



Contents

Series CHE

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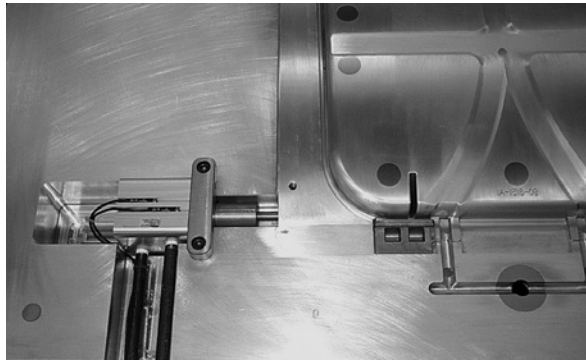
Series CHD

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Series CHE & CHD

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Choose Series CHE & CHD Compact Hydraulic Cylinders



When mounting space is at a premium and the application demands a high force cylinder...



Series CHE is your choice when either End-Of-Stroke, mid-Stroke or continuous cylinder position indication is required and when operating pressures are up to 140 bar (depending on bore size).



Series CHD steel body cylinders are your best choice for high force requirements with operating pressures up to 207 bar. Available foot mounting with manifold ports enhances machine design flexibility. Optional End-Of-Stroke position indication is available.

Series CHE Cylinder Features

Primary Seal – polyurethane rod seal with multiple sealing edges is self-compensating and self relieving to withstand pressure variations and conform to mechanical deflection that may occur.

Piston Rod – Medium carbon steel, hard chrome plated and polished.

Ports – SAE O-ring ports are standard.

OPTIONAL PORTS
 NPTF and BSPP ports are also available.

Bi-directional Piston Seal – Polyurethane seal ring with energizer provides leak-free performance.

Non-Metallic Wear Band – improves resistance to bearing loads and provides support for magnet.

Secondary Seal – Rod Wiper – wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

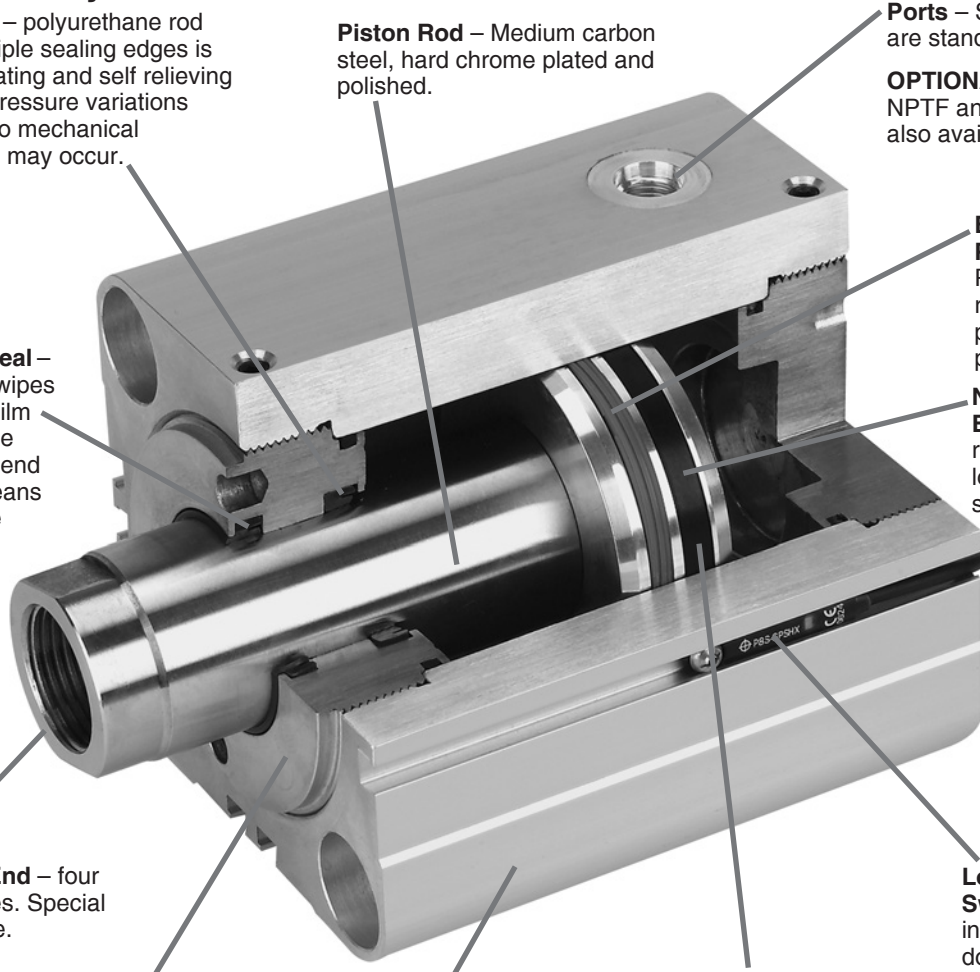
Piston Rod End – four standard styles. Special ends available.

Low Profile Switches – mount in body grooves and do not extend beyond the cylinder envelope.

Rod Gland – nodular iron bearing with RoHS compliant zinc plating for corrosion resistance. Optional pilot gland (shown) available at no additional cost.

Cylinder Body – corrosion resistant aluminum alloy. Hard anodized I.D for long wear. Sensor mounting grooves on three sides.

Magnetic Piston Option – for solid state or reed switch actuation.



CHE Compact Hydraulic Cylinders...

have a lower profile than tie rod construction cylinders with switches installed.

Optional Pilot Gland...

offers added bearing area to increase service life and also improves alignment of cylinder and load.

| | | | | | | | | | |
|--|---|--|---|---|--|-----------------------------------|--|--|--|
| <p>CHE offers mid-stroke piston sensing</p> | <table border="0"> <tr> <td data-bbox="812 1453 1055 1940"> <p>Standard Gland</p> <p>Rod Bearing Length</p> </td> <td data-bbox="1055 1453 1497 1940"> <p>Pilot Gland</p> <p>Rod Bearing Length</p> </td> </tr> <tr> <td colspan="2" style="text-align: center;"> <p>Average 63% more bearing area with Pilot Gland</p> </td> </tr> <tr> <td colspan="2" style="text-align: center;"> <p>(18mm rod glands depicted)</p> </td> </tr> <tr> <td colspan="2" style="text-align: center;"> <p>Use pilot cap to improve alignment for rear mount applications</p> </td> </tr> </table> | <p>Standard Gland</p> <p>Rod Bearing Length</p> | <p>Pilot Gland</p> <p>Rod Bearing Length</p> | <p>Average 63% more bearing area with Pilot Gland</p> | | <p>(18mm rod glands depicted)</p> | | <p>Use pilot cap to improve alignment for rear mount applications</p> | |
| <p>Standard Gland</p> <p>Rod Bearing Length</p> | <p>Pilot Gland</p> <p>Rod Bearing Length</p> | | | | | | | | |
| <p>Average 63% more bearing area with Pilot Gland</p> | | | | | | | | | |
| <p>(18mm rod glands depicted)</p> | | | | | | | | | |
| <p>Use pilot cap to improve alignment for rear mount applications</p> | | | | | | | | | |

Theoretical Push and Pull Forces

The cylinder output forces are derived from the formula:

$$F = \frac{P \times A}{10000}$$

Where F = Force in kN.

P = Pressure at the cylinder in bar.

A = Effective area of cylinder piston in square mm.

To determine the bore size for the application take the following steps.

1. Select the Operating Pressure column closest to that desired.

2. In the same column, identify the force required to move the load (always rounding up). If the piston rod is in compression use the 'Push' row and if the piston rod is in tension use the 'Pull' row.

3. In the row to the left is the bore required.

If the cylinder envelope dimensions are too large for the application, increase the operating pressure to the maximum pressure in the table below, if possible, and repeat steps 1 - 3.

Push and Pull Force in kN

| Bore Ø | Rod Ø | Operating Direction | Piston Area (mm²) | Operating Pressure (Bar) | | | | | | |
|--------|-------|---------------------|-------------------|--------------------------|------|------|------|------|------|------|
| | | | | 20 | 40 | 60 | 80 | 100 | 120 | 140 |
| 20 | 12 | Push | 314 | 0.63 | 1.26 | 1.88 | 2.51 | 3.14 | 3.77 | 4.40 |
| | | Pull | 201 | 0.40 | 0.80 | 1.21 | 1.61 | 2.01 | 2.41 | 2.81 |
| 25 | 14 | Push | 491 | 0.98 | 1.96 | 2.95 | 3.93 | 4.91 | 5.89 | 6.87 |
| | | Pull | 337 | 0.67 | 1.35 | 2.02 | 2.70 | 3.37 | 4.04 | 4.72 |
| 32 | 18 | Push | 804 | 1.61 | 3.22 | 4.83 | 6.43 | 8.04 | 9.65 | 11.3 |
| | | Pull | 550 | 1.10 | 2.20 | 3.30 | 4.40 | 5.50 | 6.60 | 7.70 |
| 40 | 22 | Push | 1,257 | 2.51 | 5.03 | 7.54 | 10.1 | 12.6 | 15.1 | 17.6 |
| | | Pull | 877 | 1.75 | 3.51 | 5.26 | 7.01 | 8.77 | 10.5 | 12.3 |
| 50 | 28 | Push | 1,963 | 3.93 | 7.85 | 11.8 | 15.7 | 19.6 | 23.6 | - |
| | | Pull | 1,348 | 2.70 | 5.39 | 8.09 | 10.8 | 13.5 | 16.2 | - |
| 63 | 36 | Push | 3,117 | 6.23 | 12.5 | 18.7 | 24.9 | 31.2 | - | - |
| | | Pull | 2,099 | 4.20 | 8.40 | 12.6 | 16.8 | 21.0 | - | - |
| 80 | 45 | Push | 5,027 | 10.1 | 20.1 | 30.2 | 40.2 | 50.3 | - | - |
| | | Pull | 3,436 | 6.87 | 13.7 | 20.6 | 27.5 | 34.4 | - | - |
| 100 | 56 | Push | 7,854 | 15.7 | 31.4 | 47.1 | 62.8 | 78.5 | - | - |
| | | Pull | 5,391 | 10.8 | 21.6 | 32.3 | 43.1 | 53.9 | - | - |

**Series CHE
Pressure Rating**

| Bore Ø | Maximum Working Pressure in bar |
|--------|---------------------------------|
| 20 | 140 |
| 25 | 140 |
| 32 | 140 |
| 40 | 140 |
| 50 | 120 |
| 63 | 100 |
| 80 | 100 |
| 100 | 100 |

Equivalents

- 1 kN = 224.81 pounds force
- 1 bar = 14.50 psi
- 1 mm = .03937 inch
- 1 mm² = .00155 inch²

Cylinder Weights

To determine the weight of a Series CHE cylinder, first select the proper basic zero stroke weight for the mounting required, and then calculate the weight of the

cylinder stroke and add the result to the basic weight. For extra rod extension, use piston rod weights per mm in Table C.

Table A Single Rod End CHE Cylinder Weights in kg.

| Bore Ø | Rod Ø | Single Rod Cylinders | | | | | | | | | |
|--------|-------|-----------------------------|-------------------|-------------------|-------------------|---------------|-----------------------------|-------------------|-------------------|-------------------|---------------|
| | | Basic Weight at Zero Stroke | | | | Per mm Stroke | Basic Weight at Zero Stroke | | | | Per mm Stroke |
| | | T | | TN, TR | | | J, H | | CA | | |
| | | PC 3 ¹ | PC B ¹ | PC 3 ¹ | PC B ¹ | | PC 3 ¹ | PC B ¹ | PC 3 ¹ | PC B ¹ | |
| 20 | 12 | 0.24 | 0.25 | 0.25 | 0.26 | 0.004 | 0.51 | 0.52 | 0.48 | 0.49 | 0.005 |
| 25 | 14 | 0.34 | 0.36 | 0.35 | 0.37 | 0.005 | 0.71 | 0.73 | 0.69 | 0.71 | 0.006 |
| 32 | 18 | 0.62 | 0.66 | 0.64 | 0.68 | 0.009 | 1.14 | 1.18 | 1.28 | 1.33 | 0.009 |
| 40 | 22 | 0.92 | 0.99 | 0.95 | 1.02 | 0.011 | 1.86 | 1.93 | 2.00 | 2.06 | 0.013 |
| 50 | 28 | 1.38 | 1.50 | 1.44 | 1.55 | 0.015 | 2.97 | 3.09 | 3.12 | 3.24 | 0.017 |
| 63 | 36 | 2.33 | 2.54 | 2.42 | 2.62 | 0.021 | 4.33 | 4.54 | 5.14 | 5.34 | 0.025 |
| 80 | 45 | 4.20 | 4.66 | 4.34 | 4.80 | 0.031 | 7.68 | 8.14 | 8.67 | 9.13 | 0.036 |
| 100 | 56 | 8.02 | 8.86 | 8.23 | 9.08 | 0.045 | 14.7 | 15.6 | 15.6 | 16.4 | 0.051 |

Table C Piston rod weights in kg.

| Rod Ø | Piston Rod Weight per mm |
|-------|--------------------------|
| 12 | 0.001 |
| 14 | 0.001 |
| 18 | 0.002 |
| 22 | 0.003 |
| 28 | 0.005 |
| 36 | 0.008 |
| 45 | 0.012 |
| 56 | 0.019 |

Table B Double Rod End CHE Cylinder Weights in kg.

| Bore Ø | Rod Ø | Double Rod Cylinders | | | | | | | | | |
|--------|-------|-----------------------------|-------------------|-------------------|-------------------|---------------|-----------------------------|-------------------|-------------------|-------------------|---------------|
| | | Basic Weight at Zero Stroke | | | | Per mm Stroke | Basic Weight at Zero Stroke | | | | Per mm Stroke |
| | | T | | TN | | | J | | CA | | |
| | | PC 3 ¹ | PC B ¹ | PC 3 ¹ | PC B ¹ | | PC 3 ¹ | PC B ¹ | PC 3 ¹ | PC B ¹ | |
| 20 | 12 | 0.26 | 0.28 | 0.28 | 0.29 | 0.005 | 0.53 | 0.55 | 0.50 | 0.51 | 0.006 |
| 25 | 14 | 0.37 | 0.40 | 0.39 | 0.41 | 0.007 | 0.75 | 0.77 | 0.72 | 0.75 | 0.008 |
| 32 | 18 | 0.68 | 0.72 | 0.71 | 0.75 | 0.011 | 1.21 | 1.25 | 1.35 | 1.39 | 0.011 |
| 40 | 22 | 1.02 | 1.09 | 1.06 | 1.13 | 0.014 | 1.97 | 2.04 | 2.10 | 2.17 | 0.016 |
| 50 | 28 | 1.59 | 1.70 | 1.64 | 1.75 | 0.020 | 3.18 | 3.29 | 3.33 | 3.44 | 0.022 |
| 63 | 36 | 2.75 | 2.95 | 2.84 | 3.04 | 0.029 | 4.75 | 4.95 | 5.56 | 5.76 | 0.033 |
| 80 | 45 | 5.00 | 5.45 | 5.14 | 5.59 | 0.043 | 8.48 | 8.93 | 9.47 | 9.92 | 0.048 |
| 100 | 56 | 9.64 | 10.5 | 9.86 | 10.7 | 0.065 | 16.3 | 17.2 | 17.2 | 18.1 | 0.071 |

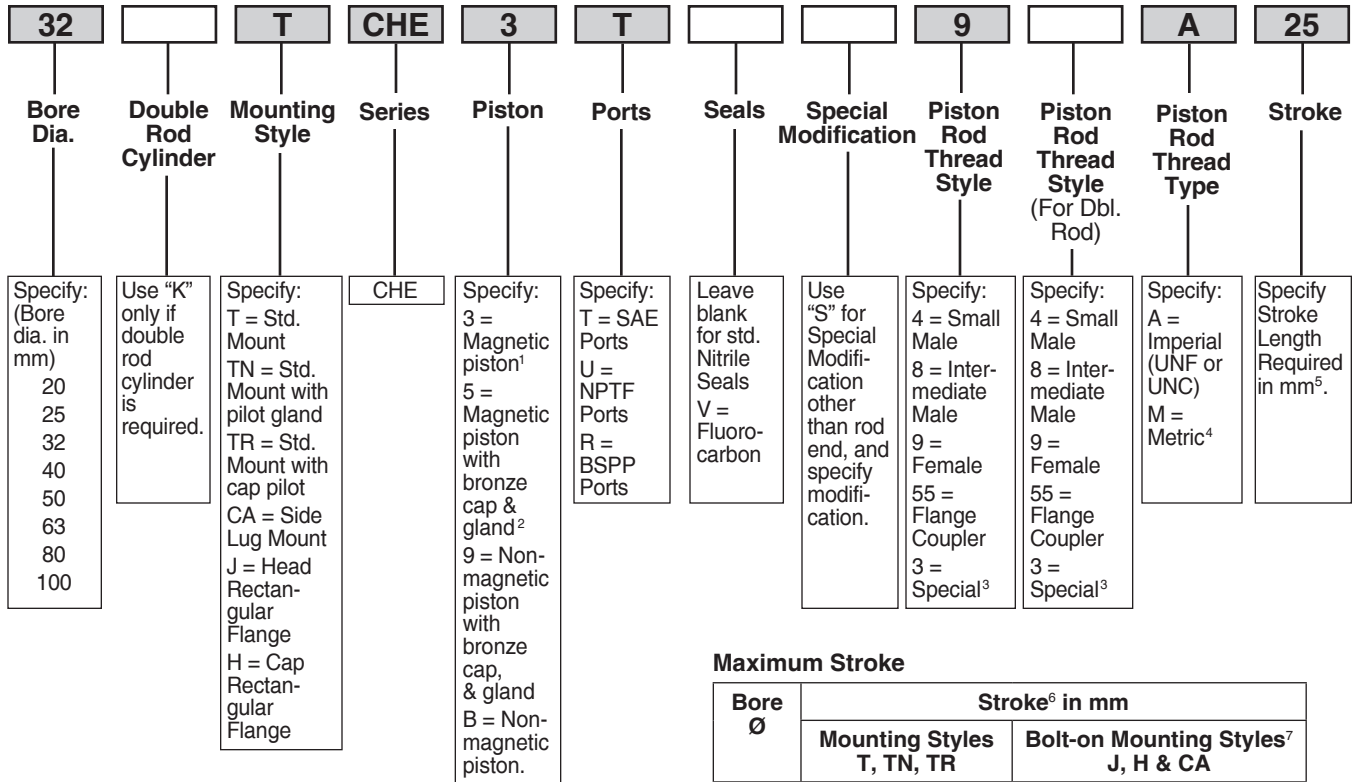
Equivalent

1 kg = 2.2046 pounds

Note 1: PC 3 = with Piston Code 3 or 5 (Magnetic Piston), PC B = with Piston Code 9 or B (Non-Magnet Piston)

Model Code & Standard Specifications

Model Ordering Code for CHE



Shaded boxes identify required model number fields.

¹ Order required Solid State or Reed Switches as separate items. See reed switch & solid state switch pages for specifications and part numbers.

² Bronze cap and gland required for CPS linear cylinder position sensor (must be ordered separately).

³ To order thread style 3, specify "3" and give the desired dimensions for KK, A, and W (or WP or WR depending on mounting) or furnish a dimensioned sketch.

⁴ Always use M for rod style 55.

⁵ See Maximum Stroke chart at right.

Maximum Stroke

| Bore Ø | Stroke ⁶ in mm | |
|--------|---------------------------|--|
| | Mounting Styles T, TN, TR | Bolt-on Mounting Styles ⁷ J, H & CA |
| 20 | 100 | 50 |
| 25 | 100 | 75 |
| 32 | 150 | 100 |
| 40 | 150 | 100 |
| 50 | 150 | 100 |
| 63 | 165 | 100 |
| 80 | 165 | 100 |
| 100 | 125 | 100 |

⁶ Intermediate strokes in 1mm increments are available.

⁷ Longer strokes (up to maximum lengths for Mounting Styles T, TN & TR) are available at increased manufacturing lead times. Contact the factory.

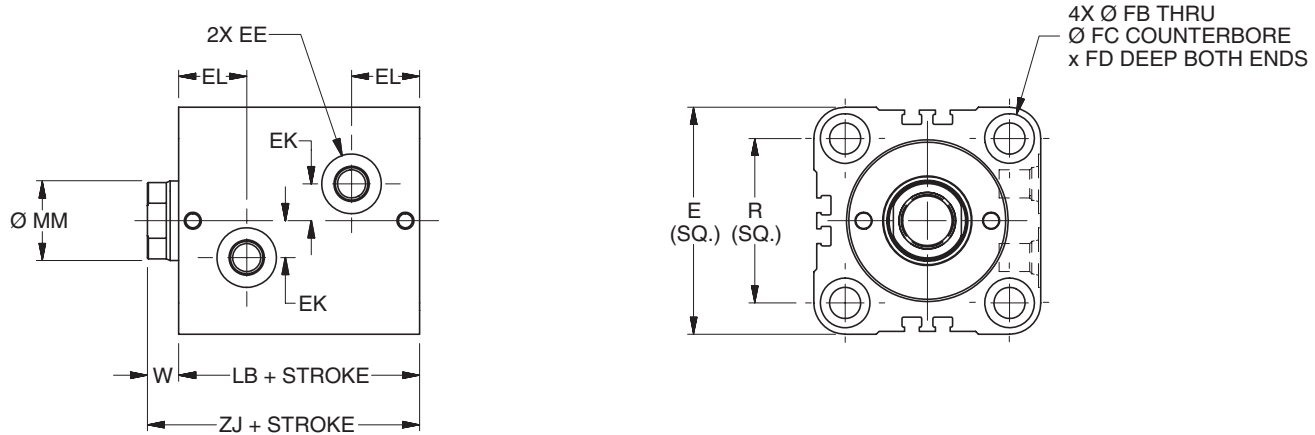
Standard Specifications

- 6 Standard mounting styles
- Bore sizes – 20mm to 100mm
- Piston Rod Diameter – 12mm to 56mm
- Single and double rod construction available
- Strokes up to 150mm depending on bore size (see table above).
- Working pressure up to 140 bar (depending on bore size)
- Temperature range – -23°C to +121°C (depending on seal class)
- Reference ISO 16656: 2004

| Seal Classes | Typical Fluids | Temperature Range |
|---|-------------------------------|---|
| 1 – Standard Nitrile & Polyurethane | Hydraulic Oil, MIL-H-5606 Oil | -23°C (-10°F) to +100°C (+212°F) |
| 5 – Optional (At extra cost) Fluorocarbon Seals | High Temperature | -23°C (-10°F) to +121°C (+250°F) Class 5 seals may be operated up to +204°C (+400°F) with reduced service life |

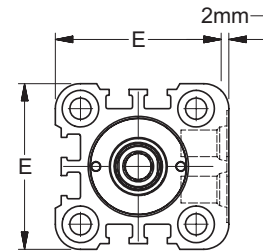
Note: Class 5 seals are not suitable for use with Skydrol fluid, but can be used with hydraulic oil if desired.

Style T Through Bolt Mount – Single Rod End – 20mm to 100mm Bore Size



T Mount Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | W | Add Stroke | |
|--------|-----------------|-----------------|------|-------|----|------|------|------|------|-----|----|------------|-----|
| | | SAE | NPTF | BSP | | | | | | | | LB | ZJ |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 8 | 43 | 51 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 8 | 45 | 53 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 10 | 51 | 61 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 10 | 55 | 65 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 11 | 60 | 71 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 13 | 67 | 80 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 17 | 78 | 95 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 18 | 26 | 17.5 | 106 | 26 | 96 | 122 |



**Port Face Extension
20mm Bore Only**

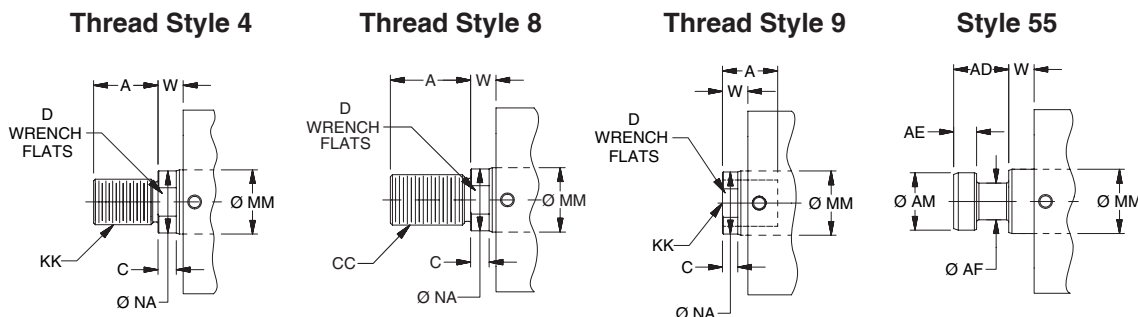
¹ Port face on 20mm bore is extended 2mm. See port face extension drawing.

² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

T Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

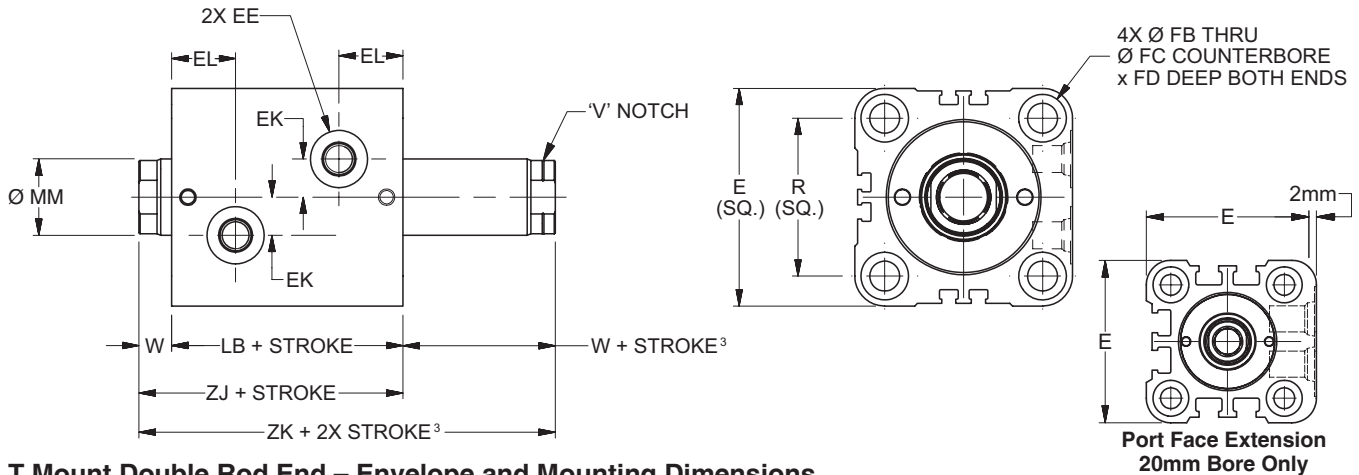
Rod End Dimensions



**“Special”
Thread Style 3**

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style T Through Bolt Mount – Double Rod End – 20mm to 100mm Bore Size



T Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | LB | R | W ³ | Add Stroke | | Add 2X Stroke ZK ³ |
|--------|-----------------|-----------------|------|-------|----|------|------|------|------|----|-----|----------------|------------|-----|-------------------------------|
| | | SAE | NPTF | BSP | | | | | | | | | LB | ZJ | |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 43 | 30 | 8 | 43 | 51 | 59 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 45 | 36 | 8 | 45 | 53 | 61 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 51 | 47 | 10 | 51 | 61 | 71 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 55 | 52 | 10 | 55 | 65 | 75 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 60 | 58 | 11 | 60 | 71 | 82 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 67 | 69 | 13 | 67 | 80 | 93 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 78 | 86 | 17 | 78 | 95 | 112 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 18 | 26 | 17.5 | 96 | 106 | 26 | 96 | 122 | 148 |

¹ Port face on 20mm bore is extended 2mm. See port face extension drawing.

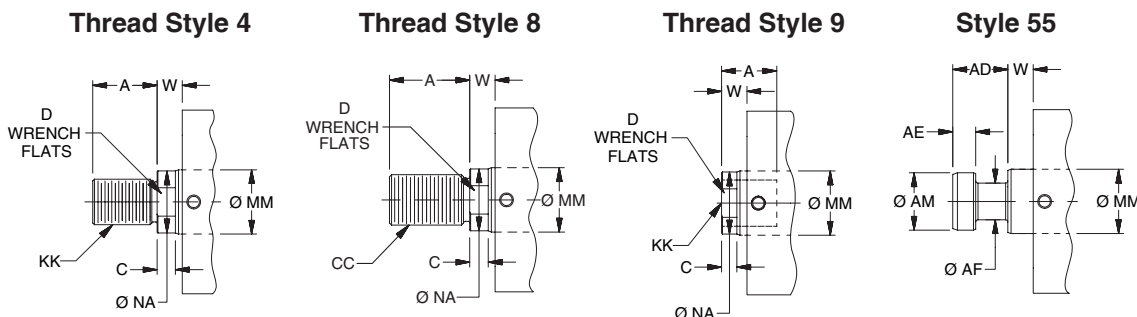
² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

³ Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

T Mount Double Rod End – Rod Dimensions

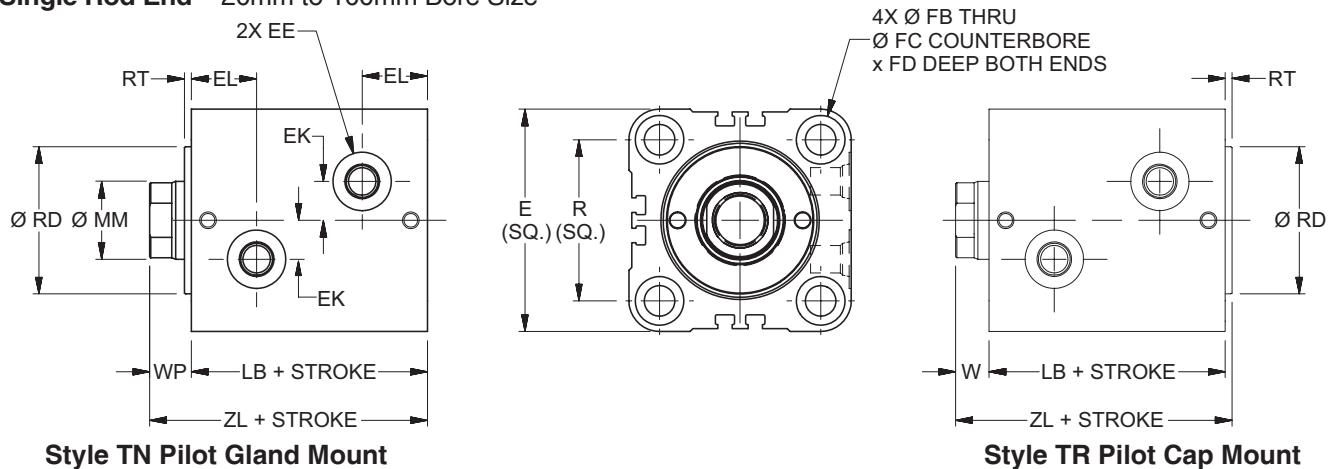
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ³ | | Style 4M | | Style 9A ³ | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Styles TN and TR Through Bolt Mount with Pilot Gland or Pilot Cap –
Single Rod End – 20mm to 100mm Bore Size



Style TN Pilot Gland Mount

Style TR Pilot Cap Mount

TN and TR Mount Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | RD Ø f9 | RT | W | WP | Add Stroke | |
|--------|-----------------|-----------------|------|-------|----|------|------|------|------|-----|---------|----|----|----|------------|-----|
| | | SAE | NPTF | BSP | | | | | | | | | | | LB | ZL |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 24 | 3 | 8 | 11 | 43 | 54 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 27 | 3 | 8 | 11 | 45 | 56 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 43 | 3 | 10 | 13 | 55 | 68 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 53 | 3 | 11 | 14 | 60 | 74 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 66 | 3 | 13 | 16 | 67 | 83 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 83 | 3 | 17 | 20 | 78 | 98 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 18 | 26 | 17.5 | 106 | 103 | 3 | 26 | 29 | 96 | 125 |

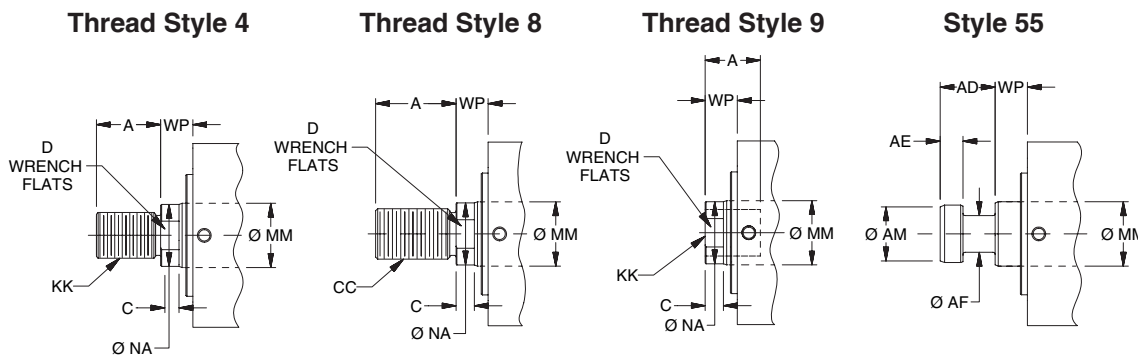
¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

TN and TR Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

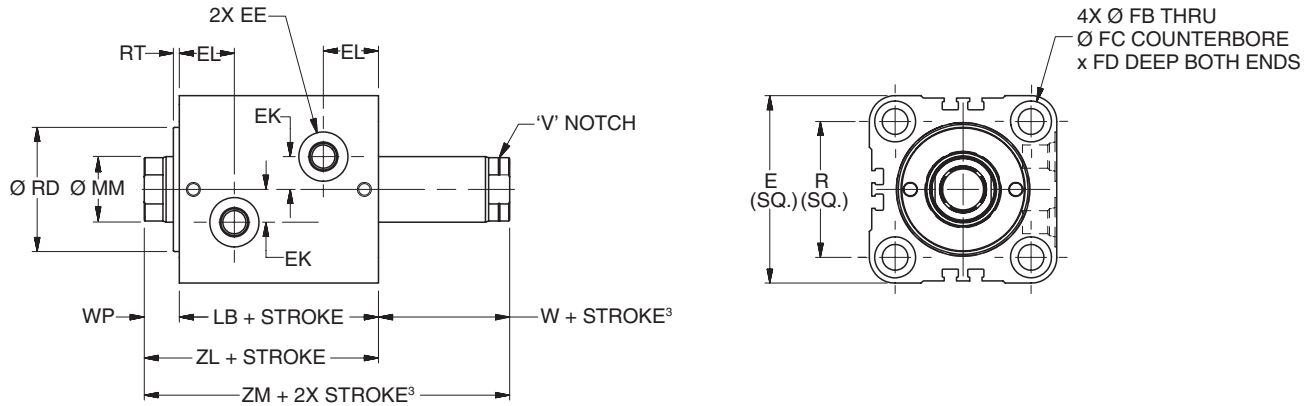
Rod End Dimensions



“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W (TR Mount) or WP (TN Mount) If otherwise special furnish dimensional sketch.

Style TN Through Bolt Mount with Pilot Gland – Double Rod End – 20mm to 100mm Bore Size



TN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | RD Ø f9 | RT | W ³ | WP | Add Stroke | | Add 2X Stroke ZM ³ |
|--------|-----------------|-----------------|------|-------|----|------|------|------|------|-----|---------|----|----------------|----|------------|-----|-------------------------------|
| | | SAE | NPTF | BSP | | | | | | | | | | | LB | ZL | |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 24 | 3 | 8 | 11 | 43 | 54 | 62 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 27 | 3 | 8 | 11 | 45 | 56 | 64 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 | 74 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 43 | 3 | 10 | 13 | 55 | 68 | 78 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 53 | 3 | 11 | 14 | 60 | 74 | 85 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 66 | 3 | 13 | 16 | 67 | 83 | 96 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 83 | 3 | 17 | 20 | 78 | 98 | 115 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 18 | 26 | 17.5 | 106 | 103 | 3 | 26 | 29 | 96 | 125 | 151 |

¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

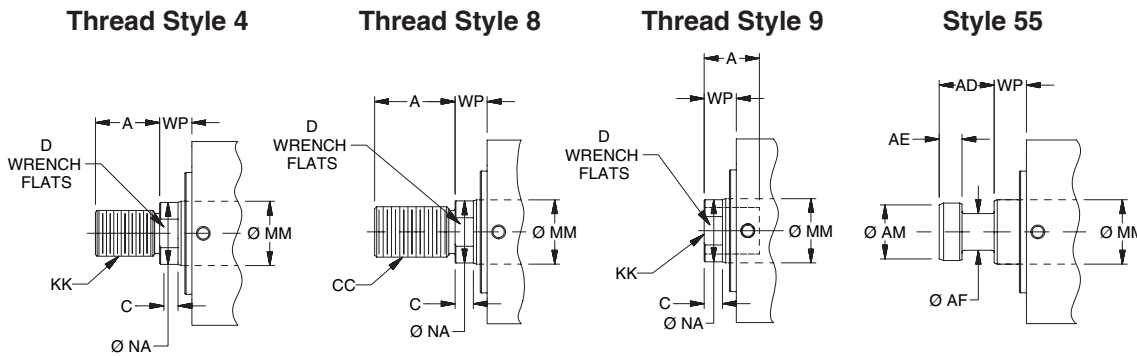
² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

³ Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

TN Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ³ | | Style 4M | | Style 9A ³ | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

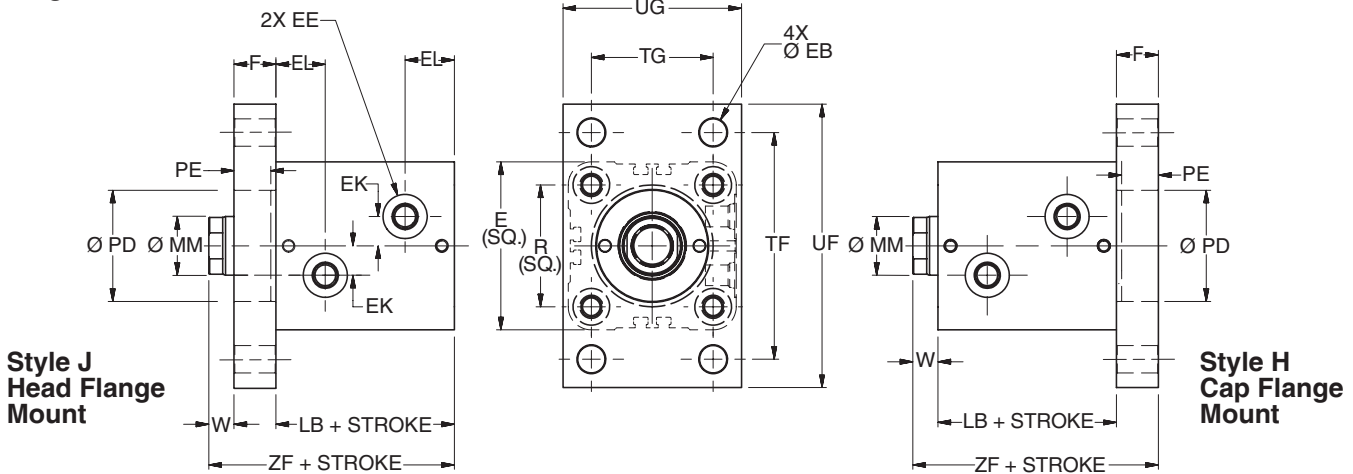
Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & WP. If otherwise special furnish dimensional sketch.

J & H Mounts – Single Rod End

Styles J Rectangular Head Flange & H Rectangular Cap Flange Mounts – Single Rod End – 20mm to 100mm Bore Size



J & H Mounts Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | F | EB Ø | PD Ø H9 | PE | R | TF | TG | UF | UG | W | Add Stroke | |
|--------|-----------------|-----------------|------|-------|----|------|----|------|---------|----|-----|-----|-----|-----|-----|----|------------|-----|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | LB | ZF |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 10 | 5.5 | 24 | 7 | 30 | 60 | 30 | 75 | 46 | 8 | 43 | 61 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 12 | 5.5 | 27 | 9 | 36 | 66 | 36 | 80 | 52 | 8 | 45 | 65 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 12 | 6.8 | 36 | 9 | 47 | 80 | 40 | 95 | 62 | 10 | 51 | 73 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 16 | 11 | 43 | 13 | 52 | 96 | 46 | 118 | 70 | 10 | 55 | 81 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 20 | 13.5 | 53 | 17 | 58 | 108 | 58 | 135 | 85 | 11 | 60 | 91 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 20 | 15 | 66 | 17 | 69 | 124 | 65 | 150 | 98 | 13 | 67 | 100 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 25 | 17 | 83 | 21 | 86 | 154 | 87 | 185 | 118 | 17 | 78 | 120 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 30 | 21.5 | 103 | 27 | 106 | 190 | 109 | 230 | 150 | 26 | 96 | 152 |

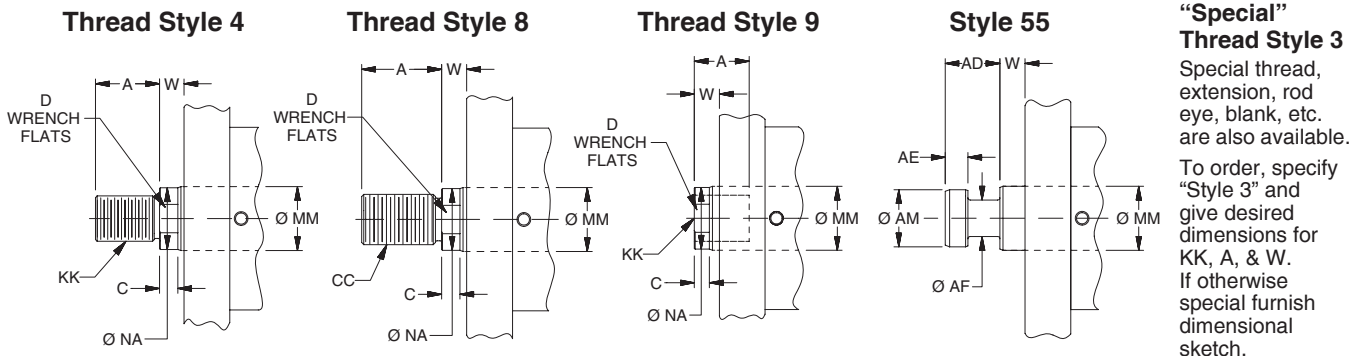
¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

J & H Mounts Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

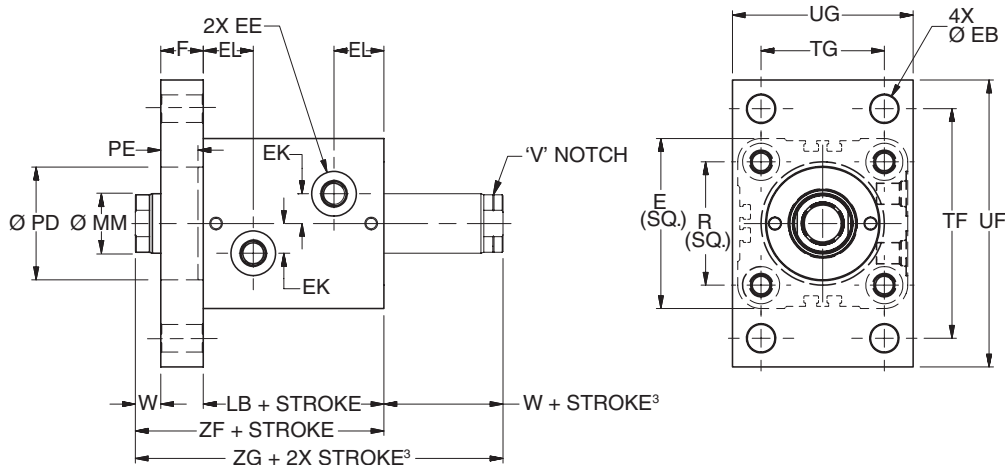
Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

J Mount – Double Rod End

Style J Rectangular Head Flange Mount – Double Rod End – 20mm to 100mm Bore Size



J Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | F | EB Ø | PD Ø H9 | PE | R | TF | TG | UF | UG | W ³ | Add Stroke | | Add 2X Stroke ZG ³ |
|--------|-----------------|-----------------|------|-------|----|------|----|------|---------|----|-----|-----|-----|-----|-----|----------------|------------|-----|-------------------------------|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | LB | ZF | |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 10 | 5.5 | 24 | 7 | 30 | 60 | 30 | 75 | 46 | 8 | 43 | 61 | 69 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 12 | 5.5 | 27 | 9 | 36 | 66 | 36 | 80 | 52 | 8 | 45 | 65 | 73 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 12 | 6.8 | 36 | 9 | 47 | 80 | 40 | 95 | 62 | 10 | 51 | 73 | 83 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 16 | 11 | 43 | 13 | 52 | 96 | 46 | 118 | 70 | 10 | 55 | 81 | 91 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 20 | 13.5 | 53 | 17 | 58 | 108 | 58 | 135 | 85 | 11 | 60 | 91 | 102 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 20 | 15 | 66 | 17 | 69 | 124 | 65 | 150 | 98 | 13 | 67 | 100 | 113 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 25 | 17 | 83 | 21 | 86 | 154 | 87 | 185 | 118 | 17 | 78 | 120 | 137 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 30 | 21.5 | 103 | 27 | 106 | 190 | 109 | 230 | 150 | 26 | 96 | 152 | 178 |

¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

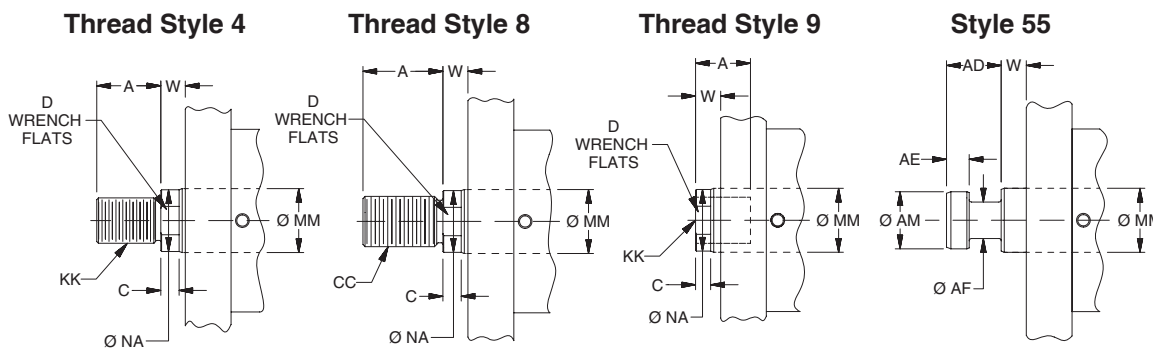
² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

³ Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

J Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ³ | | Style 4M | | Style 9A ³ | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

Rod End Dimensions

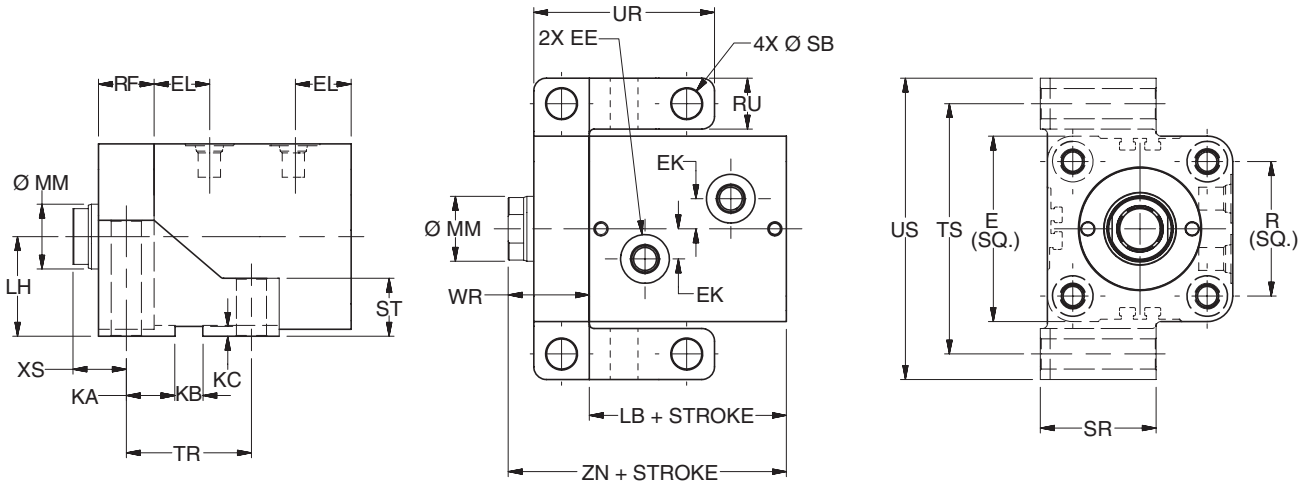


“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available.

To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style CA Side Lug Mount – Single Rod End – 20mm to 100mm Bore Size



CA Mount Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | KA | KB | KC | LH | R | RF | RU | SB Ø | SR | ST | TR | TS | UR | US | WR | XS | Add Stroke | |
|--------|-----------------|-----------------|------|-------|----|------|------|----|------|----|-----|----|----|------|----|----|----|-----|-----|-----|----|----|------------|-----|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | | | | | | | LB | ZN |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 12 | 5 | 2.75 | 24 | 30 | 10 | 10 | 5.5 | 25 | 10 | 29 | 58 | 39 | 68 | 18 | 13 | 43 | 61 |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 13.5 | 6 | 3.25 | 27 | 36 | 12 | 12 | 6.8 | 30 | 12 | 33 | 66 | 45 | 78 | 20 | 14 | 45 | 65 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 16.5 | 8 | 3.75 | 34 | 47 | 16 | 15 | 9 | 35 | 15 | 41 | 82 | 57 | 97 | 26 | 18 | 51 | 77 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 18.5 | 10 | 4.25 | 38 | 52 | 20 | 18 | 11 | 40 | 20 | 47 | 94 | 67 | 112 | 30 | 20 | 55 | 85 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 21 | 12 | 4.25 | 43 | 58 | 24 | 22 | 13.5 | 50 | 25 | 54 | 108 | 78 | 130 | 35 | 23 | 60 | 95 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 25 | 14 | 4.75 | 51 | 69 | 28 | 26 | 16 | 60 | 30 | 64 | 128 | 92 | 154 | 41 | 27 | 67 | 108 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 30 | 16 | 5.25 | 61 | 86 | 32 | 30 | 18 | 70 | 35 | 76 | 152 | 108 | 182 | 49 | 33 | 78 | 127 |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 36.5 | 20 | 6.25 | 75 | 106 | 38 | 36 | 22 | 80 | 40 | 93 | 186 | 131 | 222 | 64 | 45 | 96 | 160 |

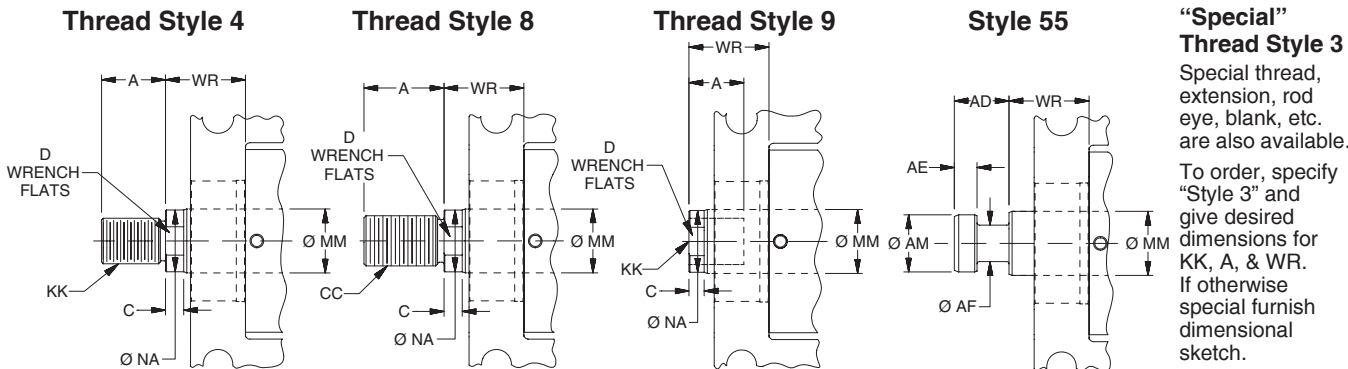
¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

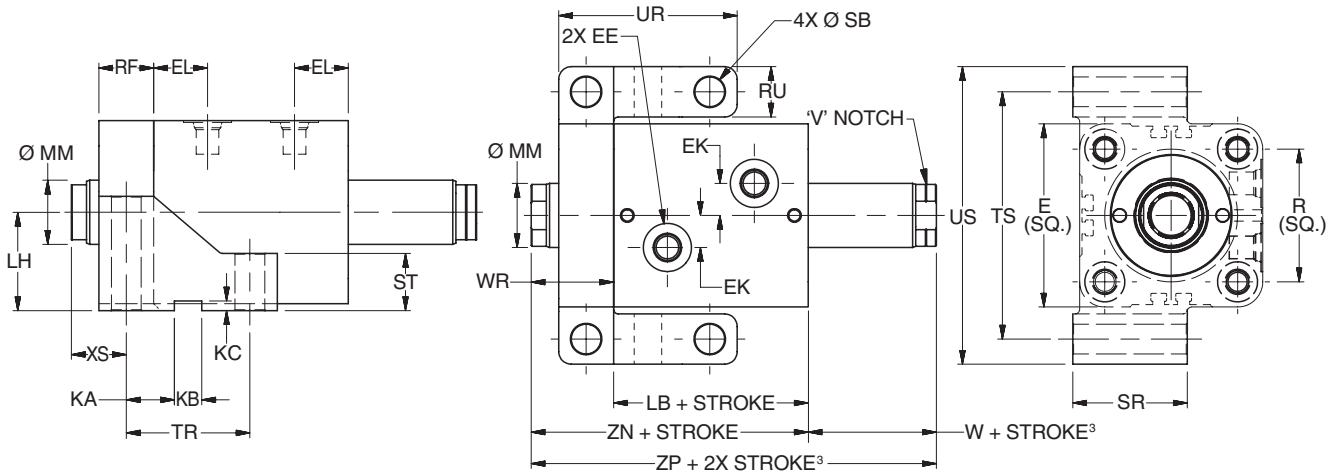
CA Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

Rod End Dimensions



Style CA Side Lug Mount – Double Rod End – 20mm to 100mm Bore Size



CA Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | KA | KB | KC | LH | R | RF | RU | SB Ø | SR | ST | TR | TS | UR | US | W ³ | WR | XS | Add Stroke | | Add 2X Stroke | |
|--------|-----------------|-----------------|------|-------|----|------|------|----|------|----|-----|----|----|------|----|----|----|-----|-----|-----|----------------|----|----|------------|-----|-----------------|----|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | | | | | | | | LB | ZN | ZP ³ | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | LB |
| 20 | 43 ¹ | #2 ² | 1/8 | G-1/8 | 6 | 16.5 | 12 | 5 | 2.75 | 24 | 30 | 10 | 10 | 5.5 | 25 | 10 | 29 | 58 | 39 | 68 | 8 | 18 | 13 | 43 | 61 | 69 | |
| 25 | 49 | #2 ² | 1/8 | G-1/8 | 8 | 17.5 | 13.5 | 6 | 3.25 | 27 | 36 | 12 | 12 | 6.8 | 30 | 12 | 33 | 66 | 45 | 78 | 8 | 20 | 14 | 45 | 65 | 73 | |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 16.5 | 8 | 3.75 | 34 | 47 | 16 | 15 | 9 | 35 | 15 | 41 | 82 | 57 | 97 | 10 | 26 | 18 | 51 | 77 | 87 | |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 18.5 | 10 | 4.25 | 38 | 52 | 20 | 18 | 11 | 40 | 20 | 47 | 94 | 67 | 112 | 10 | 30 | 20 | 55 | 85 | 95 | |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 21 | 12 | 4.25 | 43 | 58 | 24 | 22 | 13.5 | 50 | 25 | 54 | 108 | 78 | 130 | 11 | 35 | 23 | 60 | 95 | 106 | |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 25 | 14 | 4.75 | 51 | 69 | 28 | 26 | 16 | 60 | 30 | 64 | 128 | 92 | 154 | 13 | 41 | 27 | 67 | 108 | 121 | |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 30 | 16 | 5.25 | 61 | 86 | 32 | 30 | 18 | 70 | 35 | 76 | 152 | 108 | 182 | 17 | 49 | 33 | 78 | 127 | 144 | |
| 100 | 138 | #6 | 3/8 | G-3/8 | 25 | 35 | 36.5 | 20 | 6.25 | 75 | 106 | 38 | 36 | 22 | 80 | 40 | 93 | 186 | 131 | 222 | 26 | 64 | 45 | 96 | 160 | 186 | |

¹ Port face on 20mm bore is extended 2mm. See port face extension drawing on T Mount page.

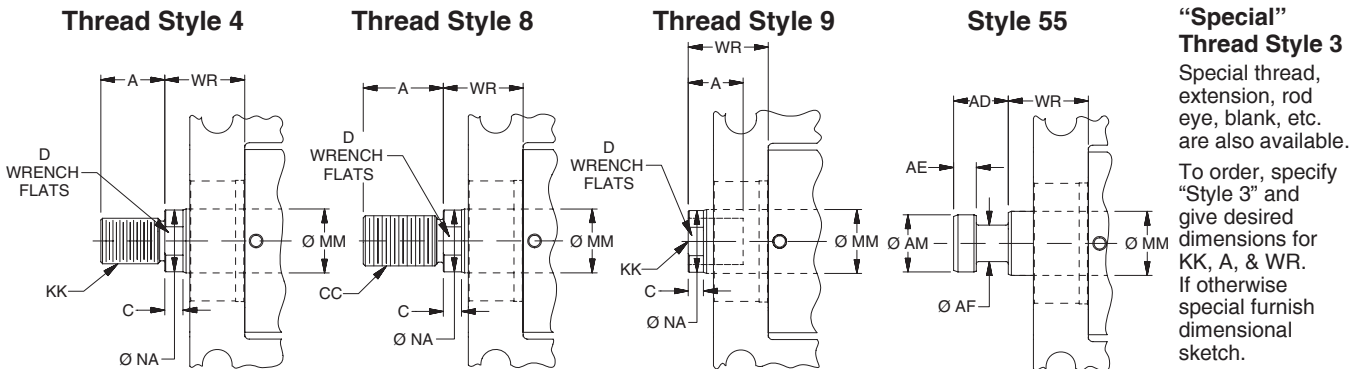
² Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

³ Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

CA Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ³ | | Style 4M | | Style 9A ³ | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |
| 100 | 56 | M42x4.5 | 45 | M42x2 | 56 | 1 1/2-12 | 45 | 1 1/2-12 | 56 | 1 3/4-12 | 70 | 42 | 16 | 35 | 52 | 22 | 48 | 54 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available.
To order, specify “Style 3” and give desired dimensions for KK, A, & WR. If otherwise special furnish dimensional sketch.

Global Position Sensing Switches



- Low Profile Keeps Switch Within Cylinder Envelope
- Both Reed and Solid State Switch Versions
- Switches Available World-Wide
- Solid State Switches use GMR Technology
- 5 Different Connection Styles
- Allow Position Sensing Anywhere Along Cylinder Stroke
- CE Approved

Global Drop-In Solid State Switches (CE) (UL)



| Wiring | PNP Switch | NPN Switch | PNP Switch ATEX Certified | PNP Switch High Temperature |
|-------------------------------|------------|------------|---------------------------|-----------------------------|
| 3m Flying Leads | P8S-GPFLX | P8S-GNFLX | P8S-GPFLX/EX ¹ | P8S-GPFLH ² |
| 10m Flying Leads | P8S-GPFTX | P8S-GNFTX | N/A | N/A |
| 0.3m Lead with 8mm Connector | P8S-GPSHX | P8S-GNSHX | | |
| 0.3m Lead with 12mm Connector | P8S-GPMHX | P8S-GNMHX | | |
| 1m Lead with 8mm Connector | P8S-GPSCX | P8S-GNSCX | | |

¹ ATEX switch is supplied with 2m Flying Leads. ² High Temperature switch is not UL Listed.

Specifications

| Switch Classification | Standard PNP or NPN | ATEX Certified PNP | High Temperature PNP |
|-----------------------------|----------------------------------|---------------------------------|-----------------------------------|
| Type | Electronic | Electronic | Electronic |
| Output Function | Normally Open | Normally Open | Normally Open |
| Switch Output | PNP/NPN | PNP | PNP |
| Operating Voltage | 10 - 30VDC | 18 - 30VDC | 10 - 30VDC |
| Continuous Current | 100 mA max. | 70 mA max. | 200 mA max. |
| Response Sensitivity | 28 Gauss min. | 28 Gauss min. | 25 Gauss |
| Switching Frequency | 5 KHz | 1 KHz | 10 KHz |
| Power Consumption | 10 mA max. | 10 mA max. | 15 mA max. |
| Voltage Drop | 2.5 VDC max. | 2.5 VDC max. | 3.1 VDC max. |
| Ripple | 10% of Operating Voltage | 10% of Operating Voltage | 15% of Operating Voltage |
| Hysteresis | 1.5 mm max. | 1.5 mm max. | 1.5 mm max. |
| Repeatability | 0.1 mm max. | 0.1 mm max. | 0.1 mm max. |
| EMC | EN 60 947-5-2 | EN 60 947-5-2 | EN 60 947-5-2 |
| Short-circuit Protection | Yes | Yes | Yes |
| Power-up Pulse Suppression | Yes | Yes | Yes |
| Reverse Polarity Protection | Yes | Yes | Yes |
| Enclosure Rating | IP68 | IP68 | IP67 |
| Shock and Vibration Stress | 30g, 11 ms, 10 to 55Hz, 1 mm | 30g, 11 ms, 10 to 55Hz, 1 mm | 30g, 11 ms, 10 to 55Hz, 1 mm |
| Operating Temperature Range | -25°C to +75°C (-13°F to +167°F) | -20°C to +45°C (-4°F to +113°F) | -25°C to +105°C (-13°F to +221°F) |
| Housing Material | PA 12 Black | PA 12 Black | Aluminum |
| Connector Cable | PVC | PVC | PUR |
| Connector | PUR | - | - |
| Approval for ATEX | - | 3D/3G | - |

Global solid state switch outputs may be influenced by an external magnetic field. Care must be taken to avoid external magnetic field exposure.

Solid State Switch – Wiring Connection

Flying Lead or 8 mm Connector (shown)

| Pin | Wire | Function |
|-----|-------|--------------------------|
| 1 | Brown | Operating Voltage (+VDC) |
| 4 | Black | Output signal (N.O.) |
| 3 | Blue | -VDC |

PNP and **NPN** wiring diagrams showing connections to +VDC, -VDC, and a LOAD.

12 mm Connector

| Pin | Wire | Function |
|----------------|-------|--------------------------|
| 1 | Brown | Operating Voltage (+VDC) |
| 4 | Black | Output Signal (N.O.) |
| 2 ¹ | White | Not Used |
| 3 | Blue | -VDC |

¹Pin 2 not present.

PNP and **NPN** wiring diagrams showing connections to +VDC, -VDC, and a LOAD.

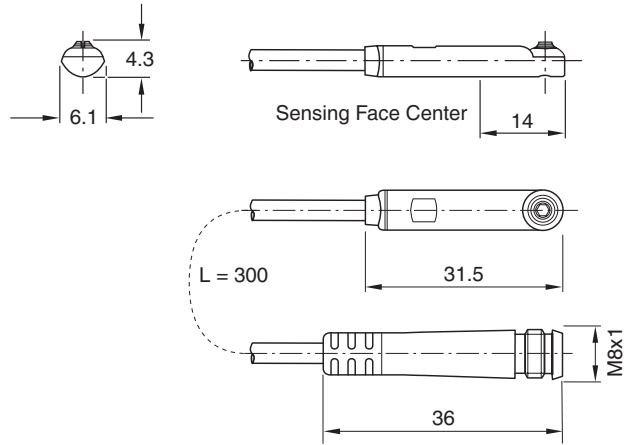
Global Drop-In Reed Switches 

| Wiring | Reed Switch |
|-------------------------------|-------------|
| 3m Flying Leads | P8S-GRFLX |
| 10m Flying Leads | P8S-GRFTX |
| 0.3m Lead with 8mm Connector | P8S-GRSHX |
| 0.3m Lead with 12mm Connector | P8S-GRMHX |
| 1m Lead with 8mm Connector | P8S-GRSCX |

Specifications

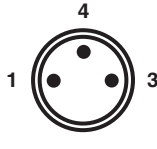
Type.....2-Wire Reed
 Output Function.....Normally Open
 Operating Voltage.....10 - 120 VAC¹
 10 - 30 VDC
 Switching Power.....6 W/VA
 Continuous Current.....100 mA max.
 Response Sensitivity.....30 Gauss min.
 Switching Frequency.....400 Hz
 Voltage Drop.....2.5 V max.
 Ripple.....10% of Operating Voltage
 Hysteresis.....1.5 mm max.
 Repeatability.....0.2 mm max.
 EMC.....EN 60 947-5-2
 Reverse Polarity Protection.....Yes
 Enclosure Rating.....IP 68
 Shock and Vibration Stress.....30g, 11 ms, 10 to 55 Hz, 1 mm
 Operating Temperature Range.....-25°C to +75°C (-13°F to 167°F)
 Housing Material.....PA 12, Black
 Connector Cable.....PVC
 Connector.....PUR cable with 8 or
 12 mm connector

Global Reed Switch output may be influenced by external magnetic fields. Care must be taken to avoid external magnetic field exposure.



Reed Switch – Wiring Connection

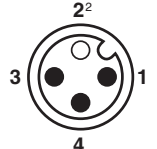
Flying Lead or 8 mm Connector¹



| Pin | Wire | Function |
|-----|-------|------------------------------|
| 1 | Brown | Operating Voltage (+V) |
| 4 | Black | Not Used |
| 3 | Blue | Output Signal (-V or Ground) |

¹8mm connector rated for 50 VAC max.

12 mm Connector



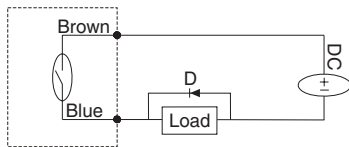
| Pin | Wire | Function |
|----------------|-------|------------------------------|
| 1 | Brown | Operating Voltage (+V) |
| 2 ² | White | Not Used |
| 3 | Blue | Output Signal (-V or Ground) |
| 4 | Black | Not Used |

²Pin 2 not present.

Circuit for Switching Contact Protection (Inductive Loads)

(Required for proper operation 24V DC)

Put Diode parallel to loads following polarity as shown below.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

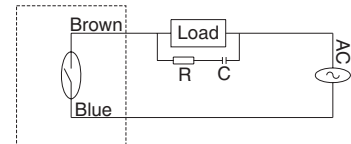
Typical Example—100 Volt, 1 Amp Diode
 CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 120 VAC)

Put a resistor and capacitor in parallel with the load. Select the resistor and capacitor according to the load.

Typical Example:

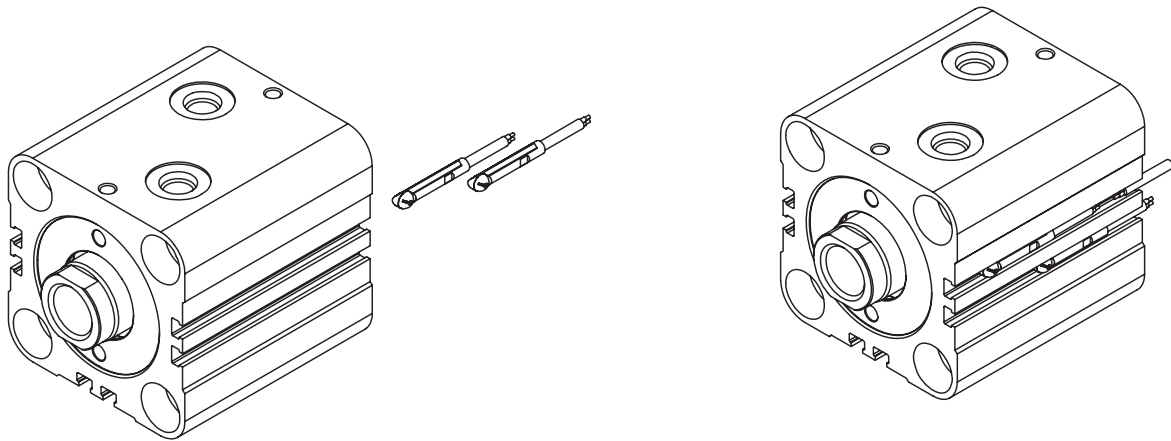
CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ - 5 KΩ, 1/4 W
 C: Capacitor 0.1 ΩF, 600 V



⚠ Caution

- Use an ammeter to test reed switch current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed switch for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed switch.
- Anti-magnetic shielding is recommended for reed switches exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our switches. Other manufacturers' switches may not operate correctly in conjunction with these magnets.
- Use relay coils for reed switch contact protection.

- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed switch. The switch may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the switch and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Switches with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed switches (the resistor should be installed as close as possible to the switches). The resistor should be selected such that R (ohms) >E/0.3.
- Global reed switch outputs may be influenced by an external magnetic field. Care must be taken to avoid external magnetic field exposure.



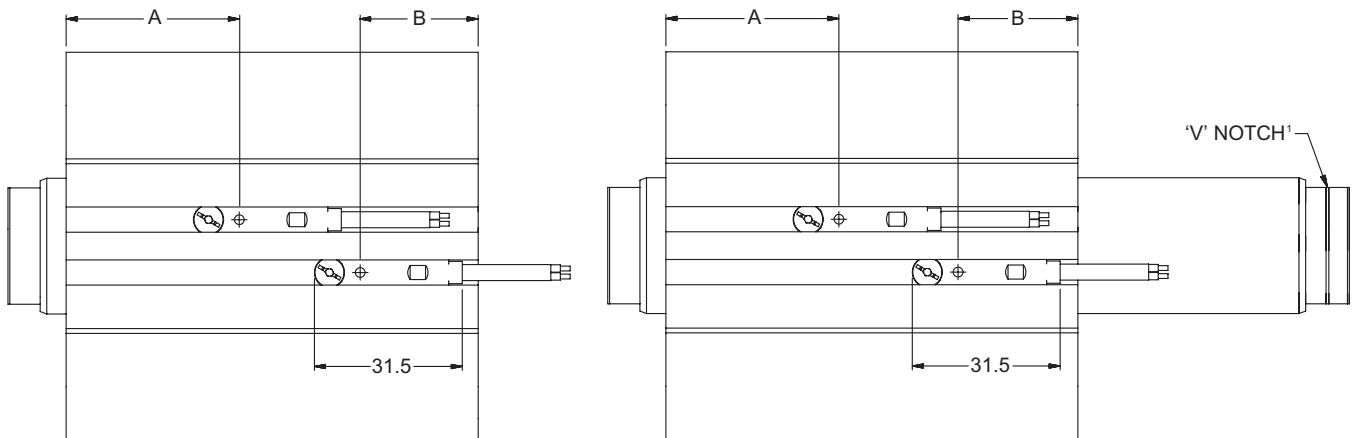
1. Slide the switch into any of the six mounting grooves provided.
2. For end of stroke sensing, position cross hairs of target symbol \oplus on the switch at the specified distance from the cylinder body end as listed in the table below.
3. Locate the switch as required for intermediate stroke position sensing.
4. Turn the locking screw clockwise to secure the switch in place.

Minimum Stroke for Cylinders with Switches

| All Bores | One Switch | Two Switches |
|-----------|------------|--------------|
| | 5mm | 10mm |

Switch Location for End-of-Stroke Sensing

| Bore | A | B |
|------|------|------|
| 20 | 24 | 18.5 |
| 25 | 25 | 19.5 |
| 32 | 28 | 22.5 |
| 40 | 31 | 23.5 |
| 50 | 33.5 | 26 |
| 63 | 37 | 29.5 |
| 80 | 42.5 | 35 |
| 100 | 53 | 42.5 |



¹ The rod side for switch location 'B', on double rod end cylinders, is identified by a 'V' notch in the 'NA' diameter of rod end styles #4, #8, and #9. The 'V' notch will be in the 'AM' diameter of rod end style #55.

CPS Cylinder Position Sensor – with analog output

The CPS is a linear position sensor that can be used to measure the distance of Series CHE cylinder magnetic piston movement. Bronze cap and gland material (as specified with piston code 5 in the model number) are also required for proper functioning of the CPS. The Cylinder Position Sensor is available in four maximum measuring ranges – 32 mm, 64 mm, 96 mm, 128 mm, 160 mm,

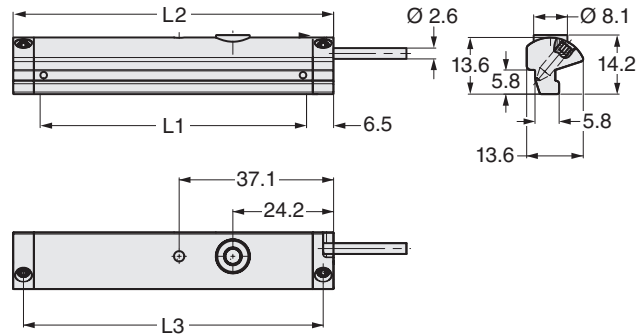
128 mm and 160 mm. The electrical zero and end points within each range are adjustable using the Teach-In button. Current (4 to 20 mA) and voltage (0 – 10 VDC) analog outputs are selectable through wiring connection and reverse acting of each output is achieved by reversing the zero and end points.

| Maximum Sensing Range | Part Number | Wiring |
|-----------------------|-------------|--------------------------------------|
| 32 mm | CPS-32 | 0.3m cable with 4-pin 8 mm connector |
| 64 mm | CPS-64 | |
| 96 mm | CPS-96 | |
| 128 mm | CPS-128 | |
| 160 mm | CPS-160 | |



Specifications

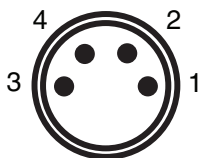
Type..... Electronic
 Supply Voltage..... 15 – 30 VDC
 Analog Output - Current..... 4 – 20 mA
 Analog Output - Voltage..... 0 – 10 VDC
 Max. Load Resistance – Current Output..... 500 Ohm
 Max. Load Resistance – Voltage Output..... 2 kOhm
 Idle Current typ. 25 mA
 Measuring Range Tolerance..... ± 1 mm
 Electrical Configuration DC 4-Wire
 Sample Time..... 1 ms
 Resolution typ. 0.05 mm
 Linearity typ. 0.3 mm
 Repeat accuracy typ. 0.1 mm
 Piston Speed 3m/s Maximum
 Ripple 10% of Operating Voltage
 EMC EN 60 947-5-7
 Short Circuit Protection Yes
 Overload Protection..... Yes
 Reverse Polarity Protection..... Yes
 Enclosure Rating IP 67
 Shock and Vibration Stress..... 30g, 11 ms, 10 to 55 Hz, 1 mm
 Operating Temperature Range .. -25°C to +70°C (-4°F to +158°F)
 Housing Material..... PA Strengthened
 Connector Cable..... PUR
 Connector PUR Cable w/8 mm connector



Dimensions

| L1 Sensing Range | L2 | L3 |
|------------------|-----|-----|
| 32 | 45 | 40 |
| 64 | 77 | 72 |
| 96 | 109 | 104 |
| 128 | 141 | 136 |
| 160 | 173 | 168 |

CPS Wiring Connection
 8 mm
 4-Pin Connector



| Pin | Wire | Function |
|-----|-------|--------------------------|
| 1 | Brown | Operating Voltage (+VDC) |
| 3 | Blue | -VDC |
| 4 | Black | 0 -10 VDC Output |
| 2 | White | 4 – 20 mA Output |

Operating Instructions

- Read the operating instructions before starting operation.
- Connection, assembly, and settings should be accomplished only by competent technicians.
- This sensor does not qualify as a safety component in accordance with EU machine guidelines.
- Use power source according to IEC/DIN EN 60204-1.
- Do not use ferrite components in the direct environment of the CPS.

Proper Use

The measurement signal is output via analog voltage or current. The yellow LED lights when the piston is within the measurement range (signal strength indicator). The desired Zero Point and End Point of the measurement range can be set precisely via the Teach-In button.

Starting Operation

1. Positioning and securing the sensor:

Connect the sensor to operating voltage (see Specifications and Wiring Connection diagram). Insert the sensor into the cylinder mounting slot from above. Move the piston into the desired Zero Point position. The yellow LED lights when the piston is in the measurement range. Move the sensor along the slot until the LED switches off. Move the sensor back again until the LED lights. Secure the sensor appropriately. The measurement range does not need to be set. If the user does not Teach-In the measurement range, the maximum possible range is used as a default.

2. Teach-In of measurement range (option):

Move the piston into the desired Zero Point position. Press the teach button for 2 seconds; LED blinks (3x/second). Release the Teach-In button; the Zero Point is stored. Set the piston position for the "End Point" of the measurement range. Press the Teach-In button; the "End Point" of the measurement range is stored.

Note: If the Zero Point is external to the measurement range, the Teach-In procedure is aborted and the LED blinks quickly as a result (6x/s). If the Teach-In procedure is not concluded, there is a timeout after 90 seconds; the last taught-in measurement range is active.

3. Check of the taught-in measurement range:

Move the piston and check the set measurement range using the LED. If necessary, correct the desired measurement range via a renewed Teach-In procedure.

4. Reset the measurement range to the default setting:

Press and hold the Teach-In button for at least 5 seconds. The sensor is reset to the default setting (max. measurement range).

Maintenance

Parker CPS magnetic cylinder sensors do not require any maintenance. It is recommend that the screw connections and plug-in connections be checked at regular intervals.

Minimum Stroke

To ensure that both CPS mounting screws engage in the cylinder body, the minimum stroke for each bore and sensor combination must be observed.

| Bore Ø | Minimum Stroke | | | | |
|--------|----------------|--------|--------|---------|---------|
| | CPS-32 | CPS-64 | CPS-96 | CPS-128 | CPS-160 |
| 20 | 2 | 34 | N/A | N/A | N/A |
| 25 | – | 32 | 64 | 96 | N/A |
| 32 | – | 26 | 58 | 90 | 122 |
| 40 | – | 22 | 54 | 86 | 118 |
| 50 | – | 17 | 49 | 81 | 113 |
| 63 | – | 10 | 42 | 74 | 106 |
| 80 | – | – | 31 | 63 | 95 |
| 100 | – | – | 13 | 45 | 77 |

Cordset for CPS Sensors

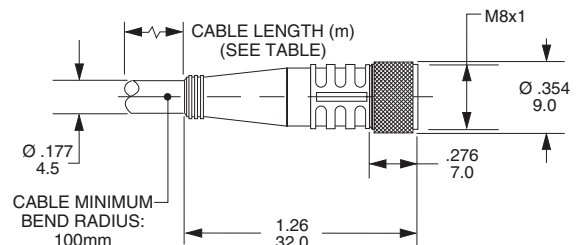
The 4-pin, 8 mm threaded connector on this cordset can be used only with CPS Sensors.

Cordset Specifications

| | |
|------------------------|---|
| Connector | Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C |
| Contacts | Gold plated brass |
| Cord Construction..... | Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V. Cable end is stripped and tinned. |
| Conductors | Extra high flex stranding, PVC insulation. |
| Temperature | -40°C to +90°C (-40°F to +176°F) |
| Protection | NEMA 6 / IP67 |
| Cable Length | 2m (6.56 ft) or 5m (16.40 ft) |

8 mm 4-Pin Connector

| Cable Length | Part Number |
|--------------|-------------|
| 5 meters | 096043T005 |
| 2 meters | 096043T002 |



8mm and 12mm Cordset for Global Switches

A female connector is available for all switches with the male 8mm and 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed below.

8mm Cordset

| Cable Length | Threaded Connector | Snap On Connector |
|--------------|--------------------|-------------------|
| 5 meters | 086620T005 | 086620S005 |
| 2 meters | 086620T002 | 086620S002 |

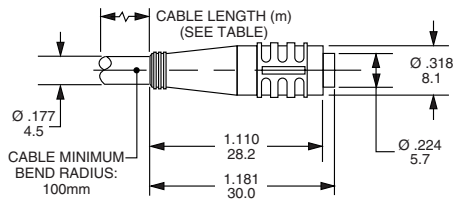
12mm Cordset

| Cable Length | Threaded Connector | Right Angle Connector |
|--------------|--------------------|-----------------------|
| 5 meters | 9126487205 | 9126487305 |
| 2 meters | 9126487202 | 9126487302 |

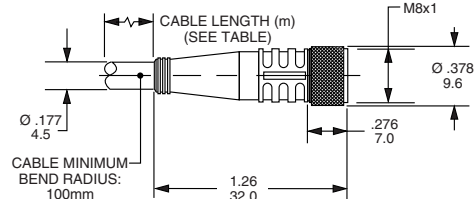
Cordset Specifications

- Connector.....Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)
- ContactsGold plated beryllium copper, machined from solid stock
- Coupling Method.....Snap-Lock or chrome plated brass nut
- Cord Construction Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V. Cable end is stripped and tinned.
- Conductors.....Extra high flex stranding, PVC insulation
- Temperature.....-40 to 194°F (-40 to 90°C)
- Protection.....NEMA 1, 3, 4, 6P and IEC 1P67
- Cable Length.....6.56 ft (2m) or 16.4 ft (5m)

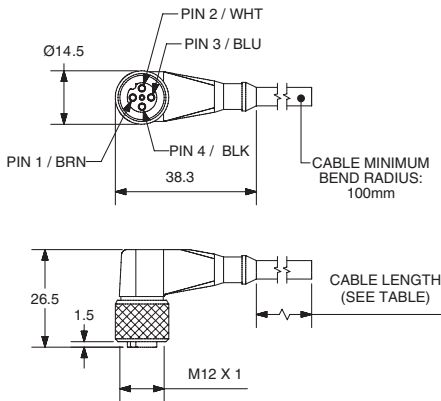
8mm Snap-On Straight Connector



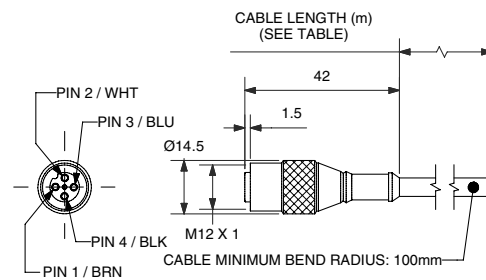
8mm Threaded Straight Connector



12mm Right Angle Connector



12mm Straight Connector



Notes

B

PL-2

PH-2

PH-3

PHX

SHM

CHE/CHD

Notes

Series CHD Cylinder Features

Primary Seal – polyurethane rod seal with multiple sealing edges is self-compensating and self relieving to withstand pressure variations and conform to mechanical deflection that may occur.

Piston Rod – Medium carbon steel, hard chrome plated and polished.

Ports – SAE O-ring ports are standard.

OPTIONAL PORTS
 NPTF and BSPP ports are also available. Manifold ports are available on mounting styles C & CN.

Secondary Seal – Rod Wiper – wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

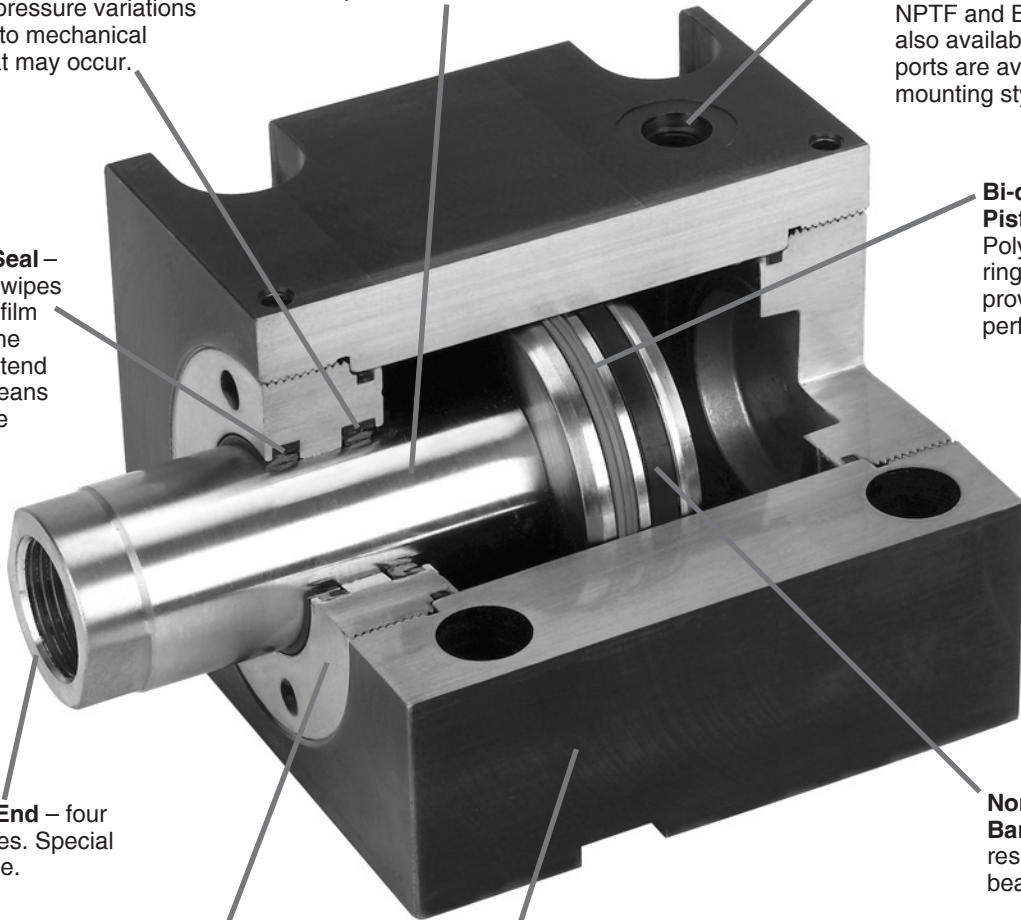
Bi-directional Piston Seal – Polyurethane seal ring with energizer provides leak-free performance.

Piston Rod End – four standard styles. Special ends available.

Non-Metallic Wear Band – improves resistance to bearing loads.

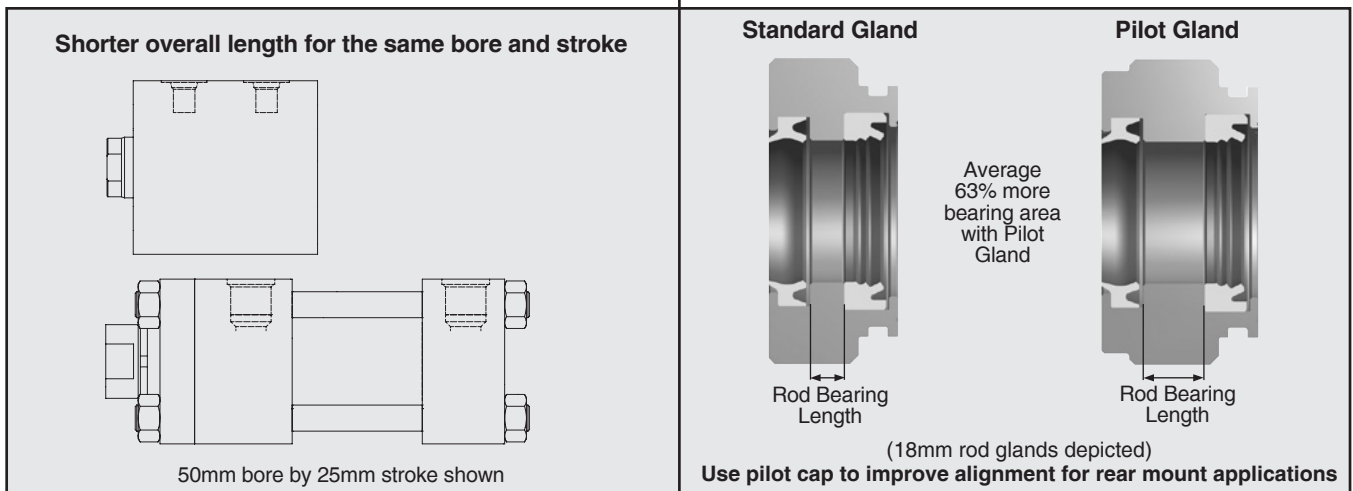
Rod Gland – nodular iron bearing with RoHS compliant zinc plating for corrosion resistance. Optional pilot gland available at no additional cost.

Cylinder Body – steel with black paint exterior surface treatment.



CHD Compact Hydraulic Cylinders... require less mounting space than conventional tie rod cylinders.

Optional Pilot Gland... offers added bearing area to increase service life and also improves alignment of cylinder and load.



Theoretical Push and Pull Forces

The cylinder output forces are derived from the formula:

$$F = \frac{P \times A}{10000}$$

Where F = Force in kN.

P = Pressure at the cylinder in bar.

A = Effective area of cylinder piston in square mm.

To determine the bore size for the application take the following steps.

Push and Pull Force in kN

| Bore Ø | Rod Ø | Operating Direction | Piston Area (mm²) | Operating Pressure (Bar) | | | | | | |
|--------|-------|---------------------|-------------------|--------------------------|------|------|------|------|------|------|
| | | | | 50 | 75 | 100 | 125 | 150 | 175 | 207 |
| 20 | 12 | Push | 314 | 1.57 | 2.36 | 3.14 | 3.93 | 4.71 | 5.50 | 6.50 |
| | | Pull | 201 | 1.01 | 1.51 | 2.01 | 2.51 | 3.02 | 3.52 | 4.16 |
| 25 | 14 | Push | 491 | 2.45 | 3.68 | 4.91 | 6.14 | 7.36 | 8.59 | 10.2 |
| | | Pull | 337 | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.97 |
| 32 | 18 | Push | 804 | 4.02 | 6.03 | 8.04 | 10.1 | 12.1 | 14.1 | 16.6 |
| | | Pull | 550 | 2.75 | 4.12 | 5.50 | 6.87 | 8.25 | 9.62 | 11.4 |
| 40 | 22 | Push | 1,257 | 6.28 | 9.42 | 12.6 | 15.7 | 18.8 | 22.0 | 26.0 |
| | | Pull | 877 | 4.38 | 6.57 | 8.8 | 11.0 | 13.1 | 15.3 | 18.1 |
| 50 | 28 | Push | 1,963 | 9.82 | 14.7 | 19.6 | 24.5 | 29.5 | 34.4 | 40.6 |
| | | Pull | 1,348 | 6.74 | 10.1 | 13.5 | 16.8 | 20.2 | 23.6 | 27.9 |
| 63 | 36 | Push | 3,117 | 15.6 | 23.4 | 31.2 | 39.0 | 46.8 | 54.6 | 64.5 |
| | | Pull | 2,099 | 10.5 | 15.7 | 21.0 | 26.2 | 31.5 | 36.7 | 43.5 |
| 80 | 45 | Push | 5,027 | 25.1 | 37.7 | 50.3 | 62.8 | 75.4 | 88.0 | 104 |
| | | Pull | 3,436 | 17.2 | 25.8 | 34.4 | 43.0 | 51.5 | 60.1 | 71.1 |

1. Select the Operating Pressure column closest to that desired.

2. In the same column, identify the force required to move the load (always rounding up). If the piston rod is in compression use the 'Push' row and if the piston rod is in tension use the 'Pull' row.

3. In the row to the left is the bore required.

If the cylinder envelope dimensions are too large for the application, increase the operating pressure to the maximum pressure in the table below, if possible, and repeat steps 1 - 3.

**Series CHD
Pressure Rating**

| Bore Ø | Maximum Working Pressure in bar |
|--------|---------------------------------|
| 20 | 207 |
| 25 | 207 |
| 32 | 207 |
| 40 | 207 |
| 50 | 207 |
| 63 | 207 |
| 80 | 207 |

Equivalents

1 kN = 224.81 pounds force

1 bar = 14.50 psi

1 mm = .03937 inch

1 mm² = .00155 inch²

Cylinder Weights

To determine the weight of a Series CHD cylinder, first select the proper basic zero stroke weight for the mounting required, and then calculate the weight of the

cylinder stroke and add the result to the basic weight. For extra rod extension, use piston rod weights per mm in Table C.

Table A Single Rod End CHD Cylinder Weights in kg.

| Bore Ø | Rod Ø | Single Rod Cylinders | | | | | | | | | |
|--------|-------|-----------------------------|--------|------|----------------|---------------|-----------------------------|---------------|-----------------------------|------|---------------|
| | | Basic Weight at Zero Stroke | | | | Per mm Stroke | Basic Weight at Zero Stroke | Per mm Stroke | Basic Weight at Zero Stroke | | Per mm Stroke |
| | | T | TN, TR | A, M | AN, AR, MN, MR | | | | C | CN | |
| 20 | 12 | 0.57 | 0.58 | 0.61 | 0.62 | 0.013 | 0.84 | 0.013 | - | - | - |
| 25 | 14 | 0.80 | 0.81 | 0.84 | 0.85 | 0.016 | 1.17 | 0.017 | 0.71 | 0.73 | 0.015 |
| 32 | 18 | 1.39 | 1.42 | 1.45 | 1.48 | 0.024 | 1.92 | 0.025 | 1.41 | 1.43 | 0.026 |
| 40 | 22 | 1.87 | 1.90 | 1.97 | 2.01 | 0.029 | 2.81 | 0.031 | 1.93 | 1.96 | 0.033 |
| 50 | 28 | 2.61 | 2.67 | 2.79 | 2.85 | 0.036 | 4.20 | 0.038 | 2.82 | 2.88 | 0.044 |
| 63 | 36 | 4.11 | 4.20 | 4.34 | 4.42 | 0.047 | 6.11 | 0.051 | 4.69 | 4.78 | 0.063 |
| 80 | 45 | 7.19 | 7.33 | 7.49 | 7.62 | 0.067 | 10.7 | 0.072 | - | - | - |

Table C Piston rod weights in kg.

| Rod Ø | Piston Rod Weight per mm |
|-------|--------------------------|
| 12 | 0.001 |
| 14 | 0.001 |
| 18 | 0.002 |
| 22 | 0.003 |
| 28 | 0.005 |
| 36 | 0.008 |
| 45 | 0.012 |

Table B Double Rod End CHD Cylinder Weights in kg.

| Bore Ø | Rod Ø | Double Rod Cylinders | | | | | | | | | |
|--------|-------|-----------------------------|------|------|--------|---------------|-----------------------------|---------------|-----------------------------|------|---------------|
| | | Basic Weight at Zero Stroke | | | | Per mm Stroke | Basic Weight at Zero Stroke | Per mm Stroke | Basic Weight at Zero Stroke | | Per mm Stroke |
| | | T | TN | A, M | AN, MN | | | | C | CN | |
| 20 | 12 | 0.60 | 0.61 | 0.64 | 0.65 | 0.013 | 0.87 | 0.014 | - | - | - |
| 25 | 14 | 0.83 | 0.85 | 0.87 | 0.89 | 0.017 | 1.21 | 0.018 | 0.75 | 0.77 | 0.016 |
| 32 | 18 | 1.46 | 1.48 | 1.52 | 1.54 | 0.026 | 1.98 | 0.027 | 1.47 | 1.50 | 0.028 |
| 40 | 22 | 1.97 | 2.01 | 2.08 | 2.11 | 0.032 | 2.92 | 0.034 | 2.03 | 2.07 | 0.036 |
| 50 | 28 | 2.81 | 2.87 | 2.99 | 3.05 | 0.041 | 4.40 | 0.043 | 3.02 | 3.08 | 0.049 |
| 63 | 36 | 4.52 | 4.61 | 4.75 | 4.83 | 0.055 | 6.53 | 0.059 | 5.10 | 5.19 | 0.071 |
| 80 | 45 | 7.99 | 8.12 | 8.28 | 8.42 | 0.080 | 11.5 | 0.085 | - | - | - |

Equivalent

1 kg = 2.2046 pounds

Model Code & Standard Specifications

Model Ordering Code for CHD

| | | | | | | | | | | | |
|--|--|---|------------|--|--|---|--|--|--|--|---|
| 32 | | T | CHD | B | T | | | 9 | | A | 25 |
| Bore Dia. | Double Rod Cylinder | Mounting Style | Series | Piston | Ports | Seals | Special Modification | Piston Rod Thread Style | Piston Rod Thread Style (For Dbl. Rod) | Piston Rod Thread Type | Stroke |
| Specify: (Bore dia. in mm) 20 25 32 40 50 63 80 | Use "K" only if double rod cylinder is required. | Specify: T = Std. Mount TN = Std. Mount with pilot gland TR = Std. Mount with cap pilot A = Imperial thread tapped both ends AN = Imperial tapped with pilot gland AR = Imperial tapped with cap pilot M = Metric thread tapped both ends MN = Metric tapped with pilot gland MR = Metric tapped with cap pilot C = Foot Mount CN = Foot Mount with pilot gland J = Head Rectangular Flange H = Cap Rectangular Flange | CHD | Specify: B = Non-magnetic piston Add option: 9 = Non-magnetic piston with bronze cap & gland. | Specify: T = SAE Ports U = NPTF Ports R = BSPP Ports M = Manifold Ports ¹ | Leave blank for std. Nitrile Seals V = Fluoro-carbon | Use "S" for Special Modification other than rod end, and specify modification. | Specify: 4 = Small Male 8 = Intermediate Male 9 = Female 55 = Flange Coupler 3 = Special ² | Specify: 4 = Small Male 8 = Intermediate Male 9 = Female 55 = Flange Coupler 3 = Special ² | Specify: A = Imperial (UNF or UNC) M = Metric ³ | Specify Stroke Length Required in mm ⁴ . |

Maximum Stroke

| Bore Ø | Stroke ⁵ in mm | | |
|--------|---|------------------------|--|
| | Mounting Styles T, TN, TR, A, AN, AR, M, MN, MR | Mounting Styles C & CN | Bolt-on Mounting Styles ⁶ J & H |
| 20 | 50 | N/A | 50 |
| 25 | 60 | 50 | 60 |
| 32 | 115 | 100 | 100 |
| 40 | 115 | 100 | 100 |
| 50 | 125 | 100 | 100 |
| 63 | 115 | 100 | 100 |
| 80 | 115 | N/A | 100 |

Shaded boxes identify required model number fields.

¹ Manifold ports are only available on Foot Mounting Styles C.
² To order thread style 3, specify "3" and give the desired dimensions for KK, A, and W (or WP depending on mounting) or furnish a dimensioned sketch.
³ Always use M for rod style 55.
⁴ See Maximum Stroke Chart at right.

⁵ Intermediate strokes in 1mm increments are available.
⁶ Longer strokes (up to maximum lengths for Mounting Styles T, TN, TR, A, AN, AR, M, MN & MR) are available at increased manufacturing lead times. Contact the factory.

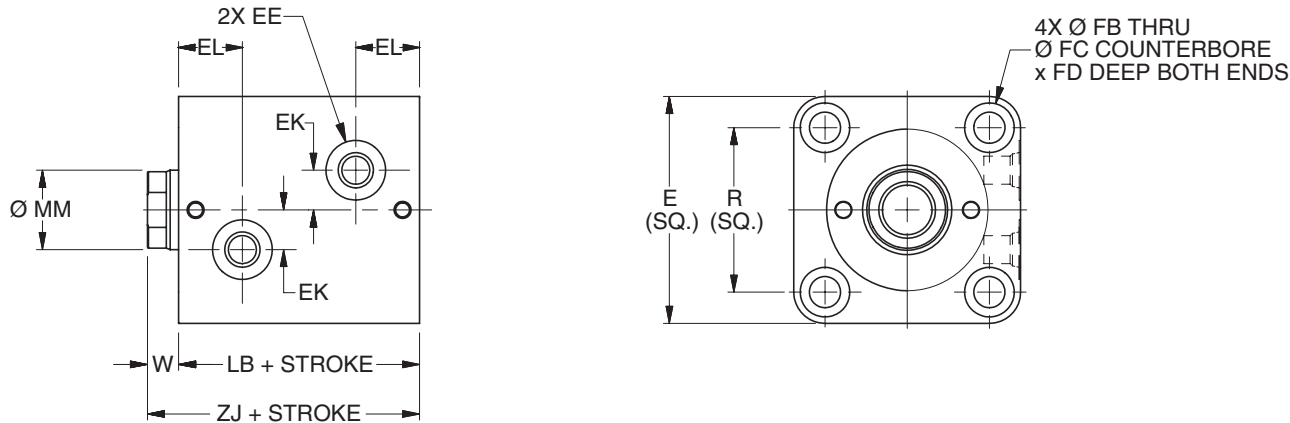
Standard Specifications

- 13 Standard mounting styles
- Bore sizes – 20mm to 80mm
- Piston Rod Diameter – 12mm to 45mm
- Single and double rod construction available
- Strokes up to 100mm depending on bore size (see table above)
- Working pressure up to 207 bar
- Temperature range – -23°C to +121°C (depending on seal class)
- Reference ISO 16656: 2004

| Seal Classes | Typical Fluids | Temperature Range |
|---|-------------------------------|---|
| 1 – Standard Nitrile & Polyurethane | Hydraulic Oil, MIL-H-5606 Oil | -23°C (-10°F) to +74°C (+165°F) |
| 5 – Optional (At extra cost) Fluorocarbon Seals | High Temperature | -23°C (-10°F) to +121°C (+250°F) Class 5 seals may be operated up to +204°C (+400°F) with reduced service life |

Note: Class 5 seals are not suitable for use with Skydrol fluid, but can be used with hydraulic oil if desired.

Style T Through Bolt Mount – Single Rod End – 20mm to 80mm Bore Size



T Mount Single Rod End – Envelope and Mounting Dimensions

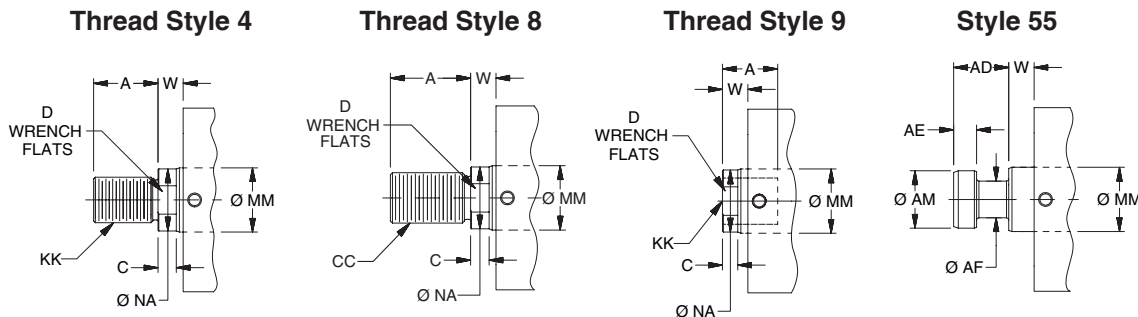
| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | W | Add Stroke | |
|--------|-----|-----------------|------|-------|----|------|------|------|------|----|----|------------|----|
| | | SAE | NPTF | BSP | | | | | | | | LB | ZJ |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 8 | 43 | 51 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 8 | 45 | 53 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 10 | 51 | 61 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 10 | 55 | 65 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 11 | 60 | 71 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 13 | 67 | 80 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 17 | 78 | 95 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

T Mount Single Rod End – Rod Dimensions

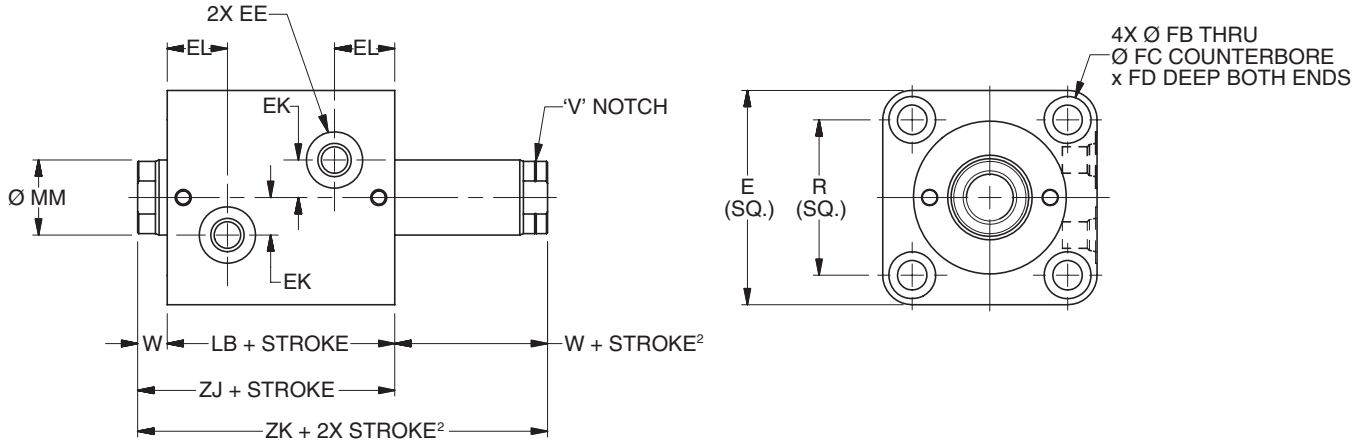
| Bore Ø | MM Rod Ø | Rod Thread | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|------------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style T Through Bolt Mount – Double Rod End – 20mm to 80mm Bore Size



T Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | W ² | Add Stroke | | Add 2X Stroke ZK ² |
|--------|-----|-----------------|------|-------|----|------|------|------|------|----|----------------|------------|----|----------------------------------|
| | | SAE | NPTF | BSP | | | | | | | | LB | ZJ | |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 8 | 43 | 51 | 59 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 8 | 45 | 53 | 61 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 10 | 51 | 61 | 71 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 10 | 55 | 65 | 75 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 11 | 60 | 71 | 82 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 13 | 67 | 80 | 93 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 17 | 78 | 95 | 112 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required.

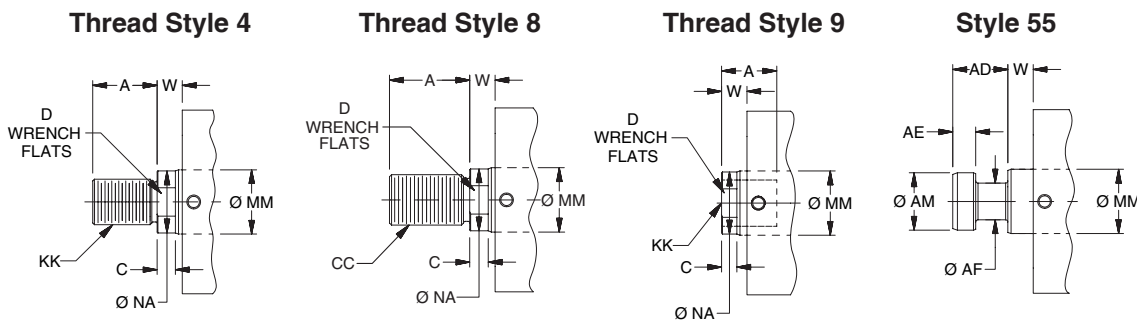
Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

T Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions

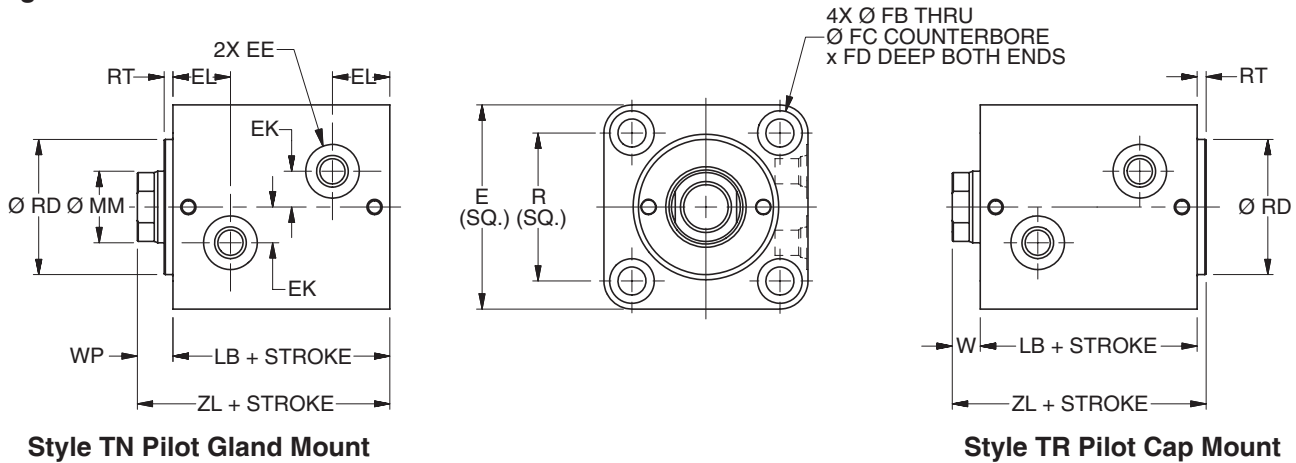


"Special" Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available.

To order, specify "Style 3" and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

**Styles TN and TR Through Bolt Mount with Pilot Gland or Pilot Cap –
Single Rod End – 20mm to 80mm Bore Size**



Style TN Pilot Gland Mount

Style TR Pilot Cap Mount

TN and TR Mount Single Rod End – Envelope and Mounting Dimensions

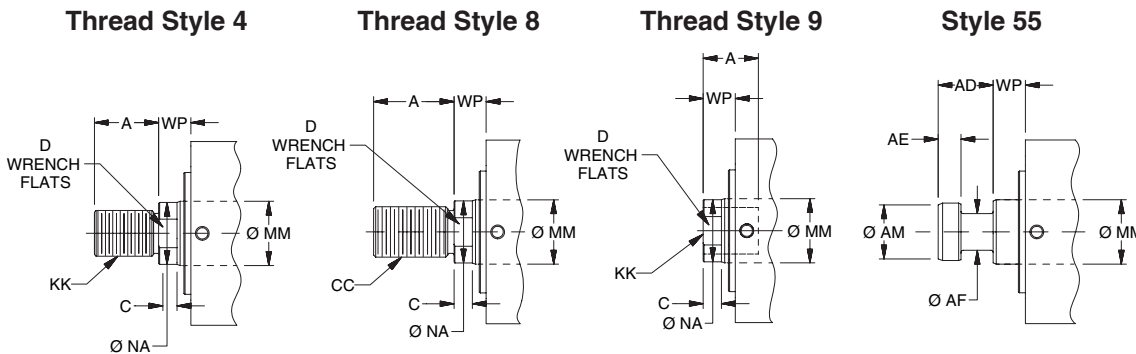
| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | RD Ø f9 | RT | W | WP | Add Stroke | |
|--------|-----|-----------------|------|-------|----|------|------|------|------|----|---------|----|----|----|------------|----|
| | | SAE | NPTF | BSP | | | | | | | | | | | LB | ZL |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 24 | 3 | 8 | 11 | 43 | 54 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 27 | 3 | 8 | 11 | 45 | 56 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 43 | 3 | 10 | 13 | 55 | 68 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 53 | 3 | 11 | 14 | 60 | 74 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 66 | 3 | 13 | 16 | 67 | 83 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 83 | 3 | 17 | 20 | 78 | 98 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

TN and TR Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

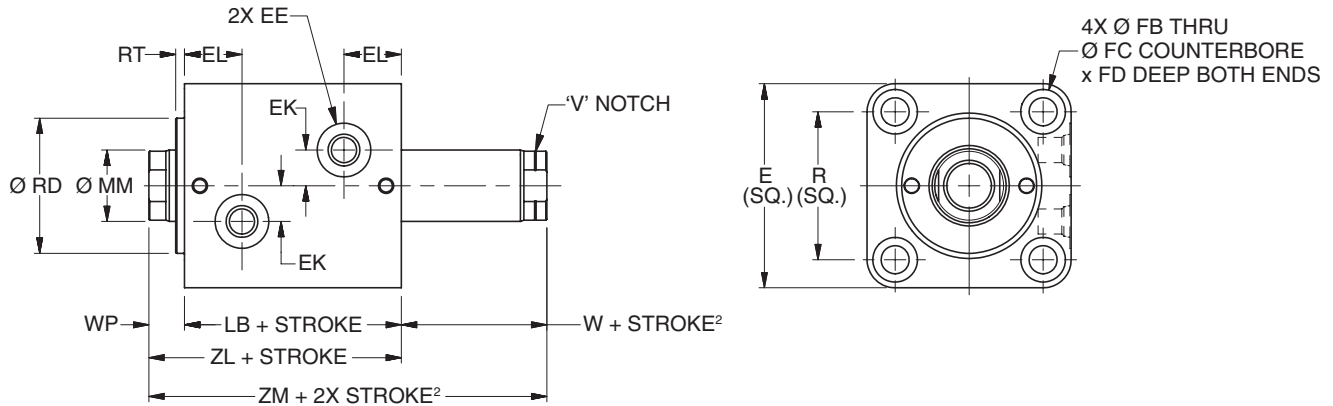
Rod End Dimensions



“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W (TR Mount) or WP (TN Mount) If otherwise special furnish dimensional sketch.

Style TN Through Bolt Mount with Pilot Gland – Double Rod End – 20mm to 80mm Bore Size



TN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | FB Ø | FC Ø | FD | R | RD Ø f9 | RT | W ² | WP | Add Stroke | | Add 2X Stroke |
|--------|-----|-----------------|------|-------|----|------|------|------|------|----|---------|----|----------------|----|------------|----|-----------------|
| | | SAE | NPTF | BSP | | | | | | | | | | | LB | ZL | ZM ² |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 5.5 | 9.5 | 5.4 | 30 | 24 | 3 | 8 | 11 | 43 | 54 | 62 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 5.5 | 9.5 | 5.4 | 36 | 27 | 3 | 8 | 11 | 45 | 56 | 64 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 7 | 11 | 6.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 | 74 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 9 | 14 | 8.6 | 52 | 43 | 3 | 10 | 13 | 55 | 68 | 78 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 11 | 17.5 | 10.8 | 58 | 53 | 3 | 11 | 14 | 60 | 74 | 85 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 13.5 | 20 | 13 | 69 | 66 | 3 | 13 | 16 | 67 | 83 | 96 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 16 | 23 | 15.2 | 86 | 83 | 3 | 17 | 20 | 78 | 98 | 115 |

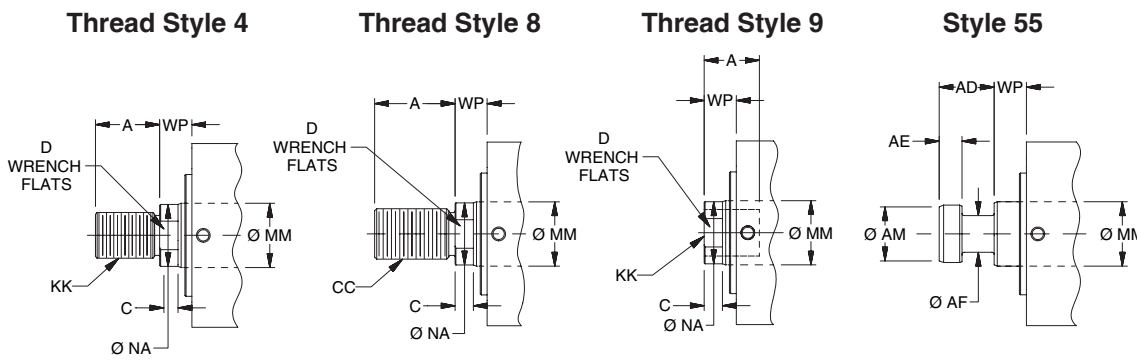
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

TN Mount Double Rod End – Rod Dimensions

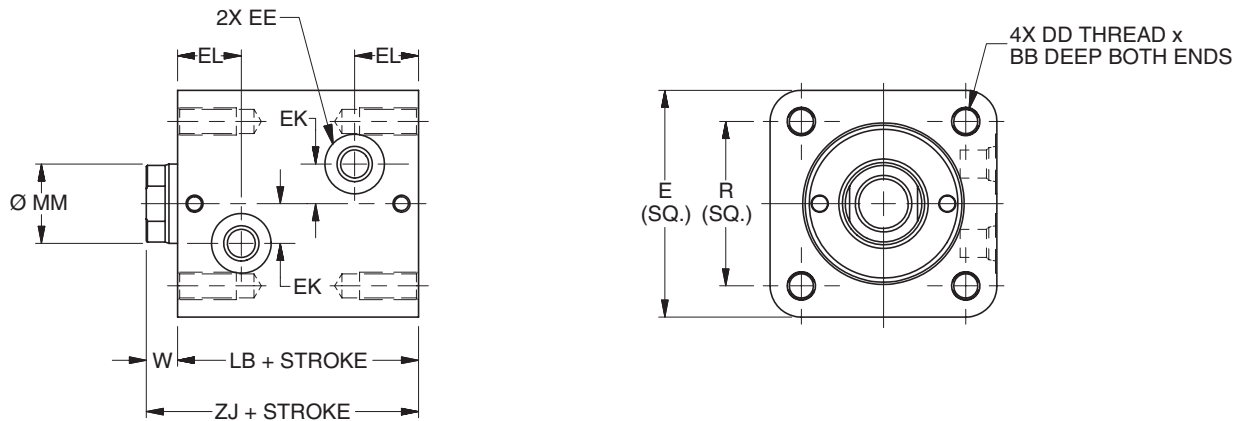
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & WP. If otherwise special furnish dimensional sketch.

Style A Imperial Tapped Both Ends Mount – Single Rod End – 20mm to 80mm Bore Size



A Mount Single Rod End – Envelope and Mounting Dimensions

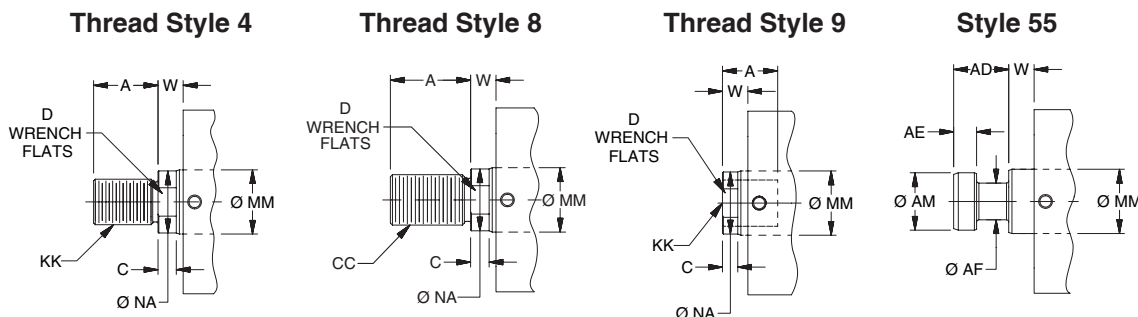
| Bore Ø | BB | DD | E | EE | | | EK | EL | R | W | Add Stroke | |
|--------|------|------------------|-----|------------------|-----|-------|----|------|----|----|------------|----|
| | | | | SAE | NPT | BSP | | | | | LB | ZJ |
| 20 | 10.1 | 10-32 UNF - 2B | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 8 | 43 | 51 |
| 25 | 10.5 | 10-32 UNF - 2B | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 8 | 45 | 53 |
| 32 | 12.5 | 1/4-28 UNF - 2B | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 10 | 51 | 61 |
| 40 | 16.6 | 5/16-24 UNF - 2B | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 10 | 55 | 65 |
| 50 | 20.8 | 3/8-24 UNF - 2B | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 11 | 60 | 71 |
| 63 | 24.3 | 1/2-20 UNF - 2B | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 13 | 67 | 80 |
| 80 | 28.8 | 5/8-18 UNF - 2B | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 17 | 78 | 95 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

A Mount Single Rod End – Rod Dimensions

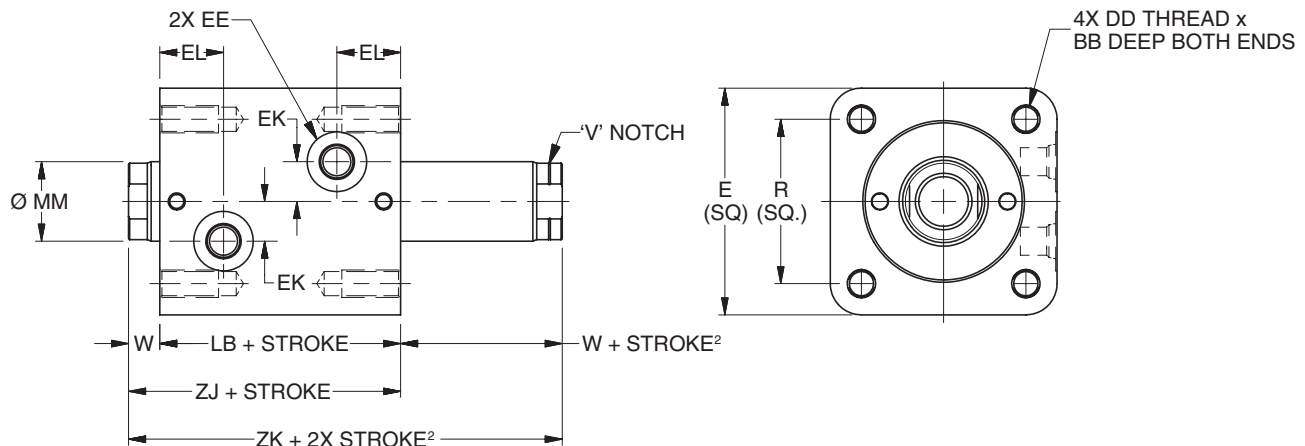
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style A Imperial Tapped Both Ends Mount – Double Rod End – 20mm to 80mm Bore Size



A Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | BB | DD | E | EE | | | EK | EL | R | W ² | Add Stroke | | Add 2X Stroke ZK ² |
|--------|------|------------------|-----|------------------|-----|-------|----|------|----|----------------|------------|----|----------------------------------|
| | | | | SAE | NPT | BSP | | | | | LB | ZJ | |
| 20 | 10.1 | 10-32 UNF - 2B | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 8 | 43 | 51 | 59 |
| 25 | 10.5 | 10-32 UNF - 2B | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 8 | 45 | 53 | 61 |
| 32 | 12.5 | 1/4-28 UNF - 2B | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 10 | 51 | 61 | 71 |
| 40 | 16.6 | 5/16-24 UNF - 2B | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 10 | 55 | 65 | 75 |
| 50 | 20.8 | 3/8-24 UNF - 2B | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 11 | 60 | 71 | 82 |
| 63 | 24.3 | 1/2-20 UNF - 2B | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 13 | 67 | 80 | 93 |
| 80 | 28.8 | 5/8-18 UNF - 2B | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 17 | 78 | 95 | 112 |

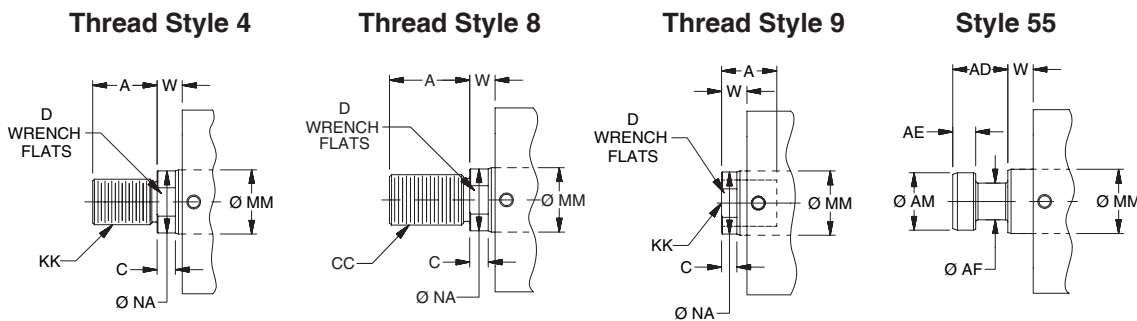
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

A Mount Double Rod End – Rod Dimensions

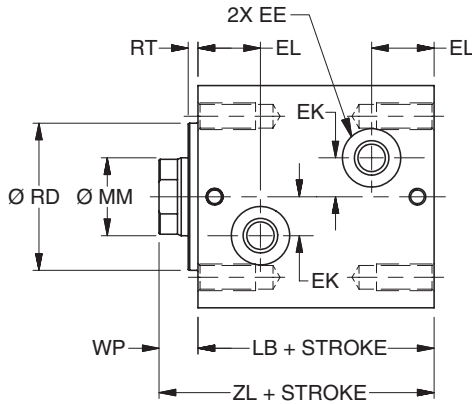
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions

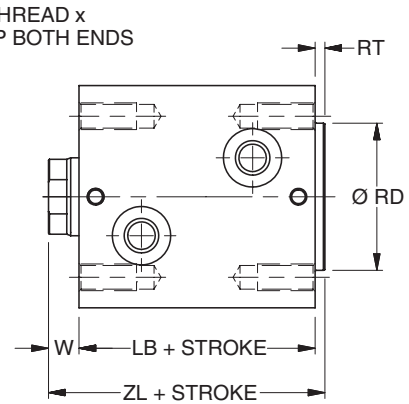
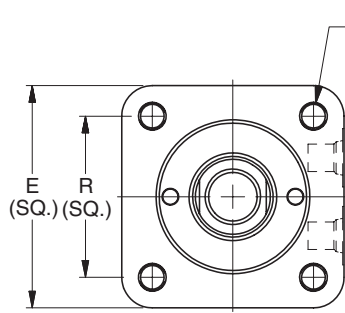


“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

**Styles AN and AR Imperial Tapped Both Ends Mounts with Pilot Gland or Pilot Cap –
Single Rod End – 20mm to 80mm Bore Size**



Style AN Imperial Tapped Both Ends Mount with Pilot Gland



Style AR Imperial Tapped Both Ends Mount with Pilot Cap

AN and AR Mount Single Rod End – Envelope and Mounting Dimensions

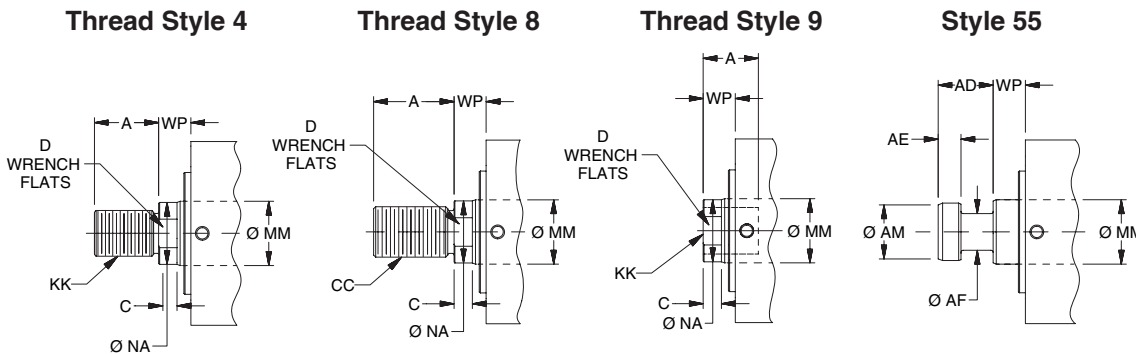
| Bore Ø | BB | DD | E | EE | | | EK | EL | R | RD Ø f9 | RT | W | WP | Add Stroke | |
|--------|------|------------------|-----|------------------|-----|-------|----|------|----|---------|----|----|----|------------|----|
| | | | | SAE | NPT | BSP | | | | | | | | LB | ZL |
| 20 | 10.1 | 10-32 UNF - 2B | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 24 | 3 | 8 | 11 | 43 | 54 |
| 25 | 10.5 | 10-32 UNF - 2B | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 27 | 3 | 8 | 11 | 45 | 56 |
| 32 | 12.5 | 1/4-28 UNF - 2B | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 |
| 40 | 16.6 | 5/16-24 UNF - 2B | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 43 | 3 | 10 | 13 | 55 | 68 |
| 50 | 20.8 | 3/8-24 UNF - 2B | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 53 | 3 | 11 | 14 | 60 | 74 |
| 63 | 24.3 | 1/2-20 UNF - 2B | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 66 | 3 | 13 | 16 | 67 | 83 |
| 80 | 28.8 | 5/8-18 UNF - 2B | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 83 | 3 | 17 | 20 | 78 | 98 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

AN and AR Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

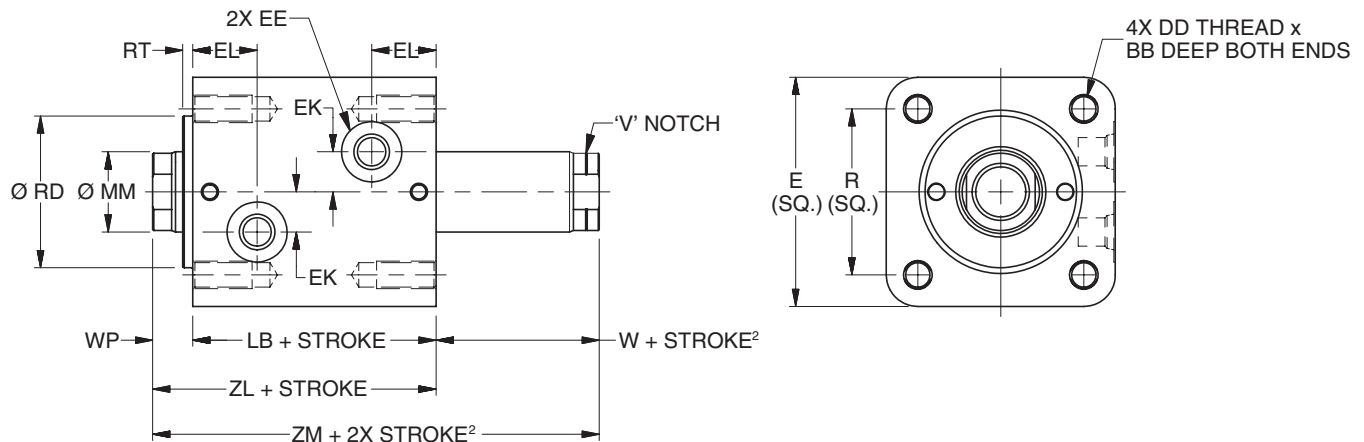
Rod End Dimensions



“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W (AR Mount) or WP (AN Mount) If otherwise special furnish dimensional sketch.

Style AN Imperial Tapped Both Ends Mount with Pilot Gland – Double Rod End – 20mm to 80mm Bore Size



AN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | BB | DD | E | EE | | | EK | EL | R | RD Ø f9 | RT | W ² | WP | Add Stroke | | Add 2X Stroke ZM ² |
|--------|------|------------------|-----|------------------|------|-------|----|------|----|---------|----|----------------|----|------------|----|----------------------------------|
| | | | | SAE | NPTF | BSP | | | | | | | | LB | ZL | |
| 20 | 10.1 | 10-32 UNF - 2B | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 24 | 3 | 8 | 11 | 43 | 54 | 62 |
| 25 | 10.5 | 10-32 UNF - 2B | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 27 | 3 | 8 | 11 | 45 | 56 | 64 |
| 32 | 12.5 | 1/4-28 UNF - 2B | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 | 74 |
| 40 | 16.6 | 5/16-24 UNF - 2B | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 43 | 3 | 10 | 13 | 55 | 68 | 78 |
| 50 | 20.8 | 3/8-24 UNF - 2B | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 53 | 3 | 11 | 14 | 60 | 74 | 85 |
| 63 | 24.3 | 1/2-20 UNF - 2B | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 66 | 3 | 13 | 16 | 67 | 83 | 96 |
| 80 | 28.8 | 5/8-18 UNF - 2B | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 83 | 3 | 17 | 20 | 78 | 98 | 115 |

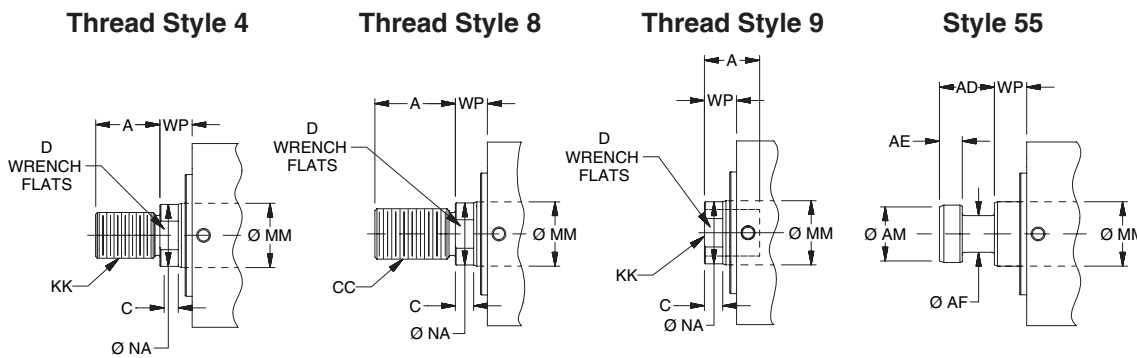
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

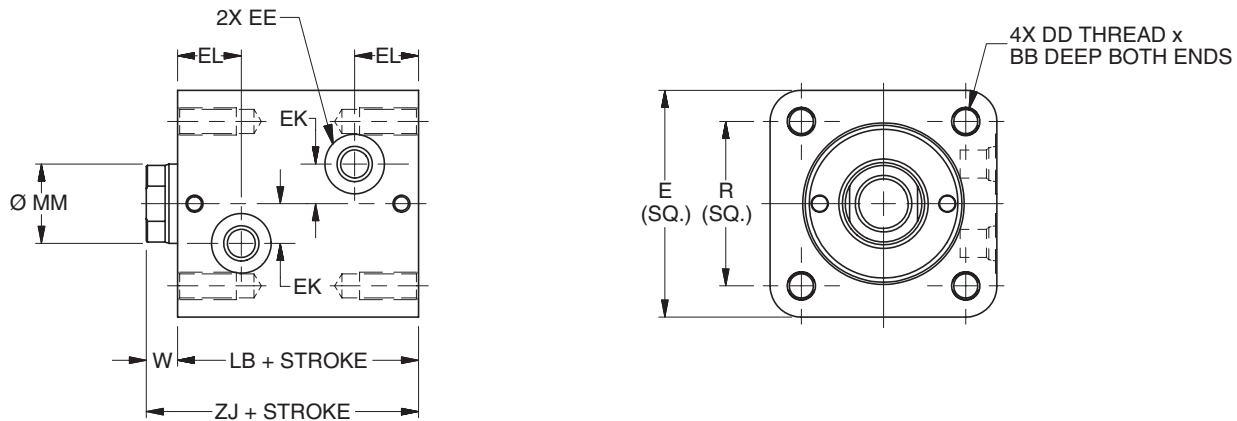
AN Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



Style M Metric Tapped Both Ends Mount – Single Rod End – 20mm to 80mm Bore Size



M Mount Single Rod End – Envelope and Mounting Dimensions

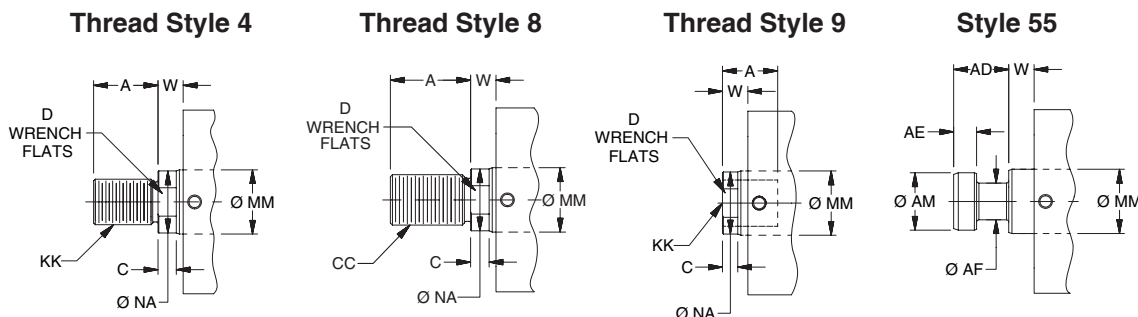
| Bore Ø | BB | DD | E | EE | | | EK | EL | R | W | Add Stroke | |
|--------|------|---------------|-----|------------------|-----|-------|----|------|----|----|------------|----|
| | | | | SAE | NPT | BSP | | | | | LB | ZJ |
| 20 | 10 | M5x0.8 - 6H | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 8 | 43 | 51 |
| 25 | 10.4 | M5x0.8 - 6H | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 8 | 45 | 53 |
| 32 | 12.5 | M6x1 - 6H | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 10 | 51 | 61 |
| 40 | 16.6 | M8x1.25 - 6H | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 10 | 55 | 65 |
| 50 | 20.7 | M10x1.5 - 6H | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 11 | 60 | 71 |
| 63 | 24.9 | M12x1.75 - 6H | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 13 | 67 | 80 |
| 80 | 29.0 | M14x2 - 6H | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 17 | 78 | 95 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

M Mount Single Rod End – Rod Dimensions

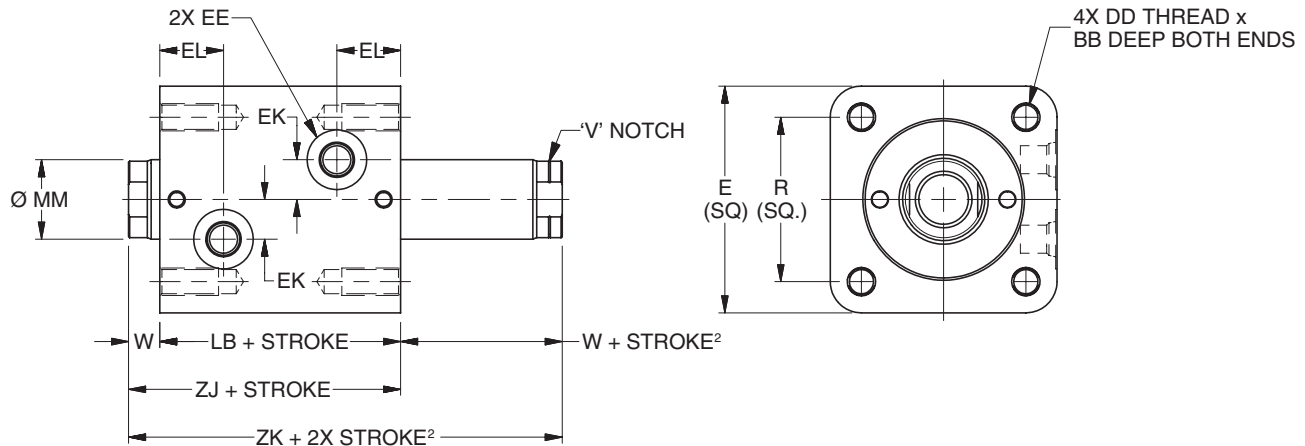
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style M Metric Tapped Both Ends Mount – Double Rod End – 20mm to 80mm Bore Size



M Mount Double Rod End – Envelope and Mounting Dimensions

| Bore | BB | DD | E | EE | | | EK | EL | R | W ² | Add Stroke | | Add 2X Stroke ZK ² |
|------|------|---------------|-----|------------------|-----|-------|----|------|----|----------------|------------|----|----------------------------------|
| | | | | SAE | NPT | BSP | | | | | LB | ZJ | |
| 20 | 10 | M5x0.8 - 6H | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 8 | 43 | 51 | 59 |
| 25 | 10.4 | M5x0.8 - 6H | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 8 | 45 | 53 | 61 |
| 32 | 12.5 | M6x1 - 6H | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 10 | 51 | 61 | 71 |
| 40 | 16.6 | M8x1.25 - 6H | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 10 | 55 | 65 | 75 |
| 50 | 20.7 | M10x1.5 - 6H | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 11 | 60 | 71 | 82 |
| 63 | 24.9 | M12x1.75 - 6H | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 13 | 67 | 80 | 93 |
| 80 | 29.0 | M14x2 - 6H | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 17 | 78 | 95 | 112 |

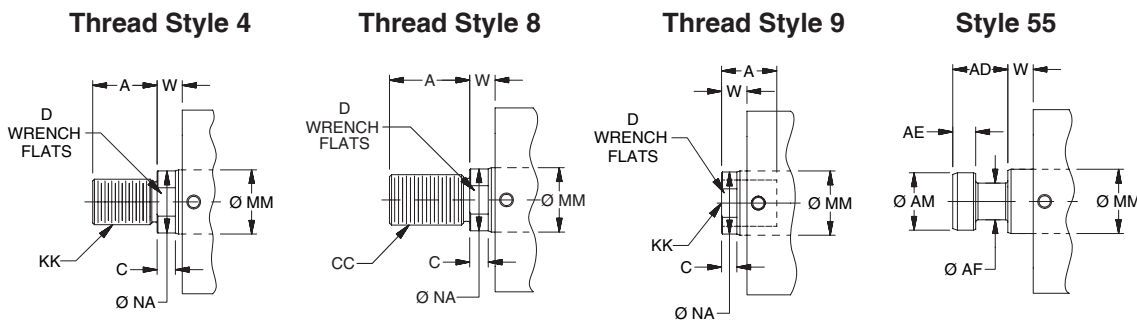
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

M Mount Double Rod End – Rod Dimensions

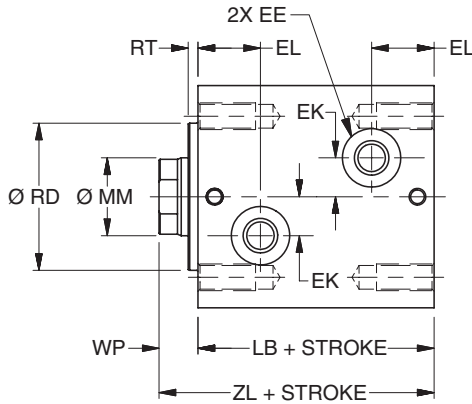
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|-----------|----------------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|-----------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions

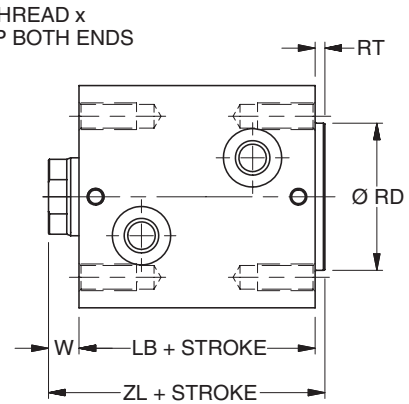
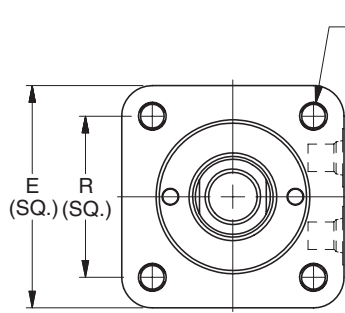


“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Styles MN and MR Metric Tapped Both Ends Mounts with Pilot Gland or Pilot Cap – Single Rod End – 20mm to 80mm Bore Size



Style MN Metric Tapped Both Ends Mount with Pilot Gland



Style MR Metric Tapped Both Ends Mount with Pilot Cap

MN and MR Mount Single Rod End – Envelope and Mounting Dimensions

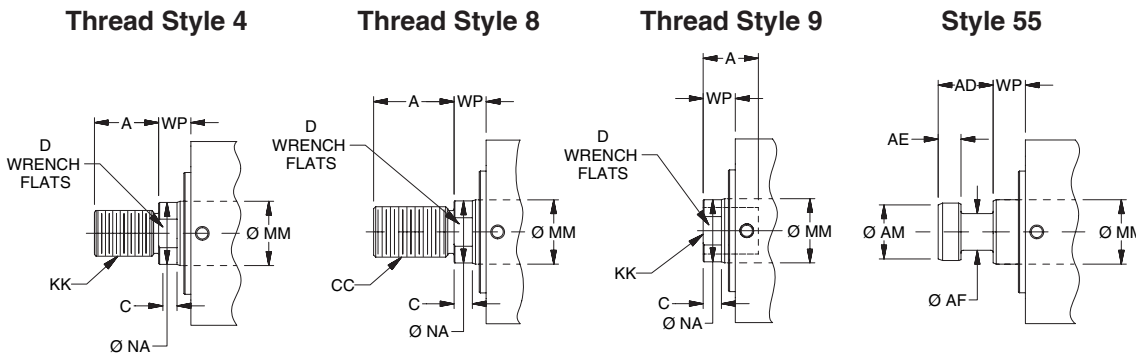
| Bore | BB | DD | E | EE | | | EK | EL | R | RD Ø f9 | RT | W | WP | Add Stroke | |
|------|------|---------------|-----|------------------|-----|-------|----|------|----|---------|----|----|----|------------|----|
| | | | | SAE | NPT | BSP | | | | | | | | LB | ZL |
| 20 | 10 | M5x0.8 - 6H | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 24 | 3 | 8 | 11 | 43 | 54 |
| 25 | 10.4 | M5x0.8 - 6H | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 27 | 3 | 8 | 11 | 45 | 56 |
| 32 | 12.5 | M6x1 - 6H | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 |
| 40 | 16.6 | M8x1.25 - 6H | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 43 | 3 | 10 | 13 | 55 | 68 |
| 50 | 20.7 | M10x1.5 - 6H | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 53 | 3 | 11 | 14 | 60 | 74 |
| 63 | 24.9 | M12x1.75 - 6H | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 66 | 3 | 13 | 16 | 67 | 83 |
| 80 | 29.0 | M14x2 - 6H | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 83 | 3 | 17 | 20 | 78 | 98 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

MN and MR Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

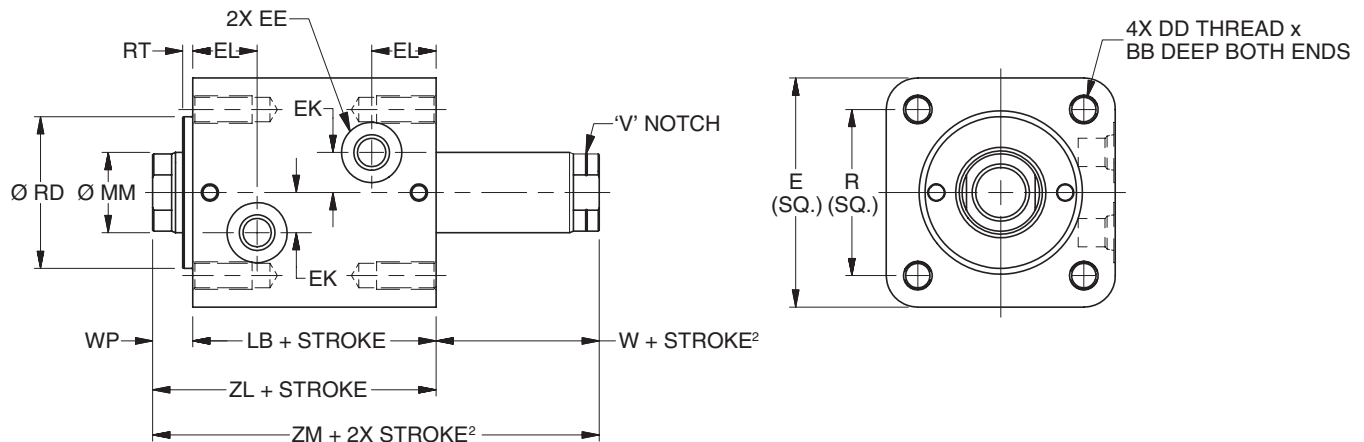
Rod End Dimensions



“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W (MR Mount) or WP (MN Mount) If otherwise special furnish dimensional sketch.

Style MN Metric Tapped Both Ends Mount with Pilot Gland – Double Rod End – 20mm to 80mm Bore Size



MN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | BB | DD | E | EE | | | EK | EL | R | RD Ø f9 | RT | W ² | WP | Add Stroke | | Add 2X Stroke ZM ² |
|--------|------|---------------|-----|------------------|------|-------|----|------|----|---------|----|----------------|----|------------|----|----------------------------------|
| | | | | SAE | NPTF | BSP | | | | | | | | LB | ZL | |
| 20 | 10 | M5x0.8 - 6H | 44 | # 2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 30 | 24 | 3 | 8 | 11 | 43 | 54 | 62 |
| 25 | 10.4 | M5x0.8 - 6H | 50 | # 2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 36 | 27 | 3 | 8 | 11 | 45 | 56 | 64 |
| 32 | 12.5 | M6x1 - 6H | 62 | # 4 | 1/4 | G-1/4 | 11 | 20.5 | 47 | 36 | 3 | 10 | 13 | 51 | 64 | 74 |
| 40 | 16.6 | M8x1.25 - 6H | 70 | # 4 | 1/4 | G-1/4 | 12 | 21 | 52 | 43 | 3 | 10 | 13 | 55 | 68 | 78 |
| 50 | 20.7 | M10x1.5 - 6H | 80 | # 4 | 1/4 | G-1/4 | 14 | 22.5 | 58 | 53 | 3 | 11 | 14 | 60 | 74 | 85 |
| 63 | 24.9 | M12x1.75 - 6H | 94 | # 4 | 1/4 | G-1/4 | 17 | 26 | 69 | 66 | 3 | 13 | 16 | 67 | 83 | 96 |
| 80 | 29.0 | M14x2 - 6H | 114 | # 6 | 3/8 | G-3/8 | 20 | 29.5 | 86 | 83 | 3 | 17 | 20 | 78 | 98 | 115 |

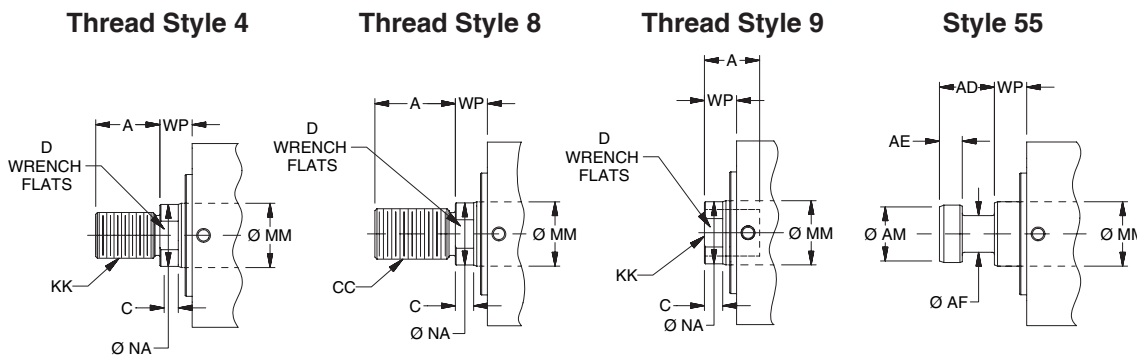
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

MN Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

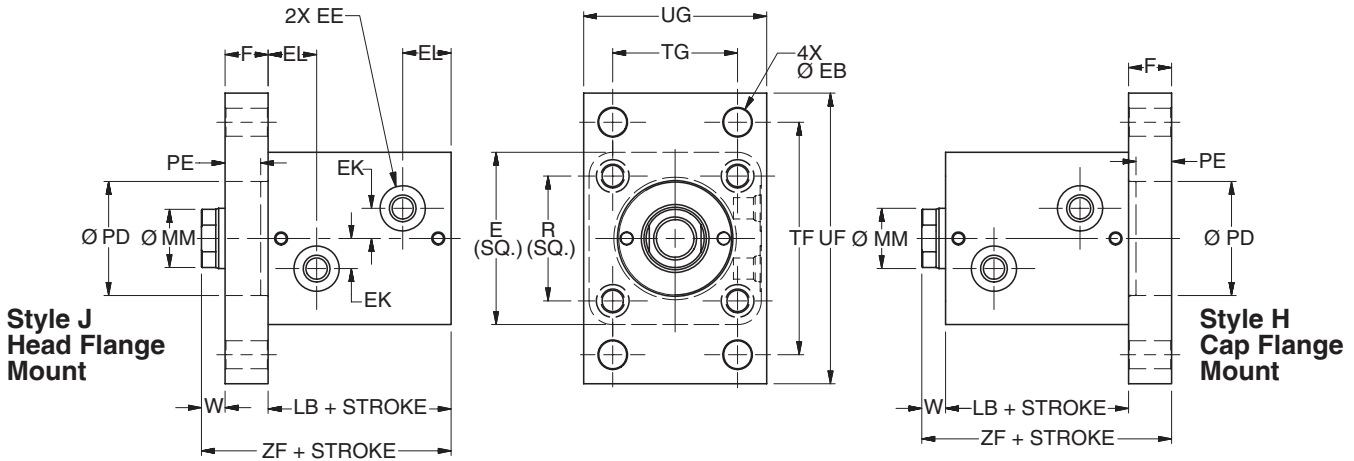
Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & WP. If otherwise special furnish dimensional sketch.

J & H Mounts – Single Rod End

Styles J Rectangular Head Flange & H Rectangular Cap Flange Mounts – Single Rod End – 20mm to 80mm Bore Size



J & H Mounts Single Rod End – Envelope and Mounting Dimensions

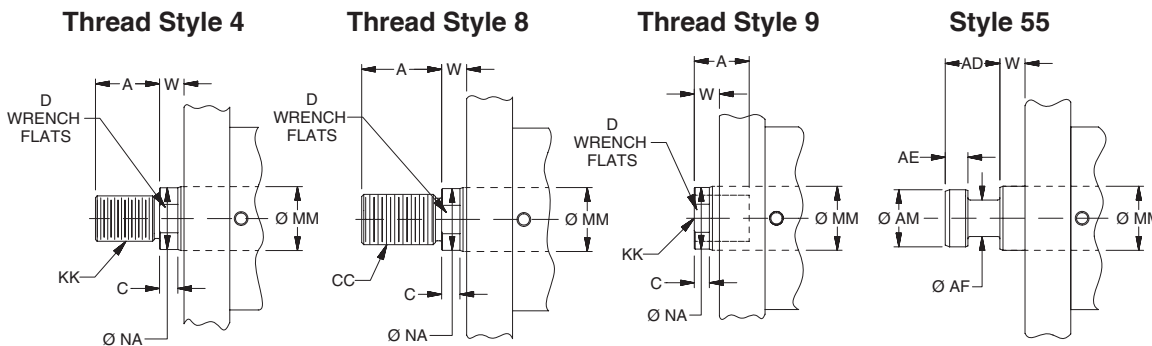
| Bore Ø | E | EE | | | EK | EL | F | EB Ø | PD Ø H9 | PE | R | TF | TG | UF | UG | W | Add Stroke | |
|--------|-----|-----------------|------|-------|----|------|----|------|---------|----|----|-----|----|-----|-----|----|------------|-----|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | LB | ZF |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 10 | 5.5 | 24 | 7 | 30 | 60 | 30 | 75 | 46 | 8 | 43 | 61 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 12 | 5.5 | 27 | 9 | 36 | 66 | 36 | 80 | 52 | 8 | 45 | 65 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 12 | 6.8 | 36 | 9 | 47 | 80 | 40 | 95 | 62 | 10 | 51 | 73 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 16 | 11 | 43 | 13 | 52 | 96 | 46 | 118 | 70 | 10 | 55 | 81 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 20 | 13.5 | 53 | 17 | 58 | 108 | 58 | 135 | 85 | 11 | 60 | 91 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 20 | 15 | 66 | 17 | 69 | 124 | 65 | 150 | 98 | 13 | 67 | 100 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 25 | 17 | 83 | 21 | 86 | 154 | 87 | 185 | 118 | 17 | 78 | 120 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

J & H Mounts Single Rod End – Rod Dimensions

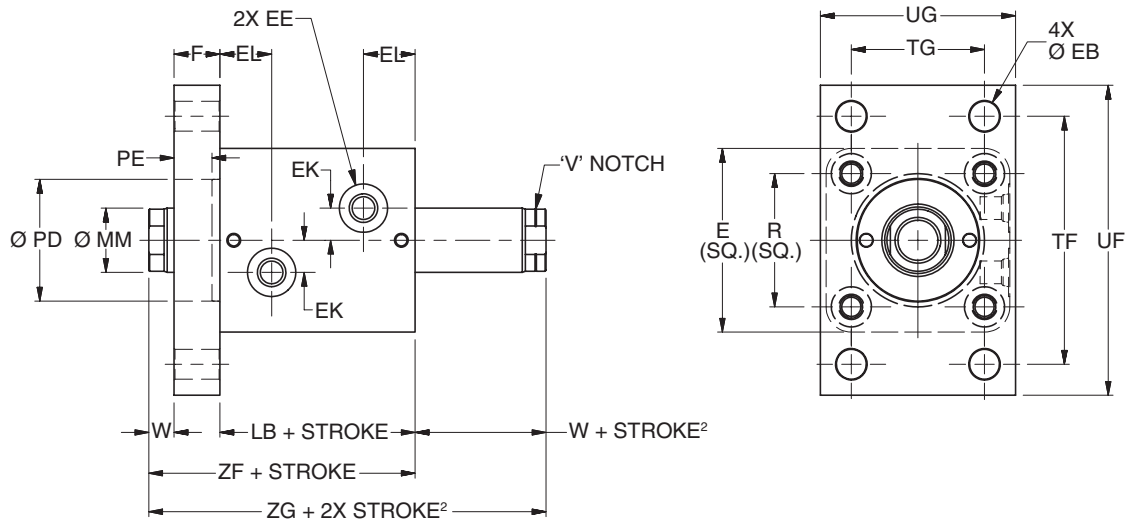
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

Style J Rectangular Head Flange Mount – Double Rod End – 20mm to 80mm Bore Size



J Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | EE | | | EK | EL | F | EB Ø | PD Ø H9 | PE | R | TF | TG | UF | UG | W ² | Add Stroke | | Add 2X Stroke ZG ² |
|--------|-----|-----------------|------|-------|----|------|----|------|---------|----|----|-----|----|-----|-----|----------------|------------|-----|-------------------------------|
| | | SAE | NPTF | BSP | | | | | | | | | | | | | LB | ZF | |
| 20 | 44 | #2 ¹ | 1/8 | G-1/8 | 6 | 16.5 | 10 | 5.5 | 24 | 7 | 30 | 60 | 30 | 75 | 46 | 8 | 43 | 61 | 69 |
| 25 | 50 | #2 ¹ | 1/8 | G-1/8 | 8 | 17.5 | 12 | 5.5 | 27 | 9 | 36 | 66 | 36 | 80 | 52 | 8 | 45 | 65 | 73 |
| 32 | 62 | #4 | 1/4 | G-1/4 | 11 | 20.5 | 12 | 6.8 | 36 | 9 | 47 | 80 | 40 | 95 | 62 | 10 | 51 | 73 | 83 |
| 40 | 70 | #4 | 1/4 | G-1/4 | 12 | 21 | 16 | 11 | 43 | 13 | 52 | 96 | 46 | 118 | 70 | 10 | 55 | 81 | 91 |
| 50 | 80 | #4 | 1/4 | G-1/4 | 14 | 22.5 | 20 | 13.5 | 53 | 17 | 58 | 108 | 58 | 135 | 85 | 11 | 60 | 91 | 102 |
| 63 | 94 | #4 | 1/4 | G-1/4 | 17 | 26 | 20 | 15 | 66 | 17 | 69 | 124 | 65 | 150 | 98 | 13 | 67 | 100 | 113 |
| 80 | 114 | #6 | 3/8 | G-3/8 | 20 | 29.5 | 25 | 17 | 83 | 21 | 86 | 154 | 87 | 185 | 118 | 17 | 78 | 120 | 137 |

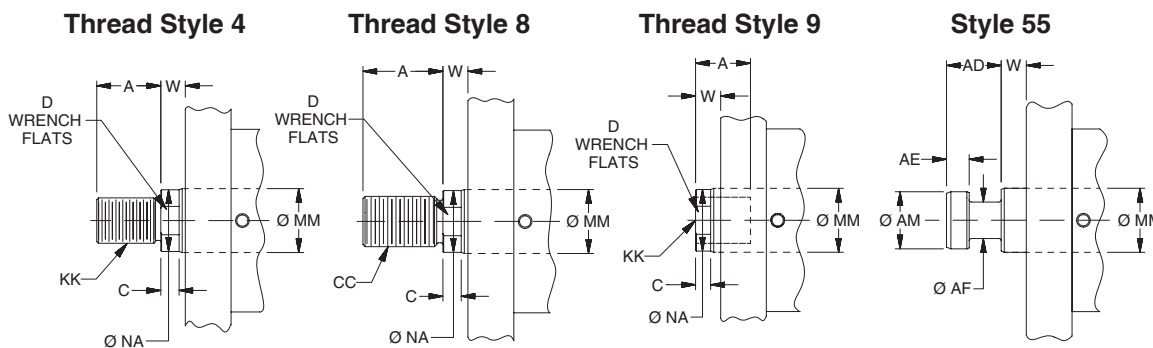
¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

J Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 20 | 12 | M8x1.25 | 10 | M8x1 | 14 | 5/16-24 | 10 | 5/16-24 | 14 | 3/8-24 | 16 | 8 | 3 | 6 | 11 | 6 | 10 | 11 |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |
| 80 | 45 | M33x3.5 | 35 | M33x2 | 45 | 1 1/4-12 | 35 | 1 1/4-12 | 45 | 1 1/2-12 | 56 | 34 | 14 | 28 | 41 | 13 | 39 | 43 |

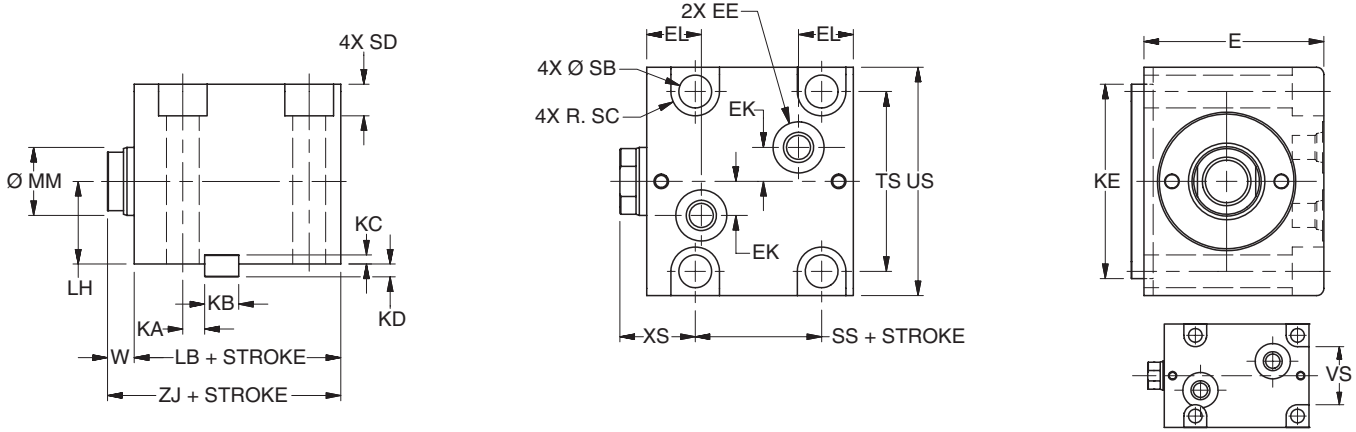
Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

C Mount – Single Rod End

Style C Foot Mount – Single Rod End – 25mm to 63mm Bore Size

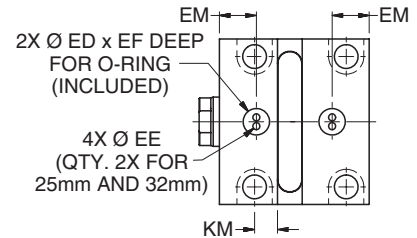


C Mount Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | ED Ø | EE | | | | EF | EK | EL | EM | KA | KB | KC | KD | KE |
|--------|----|------|------------------|-----|-------|-----------|----|----|------|------|-----|----|------|------|-----|
| | | | SAE | NPT | BSP | Mani-fold | | | | | | | | | |
| 25 | 45 | 10 | # 2 ¹ | 1/8 | G-1/8 | 3 | 2 | 7 | 17.5 | 15.8 | 8.5 | 8 | 3.25 | 3.75 | 45 |
| 32 | 56 | 10 | # 4 | 1/4 | G-1/4 | 3 | 2 | 11 | 20.5 | 18.5 | 8 | 12 | 3.25 | 4.75 | 63 |
| 40 | 64 | 12 | # 4 | 1/4 | G-1/4 | 3 | 2 | 12 | 21 | 19 | 8 | 12 | 3.25 | 4.75 | 70 |
| 50 | 74 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 14 | 22.5 | 21 | 9 | 14 | 3.75 | 5.25 | 80 |
| 63 | 89 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 17 | 26 | 24.5 | 11 | 16 | 4.25 | 5.75 | 100 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F50X.

25mm & 32mm BOLT HOLE DETAIL



MANIFOLD PORT OPTION DETAIL
CAUTION: KM key slot location is for manifold ports only. Do not use for top mounted ports. KA key slot location is for top mounted ports. Do not use for manifold ports.

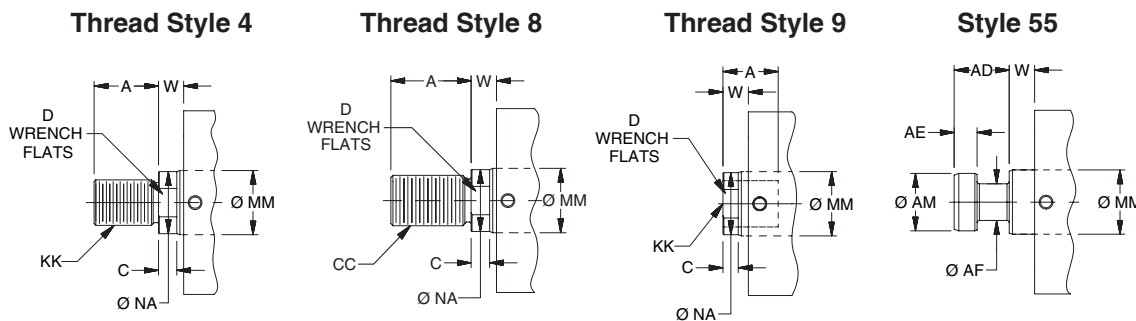
C Mount Single Rod End – Rod Dimensions

| Bore Ø | KM | LH | SB Ø | SC | SD | TS | US | VS | W | XS | Add Stroke | | | Min. Stroke For M Port |
|--------|------|----|------|------|------|----|-----|----|----|----|------------|------|----|------------------------|
| | | | | | | | | | | | LB | SS | ZJ | |
| 25 | 8.5 | 20 | 6.8 | 5.5 | 6.5 | 39 | 50 | 28 | 8 | 23 | 45 | 24.5 | 53 | 10 |
| 32 | 8 | 25 | 9 | 7 | 8.6 | 56 | 70 | 42 | 10 | 30 | 51 | 24 | 61 | 15 |
| 40 | 8 | 29 | 11 | 8.75 | 10.8 | 62 | 80 | - | 10 | 30 | 55 | 23 | 65 | 15 |
| 50 | 13 | 34 | 13.5 | 10 | 13 | 74 | 94 | - | 11 | 31 | 60 | 27 | 71 | 20 |
| 63 | 15.5 | 42 | 16 | 11.5 | 15.2 | 90 | 114 | - | 13 | 33 | 67 | 32 | 80 | 20 |

C Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |

Rod End Dimensions

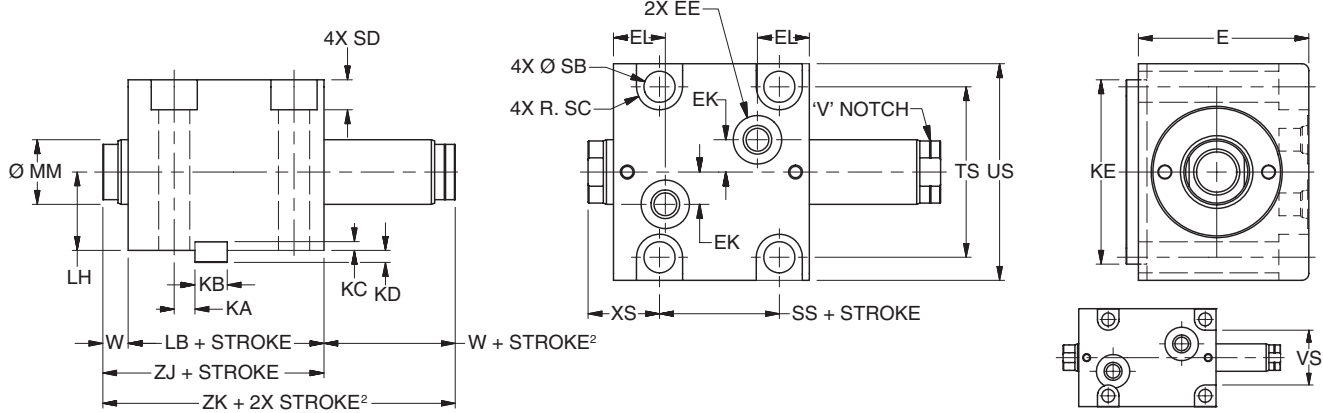


“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise special furnish dimensional sketch.

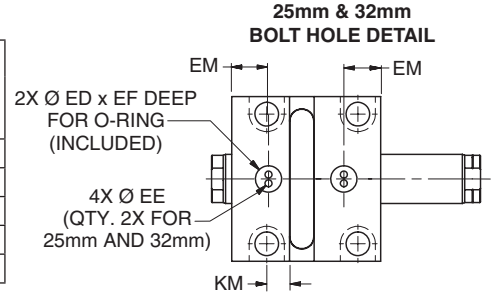
C Mount – Double Rod End

Style C Foot Mount – Double Rod End – 25mm to 63mm Bore Size



C Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | ED Ø | EE | | | | EF | EK | EL | EM | KA | KB | KC | KD | KE |
|--------|----|------|------------------|-----|-------|----------|----|----|------|------|-----|----|------|------|-----|
| | | | SAE | NPT | BSP | Manifold | | | | | | | | | |
| 25 | 45 | 10 | # 2 ¹ | 1/8 | G-1/8 | 3 | 2 | 7 | 17.5 | 15.8 | 8.5 | 8 | 3.25 | 3.75 | 45 |
| 32 | 56 | 10 | # 4 | 1/4 | G-1/4 | 3 | 2 | 11 | 20.5 | 18.5 | 8 | 12 | 3.25 | 4.75 | 63 |
| 40 | 64 | 12 | # 4 | 1/4 | G-1/4 | 3 | 2 | 12 | 21 | 19 | 8 | 12 | 3.25 | 4.75 | 70 |
| 50 | 74 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 14 | 22.5 | 21 | 9 | 14 | 3.75 | 5.25 | 80 |
| 63 | 89 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 17 | 26 | 24.5 | 11 | 16 | 4.25 | 5.75 | 100 |



¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.

MANIFOLD PORT OPTION DETAIL
CAUTION: KM key slot location is for manifold ports only. Do not use for top mounted ports. KA key slot location is for top mounted ports. Do not use for manifold ports.

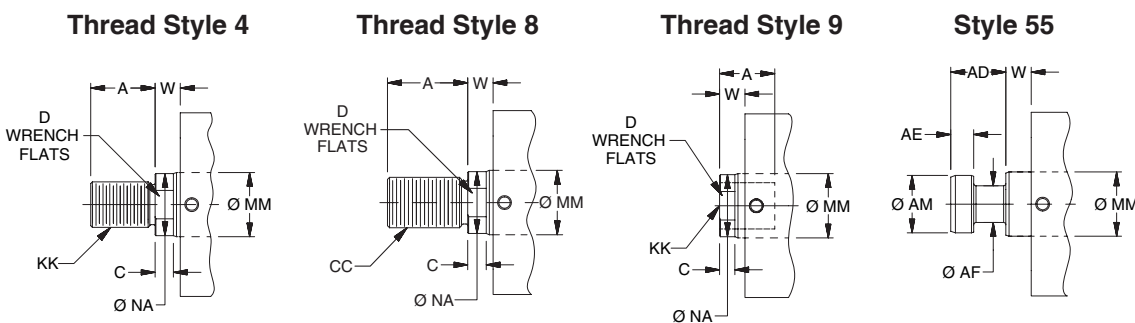
C Mount Double Rod End – Rod Dimensions

| Bore Ø | KM | LH | SB Ø | SC | SD | TS | US | VS | W ² | XS | Add Stroke | | | Add 2X Stroke | Min. Stroke For M Port |
|--------|------|----|------|------|------|----|-----|----|----------------|----|------------|------|----|-----------------|------------------------|
| | | | | | | | | | | | LB | SS | ZJ | ZK ² | |
| 25 | 8.5 | 20 | 6.8 | 5.5 | 6.5 | 39 | 50 | 28 | 8 | 23 | 45 | 24.5 | 53 | 61 | 10 |
| 32 | 8 | 25 | 9 | 7 | 8.6 | 56 | 70 | 42 | 10 | 30 | 51 | 24 | 61 | 71 | 15 |
| 40 | 8 | 29 | 11 | 8.75 | 10.8 | 62 | 80 | - | 10 | 30 | 55 | 23 | 65 | 75 | 15 |
| 50 | 13 | 34 | 13.5 | 10 | 13 | 74 | 94 | - | 11 | 31 | 60 | 27 | 71 | 82 | 20 |
| 63 | 15.5 | 42 | 16 | 11.5 | 15.2 | 90 | 114 | - | 13 | 33 | 67 | 32 | 80 | 93 | 20 |

C Mount Single Rod End – Rod Dimensions

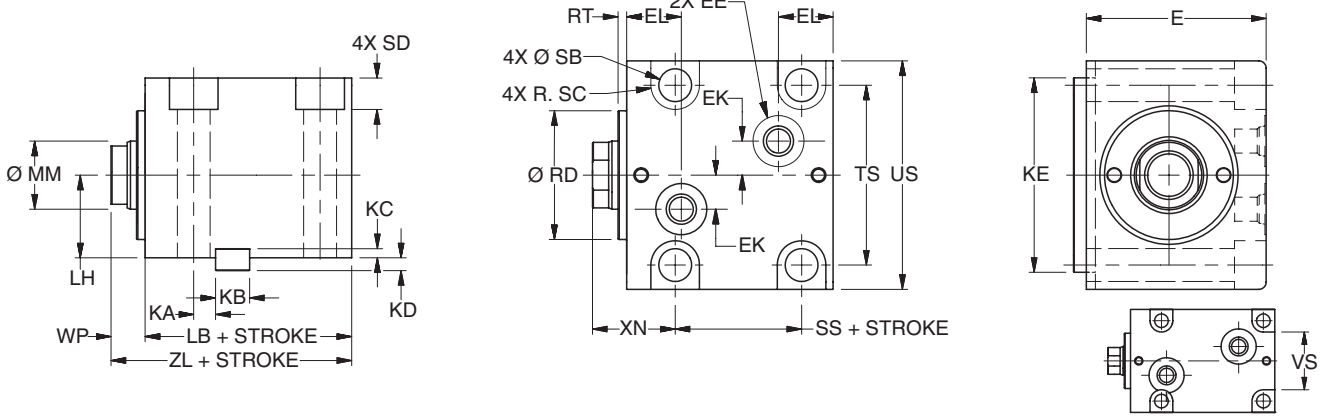
| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |

Rod End Dimensions



“Special” Thread Style 3
Special thread, extension, rod eye, blank, etc. are also available.
To order, specify “Style 3” and give desired dimensions for KK, A, & W. If otherwise specify special furnish dimensional sketch.

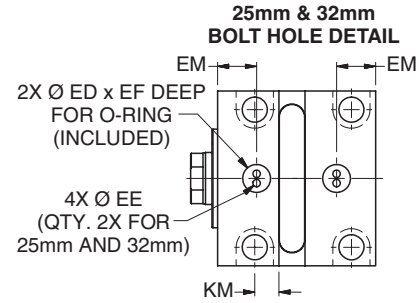
Style CN Foot Mount with Pilot Gland – Single Rod End – 25mm to 63mm Bore Size



CN Mount Single Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | ED Ø | EE | | | | EF | EK | EL | EM | KA | KB | KC | KD | KE |
|--------|----|------|------|-----|-------|-----------|----|----|------|------|-----|----|------|------|-----|
| | | | SAE | NPT | BSP | Mani-fold | | | | | | | | | |
| 25 | 45 | 10 | # 2' | 1/8 | G-1/8 | 3 | 2 | 7 | 17.5 | 15.8 | 8.5 | 8 | 3.25 | 3.75 | 45 |
| 32 | 56 | 10 | # 4 | 1/4 | G-1/4 | 3 | 2 | 11 | 20.5 | 18.5 | 8 | 12 | 3.25 | 4.75 | 63 |
| 40 | 64 | 12 | # 4 | 1/4 | G-1/4 | 3 | 2 | 12 | 21 | 19 | 8 | 12 | 3.25 | 4.75 | 70 |
| 50 | 74 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 14 | 22.5 | 21 | 9 | 14 | 3.75 | 5.25 | 80 |
| 63 | 89 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 17 | 26 | 24.5 | 11 | 16 | 4.25 | 5.75 | 100 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.



MANIFOLD PORT OPTION DETAIL

CAUTION: KM key slot location is for manifold ports only. Do not use for top mounted ports. KA key slot location is for top mounted ports. Do not use for manifold ports.

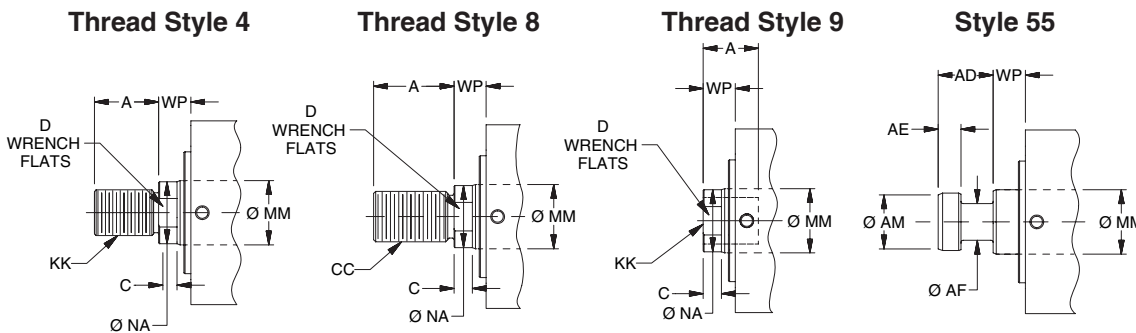
CN Mount Single Rod End – Rod Dimensions

| Bore Ø | KM | LH | RD Ø f9 | RT | SB Ø | SC | SD | TS | US | VS | WP | XN | Add Stroke | | | Min. Stroke For M Port |
|--------|------|----|---------|----|------|------|------|----|-----|----|----|----|------------|------|----|------------------------|
| | | | | | | | | | | | | | LB | SS | ZL | |
| 25 | 8.5 | 20 | 27 | 3 | 6.8 | 5.5 | 6.5 | 39 | 50 | 28 | 11 | 26 | 45 | 24.5 | 56 | 10 |
| 32 | 8 | 25 | 36 | 3 | 9 | 7 | 8.6 | 56 | 70 | 42 | 13 | 33 | 51 | 24 | 64 | 15 |
| 40 | 8 | 29 | 43 | 3 | 11 | 8.75 | 10.8 | 62 | 80 | - | 13 | 33 | 55 | 23 | 68 | 15 |
| 50 | 13 | 34 | 53 | 3 | 13.5 | 10 | 13 | 74 | 94 | - | 14 | 34 | 60 | 27 | 74 | 20 |
| 63 | 15.5 | 42 | 66 | 3 | 16 | 11.5 | 15.2 | 90 | 114 | - | 16 | 36 | 67 | 32 | 83 | 20 |

CN Mount Single Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M | | Style 4M | | Style 9A | | Style 4A | | Style 8A | | Style 55M | | | | C | D | NA |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | | | |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |

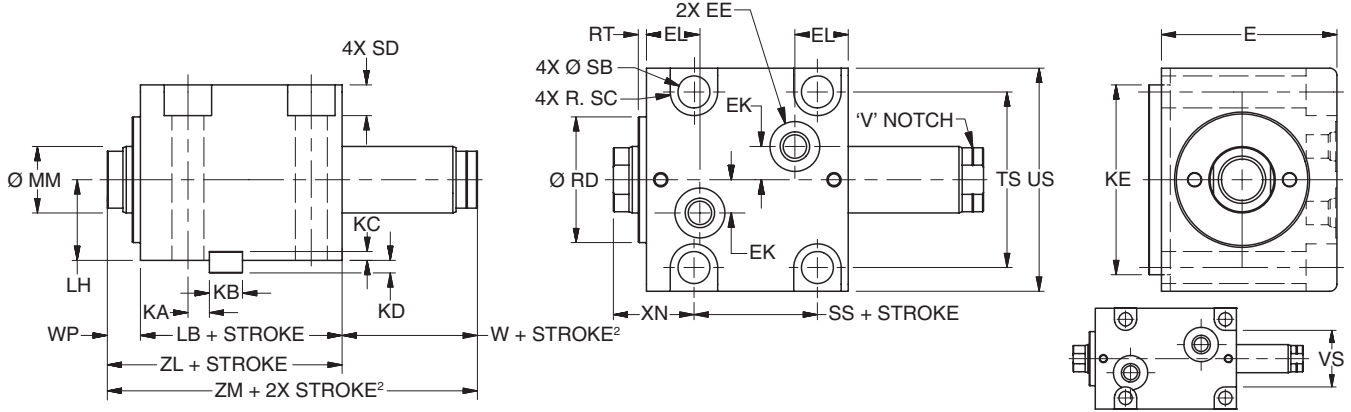
Rod End Dimensions



“Special” Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK, A, & WP. If otherwise special furnish dimensional sketch.

Style CN Foot Mount with Pilot Gland – Double Rod End – 25mm to 63mm Bore Size

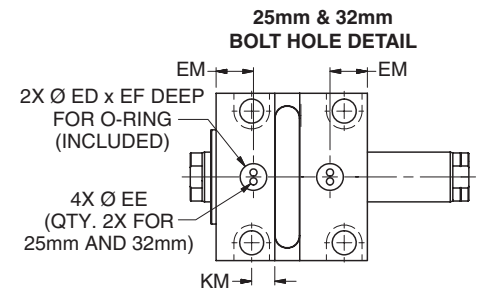


CN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | E | ED Ø | EE | | | | EF | EK | EL | EM | KA | KB | KC | KD | KE |
|--------|----|------|------|-----|-------|----------|----|----|------|------|-----|----|------|------|-----|
| | | | SAE | NPT | BSP | Manifold | | | | | | | | | |
| 25 | 45 | 10 | # 2' | 1/8 | G-1/8 | 3 | 2 | 7 | 17.5 | 15.8 | 8.5 | 8 | 3.25 | 3.75 | 45 |
| 32 | 56 | 10 | # 4 | 1/4 | G-1/4 | 3 | 2 | 11 | 20.5 | 18.5 | 8 | 12 | 3.25 | 4.75 | 63 |
| 40 | 64 | 12 | # 4 | 1/4 | G-1/4 | 3 | 2 | 12 | 21 | 19 | 8 | 12 | 3.25 | 4.75 | 70 |
| 50 | 74 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 14 | 22.5 | 21 | 9 | 14 | 3.75 | 5.25 | 80 |
| 63 | 89 | 15 | # 4 | 1/4 | G-1/4 | 4 | 2 | 17 | 26 | 24.5 | 11 | 16 | 4.25 | 5.75 | 100 |

¹ Parker Triple-Lok™ Straight Thread Connector SAE #2 to 1/4" 37° flare can be used when this port thread is required. Contact your local Parker Tube Fitting distributor and specify part number 4-2 F5OX.

² Minimum 'W + Stroke' on V notch rod side may apply. See minimum rod extension page for details.



MANIFOLD PORT OPTION DETAIL
CAUTION: KM key slot location is for manifold ports only. Do not use for top mounted ports. KA key slot location is for top mounted ports. Do not use for manifold ports.

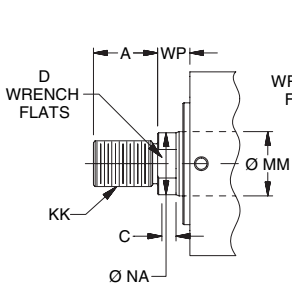
CN Mount Double Rod End – Envelope and Mounting Dimensions

| Bore Ø | KM | LH | RD Ø f9 | RT | SB Ø | SC | SD | TS | US | VS | W ² | WP | XN | Add Stroke | | | Add 2X Stroke | | Min. Stroke For M Port |
|--------|------|----|---------|----|------|------|------|----|-----|----|----------------|----|----|------------|------|----|-----------------|----|------------------------|
| | | | | | | | | | | | | | | LB | SS | ZL | ZM ² | | |
| 25 | 8.5 | 20 | 27 | 3 | 6.8 | 5.5 | 6.5 | 39 | 50 | 28 | 8 | 11 | 26 | 45 | 24.5 | 56 | 64 | 10 | |
| 32 | 8 | 25 | 36 | 3 | 9 | 7 | 8.6 | 56 | 70 | 42 | 10 | 13 | 33 | 51 | 24 | 64 | 74 | 15 | |
| 40 | 8 | 29 | 43 | 3 | 11 | 8.75 | 10.8 | 62 | 80 | - | 10 | 13 | 33 | 55 | 23 | 68 | 78 | 15 | |
| 50 | 13 | 34 | 53 | 3 | 13.5 | 10 | 13 | 74 | 94 | - | 11 | 14 | 34 | 60 | 27 | 74 | 85 | 20 | |
| 63 | 15.5 | 42 | 66 | 3 | 16 | 11.5 | 15.2 | 90 | 114 | - | 13 | 16 | 36 | 67 | 32 | 83 | 96 | 20 | |

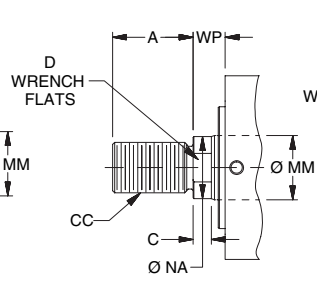
CN Mount Double Rod End – Rod Dimensions

| Bore Ø | MM Rod Ø | Rod End | | | | | | | | | | | | | | Rod Extension Dimensions | | |
|--------|----------|-----------------------|----|----------|----|-----------------------|----|----------|----|----------|----|-----------|----|----|----|--------------------------|----|----|
| | | Style 9M ² | | Style 4M | | Style 9A ² | | Style 4A | | Style 8A | | Style 55M | | | | | | |
| | | KK | A | KK | A | KK | A | KK | A | CC | A | AD | AE | AF | AM | C | D | NA |
| 25 | 14 | M10x1.5 | 12 | M10x1.25 | 16 | 3/8-24 | 12 | 3/8-24 | 16 | 1/2-20 | 18 | 12 | 4 | 8 | 13 | 6 | 12 | 13 |
| 32 | 18 | M12x1.75 | 15 | M12x1.25 | 18 | 7/16-20 | 15 | 7/16-20 | 18 | 9/16-18 | 25 | 16 | 6 | 10 | 16 | 8 | 15 | 17 |
| 40 | 22 | M16x2 | 20 | M16x1.5 | 22 | 5/8-18 | 20 | 5/8-18 | 22 | 3/4-16 | 30 | 20 | 8 | 12 | 20 | 8 | 19 | 21 |
| 50 | 28 | M20x2.5 | 24 | M20x1.5 | 28 | 3/4-16 | 24 | 3/4-16 | 28 | 7/8-14 | 35 | 24 | 10 | 16 | 25 | 9 | 24 | 27 |
| 63 | 36 | M27x3 | 30 | M27x2 | 36 | 1-14 | 30 | 1-14 | 36 | 1 1/4-12 | 45 | 28 | 12 | 22 | 33 | 11 | 32 | 35 |

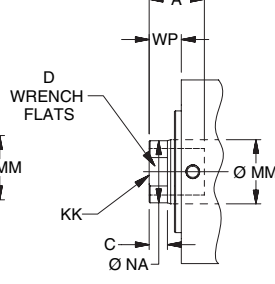
**Rod End Dimensions
Thread Style 4**



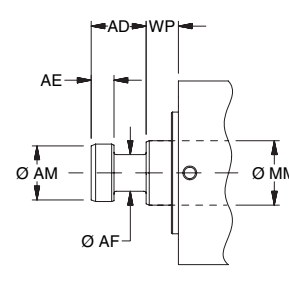
Thread Style 8



Thread Style 9



Style 55

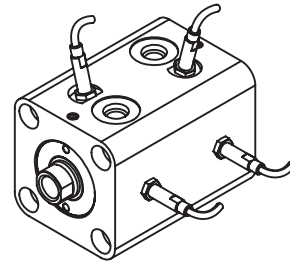


"Special" Thread Style 3

Special thread, extension, rod eye, blank, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK, A, & WP. If otherwise special furnish dimensional sketch.

EPS-C Threaded Style End-of-Stroke Switch

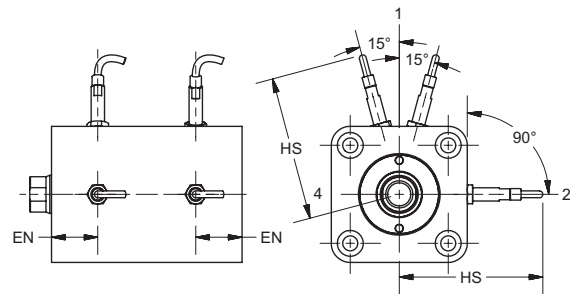
Optional high pressure inductive switches provide an end-of stroke signal in Series CHD cylinders. Available on both ends or one end only, EPS-C switches are low profile and can be specified on any of the four sides of the cylinder, except Styles C and CN where they are only available at port position #1.



| EPS-C Switch Specifications | |
|-----------------------------|---|
| Switch Type: | Inductive Proximity |
| Style: | EPS-C |
| Code Designator: | J |
| Description: | General Purpose, 3 wire, DC Sensor |
| Supply Voltage: | 10 to 30 VDC |
| Load Current, max.: | 100 mA |
| Leak Current: | 100 µA |
| Voltage Drop: | ≤ 2.5 V |
| Operating Temperature: | -13° F to +176° F |
| Part Number: | 0961930000 |
| Connection: | .3m Lead with 8mm Connector |
| Enclosure Rating: | Enclosure - IP68 |
| Led Indication: | No |
| Short Circuit Protection: | Yes |
| Weld Field Immunity: | Yes |
| Output: | PNP |
| Approvals/Marks: | CE |
| Make/Break Location: | 0.25" from end of stroke typical. Tolerance is +0 / -0.13" |
| Wiring Instructions: | |

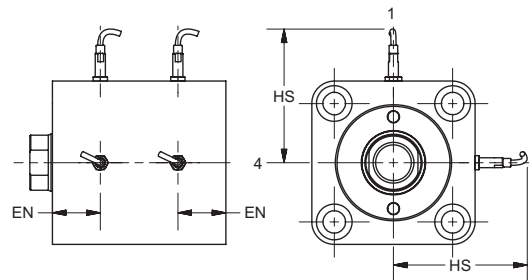
EPS-C Switch Dimensions

| Bore Ø | EN | HS |
|--------|------|------|
| 25 | 17 | 50.5 |
| 32 | 20 | 54 |
| 40 | 21 | 58 |
| 50 | 23.5 | 63 |
| 63 | 26.5 | 69.5 |
| 80 | 30 | 78 |



Bores 25 – 40
Positions 1 – 4
(Styles C & CN position 1 only)

Note: Switch installation at 15° angle is only required when specified at position 1 (same position as ports).



Bores 50 – 80
Positions 1 – 4
(Styles C & CN position 1 only)

EPS-C limit switches may be ordered as follows:

- 1) Complete the basic cylinder model number.
- 2) Place an "S" in the model number for Special Modification.
- 3) Special modifications to cylinders other than switches must be described in the item notes.
- 4) Limit Switch Code – Specify letter prefix "J" for EPS-C then fill in the four blanks specifying port location, switch location and actuation point for both head and cap. If only one switch is used, place "XXXX" in the unused blanks.

Example = J13GG-XXXX denotes a switch on the Gland end only.

Example = XXXX-J42GG denotes a switch on the cap end only.

8mm Cordset

| Cable Length | Threaded Connector | Snap On Connector |
|--------------|--------------------|-------------------|
| 5 meters | 086620T005 | 086620S005 |
| 2 meters | 086620T002 | 086620S002 |

Limit Switch Code

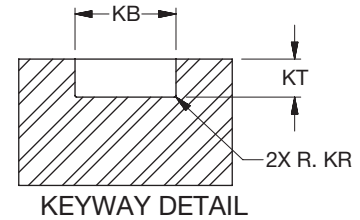
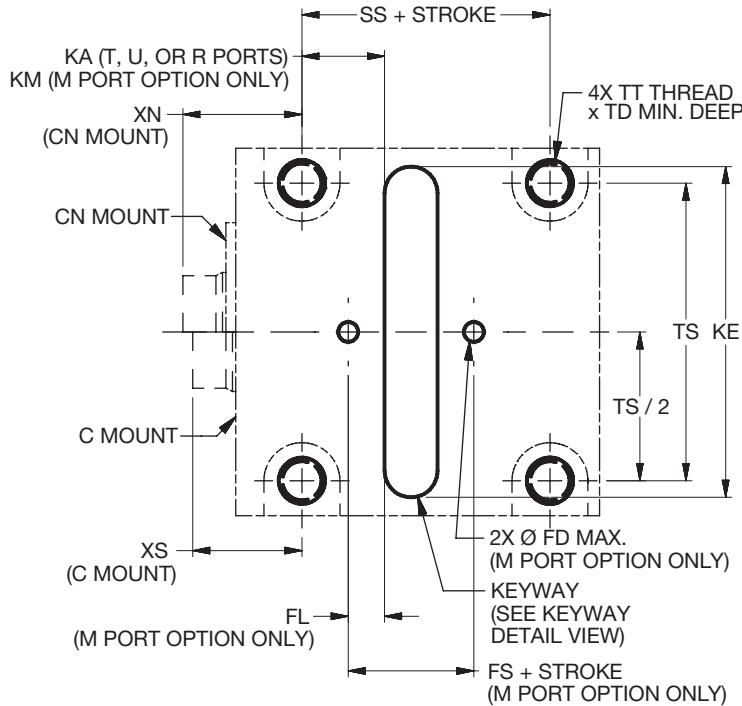
| Head End | | | | Cap End | | |
|------------------|---------------|-----------------|--------------------------------------|---------------|-----------------|--------------------------------------|
| J | 1' | 2 | GG | 1' | 2 | GG |
| Specify: J=EPS-C | Port Location | Switch Location | Actuation Point GG= End of Stroke | Port Location | Switch Location | Actuation Point GG= End of Stroke |

¹ Ports must always be specified in position 1.

Suggested Machining for Mounting Series CHD Styles C & CN Cylinders

The drawings and dimensions can be used as a suggested guide for preparing the mounting interface for a mounting style C or CN cylinder. Take care to note that the keyway location varies between top threaded port and bottom manifold port types. The KA keyway location is for top ports only and should not be

used for manifold ports. And, the KM keyway location is for bottom manifold ports and should not be used for top threaded ports. Also the XS rod dimension applies only to the C mount and the XN rod dimension applies only to the CN mount.



Machining Interface Dimensions

| Bore Ø | FD ² | FL ² | KA ¹ | KB | KE | KM ² | KR | KT | TD | TS | TT | XN ³ | XS ³ | Add Stroke | |
|--------|-----------------|-----------------|-----------------|----------------------|---------------------|-----------------|-----------------------|---------------------|----|----|-------------|-----------------|-----------------|-----------------|------|
| | | | | | | | | | | | | | | FS ² | SS |
| 25 | 3 | 7.8 | 8.5 | 8 ^{-0.043} | 45 ^{+0.5} | 8.5 | 0.16 ^{+0.09} | 4 ^{+0.2} | 14 | 39 | M6x1-6H | 26 | 23 | 13.5 | 24.5 |
| 32 | 3 | 9.5 | 8 | 12 ^{-0.043} | 63 ^{+0.5} | 8 | 0.25 ^{+0.15} | 5 ^{+0.2} | 16 | 56 | M8x1.25-6H | 33 | 30 | 14 | 24 |
| 40 | 5 | 9 | 8 | 12 ^{-0.043} | 70 ^{+0.5} | 8 | 0.25 ^{+0.15} | 5 ^{+0.2} | 20 | 62 | M10x1.5-6H | 33 | 30 | 17 | 23 |
| 50 | 6 | 12 | 9 | 14 ^{-0.043} | 80 ^{+0.5} | 13 | 0.25 ^{+0.15} | 5.5 ^{+0.2} | 22 | 74 | M12x1.75-6H | 34 | 31 | 18 | 27 |
| 63 | 6 | 11 | 11 | 16 ^{-0.043} | 100 ^{+0.5} | 15.5 | 0.25 ^{+0.15} | 6 ^{+0.2} | 24 | 90 | M14x2-6H | 36 | 33 | 18 | 32 |

¹ KA keyway location is for top ports only - do not use for 'M' manifold port option.

² KM keyway location, FD flow hole Ø and FL / FS flow hole locations apply to 'M' manifold port option only.

³ XS dimension is used for C mount; XN dimension is used for CN mount.

Mounting Hardware

| Bore Ø | Nominal Key Dimensions | Mounting SHCS ⁴ |
|--------|------------------------|----------------------------|
| 25 | 8 x 7 x 45 | M6 x 50 |
| 32 | 12 x 8 x 63 | M8 x 60 |
| 40 | 12 x 8 x 70 | M10 x 70 |
| 50 | 14 x 9 x 80 | M12 x 80 |
| 63 | 16 x 10 x 100 | M14 x 95 |

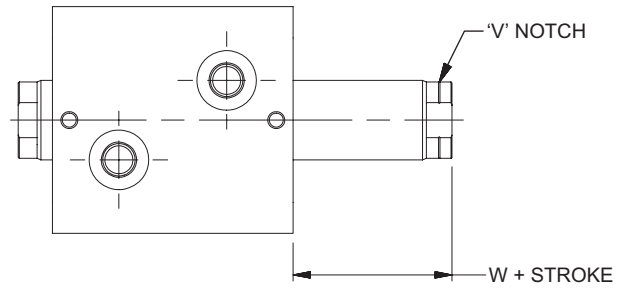
⁴ Customer supplied (4x)

Minimum Rod Extension

Double rod cylinders with Style 9 on V notch side of cylinder

When a rod end Style 9 is specified on the V notch side of a double rod cylinder, a minimum $W + \text{Stroke}$ dimension is required. This bore and stroke dependent value is shown in the following table.

| Bore Ø | Minimum W + Stroke | For Strokes Equal-to or Less-than |
|-----------|-----------------------|--------------------------------------|
| 20 | 18 | 10 |
| 25 | 23 | 15 |
| 32 | 25 | 15 |
| 40 | 30 | 20 |
| 50 | 31 | 20 |
| 63 | 38 | 25 |
| 80 | 42 | 25 |
| 100 | 51 | 25 |



Style 3 (special) rod ends with female thread depth equal to the standard A dimension are also subject to this minimum. For deeper threads, the minimum $W + \text{Stroke}$ will increase by the depth increase beyond the standard A dimension. No other rod end styles have this limitation.

Cylinder Mounting

Always mount Series CHE & CHD cylinders using high tensile alloy steel socket head screws and torque them to the values shown. In addition to bolts, styles C, CA & CN cylinders should be keyed to the mounting surface with a thrust key, utilizing the groove provided in the

cylinder body or mounting bracket. Bolt kits for T, TN, and TR mounts are offered and can be specified by kit part numbers on the next page. Refer to CHE or CHD mounting style pages for bore and mounting availability.

Mounting Bolt Torques

| Series | Bore Ø | Metric Mounting Bolts | | | Inch Mounting Bolts | | |
|-----------|--------|------------------------|----------|--------------|------------------------|---------------------|----------------|
| | | Mount | Size | Torque (N-m) | Mount | Size | Torque (lb-ft) |
| CHE | 20 | T, TN, TR | M5x0.8 | 4.5 - 4.7 | T, TN, TR | #10-32 | 3.2 - 3.4 |
| | 25 | T, TN, TR | M5x0.8 | 4.5 - 4.7 | T, TN, TR | #10-32 | 3.2 - 3.4 |
| | 32 | T, TN, TR | M6x1 | 7.5 - 7.9 | T, TN, TR | 1/4-28 | 5.6 - 5.9 |
| | 40 | T, TN, TR | M8x1.25 | 18 - 19 | T, TN, TR | 5/16-24 | 13 - 14 |
| | 50 | T, TN, TR | M10x1.5 | 35 - 37 | T, TN, TR | 3/8-24 | 25 - 26 |
| | 63 | T, TN, TR | M12x1.75 | 60 - 63 | T, TN, TR | 1/2-20 | 47 - 49 |
| | 80 | T, TN, TR | M14x2 | 100 - 105 | T, TN, TR | 1/2-20 ¹ | 70 - 73 |
| | | | | | | 9/16-18 | 75 - 79 |
| CHD | 20 | T, TN, TR M, MN, MR | M5x0.8 | 6.8 - 7.1 | T, TN, TR A, AN, AR | #10-32 | 4.7 - 4.9 |
| | 25 | T, TN, TR M, MN, MR | M5x0.8 | 6.8 - 7.1 | T, TN, TR A, AN, AR | #10-32 | 4.7 - 4.9 |
| | 32 | T, TN, TR M, MN, MR | M6x1 | 11 - 12 | T, TN, TR A, AN, AR | 1/4-28 | 8.3 - 8.7 |
| | 40 | T, TN, TR M, MN, MR | M8x1.25 | 27 - 28 | T, TN, TR A, AN, AR | 5/16-24 | 20 - 21 |
| | 50 | T, TN, TR M, MN, MR | M10x1.5 | 55 - 58 | T, TN, TR A, AN, AR | 3/8-24 | 38 - 40 |
| | 63 | T, TN, TR M, MN, MR | M12x1.75 | 90 - 95 | T, TN, TR A, AN, AR | 1/2-20 | 70 - 73 |
| | 80 | T, TN, TR M, MN, MR | M14x2 | 150 - 158 | T, TN, TR | 1/2-20 ¹ | 70 - 73 |
| | | | | | A, AN, AR | 9/16-18 | 110 - 115 |
| CHE & CHD | 20 | J, H | M5x0.8 | 6.8 - 7.1 | J, H | #10-32 | 4.7 - 4.9 |
| | 25 | J, H | M5x0.8 | 6.8 - 7.1 | J, H | #10-32 | 4.7 - 4.9 |
| | 32 | J, H | M6x1 | 11 - 12 | J, H | 1/4-28 | 8.3 - 8.7 |
| | 40 | J, H | M10x1.5 | 55 - 58 | J, H | 3/8-24 | 38 - 40 |
| | 50 | J, H | M12x1.75 | 90 - 95 | J, H | 1/2-20 | 70 - 73 |
| | 63 | J, H | M14x2 | 150 - 158 | J, H | 9/16-18 | 110 - 115 |
| | 80 | J, H | M16x2 | 230 - 240 | J, H | 5/8-18 | 170 - 178 |
| | 100 | J, H | M20x2.5 | 450 - 475 | J, H | 3/4-16 | 315 - 330 |
| CHE & CHD | 20 | CA | M5x0.8 | 6.8 - 7.1 | CA | #10-32 | 4.7 - 4.9 |
| | 25 | C, CN, CA | M6x1 | 11 - 12 | C, CN, CA | 1/4-28 | 8.3 - 8.7 |
| | 32 | C, CN, CA | M8x1.25 | 27 - 28 | C, CN, CA | 5/16-18 | 20 - 21 |
| | 40 | C, CN, CA | M10x1.5 | 55 - 58 | C, CN, CA | 3/8-18 | 38 - 40 |
| | 50 | C, CN, CA | M12x1.75 | 90 - 95 | C, CN, CA | 1/2-20 | 70 - 73 |
| | 63 | C, CN, CA | M14x2 | 150 - 158 | C, CN, CA | 9/16-18 | 110 - 115 |
| | 80 | CA | M16x2 | 230 - 242 | CA | 5/8-18 | 170 - 178 |
| | 100 | CA | M20x2.5 | 450 - 475 | CA | 3/4-16 | 315 - 330 |

¹ When using 1/2" socket head cap screws with 80mm T mount, flat washers are required; flat washer OD must be .866" ±.020 (22mm ±0.5).

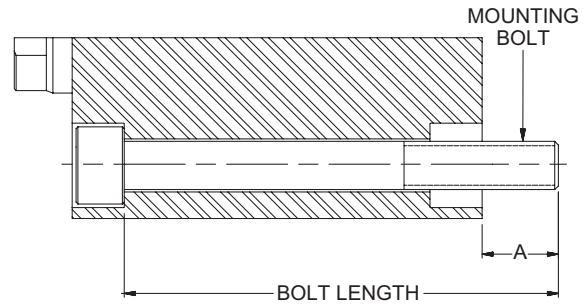
Mounting Bolt Kits for Series CHE & CHD – Styles T, TN & TR
(Kits include four bolts.)

| Bore Ø | Bolt Size | Bolt Length | A Thread Length ¹ | Kit Part Number |
|--------|-----------|----------------|------------------------------|----------------------|
| 20 | M5x0.8 | 45mm + Stroke | 7.4mm | CHEB020 ² |
| 25 | M5x0.8 | 50mm + Stroke | 10.4mm | CHEB025 ² |
| 32 | M8x1 | 55mm + Stroke | 10.5mm | CHEB032 ² |
| 40 | M8x1.25 | 60mm + Stroke | 13.6mm | CHEB040 ² |
| 50 | M10x1.5 | 65mm + Stroke | 15.8mm | CHEB050 ² |
| 63 | M12x1.75 | 70mm + Stroke | 16.0mm | CHEB063 ² |
| 80 | M14x2 | 85mm + Stroke | 22.2mm | CHEB080 ² |
| 100 | M16x2 | 105mm + Stroke | 26.5mm | CHEB100 ² |

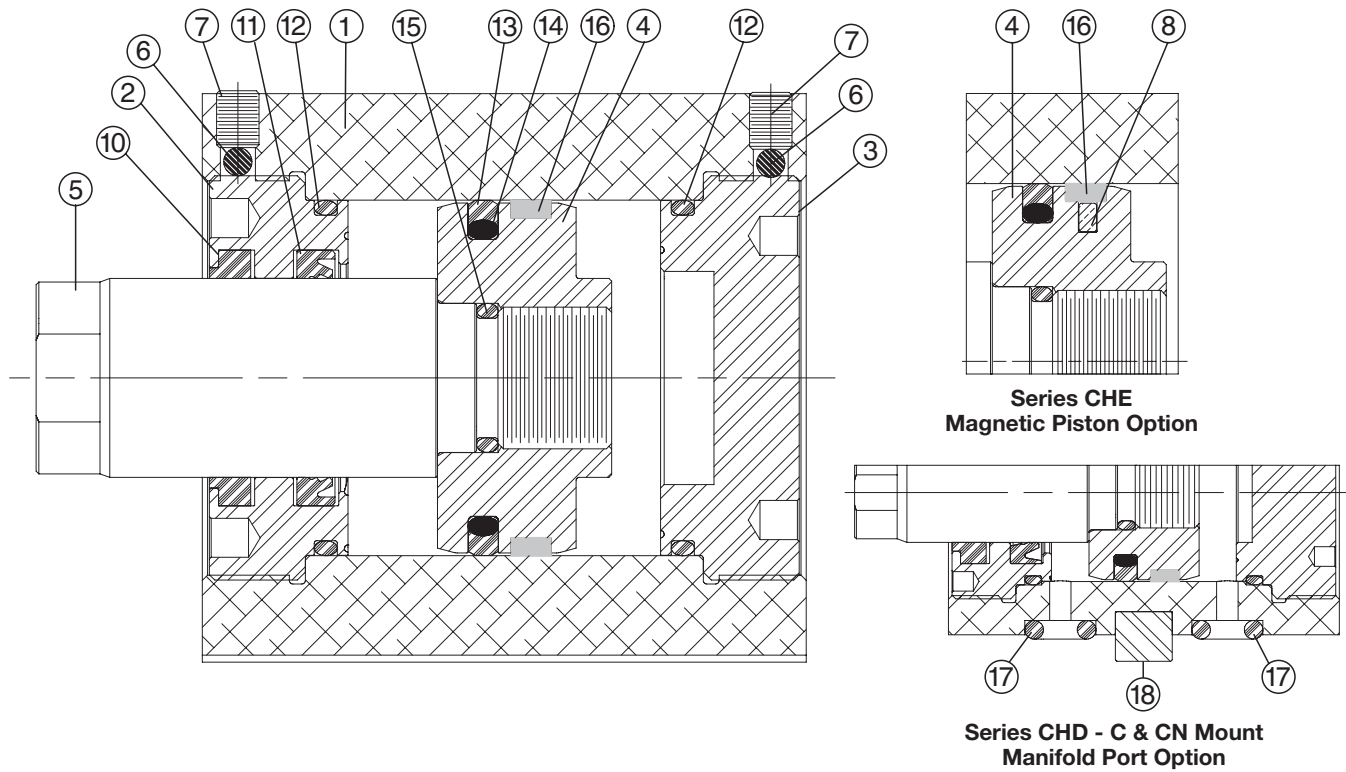
¹ For intermediate stroke lengths the 'A' exposed thread length will be therefore increased by the difference between the actual stroke and the next longer 5mm bolt stroke length increment.

² The last three digits of the kit part number are to be supplied as the cylinder stroke in 5mm increments. When specifying a bolt kit for intermediate stroke lengths, use the next longer 5mm stroke increment.

E.g. Kit number for 20mm bore, 35mm stroke – CHEB020035
Kit number for 50mm bore, 72mm stroke – CHEB050075



Parts Identification Drawing – Standard Piston



| Item No. | Description | Material | Item No. | Description | Material | |
|----------|----------------------|-----------------------------------|-----------|--------------------------------------|------------------------|------------------------|
| | | | | | Standard | Fluorocarbon |
| 1 | Cylinder Body - CHE | Aluminum Alloy (Hard Anodized) | 10 | Rod Wiper | PUR | Fluorocarbon |
| | Cylinder Body - CHD | Steel | 11 | Rod Seal | PUR | Fluorocarbon |
| 2 | Gland | Nodular Iron or Bronze | Not Shown | Rod Seal Back-up Washer ² | Not Required | Virgin PTFE |
| 3 | Cap | Nodular Iron or Bronze | 12 | End Seal | PUR | Fluorocarbon |
| 4 | Piston – Standard | Nodular Iron | 13 | Piston Seal | PUR | Filled PTFE |
| | Piston – with Magnet | Aluminum Alloy | 14 | PS Energizer | NBR | Fluorocarbon |
| 5 | Piston Rod | Carbon Steel (Hard Chrome Plated) | 15 | Piston-to-Rod o-ring | PUR | Fluorocarbon |
| | | | 16 | Piston Wear Band | Glass-reinforced nylon | Glass-reinforced nylon |
| 6 | Ball | Nylon | | | | |
| 7 | Set Screw | Alloy Steel | 17 | Manifold Port Seal | PUR | Fluorocarbon |
| 8 | Magnet | Sintered NdFeB ¹ | 18 | C & CN Mount Key | Steel | |

¹ Neodymium Iron Boron

² 32-100mm bores only

B

PL-2

PH-2

PH-3

PHX

SHM

CHE/CHD

Seal Kits For Series CHE & CHD

See Standard Specifications Page for fluid and temperature compatibility. Cylinder gland and cap are threaded into the cylinder body. To service rod seal, rod wiper, piston seal, or end seals the gland or cap must be removed. Spanner holes in the gland and cap are available for the purpose of removing and installing

these components. Be sure to torque the gland or cap to the specifications below and replace the nylon ball and set screw to further lock them in place. Refer to CHE & CHD mounting style pages for Bore and Rod Diameter availability.

Rod Gland and Rod Seal Kits for Series CHE & CHD

| Rod Ø | Rod Gland (w/o pilot ¹) Kits | | Rod Seal Kits | |
|-------|--|-----------|---|-----------|
| | Class 1 | Class 5 | Class 1 | Class 5 |
| | Consists of 1 ea. of items #2, 6, 10, 11 ² , & 12 | | Consists of 1 ea. of items #6, 10, 11 ² , & 12 | |
| 12 | A63430A12 | A63430B12 | A63430C12 | A63430D12 |
| 14 | A63430A14 | A63430B14 | A63430C14 | A63430D14 |
| 18 | A63430A18 | A63430B18 | A63430C18 | A63430D18 |
| 22 | A63430A22 | A63430B22 | A63430C22 | A63430D22 |
| 28 | A63430A28 | A63430B28 | A63430C28 | A63430D28 |
| 36 | A63430A36 | A63430B36 | A63430C36 | A63430D36 |
| 45 | A63430A45 | A63430B45 | A63430C45 | A63430D45 |
| 56 | A63430A56 | A63430B56 | A63430C56 | A63430D56 |

¹ Pilot gland is required for AN, CA, CN, J, MN and TN mounting styles. For Gland Kit with pilot change the '0' to a 'P' before the 'A' or 'B'. For example: A6343PA12.

Complete Seal Kits for Series CHE & CHD

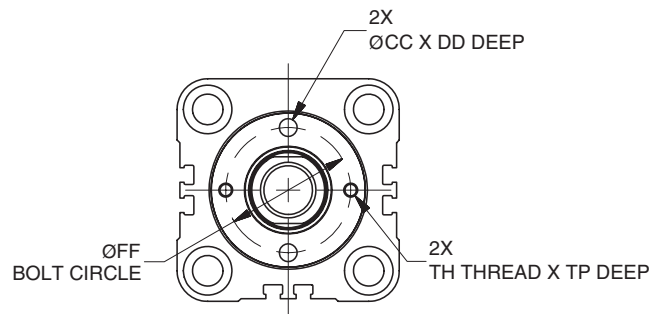
| Bore Ø | Class 1 | Class 5 | Gland & Cap Torque Specifications | | | |
|--------|---|-----------|-----------------------------------|-----------------|-----------------|-----------------|
| | Consists of 1 ea. of items #10, 11 ² , 13, 14, 16 & 2 ea. of items #6 & 12 | | Series CHE | | Series CHD | |
| | 20 | A63440A20 | A63440B20 | 17 - 18 N-m | 155 - 162 lb-in | 27 - 28 N-m |
| 25 | A63440A25 | A63440B25 | 31 - 32 N-m | 23 - 24 lb-ft | 47 - 49 N-m | 35 - 36 lb-ft |
| 32 | A63440A32 | A63440B32 | 68 - 71 N-m | 50 - 52 lb-ft | 98 - 102 N-m | 72 - 75 lb-ft |
| 40 | A63440A40 | A63440B40 | 129 - 135 N-m | 95 - 99 lb-ft | 169 - 177 N-m | 125 - 131 lb-ft |
| 50 | A63440A50 | A63440B50 | 203 - 213 N-m | 150 - 157 lb-ft | 285 - 299 N-m | 210 - 220 lb-ft |
| 63 | A63440A63 | A63440B63 | 305 - 320 N-m | 225 - 236 lb-ft | 488 - 512 N-m | 360 - 378 lb-ft |
| 80 | A63440A80 | A63440B80 | 576 - 604 N-m | 425 - 446 lb-ft | 881 - 925 N-m | 650 - 682 lb-ft |
| 100 | A63440A00 | A63440B00 | 881 - 925 N-m | 650 - 682 lb-ft | - | - |

² Class 5 kits for 32-100mm bores and 18-56mm rods include a PTFE Back-up washer for the rod seal.

Spanner Hole Dimensions

Gland & Cap Spanners

| Bore Ø | CC Ø | DD | FF Ø | TH | TP |
|--------|-------|-------|------|--------------|----|
| 20 | 2.75 | 2.75 | 22 | - | - |
| 25 | 3.25 | 3.25 | 25 | - | - |
| 32 | 4.25 | 4.25 | 30 | M3x0.5 - 6H | 6 |
| 40 | 5.25 | 5.25 | 35 | M4x0.7 - 6H | 7 |
| 50 | 6.38 | 6.25 | 45 | M5x0.8 - 6H | 7 |
| 63 | 8.38 | 8.25 | 55 | M6x1 - 6H | 8 |
| 80 | 10.50 | 10.50 | 70 | M8x1.25 - 6H | 9 |
| 100 | 10.50 | 10.50 | 85 | M8x1.25 - 6H | 9 |



Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-847-298-2400, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.

- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be reviewed by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Industrial Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.

Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods, services or work described will be referred to as "Products".

1. Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyer's request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen months from the date of delivery to Buyer. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

10. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

11. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright

infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

17. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

18. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.