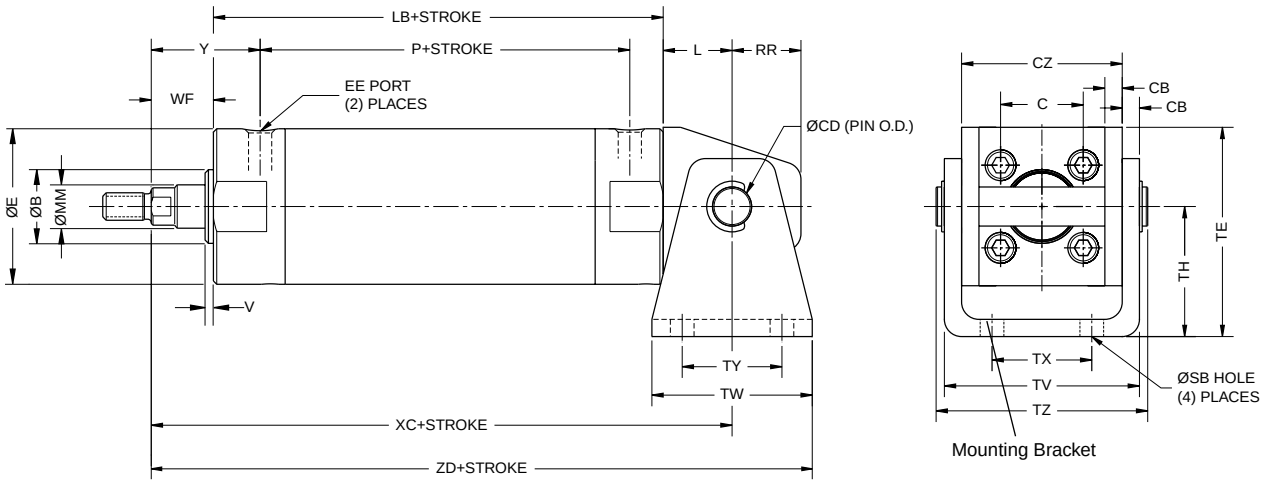
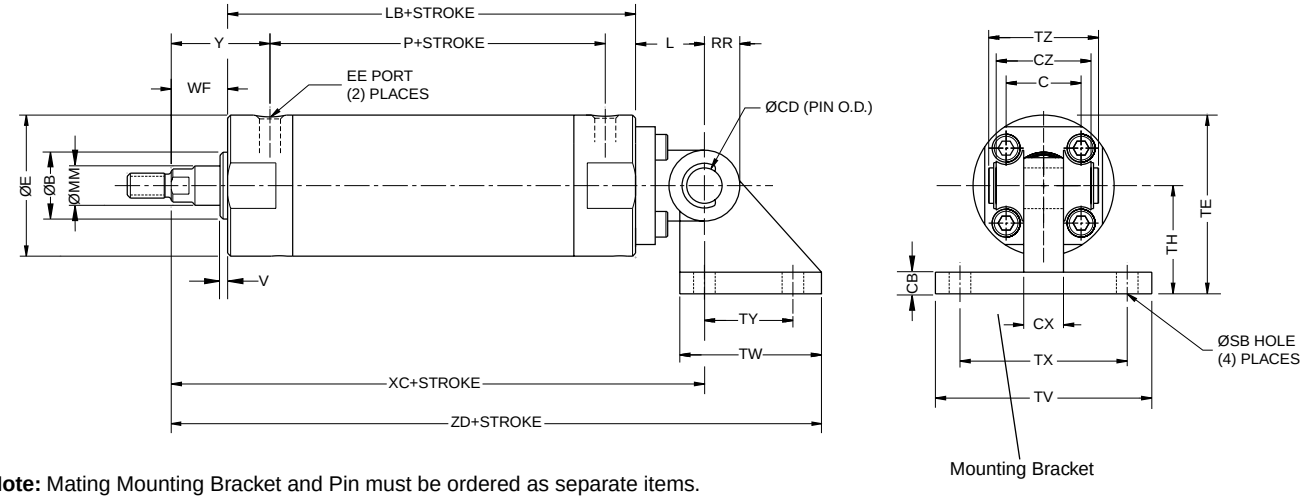
D

## Style A
## Double Rear Clevis
### Typical 20 to 63 mm Bore



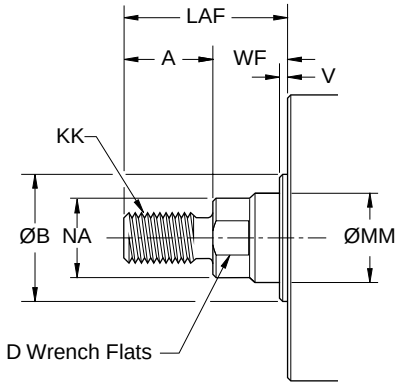

## Style A
## Double Rear Clevis
### Typical 80 to 100 mm Bore



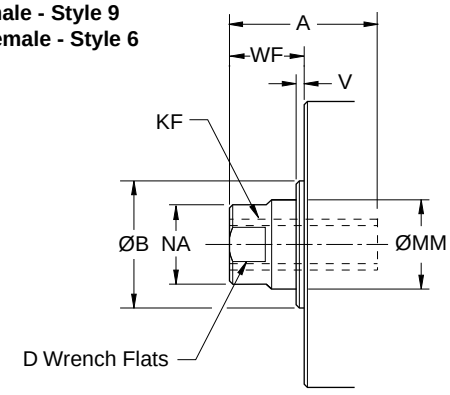

**Note:** Mating Mounting Bracket and Pin must be ordered as separate items.

## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**
**Thread Style 3**
Special Metric or Inch |threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | C | CB | ØCD d 9 | CZ | CX | D | ØE | EE (BSPT) | Thread KK Style 5 | Thread KF Style 6 | L | LAF | ØMM Rod Dia. | NA | RR | V | WF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | 14 | 3 | 8 | 29 | – | 6 | 27 | 1/8* | M8x1.25 | M5x0.80 | 14 | 26 | 8 | – | 11 | 2 | 13 |
| **25** | 13 | 14 | 16.5 | 3 | 10 | 33 | – | 8 | 32 | 1/8* | M10x1.25 | M6x1.00 | 16 | 29 | 10 | – | 13 | 2 | 16 |
| **32** | 19 | 18 | 20 | 4.5 | 12 | 40 | – | 10 | 39 | 1/8 | M10x1.25 | M8x1.25 | 20 | 41 | 12 | 11 | 15 | 2 | 22 |
| **40** | 19 | 25 | 26 | 4.5 | 14 | 49 | – | 12 | 48.5 | 1/8 | M14x1.5 | M8x1.25 | 22 | 41 | 16 | 14 | 18 | 2 | 22 |
| **50** | 22 | 30 | 32 | 6 | 16 | 60 | – | 16 | 59 | 1/4 | M18x1.5 | M10x1.25 | 25 | 52 | 20 | 18 | 20 | 2 | 30 |
| **63** | 22 | 32 | 38 | 8 | 18 | 74 | – | 16 | 72 | 1/4 | M18x1.5 | M10x1.25 | 30 | 52 | 20 | 18 | 22 | 2 | 30 |
| **80** | 38 | 40 | 50 | 11 | 18 | 56 | 28 | 20 | 90 | 3/8 | M22x1.5 | M16x1.5 | 35 | 69 | 25 | 23 | 18 | 3 | 31 |
| **100** | 48 | 50 | 60 | 12 | 22 | 64 | 32 | 26 | 110 | 1/2 | M26x1.5 | M20x1.5 | 43 | 79 | 32 | 30 | 22 | 3 | 31 |

| Bore | Ø SB | TY | TV | TE | TH | TX | TW | TZ | Y | Add Stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | LB | P | XC | ZD |
| **20** | 5.5 | 28 | 35 | 38 | 25 | 16 | 42 | 43.4 | 28 | 69 | 45 | 95 | 116 |
| **25** | 5.5 | 28 | 39 | 45.5 | 30 | 20 | 42 | 48 | 30 | 69 | 46 | 100 | 121 |
| **32** | 7 | 28 | 49 | 54 | 35 | 22 | 48 | 59.4 | 40 | 71 | 43 | 113 | 137 |
| **40** | 7 | 30 | 58 | 63.5 | 40 | 30 | 56 | 71.4 | 42 | 78 | 49 | 122 | 150 |
| **50** | 9 | 36 | 72 | 79 | 50 | 36 | 64 | 86 | 53 | 90 | 53 | 145 | 177 |
| **63** | 11 | 46 | 90 | 96 | 60 | 46 | 74 | 105.4 | 53 | 90 | 52 | 150 | 187 |
| **80** | 11 | 45 | 110 | 100 | 55 | 85 | 72 | 64 | 59 | 108 | 64 | 174 | 232.5 |
| **100** | 13.5 | 60 | 130 | 120 | 65 | 100 | 93 | 72 | 57 | 108 | 66 | 182 | 258.5 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 -0.001 | C | CB | ØCD -0.001 -0.003 | CZ | CX | D | ØE | EE (NPTF) | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | L | LAF | Ø MM | NA | RR | V | WF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | 0.55 | 0.12 | 0.315 | 1.14 | – | 0.24 | 1.06 | 1/8† | 1/4-28 | #10-32 | 0.55 | 1.00 | 0.315 | – | 0.43 | 0.08 | 0.50 |
| **25** | 0.50 | 0.551 | 0.65 | 0.12 | 0.394 | 1.30 | – | 0.31 | 1.26 | 1/8† | 5/16-24 | 1/4-28 | 0.63 | 1.12 | 0.394 | – | 0.51 | 0.08 | 0.62 |
| **32** | 0.75 | 0.709 | 0.79 | 0.18 | 0.472 | 1.57 | – | 0.39 | 1.53 | 1/8 | 7/16-20 | 5/16-24 | 0.79 | 1.63 | 0.472 | 0.43 | 0.59 | 0.08 | 0.88 |
| **40** | 0.75 | 0.984 | 1.02 | 0.18 | 0.551 | 1.93 | – | 0.47 | 1.91 | 1/8 | 7/16-20 | 3/8-24 | 0.87 | 1.63 | 0.630 | 0.55 | 0.71 | 0.08 | 0.88 |
| **50** | 0.88 | 1.181 | 1.26 | 0.25 | 0.630 | 2.36 | – | 0.63 | 2.32 | 1/4 | 1/2-20 | 1/2-20 | 0.98 | 2.07 | 0.787 | 0.71 | 0.79 | 0.08 | 1.19 |
| **63** | 0.88 | 1.260 | 1.50 | 0.31 | 0.709 | 2.91 | – | 0.63 | 2.83 | 1/4 | 1/2-20 | 1/2-20 | 1.18 | 2.07 | 0.787 | 0.71 | 0.87 | 0.08 | 1.19 |
| **80** | 1.50 | 1.575 | 1.97 | 0.43 | 0.709 | 2.20 | 1.10 | 0.79 | 3.54 | 3/8 | 3/4-16 | 5/8-18 | 1.38 | 2.72 | 0.984 | 0.91 | 0.71 | 0.12 | 1.22 |
| **100** | 1.88 | 1.968 | 2.36 | 0.47 | 0.866 | 2.52 | 1.26 | 1.02 | 4.33 | 1/2 | 1-14 | 3/4-16 | 1.69 | 3.11 | 1.260 | 1.18 | 0.87 | 0.12 | 1.22 |

| Bore (mm) | ØSB | TY | TV | TE | TH | TX | TW | TZ | Y | Add Stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | LB | P | XC | ZD |
| **20** | 0.22 | 1.10 | 1.39 | 1.50 | 0.98 | 0.63 | 1.66 | 1.71 | 1.10 | 2.70 | 1.77 | 3.75 | 4.58 |
| **25** | 0.22 | 1.10 | 1.55 | 1.79 | 1.18 | 0.79 | 1.66 | 1.89 | 1.18 | 2.70 | 1.81 | 3.95 | 4.78 |
| **32** | 0.28 | 1.10 | 1.93 | 2.13 | 1.38 | 0.87 | 1.88 | 2.34 | 1.57 | 2.78 | 1.69 | 4.45 | 5.39 |
| **40** | 0.28 | 1.18 | 2.28 | 2.50 | 1.57 | 1.18 | 2.20 | 2.81 | 1.65 | 3.06 | 1.93 | 4.81 | 5.91 |
| **50** | 0.35 | 1.42 | 2.83 | 3.11 | 1.97 | 1.42 | 2.52 | 3.38 | 2.09 | 3.53 | 2.09 | 5.70 | 6.96 |
| **63** | 0.43 | 1.81 | 3.54 | 3.78 | 2.36 | 1.81 | 2.91 | 4.15 | 2.09 | 3.53 | 2.05 | 5.90 | 7.36 |
| **80** | 0.43 | 1.77 | 4.33 | 3.94 | 2.17 | 3.35 | 2.83 | 2.52 | 2.32 | 4.25 | 2.52 | 6.85 | 9.15 |
| **100** | 0.53 | 2.36 | 5.12 | 4.72 | 2.56 | 3.94 | 3.66 | 2.83 | 2.24 | 4.25 | 2.60 | 7.17 | 10.18 |

†Ports are 10-32 for cushioned versions







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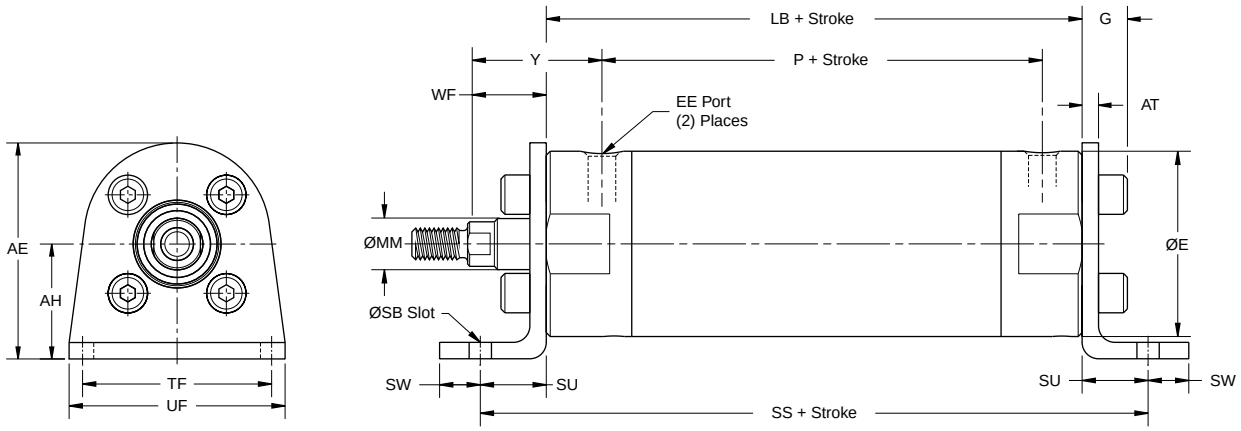
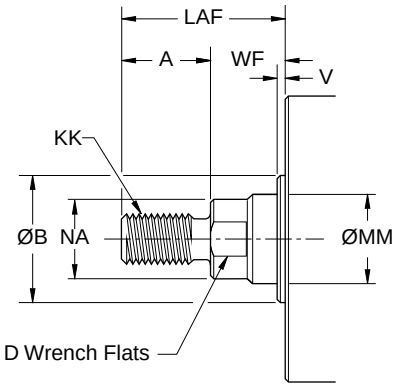
## Style F
## Foot Mount
### Typical 20 to 100 mm Bore

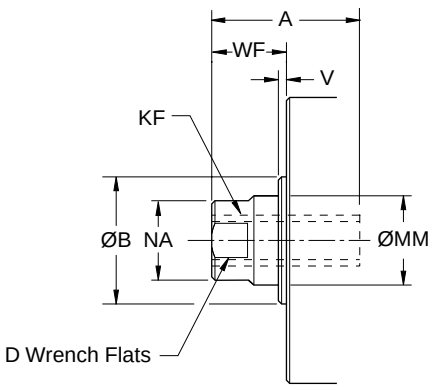



## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | AE | AH | AT | ØB +0 -0.02 | D | ØE | EE (BSPT) | G | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NA | ØSB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 36.5 | 20.6 | 3 | 12 | 6 | 27 | 1/8* | 6 | M8x1.25 | M5x0.80 | 26 | 8 | – | 7 |
| **25** | 13 | 38.5 | 20.6 | 3 | 14 | 8 | 32 | 1/8* | 6.5 | M10x1.25 | M6x1.00 | 29 | 10 | – | 7 |
| **32** | 19 | 46.5 | 25.4 | 3 | 18 | 10 | 39 | 1/8 | 6.5 | M10x1.25 | M8x1.25 | 41 | 12 | 11 | 7 |
| **40** | 19 | 51 | 25.4 | 3 | 25 | 12 | 48.5 | 1/8 | 7 | M14x1.5 | M8x1.25 | 41 | 16 | 14 | 7 |
| **50** | 22 | 72 | 38.1 | 6 | 30 | 16 | 59 | 1/4 | 11 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 9 |
| **63** | 22 | 83.5 | 44.5 | 6 | 32 | 16 | 72 | 1/4 | 12 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 9 |
| **80** | 38 | 101 | 55 | 6 | 40 | 20 | 90 | 3/8 | 12 | M22x1.5 | M16x1.5 | 69 | 25 | 23 | 11 |
| **100** | 48 | 121 | 65 | 6 | 50 | 26 | 110 | 1/2 | 13 | M26x1.5 | M20x1.5 | 79 | 32 | 30 | 14 |

| Bore | SU | SW | TF | UF | V | WF | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | LB | P | SS |
| **20** | 14 | 11 | 38 | 48 | 2 | 13 | 28 | 69 | 45 | 97 |
| **25** | 14 | 11 | 38 | 48 | 2 | 16 | 30 | 69 | 46 | 97 |
| **32** | 19 | 19 | 48 | 63.5 | 2 | 22 | 40 | 71 | 43 | 109 |
| **40** | 18 | 20 | 48 | 63.5 | 2 | 22 | 42 | 78 | 49 | 114 |
| **50** | 25 | 16 | 57 | 79 | 2 | 30 | 53 | 90 | 53 | 140 |
| **63** | 25 | 16 | 73 | 95 | 2 | 30 | 53 | 90 | 52 | 140 |
| **80** | 28.5 | 14 | 100 | 125 | 3 | 31 | 59 | 108 | 64 | 165 |
| **100** | 30 | 16 | 120 | 150 | 3 | 31 | 57 | 108 | 66 | 168 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore | A | AE | AH | AT | ØB +0 -0.001 | D | Ø E | EE (NPTF) | G | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM | NA | ØSB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 1.44 | 0.81 | 0.12 | 0.472 | 0.24 | 1.06 | 1/8† | 0.20 | 1/4-28 | #10-32 | 1.00 | 0.315 | – | 0.27 |
| **25** | 0.50 | 1.52 | 0.81 | 0.12 | 0.551 | 0.31 | 1.26 | 1/8† | 0.22 | 5/16-24 | 1/4-28 | 1.12 | 0.394 | – | 0.27 |
| **32** | 0.75 | 1.83 | 1.00 | 0.12 | 0.709 | 0.39 | 1.53 | 1/8 | 0.22 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 0.43 | 0.28 |
| **40** | 0.75 | 2.02 | 1.00 | 0.12 | 0.984 | 0.47 | 1.91 | 1/8 | 0.25 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 0.55 | 0.28 |
| **50** | 0.88 | 2.84 | 1.50 | 0.25 | 1.181 | 0.63 | 2.32 | 1/4 | 0.41 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.34 |
| **63** | 0.88 | 3.29 | 1.75 | 0.25 | 1.260 | 0.63 | 2.83 | 1/4 | 0.44 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.34 |
| **80** | 1.50 | 3.98 | 2.17 | 0.25 | 1.575 | 0.79 | 3.54 | 3/8 | 0.44 | 3/4-16 | 5/8-18 | 2.72 | 0.984 | 0.91 | 0.43 |
| **100** | 1.88 | 4.76 | 2.56 | 0.25 | 1.968 | 1.02 | 4.33 | 1/2 | 0.50 | 1-14 | 3/4-16 | 3.11 | 1.260 | 1.18 | 0.55 |

| Bore (mm) | SU | SW | TF | UF | V | WF | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | LB | P | SS |
| **20** | 0.56 | 0.44 | 1.50 | 1.88 | 0.08 | 0.50 | 1.10 | 2.70 | 1.77 | 3.82 |
| **25** | 0.56 | 0.44 | 1.50 | 1.88 | 0.08 | 0.62 | 1.18 | 2.70 | 1.81 | 3.82 |
| **32** | 0.75 | 0.75 | 1.88 | 2.50 | 0.08 | 0.88 | 1.57 | 2.78 | 1.69 | 4.28 |
| **40** | 0.72 | 0.78 | 1.88 | 2.50 | 0.08 | 0.88 | 1.65 | 3.06 | 1.93 | 4.50 |
| **50** | 1.00 | 0.62 | 2.24 | 3.12 | 0.08 | 1.19 | 2.09 | 3.53 | 2.09 | 5.53 |
| **63** | 1.00 | 0.62 | 2.88 | 3.75 | 0.08 | 1.19 | 2.09 | 3.53 | 2.05 | 5.53 |
| **80** | 1.12 | 0.55 | 3.94 | 4.92 | 0.12 | 1.22 | 2.32 | 4.25 | 2.52 | 6.49 |
| **100** | 1.18 | 0.63 | 4.72 | 5.91 | 0.12 | 1.22 | 2.24 | 4.25 | 2.60 | 6.61 |

† Ports are 10-32 for cushioned versions







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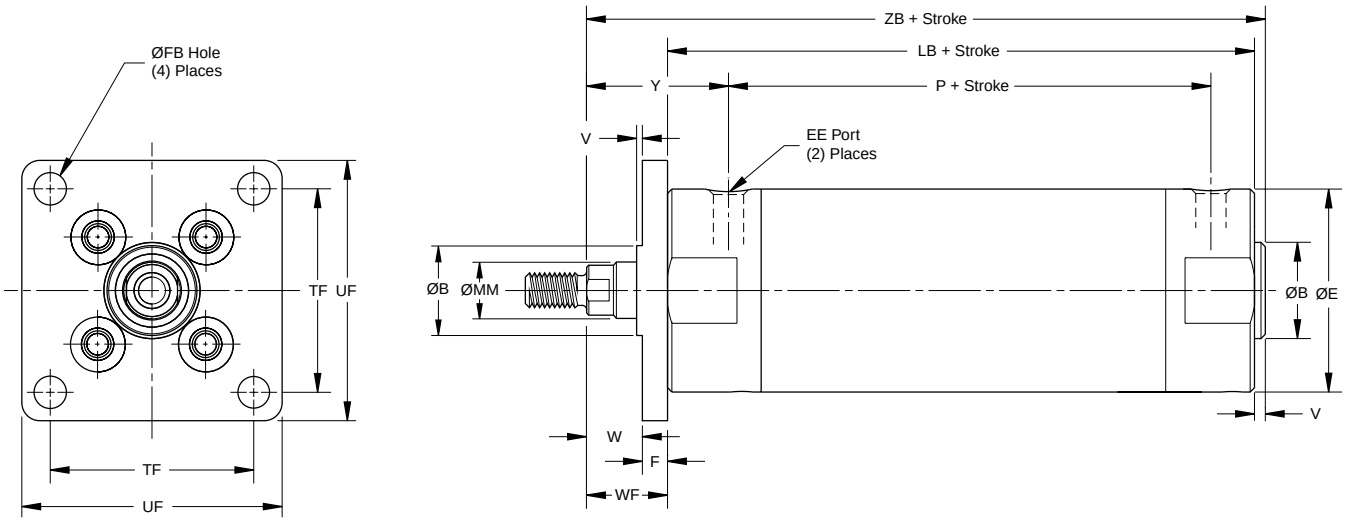
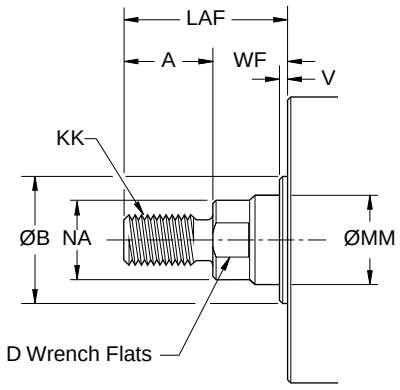
## Style J
## Front Flange
### Typical 20 to 100 mm Bore

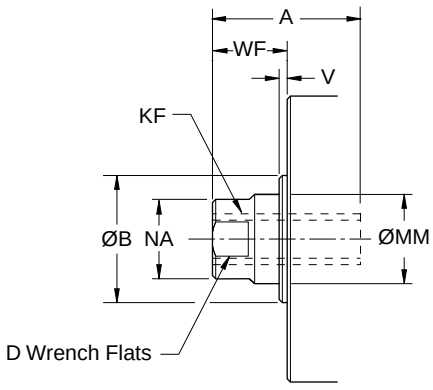



## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | D | ØE | EE (BSPT) | F | ØFB | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NA | TF | UF | V | WF | W | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | 6 | 27 | 1/8* | 6 | 5.5 | M8x1.25 | M5x0.80 | 26 | 8 | – | 28 | 40 | 2 | 13 | 7 | 28 |
| **25** | 13 | 14 | 8 | 32 | 1/8* | 7 | 5.5 | M10x1.25 | M6x1.00 | 29 | 10 | – | 32 | 44 | 2 | 16 | 9 | 30 |
| **32** | 19 | 18 | 10 | 39 | 1/8 | 7 | 7 | M10x1.25 | M8x1.25 | 41 | 12 | 11 | 38 | 53 | 2 | 22 | 15 | 40 |
| **40** | 19 | 25 | 12 | 48.5 | 1/8 | 8 | 7 | M14x1.5 | M8x1.25 | 41 | 16 | 14 | 46 | 61 | 2 | 22 | 14 | 42 |
| **50** | 22 | 30 | 16 | 59 | 1/4 | 9 | 9 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 58 | 76 | 2 | 30 | 21 | 53 |
| **63** | 22 | 32 | 16 | 72 | 1/4 | 9 | 11 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 70 | 92 | 2 | 30 | 21 | 53 |
| **80** | 38 | 40 | 20 | 90 | 3/8 | 11 | 11 | M22x1.5 | M16x1.5 | 69 | 25 | 23 | 82 | 104 | 3 | 31 | 20 | 59 |
| **100** | 48 | 50 | 26 | 110 | 1/2 | 14 | 14 | M26x1.5 | M20x1.5 | 79 | 32 | 30 | 100 | 128 | 3 | 31 | 17 | 57 |

| Bore | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZB |
| **20** | 69 | 45 | 83 |
| **25** | 69 | 46 | 86 |
| **32** | 71 | 43 | 95 |
| **40** | 78 | 49 | 102 |
| **50** | 90 | 53 | 122 |
| **63** | 90 | 52 | 122 |
| **80** | 108 | 64 | 142 |
| **100** | 108 | 66 | 142 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 -0.001 | D | ØE | EE (NPTF) | F | ØFB | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | NA | TF | UF | V | WF | W | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | 0.24 | 1.06 | 1/8† | 0.24 | 0.22 | 1/4-28 | #10-32 | 1.00 | 0.315 | – | 1.10 | 1.57 | 0.08 | 0.50 | 0.26 | 1.10 |
| **25** | 0.50 | 0.551 | 0.31 | 1.26 | 1/8† | 0.28 | 0.22 | 5/16-24 | 1/4-28 | 1.12 | 0.394 | – | 1.26 | 1.73 | 0.08 | 0.62 | 0.34 | 1.18 |
| **32** | 0.75 | 0.709 | 0.39 | 1.53 | 1/8 | 0.28 | 0.28 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 0.43 | 1.50 | 2.09 | 0.08 | 0.88 | 0.60 | 1.57 |
| **40** | 0.75 | 0.984 | 0.47 | 1.91 | 1/8 | 0.31 | 0.28 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 0.55 | 1.81 | 2.40 | 0.08 | 0.88 | 0.57 | 1.65 |
| **50** | 0.88 | 1.181 | 0.63 | 2.32 | 1/4 | 0.35 | 0.35 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 2.28 | 3.00 | 0.08 | 1.19 | 0.84 | 2.09 |
| **63** | 0.88 | 1.260 | 0.63 | 2.83 | 1/4 | 0.35 | 0.43 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 2.76 | 3.62 | 0.08 | 1.19 | 0.84 | 2.09 |
| **80** | 1.50 | 1.575 | 0.79 | 3.54 | 3/8 | 0.43 | 0.43 | 3/4-16 | 5/8-18 | 2.72 | 0.984 | 0.91 | 3.23 | 4.09 | 0.12 | 1.22 | 0.79 | 2.32 |
| **100** | 1.88 | 1.968 | 1.02 | 4.33 | 1/2 | 0.55 | 0.55 | 1-14 | 3/4-16 | 3.11 | 1.260 | 1.18 | 3.94 | 5.04 | 0.12 | 1.22 | 0.67 | 2.24 |

| Bore (mm) | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZB |
| **20** | 2.70 | 1.77 | 3.28 |
| **25** | 2.70 | 1.81 | 3.40 |
| **32** | 2.78 | 1.69 | 3.74 |
| **40** | 3.06 | 1.93 | 4.02 |
| **50** | 3.53 | 2.09 | 4.80 |
| **63** | 3.53 | 2.05 | 4.80 |
| **80** | 4.25 | 2.52 | 5.59 |
| **100** | 4.25 | 2.60 | 5.59 |

† Ports are 10-32 for cushioned versions







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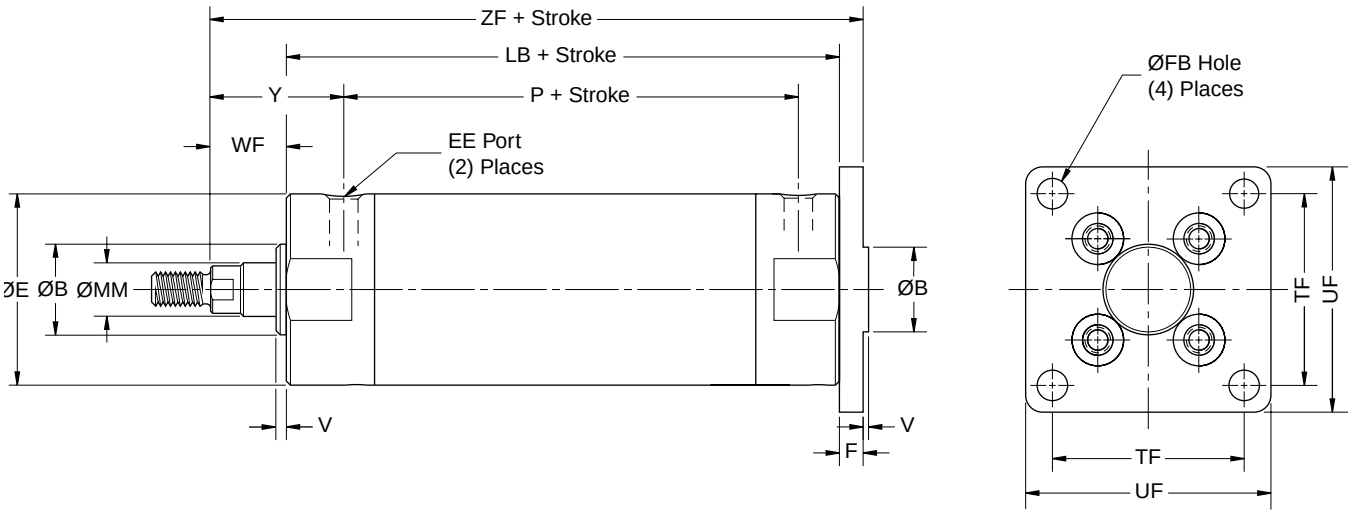
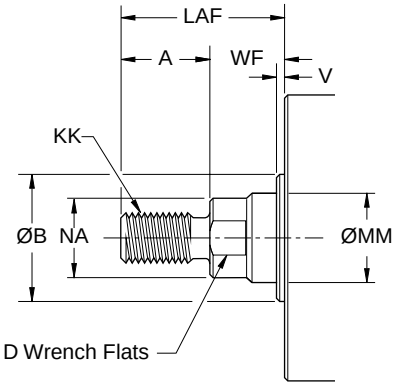
## Style H
## Rear Flange
**Typical 20 to 100 mm Bore**

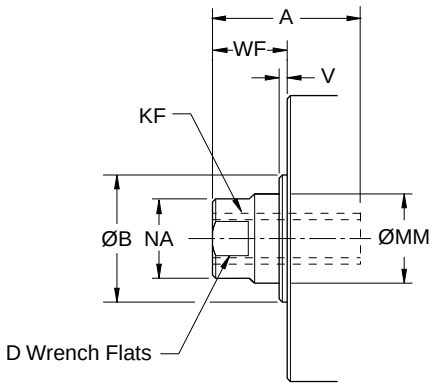



## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | D | ØE | EE (BSPT) | F | ØFB | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NA | TF | UF | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | 6 | 27 | 1/8* | 6 | 5.5 | M8x1.25 | M5x0.80 | 26 | 8 | – | 28 | 40 | 2 | 13 | 28 |
| **25** | 13 | 14 | 8 | 32 | 1/8* | 7 | 5.5 | M10x1.25 | M6x1.00 | 29 | 10 | – | 32 | 44 | 2 | 16 | 30 |
| **32** | 19 | 18 | 10 | 39 | 1/8 | 7 | 7 | M10x1.25 | M8x1.25 | 41 | 12 | 11 | 38 | 53 | 2 | 22 | 40 |
| **40** | 19 | 25 | 12 | 48.5 | 1/8 | 8 | 7 | M14x1.5 | M8x1.25 | 41 | 16 | 14 | 46 | 61 | 2 | 22 | 42 |
| **50** | 22 | 30 | 16 | 59 | 1/4 | 9 | 9 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 58 | 76 | 2 | 30 | 53 |
| **63** | 22 | 32 | 16 | 72 | 1/4 | 9 | 11 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 70 | 92 | 2 | 30 | 53 |
| **80** | 38 | 40 | 20 | 90 | 3/8 | 11 | 11 | M22x1.5 | M16x1.5 | 69 | 25 | 23 | 82 | 104 | 3 | 31 | 59 |
| **100** | 48 | 50 | 26 | 110 | 1/2 | 14 | 14 | M26x1.5 | M20x1.5 | 79 | 32 | 30 | 100 | 128 | 3 | 31 | 57 |

| Bore | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZF |
| **20** | 69 | 45 | 87 |
| **25** | 69 | 46 | 91 |
| **32** | 71 | 43 | 100 |
| **40** | 78 | 49 | 108 |
| **50** | 90 | 53 | 129 |
| **63** | 90 | 52 | 129 |
| **80** | 108 | 64 | 150 |
| **100** | 108 | 66 | 153 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 -0.001 | D | ØE | EE (NPTF) | F | ØFB | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | NA | TF | UF | V | WF | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | 0.24 | 1.06 | 1/8† | 0.24 | 0.22 | 1/4-28 | #10-32 | 1.00 | 0.315 | – | 1.10 | 1.57 | 0.08 | 0.50 | 1.10 |
| **25** | 0.50 | 0.551 | 0.31 | 1.26 | 1/8† | 0.28 | 0.22 | 5/16-24 | 1/4-28 | 1.12 | 0.394 | – | 1.26 | 1.73 | 0.08 | 0.62 | 1.18 |
| **32** | 0.75 | 0.709 | 0.39 | 1.53 | 1/8 | 0.28 | 0.28 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 0.43 | 1.50 | 2.09 | 0.08 | 0.88 | 1.57 |
| **40** | 0.75 | 0.984 | 0.47 | 1.91 | 1/8 | 0.31 | 0.28 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 0.55 | 1.81 | 2.40 | 0.08 | 0.88 | 1.65 |
| **50** | 0.88 | 1.181 | 0.63 | 2.32 | 1/4 | 0.35 | 0.35 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 2.28 | 3.00 | 0.08 | 1.19 | 2.09 |
| **63** | 0.88 | 1.260 | 0.63 | 2.83 | 1/4 | 0.35 | 0.43 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 2.76 | 3.62 | 0.08 | 1.19 | 2.09 |
| **80** | 1.50 | 1.575 | 0.79 | 3.54 | 3/8 | 0.43 | 0.43 | 3/4-16 | 5/8-18 | 2.72 | 0.984 | 0.91 | 3.23 | 4.09 | 0.12 | 1.22 | 2.32 |
| **100** | 1.88 | 1.968 | 1.02 | 4.33 | 1/2 | 0.55 | 0.55 | 1-14 | 3/4-16 | 3.11 | 1.260 | 1.18 | 3.94 | 5.04 | 0.12 | 1.22 | 2.24 |

| Bore (mm) | Add Stroke | | |
|---|---|---|---|
| | LB | P | ZF |
| **20** | 2.70 | 1.77 | 3.44 |
| **25** | 2.70 | 1.81 | 3.60 |
| **32** | 2.78 | 1.69 | 3.94 |
| **40** | 3.06 | 1.93 | 4.25 |
| **50** | 3.53 | 2.09 | 5.07 |
| **63** | 3.53 | 2.05 | 5.07 |
| **80** | 4.25 | 2.52 | 5.91 |
| **100** | 4.25 | 2.60 | 6.02 |

† Ports are 10-32 for cushioned versions







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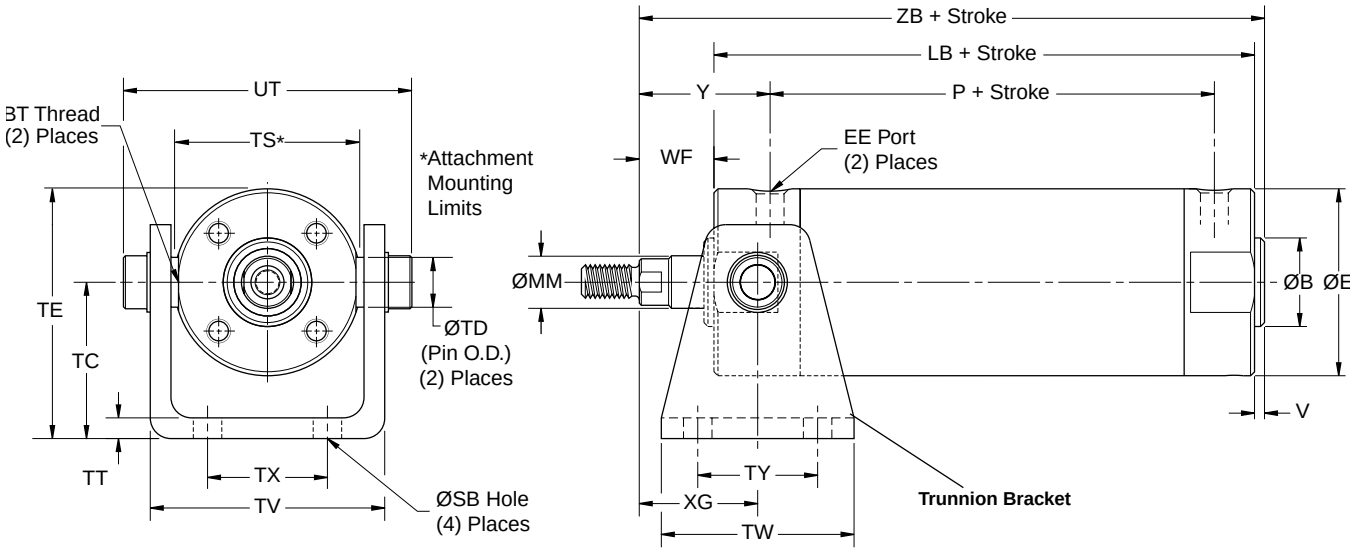
D

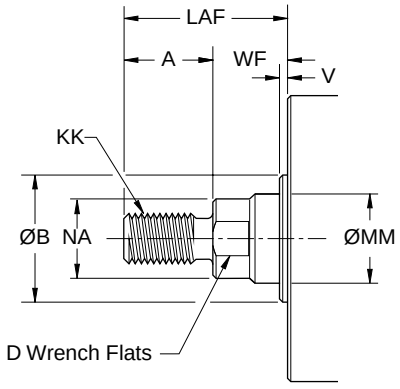
## Style E
## Front Trunnion
### Typical 20 to 63 mm Bore



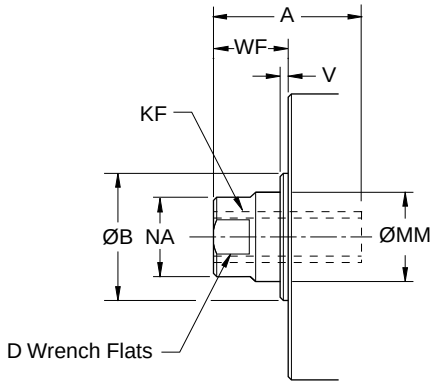

**Note:** Trunnion Bracket must be ordered as separate item

## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | BT | D | ØE | EE (BSPT) | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NA | V | WF | XG | Y | ØSB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | M5x0.80 | 6 | 27 | 1/8* | M8x1.25 | M5x0.80 | 26 | 8 | – | 2 | 13 | 24 | 28 | 5.5 |
| **25** | 13 | 14 | M6x0.75 | 8 | 32 | 1/8* | M10x1.25 | M6x1.00 | 29 | 10 | – | 2 | 16 | 27 | 30 | 5.5 |
| **32** | 19 | 18 | M8x1.00 | 10 | 39 | 1/8 | M10x1.25 | M8x1.25 | 41 | 12 | 11 | 2 | 22 | 33 | 40 | 7 |
| **40** | 19 | 25 | M10x1.25 | 12 | 48.5 | 1/8 | M14x1.5 | M8x1.25 | 41 | 16 | 14 | 2 | 22 | 34 | 42 | 7 |
| **50** | 22 | 30 | M12x1.25 | 16 | 59 | 1/4 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 2 | 30 | 43 | 53 | 9 |
| **63** | 22 | 32 | M14x1.50 | 16 | 72 | 1/4 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 2 | 30 | 43 | 53 | 11 |

| Bore | TC | ØTD e8 | TE | TS | TT | TV | TW | TX | TY | UT | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | LB | P | ZB |
| **20** | 25 | 8 | 38.5 | 28 | 3 | 35 | 42 | 16 | 28 | 47.5 | 69 | 45 | 83 |
| **25** | 30 | 10 | 46 | 33 | 3 | 39 | 42 | 20 | 28 | 53 | 69 | 46 | 86 |
| **32** | 35 | 12 | 54.5 | 40 | 4.5 | 49 | 48 | 22 | 28 | 68 | 71 | 43 | 95 |
| **40** | 40 | 14 | 64 | 49 | 4.5 | 58 | 56 | 30 | 30 | 79 | 78 | 49 | 102 |
| **50** | 50 | 16 | 79.5 | 60 | 6 | 72 | 64 | 36 | 36 | 99 | 90 | 53 | 122 |
| **63** | 60 | 18 | 96 | 74 | 8 | 90 | 74 | 46 | 46 | 119 | 90 | 52 | 122 |

* Ports are M5 for cushioned versions

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 -0.001 | BT | D | ØE | EE (NPTF) | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | NA | V | WF | XG | Y | ØSB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | M5x0.80 | 0.24 | 1.06 | 1/8† | 1/4-28 | #10-32 | 1.00 | 0.315 | – | 0.08 | 0.50 | 0.93 | 1.10 | 0.22 |
| **25** | 0.50 | 0.551 | M6x0.75 | 0.31 | 1.26 | 1/8† | 5/16-24 | 1/4-28 | 1.12 | 0.394 | – | 0.08 | 0.62 | 1.05 | 1.18 | 0.22 |
| **32** | 0.75 | 0.709 | M8x1.00 | 0.39 | 1.53 | 1/8 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 0.43 | 0.08 | 0.88 | 1.31 | 1.57 | 0.28 |
| **40** | 0.75 | 0.984 | M10x1.25 | 0.47 | 1.91 | 1/8 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 0.55 | 0.08 | 0.88 | 1.35 | 1.65 | 0.28 |
| **50** | 0.88 | 1.181 | M12x1.25 | 0.63 | 2.32 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.08 | 1.19 | 1.70 | 2.09 | 0.35 |
| **63** | 0.88 | 1.260 | M14x1.50 | 0.63 | 2.83 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.08 | 1.19 | 1.70 | 2.09 | 0.43 |

| Bore (mm) | TC | ØTD | TE | TS | TT | TV | TW | TX | TY | UT | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | LB | P | ZB |
| **20** | 0.98 | 0.315 | 1.51 | 1.10 | 0.12 | 1.39 | 1.66 | 0.63 | 1.10 | 1.87 | 2.70 | 1.77 | 3.28 |
| **25** | 1.18 | 0.394 | 1.81 | 1.30 | 0.12 | 1.55 | 1.66 | 0.79 | 1.10 | 2.09 | 2.70 | 1.81 | 3.40 |
| **32** | 1.38 | 0.472 | 2.15 | 1.58 | 0.18 | 1.93 | 1.88 | 0.87 | 1.10 | 2.67 | 2.78 | 1.69 | 3.74 |
| **40** | 1.57 | 0.551 | 2.53 | 1.93 | 0.18 | 2.28 | 2.20 | 1.18 | 1.18 | 3.10 | 3.06 | 1.93 | 4.02 |
| **50** | 1.97 | 0.630 | 3.13 | 2.36 | 0.25 | 2.83 | 2.52 | 1.42 | 1.42 | 3.88 | 3.53 | 2.09 | 4.80 |
| **63** | 2.36 | 0.709 | 3.78 | 2.91 | 0.31 | 3.54 | 2.91 | 1.81 | 1.81 | 4.69 | 3.53 | 2.05 | 4.80 |

† Ports are 10-32 for cushioned versions







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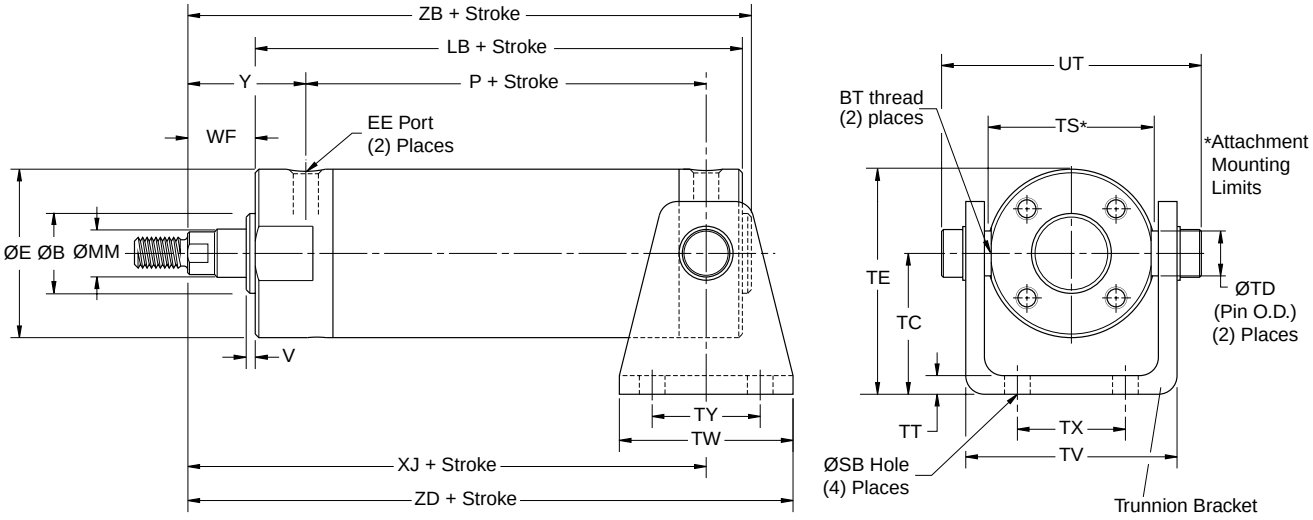
D

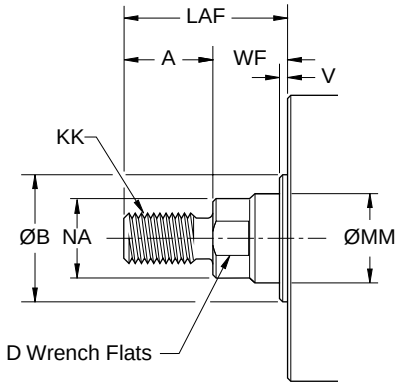
## Style D
## Rear Trunnion
### Typical 20 to 63 mm Bore



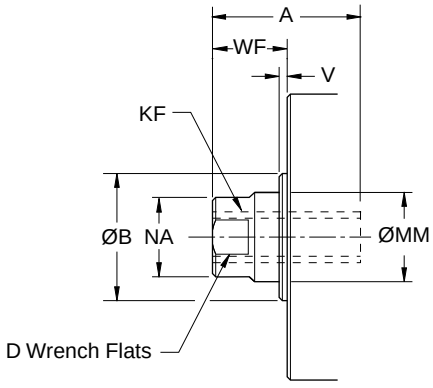

**Note:** Trunnion Bracket must be ordered as separate item

## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | BT | D | ØE | EE (BSPT) | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NA | V | WF | Y | ØSB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | M5x0.80 | 6 | 27 | 1/8* | M8x1.25 | M5x0.80 | 26 | 8 | – | 2 | 13 | 28 | 5.5 | 25 |
| **25** | 13 | 14 | M6x0.75 | 8 | 32 | 1/8* | M10x1.25 | M6x1.00 | 29 | 10 | – | 2 | 16 | 30 | 5.5 | 30 |
| **32** | 19 | 18 | M8x1.00 | 10 | 39 | 1/8 | M10x1.25 | M8x1.25 | 41 | 12 | 11 | 2 | 22 | 40 | 7 | 35 |
| **40** | 19 | 25 | M10x1.25 | 12 | 48.5 | 1/8 | M14x1.5 | M8x1.25 | 41 | 16 | 14 | 2 | 22 | 42 | 7 | 40 |
| **50** | 22 | 30 | M12x1.25 | 16 | 59 | 1/4 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 2 | 30 | 53 | 9 | 50 |
| **63** | 22 | 32 | M14x1.50 | 16 | 72 | 1/4 | M18x1.5 | M10x1.25 | 52 | 20 | 18 | 2 | 30 | 53 | 11 | 60 |

| Bore | ØTD e8 | TE | TS | TT | TV | TW | TX | TY | UT | Add Stroke | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | LB | P | XJ | ZB | ZD |
| **20** | 8 | 38.5 | 28 | 3 | 35 | 42 | 16 | 28 | 47.5 | 69 | 45 | 70 | 83 | 91 |
| **25** | 10 | 46 | 33 | 3 | 39 | 42 | 20 | 28 | 53 | 69 | 46 | 73 | 86 | 94 |
| **32** | 12 | 54.5 | 40 | 4.5 | 49 | 48 | 22 | 28 | 68 | 71 | 43 | 83 | 95 | 107 |
| **40** | 14 | 64 | 49 | 4.5 | 58 | 56 | 30 | 30 | 79 | 78 | 49 | 90 | 102 | 118 |
| **50** | 16 | 79.5 | 60 | 6 | 72 | 64 | 36 | 36 | 99 | 90 | 53 | 108 | 122 | 140 |
| **63** | 18 | 96 | 74 | 8 | 90 | 74 | 46 | 46 | 119 | 90 | 52 | 108 | 122 | 145 |

***Ports are M5 for cushioned versions**

## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore | A | ØB +0 -0.001 | BT | D | ØE | EE (NPTF) | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | NA | V | WF | Y | ØSB | TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | M5x0.80 | 0.24 | 1.06 | 1/8† | 1/4-28 | #10-32 | 1.00 | 0.315 | – | 0.08 | 0.50 | 1.10 | 0.22 | 0.98 |
| **25** | 0.50 | 0.551 | M6x0.75 | 0.31 | 1.26 | 1/8† | 5/16-24 | 1/4-28 | 1.12 | 0.394 | – | 0.08 | 0.62 | 1.18 | 0.22 | 1.18 |
| **32** | 0.75 | 0.709 | M8x1.00 | 0.39 | 1.53 | 1/8 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 0.43 | 0.08 | 0.88 | 1.57 | 0.28 | 1.38 |
| **40** | 0.75 | 0.984 | M10x1.25 | 0.47 | 1.91 | 1/8 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 0.55 | 0.08 | 0.88 | 1.65 | 0.28 | 1.57 |
| **50** | 0.88 | 1.181 | M12x1.25 | 0.63 | 2.32 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.08 | 1.19 | 2.09 | 0.35 | 1.97 |
| **63** | 0.88 | 1.260 | M14x1.50 | 0.63 | 2.83 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 0.71 | 0.08 | 1.19 | 2.09 | 0.43 | 2.36 |

| Bore (mm) | ØTD -0.001 -0.002 | TE | TS | TT | TV | TW | TX | TY | UT | Add Stroke | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | LB | P | XJ | ZB | ZD |
| **20** | 0.315 | 1.51 | 1.10 | 0.12 | 1.39 | 1.66 | 0.63 | 1.10 | 1.87 | 2.70 | 1.77 | 2.77 | 3.28 | 3.60 |
| **25** | 0.394 | 1.81 | 1.30 | 0.12 | 1.55 | 1.66 | 0.79 | 1.10 | 2.09 | 2.70 | 1.81 | 2.89 | 3.40 | 3.72 |
| **32** | 0.472 | 2.15 | 1.58 | 0.18 | 1.93 | 1.88 | 0.87 | 1.10 | 2.67 | 2.78 | 1.69 | 3.27 | 3.74 | 4.21 |
| **40** | 0.551 | 2.53 | 1.93 | 0.18 | 2.28 | 2.20 | 1.18 | 1.18 | 3.10 | 3.06 | 1.93 | 3.54 | 4.02 | 4.64 |
| **50** | 0.630 | 3.13 | 2.36 | 0.25 | 2.83 | 2.52 | 1.42 | 1.42 | 3.88 | 3.53 | 2.09 | 4.25 | 4.80 | 5.51 |
| **63** | 0.709 | 3.78 | 2.91 | 0.31 | 3.54 | 2.91 | 1.81 | 1.81 | 4.69 | 3.53 | 2.05 | 4.25 | 4.80 | 5.71 |

† Ports are 10-32 for cushioned versions







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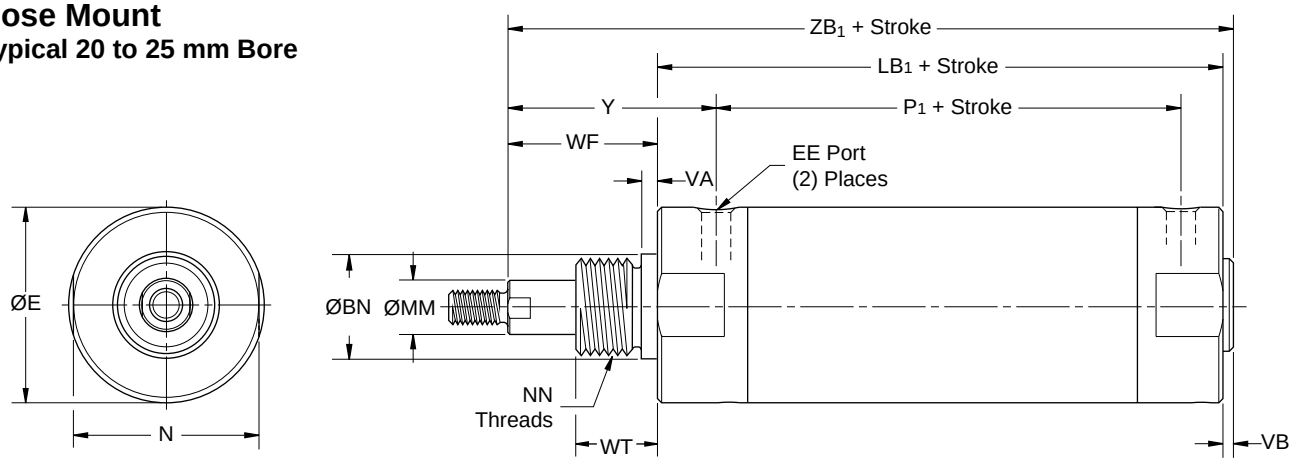
D

## Style G
## Nose Mount
**Typical 20 to 25 mm Bore**




## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | BN +0 -0.08 | D | ØE | EE (BSPT) | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | NN | N | VA | VB | WF | WT | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | LB[1] | P[1] | ZB[1] |
| **20** | 13 | 19.02 | 6 | 27 | 1/8* | M8x1.25 | M5x0.80 | 35 | 8 | 3/4-16 | 24 | 3 | 2 | 22 | 16 | 32 | 66 | 47 | 90 |
| **25** | 13 | 19.02 | 8 | 32 | 1/8* | M10x1.25 | M6x1.00 | 35 | 10 | 3/4-16 | 29 | 3 | 2 | 22 | 16 | 32 | 66 | 47 | 90 |

* Ports are M5 for cushioned versions

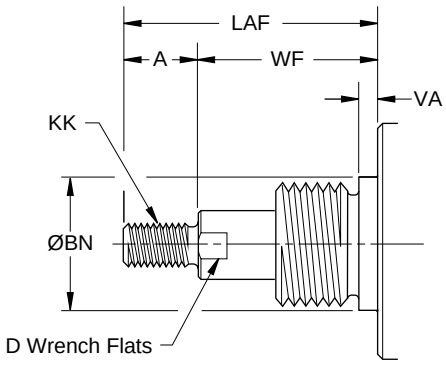
## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore | A | BN +0 -0.003 | D | ØE | EE (NPTF) | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | NN | N | VA | VB | WF | WT | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | LB[1] | P[1] | ZB[1] |
| **20** | 0.50 | 0.749 | 0.24 | 1.06 | 1/8† | 1/4-28 | #10-32 | 1.38 | 0.315 | 3/4-16 | 0.94 | 0.12 | 0.08 | 0.88 | 0.63 | 1.25 | 2.60 | 1.85 | 3.56 |
| **25** | 0.50 | 0.749 | 0.31 | 1.26 | 1/8† | 5/16-24 | 1/4-28 | 1.38 | 0.394 | 3/4-16 | 1.14 | 0.12 | 0.08 | 0.88 | 0.63 | 1.25 | 2.60 | 1.85 | 3.56 |

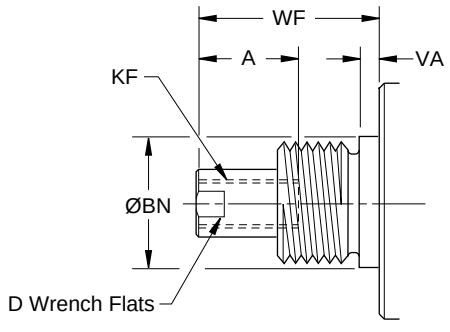
† Ports are 10-32 for cushioned versions

## Rod End Details – 20 and 25 mm Bore

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**

Special Metric or Inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.





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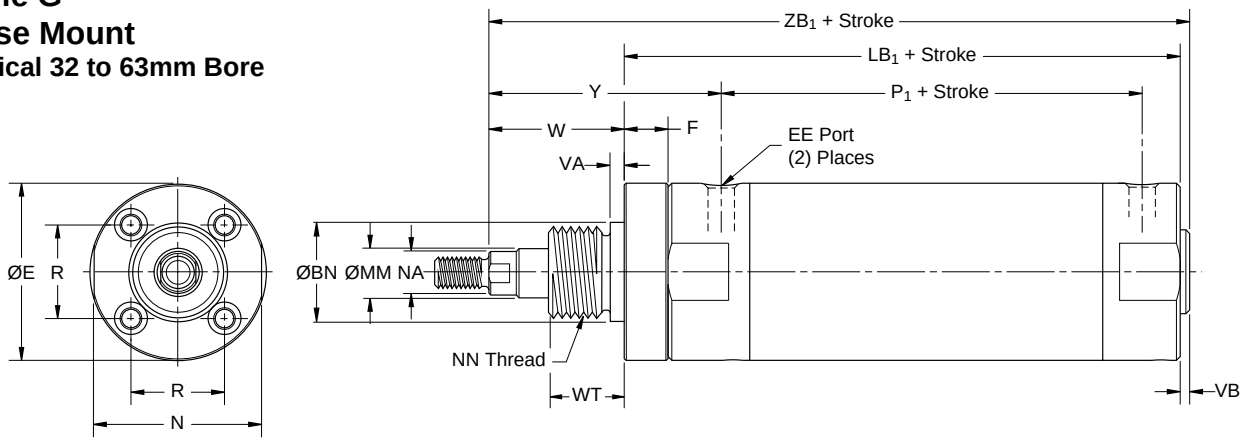
## Style G
## Nose Mount
### Typical 32 to 63mm Bore




## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | BN +0 -0.8 | D | ØE | EE* (BSPT) | F | Thread KK Style 5 | Thread KF Style 6 | LA | ØMM Rod Dia. | NN | N | NA | R | VA | VB | W | WT | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | LB[1] | P[1] | ZB[1] |
| **32** | 19 | 19.02 | 10 | 39 | 1/8 | 9 | M10x1.25 | M8x1.25 | 41 | 12 | 3/4-16 | 36 | 11 | 20 | 3 | 2 | 22 | 16 | 49 | 80 | 43 | 104 |
| **40** | 19 | 26.87 | 12 | 48.5 | 1/8 | 14 | M14x1.5 | M8x1.25 | 51 | 16 | 1-14 | 44 | 14 | 26 | 5 | 2 | 32 | 22 | 66 | 92 | 49 | 126 |
| **50** | 22 | 34.90 | 16 | 59 | 1/4 | 15 | M18x1.5 | M10x1.25 | 52 | 20 | 1-1/4-12 | 55 | 18 | 32 | 3 | 2 | 30 | 20.5 | 68 | 105 | 53 | 137 |
| **63** | 22 | 38.10 | 16 | 72 | 1/4 | 16 | M18x1.5 | M10x1.25 | 52 | 20 | 1-3/8-12 | 69 | 18 | 38 | 3 | 2 | 30 | 20.5 | 70 | 106 | 52 | 139 |

* See Inch Dimensions for NPTF Port Size.

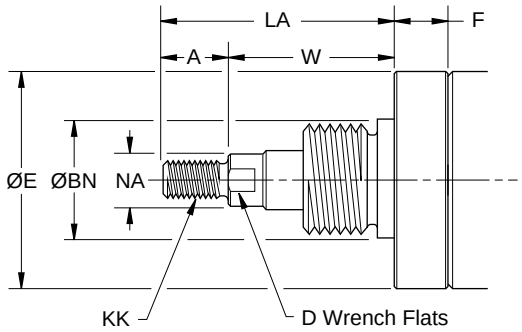
## Inch Dimensions – Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | BN +0 -0.003 | D | ØE | EE* (NPTF) | F | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LA | ØMM Rod Dia. | NN | N | NA | R | VA | VB | W | WT | Y | Add Stroke | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | LB[1] | P[1] | ZB[1] |
| **32** | 0.75 | 0.749 | 0.39 | 1.53 | 1/8 | 0.37 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 3/4-16 | 1.42 | 0.43 | 0.79 | 0.12 | 0.08 | 0.88 | 0.63 | 1.93 | 3.15 | 1.69 | 4.11 |
| **40** | 0.75 | 1.058 | 0.47 | 1.91 | 1/8 | 0.56 | 7/16-20 | 3/8-24 | 2.00 | 0.630 | 1-14 | 1.73 | 0.55 | 1.02 | 0.19 | 0.08 | 1.25 | 0.88 | 2.60 | 3.62 | 1.93 | 4.95 |
| **50** | 0.88 | 1.374 | 0.63 | 2.32 | 1/4 | 0.59 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 1-1/4-12 | 2.17 | 0.71 | 1.26 | 0.12 | 0.08 | 1.19 | 0.81 | 2.68 | 4.12 | 2.09 | 5.39 |
| **63** | 0.88 | 1.500 | 0.63 | 2.83 | 1/4 | 0.63 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 1-3/8-12 | 2.72 | 0.71 | 1.50 | 0.12 | 0.08 | 1.19 | 0.81 | 2.76 | 4.19 | 2.05 | 5.46 |

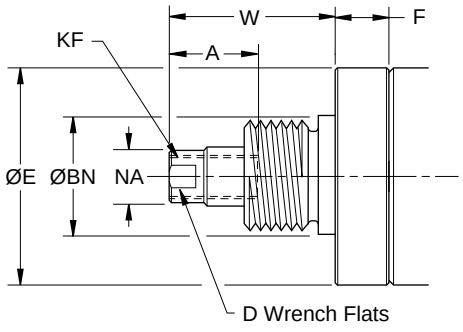
* See Metric Dimensions for BSPT Port Size.

## Rod End Details – 32 and 63 mm Bore

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




**SPECIAL ROD END THREADS**

**Thread Style 3**

Special Metric or Inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (Note: LAF = LA+F and WF = W+F) (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.







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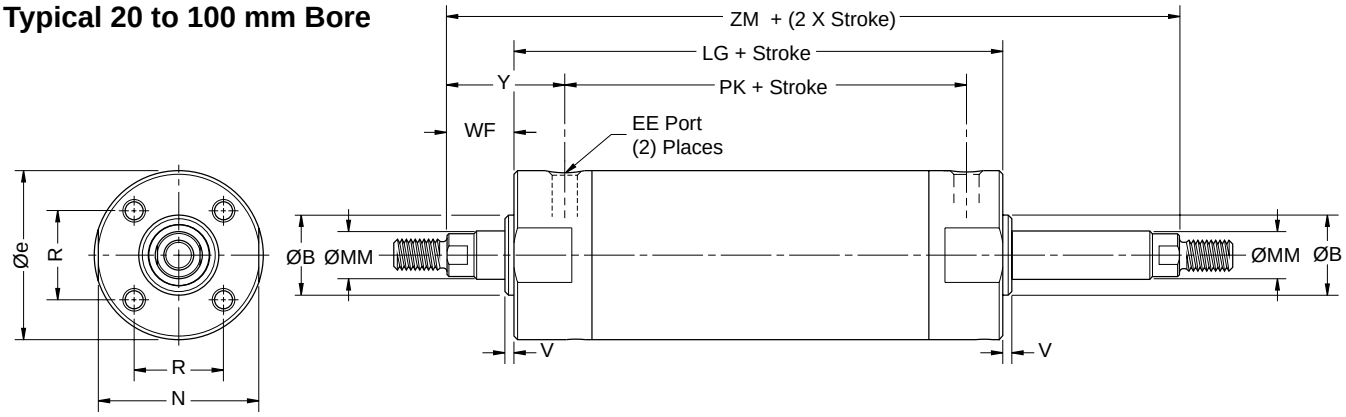
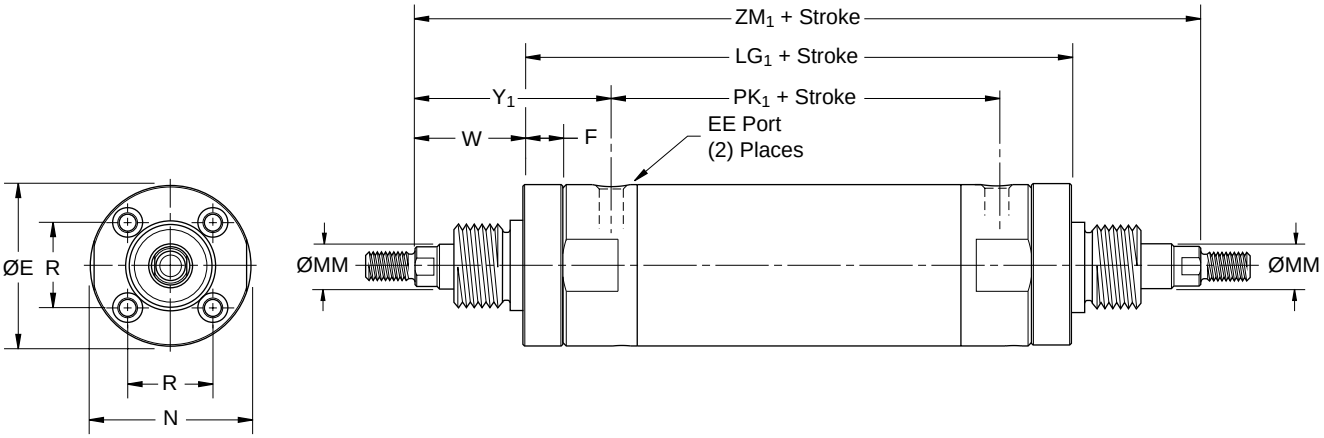
## Double-Rod
### Typical 20 to 100 mm Bore



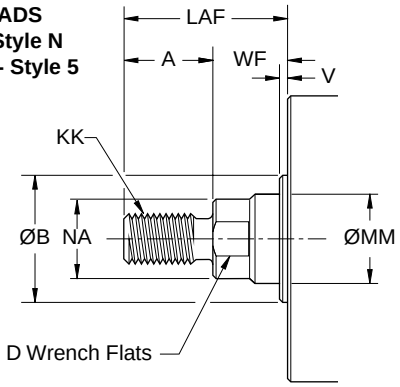

## Double-Rod
### Nose Mount (32-63mm bore)



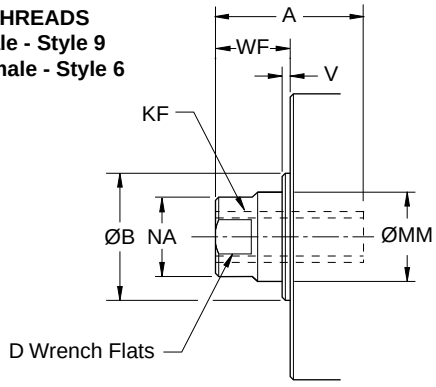

**For detailed dimensions for the nose mount from 20 to 63 mm bore, please refer to pages D78 and 2D793.**

## Rod End Details

**MALE THREADS**
**Inch Male - Style N**
**Metric Male - Style 5**




**FEMALE THREADS**
**Inch Female - Style 9**
**Metric Female - Style 6**




### SPECIAL ROD END THREADS

**Thread Style 3**
Special Metric or Inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
If otherwise special, supply a dimensioned sketch.

**When two rod ends are different on double rod cylinder, please clearly indicate what rod end should be provided on which end of the cylinder, or provide a sketch.**





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## Metric Dimensions – Envelope and Mounting Dimensions (mm)

| Bore | A | ØB +0 -0.02 | D | ØE | F | EE (BSPT) | Thread KK Style 5 | Thread KF Style 6 | LAF | ØMM Rod Dia. | N | NA | R | V | W | WF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 13 | 12 | 6 | 27 | – | 1/8* | M8x1.25 | M5x0.80 | 26 | 8 | 24 | – | 14 | 2 | – | 13 |
| **25** | 13 | 14 | 8 | 32 | – | 1/8* | M10x1.25 | M6x1.00 | 29 | 10 | 29 | – | 16.5 | 2 | – | 16 |
| **32** | 19 | 18 | 10 | 39 | 9 | 1/8 | M10x1.25 | M8x1.25 | 41 | 12 | 36 | 11 | 20 | 2 | 22 | 22 |
| **40** | 19 | 25 | 12 | 48.5 | 14 | 1/8 | M14x1.5 | M8x1.25 | 41 | 16 | 44 | 14 | 26 | 2 | 32 | 22 |
| **50** | 22 | 30 | 16 | 59 | 15 | 1/4 | M18x1.5 | M10x1.25 | 52 | 20 | 55 | 18 | 32 | 2 | 30 | 30 |
| **63** | 22 | 32 | 16 | 72 | 17 | 1/4 | M18x 1.5 | M10x1.25 | 52 | 20 | 69 | 18 | 38 | 2 | 30 | 30 |
| **80** | 38 | 40 | 20 | 90 | – | 3/8 | M22 x1.5 | M16x1.5 | 69 | 25 | 86 | 23 | 50 | 3 | – | 31 |
| **100** | 48 | 50 | 26 | 110 | – | 1/2 | M26x1.5 | M20x1.5 | 79 | 32 | 106 | 30 | 60 | 3 | – | 31 |

| Bore | Y | Y[1] | Add Stroke | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | LG | LG[1] | PK | PK[1] | ZM | ZM[1] |
| **20** | 28 | 32 | 75 | 70 | 45 | 50 | 101 | 95 |
| **25** | 30 | 32 | 75 | 70 | 47 | 50 | 107 | 101 |
| **32** | 40 | 49 | 78 | 97 | 42 | 42 | 122 | 141 |
| **40** | 42 | 66 | 87 | 115 | 47 | 47 | 131 | 179 |
| **50** | 53 | 68 | 100 | 130 | 54 | 54 | 160 | 190 |
| **63** | 53 | 70 | 100 | 133 | 54 | 54 | 160 | 194 |
| **80** | 59 | – | 119 | – | 61 | – | 181 | – |
| **100** | 57 | – | 119 | – | 65 | – | 181 | – |

* Ports are M5 for cushioned versions

## INCH DIMENSIONS - Envelope and Mounting Dimensions (inch)

| Bore (mm) | A | ØB +0 -0.001 | D | ØE | F | EE (NPTF) | Thread KK (UNF) Style N | Thread KF (UNF) Style 9 | LAF | ØMM Rod Dia. | N | NA | R | V | W | WF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 0.50 | 0.472 | 0.24 | 1.06 | – | 1/8† | 1/4-28 | #10-32 | 1.00 | 0.315 | 0.94 | – | 0.55 | 0.08 | – | 0.50 |
| **25** | 0.50 | 0.551 | 0.31 | 1.26 | – | 1/8† | 5/16-24 | 1/4-28 | 1.12 | 0.394 | 1.14 | – | 0.65 | 0.08 | – | 0.62 |
| **32** | 0.75 | 0.709 | 0.39 | 1.53 | 0.37 | 1/8 | 7/16-20 | 5/16-24 | 1.63 | 0.472 | 1.42 | 0.43 | 0.79 | 0.08 | 0.88 | 0.88 |
| **40** | 0.75 | 0.984 | 0.47 | 1.91 | 0.56 | 1/8 | 7/16-20 | 3/8-24 | 1.63 | 0.630 | 1.73 | 0.55 | 1.02 | 0.08 | 1.25 | 0.88 |
| **50** | 0.88 | 1.181 | 0.63 | 2.32 | 0.59 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 2.17 | 0.71 | 1.26 | 0.08 | 1.19 | 1.19 |
| **63** | 0.88 | 1.260 | 0.63 | 2.83 | 0.66 | 1/4 | 1/2-20 | 1/2-20 | 2.07 | 0.787 | 2.72 | 0.71 | 1.50 | 0.08 | 1.19 | 1.19 |
| **80** | 1.50 | 1.575 | 0.79 | 3.54 | – | 3/8 | 3/4-16 | 5/8-18 | 2.72 | 0.984 | 3.39 | 0.91 | 1.97 | 0.12 | – | 1.22 |
| **100** | 1.88 | 1.968 | 1.02 | 4.33 | – | 1/2 | 1-14 | 3/4-16 | 3.11 | 1.260 | 4.17 | 1.18 | 2.36 | 0.12 | – | 1.22 |

| Bore (mm) | Y | Y[1] | Add Stroke | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | LG | LG[1] | PK | PK[1] | ZM | ZM[1] |
| **20** | 1.10 | 1.25 | 2.97 | 2.74 | 1.77 | 1.97 | 3.97 | 3.74 |
| **25** | 1.18 | 1.25 | 2.97 | 2.74 | 1.85 | 1.97 | 4.21 | 3.98 |
| **32** | 1.57 | 1.93 | 3.06 | 3.80 | 1.65 | 1.65 | 4.82 | 5.56 |
| **40** | 1.65 | 2.60 | 3.41 | 4.53 | 1.85 | 1.85 | 5.17 | 7.03 |
| **50** | 2.09 | 2.68 | 3.93 | 5.11 | 2.13 | 2.13 | 6.31 | 7.49 |
| **63** | 2.09 | 2.76 | 3.93 | 5.25 | 2.13 | 2.13 | 6.31 | 7.63 |
| **80** | 2.32 | – | 4.70 | – | 2.40 | – | 7.14 | – |
| **100** | 2.24 | – | 4.70 | – | 2.56 | – | 7.14 | – |

† Ports are 10-32 for cushioned versions







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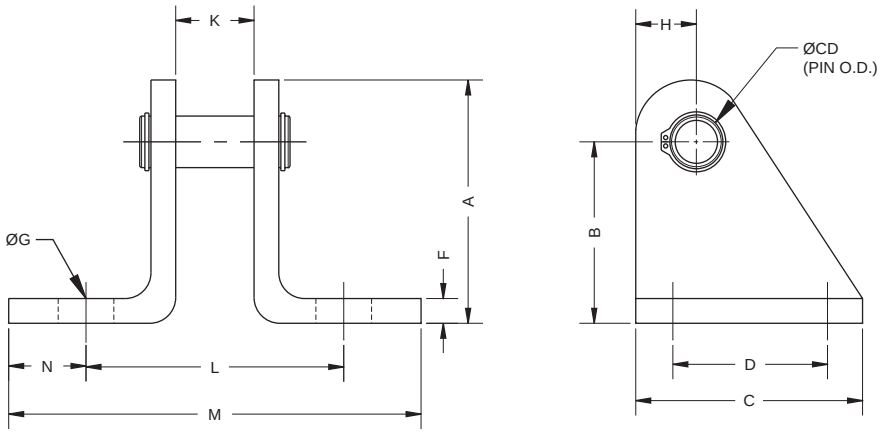
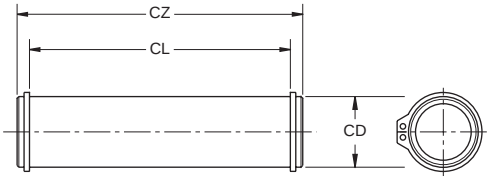
D

## Single Clevis Brackets



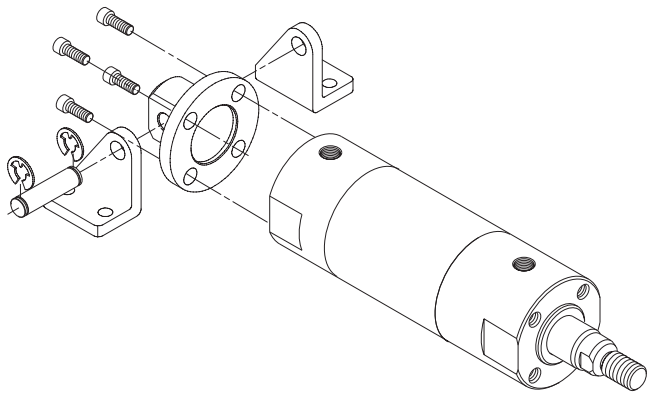

## Single Clevis Pin




Note :
Two snap rings shown are included with the pivot pin.
Order clevis bracket separately.

## Single Clevis Kit Assembly Instructions

Align the rear clevis with the port location as desired. Insert the four (4) screws through the bracket and thread them into the end caps until they are hand tight. Torque the screws to the values listed in the table below.
Single Clevis Kit, bracket and pivot pin are ordered separately.
Please see next page for part numbers.



| Bore | Fastener Size | | Torque | |
|---|---|---|---|---|
| 20 | 8-32 | M4x0.7 | 10-12 in-lbs | 1.1-1.4 Nm |
| 25 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 32 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 40 | 1/4-28 | M6x1 | 32-36 in-lbs | 3.6-4.1 Nm |
| 50 | 5/16-24 | M8x1.25 | 72-82 in-lbs | 8.1-9.3 Nm |
| 63 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 80 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 100 | 1/2-20 | M12x1.75 | 40-44 ft-lbs | 54-60 Nm |



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## Single Clevis Brackets

**Metric Dimensions (mm)**

| Part Number | Bore | A | B | C | ØCD h9 | D | F | ØG | H | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077520075** | 20 | 30 | 22 | 29 | 6.35 | 19 | 3 | 7 | 8 | 10 | 32 | 51 | 9 |
| **L077520075** | 25 | 30 | 22 | 29 | 6.35 | 19 | 3 | 7 | 8 | 10 | 32 | 51 | 9 |
| **L077520125** | 32 | 30 | 22 | 29 | 6.35 | 19 | 3 | 7 | 8 | 13 | 35 | 54 | 9 |
| **L077520150** | 40 | 44 | 35 | 38 | 9.52 | 25 | 3 | 7 | 9 | 16 | 47 | 67 | 10 |
| **L077520200** | 50 | 44 | 35 | 38 | 9.52 | 25 | 6 | 7 | 9 | 19 | 54 | 76 | 11 |
| **L077520250** | 63 | 54 | 44 | 38 | 9.52 | 25 | 6 | 7 | 9 | 19 | 54 | 76 | 11 |
| **L077520312** | 80 | 70 | 51 | 64 | 19.07 | 38 | 6 | 11 | 19 | 28 | 72 | 104 | 16 |
| **L077520400** | 100 | 79 | 60 | 70 | 19.07 | 44 | 6 | 14 | 19 | 32 | 76 | 108 | 16 |

**Imperial Dimensions (Inch)**

| Part Number | Bore (mm) | A | B | C | ØCD +0 -0.002 | D | F | ØG | H | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077520075** | 20 | 1.17 | 0.87 | 1.13 | 0.250 | 0.75 | 0.12 | 0.27 | 0.30 | 0.38 | 1.25 | 2.00 | 0.37 |
| **L077520075** | 25 | 1.17 | 0.87 | 1.13 | 0.250 | 0.75 | 0.12 | 0.27 | 0.30 | 0.38 | 1.25 | 2.00 | 0.37 |
| **L077520125** | 32 | 1.17 | 0.87 | 1.13 | 0.250 | 0.75 | 0.12 | 0.27 | 0.30 | 0.50 | 1.38 | 2.12 | 0.37 |
| **L077520150** | 40 | 1.75 | 1.38 | 1.50 | 0.375 | 1.00 | 0.12 | 0.27 | 0.37 | 0.62 | 1.86 | 2.62 | 0.38 |
| **L077520200** | 50 | 1.75 | 1.38 | 1.50 | 0.375 | 1.00 | 0.25 | 0.27 | 0.37 | 0.75 | 2.12 | 3.00 | 0.44 |
| **L077520250** | 63 | 2.12 | 1.75 | 1.50 | 0.375 | 1.00 | 0.25 | 0.27 | 0.37 | 0.75 | 2.12 | 3.00 | 0.44 |
| **L077520312** | 80 | 2.75 | 2.00 | 2.50 | 0.751 | 1.50 | 0.25 | 0.42 | 0.75 | 1.09 | 2.84 | 4.09 | 0.62 |
| **L077520400** | 100 | 3.12 | 2.37 | 2.75 | 0.751 | 1.75 | 0.25 | 0.55 | 0.75 | 1.25 | 3.00 | 4.25 | 0.62 |

## Single Clevis Pins

**Metric Dimensions (mm)**

| Part Number | Bore | ØCD h9 | CL | CZ |
|---|---|---|---|---|
| **L077490075** | 20 | 6.35 | 16 | 22 |
| **L077490075** | 25 | 6.35 | 16 | 22 |
| **L077490125** | 32 | 6.35 | 19 | 25 |
| **L077490150** | 40 | 9.52 | 23 | 29 |
| **L077490200** | 50 | 9.52 | 32 | 39 |
| **L077490200** | 63 | 9.52 | 32 | 39 |
| **L077490312** | 80 | 19.07 | 41 | 51 |
| **L077490400** | 100 | 19.07 | 45 | 55 |

**Imperial Dimensions (Inch)**

| Part Number | Bore | ØCD +0 -0.002 | CL | CZ |
|---|---|---|---|---|
| **L077490075** | 20 | 0.250 | 0.63 | 0.85 |
| **L077490075** | 25 | 0.250 | 0.63 | 0.85 |
| **L077490125** | 32 | 0.250 | 0.76 | 0.97 |
| **L077490150** | 40 | 0.375 | 0.89 | 1.15 |
| **L077490200** | 50 | 0.375 | 1.27 | 1.53 |
| **L077490200** | 63 | 0.375 | 1.27 | 1.53 |
| **L077490312** | 80 | 0.751 | 1.63 | 2.00 |
| **L077490400** | 100 | 0.751 | 1.79 | 2.16 |







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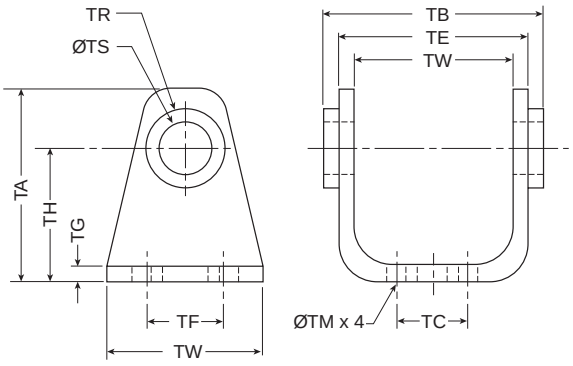
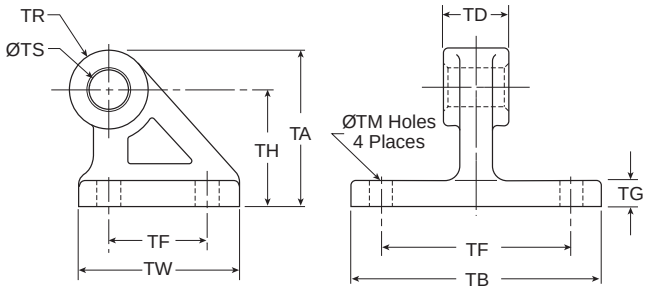
D

## Double Clevis Brackets

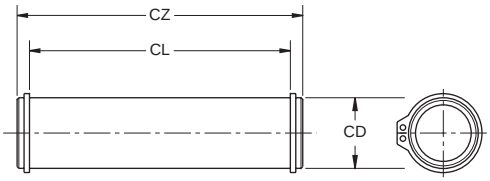
### 20-63 mm Bore Double Clevis Bracket




### 80-100 mm Bore Double Clevis Bracket

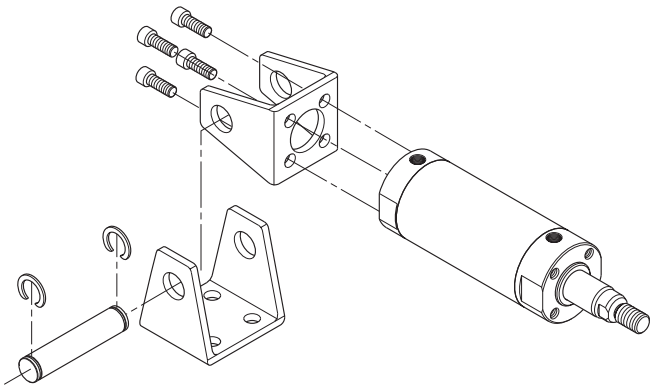



## Double Clevis Pin

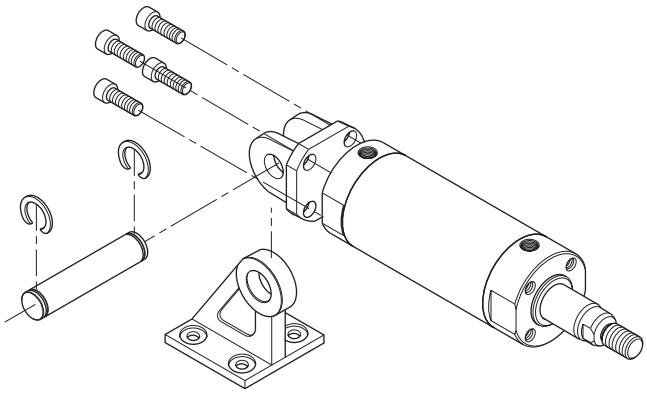



**Note:**
Two snap rings shown are included with the pivot pin.
Order clevis bracket separately.

### Double Clevis 20-63 mm Bore



### Double Clevis 80-100 mm Bore



## Double Clevis Kit Assembly Instructions

Align the rear clevis with the port location as desired. Insert the four (4) screws through the bracket and thread them into the end caps until they are hand tight. Torque the screws to the values listed in the table beside.
Double Clevis Kit, bracket and pivot pin are ordered separately. Please see next page for part numbers.

| Bore | Fastener Size | | Torque | |
|---|---|---|---|---|
| 20 | 8-32 | M4x0.7 | 10-12 in-lbs | 1.1-1.4 Nm |
| 25 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 32 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 40 | 1/4-28 | M6x1 | 32-36 in-lbs | 3.6-4.1 Nm |
| 50 | 5/16-24 | M8x1.25 | 72-82 in-lbs | 8.1-9.3 Nm |
| 63 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 80 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 100 | 1/2-20 | M12x1.75 | 40-44 ft-lbs | 54-60 Nm |





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## Double Clevis Brackets

**Metric Dimensions (mm)**

| Part Number | Bore | TA | TB | TC | TD | TE | TF | TG | TH | TM | TR | TS 49 | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077510020** | 20 | 36 | 38 | 16 | 29 | 35 | 28 | 3 | 25 | 5.5 | 13 | 8 | 42 |
| **L077510025** | 25 | 43 | 42 | 20 | 33 | 39 | 28 | 3 | 30 | 5.5 | 15 | 10 | 42 |
| **L077510032** | 32 | 50 | 53.4 | 22 | 40 | 49 | 28 | 4.5 | 35 | 7 | 17 | 12 | 48 |
| **L077510040** | 40 | 58 | 64.4 | 30 | 49 | 58 | 30 | 4.5 | 40 | 7 | 21 | 14 | 56 |
| **L077510050** | 50 | 70 | 78.8 | 36 | 60 | 72 | 36 | 6 | 50 | 9 | 24 | 16 | 64 |
| **L077510063** | 63 | 82 | 96.6 | 46 | 74 | 90 | 46 | 8 | 60 | 11 | 26 | 18 | 74 |
| **L077510080** | 80 | 73 | 110 | 85 | 28 | 110 | 45 | 11 | 55 | 11 | 36 | 18 | 72 |
| **L077510100** | 100 | 90 | 130 | 100 | 32 | 130 | 60 | 12 | 65 | 13.5 | 50 | 22 | 93 |

**Imperial Dimensions (Inch)**

| Part Number | Bore | TA | TB | TC | TD | TE | TF | TG | TH | TM | TR | TS +0.002, -0 | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077510020** | 20 | 1.42 | 1.50 | 0.63 | 1.14 | 1.39 | 1.10 | 0.12 | 0.98 | 0.22 | 0.51 | 0.315 | 1.66 |
| **L077510025** | 25 | 1.69 | 1.65 | 0.79 | 1.30 | 1.55 | 1.10 | 0.12 | 1.18 | 0.22 | 0.59 | 0.394 | 1.66 |
| **L077510032** | 32 | 1.97 | 2.10 | 0.87 | 1.57 | 1.93 | 1.10 | 0.18 | 1.38 | 0.28 | 0.67 | 0.472 | 1.88 |
| **L077510040** | 40 | 2.28 | 2.53 | 1.18 | 1.93 | 2.28 | 1.18 | 0.18 | 1.57 | 0.28 | 0.83 | 0.551 | 2.20 |
| **L077510050** | 50 | 2.76 | 3.10 | 1.42 | 2.36 | 2.83 | 1.42 | 0.25 | 1.97 | 0.35 | 0.94 | 0.630 | 2.52 |
| **L077510063** | 63 | 3.23 | 3.80 | 1.81 | 2.91 | 3.54 | 1.81 | 0.31 | 2.36 | 0.43 | 1.02 | 0.709 | 2.91 |
| **L077510080** | 80 | 2.87 | 4.33 | 3.35 | 1.10 | 4.33 | 1.77 | 0.43 | 2.17 | 0.43 | 1.42 | 0.709 | 2.83 |
| **L077510100** | 100 | 3.54 | 5.12 | 3.94 | 1.26 | 5.12 | 2.36 | 0.47 | 2.56 | 0.53 | 1.97 | 0.866 | 3.66 |

## Double Clevis Pins

**Metric Dimensions (mm)**

| Part Number | Bore | ØCD d9 | CL | CZ |
|---|---|---|---|---|
| **L077500020** | 20 | 8 | 38.6 | 43.4 |
| **L077500025** | 25 | 10 | 42.6 | 48 |
| **L077500032** | 32 | 12 | 54 | 59.4 |
| **L077500040** | 40 | 14 | 65 | 71.4 |
| **L077500050** | 50 | 16 | 79.6 | 86 |
| **L077500063** | 63 | 18 | 97.8 | 105.4 |
| **L077500080** | 80 | 18 | 56.2 | 64 |
| **L077500100** | 100 | 22 | 64.2 | 72 |

**Imperial Dimensions (Inch)**

| Part Number | Bore | ØCD -0.001 -0.003 | CL | CZ |
|---|---|---|---|---|
| **L077500020** | 20 | 0.315 | 1.52 | 1.71 |
| **L077500025** | 25 | 0.394 | 1.68 | 1.89 |
| **L077500032** | 32 | 0.472 | 2.12 | 2.34 |
| **L077500040** | 40 | 0.551 | 2.56 | 2.81 |
| **L077500050** | 50 | 0.630 | 3.13 | 3.38 |
| **L077500063** | 63 | 0.709 | 3.85 | 4.15 |
| **L077500080** | 80 | 0.709 | 2.21 | 2.52 |
| **L077500100** | 100 | 0.866 | 2.53 | 2.83 |







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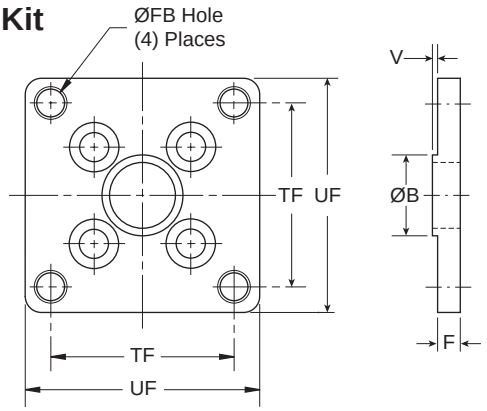
## Front or Rear Flange Mount Kit




D

**Metric Dimensions (mm)**

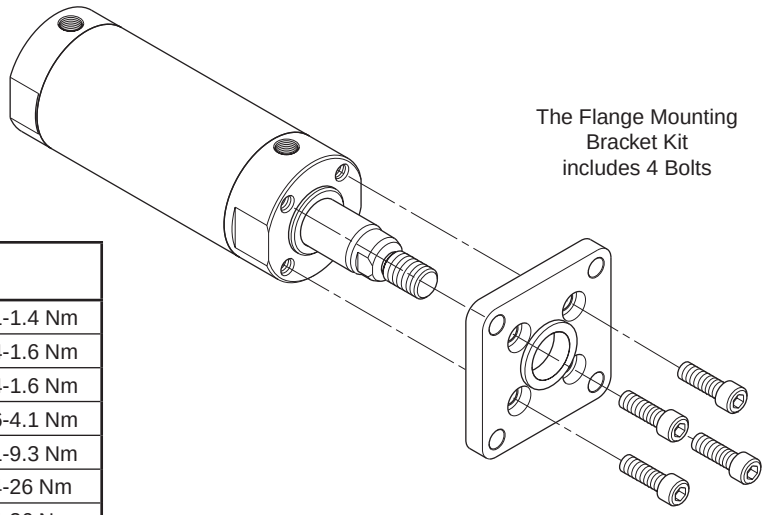
| Part Number | Bore | ØB $^{+0}_{-0.02}$ | F | FB | UF | TF | V |
|---|---|---|---|---|---|---|---|
| **L077560020** | 20 | 12 | 6 | 5.5 | 40 | 28 | 2 |
| **L077560025** | 25 | 14 | 7 | 5.5 | 44 | 32 | 2 |
| **L077560032** | 32 | 18 | 7 | 7 | 53 | 38 | 2 |
| **L077560040** | 40 | 25 | 8 | 7 | 61 | 46 | 2 |
| **L077560050** | 50 | 30 | 9 | 9 | 76 | 58 | 2 |
| **L077560063** | 63 | 32 | 9 | 11 | 92 | 70 | 2 |
| **L077560080** | 80 | 40 | 11 | 11 | 104 | 82 | 3 |
| **L077560100** | 100 | 50 | 14 | 14 | 128 | 100 | 3 |

**Imperial Dimensions (Inch)**

| Part Number | Bore | ØB $^{+0}_{-0.001}$ | F | FB | UF | TF | V |
|---|---|---|---|---|---|---|---|
| **L077450075** | 20 | 0.472 | 0.24 | 0.22 | 1.57 | 1.10 | 0.08 |
| **L077450100** | 25 | 0.551 | 0.28 | 0.22 | 1.73 | 1.26 | 0.08 |
| **L077450125** | 32 | 0.709 | 0.28 | 0.28 | 2.09 | 1.50 | 0.08 |
| **L077450150** | 40 | 0.984 | 0.31 | 0.28 | 2.40 | 1.81 | 0.08 |
| **L077450200** | 50 | 1.181 | 0.35 | 0.35 | 3.00 | 2.28 | 0.08 |
| **L077450250** | 63 | 1.260 | 0.35 | 0.43 | 3.62 | 2.76 | 0.08 |
| **L077450312** | 80 | 1.575 | 0.43 | 0.43 | 4.09 | 3.23 | 0.12 |
| **L077450400** | 100 | 1.968 | 0.55 | 0.55 | 5.04 | 3.94 | 0.12 |

## Flange Mount Kit Installation Instructions

Insert the four (4) screws through the nose mount or the flange mounts and thread them into the cylinder head or cap until they are hand tight. Torque the screws to the values listed in the table below.



The Flange Mounting Bracket Kit includes 4 Bolts

| Bore Size | Fastener Size | | Torque | |
|---|---|---|---|---|
| **20** | 8-32 | M4x0.7 | 10-12 in-lbs | 1.1-1.4 Nm |
| **25** | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| **32** | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| **40** | 1/4-28 | M6x1 | 32-36 in-lbs | 3.6-4.1 Nm |
| **50** | 5/16-24 | M8x1.25 | 72-82 in-lbs | 8.1-9.3 Nm |
| **63** | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| **80** | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| **100** | 1/2-20 | M12x1.75 | 40-44 ft-lbs | 54-60 Nm |





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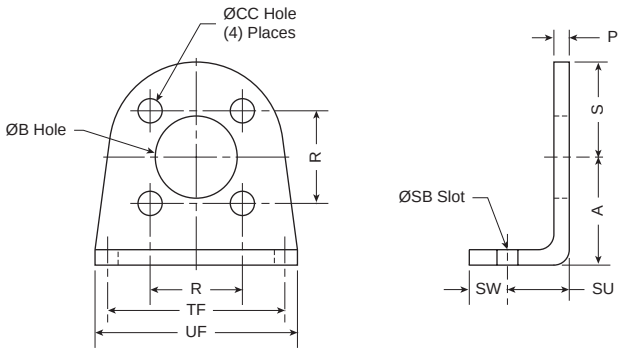
## Foot Mount Bracket




**Metric Dimensions (mm)**

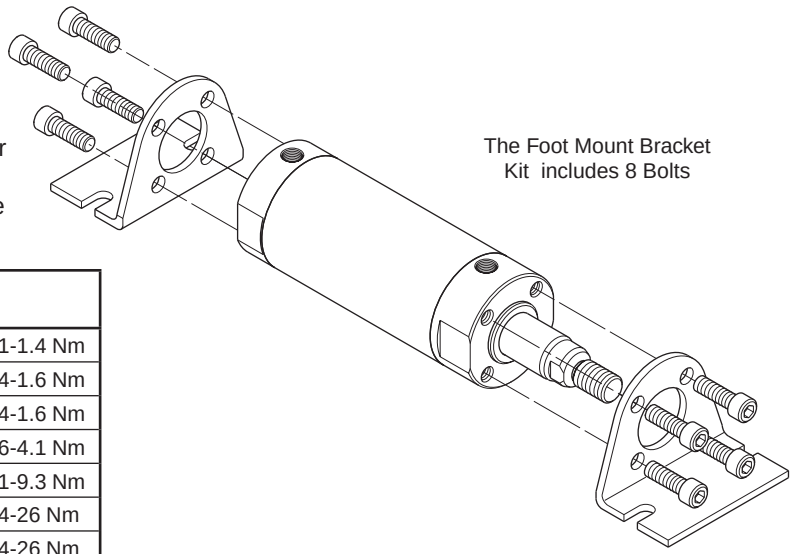
| Part Number | Bore | A | ØB $^{+0.15}_{-0}$ | ØCC | P | R | S | ØSB | SU | SW | TF | UF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077550020** | 20 | 20.6 | 12.2 | 5.00 | 3 | 14 | 16 | 7 | 14 | 11 | 38 | 48 |
| **L077550025** | 25 | 20.6 | 14.2 | 5.80 | 3 | 16.5 | 18 | 7 | 14 | 11 | 38 | 48 |
| **L077550032** | 32 | 25.4 | 18.2 | 5.80 | 3 | 20 | 21 | 7 | 19 | 19 | 48 | 63.5 |
| **L077550040** | 40 | 25.4 | 25.2 | 7.50 | 3 | 26 | 26 | 7 | 18 | 20 | 48 | 63.5 |
| **L077550050** | 50 | 38.1 | 30.2 | 9.00 | 6 | 32 | 34 | 9 | 25 | 16 | 57 | 79 |
| **L077550063** | 63 | 44.5 | 32.2 | 11.50 | 6 | 38 | 39 | 9 | 25 | 16 | 73 | 95 |
| **L077550080** | 80 | 55 | 40.2 | 11.50 | 6 | 50 | 46 | 11 | 28.5 | 14 | 100 | 125 |
| **L077550100** | 100 | 65 | 50.2 | 14.50 | 6 | 60 | 56 | 14 | 30 | 16 | 120 | 150 |

**Imperial Dimensions (inch)**

| Part Number | Bore | A | ØB $^{+0.006}_{-0}$ | ØCC | P | R | S | ØSB | SU | SW | TF | UF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077440075** | 20 | 0.81 | 0.480 | 0.20 | 0.12 | 0.55 | 0.63 | 0.27 | 0.56 | 0.44 | 1.50 | 1.88 |
| **L077440100** | 25 | 0.81 | 0.559 | 0.23 | 0.12 | 0.65 | 0.71 | 0.27 | 0.56 | 0.44 | 1.50 | 1.88 |
| **L077440125** | 32 | 1.00 | 0.717 | 0.23 | 0.12 | 0.79 | 0.83 | 0.28 | 0.75 | 0.75 | 1.88 | 2.50 |
| **L077440150** | 40 | 1.00 | 0.992 | 0.30 | 0.12 | 1.02 | 1.02 | 0.28 | 0.72 | 0.78 | 1.88 | 2.50 |
| **L077440200** | 50 | 1.50 | 1.189 | 0.35 | 0.25 | 1.26 | 1.34 | 0.34 | 1.00 | 0.62 | 2.24 | 3.12 |
| **L077440250** | 63 | 1.75 | 1.268 | 0.45 | 0.25 | 1.50 | 1.54 | 0.34 | 1.00 | 0.62 | 2.88 | 3.75 |
| **L077440312** | 80 | 2.17 | 1.583 | 0.45 | 0.25 | 1.97 | 1.81 | 0.43 | 1.12 | 0.55 | 3.94 | 4.92 |
| **L077440400** | 100 | 2.56 | 1.976 | 0.57 | 0.25 | 2.36 | 2.20 | 0.55 | 1.18 | 0.63 | 4.72 | 5.91 |

## Foot Mount Kit
## Assembly Instructions

Align each of the foot brackets with the port location as desired. Insert the four (4) screws through the foot mounts and thread them into the end caps until they are hand tight. Place the cylinder assembly on to a flat surface and torque the screws to the values listed in the table below. Make sure the foot mounts rest properly on a flat surface.



The Foot Mount Bracket Kit includes 8 Bolts

| Bore Size | Fastener Size | | Torque | |
|---|---|---|---|---|
| 20 | 8-32 | M4x0.7 | 10-12 in-lbs | 1.1-1.4 Nm |
| 25 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 32 | 10-32 | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| 40 | 1/4-28 | M6x1 | 32-36 in-lbs | 3.6-4.1 Nm |
| 50 | 5/16-24 | M8x1.25 | 72-82 in-lbs | 8.1-9.3 Nm |
| 63 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 80 | 3/8-24 | M10x1.5 | 18-19 ft-lbs | 24-26 Nm |
| 100 | 1/2-20 | M12x1.75 | 40-44 ft-lbs | 54-60 Nm |







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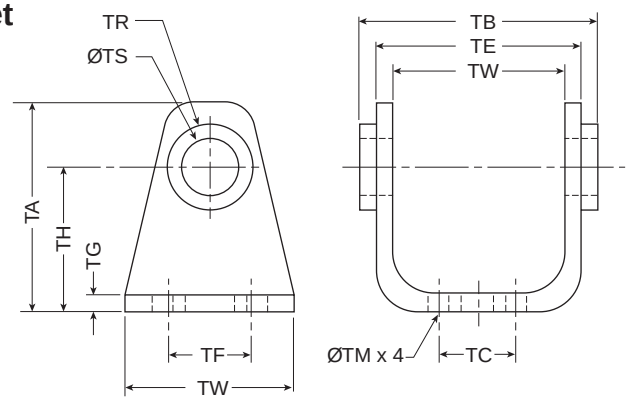
## Trunnion Mount Bracket




D

**Metric Dimensions (mm)**

| Part Number | Bore | TA | TB | TC | TD | TE | TF | TG | TH | TM | TR | TS H9 | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077510020** | 20 | 36 | 38 | 16 | 29 | 35 | 28 | 3 | 25 | 5.5 | 13 | 8 | 42 |
| **L077510025** | 25 | 43 | 42 | 20 | 33 | 39 | 28 | 3 | 30 | 5.5 | 15 | 10 | 42 |
| **L077510032** | 32 | 50 | 53.4 | 22 | 40 | 49 | 28 | 4.5 | 35 | 7 | 17 | 12 | 48 |
| **L077510040** | 40 | 58 | 64.4 | 30 | 49 | 58 | 30 | 4.5 | 40 | 7 | 21 | 14 | 56 |
| **L077510050** | 50 | 70 | 78.8 | 36 | 60 | 72 | 36 | 6 | 50 | 9 | 24 | 16 | 64 |
| **L077510063** | 63 | 82 | 96.6 | 46 | 74 | 90 | 46 | 8 | 60 | 11 | 26 | 18 | 74 |

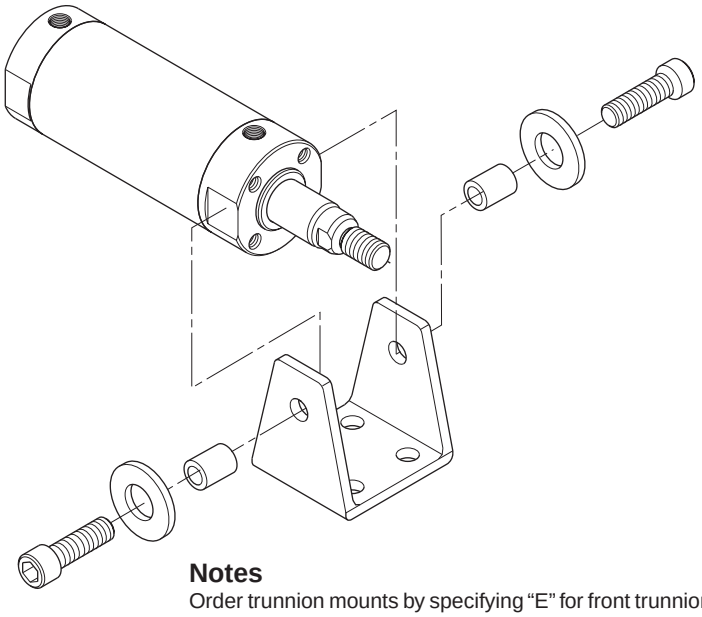
**Imperial Dimensions (Inch)**

| Part Number | Bore | TA | TB | TC | TD | TE | TF | TG | TH | TM | TR | TS $^{+0.002}_{-0}$ | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077510020** | 20 | 1.42 | 1.50 | 0.63 | 1.14 | 1.39 | 1.10 | 0.12 | 0.98 | 0.22 | 0.51 | 0.315 | 1.66 |
| **L077510025** | 25 | 1.69 | 1.65 | 0.79 | 1.30 | 1.55 | 1.10 | 0.12 | 1.18 | 0.22 | 0.59 | 0.394 | 1.66 |
| **L077510032** | 32 | 1.97 | 2.10 | 0.87 | 1.57 | 1.93 | 1.10 | 0.18 | 1.38 | 0.28 | 0.67 | 0.472 | 1.88 |
| **L077510040** | 40 | 2.28 | 2.53 | 1.18 | 1.93 | 2.28 | 1.18 | 0.18 | 1.57 | 0.28 | 0.83 | 0.551 | 2.20 |
| **L077510050** | 50 | 2.76 | 3.10 | 1.42 | 2.36 | 2.83 | 1.42 | 0.25 | 1.97 | 0.35 | 0.94 | 0.630 | 2.52 |
| **L077510063** | 63 | 3.23 | 3.80 | 1.81 | 2.91 | 3.54 | 1.81 | 0.31 | 2.36 | 0.43 | 1.02 | 0.709 | 2.91 |

## Trunnion Mount Assembly Instructions

Align the bracket on the machine member providing cylinder rotation as desired. Securely mount the bracket to the machine member. Align the cylinder head or cap with the bracket. Insert the bearing, washer and pivot bolt on to each side of the cylinder as shown. Torque the pivot bolts to the values listed in the table below. Use only bolts provided, as they have a special adhesive coating for secure fastening.

| Bore Size | Trunnion Pivot Bolt | Torque | |
|---|---|---|---|
| **20** | M5x0.8 | 12-14 in-lbs | 1.4-1.6 Nm |
| **25** | M6x0.75 | 32-36 in-lbs | 3.6-4.1 Nm |
| **32** | M8x1 | 72-82 in-lbs | 8.1-9.3 Nm |
| **40** | M10x1.25 | 18-19 ft-lbs | 24-26 Nm |
| **50** | M12x1.25 | 40-44 ft-lbs | 54-60 Nm |
| **63** | M14x1.5 | 70-74 ft-lbs | 95-100 Nm |



### Notes

Order trunnion mounts by specifying “E” for front trunnion or “D” for rear trunnion in the “Mounting Style” digit of the model code. The bearings, washers and pivot bolts will be supplied with the cylinder. The trunnion bracket must be ordered as a separate item, using the part numbers shown above.





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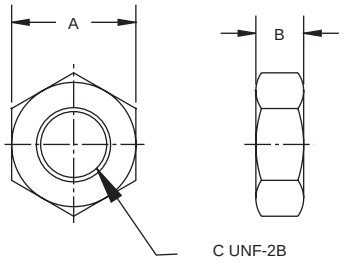
## Rod Jam Nut




Rod Jam Nut should be ordered separately on all mounting styles

## Rod Jam Nut Dimensions

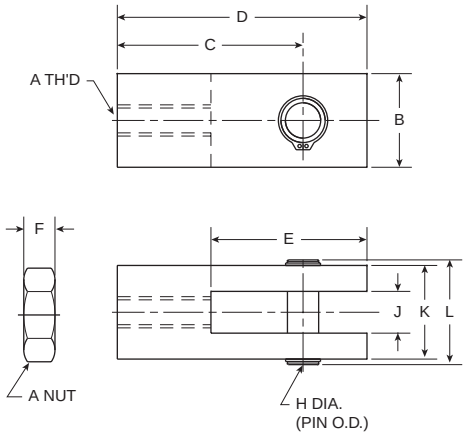
**Metric Dimensions (mm)**

| Part Number | Bore | A | B | C |
|---|---|---|---|---|
| **L075540008** | 20 | 13 | 4 | M8 x 1.25 |
| **L075540010** | 25-32 | 17 | 5 | M10 x 1.25 |
| **L075540014** | 40 | 22 | 7 | M14 x 1.5 |
| **L075540018** | 50-63 | 27 | 8 | M18 x 1.5 |
| **L075540022** | 80 | 32 | 11 | M22 x 1.5 |
| **L075540026** | 100 | 41 | 16 | M26 x 1.5 |

**Imperial Dimensions (inch)**

| Part Number | Bore | A | B | C |
|---|---|---|---|---|
| **L077970025** | 20 | 0.44 | 0.16 | 1/4-28 |
| **L077970031** | 25 | 0.50 | 0.19 | 5/16-24 |
| **L077970044** | 32-40 | 0.69 | 0.25 | 7/16-20 |
| **L077970050** | 50-63 | 0.75 | 0.31 | 1/2-20 |
| **L077970075** | 80 | 1.12 | 0.42 | 3/4 -16 |
| **L077970100** | 100 | 1.50 | 0.55 | 1-14 |

## Piston Rod Clevis




## Piston Rod Clevis Dimensions

**Metric Dimensions (mm)**

| Part Number | Bore | A | B | C | D | E | F | H h9 | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077590020** | 20 | M8x1.25 | 13 | 24 | 30 | 18 | 4 | 6.35 | 6.5 | 13 | 17.5 |
| **L077590025** | 25 | M10x1.25 | 19 | 24 | 30 | 18 | 5 | 6.35 | 6.5 | 19 | 24.5 |
| **L077590032** | 32 | M10x1.25 | 19 | 34 | 43 | 24 | 5 | 9.52 | 10 | 19 | 26 |
| **L077590040** | 40 | M14x1.5 | 19 | 34 | 43 | 24 | 7 | 9.52 | 10 | 19 | 26 |
| **L077590050** | 50 | M18x1.5 | 28 | 34 | 43 | 24 | 8 | 9.52 | 10 | 28 | 36 |
| **L077590050** | 63 | M18x1.5 | 28 | 34 | 43 | 24 | 8 | 9.52 | 10 | 28 | 36 |
| **PIM-4PRC** | 80 | M22x1.5 | 38 | 50 | 71 | 48 | 11 | 18 | 28 | 56 | 64 |
| **L077590100** | 100 | M26x1.5 | 44 | 55 | 79 | 55 | 16 | 22 | 32 | 63.5 | 72 |

**Imperial Dimensions (inch)**

| Part Number | Bore | A | B | C | D | E | F | H +0 -0.002 | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **L077960025** | 20 | 1/4-28 | 0.50 | 0.94 | 1.19 | 0.69 | 0.16 | 0.250 | 0.26 | 0.50 | 0.69 |
| **L077960031** | 25 | 5/16-24 | 0.50 | 0.94 | 1.19 | 0.69 | 0.19 | 0.250 | 0.26 | 0.50 | 0.69 |
| **L077960044** | 32 | 7/16-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.25 | 0.375 | 0.38 | 0.75 | 1.03 |
| **L077960044** | 40 | 7/16-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.25 | 0.375 | 0.38 | 0.75 | 1.03 |
| **L077960050** | 50 | 1/2-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.31 | 0.375 | 0.38 | 0.75 | 1.03 |
| **L077960050** | 63 | 1/2-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.31 | 0.375 | 0.38 | 0.75 | 1.03 |
| **L077960075** | 80 | 3/4-16 | 1.25 | 1.81 | 2.38 | 1.31 | 0.42 | 0.437 | 0.52 | 1.25 | 1.66 |
| **L077960100** | 100 | 1-14 | 1.50 | 2.63 | 3.38 | 1.81 | 0.55 | 0.500 | 0.64 | 1.50 | 1.91 |







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## How to Order P1L Mounting Kits as a Separate Item

| Bore Size | Foot Mounting | | Flange | |
|---|---|---|---|---|
| | Inch | Metric | Inch | Metric |
| 20 | L077440075 | L077550020 | L077450075 | L077560020 |
| 25 | L077440100 | L077550025 | L077450100 | L077560025 |
| 32 | L077440125 | L077550032 | L077450125 | L077560032 |
| 40 | L077440150 | L077550040 | L077450150 | L077560040 |
| 50 | L077440200 | L077550050 | L077450200 | L077560050 |
| 63 | L077440250 | L077550063 | L077450250 | L077560063 |
| 80 | L077440312 | L077550080 | L077450312 | L077560080 |
| 100 | L077440400 | L077550100 | L077450400 | L077560100 |



| Bore Size | Single Clevis | | Double Clevis | | Single Clevis Pin | Double Clevis Pin |
|---|---|---|---|---|---|---|
| | Inch | Metric | Inch | Metric | | |
| 20 | L077470075 | L077570020 | L077480075 | L077580020 | L077490075 | L077500020 |
| 25 | L077470100 | L077570025 | L077480100 | L077580025 | L077490075 | L077500025 |
| 32 | L077470125 | L077570032 | L077480125 | L077580032 | L077490125 | L077500032 |
| 40 | L077470150 | L077570040 | L077480150 | L077580040 | L077490150 | L077500040 |
| 50 | L077470200 | L077570050 | L077480200 | L077580050 | L077490200 | L077500050 |
| 63 | L077470250 | L077570063 | L077480250 | L077580063 | L077490200 | L077500063 |
| 80 | L077470312 | L077570080 | L077480312 | L077580080 | L077490312 | L077500080 |
| 100 | L077470400 | L077570100 | L077480400 | L077580100 | L077490400 | L077500100 |

**Notes :**
- "Inch" mounting kits include inch threaded bolts, while "Metric" mounting kits include metric threaded bolts. Please verify that the kit style matches the cylinder Construction type (code "N" or "M") for which it is intended.
- Clevis pins may be used for either Inch or Metric mounting kits.

## Mounting Brackets and Rod End Accessories

| Bore Size | Trunnion/ Double Clevis Bracket | Single Clevis Bracket | Piston Rod Clevis | | Rod Jam Nut | |
|---|---|---|---|---|---|---|
| | | | Inch | Metric | Inch | Metric |
| 20 | L077510020 | L077520075 | L077960025 | L077590020 | L077970025 | L075540008 |
| 25 | L077510025 | L077520075 | L077960031 | L077590025 | L077970031 | L075540010 |
| 32 | L077510032 | L077520125 | L077960044 | L077590032 | L077970044 | L075540010 |
| 40 | L077510040 | L077520150 | L077960044 | L077590040 | L077970044 | L075540014 |
| 50 | L077510050 | L077520200 | L077960050 | L077590050 | L077970050 | L075540018 |
| 63 | L077510063 | L077520250 | L077960050 | L077590050 | L077970050 | L075540018 |
| 80 | L077510080 | L077520312 | L077960075 | PIM-4PRC | L077970075 | L075540022 |
| 100 | L077510100 | L077520400 | L077960100 | L077590100 | L077970100 | L075540026 |

## Service Kits

| Bore Size | Single Rod Cylinder Repair Kits | | Double Rod Cylinder Repair Kits | |
|---|---|---|---|---|
| | Consisting of: 1 ea. Symbol #5, 7, 12, & 2 ea. Symbol #1, 8 11, 14 | | Consisting of: 1 ea. Symbol #5, 7, & 2 ea. Symbol #1, 8 11, 12, 14 | |
| | Class 1 Seals, Std. Service | Class 5 Seals, High Temp. | Class 1 Seals, Std. Service | Class 5 Seals, High Temp. |
| mm | Part No. | Part No. | Part No. | Part No. |
| 20 | P1L020D001 | P1L020D005 | P1L020K001 | P1L020K005 |
| 25 | P1L025D001 | P1L025D005 | P1L025K001 | P1L025K005 |
| 32 | P1L032D001 | P1L032D005 | P1L032K001 | P1L032K005 |
| 40 | P1L040D001 | P1L040D005 | P1L040K001 | P1L040K005 |
| 50 | P1L050D001 | P1L050D005 | P1L050K001 | P1L050K005 |
| 63 | P1L063D001 | P1L063D005 | P1L063K001 | P1L063K005 |
| 80 | P1L080D001 | P1L080D005 | P1L080K001 | P1L080K005 |
| 100 | P1L100D001 | P1L100D005 | P1L100K001 | P1L100K005 |





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