



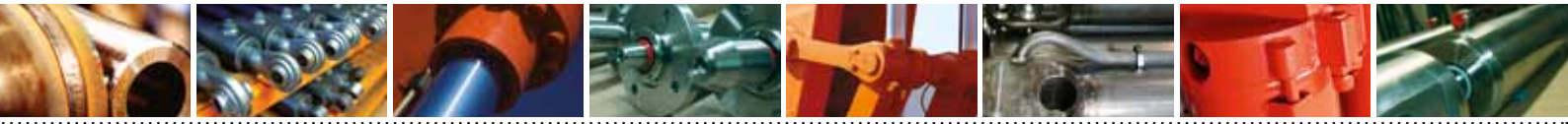
• Technical Catalogue



BUILDING ON A 60-YEAR TRADITION OF INNOVATION, QUALITY AND DELIVERY



BUILDING ON A 60-YEAR TRADITION OF INNOVATION, QUALITY AND DELIVERY



We believe in setting the benchmark high and then aiming even higher. It's this belief that ensures we remain at the forefront of our industry. Contact the Victor team to discuss how we can add value to your business.
TELEPHONE +64 3 344 2700 EMAIL INFO@VICTOR.CO.NZ



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New Zealand's Principal Manufacturer of Hydraulic Cylinders

For over sixty years, we have been building a tradition of innovation, quality and delivery that has become the foundation of everything we do. Today, we are setting the industry standard through innovative design and technology, internationally recognised quality and customised delivery.



From stock cylinders to customised one-off projects, we can design and manufacture premium steel, stainless steel, and aluminum hydraulic cylinders for a range of uses and industries.

Innovative Design and Technology

We have developed our own integrated software systems and specialised equipment to support the latest machine technology in our purpose-built flagship Christchurch factory. This includes CNC horizontal lathes, CNC vertical machining centres with one piece flow, and programmable welding manipulators designed in-house specifically for Victor.

With full-in-house engineering and analytical capacity, we can provide 3D modelling, finite element analysis, mathematical CAD stress and fatigue life predictions. We also specialise in mechanical product design and analysis, and product documentation – including purchase and maintenance specifications.



Stock Cylinders

We have a full range of hydraulic cylinders currently in stock and available for immediate delivery.

With a wide variety of cylinder specifications and sizes, stock cylinders are a cost-effective option for your next project. We can also arrange long-term supply agreements, with consistency of supply.

This catalogue showcases some of the range of hydraulic cylinders generally held in stock. For more information and pricing – or to discuss a customised option – please contact us.

Customised Cylinders

Whatever your project, we can supply the solution.

From one-off customised cylinders to project-based designs, or an OEM-specific application, we can provide the solution that will best suit your project specifications and requirements – in fact, application-specific custom-built cylinders represent over 90% of what we do.

We stock – and can source – a variety of materials for the manufacture of hydraulic cylinders for demanding applications and environments. Choose from a comprehensive range of various grades of stainless steel, aluminium and cylinder rod materials, with high performance finish coatings.

We also specialise in collaborative engineering. As an extension of your product and development team, we can provide input at a level that meets your company's needs – from concept to product release, or any part of the process.

We support a diverse range of industries, including agriculture, construction, container handling, forestry, marine, mining and transportation industries.

We also have experience working on a wide variety of projects – from mobile hydraulic platforms, elevated work platforms and cargo handling grabs, to superyachts, a marine mineral sampling tool and even a 64-seater spacecraft simulator.

With dedicated design and engineering staff, we can work with your team to design, develop and manufacture the best solution for your requirements.



Take control of your cylinder with the application of integrated control and diagnostics:

Integrated Hydraulic Control

We are able to build hydraulic control directly into the cylinder structure, ensuring inherently safer function. Load control valves are directly coupled to the cylinder, eliminating the risk of load release in the event of hose failure. In addition, we are able to reduce the overall product cost by eliminating assembly tasks and associated component inventory.

Integrated Electric Control

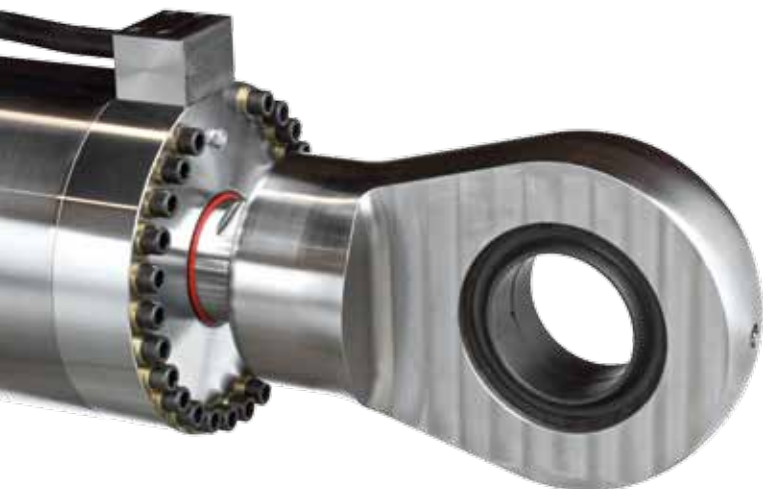
We are able to include linear transducers into the structure of the cylinder to provide a robust, protected sensor solution to facilitate closed loop control of the cylinder position. This can be combined with integrated pressure transducers and a range of control options to provide real time performance feedback.

Datalogging and Diagnostics

With a range of datalogging equipment, we have the tools to enable diagnostic trouble-shooting and system performance evaluation. High frequency datalogging also provides invaluable data in support of product development research.

System Simulation

With state-of-the-art fluid/electrical control simulation software, we are able to predict system performance early in the design process. This is used not only for design, but also troubleshooting, training and system documentation.





Specialist Machining

In recent years, we have extended our operations to include diverse component and specialist machining capability. With modern CNC machine tools, we are now able to deliver large scale boring, tube bending, deep hole drilling and honing from a dedicated machining facility.

This enables us to ensure our own products continue to be manufactured to the highest standards. It also means we are able to provide a comprehensive and cost-effective range of services to other companies looking to outsource component and specialist machining requirements.

Modern manufacturing methods and established standard operating procedures, including workflow and production planning, enables us to deliver a tailored supply solution. We can also manipulate tooling and fixture design to deliver customised manufacturing for one-off projects.



Internationally Recognised Quality

Our commitment to our customers is to provide the best, without exception. In 2006, we implemented the stringent John Deere JDS-G223 quality standard, which champions customer service, design, quality, cost and on-time in-full delivery. Now JDS-G223 certified, we are the only hydraulic cylinder business in Australasia to be ISO 9001 accredited for the design, manufacture and supply of hydraulic cylinders.

We are also committed to providing a healthy and safe workplace for our staff, with AS/NZS 4801 and BS OHSAS 18001 health and safety certifications.

Our programme of continual product, process and staff development enables us to retain our position as a key supplier to the New Zealand, Australian and global markets.



Customised Delivery

We can tailor our supply agreements to suit your supply chain - whether it's built-to-order, kanban scheduling, single unit pricing or agreements requiring quantity breaks. We can also work with you to develop competitive pricing structures and highly responsive manufacturing lead-times to ensure your job is completed on time and on budget.

With a professional and experienced sales and production team, we provide a high level of communication and transparency to ensure timely delivery and customer satisfaction.



VICTOR TECHNICAL CATALOGUE



Contact us to discuss how we can add value to your business.



Compact S Series

Smaller Bores

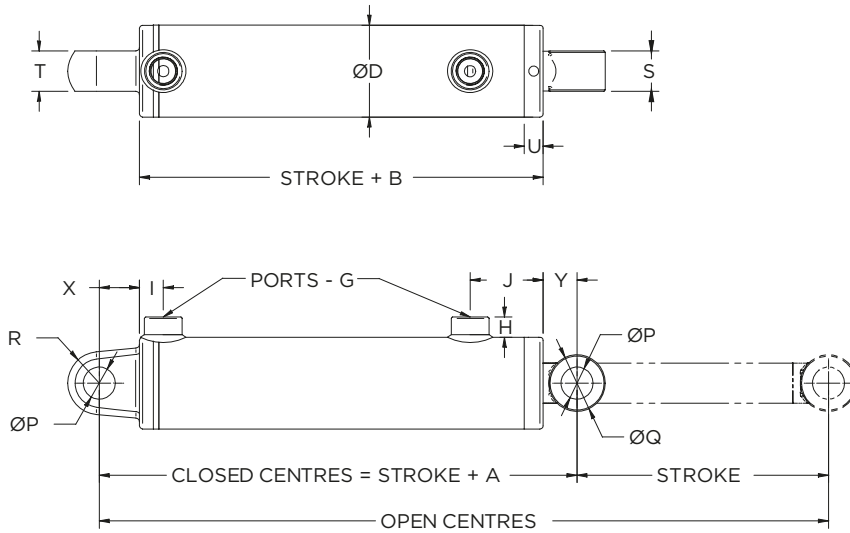
- ▶ Threaded head design – hard wearing cast iron or steel with bearing rings, depending on bore/shaft configuration †
- ▶ High tensile precision torqued cap screw piston fixing up to 3.5” bore
- ▶ Blind threaded piston also available in 3.5” bore.

- Threaded head design
- Common sizes ex-stock
- Rapidly manufactured to your dimensional and fitting requirements
- Compact closed centre dimensions
- Precision manufactured to extreme standards of dimensional accuracy
- Rated to 210 bar (3000psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- All seals rated to 400 bar (6,000 psi)
- Absolutely concentric construction.



- “BSP” ports (UN-O ring available)
- Hard chrome shaft
- Precision bore tube for accuracy, oil retention and extended seal life
- Five piece piston seal with acetal wear rings
- Alternative seal materials available.





| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | P | Q | R | S | T | U |
|---------------|-------|--------------|-------|-----|-----|----|----|------|------|-----|----|----|-------|------|----|------|----|----|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | (B11) | | | | | |
| 1.5" | 38.10 | 0.750" | 19.05 | 143 | 91 | 24 | 28 | 50.8 | 1/4" | 12 | 11 | 43 | 15.88 | 32 | 16 | 19 | 20 | 10 |
| 1.5" | 38.10 | 1.000" | 25.40 | 143 | 91 | 24 | 28 | 50.8 | 1/4" | 12 | 11 | 43 | 15.88 | 32 | 16 | 25.4 | 20 | 10 |
| 2.0" | 50.80 | 1.000" | 25.40 | 170 | 107 | 28 | 35 | 63.5 | 3/8" | 15 | 16 | 49 | 22.23 | 38 | 22 | 25.4 | 25 | 12 |
| 2.0" | 50.80 | 1.250" | 31.75 | 170 | 107 | 28 | 35 | 63.5 | 3/8" | 15 | 16 | 49 | 22.23 | 38 | 22 | 32 | 25 | 12 |
| 2.0" † | 50.80 | 1.500" | 38.10 | 195 | 129 | 28 | 38 | 63.5 | 3/8" | 15 | 16 | 71 | 22.23 | 45 | 22 | 38.1 | 25 | 34 |
| 2.5" | 63.50 | 1.250" | 31.75 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 45 | 25 | 32 | 32 | 15 |
| 2.5" | 63.50 | 1.375" | 34.92 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 45 | 25 | 35 | 32 | 15 |
| 2.5" | 63.50 | 1.500" | 38.10 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 45 | 25 | 38.1 | 32 | 15 |
| 2.5" | 63.50 | 1.750" | 44.45 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 51 | 25 | 45 | 32 | 15 |
| 2.5" † | 63.50 | 2.000" | 50.80 | 226 | 143 | 32 | 51 | 76.2 | 1/2" | 18 | 19 | 81 | 25.40 | 63.5 | 25 | 51 | 32 | 37 |
| 3.0" | 76.20 | 1.500" | 38.10 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 51 | 32 | 38.1 | 40 | 15 |
| 3.0" | 76.20 | 1.750" | 44.45 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 51 | 32 | 45 | 40 | 15 |
| 3.0" | 76.20 | 2.000" | 50.80 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 63.5 | 32 | 51 | 40 | 15 |
| 3.0" † | 76.20 | 2.250" | 57.15 | 247 | 154 | 40 | 53 | 88.9 | 1/2" | 18 | 21 | 83 | 31.75 | 63.5 | 32 | 57 | 40 | 37 |
| 3.0" † | 76.20 | 2.500" | 63.50 | 247 | 154 | 40 | 53 | 88.9 | 1/2" | 18 | 21 | 83 | 31.75 | 76.2 | 32 | 64 | 40 | 37 |
| 3.5" † | 88.90 | 1.750" | 44.45 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 45 | 45 | 15 |
| 3.5" † | 88.90 | 2.000" | 50.80 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 51 | 45 | 15 |
| 3.5" † | 88.90 | 2.500" | 63.50 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 76.2 | 38 | 64 | 45 | 15 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost. † Steel head with bearing rings.

All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.



Compact S Series

3.5" and Larger Bores

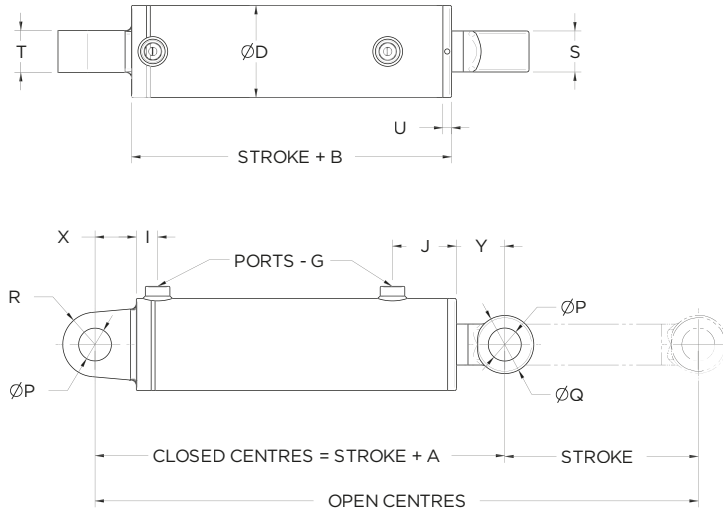
- ▶ Threaded steel head
- ▶ Blind threaded piston locked with nylon ring
- ▶ Replaceable heavy duty glass reinforced bearing rings
- ▶ 10", 12" and larger bore cylinders also available on request.

- Threaded head and piston design
- Common sizes ex-stock
- Rapidly manufactured to your dimensional and fitting requirements
- Compact closed centre dimensions
- Precision manufactured to extreme standards of dimensional accuracy
- Rated to 210 bar (3000psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- All seals rated to 400 bar (6,000 psi)
- Absolutely concentric construction.



- "BSP" ports (UN-O ring available)
- Hard chrome shaft
- Precision bore tube for accuracy, oil retention and extended seal life
- Five piece piston seal with acetal wear rings
- Alternative seal materials available.





| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | P | Q | R | S | T | U |
|---------------|--------|--------------|--------|-----|-------|-----|------|-----|------|-----|----|-----|-------|------|----|-----|-----|------|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | (B11) | | | | | |
| 3.5" | 88.90 | 1.750" | 44.45 | 245 | 144 | 48 | 53 | 102 | 1/4" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 45 | 45 | 15 |
| 3.5" | 88.90 | 2.000" | 50.80 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 51 | 45 | 15 |
| 3.5" | 88.90 | 2.500" | 63.50 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 76.2 | 38 | 64 | 45 | 15 |
| 4.0" | 101.60 | 2.000" | 50.80 | 290 | 174 | 56 | 60 | 115 | 1/2" | 18 | 28 | 84 | 44.45 | 76.2 | 45 | 51 | 50 | 15 |
| 4.0" | 101.60 | 2.500" | 63.50 | 290 | 174 | 56 | 60 | 115 | 1/2" | 18 | 28 | 84 | 44.45 | 76.2 | 45 | 64 | 50 | 15 |
| 4.0" | 101.60 | 3.000" | 76.20 | 290 | 174 | 56 | 60 | 115 | 1/2" | 18 | 28 | 84 | 44.45 | 86 | 45 | 77 | 50 | 15 |
| 4.5" | 114.30 | 2.250" | 57.15 | 316 | 177 | 64 | 75 | 133 | 3/4" | 20 | 28 | 84 | 50.80 | 90 | 50 | 57 | 60 | 15 |
| 4.5" | 114.30 | 2.500" | 63.50 | 316 | 177 | 64 | 75 | 133 | 3/4" | 20 | 28 | 84 | 50.80 | 90 | 50 | 64 | 60 | 15 |
| 4.5" | 114.30 | 3.000" | 76.20 | 316 | 177 | 64 | 75 | 133 | 3/4" | 20 | 28 | 84 | 50.80 | 90 | 50 | 77 | 60 | 15 |
| 5.0" | 127.00 | 2.500" | 63.50 | 335 | 196 | 64 | 75 | 133 | 3/4" | 20 | 33 | 99 | 50.80 | 90 | 50 | 64 | 65 | 13.5 |
| 5.0" | 127.00 | 3.000" | 76.20 | 335 | 196 | 64 | 75 | 146 | 3/4" | 20 | 33 | 99 | 50.80 | 90 | 50 | 77 | 65 | 13.5 |
| 5.0" | 127.00 | 3.500" | 88.90 | 335 | 196 | 64 | 75 | 146 | 3/4" | 20 | 33 | 99 | 50.80 | 108 | 50 | 89 | 65 | 13.5 |
| 5.0" | 127.00 | 4.000" | 101.60 | 335 | 196 | 64 | 75 | 146 | 3/4" | 20 | 33 | 99 | 50.80 | 118 | 50 | 102 | 65 | 13.5 |
| 6.0" | 152.40 | 3.000" | 76.20 | 385 | 218 | 80 | 87 | 178 | 3/4" | 20 | 39 | 115 | 63.50 | 118 | 63 | 77 | 80 | 13.5 |
| 6.0" | 152.40 | 4.000" | 101.60 | 385 | 218 | 80 | 87 | 178 | 3/4" | 20 | 39 | 115 | 63.50 | 118 | 63 | 102 | 80 | 13.5 |
| 7.0" | 177.80 | 3.500" | 88.90 | 412 | 232 | 90 | 90 | 203 | 3/4" | 20 | 39 | 129 | 69.85 | 128 | 70 | 89 | 90 | 13.5 |
| 7.0" | 177.80 | 4.000" | 101.60 | 412 | 232 | 90 | 90 | 203 | 3/4" | 20 | 39 | 129 | 69.85 | 128 | 70 | 102 | 90 | 13.5 |
| 8.0" | 203.20 | 4.000" | 101.60 | 445 | 248.5 | 100 | 96.5 | 230 | 3/4" | 20 | 39 | 145 | 76.20 | 128 | 75 | 102 | 100 | 9.5 |
| 8.0" | 203.20 | 5.000" | 127.00 | 445 | 248.5 | 100 | 96.5 | 230 | 3/4" | 20 | 39 | 145 | 76.20 | 138 | 75 | 127 | 100 | 9.5 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

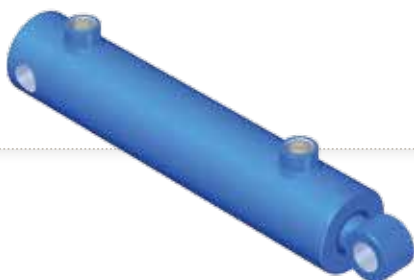
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Compact Super S Series

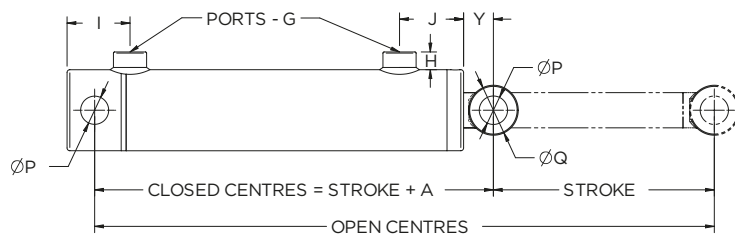
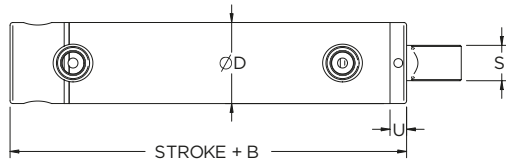
- ▶ Threaded head design - hard wearing cast iron or steel with bearing rings, depending on bore/shaft configuration †
- ▶ High tensile precision torqued cap screw piston fixing up to 3.5" bore
- ▶ Blind threaded piston locked with nylon ring from 3.5" bore
- ▶ Compact SUPER S styles are available for larger bore cylinders.

- Threaded head and piston design
- Common sizes ex-stock
- Fits where space is a real problem
- Rapidly manufactured to your dimensional and fitting requirements
- Super compact closed centre dimensions
- Precision manufactured to extreme standards of dimensional accuracy
- Rated to 210 bar (3000psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- All seals rated to 400 bar (6,000 psi)
- Absolutely concentric construction.



- "BSP" ports (UN-O ring available)
- Precision bore tube for accuracy, oil retention and extended seal life
- Hard chrome shaft
- Five piece piston seal with acetal wear rings
- Slug base.

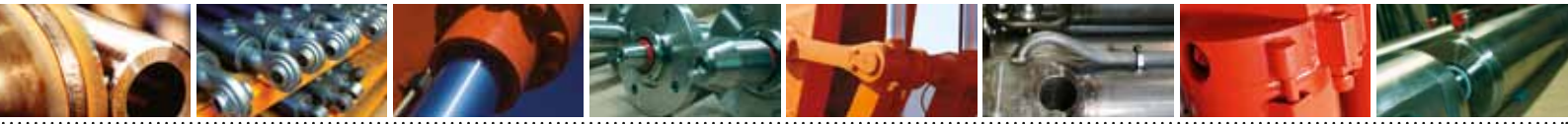




| CYLINDER BORE | | ROD DIAMETER | | A | B | Y | D | G | H | I | J | P | Q | S | U |
|---------------|--------|--------------|-------|-----|-----|----|------|------|-----|----|----|-------|------|------|----|
| in | mm | in | mm | | | | MAX | BSP* | MAX | | | (B11) | | | |
| 1.5" | 38.10 | 0.750" | 19.05 | 123 | 116 | 24 | 50.8 | 1/4" | 12 | 36 | 43 | 15.88 | 32 | 19 | 10 |
| 1.5" | 38.10 | 1.000" | 25.40 | 123 | 116 | 24 | 50.8 | 1/4" | 12 | 36 | 43 | 15.88 | 32 | 25.4 | 10 |
| 2.0" | 50.80 | 1.000" | 25.40 | 147 | 141 | 28 | 63.5 | 3/8" | 15 | 50 | 49 | 22.23 | 38 | 25.4 | 12 |
| 2.0" | 50.80 | 1.250" | 31.75 | 147 | 141 | 28 | 63.5 | 3/8" | 15 | 50 | 49 | 22.23 | 38 | 32 | 12 |
| 2.0" † | 50.80 | 1.500" | 38.10 | 173 | 163 | 32 | 63.5 | 3/8" | 15 | 50 | 71 | 22.23 | 45 | 38.1 | 34 |
| 2.5" | 63.50 | 1.250" | 31.75 | 170 | 159 | 36 | 76.2 | 1/2" | 18 | 57 | 58 | 25.40 | 45 | 32 | 15 |
| 2.5" | 63.50 | 1.375" | 34.92 | 170 | 159 | 36 | 76.2 | 1/2" | 18 | 57 | 58 | 25.40 | 45 | 35 | 15 |
| 2.5" | 63.50 | 1.500" | 38.10 | 170 | 159 | 36 | 76.2 | 1/2" | 18 | 57 | 58 | 25.40 | 45 | 38.1 | 15 |
| 2.5" | 63.50 | 1.750" | 44.45 | 170 | 159 | 36 | 76.2 | 1/2" | 18 | 57 | 58 | 25.40 | 51 | 45 | 15 |
| 2.5" † | 63.50 | 2.000" | 50.80 | 202 | 181 | 46 | 76.2 | 1/2" | 18 | 57 | 81 | 25.40 | 63.5 | 51 | 37 |
| 3.0" | 76.20 | 1.500" | 38.10 | 190 | 180 | 42 | 88.9 | 1/2" | 18 | 69 | 61 | 31.75 | 51 | 38.1 | 15 |
| 3.0" | 76.20 | 1.750" | 44.45 | 190 | 180 | 42 | 88.9 | 1/2" | 18 | 69 | 61 | 31.75 | 51 | 45 | 15 |
| 3.0" | 76.20 | 2.000" | 50.80 | 190 | 180 | 42 | 88.9 | 1/2" | 18 | 69 | 61 | 31.75 | 63.5 | 51 | 15 |
| 3.0" † | 76.20 | 2.250" | 57.15 | 225 | 202 | 55 | 88.9 | 1/2" | 18 | 69 | 83 | 31.75 | 63.5 | 57 | 37 |
| 3.0" † | 76.20 | 2.500" | 63.50 | 225 | 202 | 55 | 88.9 | 1/2" | 18 | 69 | 83 | 31.75 | 76.2 | 64 | 37 |
| 3.5" † | 88.90 | 1.750" | 44.45 | 213 | 200 | 51 | 102 | 1/2" | 18 | 79 | 71 | 38.10 | 63.5 | 45 | 15 |
| 3.5" † | 88.90 | 2.000" | 50.80 | 213 | 200 | 51 | 102 | 1/2" | 18 | 79 | 71 | 38.10 | 63.5 | 51 | 15 |
| 3.5" † | 88.90 | 2.500" | 63.50 | 213 | 200 | 51 | 102 | 1/2" | 18 | 79 | 71 | 38.10 | 76.2 | 64 | 15 |
| 4.0" † | 101.60 | 2.000" | 50.80 | 254 | 241 | 58 | 115 | 1/2" | 18 | 95 | 84 | 44.45 | 76.2 | 51 | 15 |
| 4.0" † | 101.60 | 2.500" | 63.50 | 254 | 241 | 58 | 115 | 1/2" | 18 | 95 | 84 | 44.45 | 76.2 | 64 | 15 |
| 4.0" † | 101.60 | 3.000" | 76.20 | 254 | 241 | 58 | 115 | 1/2" | 18 | 95 | 84 | 44.45 | 86 | 77 | 15 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost. † Steel head with bearing rings.

All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.



■ Compact Marine Series

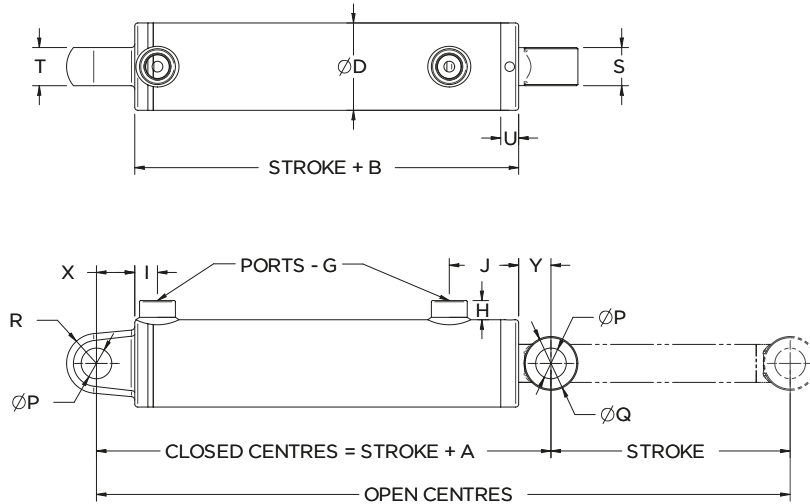
- ▶ '2205' stainless steel shaft and shaft eye
- ▶ Stainless steel head (up to 3.0" bores)
- ▶ Exterior sand blasted and arc zinc or aluminium sprayed
- ▶ Plated steel head (3.5" bores and over)
- ▶ Replaceable PTFE or glass reinforced nylon bearing rings
- ▶ High tensile precision torqued cap screw piston fixing up to 3.5" bores
- ▶ Blind threaded piston locked with nylon ring (3.5" bores and over).

- Threaded head design
- Compact closed centre dimensions
- Precision manufactured to extreme standards of dimensional accuracy
- Rapidly manufactured from stock components to your dimensional and fitting requirements
- Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- All seals rated to 400 bar (6,000 psi)
- Absolutely concentric construction.



- '2205' stainless steel shaft eye
- Replaceable bearing rings
- Stainless steel threaded head (plated steel for 3.5" bores and over)
- Precision bore tube for accuracy, oil retention and extended seal life
- Sand blasted and arc sprayed zinc or aluminium
- '2205' centreless ground stainless steel shaft
- Five piece piston seal with acetal wear rings
- Threaded piston connection
- "BSP" ports (UN-O ring available).





All Compact Series options available in Compact Marine

| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | P | Q | R | S | T | U |
|---------------|--------|--------------|-------|-----|-----|----|----|------|------|-----|----|----|-------|------|----|------|----|----|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | (B11) | | | | | |
| 1.5" | 38.10 | 0.750" | 19.05 | 143 | 91 | 24 | 28 | 50.8 | 1/4" | 12 | 11 | 43 | 15.88 | 32 | 16 | 19 | 20 | 10 |
| 1.5" | 38.10 | 1.000" | 25.40 | 143 | 91 | 24 | 28 | 50.8 | 1/4" | 12 | 11 | 43 | 15.88 | 32 | 16 | 25.4 | 20 | 10 |
| 2.0" | 50.80 | 1.000" | 25.40 | 170 | 107 | 28 | 35 | 63.5 | 3/8" | 15 | 16 | 49 | 22.23 | 38 | 22 | 25.4 | 25 | 12 |
| 2.0" | 50.80 | 1.250" | 31.75 | 170 | 107 | 28 | 35 | 63.5 | 3/8" | 15 | 16 | 49 | 22.23 | 38 | 22 | 32 | 25 | 12 |
| 2.5" | 63.50 | 1.250" | 31.75 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 45 | 25 | 32 | 32 | 15 |
| 2.5" | 63.50 | 1.500" | 38.10 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 45 | 25 | 38.1 | 32 | 15 |
| 2.5" | 63.50 | 1.750" | 44.45 | 195 | 121 | 32 | 42 | 76.2 | 1/2" | 18 | 19 | 58 | 25.40 | 51 | 25 | 45 | 32 | 15 |
| 3.0" | 76.20 | 1.500" | 38.10 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 51 | 32 | 38.1 | 40 | 15 |
| 3.0" | 76.20 | 1.750" | 44.45 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 51 | 32 | 45 | 40 | 15 |
| 3.0" | 76.20 | 2.000" | 50.80 | 220 | 132 | 40 | 48 | 88.9 | 1/2" | 18 | 21 | 61 | 31.75 | 63.5 | 32 | 51 | 40 | 15 |
| 3.5" | 88.90 | 1.750" | 44.45 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 45 | 45 | 15 |
| 3.5" | 88.90 | 2.000" | 50.80 | 245 | 144 | 48 | 53 | 102 | 1/2" | 18 | 23 | 71 | 38.10 | 63.5 | 38 | 51 | 45 | 15 |
| 4.0" | 101.60 | 2.000" | 50.80 | 290 | 174 | 56 | 60 | 115 | 1/2" | 18 | 28 | 84 | 44.45 | 76.2 | 45 | 51 | 50 | 15 |
| 4.0" | 101.60 | 2.500" | 63.50 | 290 | 174 | 56 | 60 | 115 | 1/2" | 18 | 28 | 84 | 44.45 | 76.2 | 45 | 64 | 50 | 15 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

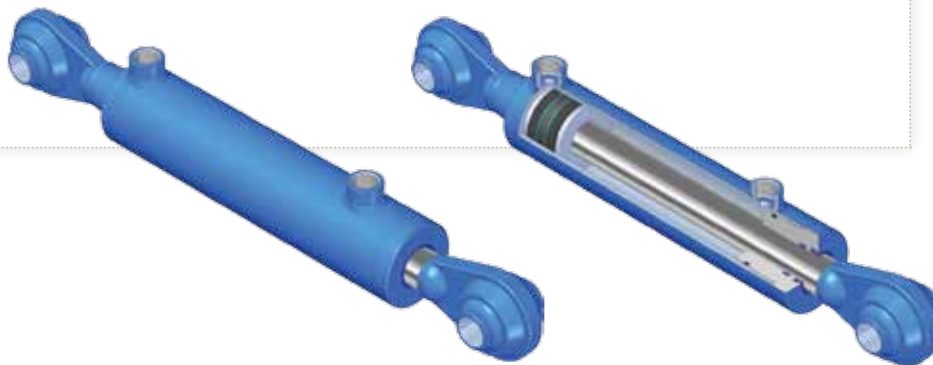
All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.

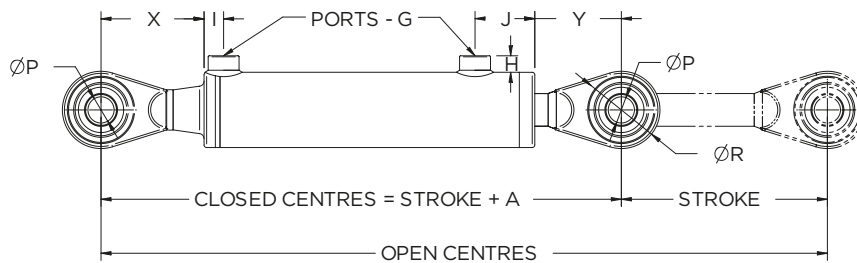
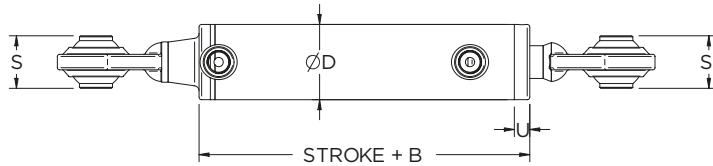


■ Compact Top Link Series

- ▶ Extended base for increased clearance
- ▶ Common sizes ex-stock
- ▶ High tensile precision torqued cap screw piston fixing
- ▶ Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- ▶ All seals rated to 400 bar (6,000 psi).

- CAT 2 or 3 ball end
- Precision bore tube for accuracy, oil retention and extended seal life
- Hard chrome shaft
- Five piece piston seal with acetal wear rings
- Cap screwed piston connection
- "BSP" ports (UN-O ring available).





| | BALLEND | CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | P | R | S | U |
|-------|---------|---------------|--------|--------------|-------|-----|-----|-----|-----|------|------|-----|----|------|-------|----|----|----|
| | | in | mm | in | mm | | | | | MAX | BSP* | MAX | | | (Nom) | | | |
| CAT 2 | | 2.5" | 63.50 | 1.250" | 31.75 | 305 | 121 | 100 | 84 | 76.2 | 1/2" | 18 | 19 | 58 | 25.4 | 68 | 51 | 15 |
| | | 2.5" | 63.50 | 1.500" | 38.10 | 305 | 121 | 100 | 84 | 76.2 | 1/2" | 18 | 19 | 58 | 25.4 | 68 | 51 | 15 |
| | | 2.5" | 63.50 | 1.750" | 44.45 | 305 | 121 | 100 | 84 | 76.2 | 1/2" | 18 | 19 | 58 | 25.4 | 68 | 51 | 15 |
| | | 3.0" | 76.20 | 1.500" | 38.10 | 305 | 132 | 100 | 78 | 88.9 | 1/2" | 18 | 21 | 61 | 25.4 | 68 | 51 | 15 |
| | | 3.0" | 76.20 | 1.750" | 44.45 | 305 | 132 | 100 | 78 | 88.9 | 1/2" | 18 | 21 | 61 | 25.4 | 68 | 51 | 15 |
| | | 3.0" | 76.20 | 2.000" | 50.80 | 305 | 132 | 100 | 78 | 88.9 | 1/2" | 18 | 21 | 61 | 25.4 | 68 | 51 | 15 |
| CAT 3 | | 3.0" | 76.20 | 1.500" | 38.10 | 356 | 132 | 100 | 129 | 88.9 | 1/2" | 18 | 21 | 61 | 31.8 | 99 | 51 | 15 |
| | | 3.0" | 76.20 | 1.750" | 44.45 | 356 | 132 | 100 | 129 | 88.9 | 1/2" | 18 | 21 | 61 | 31.8 | 99 | 51 | 15 |
| | | 3.0" | 76.20 | 2.000" | 50.80 | 356 | 132 | 100 | 129 | 88.9 | 1/2" | 18 | 21 | 61 | 31.8 | 99 | 51 | 15 |
| | | 3.5" | 88.90 | 1.750" | 44.45 | 356 | 144 | 100 | 112 | 102 | 1/2" | 18 | 23 | 71 | 31.8 | 99 | 51 | 15 |
| | | 3.5" | 88.90 | 2.000" | 50.80 | 356 | 144 | 100 | 112 | 102 | 1/2" | 18 | 23 | 71 | 31.8 | 99 | 51 | 15 |
| | 3.5" | 88.90 | 2.500" | 63.50 | 356 | 144 | 100 | 112 | 102 | 1/2" | 18 | 23 | 71 | 31.8 | 99 | 51 | 15 | |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.

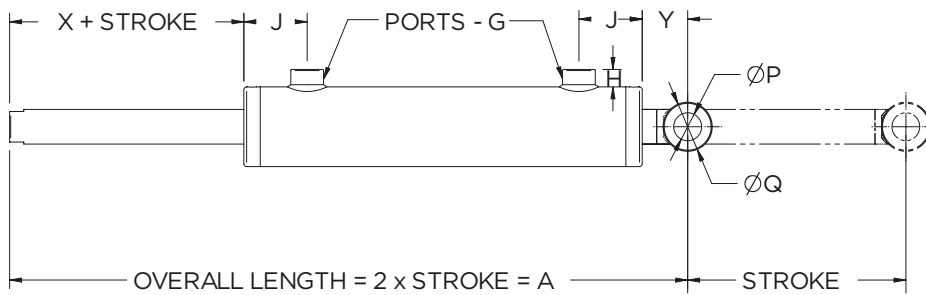
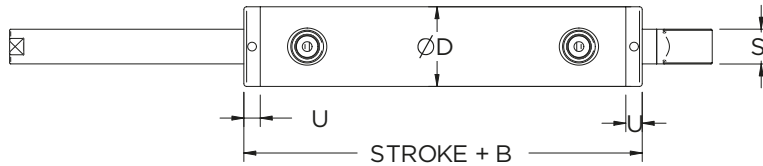


■ Thru Rod Equal Displacement D/A Series

- ▶ Thru rod, equal displacement double acting cylinder
- ▶ Hard wearing cast iron threaded heads
- ▶ Precision manufactured to extreme standards of dimensional accuracy
- ▶ Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- ▶ All seals rated to 400 bar (6,000 psi).

- Threaded heads
- "BSP" ports (UN-O ring available)
- Hard chrome shaft
- Five piece piston seal with acetal wear rings
- Precision bore tube for accuracy, oil retention and extended seal life
- High tensile threaded rod piston connection.





| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | J | P | Q | S | U |
|---------------|------|--------------|-------|-----|-----|----|----|------|------|------|----|-------|-------|------|----|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | (B11) | | |
| 1.5" | 38.1 | 0.750" | 19.05 | 169 | 128 | 13 | 28 | 50.8 | 1/4" | 12 | 43 | 15.88 | 32 | 19 | 10 |
| 1.5" | 38.1 | 1.000" | 25.40 | 169 | 128 | 13 | 28 | 50.8 | 1/4" | 12 | 43 | 15.88 | 32 | 25.4 | 10 |
| 2.0" | 50.8 | 1.000" | 25.40 | 193 | 145 | 13 | 35 | 63.5 | 3/8" | 15 | 49 | 22.23 | 38 | 25.4 | 12 |
| 2.0" | 50.8 | 1.250" | 31.75 | 195 | 145 | 15 | 35 | 63.5 | 3/8" | 15 | 49 | 22.23 | 38 | 32 | 12 |
| 2.5" | 63.5 | 1.250" | 31.75 | 222 | 165 | 15 | 42 | 73 | 1/2" | 15.5 | 58 | 25.40 | 45 | 32 | 15 |
| 2.5" | 63.5 | 1.50" | 38.10 | 222 | 165 | 15 | 42 | 73 | 1/2" | 15.5 | 58 | 25.40 | 45 | 38.1 | 15 |
| 2.5" | 63.5 | 1.750" | 44.45 | 225 | 165 | 18 | 42 | 73 | 1/2" | 15.5 | 58 | 25.40 | 51 | 45 | 15 |
| 3.0" | 76.2 | 1.500" | 38.10 | 240 | 177 | 15 | 48 | 88.9 | 1/2" | 17 | 61 | 31.75 | 51 | 38.1 | 15 |
| 3.0" | 76.2 | 1.750" | 44.45 | 243 | 177 | 18 | 48 | 88.9 | 1/2" | 18 | 61 | 31.75 | 51 | 45 | 15 |
| 3.0" | 76.2 | 2.000" | 50.80 | 243 | 177 | 18 | 48 | 88.9 | 1/2" | 17 | 61 | 31.75 | 63.5 | 51 | 15 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.



Compact S.A.E Series

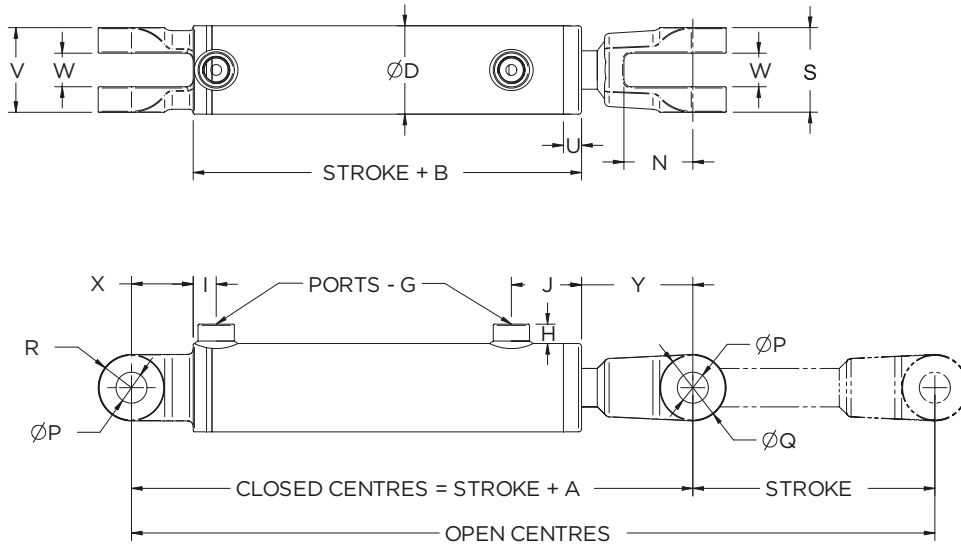
- ▶ Built to international S.A.E. J716 / ISO 2057 standards – gives full in-the field interchangeability
- ▶ Threaded head design – hard wearing cast iron or steel with bearing rings, depending on bore/shaft configuration †
- ▶ High tensile precision torqued cap screw piston fixing up to 3.5” bore
- ▶ Blind threaded piston for 3.5” and 4.0” bores.

- Threaded head design
- Common S.A.E. sizes ex-stock
- Rapidly manufactured to your dimensional and fitting requirements
- Precision manufactured to extreme standards of dimensional accuracy
- Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- All seals rated to 400 bar (6,000 psi)
- Absolutely concentric construction.



- 1” pins & clips
- Threaded head
- Hard chrome shaft
- Precision bore tube for accuracy, oil retention and extended seal life
- “BSP” ports (UN-O ring available)
- Five piece piston seal with acetal wear rings
- Cap screwed piston connection.





| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | N | P | R | S | U | V | W |
|---------------|-------|--------------|-------|-----|-----|----|-----|------|------|-----|----|----|----|-------|------|----|----|----|------|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | | (B11) | | | | | MIN |
| 2.5" | 63.5 | 1.250" | 31.75 | 311 | 121 | 51 | 139 | 76.2 | 1/2" | 18 | 19 | 58 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 2.5" | 63.5 | 1.500" | 38.10 | 311 | 121 | 51 | 139 | 76.2 | 1/2" | 18 | 19 | 58 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.0" | 76.2 | 1.500" | 38.10 | 311 | 128 | 51 | 132 | 89 | 1/2" | 18 | 19 | 61 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.0" | 76.2 | 1.750" | 44.45 | 311 | 128 | 51 | 132 | 89 | 1/2" | 18 | 19 | 61 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.5" † | 88.9 | 1.750" | 44.45 | 311 | 144 | 51 | 116 | 102 | 1/2" | 18 | 23 | 71 | 57 | 25.4 | 32.0 | 60 | 15 | 60 | 27 |
| 4.0" † | 101.6 | 2.000" | 50.80 | 311 | 174 | 51 | 86 | 115 | 1/2" | 18 | 28 | 84 | 57 | 25.4 | 32.5 | 60 | 15 | 60 | 27 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost. † Steel head with bearing rings.

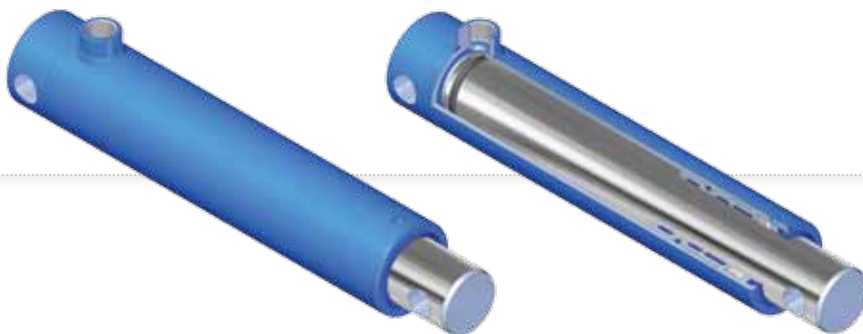
All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.

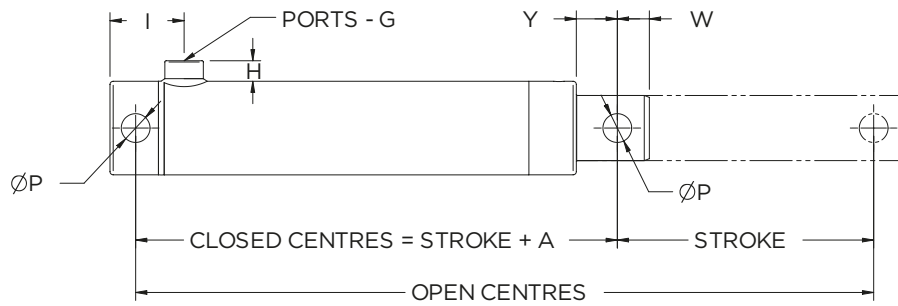
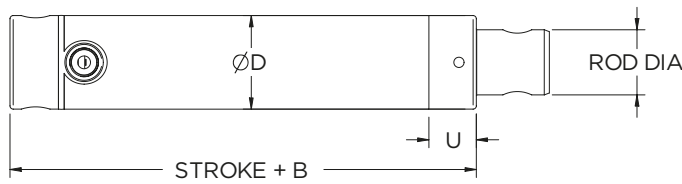


Displacement Single Acting (Unguided) Series

- ▶ Suits power up, gravity down applications
- ▶ Resistance to sideloads from extended head bearing area
- ▶ Threaded steel head with bearing rings
- ▶ Rapidly manufactured to your dimensional and fitting requirements
- ▶ Precision manufactured to extreme standards of dimensional accuracy
- ▶ Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- ▶ All seals rated to 400 bar (6,000 psi)
- ▶ Absolutely concentric construction.

- Threaded head
- Extended head bearing area
- Hard chrome shaft
- "BSP" port (UN-O ring available)
- Slug base.





| ROD DIAMETER | | A | B | Y | D | G | H | I | P | U | w |
|--------------|-------|-----|-----|----|------|------|-----|----|-------|----|----|
| in | mm | | | | MAX | BSP* | MAX | | (B11) | | |
| 1.500" | 38.10 | 155 | 145 | 30 | 63.5 | 3/8" | 15 | 53 | 19.05 | 34 | 20 |
| 1.750" | 44.45 | 176 | 164 | 32 | 76.2 | 1/2" | 18 | 58 | 22.23 | 37 | 25 |
| 2.000" | 50.80 | 176 | 164 | 32 | 76.2 | 1/2" | 18 | 58 | 22.23 | 37 | 25 |
| 2.500" | 63.50 | 179 | 172 | 32 | 88.9 | 1/2" | 18 | 63 | 25.40 | 37 | 25 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

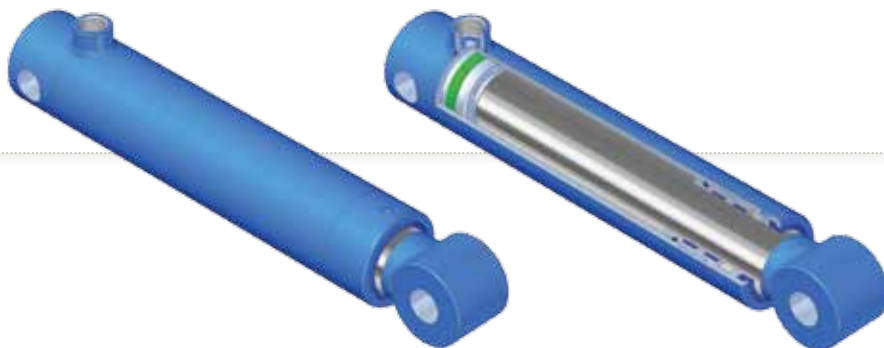
All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.

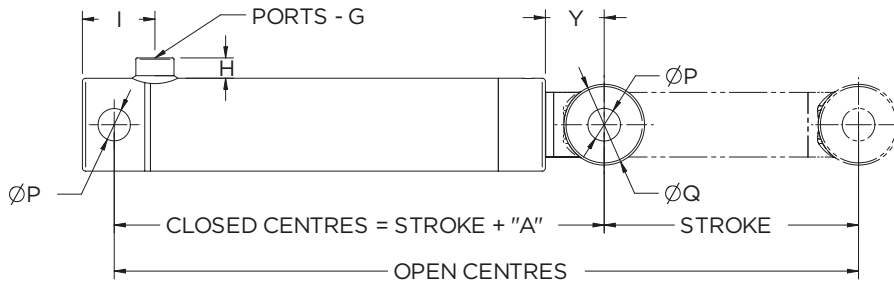
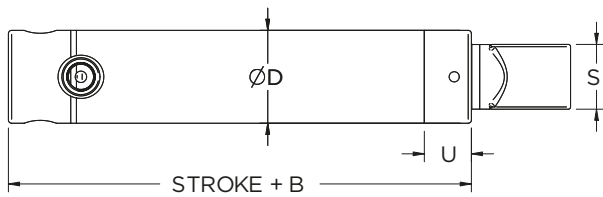


■ Displacement Single Acting (Guided) Series

- ▶ Guided shaft improves resistance to sideloads and buckling
- ▶ Suits power up, gravity down applications
- ▶ Threaded steel head with bearing rings
- ▶ Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
- ▶ All seals rated to 400 bar (6,000 psi).

- Threaded head
- Guided hard chrome shaft
- Guiding piston with single wear ring
- "BSP" port (UN-O ring available)
- Slug base.





| ROD DIAMETER | | A | B | Y | D | G | H | I | P | Q | S | U |
|--------------|-------|-----|-----|----|------|------|-----|----|-------|------|------|----|
| in | mm | | | | MAX | BSP* | MAX | | (B11) | | | |
| 1.000" | 25.40 | 109 | 102 | 24 | 50.8 | 1/4" | 12 | 36 | 15.88 | 32 | 25.4 | 10 |
| 1.250" | 31.75 | 126 | 120 | 28 | 63.5 | 3/8" | 15 | 50 | 22.23 | 38 | 32 | 12 |
| 1.500" | 38.10 | 152 | 142 | 32 | 63.5 | 1/2" | 18 | 50 | 22.23 | 45 | 38.1 | 34 |
| 1.750" | 44.45 | 153 | 142 | 36 | 76.2 | 1/2" | 18 | 57 | 25.40 | 51 | 45 | 15 |
| 2.000" | 50.80 | 185 | 164 | 46 | 76.2 | 1/2" | 18 | 57 | 25.40 | 63.5 | 51 | 37 |
| 2.250" | 57.15 | 213 | 190 | 55 | 88.9 | 1/2" | 18 | 69 | 31.75 | 76.2 | 57 | 37 |
| 2.500" | 63.50 | 213 | 190 | 55 | 88.9 | 1/2" | 18 | 69 | 31.75 | 76.2 | 64 | 37 |

* UN-O ring ports may be substituted on standard cylinders at no extra cost.

All dimensions metric unless otherwise stated. Our policy of continuous improvement may cause specifications to change without notice. General assembly drawings are provided for verification following receipt of customer order, prior to manufacture.



■ Phasing Cylinders

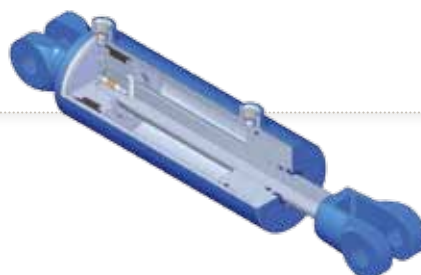
We have combined innovative design and technology with precision manufacturing to introduce a new generation of phasing cylinders. The Victor phasing cylinder has the ability to precisely synchronise multiple cylinders, which is critical for the optimal performance of a range of machinery in the agricultural sector.

Each cylinder is manufactured to extremely high standards of dimensional accuracy to help enhance and then maintain high productivity levels, and to optimise yields. Extensively field-tested, the Victor phasing cylinder has a very high tolerance to contaminants, such as dirt and dust, with the ability to maintain pressure stability over long periods of time.

The new technology also directly improves the performance of other machinery parts in the system, such as the longevity of piston seals, which have been known to fail prematurely in lower quality cylinders. As with all Victor products, these phasing cylinders can be used across a range of applications – from rotary cutters to seed drills – and can be customised to fit specific customer requirements.

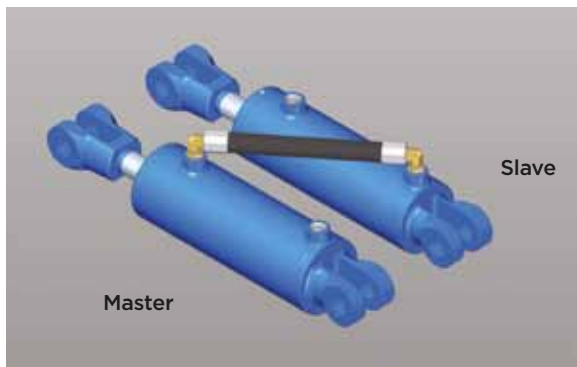
Design benefits

- ▶ The balls have infinite degree of rotational freedom allowing greater resistance to contamination and seat simply without undue influence from any attached extensions as in piston type poppet valves.
 - ▶ Machining is simply turned into the shaft, which is relatively simple and cost competitive.
- Precision manufactured to extreme standards of dimensional accuracy
 - Rated to 210 bar (3,000 psi) continuous operating pressure (350 bar (5,000 psi) intermittent)
 - All seals rated to 400 bar (6,000 psi)
 - Absolutely concentric construction
 - 1" pins & clips
 - "BSP" ports (UN-O ring available).





Master - Slave Configuration



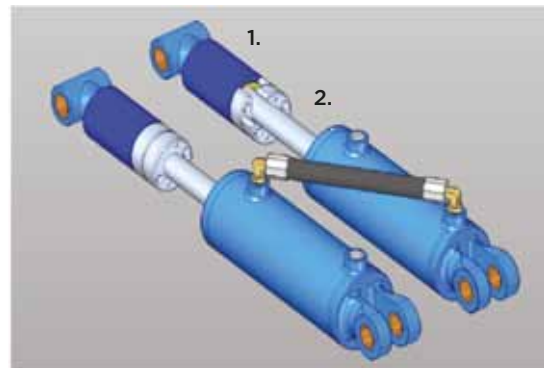
Rephasing cylinders are designed to retract and extend simultaneously when connected in series. This is achieved by matching the annular volume of the master to the piston volume of the slave.

On the extend stroke of the master cylinder oil is not returned to tank but used to extend the slaves.

Note: The master cylinder should be sized to lift the entire load.

| MASTER | SLAVE | VOLUME RATIO |
|---------------------------|--------------|--------------|
| 2.50 x 1.500 | 2.00 x 1.500 | 1.0000 |
| 2.75 x 1.125 | 2.50 x 1.125 | 1.0076 |
| 3.25 x 1.250 | 3.00 x 1.250 | 1.0000 |
| 3.50 x 1.250 | 3.25 x 1.250 | 1.0118 |
| 3.75 x 1.375 | 3.50 x 1.250 | 0.9937 |
| 4.00 x 1.375 | 3.75 x 1.375 | 1.0034 |
| HEAVY DUTY OPTION EXAMPLE | | |
| 5.00 x 3.00 | 4.00 x 3.00 | 1.0000 |

- ▶ Refer to table for volume ratios of suggested paired cylinders
- ▶ Heavy duty options available on request
- ▶ Cylinders can be customised to suit your required configurations.



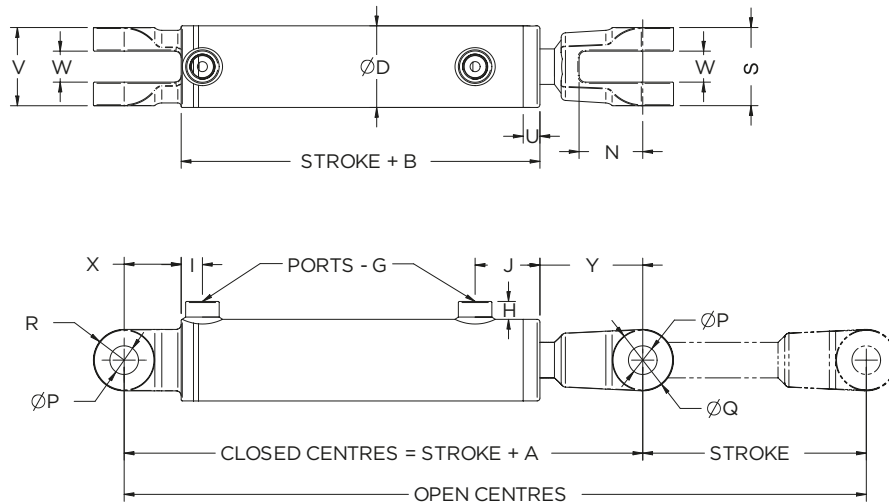
Depth control options also available:

- Optional threaded adjustment stop collar
- SAE clevis designed to take fixed width stop collars



New design patent pending (no. 575599)

- Extensively field trialed
- Extremely dirt tolerant
- Easy to service
- Rephase at either or both ends of stroke
- Threaded head design - hard wearing cast iron or steel with bearing rings depending on bore shaft configuration
- Standard SAE connections on base and rod/shaft connections
- Fully customisable to meet your specific requirements.



| CYLINDER BORE | | ROD DIAMETER | | A | B | X | Y | D | G | H | I | J | N | P | R | S | U | V | W |
|---------------|--------|--------------|-------|-----|-----|----|-----|------|------|-----|----|----|----|-------|------|----|----|----|------|
| in | mm | in | mm | | | | | MAX | BSP* | MAX | | | | (B11) | | | | | MIN |
| 2.00" | 50.80 | 1.500" | 38.10 | 311 | 124 | 51 | 136 | 88 | 1/2" | 18 | 19 | 60 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 2.50" | 63.50 | 1.500" | 38.10 | 311 | 128 | 51 | 132 | 76.2 | 1/2" | 18 | 19 | 58 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 2.50" | 63.50 | 1.125" | 28.57 | 311 | 128 | 51 | 132 | 76.2 | 1/2" | 18 | 19 | 58 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 2.75" | 69.85 | 1.125" | 28.57 | 311 | 128 | 51 | 132 | 83 | 1/2" | 18 | 19 | 58 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.00" | 76.20 | 1.250" | 31.75 | 311 | 128 | 51 | 132 | 89 | 1/2" | 18 | 19 | 61 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.25" | 82.55 | 1.250" | 31.75 | 311 | 128 | 51 | 132 | 96 | 1/2" | 18 | 19 | 61 | 57 | 25.4 | 27.5 | 70 | 15 | 70 | 27.5 |
| 3.50" | 88.90 | 1.250" | 31.75 | 311 | 144 | 51 | 116 | 102 | 1/2" | 18 | 23 | 71 | 57 | 25.4 | 32.0 | 70 | 15 | 60 | 27.5 |
| 3.75" | 95.25 | 1.375" | 34.92 | 311 | 147 | 51 | 113 | 115 | 1/2" | 18 | 24 | 71 | 57 | 25.4 | 32.5 | 70 | 15 | 60 | 27.5 |
| 4.00" | 101.60 | 1.375" | 34.92 | 311 | 157 | 51 | 103 | 115 | 1/2" | 18 | 26 | 83 | 57 | 25.4 | 32.5 | 70 | 15 | 60 | 27.5 |

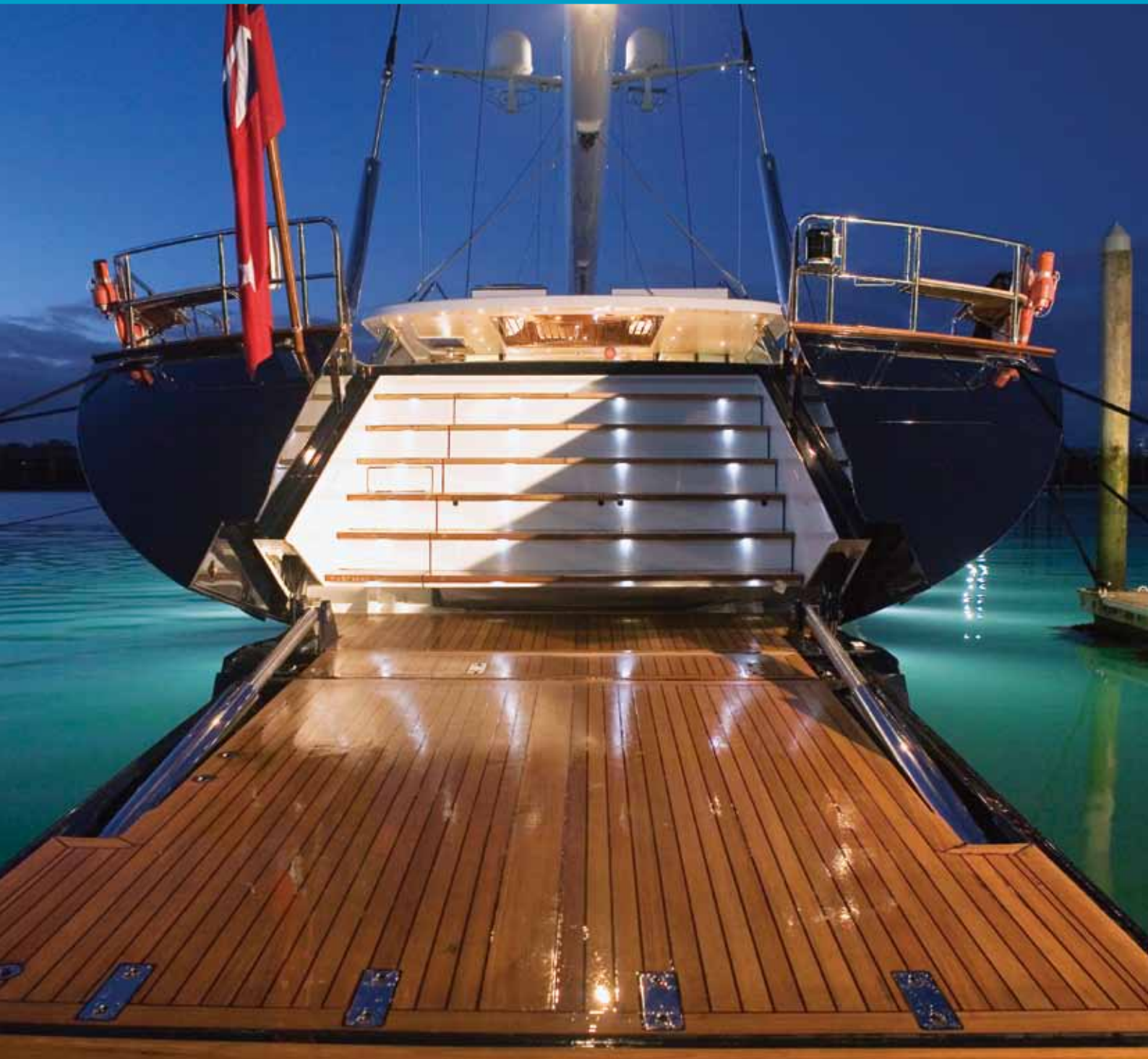
This table shows standard SAE connection dimensions. Please contact the Victor team for information on your required connection options.



VICTOR TECHNICAL CATALOGUE

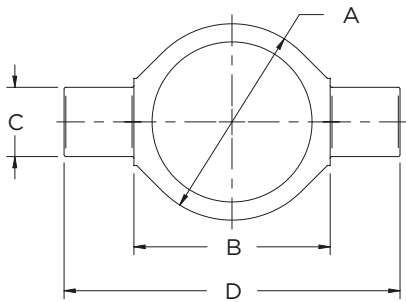


■ Cylinder Options



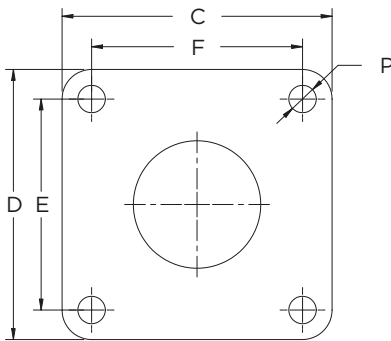


Trunnion Mount



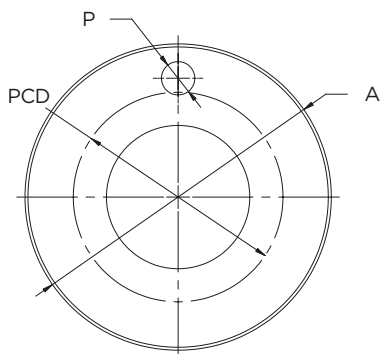
| CYLINDER BORE | | A | B | C | D | WIDTH |
|---------------|-------|-----|-----|-------|-----|-------|
| in | mm | | | (f8) | | |
| 1.5" | 38.1 | 60 | 60 | 22.23 | 110 | 25 |
| 2.0" | 50.8 | 75 | 75 | 25.40 | 126 | 32 |
| 2.5" | 63.5 | 90 | 90 | 31.75 | 154 | 40 |
| 3.0" | 76.2 | 110 | 110 | 38.10 | 186 | 50 |
| 3.5" | 88.9 | 125 | 125 | 44.45 | 214 | 50 |
| 4.0" | 101.6 | 140 | 140 | 50.80 | 242 | 60 |
| 4.5" | 114.3 | 156 | 156 | 57.15 | 270 | 65 |
| 5.0" | 127.0 | 170 | 170 | 63.50 | 297 | 80 |
| 6.0" | 152.4 | 210 | 210 | 76.20 | 363 | 80 |
| 7.0" | 177.8 | 243 | 243 | 88.90 | 420 | 100 |
| 8.0" | 203.2 | 270 | 270 | 101.6 | 474 | 120 |

Flange Mount - Square



| CYLINDER BORE | | C | D | P | E | F | WIDTH |
|---------------|-------|-----|-----|----|-----|-----|-------|
| in | mm | | | | | | |
| 1.5" | 38.1 | 106 | 106 | 11 | 82 | 82 | 11 |
| 2.0" | 50.8 | 128 | 128 | 13 | 100 | 100 | 11 |
| 2.5" | 63.5 | 157 | 157 | 17 | 121 | 121 | 15 |
| 3.0" | 76.2 | 177 | 177 | 17 | 141 | 141 | 19 |
| 3.5" | 88.9 | 204 | 204 | 21 | 160 | 160 | 24 |
| 4.0" | 101.6 | 216 | 216 | 21 | 172 | 172 | 30 |

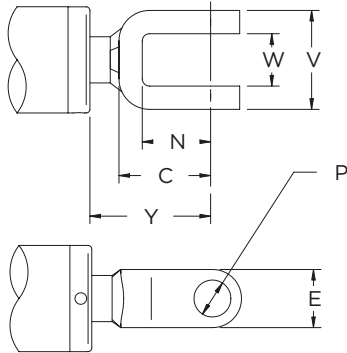
Flange Mount - Round



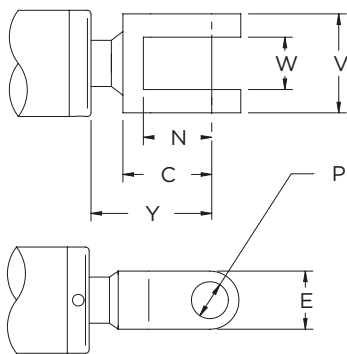
| CYLINDER BORE | | A | P | HOLES | PCD | WIDTH |
|---------------|-------|-----|----|-------|-----|-------|
| in | mm | | | | | |
| 1.5" | 38.1 | 106 | 11 | 4 | 84 | 11 |
| 2.0" | 50.8 | 128 | 13 | 4 | 101 | 11 |
| 2.5" | 63.5 | 156 | 17 | 4 | 121 | 15 |
| 3.0" | 76.2 | 176 | 17 | 4 | 141 | 19 |
| 3.5" | 88.9 | 204 | 21 | 4 | 161 | 24 |
| 4.0" | 101.6 | 217 | 21 | 4 | 174 | 30 |
| 4.5" | 114.3 | 250 | 25 | 4 | 200 | 30 |
| 5.0" | 127.0 | 270 | 25 | 6 | 218 | 30 |
| 6.0" | 152.4 | 300 | 25 | 6 | 247 | 38 |
| 7.0" | 177.8 | 360 | 31 | 6 | 295 | 48 |
| 8.0" | 203.2 | 384 | 31 | 8 | 320 | 48 |



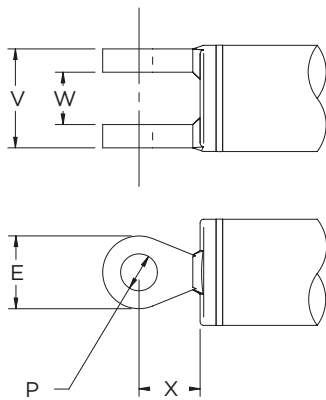
Female Clevis - Rod Application



FORMED FEMALE CLEVIS



FABRICATED FEMALE CLEVIS



FABRICATED BASE CLEVIS

| CYLINDER BORE | | TYPE | W | P | Y | C | N | E | V |
|---------------|-------|------------|------|-------|------|-----|-----|-----|-----|
| in | mm | | | (B11) | min* | † | | | |
| 1.5" | 38.1 | Formed | 23 | 15.88 | 48 | 38 | 28 | 32 | 43 |
| 2.0" | 50.8 | Formed | 28 | 22.23 | 60 | 49 | 37 | 40 | 52 |
| 2.0" | 50.8 | Cast SAE | 22.5 | 19.05 | 61 | 50 | 38 | 44 | 59 |
| 2.5" | 63.5 | Formed | 36 | 25.40 | 71 | 58 | 42 | 50 | 68 |
| 2.5" | 63.5 | Cast SAE | 27.5 | 25.40 | 86 | 73 | 57 | 55 | 70 |
| 3.0" | 76.2 | Formed | 44 | 31.75 | 79 | 66 | 50 | 64 | 76 |
| 3.0" | 76.2 | Cast SAE | 27.5 | 25.40 | 86 | 73 | 57 | 55 | 70 |
| 3.5" | 88.9 | Formed | 49 | 38.10 | 92 | 77 | 57 | 76 | 89 |
| 4.0" | 101.6 | Fabricated | 54 | 44.45 | 101 | 86 | 66 | 90 | 94 |
| 4.5" | 114.3 | Fabricated | 64 | 50.80 | 125 | 108 | 76 | 102 | 114 |
| 5.0" | 127 | Fabricated | 69 | 50.80 | 125 | 108 | 76 | 102 | 133 |
| 6.0" | 152.4 | Fabricated | 84 | 63.50 | 144 | 127 | 95 | 127 | 148 |
| 7.0" | 177.8 | Fabricated | 95 | 69.85 | 161 | 140 | 100 | 140 | 175 |
| 8.0" | 203.2 | Fabricated | 105 | 76.20 | 187 | 161 | 111 | 152 | 205 |

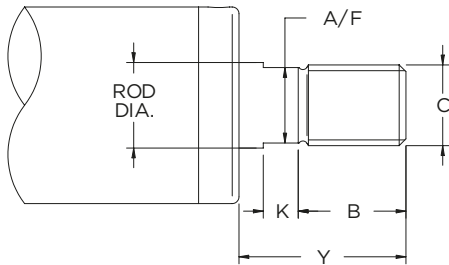
* Rod Applications only. † "X" dimension for base applications.

Female Clevis - Base Application

| CYLINDER BORE | | TYPE | W | P | X | E | V |
|---------------|-------|------------|------|-------|-----|-----|-----|
| in | mm | | | (B11) | | | |
| 1.5" | 38.1 | Fabricated | 23 | 15.88 | 28 | 32 | 43 |
| 2.0" | 50.8 | Fabricated | 28 | 22.23 | 37 | 40 | 52 |
| 2.0" | 50.8 | Cast SAE | 22.5 | 19.05 | 38 | 44 | 59 |
| 2.5" | 63.5 | Fabricated | 36 | 25.40 | 42 | 50 | 68 |
| 2.5" | 63.5 | Cast SAE | 27.5 | 25.40 | 51 | 55 | 70 |
| 3.0" | 76.2 | Fabricated | 44 | 31.75 | 50 | 64 | 76 |
| 3.0" | 76.2 | Cast SAE | 27.5 | 25.40 | 51 | 55 | 70 |
| 3.5" | 88.9 | Fabricated | 49 | 38.10 | 57 | 76 | 89 |
| 4.0" | 101.6 | Fabricated | 54 | 44.45 | 66 | 90 | 94 |
| 4.5" | 114.3 | Fabricated | 64 | 50.80 | 76 | 102 | 114 |
| 5.0" | 127.0 | Fabricated | 69 | 50.80 | 76 | 102 | 133 |
| 6.0" | 152.4 | Fabricated | 84 | 63.50 | 95 | 127 | 148 |
| 7.0" | 177.8 | Fabricated | 95 | 69.85 | 100 | 140 | 175 |
| 8.0" | 203.2 | Fabricated | 105 | 76.20 | 111 | 152 | 205 |



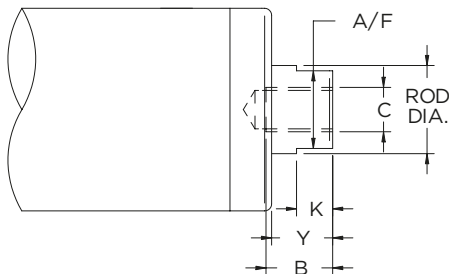
Threaded Rod - External



| ROD DIAMETER | | Y | B | C | C | K | A/F | T.P.I. |
|--------------|--------|-----|-----|--------|---------|----|-----|--------|
| in | mm | | | UNF* | METRIC* | | | UNF* |
| 0.750" | 19.05 | 40 | 20 | 5/8" | M16 | 11 | 16 | 18 |
| 1.000" | 25.40 | 50 | 30 | 7/8" | M20 | 11 | 23 | 14 |
| 1.250" | 31.75 | 62 | 40 | 1 1/8" | M30 | 13 | 28 | 12 |
| 1.375" | 34.92 | 62 | 40 | 1 1/8" | M30 | 13 | 32 | 12 |
| 1.500" | 38.10 | 80 | 40 | 1 1/8" | M30 | 13 | 32 | 12 |
| 1.750" | 44.45 | 95 | 50 | 1 1/2" | M36 | 15 | 40 | 12 |
| 2.000" | 50.80 | 95 | 60 | 1 3/4" | M42 | 15 | 45 | 12 |
| 2.250" | 57.15 | 100 | 65 | 2" | M48 | 15 | 51 | 12 |
| 2.500" | 63.50 | 100 | 65 | 2" | M48 | 15 | 54 | 12 |
| 3.000" | 76.20 | 125 | 80 | 2 1/2" | M64 | 20 | 65 | 12 |
| 3.500" | 88.90 | 140 | 90 | 3" | M72 | 20 | 78 | 12 |
| 4.000" | 101.60 | 150 | 100 | 3 1/2" | M90 | 20 | 90 | 12 |
| 5.000" | 127.00 | 175 | 125 | 4 1/2" | M100 | 20 | 115 | 12 |

* NOMINATE UNF OR METRIC

Threaded Rod - Internal

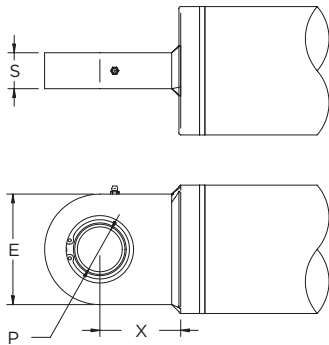


| ROD DIAMETER | | Y | B | C | C | K | A/F | T.P.I. |
|--------------|--------|----|----|--------|---------|----|-----|--------|
| in | mm | | | UNF* | METRIC* | | | UNF* |
| 0.750" | 19.05 | 20 | 15 | 3/8" | M10 | 11 | 16 | 24 |
| 1.000" | 25.40 | 20 | 21 | 1/2" | M14 | 11 | 23 | 20 |
| 1.250" | 31.75 | 22 | 24 | 5/8" | M16 | 13 | 28 | 18 |
| 1.375" | 34.92 | 22 | 24 | 5/8" | M16 | 13 | 32 | 18 |
| 1.500" | 38.10 | 22 | 30 | 5/8" | M20 | 13 | 32 | 18 |
| 1.750" | 44.45 | 30 | 30 | 3/4" | M20 | 16 | 40 | 16 |
| 2.000" | 50.80 | 35 | 36 | 1" | M24 | 15 | 45 | 12 |
| 2.250" | 57.15 | 35 | 45 | 1 1/4" | M30 | 15 | 51 | 12 |
| 2.500" | 63.50 | 35 | 45 | 1 1/4" | M30 | 15 | 54 | 12 |
| 3.000" | 76.20 | 35 | 54 | 1 1/2" | M36 | 20 | 65 | 12 |
| 3.500" | 88.90 | 50 | 63 | 1 3/4" | M42 | 20 | 78 | 12 |
| 4.000" | 101.60 | 50 | 72 | 2" | M48 | 20 | 90 | 12 |
| 5.000" | 127.00 | 50 | 96 | 2 1/2" | M64 | 20 | 115 | 12 |

* NOMINATE UNF OR METRIC

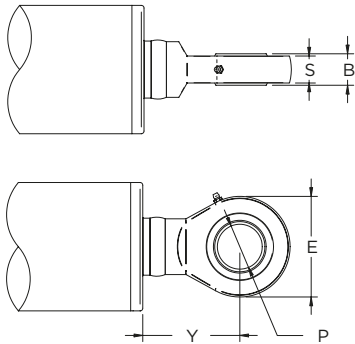


Plain Spherical Bearing - Base Application

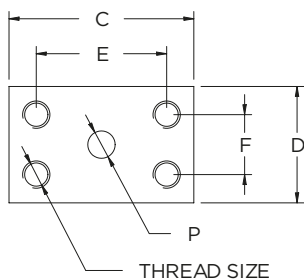


| P | X | E | S |
|----------|-----|-------|------|
| mm (Nom) | | | |
| 20 | 38 | 51.5 | 20 |
| 25 | 45 | 56.5 | 24 |
| 30 | 51 | 66.5 | 29 |
| 35 | 61 | 85 | 31 |
| 40 | 69 | 102 | 36.5 |
| 45 | 77 | 112 | 41.5 |
| 50 | 88 | 125.5 | 41.5 |
| 60 | 100 | 142.5 | 51.5 |
| 80 | 141 | 182.5 | 62 |

Plain Spherical Bearing - Rod Application



| P | Y | E | S | B |
|----------|-----|-----|------|----|
| mm (Nom) | min | | | |
| 20 | 49 | 54 | 13.5 | 16 |
| 25 | 58 | 65 | 18 | 20 |
| 30 | 88 | 75 | 20 | 22 |
| 35 | 99 | 84 | 22 | 25 |
| 40 | 109 | 94 | 24 | 28 |
| 45 | 121 | 104 | 28 | 32 |
| 50 | 131 | 114 | 31 | 35 |
| 60 | 154 | 137 | 39 | 44 |
| 80 | 208 | 182 | 48 | 55 |

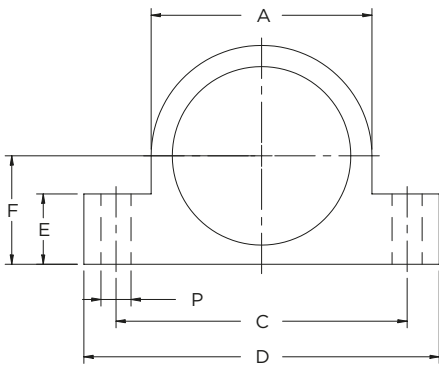


Pad Mounts

| STYLE | C | D | E | F | P | THREAD |
|---------------------|----|----|------|------|-----|--------|
| 1/2" SAE Pad 2 bolt | 54 | 34 | 38.1 | 17.5 | 7.4 | M8 |
| 1/2" SAE Pad 4 bolt | 54 | 34 | 38.1 | 17.5 | 7.4 | M8 |
| 32mm Pad 2 bolt | 56 | 25 | 32 | n/a | 7.4 | M8 |



Foot Mount



| BORE | | A | B | C | D | E | F | WIDTH |
|------|-------|-----|----|-----|-----|----|-------|-------|
| in | mm | | | | | | | |
| 1.5" | 38.1 | 60 | 9 | 83 | 101 | 20 | 29 | 20 |
| 2.0" | 50.8 | 75 | 11 | 103 | 125 | 25 | 36.5 | 25 |
| 2.5" | 63.5 | 90 | 13 | 120 | 146 | 30 | 44 | 25 |
| 3.0" | 76.2 | 110 | 15 | 145 | 177 | 35 | 54 | 32 |
| 3.5" | 88.9 | 125 | 17 | 165 | 200 | 40 | 61.5 | 32 |
| 4.0" | 101.6 | 140 | 22 | 186 | 230 | 45 | 69 | 40 |
| 4.5" | 114.3 | 156 | 22 | 202 | 246 | 50 | 78 | 40 |
| 5.0" | 127.0 | 170 | 26 | 222 | 274 | 55 | 84 | 50 |
| 6.0" | 152.4 | 210 | 32 | 271 | 335 | 70 | 104 | 65 |
| 7.0" | 177.8 | 243 | 38 | 313 | 389 | 80 | 121.5 | 80 |
| 8.0" | 203.2 | 270 | 38 | 340 | 416 | 90 | 134 | 80 |

Miscellaneous options available on request

General

- Any stroke
- Extended shaft
- Closed/open centre variations
- S.A.E. Weld on implement lugs
- Alternative seal materials for critical temperature, speed or heavy duty applications
- Specialised C.N.C. Component machining.

Rod and/or base

- Special lug or eye
- Extra wide eye
- Bushed rod eye
- Special pin hole size
- Base flange
- Threaded base stud
- Stop tube
- Blank ends
- Linear transducer

Ports

- Port size and thread
- Port orientation
- Port elbows
- Male or female ports
- Feed tubes
- Check valves
- Depth control

Some options are not available on some cylinders.



Seal Kits



Displacement - Single Acting Cylinders

| CYLINDER BORE | | SCREWED HEAD | | WIRE RETAINED* |
|---------------|-------|--------------|-------------|----------------|
| in | mm | GUIDED | UNGUIDED | |
| | | Part Number | Part Number | Part Number |
| 1.00" | 25.40 | KGS0604 | n/a | n/a |
| 1.25" | 31.75 | KGS0805 | n/a | n/a |
| 1.50" | 38.10 | KGS0806 | KUS06 | n/a |
| 1.75" | 44.45 | KGS1007 | KUS07 | KUW07 |
| 2.00" | 50.80 | KGS1008 | KUS08 | KUW08 |
| 2.25" | 57.15 | KGS1209 | n/a | n/a |
| 2.50" | 63.50 | KGS1210 | KUS10 | KUW10 |

* Cylinders no longer made in this style. Seal kits available ex-stock.



Double Acting Cylinders

| CYLINDER BORE | | ROD DIAMETER | | SCREWED HEAD | WIRE RETAINED* |
|---------------|-------|--------------|--------|--------------|----------------|
| in | mm | in | mm | Part Number | Part Number |
| 1.5" | 38.1 | 0.7500" | 19.05 | KDS0603 | KDW0603 |
| 1.5" | 38.1 | 1.000" | 25.40 | KDS0604 | KDW0604 |
| 2.0" | 50.8 | 1.000" | 25.40 | KDS0804 | KDW0804 |
| 2.0" | 50.8 | 1.250" | 31.75 | KDS0805 | KDW0805 |
| 2.0" | 50.8 | 1.500" | 38.10 | KDS0806 | n/a |
| 2.5" | 63.5 | 1.250" | 31.75 | KDS1005 | KDW1005 |
| 2.5" | 63.5 | 1.375" | 34.92 | KDS1055 | n/a |
| 2.5" | 63.5 | 1.500" | 38.10 | KDS1006 | KDW1006 |
| 2.5" | 63.5 | 1.750" | 44.45 | KDS1007 | n/a |
| 2.5" | 63.5 | 2.000" | 50.80 | KDS1008 | n/a |
| 3.0" | 76.2 | 1.500" | 38.10 | KDS1206 | KDW1206 |
| 3.0" | 76.2 | 1.750" | 44.45 | KDS1207 | KDW1207 |
| 3.0" | 76.3 | 2.000" | 50.80 | KDS1208 | n/a |
| 3.0" | 76.2 | 2.250" | 57.15 | KDS1209 | n/a |
| 3.0" | 76.5 | 2.500" | 63.50 | KDS1210 | n/a |
| 3.0" | 76.6 | 1.750" | 44.45 | KDS1407 | KDW1407 |
| 3.0" | 76.7 | 2.000" | 50.80 | KDS1408 | KDW1408 |
| 3.0" | 76.8 | 2.500" | 63.50 | KDS1410 | n/a |
| ALL TYPES | | | | | |
| 4.0" | 101.6 | 2.000" | 50.80 | KD1608 | |
| 4.0" | 101.6 | 2.500" | 63.50 | KD1610 | |
| 4.0" | 101.6 | 3.000" | 76.20 | KD1612 | |
| 4.5" | 114.3 | 2.250" | 57.15 | KD1809 | |
| 4.5" | 114.3 | 2.500" | 63.50 | KD1810 | |
| 4.5" | 114.3 | 3.000" | 76.20 | KD1812 | |
| 5.0" | 127.0 | 2.500" | 63.50 | KD2010 | |
| 5.0" | 127.0 | 3.000" | 76.20 | KD2012 | |
| 5.0" | 127.0 | 3.500" | 88.90 | KD2014 | |
| 5.0" | 127.0 | 4.000" | 101.60 | KD2016 | |
| 6.0" | 152.4 | 3.000" | 76.20 | KD2412 | |
| 6.0" | 152.4 | 4.000" | 101.60 | KD2416 | |
| 7.0" | 177.8 | 3.500" | 88.90 | KD2814 | |
| 7.0" | 177.8 | 4.000" | 101.60 | KD2816 | |
| 8.0" | 203.2 | 4.000" | 101.60 | KD3216 | |
| 8.0" | 203.2 | 5.000" | 127.00 | KD3220 | |

KEY

- KDS** Kit Double-acting Screwed
- KDW** Kit Double-acting Wire retained
- KD** Kit Double-acting all types
- KGS** Kit Guided Screwed
- KUS** Kit Unguided Screwed
- KUW** Kit Unguided Wire retained

Bearing rings are not included in seal kits.
Order these parts separately if required.

* Cylinders no longer made in this style. Seal kits available ex-stock.



VICTOR TECHNICAL CATALOGUE



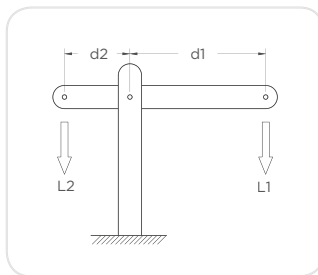
■ Design and Performance





Principles of moments

SIMPLE LEVER

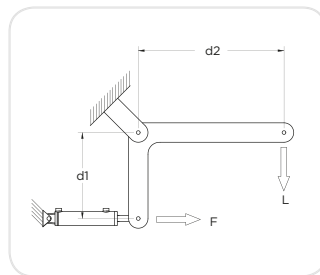


FORMULA

$$L_1 \times d_1 = L_2 \times d_2$$

$$L_1 = \frac{L_2 \times d_2}{d_1}$$

BENT LEVER

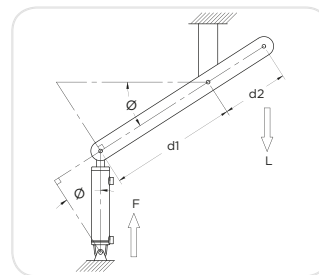


FORMULA

$$F \times d_1 = L \times d_2$$

$$L = \frac{F \times d_1}{d_2} \quad \text{or} \quad F = \frac{L \times d_2}{d_1}$$

LEVER



FORMULA

$$F \times d_1 \cos \theta = L \times d_2 \cos \theta$$

or

$$F \cos \theta \times d_1 = L \cos \theta \times d_2$$

where θ is less than 15° , $\cos \theta$ is approximately equal to 1.

$$\rightarrow L = \frac{F \times d_1}{d_2} \quad \text{or} \quad F = \frac{L \times d_2}{d_1}$$

LAW OF MOMENTS: All moments in one direction equal all moments in the opposite direction

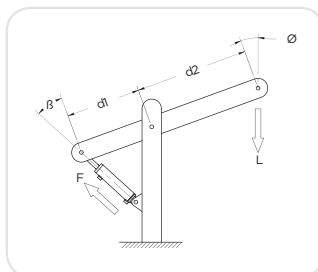
Moments = Force x Distance

but the direction of the force must be at right angles to the measurement of distance

therefore Moment = **Force x Distance at right angles to force**

or Moment = **Distance x component of Force operating at right angles to distance.**

LEVER VARIATION



FORMULA

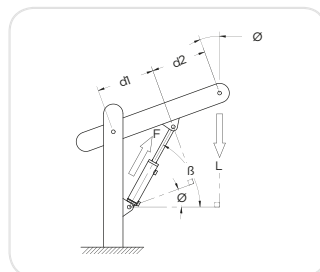
$$F \cos \beta \times d_1 = L \times d_2$$

$$F = \frac{L \times d_2 \times \cos \beta}{d_1}$$

or

$$L = \frac{F \cos \beta \times d_1}{d_2}$$

CRANE



FORMULA

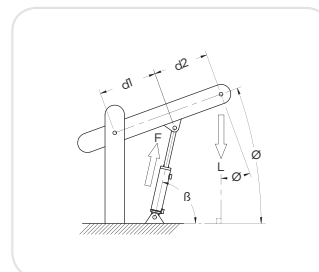
$$F \sin(\beta - \theta) \times d_1 = L \times d_2 \times \cos \theta$$

$$F = \frac{L \times d_2 \times \cos \theta}{\sin(\beta - \theta) \times d_1}$$

or

$$L = \frac{F \sin(\beta - \theta) \times d_1}{d_2 \times \cos \theta}$$

CRANE AND BEAM



FORMULA

$$F \sin(\beta - \theta) \times d_1 = L \times d_2 \times \cos \theta$$

$$F = \frac{L \times d_2 \times \cos \theta}{\sin(\beta - \theta) \times d_1}$$

or

$$L = \frac{F \sin(\beta - \theta) \times d_1}{d_2 \times \cos \theta}$$



Why shafts bend in hydraulic cylinders

Shafts in tension will not bend. Shafts in compression will bend if subjected to too much force. Excessive force may come from either too much pressure, or excessive mechanical loads applied to the shaft. For short shafts in compression, the limiting load is determined by the yield point of the material. For long shafts, the limiting load is a function of length and the mounting method.

Calculate the shaft diameter needed

The method of supporting the ends of the shaft makes a considerable difference to the maximum load permitted. This difference is expressed by a constant called the “fixity factor” (*ff*). To calculate the maximum permitted extended length (*E*) for a given application and shaft diameter, multiply the “apparent length” (*L*) by the “fixity factor” (*ff*). Select the appropriate “fixity factor” (*ff*) from the application guide below. (*L*) can be obtained from Euler’s formula.

$$E = L \times ff \quad \text{or} \quad L = \frac{E}{ff}$$

EULER’S FORMULA

For steel to En8 or AISI 1045, and a safety factor of 2.2 (i.e. a maximum permissible stress of 240 MPa), the formula is:

$$L = \frac{2.108 d^2}{\sqrt{P}} \quad \text{where} \quad L = \text{“Apparent” length of shaft (mm)}$$

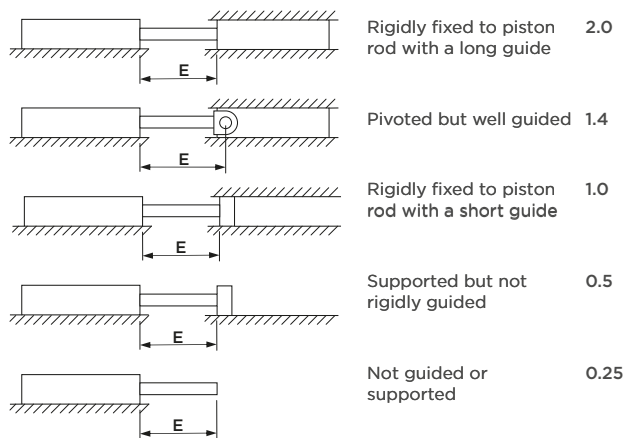
d = diameter of shaft (mm)

$$P = \left(\frac{2.108 d^2}{L} \right)^2$$

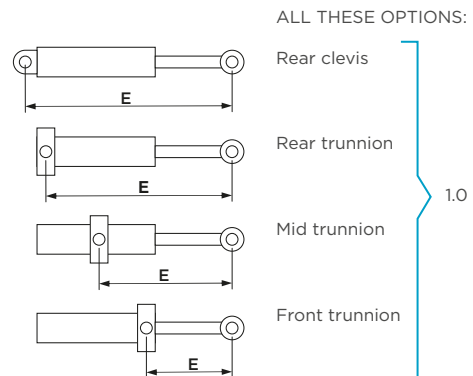
P = load (tonnes)

Fixity Factor Chart

FOR RIGIDLY MOUNTED CYLINDERS: Fixity Factor



FOR PIN MOUNTED CYLINDERS: Fixity Factor





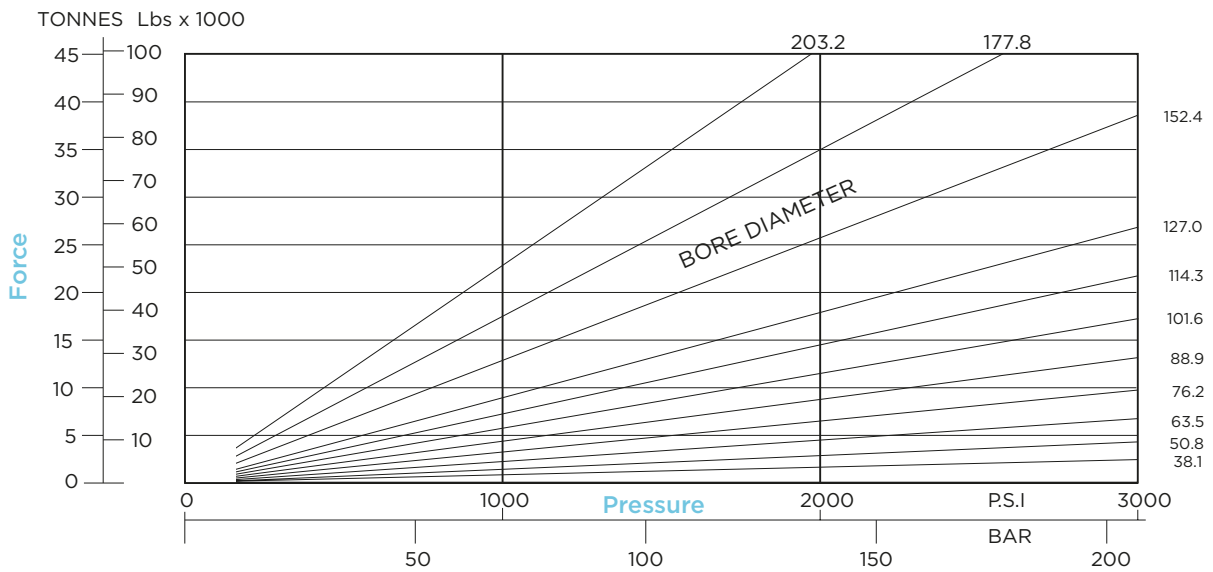
Theoretical Performance

Force vs. Pressure

(Extending force only)

$$\text{Extending FORCE} = \text{PRESSURE} \times \text{AREA}$$

$$\text{Retraction FORCE} = \text{PRESSURE} \times (\text{Bore AREA} - \text{Shaft AREA})$$

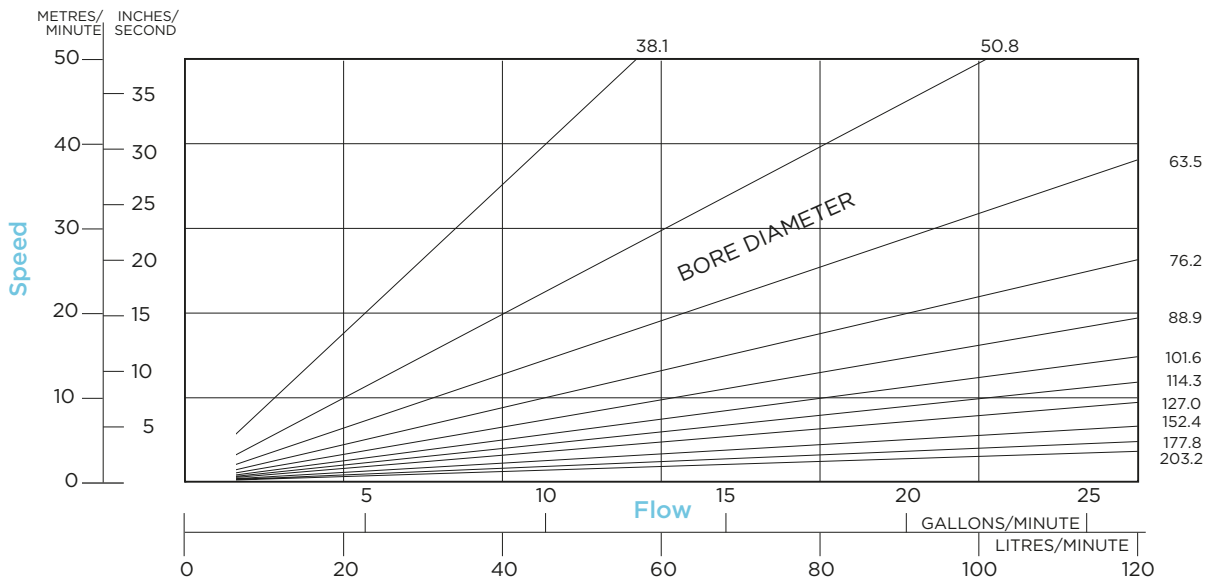


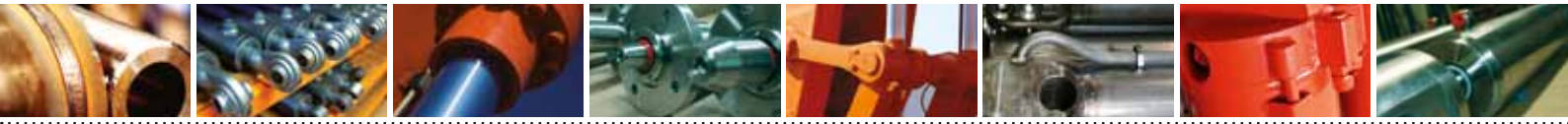
Speed vs. Flow

(Extending speed only)

$$\text{Extending VELOCITY} = \text{Q(Flow)} / \text{AREA}$$

$$\text{Retraction VELOCITY} = \text{Q(Flow)} / (\text{Bore AREA} - \text{Shaft AREA})$$



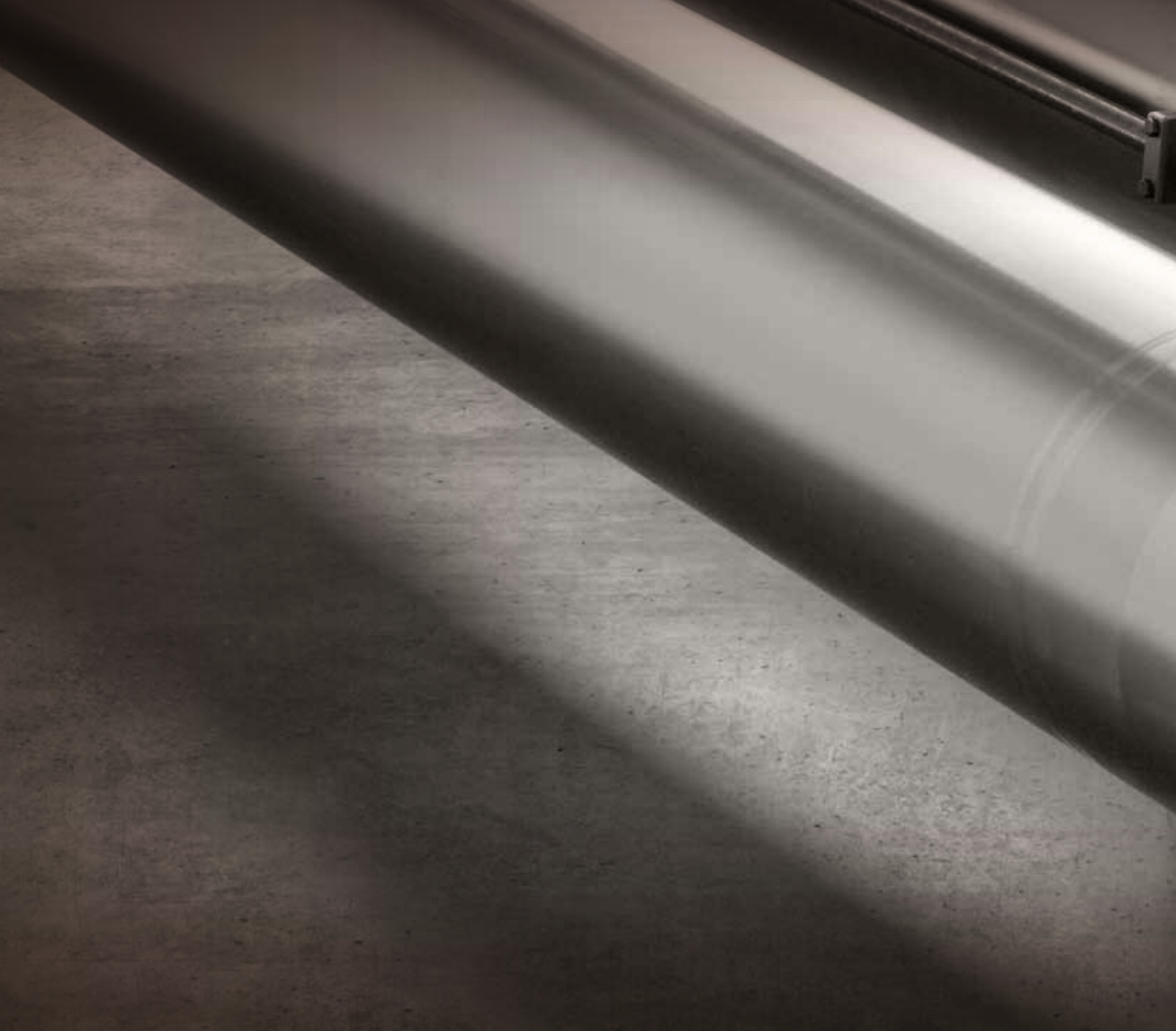


■ Cylinder Identification



- Hydraulic cylinders are usually described by stating the cylinder internal diameter (bore), shaft diameter and stroke. The type of cylinder (e.g. Compact S, SAE, etc) is also needed. Other useful information includes the closed and open centre dimensions, and details of the mounts and other hardware.
- All hydraulic cylinders made by Victor Hydraulics Limited are identified by a unique numeric code, stamped on the barrel of the cylinder. Typically, this is found in the vicinity of the head port.
- In some size ranges, the cylinder type identifies seal types, so please note if the cylinder is a screwed head design.

To re-order cylinders and parts, please contact us with your unique code. If you do not know your code, contact our sales team on +64 3 344 2700 who will be able to place your order for you and provide your code number for easy re-ordering in the future.



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