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- **Reliable Service, World-Wide**
  - From a world-wide leader producing millions of actuators each year
- **Environmental**
  - Pre-lubricated for longer, maintenance free operation ①
- **Noise Reduction**
  - Shock absorbing bumpers ②
- **Performance And Quality Processes Throughout**
  - Roll formed threads ③
  - High strength pistons permanently riveted and sealed ④
  - Roller burnished stainless steel rods
- **Productivity**
  - Advanced bearing and seal materials for higher speed applications ⑤
- **Safety**
  - Double rolled construction ⑥
  - Permanent mechanical retention; needles cannot blow out under pressure ⑦
- **Reduced Envelope**
  - Space savings available resulting from smaller external dimensions
- **A Material For Any Application**
  - Heads available in Aluminum, Stainless Steel and Delrin®
- **Unique Customer Solutions**
  - Rapid design and delivery time for custom modifications

# Bimba ISO 6432 Air Cylinders

## How to Order

The Model Number consists of five alphanumeric clusters. The first designates **Type**, the second **Bore Size**, the third **Stroke Length**, the fourth **Mounting** style, and fifth **Options**.

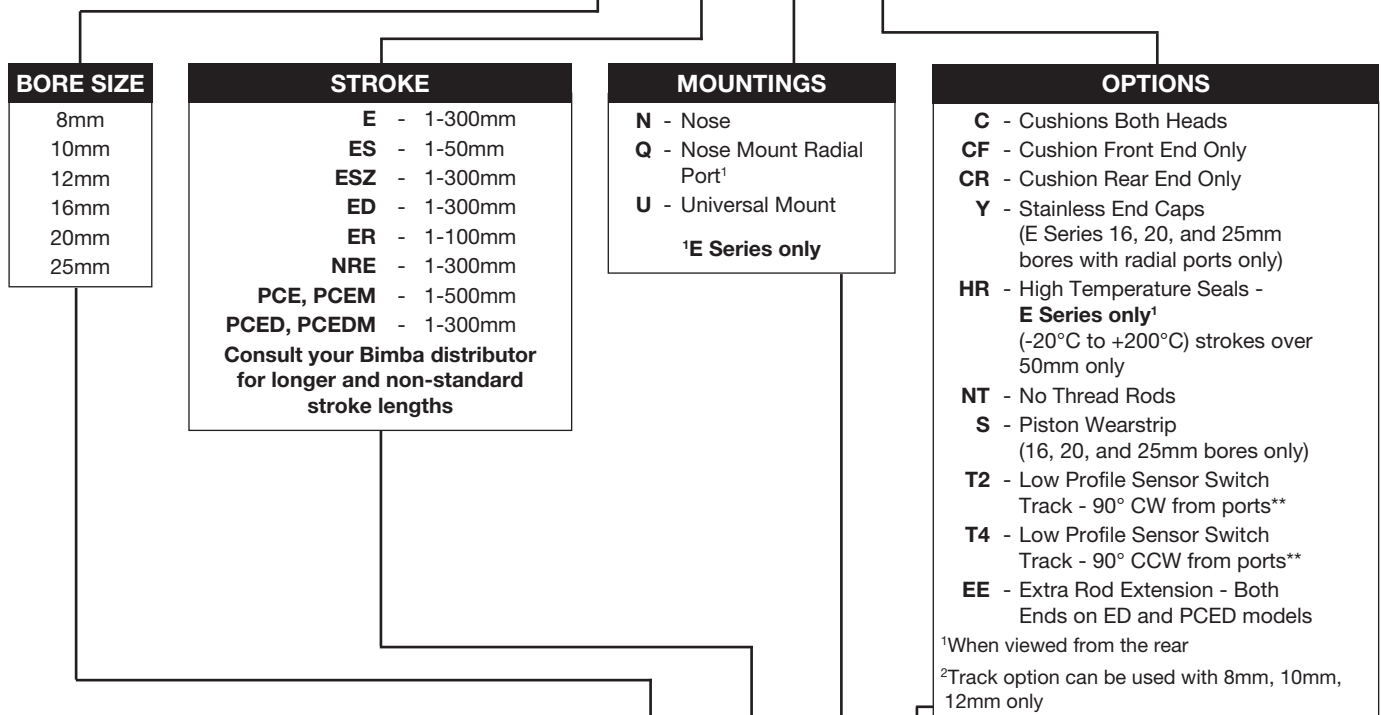
Two examples are shown below:

**EM-25-100-N-CNT:** This is a double acting ISO 6432 cylinder with anodized aluminum end caps and magnet. Bore size 25mm; Stroke 100mm; nose mount; cushions both ends; No rod threads.

**PCEM-16-N-100-NT:** This is a double acting ISO 6432 cylinder with Delrin end caps and magnet. Bore size 16mm; nose mount; no rod threads.

| TYPE - ISO 6432 - E Series - Aluminum End Caps  |
|---|
| <b>E</b> ( ) - Double Acting  |
| <b>ED</b> ( ) - Double Acting/Double End Rod  |
| <b>ES</b> ( ) - Single Acting - 0-50mm Stroke   |
| <b>ESZ</b> ( ) - Single Acting - HD Spring  |
| <b>ER</b> ( ) - Reverse Single Acting - HD Spring*                                    |
| <b>NRE</b> ( ) - Non-Rotating Rod   |
| Insert <b>M</b> ( ) to add Piston Sensor Magnet<br>Bore Sizes 8, 10, 12, 16, 20, 25mm |

### EM-25-100-N-CNT



### PCEM-16-100-N-NT

| TYPE - ISO 6432 - E Series - Delrin End Caps                          |
|---|
| <b>PCE</b> - Double Acting  |
| <b>PCEM</b> - Double Acting with Piston Sensor Magnet                 |
| <b>PCED</b> - Double Acting/Double End Rod                            |
| <b>PCEDM</b> - Double Acting/Double Rod End with Piston Sensor Magnet |
| Bore Sizes 16, 20, 25mm only  |

# Bimba ISO 6432 Air Cylinders

## Accessories

### Foot Bracket

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | FB-1         |
| 12, 16 | FB-2         |
| 20, 25 | FB-3         |

### Flange Mount

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | MF-1         |
| 12, 16 | MF-2         |
| 20, 25 | MF-3         |

### Clevis Foot

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | CFB-1        |
| 12, 16 | CFB-2        |
| 20, 25 | CFB-3        |

### Rod Clevis

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | RC-M4X0.7    |
| 12, 16 | RC-M6X1.0    |
| 20     | RC-M8X1.25   |
| 25     | RC-M10X1.25  |

### Mounting Nut

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | MN-1         |
| 12, 16 | MN-2         |
| 20, 25 | MN-3         |

### Rod Nut

| Bore   | Model Number |
|--------|--------------|
| 8, 10  | RN-1         |
| 12, 16 | RN-2         |
| 20     | RN-3         |
| 25     | RN-4         |

## PCE Accessories (All Stainless Construction)

### Foot Bracket

| Bore   | Model Number |
|--------|--------------|
| 16     | FB-2-SS      |
| 20, 25 | FB-3-SS      |

### Clevis Foot (Pivot Bracket)

| Bore   | Model Number |
|--------|--------------|
| 16     | CFB-2-SS     |
| 20, 25 | CFB-3-SS     |

### Rod Clevis

| Bore | Model Number |
|------|--------------|
| 16   | RC-2-SS      |
| 20   | RC-3-SS      |
| 25   | RC-4-SS      |

### Mounting Nut

| Bore   | Model Number |
|--------|--------------|
| 16     | MN-2-SS      |
| 20, 25 | MN-3-SS      |

### Rod Nut

| Bore | Model Number |
|------|--------------|
| 16   | RN-2-SS      |
| 20   | RN-3-SS      |
| 25   | RN-4-SS      |

# Bimba ISO 6432 Air Cylinders

## Compatibility Chart

Due to design or incompatibility restrictions, the following options may **NOT** be ordered in combination. For example stainless steel end cap may not be ordered with cushions.

Options NT and EE are available independently, with each other or with all viable option combinations.

| BORE | OPTION |        |        |     |     |
|------|--------|--------|--------|-----|-----|
|      | NRE    | C      | Y      | M   | S   |
| 8    | N/A    | N/A    | N/A    | N/A | N/A |
| 10   | N/A    | N/A    | N/A    | N/A | N/A |
| 12   | N/A    | N/A    | N/A    | N/A | N/A |
| 16   | C, Y   | NRE, Y | NRE, C | S   | M   |
| 20   | C, Y   | NRE, Y | NRE, C | S   | M   |
| 25   | C, Y   | NRE, Y | NRE, C | S   | M   |

## Conversion Tables

|             | Metric Unit Of Measure | Metric To Imperial Conversion      | Imperial Unit Of Measure     | Imperial To Metric Conversion          |
|-------------|------------------------|------------------------------------|------------------------------|--|
| Force       | Newtons (N)            | x 0.2248                           | Pounds (lbs)                 | x 4.448                                |
| Pressure    | Bar (b)                | x 14.5                             | Pounds Per Square Inch (PSI) | x 0.069                                |
| Measurement | Millimetres            | x 0.03937                          | Inches                       | x 25.4                                 |
| Temperature | Centigrade             | $\frac{9}{5} \times ^\circ C + 32$ | Fahrenheit                   | $\frac{5}{9} \times (^{\circ} F - 32)$ |

## General Specifications

|                              | BORE  |    |    |    |    |    |
|------------------------------|---|----|----|----|----|----|
|                              | 8   | 10 | 12 | 16 | 20 | 25 |
| Cushion Length (mm) Each End | N/A   |    |    | 18 | 21 | 21 |
| Operating Pressure Range     | 10 bar  |    |    |    |    |    |
| Maximum                      | 0.5 bar   |    |    |    |    |    |
| Minimum - Double Acting      |   |    |    |    |    |    |
| Operating Temperature Range  | -10°C to +80°C  |    |    |    |    |    |
| Standard Seals               | -20°C to +200°C                                       |    |    |    |    |    |
| High Temperature Seals       |   |    |    |    |    |    |
| Operating Media              | Filtered Compressed Air/Lubricated or Non-Lubricated  |    |    |    |    |    |
| Standard Stroke Lengths      | See Table on page 11.11                               |    |    |    |    |    |
| Maximum Stroke Length*       | 1000mm  |    |    |    |    |    |
| Stroke Tolerance             | +1.0mm/-0mm   |    |    |    |    |    |
| Piston Speed                 | 5mm/s to 1000mm/s (Higher speed available on request) |    |    |    |    |    |
| Life Expectancy              | 3000km  |    |    |    |    |    |

\* Varies according to bore size, please consult your local BIMBA distributor.

# Bimba ISO 6432 Air Cylinders

## Weights

|                       | BORE |    |    |    |     |     |
|-----------------------|------|----|----|----|-----|-----|
|                       | 8    | 10 | 12 | 16 | 20  | 25  |
| Option N              | 20   | 22 | 41 | 53 | 102 | 149 |
| Option U              | 23   | 25 | 46 | 59 | 118 | 167 |
| Type ED               | 28   | 30 | 61 | 74 | 152 | 218 |
| adder per 10mm stroke | 2    | 2  | 4  | 5  | 8   | 11  |

Weights (approximate) are for zero stroke, in grams.

## Rod Buckling Formula

The maximum recommended cylinder stroke is dependent upon:

1. Mounting type
2. Rod diameter
3. Rod end connection

Using the following formula it is possible to determine the buckling load for a given stroke length of cylinder

$$BL = \frac{\pi^2 EJ}{(l \times M)^2 S}$$

$BL$  = Permissible Buckling Load (N)  
 $E$  = Young's Modulus of Elasticity (N/mm<sup>2</sup>)  
 $J$  = Moment of Inertia (mm<sup>4</sup>)  
 $l$  = Buckling Length = Stroke (mm)  
 $M$  = Stroke Multiplier (see table below)  
 $S$  = Safety Factor (recommended minimum 5)

### HOW TO CALCULATE ROD BUCKLING FORCES

#### EXAMPLE:

Q. What is the buckling load for a 25mm bore cylinder with a pivoted and guided load attached, stroke 200mm?

A. Using the formula:  $BL = \frac{\pi^2 EJ}{(l \times M)^2 S}$

$$E = 190.05 \times 10^3 \text{ N/mm}^2$$

$$l = 200 \text{ mm (stroke)}$$

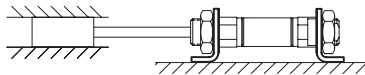
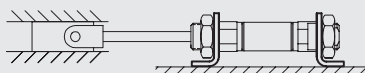
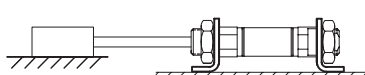
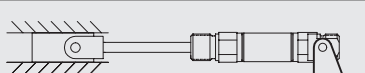
$$M = 2 \text{ (for pivoted and guided load)}$$

$$S = 5 \text{ (safety factor)}$$

$$D = 10 \text{ mm (piston rod diameter for cylinder)}$$

$$J = \frac{\pi D^4}{64} = \frac{\pi 10^4}{64} = 490.87 \text{ mm}^4$$

$$BL = \frac{\pi^2 \times 190.05 \times 10^3 \times 490.9}{(2 \times 200)^2 \times 5} = 1150.9 \text{ N} - 1.15 \text{ kN}$$

| ROD END CONNECTION | CYLINDER MOUNTING   | TYPE | STROKE MULTIPLIER |
|--------------------|---|------|-------------------|
| FIXED & GUIDED     |  | A    | 0.5               |
| PIVOTED & GUIDED   |  | B    | 0.7               |
| FIXED & SUPPORTED  |  | C    | 2                 |
| PIVOTED & GUIDED   |  | C    | 2                 |

# Bimba ISO 6432 Air Cylinders

## Output Forces

Cylinder output forces can be determined in one of two ways:

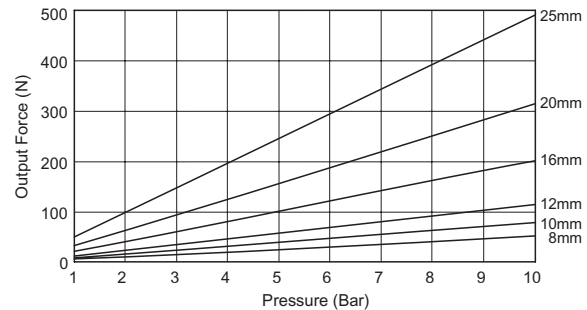
1. Calculation

$$\text{Cylinder Output Force (N)} = \text{Power Factor} \times \text{Pressure (bar)}$$

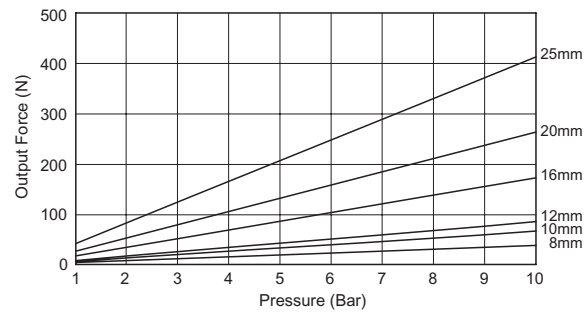
| BORE | POWER FACTOR |            |
|------|--------------|------------|
|      | EXTENSION    | RETRACTION |
| 8    | 5.3          | 4.0        |
| 10   | 7.9          | 6.6        |
| 12   | 11.3         | 8.5        |
| 16   | 20.1         | 17.3       |
| 20   | 31.4         | 26.1       |
| 25   | 49.1         | 41.2       |

2. Graph

Extend



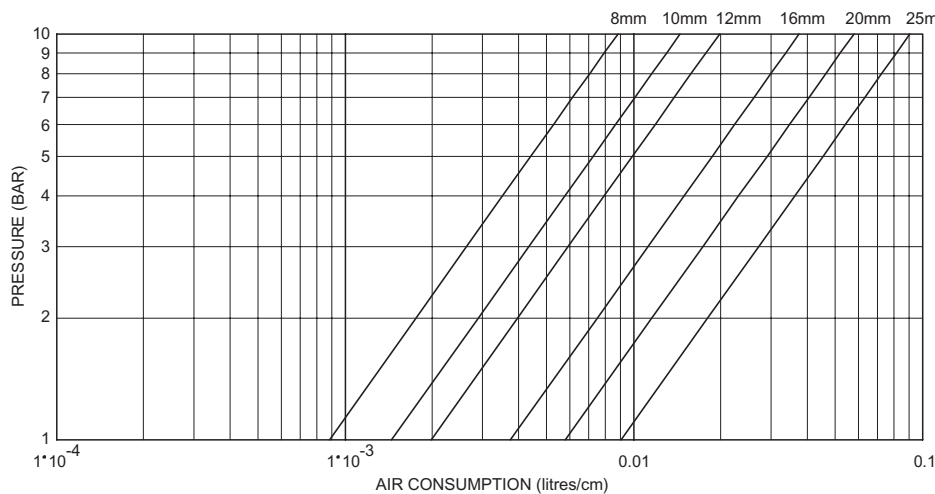
Retract



## Air Consumption Chart

The Air Consumption Chart is based on the following formula for a complete cylinder cycle (cylinder extends and retracts):

$$Q = \left[ \frac{\pi D^2}{4} + \frac{\pi(D^2 - d^2)}{4} \right] h p 10^{-6}$$



Draw a line across for the pressure used. Where this intersects the required bore size, draw a vertical line down. This will give you the air consumption. Multiply this by the stroke in cm, and this will give the air consumption per cycle.

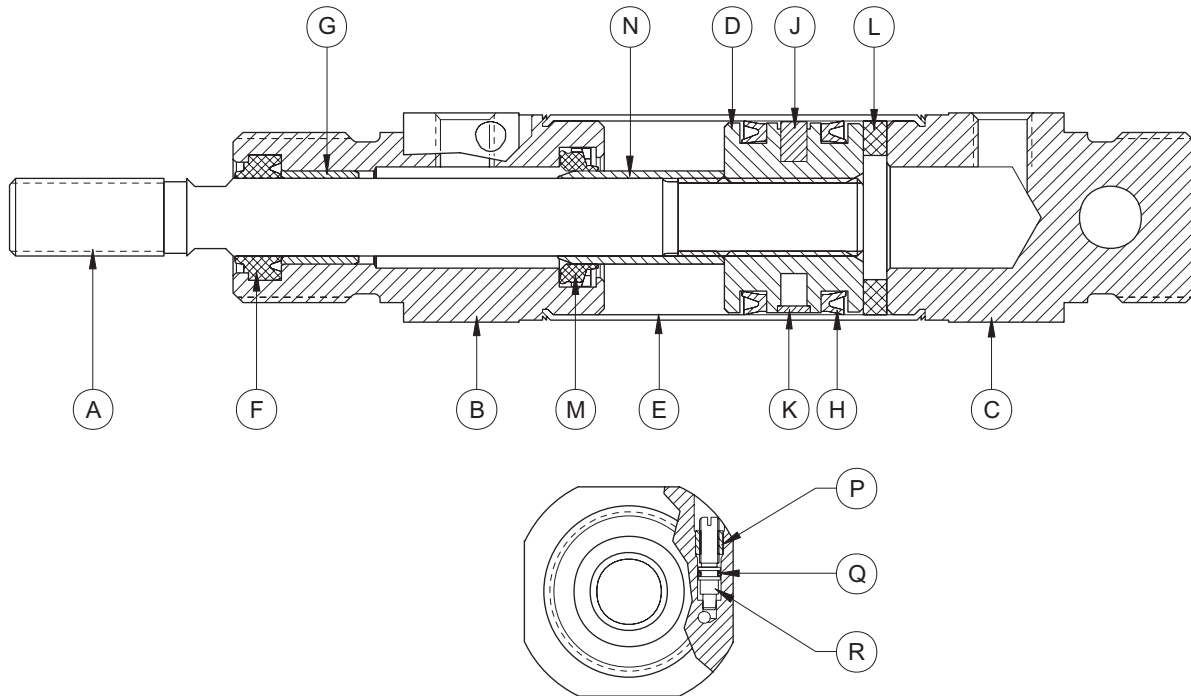
Q = Air volume per cm of stroke (L)  
 D = Piston or piston rod diameter (mm)  
 h = Stroke (mm)  
 p = Operating pressure (bar)  
 d = Piston rod diameter (mm)

EXAMPLE:

Cylinder Stroke = 2.5cm  
 Cylinder Bore = Ø25mm  
 Operating Pressure = 7 Bar  
 Air Consumption = 0.158 Litres

# Bimba ISO 6432 Air Cylinders

## Materials

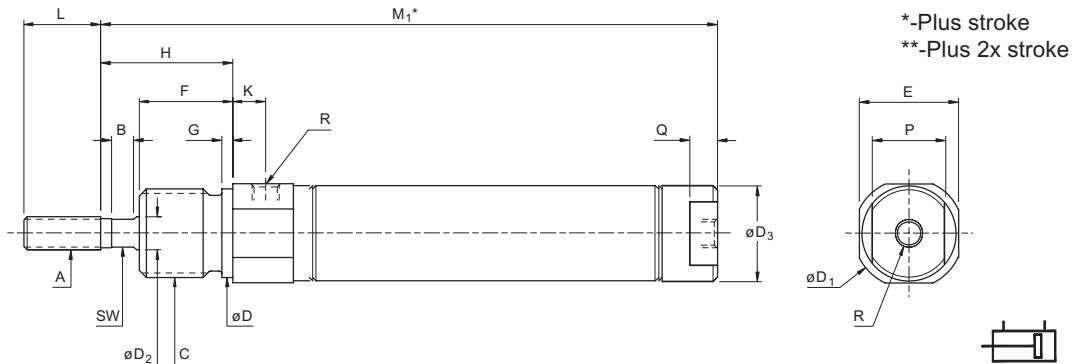


| ITEM | COMPONENT              | MATERIAL  |
|------|------------------------|---|
| A    | Piston Rod             | Stainless Steel (type 303 s31)  |
| B    | Rod Guide              | Aluminum Alloy (anodized)<br>Delrin® Plastic - (type PCE)<br>Stainless Steel - (option Y) |
| C    | Rear Head              | Aluminum Alloy (anodized)<br>Delrin® Plastic - (type PCE)<br>Stainless Steel - (option Y) |
| D    | Piston                 | Aluminum Alloy<br>Brass - (type ED)   |
| E    | Body                   | Stainless Steel (type 304)  |
| F    | Rod Seal/Rod Wiper     | Nitrile (NBR) or Fluoro-rubber (FPM) - (option HR)  |
| G    | Rod Bearing            | Self Lubricating Thermoplastic Alloy  |
| H    | Piston Seal            | Nitrile (NBR) or Fluoro-rubber (FPM) - (option HR)  |
| J    | Magnet                 | Neodymium Iron Boron<br>Nitrile   |
| K    | Piston Bearing Ring    | Carbon Filled PTFE  |
| L    | Bumper                 | Fluoro-rubber (FPM)   |
| M    | Cushion Seal           | Nitrile (NBR) - Standard<br>or Fluoro-rubber (FPM) - (option HR)                          |
| N    | Cushion Sleeve         | Aluminum Alloy  |
| P    | Cushion Screw Retainer | Aluminum Alloy (anodized)<br>Stainless Steel - (type PCE)                                 |
| Q    | Cushion o-ring         | Fluoro-rubber (FPM)   |
| R    | Cushion Screw          | Stainless Steel (type 303 s31)  |

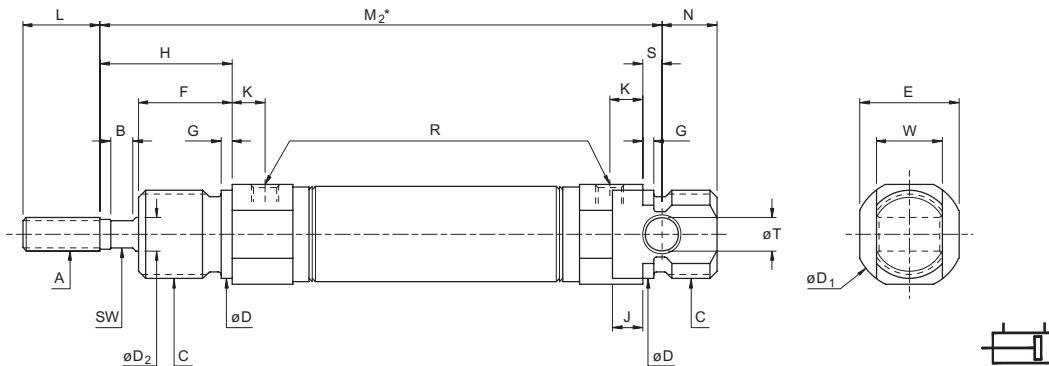
# Bimba ISO 6432 Air Cylinders

## Double Acting

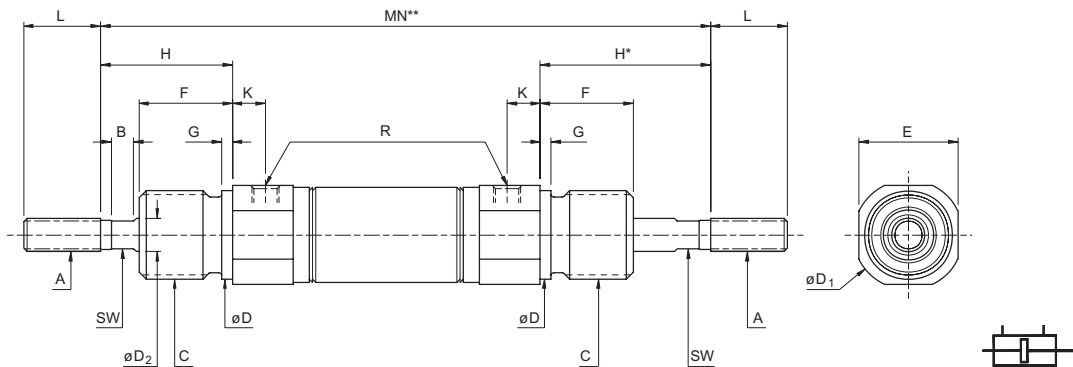
### NOSE MOUNT - N option



### UNIVERSAL MOUNT - U option



### DOUBLE ENDED



| Bore | A <sup>69</sup> | B | C <sup>69</sup> | D  | D <sub>1</sub> | D <sub>2</sub> <sup>h8</sup> | D <sub>3</sub> | E  | F  | G | H  | J   | K | L  | P  | Q | N  | R      | S   | T <sup>H9</sup> | W <sup>H13</sup> | SW | M <sub>1</sub> | M <sub>2</sub> | MN  |
|------|-----------------|---|-----------------|----|----------------|------------------------------|----------------|----|----|---|----|-----|---|----|----|---|----|--------|-----|-----------------|------------------|----|----------------|----------------|-----|
| 8    | M4x0.7          | - | M12x1.25        | 12 | 17             | 4                            | 9              | 15 | 12 | 2 | 16 | 3   | 6 | 12 | 8  | 4 | 9  | M5x0.8 | 3   | 4               | 8                | -  | 56.5           | 64             | 77  |
| 10   | M4x0.7          | - | M12x1.25        | 12 | 17             | 4                            | 11             | 15 | 12 | 2 | 16 | 3   | 6 | 12 | 10 | 5 | 9  | M5x0.8 | 3   | 4               | 8                | -  | 58             | 64             | 77  |
| 12   | M6x1.0          | 4 | M16x1.5         | 16 | 20             | 6                            | 13             | 18 | 17 | 2 | 24 | 5.4 | 6 | 14 | 10 | 5 | 8  | M5x0.8 | 3.6 | 6               | 12               | 5  | 68.7           | 77             | 97  |
| 16   | M6x1.0          | 4 | M16x1.5         | 16 | 20             | 6                            | 17             | 18 | 17 | 2 | 24 | 5.5 | 6 | 14 | 13 | 5 | 10 | M5x0.8 | 3.5 | 6               | 12               | 5  | 74             | 84             | 104 |
| 20   | M8x1.25         | 4 | M22x1.5         | 22 | 28             | 8                            | 21             | 24 | 19 | 3 | 25 | 8   | 8 | 19 | 19 | 7 | 11 | G1/8   | 4   | 8               | 16               | 6  | 84.5           | 96             | 117 |
| 25   | M10x1.25        | 4 | M22x1.5         | 22 | 30             | 10                           | 26             | 27 | 22 | 3 | 30 | 6   | 8 | 20 | 22 | 8 | 11 | G1/8   | 6   | 8               | 16               | 8  | 92             | 106            | 130 |

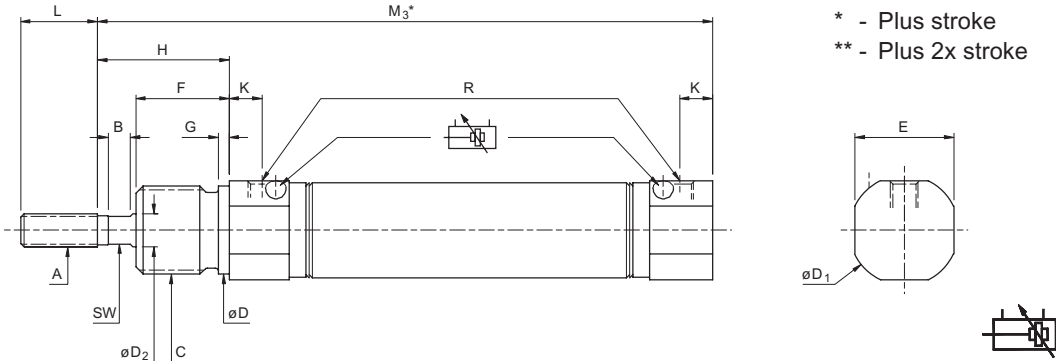


# Bimba ISO 6432 Air Cylinders

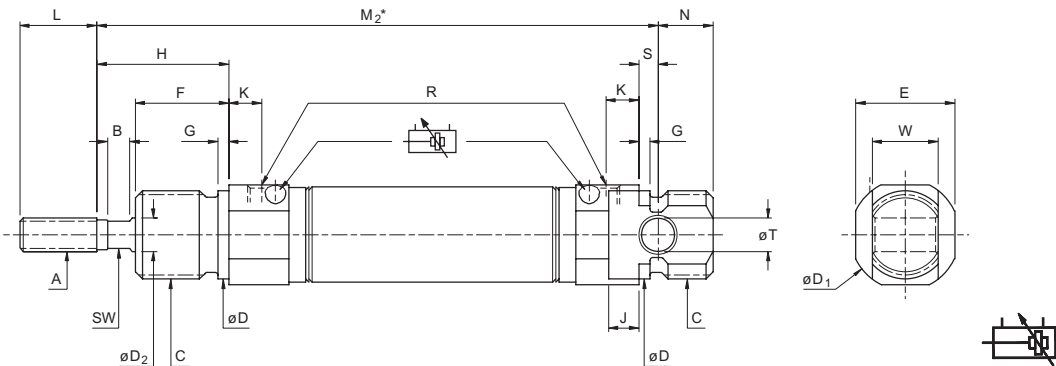
| Q option   | Bore | Adder | Bore | Adder |
|--|------|-------|------|-------|
| Radially ported rear head available on non-cushioned cylinders.<br>The $M_1$ dimension increases by the amount shown alongside | 8    | 4.5   | 16   | 6.5   |
|  | 10   | 3     | 20   | 7.5   |
|  | 12   | 4.7   | 25   | 8     |

## Double Acting - With Adjustable Cushioning

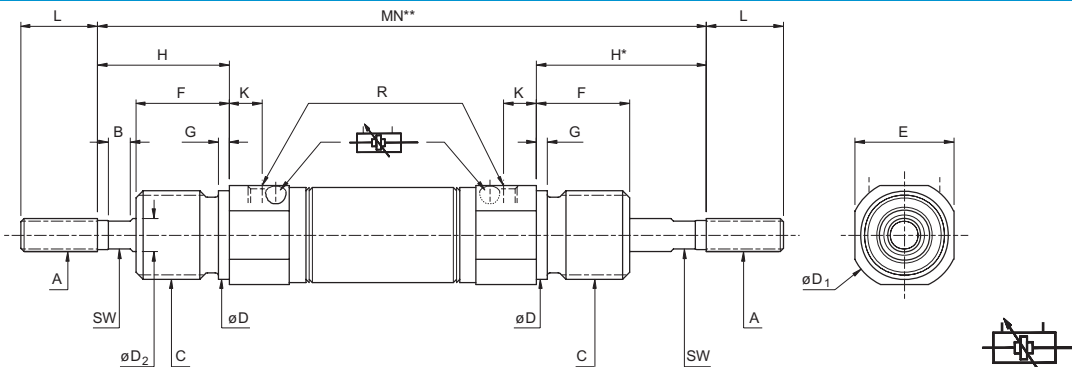
### NOSE MOUNT - N option



### UNIVERSAL MOUNT - U option



### DOUBLE ENDED



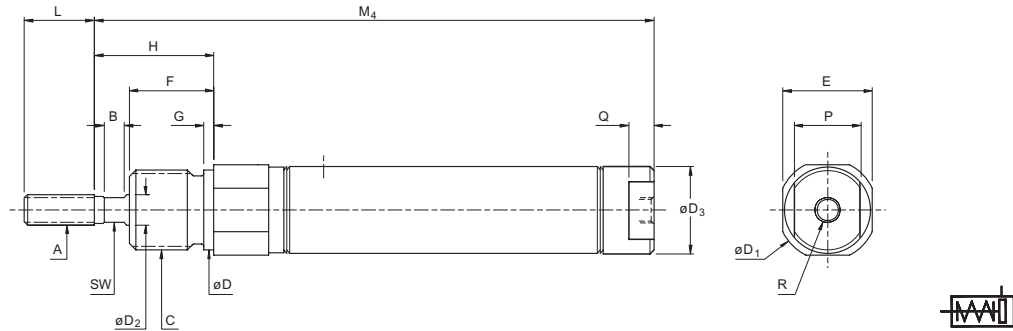
| Bore | A <sup>6a</sup> | B | C <sup>6a</sup> | D  | D <sub>1</sub> | D <sub>2</sub> <sup>h8</sup> | E  | F  | G | H  | J   | K | L  | N  | R      | S   | T <sup>h9</sup> | W <sup>d13</sup> | SW | M <sub>2</sub> | M <sub>3</sub> | MN  |
|------|-----------------|---|-----------------|----|----------------|------------------------------|----|----|---|----|-----|---|----|----|--------|-----|-----------------|------------------|----|----------------|----------------|-----|
| 16   | M6x1.0          | 4 | M16x1.5         | 16 | 20             | 6                            | 18 | 17 | 2 | 24 | 5.5 | 6 | 14 | 10 | M5x0.8 | 3.5 | 6               | 12               | 5  | 84             | 80.5           | 104 |
| 20   | M8x1.25         | 4 | M22x1.5         | 22 | 28             | 8                            | 24 | 19 | 3 | 25 | 8   | 8 | 19 | 11 | G1/8   | 4   | 8               | 16               | 6  | 96             | 92             | 117 |
| 25   | M10x1.25        | 4 | M22x1.5         | 22 | 30             | 10                           | 27 | 22 | 3 | 30 | 6   | 8 | 20 | 11 | G1/8   | 6   | 8               | 16               | 8  | 106            | 100            | 130 |

# Bimba ISO 6432 Air Cylinders

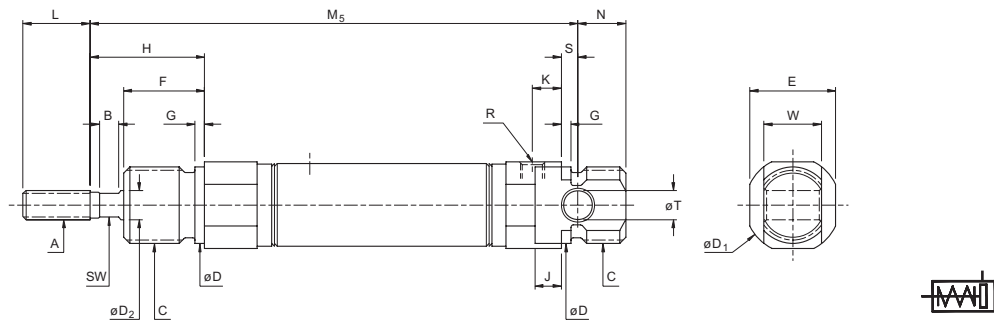
## Single Acting - Spring To Retract (ESZ)

The ESZ & ER series offer a heavier spring force than the ES, and the flexibility of strokes exceeding 50mm.

### NOSE MOUNT - N option

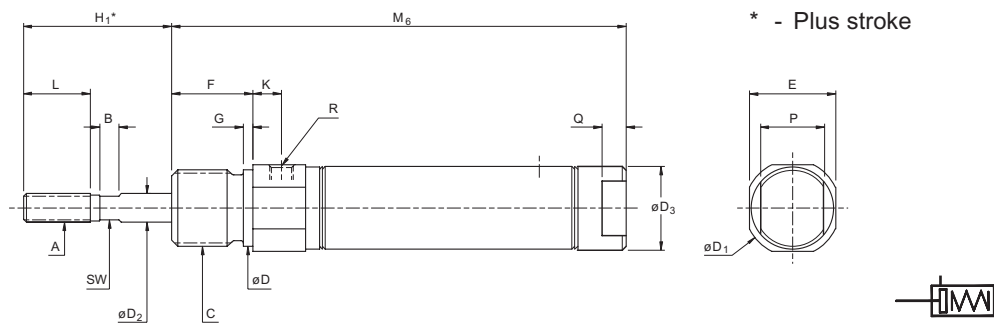


### UNIVERSAL MOUNT - U option

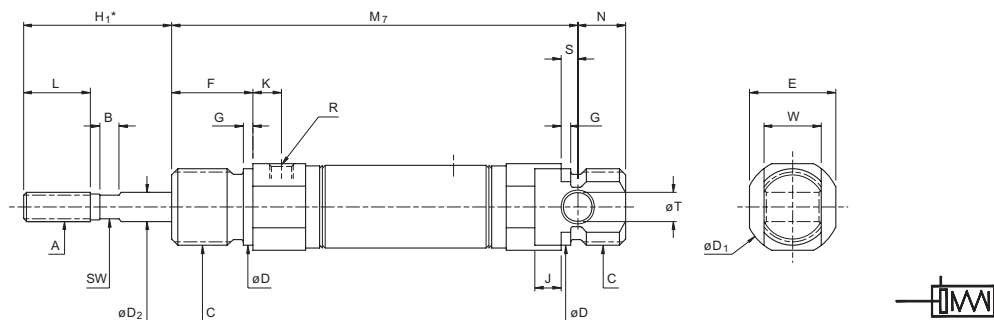


## Single Acting - Spring To Extend (ER)

### NOSE MOUNT - N option



### UNIVERSAL MOUNT - U option



See following page for dimensional tables

# Bimba ISO 6432 Air Cylinders

| Bore | A <sup>69</sup> | B | C <sup>69</sup> | D  | D <sub>1</sub> | D <sub>2</sub> <sup>h6</sup> | D <sub>3</sub> | E  | F  | G | H  | H <sub>1</sub> | J   | K | L  | N  | P  | Q | R      | S   | T <sup>h9</sup> | W <sup>d13</sup> | SW |
|------|-----------------|---|-----------------|----|----------------|------------------------------|----------------|----|----|---|----|----------------|-----|---|----|----|----|---|--------|-----|-----------------|------------------|----|
| 8    | M4x0.7          | - | M12x1.25        | 12 | 17             | 4                            | 9              | 15 | 12 | 2 | 16 | 16             | 3   | 6 | 12 | 9  | 8  | 4 | M5x0.8 | 3   | 4               | 8                | -  |
| 10   | M4x0.7          | - | M12x1.25        | 12 | 17             | 4                            | 11             | 15 | 12 | 2 | 16 | 16             | 3   | 6 | 12 | 9  | 10 | 5 | M5x0.8 | 3   | 4               | 8                | -  |
| 12   | M6x1.0          | 4 | M16x1.5         | 16 | 20             | 6                            | 13             | 18 | 17 | 2 | 24 | 21             | 5.4 | 6 | 14 | 8  | 10 | 5 | M5x0.8 | 3.6 | 6               | 12               | 5  |
| 16   | M6x1.0          | 4 | M16x1.5         | 16 | 20             | 6                            | 17             | 18 | 17 | 2 | 24 | 21             | 5.5 | 6 | 14 | 10 | 13 | 5 | M5x0.8 | 3.5 | 6               | 12               | 5  |
| 20   | M8x1.25         | 4 | M22x1.5         | 22 | 28             | 8                            | 21             | 24 | 19 | 3 | 25 | 27             | 8   | 8 | 19 | 11 | 19 | 7 | G1/8   | 4   | 8               | 16               | 6  |
| 25   | M10x1.25        | 4 | M22x1.5         | 22 | 30             | 10                           | 26             | 27 | 22 | 3 | 30 | 28             | 6   | 8 | 20 | 11 | 22 | 8 | G1/8   | 6   | 8               | 16               | 8  |

## Calculating Cylinder Lengths

In order to provide greater customer flexibility, Bimba ESZ and ER cylinders can be fitted with multiple springs. To calculate the length ("M" dimension), use the following formula based on the table below:

Example 1: **ESZ-25-78-U**

ESZ-25-\_-U Base length ( $M_b$ ) = 103mm  
 Multiplier = Stroke ÷ Increment = 78 ÷ 25 = 3.12  
 Multiplier = 3 (always round down)  
 Multiplier x Adder = 3 x 47 = 141mm  
 Add Base Length = 141 + 103 = 244

Add whole stroke increment:  
 Stroke - (Multiplier x 25) = 78 - 75 = 3

ESZ-25-78-U = 244 + 3 = 247

Example 2: **ER-12-86-N**

ER-12-86-N Base length ( $M_b$ ) = 60.2mm  
 Multiplier = Stroke ÷ Increment = 86 ÷ 12.5 = 6.88  
 Multiplier = 6 (always round down)  
 Multiplier x Adder = 6 x 29 = 174mm  
 Add Base Length = 174 + 60.2 = 234.2

Add whole stroke increment:  
 Stroke - (Multiplier x 12.5) = 86 - 75 = 11

ER-12-86-N = 234.2 - 11 = 223.2

|    | ESZ - Single Acting, Rod To Retract |                    |       |           | ER - Single Acting, Rod To Extend |                    |       |           |
|----|-------------------------------------|--------------------|-------|-----------|-----------------------------------|--------------------|-------|-----------|
|    | M <sub>4</sub> (N)                  | M <sub>5</sub> (U) | Adder | Increment | M <sub>6</sub> (N)                | M <sub>7</sub> (U) | Adder | Increment |
| 8  | 63.8                                | 71.3               | 20.8  | 12.5      | 51.5                              | 59                 | 20.8  | 12.5      |
| 10 | 57                                  | 63                 | 24    |           | 53                                | 59                 | 29    |           |
| 12 | 67.2                                | 75.5               | 26.5  |           | 60.2                              | 68.5               | 29    |           |
| 16 | 72                                  | 82                 | 48.5  | 25        | 65                                | 75                 | 49    | 25        |
| 20 | 81.5                                | 93                 | 46.5  |           | 75.5                              | 87                 | 49    |           |
| 25 | 89                                  | 103                | 47    |           | 81                                | 95                 | 41.7  |           |

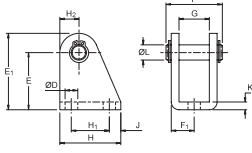
## Spring Forces

| Bore | ES (available up to 50mm stroke) |      |      | ESZ & ER       |                            |                |
|------|----------------------------------|------|------|----------------|----------------------------|----------------|
|      | Preload At Strokes (N)           |      |      | Final Load (N) | Preload At 10mm Stroke (N) | Final Load (N) |
|      | 10mm                             | 25mm | 50mm |                |                            |                |
| 8    | 5.1                              | 4.2  | 2.6  | 5.7            | 1.8                        | 8              |
| 10   | 5.1                              | 4.2  | 2.6  | 5.7            | 3.1                        | 8              |
| 12   | 5.8                              | 4.4  | 3.1  | 6.2            | 4.9                        | 16             |
| 16   | 5.8                              | 4.4  | 3.1  | 6.2            | 8.9                        | 22.7           |
| 20   | 20                               | 16.5 | 11.1 | 22             | 12                         | 31.7           |
| 25   | 28                               | 23.1 | 15.6 | 31.1           | 12                         | 39.2           |

# Bimba ISO 6432 Air Cylinders

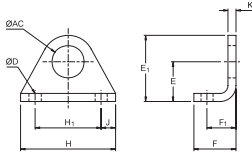
## Accessories - Carbon Steel

### CLEVIS FOOT



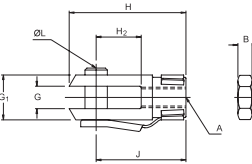
| Bore   | Type  | D   | E  | E <sub>1</sub> | F    | F <sub>1</sub> | G    | H  | H <sub>1</sub> | H <sub>2</sub> | J | K   | L |
|--------|-------|-----|----|----------------|------|----------------|------|----|----------------|----------------|---|-----|---|
| 8, 10  | CFB-1 | 4.5 | 24 | 29             | 17   | 6.5            | 8.1  | 20 | 12.5           | 5              | 4 | 2.5 | 4 |
| 12, 16 | CFB-2 | 5.5 | 27 | 34             | 23   | 9              | 12.1 | 25 | 15             | 7              | 5 | 3   | 6 |
| 20, 25 | CFB-3 | 6.6 | 30 | 40             | 29.5 | 12             | 16.1 | 32 | 20             | 10             | 6 | 4   | 8 |

### FOOT MOUNTING



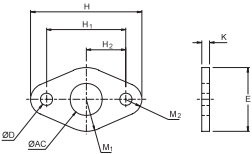
| Bore   | Type | AC   | D   | E  | E <sub>1</sub> | F  | F <sub>1</sub> | H  | H <sub>1</sub> | J   | K   |
|--------|------|------|-----|----|----------------|----|----------------|----|----------------|-----|-----|
| 8, 10  | FB-1 | 12.1 | 4.6 | 15 | 25             | 16 | 11             | 36 | 25             | 5.5 | 3   |
| 12, 16 | FB-2 | 16.1 | 5.6 | 20 | 33             | 20 | 14             | 45 | 32             | 6.5 | 4   |
| 20, 25 | FB-3 | 22.1 | 6.6 | 25 | 40             | 24 | 17             | 56 | 40             | 8   | 4.5 |

### ROD CLEVIS



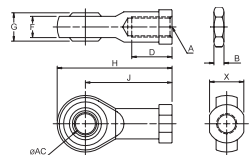
| Bore   | Type        | A        | B   | G  | G <sub>1</sub> | H  | H <sub>2</sub> | J  | L  |
|--------|-------------|----------|-----|----|----------------|----|----------------|----|----|
| 8, 10  | RC-M4x0.7   | M4x0.7   | 3.2 | 4  | 8              | 21 | 8              | 16 | 84 |
| 12, 16 | RC-M6x1.0   | M6x1.0   | 5   | 6  | 12             | 31 | 12             | 24 | 6  |
| 20     | RC-M8x1.25  | M8x1.25  | 4   | 8  | 16             | 42 | 16             | 32 | 8  |
| 25     | RC-M10x1.25 | M10x1.25 | 5   | 10 | 20             | 52 | 24             | 40 | 10 |

### FLANGE MOUNTING



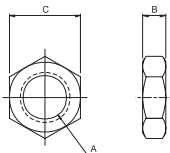
| Bore   | Type | AC   | D   | E  | H  | H <sub>1</sub> | H <sub>2</sub> | K   | M <sub>1</sub> | M <sub>2</sub> |
|--------|------|------|-----|----|----|----------------|----------------|-----|----------------|----------------|
| 8, 10  | MF-1 | 12.1 | 4.6 | 24 | 42 | 30             | 15             | 3   | 12             | 6              |
| 12, 16 | MF-2 | 16.1 | 5.6 | 28 | 54 | 40             | 20             | 4   | 14             | 7              |
| 20, 25 | MF-3 | 22.1 | 6.6 | 38 | 66 | 50             | 25             | 4.5 | 19             | 8              |

### SPHERICAL ROD EYE



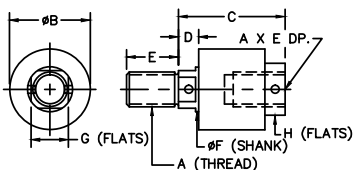
| Bore   | Type         | A        | AC | B   | D  | F    | G  | H  | J  | X  |
|--------|--------------|----------|----|-----|----|------|----|----|----|----|
| 8, 10  | SRE-M4x0.7   | M4x0.7   | 5  | 3.2 | 10 | 6    | 8  | 36 | 27 | 9  |
| 12, 16 | SRE-M6x1.0   | M6x1.0   | 6  | 5   | 12 | 6.75 | 9  | 40 | 30 | 11 |
| 20     | SRE-M8x1.25  | M8x1.25  | 8  | 4   | 16 | 9    | 12 | 48 | 36 | 14 |
| 25     | SRE-M10x1.25 | M10x1.25 | 10 | 5   | 20 | 10.5 | 14 | 57 | 43 | 17 |

### ROD/MOUNTING NUT



| Bore   | Type | A        | B   | C  | Type | A        | B  | C  |
|--------|------|----------|-----|----|------|----------|----|----|
|        |      |          |     |    | Type | A        | B  | C  |
| 8, 10  | RN-1 | M4x0.7   | 3.2 | 7  | MN-1 | M12x1.25 | 7  | 19 |
|        |      |          |     |    | MN-2 | M16x1.5  | 8  | 24 |
| 12, 16 | RN-2 | M6x1.0   | 5   | 10 | MN-3 | M22x1.5  | 10 | 32 |
| 20     | RN-3 | M8x1.25  | 4   | 13 |      |          |    |    |
| 25     | RN-4 | M10x1.25 | 5   | 17 |      |          |    |    |

### ROD COUPLER



| Bore    | Model           | A        | B    | C    | D   | E    | F    | G    | H    |
|---------|-----------------|----------|------|------|-----|------|------|------|------|
| 8, 10   | MAC250-M4x0.7   | M4x0.7   | 28.5 | 44.4 | 9.5 | 12.7 | 12.7 | 9.5  | 17.4 |
| 12, 16  | MAC250-M6x1.0   | M6x1.0   | 28.5 | 44.4 | 9.5 | 12.7 | 12.7 | 9.5  | 17.4 |
| 20      | MAC312-M8x1.25  | M8x1.25  | 28.5 | 44.4 | 9.5 | 12.7 | 12.7 | 9.5  | 17.4 |
| 25, 32  | MAC437-M10x1.25 | M10x1.25 | 31.7 | 50.8 | 11  | 19   | 15.8 | 12.7 | 20.6 |
| 40      | MAC500-M12x1.25 | M12x1.25 | 31.7 | 50.8 | 11  | 19   | 15.8 | 12.7 | 20.6 |
| 50, 63  | MAC625-M16x1.50 | M16x1.5  | 31.7 | 50.8 | 11  | 19   | 15.8 | 12.7 | 20.6 |
| 80, 100 | MAC750-M20x1.50 | M20x1.5  | 44.4 | 58.7 | 11  | 28.5 | 24.5 | 20.6 | 28.5 |