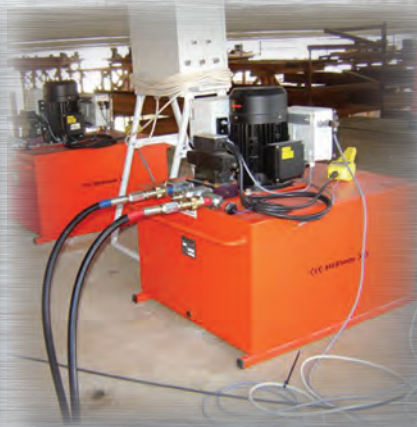


Hi-Force®

HYDRAULIC TOOLS



Global Brand



Local Service



Jacks - Pumps - Cutters - Presses - Cylinders - Puller kits - Spreaders - Pipe benders
Torque tools - Bolt tensioners - Nut splitters - Hole punchers
Moving skates - Crimping tools - Hydrotest pumps - ToughLift jacking systems

HI-FORCE COMPANY INFORMATION

OUR MISSION STATEMENT

To support our valued customers through the design, manufacture and supply of first class products and services of exceptional quality, to assist them to gain competitive advantage in their markets.

To sustain our vision and mission by constantly seeking improvement via continuous education and learning, and the application of the best available technology and business practices.

To provide a pleasant, nurturing and growth orientated environment, which encourages our employees to be highly productive and to grow both personally and professionally.

To develop diversified markets, that provide stability, and adequate financial returns and allow us to achieve our vision and provide opportunities for existing and future employees.

HI-FORCE CATALOGUES

In addition to this new 2015 catalogue, other product specific and condensed catalogues are available in several languages including Chinese, Dutch, English (both in imperial and metric), French, German, Italian, Norwegian, Portuguese, Russian, Slovakian and Spanish. To request copies of our catalogue(s) contact your local sales representative, or alternatively you can access our catalogues online! Simply go to www.hi-force.com.

HI-FORCE UK FACILITIES



HI-FORCE WEBSITE

Check out the Hi-Force Website for the latest company and product information.

www.hi-force.com

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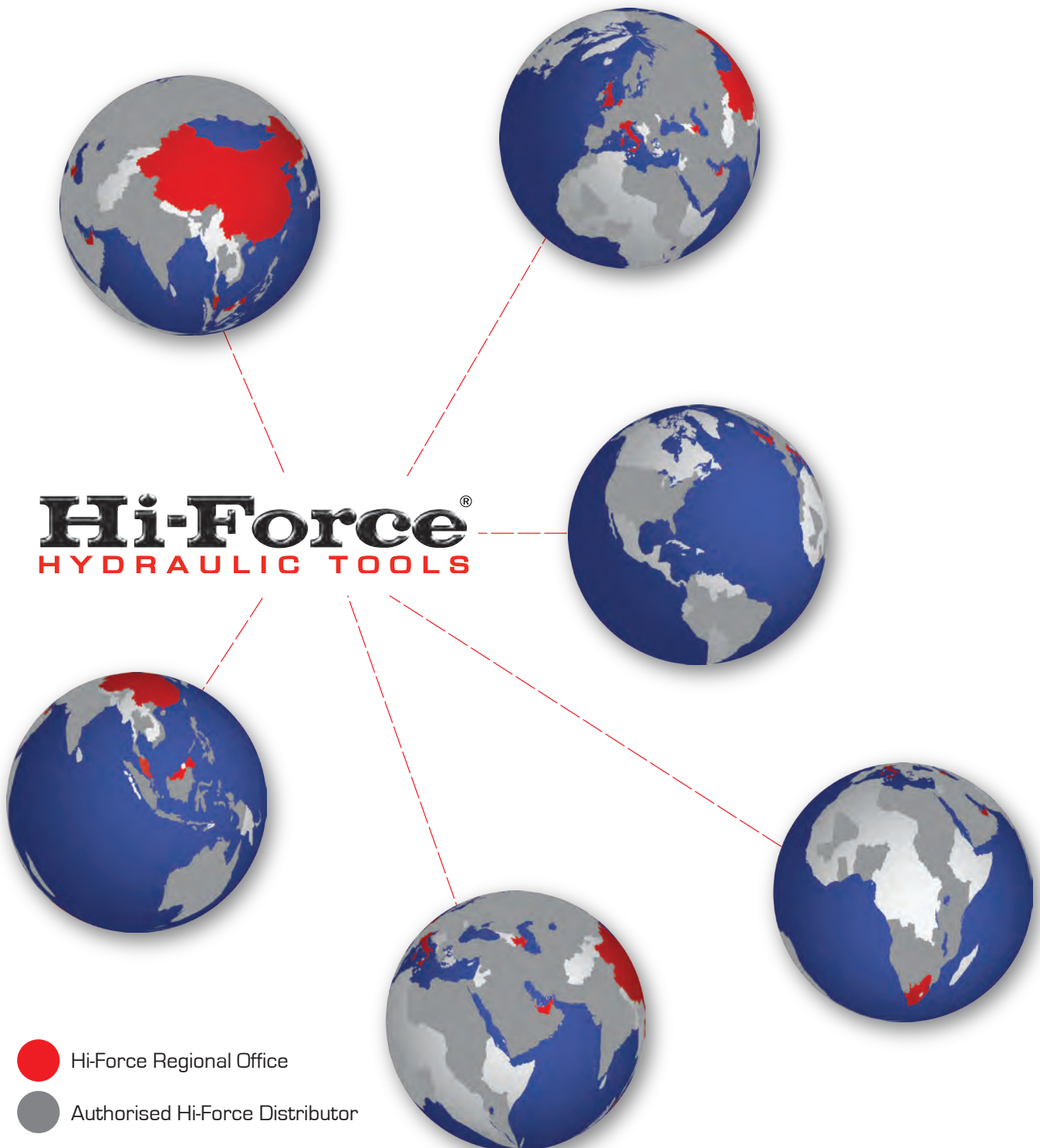
| | | | |
|-----------------------|--|-----------------|---|
| General | Information about the company, products, markets, quality and safety | Pages 4 - 8 | A |
| Cylinders & Sets | Low height, multi-purpose, hollow piston, double acting and high tonnage cylinders, sets & saddles | Pages 9 - 28 | B |
| Pumps | Manual, electric, air, petrol engine driven, split flow electric pumps and accessories | Pages 29 - 50 | C |
| System Components | Hoses, oil, pressure gauges, manifolds, couplers, fittings and control valves | Pages 51 - 60 | D |
| Jacks | Industrial aluminium jacks, compact jacks, steel bottle jacks and machine lift low height jacks | Pages 61 - 66 | E |
| Torque Tools | Manual, pneumatic and hydraulic torque wrenches, multipliers, pumps and accessories | Pages 67 - 92 | F |
| Bolt Tensioners | Hydraulic topside and sub-sea tensioners, manual and air driven pumps and accessories | Pages 93 - 118 | G |
| Hydrotest Pumps | Manually operated and air driven hydrotest pumps and accessories | Pages 119 - 128 | H |
| Puller Kits | Self-contained and heavy duty hydraulic pullers, pin and bush replacement kits | Pages 129 - 136 | I |
| Crimpers & Cutters | Hydraulic crimping tools, cable cutters, chain cutters and wire rope cutters | Pages 137 - 150 | J |
| Tools | Hole punchers, nut splitters, flange spreaders, pipe benders, skates, presses and tool boxes | Pages 151 - 168 | K |
| ToughLift | ToughLift jacking systems and accessories | Pages 169 - 174 | L |
| Services | Equipment rental, on-site services, maintenance and training | Pages 175 - 186 | M |
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| Extras | New products, Hi-Force contact details, model number index | Pages 203 - 207 | O |

ABOUT HI-FORCE, PRODUCTS & MARKETS

A

Welcome to the 2015 Hi-Force catalogue comprising of 208 pages, packed full of product and technical information from the fastest growing hydraulic tools manufacturer in the world today. Our continually expanding Regional Office, Service Centre and Distribution network continue to fuel our desire to ensure that Hi-Force products and after sales services are both available to hydraulic tools users anywhere in the world.

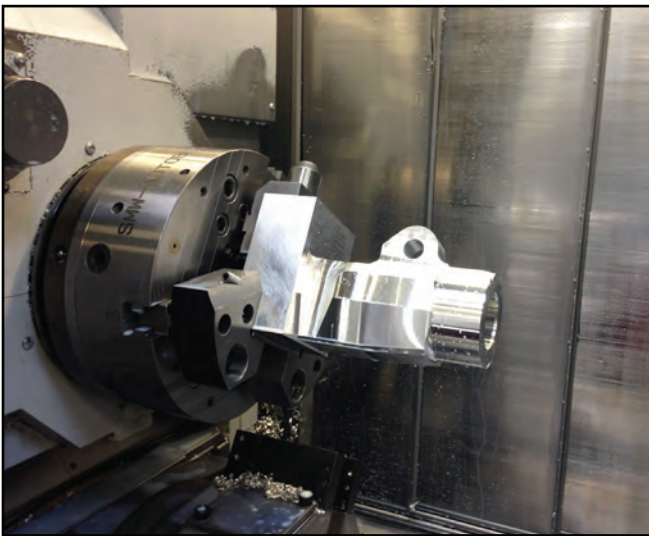
Hi-Force is and will continue to be a fiercely independent Company, managed by hard working Shareholders & Directors, ably supported by a highly motivated and conscientious workforce, all of whom retain the same passion, for success, that helped Hi-Force to produce its first hydraulic tools over 30 years ago.



ABOUT HI-FORCE, PRODUCTS & MARKETS

During the past five years Hi-Force has invested a significant amount of money in twelve “state of the art” Mori Seiki CNC Machines. Our latest addition, a brand new 4 axis machine, capable of machining hydraulic cylinders up to 1000 tonnes capacity and 1200mm stroke, was received in May 2014 along with an additional milling machine, bringing our total fleet of production machines to 15. Hi-Force is totally committed to manufacturing products of the highest quality, using the best machinery available, to ensure that our products meet the most stringent quality requirements possible, whilst also retaining a competitive price in the global market for hydraulic tools. Our research, development and design office is working hard and continuing to expand, ensuring that our products remain at the leading edge of currently available hydraulic tool technology.

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Following our UK head office relocation in 2010, to a brand new, state of the art facility in Daventry, UK, we also added a further 20,000 square feet of purpose built Logistics Centre in 2012. In just 4 short years we have increased in size by more than five fold, which is surely testament to our claims, of being the fastest growing hydraulic tools manufacturer in the world. Within our new Logistics Centre we have also invested a significant amount of money in our new, purpose built, Training School. Covering an area of over 1,500 square feet, this new facility is fully equipped with a classroom and two separate practical training areas, one for product training and one for service & repair training.

The Training School has also been approved by the ECITB (Engineering Construction Industry Training Board), to deliver ECITB approved courses in Flange Management, a critical area within the Oil & Gas industry. By the end of 2015, our UK Training School will have delivered over 30 ECITB approved training courses, with almost 150 delegates trained and certified. Our Middle East facilities have now also been approved by the ECITB, with plans already in place to complete ECITB approval in Malaysia & South Africa by early 2016. There is no doubt that the huge investment in facilities, personnel, product design and manufacturing capabilities, that we are making today, will see Hi-Force continue to grow at a significant rate over the coming years.

With over 30 years of hydraulic tool manufacturing and technical sales experience in place, we believe that Hi-Force is certainly a company that can be trusted with your current and future demands for hydraulic tools, safe in the knowledge that when you need us we will be ready to support you worldwide, 24 hours a day, 7 days a week, 365 days per year.

ABOUT HI-FORCE, PRODUCTS & MARKETS

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Hi-Force products are in use every day in a wide variety of industries including Oil & Gas, Petrochemical & Refining, Power Generation, Steel & Aluminium Plants, Paper Mills, Sugar Refineries, Railways, Mining, Construction, Ship Building & Ship Repair, Aerospace, Defence, Heavy Engineering and the many thousands of industrial service companies supporting these market sectors. Hi-Force hydraulic tools continually satisfy the demands of industry during construction, production, breakdown and routine shutdown repair and maintenance. Every year more and more companies continue to join the ever growing list of satisfied Hi-Force hydraulic tool users.



We are very proud of our latest edition of the Hi-Force hydraulic tools catalogue which now includes over 2000 products. A large number of new products are being launched in this catalogue including spring return stud bolt tensioners, three speed hydraulic torque wrench pumps, a new range of manual hydrotest pumps, improved range of manual and pneumatic torque multipliers and hand torque wrenches, hydraulic pin and bush removal and installation kits, hollow bore, lightweight, aluminum cylinders, increased capacity and range of heavy lift cylinders and remote controlled, high tonnage trolley mounted pullers.

Furthermore, our innovative BoltRight software, designed to accurately calculate the correct torque and tension figures for a wide variety of bolted joints, is now available in multiple languages including Chinese, Dutch, French, Italian, Portuguese and Russian with the addition of further language options an ongoing process. The continuous expansion of the Hi-Force product range enables us to offer our valued customers a “one stop” solution for all of their hydraulic tool requirements.

ABOUT HI-FORCE, PRODUCTS & MARKETS

Hi-Force is fully committed to improving levels of technical capability, both within our own workforce and also throughout our distributor network, and we believe that training is a key element to help us in achieving our goals. Hi-Force continues to invest considerable time and money in the establishment of first class technical sales and service training courses for both our distributors and product users. Courses are held on a regular basis at our UK head office and at selected regional offices worldwide. All training is carried out in our ECITB approved Training Schools; located in UK & Middle East, with additional ECITB approved Training Schools being set up in Malaysia & South Africa by early 2016. Please refer to pages 181 to 186 for further information or contact your local Hi-Force office.

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Our Sales & Marketing teams provide the essential link between Hi-Force and our customers, to ensure that our 30 plus years of expertise and experience continues to anticipate the needs of tomorrow's market today! Another key link with our customers is provided by our Regional Office service centres, each fully equipped with the latest "state of the art" service, repair, calibration and testing facilities ensuring that the after sales service provided for Hi-Force products is second to none in the industry. Additionally, over the past few years many of our authorised distributors have established their own accredited Hi-Force Service Centre, further enhancing the Hi-Force "Global Brand, Local Service" philosophy. The appointment of additional strategically placed service centres, authorised by and compliant with Hi-Force's strict levels of competence, is continuing year on year.



May I thank you on behalf of everyone at Hi-Force, for taking the time to read this section of our 2015 catalogue, which yet again has increased in size and product range compared to its predecessor. I am confident that the products and technical information, detailed on the following pages, will greatly assist you when selecting the most suitable Hi-Force tool for the application at hand. We are justifiably very proud of our achievements to date, none of which could have been realised without the continued support of our many customers and distributors worldwide. Be assured Hi-Force will continually strive to improve in everything we do.

Kevin P. Brown
Group Managing Director

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All Hi-Force products are designed and manufactured to meet or exceed the requirements of current national and international standards and codes of practice, which are essential to ensure that Hi-Force manufactures hydraulic tools and equipment of the highest possible quality, both today, and in the future. All items are manufactured in accordance with the quality assurance requirements of ISO9001:2008 as verified by our certificate of registration number A21 438, originally issued in January 1998 and valid until November 2015 at which time it will be renewed for a further three year period.

All Hi-Force tools are permanently marked with their respective model number and a unique serial number, which are both traceable to an individually issued test certificate. Every Hi-Force tool manufactured is individually tested in accordance with the latest international test procedures, applicable to hydraulic tools and equipment.

All Hi-Force products are covered by a comprehensive warranty against material and/or workmanship defects. All warranty claims must, in the first instance, be registered via our website online warranty claim registration procedure at www.hi-force.com/warranty. The procedure is easy to complete and enables Hi-Force to provide an initial response, within 48 hours of registration of the warranty claim. Following a detailed evaluation of the online warranty claim by our technical department, claims can, in most cases, be approved immediately avoiding the need for costly and time consuming return shipment of the faulty items to Hi-Force. Dependant on whether the approval is to repair or replace, Hi-Force will authorise the warranty through your local authorised Hi-Force Distributor or Service Centre.

Hi-Force reserves the right to request the return of defective or faulty product for a more detailed evaluation and inspection should the information provided in the online warranty claim prove inconclusive. All warranty claim rejections will be supported by a report explaining the reasons why warranty has not been approved.

High pressure hydraulic power provides one of the simplest means of applying a high force in confined spaces, however respect for common sense safety precautions is essential at all times. Every Hi-Force employee is fully conversant with all Hi-Force safety procedures, applicable to the safe operation and use of our products and we feel it is our duty to ensure that all users of hydraulic tools are equally aware of these procedures. With every product that we supply, we provide operation and maintenance instructions to ensure that all operators are equally aware of these safety issues.



CYLINDERS

| | | |
|---------------------|--|------------------|
| Hydraulic Cylinders | Selection table | Page 10 |
| HVL Range | Single acting Very low height pancake cylinders | Page 11 |
| HPS Range | Single acting Low height pad cylinders | Page 12 |
| HLS Range | Single acting Low height cylinders | Page 13 |
| HSS Range | Single acting Multi-purpose cylinders | Pages 14 - 15 |
| HAS Range | Single acting lightweight Solid piston aluminium cylinders | Page 16 |
| HHA Range | Single acting lightweight Hollow piston aluminium cylinders | Page 17 |
| HHS Range | Single acting Hollow piston cylinders | Page 18 |
| HHR Range | Double acting Hollow piston cylinders | Page 19 |
| HDA Range | Double acting High tonnage cylinders | Page 20 |
| HFL & HFG Range | Single acting Failsafe lock ring cylinders | Pages 21 - 22 |
| HGG & HSG Range | Single acting Load return high tonnage cylinders | Page 23 |
| HPC Range | Single acting Pull cylinders | Page 24 |
| PCS Sets | Pump and cylinders sets | Page 25 |
| Saddles | Cylinder saddles and Piston rod specifications | Pages 26 - 27 |

SELECTION TABLE FOR HI-FORCE STANDARD RANGE CYLINDERS

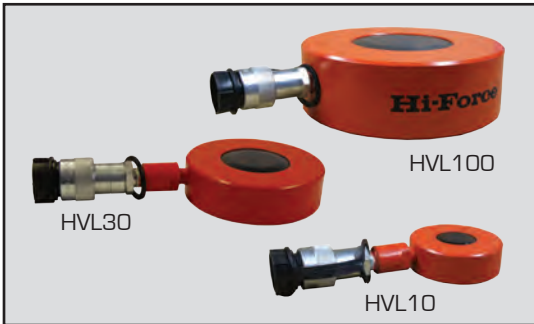
Choice of 124 standard cylinder models and unlimited specials made to order, Hi-Force will provide the best cylinder for the job !

B

| Cylinder stroke in mm | Nominal lifting capacity of cylinder in tonnes | | | | | | | | | | | | |
|-----------------------|--|----------|------------|----------|----------|----------|----------|------------|------------|------------|------------|------------|----------|
| | 4.5 | 10 to 11 | 14.5 to 20 | 23 to 32 | 33 to 37 | 50 to 52 | 61 to 73 | 102 to 110 | 147 to 152 | 200 to 260 | 320 to 398 | 520 to 800 | 1012 |
| 6 | HPS50 | HVL10 | HVL20 | HVL30 | | HVL50 | | HVL100 | | | | | |
| 10 | | HPS100 | | | | | | | | | | | |
| 11 | | | HPS200 | | | | | | | | | | |
| 12 | | | | HPS300 | | | | | | | | | |
| 15 | | | | | | HPS500 | | | | | | | |
| 16 | HPS51 | | | | | | HPS750 | HPS1000 | HPS1500 | | | | |
| 25 | HSS51 | HSS101 | | | | | | HLS1001 | | | | | |
| 25 | | HHS101 | | HLS301 | | HLS501 | | | HLS1501 | | | | |
| 40 | | HLS101 | | | | | | | | | | | |
| 44 | | | HLS201 | | | | | | | | | | |
| 45 | | | | | | | | | HFL1502 | HFL2502 | HFL4002 | HFL5002 | |
| 50 | HSS52 | HHS102 | HSS152 | HHS202 | HHS302 | | | HFL1002 | HLS1502 | HFG2002 | | | |
| 51 | | | | | HHR302 | HSS502 | | | | | | | |
| 51 | | | HHA182 | HSS252 | HHA372 | HFL502 | | | | | | | |
| 56 | | HSS102 | | | | | | | | | | | |
| 60 | | | | HLS302 | | HLS502 | | HLS1002 | | | | | |
| 75 | HSS53 | | | | | | | | | | | | |
| 76 | | | | | | | HHS603 | HHS1003 | | | | | |
| 76 | | | | | | | HHR603 | HHR1003 | | | | | |
| 100 | HSS54 | HSS104 | HSS154 | | | | | HFG1004 | HFG1504 | | | | |
| 102 | | | | HSS254 | | HSS504 | | | | | | | |
| 102 | | | | | | HFG504 | | HSS1004 | | | | | |
| 105 | | | | | | HHA504 | | | | | | | |
| 125 | HSS55 | | | | | | | | | | | | |
| 150 | | HSS106 | HSS156 | HHS206 | HHR306 | HFG506 | | HFG1006 | | | | | |
| 150 | | | | HSS256 | | | HHS606 | HHS1006 | HFG1506 | | HFG3006 | | |
| 151 | | | | | | | | | | | HFG4006 | | |
| 152 | | HHS106 | | HDA256 | | HSS506 | HSS756 | HDA1006 | | HDA2006 | HDA3006 | HDA5006 | |
| 152 | | | | HAS306 | HHS306 | HDA506 | HHR606 | HHR1006 | HDA1506 | HFG2006 | HDA4006 | HFG5006 | HDA10006 |
| 152 | | | | | | HAS506 | | HAS1006 | HSG1506 | HSG2006 | | HDA8006 | HFG10006 |
| 152 | | | | | | | | | | | | HFG8006 | |
| 153 | | | | | | | | HSS1006 | | | HSG3006 | | |
| 155 | | | | | | | | | HGG1506 | HGG2006 | HGG3006 | | |
| 176 | HSS57 | | | | | | | | | | | | |
| 203 | | | | | | HSS508 | | | HHR1508 | HHR2508 | | | |
| 205 | | | | HSS308 | | | | | | | | | |
| 206 | | HSS108 | | | | | | | | | | | |
| 227 | HSS59 | | | | | | | | | | | | |
| 250 | | HSS1010 | HSS1510 | HSS2510 | | | | | | | | | |
| 254 | | | | | | | HHR6010 | HSS10010 | | | | | |
| 305 | | HSS1012 | | | | HHR3012 | | | HDA15012 | HDA20012 | | | |
| 330 | | | | | | HDA5013 | | | | | | | |
| 330 | | | | | | HSS5013 | | HDA10013 | | | | | |
| 356 | | | | HSS2514 | | | | | | | | | |
| 457 | | | | HSS2518 | | | | | | | | | |

| Cylinder Range | Page | Main characteristics of Hi-Force cylinder range | | | | |
|----------------|-------|---|------------------------|-----------------------------|---------------------------|------------------------|
| | | Cylinder principle | Return action | Piston feature | Saddle | Stroke limiting device |
| HVL | 11 | single acting | load/gravity return | solid piston | integrated | stop ring |
| HPS | 12 | single acting | spring assisted return | solid piston | integrated | stop ring |
| HLS | 13 | single acting | spring assisted return | solid piston | integrated | stop ring |
| HSS | 14-15 | single acting | spring assisted return | solid piston | several options available | stop ring |
| HAS | 16 | single acting | spring assisted return | solid piston | flat saddle | stop ring |
| HHA | 17 | single acting | spring assisted return | hollow piston | several options available | stop ring |
| HHS | 18 | single acting | spring assisted return | hollow piston | several options available | stop ring |
| HHR | 19 | double acting | hydraulic return | hollow piston | several options available | stop ring |
| HDA | 20 | double acting | hydraulic return | solid piston | several options available | stop ring |
| HFL | 21 | single acting | load/gravity return | threaded piston & lock ring | tilting saddle | restriction port |
| HFG | 22 | single acting | load/gravity return | threaded piston & lock ring | tilting saddle | restriction port |
| HGG | 23 | single acting | load/gravity return | solid piston | tilting saddle | stop ring |
| HSG | 23 | single acting | load/gravity return | solid piston | tilting saddle | restriction port |

HVL - SINGLE ACTING VERY LOW HEIGHT PANCAKE CYLINDERS



Capacities from 10 to 104 tonnes

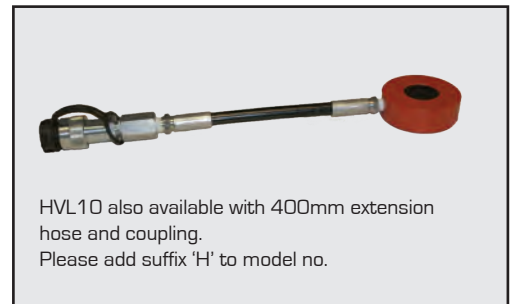
Stroke length 6mm

Working pressure 700 Bar

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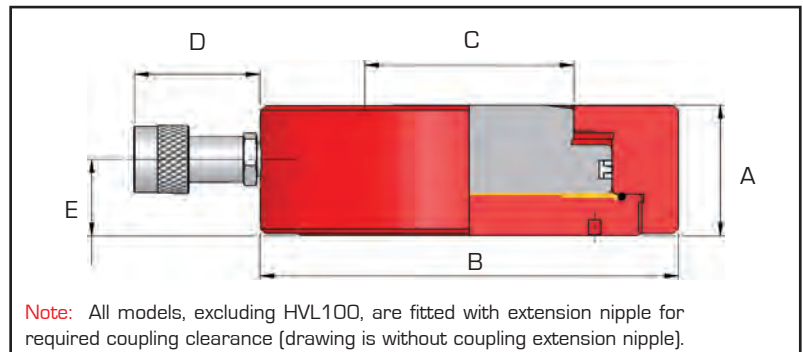
The HVL pancake cylinder range combines a very low closed height with a 6mm stroke, providing a precise adjusting and lifting force in very confined work areas. Ideally suited for applications requiring alignment of machinery, turbines, heavy structures etc. All models are single acting, load return design. The base of all HVL cylinders must be fully supported during use.

- >> Single acting load return
- >> Nitrocarburised piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals



! Did you know....

Hi-Force HVL pancake cylinders are the lowest closed height hydraulic cylinders available on the market. If you don't have the space, we have the solution!



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|---------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HVL10 | 10 | 6 | 9 | 14.4 | 1.6 |
| HVL20 | 20 | 6 | 17 | 28.6 | 2.6 |
| HVL30 | 32 | 6 | 27 | 45.6 | 3.0 |
| HVL50 | 50 | 6 | 43 | 71.3 | 7.2 |
| HVL100 | 104 | 6 | 88 | 146.5 | 15.6 |

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|------|
| A | B | C | D | E |
| 28 | 87 | 38 | 111 | 16.0 |
| 32 | 104 | 52 | 111 | 19.0 |
| 34 | 120 | 60 | 111 | 19.5 |
| 45 | 158 | 75 | 111 | 29.0 |
| 65 | 200 | 100 | 76 | 37.0 |

HPS - SINGLE ACTING LOW HEIGHT PAD CYLINDERS

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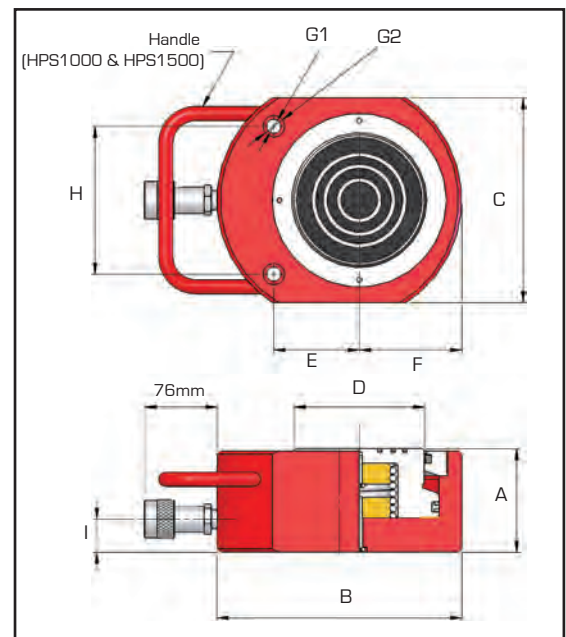
Capacities from 4.5 to 147 tonnes

Stroke lengths from 6 to 16mm

Working pressure 700 Bar

The HPS pad cylinder range offers the best capacity, closed height and stroke length combination, spring assisted return cylinders in the industry. Ideally suited for applications where a low closed height and maximum possible stroke is of prime importance, these highly versatile cylinders are extensively used for maintenance, structural weld positioning, rigging, flange separating and many other applications.

- >> Single acting, spring assisted return
- >> Nitrocarburised piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|----------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HPS50 | 4.5 | 6 | 4 | 6.4 | 0.8 |
| HPS51 | 4.5 | 16 | 10 | 6.4 | 0.9 |
| HPS100 | 10 | 10 | 14 | 14.4 | 1.6 |
| HPS200 | 20 | 11 | 31 | 28.6 | 2.6 |
| HPS300 | 32 | 12 | 55 | 45.6 | 4.2 |
| HPS500 | 50 | 15 | 107 | 71.3 | 6.6 |
| HPS750 | 73 | 16 | 164 | 102.7 | 10.4 |
| HPS1000 | 109 | 16 | 245 | 153.4 | 23.2 |
| HPS1500 | 147 | 16 | 330 | 206.2 | 28.5 |

| Dimensions in mm | | | | | | | | | | |
|------------------|-----|-----|-----|----|----|------|-------|-----|----|--|
| A | B | C | D | E | F | G1 | G2 | H | I | |
| 32 | 60 | 38 | 24 | 20 | 19 | 5.6 | 9.75 | 26 | 19 | |
| 42 | 60 | 38 | 24 | 20 | 19 | 5.6 | 9.75 | 26 | 19 | |
| 46 | 81 | 56 | 38 | 34 | 28 | 6.8 | 11.25 | 37 | 19 | |
| 52 | 100 | 76 | 51 | 40 | 39 | 8.8 | 14.25 | 50 | 19 | |
| 59 | 115 | 95 | 60 | 46 | 48 | 8.8 | 14.25 | 52 | 19 | |
| 67 | 140 | 114 | 70 | 54 | 60 | 10.8 | 17.25 | 67 | 20 | |
| 81 | 165 | 140 | 82 | 67 | 70 | 13.0 | 19.00 | 76 | 21 | |
| 91 | 215 | 180 | 114 | 75 | 90 | 12.8 | 19.00 | 130 | 29 | |
| 100 | 215 | 191 | 114 | 83 | 95 | 13.0 | 19.00 | 117 | 29 | |

HLS - SINGLE ACTING LOW HEIGHT CYLINDERS



Capacities from 10 to 147 tonnes

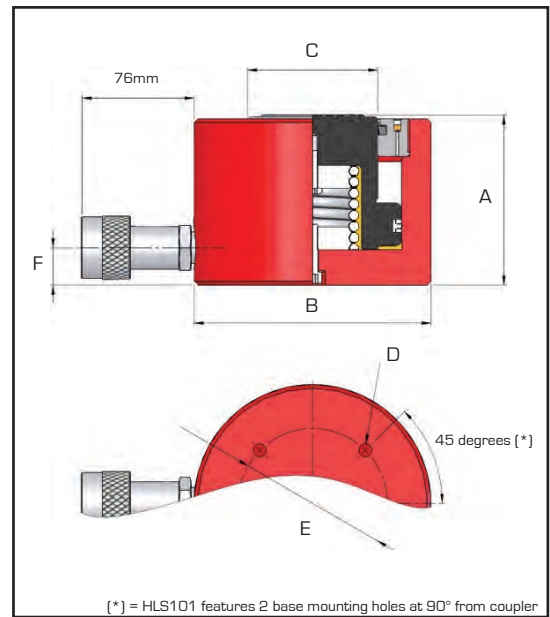
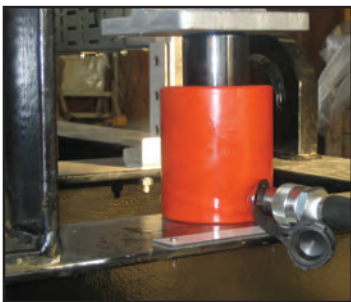
Stroke lengths from 25 to 60mm

Working pressure 700 Bar

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The HLS low height cylinder range is the most widely used Hi-Force cylinder design in the world today. All models have spring assisted return pistons and combine low closed height with optimum stroke lengths. Offering a compact, powerful force for a wide variety of applications in many industries including power generation, ship building & repair, construction, railways, mining, steel works, oil & gas and many others. The HLS range offers a compact, portable option in an inexpensive package.

- >> Spring assisted return
- >> Nitrocarburised piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|----------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HLS101 | 10 | 40 | 58 | 14.4 | 2.4 |
| HLS201 | 20 | 44 | 126 | 28.6 | 4.8 |
| HLS301 | 32 | 25 | 114 | 45.6 | 5.0 |
| HLS302 | 32 | 60 | 274 | 45.6 | 7.0 |
| HLS501 | 50 | 25 | 178 | 71.3 | 8.4 |
| HLS502 | 50 | 60 | 428 | 71.3 | 10.4 |
| HLS1001 | 109 | 25 | 384 | 153.4 | 19.8 |
| HLS1002 | 109 | 60 | 921 | 153.4 | 24.0 |
| HLS1501 | 147 | 25 | 516 | 206.2 | 37.0 |
| HLS1502 | 147 | 50 | 1031 | 206.2 | 42.0 |

| Dimensions in mm | | | | | |
|------------------|-----|-----|-----|-----|----|
| A | B | C | D | E | F |
| 95 | 70 | 38 | M8 | 40 | 19 |
| 102 | 90 | 51 | M8 | 60 | 19 |
| 83 | 102 | 60 | M8 | 80 | 19 |
| 119 | 102 | 60 | M8 | 80 | 19 |
| 91 | 127 | 70 | M8 | 80 | 20 |
| 126 | 127 | 70 | M8 | 80 | 20 |
| 108 | 178 | 114 | M12 | 140 | 30 |
| 143 | 178 | 114 | M12 | 140 | 30 |
| 130 | 216 | 114 | M12 | 165 | 41 |
| 155 | 216 | 114 | M12 | 165 | 41 |

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS

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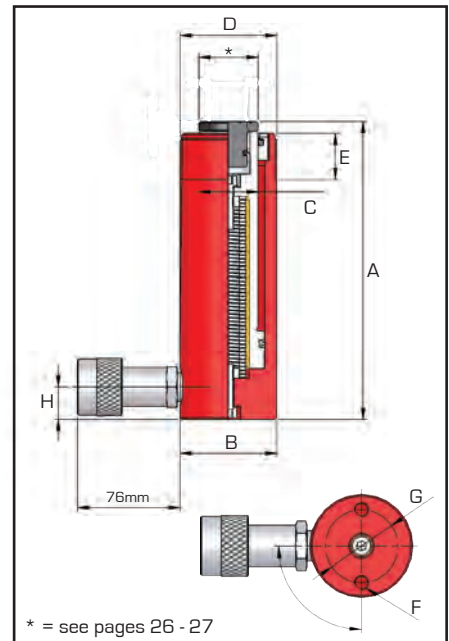
Capacities from 4.5 to 109 tonnes

Stroke lengths from 25 to 457mm

Working pressure 700 Bar

The HSS single acting multi-purpose cylinder range offers the widest choice of stroke lengths and lifting capacities available, and provides an excellent choice for maintenance, production, fabrication and construction applications. All models are provided with a collar thread and thread protector, cylinder base and piston rod mountings for easy fixturing, making the HSS range the most versatile and adaptable multi-purpose cylinders available. Major user industries include power generation, railways, steelworks, mining, shipyards and oil & gas.

- >> Spring assisted return
- >> Nitrocarburised piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Collar threads withstand full load
- >> Piston rod thread on all models up to 30t
- >> Base mounting holes on all models (except HSS308)
- >> Optional piston rod saddles (see pages 26 - 27)
- >> Collar thread protector supplied as standard



Lightweight aluminium alternatives available (see page 16)

| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|--------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HSS51 | 4.5 | 25 | 16 | 6.4 | 1.0 |
| HSS52 | 4.5 | 50 | 32 | 6.4 | 1.2 |
| HSS53 | 4.5 | 75 | 48 | 6.4 | 1.4 |
| HSS54 | 4.5 | 100 | 64 | 6.4 | 1.5 |
| HSS55 | 4.5 | 125 | 80 | 6.4 | 1.8 |
| HSS57 | 4.5 | 176 | 113 | 6.4 | 2.0 |
| HSS59 | 4.5 | 227 | 146 | 6.4 | 2.4 |
| HSS101 | 10 | 25 | 36 | 14.4 | 1.8 |
| HSS102 | 10 | 56 | 81 | 14.4 | 2.4 |
| HSS104 | 10 | 100 | 144 | 14.4 | 3.0 |
| HSS106 | 10 | 150 | 217 | 14.4 | 4.2 |
| HSS108 | 10 | 206 | 297 | 14.4 | 5.0 |
| HSS1010 | 10 | 250 | 361 | 14.4 | 5.4 |
| HSS1012 | 10 | 305 | 440 | 14.4 | 6.2 |

| Dimensions in mm (unless otherwise stated) | | | | | | | |
|--|----|----|-------------|----|----|----|----|
| A | B | C | D | E | F | G | H |
| 107 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 132 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 157 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 182 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 207 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 258 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 308 | 38 | 24 | 1 1/2"-16un | 28 | M6 | 25 | 19 |
| 100 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 131 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 175 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 225 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 281 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 325 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 19 |
| 379 | 57 | 35 | 2 1/4"-14un | 27 | M8 | 40 | 16 |

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS



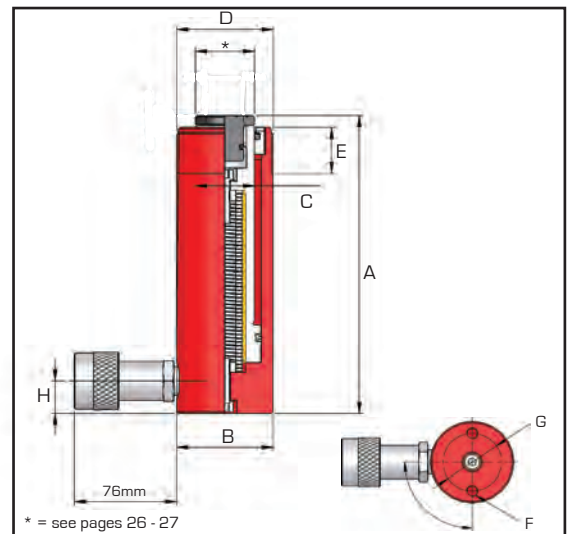
Spring assisted return

Nitrocarburised piston rod

Working pressure 700 Bar

B

- >> Capacities from 4.5 to 109 tonnes
- >> Stroke lengths from 25 to 457mm
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Collar threads withstand full load
- >> Piston rod thread on all models up to 30t
- >> Base mounting holes on all models (except HSS308)
- >> Optional piston rod saddles (see pages 26 - 27)
- >> Collar thread protector supplied as standard



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|--------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HSS152 | 14.5 | 50 | 101 | 20.3 | 3.4 |
| HSS154 | 14.5 | 100 | 203 | 20.3 | 5.0 |
| HSS156 | 14.5 | 150 | 304 | 20.3 | 6.6 |
| HSS1510 | 14.5 | 250 | 507 | 20.3 | 8.8 |
| HSS252 | 25 | 51 | 178 | 34.9 | 6.5 |
| HSS254 | 25 | 102 | 356 | 34.9 | 8.0 |
| HSS256 | 25 | 150 | 524 | 34.9 | 9.6 |
| HSS2510 | 25 | 250 | 874 | 34.9 | 12.6 |
| HSS2514 | 25 | 356 | 1242 | 34.9 | 16.8 |
| HSS2518 | 25 | 457 | 1597 | 34.9 | 21.4 |
| HSS308 | 29 | 205 | 860 | 41.9 | 18.6 |
| HSS502 | 50 | 51 | 364 | 71.3 | 13.0 |
| HSS504 | 50 | 102 | 728 | 71.3 | 16.8 |
| HSS506 | 50 | 152 | 1084 | 71.3 | 20.0 |
| HSS508 | 50 | 203 | 1448 | 71.3 | 23.2 |
| HSS5013 | 50 | 330 | 2354 | 71.3 | 33.6 |
| HSS756 | 73 | 152 | 1561 | 102.7 | 31.0 |
| HSS1004 | 109 | 102 | 1565 | 153.4 | 41.6 |
| HSS1006 | 109 | 153 | 2347 | 153.4 | 49.8 |
| HSS10010 | 109 | 254 | 3896 | 153.4 | 65.5 |

| Dimensions in mm (unless otherwise stated) | | | | | | | |
|--|-----|-----|--------------|----|-----|-----|------|
| A | B | C | D | E | F | G | H |
| 154 | 70 | 41 | 2 3/4"-16un | 39 | M10 | 48 | 19.0 |
| 204 | 70 | 41 | 2 3/4"-16un | 39 | M10 | 48 | 19.0 |
| 254 | 70 | 41 | 2 3/4"-16un | 39 | M10 | 48 | 19.0 |
| 354 | 70 | 41 | 2 3/4"-16un | 39 | M10 | 48 | 19.0 |
| 174 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 225 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 273 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 374 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 480 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 611 | 86 | 54 | 3 5/16"-12un | 49 | M12 | 60 | 25.0 |
| 374 | 102 | 57 | 3 5/16"-12un | 50 | - | - | 50.0 |
| 150 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20.0 |
| 201 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20.0 |
| 251 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20.0 |
| 302 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20.0 |
| 429 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20.0 |
| 272 | 146 | 95 | 5 3/4"-12un | 45 | M12 | 115 | 31.5 |
| 223 | 185 | 114 | 6 7/8"-12un | 50 | M12 | 146 | 32.0 |
| 274 | 185 | 114 | 6 7/8"-12un | 50 | M12 | 146 | 32.0 |
| 375 | 185 | 114 | 6 7/8"-12un | 50 | M12 | 146 | 32.0 |

HAS - SINGLE ACTING LIGHTWEIGHT ALUMINIUM CYLINDERS

B



Capacities from 32 to 110 tonnes

Stroke length 152mm

Working pressure 700 Bar

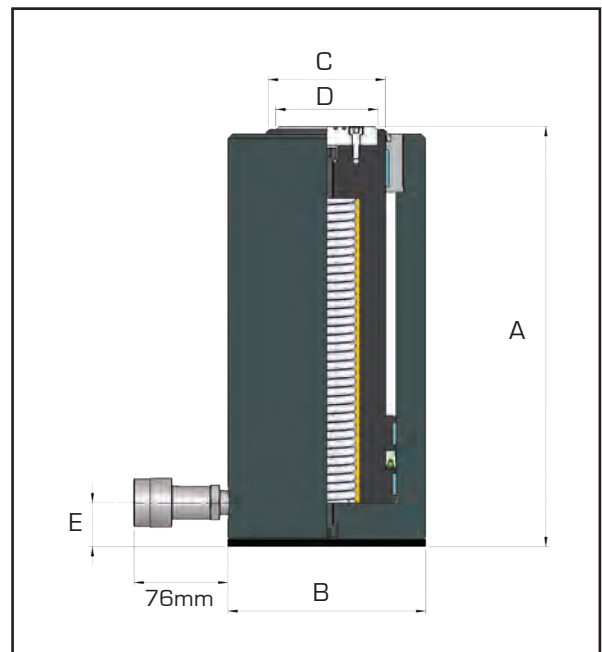
The HAS range of single acting, lightweight, aluminium cylinders is specifically designed for applications where weight and ease of positioning are features of prime importance. With an average weight of approximately 50% of comparable capacity steel construction cylinders, all models are supplied with a hard anodised, wear resistant, piston rod and cylinder body and a steel cylinder base protection plate. Available lifting capacities range from 32 to 110 tonnes capacity, at maximum working pressure of 700 Bar. All models are commonly used in a wide variety of industrial applications in shipyards, steel mills, construction and power plants. Other capacities and stroke length options available on request.

- >> Spring assisted return
- >> Hard anodised piston rod and cylinder
- >> Steel base plate to protect cylinder body
- >> Low friction bearing surfaces
- >> Optional piston rod saddles (see pages 26 - 27)



Please Note

Aluminium cylinders offer the benefit of greatly reduced weight compared to conventional steel cylinders. However, due to the inherent nature of the material, are not recommended for use in high cycle production applications. The recommended life cycle is estimated at approximately 5000 operations at maximum pressure, which in most lifting and maintenance applications represents a more than acceptable period of usage.



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|----------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HAS306 | 32 | 152 | 672 | 44.2 | 6.0 |
| HAS506 | 51 | 152 | 1077 | 70.9 | 9.0 |
| HAS1006 | 110 | 152 | 2340 | 153.9 | 23.0 |

| Dimensions in mm (unless otherwise stated) | | | | |
|--|-----|-----|-----|----|
| A | B | C | D | E |
| 282 | 104 | 60 | 50 | 20 |
| 287 | 135 | 80 | 70 | 25 |
| 317 | 195 | 110 | 100 | 35 |

Note: Other capacities and stroke lengths available on request

HHA - SINGLE ACTING HOLLOW PISTON ALUMINIUM CYLINDERS



Capacities from 18 to 52 tonnes

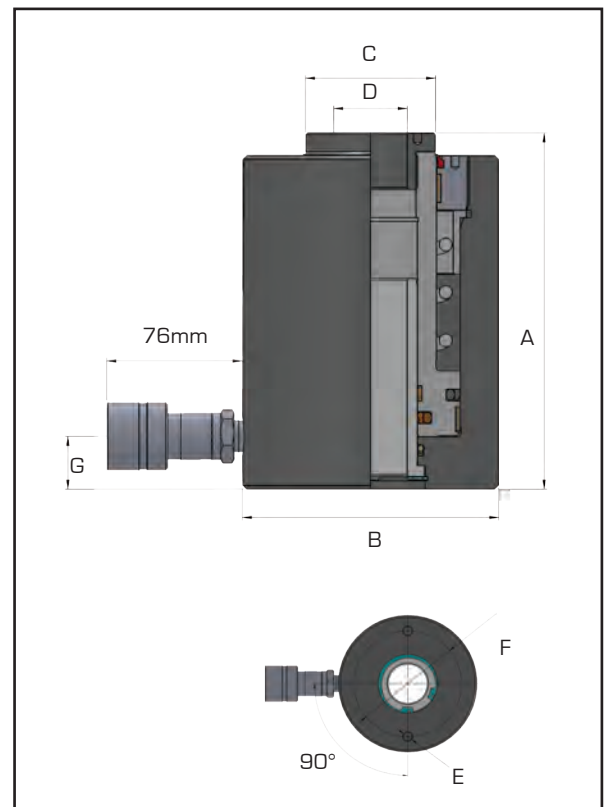
Stroke lengths from 51 to 105mm

Working pressure 700 Bar

B

The HHA range of single acting hollow piston aluminium cylinders are specifically designed for applications where weight and ease of positioning are of prime importance. Similar in design to the HHS range, the HHA cylinder models have a hollow piston to enable a rod or cable to be passed through the entire cylinder length making it suitable for applications where a pulling force is required. All models are supplied with a hard anodised, wear resistant, piston rod and cylinder body and a steel cylinder base protection plate. Available lifting capacities range from 18 to 52 tonnes, at maximum working pressure of 700 Bar.

- >> Spring assisted return
- >> Hard anodised piston rod and cylinder
- >> Steel base plate to protect cylinder body
- >> Low friction bearing surfaces
- >> Optional piston rod saddles (see pages 26 - 27)



Please Note.....

Aluminium cylinders offer the benefit of greatly reduced weight compared to conventional steel cylinders. However, due to the inherent nature of the material, are not recommended for use in high cycle production applications. The recommended life cycle is estimated at approximately 5000 operations at maximum pressure, which in most lifting and maintenance applications represents a more than acceptable period of usage.

| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|---------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HHA182 | 18 | 51 | 129 | 25.2 | 3.6 |
| HHA372 | 37 | 51 | 266 | 52.1 | 7.2 |
| HHA504 | 52 | 105 | 765 | 72.8 | 13.4 |

| Dimensions in mm (unless otherwise stated) | | | | | | |
|--|-----|----|----|--------|-------|----|
| A | B | C | D | E | F | G |
| 175 | 98 | 45 | 26 | M8x10 | 66.0 | 26 |
| 193 | 136 | 69 | 39 | M10x15 | 105.0 | 32 |
| 280 | 160 | 79 | 51 | M10x15 | 130.2 | 39 |

HHS - SINGLE ACTING HOLLOW PISTON CYLINDERS

B



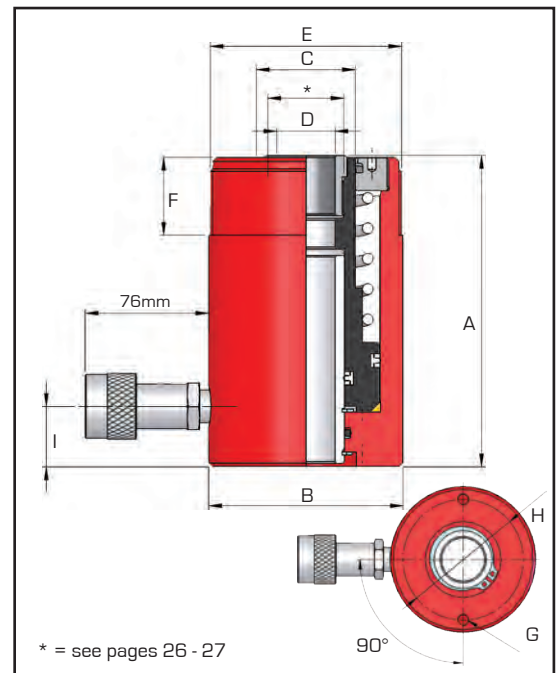
Capacities from 11 to 102 tonnes

Stroke lengths from 25 to 152mm

Working pressure 700 Bar

The HHS single acting hollow piston cylinder range is extremely versatile for use in tooling, maintenance and tensioning applications. Specifically designed with a hollow piston to enable a rod or cable to be passed through the entire cylinder length for applications where a pulling force is required, the HHS range is used extensively in post-tensioning and pre-stressing applications as well as testing of various bonded or mechanical anchoring systems. HHS cylinders can also be used for general lifting applications, when fitted with readily available interchangeable hardened steel piston rod saddles.

- >> Spring assisted return
- >> Nitrocarburised piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Optional piston rod saddles (see pages 26 - 27)
- >> Collar thread protector supplied as standard



| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|--------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HHS101 | 11 | 25 | 39 | 15.8 | 2.8 |
| HHS102 | 11 | 50 | 79 | 15.8 | 3.0 |
| HHS106 | 11 | 152 | 240 | 15.8 | 10.2 |
| HHS202 | 23 | 50 | 167 | 33.3 | 7.0 |
| HHS206 | 23 | 150 | 500 | 33.3 | 13.8 |
| HHS302 | 33 | 50 | 233 | 46.7 | 10.6 |
| HHS306 | 33 | 152 | 710 | 46.7 | 19.2 |
| HHS603 | 61 | 76 | 651 | 85.7 | 28.0 |
| HHS606 | 61 | 150 | 1285 | 85.7 | 40.6 |
| HHS1003 | 102 | 76 | 1088 | 143.1 | 64.0 |
| HHS1006 | 102 | 150 | 2147 | 143.1 | 75.0 |

| Dimensions in mm (unless otherwise stated) | | | | | | | | | |
|--|-----|-----|----|-------------|----|-----|------|----|--|
| A | B | C | D | E | F | G | H | I | |
| 110 | 70 | 38 | 20 | 2 3/4"-16un | 30 | M8 | 51 | 19 | |
| 140 | 70 | 38 | 20 | 2 3/4"-16un | 30 | M8 | 51 | 19 | |
| 297 | 70 | 38 | 20 | 2 3/4"-16un | 30 | M8 | 51 | 19 | |
| 160 | 100 | 51 | 30 | 3 7/8"-12un | 40 | M8 | 82.5 | 31 | |
| 306 | 100 | 51 | 30 | 3 7/8"-12un | 40 | M8 | 82.5 | 31 | |
| 165 | 115 | 60 | 35 | 4 1/2"-12un | 40 | M8 | 92 | 31 | |
| 320 | 115 | 60 | 35 | 4 1/2"-12un | 40 | M8 | 92 | 31 | |
| 226 | 160 | 92 | 55 | 6 1/4"-12un | 59 | M12 | 130 | 31 | |
| 315 | 160 | 92 | 55 | 6 1/4"-12un | 59 | M12 | 130 | 31 | |
| 276 | 213 | 127 | 81 | 8 3/8"-12un | 60 | M16 | 178 | 45 | |
| 350 | 213 | 127 | 81 | 8 3/8"-12un | 60 | M16 | 178 | 45 | |

HHR - DOUBLE ACTING HOLLOW PISTON CYLINDERS



Capacities from 33 to 247 tonnes

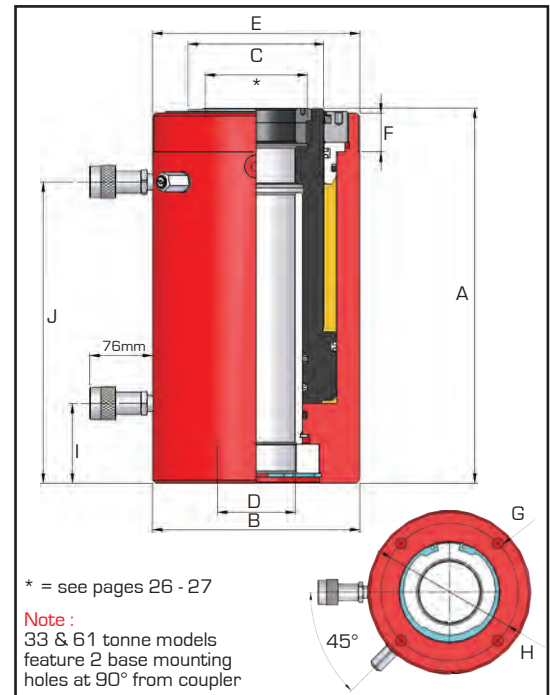
Stroke lengths from 51 to 305mm

Working pressure 700 Bar

B

The HHR double acting hollow piston cylinder range incorporates all of the design features of the HHS range with the added benefit of double acting design, which greatly enhances speed of operation and performance particularly in the longer length stroke options. Additionally a substantial hydraulic pulling force is available in the piston retraction mode of operation. Standard range models are featured in this catalogue, however other stroke and tonnage options are available on request.

- >> Double acting design
- >> Nitrocarburised piston rod
- >> Annular area overload protection valve
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Optional piston rod saddles (see pages 26 - 27)
- >> Collar thread protector supplied as standard



| Model number | Capacity | | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|--------------|-------------|-------------|-----------|--------------------------|--------------------------------|-----------|
| | Push tonnes | Pull tonnes | | | | |
| HHR302 | 33 | 24 | 51 | 238 | 46.7 | 12.2 |
| HHR306 | 33 | 24 | 150 | 701 | 46.7 | 17.6 |
| HHR3012 | 33 | 24 | 305 | 1424 | 46.7 | 25.7 |
| HHR603 | 61 | 38 | 76 | 652 | 85.7 | 30.6 |
| HHR606 | 61 | 38 | 152 | 1304 | 85.7 | 41.6 |
| HHR6010 | 61 | 38 | 254 | 2179 | 85.7 | 52.5 |
| HHR1003 | 102 | 43 | 76 | 1087 | 143.1 | 68.5 |
| HHR1006 | 102 | 43 | 152 | 2174 | 143.1 | 90.0 |
| HHR1508 | 152 | 71 | 203 | 4320 | 212.8 | 170.0 |
| HHR2508 | 247 | 76 | 203 | 7039 | 346.5 | 269.0 |

| Dimensions in mm (unless otherwise stated) | | | | | | | | | |
|--|-----|------|-----|-------------|-----|-----|-----|----|-----|
| A | B | C | D | E | F | G | H | I | J |
| 180 | 115 | 60.3 | 35 | 4 1/2"-12un | 40 | M8 | 92 | 28 | 119 |
| 279 | 115 | 60.3 | 35 | 4 1/2"-12un | 40 | M8 | 92 | 28 | 218 |
| 434 | 115 | 60.3 | 35 | 4 1/2"-12un | 40 | M8 | 92 | 28 | 373 |
| 239 | 160 | 92 | 55 | 6 1/4"-12un | 45 | M12 | 130 | 31 | 166 |
| 315 | 160 | 92 | 55 | 6 1/4"-12un | 45 | M12 | 130 | 31 | 242 |
| 417 | 160 | 92 | 55 | 6 1/4"-12un | 45 | M12 | 130 | 31 | 344 |
| 310 | 213 | 140 | 80 | 8 3/8"-12un | 40 | M16 | 178 | 82 | 234 |
| 386 | 213 | 140 | 80 | 8 3/8"-12un | 40 | M16 | 178 | 82 | 310 |
| 503 | 270 | 184 | 102 | n/a | n/a | n/a | n/a | 98 | 389 |
| 505 | 350 | 254 | 150 | n/a | n/a | n/a | n/a | 98 | 389 |

HDA - DOUBLE ACTING HIGH TONNAGE CYLINDERS

HDA506



HDA5013



Capacities from 25 to 1012 tonnes

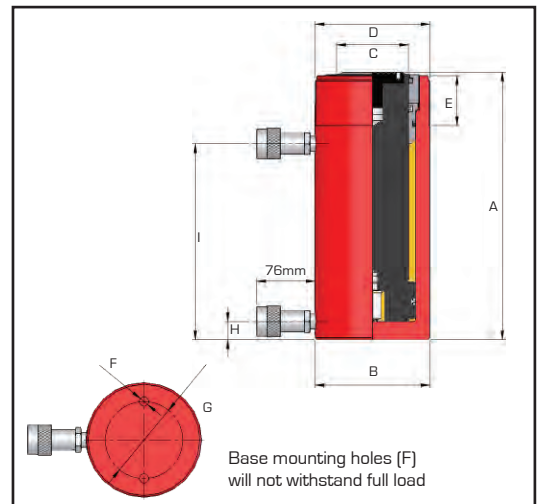
Stroke lengths from 152 to 330mm

Working pressure 700 Bar

The HDA double acting cylinder range offers the utmost in versatility and durability. Specifically designed for heavy duty lifting, construction and maintenance applications as well as presswork and industrial production, the double acting design provides substantial pulling force in the piston retraction mode as well as providing fast, controlled retraction for continuous duty cycle operation. All models up to 203 tonnes are supplied with flat saddle, piston rod threads and collar threads as standard. Models from 326 tonnes and upwards are supplied without collar thread and piston rod thread, however include replaceable tilting saddle as standard.

- >> Internal annular area overload protection valve
- >> Low friction bearing surfaces
- >> Nitrocarburised piston rod
- >> Anti-extrusion seals
- >> Lifting ring as standard on models from 50 to 109 tonnes
- >> Eyebolts as standard on models from 152 to 1012 tonnes
- >> Base mounting holes *

*Base mounting holes are for location of cylinder only. They are not designed to resist the full capacity of the cylinder



Optional piston rod saddles on pages 26 - 27



| Model number | Capacity | | Stroke mm | Oil cap. litres | Cyl. eff. area cm ² | Weight kg |
|--------------|-------------|-------------|-----------|-----------------|--------------------------------|-----------|
| | Push tonnes | Pull tonnes | | | | |
| HDA256 | 25 | 10 | 152 | 0.53 | 34.9 | 15.0 |
| HDA506 | 50 | 15 | 152 | 1.08 | 71.3 | 28.4 |
| HDA5013 | 50 | 15 | 330 | 2.35 | 71.3 | 42.6 |
| HDA1006 | 109 | 36 | 152 | 2.33 | 153.3 | 64.5 |
| HDA10013 | 109 | 36 | 330 | 5.06 | 153.3 | 89.0 |
| HDA1506 | 152 | 79 | 152 | 3.26 | 214.2 | 90.0 |
| HDA15012 | 152 | 79 | 305 | 6.53 | 214.2 | 120.5 |
| HDA2006 | 203 | 94 | 152 | 4.33 | 285.2 | 129.8 |
| HDA20012 | 203 | 94 | 305 | 8.69 | 285.2 | 167.4 |
| HDA3006 | 326 | - | 152 | 6.95 | 457.4 | 193.0 |
| HDA4006 | 398 | - | 152 | 8.49 | 558.9 | 286.0 |
| HDA5006 | 520 | - | 152 | 11.09 | 729.9 | 372.0 |
| HDA8006 | 809 | - | 152 | 17.28 | 1134.1 | 650.0 |
| HDA10006 | 1012 | - | 152 | 21.62 | 1419.3 | 900.0 |

| Dimensions in mm (unless otherwise stated) | | | | | | | | | |
|--|-----|-----|--------------|----------|----------|----------|----|-----|--|
| A | B | C | D | E | F* | G | H | I | |
| 287 | 92 | 50 | 3 5/16"-12un | 53 | M10 | 60 | 30 | 212 | |
| 295 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20 | 216 | |
| 473 | 127 | 79 | 5"-12un | 55 | M12 | 85 | 20 | 394 | |
| 304 | 185 | 114 | 6 7/8"-12un | 51 | M12 | 146 | 30 | 226 | |
| 482 | 185 | 114 | 6 7/8"-12un | 51 | M12 | 146 | 30 | 404 | |
| 310 | 210 | 114 | 8"-12un | 55 | M16 | 160 | 35 | 231 | |
| 463 | 210 | 114 | 8"-12un | 55 | M16 | 160 | 35 | 384 | |
| 327 | 254 | 140 | 9 3/4"-12un | 65 | M20 | 185 | 43 | 238 | |
| 480 | 254 | 140 | 9 3/4"-12un | 65 | M20 | 185 | 43 | 391 | |
| 409 | 312 | 165 | Optional | Optional | M20 | 158 | 50 | 262 | |
| 431 | 360 | 216 | Optional | Optional | M24 | 203 | 55 | 277 | |
| 470 | 397 | 203 | Optional | Optional | M24 | 203 | 65 | 300 | |
| 535 | 500 | 300 | Optional | Optional | Optional | Optional | 70 | 318 | |
| 590 | 540 | 320 | Optional | Optional | Optional | Optional | 99 | 357 | |

Note: Other capacities and stroke lengths available on request

HFL - SINGLE ACTING LOW HEIGHT FAILSAFE LOCK RING CYLINDERS



Capacities from 50 to 520 tonnes

Stroke lengths from 45 to 51 mm

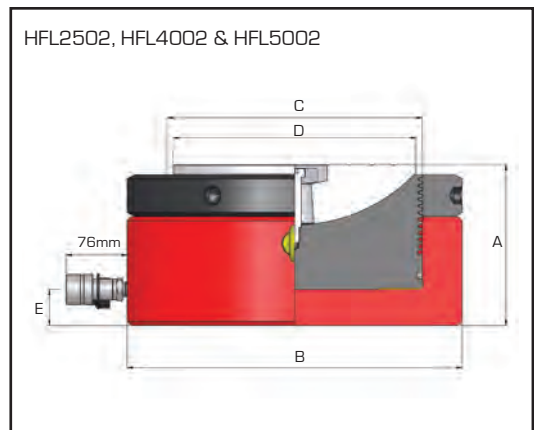
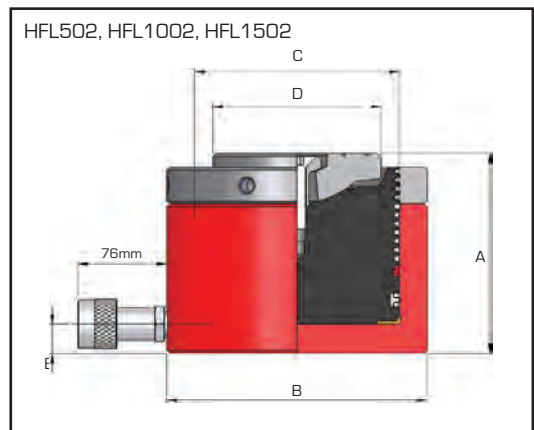
Working pressure 700 Bar

B

The HFL low height single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support, offering a sustainable lifting force in very confined work areas. Ideally suited for applications requiring load holding for extended periods, such as bridge support work. The HFL range features a single acting load return piston, threaded throughout its stroke length to suit the threaded mechanical load holding lock ring. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard.

- >> Single acting load return design
- >> Nitrocarburised cylinder and piston rod
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Tilting saddle fitted as standard
- >> Overstroke restrictor port
- >> See pages 29 - 50 for pumps suitable for use with all Hi-Force cylinders
- >> Saddle and piston rod details, see pages 26 - 27

For easy rotation of the load holding locking ring, Hi-Force recommends the purchase of tommy bar(s). Model numbers of suitable tommy bars are listed in below table.



| Model number | Capacity tonnes | Stroke mm | Oil cap. litres | Cyl. eff. area cm ² | Weight kg | Tommy bar |
|----------------|-----------------|-----------|-----------------|--------------------------------|-----------|--------------|
| HFL502 | 50 | 51 | 0.36 | 71.3 | 14.2 | TTB10 |
| HFL1002 | 109 | 50 | 0.77 | 153.4 | 27.9 | TTB10 |
| HFL1502 | 152 | 45 | 1.07 | 214.3 | 44.0 | TTB10 |
| HFL2502 | 260 | 45 | 1.65 | 366.1 | 69.4 | TTB14 |
| HFL4002 | 398 | 45 | 2.51 | 559.0 | 121.0 | TTB16 |
| HFL5002 | 520 | 45 | 3.29 | 729.9 | 186.0 | TTB16 |

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|----|
| A | B | C | D | E |
| 125 | 127 | 95 | 70 | 19 |
| 137 | 185 | 140 | 115 | 20 |
| 150 | 216 | 165 | 135 | 28 |
| 159 | 273 | 216 | 200 | 31 |
| 178 | 360 | 267 | 260 | 36 |
| 192 | 400 | 305 | 290 | 43 |

HFG - SINGLE ACTING FAILSAFE LOCK RING CYLINDERS

B



Capacities from 50 to 1012 tonnes

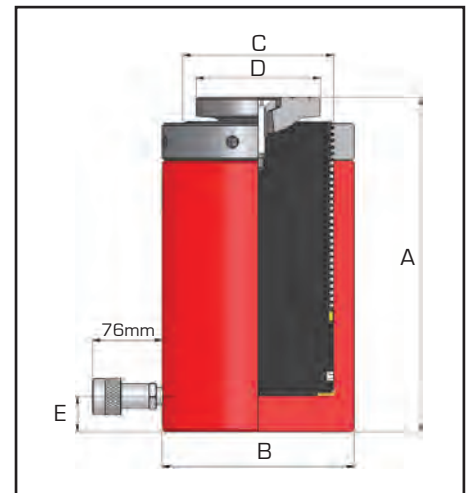
Stroke lengths from 50 to 152mm

Working pressure 700 Bar

The HFG single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support. Ideally suited for applications requiring sustained load holding for extended periods, such as bridge support work, the HFG range features a single acting, load return piston, threaded throughout its stroke length to suit the threaded mechanical load holding lock ring. Simply jack up the load, wind down the mechanical lock ring until it comes into contact with the cylinder body, release the hydraulic pressure and sustain the load mechanically. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard to reduce the risk of side loading the cylinder.

- >> Single acting load return design
- >> Nitrocarburised cylinder and piston rod for corrosion protection
- >> Low friction bearing surfaces
- >> Anti-extrusion seals
- >> Tilting saddle fitted as standard
- >> Overstroke restrictor port
- >> Saddle and piston rod details, see pages 26 - 27

For easy rotation of the load holding locking ring, Hi-Force recommends the purchase of tommy bar(s). Model numbers of suitable tommy bars are listed in below table.



| Model number | Capacity tonnes | Stroke mm | Oil cap. litres | Cyl. eff. area cm ² | Weight kg | Tommy bar |
|--------------|-----------------|-----------|-----------------|--------------------------------|-----------|-----------|
| HFG504 | 50 | 102 | 0.73 | 71.3 | 20.6 | TTB10 |
| HFG506 | 50 | 150 | 1.07 | 71.3 | 25.0 | TTB10 |
| HFG1004 | 109 | 100 | 1.53 | 153.4 | 50.3 | TTB10 |
| HFG1006 | 109 | 150 | 2.30 | 153.4 | 65.4 | TTB10 |
| HFG1504 | 152 | 100 | 2.14 | 214.3 | 84.0 | TTB10 |
| HFG1506 | 152 | 150 | 3.21 | 214.3 | 89.5 | TTB10 |
| HFG2002 | 203 | 50 | 1.42 | 285.1 | 95.4 | TTB14 |
| HFG2006 | 203 | 152 | 4.33 | 285.1 | 137.0 | TTB14 |
| HFG3006 | 326 | 150 | 6.87 | 457.7 | 228.5 | TTB14 |
| HFG4006 | 398 | 151 | 8.44 | 559.0 | 308.5 | TTB14 |
| HFG5006 | 520 | 152 | 11.10 | 729.9 | 457.0 | TTB16 |
| HFG8006 | 809 | 152 | 17.47 | 1134.1 | 735.0 | TTB16 |
| HFG10006 | 1012 | 152 | 21.61 | 1419.3 | 1016.0 | TTB20 |

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|------|
| A | B | C | D | E |
| 224 | 127 | 95 | 70 | 25.0 |
| 272 | 128 | 95 | 70 | 25.0 |
| 240 | 185 | 140 | 115 | 27.5 |
| 311 | 185 | 140 | 115 | 27.5 |
| 288 | 216 | 165 | 135 | 42.0 |
| 338 | 216 | 165 | 135 | 42.0 |
| 261 | 254 | 190 | 135 | 50.0 |
| 362 | 254 | 190 | 135 | 50.0 |
| 417 | 310 | 241 | 150 | 50.0 |
| 459 | 360 | 267 | 180 | 70.0 |
| 498 | 400 | 305 | 180 | 80.0 |
| 565 | 480 | 380 | 340 | 80.0 |
| 620 | 540 | 425 | 380 | 90.0 |

Note: Other capacities and stroke lengths available on request

HGG - SINGLE ACTING LOAD RETURN INDUSTRIAL CYLINDERS

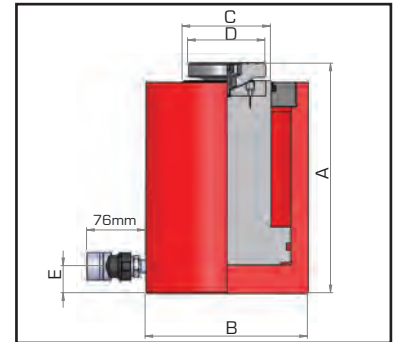


Capacities from 152 to 326 tonnes

Stroke length 155mm

Working pressure 700 Bar

The HGG range of load return industrial cylinders is specifically designed for lifting and maintenance applications. All models are supplied with a tilting saddle to reduce the risk of damage caused by side loading and an integral stop ring for stroke limitation is fitted as standard. Standard range models are featured in this catalogue, however additional capacities and stroke options are available on request.



| Model number | Capacity tonnes | Stroke mm | Oil cap. litres | Cyl. eff. area cm ² | Weight kg |
|----------------|-----------------|-----------|-----------------|--------------------------------|-----------|
| HGG1506 | 152 | 155 | 3.32 | 214.3 | 58.3 |
| HGG2006 | 203 | 155 | 4.63 | 285.1 | 95.3 |
| HGG3006 | 326 | 155 | 7.10 | 457.7 | 153.5 |

| Dimensions in mm (unless otherwise stated) | | | | |
|--|-----|-----|-----|----|
| A | B | C | D | E |
| 297 | 210 | 114 | 100 | 37 |
| 310 | 254 | 140 | 135 | 50 |
| 343 | 312 | 165 | 150 | 50 |

B

HSG - SINGLE ACTING LOAD RETURN CONSTRUCTION CYLINDERS

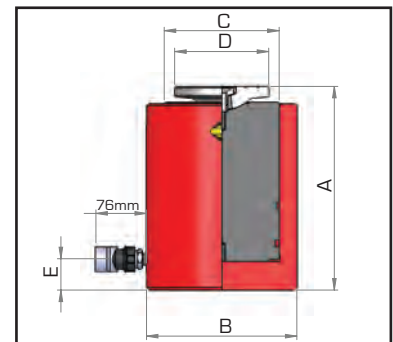


Capacities from 152 to 326 tonnes

Stroke length 152 to 153mm

Working pressure 700 Bar

The HSG range of single acting load return construction cylinders is ideally suited for construction, civil engineering, heavy fabrication and maintenance applications. All models are supplied with a tilting saddle fitted as standard and have an overstroke restrictor port to prevent over extension of the piston. Standard range models are featured in this catalogue, however additional capacities and stroke options are available on request.

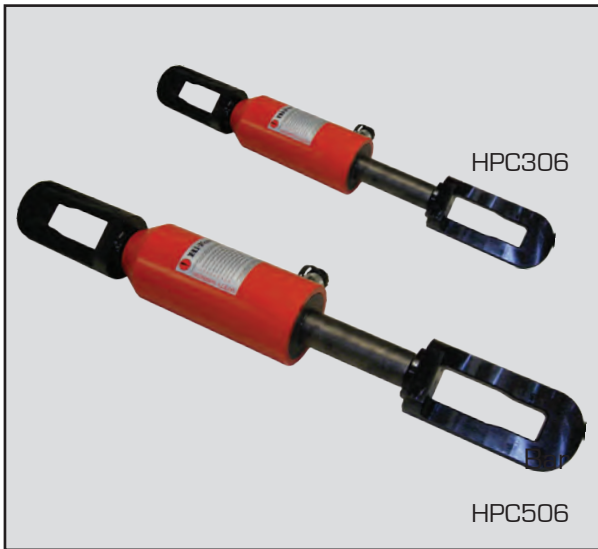


| Model number | Capacity tonnes | Stroke mm | Oil cap. litres | Cyl. eff. area cm ² | Weight kg |
|----------------|-----------------|-----------|-----------------|--------------------------------|-----------|
| HSG1506 | 152 | 152 | 3.21 | 214.3 | 77.5 |
| HSG2006 | 203 | 152 | 4.34 | 285.1 | 107.7 |
| HSG3006 | 326 | 153 | 6.99 | 457.7 | 175.2 |

| Dimensions in mm (unless otherwise stated) | | | | |
|--|-----|-------|-----|----|
| A | B | C | D | E |
| 293 | 216 | 165.1 | 135 | 45 |
| 296 | 254 | 190.5 | 135 | 45 |
| 326 | 312 | 241.3 | 150 | 50 |

HPC - SINGLE ACTING PULL CYLINDERS

B



Capacities from 10 to 50 tonnes

Stroke length 152mm

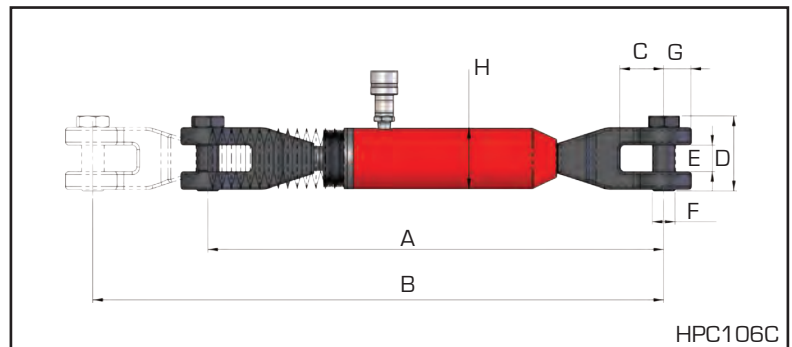
Working pressure 700



Hand and powered pumps suitable for use with HPC range pull cylinders are detailed on pages 29 to 50

The HPC pull cylinder range comprises of four models, with capacities ranging from 10 tonnes to 50 tonnes of pulling force. All models are 700 Bar maximum working pressure and feature a single acting, spring assisted return piston, with a 152mm stroke length. Fitted with easily replaceable machined pulling eyes on the piston rod and cylinder base, the 10 tonnes capacity version can also be supplied with clevis eye attachments. Typical applications for HPC pull cylinders are plate alignment prior to welding in shipyards, cable tensioning and heavy load moving using chains or wire ropes.

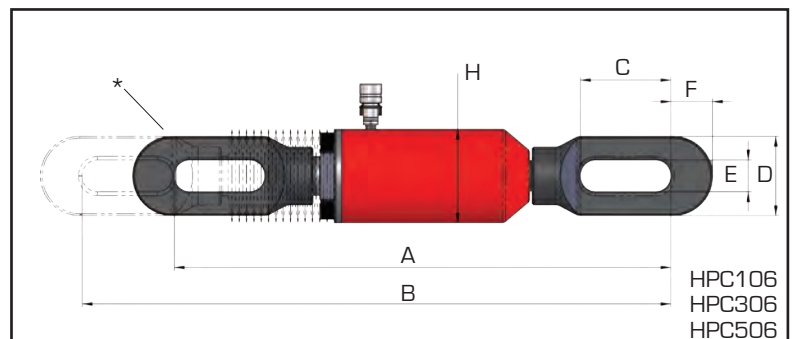
- >> Spring assisted return
- >> Surface treated piston rod
- >> Replaceable pulling and clevis eyes
- >> Piston wiper prevents contamination



Protective bellows are fitted as standard



HPC106 c/w bellows



* Eye bolt thickness: HPC106 = 22mm, HPC306 = 35mm, HPC506 = 40mm

| Model number | Capacity tonnes | Stroke mm | Oil cap. cm ³ | Cyl. eff. area cm ² | Weight kg |
|--------------|-----------------|-----------|--------------------------|--------------------------------|-----------|
| HPC106 | 10 | 152 | 228 | 15.0 | 12.0 |
| HPC106C | 10 | 152 | 228 | 15.0 | 15.5 |
| HPC306 | 30 | 152 | 636 | 41.8 | 31.0 |
| HPC506 | 50 | 152 | 1078 | 71.0 | 54.0 |

| Dimensions in mm | | | | | | | |
|------------------|-----|-----|-----|----|----|----|-----|
| A | B | C | D | E | F | G | H |
| 600 | 752 | 114 | 67 | 32 | 33 | - | 80 |
| 602 | 754 | 58 | 99 | 35 | 30 | 36 | 80 |
| 695 | 847 | 145 | 105 | 42 | 50 | - | 122 |
| 819 | 971 | 149 | 130 | 52 | 69 | - | 153 |

PCS - PUMP AND CYLINDER SETS



Working pressure 700 Bar

Capacities from 4.5 to 109 tonnes

Stroke lengths from 10 to 153mm

B

Hi-Force PCS pump and cylinder sets provide the simplest and most cost effective way to start your job immediately. All sets comprise of a Hi-Force hydraulic cylinder (wide choice available), suitable Hi-Force manual pump and a two metre hose with high flow, quick release coupler.

- >> 18 standard sets
- >> Cylinders are spring assisted return design
- >> Manual pumps include factory set relief valve
- >> Optional piston rod (tilting) saddles are available for most cylinder models (see pages 26 - 27)



For optional pressure gauges please refer to pages 53 - 54.

| Set | | Pump | | Cylinder | | | Hose | | Weight kg |
|--------------|--------------------------|--------------|-----------------|--------------|-----------|------------------|--------------|---------------|--------------|
| Model number | Cylinder capacity tonnes | Model number | Capacity litres | Model number | Stroke mm | Closed height mm | Model number | Length metres | |
| PCS50 | 4.5 | HP110 | 1.0 | HPS51 | 16 | 42 | HC2 | 2.0 | 7.4 |
| PCS53 | 4.5 | HP110 | 1.0 | HSS53 | 75 | 157 | HC2 | 2.0 | 8.0 |
| PCS100 | 10 | HP110 | 1.0 | HPS100 | 10 | 46 | HC2 | 2.0 | 8.2 |
| PCS101 | 10 | HP110 | 1.0 | HLS101 | 40 | 95 | HC2 | 2.0 | 9.0 |
| PCS102 | 10 | HP110 | 1.0 | HSS102 | 56 | 131 | HC2 | 2.0 | 9.0 |
| PCS106 | 10 | HP110 | 1.0 | HSS106 | 150 | 225 | HC2 | 2.0 | 10.8 |
| PCS200 | 20 | HP110 | 1.0 | HPS200 | 11 | 52 | HC2 | 2.0 | 9.4 |
| PCS201 | 20 | HP110 | 1.0 | HLS201 | 44 | 102 | HC2 | 2.0 | 11.3 |
| PCS256 | 25 | HP110 | 1.0 | HSS256 | 150 | 273 | HC2 | 2.0 | 16.0 |
| PCS300 | 32 | HP110 | 1.0 | HPS300 | 12 | 59 | HC2 | 2.0 | 10.8 |
| PCS302 | 32 | HP110 | 1.0 | HLS302 | 60 | 119 | HC2 | 2.0 | 13.6 |
| PCS502 | 50 | HP110 | 1.0 | HLS502 | 60 | 126 | HC2 | 2.0 | 17.0 |
| PCS506 | 50 | HP232 | 2.0 | HSS506 | 152 | 251 | HC2 | 2.0 | 31.0 |
| PCS1002 | 109 | HP232 | 2.0 | HLS1002 | 60 | 143 | HC2 | 2.0 | 35.5 |
| PCS1006 | 109 | HP252 | 5.0 | HSS1006 | 153 | 274 | HC2 | 2.0 | 66.0 |
| PCS202H | 23 | HP110 | 1.0 | HHS202 | 50 | 160 | HC2 | 2.0 | 13.9 |
| PCS302H | 33 | HP110 | 1.0 | HHS302 | 50 | 165 | HC2 | 2.0 | 17.2 |
| PCS603H | 61 | HP232 | 2.0 | HHS603 | 76 | 226 | HC2 | 2.0 | 34.6 |

Note : Models PCS202H, PCS302H & PCS603H are supplied with a hollow piston cylinder

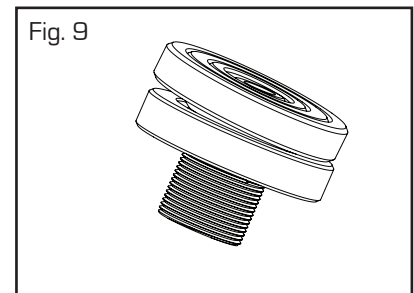
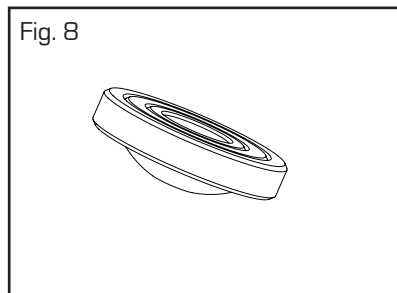
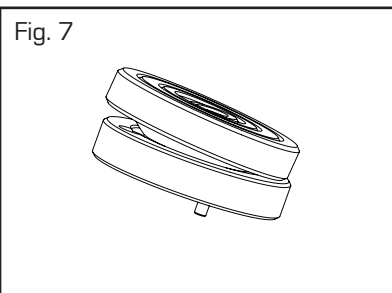
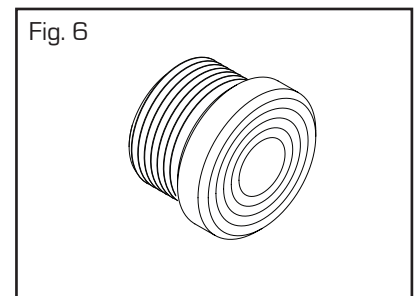
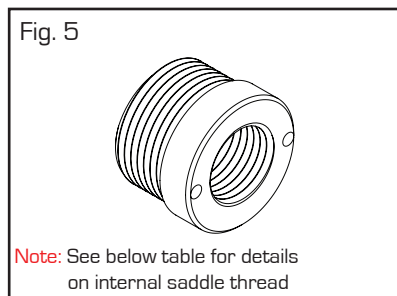
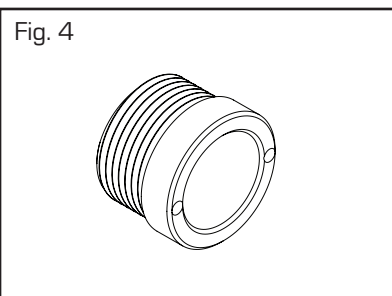
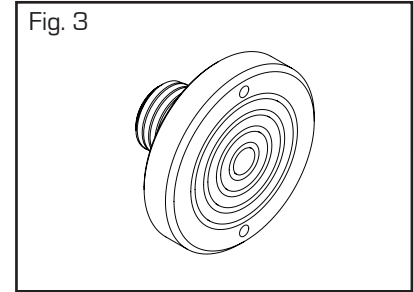
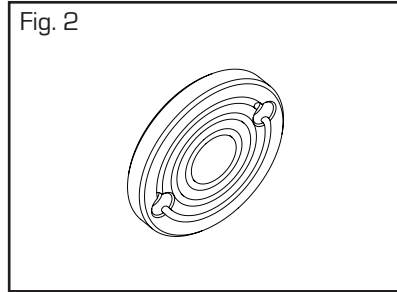
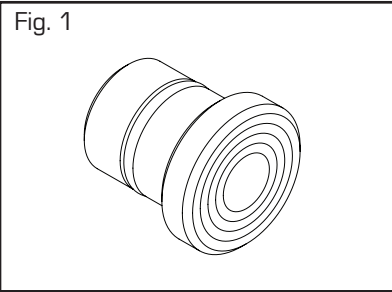
CYLINDER SADDLES & PISTON ROD THREAD SPECIFICATIONS

B

| Cylinder Range | Saddles | | | | | Piston rod thread | | | | |
|---------------------------|-----------------|--------|------------------|--------|-----|-------------------|-------|-----------|-------------|--------|
| | Standard Saddle | | Optional Saddle | | | Dimensions in mm | | | Thread Size | Figure |
| | Model No. | Figure | Model No. | Figure | A | B | C | D | | |
| HSS Cylinder Range | | | | | | | | | | |
| HSS5 | HA5 | 1 | - | - | - | - | 20 | ¾"-16UNF | 12 | |
| HSS10 | HA10 | 1 | HAT10 | 9 | - | - | 14 | 1"-8UNC | 12 | |
| HSS15 | HA15 | 1 | HAT10 | 9 | - | - | 14 | 1"-8UNC | 12 | |
| HSS25 | HA25 | 1 | HAT25 | 9 | - | - | 30 | 1½"-16UN | 12 | |
| HSS30 | HA30 | 1 | HAT25 | 9 | - | - | 30 | 1½"-16UN | 12 | |
| HSS50 | HA50 | 2 | HAT50 | 7 | 70 | 11 | - | - | 10 | |
| HSS75 | HA75 | 2 | HAT75 | 7 | 80 | 12 | - | - | 10 | |
| HSS100 | HA100 | 2 | HAT100 | 7 | 100 | 12 | - | - | 10 | |
| HAS Cylinder Range | | | | | | | | | | |
| HAS30 | HA30 | 2 | HAT30 | 7 | 50 | 10 | - | - | 10 | |
| HAS50 | HA50 | 2 | HAT50 | 7 | 70 | 11 | - | - | 10 | |
| HAS100 | HA100 | 2 | HAT100 | 7 | 100 | 12 | - | - | 10 | |
| HHS Cylinder Range | | | | | | | | | | |
| HHS11 | HA102 | 4 | HA102T, HA102G | 5,6 | 32 | 7 | 21 | M28x1.5 | 13 | |
| HHS23 | HA202 | 4 | HA202T, HA202G | 5,6 | 43 | 10 | 31 | M39x1.5 | 13 | |
| HHS33 | HA302 | 4 | HA302T, HA302G | 5,6 | 52 | 10 | 31 | M48x1.5 | 13 | |
| HHS61 | HA603 | 4 | HA603T, HA603G | 5,6 | 80 | 10 | 31 | M70x1.5 | 13 | |
| HHS102 | HA1003 | 4 | HA1003T, HA1003G | 5,6 | 114 | 12 | 38 | M105x2 | 13 | |
| HHA Cylinder Range | | | | | | | | | | |
| HHA18 | HA18 | 4 | HA18T | 5 | - | - | 28 | M35x1.5 | 12 | |
| HHA37 | HA37 | 4 | HA37T | 5 | - | - | 35 | M50x1.5 | 12 | |
| HHA50 | HA50 | 4 | HA50T | 5 | - | - | 37 | M60x1.5 | 12 | |
| HHR Cylinder Range | | | | | | | | | | |
| HHR33 | HA302 | 4 | HA302T, HA302G | 5,6 | 52 | 10.0 | 32 | M48x1.5 | 13 | |
| HHR61 | HA603 | 4 | HA603T, HA603G | 5,6 | 80 | 10.0 | 32 | M70x1.5 | 13 | |
| HHR102 | HA1003 | 4 | HA1003T, HA1003G | 5,6 | 114 | 12.0 | 38 | M105x2 | 13 | |
| HHR150 | HA1508 | 4 | HA1508G | 6 | 170 | 13.5 | 50 | M150x3 | 13 | |
| HHR250 | HA2508 | 4 | HA2508G | 6 | 242 | 13.5 | 74 | M220x3 | 13 | |
| HDA Cylinder Range | | | | | | | | | | |
| HDA25 | HD25 | 3 | HD25T | 9 | 45 | 9 | 35 | 1"-12UNF | 11 | |
| HDA50 | HD50 | 3 | HD50T | 9 | 70 | 11 | 45 | 1"-12UNF | 11 | |
| HDA100 | HD100 | 3 | HD100T | 9 | 100 | 12 | 55 | 1¾"-12UNF | 11 | |
| HDA150 | HD150 | 3 | HD150T | 9 | 100 | 12 | 52 | 3"-16UN | 11 | |
| HDA200 | HD200 | 3 | HD200T | 9 | 110 | 12 | 70 | 2½"-12UN | 11 | |
| HDA300 | HD300T | 7 | HD300 | 2 | 150 | 25 | - | - | - | |
| HDA400 | HD400T | 7 | HD400 | 2 | 180 | 25 | - | - | - | |
| HDA500 | HD500T | 7 | HD500 | 2 | 180 | 25 | - | - | - | |
| HDA800 | TS800 | 8 | - | - | 180 | - | 51 | M24x3 | 14 | |
| HDA1000 | TS1000 | 8 | - | - | 180 | - | 51 | M24x3 | 14 | |
| HFG Cylinder Range | | | | | | | | | | |
| HFG50 | TS50 | 8 | - | - | 15 | - | 30 | M8x1.25 | 14 | |
| HFG100 | TS100 | 8 | - | - | 18 | - | 60 | M12x1.75 | 14 | |
| HFG150 | TS150 | 8 | - | - | 18 | - | 60 | M12x1.75 | 14 | |
| HFG200 | TS200 | 8 | - | - | 18 | - | 60 | M12x1.75 | 14 | |
| HFG300 | TS300 | 8 | - | - | 16 | - | 70 | M10x1.5 | 14 | |
| HFG400 | TS400 | 8 | - | - | 17 | - | 125 | M12x1.75 | 14 | |
| HFG500 | TS500 | 8 | - | - | 17 | - | 125 | M12x1.75 | 14 | |
| HFG800 | TS800 | 8 | - | - | 50 | - | 175 | M24x3 | 14 | |
| HFG1000 | TS1000 | 8 | - | - | 51 | - | 175 | M24x3 | 14 | |
| HFL Cylinder Range | | | | | | | | | | |
| HFL50 | TS50 | 8 | - | - | 15 | - | 31 | M8x1.25 | 14 | |
| HFL100 | TS100 | 8 | - | - | 18 | - | 60 | M12x1.75 | 14 | |
| HFL150 | TS150 | 8 | - | - | 18 | - | 120 | M12x1.75 | 14 | |
| HFL250 | TS250 | 8 | - | - | 40 | - | 140 | M10x1.5 | 14 | |
| HFL400 | TS400 | 8 | - | - | 40 | - | 180 | M12x1.75 | 14 | |
| HFL500 | TS500 | 8 | - | - | 40 | - | 200 | M12x1.75 | 14 | |
| HGG Cylinder Range | | | | | | | | | | |
| HGG150 | TS150 | 8 | - | - | 18 | - | 60.0 | M12x1.75 | 14 | |
| HGG200 | TS201 | 8 | - | - | 18 | - | 124.5 | M12x1.75 | 14 | |
| HGG300 | TS301 | 8 | - | - | 21 | - | 95.0 | M12x1.75 | 14 | |
| HSG Cylinder Range | | | | | | | | | | |
| HSG150 | TS150 | 8 | - | - | 18 | - | 60.0 | M12x1.75 | 14 | |
| HSG200 | TS201 | 8 | - | - | 18 | - | 124.5 | M12x1.75 | 14 | |
| HSG300 | TS302 | 8 | - | - | 28 | - | 160.0 | M22x2.5 | 14 | |

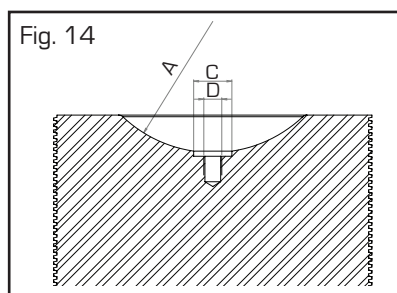
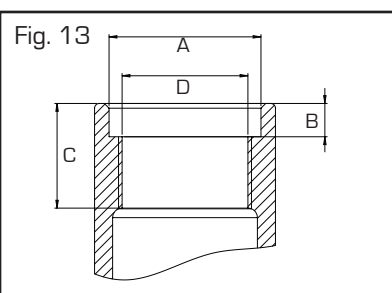
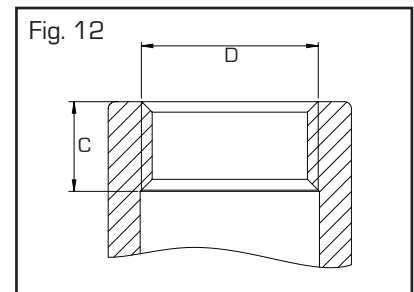
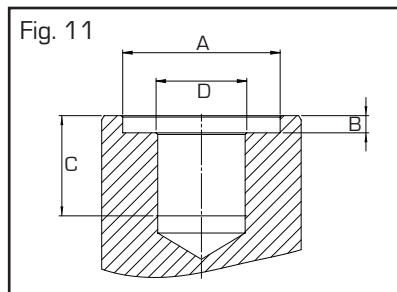
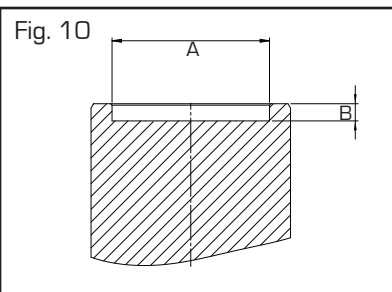
CYLINDER SADDLES & PISTON ROD THREAD SPECIFICATIONS

SADDLE DRAWINGS (for specifications, see facing page)



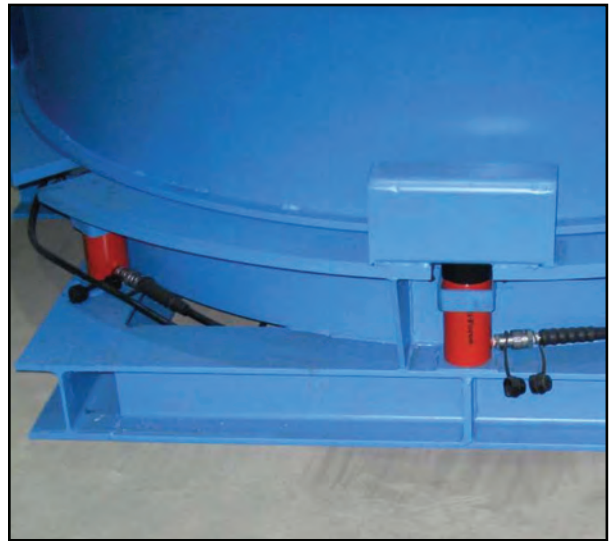
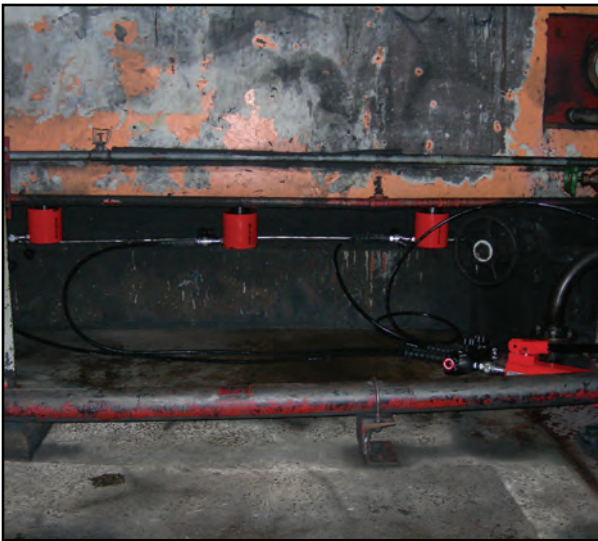
B

PISTON ROD DRAWINGS (for specifications, see facing page)



| Saddle Model | Internal saddle thread specification |
|--------------|---|
| HA18T | M24 |
| HA37T | M36 |
| HA50T | M48 |
| HA102T | $\frac{3}{4}$ " - 16 UNF |
| HA202T | 1" x 8 UNC |
| HA302T | 1 $\frac{1}{4}$ " x 7 UNC |
| HA603T | 1 $\frac{5}{8}$ " x 5 $\frac{1}{2}$ " UNS |
| HA1003T | 2 $\frac{1}{2}$ " x 8 UN |

B



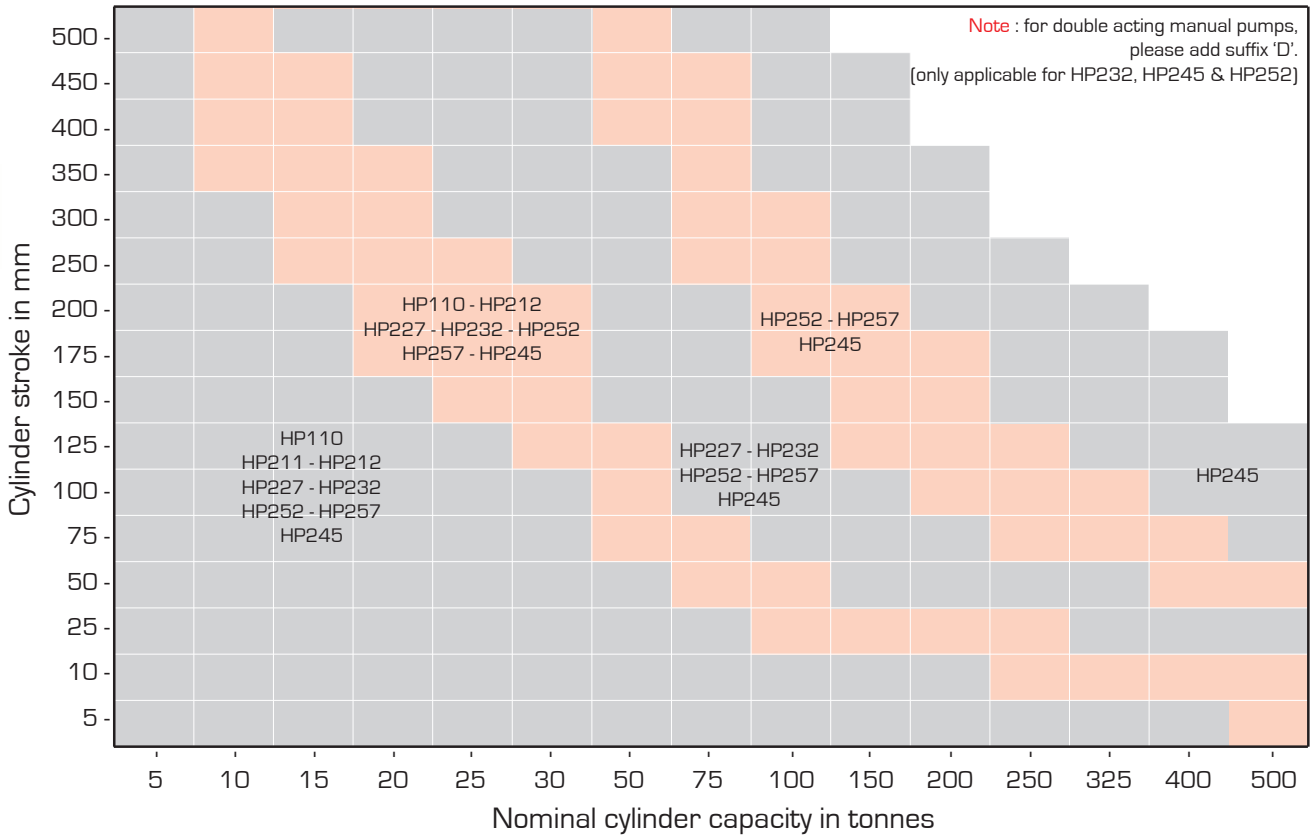
PUMPS

| | | |
|----------------------|---|------------------|
| Hydraulic Pumps | Selection table | Page 30 |
| HP & HPX Range | Manually operated pumps Steel, aluminium & Ultra high pressure | Pages 31 - 34 |
| HP-FP Range | Foot operated pump Two stage operation | Page 35 |
| Powered Pumps | General information Powered pumps | Page 36 |
| Battery Powered Pump | Battery powered pump Lightweight & portable | Page 37 |
| HEP1 Range | Electric driven pumps Lightweight & portable with carrying strap | Page 38 |
| HEP103 Range | Electric driven two stage Compact pumps | Pages 39 - 40 |
| HEP2 Range | Electric driven pumps General duty medium flow | Page 41 |
| HEP3 Range | Electric driven pumps General duty high flow | Page 42 |
| HEP5 Range | Electric driven pumps Heavy duty high flow | Page 43 |
| HSP Range | Electric driven pumps Split flow, multi outlet | Pages 44 - 45 |
| AHP11 Range | Air driven pumps Single stage, hand and foot operated | Pages 46 - 47 |
| HAP Range | Air driven pumps General duty high flow | Page 48 |
| HPP Range | Petrol engine driven pumps General duty high flow | Page 49 |
| Accessories | Accessories for powered pumps Solenoid valves, trolleys, protection frames, etc. | Page 50 |

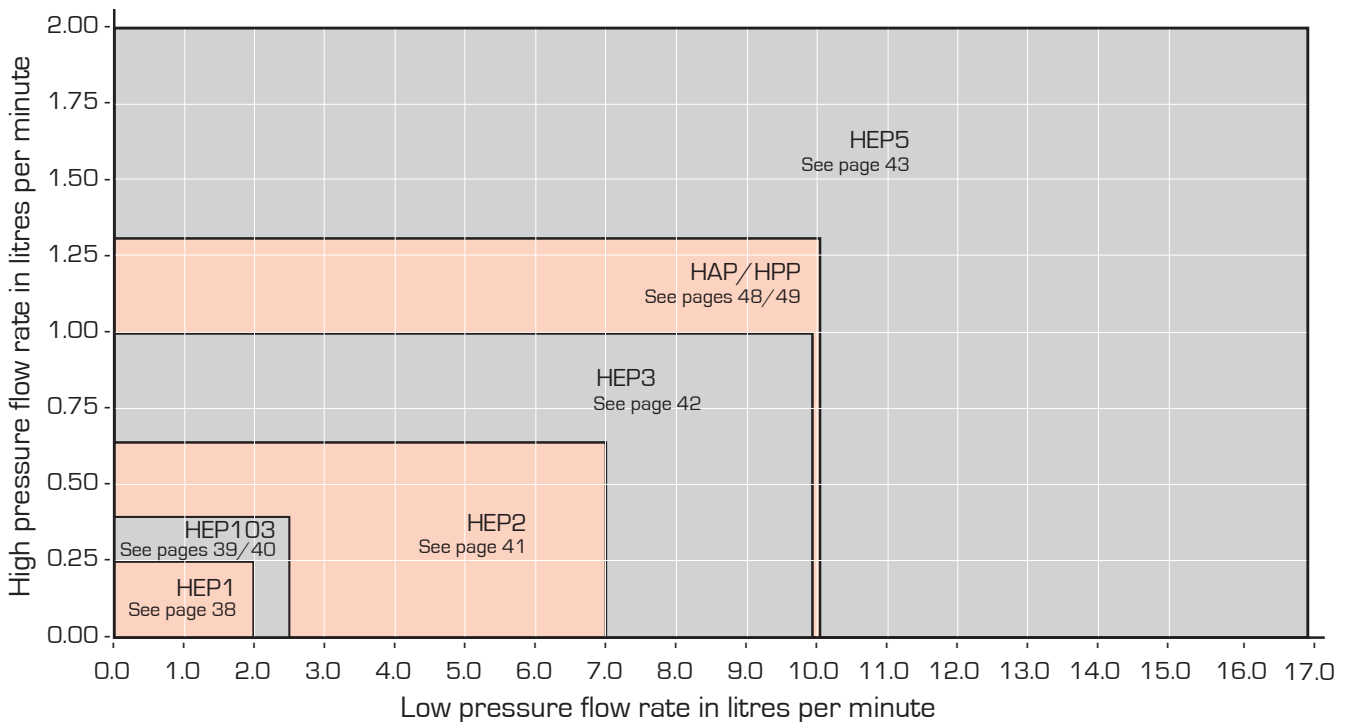
SELECTION TABLE FOR HI-FORCE HYDRAULIC PUMPS

MANUAL PUMPS

C



POWERED PUMPS



HP - MANUALLY OPERATED PUMPS - STEEL



Single or two speed operation

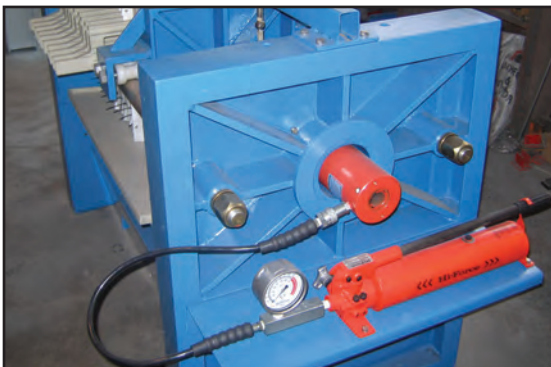
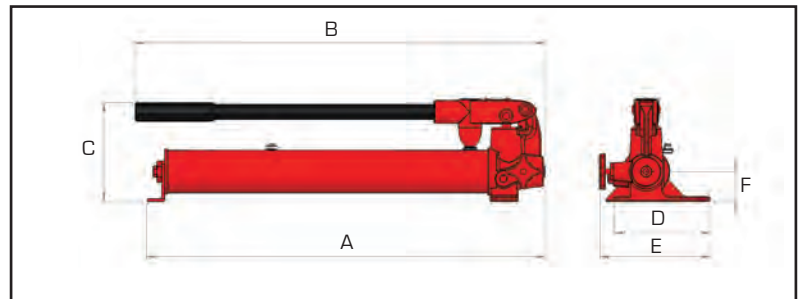
Choice of control valves

Working pressure 700 Bar

C

The HP manually operated pump range offers a choice of single or two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single acting cylinders or tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power. A full range of system components suitable for use with HP manually operated pumps is detailed on pages 51 - 60.

- >> Oil reservoir capacity up to 5 litres
- >> Durable steel construction
- >> External pressure release valve
- >> Factory set safety relief valve
- >> Changeover pressure for two speed models is 14 Bar



| Model number | Valve type | Displacement per stroke cm ³ | | Usable oil cap. litres | Handle effort kg | Weight kg |
|--|------------|---|-----------------------|------------------------|------------------|-----------|
| | | 1 st stage | 2 nd stage | | | |
| Single speed hand operated pumps for single acting cylinders and tools | | | | | | |
| HP110 | 2-way | 2.9 | - | 1.0 | 45 | 5.6 |
| Two speed hand operated pumps for single acting cylinders and tools | | | | | | |
| HP227 | 2-way | 12.9 | 2.3 | 2.3 | 38 | 10.5 |
| HP257 | 2-way | 12.9 | 2.3 | 5.0 | 38 | 15.2 |

| Dimensions in mm | | | | | |
|------------------|-----|-----|-----|-----|----|
| A | B | C | D | E | F |
| 558 | 566 | 128 | 134 | 145 | 40 |
| 544 | 597 | 168 | 135 | 145 | 53 |
| 545 | 597 | 168 | 135 | 150 | 53 |

HP - MANUALLY OPERATED PUMPS - ALUMINIUM

C



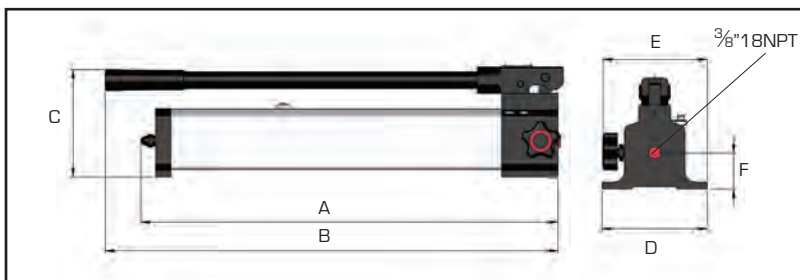
Two speed operation

Working pressure 700 Bar

Six models with choice of control valve

The HP manually operated aluminium pump range offers two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single or double acting cylinders and tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation and lightweight design, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power.

- >> Oil reservoir capacity up to 5 litres
- >> Lightweight aluminium construction
- >> External pressure release valve
- >> Factory set safety relief valve
- >> Changeover pressure 14 Bar



| Model number | Valve type | Displacement per stroke cm ³ | | Usable oil cap. litres | Handle effort kg | Weight kg |
|---|------------|---|-----------------------|------------------------|------------------|-----------|
| | | 1 st stage | 2 nd stage | | | |
| Two speed hand operated pumps for single acting cylinders and tools | | | | | | |
| HP211 | 2-way | 12.9 | 1.0 | 0.5 | 27 | 2.0 |
| HP212 | 2-way | 12.9 | 2.3 | 1.0 | 40 | 4.0 |
| HP232 | 2-way | 12.9 | 2.3 | 2.0 | 40 | 6.9 |
| HP252 | 2-way | 12.9 | 2.3 | 5.0 | 40 | 9.6 |
| Two speed hand operated pumps for double acting cylinders and tools | | | | | | |
| HP232D | 4-way | 12.9 | 2.3 | 2.0 | 40 | 8.7 |
| HP252D | 4-way | 12.9 | 2.3 | 5.0 | 40 | 13.6 |

| Dimensions in mm | | | | | |
|------------------|-----|-----|-----|-----|----|
| A | B | C | D | E | F |
| 335 | 388 | 135 | 100 | 125 | 40 |
| 560 | 610 | 140 | 100 | 125 | 40 |
| 560 | 610 | 160 | 140 | 155 | 50 |
| 585 | 610 | 160 | 168 | 145 | 50 |
| 580 | 625 | 160 | 140 | 175 | 30 |
| 605 | 625 | 160 | 168 | 175 | 30 |

HP - MANUALLY OPERATED PUMPS - HIGH FLOW



High flow manual pump

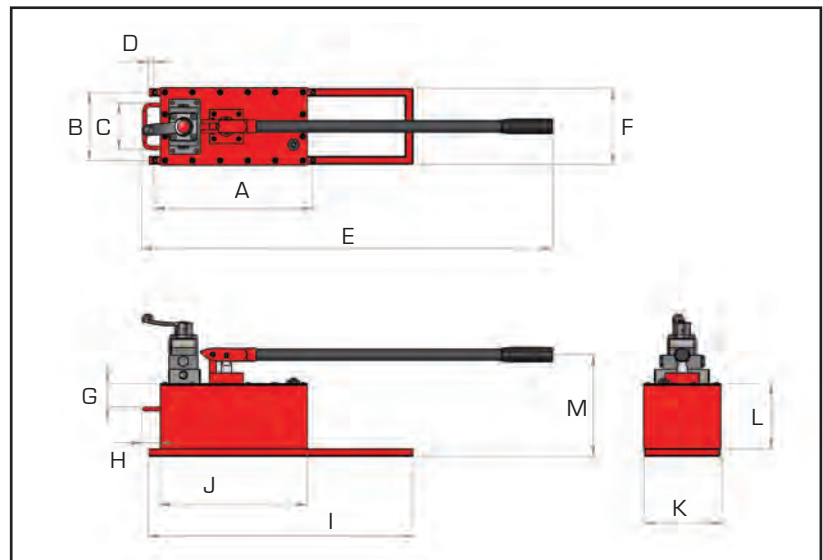
Working pressure 700 Bar

2 stage with semi automatic change-over

C

The HP245 range of high flow, two speed, manually operated pumps is ideally suited for applications where high tonnage cylinders are to be used on sites, without any available electric or compressed air power supply. Both models are suitable for working pressures up to 700 Bar and the very high, low pressure displacement (113 cm³ per stroke), enables fast piston extension (and retraction) under no load. These high performance pumps are also ideally suited to multiple cylinder lifting applications where a larger volume of oil is required to complete the job. Available with a 2-way valve for single acting cylinders or a 4-way valve for double acting cylinders, both models are supplied with a pre-filled 10 litre oil reservoir and are ready for immediate use.

- >> Durable steel construction
- >> Factory set safety relief valve
- >> Changeover pressure 28 Bar
- >> Low handle effort characteristics
- >> 10 litres of usable oil capacity



| Model number | Valve type | Displacement per stroke cm ³ | | Usable oil cap. litres | Handle effort kg | Material | Weight kg |
|--|------------|---|-----------------------|------------------------|------------------|----------|-----------|
| | | 1 st stage | 2 nd stage | | | | |
| Two speed hand operated pump for single acting cylinders and tools | | | | | | | |
| HP245 | 2-Way | 113 | 4 | 10 | 40 | Steel | 29.5 |
| Two speed hand operated pump for double acting cylinders and tools | | | | | | | |
| HP245D | 4-Way | 113 | 4 | 10 | 40 | Steel | 31.0 |

| Model number | Dimensions in mm | | | | | | | | | | | | | |
|---------------|------------------|-----|-----|----|------|-----|----|----|-----|-----|-----|-----|-----|--|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | |
| HP245 | 420 | 180 | 124 | 15 | 1050 | 200 | 63 | 47 | 700 | 390 | 205 | 173 | 270 | |
| HP245D | 420 | 180 | 124 | 15 | 1050 | 200 | 63 | 47 | 700 | 390 | 205 | 173 | 270 | |

HPX - MANUALLY OPERATED ULTRA HIGH PRESSURE PUMP



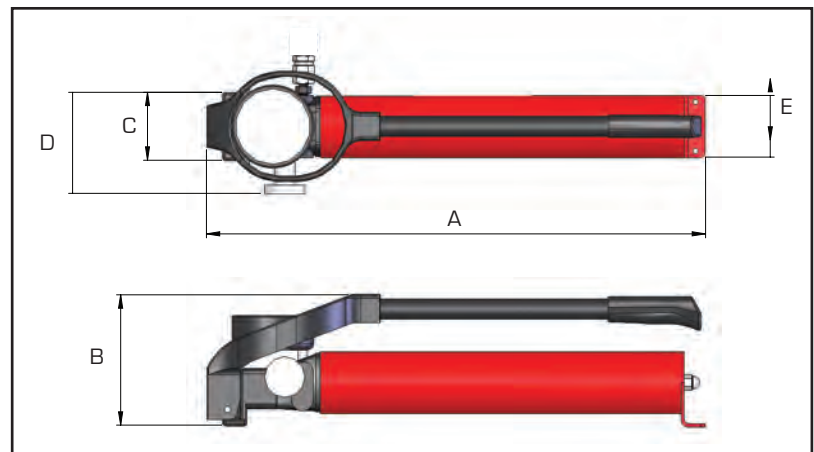
Compact design

Two speed operation

Working pressure up to 2800 Bar

The HPX range of manually operated ultra high pressure hydraulic pumps is specifically designed for high pressure applications such as oil injection for bushing removal, valve testing, calibration of high pressure equipment and instruments, laboratory burst and proof testing, etc. The two speed operation, on both the HPX1500 and HPX2800 incorporates automatic changeover from low to high pressure at 20 Bar, enabling smooth and low operator handle effort. Both models are fitted with a dual scale gauge reading Bar and PSI contained within a bespoke loop handle and feature a mesh casing to protect the gauge from accidental damage.

- >> Lightweight aluminium construction
- >> Factory set safety relief valve
- >> External pressure release valve
- >> Low handle effort
- >> Oil reservoir capacity of 1.2 litres



| Model number | Working pressure Bar | Usable oil capacity litres | Displacement per stroke (cm ³) | | Outlet port | Weight kg | Dimensions in mm | | | | |
|----------------|----------------------|----------------------------|--|-----------------------|--------------|-----------|------------------|-----|----|-----|----|
| | | | 1 st stage | 2 nd stage | | | A | B | C | D | E |
| HPX1500 | 1500 | 1.2 | 20.0 | 1.0 | 1/4" BSP | 6.5 | 617 | 161 | 84 | 125 | 76 |
| HPX2800 | 2800 | 1.2 | 20.0 | 0.8 | 9/16"-18 UNF | 6.5 | 617 | 161 | 84 | 125 | 76 |

Optional hoses :

| Model number | Working pressure Bar | Description |
|----------------|----------------------|---|
| XHH3-15 | 1500 | 3 metres hose with 1/4" BSP male thread each end |
| XHH5-15 | 1500 | 5 metres hose with 1/4" BSP male thread each end |
| XHH3-30 | 3000 | 3 metres hose with 9/16" UNF male coned thread each end |
| XHH5-30 | 3000 | 5 metres hose with 9/16" UNF male coned thread each end |

HP227FPC & HP227FP - MANUALLY OPERATED FOOT PUMPS



Working pressure 700 Bar

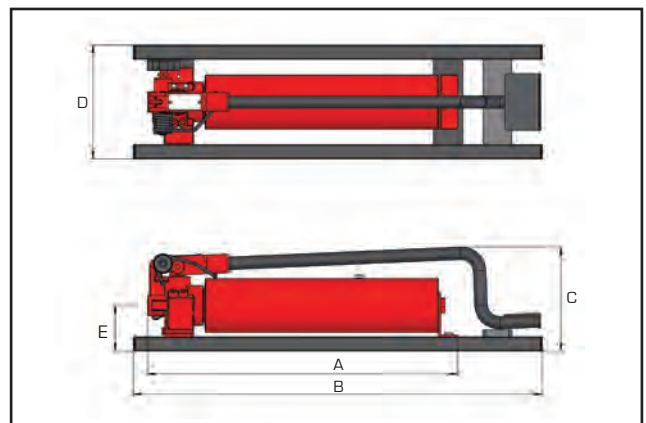
Two stage operation

Complete with accessories

C

The HP227FPC manually operated foot pump is supplied complete with 100mm diameter pressure gauge, gauge mounting block and 3 metre length hydraulic hose with CM1 quick connect male coupler. Ideally suited for use with Hi-Force CH series crimper heads (see pages 139 & 140) and all other Hi-Force 700 Bar maximum working pressure, hydraulic tools that require a remote pump operation, the HP227FPC has a superb two speed low pressure displacement (12.9 cm³ per stroke) with automatic changeover to high pressure displacement (2.3 cm³ per stroke) up to 700 Bar. Supplied with a pre-filled oil reservoir offering a usable oil capacity of 2.3 litres, the HP227FPC is supplied ready for immediate use.




The HP227FP pump incorporates the same specification and features of the HP227FPC pump however is supplied without the pressure gauge, gauge mounting block and 3 metre hose assembly.



| Model number | Valve type | Displacement per stroke cm ³ | | Usable oil cap. litres | Handle effort kg | Material | Weight kg |
|-----------------|------------|---|-----------------------|------------------------|------------------|----------|-----------|
| | | 1 st stage | 2 nd stage | | | | |
| HP227FPC | 2-way | 12.9 | 2.3 | 2.3 | 39 | Steel | 14.5 |
| HP227FP | 2-way | 12.9 | 2.3 | 2.3 | 39 | Steel | 12.5 |

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|----|
| A | B | C | D | E |
| 544 | 763 | 227 | 200 | 78 |
| 544 | 715 | 185 | 200 | 78 |

POWERED PUMPS - GENERAL INFORMATION

| | | |
|-----------------|---|---|
| Light - Battery |  | <p>On page 37 the BPP107 battery powered hydraulic pump is designed for operator convenience in terms of handling (only 8.0 kg) and is driven by a powerful 14.4V long life battery. The pump incorporates an automatic pressure relief and release valve meaning that the pressure automatically relieves once the pump reaches its maximum pressure of 700 Bar, making the pump ideal for use with Hi-Force CH series crimping tools, NS series Nut Splitters, HCH Cutters and HKP series knockout punchers.</p> |
| Light |  | <p>On page 38 the HEP1 series two stage electric driven hydraulic mini pump range offers a choice of 110 or 240 Volt motor, with both models being suitable for 700 Bar maximum working pressure. The two stage design offers a low pressure flow rate up to 2 litres/min with automatic changeover to high pressure, with a flow rate up to 0.2 litres/min. Incorporating a 2-way solenoid valve and internal safety overload valve, both models are extremely compact & lightweight, suitable for use with single acting Hi-Force cylinders or tools.</p> |
| Standard |  | <p>On pages 39 & 40 the HEP103 series two stage electric driven hydraulic pump range offers a choice of 110 or 240 Volt electric driven motors. All models are suitable for 700 Bar maximum working pressure. The two stage design offers a low pressure flow rate up to 2.5 litres/min with automatic changeover to high pressure, with a flow rate up to 0.35 litres/min. Available with manual or solenoid valve options, suitable for both single acting and double acting cylinders and tools in a wide variety of applications.</p> |
| Intermediate |  | <p>On page 41 the HEP2 series two stage electric driven hydraulic pump range offers a low pressure flow rate of 7 litres/min with automatic changeover to high pressure flow rate of 0.65 litres/min up to 700 Bar with a choice of 110, 240 or 380/440 Volt motor options. With 2, 3 or 4-way manual and electric solenoid valve options the HEP2 series is suitable for a wide range of applications and is the most commonly selected Hi-Force electric pump. All HEP2 series pumps are also fitted with an externally adjustable pressure relief valve for easy adjustment up to the maximum working pressure of 700 Bar.</p> |
| Continuous |  | <p>On page 42 the HEP3 series two stage electric driven hydraulic pump range has all the features of the HEP2 series, but with an increased flow of 10 litres/min at low pressure and 1 litre/min at high pressure (up to 700 Bar) these pumps are particularly useful when operating high tonnage or long stroke cylinders. Both HEP2 and HEP3 range of electric pumps are fitted with totally enclosed, fan cooled, low noise, electric motors, making them ideal for quiet in-works operation or outdoor site use in most environments.</p> |
| Heavy duty |  | <p>On page 43 the HEP5 series two stage electric driven hydraulic pump range offers the highest flow rate combination in the Hi-Force range. Offering a low pressure flow rate of 17 litres/min with automatic changeover to a superb high pressure flow rate of 2 litres/min. The HEP5 offers all the features of the HEP2 and HEP3 series with the addition of a 2.2 kW high speed, heavy duty motor, making it the ideal pump unit for all heavy duty applications, requiring a high flow and intensive usage over longer time periods.</p> |
| Intermediate |  | <p>On pages 44 - 45 the HSP series electric driven split flow hydraulic pump range offers users the opportunity to operate up to 8 independent hydraulic outlets from within a single pump assembly. With easy to operate controls HSP series pumps are ideally suited for synchronous lift applications particularly where there is uneven load distribution between the multiple jacking points. All models are 380/440 volt three phase electrical supply operation.</p> |
| Light |  | <p>On pages 46 & 47 the AHP11 series of air driven single stage pumps offer an economical and faster working alternative to basic hand operated pumps. Available with both 2-way and 4-way manually operated control valves AHP11 series pumps incorporate an ergonomically designed pedal offering the operator the choice of hand or foot operated control [excludes 4-way valve models]. Remote air powered pendant control options also available.</p> |
| Intermediate |  | <p>On page 48 the HAP series two stage air driven hydraulic pump range offers a low pressure flow rate of 10 litres/min, with automatic changeover to high pressure flow rate, of 1.3 litres/min up to the 700 Bar maximum working pressure. The modular construction of these pumps ensures that many similar features to the HEP2 & HEP3 series are included with the air motor driven motive force being the principle design difference.</p> |
| Intermediate |  | <p>On page 49 the HPP series two stage petrol engine driven hydraulic pump range offers all the modular design and performance characteristics of the HAP series with the only principle difference being the change of motive force from air driven to petrol engine driven. HPP series pumps are ideally suited for job site locations where electrical or compressed air power supply are not readily available.</p> |

BPP - BATTERY POWERED HYDRAULIC PUMP



Working pressure 700 Bar

Lightweight design

14.4V long life battery

C

The Hi-Force BPP107 battery powered hydraulic pump is designed for operator convenience in terms of handling and power supply. Driven by a powerful 14.4V long life battery the unit takes away the physical effort required by a manually operated hand or foot pump, whilst at the same time eliminating the need for an external power source. The pump is supplied with a shoulder strap and its ergonomic lightweight design (8.0 kg) makes the unit very portable and user friendly. The pump incorporates an automatic pressure relief and release valve meaning that the pressure automatically relieves once the pump reaches its maximum pressure of 700 Bar, making the pump ideal for use with Hi-Force CH series crimping tools, NS series nut splitters, HCH cutters and HKP series knockout punches.

| Model number | Max working pressure | Oil Cap litres | Oil Flow litres/min | | Weight kg | Dimensions in mm | | |
|---------------|----------------------|----------------|---------------------|-----------|-----------|------------------|-------|--------|
| | | | 1st stage | 2nd stage | | Length | Width | Height |
| BPP107 | 700 Bar | 0.7 | 0.5 | 0.15 | 8.0 | 355 | 160 | 260 |

ACCESSORIES



| Model No | Description |
|-----------------------------------|--------------------|
| BP12 | Battery Pack 14.4V |
| Note: Charger supplied separately | |



| Model No | Description |
|---------------|------------------------------------|
| CCU144 | Car cigarette lighter charger unit |



| Model No | Description |
|-------------|---------------------|
| CU12 | Charger 110V - 230V |



| Model No | Description |
|--|-------------|
| Power supply to operate unit directly from mains | |
| MP110 | 110V |
| MP220 | 220/230V |

HEP1 - ELECTRIC DRIVEN LIGHTWEIGHT MINI PUMPS WITH CARRYING STRAP



Working pressure 700 Bar

Two-stage design, changeover pressure 10 Bar

Extremely compact, lightweight & powerful

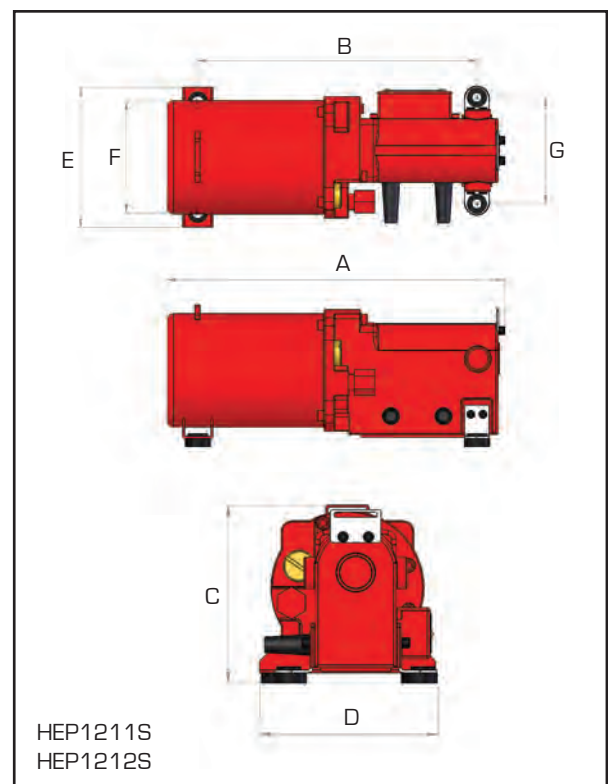
The HEP1 range of two stage electric driven hydraulic mini pumps, offers the smallest and lightest weight, electric powered pump in the Hi-Force product range. Available with a choice of 110 volt or 240 volt single phase electric motor, both models feature an electric solenoid operated valve, complete with remote hand pendant controller and 3 metre control cable as standard. The two stage design of these pumps incorporates an automatic changeover from low to high pressure ensuring that an optimum pressure and flow rate combination is achievable from an extremely compact pump.

- >> 110 or 240V single phase motor options
- >> Internal safety overload valve
- >> Supplied with carrying strap

| Model number | Motor voltage | Maximum pressure bar | Maximum flow rate l/min | | Valve type | Usable oil cap. litres | Weight kg |
|-----------------|---------------|----------------------|-------------------------|-----------------------|------------|------------------------|-----------|
| | | | 1 st stage | 2 nd stage | | | |
| HEP1211S | 110 V - 1 Ph | 700 | 2.00 | 0.2 | 2-way | 0.8 | 7.5 |
| HEP1212S | 240 V - 1Ph | 700 | 2.00 | 0.2 | 2-way | 0.8 | 7.5 |



| Model number | Dimensions in mm | | | | | | |
|-----------------|------------------|-----|-----|-----|-----|-----|-----|
| | A | B | C | D | E | F | G |
| HEP1211S | 333 | 269 | 140 | 139 | 138 | 110 | 105 |
| HEP1212S | 333 | 269 | 140 | 139 | 138 | 110 | 105 |



HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS



HEP103442

Working pressure 700 Bar

Choice of valve options

Compact, lightweight & powerful

C

The HEP103 range of two stage electric driven hydraulic pumps is suitable for a wide variety of applications and pumps are available in either 110 volt or 240 volt single phase electric motor options. Both voltage options also offer a choice of manual or electrically operated control valves, available as 2-way, 3-way or 4-way options with additional features like open centre, closed centre and locking valve designs available. Maximum working pressure is 700 Bar with automatic low to high pressure changeover fitted as standard. All models are supplied complete with a glycerine filled hydraulic pressure gauge, pre-filled 4 litre usable oil capacity reservoir with oil sight level gauge and an integral carrying handle for easy transportation of these lightweight, compact and versatile pumps to the job site.

| Model number | Motor voltage | Maximum pressure Bar | Maximum flow rate l/min 1 st stage 2 nd stage | Changeover pressure Bar | Remote pendant functions | Usable oil capacity litres | Weight kg |
|--|---------------|----------------------|--|-------------------------|--------------------------|----------------------------|-----------|
| Models featuring 2-way solenoid valve, normally closed (hold function), suitable for use with single acting cylinders and tools, requiring hold. | | | | | | | |
| HEP103241LS | 110 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 19.2 |
| HEP103242LS | 240 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 19.2 |
| Models featuring 2-way solenoid valve, normally open (auto retract function), suitable for use with single acting cylinders and tools, requiring auto retract. | | | | | | | |
| HEP103241S | 110 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 20.5 |
| HEP103242S | 240 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 20.5 |
| Models featuring 3-way manually operated valve, suitable for use with single acting cylinders and tools. | | | | | | | |
| HEP103341 | 110 V - 1 Ph | 700 | 2.50 0.35 | 150 | motor on/off | 4 | 18.1 |
| HEP103342 | 240 V - 1 Ph | 700 | 2.50 0.35 | 150 | motor on/off | 4 | 18.1 |
| Models featuring 4-way manually operated valve, suitable for use with double acting cylinders and tools. | | | | | | | |
| HEP103441 | 110 V - 1 Ph | 700 | 2.50 0.35 | 150 | motor on/off | 4 | 18.1 |
| HEP103442 | 240 V - 1 Ph | 700 | 2.50 0.35 | 150 | motor on/off | 4 | 18.1 |
| Models featuring 4-way solenoid valve, locking feature on A and B port, suitable for use with double acting cylinders and tools, requiring hold. | | | | | | | |
| HEP103441LS | 110 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 20.5 |
| HEP103442LS | 240 V - 1 Ph | 700 | 2.50 0.35 | 150 | advance/retract | 4 | 20.5 |

Note: All motors are dual frequency (50/60 Hz)

HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS

C



Working pressure 700 Bar

Choice of valve options

Compact, lightweight & powerful

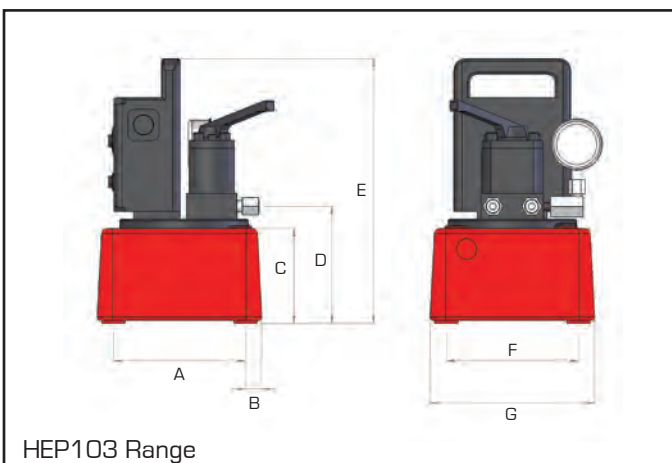
- >> Integral carrying handle
- >> Pressure gauge and remote control fitted as standard
- >> Suitable for single and double acting cylinders and hydraulic tools
- >> All models are fitted with dual frequency (50/60 Hz) motor



Did you know

Hi-Force manufactures powered pumps with flow rates up to 17 litres per minute in low pressure and 2 litres per minute up to 700 Bar.

See pages 41 to 43 for more details



| All models | Dimensions in mm |
|------------|------------------|
| A | 195.0 |
| B | 25.0 |
| C | 117.5 |
| D | 141.5 |
| E | 342.0 |
| F | 210.0 |
| G | 260.0 |

HEP2 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY MEDIUM FLOW

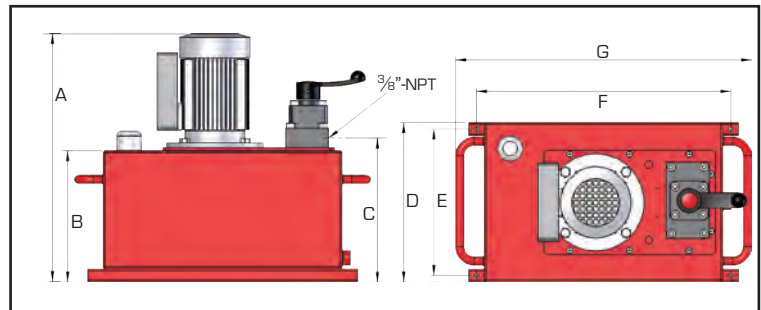


Low pressure flow rate 7 ltr/min. up to 70 Bar

High pressure flow rate 0.65 ltr/min. up to 700 Bar

Two stage hydraulic pump unit

- >> Externally adjustable pressure relief valve
- >> Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- >> Solenoid valve options available



| Model number | Valve type | Oil cap. litres | Motor kW | Motor voltage | Weight kg |
|--------------|------------|-----------------|----------|-------------------|-----------|
| HEP207111 | P-T Plate | 10 | 1.5 | 110 / 115 V - 1Ph | 47.0 |
| HEP207112 | P-T Plate | 10 | 1.5 | 220 / 240 V - 1Ph | 47.0 |
| HEP207114 | P-T Plate | 10 | 1.5 | 380 / 440 V - 3Ph | 47.0 |
| HEP207121 | P-T Plate | 25 | 1.5 | 110 / 115 V - 1Ph | 63.0 |
| HEP207122 | P-T Plate | 25 | 1.5 | 220 / 240 V - 1Ph | 63.0 |
| HEP207124 | P-T Plate | 25 | 1.5 | 380 / 440 V - 3Ph | 63.0 |
| HEP207211 | 2-way | 10 | 1.5 | 110 / 115 V - 1Ph | 47.5 |
| HEP207212 | 2-way | 10 | 1.5 | 220 / 240 V - 1Ph | 47.5 |
| HEP207214 | 2-way | 10 | 1.5 | 380 / 440 V - 3Ph | 47.5 |
| HEP207221 | 2-way | 25 | 1.5 | 110 / 115 V - 1Ph | 63.5 |
| HEP207222 | 2-way | 25 | 1.5 | 220 / 240 V - 1Ph | 63.5 |
| HEP207224 | 2-way | 25 | 1.5 | 380 / 440 V - 3Ph | 63.5 |
| HEP207311 | 3-way | 10 | 1.5 | 110 / 115 V - 1Ph | 47.5 |
| HEP207312 | 3-way | 10 | 1.5 | 220 / 240 V - 1Ph | 47.5 |
| HEP207314 | 3-way | 10 | 1.5 | 380 / 440 V - 3Ph | 47.5 |
| HEP207321 | 3-way | 25 | 1.5 | 110 / 115 V - 1Ph | 63.5 |
| HEP207322 | 3-way | 25 | 1.5 | 220 / 240 V - 1Ph | 63.5 |
| HEP207324 | 3-way | 25 | 1.5 | 380 / 440 V - 3Ph | 63.5 |
| HEP207411 | 4-way | 10 | 1.5 | 110 / 115 V - 1Ph | 47.5 |
| HEP207412 | 4-way | 10 | 1.5 | 220 / 240 V - 1Ph | 47.5 |
| HEP207414 | 4-way | 10 | 1.5 | 380 / 440 V - 3Ph | 47.5 |
| HEP207421 | 4-way | 25 | 1.5 | 110 / 115 V - 1Ph | 63.5 |
| HEP207422 | 4-way | 25 | 1.5 | 220 / 240 V - 1Ph | 63.5 |
| HEP207424 | 4-way | 25 | 1.5 | 380 / 440 V - 3Ph | 63.5 |

| Dimensions in mm | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|
| A | B | C | D | E | F | G |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 498 | 198 | 230 | 246 | 221 | 368 | 438 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |

Note: For optional extras please see page 50

HEP3 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY HIGH FLOW



HEP310322S

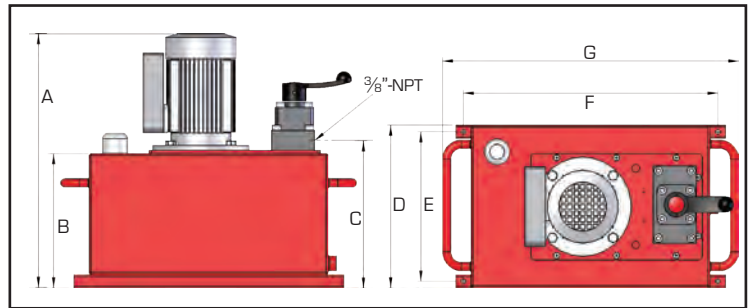
Low pressure flow rate 10 ltr/min. up to 70 Bar

High pressure flow rate 1 ltr/min. up to 700 Bar

Two stage hydraulic pump unit

C

- >> Externally adjustable pressure relief valve
- >> Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- >> Solenoid valve options available



| Model number | Valve type | Oil cap. litres | Motor kW | Motor voltage | Weight kg |
|--------------|------------|-----------------|----------|-------------------|-----------|
| HEP310121 | P-T Plate | 25 | 2.2 | 110 / 115 V - 1Ph | 63.5 |
| HEP310122 | P-T Plate | 25 | 2.2 | 220 / 240 V - 1Ph | 63.5 |
| HEP310124 | P-T Plate | 25 | 2.2 | 380 / 440 V - 3Ph | 63.5 |
| HEP310141 | P-T Plate | 40 | 2.2 | 110 / 115 V - 1Ph | 88.5 |
| HEP310142 | P-T Plate | 40 | 2.2 | 220 / 240 V - 1Ph | 88.5 |
| HEP310144 | P-T Plate | 40 | 2.2 | 380 / 440 V - 3Ph | 88.5 |
| HEP310221 | 2-way | 25 | 2.2 | 110 / 115 V - 1Ph | 64.0 |
| HEP310222 | 2-way | 25 | 2.2 | 220 / 240 V - 1Ph | 64.0 |
| HEP310224 | 2-way | 25 | 2.2 | 380 / 440 V - 3Ph | 64.0 |
| HEP310241 | 2-way | 40 | 2.2 | 110 / 115 V - 1Ph | 89.0 |
| HEP310242 | 2-way | 40 | 2.2 | 220 / 240 V - 1Ph | 89.0 |
| HEP310244 | 2-way | 40 | 2.2 | 380 / 440 V - 3Ph | 89.0 |
| HEP310321 | 3-way | 25 | 2.2 | 110 / 115 V - 1Ph | 64.0 |
| HEP310322 | 3-way | 25 | 2.2 | 220 / 240 V - 1Ph | 64.0 |
| HEP310324 | 3-way | 25 | 2.2 | 380 / 440 V - 3Ph | 64.0 |
| HEP310341 | 3-way | 40 | 2.2 | 110 / 115 V - 1Ph | 89.0 |
| HEP310342 | 3-way | 40 | 2.2 | 220 / 240 V - 1Ph | 89.0 |
| HEP310344 | 3-way | 40 | 2.2 | 380 / 440 V - 3Ph | 89.0 |
| HEP310421 | 4-way | 25 | 2.2 | 110 / 115 V - 1Ph | 64.0 |
| HEP310422 | 4-way | 25 | 2.2 | 220 / 240 V - 1Ph | 64.0 |
| HEP310424 | 4-way | 25 | 2.2 | 380 / 440 V - 3Ph | 64.0 |
| HEP310441 | 4-way | 40 | 2.2 | 110 / 115 V - 1Ph | 89.0 |
| HEP310442 | 4-way | 40 | 2.2 | 220 / 240 V - 1Ph | 89.0 |
| HEP310444 | 4-way | 40 | 2.2 | 380 / 440 V - 3Ph | 89.0 |

| Dimensions in mm | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|
| A | B | C | D | E | F | G |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 527 | 227 | 259 | 306 | 281 | 490 | 570 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 |

Note: For optional extras please see page 50

HEP5 - ELECTRIC DRIVEN PUMPS - HEAVY DUTY HIGH FLOW

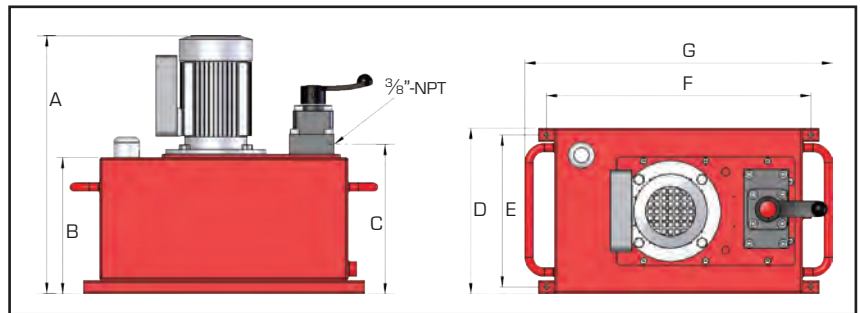


Low pressure flow rate 17 ltr/min up to 70 Bar

High pressure flow rate 2 ltr/min up to 700 Bar

Two stage hydraulic pump unit

- >> Externally adjustable pressure relief valve
- >> Manual valve with load holding feature fitted as standard (excl. 2-way valves)
- >> Solenoid valve options available



| Model number | Valve type | Oil cap. litres | Motor kW | Motor voltage | Weight kg |
|--------------|------------|-----------------|----------|---------------|-----------|
| HEP517142 | P-T Plate | 40 | 2.2 | 220 / 240 | 88.5 |
| HEP517144 | P-T Plate | 40 | 2.2 | 380 / 440 | 88.5 |
| HEP517162 | P-T Plate | 60 | 2.2 | 220 / 240 | 120.0 |
| HEP517164 | P-T Plate | 60 | 2.2 | 380 / 440 | 120.0 |
| HEP517242 | 2-way | 40 | 2.2 | 220 / 240 | 89.0 |
| HEP517244 | 2-way | 40 | 2.2 | 380 / 440 | 89.0 |
| HEP517262 | 2-way | 60 | 2.2 | 220 / 240 | 120.0 |
| HEP517264 | 2-way | 60 | 2.2 | 380 / 440 | 120.0 |
| HEP517342 | 3-way | 40 | 2.2 | 220 / 240 | 89.0 |
| HEP517344 | 3-way | 40 | 2.2 | 380 / 440 | 89.0 |
| HEP517362 | 3-way | 60 | 2.2 | 220 / 240 | 120.0 |
| HEP517364 | 3-way | 60 | 2.2 | 380 / 440 | 120.0 |
| HEP517442 | 4-way | 40 | 2.2 | 220 / 240 | 89.0 |
| HEP517444 | 4-way | 40 | 2.2 | 380 / 440 | 89.0 |
| HEP517462 | 4-way | 60 | 2.2 | 220 / 240 | 120.0 |
| HEP517464 | 4-way | 60 | 2.2 | 380 / 440 | 120.0 |

| Dimensions in mm | | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|--|
| A | B | C | D | E | F | G | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 636 | 336 | 368 | 306 | 281 | 490 | 560 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |
| 657 | 357 | 389 | 406 | 381 | 513 | 583 | |

Note: For optional extras please see page 50

C

HSP - ELECTRIC DRIVEN SPLIT FLOW MULTI-OUTLET PUMPS



HSP44E104

Working pressure 700 Bar

Multiple outlet valve options

Precise control to achieve synchronised lift

The HSP range of electric driven, split flow, hydraulic pumps is designed to deliver equal volumes of oil from each individual control valve regardless of any variations in the hydraulic pressure. The range offers a selection of outlet valve configurations ranging from a 2-outlet model with manually operated directional control valves, through to a 8-outlet model with electric solenoid operated valves. Each valve outlet is connected directly to an independent internal piston pump which is driven by a common electric motive force. This technology allows each internal piston pump to deliver an equal amount of oil flow per minute regardless of any variations in the required operating pressure at each control valve outlet. With HSP split flow pumps lifting and positioning large, unevenly weighted loads using multiple jacking points in a synchronised, level lift and controlled manner is easily achievable. Individual control of each valve on all electric valve versions, is via a specially made electric control box with easily identifiable on/off switches for each applicable valve plus a synchronised lift control button for all of the selected control valves. Maximum working pressure of all HSP pumps is 700 Bar with an externally adjustable pressure relief valve on each outlet for easy pressure adjustment between 70 and 700 Bar. A full range of system components is available and detailed on pages 51 to 60.

Optional extra's include a fully automatic PLC controlled synchronised lifting system, with a variety of user settings, such as target lifting height, maximum tolerance between the jacking points and other key settings, all controlled from a centralised touch screen computer.

| Model number | Valve configuration | Valve type | Oil Capacity litres | Oil flow per outlet l/min | Motor voltage | Weight kg |
|------------------|---------------------|------------|---------------------|---------------------------|---------------|-----------|
| HSP23M54 | 2 x 3-way | manual | 50 | 0.9 | 380 / 440 | 178 |
| HSP24M54 | 2 x 4-way | manual | 50 | 0.9 | 380 / 440 | 178 |
| HSP33M104 | 3 x 3-way | manual | 100 | 1.8 | 380 / 440 | 333 |
| HSP34M104 | 3 x 4-way | manual | 100 | 1.8 | 380 / 440 | 333 |
| HSP43M104 | 4 x 3-way | manual | 100 | 1.1 | 380 / 440 | 272 |
| HSP44M104 | 4 x 4-way | manual | 100 | 1.1 | 380 / 440 | 272 |
| HSP23E54 | 2 x 3-way | electric | 50 | 0.9 | 380 / 440 | 180 |
| HSP24E54 | 2 x 4-way | electric | 50 | 0.9 | 380 / 440 | 180 |
| HSP33E104 | 3 x 3-way | electric | 100 | 1.8 | 380 / 440 | 335 |
| HSP34E104 | 3 x 4-way | electric | 100 | 1.8 | 380 / 440 | 335 |
| HSP43E104 | 4 x 3-way | electric | 100 | 1.1 | 380 / 440 | 274 |
| HSP44E104 | 4 x 4-way | electric | 100 | 1.1 | 380 / 440 | 274 |
| HSP63E104 | 6 x 3-way | electric | 100 | 0.9 | 380 / 440 | 335 |
| HSP64E104 | 6 x 4-way | electric | 100 | 0.9 | 380 / 440 | 335 |
| HSP83E104 | 8 x 3-way | electric | 150 | 0.7 | 380 / 440 | 370 |
| HSP84E104 | 8 x 4-way | electric | 150 | 0.7 | 380 / 440 | 370 |

HSP - ELECTRIC DRIVEN SPLIT FLOW PUMPS



Choice of manual or electric valve options

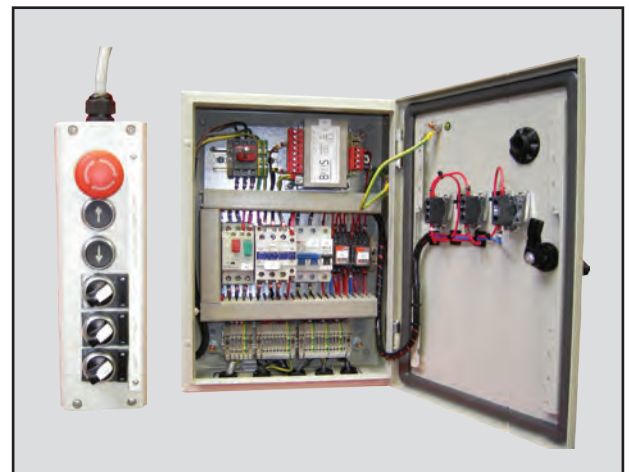
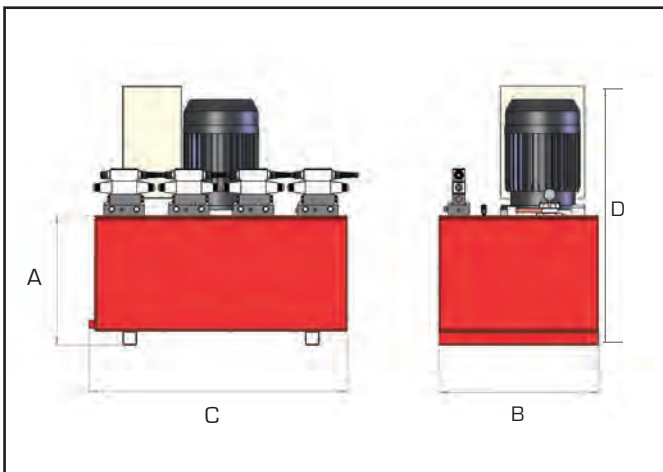
Reservoir capacity 50 to 150 litres

Consistent single speed flow rate

C

- >> Working pressure 700 Bar
- >> Equal output flow regardless of pressure
- >> Control panel with selector switches for each individual outlet, allowing for single or multiple (synchronised) operation
- >> Externally adjustable pressure relief valve for control of maximum system pressure

- >> Hi-Force HSP series split flow pumps fitted with low voltage solenoid valves are complete with a low voltage control system, which allows the user to individually or simultaneously control each valve and the movement of the lifting cylinder pistons. Once the load is correctly supported, by the selected cylinder pistons, the synchronised lift operation can commence. The operation of the HSP Pump Unit can be entirely controlled from the remote control panel, which features individual valve on/off switches and a set of cylinder piston lift and lower buttons that can be individually selected for inclusion in the lift operation.



| Model number | Oil capacity litres | Dimensions in mm | | | |
|-------------------|---------------------|------------------|-----|------|------|
| | | A | B | C | D |
| HSP2 (all models) | 50 | 460 | 570 | 500 | 817 |
| HSP3 (all models) | 100 | 460 | 570 | 920 | 920 |
| HSP4 (all models) | 100 | 460 | 570 | 920 | 920 |
| HSP6 (all models) | 100 | 470 | 800 | 750 | 920 |
| HSP8 (all models) | 150 | 470 | 800 | 1010 | 1085 |

AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS



Working pressure 700 Bar

Operates from standard 7 Bar air supply

Compact, lightweight & powerful

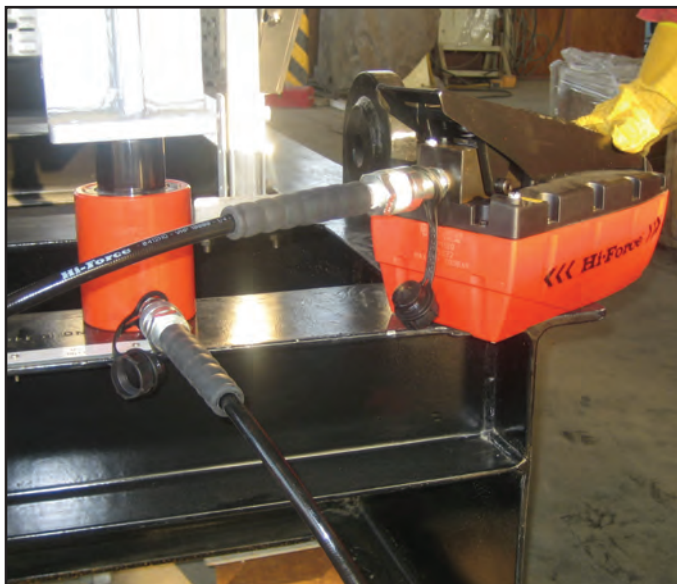
The AHP11 single stage air powered hydraulic pump range provides an economical, portable alternative to manually operated hydraulic pumps. Designed to operate from a standard 7 Bar compressed air supply, these versatile compact pumps are ideally suited for use with Hi-Force hydraulic cylinders and tools in maintenance and construction applications. The ergonomically designed pump treadle can be operated by hand or foot for better versatility. With a choice of reservoir capacities, all models are supplied pre-filled with hydraulic oil ready for immediate use. A full range of system components suitable for use with AHP11 series pumps is detailed on pages 51 - 60.

- >> Choice of 2-way or 4-way control valves
- >> Internal safety overload valve
- >> Reservoir oil sight level gauge
- >> Standard oil reservoir capacities up to 10 litres



OPTIONAL REMOTE PENDANT:

Please suffix model number with 'R' for remote pendant options to suit AHP1120, AHP1121 and AHP1122.



Filter, regulator & lubricator units for use in combination with air driven pump units are also available. Please see page 92 for more details.

| Model number | Maximum pressure bar | Maximum flow rate l/min | Valve type | Usable oil capacity litres | Air inlet connection G | Oil outlet connection NPTF | Weight kg |
|----------------|----------------------|-------------------------|------------|----------------------------|------------------------|----------------------------|-----------|
| AHP1120 | 700 | 0.8 | 2-way | 2.4 | 1/4" | 3/8" | 4.7 |
| AHP1121 | 700 | 0.8 | 2-way | 5.0 | 1/4" | 3/8" | 9.0 |
| AHP1122 | 700 | 0.8 | 2-way | 10.0 | 1/4" | 3/8" | 17.8 |
| AHP1141 | 700 | 0.8 | 4-way | 5.0 | 1/4" | 3/8" | 9.5 |
| AHP1142 | 700 | 0.8 | 4-way | 10.0 | 1/4" | 3/8" | 18.3 |

AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS

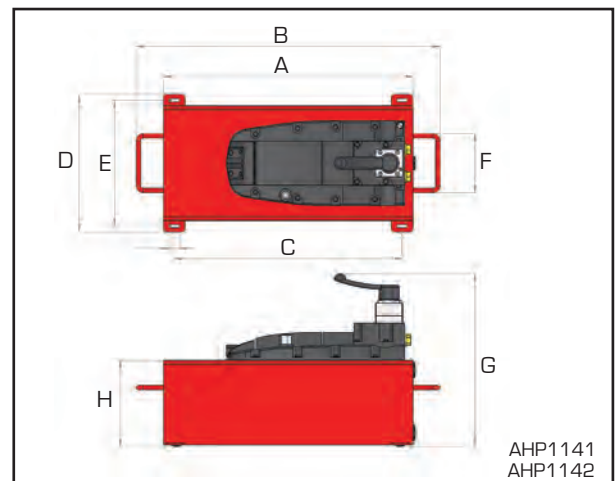
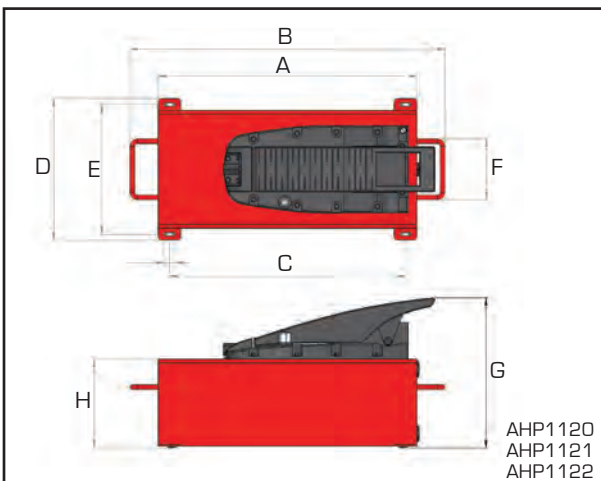
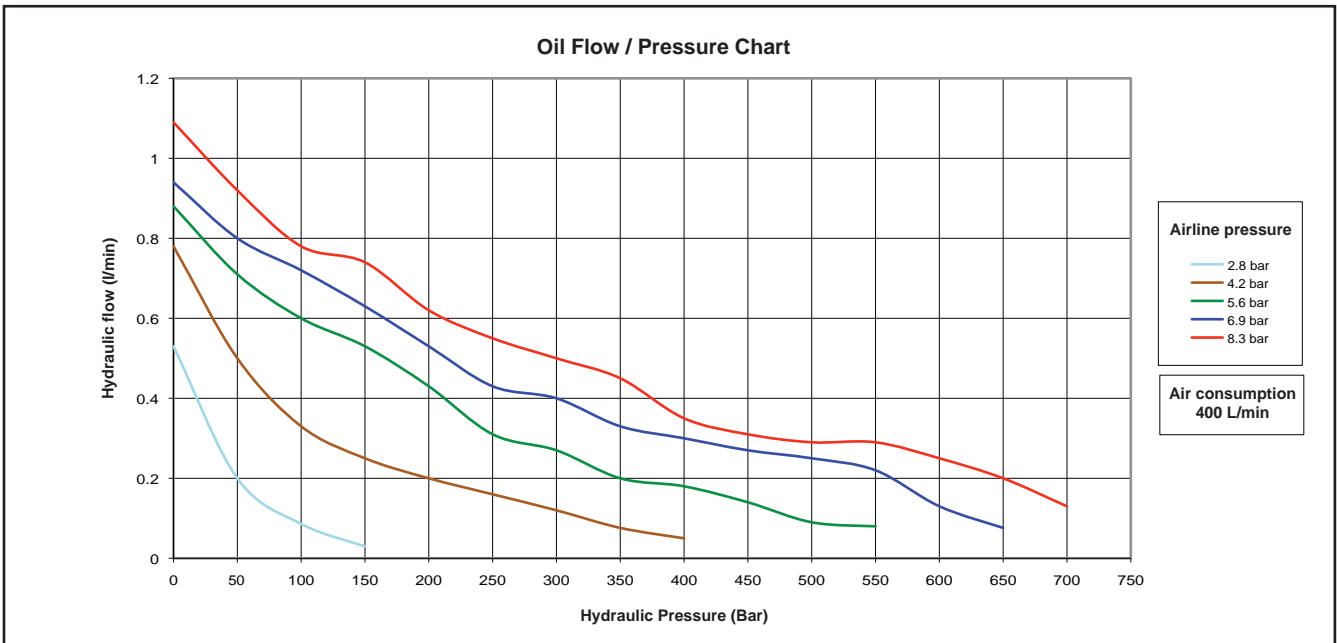


Working pressure 700 Bar

Operates from standard 7 Bar air supply

Compact, lightweight & powerful

C



| Model number | Dimensions in mm | | | | | | | |
|----------------|------------------|-----|-----|-----|-------|-----|-----|-----|
| | A | B | C | D | E | F | G | H |
| AHP1120 | 365 | * | 237 | 157 | 66-90 | * | 210 | 125 |
| AHP1121 | 420 | * | 380 | 240 | 220 | * | 223 | 114 |
| AHP1122 | 464 | 560 | * | 210 | * | 108 | 274 | 158 |
| AHP1141 | 420 | * | 380 | 240 | 220 | * | 265 | 114 |
| AHP1142 | 464 | 560 | * | 210 | * | * | 315 | 158 |

*Not applicable

HAP - AIR DRIVEN PUMPS - GENERAL DUTY HIGH FLOW

C



HAP21026

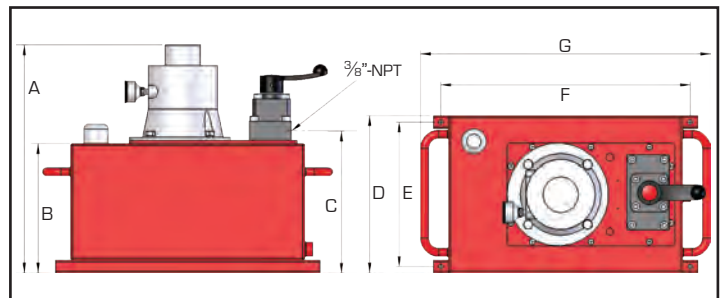
Low pressure flow rate 10 litres/min up to 70 Bar

High pressure flow rate 1.3 litres/min

Working pressure 700 Bar

The HAP two stage air powered hydraulic pump range offers a low pressure flow of 10 litres/min with automatic changeover to 700 Bar high pressure flow rate of 1.3 litres/min. Driven by a powerful 3 kW rotary air motor with a maximum air consumption of 2.4m³ per minute at 7 Bar inlet air pressure, the HAP range offers a choice of pump mounted or remote control valves (page 59) and oil reservoirs all fitted with filler and drain plugs. A full range of system components suitable for use with HAP pump units is detailed on pages 51 - 60.

- >> Two stage hydraulic pump unit
- >> Powerful air motor
- >> Externally adjustable pressure relief valve
- >> Choice of control valves
- >> Manual valve with load holding feature fitted as standard



| Model number | Valve type | Oil cap. litres | Motor kW | Weight kg |
|--------------|------------|-----------------|----------|-----------|
| HAP21011 | P-T Plate | 10 | 3.0 | 41.5 |
| HAP21012 | P-T Plate | 25 | 3.0 | 57.5 |
| HAP21014 | P-T Plate | 40 | 3.0 | 71.5 |
| HAP21016 | P-T Plate | 60 | 3.0 | 96.5 |
| HAP21021 | 2-way | 10 | 3.0 | 42.0 |
| HAP21022 | 2-way | 25 | 3.0 | 58.0 |
| HAP21024 | 2-way | 40 | 3.0 | 72.0 |
| HAP21026 | 2-way | 60 | 3.0 | 97.0 |
| HAP21031 | 3-way | 10 | 3.0 | 42.0 |
| HAP21032 | 3-way | 25 | 3.0 | 58.0 |
| HAP21034 | 3-way | 40 | 3.0 | 72.0 |
| HAP21036 | 3-way | 60 | 3.0 | 97.0 |
| HAP21041 | 4-way | 10 | 3.0 | 42.0 |
| HAP21042 | 4-way | 25 | 3.0 | 58.0 |
| HAP21044 | 4-way | 40 | 3.0 | 72.0 |
| HAP21046 | 4-way | 60 | 3.0 | 97.0 |

| Dimensions in mm | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|
| A | B | C | D | E | F | G |
| 393 | 198 | 230 | 246 | 221 | 368 | 438 |
| 422 | 227 | 259 | 306 | 281 | 490 | 570 |
| 531 | 336 | 368 | 306 | 281 | 490 | 560 |
| 552 | 357 | 389 | 406 | 381 | 513 | 583 |
| 393 | 198 | 230 | 246 | 221 | 368 | 438 |
| 422 | 227 | 259 | 306 | 281 | 490 | 570 |
| 531 | 336 | 368 | 306 | 281 | 490 | 560 |
| 552 | 357 | 389 | 406 | 381 | 513 | 583 |
| 393 | 198 | 230 | 246 | 221 | 368 | 438 |
| 422 | 227 | 259 | 306 | 281 | 490 | 570 |
| 531 | 336 | 368 | 306 | 281 | 490 | 560 |
| 552 | 357 | 389 | 406 | 381 | 513 | 583 |

Note: For optional extras, please see page 50



Low pressure flow rate 10 litres/min up to 70 Bar

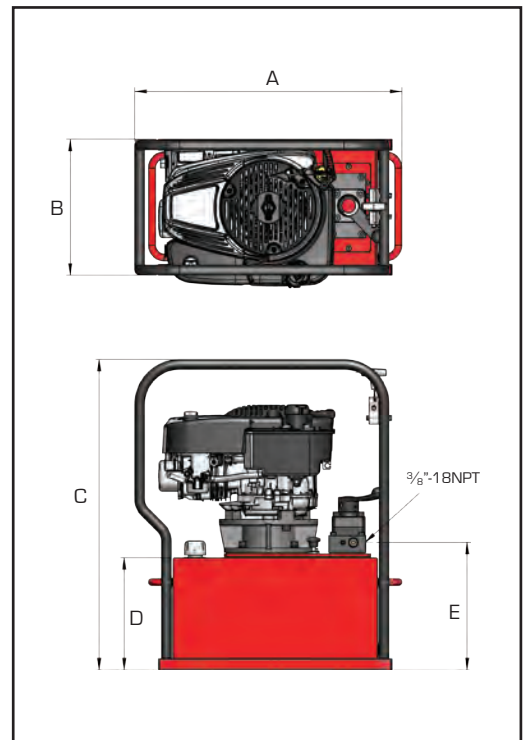
High pressure flow rate 1.3 litres/min

Working pressure 700 Bar

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The HPP range of two stage petrol engine driven hydraulic pumps is ideally suited for applications in locations where there is no electricity or compressed air supply available. The range has similar reservoir and valve options (excluding solenoid valves) as electric and air powered pumps. All models are 700 Bar maximum working pressure and offer a low pressure flow rate of 10 litres/min with automatic changeover to a high pressure flow rate of 1.3 litres/min. Powered by a 3.35 kW rated four stroke engine, the HPP range provides reliable, independent hydraulic power. All models are fitted with a protective roll bar carrying frame for easy transportation and handling. A full range of system components suitable for use with HPP pumps is detailed on pages 51 - 60.

- >> Two stage hydraulic pump unit
- >> Powerful 3.35 kW four stroke petrol engine
- >> Externally adjustable pressure relief valve
- >> Roll bar protection frame included
- >> Manual valve with load holding feature fitted as standard



| Model number | Valve type | Oil cap. litres | Motor kW | Weight kg |
|--------------|------------|-----------------|----------|-----------|
| HPP21012 | P-T Plate | 25 | 3.35 | 70.5 |
| HPP21014 | P-T Plate | 40 | 3.35 | 85.5 |
| HPP21016 | P-T Plate | 60 | 3.35 | 113.5 |
| HPP21022 | 2-way | 25 | 3.35 | 71.0 |
| HPP21024 | 2-way | 40 | 3.35 | 86.0 |
| HPP21026 | 2-way | 60 | 3.35 | 114.0 |
| HPP21032 | 3-way | 25 | 3.35 | 71.0 |
| HPP21034 | 3-way | 40 | 3.35 | 86.0 |
| HPP21036 | 3-way | 60 | 3.35 | 114.0 |
| HPP21042 | 4-way | 25 | 3.35 | 71.0 |
| HPP21044 | 4-way | 40 | 3.35 | 86.0 |
| HPP21046 | 4-way | 60 | 3.35 | 114.0 |

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|-----|
| A | B | C | D | E |
| 570 | 306 | 686 | 227 | 259 |
| 570 | 306 | 795 | 336 | 368 |
| 583 | 406 | 816 | 357 | 389 |
| 570 | 306 | 686 | 227 | 259 |
| 570 | 306 | 795 | 336 | 368 |
| 583 | 406 | 816 | 357 | 389 |
| 570 | 306 | 686 | 227 | 259 |
| 570 | 306 | 795 | 336 | 368 |
| 583 | 406 | 816 | 357 | 389 |
| 570 | 306 | 686 | 227 | 259 |
| 570 | 306 | 795 | 336 | 368 |
| 583 | 406 | 816 | 357 | 389 |

ACCESSORIES FOR POWERED PUMPS

C



Protective roll frame

| Model number | Description |
|----------------|----------------------------|
| | For all HEP and HAP models |
| PPA10RF | All pumps with 10L tank |
| PPA25RF | All pumps with 25L tank |
| PPA40RF | All pumps with 40L tank |
| PPA60RF | All pumps with 60L tank |

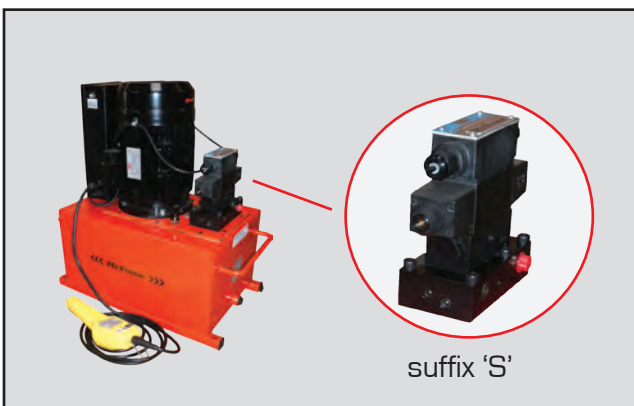
All pumps can be supplied with roll frame factory fitted.
Just suffix pump model number with 'P'.



Wheel trolley

| Model number | Description |
|----------------|--|
| | For all HEP, HAP and HPP models |
| PPA40WT | Wheel trolley for all 25 and 40 litre model pumps. |
| PPA60WT | Wheel trolley for all 60 litre model pumps. |

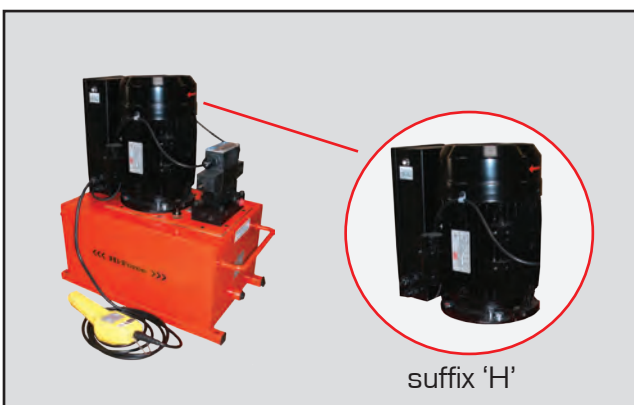
All pumps can be supplied with wheel trolley factory fitted.
Just suffix pump model number with 'WT'.



Low voltage solenoid valve with hand pendant controller

| Suffix | Description |
|----------|---|
| S | All HEP2, 3 and 5 series electric pumps can be supplied with low voltage (24V) solenoid valve, either in 3-way or 4-way versions, both featuring a locking feature and remote pendant control as standard |

To order pump with solenoid valve,
just suffix pump model number with 'S'.



60Hz Electric Motor

| Suffix | Description |
|----------|--|
| H | All HEP2, 3 and 5 series electric pumps can be supplied with an electric motor suitable for 60 Hz. |

To order pump with 60Hz motor,
just suffix pump model number with 'H'.

Hydraulic Hoses

High pressure hydraulic hoses

Page
52

Pressure Gauges

Pressure gauges, gauge mounting blocks
digital gauges, transducers and cables

Pages
53 - 55

Manifolds

Distribution blocks, controlled manifolds and
manifold stations with pressure gauges

Pages
56 - 57

Hydraulic Oil

Premium grade hydraulic oil

Page
57

Couplers & Fittings

High pressure couplers, fittings and adaptors

Page
58

Control Valves

Directional and flow control valves

Pages
59 - 60



HIGH PRESSURE HYDRAULIC HOSES - BLACK & RED



Working pressure 700 Bar

4:1 Factor of safety

Hand grip protective strain relievers

D

Hi-Force high pressure hydraulic hoses provide the vital, high quality, safe connection for your hydraulic equipment. Available in black and red and supplied complete with an ergonomically designed protective strain reliever at both ends, Hi-Force high pressure hoses are suitable for working pressures up to 700 Bar with a 4 : 1 factor of safety.



Tip for double acting systems ...

By using black hoses for the advance lines and red hoses for the retract lines, identification is made easy and the possibility of incorrectly connected hoses is reduced.

Hose bore is 6.6mm and outside diameter is 12.7mm

| Length Metres | No couplers $\frac{3}{8}$ " - 18 NPT male fittings both ends Model number | | $\frac{3}{8}$ " - 18 NPT male fitting one end with CM1 coupler fitted one end Model number | | CM1 male couplers fitted both ends Model number | |
|------------------|--|--------|---|--------|---|---------|
| | Black | Red | Black | Red | Black | Red |
| 0.5 | HH0.5 | HH0.5R | HC0.5 | HC0.5R | HC0.5C | HC0.5CR |
| 1.0 | HH1 | HH1R | HC1 | HC1R | HC1C | HC1CR |
| 2.0 | HH2 | HH2R | HC2 | HC2R | HC2C | HC2CR |
| 3.0 | HH3 | HH3R | HC3 | HC3R | HC3C | HC3CR |
| 4.0 | HH4 | HH4R | HC4 | HC4R | HC4C | HC4CR |
| 5.0 | HH5 | HH5R | HC5 | HC5R | HC5C | HC5CR |
| 6.0 | HH6 | HH6R | HC6 | HC6R | HC6C | HC6CR |
| 10.0 | HH10 | HH10R | HC10 | HC10R | HC10C | HC10CR |
| 12.0 | HH12 | HH12R | HC12 | HC12R | HC12C | HC12CR |
| 15.0 | HH15 | HH15R | HC15 | HC15R | HC15C | HC15CR |
| 20.0 | HH20 | HH20R | HC20 | HC20R | HC20C | HC20CR |
| 25.0 | HH25 | HH25R | HC25 | HC25R | HC25C | HC25CR |
| 30.0 | HH30 | HH30R | HC30 | HC30R | HC30C | HC30CR |

PRESSURE GAUGES & GAUGE MOUNTING BLOCKS



Clear precise dual scale readings

Manufactured to EN837-1

Calibration certificates on request

Hi-Force hydraulic pressure gauges are your “window” to the system and are recommended for use within all hydraulic systems to allow the user to constantly monitor the system pressure. Hi-Force hydraulic pressure gauges are manufactured to EN837-1 and are accurate to +/- 1% of full scale. Standard range models up to 109 tonnes are featured in this catalogue, however gauges to suit Hi-Force high tonnage cylinders are available on request. For digital pressure gauges, please see page 54. Always specify Hi-Force pressure gauges for use with your Hi-Force hydraulic tools.

Gauges :

| Model number | Gauge diameter mm | Gauge type | Reading Inner scale | Reading Outer scale | Inlet thread | Compatible Hi-Force cylinders | Weight kg |
|--------------|-------------------|------------|---------------------|---------------------|--------------|-------------------------------|-----------|
| HG63G | 63 | glycerine | 0-700 Bar | 0-10000 Psi | 1/4"-18NPT | All models | 0.2 |
| HG1 | 100 | dry | 0-700 Bar | 0-10000 Psi | 1/2"-14NPT | All models | 0.9 |
| HG1G | 100 | glycerine | 0-700 Bar | 0-10000 Psi | 1/2"-14NPT | All models | 1.0 |
| HG5 | 100 | dry | 0-700 Bar | 0-4.5 tonnes | 1/2"-14NPT | All 4.5 tonnes models | 0.9 |
| HG10 | 100 | dry | 0-700 Bar | 0-10 tonnes | 1/2"-14NPT | All 10 tonnes models | 0.9 |
| HG11 | 100 | dry | 0-700 Bar | 0-11 tonnes | 1/2"-14NPT | All 11 tonnes models | 0.9 |
| HG20 | 100 | dry | 0-700 Bar | 0-20 tonnes | 1/2"-14NPT | All 20 tonnes models | 0.9 |
| HG23 | 100 | dry | 0-700 Bar | 0-23 tonnes | 1/2"-14NPT | All 23 tonnes models | 0.9 |
| HG25 | 100 | dry | 0-700 Bar | 0-25 tonnes | 1/2"-14NPT | All 25 tonnes models | 0.9 |
| HG32 | 100 | dry | 0-700 Bar | 0-32 tonnes | 1/2"-14NPT | All 32 tonnes models | 0.9 |
| HG33 | 100 | dry | 0-700 Bar | 0-33 tonnes | 1/2"-14NPT | All 33 tonnes models | 0.9 |
| HG50 | 100 | dry | 0-700 Bar | 0-50 tonnes | 1/2"-14NPT | All 50 tonnes models | 0.9 |
| HG61 | 100 | dry | 0-700 Bar | 0-61 tonnes | 1/2"-14NPT | All 61 tonnes models | 0.9 |
| HG102 | 100 | dry | 0-700 Bar | 0-102 tonnes | 1/2"-14NPT | All 102 tonnes models | 0.9 |
| HG109 | 100 | dry | 0-700 Bar | 0-109 tonnes | 1/2"-14NPT | All 109 tonnes models | 0.9 |
| HG2 | 150 | dry | 0-700 Bar | 0-10000 Psi | 1/2"-14NPT | All models | 1.6 |
| HG2G | 150 | glycerine | 0-700 Bar | 0-10000 Psi | 1/2"-14NPT | All models | 1.7 |

Gauge mounting blocks :

| Model number | Dimensions | | | Gauge thread | Inlet thread | Outlet thread | Weight kg |
|----------------|------------|----------|-----------|--------------|-----------------|-------------------|-----------|
| | Length mm | Width mm | Height mm | | | | |
| HGA1 | 75 | 32 | 32 | 1/2"-14NPT | 3/8"-18NPT male | 3/8"-18NPT female | 0.25 |
| HGA2 | 170 | 32 | 32 | 1/2"-14NPT | 3/8"-18NPT male | 3/8"-18NPT female | 0.85 |
| HGA1-25 | 75 | 32 | 32 | 1/4"-18NPT | 3/8"-18NPT male | 3/8"-18NPT female | 0.30 |
| HGA2-25 | 170 | 32 | 32 | 1/4"-18NPT | 3/8"-18NPT male | 3/8"-18NPT female | 0.90 |
| AGA1-25 | 75 | 32 | 50 | 1/4"-18NPT | 3/8"-18NPT male | 3/8"-18NPT female | 0.55 |

DIGITAL GAUGE



5 digit LCD display

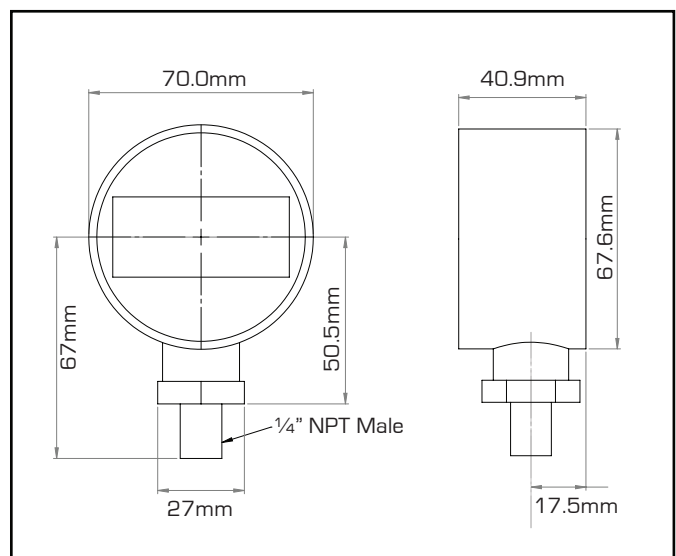
Choice of pressure readings

0.5% full scale accuracy

The Hi-Force HDG1 digital general purpose gauge is capable of measuring hydraulic pressure up to 1000 Bar (14,503 PSI) and can display in a variety of units of measure that include Bar, PSI, mPa, kg/cm², as well as one additional user defined, programmable unit.

This high quality gauge offers an accuracy of 0.5% across its full scale range and incorporates a laser welded, stainless steel sensor & socket making it suitable for use with a wide variety of fluids. Standard features also include tare, min and max memory, blue backlight display, rubber protective enclosure and IP67 weatherproof enclosure rating.

- >> LCD display with 12mm, 5 digit upper line pressure reading and 6mm, 5 digit lower line unit reading.
- >> Blue backlight allows reading in low visibility situations
- >> 20 segment graphical display of pressure
- >> 0.5% terminal point accuracy
- >> Minimum 2000 hours battery life (3 VDC)
- >> Supplied with protective rubber enclosure
- >> Suitable gauge mounting blocks can be found on Page 53



| Model number | Gauge diameter mm | Pressure reading Bar | Pressure reading PSI | Pressure reading mPa | Pressure reading kg/cm ² | Inlet thread | Weight kg |
|--------------|-------------------|----------------------|----------------------|----------------------|-------------------------------------|--------------|-----------|
| HDG1 | 70 | 0-1000 | 0-14503 | 0-100 | 0-1019.7 | 1/4"-18NPT | 0.2 |

PRESSURE TRANSDUCER & DIGITAL DISPLAY



Maximum working pressure 700 Bar

Pressure readings in Bar and PSI

0.5% full scale accuracy

D

The Hi-Force HPT1 pressure transducer is capable of measuring hydraulic pressure up to 700 Bar (10,000 PSI) and is supplied complete with a 2 metre connecting cable. Offering an accuracy of 0.5%, this universal pressure transducer offers an economical solution for precise pressure measurement in many different applications.

The Hi-Force HDD1 digital display complements the HPT1 pressure transducer for applications where remote pressure reading is preferred. A choice of pressure unit in Bar or PSI is easily selected via panel buttons, conveniently located below the LCD display that provides clear easy to read measurements. Additional features include minimum and maximum value, average value, tare offset and reset

- >> IP65 enclosure rating
- >> Compact size with large LCD display
- >> 0.5% full scale accuracy
- >> Pressure reading in Bar or PSI
- >> Display voltage 18-32 VDC, supplied including power supply unit
- >> Suitable gauge mounting blocks can be found on Page 53

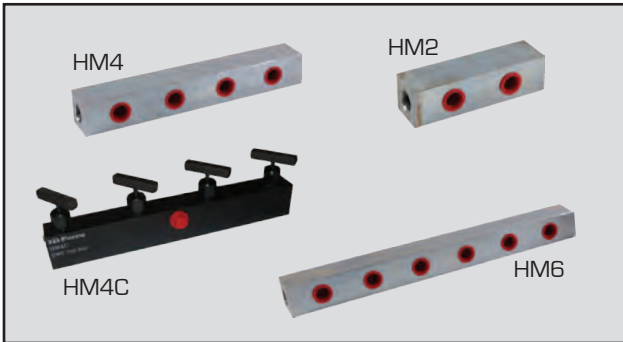
Pressure transducer:

| Model number | Pressure range Bar | Pressure range PSI | Connection thread | Accuracy percentage full scale | Cable length m | Weight kg |
|--------------|--------------------|--------------------|-------------------|--------------------------------|----------------|-----------|
| HPT1 | 0-700 | 0-10000 | ¼"-18NPT | 0.5 | 2 | 0.1 |

Digital display unit:

| Model number | Pressure reading Bar | Pressure reading PSI | Display size L x H mm | Overall size L x W x H mm | Voltage VDC | Weight kg |
|--------------|----------------------|----------------------|-----------------------|---------------------------|-------------|-----------|
| HDD1 | 0-700 | 0-10000 | 76 x 25 | 120 x 110 x 40 | 18 - 32 | 0.3 |

MANIFOLDS



Working pressure 700 Bar

Choice of open or controlled manifolds

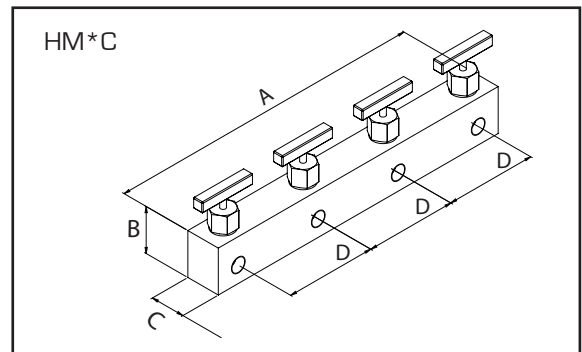
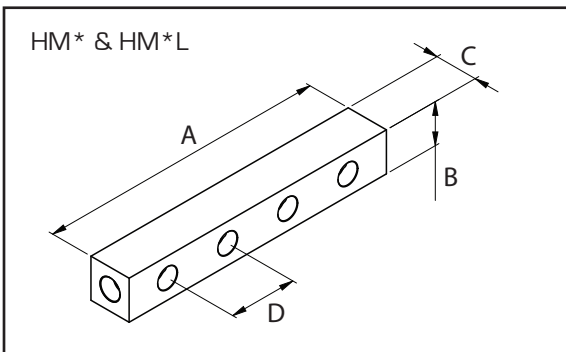
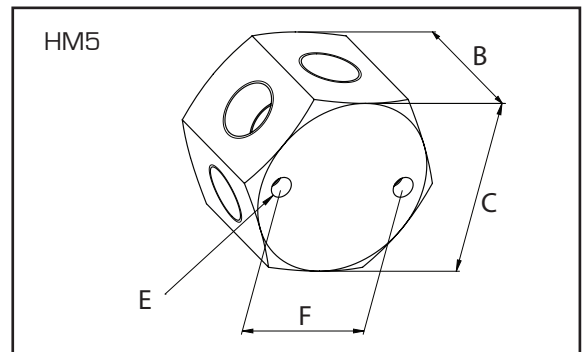
2, 4, 5, 6 or 8 outlet port models available

D

Hi-Force manifolds are designed specifically to allow easy control of the direction of flow of the hydraulic fluid within the system. Supplied either as open manifold blocks or with individual needle type shut off/throttle valves on each 3/8" NPT outlet, Hi-Force manifolds provide even greater versatility in your hydraulic system. The range offers 9 models with a choice of up to 8 outlets per manifold and all models are suitable for 700 Bar maximum working pressure.



Manifolds are used in conjunction with Hi-Force manual and powered pumps. Refer to catalogue pages 29 - 50 for a full range of pumps.



| Model number | Type | Design | Number of outlets | Female Threads | | Weight kg | Dimensions in mm | | | | | |
|--------------|---------------------|-------------------|-------------------|----------------|----------------|-----------|------------------|----|----|-----|----|----|
| | | | | Inlet | Outlet | | A | B | C | D | E | F |
| HM2 | manifold | parallel | 2 | 3/8"-18NPT | 2 x 3/8"-18NPT | 1.0 | 114 | 32 | 32 | 50 | - | - |
| HM4 | manifold | parallel | 4 | 3/8"-18NPT | 4 x 3/8"-18NPT | 1.5 | 214 | 32 | 32 | 50 | - | - |
| HM5 | manifold | hexagon | 5 | 3/8"-18NPT | 5 x 3/8"-18NPT | 0.7 | - | 41 | 51 | - | M6 | 38 |
| HM6 | manifold | parallel | 6 | 3/8"-18NPT | 6 x 3/8"-18NPT | 2.0 | 314 | 32 | 32 | 50 | - | - |
| HM8 | manifold | parallel | 8 | 3/8"-18NPT | 8 x 3/8"-18NPT | 2.5 | 414 | 32 | 32 | 50 | - | - |
| HM4L | manifold | extended parallel | 4 | 3/8"-18NPT | 4 x 3/8"-18NPT | 2.4 | 394 | 32 | 32 | 110 | - | - |
| HM6L | manifold | extended parallel | 6 | 3/8"-18NPT | 6 x 3/8"-18NPT | 3.7 | 614 | 32 | 32 | 110 | - | - |
| HM2C | controlled manifold | parallel | 2 | 3/8"-18NPT | 2 x 3/8"-18NPT | 2.0 | 150 | 51 | 38 | 100 | - | - |
| HM4C | controlled manifold | parallel | 4 | 3/8"-18NPT | 4 x 3/8"-18NPT | 3.5 | 350 | 51 | 38 | 100 | - | - |

MANIFOLDS



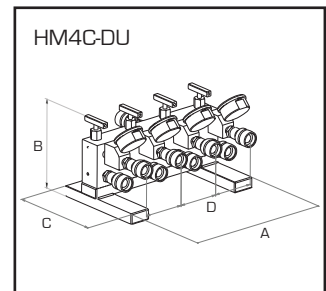
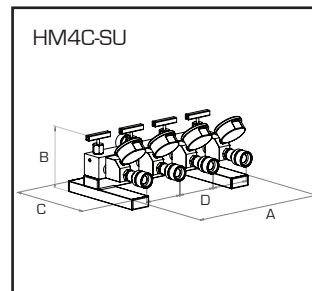
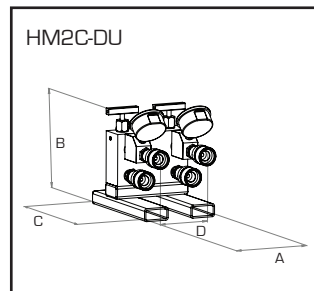
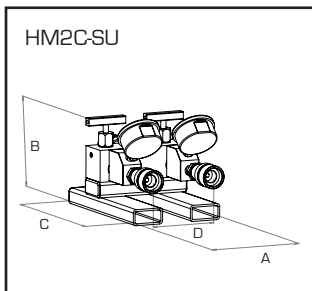
Working pressure 700 Bar

Designed for single or double acting systems

2 or 4 outlet port models available

D

Hi-Force controlled manifold units are designed specifically to allow easy control of the direction of flow of the hydraulic fluid, within a single acting or double acting system. These controlled manifold units are mounted in a sturdy framework and are available as 2-outlet or 4-outlet options and are supplied with pressure gauges, reading 0-700 Bar, fitted to each outlet port. All models are fitted with quick connect couplings on all inlet and outlet ports, including the 2-Way and 4-Way open manifold return flow lines on double acting versions.



| Model number | Type | Weight kg | Dimensions in mm | | | |
|----------------|--|-----------|------------------|-----|----|-----|
| | | | A | B | C | D |
| HM2C-SU | 2-Way controlled manifold unit, suitable for single acting systems | 2.0 | 150 | 51 | 51 | 100 |
| HM2C-DU | 2-Way controlled manifold unit, suitable for double acting systems | 3.0 | 150 | 102 | 51 | 100 |
| HM4C-SU | 4-Way controlled manifold unit, suitable for single acting systems | 3.5 | 350 | 51 | 51 | 100 |
| HM4C-DU | 4-Way controlled manifold unit, suitable for double acting systems | 6.0 | 350 | 102 | 51 | 100 |

HYDRAULIC OIL

Hi-Force premium grade hydraulic oil is specially formulated for use with Hi-Force hydraulic tools, providing optimum performance throughout all working conditions.



| Model number | Capacity litres | For use with |
|-----------------|-----------------|-------------------------|
| HFO32-1 | 1 | Manually operated pumps |
| HFO32-5 | 5 | Manually operated pumps |
| HFO32-25 | 25 | Manually operated pumps |
| HFO46-1 | 1 | Powered pumps |
| HFO46-5 | 5 | Powered pumps |
| HFO46-25 | 25 | Powered pumps |

HIGH PRESSURE COUPLERS AND FITTINGS

Hi-Force high pressure couplers and fittings are designed for easy system connection and assembly of your Hi-Force hydraulic equipment. All Hi-Force couplers and fittings are suitable for 700 Bar maximum working pressure. Hi-Force recommends the use of threaded dust caps with quick connect couplers to protect the thread of the coupler and at the same time prevent any contaminants entering your hydraulic system. Always specify Hi-Force couplers and fittings for use with your Hi-Force hydraulic tools.



Safety first !

Be sure to use genuine Hi-Force couplers and fittings which are designed to withstand the full 700 Bar working pressure.

Large selection of standard adaptors

Working pressure 700 Bar

| Model number | See picture | Description | Thread specification |
|--------------|-------------|--|------------------------------------|
| HF7 | 1 | Nipple | 1/4" NPT male to 1/4" NPT male |
| HF8 | 5 | Adaptor | 1/4" NPT female to 1/4" NPT female |
| HF10 | 2 | Elbow | 3/8" NPT female to 3/8" NPT female |
| HF12 | 3 | Equal tee | 3/8" NPT female |
| HF13 | 4 | Cross | 3/8" NPT female |
| HF14 | 5 | Adaptor | 3/8" NPT female to 3/8" NPT female |
| HF15 | 5 | Reducer | 3/8" NPT female to 1/4" NPT female |
| HF16 | 6 | Elbow | 3/8" NPT female to 3/8" NPT male |
| HF17 | 1 | Nipple | 3/8" NPT male to 3/8" NPT male |
| HF19 | 1 | Long nipple | 3/8" NPT male to 3/8" NPT male |
| HF24 | 7 | Adaptor | 3/8" NPT male to 3/8" BSP female |
| HF27 | 1 | Nipple | 1/4" NPT male to 3/8" NPT male |
| HF30 | 7 | Reducer | 3/8" NPT male to 1/4" NPT female |
| HF31 | 8 | Tee | 3/8" NPT female to 3/8" NPT male |
| HF33 | 7 | Reducer | 3/8" NPT male to 1/4" BSPT female |
| HF55 | 7 | Reducer | 3/8" NPT female to 1/4" NPT male |
| HF69 | 7 | Adaptor | 1/2" BSP male to 3/8" NPT female |
| CF1 | 9 | Female coupler | 3/8" NPT male |
| CM1 | 10 | Male coupler | 3/8" NPT female |
| CMF1 | 9 + 10 | Complete coupler | 3/8" NPT |
| CF2 | 9 | Female coupler | 1/4" NPT male |
| CM2 | 10 | Male coupler | 1/4" NPT female |
| CMF2 | 9 + 10 | Complete coupler | 1/4" NPT |
| CFD1 | 11 | Metal dust cap for CF1 | |
| CMD1 | 12 | Metal dust cap for CM1 | |
| CFD2 | 11 | Metal dust cap for CF2 | |
| CMD2 | 12 | Metal dust cap for CM2 | |
| PPC1 | 13 | Moulded universal dust cap to suit CF1 & CM1 | |

DIRECTIONAL CONTROL VALVES

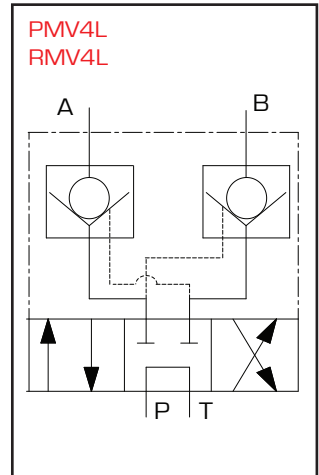
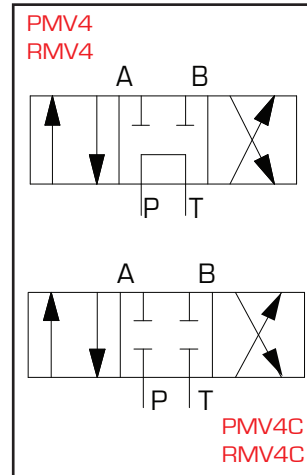
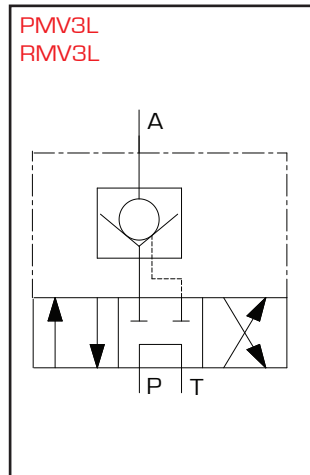
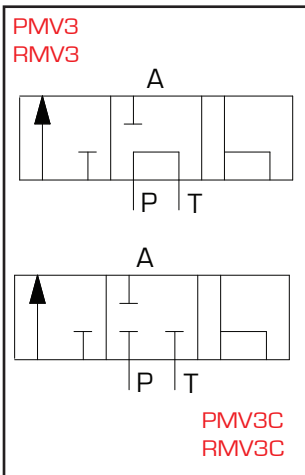
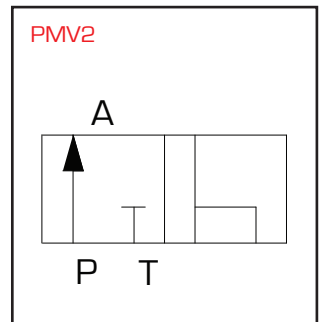


Working pressure 700 Bar

Pump or remote mounted design

Manual or solenoid options available

Hi-Force control valves are designed to provide precise control of the hydraulic system either by accurate pressure or directional flow control. The PMV range of pump mounted valves is identical to the valves fitted to the Hi-Force powered pumps featured on pages 41-43, 44-45, 48, 49 and can be easily interchanged, making your powered pump even more versatile. The RMV range allows for remote mounting away from the pump. Always specify Hi-Force control valves for use with your Hi-Force hydraulic tools. Flow control valves are featured on the next page.



Directional control valves :

| Description | Model number | | | |
|---|---------------------------------|-----------------------------------|-------------------------------------|-------------------------------|
| | Manual valve no load holding | Manual valve with load holding | Solenoid valve 24V incl. control | Manual valve closed centre |
| Pump mounted, 2-way, 2 position valve | PMV2 | - | - | - |
| Pump mounted, 3-way, 3 position valve | PMV3 | PMV3L | PMV3S | PMV3C |
| Pump mounted, 4-way, 3 position valve | PMV4 | PMV4L | PMV4S | PMV4C |
| Remote mounted, 3-way, 3 position valve | RMV3 | RMV3L | RMV3S | RMV3C |
| Remote mounted, 4-way, 3 position valve | RMV4 | RMV4L | RMV4S | RMV4C |

FLOW CONTROL VALVES

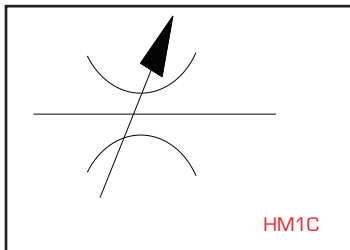


Working pressure 700 Bar

3/8" -18 NPT connections

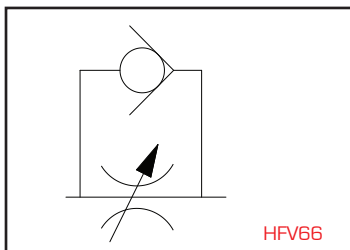
Ensures system safety and control

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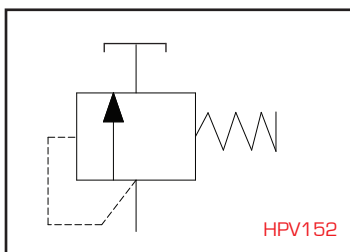
Manual shut off valve with needle type flow control. Used for load holding and throttling functions. Can also be used as a gauge isolator.

| Dimensions in mm | | | |
|------------------|--------|--------|-------|
| Model Number | Height | Length | Width |
| HM1C | 82 | 64 | 38 |



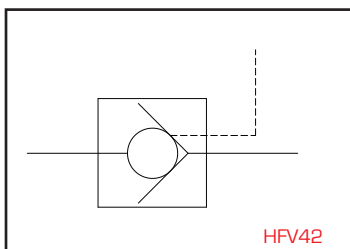
Manual check valve used for automatic load locking, with precise manual load lowering feature.

| Dimensions in mm | | | |
|------------------|--------|--------|-------|
| Model Number | Height | Length | Width |
| HFV66 | 86 | 75 | 47 |



Adjustable pressure relief valve, for pressure setting from 55 to 700 Bar. Supplied complete with return line hose.

| Dimensions in mm | | | |
|------------------|--------|--------|-------|
| Model Number | Height | Length | Width |
| HPV152 | 102 | 64 | 32 |



Pilot operated check valve used as a safety valve for double acting cylinders. Pilot port connects to cylinder retract line.

| Dimensions in mm | | | |
|------------------|--------|--------|-------|
| Model Number | Height | Length | Width |
| HFV42 | 84 | 64 | 32 |

JACKS

JAH Range

Aluminium jacks
Plain piston, claw jacks and locking ring design

Page
62

JAS Range

Aluminium jacks
Compact multi-purpose design

Page
62

JCS Range

Steel & aluminium jacks
Compact low height design

Page
63

JCH Range

Steel & aluminium jacks
Compact low height hollow piston design

Page
63

JSS Range

Steel jacks
Conventional bottle jack design

Page
64

HCJ Range

Steel jacks
Combination head and toe lift design

Page
64

HMJ Range

Steel jacks
Low height access machine lift design

Page
65

E



JAH & JAS - ALUMINIUM JACKS



Capacities from 10 to 60 tonnes

Stroke lengths from 75 to 305mm

Internal safety overload device

The JAH and JAS ranges of lightweight aluminium jacks offers a wide variety of capacities and lift height options. Available as either plain ram lifting jacks, with or without “failsafe” mechanical lock ring, or optional low height claw lifting design, all models are constructed predominantly of lightweight aluminium alloy with all critical functioning parts manufactured from high quality steel. Used extensively in maintenance, construction, heavy plant and machinery applications, these high quality jacks are the proven industry standard.

- >> Lightweight construction
- >> Stroke limiting device
- >> Available as plain ram jack, claw jack or “failsafe” locking ring design

| Model number | Jack capacity tonnes | Claw capacity tonnes | Stroke mm | Weight kg |
|--|----------------------|----------------------|-----------|-----------|
| Multi purpose superjack | | | | |
| JAS103 | 10 | - | 75 | 4.3 |
| JAS105 | 10 | - | 125 | 5.7 |
| Jack with plain piston | | | | |
| JAH620 | 20 | - | 152 | 11 |
| JAH1220 | 20 | - | 305 | 17 |
| JAH630 | 30 | - | 152 | 16 |
| JAH1230 | 30 | - | 305 | 24 |
| JAH660 | 60 | - | 152 | 28 |
| JAH1260 | 60 | - | 305 | 44 |
| Jack with plain piston & lifting claw & with extended base | | | | |
| JAH620C | 20 | 8 | 152 | 15 |
| JAH1220C | 20 | 8 | 305 | 23 |
| JAH630C | 30 | 12 | 152 | 21 |
| JAH1230C | 30 | 12 | 305 | 32 |
| JAH660C | 60 | 24 | 152 | 44 |
| JAH1260C | 60 | 24 | 305 | 65 |
| Jack with “failsafe” locking ring | | | | |
| JAH620SR | 20 | - | 152 | 13 |
| JAH1220SR | 20 | - | 305 | 19 |
| JAH630SR | 30 | - | 152 | 17 |
| JAH1230SR | 30 | - | 305 | 25 |
| JAH660SR | 60 | - | 152 | 30 |
| JAH1260SR | 60 | - | 305 | 46 |

| Closed height | Dimensions in mm | | |
|---------------|------------------|-------------|------------|
| | Toe height | Base length | Base width |
| 131 | - | 162 | 75 |
| 181 | - | 162 | 75 |
| 263 | - | 178 | 121 |
| 438 | - | 246 | 121 |
| 263 | - | 203 | 140 |
| 451 | - | 273 | 140 |
| 293 | - | 251 | 190 |
| 500 | - | 342 | 190 |
| 280 | 67 | 246 | 121 |
| 456 | 67 | 246 | 121 |
| 281 | 73 | 273 | 140 |
| 472 | 73 | 273 | 140 |
| 327 | 73 | 342 | 190 |
| 540 | 73 | 342 | 190 |
| 289 | - | 178 | 121 |
| 464 | - | 246 | 121 |
| 292 | - | 203 | 140 |
| 479 | - | 273 | 140 |
| 330 | - | 251 | 190 |
| 536 | - | 342 | 190 |

Note: JAS103 and JAS105 feature spring assisted piston retraction

JCS - COMPACT JACKS - SOLID PISTON



Capacities from 10 to 30 tonnes

Operates in any position

Lightweight and compact

The Hi-Force JCS range of compact jacks is ideally suited for applications requiring a lifting or positioning force in confined spaces. Lightweight, easy to operate and manufactured from high grade steel (JCS10) and aluminium (JCS20 & JCS30), all models incorporate a spring assisted return, wear coated piston. The pumping mechanism rotates through 360° providing maximum versatility in any application. With the removable operating handle measuring only 240mm in length, these compact lifting jacks will fit in any toolbox.

- >> Spring assisted return piston
- >> Multi-position pump mechanism
- >> Internal safety overload valve
- >> Nitrocarburised piston rod
- >> Sealed hydraulic system

| Model number | Capacity tonnes | Material | Stroke mm | Weight kg |
|--------------|-----------------|-----------|-----------|-----------|
| JCS10 | 10 | Steel | 35 | 4.5 |
| JCS20 | 20 | Aluminium | 41 | 5.5 |
| JCS30 | 30 | Aluminium | 45 | 8.0 |

| Dimensions in mm | | | | |
|------------------|--------|-------------|---------------|-------|
| | Closed | | Max | |
| Length | Height | Piston Dia. | handle height | Width |
| 240 | 76 | 38 | 266 | 70 |
| 257 | 102 | 51 | 281 | 102 |
| 281 | 112 | 60 | 285 | 125 |

JCH - COMPACT JACKS - HOLLOW PISTON



Capacity of 13 and 21 tonnes

Operates in any position

Lightweight and compact

The JCH range of compact jacks is of similar design to the JCS range detailed above, however JCH models feature a hollow piston design for even greater versatility. Suitable for use in tooling, maintenance and tensioning applications, where a pulling force is required. With many common parts to the JCS range these multi-purpose JCH jacks can also be used for general lifting applications.

| Model number | Capacity tonnes | Material | Stroke mm | Weight kg |
|--------------|-----------------|-----------|-----------|-----------|
| JCH13 | 13 | Aluminium | 41 | 5.5 |
| JCH21 | 21 | Aluminium | 45 | 8.0 |

| Dimensions in mm | | | | | |
|------------------|--------|-------------|---------------|--------|-------|
| | Closed | | Max | Centre | |
| Length | Height | Piston Dia. | handle height | Hole | Width |
| 257 | 95 | 51 | 281 | 25 | 102 |
| 281 | 114 | 60 | 285 | 35 | 125 |

JSS - STEEL BOTTLE JACKS



Capacities from 3 to 100 tonnes

Strong rigid steel construction

Suitable for industrial and automotive use

The Hi-Force JSS range of steel bottle jacks offers capacities from 3 to 100 tonnes, with stroke lengths from 135 to 195mm. Models up to 16 tonnes capacity feature a screw extension to span the gap between the piston ram cap and the load. All models are supplied with a tubular operating lever.

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| Model number | Capacity tonnes | Stroke mm | Screw extension mm | Weight kg |
|--------------|-----------------|-----------|--------------------|-----------|
| JSS35 | 3 | 135 | 70 | 3.0 |
| JSS55 | 5 | 135 | 90 | 4.0 |
| JSS106 | 10 | 174 | 90 | 7.0 |
| JSS166 | 16 | 178 | 95 | 10.0 |
| JSS207 | 20 | 190 | - | 15.0 |
| JSS327 | 32 | 190 | - | 22.0 |
| JSS507 | 50 | 195 | - | 32.0 |
| JSS1007 | 100 | 195 | - | 69.0 |

| Closed height | Dimensions in mm | | |
|---------------|------------------|-------------|------------|
| | Piston diameter | Base length | Base width |
| 195 | 28 | 100 | 100 |
| 200 | 32 | 110 | 115 |
| 243 | 43 | 135 | 130 |
| 255 | 53 | 160 | 150 |
| 280 | 56 | 127 | 165 |
| 285 | 71 | 152 | 190 |
| 300 | 85 | 177 | 217 |
| 340 | 117 | 265 | 240 |

HCJ - STEEL TOE JACK

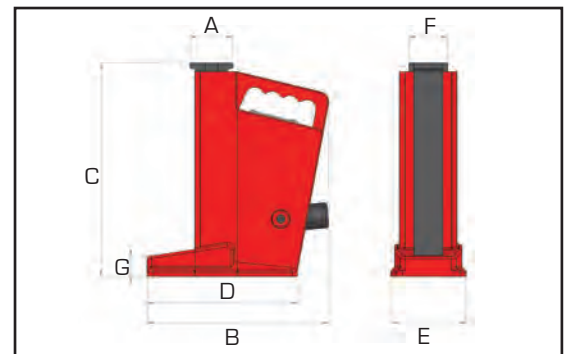


Capacity 5 tonnes

Strong rigid steel construction

Toe guided over full stroke length

The Hi-Force HCJ5 toe jack offers a full 5 tonnes capacity either on the piston head or the fully integrated toe. The low height toe is guided over the full stroke length of the jack, reducing the effects of side loading. The piston is enclosed within the toe and is not exposed during operation. These features make the HCJ5 a truly multi-purpose jack which can easily and safely be used in the most difficult conditions, including underground mining applications.



| Model number | Jack capacity tonnes | Toe capacity tonnes | Stroke mm | Weight kg |
|--------------|----------------------|---------------------|-----------|-----------|
| HCJ5 | 5 | 5 | 175 | 18 |

| Dimensions in mm | | | | | | |
|------------------|-----|-----|-----|-----|----|----|
| A | B | C | D | E | F | G |
| 64 | 255 | 327 | 219 | 114 | 57 | 41 |

HMJ - STEEL MACHINE LIFT JACKS



Capacities of 10 and 25 tonnes

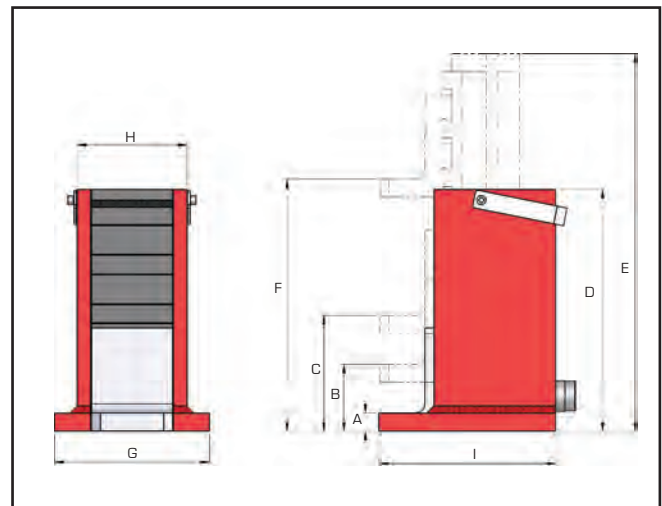
Working pressure 700 Bar

Minimum toe height as low as 21mm

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The HMJ range of hydraulic machine lifting jacks are designed specifically for lifting heavy equipment and machinery where a minimum low height lifting access point is available. The low height lifting toe is precision guided throughout its lifting stroke to reduce friction and prevent the hydraulic cylinder from potential side loading. Both models are 700 Bar maximum working pressure and incorporate a 150mm hydraulic lift with a lifting toe, which can be preset at three different initial lifting positions, for even greater flexibility. Suitable manual or powered pumps for use with HMJ jacks can be found on pages 29 to 50 of this catalogue.

- >> Multi-position lifting toe
- >> Remote operation gives improved operator safety
- >> Stroke length 150mm
- >> Can be used for simultaneous multiple lift point applications
- >> See pages 29 to 50 for compatible pumps
- >> See pages 51 to 60 for system components

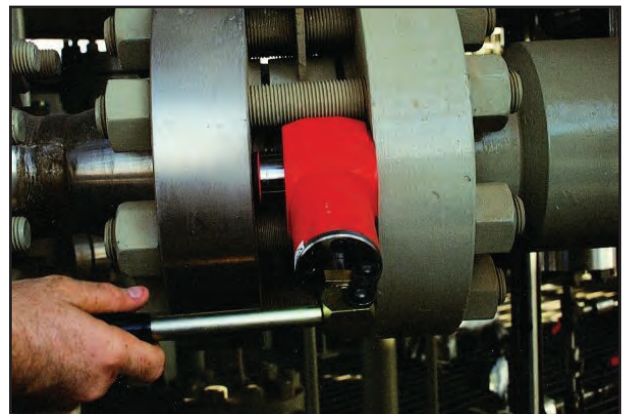


| Model number | Capacity | | Stroke mm | Weight kg | Dimensions in mm | | | | | | | | |
|--------------|------------|-------------|-----------|-----------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | Toe tonnes | Head tonnes | | | A | B | C | D | E | F | G | H | I |
| HMJ10 | 8.5 | 10 | 150 | 29.2 | 25 | 79 | 133 | 272 | 422 | 283 | 202 | 122 | 187 |
| HMJ25 | 20 | 25 | 150 | 55.1 | 35 | 117 | 199 | 330 | 480 | 349 | 292 | 152 | 211 |

HYDRAULIC JACK APPLICATIONS



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TORQUE TOOLS

| | | |
|-------------------------|---|------------------|
| TWM & HTW Range | Manual torque wrenches | Pages 68 - 70 |
| TWG Range | Mechanical torque multipliers | Page 71 |
| TWP & TWP-OG Range | Pneumatic torque multipliers | Pages 72 - 73 |
| TWS-N Range | Hydraulic torque wrenches Reversible square drive design | Pages 74 - 75 |
| TWS-N Accessories | Allen hexagon drive adaptors and extended reaction arms | Page 76 |
| IS & MS Range | Hexagon AF size heavy duty sockets Imperial and metric range | Pages 77 - 78 |
| TWH-N Range | Hydraulic torque wrenches Low profile female hexagon design | Pages 79 - 80 |
| TWH-NRH Range | Hydraulic torque wrenches Female hexagon ratchet heads | Pages 81 - 82 |
| TWH-N Accessories | Square drive conversion kits and extended reaction arms | Page 83 |
| IB & MB Range | Hexagon reducer bushes Imperial and metric size range | Pages 84 - 85 |
| BW Range | Backup wrenches | Page 86 |
| HTWP Range | Torque wrench pumps Standard range | Page 87 |
| TPA & TPE Range | Torque wrench pumps Premium range | Pages 88 - 89 |
| Torque Pump Accessories | Torque pump hoses, couplers and multi-split block | Page 90 |
| IW & FRL Range | Pneumatic impact wrenches and filter, regulator, lubricator unit | Pages 91 - 92 |

TWM - MANUAL TORQUE WRENCHES - CLICK TYPE



Torque capacities from 5 to 850 Nm

Repeatable accuracy +/- 3%

Dual scale Nm & lbf.ft.

The TWM range of industrial manual torque wrenches offers 7 models with torque capacities from 5 to 850 Nm (3.5 to 630 lbf.ft) with square drive sizes from $\frac{3}{8}$ " to $\frac{3}{4}$ ". All models are designed and manufactured to meet or exceed the highest demands of industry and are marked with a unique serial number and supplied with a calibration certificate.

All TWM manual torque wrenches have a dual scale reading of Nm and lbf.ft and are ideally suited for applications requiring repeatable, accurate torquing of bolts and nuts. The reversible square drive and integrated ratchet head allows the wrench to be used for torque control in both clockwise and anti-clockwise directions. All models incorporate an ergonomic handgrip and integrated locking mechanism to prevent accidental alteration of the torque setting during operation. The ratchet head gives a audible click immediately the required preset torque is achieved.

- >> Heavy duty ratchet head
- >> Accuracy +/- 3%
- >> Reversible square drive
- >> Supplied with calibration certificate
- >> Micrometer scale for setting accurate interim values



See pages 69 & 70 for manual torque wrenches with higher torque capacities.

| Model number | Square drive | Torque range | | Main scale grad. Nm | Micro scale grad. Nm | Overall length mm | Ratchet head dia mm | Weight kg |
|---------------|-----------------|--------------|-----------|---------------------|----------------------|-------------------|---------------------|-----------|
| | | Nm | lbf.ft | | | | | |
| TWM50 | $\frac{3}{8}$ " | 5 - 50 | 3.5 - 37 | 2.50 | 0.25 | 334 | 35 | 0.5 |
| TWM100 | $\frac{1}{2}$ " | 20 - 100 | 15 - 75 | 5.00 | 0.50 | 394 | 44 | 0.9 |
| TWM200 | $\frac{1}{2}$ " | 40 - 200 | 30 - 150 | 10.00 | 1.00 | 485 | 44 | 1.1 |
| TWM300 | $\frac{1}{2}$ " | 60 - 300 | 45 - 220 | 10.00 | 1.00 | 577 | 46 | 1.4 |
| TWM400 | $\frac{3}{4}$ " | 80 - 400 | 60 - 300 | 10.00 | 1.00 | 686 | 67 | 2.0 |
| TWM550 | $\frac{3}{4}$ " | 110 - 550 | 80 - 405 | 10.00 | 1.00 | 956 | 69 | 3.8 |
| TWM850 | $\frac{3}{4}$ " | 250 - 850 | 185 - 630 | 10.00 | 1.00 | 1379 | 69 | 4.7 |

HTW - MANUAL TORQUE WRENCHES - BREAK BACK TYPE



Torque capacities from 300 to 2000 Nm

Repeatable accuracy +/- 4%

Dual scale Nm & lbf.ft.

Hi-Force HTW industrial manual torque wrenches offer output torque capacities ranging from 300 to 2000 Nm (220 to 1500 lbf.ft) with repeatable accuracy of +/- 4% and a choice of 3/4" and 1" square drives. All HTW break-back type models provide a large break angle, to prevent the possibility of over torquing. The cam control of the internal mechanism will ensure a controlled "break" once the required preset torque is achieved, which reduces the risk of the operator losing balance. The wrench automatically resets when hand pressure is released.

All models are designed and manufactured to meet or exceed the highest demands of industry and are marked with a unique serial number and supplied with a calibration certificate. All HTW manual torque wrenches incorporate a push-through square drive which allows for torque control in both clockwise and anti-clockwise directions.

- >> Heavy duty ratchet head
- >> Accuracy +/- 4%
- >> Push-through square drive
- >> Supplied with calibration certificate
- >> Complete with carrying & storage case



Need a higher torque capacity

Please check our mechanical and pneumatic torque multipliers on pages 71 to 73.

Alternatively see pages 74 to 83 for hydraulic torque wrench options.

| Model number | Square drive | Torque range | | Overall length mm | Ratchet head dia mm | Weight kg |
|-----------------|--------------|--------------|------------|-------------------|---------------------|-----------|
| | | Nm | lbf.ft | | | |
| HTW1000B | 3/4" | 300 - 1000 | 220 - 750 | 1475 | 70 | 7.3 |
| HTW1500B | 3/4" | 700 - 1500 | 500 - 1000 | 1475 | 70 | 10.4 |
| HTW1800B | 1" | 700 - 1500 | 500 - 1000 | 1475 | 70 | 10.4 |
| HTW2000B | 1" | 900 - 2000 | 600 - 1500 | 1920 | 70 | 13.0 |

TWM - HIGH CAPACITY ALUMINIUM MANUAL TORQUE WRENCHES



Torque capacities from 520 to 2000 Nm

Repeatable accuracy +/- 3%

Lightweight design

Hi-Force TWM high capacity, aluminium manual torque wrenches offer comparable output torque capacities to the HTW range of manual torque wrenches, featured on page 69, but have the added benefit of a lightweight aluminium body. The range offers a choice of 3 models with torque capacities from 520 to 2000 Nm and square drive sizes of $\frac{3}{4}$ " and 1".

All models are supplied with extension handles to minimise operator effort when high torque values need to be achieved. Optional ratchet heads available for use with the TWM aluminium manual torque wrenches are detailed below under accessories.

| Model number | Square drive | Torque range Nm | Torque range lbf. ft | Scale grad. Nm | Nr. of ext. rods | Overall length mm | Recom. ratchet head | Weight kg |
|----------------|-----------------|-----------------|----------------------|----------------|------------------|-------------------|---------------------|-----------|
| TWM1000 | $\frac{3}{4}$ " | 520 - 1000 | 380 - 730 | 10 | 1 | 1413 | TWM075R | 5.6 |
| TWM1500 | 1" | 600 - 1500 | - | 25 | 1 | 1608 | TWM100R | 10.8 |
| TWM2000 | 1" | 750 - 2000 | - | 50 | 2 | 2353 | TWM100R | 11.6 |

ACCESSORIES

- >> Ratchet heads for use with high capacity aluminium manual torque wrench models
- >> Clockwise controlled torquing
- >> Square drives of $\frac{3}{4}$ " and 1"



| Model number | Square drive input | Square drive output | Max. torque capacity Nm | Height mm | Diameter mm | Weight kg |
|----------------|--------------------|---------------------|-------------------------|-----------|-------------|-----------|
| TWM075R | $\frac{3}{4}$ " | $\frac{3}{4}$ " | 1000 | 53 | 65 | 1.0 |
| TWM100R | 1" | 1" | 2000 | 63 | 73 | 1.8 |

TWG - MECHANICAL TORQUE MULTIPLIERS



Torque capacities up to 10000 Nm

Lightweight aluminium housing

Supplied complete with reaction arm

The Hi-Force TWG range of mechanical torque multipliers offers output torque capacities from 50 to 10000 Nm with gearbox multiplication ratios from 1:4 to 1:28.5. Available in a choice of 6 models, each fitted with a high performance aluminium housing, all models are ideal for use in bolting applications in many industries including oil & gas, construction, railways, ship building, machinery & plant engineering and heavy vehicle workshops.

All models are supplied with an offset reaction arm and models TWG40, TWG60 and TWG100 are additionally fitted with an anti-wind up ratchet and non-destructive overload safety mechanism for enhanced gear protection. Hi-Force manual torque wrenches recommended for use with TWG torque multipliers are detailed on page 68 of this catalogue.

- >> Single stage planetary gear in models up to 2800 Nm
- >> Compact two stage planetary gear in models up to 10000 Nm
- >> Output square drives of 3/4", 1" and 1 1/2"



| Model number | Torque capacity | | Gearbox ratio | Input square drive | Output square drive | Recom. torque wrench | Weight kg | Dimensions in mm | | | | |
|---------------|-----------------|--------|---------------|--------------------|---------------------|----------------------|-----------|------------------|-----|-----|-----|-----|
| | Nm | lbf.ft | | | | | | A | B | C | D | E |
| TWG13 | 1300 | 950 | 1:5 | 1/2" | 3/4" | TWM300 | 1.3 | 133 | 80 | 124 | 96 | 98 |
| TWG20 | 2000 | 1500 | 1:4 | 3/4" | 1" | TWM550 | 1.8 | 131 | 88 | 190 | 150 | 80 |
| TWG28 | 2800 | 2050 | 1:5.5 | 3/4" | 1" | TWM550 | 2.4 | 146 | 106 | 156 | 159 | 83 |
| TWG40 | 4000 | 2930 | 1:16 | 1/2" | 1" | TWM300 | 4.2 | 227 | 88 | 175 | 135 | 110 |
| TWG60 | 6000 | 4400 | 1:18 | 3/4" | 1 1/2" | TWM400 | 6.6 | 256 | 102 | 240 | 190 | 145 |
| TWG100 | 10000 | 7330 | 1:28.5 | 3/4" | 1 1/2" | TWM400 | 10.9 | 292 | 142 | 267 | 215 | 163 |

TWP - PISTOL GRIP PNEUMATIC TORQUE MULTIPLIERS



Torque capacities up to 6000 Nm

Repeatable accuracy of +/- 5%

Lightweight and durable construction

F

The TWP pistol grip, pneumatic torque multiplier range is designed to provide smooth, controllable bolt tightening operations, without impacting or pulsing. Offering a repeatable torque accuracy of +/- 5%, this low noise, ultra lightweight range of tools, reduces operator fatigue, increases safety and ensures fast, consistently accurate, tightening of bolted components. The powerful, but lightweight, reversible, pistol grip design air motor, allows the tool to be used for tightening and loosening of bolts. The non-impacting design of the planetary gears, ensures that there is minimum wear to sockets and bolted components. The high grade, steel gearbox has a electro coated galvanized surface, offering even greater corrosion protection and reduces the importance of lubrication, in the gear box. All models are supplied with an airline pressure and lubrication control unit, in a handy carrying frame with a 3 metre length connecting hose with quick connect couplings. Accurate pre-set and consistent torque repeatability is easily achieved by adjusting the input air pressure, to the tool, in conjunction with the calibration graph, supplied with each tool. Average air consumption is 23 litres per second, from a standard airline pressure of 8 Bar [49.5 cubic feet per minute at 116 PSI].

- >> Slimline gearbox allows excellent access
- >> Sensitive trigger control allows for easy reaction arm positioning
- >> Smooth, quiet, non-impacting design with reversible air motor
- >> Two speed models available on request
- >> Supplied complete with FRL filter, regulator and lubricator unit including class 1.0 air inlet pressure gauge and connecting hose



| Model number | Torque capacity * Nm | lbf.ft | Square drive size | R.P.M. at max pressure | Overall length mm | Gearbox diameter mm | Weight kg |
|---------------|-------------------------|----------|-------------------|------------------------|-------------------|---------------------|-----------|
| TWP09S | 200-900 | 150-670 | 3/4" | 24 | 328 | 80 | 3.2 |
| TWP15S | 300-1500 | 220-1110 | 1" | 12 | 343 | 88 | 4.7 |
| TWP22S | 500-2200 | 370-1620 | 1" | 7 | 360 | 88 | 5.1 |
| TWP32S | 800-3200 | 590-2360 | 1" | 4 | 383 | 88 | 5.8 |
| TWP40S | 850-4200 | 620-3100 | 1" | 4 | 383 | 88 | 5.8 |
| TWP60S | 1200-6000 | 880-4400 | 1 1/2" | 4 | 400 | 102 | 7.7 |

(*) Minimum torque value at 1.5 Bar, maximum torque value at 8 Bar airline pressure. Weight is without reaction arm.

TWP-OG - PISTOL GRIP PNEUMATIC TORQUE MULTIPLIERS



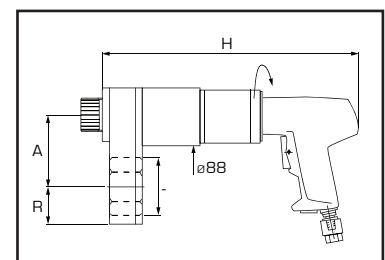
Torque capacities up to 4800 Nm

Repeatable accuracy of +/- 5%

Lightweight and durable construction

The TWP-OG pistol grip, pneumatic torque multiplier, with integrated offset gearbox is designed to provide smooth, controllable bolt tightening operations, without impacting or pulsing. Offering a repeatable torque accuracy of +/- 5%, this low noise, ultra lightweight tool, reduces operator fatigue, increases safety and ensures fast, consistently accurate tightening of bolted components. The powerful, but lightweight, reversible, pistol grip design air motor allows the tool to be used for tightening and loosening of bolts. The non-impacting design of the planetary gears ensures that there is minimum wear to sockets and bolted components. The high grade steel gearbox has a electro coated galvanized surface offering even greater corrosion protection and reduces the importance of lubrication in the gear box. All models are supplied complete with an airline pressure and lubrication control unit, in a handy carrying frame, with a 3 metre length connecting hose with quick connect couplings. Accurate preset and consistent torque repeatability is easily achieved by adjusting the input air pressure to the tool, in conjunction with the pressure table supplied with the tool. Average air consumption is 23 litres per second from a standard airline pressure of 8 Bar [49.5 cubic feet per minute at 116 PSI].

- >> Offset gearbox specially designed for heat exchangers
- >> Sensitive trigger control allows for easy reaction arm positioning
- >> Smooth, quiet, non-impacting design with reversible air motor
- >> Two speed models available on request
- >> Supplied complete with FRL filter, regulator and lubricator unit including class 1.0 air inlet pressure gauge and connecting hose



| Model number | Torque capacity * | | R.P.M. at max pressure | Weight kg | Female Hexagon | Dimensions in mm | | |
|-------------------|-------------------|--------|------------------------|-----------|----------------|------------------|-----|----|
| | Nm | lbf.ft | | | | A | H | R |
| TWP30S-OG1 | 3000 | 2200 | 7 | 10 | 60 mm AF | 112 | 396 | 61 |
| TWP30S-OG2 | 3600 | 2650 | 5 | 12 | 80 mm AF | 118 | 396 | 75 |
| TWP30S-OG3 | 4800 | 3500 | 4 | 13 | 95 mm AF | 135 | 396 | 95 |

(*) Maximum torque value at 8 Bar airline pressure

TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE



Working pressure 700 Bar

Compact, lightweight, aluminium construction

Fitted with 360° Uni-Swivel quick release couplings

Hi-Force TWS-N series lightweight aluminium hydraulic torque wrenches are designed to handle the toughest bolting jobs accurately and quickly. All models provide a torque accuracy of $\pm 3\%$. The internal reaction arm spline allows the operator to easily position the tool and, if necessary, react directly off the tool body in very confined access applications. All models incorporate an easily reversible high grade alloy steel square drive enabling the operator to quickly switch from tightening to loosening applications. Uni-Swivel quick release couplers are fitted as standard to all models enabling easy positioning of the hydraulic hoses away from any possible "pinch points". Optional allen hex drives are available (see page 76) along with a comprehensive range of high quality torque wrench sockets. (See pages 77 & 78).

- >> Accurate to $\pm 3\%$ with calibration chart supplied
- >> Multi-position reaction foot with safety lock feature
- >> Reversible square drive for tightening and loosening applications
- >> Suitable for continuous operation at maximum pressure



Allen hex drive adaptors
(see page 76)



Did you know.....

Hi-Force hydraulic torque tools are manufactured on the latest "State of the art" CNC machining centres, guaranteed to manufacture components to the highest quality standards available.

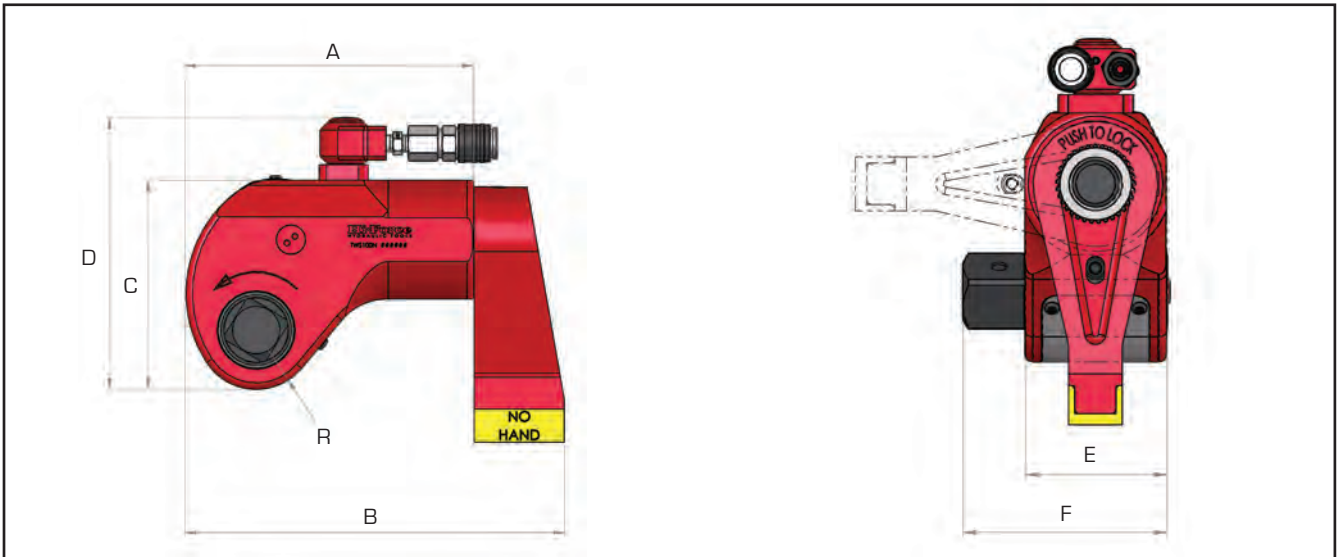
TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE



Designed for tightening and loosening

Internal reaction arm spline

Accurate to +/- 3%



| Model number | Torque Capacity | | Square drive size | Weight incl. reaction foot kg |
|----------------|-----------------|----------------------|-------------------|-------------------------------|
| | Nm at 700 Bar | lbf.ft at 10,000 PSI | | |
| TWS17N | 1727 | 1254 | 3/4" | 1.9 |
| TWS45N | 4529 | 3289 | 1" | 4.8 |
| TWS100N | 10064 | 7308 | 1 1/2" | 9.0 |
| TWS150N | 14974 | 10873 | 1 1/2" | 15.0 |
| TWS370N | 36992 | 26860 | 2 1/2" | 32.5 |

| Dimensions in mm | | | | | | |
|------------------|-----|-----|-----|-----|-----|----|
| A | B | C | D | E | F | R |
| 129 | 167 | 90 | 131 | 51 | 73 | 25 |
| 167 | 218 | 121 | 170 | 68 | 98 | 34 |
| 223 | 293 | 163 | 211 | 92 | 135 | 46 |
| 247 | 323 | 192 | 236 | 100 | 141 | 54 |
| 329 | 432 | 240 | 288 | 137 | 204 | 66 |

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TWS-N - ACCESSORIES



Sizes available for all TWS-N wrenches

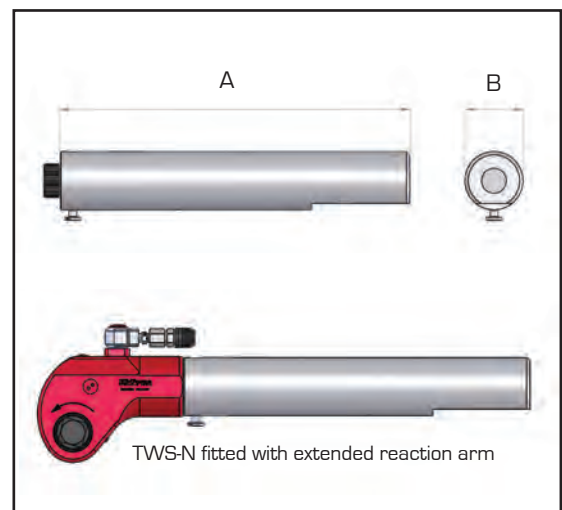
Limitations on applied torque (check before use)

Suitable for tightening & loosening applications

| For tool Model number | Imperial Allen Hexagon Drive Adaptors | | | Metric Allen Hexagon Drive Adaptors | | |
|--------------------------|---------------------------------------|--------------|------------------------|-------------------------------------|--------------|------------------------|
| | Model Number | Hexagon Size | Maximum Torque load Nm | Model Number | Hexagon Size | Maximum Torque load Nm |
| TWS17N | IH17N-008 | 1/2" | 470 | MH17N-14 | 14mm | 740 |
| | IH17N-010 | 5/8" | 930 | MH17N-17 | 17mm | 1350 |
| | IH17N-012 | 3/4" | 1600 | MH17N-19 | 19mm | 1612 |
| | IH17N-014 | 7/8" | 1700 | MH17N-22 | 22mm | 1700 |
| | IH17N-100 | 1" | 1700 | MH17N-24 | 24mm | 1700 |
| TWS45N | IH45N-010 | 5/8" | 930 | MH45N-17 | 17mm | 1100 |
| | IH45N-012 | 3/4" | 1600 | MH45N-19 | 19mm | 1600 |
| | IH45N-014 | 7/8" | 2550 | MH45N-22 | 22mm | 2550 |
| | IH45N-100 | 1" | 3800 | MH45N-24 | 24mm | 3700 |
| | IH45N-102 | 1 1/8" | 4500 | MH45N-27 | 27mm | 4500 |
| | IH45N-104 | 1 1/4" | 4500 | MH45N-32 | 32mm | 4500 |
| TWS100N | IH100N-014 | 7/8" | 1890 | MH100N-22 | 22mm | 2480 |
| | IH100N-100 | 1" | 3800 | MH100N-24 | 24mm | 3700 |
| | IH100N-102 | 1 1/8" | 5440 | MH100N-27 | 27mm | 4650 |
| | IH100N-104 | 1 1/4" | 7480 | MH100N-30 | 30mm | 6380 |
| | IH100N-106 | 1 3/8" | 9920 | MH100N-32 | 32mm | 7625 |
| | IH100N-108 | 1 1/2" | 10000 | MH100N-36 | 36mm | 10000 |
| TWS150N | IH150N-104 | 1 1/4" | 7400 | MH150N-30 | 30mm | 7000 |
| | IH150N-106 | 1 3/8" | 9900 | MH150N-32 | 32mm | 7500 |
| | IH150N-108 | 1 1/2" | 15000 | MH150N-36 | 36mm | 10900 |
| | IH150N-110 | 1 5/8" | 15000 | MH150N-41 | 41mm | 15000 |
| | IH150N-112 | 1 3/4" | 15000 | MH150N-46 | 46mm | 15000 |
| TWS370N | IH370N-108 | 1 1/2" | 12900 | MH370N-36 | 36mm | 10000 |
| | IH370N-110 | 1 5/8" | 16300 | MH370N-41 | 41mm | 16300 |
| | IH370N-112 | 1 3/4" | 20400 | MH370N-46 | 46mm | 22500 |
| | IH370N-114 | 1 7/8" | 25100 | MH370N-50 | 50mm | 30600 |
| | IH370N-200 | 2" | 30600 | MH370N-55 | 55mm | 37000 |
| | IH370N-204 | 2 1/4" | 37000 | MH370N-60 | 60mm | 37000 |

Extended Reaction Arms

| For tool Model number | Model Number | Length A | | Diameter B | |
|--------------------------|--------------|----------|-----|------------|-------|
| | | Inch | mm | Inch | mm |
| TWS17N | ERA17-21 | 21" | 533 | 1 3/4" | 44.5 |
| | ERA17-24 | 24" | 610 | 1 3/4" | 44.5 |
| | ERA17-36 | 36" | 914 | 1 3/4" | 44.5 |
| TWS45N | ERA45-21 | 21" | 533 | 2 1/2" | 63.5 |
| | ERA45-24 | 24" | 610 | 2 1/2" | 63.5 |
| | ERA45-36 | 36" | 914 | 2 1/2" | 63.5 |
| TWS100N | ERA100-21 | 21" | 533 | 3 1/2" | 88.9 |
| | ERA100-24 | 24" | 610 | 3 1/2" | 88.9 |
| | ERA100-36 | 36" | 914 | 3 1/2" | 88.9 |
| TWS150N | ERA150-21 | 21" | 533 | 3 1/2" | 88.9 |
| | ERA150-24 | 24" | 610 | 3 1/2" | 88.9 |
| | ERA150-36 | 36" | 914 | 3 1/2" | 88.9 |
| TWS370N | ERA370-21 | 21" | 533 | 4 3/4" | 120.6 |
| | ERA370-24 | 24" | 610 | 4 3/4" | 120.6 |
| | ERA370-36 | 36" | 914 | 4 3/4" | 120.6 |



IS - IMPERIAL HEXAGON AF SIZE HEAVY DUTY SOCKETS

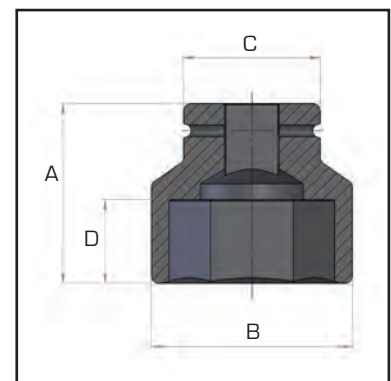


Square drives from $\frac{3}{4}$ " to $2\frac{1}{2}$ "

Across flat sizes up to $6\frac{7}{8}$ "

Supplied complete with retaining ring and pin

Hi-Force high quality imperial size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The IS range of imperial impact sockets offers 47 models, with square drives from $\frac{3}{4}$ " to $2\frac{1}{2}$ " and across flat sizes up to $6\frac{7}{8}$ ". Long length, bi-hexagonal and special sockets are available on request.



| Model number | Square drive | Nut AF inches | Dimensions in mm | | | |
|--------------|------------------|--------------------|------------------|-----|----|----|
| | | | A | B | C | D |
| IS2-101 | $\frac{3}{4}$ " | $1\frac{1}{16}$ " | 52 | 40 | 38 | 16 |
| IS2-104 | $\frac{3}{4}$ " | $1\frac{1}{4}$ " | 52 | 44 | 44 | 20 |
| IS2-107 | $\frac{3}{4}$ " | $1\frac{7}{16}$ " | 56 | 51 | 44 | 23 |
| IS2-110 | $\frac{3}{4}$ " | $1\frac{5}{8}$ " | 62 | 58 | 44 | 27 |
| IS2-113 | $\frac{3}{4}$ " | $1\frac{13}{16}$ " | 68 | 67 | 44 | 32 |
| IS2-200 | $\frac{3}{4}$ " | 2" | 72 | 71 | 54 | 35 |
| IS2-203 | $\frac{3}{4}$ " | $2\frac{3}{16}$ " | 74 | 77 | 54 | 35 |
| IS2-206 | $\frac{3}{4}$ " | $2\frac{3}{8}$ " | 75 | 84 | 54 | 35 |
| IS9-101 | 1" | $1\frac{1}{16}$ " | 58 | 44 | 51 | 17 |
| IS9-104 | 1" | $1\frac{1}{4}$ " | 60 | 51 | 51 | 21 |
| IS9-107 | 1" | $1\frac{7}{16}$ " | 62 | 56 | 52 | 26 |
| IS9-110 | 1" | $1\frac{5}{8}$ " | 62 | 62 | 52 | 26 |
| IS9-113 | 1" | $1\frac{13}{16}$ " | 64 | 68 | 58 | 27 |
| IS9-200 | 1" | 2" | 70 | 74 | 58 | 31 |
| IS9-203 | 1" | $2\frac{3}{16}$ " | 72 | 80 | 62 | 32 |
| IS9-206 | 1" | $2\frac{3}{8}$ " | 78 | 87 | 62 | 35 |
| IS9-209 | 1" | $2\frac{9}{16}$ " | 80 | 93 | 62 | 36 |
| IS9-212 | 1" | $2\frac{3}{4}$ " | 85 | 98 | 62 | 40 |
| IS9-215 | 1" | $2\frac{15}{16}$ " | 95 | 104 | 86 | 48 |
| IS9-302 | 1" | $3\frac{1}{8}$ " | 100 | 109 | 86 | 52 |
| IS9-308 | 1" | $3\frac{1}{2}$ " | 105 | 125 | 86 | 52 |
| IS9-314 | 1" | $3\frac{7}{8}$ " | 105 | 136 | 95 | 52 |
| IS5-113 | $1\frac{1}{2}$ " | $1\frac{13}{16}$ " | 84 | 76 | 86 | 27 |
| IS5-200 | $1\frac{1}{2}$ " | 2" | 87 | 82 | 86 | 29 |

| Model number | Square drive | Nut AF inches | Dimensions in mm | | | |
|--------------|------------------|--------------------|------------------|-----|-----|-----|
| | | | A | B | C | D |
| IS5-203 | $1\frac{1}{2}$ " | $2\frac{3}{16}$ " | 90 | 86 | 86 | 36 |
| IS5-206 | $1\frac{1}{2}$ " | $2\frac{3}{8}$ " | 92 | 93 | 86 | 38 |
| IS5-209 | $1\frac{1}{2}$ " | $2\frac{9}{16}$ " | 95 | 97 | 86 | 40 |
| IS5-212 | $1\frac{1}{2}$ " | $2\frac{3}{4}$ " | 100 | 105 | 86 | 43 |
| IS5-215 | $1\frac{1}{2}$ " | $2\frac{15}{16}$ " | 103 | 110 | 86 | 45 |
| IS5-302 | $1\frac{1}{2}$ " | $3\frac{1}{8}$ " | 110 | 116 | 86 | 50 |
| IS5-308 | $1\frac{1}{2}$ " | $3\frac{1}{2}$ " | 118 | 130 | 86 | 55 |
| IS5-314 | $1\frac{1}{2}$ " | $3\frac{7}{8}$ " | 125 | 140 | 95 | 58 |
| IS5-404 | $1\frac{1}{2}$ " | $4\frac{1}{4}$ " | 125 | 150 | 95 | 58 |
| IS5-410 | $1\frac{1}{2}$ " | $4\frac{5}{8}$ " | 135 | 165 | 95 | 65 |
| IS5-500 | $1\frac{1}{2}$ " | 5" | 140 | 179 | 127 | 70 |
| IS5-506 | $1\frac{1}{2}$ " | $5\frac{3}{8}$ " | 150 | 195 | 127 | 75 |
| IS6-302 | $2\frac{1}{2}$ " | $3\frac{1}{8}$ " | 140 | 124 | 127 | 51 |
| IS6-308 | $2\frac{1}{2}$ " | $3\frac{1}{2}$ " | 140 | 135 | 127 | 51 |
| IS6-314 | $2\frac{1}{2}$ " | $3\frac{7}{8}$ " | 150 | 147 | 127 | 57 |
| IS6-404 | $2\frac{1}{2}$ " | $4\frac{1}{4}$ " | 160 | 159 | 127 | 64 |
| IS6-410 | $2\frac{1}{2}$ " | $4\frac{5}{8}$ " | 170 | 172 | 127 | 71 |
| IS6-500 | $2\frac{1}{2}$ " | 5" | 175 | 185 | 127 | 75 |
| IS6-506 | $2\frac{1}{2}$ " | $5\frac{3}{8}$ " | 180 | 197 | 127 | 79 |
| IS6-512 | $2\frac{1}{2}$ " | $5\frac{3}{4}$ " | 185 | 210 | 127 | 83 |
| IS6-602 | $2\frac{1}{2}$ " | $6\frac{1}{8}$ " | 190 | 223 | 127 | 91 |
| IS6-608 | $2\frac{1}{2}$ " | $6\frac{1}{2}$ " | 195 | 235 | 127 | 95 |
| IS6-614 | $2\frac{1}{2}$ " | $6\frac{7}{8}$ " | 200 | 248 | 127 | 105 |

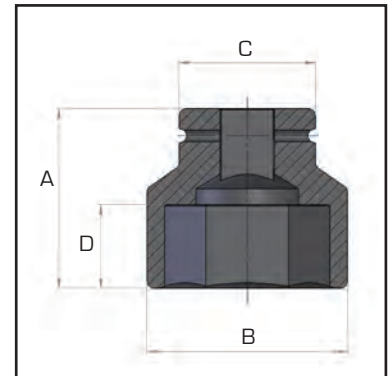
MS - METRIC HEXAGON AF SIZE HEAVY DUTY SOCKETS



Square drives from $\frac{3}{4}$ " to $2\frac{1}{2}$ "

Across flat sizes up to 145mm

Supplied complete with retaining ring and pin



Hi-Force high quality metric size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The MS range of metric impact sockets offers 56 models, with square drives from $\frac{3}{4}$ " to $2\frac{1}{2}$ " and across flat sizes up to 145mm. Long length, bi-hexagonal and special sockets are available on request.

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| Model number | Square drive | Nut AF mm | Dimensions in mm | | | |
|--------------|-----------------|-----------|------------------|-----|----|----|
| | | | A | B | C | D |
| MS2-24 | $\frac{3}{4}$ " | 24 | 50 | 39 | 44 | 16 |
| MS2-27 | $\frac{3}{4}$ " | 27 | 54 | 43 | 44 | 16 |
| MS2-30 | $\frac{3}{4}$ " | 30 | 54 | 47 | 44 | 23 |
| MS2-32 | $\frac{3}{4}$ " | 32 | 56 | 49 | 44 | 23 |
| MS2-36 | $\frac{3}{4}$ " | 36 | 56 | 54 | 44 | 23 |
| MS2-41 | $\frac{3}{4}$ " | 41 | 58 | 60 | 44 | 24 |
| MS2-46 | $\frac{3}{4}$ " | 46 | 63 | 67 | 44 | 30 |
| MS2-50 | $\frac{3}{4}$ " | 50 | 72 | 71 | 54 | 32 |
| MS2-55 | $\frac{3}{4}$ " | 55 | 74 | 78 | 54 | 35 |
| MS2-60 | $\frac{3}{4}$ " | 60 | 75 | 84 | 54 | 37 |
| MS9-24 | 1" | 24 | 58 | 42 | 54 | 17 |
| MS9-27 | 1" | 27 | 58 | 46 | 54 | 17 |
| MS9-30 | 1" | 30 | 60 | 50 | 54 | 21 |
| MS9-32 | 1" | 32 | 60 | 51 | 54 | 21 |
| MS9-36 | 1" | 36 | 65 | 56 | 54 | 30 |
| MS9-41 | 1" | 41 | 67 | 63 | 54 | 31 |
| MS9-46 | 1" | 46 | 74 | 69 | 54 | 36 |
| MS9-50 | 1" | 50 | 80 | 74 | 54 | 42 |
| MS9-55 | 1" | 55 | 84 | 80 | 54 | 44 |
| MS9-60 | 1" | 60 | 87 | 86 | 54 | 44 |
| MS9-65 | 1" | 65 | 90 | 92 | 54 | 46 |
| MS9-70 | 1" | 70 | 96 | 99 | 54 | 51 |
| MS9-75 | 1" | 75 | 98 | 106 | 86 | 45 |
| MS9-80 | 1" | 80 | 100 | 112 | 86 | 48 |
| MS9-85 | 1" | 85 | 105 | 118 | 86 | 52 |
| MS9-90 | 1" | 90 | 105 | 125 | 86 | 52 |
| MS9-95 | 1" | 95 | 115 | 131 | 86 | 52 |
| MS9-100 | 1" | 100 | 115 | 137 | 95 | 58 |

| Model number | Square drive | Nut AF mm | Dimensions in mm | | | |
|--------------|------------------|-----------|------------------|-----|-----|----|
| | | | A | B | C | D |
| MS5-36 | $1\frac{1}{2}$ " | 36 | 78 | 64 | 86 | 23 |
| MS5-41 | $1\frac{1}{2}$ " | 41 | 80 | 70 | 86 | 26 |
| MS5-46 | $1\frac{1}{2}$ " | 46 | 84 | 76 | 86 | 27 |
| MS5-50 | $1\frac{1}{2}$ " | 50 | 87 | 81 | 86 | 29 |
| MS5-55 | $1\frac{1}{2}$ " | 55 | 90 | 86 | 86 | 36 |
| MS5-60 | $1\frac{1}{2}$ " | 60 | 92 | 93 | 86 | 38 |
| MS5-65 | $1\frac{1}{2}$ " | 65 | 95 | 97 | 86 | 40 |
| MS5-70 | $1\frac{1}{2}$ " | 70 | 100 | 105 | 86 | 43 |
| MS5-75 | $1\frac{1}{2}$ " | 75 | 103 | 110 | 86 | 45 |
| MS5-80 | $1\frac{1}{2}$ " | 80 | 110 | 116 | 86 | 50 |
| MS5-85 | $1\frac{1}{2}$ " | 85 | 118 | 125 | 86 | 55 |
| MS5-90 | $1\frac{1}{2}$ " | 90 | 118 | 130 | 86 | 55 |
| MS5-95 | $1\frac{1}{2}$ " | 95 | 118 | 137 | 95 | 55 |
| MS5-100 | $1\frac{1}{2}$ " | 100 | 125 | 140 | 95 | 58 |
| MS5-105 | $1\frac{1}{2}$ " | 105 | 125 | 150 | 95 | 58 |
| MS5-110 | $1\frac{1}{2}$ " | 110 | 125 | 156 | 95 | 58 |
| MS5-115 | $1\frac{1}{2}$ " | 115 | 135 | 160 | 95 | 65 |
| MS5-130 | $1\frac{1}{2}$ " | 130 | 140 | 185 | 127 | 70 |
| MS6-80 | $2\frac{1}{2}$ " | 80 | 140 | 124 | 127 | 51 |
| MS6-85 | $2\frac{1}{2}$ " | 85 | 140 | 130 | 127 | 51 |
| MS6-90 | $2\frac{1}{2}$ " | 90 | 145 | 136 | 127 | 54 |
| MS6-95 | $2\frac{1}{2}$ " | 95 | 145 | 143 | 127 | 54 |
| MS6-100 | $2\frac{1}{2}$ " | 100 | 150 | 149 | 127 | 57 |
| MS6-105 | $2\frac{1}{2}$ " | 105 | 155 | 155 | 127 | 61 |
| MS6-110 | $2\frac{1}{2}$ " | 110 | 160 | 161 | 127 | 64 |
| MS6-115 | $2\frac{1}{2}$ " | 115 | 165 | 167 | 127 | 67 |
| MS6-130 | $2\frac{1}{2}$ " | 130 | 175 | 188 | 127 | 75 |
| MS6-145 | $2\frac{1}{2}$ " | 145 | 185 | 208 | 127 | 83 |

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS



Working pressure 700 Bar

Powerful with low clearance design

Fitted with 360° x 360° Uni-Swivel couplings

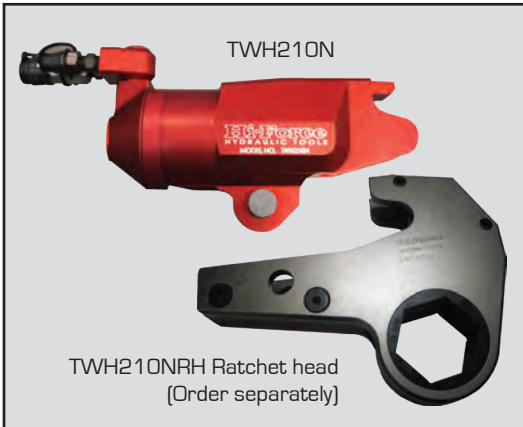
Hi-Force TWH-N series female hexagon cassette head hydraulic torque wrenches offer a choice of 5 models with output torque capacities from 2625 Nm to 48181 Nm (1906 to 34985 lbf.ft). Manufactured from high grade aluminium (except TWH430N), all models provide direct in-line reaction and a minimal radius clearance for easy fitment in confined spaces. The user friendly design of the tool simply requires the operator to withdraw/insert a single pin to change the ratchet head. Ratchet heads are available in all standard metric and imperial AF sizes from 24 to 175mm (1 $\frac{1}{16}$ " to 6 $\frac{7}{8}$ ") with low cost hexagon reducer bushes also available (see pages 84 - 85). Uni-Swivel quick release couplers are fitted as standard to all models, enabling easy positioning of the hydraulic hoses.

- >> Compact, lightweight, aluminium drive unit (except TWH430N)
- >> Accurate to +/- 3% with standard torque chart supplied
- >> Low profile design for limited access applications
- >> Minimum radius cassette head for fitment in confined spaces
- >> Suitable for continuous operation at maximum pressure



Note: Model TWH430N manufactured from high grade alloy steel

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS



Designed for tightening and loosening applications

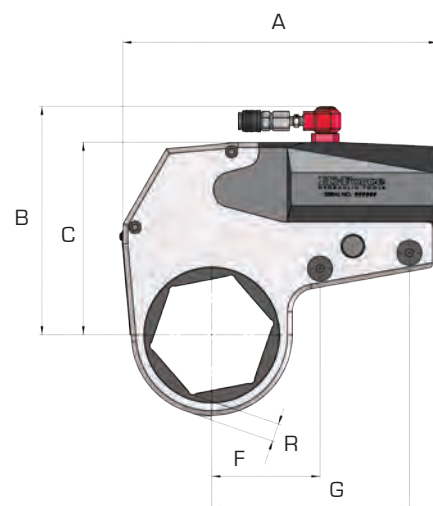
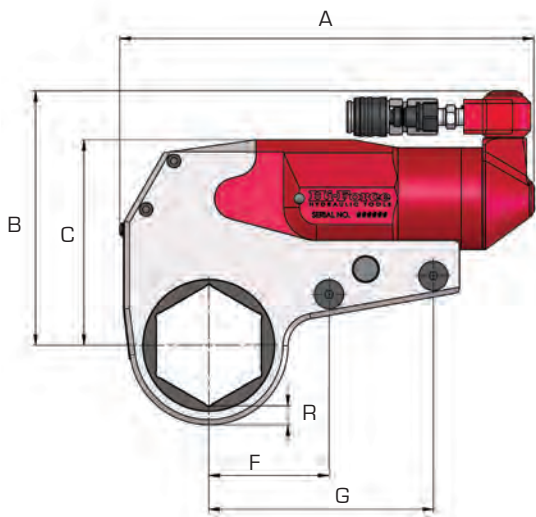
Easily assembled to selected ratchet head

Minimal nose radius for fitment in confined spaces

TWH27N, TWH54N,
TWH120N, TWH210N

TWH430N

All Models



Note: Drawing shows drive cylinder, including ratchet head as detailed on pages 81 - 82.
Drive cylinder and ratchet head are separate items and must be ordered separately.

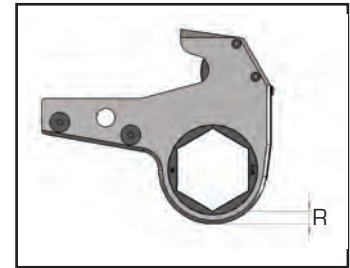
| Model number (drive cyl.) | Torque capacity | | Hexagon AF size | | Weight kg | Dimensions in mm | | | | | | | |
|------------------------------|------------------|-------------------------|-----------------|--------------------|--------------|------------------|----------|----------|----|----|-----|-----|----------------|
| | Nm at 700 Bar | lbf. ft at 10,000PSI | Metric min | Imperial max | | A max | B max | C max | D | E | F | G | R min - max |
| TWH27N | 2625 | 1906 | 24 to 46 | 1 1/16" to 1 3/16" | 1.4 | 193 | 125 | 97 | 32 | 51 | 54 | 109 | 9.5 - 12.2 |
| | 3068 | 2228 | 50 to 60 | 2" to 2 3/8" | 1.4 | 193 | 136 | 108 | 32 | 51 | 54 | 109 | 10.1 - 10.5 |
| TWH54N | 5372 | 3901 | 38 to 65 | 1 7/16" to 2 1/16" | 2.3 | 250 | 158 | 125 | 41 | 64 | 73 | 137 | 10.7 - 13.8 |
| | 6037 | 4384 | 70 to 80 | 2 3/4" to 3 1/8" | 2.3 | 250 | 169 | 136 | 41 | 64 | 73 | 137 | 11.7 - 14.6 |
| TWH120N | 11737 | 8522 | 50 to 80 | 2 3/16" to 3 1/8" | 3.8 | 310 | 189 | 157 | 52 | 78 | 92 | 112 | 14.7 - 15.2 |
| | 14349 | 10419 | 85 to 100 | 3 1/2" to 3 7/8" | 3.8 | 310 | 214 | 182 | 52 | 78 | 92 | 112 | 15.9 - 18.7 |
| TWH210N | 21216 | 15405 | 70 to 100 | 2 3/4" to 3 7/8" | 6.4 | 378 | 223 | 191 | 64 | 97 | 114 | 213 | 18.1 - 18.6 |
| | 23124 | 16791 | 105 to 115 | 4 1/4" to 4 5/8" | 6.4 | 378 | 236 | 204 | 64 | 97 | 114 | 213 | 18.3 - 20.7 |
| TWH430N | 43792 | 31798 | 80 to 115 | 3 1/8" to 4 5/8" | 16.1 | 405 | 291 | 242 | 83 | 93 | 146 | 267 | 25.6 - 31.3 |
| | 48181 | 34985 | 130 to 175 | 5" to 6 7/8" | 16.1 | 425 | 309 | 260 | 83 | 93 | 146 | 267 | 24.8 - 27.3 |

Note: Above selection table is for drive unit only. Ratchet head(s) to be ordered separately - see pages 81 - 82.
Weight as stated is drive cylinder only, exact radius size (R) varies according to ratchet AF size selected.

TWH-NRH - IMPERIAL SIZE RATCHET HEADS



- >> Choice of standard imperial sizes
- >> Easily fitted to TWH-N drive units
- >> Strong steel construction
- >> Non standard and special design ratchet heads can be made to order



The TWH-NRH range of imperial hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 79-80), provide exceptional flexibility with across flats (AF) sizes from 1 1/16" to 6 7/8" available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of imperial hexagon reducer bushes (see page 84) and square drive conversion kits (see page 83) to suit TWH-NRH imperial ratchet heads are also available.



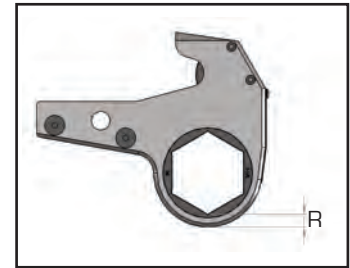
IMPERIAL RATCHET HEAD SELECTION TABLE:

| Bolt size | Nut AF size | For TWH27N | | | For TWH54N | | | For TWH120N | | | For TWH210N | | | For TWH430N | | |
|-----------|-------------|-----------------|------|-------|-----------------|------|-------|------------------|------|-------|------------------|------|-------|----------------|------|-------|
| | | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg |
| 5/8" | 1 1/16" | TWH27NRH1.1/16 | 10.4 | 1.5 | | | | | | | | | | | | |
| 3/4" | 1 1/4" | TWH27NRH1.1/4 | 9.7 | 1.6 | | | | | | | | | | | | |
| 7/8" | 1 7/16" | TWH27NRH1.7/16 | 9.8 | 1.6 | TWH54NRH1.7/16 | 13.5 | 2.9 | | | | | | | | | |
| 1" | 1 5/8" | TWH27NRH1.5/8 | 10.0 | 1.6 | TWH54NRH1.5/8 | 10.8 | 2.8 | | | | | | | | | |
| 1 1/8" | 1 13/16" | TWH27NRH1.13/16 | 10.5 | 1.7 | TWH54NRH1.13/16 | 10.7 | 2.9 | | | | | | | | | |
| 1 1/4" | 2" | TWH27NRH2 | 10.5 | 1.7 | TWH54NRH2 | 11.7 | 3.0 | | | | | | | | | |
| 1 3/8" | 2 3/16" | TWH27NRH2.3/16 | 10.3 | 1.8 | TWH54NRH2.3/16 | 11.8 | 3.1 | TWH120NRH2.3/16 | 14.7 | 6.1 | | | | | | |
| 1 1/2" | 2 3/8" | TWH27NRH2.3/8 | 10.5 | 1.8 | TWH54NRH2.3/8 | 11.8 | 3.2 | TWH120NRH2.3/8 | 14.8 | 6.4 | | | | | | |
| 1 5/8" | 2 9/16" | | | | TWH54NRH2.9/16 | 11.6 | 3.3 | TWH120NRH2.9/16 | 14.8 | 6.4 | | | | | | |
| 1 3/4" | 2 3/4" | | | | TWH54NRH2.3/4 | 11.8 | 3.4 | TWH120NRH2.3/4 | 14.9 | 6.5 | TWH210NRH2.3/4 | 18.3 | 12.1 | | | |
| 1 7/8" | 2 15/16" | | | | TWH54NRH2.15/16 | 14.8 | 3.5 | TWH120NRH2.15/16 | 14.9 | 6.5 | TWH210NRH2.15/16 | 18.3 | 12.2 | | | |
| 2" | 3 1/8" | | | | TWH54NRH3.1/8 | 12.1 | 3.5 | TWH120NRH3.1/8 | 15.1 | 6.5 | TWH210NRH3.1/8 | 18.5 | 12.3 | TWH430NRH3.1/8 | 26.0 | 23.2 |
| 2 1/4" | 3 1/2" | | | | | | | TWH120NRH3.1/2 | 16.9 | 7.9 | TWH210NRH3.1/2 | 19.3 | 12.4 | TWH430NRH3.1/2 | 26.8 | 23.9 |
| 2 1/2" | 3 7/8" | | | | | | | TWH120NRH3.7/8 | 19.6 | 8.5 | TWH210NRH3.7/8 | 19.5 | 12.5 | TWH430NRH3.7/8 | 26.5 | 25.7 |
| 2 3/4" | 4 1/4" | | | | | | | | | | TWH210NRH4.1/4 | 19.5 | 13.3 | TWH430NRH4.1/4 | 26.9 | 26.1 |
| 3" | 4 5/8" | | | | | | | | | | TWH210NRH4.5/8 | 19.3 | 13.8 | TWH430NRH4.5/8 | 25.9 | 26.3 |
| 3 1/4" | 5" | | | | | | | | | | | | | TWH430NRH5 | 27.4 | 27.9 |
| 3 1/2" | 5 3/8" | | | | | | | | | | | | | TWH430NRH5.3/8 | 25.8 | 28.3 |
| 3 3/4" | 5 3/4" | | | | | | | | | | | | | TWH430NRH5.3/4 | 24.8 | 29.3 |
| 4" | 6 1/8" | | | | | | | | | | | | | TWH430NRH6.1/8 | 25.0 | 30.1 |
| 4 1/4" | 6 1/2" | | | | | | | | | | | | | TWH430NRH6.1/2 | 25.0 | 31.0 |
| 4 1/2" | 6 7/8" | | | | | | | | | | | | | TWH430NRH6.7/8 | 27.3 | 31.8 |

TWH-NRH - METRIC SIZE RATCHET HEADS



- >> Choice of standard metric sizes
- >> Easily fitted to TWH-N drive units
- >> Strong steel construction
- >> Non standard and special design ratchet heads can be made to order



The TWH-NRH range of metric hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 79-80), provide exceptional flexibility with across flats (AF) sizes from 24mm to 175mm available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of metric hexagon reducer bushes (see page 85) and square drive conversion kits (see page 83) to suit TWH-NRH metric ratchet heads are also available.



METRIC RATCHET HEAD SELECTION TABLE:

| Bolt size | Nut AF size | For TWH27N | | | For TWH54N | | | For TWH120N | | | For TWH210N | | | For TWH430N | | |
|-----------|-------------|--------------|------|-------|--------------|------|-------|---------------|------|-------|---------------|------|-------|---------------|------|-------|
| | | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg | Model number | R mm | Wt kg |
| 16 | 24 | TWH27NRH-24 | 12.1 | 1.5 | | | | | | | | | | | | |
| 18 | 27 | TWH27NRH-27 | 10.4 | 1.5 | | | | | | | | | | | | |
| 20 | 30 | TWH27NRH-30 | 10.7 | 1.6 | | | | | | | | | | | | |
| 22 | 32 | TWH27NRH-32 | 9.5 | 1.6 | | | | | | | | | | | | |
| 24 | 36 | TWH27NRH-36 | 10.1 | 1.6 | TWH54NRH-36 | 13.8 | 2.9 | | | | | | | | | |
| - | 38 | | | | TWH54NRH-38 | 12.6 | 2.8 | | | | | | | | | |
| 27 | 41 | TWH27NRH-41 | 10.1 | 1.6 | TWH54NRH-41 | 10.9 | 2.8 | | | | | | | | | |
| 30 | 46 | TWH27NRH-46 | 10.5 | 1.7 | TWH54NRH-46 | 10.7 | 2.9 | | | | | | | | | |
| 33 | 50 | TWH27NRH-50 | 10.4 | 1.7 | TWH54NRH-50 | 12.1 | 3.0 | TWH120NRH-50 | 15.2 | 5.8 | | | | | | |
| 36 | 55 | TWH27NRH-55 | 10.1 | 1.8 | TWH54NRH-55 | 12.1 | 3.1 | TWH120NRH-55 | 15.0 | 6.1 | | | | | | |
| 39 | 60 | TWH27NRH-60 | 10.5 | 1.8 | TWH54NRH-60 | 12.0 | 3.2 | TWH120NRH-60 | 15.0 | 6.4 | | | | | | |
| 42 | 65 | | | | TWH54NRH-65 | 11.7 | 3.3 | TWH120NRH-65 | 14.9 | 6.4 | | | | | | |
| 45 | 70 | | | | TWH54NRH-70 | 11.7 | 3.4 | TWH120NRH-70 | 14.8 | 6.5 | TWH210NRH-70 | 18.2 | 12.1 | | | |
| 48 | 75 | | | | TWH54NRH-75 | 14.6 | 3.5 | TWH120NRH-75 | 14.7 | 6.5 | TWH210NRH-75 | 18.1 | 12.2 | | | |
| 52 | 80 | | | | TWH54NRH-80 | 11.7 | 3.5 | TWH120NRH-80 | 14.7 | 6.5 | TWH210NRH-80 | 18.1 | 12.3 | TWH430NRH-80 | 25.6 | 23.2 |
| 56 | 85 | | | | | | | TWH120NRH-85 | 16.4 | 7.8 | TWH210NRH-85 | 18.2 | 12.4 | TWH430NRH-85 | 29.0 | 24.0 |
| 60 | 90 | | | | | | | TWH120NRH-90 | 16.2 | 7.9 | TWH210NRH-90 | 18.6 | 12.4 | TWH430NRH-90 | 31.3 | 26.0 |
| 64 | 95 | | | | | | | TWH120NRH-95 | 15.9 | 7.9 | TWH210NRH-95 | 18.6 | 12.5 | TWH430NRH-95 | 28.5 | 25.8 |
| 68 | 100 | | | | | | | TWH120NRH-100 | 18.7 | 8.5 | TWH210NRH-100 | 18.6 | 12.5 | TWH430NRH-100 | 25.6 | 25.6 |
| 72 | 105 | | | | | | | | | | TWH210NRH-105 | 18.4 | 12.9 | TWH430NRH-105 | 28.6 | 26.5 |
| 76 | 110 | | | | | | | | | | TWH210NRH-110 | 18.3 | 13.3 | TWH430NRH-110 | 25.7 | 26.2 |
| 80 | 115 | | | | | | | | | | TWH210NRH-115 | 20.7 | 13.8 | TWH430NRH-115 | 27.3 | 26.4 |
| 90 | 130 | | | | | | | | | | | | | TWH430NRH-130 | 25.6 | 27.3 |
| - | 135 | | | | | | | | | | | | | TWH430NRH-135 | 26.6 | 28.3 |
| 100 | 145 | | | | | | | | | | | | | TWH430NRH-145 | 25.4 | 29.4 |
| 110 | 155 | | | | | | | | | | | | | TWH430NRH-155 | 25.0 | 30.1 |
| 115 | 165 | | | | | | | | | | | | | TWH430NRH-165 | 25.0 | 31.0 |
| - | 175 | | | | | | | | | | | | | TWH430NRH-175 | 27.3 | 31.8 |

TWH-N ACCESSORIES



Suitable for TWH-N range up to 23124 Nm

Square drive sizes from 1" to 2½"

Easily fitted, no special tools required

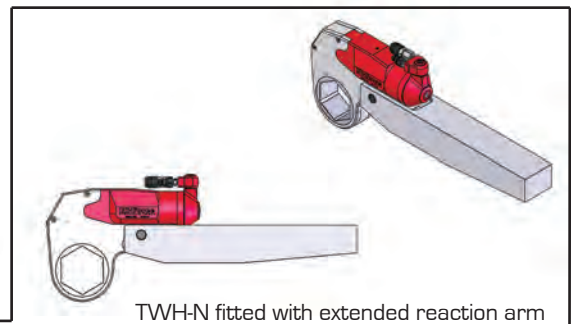
- » Supplied complete with reaction foot
- » Makes your hexagon drive torque wrench even more versatile
- » Full range of heavy duty sockets available [see pages 77 & 78]

Hi-Force SDC square drive conversion kits, suitable for Hi-Force TWH-N hexagon drive hydraulic torque wrenches (see pages 79-82) are available for all models, excluding TWH430N. All models are supplied complete with an easily attachable reaction foot and a standard hexagon AF size adaptor, suitable for fitment to a commonly used size of imperial or metric ratchet head, per tool type (see table for more details). These SDC square drive conversion kits provide the most flexible and cost effective method of converting a female hexagon drive hydraulic torque wrench into a square drive wrench.

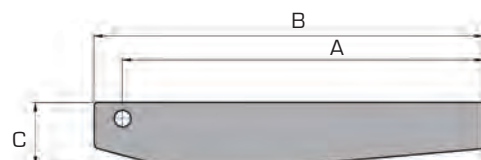
| Model number | Square drive | Hexagon AF Size | Maximum torque Nm | Maximum torque lbf.ft | Suitable for drive cylinder incl. ratchet head | | Weight kg |
|-----------------|--------------|-----------------------------------|-------------------|-----------------------|--|---|-----------|
| SDC27-I | 1" | 1 ¹³ / ₁₆ " | 3068 | 2263 | TWH27N | TWH27NRH-1¹³/₁₆" | 1.1 |
| SDC27-M | 1" | 46mm | 3068 | 2263 | TWH27N | TWH27NRH-46 | 1.1 |
| SDC54-I | 1½" | 2 ⁹ / ₁₆ " | 6037 | 4453 | TWH54N | TWH54NRH-2⁹/₁₆" | 3.0 |
| SDC54-M | 1½" | 65mm | 6037 | 4453 | TWH54N | TWH54NRH-65 | 3.0 |
| SDC120-I | 1½" | 3 ¹ / ₈ " | 14349 | 10583 | TWH120N | TWH120NRH-3¹/₈" | 4.4 |
| SDC120-M | 1½" | 80mm | 14349 | 10583 | TWH120N | TWH120NRH-80 | 4.4 |
| SDC210-I | 2½" | 3 ⁷ / ₈ " | 23124 | 17055 | TWH210N | TWH210NRH-3⁷/₈" | 9.1 |
| SDC210-M | 2½" | 100mm | 23124 | 17055 | TWH210N | TWH210NRH-100 | 9.1 |

Extended Reaction Arms

| Model Number | Length A | | Length B | | Height [C] | | Width [D] | |
|------------------|----------|-----|----------|-----|------------|-----|-----------|-----|
| | Inch | mm | Inch | mm | Inch | mm | Inch | mm |
| ERA27-20 | 19.6" | 499 | 20.7" | 525 | 1.8" | 45 | 2.0" | 50 |
| ERA54-20 | 20.2" | 513 | 21.1" | 535 | 2.2" | 55 | 2.5" | 65 |
| ERA120-21 | 20.8" | 527 | 21.7" | 550 | 3.0" | 75 | 3.4" | 85 |
| ERA210-21 | 21.5" | 545 | 23.2" | 588 | 3.7" | 95 | 3.7" | 95 |
| ERA430-22 | 22.2" | 565 | 24.7" | 628 | 4.7" | 120 | 4.7" | 120 |



Extended reaction arm



IB - IMPERIAL HEXAGON REDUCER BUSHES



To reduce the female hexagon AF size of the TWH-NRH imperial ratchet heads [see page 81], these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.

| Outside AF size | Inside AF size | For TWH27NRH | | For TWH54NRH | | For TWH120NRH | | For TWH210NRH | | For TWH430NRH | |
|-----------------|----------------|--------------|-----------------|--------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
| | | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} |
| 1 1/4" | 1 1/16" | IB27-104-101 | 2.4 | | | | | | | | |
| 1 7/16" | 1 1/16" | IB27-107-101 | 4.8 | | | | | | | | |
| 1 7/16" | 1 1/4" | IB27-107-104 | 2.4 | | | | | | | | |
| 1 5/8" | 1 1/4" | IB27-110-104 | 4.8 | IB54-110-104 | 4.8 | | | | | | |
| 1 5/8" | 1 7/16" | IB27-110-107 | 2.4 | IB54-110-107 | 2.4 | | | | | | |
| 1 13/16" | 1 7/16" | IB27-113-107 | 4.8 | IB54-113-107 | 4.8 | | | | | | |
| 1 13/16" | 1 5/8" | IB27-113-110 | 2.4 | IB54-113-110 | 2.4 | | | | | | |
| 2" | 1 5/8" | IB27-200-110 | 4.8 | IB54-200-110 | 4.8 | | | | | | |
| 2" | 1 13/16" | IB27-200-113 | 2.4 | IB54-200-113 | 2.4 | | | | | | |
| 2 3/16" | 1 5/8" | IB27-203-110 | 7.2 | IB54-203-110 | 7.2 | | | | | | |
| 2 3/16" | 1 13/16" | IB27-203-113 | 4.8 | IB54-203-113 | 4.8 | | | | | | |
| 2 3/16" | 2" | IB27-203-200 | 2.4 | IB54-203-200 | 2.4 | | | | | | |
| 2 3/8" | 1 13/16" | IB27-206-113 | 7.2 | IB54-206-113 | 7.2 | | | | | | |
| 2 3/8" | 2" | IB27-206-200 | 4.8 | IB54-206-200 | 4.8 | | | | | | |
| 2 3/8" | 2 3/16" | IB27-206-203 | 2.4 | IB54-206-203 | 2.4 | IB120-206-203 | 2.4 | | | | |
| 2 9/16" | 2" | | | IB54-209-200 | 7.2 | not available | - | | | | |
| 2 9/16" | 2 3/16" | | | IB54-209-203 | 4.8 | IB120-209-203 | 4.8 | | | | |
| 2 9/16" | 2 3/8" | | | IB54-209-206 | 2.4 | IB120-209-206 | 2.4 | | | | |
| 2 3/4" | 2 3/16" | | | IB54-212-203 | 7.2 | IB120-212-203 | 7.2 | | | | |
| 2 3/4" | 2 3/8" | | | IB54-212-206 | 4.8 | IB120-212-206 | 4.8 | | | | |
| 2 3/4" | 2 9/16" | | | IB54-212-209 | 2.4 | IB120-212-209 | 2.4 | | | | |
| 2 15/16" | 2 3/8" | | | IB54-215-206 | 7.2 | IB120-215-206 | 7.2 | | | | |
| 2 15/16" | 2 9/16" | | | IB54-215-209 | 4.8 | IB120-215-209 | 4.8 | | | | |
| 2 15/16" | 2 3/4" | | | IB54-215-212 | 2.4 | IB120-215-212 | 2.4 | IB210-215-212 | 2.4 | | |
| 3 1/8" | 2 9/16" | | | IB54-302-209 | 7.2 | IB120-302-209 | 7.2 | not available | - | | |
| 3 1/8" | 2 3/4" | | | IB54-302-212 | 4.8 | IB120-302-212 | 4.8 | IB210-302-212 | 4.8 | | |
| 3 1/8" | 2 15/16" | | | IB54-302-215 | 2.4 | IB120-302-215 | 2.4 | IB210-302-215 | 2.4 | | |
| 3 1/2" | 2 15/16" | | | | | IB120-308-215 | 7.2 | IB210-308-215 | 7.2 | | |
| 3 1/2" | 3 1/2" | | | | | IB120-308-302 | 4.8 | IB210-308-302 | 4.8 | IB430-308-302 | 4.8 |
| 3 7/8" | 3 1/8" | | | | | IB120-314-302 | 9.5 | IB210-314-302 | 9.5 | IB430-314-302 | 9.5 |
| 3 7/8" | 3 1/2" | | | | | IB120-314-308 | 4.8 | IB210-314-308 | 4.8 | IB430-314-308 | 4.8 |
| 4 1/4" | 3 1/2" | | | | | | | IB210-404-308 | 9.5 | IB430-404-308 | 9.5 |
| 4 1/4" | 3 7/8" | | | | | | | IB210-404-314 | 4.8 | IB430-404-314 | 4.8 |
| 4 5/8" | 3 7/8" | | | | | | | IB210-410-314 | 9.5 | IB430-410-314 | 9.5 |
| 4 5/8" | 4 1/4" | | | | | | | IB210-410-404 | 4.8 | IB430-410-404 | 4.8 |
| 5" | 4 1/4" | | | | | | | | | IB430-500-404 | 9.5 |
| 5" | 4 5/8" | | | | | | | | | IB430-500-410 | 4.8 |
| 5 3/8" | 4 5/8" | | | | | | | | | IB430-506-410 | 9.5 |
| 5 3/8" | 5" | | | | | | | | | IB430-506-500 | 4.8 |
| 5 3/4" | 5" | | | | | | | | | IB430-512-500 | 9.5 |
| 5 3/4" | 5 3/8" | | | | | | | | | IB430-512-506 | 4.8 |
| 6 1/8" | 5 3/8" | | | | | | | | | IB430-602-506 | 9.5 |
| 6 1/8" | 5 3/4" | | | | | | | | | IB430-602-512 | 4.8 |
| 6 1/2" | 5 3/4" | | | | | | | | | IB430-608-512 | 9.5 |
| 6 1/2" | 6 1/8" | | | | | | | | | IB430-608-602 | 4.8 |
| 6 7/8" | 6 1/8" | | | | | | | | | IB430-614-602 | 9.5 |
| 6 7/8" | 6 1/2" | | | | | | | | | IB430-614-608 | 4.8 |

MB - METRIC HEXAGON REDUCER BUSHES



To reduce the female hexagon AF size of the TWH-NRH metric ratchet heads (see page 82), these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.

| Outside AF size | Inside AF size | For TWH27NRH | | For TWH54NRH | | For TWH120NRH | | For TWH210NRH | | For TWH430NRH | |
|-----------------|----------------|--------------|-----------------|--------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
| | | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} | Model number | W _{mm} |
| 30 | 24 | MB27-30-24 | 3.0 | | | | | | | | |
| 32 | 24 | MB27-32-24 | 3.0 | | | | | | | | |
| 32 | 27 | MB27-32-27 | 3.0 | | | | | | | | |
| 36 | 30 | MB27-36-30 | 3.0 | MB54-36-30 | 3.0 | | | | | | |
| 41 | 36 | MB27-41-36 | 2.5 | MB54-41-36 | 2.5 | | | | | | |
| 46 | 36 | MB27-46-36 | 5.0 | MB54-46-36 | 5.0 | | | | | | |
| 46 | 41 | MB27-46-41 | 2.5 | MB54-46-41 | 2.5 | | | | | | |
| 50 | 41 | MB27-50-41 | 4.5 | MB54-50-41 | 4.5 | | | | | | |
| 50 | 46 | MB27-50-46 | 2.0 | MB54-50-46 | 2.0 | | | | | | |
| 55 | 41 | MB27-55-41 | 7.0 | MB54-55-41 | 7.0 | | | | | | |
| 55 | 46 | MB27-55-46 | 4.5 | MB54-55-46 | 4.5 | | | | | | |
| 55 | 50 | MB27-55-50 | 2.5 | MB54-55-50 | 2.5 | MB120-55-50 | 2.5 | | | | |
| 60 | 46 | MB27-60-46 | 7.0 | MB54-60-46 | 7.0 | not available | | | | | |
| 60 | 50 | MB27-60-50 | 5.0 | MB54-60-50 | 5.0 | MB120-60-50 | 5.0 | | | | |
| 60 | 55 | MB27-60-55 | 2.5 | MB54-60-55 | 2.5 | MB120-60-55 | 2.5 | | | | |
| 65 | 50 | | | MB54-65-50 | 7.5 | MB120-65-50 | 7.5 | | | | |
| 65 | 55 | | | MB54-65-55 | 5.0 | MB120-65-55 | 5.0 | | | | |
| 65 | 60 | | | MB54-65-60 | 2.5 | MB120-65-60 | 2.5 | | | | |
| 70 | 55 | | | MB54-70-55 | 7.5 | MB120-70-55 | 7.5 | | | | |
| 70 | 60 | | | MB54-70-60 | 5.0 | MB120-70-60 | 5.0 | | | | |
| 70 | 65 | | | MB54-70-65 | 2.5 | MB120-70-65 | 2.5 | | | | |
| 75 | 60 | | | MB54-75-60 | 7.5 | MB120-75-60 | 7.5 | | | | |
| 75 | 65 | | | MB54-75-65 | 5.0 | MB120-75-65 | 5.0 | | | | |
| 75 | 70 | | | MB54-75-70 | 2.5 | MB120-75-70 | 2.5 | MB210-75-70 | 2.5 | | |
| 80 | 65 | | | MB54-80-65 | 7.5 | MB120-80-65 | 7.5 | not available | - | | |
| 80 | 70 | | | MB54-80-70 | 5.0 | MB120-80-70 | 5.0 | MB210-80-70 | 5.0 | | |
| 80 | 75 | | | MB54-80-75 | 2.5 | MB120-80-75 | 2.5 | MB210-80-75 | 2.5 | | |
| 85 | 70 | | | | | MB120-85-70 | 7.5 | MB210-85-70 | 7.5 | | |
| 85 | 75 | | | | | MB120-85-75 | 5.0 | MB210-85-75 | 5.0 | | |
| 85 | 80 | | | | | MB120-85-80 | 2.5 | MB210-85-80 | 2.5 | MB430-85-80 | 2.5 |
| 90 | 75 | | | | | MB120-90-75 | 7.5 | MB210-90-75 | 7.5 | not available | - |
| 90 | 80 | | | | | MB120-90-80 | 5.0 | MB210-90-80 | 5.0 | MB430-90-80 | 5.0 |
| 90 | 85 | | | | | MB120-90-85 | 2.5 | MB210-90-85 | 2.5 | MB430-90-85 | 2.5 |
| 95 | 80 | | | | | MB120-95-80 | 7.5 | MB210-95-80 | 7.5 | MB430-95-80 | 7.5 |
| 95 | 85 | | | | | MB120-95-85 | 5.0 | MB210-95-85 | 5.0 | MB430-95-85 | 5.0 |
| 95 | 90 | | | | | MB120-95-90 | 2.5 | MB210-95-90 | 2.5 | MB430-95-90 | 2.5 |
| 100 | 85 | | | | | MB120-100-85 | 7.5 | MB210-100-85 | 7.5 | MB430-100-85 | 7.5 |
| 100 | 90 | | | | | MB120-100-90 | 5.0 | MB210-100-90 | 5.0 | MB430-100-90 | 5.0 |
| 100 | 95 | | | | | MB120-100-95 | 2.5 | MB210-100-95 | 2.5 | MB430-100-95 | 2.5 |
| 105 | 90 | | | | | | | MB210-105-90 | 7.5 | MB430-105-90 | 7.5 |
| 105 | 95 | | | | | | | MB210-105-95 | 5.0 | MB430-105-95 | 5.0 |
| 105 | 100 | | | | | | | MB210-105-100 | 2.5 | MB430-105-100 | 2.5 |
| 110 | 95 | | | | | | | MB210-110-95 | 7.5 | MB430-110-95 | 7.5 |
| 110 | 100 | | | | | | | MB210-110-100 | 5.0 | MB430-110-100 | 5.0 |
| 110 | 105 | | | | | | | MB210-110-105 | 2.5 | MB430-110-105 | 2.5 |
| 115 | 100 | | | | | | | MB210-115-100 | 7.5 | MB430-115-100 | 7.5 |
| 115 | 105 | | | | | | | MB210-115-105 | 5.0 | MB430-115-105 | 5.0 |
| 115 | 110 | | | | | | | MB210-115-110 | 2.5 | MB430-115-110 | 2.5 |
| 130 | 105 | | | | | | | | | MB430-130-105 | 12.5 |
| 130 | 110 | | | | | | | | | MB430-130-110 | 10.0 |
| 130 | 115 | | | | | | | | | MB430-130-115 | 7.5 |
| 145 | 110 | | | | | | | | | MB430-145-110 | 17.5 |
| 145 | 115 | | | | | | | | | MB430-145-115 | 15.0 |
| 145 | 130 | | | | | | | | | MB430-145-130 | 7.5 |

BW - BACKUP WRENCHES



BWH with BWM-50

Suitable for use with TWS-N & TWH-N Wrenches

Interchangeable hexagon links

Positive release mechanism

The Hi-Force BW series of backup wrenches provide an easily fitted and easily removable back nut reaction arm to prevent both nuts rotating during tightening applications. The 'T-Bar' design adjustable reaction point prevents lock up once tightening is completed.

Complete set:

| Model Number | Description | Backup wrench holder incl. set of links: | | | |
|----------------|---|--|--------|----------|--------|
| | | From | | To | |
| | | Imperial | Metric | Imperial | Metric |
| BWI-SET | Holder complete with imperial link set (12 pcs) | 1 7/16" | - | 3 7/8" | - |
| BWM-SET | Holder complete with metric link set (14 pcs) | - | 36mm | - | 100mm |

Individual components:

| Model Number | Description | Hexagon AF size | |
|----------------|--|-----------------|--------|
| | | Imperial | Metric |
| Holder | | | |
| BWH | Backup wrench holder | - | - |
| Hexagon links | | | |
| BWI-107 | Female hexagon link for backup wrench (imperial) | 1 1/8" | - |
| BWI-110 | Female hexagon link for backup wrench (imperial) | 1 5/8" | - |
| BWI-113 | Female hexagon link for backup wrench (imperial) | 1 13/16" | - |
| BWI-200 | Female hexagon link for backup wrench (imperial) | 2" | - |
| BWI-203 | Female hexagon link for backup wrench (imperial) | 2 3/16" | - |
| BWI-206 | Female hexagon link for backup wrench (imperial) | 2 3/8" | - |
| BWI-209 | Female hexagon link for backup wrench (imperial) | 2 9/16" | - |
| BWI-212 | Female hexagon link for backup wrench (imperial) | 2 3/4" | - |
| BWI-215 | Female hexagon link for backup wrench (imperial) | 2 15/16" | - |
| BWI-302 | Female hexagon link for backup wrench (imperial) | 3 1/8" | - |
| BWI-308 | Female hexagon link for backup wrench (imperial) | 3 1/2" | - |
| BWI-314 | Female hexagon link for backup wrench (imperial) | 3 7/8" | - |
| BWM-36 | Female hexagon link for backup wrench (metric) | - | 36 mm |
| BWM-41 | Female hexagon link for backup wrench (metric) | - | 41 mm |
| BWM-46 | Female hexagon link for backup wrench (metric) | - | 46 mm |
| BWM-50 | Female hexagon link for backup wrench (metric) | - | 50 mm |
| BWM-55 | Female hexagon link for backup wrench (metric) | - | 55 mm |
| BWM-60 | Female hexagon link for backup wrench (metric) | - | 60 mm |
| BWM-65 | Female hexagon link for backup wrench (metric) | - | 65 mm |
| BWM-70 | Female hexagon link for backup wrench (metric) | - | 70 mm |
| BWM-75 | Female hexagon link for backup wrench (metric) | - | 75 mm |
| BWM-80 | Female hexagon link for backup wrench (metric) | - | 80 mm |
| BWM-85 | Female hexagon link for backup wrench (metric) | - | 85 mm |
| BWM-90 | Female hexagon link for backup wrench (metric) | - | 90 mm |
| BWM-95 | Female hexagon link for backup wrench (metric) | - | 95 mm |
| BWM-100 | Female hexagon link for backup wrench (metric) | - | 100 mm |

HTWP - TORQUE WRENCH PUMPS



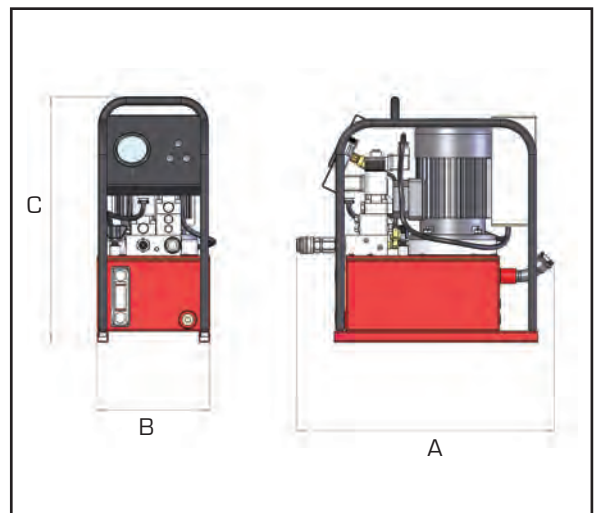
Working pressure 700 Bar

Choice of air or electric power options

Supplied complete with hand pendant controller

Hi-Force hydraulic torque wrench pumps are compatible for use with all Hi-Force hydraulic torque wrenches. All models are 700 Bar maximum working pressure, fitted with an easily accessible and adjustable torque setting pressure relief valve, and are available as air driven or electric driven pump units. All pumps are supplied with a remote operation, push button hand pendant controller with three metres of control line cable. Glycerine filled, easy to read, dual scale (0-700 Bar/0-10,000 PSI) hydraulic pressure gauges are fitted as standard to all models. Air driven versions also include an integral inline filter, regulator, lubricator system with airline pressure gauge and an exhaust air cooling system.

- >> Dual scale glycerine filled pressure gauge
- >> Two speed operation
- >> Externally adjustable torque setting valve
- >> Protective rollbar carrying frame
- >> Air pressure gauge and filter-regulator-lubricator unit (air powered pumps only)
- >> Integral oil cooling system (air powered pumps only)
- >> Reservoir oil sight level gauge
- >> Auto retract function (electric powered pumps only)
- >> Choice of standard hose length available, see page 90



| Model number | Max pressure Bar | Power supply | Motor rating kW | Displacement l/min | | Changeover pressure Bar | Weight kg | Dimensions in mm | | |
|--------------------|------------------|--------------|-----------------|--------------------|---------------|-------------------------|-----------|------------------|-----|-----|
| | | | | low pressure | high pressure | | | A | B | C |
| HTWP2140P | 700 | 7 Bar | 1.50 | 6.1 | 0.51 | 60 | 28.0 | 468 | 205 | 445 |
| HTWP2141AR | 700 | 110 volt | 0.75 | 3.9 | 0.36 | 60 | 34.0 | 468 | 205 | 445 |
| HTWP2141ARH | 700 | 110 volt | 0.75 | 3.9 | 0.36 | 60 | 34.0 | 468 | 205 | 445 |
| HTWP2142AR | 700 | 240 volt | 0.75 | 3.9 | 0.36 | 60 | 34.0 | 468 | 205 | 445 |
| HTWP2142ARH | 700 | 240 volt | 0.75 | 3.9 | 0.36 | 60 | 34.0 | 468 | 205 | 445 |

Note: Pumps with suffix 'H' in the model number are supplied with 60Hz electric motor.

TPA / TPE - TORQUE WRENCH PUMPS - PREMIUM LINE



High flow 3-stage pump unit

Choice of air or electric power options

Rigid, compact & lightweight

The Hi-Force TPA & TPE range of Premium line torque wrench pumps offers the following features :

F

- >> High speed 3-stage, 8 piston pump unit
- >> Multi outlet 4-way split block for simultaneous operation of up to 4 hydraulic wrenches
- >> Compact design, fitted within a rigid rollbar protection & carrying frame
- >> Automatically activated oil cooling heat exchanger fitted as standard on all electric driven models
- >> Exhaust air radiator cooling system on air driven models
- >> Adjustable torque setting pressure relief valve with locking nut
- >> Models with suffix 'A' fitted with analogue pressure gauge
- >> Models with suffix 'D' fitted with pressure transducer and digital pressure gauge
- >> Pendant controlled choice of manual with auto retract or full automatic cycle operation (automatic cycle functions only available on electric driven models)
- >> Solenoid valve with pendant control including motor on/off and 5 metre cable

| Model number | Max. pressure Bar | Power supply | Pressure gauge | Gauge reading [*] | Displacements l / m | | |
|----------------------------|-------------------|---------------|----------------|-------------------|---------------------|----------------------|-----------------------|
| | | | | | 1st stage 0-65 bar | 2nd stage 65-325 bar | 3rd stage 325-700 bar |
| Air driven pump units | | | | | | | |
| TPA07A | 700 | 7.0 Bar air | analogue | Bar/PSI | 7.0 | 1.6 | 0.80 |
| TPA07D | 700 | 7.0 Bar air | digital | Bar/PSI/Nm/Lbf.Ft | 7.0 | 1.6 | 0.80 |
| Electric driven pump units | | | | | | | |
| TPE15A | 700 | 110V-1Ph-50Hz | analogue | Bar/PSI | 6.5 | 1.5 | 0.75 |
| TPE15D | 700 | 110V-1Ph-50Hz | digital | Bar/PSI/Nm/Lbf.Ft | 6.5 | 1.5 | 0.75 |
| TPE16A | 700 | 120V-1Ph-60Hz | analogue | Bar/PSI | 7.8 | 1.8 | 0.90 |
| TPE16D | 700 | 120V-1Ph-60Hz | digital | Bar/PSI/Nm/Lbf.Ft | 7.8 | 1.8 | 0.90 |
| TPE25A | 700 | 230V-1Ph-50Hz | analogue | Bar/PSI | 6.5 | 1.5 | 0.75 |
| TPE25D | 700 | 230V-1Ph-50Hz | digital | Bar/PSI/Nm/Lbf.Ft | 6.5 | 1.5 | 0.75 |
| TPE26A | 700 | 230V-1Ph-60Hz | analogue | Bar/PSI | 7.8 | 1.8 | 0.90 |
| TPE26D | 700 | 230V-1Ph-60Hz | digital | Bar/PSI/Nm/Lbf.Ft | 7.8 | 1.8 | 0.90 |
| TPE45A | 700 | 400V-3Ph-50Hz | analogue | Bar/PSI | 6.5 | 1.5 | 0.75 |
| TPE45D | 700 | 400V-3Ph-50Hz | digital | Bar/PSI/Nm/Lbf.Ft | 6.5 | 1.5 | 0.75 |
| TPE46A | 700 | 480V-3Ph-60Hz | analogue | Bar/PSI | 7.8 | 1.8 | 0.90 |
| TPE46D | 700 | 480V-3Ph-60Hz | digital | Bar/PSI/Nm/Lbf.Ft | 7.8 | 1.8 | 0.90 |

Note: [*] Torque value reading only available on software controlled, programmable pump unit

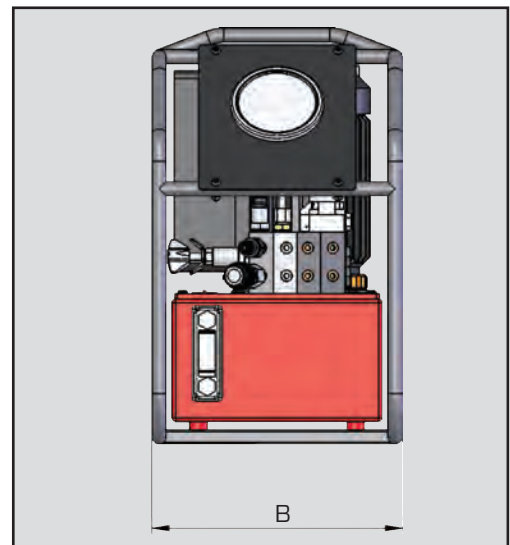
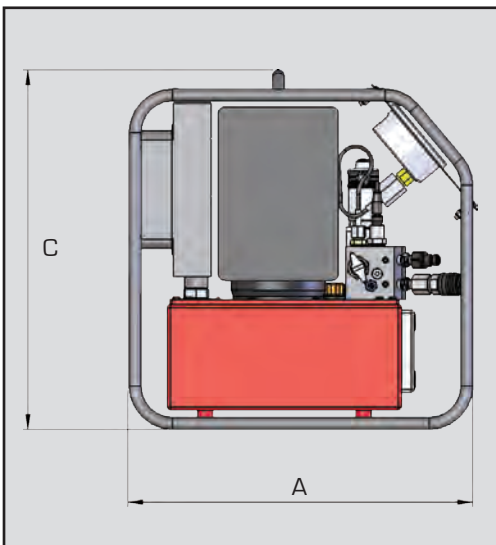


Maximum working pressure 700 Bar

Inbuilt oil cooling system

Multi-outlet block for operation of 4 wrenches

- >> Optional extras include a full software controlled pump unit, enabling the user to select the hydraulic torque wrench in use via the digital display and have torque readings (in Nm or Lbf.ft) on the digital gauge. All Hi-Force TWS-N and TWH-N hydraulic torque wrenches are programmed and selectable as standard.



| Pump Model | Oil capacity | Max. noise level | Max. oil temp | Weight incl. oil | Dimensions in mm | | |
|--------------------------------|--------------|------------------|---------------|------------------|------------------|-----------|------------|
| | | | | | Length (A) | Width (B) | Height (C) |
| All TPA air driven models | 7 litres | 90 db (A) | 80° C | 30 kg | 456 | 286 | 476 |
| All TPE electric driven models | 7 litres | 88 db (A) | 80° C | 39 kg | 456 | 286 | 476 |

Optional coupler sets for simultaneous operation of multiple torque wrenches (one set supplied fitted as standard):

| Model number | Description |
|---------------|--|
| TP-CS1 | Single set of male / female flat face couplers, for simultaneous operation of two hydraulic wrenches |
| TP-CS2 | Double set of male / female flat face couplers, for simultaneous operation of three hydraulic wrenches |
| TP-CS3 | Triple set of male / female flat face couplers, for simultaneous operation of four hydraulic wrenches |



4-WAY MULTI SPLIT BLOCK

| Model number | Description |
|--------------|---|
| HTWM4 | Multi-split block complete with quick connect couplers. Suitable for use with up to 4 hydraulic wrenches from one pump unit |



QUICK CONNECT COUPLINGS

| Model number | Thread type | Description |
|--------------|-----------------|---------------------|
| CF4F | 1/4" NPT Female | Female half coupler |
| CM4F | 1/4" NPT Female | Male half coupler |

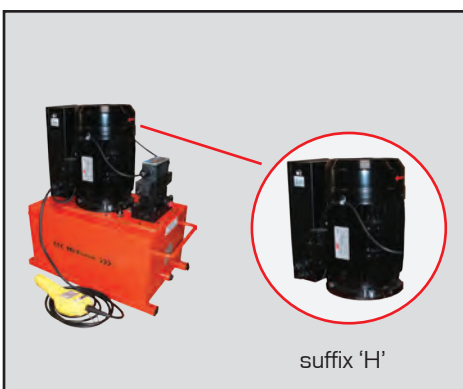
Note: Always check for the required thread size when ordering spare or replacement couplings. If different thread size is required, please check available reducers and adaptors on page 58 of this catalogue.



HYDRAULIC HOSES

| Model number | Length metres | Description |
|---------------|---------------|--|
| HTWH4 | 4 | Twin hose set with hose clips and quick connect couplers on both ends. |
| HTWH5 | 5 | |
| HTWH6 | 6 | |
| HTWH8 | 8 | |
| HTWH10 | 10 | |

Note: Alternative length hoses available on request.



50 Hz & 60 Hz ELECTRIC MOTOR

| Description |
|--|
| HTWP Pump models with suffix 'H' are supplied with 60Hz electric motor. |
| HTWP Pump models without suffix 'H' are supplied with 50Hz electric motor. |

IW - PNEUMATIC IMPACT WRENCHES



Industrial heavy duty design

Square drive sizes from 1/2" to 1 1/2"

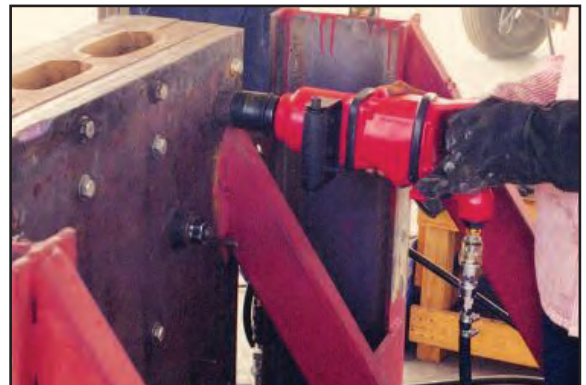
Excellent power to weight ratio

The IW range of heavy duty pneumatic impact wrenches is designed for high volume production, heavy maintenance and construction work. A choice of four models in square drive sizes 1/2", 3/4", 1" or 1 1/2" is available all offering an excellent power to weight ratio, compact design and low vibration. Available with pistol grip (models IW13P and IW19P) and back handle grip (models IW25B and IW38B) these high quality tools offer increased durability, low noise level and reduced operator fatigue. All models can be used for tightening and loosening applications and incorporate a four position adjustable power output device.

- >> Choice of four models
- >> Minimal noise and vibration features
- >> Operates from standard 6 Bar air pressure



A full range of impact quality sockets, in both imperial and metric sizes, for use with Hi-Force impact wrenches is detailed on pages 77 and 78.



| Model number | Square drive size | Bolt capacity mm | Bolt capacity inch | Free speed R.P.M. | Free speed I.P.M. | Max. torque Nm | Max. torque lbf.ft | Recommended torque Nm | Recommended torque lbf.ft | Air Consumption m³/min | Air Consumption cfm | Weight kg |
|---------------------------|-------------------|------------------|--------------------|-------------------|-------------------|----------------|--------------------|-----------------------|---------------------------|------------------------|---------------------|-----------|
| Pistol grip versions | | | | | | | | | | | | |
| IW13P | 1/2" | 16 | 5/8" | 6300 | 1200 | 450 | 300 | 90-350 | 65-260 | 0.35 | 12.5 | 2.8 |
| IW19P | 3/4" | 22 | 7/8" | 3800 | 1100 | 870 | 640 | 250-800 | 185-590 | 0.60 | 21.4 | 6.4 |
| Back handle grip versions | | | | | | | | | | | | |
| IW25B | 1" | 45 | 1 3/4" | 3700 | 700 | 2700 | 1980 | 1000-2450 | 740-1772 | 0.75 | 26.7 | 10.6 |
| IW38B | 1 1/2" | 50 | 2" | 3000 | 600 | 3500 | 2600 | 1000-3200 | 740-2370 | 0.82 | 29.2 | 15.9 |

FRL11 - FILTER REGULATOR LUBRICATOR UNIT



Protective carrying frame

Complete with air inlet hose

Air pressure gauge fitted as standard

The Hi-Force FRL11 filter regulator lubricator unit is designed to be used in conjunction with air operated tools and air driven pump units. The unit allows the air pressure to be adjusted to suit the requirements of the tool. The unit will also remove dust and water from the air supply and inject lubricant to the tool to ensure smooth operation. Supplied in a robust steel carrying and protective frame as standard, the unit comes complete with dual scale (Bar/PSI) air inlet pressure gauge and 3 meter air hose with end fittings.

The Hi-Force FRL11 filter regulator lubricator unit is supplied as standard with all pneumatic torque multipliers, series TWP and TWP-OG (see pages 72 and 73). Please note, if ordering a replacement FRL11 for use with TWP or TWP-OG torque multipliers, the gauge of FRL11 must be calibrated with the pneumatic multiplier. Please contact your local Hi-Force regional office or distributor for further details.



FRL11 fitted to the IW25B impact wrench

We strongly advise to use this FRL11 unit with all air operated tools and air driven pumps, such as IW series of pneumatic impact wrenches (see page 91), the AHP11 series foot operated air driven pumps (see page 46 to 47) and similar air driven tools, to maintain integrity of air supply.

| Model number | Air inlet connection | Air outlet connection | Weight kg | Dimensions in mm | | |
|--------------|----------------------|-----------------------|-----------|------------------|-------|--------|
| | | | | Length | Width | Height |
| FRL11 | 1/2" NPT | 1/2" NPT | 3.0 | 200 | 200 | 310 |

BOLT TENSIONERS

| | | |
|---------------------|---|--------------------|
| SBT Imperial Range | Spring return topside bolt tensioners Imperial range | Pages 94 - 95 |
| SBT Imperial Range | Bolt tensioner components Imperial range | Pages 96 - 97 |
| SBT Metric Range | Spring return topside bolt tensioners Metric range | Pages 98 - 99 |
| SBT Metric Range | Bolt tensioner components Metric range | Pages 100 - 101 |
| STS Imperial Range | Topside bolt tensioners Imperial range | Pages 102 - 103 |
| STS Imperial Range | Bolt tensioner components Imperial range | Pages 104 - 105 |
| STS Metric Range | Topside bolt tensioners Metric range | Pages 106 - 107 |
| STS Metric Range | Bolt tensioner components Metric range | Pages 108 - 109 |
| STS Specials | Topside bolt tensioners Customised & special application design | Page 110 |
| STU Imperial Range | Sub-sea bolt tensioners Imperial range | Page 111 |
| STU Metric Range | Sub-sea bolt tensioners Metric range | Page 112 |
| HTN Imperial Range | Hydraulic tensioner nuts Imperial range | Page 113 |
| HTN Metric Range | Hydraulic tensioner nuts Metric range | Page 114 |
| Pumps & Accessories | Bolt tensioner pumps, hoses, hose reels, couplers and bolt & nut protection caps | Pages 115 - 117 |
| BoltRight | The ultimate software package for calculation of the correct torque and tension values | Page 118 |

SBT - SPRING RETURN BOLT TENSIONERS - IMPERIAL



Imperial bolt size range from 1 1/4" to 4"

Maximum working pressure 1500 Bar

Spring assisted piston retraction

The SBT imperial range of hydraulic bolt tensioners, offers all of the features and benefits of our standard STS range (see pages 102 and 103), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature will reduce bolt tensioning cycle times considerably, as the tensioner pistons will automatically start to retract, after the hydraulic pressure is released. The range currently comprises of 22 models, suitable for standard size bolts from 1 1/4" to 4" diameter.

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The versatility of the SBT bolt tensioner range, is identical to our standard STS range, with a variety of interchangeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. Further details on SBT imperial conversion kits are detailed on pages 96 & 97. All SBT bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum.

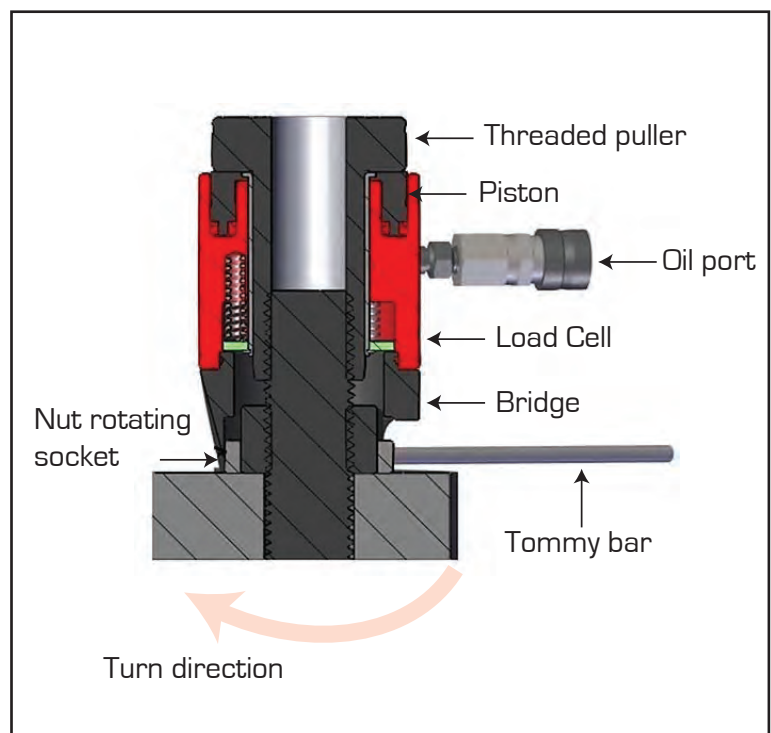
Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with SBT tensioners are detailed on pages 115 & 116 of this catalogue.

- >> Nitrocarburised piston
- >> Maximum piston stroke indicator
- >> Spring assisted return
- >> User friendly operating and maintenance procedure



Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioners. We recommend the purchase of one tommy bar for every four hydraulic tensioners.

| Tensioner range | Tommy bar |
|-----------------|-----------|
| SBT2 | TTB08 |
| SBT3 | TTB10 |
| SBT4 | TTB10 |
| SBT5 | TTB14 |
| SBT6 | TTB14 |



SBT - SPRING RETURN BOLT TENSIONERS - IMPERIAL



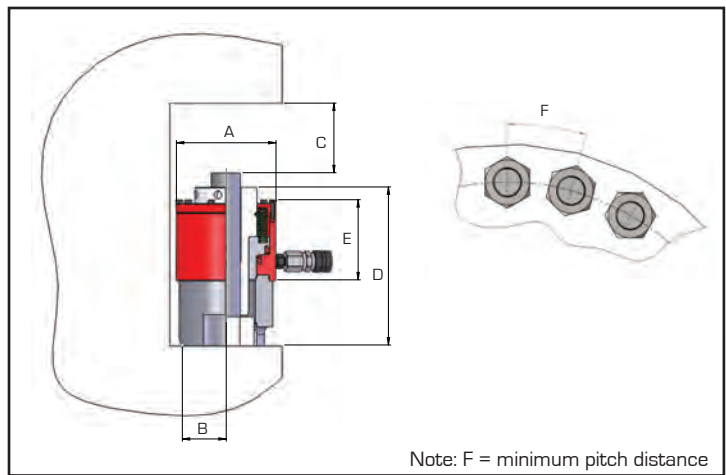
Bolt sizes from 1 1/4" to 4"

Modular design for optimum versatility

Dual quick connect couplings for easy connection



Conversion kits for SBT imperial range of bolt tensioners can be found on pages 96 and 97 of this catalogue.



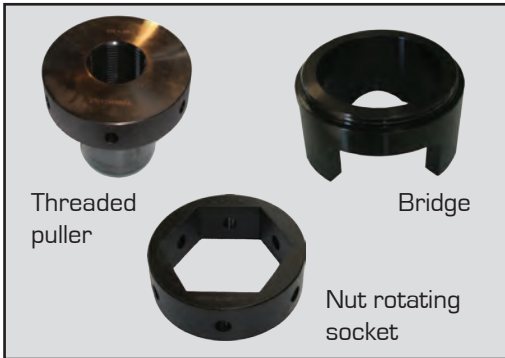
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| Model number | Bolt thread size | Threads per inch | Capacity | | Effective area cm ² | Stroke mm | Weight kg |
|--------------|------------------|------------------|----------|--------|--------------------------------|-----------|-----------|
| | | | kN | tonnes | | | |
| SBT2-125B1 | 1 1/4" | 8 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT2-137B1 | 1 3/8" | 8 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT2-150B1 | 1 1/2" | 8 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT3-162B1 | 1 5/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-175B1 | 1 3/4" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-175B2 | 1 3/4" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-187B1 | 1 7/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-187B2 | 1 7/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-200B2 | 2" | 8 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT4-187B1 | 1 7/8" | 8 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-200B1 | 2" | 8 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-200B2 | 2" | 8 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-225B2 | 2 1/4" | 8 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-250B2 | 2 1/2" | 8 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT5-250B1 | 2 1/2" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT5-275B1 | 2 3/4" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT5-300B1 | 3" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT6-300B1 | 3" | 8 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-325B1 | 3 1/4" | 8 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-350B1 | 3 1/2" | 8 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-375B3 | 3 3/4" | 8 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-400B3 | 4" | 8 | 2649 | 270.0 | 176.6 | 15 | 24.0 |

| Dimensions in mm | | | | | |
|------------------|-----|-------|-----|-----|-----|
| A | B | C min | D | E | F |
| 102 | 39 | 140 | 164 | 91 | 74 |
| 102 | 39 | 140 | 164 | 91 | 77 |
| 102 | 39 | 140 | 164 | 91 | 80 |
| 137 | 47 | 158 | 188 | 94 | 92 |
| 137 | 47 | 158 | 188 | 94 | 93 |
| 137 | 50 | 156 | 193 | 94 | 104 |
| 137 | 47 | 158 | 188 | 94 | 97 |
| 137 | 50 | 156 | 193 | 94 | 104 |
| 137 | 50 | 156 | 193 | 94 | 104 |
| 167 | 50 | 167 | 197 | 97 | 104 |
| 167 | 50 | 167 | 197 | 97 | 104 |
| 167 | 62 | 177 | 213 | 97 | 106 |
| 167 | 62 | 177 | 213 | 97 | 121 |
| 167 | 62 | 177 | 213 | 97 | 127 |
| 209 | 73 | 187 | 229 | 102 | 134 |
| 209 | 73 | 187 | 229 | 102 | 140 |
| 209 | 73 | 187 | 229 | 102 | 147 |
| 257 | 84 | 219 | 254 | 102 | 161 |
| 257 | 84 | 219 | 254 | 102 | 167 |
| 257 | 84 | 219 | 254 | 102 | 172 |
| 257 | 105 | 258 | 295 | 102 | 191 |
| 257 | 105 | 258 | 295 | 102 | 196 |

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 94 for ordering code.

SBT - BOLT TENSIONER COMPONENTS - IMPERIAL



Use with SBT Imperial Spring Return Tensioners

Modular design

Offers greater versatility

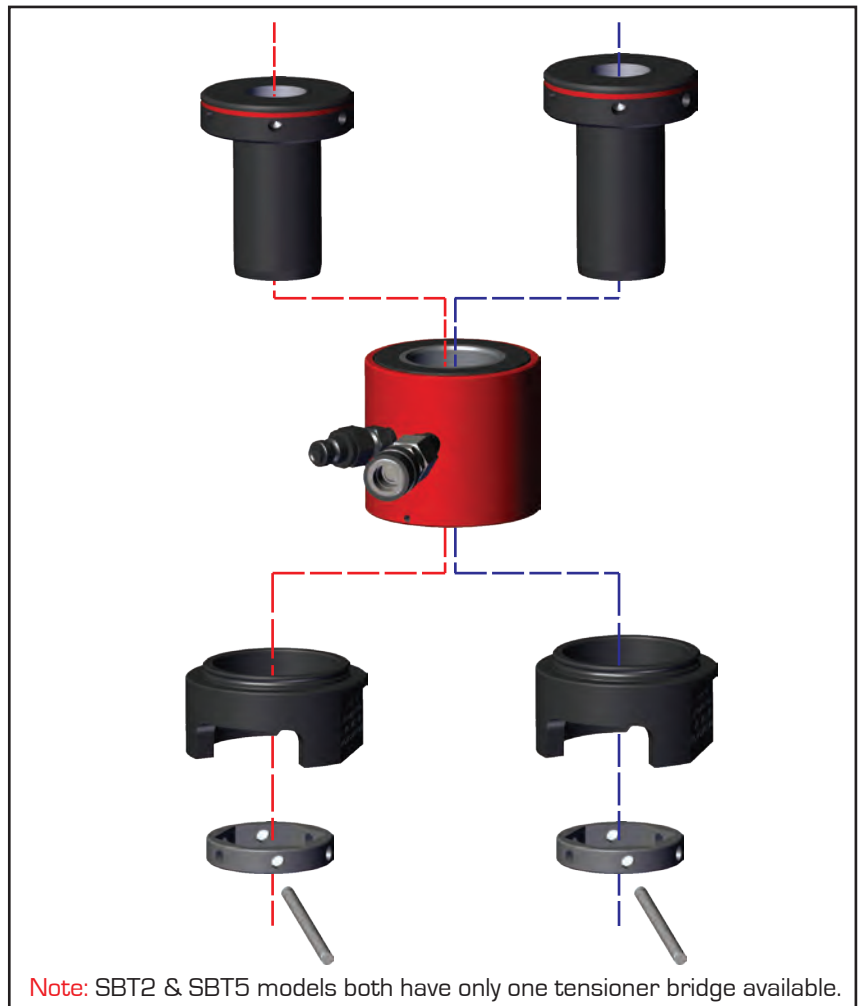
The modular design of Hi-Force SBT series spring return hydraulic bolt tensioners enables the user to adapt an existing SBT tensioner assembly to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force SBT bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models SBT3, SBT4 and SBT6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. **DO NOT** mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

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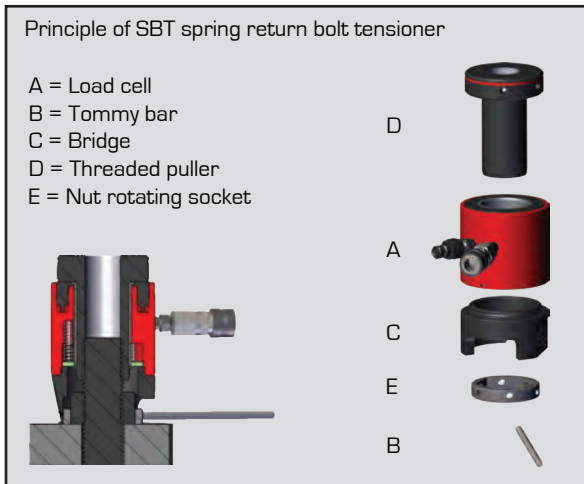
Changes within the same colour code **DO NOT** require a bridge change however, changes from the red to blue line (or vice versa) **MUST** include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.



Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

SBT - BOLT TENSIONER COMPONENTS - IMPERIAL



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

To change from SBT3-162B1 to SBT3-187B1 would require conversion kit CKS3-187B1 only.

To change from SBT3-187B1 to SBT3-200B2 would require conversion kit CKS3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

| Complete tensioner Model number Bolt Thread | Individual components | | | | | D & E Complete conversion kit |
|--|-----------------------|----------------|-------------|--|------------|----------------------------------|
| | A Load cell | B Tommy bar | C Bridge | Available as conversion kit D - Threaded puller E - Rotating socket | | |
| For tensioner range SBT2: | | | | | | |
| SBT2-125B1 | 1 1/4" | TTB08 | STS2-B1 | TPS2-125B1 | RS2-51B1 | CKS2-125B1 |
| SBT2-137B1 | 1 3/8" | | | TPS2-137B1 | RS2-56B1 | CKS2-137B1 |
| SBT2-150B1 | 1 1/2" | | | TPS2-150B1 | RS2-60B1 | CKS2-150B1 |
| For tensioner range SBT3: | | | | | | |
| SBT3-162B1 | 1 5/8" | TTB10 | STS3-B1 | TPS3-162B1 | RS3-65B1 | CKS3-162B1 |
| SBT3-175B1 | 1 3/4" | | | TPS3-175B1 | RS3-70B1 | CKS3-175B1 |
| SBT3-187B1 | 1 7/8" | | TPS3-187B1 | RS3-75B1 | CKS3-187B1 | |
| SBT3-175B2 | 1 3/4" | | STS3-B2 | TPS3-175B2 | RS3-70B2 | CKS3-175B2 |
| SBT3-187B2 | 1 7/8" | | | TPS3-187B2 | RS3-75B2 | CKS3-187B2 |
| SBT3-200B2 | 2" | | | TPS3-200B2 | RS3-80B2 | CKS3-200B2 |
| For tensioner range SBT4: | | | | | | |
| SBT4-187B1 | 1 7/8" | TTB10 | STS4-B1 | TPS4-187B1 | RS4-75B1 | CKS4-187B1 |
| SBT4-200B1 | 2" | | | TPS4-200B1 | RS4-80B1 | CKS4-200B1 |
| SBT4-200B2 | 2" | | STS4-B2 | TPS4-200B2 | RS4-80B2 | CKS4-200B2 |
| SBT4-225B2 | 2 1/4" | | | TPS4-225B2 | RS4-90B2 | CKS4-225B2 |
| SBT4-250B2 | 2 1/2" | TPS4-250B2 | RS4-98B2 | CKS4-250B2 | | |
| For tensioner range SBT5: | | | | | | |
| SBT5-250B1 | 2 1/2" | TTB14 | STS5-B1 | TPS5-250B1 | RS5-100B1 | CKS5-250B1 |
| SBT5-275B1 | 2 3/4" | | | TPS5-275B1 | RS5-108B1 | CKS5-275B1 |
| SBT5-300B1 | 3" | | | TPS5-300B1 | RS5-118B1 | CKS5-300B1 |
| For tensioner range SBT6: | | | | | | |
| SBT6-300B1 | 3" | TTB14 | STS6-B1 | TPS6-300B1 | RS6-118B1 | CKS6-300B1 |
| SBT6-325B1 | 3 1/4" | | | TPS6-325B1 | RS6-127B1 | CKS6-325B1 |
| SBT6-350B1 | 3 1/2" | | STS6-B3 | TPS6-350B1 | RS6-137B1 | CKS6-350B1 |
| SBT6-375B3 | 3 3/4" | | | TPS6-375B3 | RS6-146B3 | CKS6-375B3 |
| SBT6-400B3 | 4" | | | TPS6-400B3 | RS6-156B3 | CKS6-400B3 |

Note: Remember to check bridge compatibility for SBT3, SBT4 and SBT6 models when ordering components.

SBT - SPRING RETURN BOLT TENSIONERS - METRIC



Metric bolt size range from M30 to M100

Maximum working pressure 1500 Bar

Spring assisted piston retraction

The SBT metric range of hydraulic bolt tensioners, offers all of the features and benefits of our standard STS range (see pages 106 and 107), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature will reduce bolt tensioning cycle times considerably, as the tensioner piston will automatically start to retract, after the hydraulic pressure is released. The range currently comprises of 26 models, suitable for standard size bolts from M30 to M100 diameter.

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The versatility of the SBT bolt tensioner range, is identical to our standard STS range, with a variety of interchangeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. Further details on SBT metric conversion kits are detailed on pages 100 & 101. All SBT bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum.

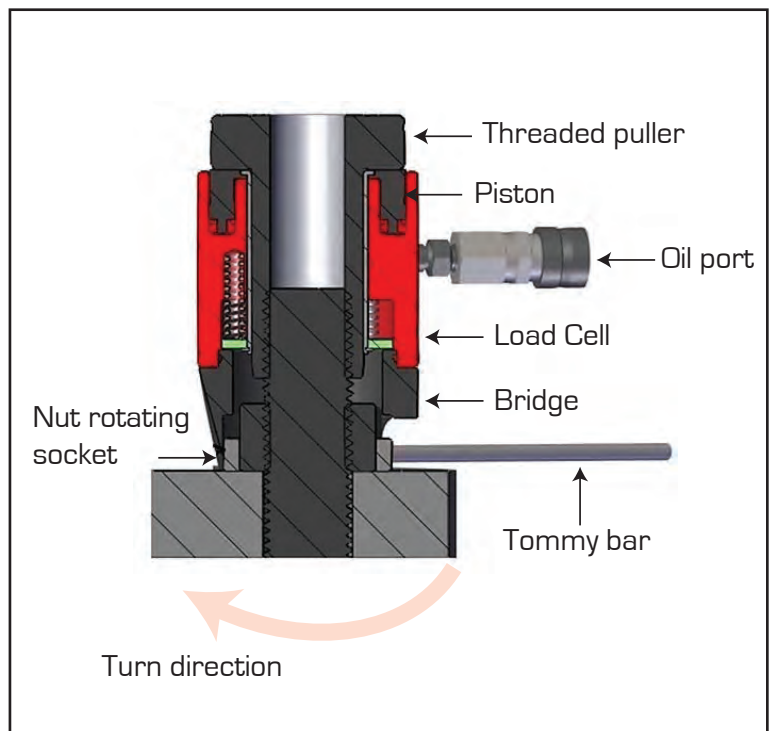
Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with SBT tensioners are detailed on pages 115 & 116 of this catalogue.

- >> Nitrocarburised piston
- >> Maximum piston stroke indicator
- >> Spring assisted return
- >> User friendly operating and maintenance procedure



Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioners. We recommend the purchase of one tommy bar for every four hydraulic tensioners.

| Tensioner range | Tommy bar |
|-----------------|-----------|
| SBT2 | TTB08 |
| SBT3 | TTB10 |
| SBT4 | TTB10 |
| SBT5 | TTB14 |
| SBT6 | TTB14 |



SBT - SPRING RETURN BOLT TENSIONERS - METRIC



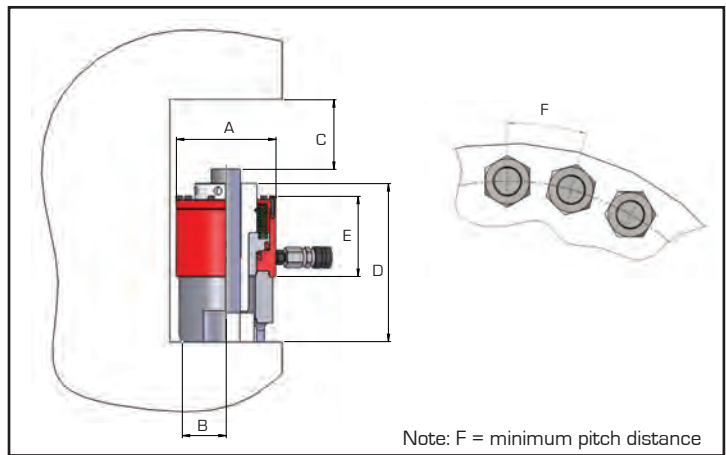
Bolt sizes from M30 to M100

Modular design for optimum versatility

Dual quick connect couplings for easy connection



Conversion kits for SBT metric range of bolt tensioners can be found on pages 100 and 101 of this catalogue.

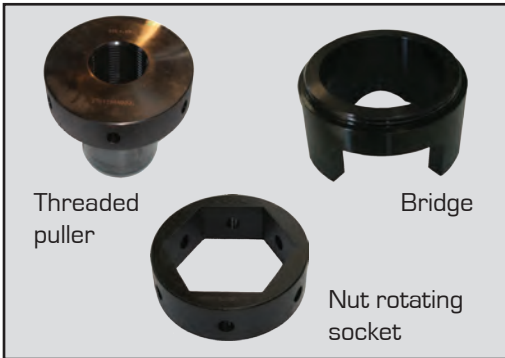


| Model number | Bolt thread size | Thread pitch | Capacity kN | Capacity tonnes | Effective area cm ² | Stroke mm | Weight kg |
|--------------|------------------|--------------|-------------|-----------------|--------------------------------|-----------|-----------|
| SBT2-M30B1 | M30 | 3.5 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT2-M33B1 | M33 | 3.5 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT2-M36B1 | M36 | 4 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT2-M39B1 | M39 | 4 | 457 | 46.6 | 30.5 | 15 | 4.0 |
| SBT3-M42B1 | M42 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-M45B1 | M45 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-M45B2 | M45 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-M48B1 | M48 | 5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-M48B2 | M48 | 5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT3-M52B2 | M52 | 5 | 822 | 83.8 | 54.8 | 15 | 6.7 |
| SBT4-M48B1 | M48 | 5 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-M52B1 | M52 | 5 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-M52B2 | M52 | 5 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-M56B2 | M56 | 5.5 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-M60B2 | M60 | 5.5 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT4-M64B2 | M64 | 6 | 1264 | 128.9 | 84.3 | 15 | 11.0 |
| SBT5-M64B1 | M64 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT5-M68B1 | M68 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT5-M72B1 | M72 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT5-M76B1 | M76 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.5 |
| SBT6-M76B1 | M76 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-M80B1 | M80 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-M85B1 | M85 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-M90B1 | M90 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-M95B3 | M95 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |
| SBT6-M100B3 | M100 | 6 | 2649 | 270.0 | 176.6 | 15 | 24.0 |

| Dimensions in mm | | | | | |
|------------------|-----|-------|-----|-----|-----|
| A | B | C min | D | E | F |
| 102 | 39 | 140 | 164 | 91 | 71 |
| 102 | 39 | 140 | 164 | 91 | 74 |
| 102 | 39 | 140 | 164 | 91 | 77 |
| 102 | 39 | 140 | 164 | 91 | 80 |
| 137 | 47 | 158 | 188 | 94 | 91 |
| 137 | 47 | 158 | 188 | 94 | 94 |
| 137 | 50 | 156 | 193 | 94 | 105 |
| 137 | 47 | 158 | 188 | 94 | 97 |
| 137 | 50 | 156 | 193 | 94 | 105 |
| 137 | 50 | 156 | 193 | 94 | 105 |
| 167 | 50 | 167 | 197 | 97 | 105 |
| 167 | 50 | 167 | 197 | 97 | 108 |
| 167 | 62 | 177 | 213 | 97 | 120 |
| 167 | 62 | 177 | 213 | 97 | 120 |
| 167 | 62 | 177 | 213 | 97 | 124 |
| 167 | 62 | 177 | 213 | 97 | 126 |
| 209 | 73 | 187 | 229 | 102 | 134 |
| 209 | 73 | 187 | 229 | 102 | 136 |
| 209 | 73 | 187 | 229 | 102 | 139 |
| 209 | 73 | 187 | 229 | 102 | 142 |
| 257 | 84 | 219 | 254 | 102 | 158 |
| 257 | 84 | 219 | 254 | 102 | 160 |
| 257 | 84 | 219 | 254 | 102 | 162 |
| 257 | 84 | 219 | 254 | 102 | 170 |
| 257 | 105 | 258 | 295 | 102 | 184 |
| 257 | 105 | 258 | 295 | 102 | 190 |

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 98 for ordering code.

SBT - BOLT TENSIONER COMPONENTS - METRIC



Cost saving option

Easily fitted to existing tensioner assembly

Offers greater versatility

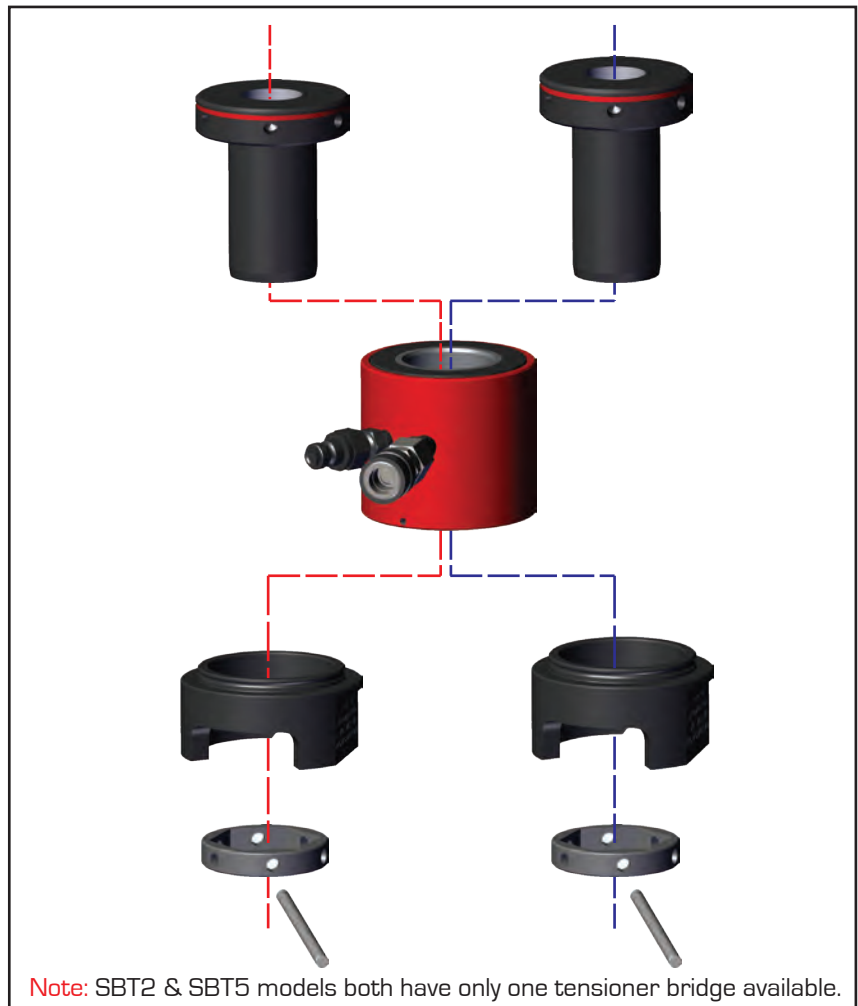
Similar to the imperial tensioner components (pages 96 & 97), the Hi-Force metric spring return hydraulic bolt tensioners are also modular in design and can be adapted to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force SBT spring return bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models SBT3, SBT4 & SBT6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. **DO NOT** mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

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Changes within the same colour code **DO NOT** require a bridge change however, changes from the red to blue line (or vice versa) **MUST** also include a relative bridge.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.

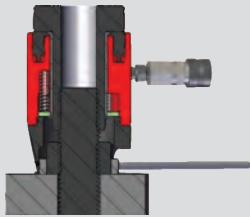


Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

SBT - BOLT TENSIONER COMPONENTS - METRIC

Principle of SBT spring return bolt tensioner

- A = Load cell
- B = Tommy bar
- C = Bridge
- D = Threaded puller
- E = Nut rotating socket



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

To change from SBT3-M42B1 to SBT3-M48B1 would require conversion kit CKS3-M48B1 only.

To change from SBT3-M48B1 to SBT3-M52B2 would require conversion kit CKS3-M52B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

| Complete tensioner Model number Bolt Thread | Individual components | | | | | D & E Complete conversion kit |
|--|-----------------------|----------------|-------------|--|------------|----------------------------------|
| | A Load cell | B Tommy bar | C Bridge | Available as conversion kit D - Threaded puller E - Rotating socket | | |
| For tensioner range SBT2: | | | | | | |
| SBT2-M30B1 M30 | SBT2-LC | TTB08 | STS2-B1 | TPS2-M30B1 | RS2-46B1 | CKS2-M30B1 |
| SBT2-M33B1 M33 | | | | TPS2-M33B1 | RS2-51B1 | CKS2-M33B1 |
| SBT2-M36B1 M36 | | | | TPS2-M36B1 | RS2-56B1 | CKS2-M36B1 |
| SBT2-M39B1 M39 | | | | TPS2-M39B1 | RS2-60B1 | CKS2-M39B1 |
| For tensioner range SBT3: | | | | | | |
| SBT3-M42B1 M42 | SBT3-LC | TTB10 | STS3-B1 | TPS3-M42B1 | RS3-65B1 | CKS3-M42B1 |
| SBT3-M45B1 M45 | | | | TPS3-M45B1 | RS3-70B1 | CKS3-M45B1 |
| SBT3-M48B1 M48 | | | TPS3-M48B1 | RS3-75B1 | CKS3-M48B1 | |
| SBT3-M45B2 M45 | | | STS3-B2 | TPS3-M45B2 | RS3-70B2 | CKS3-M45B2 |
| SBT3-M48B2 M48 | | | | TPS3-M48B2 | RS3-75B2 | CKS3-M48B2 |
| SBT3-M52B2 M52 | | | | TPS3-M52B2 | RS3-80B2 | CKS3-M52B2 |
| For tensioner range SBT4: | | | | | | |
| SBT4-M48B1 M48 | SBT4-LC | TTB10 | STS4-B1 | TPS4-M48B1 | RS4-75B1 | CKS4-M48B1 |
| SBT4-M52B1 M52 | | | | TPS4-M52B1 | RS4-80B1 | CKS4-M52B1 |
| SBT4-M52B2 M52 | | | STS4-B2 | TPS4-M52B2 | RS4-80B2 | CKS4-M52B2 |
| SBT4-M56B2 M56 | | | | TPS4-M56B2 | RS4-85B2 | CKS4-M56B2 |
| SBT4-M60B2 M60 | | | | TPS4-M60B2 | RS4-90B2 | CKS4-M60B2 |
| SBT4-M64B2 M64 | | | | TPS4-M64B2 | RS4-95B2 | CKS4-M64B2 |
| For tensioner range SBT5: | | | | | | |
| SBT5-M64B1 M64 | SBT5-LC | TTB14 | STS5-B1 | TPS5-M64B1 | RS5-95B1 | CKS5-M64B1 |
| SBT5-M68B1 M68 | | | | TPS5-M68B1 | RS5-100B1 | CKS5-M68B1 |
| SBT5-M72B1 M72 | | | | TPS5-M72B1 | RS5-105B1 | CKS5-M72B1 |
| SBT5-M76B1 M76 | | | | TPS5-M76B1 | RS5-110B1 | CKS5-M76B1 |
| For tensioner range SBT6: | | | | | | |
| SBT6-M76B1 M76 | SBT6-LC | TTB14 | STS6-B1 | TPS6-M76B1 | RS6-110B1 | CKS6-M76B1 |
| SBT6-M80B1 M80 | | | | TPS6-M80B1 | RS6-115B1 | CKS6-M80B1 |
| SBT6-M85B1 M85 | | | | TPS6-M85B1 | RS6-120B1 | CKS6-M85B1 |
| SBT6-M90B1 M90 | | | STS6-B3 | TPS6-M90B1 | RS6-130B1 | CKS6-M90B1 |
| SBT6-M95B3 M95 | | | | TPS6-M95B3 | RS6-135B3 | CKS6-M95B3 |
| SBT6-M100B3 M100 | | | | TPS6-M100B3 | RS6-146B3 | CKS6-M100B3 |

Note: Remember to check bridge compatibility for SBT3, SBT4 and SBT6 models when ordering components.

STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE



Capacities from 234 to 2649 kN

Working pressure 1500 Bar

Single acting design

- >> Nitrocarburised piston
- >> Maximum piston stroke indicator
- >> Suitable for single or multi-tensioning applications
- >> Specially designed tensioners available on request (see page 110)
- >> User friendly operating and maintenance procedure
- >> Choice of manually operated or air powered pumps available (see page 115)



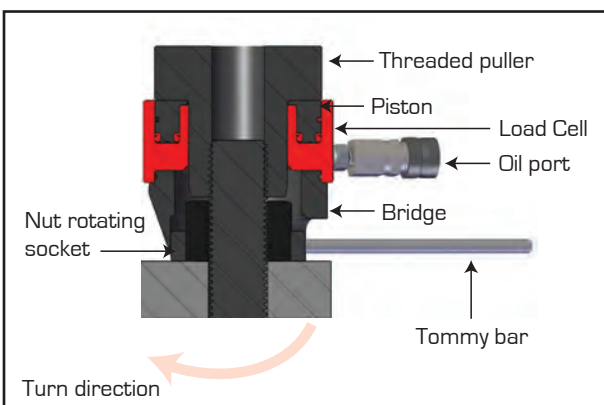
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The STS imperial bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 26 imperial size options ranging from 3/4" to 4" thread size and all models are suitable for working pressures up to 1500 Bar. Each model of hydraulic tensioning cylinder within the tensioner range can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers, bridges and nut rotating sockets are available as individual components (see pages 104 & 105 for detailed information).

All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 115 & 116.



The STS range of tensioners are push back type tensioners. For spring return tensioners, see pages 94-97 of this catalogue.



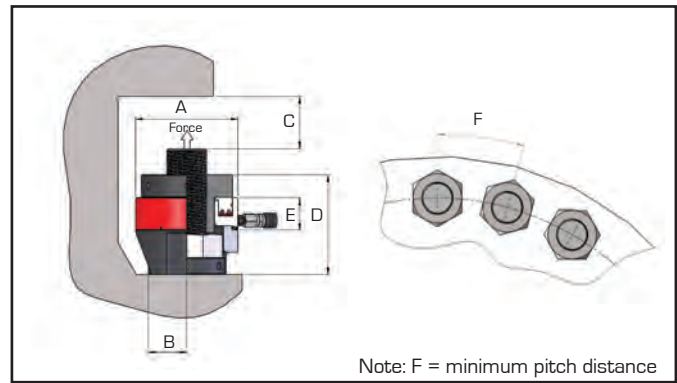
STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE



Bolt sizes from 3/4" to 4"

Modular design for optimum versatility

Dual quick connect couplings for easy connection

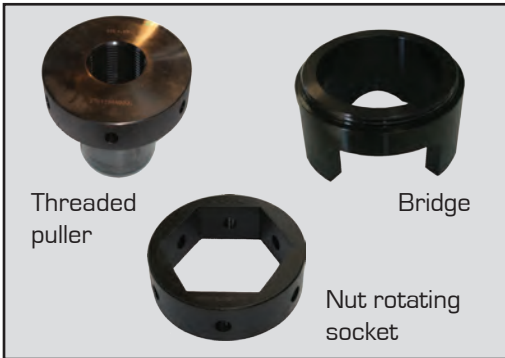


| Model number | Bolt thread size | Threads per inch | Capacity kN | Capacity tonnes | Effective area cm ² | Stroke mm | Weight kg |
|--------------|------------------|------------------|-------------|-----------------|--------------------------------|-----------|-----------|
| STS1-075B1 | 3/4" | 10 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-087B1 | 7/8" | 9 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-100B2 | 1" | 8 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-112B2 | 1 1/8" | 8 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS2-125B1 | 1 1/4" | 8 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS2-137B1 | 1 3/8" | 8 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS2-150B1 | 1 1/2" | 8 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS3-162B1 | 1 5/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-175B1 | 1 3/4" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-175B2 | 1 3/4" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-187B1 | 1 7/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-187B2 | 1 7/8" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-200B2 | 2" | 8 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS4-187B1 | 1 7/8" | 8 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-200B1 | 2" | 8 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-200B2 | 2" | 8 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-225B2 | 2 1/4" | 8 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-250B2 | 2 1/2" | 8 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS5-250B1 | 2 1/2" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS5-275B1 | 2 3/4" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS5-300B1 | 3" | 8 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS6-300B1 | 3" | 8 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-325B1 | 3 1/4" | 8 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-350B1 | 3 1/2" | 8 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-375B3 | 3 3/4" | 8 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-400B3 | 4" | 8 | 2649 | 270.0 | 176.6 | 15 | 23.5 |

| Dimensions in mm | | | | | |
|------------------|-----|-------|-----|----|-----|
| A | B | C min | D | E | F |
| 74 | 28 | 74 | 90 | 45 | 51 |
| 74 | 28 | 74 | 90 | 45 | 54 |
| 74 | 30 | 80 | 98 | 45 | 61 |
| 74 | 30 | 80 | 98 | 45 | 64 |
| 102 | 39 | 103 | 128 | 54 | 74 |
| 102 | 39 | 103 | 128 | 54 | 77 |
| 102 | 39 | 103 | 128 | 54 | 80 |
| 133 | 47 | 115 | 150 | 56 | 92 |
| 133 | 47 | 115 | 150 | 56 | 93 |
| 133 | 50 | 117 | 155 | 56 | 104 |
| 133 | 47 | 115 | 150 | 56 | 97 |
| 133 | 50 | 117 | 155 | 56 | 104 |
| 133 | 50 | 117 | 155 | 56 | 104 |
| 163 | 50 | 119 | 149 | 57 | 104 |
| 163 | 50 | 119 | 149 | 57 | 104 |
| 163 | 62 | 119 | 149 | 57 | 106 |
| 163 | 62 | 135 | 165 | 57 | 121 |
| 163 | 62 | 135 | 165 | 57 | 127 |
| 193 | 73 | 145 | 187 | 60 | 134 |
| 193 | 73 | 145 | 187 | 60 | 140 |
| 193 | 73 | 145 | 187 | 60 | 147 |
| 233 | 84 | 178 | 216 | 64 | 161 |
| 233 | 84 | 178 | 216 | 64 | 167 |
| 233 | 84 | 178 | 216 | 64 | 172 |
| 233 | 105 | 205 | 257 | 64 | 191 |
| 233 | 105 | 205 | 257 | 64 | 196 |

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 105 column B for ordering code.

STS - BOLT TENSIONER COMPONENTS - IMPERIAL



For use with STS Imperial Tensioners

Modular design

Offers greater versatility

The modular design of Hi-Force STS series topside hydraulic bolt tensioners enables the user to adapt an existing STS tensioner assembly to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components [see drawing and table on the next page], Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. **DO NOT** mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

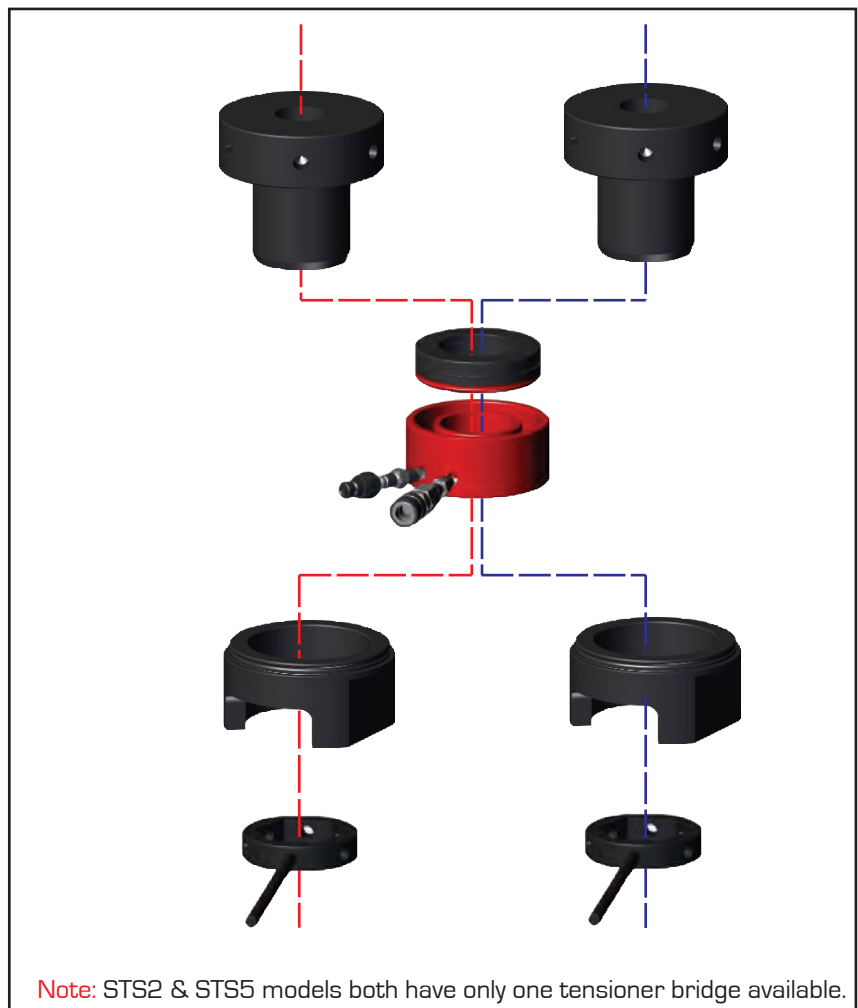
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Changes within the same colour code **DO NOT** require a bridge change however, changes from the red to blue line (or vice versa) **MUST** include a relative bridge also.

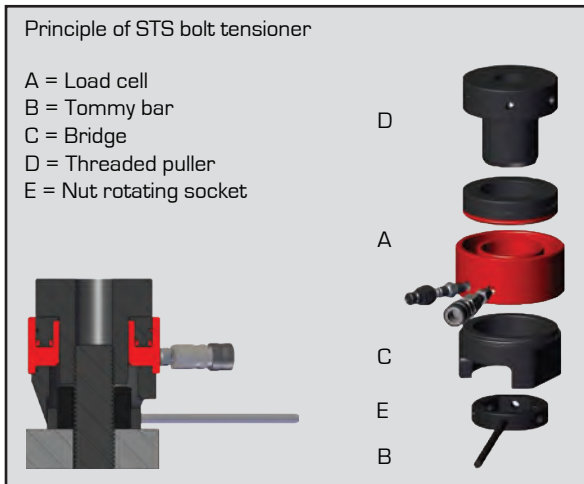
The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.



Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.



STS - BOLT TENSIONER COMPONENTS - IMPERIAL



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

To change from STS3-162B1 to STS3-187B1 would require conversion kit CK3-187B1 only.

To change from STS3-187B1 to STS3-200B2 would require conversion kit CK3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

| Complete tensioner Model number | Bolt Thread | Individual components | | | | | D & E Complete conversion kit |
|------------------------------------|----------------|-----------------------|----------------|-------------|--|-----------|-------------------------------------|
| | | A Load cell | B Tommy bar | C Bridge | Available as conversion kit D - Threaded puller E - Rotating socket | | |
| For tensioner range STS1: | | | | | | | |
| STS1-075B1 | 3/4" | STS1-LC | TTB06 | STS1-B1 | TP1-075B1 | RS1-32B1 | CK1-075B1 |
| STS1-087B1 | 7/8" | | | TP1-087B1 | RS1-37B1 | CK1-087B1 | |
| STS1-100B2 | 1" | STS1-LC | TTB06 | STS1-B2 | TP1-100B2 | RS1-41B2 | CK1-100B2 |
| STS1-112B2 | 1 1/8" | | | TP1-112B2 | RS1-46B2 | CK1-112B2 | |
| For tensioner range STS2: | | | | | | | |
| STS2-125B1 | 1 1/4" | STS2-LC | TTB08 | STS2-B1 | TP2-125B1 | RS2-51B1 | CK2-125B1 |
| STS2-137B1 | 1 3/8" | | | TP2-137B1 | RS2-56B1 | CK2-137B1 | |
| STS2-150B1 | 1 1/2" | STS2-LC | TTB08 | STS2-B1 | TP2-150B1 | RS2-60B1 | CK2-150B1 |
| STS2-150B1 | 1 1/2" | | | TP2-150B1 | RS2-60B1 | CK2-150B1 | |
| For tensioner range STS3: | | | | | | | |
| STS3-162B1 | 1 5/8" | STS3-LC | TTB10 | STS3-B1 | TP3-162B1 | RS3-65B1 | CK3-162B1 |
| STS3-175B1 | 1 3/4" | | | TP3-175B1 | RS3-70B1 | CK3-175B1 | |
| STS3-187B1 | 1 7/8" | STS3-LC | TTB10 | STS3-B1 | TP3-187B1 | RS3-75B1 | CK3-187B1 |
| STS3-175B2 | 1 3/4" | | | TP3-175B2 | RS3-70B2 | CK3-175B2 | |
| STS3-187B2 | 1 7/8" | STS3-LC | TTB10 | STS3-B2 | TP3-187B2 | RS3-75B2 | CK3-187B2 |
| STS3-200B2 | 2" | | | TP3-200B2 | RS3-80B2 | CK3-200B2 | |
| For tensioner range STS4: | | | | | | | |
| STS4-187B1 | 1 7/8" | STS4-LC | TTB10 | STS4-B1 | TP4-187B1 | RS4-75B1 | CK4-187B1 |
| STS4-200B1 | 2" | | | TP4-200B1 | RS4-80B1 | CK4-200B1 | |
| STS4-200B2 | 2" | STS4-LC | TTB10 | STS4-B1 | TP4-200B2 | RS4-80B2 | CK4-200B2 |
| STS4-225B2 | 2 1/4" | | | STS4-B2 | TP4-225B2 | RS4-90B2 | CK4-225B2 |
| STS4-250B2 | 2 1/2" | STS4-LC | TTB10 | STS4-B2 | TP4-250B2 | RS4-98B2 | CK4-250B2 |
| STS4-250B2 | 2 1/2" | | | TP4-250B2 | RS4-98B2 | CK4-250B2 | |
| For tensioner range STS5: | | | | | | | |
| STS5-250B1 | 2 1/2" | STS5-LC | TTB14 | STS5-B1 | TP5-250B1 | RS5-100B1 | CK5-250B1 |
| STS5-275B1 | 2 3/4" | | | TP5-275B1 | RS5-108B1 | CK5-275B1 | |
| STS5-300B1 | 3" | STS5-LC | TTB14 | STS5-B1 | TP5-300B1 | RS5-118B1 | CK5-300B1 |
| STS5-300B1 | 3" | | | TP5-300B1 | RS5-118B1 | CK5-300B1 | |
| For tensioner range STS6: | | | | | | | |
| STS6-300B1 | 3" | STS6-LC | TTB14 | STS6-B1 | TP6-300B1 | RS6-118B1 | CK6-300B1 |
| STS6-325B1 | 3 1/4" | | | TP6-325B1 | RS6-127B1 | CK6-325B1 | |
| STS6-350B1 | 3 1/2" | STS6-LC | TTB14 | STS6-B1 | TP6-350B1 | RS6-137B1 | CK6-350B1 |
| STS6-375B3 | 3 3/4" | | | STS6-B3 | TP6-375B3 | RS6-146B3 | CK6-375B3 |
| STS6-400B3 | 4" | STS6-LC | TTB14 | STS6-B3 | TP6-400B3 | RS6-156B3 | CK6-400B3 |
| STS6-400B3 | 4" | | | TP6-400B3 | RS6-156B3 | CK6-400B3 | |

Note: Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE

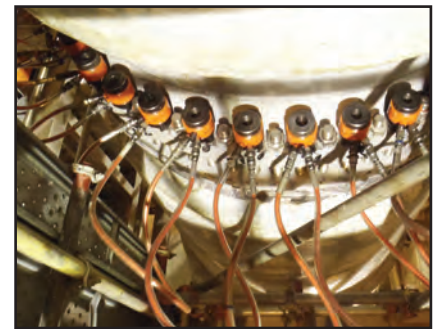


Capacities from 234 to 2649 kN

Working pressure 1500 Bar

Single acting design

- >> Nitrocarburised piston
- >> Maximum piston stroke indicator
- >> Suitable for single or multi-tensioning applications
- >> Specially designed tensioners available on request (see page 110)
- >> User friendly operating and maintenance procedure
- >> Choice of manually operated or air powered pumps available (see page 115)



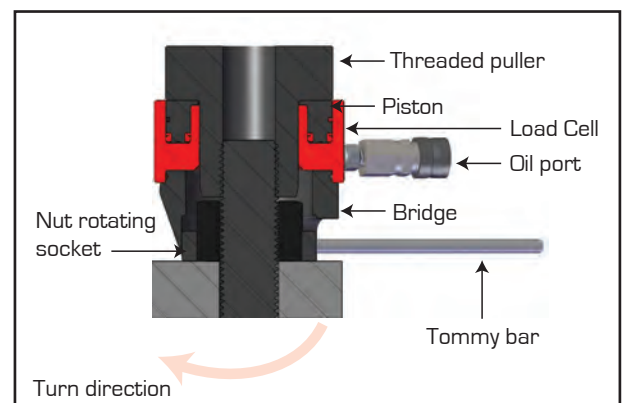
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The STS metric bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 32 metric size options ranging from M16 to M100 thread size and all models are suitable for working pressures up to 1500 Bar. Each model of hydraulic tensioning cylinder within the tensioner range can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers and nut rotating sockets are available as individual components (see pages 108 & 109 for detailed information).

All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 115 & 116.



The STS range of tensioners are push back type tensioners. For spring return tensioners, see pages 98-101 of this catalogue.



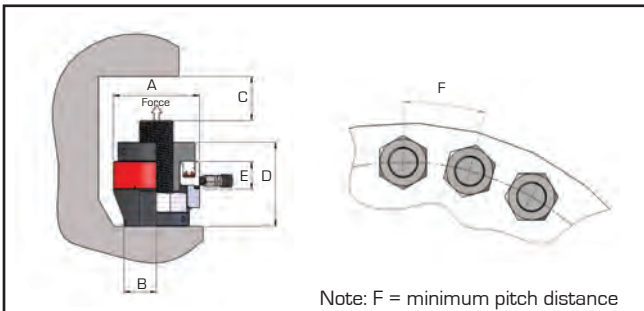
STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE



Bolt sizes from M16 to M100

Modular design for optimum versatility

Dual quick couplings for easy connection

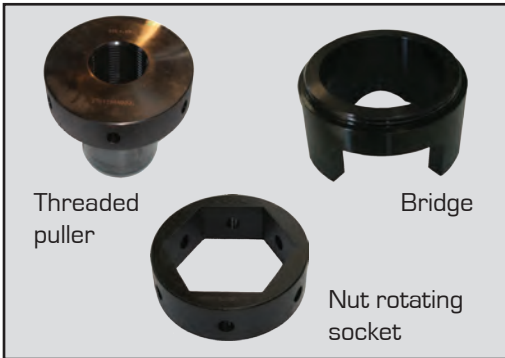


| Model number | Bolt thread size | Thread pitch | Capacity kN | Capacity tonnes | Effective area cm ² | Stroke mm | Weight kg |
|--------------|------------------|--------------|-------------|-----------------|--------------------------------|-----------|-----------|
| STS1-M16B1 | M16 | 2 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-M18B1 | M18 | 2.5 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-M20B1 | M20 | 2.5 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-M22B2 | M22 | 2.5 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-M24B2 | M24 | 3 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS1-M27B2 | M27 | 3 | 234 | 23.9 | 15.6 | 10 | 1.7 |
| STS2-M30B1 | M30 | 3.5 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS2-M33B1 | M33 | 3.5 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS2-M36B1 | M36 | 4 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS2-M39B1 | M39 | 4 | 457 | 46.6 | 30.5 | 15 | 3.5 |
| STS3-M42B1 | M42 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-M45B1 | M45 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-M45B2 | M45 | 4.5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-M48B1 | M48 | 5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-M48B2 | M48 | 5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS3-M52B2 | M52 | 5 | 822 | 83.8 | 54.8 | 15 | 6.1 |
| STS4-M48B1 | M48 | 5 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-M52B1 | M52 | 5 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-M52B2 | M52 | 5 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-M56B2 | M56 | 5.5 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-M60B2 | M60 | 5.5 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS4-M64B2 | M64 | 6 | 1264 | 128.9 | 84.3 | 15 | 10.6 |
| STS5-M64B1 | M64 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS5-M68B1 | M68 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS5-M72B1 | M72 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS5-M76B1 | M76 | 6 | 1833 | 186.9 | 122.2 | 15 | 16.0 |
| STS6-M76B1 | M76 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-M80B1 | M80 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-M85B1 | M85 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-M90B1 | M90 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-M95B3 | M95 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |
| STS6-M100B3 | M100 | 6 | 2649 | 270.0 | 176.6 | 15 | 23.5 |

| Dimensions in mm | | | | | |
|------------------|-----|-----|-----|----|-----|
| A | B | C | D | E | F |
| 74 | 28 | 74 | 90 | 45 | 47 |
| 74 | 28 | 74 | 90 | 45 | 49 |
| 74 | 28 | 74 | 90 | 45 | 51 |
| 74 | 30 | 80 | 98 | 45 | 56 |
| 74 | 30 | 80 | 98 | 45 | 59 |
| 74 | 30 | 80 | 98 | 45 | 61 |
| 102 | 39 | 103 | 128 | 54 | 71 |
| 102 | 39 | 103 | 128 | 54 | 74 |
| 102 | 39 | 103 | 128 | 54 | 77 |
| 102 | 39 | 103 | 128 | 54 | 80 |
| 133 | 47 | 115 | 150 | 56 | 91 |
| 133 | 47 | 115 | 150 | 56 | 94 |
| 133 | 50 | 117 | 155 | 56 | 105 |
| 133 | 47 | 115 | 150 | 56 | 97 |
| 133 | 50 | 117 | 155 | 56 | 105 |
| 133 | 50 | 117 | 155 | 56 | 105 |
| 163 | 50 | 119 | 149 | 57 | 105 |
| 163 | 50 | 119 | 149 | 57 | 108 |
| 163 | 62 | 135 | 165 | 57 | 120 |
| 163 | 62 | 135 | 165 | 57 | 120 |
| 163 | 62 | 135 | 165 | 57 | 124 |
| 163 | 62 | 135 | 165 | 57 | 126 |
| 193 | 73 | 145 | 187 | 60 | 134 |
| 193 | 73 | 145 | 187 | 60 | 136 |
| 193 | 73 | 145 | 187 | 60 | 139 |
| 193 | 73 | 145 | 187 | 60 | 142 |
| 233 | 84 | 178 | 216 | 64 | 158 |
| 233 | 84 | 178 | 216 | 64 | 160 |
| 233 | 84 | 178 | 216 | 64 | 162 |
| 233 | 84 | 178 | 216 | 64 | 170 |
| 233 | 105 | 205 | 257 | 64 | 184 |
| 233 | 105 | 205 | 257 | 64 | 190 |

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected. Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners, please see page 109, column B for ordering code.

STS - BOLT TENSIONER COMPONENTS - METRIC



Cost saving option

Easily fitted to existing tensioner assembly

Offers greater versatility

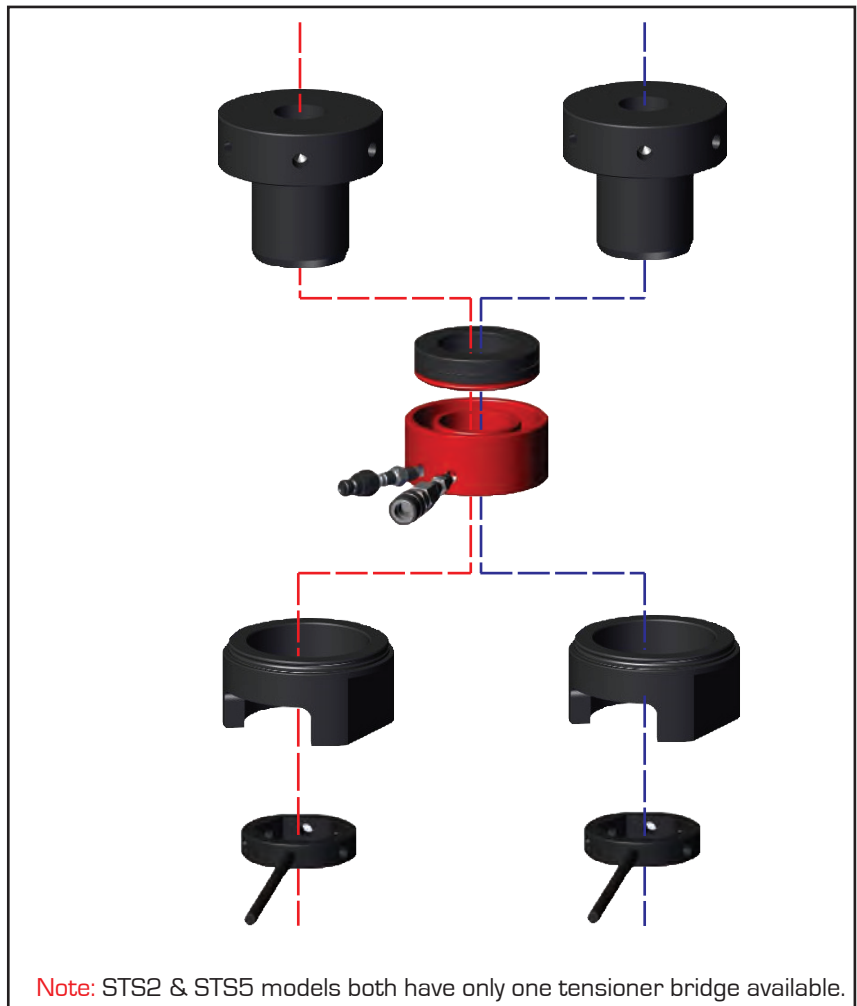
Similar to the imperial tensioner components (pages 104 & 105), the Hi-Force metric topside hydraulic bolt tensioners are also modular in design and can be adapted to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. **DO NOT** mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

G

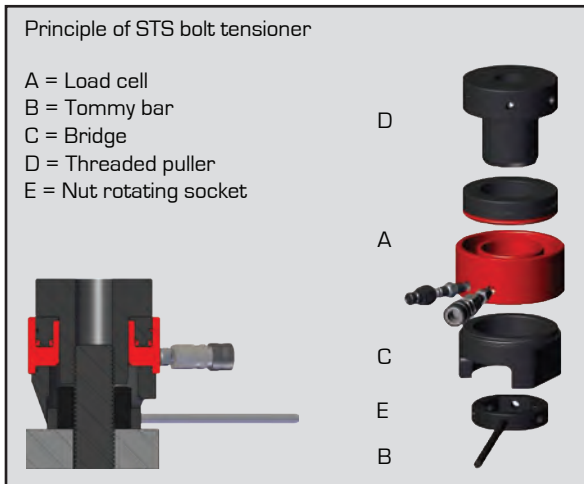
Changes within the same colour code **DO NOT** require a bridge change however, changes from the red to blue line (or vice versa) **MUST** include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adaptor, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.



Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

STS - BOLT TENSIONER COMPONENTS - METRIC



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:

To change from STS3-M42B1 to STS3-M48B1 would require conversion kit CK3-M48B1 only.

To change from STS3-M48B1 to STS3-M52B2 would require conversion kit CK3-M52B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

| Complete tensioner Bolt Model number Thread | Individual components | | | | | D & E Complete conversion kit |
|---|-----------------------|----------------|-------------|--|-----------|-------------------------------------|
| | A Load cell | B Tommy bar | C Bridge | Available as conversion kit D - Threaded puller E - Rotating socket | | |
| For tensioner range STS1: | | | | | | |
| STS1-M16B1 M16 | STS1-LC | TTB06 | STS1-B1 | TP1-M16B1 | RS1-24B1 | CK1-M16B1 |
| STS1-M18B1 M18 | | | | TP1-M18B1 | RS1-27B1 | CK1-M18B1 |
| STS1-M20B1 M20 | | | | TP1-M20B1 | RS1-30B1 | CK1-M20B1 |
| STS1-M22B2 M22 | | | STS1-B2 | TP1-M22B2 | RS1-32B2 | CK1-M22B2 |
| STS1-M24B2 M24 | | | | TP1-M24B2 | RS1-37B2 | CK1-M24B2 |
| STS1-M27B2 M27 | | | | TP1-M27B2 | RS1-41B2 | CK1-M27B2 |
| For tensioner range STS2: | | | | | | |
| STS2-M30B1 M30 | STS2-LC | TTB08 | STS2-B1 | TP2-M30B1 | RS2-46B1 | CK2-M30B1 |
| STS2-M33B1 M33 | | | | TP2-M33B1 | RS2-51B1 | CK2-M33B1 |
| STS2-M36B1 M36 | | | | TP2-M36B1 | RS2-56B1 | CK2-M36B1 |
| STS2-M39B1 M39 | | | | TP2-M39B1 | RS2-60B1 | CK2-M39B1 |
| For tensioner range STS3: | | | | | | |
| STS3-M42B1 M42 | STS3-LC | TTB10 | STS3-B1 | TP3-M42B1 | RS3-65B1 | CK3-M42B1 |
| STS3-M45B1 M45 | | | | TP3-M45B1 | RS3-70B1 | CK3-M45B1 |
| STS3-M48B1 M48 | | | | TP3-M48B1 | RS3-75B1 | CK3-M48B1 |
| STS3-M45B2 M45 | | | STS3-B2 | TP3-M45B2 | RS3-70B2 | CK3-M45B2 |
| STS3-M48B2 M48 | | | | TP3-M48B2 | RS3-75B2 | CK3-M48B2 |
| STS3-M52B2 M52 | | | | TP3-M52B2 | RS3-80B2 | CK3-M52B2 |
| For tensioner range STS4: | | | | | | |
| STS4-M48B1 M48 | STS4-LC | TTB10 | STS4-B1 | TP4-M48B1 | RS4-75B1 | CK4-M48B1 |
| STS4-M52B1 M52 | | | | TP4-M52B1 | RS4-80B1 | CK4-M52B1 |
| STS4-M52B2 M52 | | | | TP4-M52B2 | RS4-80B2 | CK4-M52B2 |
| STS4-M56B2 M56 | | | STS4-B2 | TP4-M56B2 | RS4-85B2 | CK4-M56B2 |
| STS4-M60B2 M60 | | | | TP4-M60B2 | RS4-90B2 | CK4-M60B2 |
| STS4-M64B2 M64 | | | | TP4-M64B2 | RS4-95B2 | CK4-M64B2 |
| For tensioner range STS5: | | | | | | |
| STS5-M64B1 M64 | STS5-LC | TTB14 | STS5-B1 | TP5-M64B1 | RS5-95B1 | CK5-M64B1 |
| STS5-M68B1 M68 | | | | TP5-M68B1 | RS5-100B1 | CK5-M68B1 |
| STS5-M72B1 M72 | | | | TP5-M72B1 | RS5-105B1 | CK5-M72B1 |
| STS5-M76B1 M76 | | | | TP5-M76B1 | RS5-110B1 | CK5-M76B1 |
| For tensioner range STS6: | | | | | | |
| STS6-M76B1 M76 | STS6-LC | TTB14 | STS6-B1 | TP6-M76B1 | RS6-110B1 | CK6-M76B1 |
| STS6-M80B1 M80 | | | | TP6-M80B1 | RS6-115B1 | CK6-M80B1 |
| STS6-M85B1 M85 | | | | TP6-M85B1 | RS6-120B1 | CK6-M85B1 |
| STS6-M90B1 M90 | | | STS6-B3 | TP6-M90B1 | RS6-130B1 | CK6-M90B1 |
| STS6-M95B3 M95 | | | | TP6-M95B3 | RS6-135B3 | CK6-M95B3 |
| STS6-M100B3 M100 | | | | TP6-M100B3 | RS6-146B3 | CK6-M100B3 |

Note: Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

STS - CUSTOMISED & SPECIAL DESIGN BOLT TENSIONERS



Custom design & built to your requirements

Working pressure up to 2275 Bar

Short delivery lead time

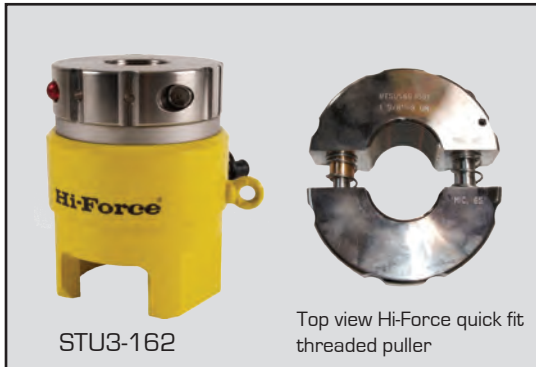
In addition to the large range of standard topside and sub-sea bolt tensioners available, Hi-Force has the capability to manufacture tensioners to suit special requirements. Our product designs incorporate the latest Solid Works computer technology and together with our 'state of the art' CNC production machinery, we have the capability to offer a solution to meet your needs.

Example of situations where Hi-Force have been able to offer bespoke solutions include:

- >> Non standard sizes and shapes of nut requiring special bridges
- >> Nuts recessed into holes requiring special sockets
- >> Studs with two different thread sizes
- >> Larger size bolts
- >> Applications with restricted space requirements
- >> Systems with different operating pressures
- >> Bridges with increased load bearing area



STU - SUB SEA BOLT TENSIONERS - IMPERIAL

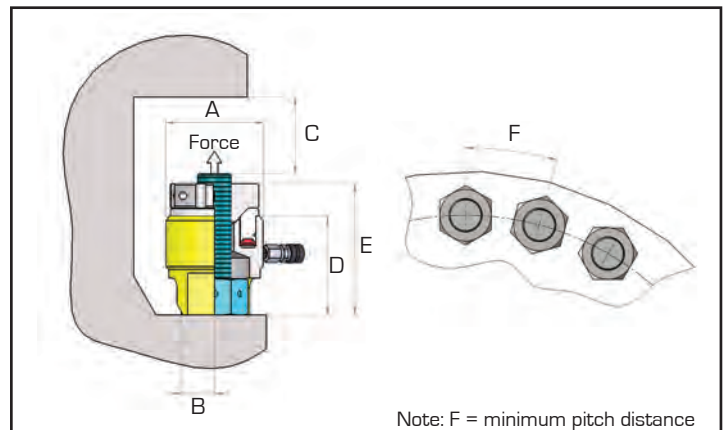
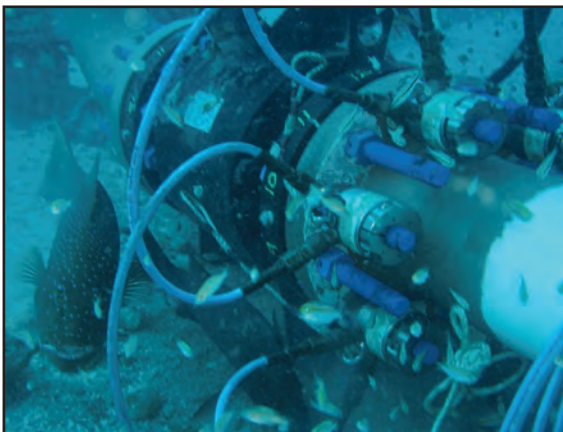


Working pressure 1500 Bar

Interchangeable quickfit/release pullers

Load cell with integral bridge

Hi-Force STU series sub-sea bolt tensioners are designed and manufactured to suit the demanding requirements of divers operating in harsh sub-sea environments. With an easy to operate two piece design comprising of a quick fit/release threaded puller and a hydraulic load cell with integral bridge and an extra long 30mm piston stroke to reduce re-setting operations, Hi-Force STU series sub-sea bolt tensioners offer a consistent, reliable and cost effective method of tensioning sub-sea bolted joints. All hydraulic load cells are suitable for different thread sizes (see table below and on page 112) and interchangeable quick fit/release pullers can be ordered separately, as required, resulting in even greater flexibility and cost savings.



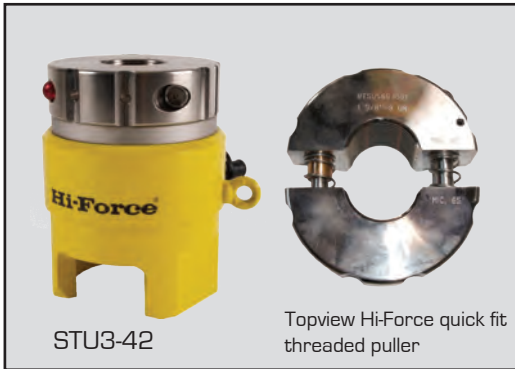
| Model number | Bolt thread size | Capacity | | Effective area cm ² | Stroke mm | Weight kg | Tommy bar |
|--------------|------------------|----------|--------|--------------------------------|-----------|-----------|-----------|
| | | kN | Tonnes | | | | |
| STU1-100 | 1" - 8UN | 256.04 | 26.10 | 17.07 | 20 | 3.4 | TTB06 |
| STU1-112 | 1 1/8" - 8UN | 256.04 | 26.10 | 17.07 | 20 | 3.4 | TTB06 |
| STU2-125 | 1 1/4" - 8UN | 430.36 | 43.87 | 28.69 | 30 | 6.0 | TTB08 |
| STU2-137 | 1 3/8" - 8UN | 430.36 | 43.87 | 28.69 | 30 | 6.0 | TTB08 |
| STU3-150 | 1 1/2" - 8UN | 553.35 | 56.41 | 36.89 | 30 | 7.5 | TTB10 |
| STU3-162 | 1 5/8" - 8UN | 553.35 | 56.41 | 36.89 | 30 | 7.5 | TTB10 |
| STU4-175 | 1 3/4" - 8UN | 756.30 | 77.09 | 50.42 | 30 | 9.8 | TTB10 |
| STU4-187 | 1 7/8" - 8UN | 756.30 | 77.09 | 50.42 | 30 | 9.8 | TTB10 |
| STU5-200 | 2" - 8UN | 1168.19 | 119.08 | 77.88 | 30 | 14.5 | TTB12 |
| STU5-225 | 2 1/4" - 8UN | 1168.19 | 119.08 | 77.88 | 30 | 14.5 | TTB12 |
| STU6-250 | 2 1/2" - 8UN | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB14 |
| STU6-275 | 2 3/4" - 8UN | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB14 |
| STU7-300 | 3" - 8UN | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |
| STU7-325 | 3 1/4" - 8UN | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |
| STU7-350 | 3 1/2" - 8UN | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |

| Dimensions in mm | | | | | | |
|------------------|----|-----|-----|-----|-----|--|
| A | B | C | D | E | F | |
| 82 | 22 | 119 | 119 | 140 | 61 | |
| 82 | 22 | 119 | 119 | 140 | 64 | |
| 102 | 30 | 140 | 140 | 164 | 73 | |
| 102 | 30 | 140 | 140 | 164 | 75 | |
| 114 | 35 | 142 | 142 | 169 | 82 | |
| 114 | 35 | 142 | 142 | 169 | 85 | |
| 128 | 41 | 151 | 151 | 181 | 94 | |
| 128 | 41 | 151 | 151 | 181 | 98 | |
| 150 | 48 | 164 | 164 | 202 | 112 | |
| 150 | 48 | 164 | 164 | 202 | 116 | |
| 176 | 60 | 183 | 183 | 231 | 136 | |
| 176 | 60 | 183 | 183 | 231 | 141 | |
| 215 | 89 | 215 | 215 | 260 | 162 | |
| 215 | 89 | 215 | 215 | 260 | 173 | |
| 215 | 89 | 215 | 215 | 260 | 175 | |

Note: Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners.

Please note that the tommy bar listed will fit related quickfit puller; a different size may be required for the hexagon nut.

STU - SUB-SEA BOLT TENSIONERS - METRIC

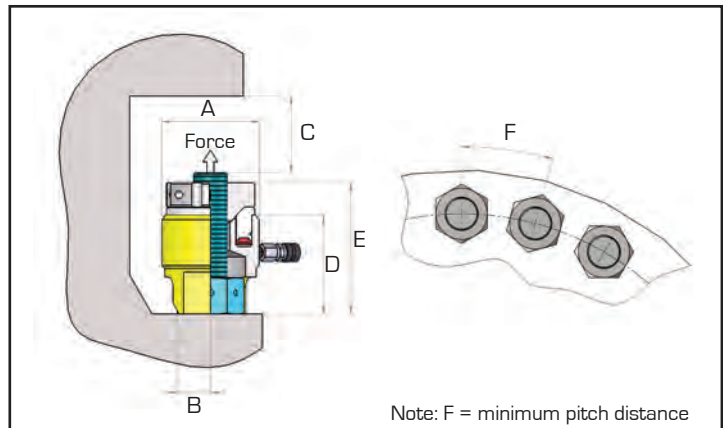


Working pressure 1500 Bar

Interchangeable quickfit/release pullers

Load cell with integral bridge

- >> Dual hose connection for easy hook up
- >> Extra long 30mm piston stroke to reduce re-setting time
- >> Maximum piston stroke indicator
- >> Corrosion protected for operation in harsh sub-sea environments



| Model number | Bolt thread size | Capacity kN | Capacity Tonnes | Effective area cm ² | Stroke mm | Weight kg | Tommy bar |
|--------------|------------------|-------------|-----------------|--------------------------------|-----------|-----------|-----------|
| STU1-24 | M24 x 3 | 256.04 | 26.10 | 17.07 | 20 | 3.4 | TTB06 |
| STU1-27 | M27 x 3 | 256.04 | 26.10 | 17.07 | 20 | 3.4 | TTB06 |
| STU2-30 | M30 x 3.5 | 430.36 | 43.87 | 28.69 | 30 | 6.0 | TTB08 |
| STU2-33 | M33 x 3.5 | 430.36 | 43.87 | 28.69 | 30 | 6.0 | TTB08 |
| STU2-36 | M36 x 4 | 430.36 | 43.87 | 28.69 | 30 | 6.0 | TTB10 |
| STU3-39 | M39 x 4 | 553.35 | 56.41 | 36.89 | 30 | 7.5 | TTB10 |
| STU3-42 | M42 x 4.5 | 553.35 | 56.41 | 36.89 | 30 | 7.5 | TTB10 |
| STU4-45 | M45 x 4.5 | 756.30 | 77.09 | 50.42 | 30 | 9.8 | TTB10 |
| STU4-48 | M48 x 5 | 756.30 | 77.09 | 50.42 | 30 | 9.8 | TTB12 |
| STU5-52 | M52 x 5 | 1168.19 | 119.08 | 77.88 | 30 | 14.5 | TTB12 |
| STU5-56 | M56 x 5.5 | 1168.19 | 119.08 | 77.88 | 30 | 14.5 | TTB14 |
| STU6-60 | M60 x 5.5 | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB14 |
| STU6-64 | M64 x 6 | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB16 |
| STU6-68 | M68 x 6 | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB16 |
| STU6-72 | M72 x 6 | 1649.12 | 168.11 | 109.94 | 30 | 22.8 | TTB16 |
| STU7-76 | M76 x 6 | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |
| STU7-80 | M80 x 6 | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |
| STU7-85 | M85 x 6 | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |
| STU7-90 | M90 x 6 | 2483.44 | 253.15 | 165.56 | 30 | 35.6 | TTB16 |

| Dimensions in mm | | | | | | |
|------------------|----|-----|-----|-----|-----|--|
| A | B | C | D | E | F | |
| 82 | 22 | 119 | 119 | 140 | 61 | |
| 82 | 22 | 119 | 119 | 140 | 64 | |
| 102 | 30 | 140 | 140 | 164 | 73 | |
| 102 | 30 | 140 | 140 | 164 | 75 | |
| 102 | 30 | 140 | 140 | 164 | 78 | |
| 114 | 35 | 142 | 142 | 169 | 82 | |
| 114 | 35 | 142 | 142 | 169 | 85 | |
| 128 | 41 | 151 | 151 | 181 | 94 | |
| 128 | 41 | 151 | 151 | 181 | 98 | |
| 150 | 48 | 164 | 164 | 202 | 112 | |
| 150 | 48 | 164 | 164 | 202 | 116 | |
| 176 | 60 | 183 | 183 | 231 | 136 | |
| 176 | 60 | 183 | 183 | 231 | 136 | |
| 176 | 60 | 183 | 183 | 231 | 136 | |
| 176 | 60 | 183 | 183 | 231 | 141 | |
| 215 | 89 | 215 | 215 | 260 | 164 | |
| 215 | 89 | 215 | 215 | 260 | 164 | |
| 215 | 89 | 215 | 215 | 260 | 175 | |
| 215 | 89 | 215 | 215 | 260 | 175 | |

Note: Tommy bars are not included. Hi-Force recommends one tommy bar for every four tensioners.

Please note that the tommy bar listed will fit related quickfit puller; a different size may be required for the hexagon nut.

HTN - HYDRAULIC TENSIONER NUTS - IMPERIAL



Integral mechanical load retaining collar

Working pressure 1500 Bar

Imperial thread sizes from 1" to 4"

The Hi-Force HTN range of imperial top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint, for inspection and maintenance purposes is required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts, on one side of the bolted joint. Initially the bolt tension or elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar.

Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, if the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for imperial bolt sizes from 1" to 4", with other sizes available to special order. All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses (see pages 115 & 116).



Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioner nuts. We recommend the purchase of one tommy bar for every four tensioners nuts.

| Model Number | Bolt Size | Capacity kN | Capacity tonnes | Effective area cm ² | Stroke mm | Diameter mm | Height mm | Weight kg | Tommy bar |
|--------------|---------------|-------------|-----------------|--------------------------------|-----------|-------------|-----------|-----------|-----------|
| HTN1-100 | 1" - 8 UN | 198.27 | 20.21 | 13.22 | 5 | 72 | 55 | 1.9 | TTB06 |
| HTN2-112 | 1 1/8" - 8 UN | 216.30 | 22.05 | 14.42 | 5 | 75 | 55 | 2.0 | TTB06 |
| HTN3-125 | 1 1/4" - 8 UN | 252.94 | 25.78 | 16.86 | 5 | 82 | 57 | 2.4 | TTB06 |
| HTN4-137 | 1 3/8" - 8 UN | 305.83 | 31.18 | 20.39 | 5 | 88 | 57 | 2.7 | TTB06 |
| HTN5-150 | 1 1/2" - 8 UN | 344.12 | 35.08 | 22.94 | 6 | 93 | 58 | 2.9 | TTB06 |
| HTN6-162 | 1 5/8" - 8 UN | 397.61 | 40.53 | 26.51 | 6 | 100 | 62 | 3.5 | TTB06 |
| HTN7-175 | 1 3/4" - 8 UN | 475.01 | 48.42 | 31.67 | 6 | 106 | 64 | 4.0 | TTB06 |
| HTN8-187 | 1 7/8" - 8 UN | 501.40 | 51.11 | 33.43 | 6 | 110 | 64 | 4.2 | TTB06 |
| HTN9-200 | 2" - 8 UN | 563.72 | 57.46 | 37.58 | 6 | 117 | 67 | 4.9 | TTB06 |
| HTN10-225 | 2 1/4" - 8 UN | 746.44 | 76.09 | 49.76 | 8 | 128 | 74 | 6.4 | TTB06 |
| HTN11-250 | 2 1/2" - 8 UN | 905.13 | 92.27 | 60.34 | 8 | 141 | 77 | 8.0 | TTB06 |
| HTN12-275 | 2 3/4" - 8 UN | 999.85 | 101.92 | 66.66 | 8 | 150 | 78 | 8.8 | TTB08 |
| HTN13-300 | 3" - 8 UN | 1203.43 | 122.67 | 80.23 | 8 | 162 | 81 | 10.6 | TTB08 |
| HTN14-325 | 3 1/4" - 8 UN | 1413.72 | 144.11 | 94.25 | 10 | 174 | 87 | 12.9 | TTB08 |
| HTN15-350 | 3 1/2" - 8 UN | 1605.04 | 163.61 | 107.00 | 10 | 187 | 95 | 16.2 | TTB10 |
| HTN16-375 | 3 3/4" - 8 UN | 1704.59 | 173.76 | 113.64 | 10 | 194 | 102 | 18.3 | TTB10 |
| HTN17-400 | 4" - 8 UN | 1911.46 | 194.85 | 127.43 | 10 | 205 | 110 | 21.9 | TTB10 |

HTN - HYDRAULIC TENSIONER NUTS - METRIC



Integral mechanical load retaining collar

Working pressure 1500 Bar

Metric thread sizes from M24 to M100

The Hi-Force HTN range of metric top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint for inspection and maintenance purposes is

required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts on one side of the bolted joint. Initially the bolt tension or elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar.

Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, when the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for bolt sizes from M24 to M100, with other sizes available to special order. All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses [see page 115 & 116].

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Don't forget to order your tommy bars when purchasing Hi-Force hydraulic tensioner nuts. We recommend the purchase of one tommy bar for every four tensioners nuts.

| Model number | Bolt size | Capacity kN | Capacity tonnes | Effective area cm ² | Stroke mm | Diameter mm | Height mm | Weight kg | Tommy bar |
|-------------------|-----------|----------------|--------------------|--------------------------------------|--------------|----------------|--------------|--------------|--------------|
| HTN1-M24 | M24 x 3 | 198.27 | 20.21 | 13.22 | 5 | 72 | 55 | 1.9 | TTB06 |
| HTN2-M27 | M27 x 3 | 216.30 | 22.05 | 14.42 | 5 | 75 | 55 | 2.0 | TTB06 |
| HTN3-M30 | M30 x 3.5 | 252.94 | 25.78 | 16.86 | 5 | 82 | 57 | 2.4 | TTB06 |
| HTN3-M33 | M33 x 3.5 | 252.94 | 25.78 | 16.86 | 5 | 82 | 57 | 2.4 | TTB06 |
| HTN4-M36 | M36 x 4 | 305.83 | 31.18 | 20.39 | 5 | 88 | 57 | 2.7 | TTB06 |
| HTN5-M39 | M39 x 4 | 344.12 | 35.08 | 22.94 | 6 | 93 | 58 | 2.9 | TTB06 |
| HTN6-M42 | M42 x 4.5 | 397.61 | 40.53 | 26.51 | 6 | 100 | 62 | 3.5 | TTB06 |
| HTN7-M45 | M45 x 4.5 | 475.01 | 48.42 | 31.67 | 6 | 106 | 64 | 4.0 | TTB06 |
| HTN8-M48 | M48 x 5 | 501.40 | 51.11 | 33.43 | 6 | 110 | 64 | 4.2 | TTB06 |
| HTN9-M52 | M52 x 5 | 563.72 | 57.46 | 37.58 | 6 | 117 | 67 | 4.9 | TTB06 |
| HTN10-M56 | M56 x 5.5 | 746.44 | 76.09 | 49.76 | 8 | 128 | 74 | 6.4 | TTB06 |
| HTN11-M60 | M60 x 5.5 | 905.13 | 92.27 | 60.34 | 8 | 141 | 77 | 8.0 | TTB06 |
| HTN11-M64 | M64 x 6 | 905.13 | 92.27 | 60.34 | 8 | 141 | 77 | 8.0 | TTB06 |
| HTN12-M68 | M68 x 6 | 999.85 | 101.92 | 66.66 | 8 | 150 | 78 | 8.8 | TTB08 |
| HTN13-M72 | M72 x 6 | 1203.43 | 122.67 | 80.23 | 8 | 162 | 81 | 10.6 | TTB08 |
| HTN13-M76 | M76 x 6 | 1203.43 | 122.67 | 80.23 | 8 | 162 | 81 | 10.6 | TTB08 |
| HTN14-M80 | M80 x 6 | 1413.72 | 144.11 | 94.25 | 10 | 174 | 87 | 12.9 | TTB08 |
| HTN15-M85 | M85 x 6 | 1605.04 | 163.61 | 107.00 | 10 | 187 | 95 | 16.2 | TTB10 |
| HTN15-M90 | M90 x 6 | 1605.04 | 163.61 | 107.00 | 10 | 187 | 95 | 16.2 | TTB10 |
| HTN16-M95 | M95 x 6 | 1704.59 | 173.76 | 113.64 | 10 | 194 | 102 | 18.3 | TTB10 |
| HTN17-M100 | M100 x 6 | 1911.46 | 194.85 | 127.43 | 10 | 205 | 110 | 21.9 | TTB10 |

AHP-BTU - AIR DRIVEN PUMP FOR BOLT TENSIONERS



Operates from standard 7 Bar air supply

Air consumption 28 scfm (0.79 m³/minute)

Working pressure 1500 Bar

The Hi-Force AHP-BTU range of air driven hydraulic pumps is compatible for use with Hi-Force STS, SBT and STU bolt tensioners as well as HTN hydraulic nuts. The pump unit is easy to operate and is supplied complete with a glycerine filled vibra-gauge and quick release outlet coupling. The complete system, including an air inlet filter, regulator and lubricator unit is fitted in a robust stainless steel frame. See page 116 for compatible high pressure hydraulic hoses and couplings.

| Model number | Working pressure Bar | Usable oil capacity litres | Oil flow per stroke cm ³ | Outlet coupler | Weight kg | Dimensions in mm | | |
|--------------------|----------------------|----------------------------|-------------------------------------|----------------|-----------|------------------|-------|--------|
| | | | | | | Length | Width | Height |
| AHP275BTU | 1500 | 7 | 1.6 | STFC4 | 20 | 450 | 395 | 395 |
| AHP2-237BTU | 1500 | 7 | 6.1 | STFC4 | 24 | 450 | 390 | 465 |

G

HPX-BTU - MANUALLY OPERATED PUMP FOR BOLT TENSIONERS



Compact & lightweight design

Complete with pressure gauge

Working pressure 1500 Bar

Hi-Force HPX1500BTU manually operated high pressure hydraulic pump is compatible for use with Hi-Force STS, SBT and STU bolt tensioners as well as HTN hydraulic nuts. Lightweight, compact and independent from any required power source, it is suitable for all tensioning applications on-site requiring reliable hydraulic power. The pump is easy to operate and supplied complete with a pressure gauge and quick release outlet coupling. See page 116 for compatible high pressure hydraulic hoses.

| Model number | Working pressure Bar | Usable oil capacity litres | Displacement per stroke (cm ³) | | Outlet coupler | Weight kg | Dimensions in mm | | |
|-------------------|----------------------|----------------------------|--|-----------------------|----------------|-----------|------------------|-------|--------|
| | | | 1 st stage | 2 nd stage | | | Length | Width | Height |
| HPX1500BTU | 1500 | 1.2 | 20.0 | 1.0 | STFC4 | 6.5 | 617 | 125 | 161 |

BOLT TENSIONER HOSES, COUPLERS & HOSE REELS

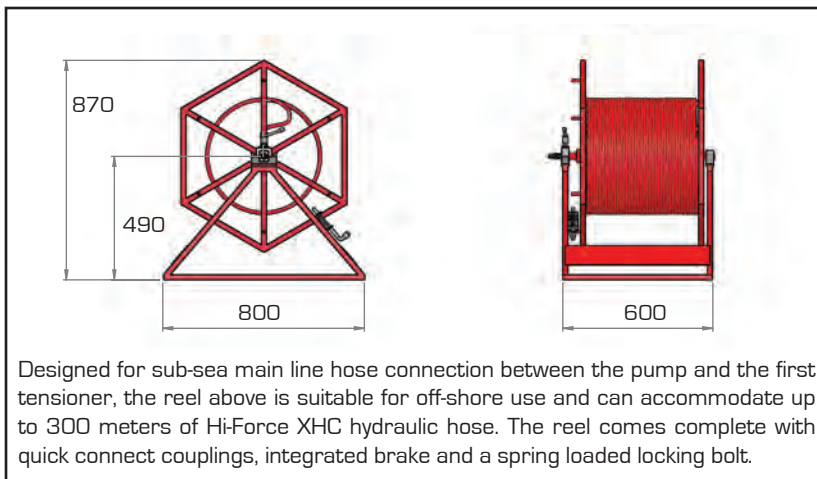


Safety factor 3 : 1

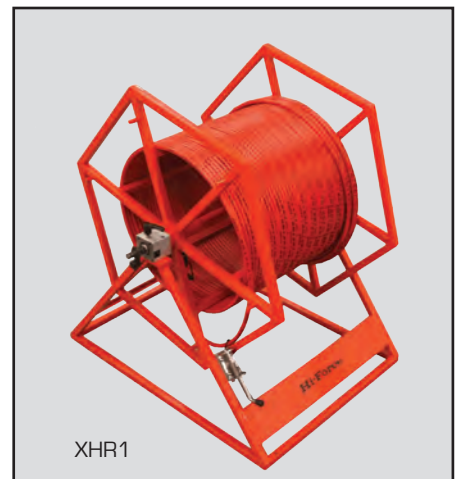
Working pressure up to 1500 Bar

Supplied with quick connect couplings

Hi-Force ultra-high pressure hoses are compatible for use with all Hi-Force bolt tensioning products up to a maximum of 1500 Bar working pressure. Each hose is supplied complete with quick connect couplings on each end (male/female) and has a safety factor of 3:1 on maximum working pressure. Eleven standard lengths are available with special lengths available on request.



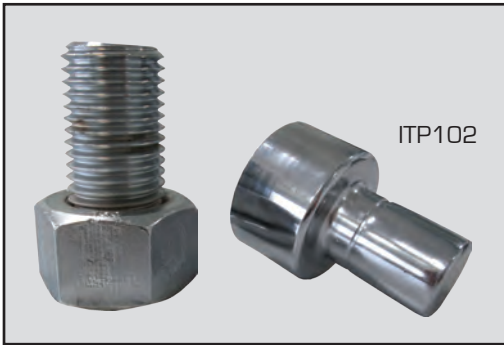
Designed for sub-sea main line hose connection between the pump and the first tensioner, the reel above is suitable for off-shore use and can accommodate up to 300 meters of Hi-Force XHC hydraulic hose. The reel comes complete with quick connect couplings, integrated brake and a spring loaded locking bolt.



XHR1

| Model number | Maximum pressure Bar | Description |
|-----------------|----------------------|--|
| XHC1.5B | 1500 | Link hose complete with quick connect couplings, length 1.5 metres |
| XHC3B | 1500 | Link hose complete with quick connect couplings, length 3.0 metres |
| XHC5B | 1500 | Mainline hose complete with quick connect couplings, length 5.0 metres |
| XHC10B | 1500 | Mainline hose complete with quick connect couplings, length 10.0 metres |
| XHC25B | 1500 | Mainline hose complete with quick connect couplings, length 25.0 metres |
| XHC50B | 1500 | Mainline hose complete with quick connect couplings, length 50.0 metres |
| XHC100B | 1500 | Mainline hose complete with quick connect couplings, length 100.0 metres |
| XHC150B | 1500 | Mainline hose complete with quick connect couplings, length 150.0 metres |
| XHC200B | 1500 | Mainline hose complete with quick connect couplings, length 200.0 metres |
| XHC250B | 1500 | Mainline hose complete with quick connect couplings, length 250.0 metres |
| XHC300B | 1500 | Mainline hose complete with quick connect couplings, length 300.0 metres |
| XHR1 | 1500 | Hose reel, suitable for up to 300 meters of XHC high pressure hose |
| STFC4 | 1500 | Female coupling |
| STMC4 | 1500 | Male coupling |
| STN1P2 | 1500 | 1/8" x 1/4" BSP nipple for current model STS1 only |
| STN1P4 | 1500 | 1/4" BSP nipple c/w bonded sealing washer (old design - not for STS1) |
| STN1P4-C | 1500 | 1/4" BSP nipple with cone seat seal (current design - not for STS1) |

ITP & MTP - BOLT & NUT PROTECTION CAPS

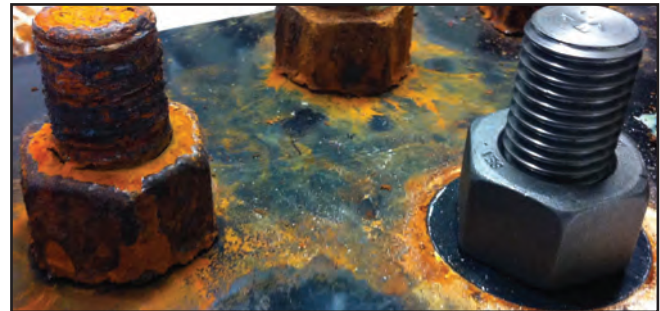
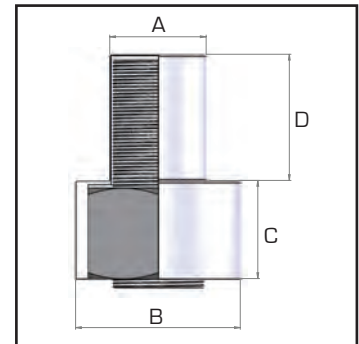


Protects exposed bolt threads and nuts

Sizes from 3/4" to 4" (M16 to M100)

Strong and secure fixing

The ITP & MTP bolt and nut protection caps are designed to protect bolts and nuts from thread damage and to considerably help prevent corrosion. These screw-on metal caps have a special internal female thread matching the bolt thread, that ensures a strong and secure fixing to the bolt. These protection caps are commonly installed on heat exchangers and reactors operating at temperatures up to 550 °C and over, where common plastic caps would melt. Ideal for use in refineries, petrochemical, LNG plants, offshore platforms and steel structures. The ITP caps are available to suit imperial bolt thread sizes from 3/4" to 4" and MTP caps are suitable for metric bolt thread sizes from M16 to M100.



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| Model number | Bolt size | Imperial Sizes | | | |
|--------------|-----------|------------------|-----|-----|-----|
| | | Dimensions in mm | | | |
| | | A | B | C | D |
| ITP012 | 3/4" | 19.0 | 39 | 22 | 23 |
| ITP014 | 7/8" | 22.3 | 44 | 26 | 33 |
| ITP100 | 1" | 25.5 | 48 | 29 | 37 |
| ITP102 | 1 1/8" | 28.6 | 55 | 33 | 40 |
| ITP104 | 1 1/4" | 31.8 | 60 | 36 | 44 |
| ITP106 | 1 3/8" | 35.0 | 65 | 39 | 48 |
| ITP108 | 1 1/2" | 38.2 | 70 | 42 | 53 |
| ITP110 | 1 5/8" | 41.3 | 77 | 46 | 59 |
| ITP112 | 1 3/4" | 44.5 | 83 | 49 | 64 |
| ITP114 | 1 7/8" | 47.7 | 88 | 53 | 67 |
| ITP200 | 2" | 51.0 | 94 | 56 | 72 |
| ITP204 | 2 1/4" | 57.2 | 105 | 62 | 80 |
| ITP208 | 2 1/2" | 63.5 | 114 | 69 | 91 |
| ITP212 | 2 3/4" | 70.0 | 125 | 75 | 99 |
| ITP300 | 3" | 76.3 | 136 | 81 | 107 |
| ITP304 | 3 1/4" | 82.7 | 152 | 87 | 116 |
| ITP308 | 3 1/2" | 89.0 | 160 | 94 | 126 |
| ITP312 | 3 3/4" | 95.4 | 172 | 100 | 135 |
| ITP400 | 4" | 102.0 | 183 | 107 | 152 |

| Model number | Bolt size | Metric Sizes | | | |
|--------------|-----------|------------------|-----|-----|-----|
| | | Dimensions in mm | | | |
| | | A | B | C | D |
| MTP16 | M16 | 16 | 31 | 18 | 22 |
| MTP18 | M18 | 18 | 34 | 21 | 23 |
| MTP20 | M20 | 20 | 39 | 23 | 25 |
| MTP22 | M22 | 22 | 40 | 25 | 32 |
| MTP24 | M24 | 24 | 45 | 29 | 34 |
| MTP27 | M27 | 27 | 51 | 30 | 37 |
| MTP30 | M30 | 30 | 55 | 33 | 40 |
| MTP33 | M33 | 33 | 61 | 36 | 46 |
| MTP36 | M36 | 36 | 65 | 39 | 48 |
| MTP39 | M39 | 39 | 70 | 42 | 52 |
| MTP42 | M42 | 42 | 77 | 46 | 59 |
| MTP45 | M45 | 45 | 83 | 49 | 64 |
| MTP48 | M48 | 48 | 88 | 53 | 67 |
| MTP52 | M52 | 52 | 94 | 56 | 72 |
| MTP56 | M56 | 56 | 102 | 60 | 84 |
| MTP64 | M64 | 64 | 113 | 69 | 91 |
| MTP68 | M68 | 68 | 119 | 73 | 98 |
| MTP72 | M72 | 72 | 125 | 77 | 100 |
| MTP76 | M76 | 76 | 131 | 81 | 105 |
| MTP80 | M80 | 80 | 136 | 85 | 107 |
| MTP90 | M90 | 90 | 159 | 95 | 126 |
| MTP100 | M100 | 100 | 183 | 105 | 144 |


 Standard material : plated steel
 Optional material : aluminium & stainless steel



Available as download only

Multi-Language Interface

Easy to use, minimal computer knowledge required

Designed for :



G The Hi-Force BoltRight software programme is designed to assist engineers in a wide variety of industries where accurate and consistent “bolt up” of components is required. The programme allows the user to input key joint data related to flange size and class, for all ANSI/ASME, API and ISO type flanges along with the applicable bolt material, gasket material and type, operating temperature, preferred or specified method of bolt tightening [torque or direct tension], friction reducing lubricant to be applied, or the applicable value of friction coefficient necessary for torque tightening applications. Based on the information entered, the BoltRight programme will analyse all of the data and produce a comprehensive calculation sheet along with the required torque or tension figures to ensure an accurate and correctly bolted joint is achieved.

BoltRight will also create an individual tightening procedure for each bolted joint, which can include specific information such as plant owner name, bolting contractor company name, joint tag reference number and any special remarks all of which can be easily entered into the procedure by the user. These individually produced tightening procedures can also be added to a master joint register, which can be either printed or stored electronically to ensure full traceability.

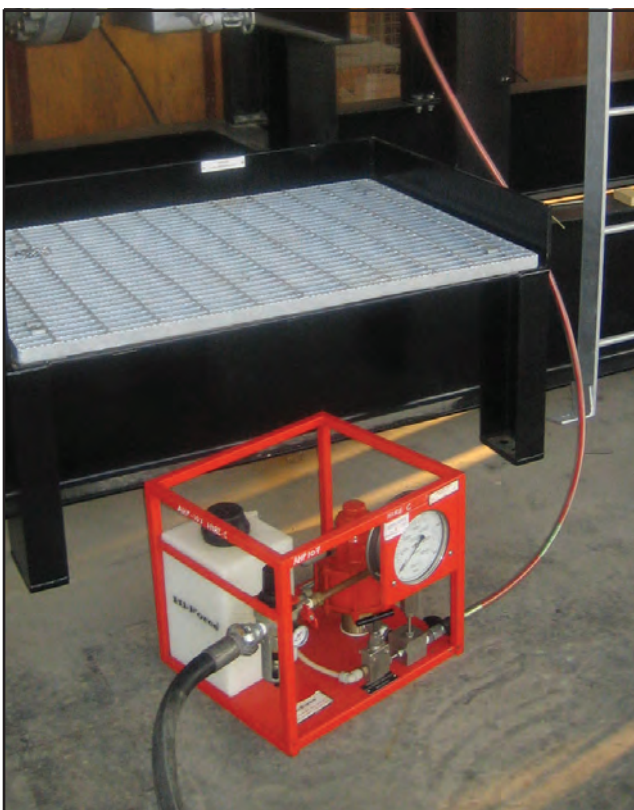
Whilst calculating the applicable torque or direct tension figures, the BoltRight programme will also calculate the required pump pressure settings for the selected Hi-Force hydraulic wrench or bolt tensioner to be used. In most cases the programme will offer a multiple choice of suitable Hi-Force tools based on the applicable torque or tension figures and the design output capacity of the tools recommended.

For bolt tensioning applications BoltRight also offers the user a choice of 25%, 33%, 50% and 100% simultaneous bolt tensioning options along with the applicable A and B pump pressure settings for all options, excluding 100% simultaneous tensioning, where only one pump pressure setting is required. For torque wrench applications the BoltRight programme will calculate the required pump pressure settings for a 25%, 50% and 100% applied output torque figure, which is the recommended three stage procedure when using a single hydraulic torque wrench to tighten a multiple bolt flange in a diametrically opposed manner. The tightening procedure will also provide the necessary bolt numbering sequence to ensure that the bolts are tightened in the correct numerical order.

Currently the BoltRight programme is available in English, Dutch, Portuguese, French, Chinese, Russian and Italian with the addition of further languages an ongoing process. The BoltRight programme is Windows compatible and only available by download from www.hi-force.com and www.boltright.com using an authorised password issued by Hi-Force. Applications for the password can be made via the website.

HYDROTEST PUMPS

| | | |
|--------------------|---|--------------------|
| MHP Range | Hydrotest pumps & accessories Manually operated | Pages 120 - 121 |
| AHP Range | Hydrotest pumps - air driven Standard flow | Page 122 |
| AHP-CR Range | Hydrotest pumps - air driven Standard flow - with chart recorder | Page 123 |
| AHP2 Range | Hydrotest pumps - air driven Medium flow | Page 124 |
| AHP2-CR Range | Hydrotest pumps - air driven Medium flow - with chart recorder | Page 125 |
| AHP3 Range | Hydrotest pumps - air driven High flow | Page 126 |
| ATDP Range | Hydrotest pumps - air driven High flow - twin double acting design | Page 127 |
| AHP-CR Accessories | Spare recorder charts & Pens for chart recorder | Page 128 |



MHP - MANUALLY OPERATED HYDROTEST PUMPS



Up to 1000 Bar working pressure

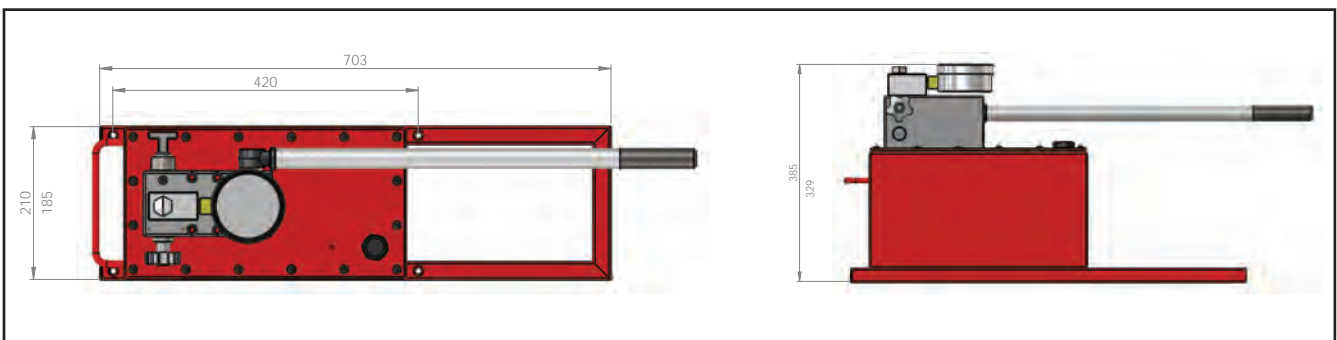
Suitable for use with a wide variety of fluids

Two stage with manual pressure changeover

The Hi-Force MHP series of manually operated two speed hydraulic pumps are suitable for use with a wide variety of fluids including water. Manufactured predominantly from high quality aluminium alloy, with stainless steel piston assemblies, the MHP pump series are lightweight, versatile and robust. The pumps two stage piston design gives a high flow low pressure stage of 50cm³ up to 50 Bar pressure. The pump incorporates a reliable smooth manual changeover from low to high pressure output. The MHP series pumps are available in 5 different pressure capacities ranging from 100 to 1000 Bar working pressure and all models are fitted with a factory pre-set relief valve for added safety. Each pump is supplied with a multi positional 610mm operating lever for increased operator comfort during use. Major applications for the MHP series of pumps include hydro-testing of pipes, pressure vessels, valves, and also back-up systems and other pressure retaining equipment, prior to commissioning.

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- >> Lightweight aluminium design with stainless steel pistons
- >> Relief valve incorporated as standard
- >> Standard 15 litre capacity stainless steel powder coated fluid reservoir
- >> Optional pressure gauges available (see page 121)



| Model number (with tank) | Model number (pump only) | Working pressure Bar | Valve type | Displacement per stroke cm ³ | | Changeover pressure Bar | Outlet port | Suction port | Weight with tank kg |
|--------------------------|--------------------------|----------------------|------------|---|-----------------------|-------------------------|-------------|--------------|---------------------|
| | | | | 1 st stage | 2 nd stage | | | | |
| MHP100 | MHP100PU | 100 | 2-way | 50 | 22 | 50 | 3/8" NPT | 3/8" BSP | 20 |
| MHP300 | MHP300PU | 300 | 2-way | 50 | 8 | 50 | 3/8" NPT | 3/8" BSP | 20 |
| MHP500 | MHP500PU | 500 | 2-way | 50 | 4 | 50 | 3/8" NPT | 3/8" BSP | 20 |
| MHP700 | MHP700PU | 700 | 2-way | 50 | 3 | 50 | 3/8" NPT | 3/8" BSP | 20 |
| MHP1000 | MHP1000PU | 1000 | 2-way | 50 | 2 | 50 | 3/8" BSP | 3/8" BSP | 20 |

MHP-PU - MANUALLY OPERATED HYDROTEST PUMPS



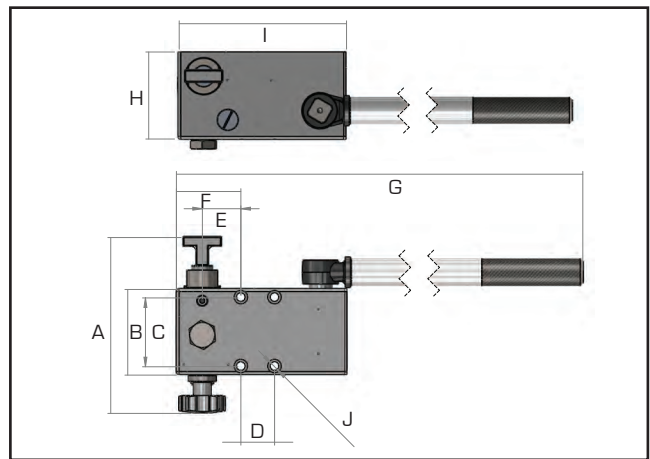
MHP300PU

The Hi-Force MHP-PU series offer the same features as the MHP range on page 120 however these are supplied as a pump unit only without a fluid reservoir. The pump unit is supplied complete with a mounting kit for easy attachment to any specially designed fluid reservoir and an operating lever.

Choice of 5 different models

Supplied complete with fixing kit

Compact, lightweight and easy to operate



| Weight kg | Dimensions in mm (all models) | | | | | | | | | | |
|--------------|-------------------------------|------|------|------|------|------|-------|------|-------|--------|--|
| | A | B | C | D | E | F | G | H | I | J | |
| 5.0 | 183.0 | 89.0 | 71.5 | 35.0 | 40.0 | 67.0 | 760.0 | 92.0 | 177.0 | 4 X M8 | |

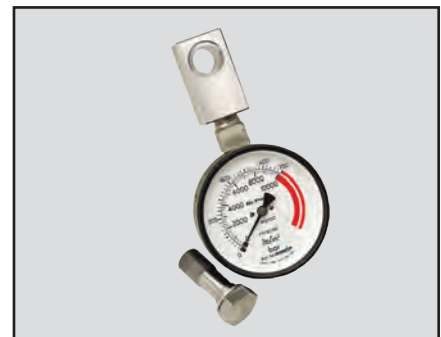
RESERVOIR

| Model number | Description |
|--------------|-----------------------------|
| MHR15 | 15 litre standard reservoir |



PRESSURE GAUGES

| Model number | Pressure range Bar |
|------------------|-----------------------|
| MHP100GK | 110 |
| MHP300GK | 310 |
| MHP500GK | 552 |
| MHP700GK | 700 |
| MHP1000GK | 1000 |

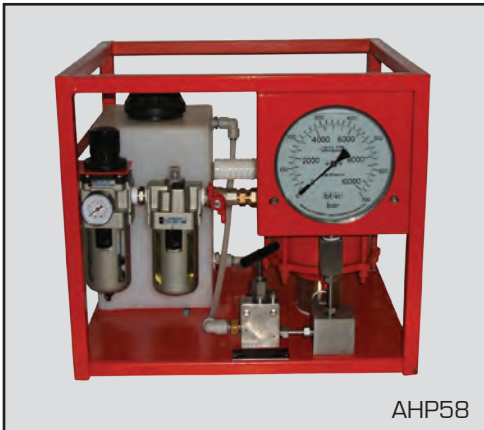


HOSES

| Model Number | Max W.P Bar | Length (metres) | End Fitting | For model number |
|-------------------|----------------|--------------------|----------------------|------------------|
| HH3-6NMS-1 | up to 300 | 3 | 3/8" NPT Male Swivel | MHP100 & MHP300 |
| HH3-6NMS-2 | up to 700 | 3 | 3/8" NPT Male Swivel | MHP500 & MHP700 |
| HH3-6NMS-3 | 1000 | 3 | 3/8" NPT Male Swivel | MHP1000 |



AHP - AIR DRIVEN HYDROTEST PUMPS - STANDARD FLOW



Output pressures up to 2931 Bar

Suitable for use with various fluids

150mm dual scale vibra pressure gauge

- >> Air consumption 28 scfm (0.79m³/minute)
- >> Infinitely variable output pressure and flow
- >> 7 litre reservoir capacity

The Hi-Force AHP series of air driven hydrostatic pressure testing pumps offer a choice of eight models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI). All models are suitable for use with various fluids, including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve. All units are of compact design with a maximum weight of 23 kg.

| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke (cm ³) | Outlet port thread | Weight kg |
|---------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 10 PSI 0.69 Bar | 50 PSI 3.45 Bar | 100 PSI 6.9 Bar | | | |
| AHP10 | 6 | 34 | 69 | 42.3 | 1/2" NPT | 23 |
| AHP26 | 14 | 90 | 181 | 16.0 | 1/2" NPT | 21 |
| AHP36 | 17 | 122 | 250 | 12.3 | 1/2" NPT | 20 |
| AHP58 | 28 | 200 | 400 | 7.6 | 1/2" NPT | 20 |
| AHP107 | 62 | 373 | 738 | 4.0 | 1/2" NPT | 20 |
| AHP187 | 97 | 638 | 1293 | 2.2 | 9/16"-18UNF | 20 |
| AHP275 | 155 | 931 | 1897 | 1.6 | 9/16"-18UNF | 20 |
| AHP425 | 345 | 1448 | 2931 | 1.0 | 9/16"-18UNF | 20 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |
| 450 | 395 | 395 |

| Hydraulic pressure PSI Bar | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | | | | | | |
|----------------------------------|--|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
| | AHP10 | AHP26 | AHP36 | AHP58 | AHP107 | AHP187 | AHP275 | AHP425 |
| 0 0 | 23.10 | 8.80 | 6.00 | 3.56 | 1.97 | 1.15 | 0.72 | 0.43 |
| 500 35 | 12.00 | 5.85 | 4.39 | 3.05 | 1.50 | 1.05 | 0.68 | 0.40 |
| 1000 69 | * | 4.72 | 3.80 | 2.51 | 1.28 | 1.00 | 0.65 | 0.38 |
| 1500 104 | * | 3.90 | 3.34 | 2.38 | 1.25 | 0.90 | 0.60 | 0.36 |
| 2000 138 | * | 3.00 | 3.00 | 2.25 | 1.21 | 0.78 | 0.55 | 0.34 |
| 2500 173 | * | 1.21 | 2.56 | 2.05 | 1.18 | 0.75 | 0.50 | 0.33 |
| 3000 207 | * | * | 1.95 | 1.85 | 1.16 | 0.73 | 0.48 | 0.31 |
| 4000 276 | * | * | * | 1.56 | 1.02 | 0.70 | 0.45 | 0.29 |
| 5000 345 | * | * | * | 1.02 | 0.95 | 0.67 | 0.42 | 0.26 |
| 7500 517 | * | * | * | * | 0.76 | 0.60 | 0.40 | 0.25 |
| 10000 690 | * | * | * | * | 0.44 | 0.52 | 0.37 | 0.24 |
| 15000 1034 | * | * | * | * | * | 0.39 | 0.33 | 0.21 |
| 20000 1379 | * | * | * | * | * | * | 0.30 | 0.20 |
| 25000 1724 | * | * | * | * | * | * | 0.21 | 0.16 |
| 30000 2069 | * | * | * | * | * | * | * | 0.13 |
| 40000 2760 | | | | | | | | 0.05 |

* Pressure exceeds pump capacity

AHP-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER



AHP187-CR

Output pressures up to 2931 Bar

Suitable for use with various fluids

150mm dual scale vibra pressure gauge

- >> Air consumption 28 scfm (0.79m³/minute)
- >> Infinitely variable output pressure and flow
- >> 7 litre reservoir capacity
- >> Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 128

The Hi-Force AHP-CR series of air driven hydrostatic pressure testing pumps offer a choice of 8 models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge [calibrated on request], inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds. All units are of compact design with a maximum weight of 31 kg.

| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke (cm ³) | Outlet port thread | Weight kg |
|------------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 10 PSI 0.69 Bar | 50 PSI 3.45 Bar | 100 PSI 6.9 Bar | | | |
| AHP10-CR | 6 | 34 | 69 | 42.3 | ½" NPT | 31 |
| AHP26-CR | 14 | 90 | 181 | 16.0 | ½" NPT | 29 |
| AHP36-CR | 17 | 122 | 250 | 12.3 | ½" NPT | 28 |
| AHP58-CR | 28 | 200 | 400 | 7.6 | ½" NPT | 28 |
| AHP107-CR | 62 | 373 | 738 | 4.0 | ½" NPT | 28 |
| AHP187-CR | 97 | 638 | 1293 | 2.2 | 9/16"-18UNF | 28 |
| AHP275-CR | 155 | 931 | 1897 | 1.6 | 9/16"-18UNF | 28 |
| AHP425-CR | 345 | 1448 | 2931 | 1.0 | 9/16"-18UNF | 28 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |
| 530 | 390 | 390 |

| Hydraulic pressure | | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | | | | | | |
|--------------------|------|--|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| PSI | Bar | AHP10-CR | AHP26-CR | AHP36-CR | AHP58-CR | AHP107-CR | AHP187-CR | AHP275-CR | AHP425-CR |
| 0 | 0 | 23.10 | 8.80 | 6.00 | 3.56 | 1.97 | 1.15 | 0.72 | 0.43 |
| 500 | 35 | 12.00 | 5.85 | 4.39 | 3.05 | 1.50 | 1.05 | 0.68 | 0.40 |
| 1000 | 69 | * | 4.72 | 3.80 | 2.51 | 1.28 | 1.00 | 0.65 | 0.38 |
| 1500 | 104 | * | 3.90 | 3.34 | 2.38 | 1.25 | 0.90 | 0.60 | 0.36 |
| 2000 | 138 | * | 3.00 | 3.00 | 2.25 | 1.21 | 0.78 | 0.55 | 0.34 |
| 2500 | 173 | * | 1.21 | 2.56 | 2.05 | 1.18 | 0.75 | 0.50 | 0.33 |
| 3000 | 207 | * | * | 1.95 | 1.85 | 1.16 | 0.73 | 0.48 | 0.31 |
| 4000 | 276 | * | * | * | 1.56 | 1.02 | 0.70 | 0.45 | 0.29 |
| 5000 | 345 | * | * | * | 1.02 | 0.95 | 0.67 | 0.42 | 0.26 |
| 7500 | 517 | * | * | * | * | 0.76 | 0.60 | 0.40 | 0.25 |
| 10000 | 690 | * | * | * | * | 0.44 | 0.52 | 0.37 | 0.24 |
| 15000 | 1034 | * | * | * | * | * | 0.39 | 0.33 | 0.21 |
| 20000 | 1379 | * | * | * | * | * | * | 0.30 | 0.20 |
| 25000 | 1724 | * | * | * | * | * | * | 0.21 | 0.16 |
| 30000 | 2069 | * | * | * | * | * | * | * | 0.13 |
| 40000 | 2760 | * | * | * | * | * | * | * | 0.05 |

* Pressure exceeds pump capacity

AHP2 - AIR DRIVEN HYDROTEST PUMPS - MEDIUM FLOW



Output pressures up to 1634 Bar

Suitable for use with various fluids

150mm dual scale vibra pressure gauge

- >> Air consumption 56 scfm (1.59m³/minute)
- >> Infinitely variable output pressure and flow
- >> 7 litre reservoir capacity

The Hi-Force AHP2 series of air driven hydrostatic pressure testing pumps offer a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve.

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| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke (cm ³) | Outlet port thread | Weight kg |
|-----------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 10 PSI 0.69 Bar | 50 PSI 3.45 Bar | 100 PSI 6.9 Bar | | | |
| AHP2-036 | 17.2 | 124.1 | 248.2 | 40.8 | ½" NPT | 24 |
| AHP2-060 | 31.0 | 199.9 | 413.7 | 24.6 | ½" NPT | 24 |
| AHP2-097 | 51.7 | 327.5 | 668.8 | 15.2 | ½" NPT | 24 |
| AHP2-144 | 75.8 | 489.5 | 992.8 | 10.2 | ½" NPT | 24 |
| AHP2-237 | 131.0 | 799.8 | 1634.1 | 6.1 | ¾"-18UNF | 24 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 450 | 390 | 465 |
| 450 | 390 | 465 |
| 450 | 390 | 465 |
| 450 | 390 | 465 |
| 450 | 390 | 465 |

| Hydraulic pressure PSI Bar | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | | | |
|----------------------------------|--|-----------------|-----------------|-----------------|-----------------|
| | AHP2-036 | AHP2-060 | AHP2-097 | AHP2-144 | AHP2-237 |
| 0 0 | 10.20 | 6.20 | 3.90 | 2.70 | 1.57 |
| 500 35 | 8.60 | 5.50 | 3.55 | 2.50 | 1.52 |
| 1000 69 | 7.25 | 4.80 | 3.19 | 2.35 | 1.47 |
| 1500 104 | 6.15 | 4.50 | 3.00 | 2.16 | 1.42 |
| 2000 138 | 5.40 | 4.20 | 2.87 | 2.15 | 1.38 |
| 3000 207 | 3.05 | 3.50 | 2.55 | 1.88 | 1.29 |
| 4000 276 | * | 2.75 | 2.28 | 1.75 | 1.22 |
| 5000 345 | * | 2.16 | 2.10 | 1.64 | 1.20 |
| 7500 517 | * | * | 1.45 | 1.35 | 1.10 |
| 10000 690 | * | * | * | 1.15 | 0.98 |
| 15000 1034 | * | * | * | * | 0.78 |
| 20000 1379 | * | * | * | * | 0.51 |
| 23700 1634 | * | * | * | * | 0.34 |

* Pressure exceeds pump capacity

AHP2-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER



Output pressures up to 1634 Bar

Suitable for use with various fluids

150mm dual scale vibra pressure gauge

- >> Air consumption 56 scfm (1.59m³/minute)
- >> Infinitely variable output pressure and flow
- >> 7 litre reservoir capacity
- >> Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 128

The Hi-Force AHP2-CR series of air driven hydrostatic pressure testing pumps offer a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds.

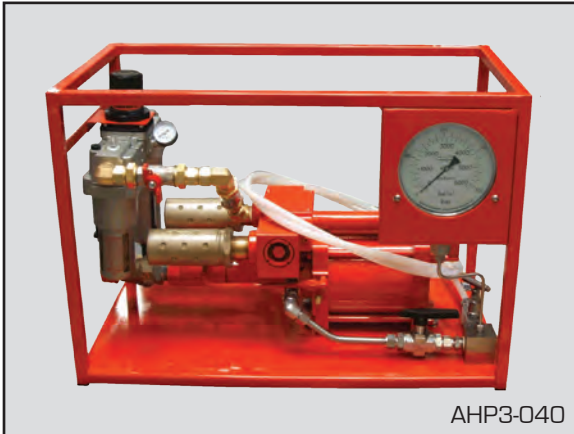
| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke (cm ³) | Outlet port thread | Weight kg |
|-------------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 10 PSI 0.69 Bar | 50 PSI 3.45 Bar | 100 PSI 6.9 Bar | | | |
| AHP2-036CR | 17.2 | 124.1 | 248.2 | 40.8 | ½" NPT | 32 |
| AHP2-060CR | 31.0 | 199.9 | 413.7 | 24.6 | ½" NPT | 32 |
| AHP2-097CR | 51.7 | 327.5 | 668.8 | 15.2 | ½" NPT | 32 |
| AHP2-144CR | 75.8 | 489.5 | 992.8 | 10.2 | ½" NPT | 32 |
| AHP2-237CR | 131.0 | 799.8 | 1634.1 | 6.1 | 9/16"-18UNF | 32 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 555 | 390 | 465 |
| 555 | 390 | 465 |
| 555 | 390 | 465 |
| 555 | 390 | 465 |
| 555 | 390 | 465 |

| Hydraulic pressure PSI | Bar | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | | | |
|---------------------------|------|--|-------------------|-------------------|-------------------|-------------------|
| | | AHP2-036CR | AHP2-060CR | AHP2-097CR | AHP2-144CR | AHP2-237CR |
| 0 | 0 | 10.20 | 6.20 | 3.90 | 2.70 | 1.57 |
| 500 | 35 | 8.60 | 5.50 | 3.55 | 2.50 | 1.52 |
| 1000 | 69 | 7.25 | 4.80 | 3.19 | 2.35 | 1.47 |
| 1500 | 104 | 6.15 | 4.50 | 3.00 | 2.16 | 1.42 |
| 2000 | 138 | 5.40 | 4.20 | 2.87 | 2.15 | 1.38 |
| 3000 | 207 | 3.05 | 3.50 | 2.55 | 1.88 | 1.29 |
| 4000 | 276 | * | 2.75 | 2.28 | 1.75 | 1.22 |
| 5000 | 345 | * | 2.16 | 2.10 | 1.64 | 1.20 |
| 7500 | 517 | * | * | 1.45 | 1.35 | 1.10 |
| 10000 | 690 | * | * | * | 1.15 | 0.98 |
| 15000 | 1034 | * | * | * | * | 0.78 |
| 20000 | 1379 | * | * | * | * | 0.51 |
| 23700 | 1634 | * | * | * | * | 0.34 |

* Pressure exceeds pump capacity

AHP3 - AIR DRIVEN HYDROTEST PUMPS - HIGH FLOW



Output pressures up to 700 Bar

Suitable for use with various fluids

150mm dual scale vibra pressure gauge

- >> Air consumption 175 scfm (4.96 m³/minute)
- >> Infinitely variable output pressure and flow
- >> Fluid inlet 1.1/4" BSPF

The Hi-Force AHP3 series of air driven hydrostatic pressure testing pumps offer a choice of 3 models with output pressure capacities ranging from 42 Bar (609 PSI) to 700 Bar (10000 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, pressure isolation valve, pressure release valve, fluid inlet via Y-type fluid strainer, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system, distance piece for chemical duty and chart recorder.

| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke (cm ³) | Outlet port thread | Weight kg |
|-----------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 15 PSI 1.04 Bar | 50 PSI 3.45 Bar | 100 PSI 6.9 Bar | | | |
| AHP3-040 | 41.4 | 137.9 | 275.8 | 98.3 | ½" NPTF | 40 |
| AHP3-060 | 62.1 | 206.9 | 413.7 | 57.4 | ½" NPTF | 40 |
| AHP3-100 | 103.4 | 344.8 | 689.5 | 34.4 | ½" NPTF | 40 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 715 | 390 | 490 |
| 715 | 390 | 490 |
| 715 | 390 | 490 |

| Hydraulic pressure PSI Bar | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | |
|----------------------------------|--|-----------------|-----------------|
| | AHP3-040 | AHP3-060 | AHP3-100 |
| 0 | 18.35 | 15.63 | 11.96 |
| 500 | 14.42 | 12.85 | 10.49 |
| 1000 | 10.81 | 10.51 | 8.69 |
| 1500 | 7.21 | 8.57 | 7.05 |
| 2000 | 5.90 | 6.97 | 5.65 |
| 2500 | 4.26 | 5.66 | 4.83 |
| 3000 | 2.62 | 4.60 | 4.18 |
| 3500 | 1.31 | 3.74 | 3.85 |
| 4000 | 0 | 3.02 | 3.52 |
| 4500 | * | 2.40 | 3.03 |
| 5000 | * | 1.84 | 2.79 |
| 5500 | * | 1.27 | 2.62 |
| 6000 | * | 0.65 | 2.46 |
| 6500 | * | * | 1.88 |
| 7000 | * | * | 1.39 |
| 7500 | * | * | 1.15 |
| 8000 | * | * | 0.90 |
| 8500 | * | * | 0.66 |
| 9000 | * | * | 0.49 |
| 9500 | * | * | 0.33 |
| 10000 | * | * | 0.16 |

* Pressure exceeds pump capacity

ATDP - AIR DRIVEN TWIN DOUBLE ACTING HYDROTEST PUMPS



ATDP125

Output pressures up to 1489 Bar

Suitable for use with various fluids

Twin double acting design offering high volume flow

The Hi-Force ATDP series of twin double acting air driven hydrostatic pressure testing pumps offer a choice of 3 models with output pressure capacities ranging from 87 Bar (1260 PSI) to 1489 Bar (21600 PSI). The twin double acting design offers a much higher displacement volume per stroke than the smaller AHP & AHP2 series, making it ideal for prefill as well as pressure testing. All models are supplied with a 150mm diameter glycerine filled vibra-gauge (calibrated on request), inlet airline filter, lubricator and regulator unit, pump start/stop valve and fluid strainer. Viton and ethylene propylene seals for handling special fluids or chemicals can be factory fitted prior to delivery if required. Other seal materials are available on request.

- >> Air consumption 212 scfm (6m³ /minute)
- >> Suitable for use with various fluids including water
- >> 150mm dual scale glycerine filled gauge
- >> Infinitely variable output pressure and flow
- >> Fitted with inlet air filter, regulator & lubricator
- >> Optional extras include stainless steel frame work, pneumatic or LCD stroke counter system, onboard chart recorder, pressure isolation valve and wheel mounting

| Model number | Max. output pressure (Bar) at airline input pressure | | | Fluid volume displacement per stroke [cm ³] | Outlet port thread | Weight kg |
|----------------|--|--------------------|--------------------|---|--------------------|-----------|
| | 20 PSI 1.38 Bar | 60 PSI 4.14 Bar | 100 PSI 6.9 Bar | | | |
| ATDP63 | 87 | 260 | 434 | 275 | ½" NPT | 96 |
| ATDP125 | 172 | 517 | 862 | 140 | ½" NPT | 96 |
| ATDP216 | 298 | 894 | 1489 | 79 | 1½"-12UNF | 96 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 765 | 570 | 700 |
| 765 | 570 | 700 |
| 765 | 570 | 700 |

| Hydraulic pressure PSI | Bar | Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) | | |
|---------------------------|------|--|----------------|----------------|
| | | ATDP63 | ATDP125 | ATDP216 |
| 0 | 0 | 32.2 | 16.9 | 9.5 |
| 1000 | 69 | 25.7 | 14.0 | 8.8 |
| 2000 | 138 | 20.5 | 12.3 | 8.0 |
| 3000 | 207 | 16.2 | 10.6 | 7.4 |
| 4000 | 276 | 12.5 | 9.4 | 6.9 |
| 5000 | 345 | 8.0 | 8.3 | 6.4 |
| 6000 | 414 | 2.8 | 7.3 | 6.1 |
| 8000 | 552 | * | 4.8 | 5.5 |
| 10000 | 690 | * | 3.0 | 4.9 |
| 12000 | 828 | * | 0.4 | 4.3 |
| 16000 | 1103 | * | * | 3.2 |
| 20000 | 1379 | * | * | 1.6 |

* Pressure exceeds pump capacity

HYDROTEST PUMP ACCESSORIES AND APPLICATIONS

Pack of 100 spare charts, diameter 163mm, 4 hour time scale

| Model No | Chart Reading PSI | Suitable for Hydrotest Pump unit |
|----------------|-------------------|----------------------------------|
| AHP-C01 | 0 - 1.500 | AHP10-CR |
| AHP-C03 | 0 - 3.000 | AHP26-CR |
| AHP-C05 | 0 - 5.000 | AHP36-CR - AHP2-036CR |
| AHP-C10 | 0 - 10.000 | AHP58-CR - AHP2-060CR |
| AHP-C15 | 0 - 15.000 | AHP107-CR - AHP2-097CR |
| AHP-C20 | 0 - 20.000 | AHP187-CR - AHP2-144CR |
| AHP-C30 | 0 - 30.000 | AHP275-CR - AHP2-237CR |
| AHP-C45 | 0 - 45.000 | AHP425-CR |

Replacement pen for chart recorder

| Model No | Colour | Description |
|---------------|--------|---|
| AHP-PB | Black | Suitable for pressure reading on all Hi-Force AHP pumps with chart recorder |



Did you know

Hi-Force can also supply chart recorders with multiple reading functions



PULLER KITS

SCP Range

Self-contained hydraulic pullers

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ACP Range

Auto-centre hydraulic puller kits

Page
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PKS Range

Hydraulic 2 & 3 way puller kits

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PKC Range

Comprehensive hydraulic puller kits

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SPP Range

Heavy duty hydraulic pullers

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HBR Range

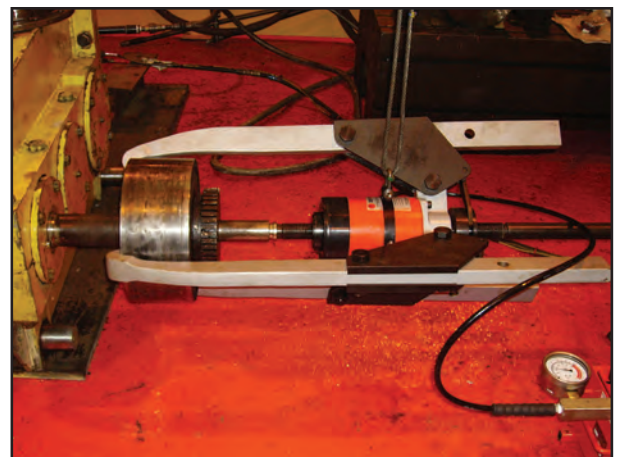
Spring eye bush replacement tool kit

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135

HPR Range

Pin & bush replacement tool kits

Page
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SCP - SELF-CONTAINED HYDRAULIC PULLERS



Capacities from 10 to 30 tonnes

Sealed hydraulic system

Operates in any position

The SCP range of self-contained hydraulic pullers offers a choice of 3 models, each with integral manually operated hydraulic pump and multi-position operating handle. The completely sealed hydraulic system of the SCP pullers enables use of the tool in any position and all models are easy to operate and provide an efficient solution for many pulling applications.



| Model number | Capacity tonnes | Type of puller | Hydraulic stroke mm | Piston Ext. mm | Weight kg |
|---------------|-----------------|----------------|---------------------|----------------|-----------|
| SCP103 | 10 | 3-way jaw | 82 | 50 | 11.6 |
| SCP203 | 20 | 3-way jaw | 82 | 100 | 23.7 |
| SCP303 | 30 | 3-way jaw | 110 | 150 | 50.0 |

| Dimensions in mm | | | | |
|------------------|----------|----------|-----------|------------|
| Reach | Dia min. | Dia max. | Tip depth | Tip height |
| 195 | 30 | 310 | 22 | 6 |
| 275 | 50 | 430 | 29 | 10 |
| 405 | 100 | 610 | 38 | 36 |

ACP - AUTO-CENTRE HYDRAULIC PULLER KITS

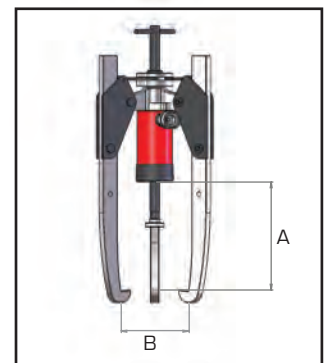


Capacities from 10 to 50 tonnes

Quick set-up time, easy to use

High quality, drop forged steel components

The ACP heavy duty, auto-centering hydraulic puller kit range offers a choice of 4 models, with capacities from 10 to 50 tonnes. All models are supplied complete with a detachable hollow ram cylinder, manually operated pump, hydraulic hose and a 100mm diameter pressure gauge. All models are easy to set up and are the ideal tool for all pulling, pushing, installing and removing applications required for press fitted or heat fitted parts, including wheels, sprockets, flywheels, gears and bearings.



| Model number | Capacity tonnes | Type of puller | Cylinder model no. | Pump model no. | Weight kg |
|--------------|-----------------|----------------|--------------------|----------------|-----------|
| ACP10 | 10 | 2 & 3 jaw | HHS102 | HP110 | 24.5 |
| ACP20 | 20 | 3 jaw | HHS202 | HP110 | 44.0 |
| ACP30 | 30 | 3 jaw | HHS302 | HP110 | 76.5 |
| ACP50 | 50 | 3 jaw | HHS603 | HP227 | 181.0 |

| Dimensions in mm | | |
|------------------|---------|---------|
| A | B (min) | B (max) |
| 296 | 50 | 350 |
| 320 | 70 | 480 |
| 407 | 90 | 580 |
| 727 | 120 | 920 |

PKS - HYDRAULIC 2 & 3 WAY PULLER KITS



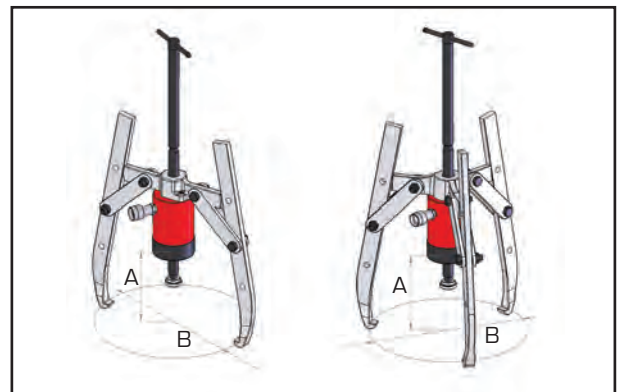
Capacities from 4.5 to 50 tonnes

Quick set-up time, easy to use

High quality, drop forged steel components

The PKS heavy duty hydraulic puller range is designed for removing stubborn parts such as wheels, gears, sprockets, sleeves, pulleys and other similar items. The range offers a selection of 8 models with pulling capacities up to 50 tonnes. All models are supplied complete with a full set of versatile detachable hydraulic components. All models are safe and easy to operate and avoid the need for heating and hammering.

- >> Working pressure 700 Bar
- >> Multi-purpose hollow piston cylinder (excl. PKS5-2-3)
- >> Complete with all hydraulic components (pump, cylinder, hose, gauge, etc.)
- >> Supplied complete with storage and transport box

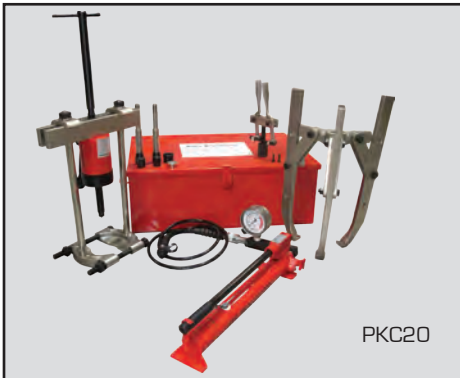


| Model number | Capacity tonnes | Type of puller | Cylinder model no. | Pump model no. | Weight kg |
|------------------|-----------------|----------------|--------------------|----------------|-----------|
| PKS5-2-3 | 4.5 | 2 & 3 jaw | HSS53 | HP110 | 24 |
| PKS10-2-3 | 10 | 2 & 3 jaw | HHS102 | HP110 | 34 |
| PKS20-2 | 20 | 2 jaw | HHS202 | HP110 | 29 |
| PKS20-3 | 20 | 3 jaw | HHS202 | HP110 | 37 |
| PKS30-2 | 30 | 2 jaw | HHS302 | HP110 | 49 |
| PKS30-3 | 30 | 3 jaw | HHS302 | HP110 | 58 |
| PKS50-2 | 50 | 2 jaw | HHS603 | HP227 | 105 |
| PKS50-3 | 50 | 3 jaw | HHS603 | HP227 | 130 |
| PK202 | 20 | 2 jaw beam | * | * | 3 |
| PK302 | 30 | 2 jaw beam | * | * | 4 |
| PK502 | 50 | 2 jaw beam | * | * | 7 |

| Dimensions in mm | | |
|------------------|---------|---------|
| A | B (min) | B (max) |
| 225 | * | 240 |
| 296 | 50 | 350 |
| 320 | 70 | 480 |
| 320 | 70 | 480 |
| 407 | 90 | 580 |
| 407 | 90 | 580 |
| 727 | 120 | 920 |
| 727 | 120 | 920 |
| * | * | * |
| * | * | * |
| * | * | * |

Note: PK202, PK302 & PK502 are 2-jaw beam only (not complete kit). Dimensions calculated with 15° outward angled puller legs.

PKC - COMPREHENSIVE HYDRAULIC PULLER KITS

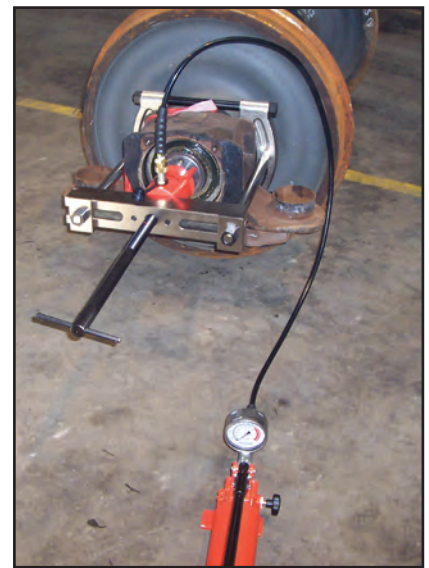


Capacities from 10 to 50 tonnes

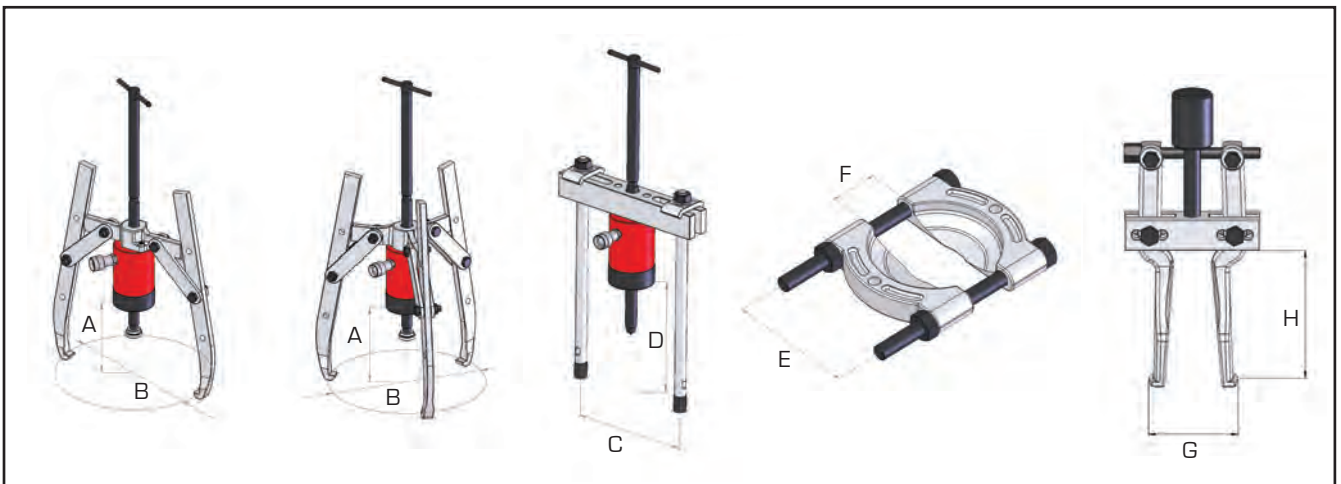
Combination of 4 different pullers in one set

Quick set-up time, easy to use

The PKC heavy duty, multi-purpose hydraulic puller kit range is extremely versatile and includes 2-way and 3-way grip pullers (as detailed on page 131), bearing pullers, bearing cup pullers and cross head pullers. All models are designed for pulling, pushing, installing and removing all press fitted or heat fitted parts such as gears, bearings, sleeves, cogs, internal bearings, wheels, sprockets, flywheels, etc. The range offers a selection of 4 models with pulling capacities up to 50 tonnes, all supplied complete with a full set of versatile, detachable hydraulic components.



- >> Working pressure 700 Bar
- >> Complete hydraulic system supplied, including gauge
- >> High quality, drop-forged steel components
- >> Supplied complete with storage and transport box



| Model number | Capacity tonnes | Cylinder model no. | Pump model no. | Weight kg |
|--------------|-----------------|--------------------|----------------|-----------|
| PKC10 | 10 | HHS102 | HP110 | 25 |
| PKC20 | 20 | HHS202 | HP110 | 60 |
| PKC30 | 30 | HHS302 | HP110 | 116 |
| PKC50 | 50 | HHS603 | HP227 | 268 |

| Dimensions in mm | | | | | | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| A | B | B | C | C | D | E | F | F | G | G | H |
| | min | max | min | max | | | min | max | min | max | |
| 296 | 50 | 350 | 115 | 260 | 300 | 110 | 10 | 110 | 40 | 145 | 115 |
| 320 | 70 | 480 | 135 | 345 | 265 | 152 | 11 | 134 | 40 | 145 | 115 |
| 407 | 90 | 580 | 180 | 440 | 284 | 260 | 15 | 250 | 60 | 240 | 150 |
| 727 | 120 | 920 | 230 | 580 | 447 | 260 | 15 | 250 | 60 | 240 | 150 |

Dimensions A & B calculated with 15° outward angled puller legs

SPP - HEAVY DUTY HYDRAULIC PULLERS



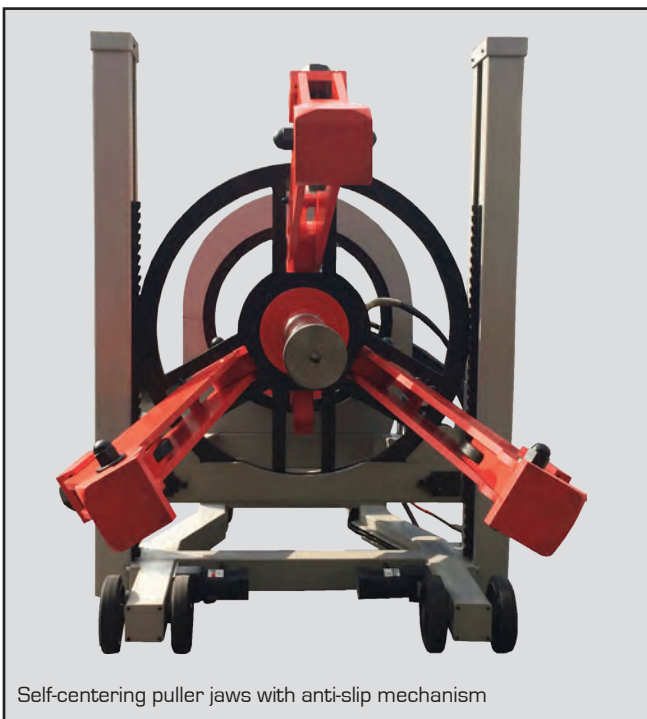
Capacities from 75 to 220 tonnes

Wireless remote controlled operation

Powered driven trolley for easy positioning

The SPP range of heavy duty pullers offers a choice of 18 models with capacities ranging from 75 to 220 tonnes. The functional and ergonomic design of the heavy duty hydraulic pullers features a movable trolley and the two vertical supports provide stability and safety as well as allow the user to adjust the height to the desired position.

All models include self-centering pulling jaws that can rotate 180° and a wireless remote control that allows for an easier and safer operation. Ideal for use in steel plants, mines, shipyards, petrochemical industries for repair and maintenance applications.



SPP - HEAVY DUTY HYDRAULIC PULLERS



Self-centering jaw design

Spread up to 1220mm

Adjustable height

- >> Hydraulically actuated jaws with adjustable jaw tip angle
- >> Anti-slip mechanism in puller jaws
- >> Easy to manoeuvre with wheel locking feature



Did you know

The SPP pullers incorporate the HEP2 series electric driven pump. For more information on HEP2 series pumps, see page 41.

| Model number | Capacity tonnes | Type of puller | Motor Voltage | Stroke mm | Weight kg |
|------------------------|-----------------|----------------|---------------|-----------|-----------|
| Puller with 50Hz motor | | | | | |
| SPP7515 | 75 | 2 & 3 jaw | 110/115V | 165 | 660 |
| SPP7525 | 75 | 2 & 3 jaw | 220/240V | 165 | 660 |
| SPP7545 | 75 | 2 & 3 jaw | 380/440V | 165 | 660 |
| SPP12015 | 120 | 2 & 3 jaw | 110/115V | 170 | 888 |
| SPP12025 | 120 | 2 & 3 jaw | 220/240V | 170 | 888 |
| SPP12045 | 120 | 2 & 3 jaw | 380/440V | 170 | 888 |
| SPP22015 | 220 | 2 & 3 jaw | 110/115V | 170 | 1300 |
| SPP22025 | 220 | 2 & 3 jaw | 220/240V | 170 | 1300 |
| SPP22045 | 220 | 2 & 3 jaw | 380/440V | 170 | 1300 |
| Puller with 60Hz motor | | | | | |
| SPP7516 | 75 | 2 & 3 jaw | 110/115V | 165 | 660 |
| SPP7526 | 75 | 2 & 3 jaw | 220/240V | 165 | 660 |
| SPP7546 | 75 | 2 & 3 jaw | 380/440V | 165 | 660 |
| SPP12016 | 120 | 2 & 3 jaw | 110/115V | 170 | 888 |
| SPP12026 | 120 | 2 & 3 jaw | 220/240V | 170 | 888 |
| SPP12046 | 120 | 2 & 3 jaw | 380/440V | 170 | 888 |
| SPP22016 | 220 | 2 & 3 jaw | 110/115V | 170 | 1300 |
| SPP22026 | 220 | 2 & 3 jaw | 220/240V | 170 | 1300 |
| SPP22046 | 220 | 2 & 3 jaw | 380/440V | 170 | 1300 |

| Dimensions in mm | |
|------------------|------------|
| Reach | Spread |
| 490 - 700 | 110 - 1220 |
| 490 - 700 | 110 - 1220 |
| 490 - 700 | 110 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
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| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |
| 900 - 1100 | 150 - 1220 |

HBR-1 - SPRING EYE BUSH REPLACEMENT TOOL KIT



Bushes replaced directly on the vehicle

Safe, simple and easy to operate

Portable and powerful hydraulic operation

The Hi-Force HBR-1 spring eye bush replacement tool kit is offered with a choice of manual or air powered hydraulic pump unit, or it can be supplied without a pump, should the user already have a suitable 700 Bar pump within his tool store. All models offer a superb 18 tonnes of hydraulic power, when operated at the maximum working pressure of 700 Bar. This innovative product from Hi-Force is primarily targeted at commercial vehicle manufacturers and service centres, as well as heavy plant vehicle workshops, where traditional hammer and heat methods of bush replacement activities have proved unsafe, time consuming and costly. All kits incorporate a standard Hi-Force HHA182 lightweight, aluminium hydraulic cylinder making the kit portable and easy to fit to a wide variety of bush replacement applications. Supplied in a smart metal storage case for easy transportation and storage, all kits include a range of standard tooling with non standard and special tooling available on request.

- >> Offers time & labour savings of up to 60%
- >> Lightweight & compact design for easy transportation
- >> Minimal manual effort during operation
- >> Improved safety over traditional methods

Pump options

The HBR-1 hydraulic spring eye bush replacement tool kit can be operated by either the AHP1120 air driven foot pump or the HP212 lightweight aluminium hand pump.

AHP1120

HP212



| Model number | Capacity tonnes | Stroke mm | Complete set comprising of | | | | | | | |
|---------------|-----------------|-----------|----------------------------|---------|------|------------|---------------|---------|--------------|-----------|
| | | | Cylinder | Pump | Hose | Base plate | Threaded rods | Dolleys | Pull sleeves | Weight kg |
| HBR-1 | 18 | 51 | HHA182 | n/a | n/a | 1 | 3 | 5 | 2 | 27 |
| HBR-1H | 18 | 51 | HHA182 | HP212 | HC2 | 1 | 3 | 5 | 2 | 33 |
| HBR-1A | 18 | 51 | HHA182 | AHP1120 | HC2 | 1 | 3 | 5 | 2 | 35 |

HPR - PIN & BUSH REPLACEMENT TOOL KITS



Safe, simple, hands free operation

Offers time & labour savings of up to 60%

Flexible and adaptable system

The Hi-Force HPR range of pin and bush replacement kits is offered with a choice of 37 or 50 tonnes capacity, both available with either a manual or air driven hydraulic pump unit. Both the HPR-1 & the HPR-2 can also be supplied without a hydraulic pump for those users that already have a suitable 700 Bar pump available within their tool store. All models operate at 700 Bar maximum working pressure and incorporate either a standard HHA372 37 tonne capacity or a HHA504 50 tonne capacity, lightweight, aluminium hydraulic cylinder. This innovative product from Hi-Force is targeted at manufacturers, service centres and users of heavy plant vehicles, used in the construction and mining industries. Supplied in a smart metal storage case for easy transportation and storage, all kits include a range of standard tooling with non-standard and special tooling available on request.

- >> Ideal for use on-site and in the workshop
- >> Improved safety over traditional methods
- >> Suitable for a wide range of pin & bush applications
- >> Multi-purpose aluminium hollow piston cylinder



| Model number | Capacity tonnes | Stroke mm | Complete set comprising of | | | | | | | | Weight kg |
|---------------|-----------------|-----------|----------------------------|---------|------|------------|---------------|--------------|----------|-----------------|-----------|
| | | | Cylinder | Pump | Hose | Base plate | Threaded rods | Pull sleeves | Adaptors | Reducer sleeves | |
| HPR-1 | 37 | 51 | HHA372 | n/a | n/a | 1 | 1 | 2 | 2 | 1 | 38 |
| HPR-1H | 37 | 51 | HHA372 | HP212 | HC2 | 1 | 1 | 2 | 2 | 1 | 44 |
| HPR-1A | 37 | 51 | HHA372 | AHP1120 | HC2 | 1 | 1 | 2 | 2 | 1 | 46 |
| HPR-2 | 50 | 104 | HHA504 | n/a | n/a | 2 | 1 | 4 | 1 | 1 | 66 |
| HPR-2H | 50 | 104 | HHA504 | HP212 | HC2 | 2 | 1 | 4 | 1 | 1 | 72 |
| HPR-2A | 50 | 104 | HHA504 | AHP1120 | HC2 | 2 | 1 | 4 | 1 | 1 | 74 |

CRIMPERS AND CUTTERS

| | | |
|----------------|---------------------------------------|--------------------|
| Information | General information on crimping tools | Page 138 |
| CH Range | Cable crimping heads | Pages 139 - 140 |
| SC Range | Self-contained cable crimping tools | Pages 141 - 142 |
| BC Range | Battery operated cable crimping tools | Page 143 |
| BC Accessories | Battery powered pump and accessories | Page 144 |
| HCH Range | Cutter heads | Page 145 |
| CT Range | Self-contained cutters | Page 146 |
| HWC Range | Hammer blow cutters | Page 147 |
| HSWC Range | Self-contained wire rope cutters | Page 148 |
| HWRC Range | Double acting wire rope cutters | Page 149 |
| HCC Range | Chain cutters | Page 150 |

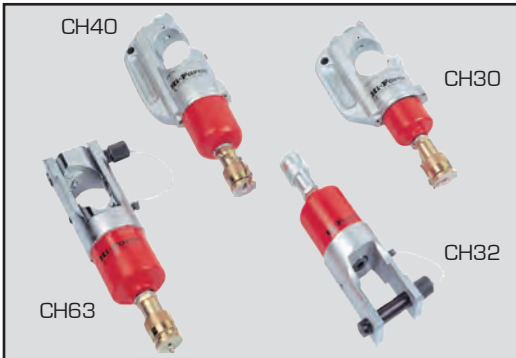
CRIMPING TOOLS - GENERAL INFORMATION

Hi-Force hydraulic cable crimping tools are designed and manufactured for crimping un-insulated compression and mechanical connectors, in copper and aluminium, to a wide range of electrical power cables including distribution and transmission lines. Offering a choice of self-contained operation with inbuilt manually operated hydraulic pump mechanism, separate remote operation crimping head for use with a separate hydraulic pump and hose assembly, or battery operated which offers all the versatility of our self-contained and manually operated tools but, with the added speed and ease of use associated with a battery powered tool.

The Hi-Force hydraulic crimping tools range offers the most optimum choice to suit the widest range of electrical cable crimping applications. All models are designed and manufactured for use at 700 Bar maximum working pressure, supplied complete with all applicable die sets, compatible for use with the selected tool and include a convenient carrying and storage case. Self contained manually operated and battery powered crimper tools are fitted with an automatic pump pressure relief valve, which activates and releases the hydraulic pressure immediately once the compression (crimping) process has been successfully achieved. All remote operation crimper heads must be operated with a compatible Hi-Force 700 Bar hydraulic pump unit, fitted with an inbuilt pump safety overload, pressure relief valve, 700 Bar pressure gauge and 700 Bar rated hydraulic hose assembly.



CH - CABLE CRIMPING HEADS



Choice of 7 models available

Supplied complete with die sets

Working pressure 700 Bar

The CH hydraulic cable crimping tool range offers 7 models with a choice of open “C” jaw or parallel guide design. All models are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces. Suitable pump units include HP227FPC foot operated pump set which includes elbow fitting, gauge, gauge block, 3 metre hose and male coupler, as shown below. Standard hand operated pumps suitable for use with CH crimper heads can be found on pages 31-33. All models, excluding CH1000, are available as a complete kit, comprising of HP227FPC, CSB1 metal storage case and selected crimping tool with die sets.

- >> Model CH21 is suitable for crimping non-insulated terminals up to 240mm²
- >> Models CH30, CH32 & CH40 are suitable for crimping connectors up to 400mm²
- >> Models CH63 & CH80 are suitable for crimping connectors up to 630mm²
- >> Model CH1000 is suitable for crimping distribution and transmission lines up to 1000mm²



Crimping tools complete with die set:

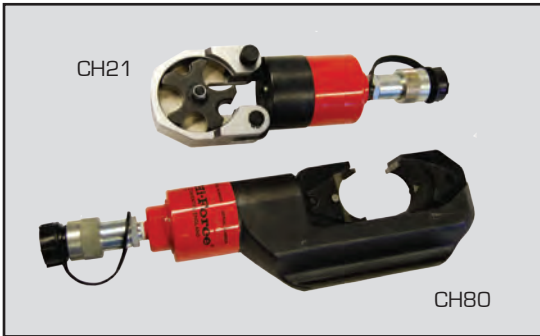
| Model number | Output tonnes | C-Jaw opening | Applicable range DIN mm ² | Standard dies mm ² | Length mm | Weight kg |
|---------------|---------------|----------------|--------------------------------------|---|-----------|-----------|
| CH21 | 10 | not applicable | 16-240 | With die (4pcs) 16-25, 35-70, 70-185, 240 Female die (1pc) 25-35, 50-70, 95-120, 150-185, 240 | 210 | 3.0 |
| CH30 | 12 | 30 mm | 35-400 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 220 | 4.0 |
| CH32 | 18 | not applicable | 16-400 | With die (4pcs) 16, 25-35, 50-120, 150-400 Female die (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400 | 210 | 3.6 |
| CH40 | 12 | 38 mm | 35-400 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 245 | 4.8 |
| CH63 | 18 | not applicable | 35-630 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630 | 240 | 4.8 |
| CH80 | 15 | 50 mm | 35-630 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630 | 300 | 7.0 |
| CH1000 | 55 | not applicable | 500-1000 | With die 500, 630, 800, 1000 | 450 | 30.7 |

Complete set:

| Model number | Description |
|--------------|--|
| CHP21 | Comprehensive kit, comprising of crimper CH21, manual operated foot pump HP227FPC and steel box CSB1 |
| CHP30 | Comprehensive kit, comprising of crimper CH30, manual operated foot pump HP227FPC and steel box CSB1 |
| CHP32 | Comprehensive kit, comprising of crimper CH32, manual operated foot pump HP227FPC and steel box CSB1 |
| CHP40 | Comprehensive kit, comprising of crimper CH40, manual operated foot pump HP227FPC and steel box CSB1 |
| CHP63 | Comprehensive kit, comprising of crimper CH63, manual operated foot pump HP227FPC and steel box CSB1 |
| CHP80 | Comprehensive kit, comprising of crimper CH80, manual operated foot pump HP227FPC and steel box CSB1 |

Note : Models CH21 & CH32 supplied with single indent dies, all other models supplied with hexagon dies.

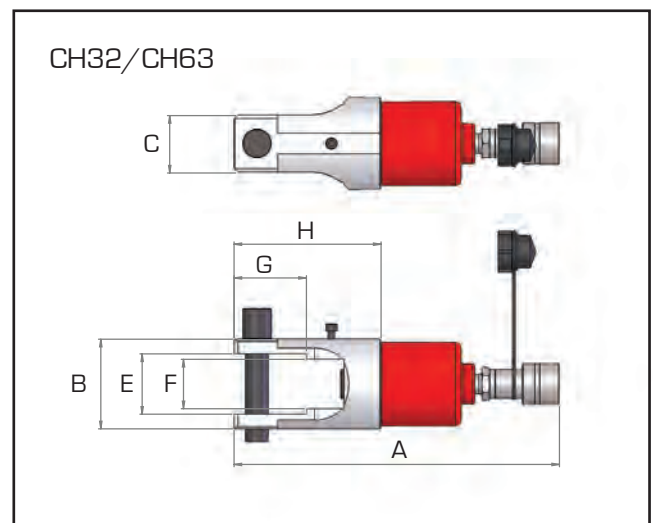
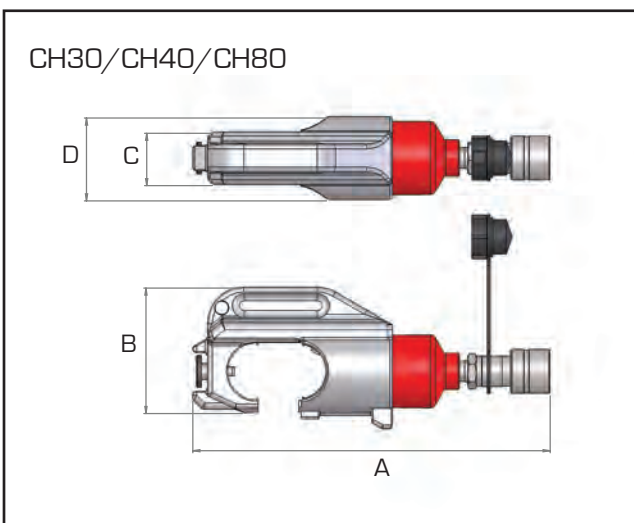
CH - CABLE CRIMPING HEADS



All fitted with standard quick connect coupler

Choice of 'C' jaw or parallel guide design

Designed for easy access in confined spaces



| Model Number | Dimensions in mm | | | | | | | |
|---------------|------------------|-----|----|----|-----|----|-----|----|
| | A | B | C | D | E | F | G | H |
| CH21 | 278 | 88 | 28 | - | - | - | - | - |
| CH30 | 294 | 105 | 43 | 68 | - | - | - | - |
| CH32 | 284 | 78 | 50 | - | 53 | 43 | 63 | 96 |
| CH40 | 326 | 113 | 43 | 74 | - | - | - | - |
| CH63 | 319 | 78 | 50 | - | 49 | - | 163 | - |
| CH80 | 370 | 106 | 63 | - | - | - | - | - |
| CH1000 | 455 | 210 | 60 | - | 100 | - | 285 | - |

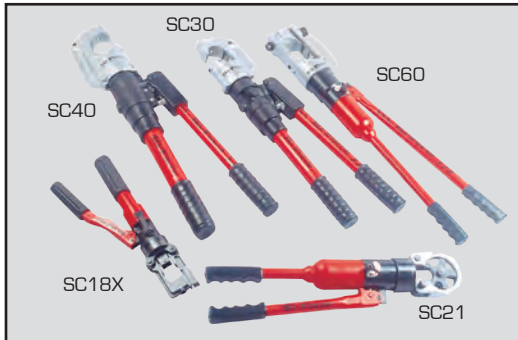
Note : CH21 and CH1000 dimensional drawings are not shown.

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

| Model Number | Description |
|--------------|--|
| CD10 | Die set 10mm ² , suitable for crimping tool CH30, CH40 & CH63 |
| CD16 | Die set 16mm ² , suitable for crimping tool CH30, CH40 & CH63 |
| CD25 | Die set 25mm ² , suitable for crimping tool CH30, CH40 & CH63 |

SC - SELF-CONTAINED CABLE CRIMPING TOOLS



Choice of 6 models available

Supplied complete with die sets

Automatic pressure release valve

The SC self-contained hydraulic cable crimping tool range offers 6 models with a choice of open “C” jaw or parallel guide design. All models are fitted with an automatic pressure release valve and are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces.

- >> Model SC21 is suitable for crimping connectors up to 240mm²
- >> Models SC30, SC32 & SC40 are suitable for crimping connectors up to 400mm²
- >> Model SC60 is suitable for crimping non-insulated terminals up to 630mm²
- >> Model SC18X is suitable for crimping non-insulated terminals up to 185mm²



| Model number | Output tonnes | C - Jaw opening | Applicable range DIN mm ² | Standard dies mm ² | Length mm | Weight kg |
|--------------|---------------|-----------------|--------------------------------------|---|-----------|-----------|
| SC21 | 10 | not applicable | 25-240 | With die (4pcs) 16-25, 35-70, 70-185, 240 Female die (1pc) 25-35, 50-70, 95-120, 150-185, 240 | 528 | 5.2 |
| SC30 | 12 | 30 mm | 35-400 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 610 | 6.3 |
| SC32 | 18 | not applicable | 16-400 | With die (4pcs) 16, 25-35, 50-120, 150-400 Female die (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400 | 650 | 6.2 |
| SC40 | 12 | 38 mm | 35-400 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 636 | 7.7 |
| SC60 | 18 | not applicable | 35-630 | With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630 | 650 | 6.5 |
| SC18X | 6 | not applicable | 10-185 | With die 10-16, 25-35, 50-70, 95-120, 150, 185 | 370 | 2.0 |

Note : Models SC21 & SC32 are supplied with single indent dies, all other models are supplied with hexagonal dies.

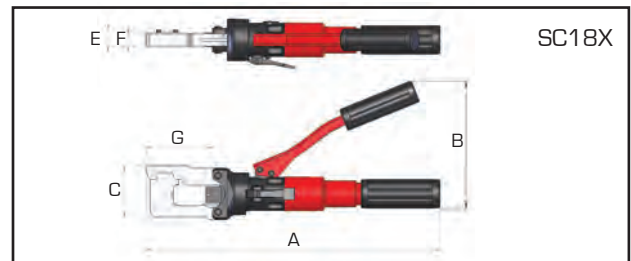
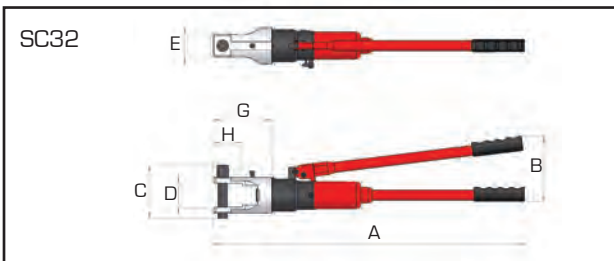
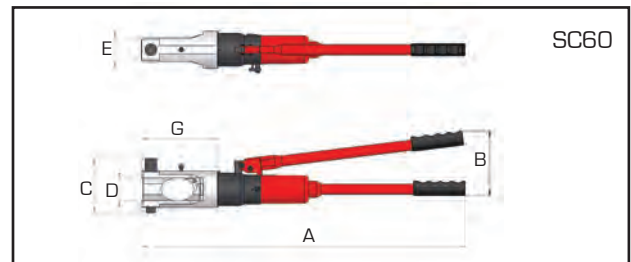
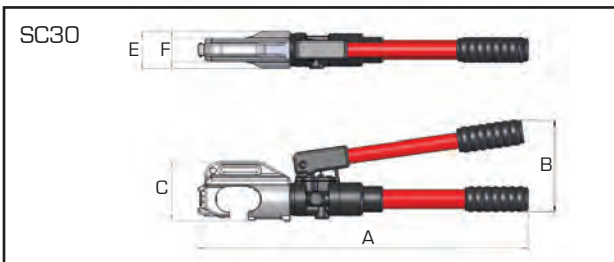
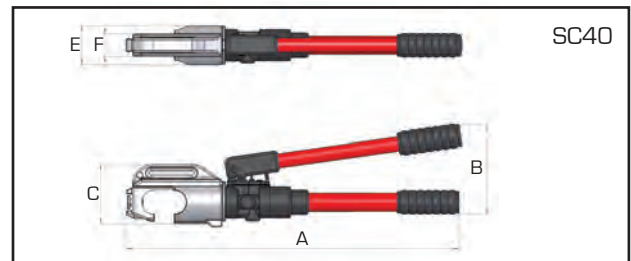
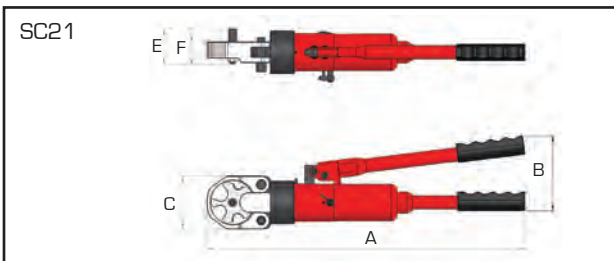
SC - SELF-CONTAINED CABLE CRIMPING TOOLS



Supplied in convenient carrying & storage case

Easy to operate, self-contained design

Choice of open 'C' jaw or parallel guide design



| Model Number | Dimensions in mm | | | | | | | | |
|--------------|------------------|-----|-----|----|----|----|-----|----|--|
| | A | B | C | D | E | F | G | H | |
| SC21 | 520 | 122 | 86 | - | 57 | 27 | - | - | |
| SC30 | 602 | 166 | 116 | - | 68 | 43 | - | - | |
| SC32 | 680 | 137 | 116 | 52 | 50 | - | 128 | 63 | |
| SC40 | 630 | 166 | 113 | - | 74 | 48 | - | - | |
| SC60 | 690 | 140 | 116 | 52 | 50 | - | 163 | - | |
| SC18X | 380 | 142 | 70 | - | 21 | 16 | 86 | - | |

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

| Model Number | Description |
|--------------|--|
| CD10 | Die set 10mm ² , suitable for crimping tool SC30, SC40 & SC60 |
| CD16 | Die set 16mm ² , suitable for crimping tool SC30, SC40 & SC60 |
| CD25 | Die set 25mm ² , suitable for crimping tool SC30, SC40 & SC60 |

BC - BATTERY OPERATED CABLE CRIMPING TOOLS



Supplied complete with standard set of dies

Battery power warning light

Efficient and quick battery recharger

The BC range of battery powered crimping tools consists of 4 models with a choice of 'C' jaw or parallel guide design that incorporates a 360° swivel head.

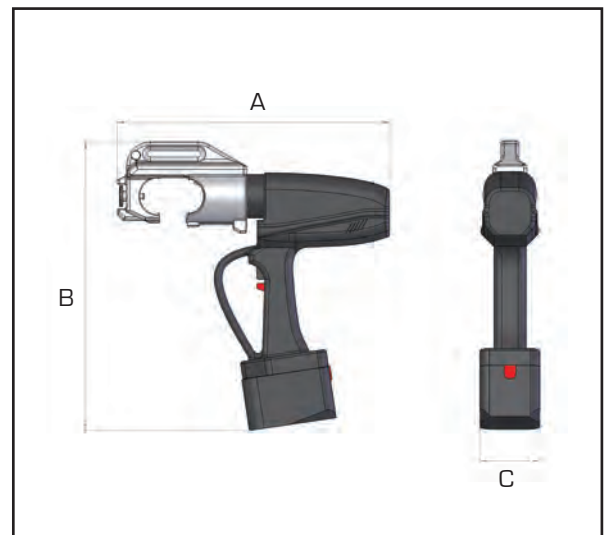
The range offers all the versatility of the manually operated CH and SC range but with the added speed and ease of use associated with a battery powered tool. All models are supplied with battery, battery charger, shoulder strap and tool box storage case.

| Model number | Output tonnes | C - Jaw opening | Applicable range DIN mm ² | Standard dies mm ² | Dimensions in mm | | | Weight kg | |
|--------------|---------------|-----------------|--------------------------------------|-------------------------------|--|-----|-----|-----------|-----|
| | | | | | A | B | C | | |
| BC18X | 7 | not applicable | 10-185 | With die | 10-16, 25-35, 50-70, 95-120, 150, 185 | 370 | 280 | 70 | 3.8 |
| BC30 | 12 | 30 mm | 35-400 | With die | 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 400 | 280 | 70 | 5.9 |
| BC40 | 12 | 38 mm | 35-400 | With die | 35, 50, 70, 95, 120, 150, 185, 240, 300, 400 | 430 | 270 | 70 | 7.2 |
| BC63 | 18 | not applicable | 35-630 | With die | 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630 | 420 | 320 | 75 | 6.9 |

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified, optional dies sets are available as per the below table.

| Model Number | Description |
|--------------|--|
| CD10 | Die set 10mm ² , suitable for crimping tool BC30, BC40 & BC63 |
| CD16 | Die set 16mm ² , suitable for crimping tool BC30, BC40 & BC63 |
| CD25 | Die set 25mm ² , suitable for crimping tool BC30, BC40 & BC63 |



BC - ACCESSORIES



| Model Number | Description |
|-----------------------------------|--------------------|
| BP12 | Battery Pack 14.4V |
| Note: Charger supplied separately | |



| Model Number | Description |
|---------------|--|
| CCU144 | 14.4V Car cigarette lighter charger unit |



| Model Number | Description |
|--------------|---------------------|
| CU12 | Charger 110V - 230V |



| Model Number | Description |
|--|-------------|
| Power supply to operate unit directly from mains | |
| MP110 | 110V |
| MP220 | 220/230V |

HCH - HYDRAULIC CUTTER HEADS



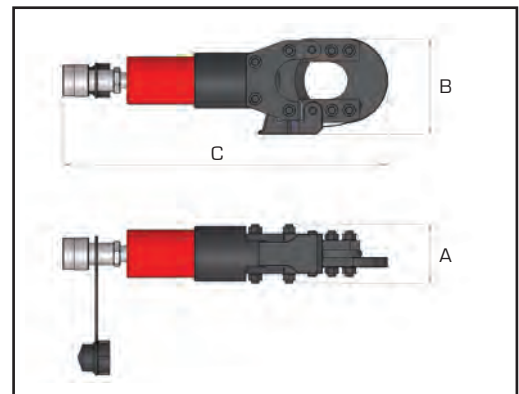
Cutting capacity up to 120mm diameter

Working pressure 700 Bar

Compact and lightweight

The HCH cutter head range cuts a wide range of materials and offers 2 models with similar features to the CT range of self-contained cutters. A comprehensive range of suitable manually operated and powered hydraulic pumps suitable for use with Hi-Force HCH cutters is detailed on pages 29 to 50.

| Model number | Cutting force tonnes | Weight kg | Dimensions in mm | | |
|---------------|----------------------|-----------|------------------|-----|-----|
| | | | A | B | C |
| HCH40 | 7 | 2.8 | 62 | 101 | 247 |
| HCH120 | 13 | 15.0 | 76 | 250 | 600 |



| Material | Description | Maximum diameter cutting capacity in mm | |
|------------------------|-------------------------------|---|--------|
| | | HCH40 | HCH120 |
| Steel Wire Rope | 6x7 Hempcore | 20 | 30 |
| | 6x12 Hempcore | 25 | 36 |
| | 6x19 Hempcore | 25 | 36 |
| Round Bar | Soft copper bar | 25 | 40 |
| | Soft aluminium bar | 22 | 40 |
| | Soft steel bar | 16 | - |
| Wire Strands | Bare copper strands | 32 | 50 |
| | Bare aluminium strands | 32 | 50 |
| Cable | Telephone cable CCP | 40 | 120 |
| | Lead sheathed telephone cable | 40 | 120 |
| | Armoured underground cable | 40 | 120 |

Replacement blades for HCH hydraulic cutter models :

| Blade Part number | Blade type | For Cutter |
|-------------------|------------|------------|
| CT40-11 | Moving | HCH40 |
| CT40-05 | Static | HCH40 |
| HCH120-01 | Moving | HCH120 |
| HCH120-02 | Static | HCH120 |



Did you know

HCH cutters can be operated with battery powered pumps. For more details, see page 37 of this catalogue.

CT - SELF-CONTAINED HYDRAULIC CUTTERS



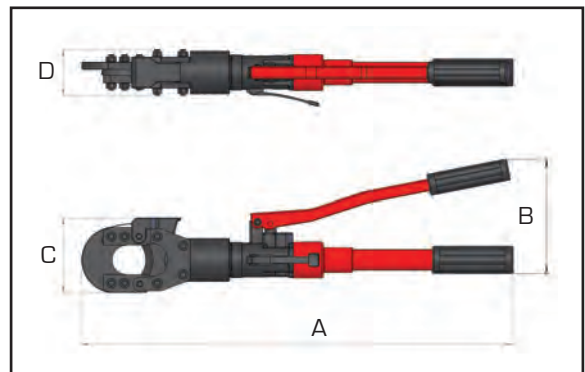
Cutting capacity up to 40mm diameter

Cuts a wide variety of materials

Self-contained operation

The CT self-contained hydraulic cutter range offers a choice of 2 models with cutting capacities up to 25mm steel wire rope and 40mm cable. These versatile cutters are suitable for cutting wire rope, round bar, wire strands and electrical cable.

| Model number | Cutting force tonnes | Weight kg | Dimensions in mm | | | |
|--------------|----------------------|-----------|------------------|-----|-----|----|
| | | | A | B | C | D |
| CT20 | 6 | 2.8 | 390 | 145 | 76 | 40 |
| CT40 | 7 | 6.0 | 560 | 155 | 103 | 65 |



| Material | Description | Maximum diameter cutting capacity in mm | |
|------------------------|-------------------------------|---|------|
| | | CT20 | CT40 |
| Steel Wire Rope | 6x7 Hempcore | 16 | 20 |
| | 6x12 Hempcore | 20 | 25 |
| | 6x19 Hempcore | 20 | 25 |
| Round Bar | Soft copper bar | 20 | 25 |
| | Soft aluminium bar | 20 | 22 |
| | Soft steel bar | 16 | 16 |
| Wire Strands | Bare copper strands | 20 | 32 |
| | Bare aluminium strands | 20 | 32 |
| Cable | Telephone cable CCP | 20 | 40 |
| | Lead sheathed telephone cable | 20 | 40 |
| | Armoured underground cable | 20 | 40 |

Replacement blades for CT self-contained cutter models :

| Blade Part number | Blade type | For Cutter |
|-------------------|------------|------------|
| CT20-04 | Moving | CT20 |
| CT20-05 | Static | CT20 |
| CT40-11 | Moving | CT40 |
| CT40-05 | Static | CT40 |



Comprehensive service kits are also available for CT self-contained cutters.

For more information, visit our website www.hi-force.com or contact your regional Hi-Force office.

HWC - HAMMER BLOW WIRE ROPE AND CABLE CUTTERS

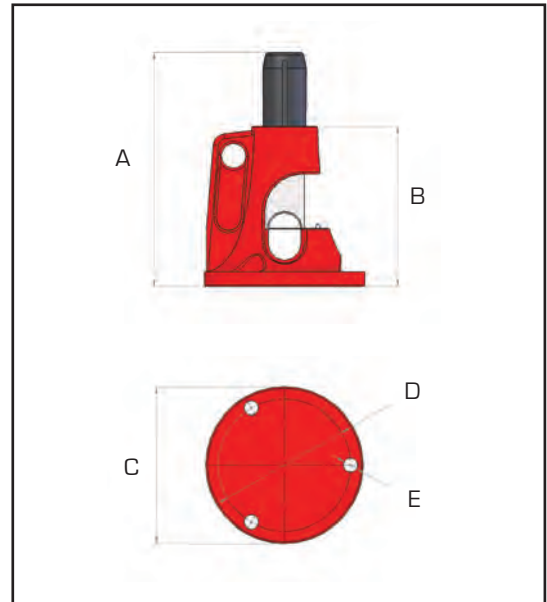


Highly cost efficient impact design

Cutting capacity up to 38mm diameter wire rope

Portable and lightweight

The Hi-Force HWC range of highly cost effective hammer blow cutters is manufactured from high quality, shock resistant, ductile iron and is fitted with replaceable cutting blades made from tool steel. The cutting blades are retained in the housing at the moment of impact, ensuring absolute safety. These cutters offer a considerable time saving over conventional axe, chisel and hacksaw methods.



| Model number | Cutting capacity | | Weight kg |
|--------------|------------------|-------------------------------------|-----------|
| | Wire rope Ø mm | Electric cable mcm* mm ² | |
| HWC90 | 19 | 250 127 | 3.2 |
| HWC91 | 27 | 300 152 | 7.0 |
| HWC92 | 38 | 750 380 | 13.0 |

*mcm = 1,000 circular mils

| Dimensions in mm | | | | |
|------------------|-----|-----|-----|-----|
| A | B | C | D | E |
| 225 | 140 | 88 | N/A | N/A |
| 245 | 154 | 160 | 148 | 14 |
| 285 | 195 | 195 | 164 | 18 |

Replacement blades for HWC hammer blow wire rope and cable cutters :

| Blade Part number | For Cutter |
|-------------------|------------|
| HWC90-105 | HWC90 |
| HWC91-125 | HWC91 |
| HWC92-135 | HWC92 |



J

HSWC - SELF-CONTAINED HYDRAULIC WIRE ROPE CUTTERS



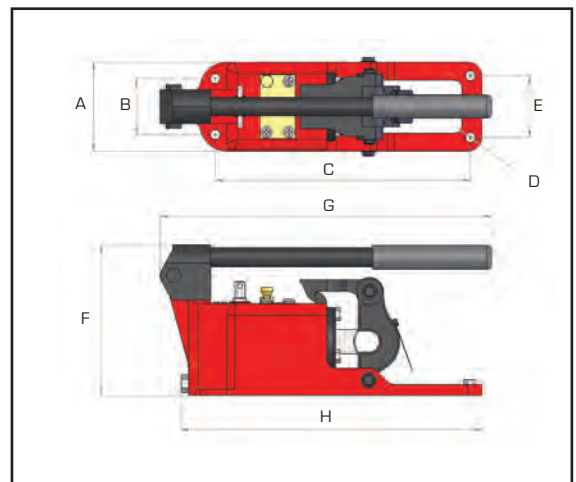
Cutting capacities up to 44mm diameter

Strong rigid steel construction

Easy to use with minimum operator effort

The Hi-Force range of self-contained portable hydraulic wire rope and cable cutters comprises of 3 models with cutting capacities up to 44mm diameter. Approved and specified by many major industries throughout the world, these high quality cutters are precision engineered to give a good, clean cut with minimum effort, time after time. The self-contained design of the cutter enables easy transportation to the job site with minimum of fuss.

The shear blades are manufactured using high quality tool steel, which is heat treated and ground to very tight tolerances, ensuring superior performance and long-life. Users include wire rope manufacturers, earthmoving and construction contractors, rigging shops, elevator manufacturers and repairers and many others.



| Model number | Cutting capacity wire rope mm Ø | Weight kg |
|---------------|---------------------------------|-----------|
| HSWC19 | 19 | 9.5 |
| HSWC28 | 28 | 15.5 |
| HSWC44 | 44 | 30.0 |

| Dimensions in mm | | | | | | | |
|------------------|----|-----|------|----|-----|-----|-----|
| A | B | C | D | E | F | G | H |
| 93 | 58 | 265 | 10.2 | 64 | 154 | 345 | 315 |
| 105 | 64 | 294 | 10.2 | 67 | 174 | 374 | 357 |
| 125 | 70 | 393 | 10.2 | 84 | 203 | 490 | 460 |

Replacement blades for HSWC self-contained wire rope cutters :

| Blade Part number | For Cutter |
|-------------------|------------|
| HSWC19-4 | HSWC19 |
| HSWC28-4 | HSWC28 |
| HSWC44-4 | HSWC44 |



HWRC - DOUBLE ACTING WIRE ROPE CUTTERS



Working pressure 700 Bar

Double acting design

Smooth guillotine cutting action

The HWRC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile locked coil wire rope and solid steel bar. Maximum cutting capacities up to 114mm diameter wire rope and up to 40mm diameter 28 tonnes tensile solid steel bar. All models incorporate a double acting hydraulic cylinder, suitable for working pressures up to 700 Bar and an open jaw design cutting head (see pictures below) for easy access to the material to be cut. Cutting blades and jaws are manufactured from specially toughened high tensile steel and the smooth guillotine action of the cutter greatly reduces the risk of blade jamming.



Step 1:
To open the cutter, swivel cutting head forward.



Step 2:
Position material to be cut in the cutting head slot.



Step 3:
Close the cutting head by swivelling it back to its original position and secure behind the latch.

| Model number | Output tonnes | Cutting capacity in mm | | | Oil capacity cm ³ | Weight kg | Dimensions in mm | | |
|-----------------|---------------|------------------------|-------|-----------------|------------------------------|-----------|------------------|-------|--------|
| | | Wire rope mm Ø | Cable | Reinforcing Bar | | | Length | Width | Height |
| HWRC1115 | 36 | 38 | 38 | 20 | 350 | 30 | 400 | 155 | 270 |
| HWRC1125 | 80 | 63 | 63 | 32 | 900 | 60 | 450 | 200 | 390 |
| HWRC1136 | 80 | 90 | 90 | 32 | 1200 | 70 | 515 | 200 | 390 |
| HWRC1145 | 120 | 114 | 114 | 40 | 2400 | 95 | 570 | 280 | 445 |

Replacement blades for HWRC wire rope cutter models :

| Blade Part number | For Cutter |
|-------------------|------------|
| HWRC1115-B | HWRC1115 |
| HWRC1125-B | HWRC1125 |
| HWRC1136-B | HWRC1136 |
| HWRC1145-B | HWRC1145 |



Hand and powered pumps suitable for use with HWRC cutters are detailed on pages 29 to 50.

HCC - CHAIN CUTTERS



Working pressure 700 Bar

Single acting design

Fitted with locking guard

The HCC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile chain and reinforcing bar. The easily replaceable cutter blades are manufactured from specially toughened high tensile steel and the choice of models available offer maximum cutting capacities up to 50mm diameter. All models are suitable for working pressures up to 700 Bar and incorporate a single acting cylinder fitted with a powerful piston retraction spring. The swivel action design of the locking safety guard (see pictures below) allows easy access for the material to be cut.

| Model number | Cutting capacity mm Ø | Cutting force tonnes | Max. allowed chain grade | steel hardness | Oil capacity cm ³ | Weight kg |
|------------------|-----------------------|----------------------|--------------------------|----------------|------------------------------|-----------|
| HCC26-100 | 26 | 70 | 100 | 47 HRC | 276 | 23 |
| HCC34-100 | 34 | 100 | 100 | 47 HRC | 492 | 40 |
| HCC46-100 | 46 | 140 | 100 | 47 HRC | 980 | 72 |
| HCC50-100 | 50 | 145 | 100 | 47 HRC | 1100 | 77 |

| Dimensions in mm | | |
|------------------|-------|--------|
| Length | Width | Height |
| 440 | 180 | 180 |
| 410 | 460 | 250 |
| 565 | 635 | 345 |
| 565 | 635 | 360 |

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Replacement blades for HCC chain cutter models :

| Blade Part number | Blade type | For Cutter |
|---------------------|------------|------------|
| HCC26-4M100 | Moving | HCC26-100 |
| HCC26-4S100 | Static | HCC26-100 |
| HCC34-5M100 | Moving | HCC34-100 |
| HCC34-5S100 | Static | HCC34-100 |
| HCC46-11M100 | Moving | HCC46-100 |
| HCC46-11S100 | Static | HCC46-100 |
| HCC50-17M100 | Moving | HCC50-100 |
| HCC50-17S100 | Static | HCC50-100 |



Picture 1:
Cutter shown with swivel action safety guard opened.



Picture 2:
Cutter shown with swivel action safety guard closed.



Hand and powered pumps suitable for HCC cutters are detailed on pages 29 to 50.

TOOLS

| | | |
|--------------------|--|--------------------|
| HHP Range | Hole punchers | Page 152 |
| HKP & SKP Range | Knock-out punchers | Page 153 |
| NS Range | Nut splitters | Page 154 |
| HMNS Range | Self-contained nut splitters | Page 155 |
| DNS Range | Double acting nut splitters | Page 156 |
| HFS-H Range | Hydraulic flange spreaders | Page 157 |
| HFS & HFS-TK Range | Hydraulic flange spreader kits | Page 158 |
| MFS & JS Range | Mechanical flange spreaders & jaw spreaders | Page 159 |
| SJS & SJS-TK Range | Stepped jaw spreaders & jaw spreader kits | Pages 160 - 161 |
| PB Range | Hydraulic pipe bender & accessories | Page 162 |
| RKT & RKF Range | Roller skate kits | Page 163 |
| RSN & RSA Range | Multi-purpose moving skates | Page 164 |
| RSG & RSD Range | Heavy duty moving skates | Page 165 |
| HPF Range | Workshop presses, V-blocks & bed winches | Pages 166 - 167 |
| Tool Boxes | Storage and transport boxes | Page 168 |

HHP - HOLE PUNCHERS

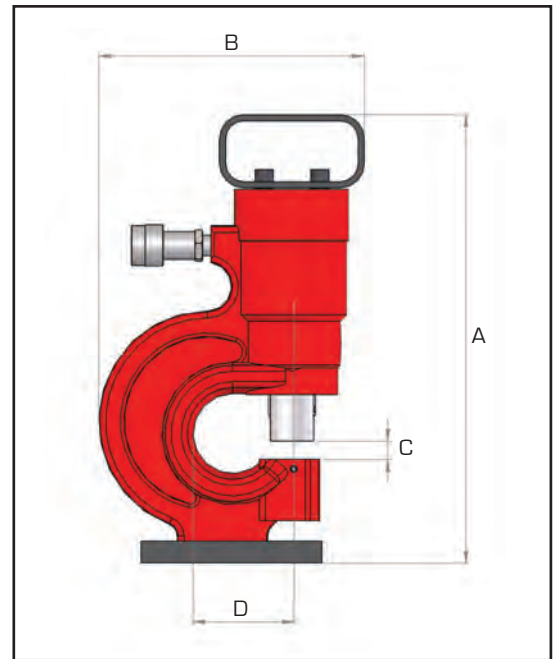


Punching force up to 50 tonnes

Throat depth 70mm

Working pressure 700 Bar

The Hi-Force HHP series hydraulic hole puncher range offers a choice of two models comprising of the HHP30, 30 tonnes capacity single acting version, and the HHP50, 50 tonnes capacity double acting version. Both models are suitable for punching holes in steel plate as per the respective capacity of each model and are supplied complete with standard punch and die sets and an integral positioning and carrying handle. See pages 29-50 for detailed information of suitable pumps for use with HHP series punchers.



K

| Model number | Maximum force tonnes | Throat depth mm | Punch capacity (mm) | | Standard punch/die sets included mm | Recommended pump & hose | | Weight excl. pump kg |
|--------------|----------------------|-----------------|---------------------|---------------------|-------------------------------------|---------------------------------------|---|----------------------|
| | | | Steel plate | Hole punch diameter | | Manually operated | Pneumatically operated | |
| HHP30 | 30 | 70 | 10.0 | up to 20.5 | 10.5, 13.5 17.5, 20.5 | HP232 complete with HC3 3m hose | AHP1120 complete with HC3 3m hose | 13 |
| HHP50 | 50 | 70 | 15.0 | up to 25.5 | 10.5, 13.5 17.5, 20.5, 25.5 | HP232D c/w 2 x HC3 | AHP1141 c/w 2 x HC3 | 42 |

Note: pump supplied separately

| Model number | Dimensions in mm | | | |
|--------------|------------------|-----|----|------|
| | A | B | C | D |
| HHP30 | 370.0 | 220 | 13 | 78.0 |
| HHP50 | 413.5 | 281 | 15 | 70.6 |



The HHP30 is single acting operation, the HHP50 is double acting operation

HKP & SKP - KNOCK OUT PUNCHERS



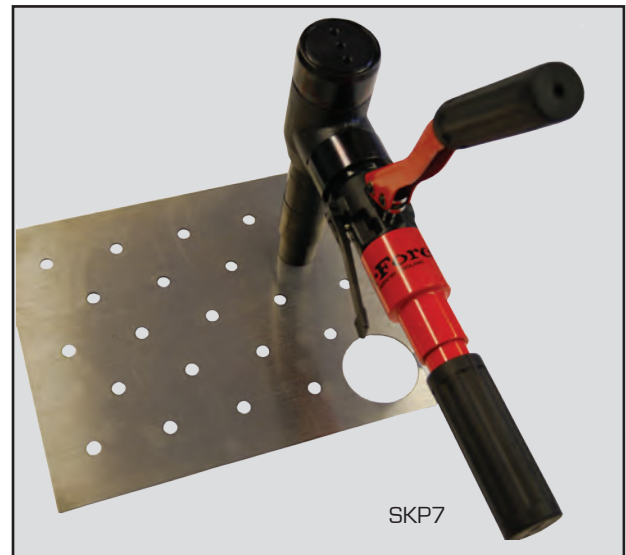
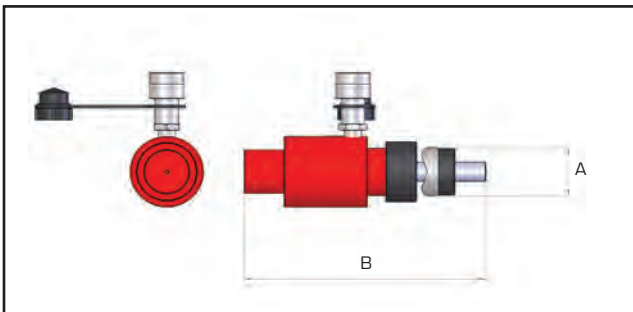
Capacity up to 10 tonnes

Spring return hydraulic cylinder

Working pressure 700 Bar

The Hi-Force HKP and SKP knock out puncher range is supplied as a complete set, including all standard sizes of punches/dies as specified below. Ideal for on-site hole punching in electric control panels and metal plates.

| Model number | Maximum force tonnes | Plate capacity (mm) | | Pump Included | Hose Included | Complete set weight kg |
|-----------------|----------------------|---------------------|------------|--|---------------|------------------------|
| | | Stainless steel | Mild steel | | | |
| HKP10-2 | 10 | 1.6 | 3.2 | HP110 | HC2 | 14.6 |
| HKP10-4 | 10 | 1.6 | 3.2 | HP110 | HC2 | 26.1 |
| HKP10-2H | 10 | 1.6 | 3.2 | Not included | Not included | 7.0 |
| HKP10-4H | 10 | 1.6 | 3.2 | Not included | Not included | 18.5 |
| SKP7 | 7 | 1.6 | 3.2 | Self contained unit with integral pump | | 10.0 |



Did you know.....

Hi-Force knock-out punchers are supplied complete with a carrying case

| Model number | Description | Punches/dies included | | | | | | | | | |
|----------------|-----------------|-----------------------|------|------|------|------|------|------|------|-------|-------|
| | | 21.8 | 27.6 | 34.1 | 42.7 | 48.7 | 60.5 | | | | |
| HKP10-2 | Std.punch/die A | 21.8 | 27.6 | 34.1 | 42.7 | 48.7 | 60.5 | | | | |
| | Conduit Size | ½" | ¾" | 1" | 1¼" | 1½" | 2" | | | | |
| | Length B | 306 | 240 | 240 | 240 | 240 | 240 | | | | |
| HKP10-4 | Std.punch/die A | 21.8 | 27.6 | 34.1 | 42.7 | 48.7 | 60.5 | 76.1 | 88.9 | 102.8 | 115.5 |
| | Conduit Size | ½" | ¾" | 1" | 1¼" | 1½" | 2" | 2½" | 3" | 3½" | 4" |
| | Length B | 306 | 240 | 240 | 240 | 240 | 240 | 253 | 253 | 253 | 253 |
| SKP7 | Std.punch/die A | 21.8 | 27.6 | 34.1 | 42.7 | 48.7 | 60.5 | | | | |
| | Conduit Size | ½" | ¾" | 1" | 1¼" | 1½" | 2" | | | | |
| | Length B | 306 | 240 | 240 | 240 | 240 | 240 | | | | |

NS - NUT SPLITTERS



NS104

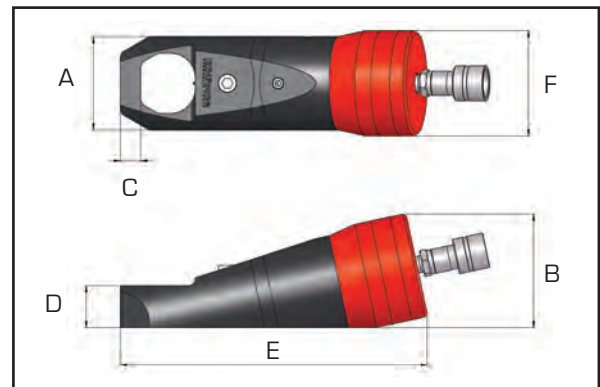
Capacities from 17 to 75mm AF

Working pressure 700 Bar

Compact & easy to use

The improved NS range of hydraulic nut splitters offers a choice of 5 models suitable for hexagon nut AF sizes from 17 to 75mm [M10 to M48 bolt sizes]. The revolutionary design incorporates a hardened steel linkage that ensures the blade cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. Optional unique 360° positional swivel coupling for easy adjustment and fitment in confined spaces is available for use with models NS104 and NS110. Suitable pumps are detailed on pages 29 to 50.

- >> Angled body design on all models
- >> Provides necessary clearance on flanges and flat surfaces
- >> Manufactured from high quality steel



| Model number | Hexagon AF sizes | | Bolt sizes | | Weight kg |
|--------------|------------------|--|------------|---|-----------|
| | mm | inch | metric | imperial | |
| NS104 | 17 - 32 | 1 ¹ / ₁₆ " - 1 ¹ / ₄ " | M10 - M22 | 1/2" - 3/4" | 4.0 |
| NS110 | 32 - 41 | 1 ¹ / ₄ " - 1 ⁵ / ₁₆ " | M22 - M27 | 3/4" - 1 ⁵ / ₁₆ " | 7.4 |
| NS200 | 41 - 50 | 1 ⁵ / ₁₆ " - 2" | M27 - M33 | 1" - 1 ¹ / ₄ " | 10.6 |
| NS206 | 50 - 60 | 2" - 2 ³ / ₁₆ " | M33 - M39 | 1 ¹ / ₄ " - 1 ¹ / ₂ " | 15.8 |
| NS215 | 60 - 75 | 2 ³ / ₁₆ " - 2 ¹⁵ / ₁₆ " | M39 - M48 | 1 ¹ / ₂ " - 1 ⁷ / ₈ " | 39.3 |

| Dimensions in mm | | | | | |
|------------------|-----|------|------|-----|-----|
| A | B | C | D | E | F |
| 64 | 77 | 12.5 | 30.0 | 210 | 67 |
| 78 | 96 | 20.0 | 37.0 | 268 | 88 |
| 96 | 116 | 21.0 | 43.0 | 315 | 108 |
| 115 | 138 | 24.0 | 52.0 | 336 | 126 |
| 156 | 175 | 27.0 | 75.0 | 426 | 162 |

Note : The NS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

Replacement blades for NS nut splitters :

| Blade Part number | For Nut splitter |
|-------------------|------------------|
| NS104-B | NS104 |
| NS110-B | NS110 |
| NS200-B | NS200 |
| NS206-B | NS206 |
| NS215-B | NS215 |



HMNS - SELF CONTAINED NUT SPLITTERS



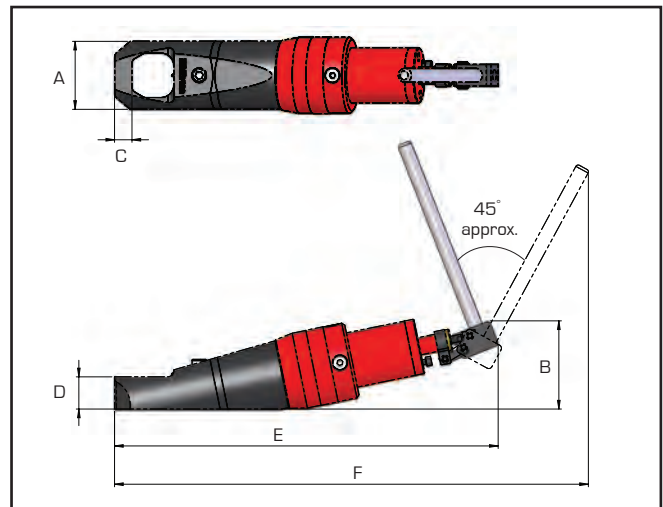
Capacities from 17 to 50mm AF

Choice of 3 models

Compact & easy to use

The HMNS range of hydraulic nut splitters offers a choice of 3 models suitable for hexagon nut AF sizes from 17 to 50mm (M10 to M33 bolt sizes). All models have an angled body design to provide the necessary clearance on flanges and flat surfaces. The revolutionary design incorporates a hardened steel linkage that ensures the blades cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. All models incorporate an integral hydraulic pump with multi-positional lever for even greater versatility.

- >> Angled body design on all models
- >> Provides necessary clearance on flanges and flat surfaces
- >> Manufactured from high quality steel



| Model number | Hexagon AF sizes | | Bolt sizes | | Weight kg |
|----------------|------------------|-----------------|------------|---------------|-----------|
| | mm | inch | mm | imperial | |
| HMNS104 | 17 - 32 | 11/16" - 1 1/4" | M10 - M22 | 1/2" - 3/4" | 5.8 |
| HMNS110 | 32 - 41 | 1 1/4" - 1 5/8" | M22 - M27 | 3/4" - 1 5/8" | 7.9 |
| HMNS200 | 41 - 50 | 1 5/8" - 2" | M27 - M33 | 1" - 1 1/4" | 13.6 |

| Dimensions in mm | | | | | |
|------------------|-----|------|------|-----|-----|
| A | B | C | D | E | F |
| 64 | 88 | 12.5 | 30.0 | 380 | 455 |
| 78 | 101 | 20.0 | 37.0 | 440 | 540 |
| 94 | 112 | 21.0 | 43.0 | 471 | 566 |

Note: The HMNS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

Replacement blades for HMNS nut splitters :

| Blade Part number | For Nut splitter |
|-------------------|------------------|
| NS104-B | HMNS104 |
| NS110-B | HMNS110 |
| NS200-B | HMNS200 |



DNS - DOUBLE ACTING NUT SPLITTERS

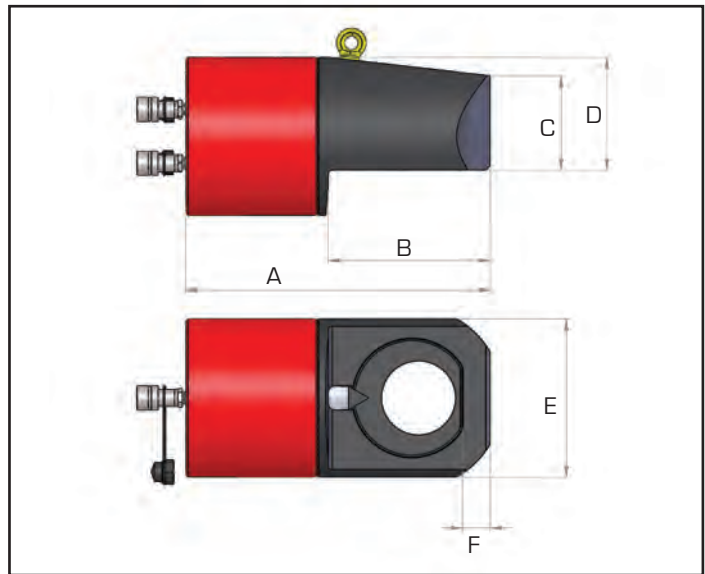


Choice of 2 models

Working pressure 700 Bar

Double acting design

The Hi-Force DNS range of double acting, hydraulic nut splitters offers a choice of 2 models suitable for splitting nuts of across flats (AF) sizes from 2.15/16" to 5.3/8" (74mm to 136mm). Both models are 700 Bar maximum working pressure and feature a double acting hydraulic piston for easy extension and retraction of the toughened steel splitting blade. Hi-Force DNS range hydraulic nut splitters are easy to set up and capable of safely splitting nuts quickly without any sparks, flames or flying debris usually associated with cutting torches. The DNS range nut splitter heads are designed to fit on all API and ANSI flanges and capable of splitting the hardest nuts with minimal damage to the stud bolt threads. Splitting blades are easy to remove and re-install after re-sharpening or when a replacement blade is required.



| Model number | Hexagon AF sizes | | Stud bolt thread sizes | | Weight kg | Dimensions in mm | | | | | |
|---------------|------------------|-------------------|------------------------|-----------------|-----------|------------------|-----|-------|-------|-----|----|
| | mm | inch | metric | imperial | | A | B | C | D | E | F |
| DNS404 | 75 - 105 | 2 15/16" - 4 1/4" | M48 - M72 | 1 7/8" - 2 3/4" | 50 | 379.5 | 192 | 99.5 | 130.5 | 183 | 34 |
| DNS506 | 105 - 136 | 4 1/4" - 5 3/8" | M72 - M95 | 2 3/4" - 3 1/2" | 96 | 451.0 | 240 | 140.0 | 167.5 | 235 | 41 |

Note : The DNS nut splitters are for use on heavy duty nuts, where the nut height is equal to or greater than two-thirds of the blade length of the tool being used.

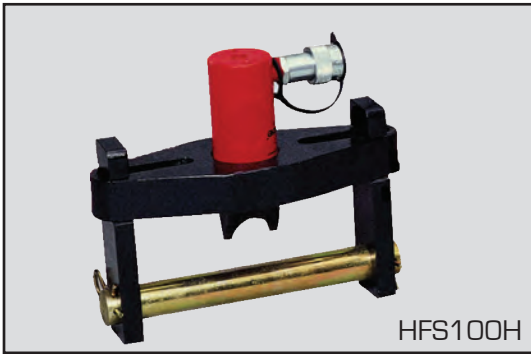
Replacement blades for DNS nut splitters :

| Blade Part number | For Nut splitter |
|-------------------|------------------|
| DNS404-B | DNS404 |
| DNS506-B | DNS506 |



Hand and powered pumps suitable for use with DNS nut splitters are detailed on pages 29 to 50.

HFS-H - HYDRAULIC FLANGE SPREADERS



Capacities from 4.5 to 10 tonnes

Working pressure 700 Bar

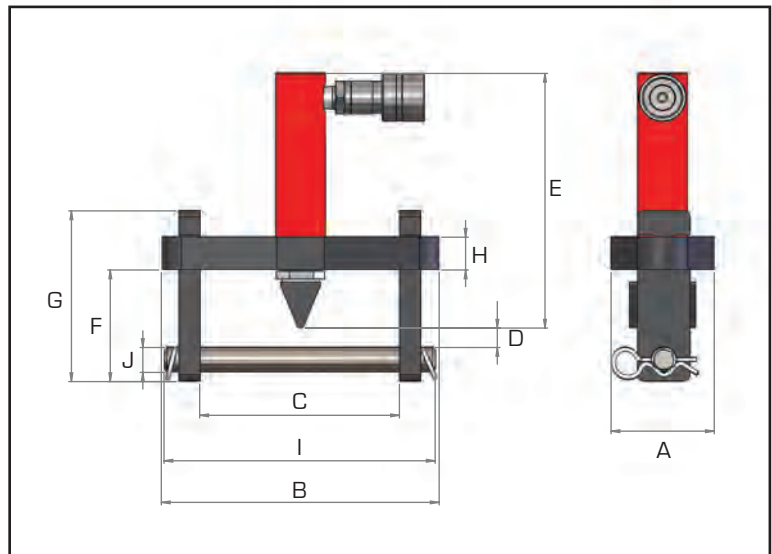
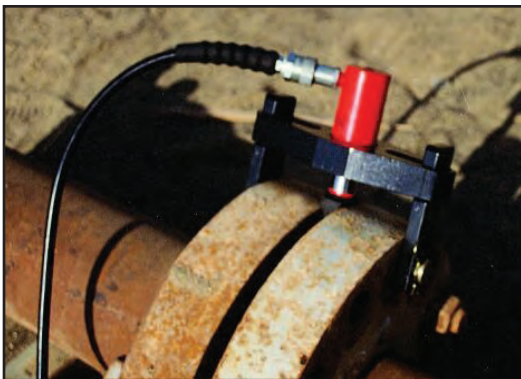
Quick and easy to assemble on flange

HFS-H hydraulic flange spreaders provide the ideal solution for safely opening pipe flanges in the marine and oil & gas industry. Available in capacities from 0 - 4.5 tonnes and 0 - 10 tonnes, these models offer the user the capability of opening flanges up to 2 x 57mm or 2 x 92mm thick respectively. Hi-Force flange spreaders can be operated individually, or as a pair when opening large flanges using a standard pump (see pages 31 to 33) and connecting hose (see page 52). With Hi-Force flange spreaders you are only minutes away from safely opening the toughest flanges without the risk of sparks caused by hammer blows, chisels and flying wedges.

» Suitable for fitment onto flanges with a maximum stud bolt size of 1 5/8" [41 mm]



Pump and hose not included!
See page 158 for complete kits.



| Model number | Capacity tonnes | Stroke mm | Oil capacity cm ³ | Max. flange thickness mm | Stud size mm | Standard wedge mm | Weight kg |
|----------------|-----------------|-----------|------------------------------|--------------------------|--------------|-------------------|-----------|
| HFS50H | 4.5 | 75 | 48 | 2 x 57 | 19 - 29 | 3 - 29 | 5.0 |
| HFS100H | 10 | 56 | 81 | 2 x 92 | 32 - 41 | 3 - 29 | 11.6 |

| Model number | Dimensions in mm | | | | | | | | | | |
|----------------|------------------|-----|-------|-------|----|-----|----|-----|----|-----|----|
| | A | B | C min | C max | D | E | F | G | H | I | J |
| HFS50H | 76 | 210 | 61 | 155 | 10 | 192 | 69 | 129 | 25 | 206 | 18 |
| HFS100H | 108 | 290 | 61 | 224 | 30 | 165 | 89 | 178 | 38 | 273 | 31 |

HFS & HFS-TK - HYDRAULIC FLANGE SPREADER KITS



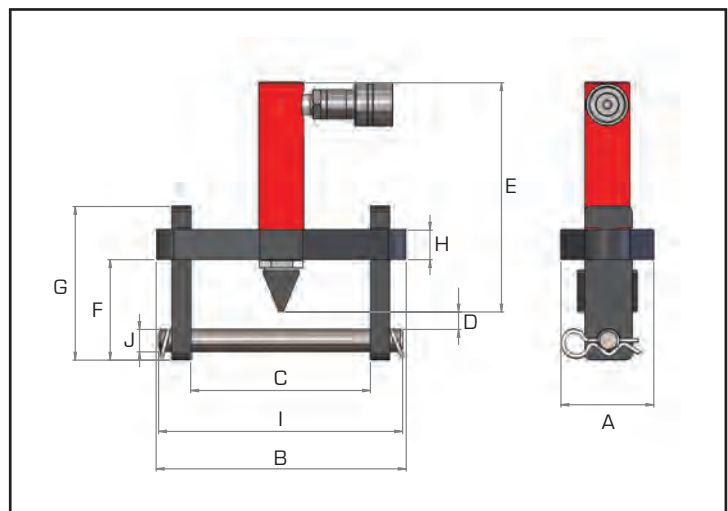
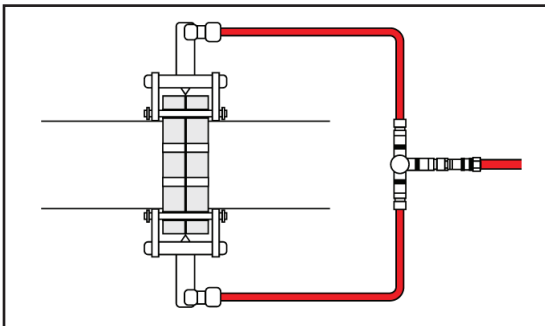
Capacities from 4.5 to 10 tonnes per spreader

Working pressure 700 Bar

Complete with manual pump

HFS and HFS-TK hydraulic flange spreader kits offer a choice of either single spreader complete with pump and accessories (HFS) or a twin spreader arrangement incorporating two flange spreaders operated from a single pump with a T-piece and twin hose connection (HFS-TK). For flange separation in applications where long lengths of heavy pipe work are involved, the HFS-TK twin spreader kit enables the operator to achieve parallel flange separation all around the joint. Hi-Force HP110 hand pump is supplied as standard to HFS & HFS-TK flange spreader kits and details can be found on page 31 of this catalogue.

- >> Supplied complete with manually operated pump and hose assembly
- >> Suitable for fitment onto flanges with a maximum stud bolt size of 1⁵/₈" [41 mm]



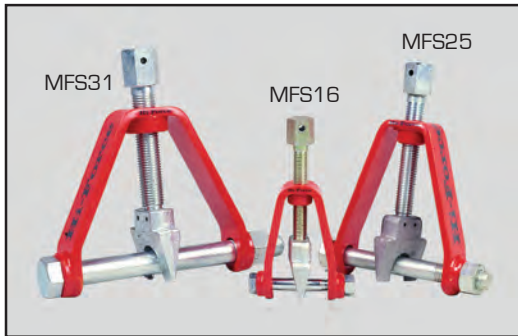
Specifications :

| Model number | Capacity tonnes | Stroke mm | Oil capacity cm ³ | Max. flange thickness mm | Stud size mm | Standard wedge mm | Weight kg |
|------------------|-----------------|-----------|------------------------------|--------------------------|--------------|-------------------|-----------|
| HFS50 | 4.5 | 75 | 48 | 2 x 57 | 19 - 29 | 3 - 29 | 22.5 |
| HFS100 | 10 | 56 | 81 | 2 x 92 | 32 - 41 | 3 - 29 | 29.1 |
| HFS50-TK | 2 x 4.5 | 75 | 2 x 48 | 2 x 57 | 19 - 29 | 3 - 29 | 27.5 |
| HFS100-TK | 2 x 10 | 56 | 2 x 81 | 2 x 92 | 32 - 41 | 3 - 29 | 35.7 |

Dimensions in mm :

| Model number | A | B | C min | C max | D | E | F | G | H | I | J |
|------------------|-----|-----|-------|-------|----|-----|----|-----|----|-----|----|
| HFS-50 | 76 | 210 | 61 | 155 | 10 | 192 | 69 | 129 | 25 | 206 | 18 |
| HFS-100 | 108 | 290 | 61 | 224 | 30 | 165 | 89 | 178 | 38 | 273 | 31 |
| HFS50-TK | 76 | 210 | 61 | 155 | 10 | 192 | 69 | 129 | 25 | 206 | 18 |
| HFS100-TK | 108 | 290 | 61 | 224 | 30 | 165 | 89 | 178 | 38 | 273 | 31 |

MFS - MECHANICAL FLANGE SPREADERS



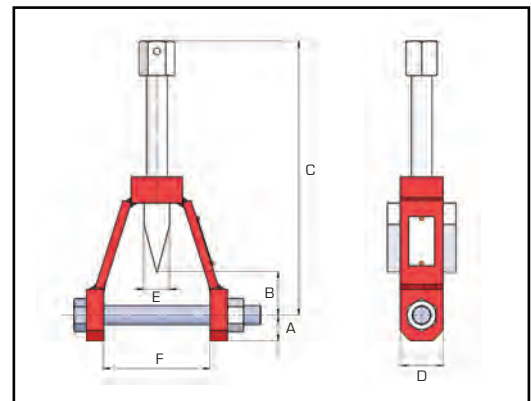
Suitable for bolt diameters up to 31mm

Maximum spread 231mm

No external power source required

The MFS range of mechanical flange spreaders comprises of 6 models, each offering a safe and economical way to open flanges without the risk of sparks. The threaded spindle can be operated using a standard spanner, allowing the user to apply a controlled force without damaging the flange. Due to the mechanical design of these flange spreaders, no external power source is needed and therefore, they can be used anywhere on-site.

- >> Choice of six models available
- >> High grade steel construction with high tensile cross bolt
- >> Case hardened spreading wedge



| Model number | Pin diameter | | Min flange bolt hole diameter | Maximum flange thickness | | Weight kg | Dimensions in mm | | | | | | |
|--------------|--------------|--------|-------------------------------|--------------------------|--------------|-----------|------------------|--------|--------|--------|----|----|-----|
| | mm | inch | | mm | inch | | A | B max. | C min. | C max. | D | E | F |
| MFS16 | 16 | 5/8" | 17 | 2 x 22 | 2 x 7/8" | 2.2 | 25 | 28 | 185 | 232 | 40 | 25 | 70 |
| MFS19 | 19 | 3/4" | 20 | 2 x 35 | 2 x 1 3/8" | 2.7 | 30 | 50 | 185 | 254 | 50 | 25 | 95 |
| MFS22 | 22 | 7/8" | 23 | 2 x 47 | 2 x 1 13/16" | 4.1 | 30 | 50 | 247 | 318 | 50 | 30 | 124 |
| MFS25 | 25 | 1" | 26 | 2 x 62 | 2 x 2 7/16" | 6.4 | 30 | 85 | 247 | 353 | 50 | 30 | 155 |
| MFS28 | 28 | 1 1/8" | 29 | 2 x 70 | 2 x 2 3/4" | 8.2 | 30 | 80 | 275 | 382 | 60 | 40 | 181 |
| MFS31 | 31 | 1 1/4" | 32 | 2 x 95 | 2 x 3 3/4" | 9.6 | 32 | 84 | 275 | 385 | 60 | 40 | 231 |

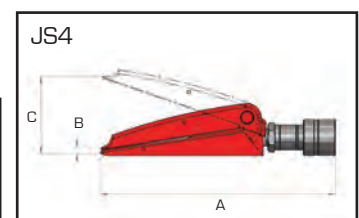
JS - JAW SPREADER



The JS4 hydraulic spreader is the ideal solution for spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted return design enables the tool to fit into a gap of 12mm and offers a maximum spread of 81mm. Manufactured from high strength steel, with a maximum pressure of 700 Bar, the JS4 is supplied fitted with a quick connect female half coupler, and can be used with HP110 manual hand pump and HC hose.

| Model number | Capacity tonnes | Oil capacity cm ³ | Weight kg |
|--------------|-----------------|------------------------------|-----------|
| JS4 | 0.9 | 10.0 | 2.2 |

| Dimensions in mm | | |
|------------------|----|----|
| A | B | C |
| 230 | 12 | 81 |



K

SJS - STEPPED JAW SPREADERS



Capacity 13 tonnes per spreader unit

Supplied with safety block & stepped blocks

Maximum spread 60mm

- >> Single acting, spring assisted return
- >> Compact & lightweight design

The Hi-Force SJS10 hydraulic spreader offers the ideal solution for spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted, piston retract design of the SJS10 offers the user a powerful 13 tonnes of spreading capacity. Manufactured from high strength steel, the low height jaw tips can easily fit within an 8mm gap and can provide a total spreading distance of 60mm in 5 operations, using the step blocks provided with the tool. Suitable for operation up to 700 Bar maximum working pressure, and supplied complete with a female half quick connect coupler for easy attachment to a Hi-Force manually operated or powered hydraulic pump.

Many applications require two tools, operated simultaneously, to achieve an even spread of a flange joint during gasket replacement. The SJS10-TK comprehensive kit offers the solution for this and comprises of two SJS10 spreaders, manually operated lightweight aluminium pump, controlled manifold, two pressure gauges, gauge blocks and hoses. All connections are fitted with quick release couplers and the set is supplied in a strong metal transport and storage box.

The SJS10-M has all the features of the SJS10, but with the added benefit of an inbuilt manually operated hand pump.



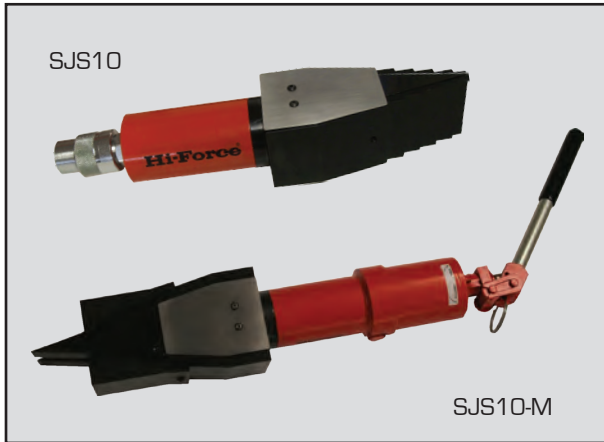
Single spreaders:

| Model number | Capacity tonnes | Stroke mm | Min. height mm | Max. spread mm | Oil capacity cm ³ | Weight kg |
|----------------|-----------------|-----------|----------------|----------------|------------------------------|-----------|
| SJS10 | 13 | 50 | 8 | 60 | 74 | 5.5 |
| SJS10-M | 13 | 50 | 8 | 60 | 74 | 7.5 |

Twin kit existing of:

| Model number | Spreaders | Pump | Hoses | Manifold | Gauges | Gauge blocks | Metal box | Weight kg |
|-----------------|--------------|--------------|-------------|-------------|--------------|----------------|-------------|-----------|
| SJS10-TK | SJS10 2 x | HP212 1 x | HC3C 2 x | HM2C 1 x | HG63G 2 x | AGA1-25 2 x | MSB1 1 x | 34.5 |

SJS - STEPPED JAW SPREADERS



Capacity 13 tonnes per spreader unit

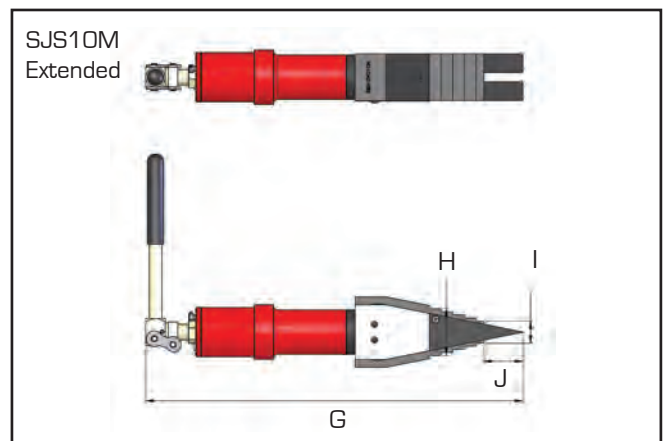
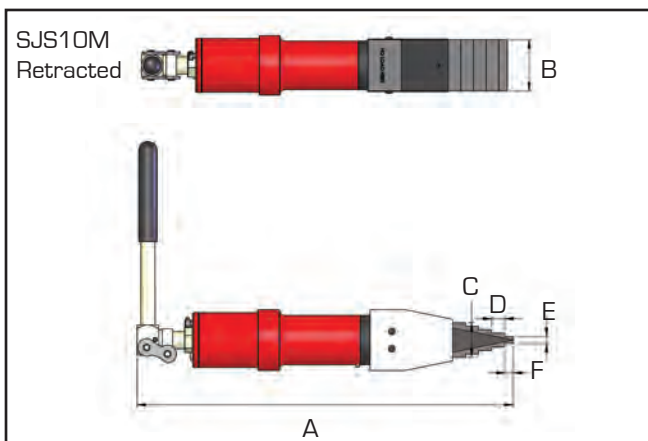
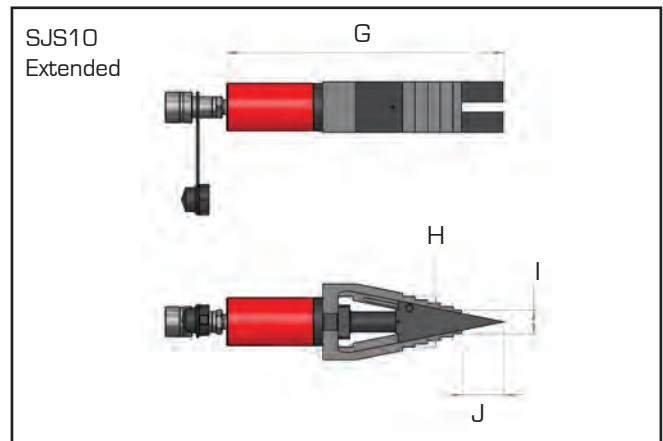
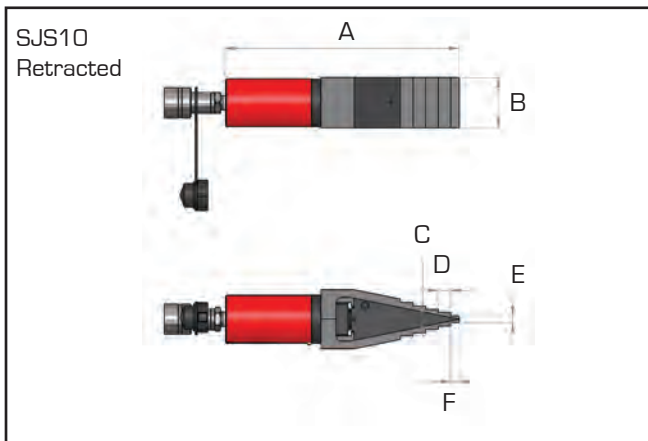
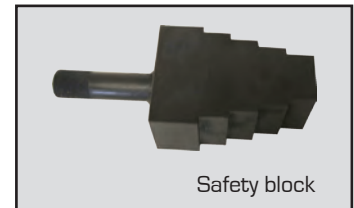
Supplied with safety block & stepped blocks

Maximum spread 60mm

>> Single acting, spring assisted return

>> Compact & lightweight design

All SJS10 & SJS10-M hydraulic spreaders are supplied complete with two stepped blocks (for increased spreading capacity) and one stepped safety block. The SJS10-TK comes complete with a double set of stepped and safety blocks. Suitable manual pumps and accessories for use with SJS10 can be found on pages 31-32 and 52-53.



| Model number | Capacity tonnes | Dimensions in mm | | | | | | | | | |
|----------------|-----------------|------------------|----|----|----|---|----|-----|----|----|----|
| | | A | B | C | D | E | F | G | H | I | J |
| SJS10 | 13 | 279 | 60 | 40 | 15 | 8 | 10 | 328 | 60 | 28 | 49 |
| SJS10-M | 13 | 433 | 60 | 40 | 15 | 8 | 10 | 483 | 60 | 28 | 49 |

PB - HYDRAULIC PIPE BENDER



Working pressure 700 Bar

Bends up to 90 degrees

For use with hydraulic pumps

The Hi-Force PB10 hydraulic pipe bender is designed to bend various sizes and thicknesses of JIS standardised conduit pipe and gas pipe ranging from 15mm-82mm (1/2" to 3"). Made of aluminium, the bending frame and pivot shoes are lightweight so that it can be easily carried on and off site, and can be operated by any manual or powered pump up to 700 Bar. Available as single pipe bender unit (PB10) or as convenient set including all available bending shoes, suitable for either thin steel conduit (PB10A), thick steel conduit (PB10B) or standard gas pipe (PB10C). For a range of suitable Hi-Force pumps see pages 29-50 of this catalogue.

| Model number | Max capacity tonnes | Stroke mm | Oil capacity litres | Weight kg | Applicable range / included bending shoes |
|--------------|---------------------|-----------|---------------------|-----------|---|
| PB10 | 10 | 250 | 0.4 | 18.6 | PB10 does not include bending shoes |
| PB10A | 10 | 250 | 0.4 | 62.5 | Thin steel conduit from 15mm (5/8") to 75mm (3") |
| PB10B | 10 | 250 | 0.4 | 62.5 | Thick steel conduit from 16mm (1/2") to 82mm (3") |
| PB10C | 10 | 250 | 0.4 | 60.0 | Standard gas pipe from 15mm (1/2") to 65mm (2 1/2") |

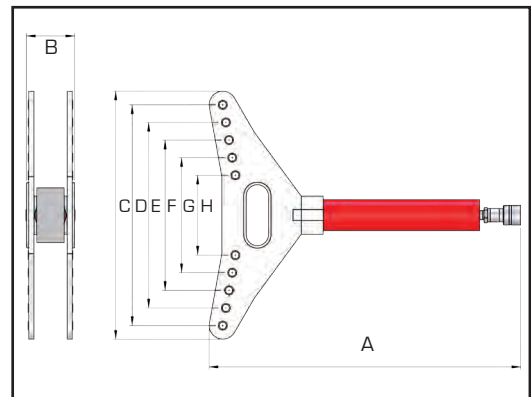
Note: Weight for PB10A, PB10B, & PB10C includes metal storage box

| Dimensions in mm | | | | | | | |
|------------------|-----|-----|-----|-----|-----|-----|-----|
| A | B | C | D | E | F | G | H |
| 720 | 147 | 755 | 695 | 595 | 495 | 395 | 295 |

BENDING SHOES

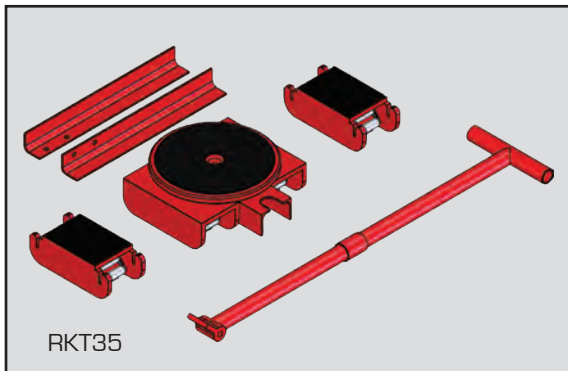
A range of bending shoes, compatible with the pipe bender PB10, are available as an optional extra to ensure a smooth, wrinkle free bend.

Note: PB10A includes all BS-A bending shoes (8 pcs)
 PB10B includes all BS-B bending shoes (8 pcs)
 PB10C includes all BS-SGP bending shoes (7 pcs)



| For thin conduit | | | | | For thick conduit | | | | | For standard gas pipe | | | | |
|------------------|------------------|---------------------|---------------------|---------------------|-------------------|------------------|---------------------|---------------------|---------------------|-----------------------|------------------|---------------------|---------------------|---------------------|
| Model number | Pipe size (inch) | Pipe outer dia (mm) | Pipe inner dia (mm) | Bending radius (mm) | Model number | Pipe size (inch) | Pipe outer dia (mm) | Pipe inner dia (mm) | Bending radius (mm) | Model number | Pipe size (inch) | Pipe outer dia (mm) | Pipe inner dia (mm) | Bending radius (mm) |
| BS-A15 | 5/8" | 15.9 | 13.5 | 80 | BS-B16 | 1/2" | 21.0 | 16.4 | 75 | BS-SGP15 | 1/2" | 21.7 | 16.1 | 60 |
| BS-A19 | 3/4" | 19.1 | 15.9 | 100 | BS-B22 | 3/4" | 26.5 | 21.9 | 90 | BS-SGP20 | 3/4" | 27.2 | 21.6 | 80 |
| BS-A25 | 1" | 25.4 | 22.2 | 137 | BS-B28 | 1" | 33.3 | 28.3 | 130 | BS-SGP25 | 1" | 34.0 | 27.6 | 100 |
| BS-A31 | 1 1/4" | 31.8 | 28.6 | 200 | BS-B36 | 1 1/4" | 41.9 | 36.9 | 195 | BS-SGP32 | 1 1/4" | 42.7 | 35.7 | 130 |
| BS-A39 | 1 1/2" | 38.1 | 34.9 | 220 | BS-B42 | 1 1/2" | 47.8 | 42.8 | 230 | BS-SGP40 | 1 1/2" | 48.6 | 41.6 | 160 |
| BS-A51 | 2" | 50.8 | 47.6 | 365 | BS-B54 | 2" | 59.6 | 54.0 | 270 | BS-SGP50 | 2" | 60.5 | 52.9 | 220 |
| BS-A63 | 2 1/2" | 63.5 | 59.5 | 420 | BS-B70 | 2 1/2" | 75.2 | 69.6 | 450 | BS-SGP65 | 2 1/2" | 76.3 | 67.9 | 320 |
| BS-A75 | 3" | 76.2 | 72.2 | 530 | BS-B82 | 3" | 87.9 | 82.3 | 500 | | | | | |

RKT - ROLLER SKATE KIT - TRICYCLE



Capacity 35 tonnes

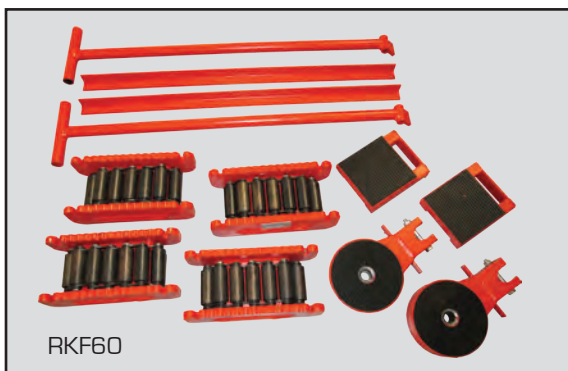
Available as a complete kit

Endless hardened roller chain

The RKT roller skate kit is an easy to assemble unit with a low level construction and offers an easy and safe method of moving heavy loads. This transport kit comprises of a twin skate roller fitted with a turntable, two single roller skates fitted with top plates, a handle and a link bar, all supplied in a metal storage case.

| Model number | Cap. per set tonnes | Twin rollers ø mm | Single rollers ø mm | Height mm | Turntable ø mm | Handle length mm | Metal box (LxWxH mm) | Weight kg |
|--------------|---------------------|-------------------|---------------------|-----------|----------------|------------------|----------------------|-----------|
| RKT35 | 35 | 30 | 24 | 110 | 250 | 880 | 610x310x165 | 68 |

RKF - ROLLER SKATE KITS - QUAD



Capacities from 20 to 60 tonnes

Minimum turning circle 3 metres

Endless hardened roller chain

The RKF roller skate kits are suitable for moving moderately heavy equipment such as transformers, generators, turbines and heavy machinery over short distances. The range comprises of 3 models available with capacities of up to 60 tonnes per skate and each set is supplied in a metal storage case. Designed with an endless hardened roller chain which revolves around the skate, at least 5 rollers remain in contact with the floor at any one time, ensuring smooth travel even over cracked concrete floors.

| Model number | Cap. per set tonnes | Skates Qty: 4 | Turntables Qty: 2 | Levelling Plates Qty: 2 | Link bars Qty: 2 | Handles Qty: 2 | Weight kg |
|--------------|---------------------|---------------|-------------------|-------------------------|------------------|----------------|-----------|
| RKF20 | 20 | RSN10 | RTT10 | RLP10 | RLB00 | RPH00 | 48 |
| RKF30 | 30 | RSN15 | RTT15 | RLP15 | RLB00 | RPH00 | 56 |
| RKF60 | 60 | RSN30 | RTT30 | RLP30 | RLB00 | RPH00 | 90 |

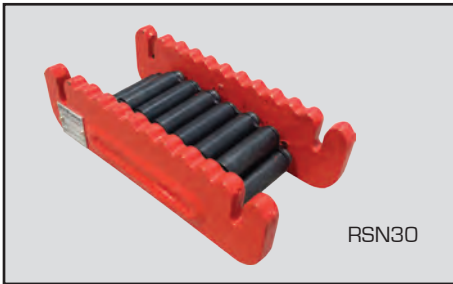
Note: Each set carrying capacity is calculated taking into consideration that two roller skates are sufficient to support the full load.

Dimensions:

| Model number | Rollers ø mm | Total height mm | Turntable ø mm | Handle length mm |
|--------------|--------------|-----------------|----------------|------------------|
| RKF20 | 18 | 108 | 130 | 880 |
| RKF30 | 24 | 117 | 130 | 880 |
| RKF60 | 30 | 140 | 150 | 880 |

! For detailed information on RSN roller skates, RTT turntables and RLP levelling plates, please refer to page 164 of this catalogue.

RSN - MULTI-PURPOSE SKATES



Capacities from 10 to 80 tonnes

Low level construction

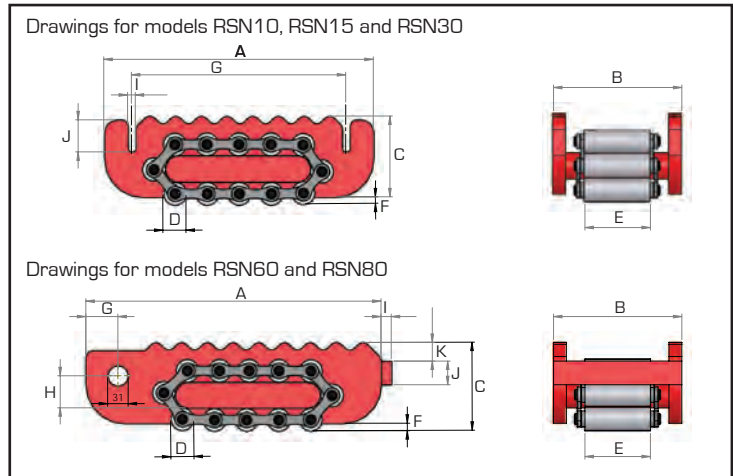
Accessories for turning corners

The RSN industrial, low profile skates are ideal for moving moderately heavy loads in the construction, mining and steel industries. Available with capacities of up to 80 tonnes, these skates can move and position heavy and irregular shaped loads easily and more economically than other lifting devices. Optional accessories such as turntables and levelling plates are available for use with the RSN skates.

| Model number | Capacity tonnes | Rollers in contact | Rollers total | Weight kg |
|--------------|-----------------|--------------------|---------------|-----------|
| RSN10 | 10 | 5 | 15 | 5.2 |
| RSN15 | 15 | 4 | 13 | 7.3 |
| RSN30 | 30 | 4 | 13 | 13.0 |
| RSN60 | 60 | 4 | 13 | 32.0 |
| RSN80 | 80 | 6 | 17 | 61.0 |

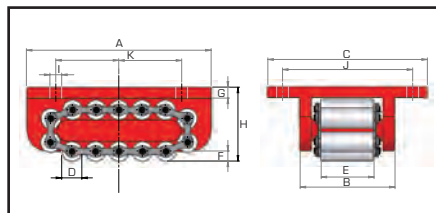
| Dimensions in mm | | | | | | | | | | |
|------------------|-----|-----|----|----|----|-----|----|----|----|----|
| A | B | C | ∅D | E | F | G | H | I | J | K |
| 210 | 100 | 66 | 18 | 51 | 6 | 167 | - | 6 | 25 | - |
| 220 | 113 | 75 | 24 | 60 | 10 | 180 | - | 6 | 25 | - |
| 270 | 130 | 92 | 30 | 68 | 10 | 217 | - | 6 | 25 | - |
| 380 | 168 | 127 | 42 | 76 | 16 | 36 | 48 | 10 | 40 | 15 |
| 530 | 182 | 147 | 50 | 86 | 19 | 36 | 60 | 10 | 40 | 15 |

| Model number | Description | Diameter mm | Capacity tonnes | Weight kg |
|--------------|-----------------|-------------|-----------------|-----------|
| RTT10 | Turntable | 130 | 10 | 4.5 |
| RTT15 | Turntable | 130 | 15 | 4.5 |
| RTT30 | Turntable | 150 | 30 | 6.7 |
| RTT60 | Turntable | 190 | 60 | 13.7 |
| RTT80 | Turntable | 220 | 80 | 18.9 |
| RLP10 | Levelling plate | n/a | 10 | 3.7 |
| RLP15 | Levelling plate | n/a | 15 | 3.7 |
| RLP30 | Levelling plate | n/a | 30 | 5.3 |
| RLP60 | Levelling plate | n/a | 60 | 13.8 |
| RLP80 | Levelling plate | n/a | 80 | 18.8 |



RSA - HEAVY DUTY SKATES

The RSA range of heavy duty moving skates is ideal for movement of heavy loads such as transformers, generators, turbines and machinery. Available with capacities ranging from 15 to 85 tonnes each skate.



| Model number | Capacity tonnes | Rollers in contact | Rollers total | Weight kg |
|--------------|-----------------|--------------------|---------------|-----------|
| RSA15 | 15 | 5 | 15 | 8.9 |
| RSA20 | 20 | 4 | 13 | 11.7 |
| RSA40 | 40 | 4 | 13 | 19.3 |
| RSA50 | 50 | 6 | 17 | 29.0 |
| RSA65 | 65 | 4 | 13 | 51.0 |
| RSA85 | 85 | 6 | 17 | 92.0 |

| Dimensions in mm | | | | | | | | | | |
|------------------|-----|-----|----|----|----|----|-----|----|-----|-----|
| A | B | C | ∅D | E | F | G | H | ∅I | J | K |
| 210 | 100 | 175 | 18 | 51 | 6 | 13 | 76 | 14 | 140 | 75 |
| 220 | 113 | 190 | 24 | 60 | 10 | 14 | 87 | 14 | 155 | 75 |
| 270 | 130 | 210 | 30 | 68 | 10 | 14 | 104 | 18 | 175 | 95 |
| 320 | 140 | 220 | 30 | 68 | 10 | 18 | 115 | 18 | 180 | 120 |
| 380 | 168 | 270 | 42 | 76 | 19 | 19 | 145 | 22 | 220 | 140 |
| 530 | 182 | 300 | 50 | 86 | 19 | 19 | 165 | 22 | 240 | 205 |

RSG & RSD - HEAVY DUTY SKATES WITH GROOVED GUIDE



Capacities from 40 to 400 tonnes

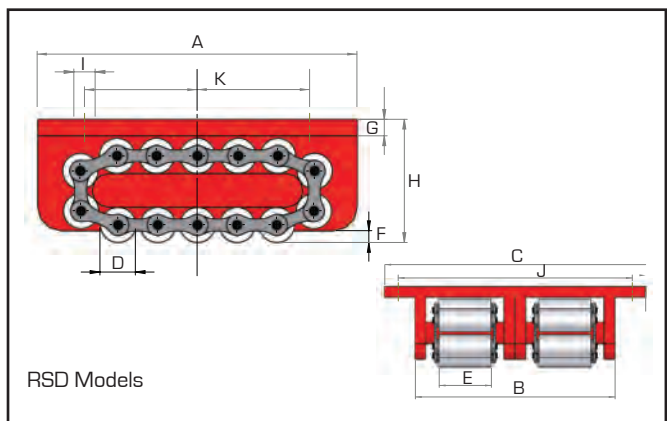
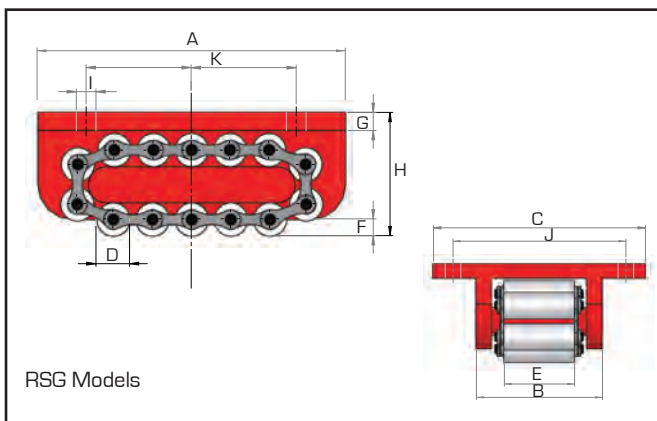
Low level, robust construction

Heat treated, special chrome alloy chains

The RSG heavy duty range of single roller moving skates is available with capacities up to 200 tonnes each skate and incorporates a chain groove cut into the centre member of the skate, which helps to keep the chain running parallel with the body and is specially suited for moving loads over long distances.

The RSD range offers the same features as the RSG range, however has a double roller design, capable of transporting loads up to 400 tonnes per skate.

Both the RSG and RSD models feature high quality, heat treated components and are supplied with 4 mounting bolt holes for easy attachment to the load.



| Model number | Capacity tonnes | Rollers in contact | Rollers total | Weight kg |
|----------------------------------|-----------------|--------------------|---------------|-----------|
| RSG Range - Single-roller design | | | | |
| RSG40 | 40 | 4 | 13 | 19.6 |
| RSG50 | 50 | 6 | 17 | 29.5 |
| RSG65 | 65 | 4 | 13 | 51.7 |
| RSG85 | 85 | 6 | 17 | 93.0 |
| RSG100 | 100 | 8 | 21 | 109.0 |
| RSG150 | 150 | 9 | 23 | 162.0 |
| RSG200 | 200 | 13 | 31 | 266.0 |
| RSD Range - Double-roller design | | | | |
| RSD80 | 80 | 2 x 4 | 2 x 13 | 36.2 |
| RSD100 | 100 | 2 x 6 | 2 x 17 | 57.5 |
| RSD130 | 130 | 2 x 4 | 2 x 13 | 96.0 |
| RSD170 | 170 | 2 x 6 | 2 x 17 | 175.0 |
| RSD200 | 200 | 2 x 8 | 2 x 21 | 207.0 |
| RSD300 | 300 | 2 x 9 | 2 x 23 | 305.0 |
| RSD400 | 400 | 2 x 13 | 2 x 31 | 485.0 |

| Dimensions in mm | | | | | | | | | | |
|------------------|-----|-----|----|-----|----|----|-----|----|-----|-----|
| A | B | C | øD | E | F | G | H | øI | J | K |
| 270 | 130 | 210 | 30 | 68 | 10 | 14 | 104 | 18 | 175 | 95 |
| 320 | 140 | 220 | 30 | 68 | 10 | 18 | 115 | 18 | 180 | 120 |
| 380 | 168 | 270 | 42 | 76 | 19 | 19 | 145 | 22 | 220 | 140 |
| 530 | 182 | 300 | 50 | 86 | 19 | 19 | 165 | 22 | 240 | 205 |
| 580 | 182 | 300 | 50 | 86 | 19 | 23 | 170 | 26 | 250 | 250 |
| 650 | 205 | 350 | 50 | 100 | 20 | 28 | 190 | 26 | 280 | 240 |
| 900 | 205 | 380 | 50 | 100 | 20 | 38 | 200 | 33 | 300 | 360 |
| 270 | 260 | 340 | 30 | 68 | 10 | 14 | 104 | 18 | 305 | 95 |
| 320 | 280 | 360 | 30 | 68 | 10 | 18 | 115 | 18 | 325 | 120 |
| 380 | 336 | 440 | 42 | 76 | 19 | 19 | 145 | 22 | 390 | 150 |
| 530 | 364 | 480 | 50 | 86 | 19 | 19 | 165 | 22 | 430 | 210 |
| 580 | 364 | 480 | 50 | 86 | 19 | 23 | 170 | 26 | 430 | 250 |
| 650 | 410 | 560 | 50 | 100 | 20 | 28 | 190 | 26 | 490 | 240 |
| 900 | 410 | 590 | 50 | 100 | 20 | 38 | 200 | 33 | 500 | 360 |

HPF - WORKSHOP PRESSES



Capacities from 10 to 200 tonnes

Stroke lengths from 250 to 330mm

Working pressure 700 Bar

- >> Choice of manual, air or electric powered pumps
- >> Supplied complete with pressure gauge
- >> Other configurations available on request

The HPF range of workshop presses offers a choice of 25 models with either single acting or double acting cylinders and manually operated, air powered or electric powered pumps. Floor presses incorporate an adjustable work table and dual scale pressure gauge.

| Model number | Capacity tonnes | Stroke mm | Cylinder model no. ¹ | Cylinder principle | Pump model no. ² | Pump operation | Weight kg |
|--------------|-----------------|-----------|---------------------------------|--------------------|-----------------------------|-----------------------|-----------|
| HPF1020 | 10 | 250 | HSS1010 | single acting | HP110 | hand operated | 95 |
| HPF1030 | 10 | 250 | HSS1010 | single acting | AHP1120 | air powered | 85 |
| HPF2520 | 25 | 250 | HSS2510 | single acting | HP227 | hand operated | 145 |
| HPF2530 | 25 | 250 | HSS2510 | single acting | AHP1120 | air powered | 138 |
| HPF2541 | 25 | 250 | HSS2510 | single acting | HEP103341 | electric driven 110 V | 160 |
| HPF2542 | 25 | 250 | HSS2510 | single acting | HEP103342 | electric driven 240 V | 160 |
| HPF2544 | 25 | 250 | HSS2510 | single acting | HEP207314 | electric driven 415 V | 160 |
| HPF5020S | 50 | 330 | HSS5013 | single acting | HP257 | hand operated | 470 |
| HPF5020D | 50 | 330 | HDA5013 | double acting | HP252D | hand operated | 500 |
| HPF5030S | 50 | 330 | HSS5013 | single acting | AHP1121 | air powered | 505 |
| HPF5030D | 50 | 330 | HDA5013 | double acting | AHP1141 | air powered | 505 |
| HPF5041S | 50 | 330 | HSS5013 | single acting | HEP207311 | electric driven 110 V | 505 |
| HPF5041D | 50 | 330 | HDA5013 | double acting | HEP207411 | electric driven 110 V | 481 |
| HPF5042S | 50 | 330 | HSS5013 | single acting | HEP207312 | electric driven 240 V | 512 |
| HPF5042D | 50 | 330 | HDA5013 | double acting | HEP207412 | electric driven 240 V | 518 |
| HPF5044S | 50 | 330 | HSS5013 | single acting | HEP207314 | electric driven 415 V | 518 |
| HPF5044D | 50 | 330 | HDA5013 | double acting | HEP207414 | electric driven 415 V | 518 |
| HPF10020 | 100 | 330 | HDA10013 | double acting | HP245D | hand operated | 1011 |
| HPF10030 | 100 | 330 | HDA10013 | double acting | HAP21042 | air powered | 1029 |
| HPF10041 | 100 | 330 | HDA10013 | double acting | HEP207421 | electric driven 110 V | 1043 |
| HPF10042 | 100 | 330 | HDA10013 | double acting | HEP207422 | electric driven 240 V | 1043 |
| HPF10044 | 100 | 330 | HDA10013 | double acting | HEP207424 | electric driven 415 V | 1043 |
| HPF20041 | 200 | 305 | HDA20012 | double acting | HEP310421 | electric driven 110 V | 3250 |
| HPF20042 | 200 | 305 | HDA20012 | double acting | HEP310422 | electric driven 240 V | 3250 |
| HPF20044 | 200 | 305 | HDA20012 | double acting | HEP310424 | electric driven 415 V | 3250 |

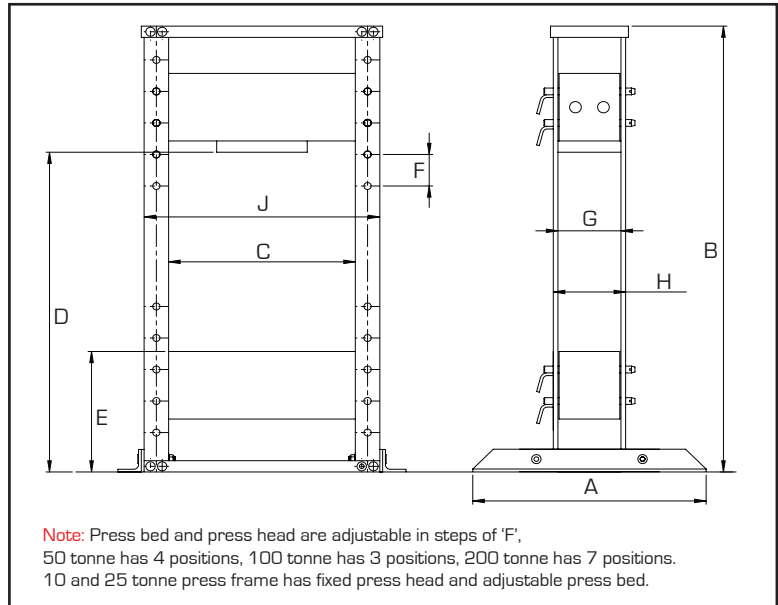
Notes: ¹] For detailed specification on applicable cylinders, see pages 14 - 15 for HSS range and page 20 for HDA range. ²] For detailed specification on applicable pumps, see pages 31 - 33 for HP range, pages 39 - 43 for HEP range, pages 46 - 47 for AHP11 range and page 48 for HAP range.

HPF - WORKSHOP PRESSES

Factory mounted optional accessories include a mechanical bed winch for easy adjustment of the work table, rolling head kit and multi-position V-blocks. All presses are supplied completely assembled, ready for use. Hi-Force workshop presses are manufactured to the highest quality standards, and are suitable for the most demanding jobs.



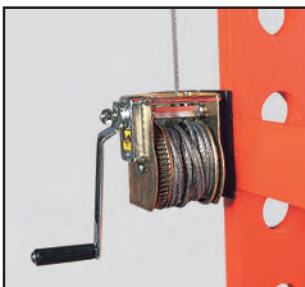
In order to fully comply with CE regulations, some presses must be equipped with specific safety components, such as spring centered valves, two-hand control devices or others.



| Press Range | Capacity tonnes |
|-----------------|-----------------|
| HPF1000 | 10 |
| HPF2500 | 25 |
| HPF5000 | 50 |
| HPF10000 | 100 |
| HPF20000 | 200 |

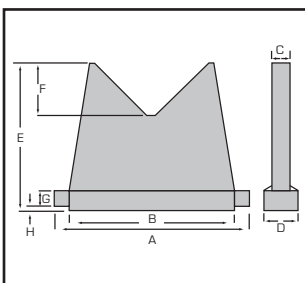
| Frame dimensions in mm | | | | | | | | | | | |
|------------------------|------|------|---------|---------|---------|---------|-----|-----|-----|------|--|
| A | B | C | D (min) | D (max) | E (min) | E (max) | F | G | H | J | |
| 742 | 1448 | 508 | 1258 | 260 | 1010 | 150 | - | 152 | 660 | | |
| 742 | 1448 | 508 | 1258 | 260 | 1010 | 150 | - | 152 | 660 | | |
| 1000 | 2055 | 800 | 1140 | 1560 | 395 | 815 | 140 | 258 | 298 | 1000 | |
| 1000 | 1980 | 1000 | 1090 | 1370 | 550 | 830 | 140 | 338 | 388 | 1240 | |
| 1200 | 2500 | 1250 | 1815 | 2115 | 610 | 1510 | 150 | 330 | 410 | 1750 | |

OPTIONAL EXTRAS



- >> Only available factory fitted option
- >> Lifts and lowers work table
- >> Available for 50 and 100 tonne presses

| Suffix | Description |
|-----------|---|
| BW | Bed winch, suitable for 50 and 100 tonne models |



- >> Multi-position V-blocks with flat bed and V-shape press surfaces
- >> Available for 10, 25, 50 and 100 tonne presses

| Model number | Cap. per set tonnes | Dimensions in mm | | | | | | | |
|-----------------|---------------------|------------------|-----|----|----|-----|----|----|----|
| | | A | B | C | D | E | F | G | H |
| HVB2500 | 10 - 25 | 204 | 154 | 20 | 45 | 155 | 45 | 20 | 8 |
| HVB5000 | 50 | 365 | 265 | 25 | 50 | 190 | 60 | 25 | 10 |
| HVB10000 | 100 | 425 | 325 | 35 | 60 | 265 | 85 | 35 | 10 |

TOOL BOXES



Metal storage and transport box

Width up to 500mm

Durable steel body

Hi-Force offers users a choice of four tool box models that can be used for storing and transporting Hi-Force products and accessories. These tool boxes are of strong durable steel construction and have an anti-corrosion powder coating making them resistant to rust and abrasion and hence suitable for long term use at on-site locations, workshops and service centres.

Available in lengths of 620 to 1100mm, these lockable tool boxes help control authorised tool usage, maintain tool integrity and protect them in harsh environments.

| Model number | Weight kg | Length mm | Width mm | Height mm |
|--------------|-----------|-----------|----------|-----------|
| MSB2 | 9.7 | 620 | 340 | 147 |
| MSB4 | 13.8 | 875 | 280 | 250 |
| MSB6 | 16.3 | 720 | 500 | 250 |
| MSB8 | 30.5 | 1100 | 500 | 250 |

K



Need help deciding which tool box will best suit your requirement?

Contact your local Hi-Force office or authorised Hi-Force Distributor for assistance.

A tool box used for storing and transporting PCS cylinder & pump sets. For details on PCS sets, see Page 25 of this catalogue.



TL Range

ToughLift Jacking Systems

Pages
170 - 172

TL Accessories

Extensions, load block sets,
saddles and tool box

Pages
173 - 174



TL - TOUGHLIFT JACKING SYSTEMS

The Hi-Force ToughLift jacking system offers users the easiest and safest method of lifting material haulers in the mining and construction industry and locomotives in the railway industry, when critical maintenance and breakdown repair work requires completion.

Suitable for lifting even the largest earth haulers in the world, the Hi-Force ToughLift is available in 50, 100, 150 and 200 tonnes lifting capacities. All models are available with either a 110 volt or 240 volt single phase electric driven pump unit or a 6 Bar compressed air driven pump version. All models are operated via a remote, push button hand pendant controller with a 6 metre length control cable to ensure the operator has precise control over the lifting operation from a safe distance away from the load.

Hi-Force ToughLift jacking systems are supplied fitted as standard with a hardened steel lifting saddle, patented “snap latch” handle assembly for easy positioning and transportation and a patented jacking system design for increased safety, enabling them to be easily positioned, in the tightest of spaces, to ensure location into the correct and exact lifting and jacking position.

Fitted with large diameter wheels and heavy duty tyres as standard, all ToughLift models are narrow in width and have the smallest footprint area in the industry.

A wide variety of optional extras are also available which include load holding blocks, swivel load caps, locking, load block extensions, slip lock extensions and accessory tool boxes. Further details can be found on pages 172 to 174.

With the Hi-Force ToughLift, plant operators in mining, construction and railway industries are assured of minimal maintenance and repair downtime, of their capital intensive equipment, from the strongest and most versatile lifting jack in the world!



TL - TOUGHLIFT JACKING SYSTEMS



Working pressure 700 Bar

Choice of 12 models with a range of accessories

Used in mining, construction & railway industries



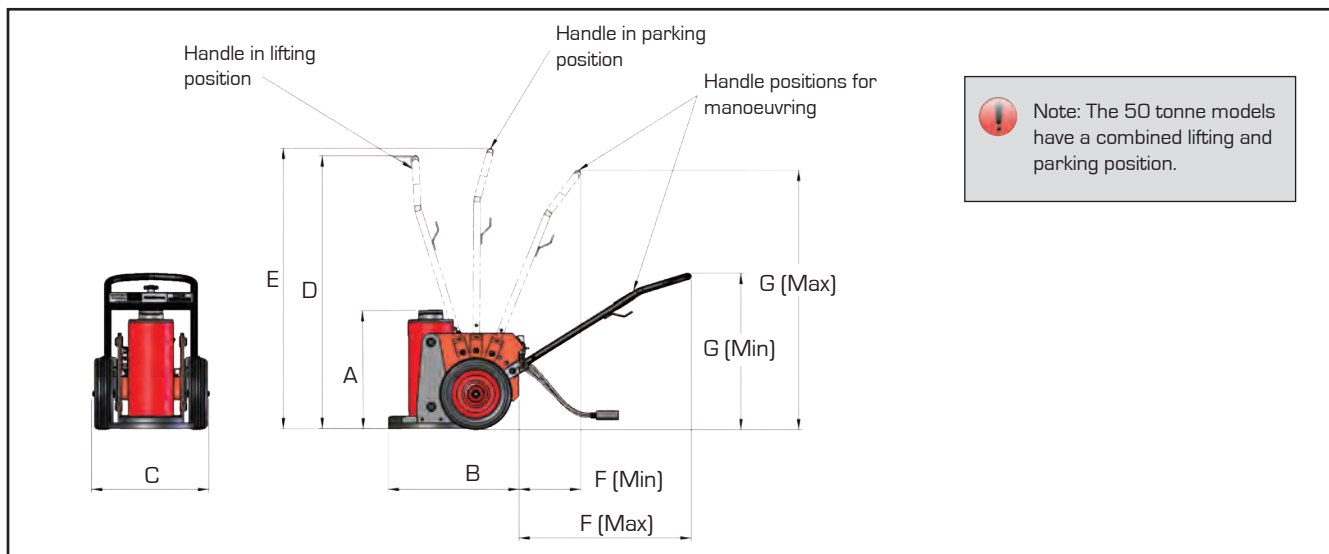
For more information take a look at the ToughLift website www.toughlift.com

- >> Choice of 50, 100, 150 or 200 tonne lifting capacities
- >> Patented multi-positional lifting handle for easy transportation and positioning
- >> Available with choice of electric or air driven hydraulic pump unit
- >> Push button remote hand pendant controller with 6 metre control cable
- >> Patented jacking system for safe and correct positioning prior to load lift
- >> Wide range of accessories available for even greater versatility (see pages 172 to 174)
- >> Narrow width, with small footprint for easy access into confined spaces
- >> Integral airline filter, lubricator and pressure regulator unit (air driven models only)
- >> User friendly design with easily accessible maintenance features
- >> Large diameter, heavy duty wheels for easy positioning underneath the load

| Model number | Capacity tonnes | Power Supply | Stroke mm | Weight kg | Max additional stack in mm |
|------------------|-----------------|------------------|-----------|-----------|----------------------------|
| TL050A255 | 50 | 6-Bar air driven | 254 | 160 | 680 |
| TL050E255 | 50 | 240V electric | 254 | 168 | 680 |
| TL100A405 | 100 | 6-Bar air driven | 405 | 288 | 480 |
| TL100A530 | 100 | 6-Bar air driven | 530 | 318 | 180 |
| TL100E405 | 100 | 240V electric | 405 | 296 | 480 |
| TL100E530 | 100 | 240V electric | 530 | 326 | 180 |
| TL150A390 | 150 | 6-Bar air driven | 390 | 312 | 485 |
| TL150A520 | 150 | 6-Bar air driven | 520 | 348 | 180 |
| TL150E390 | 150 | 240V electric | 390 | 320 | 485 |
| TL150E520 | 150 | 240V electric | 520 | 356 | 180 |
| TL200A380 | 200 | 6-Bar air driven | 381 | 372 | 500 |
| TL200E380 | 200 | 240V electric | 381 | 380 | 500 |

Note: All electric driven ToughLift jacking systems are available in 110V and 240V single phase, power supply options. For 110V version, please suffix model number with A, i.e TL050E255-A for 110V version.

TL - TOUGHLIFT JACKING SYSTEMS



| Model number | Dimensions in mm | | | | | | |
|------------------|------------------|-----|-----|------|------|----------------|----------------|
| | A | B | C | D | E | F MIN - MAX | G MIN - MAX |
| TL050A255 | 455 | 660 | 560 | 1440 | | 380-1000 | 700-1300 |
| TL050E255 | 455 | 660 | 560 | 1440 | | 380-1000 | 700-1300 |
| TL100A405 | 665 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL100A530 | 843 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL100E405 | 665 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL100E530 | 843 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL150A390 | 665 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL150A520 | 843 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL150E390 | 665 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL150E520 | 843 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL200A380 | 660 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |
| TL200E380 | 660 | 730 | 660 | 1520 | 1560 | 360-960 | 860-1440 |

SADDLES

Tilting saddles are fitted as standard to all ToughLift jacks, however flat saddles can also be supplied as an optional extra. Both types of saddle (flat or tilting swivel) can be easily fitted to all slip lock and load lock extensions.

SPACERS

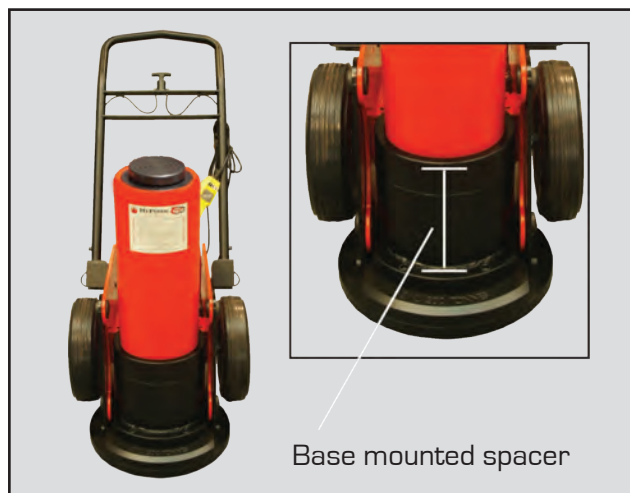
Base mounted spacers increase the closed height by 300mm. This optional extra is available for 200 tonne models only and weighs 78.5 kg. Please suffix model number with "E" when ordering.

L

EXTENSIONS

Hi-Force also offers a range of extensions for use with ToughLift jacking systems. Slip lock extensions can be used in multiples up to the maximum height specified on page 173. Load lock extensions can only be used one at a time, however, they can be used in conjunction with slip lock extensions.

Both extension options must terminate with a flat or swivel tilting saddle on the top of the extension stack.



TL - TOUGHLIFT JACKING SYSTEMS

SLIP LOCK EXTENSIONS



| Length 180mm | Length 300mm | Length 400mm | Length 485mm | Length 500mm | To suit jack model | Recom. max. extension height in mm |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|--|
| SLE180-50 | SLE300-50 | SLE400-50 | * | SLE500-50 | TL050A255 | 680 |
| SLE180-50 | SLE300-50 | SLE400-50 | * | SLE500-50 | TL050E255 | 680 |
| SLE180-100 | SLE300-100 | * | SLE485-100 | * | TL100A405 | 485 |
| SLE180-100 | * | * | * | * | TL100A530 | 180 |
| SLE180-100 | SLE300-100 | * | SLE485-100 | * | TL100E405 | 485 |
| SLE180-100 | * | * | * | * | TL100E530 | 180 |
| SLE180-150 | SLE300-150 | * | SLE485-150 | * | TL150A390 | 485 |
| SLE180-150 | * | * | * | * | TL150A520 | 180 |
| SLE180-150 | SLE300-150 | * | SLE485-150 | * | TL150E390 | 485 |
| SLE180-150 | * | * | * | * | TL150E520 | 180 |
| SLE180-200 | SLE300-200 | SLE400-200 | * | SLE500-200 | TL200A380 | 500 |
| SLE180-200 | SLE300-200 | SLE400-200 | * | SLE500-200 | TL200E380 | 500 |

* = Exceeds recommended maximum extension height

LOAD LOCK EXTENSIONS



| Length 180mm | Length 300mm | Length 400mm | Length 485mm | Length 500mm | To suit jack model | Recom. max. extension height in mm |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|--|
| LLE180-50 | LLE300-50 | LLE400-50 | * | LLE500-50 | TL050A255 | 680 |
| LLE180-50 | LLE300-50 | LLE400-50 | * | LLE500-50 | TL050E255 | 680 |
| LLE180-100 | LLE300-100 | * | LLE485-100 | * | TL100A405 | 485 |
| LLE180-100 | * | * | * | * | TL100A530 | 180 |
| LLE180-100 | LLE300-100 | * | LLE485-100 | * | TL100E405 | 485 |
| LLE180-100 | * | * | * | * | TL100E530 | 180 |
| LLE180-150 | LLE300-150 | * | LLE485-150 | * | TL150A390 | 485 |
| LLE180-150 | * | * | * | * | TL150A520 | 180 |
| LLE180-150 | LLE300-150 | * | LLE485-150 | * | TL150E390 | 485 |
| LLE180-150 | * | * | * | * | TL150E520 | 180 |
| LLE180-200 | LLE300-200 | LLE400-200 | * | LLE500-200 | TL200A380 | 500 |
| LLE180-200 | LLE300-200 | LLE400-200 | * | LLE500-200 | TL200E380 | 500 |

* = Exceeds recommended maximum extension height

LOAD BLOCK SETS



| Load block sets Model number | Capacity tonnes | Lock out Height (mm) | Load Blocks | Adaptor | To suit jack model |
|---------------------------------|--------------------|-------------------------|----------------|---------|-----------------------|
| TLB50-250 | 50 | 250 | 3 | 1 | TL050A255 |
| TLB50-250 | 50 | 250 | 3 | 1 | TL050E255 |
| TLB100-405 | 100 | 400 | 5 | 1 | TL100A405 |
| TLB100-530 | 100 | 525 | 7 | 1 | TL100A530 |
| TLB100-405 | 100 | 400 | 5 | 1 | TL100E405 |
| TLB100-530 | 100 | 525 | 7 | 1 | TL100E530 |
| TLB150-390 | 150 | 385 | 5 | 1 | TL150A390 |
| TLB150-520 | 150 | 515 | 7 | 1 | TL150A520 |
| TLB150-390 | 150 | 385 | 5 | 1 | TL150E390 |
| TLB150-520 | 150 | 515 | 7 | 1 | TL150E520 |
| TLB200-380 | 200 | 375 | 5 | 1 | TL200A380 |
| TLB200-380 | 200 | 375 | 5 | 1 | TL200E380 |

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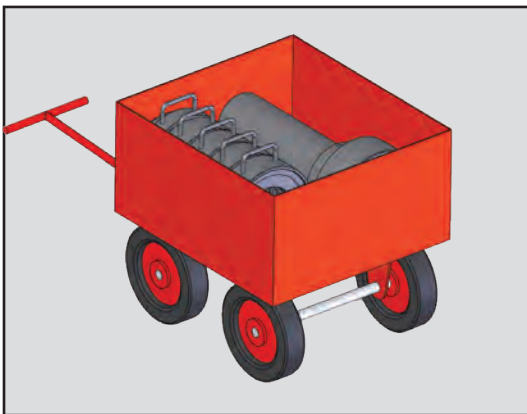
TL - TOUGHLIFT JACKING SYSTEMS

FLAT SADDLES



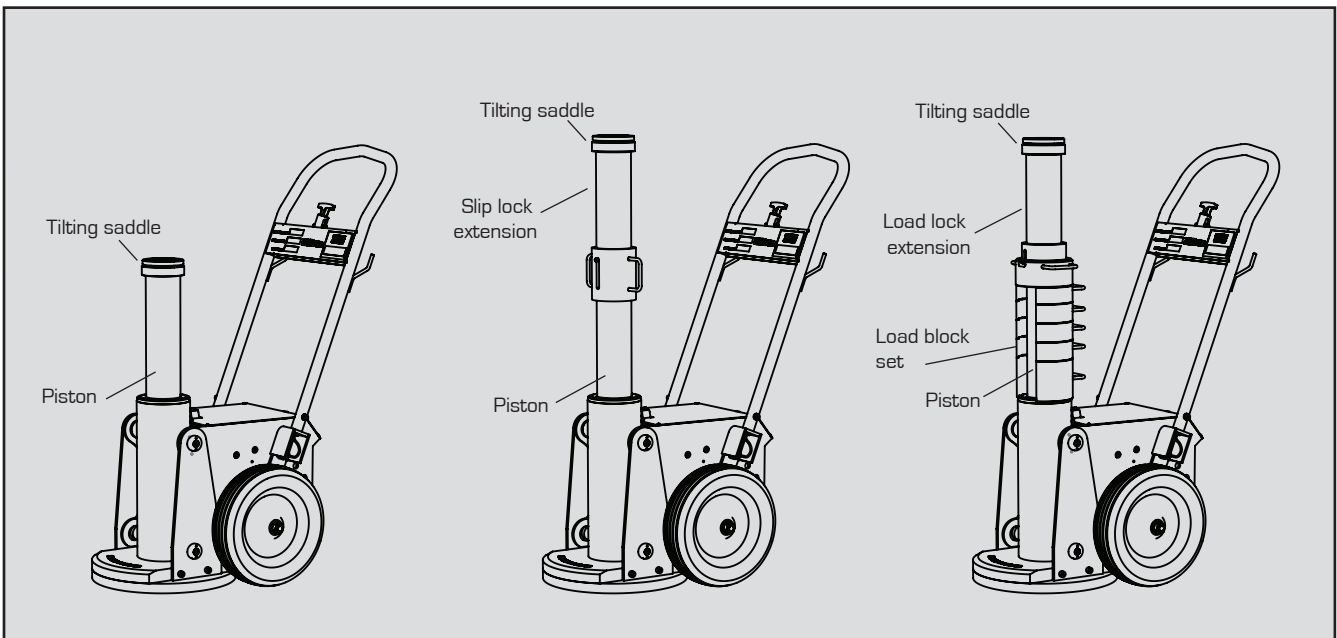
| Flat saddle Model number | Capacity tonnes | To Suit Jack Model |
|--------------------------|-----------------|--------------------|
| TLF50 | 50 | TL050A255 |
| TLF50 | 50 | TL050E255 |
| TLF150 | 100 | TL100A405 |
| TLF150 | 100 | TL100A530 |
| TLF150 | 100 | TL100E405 |
| TLF150 | 100 | TL100E530 |
| TLF150 | 150 | TL150A390 |
| TLF150 | 150 | TL150A520 |
| TLF150 | 150 | TL150E390 |
| TLF150 | 150 | TL150E520 |
| TLF200 | 200 | TL200A380 |
| TLF200 | 200 | TL200E380 |

TOOL BOXES



To store your ToughLift accessories safely why not consider ordering a tool box made specifically to suit your accessory set. Hi-Force offers ToughLift accessory tool boxes made to special order with a fast delivery time to help maintain the working condition and integrity of your ToughLift system.

TOUGHLIFT CONFIGURATION EXAMPLES



SERVICES

Rental

Rental services

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On-Site services

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Maintenance

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Training

ECITB Mechanical Joint Integrity approved courses
Product, service and repair training

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RENTAL SERVICES

The Hi-Force philosophy of offering a complete service package to support our valued customers needs and requirements also extends to tool rental services. With an extensive array of products available within the Hi-Force range, it is sometimes difficult for our customers to decide on the most suitable tool in which to invest their money. Additionally, with our higher value products like high tonnage cylinders, powered pumps, hydraulic wrenches, stud bolt tensioners and hydrotest pumps, many clients simply cannot justify the high capital outlay to purchase, especially in cases where their needs for the product are relatively short term or even simply for a one off job. In some cases annual budget restraints also make it difficult to get purchase expenditure approval even though there is a definite requirement for the tools.

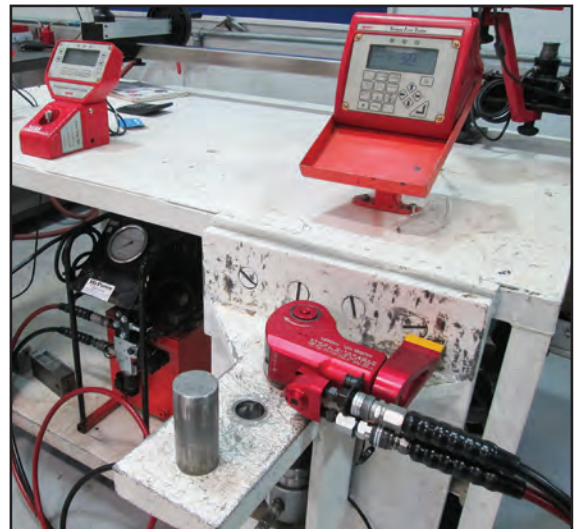
Hi-Force actively encourages and promotes its tool rental services package, both at Regional Offices and at participating distributors worldwide. Unlike our competitors who believe that tool rental business reduces product sales, we at Hi-Force believe it actually increases them!

Many of our customers worldwide who have purchased Hi-Force products, initially took the opportunity to “try out” both our product quality and our level of service support via tool rental. Once satisfied, these same customers became, brand loyal purchasers of Hi-Force products on a regular basis.

An additional benefit of maintaining a comprehensive fleet of rental tools at our Regional Offices and participating distributors is that users can easily request on-site demonstrations, using rental tools at short notice, or even utilise our rental services whilst having their own equipment serviced or repaired. In most industries the biggest drain on profits is the cost to the company of maintenance and shutdown activities. Hi-Force tool rental is available at very short notice and helps ensure that production recommences as quickly as possible without any unnecessary delays.



All Hi-Force rental equipment is proof-tested prior to release for rental. All tests are documented and all equipment is supplied with a test certificate.



Additionally, torque equipment is calibrated, using the latest technology. Test & calibration results are automatically transferred to purpose-written software for producing unique and traceable certificates.

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Hi-Force tool rental is available on both short and long term basis and all equipment provided is guaranteed, tested and certified prior to mobilisation to site.

Hi-Force tool rental offers an economical alternative to purchasing capital intensive specialised equipment at short notice. Give it a try, you will be pleasantly surprised!

ON-SITE SERVICES

In addition to the tool rental services offered by Hi-Force and detailed on page 176, we also offer a first class on-site services package. Utilising Hi-Force tools drawn from our extensive global rental tool inventory, Hi-Force is also able to offer a first class on-site bolting and jacking service. Available globally via Hi-Force Regional Offices and participating distributors, the Hi-Force on-site services package combines the expertise of our highly trained and experienced crews with the high quality reputation of Hi-Force products.

For on-site bolting services we are able to carry out jobs ranging from a simple bolt up of a single flange joint to major construction and maintenance shut down projects. Our record and past experience of working with many major multi-national companies is second to none and our crews have established an excellent reputation for meeting and beating critical time deadlines, even in the most demanding conditions. Major customer industries include oil & gas, power generation, cement plants, civil and mechanical construction and maintenance.

We also offer on-site lifting and jacking services usually related to heavy lift applications involving multiple numbers of Hi-Force high tonnage cylinders, pumps, hoses and accessories. Past jobs undertaken and successfully completed include bridge lifting, cantilever and steel structure weighing and a variety of lift and shift applications.

Our crews have received many verbal and written testimonials for their excellent performance and copies of these are available on request.

Hi-Force is very proud of its excellent reputation for carrying out efficient, safe, competitively priced on-site jobs, within client specified time periods. Please do not hesitate to contact us if you have a requirement for Hi-Force on-site services.



REPAIR SERVICES

Every year huge amounts of money are lost to industries worldwide due to the breakdown of capital intensive hydraulic and pneumatic tools. This extensive loss of revenue could be drastically reduced if users and owners were always in a position to call upon specialist repairers, at short notice, to identify the faults and carry out fast, reliable, guaranteed repairs.

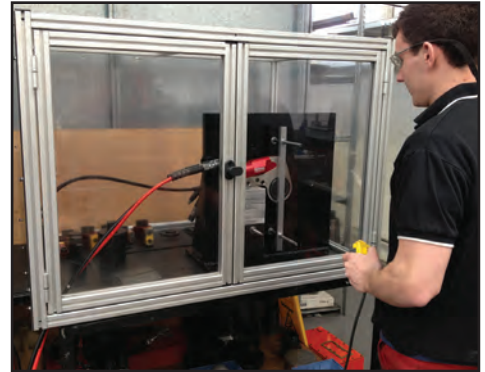
Hi-Force is at your service!! We have built our success on our “service first philosophy” and a long history of providing customers with a comprehensive repair service for a wide range of hydraulic and pneumatic tools.

All Hi-Force offices worldwide, along with participating Hi-Force Distributors operate a fully equipped workshop repair facility, using the latest “state of the art” repair and testing equipment and techniques, carried out by trained and qualified workshop technicians. Our global network of Hi-Force service centres is modelled on our highly successful and wholly owned UK Distributor company, H.E.S. Sales Limited, who have been offering repair services, along with the other services detailed in this section of the catalogue, from two strategically placed locations in England, since the early 1970’s.

All Hi-Force service centres carry good stocks of commonly used spare parts and are able to offer a first class guaranteed repair service for all Hi-Force products as well as most international competitor brands. All items repaired carry a 90 day warranty against faulty materials or workmanship and each item is returned to the customer with an individual test/calibration certificate.

Make the most of your investment in tools through regular servicing and repair, at an economical cost, through the Hi-Force service network.

Test and Repair facilities at Hi-Force Offices



Hi-Force Dubai workshop



H.E.S. Sales Ltd. UK workshop



As part of our ever improving after sales and service support facilities, Hi-Force offers a comprehensive calibration service for all makes of manual, pneumatic and hydraulic torque tools to our services portfolio. Available from selected Hi-Force Regional Offices and distributors worldwide, this fast expanding activity is currently receiving considerable attention from our customer base.

All of our in-house calibration equipment has valid, independently approved “NAMAS” calibration certificates which are renewed annually. All items calibrated are returned with an individual test and calibration certificate traceable to our “NAMAS” certification.

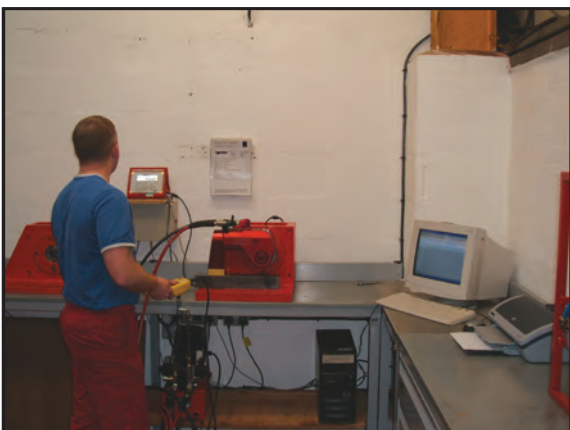
This service is particularly focused on tools used for accurate bolt tightening, which according to industry standards, recommends that they are calibrated, at least once per year and in some cases more often if used extensively. When did you last have your critical bolt tightening tools calibrated? Check and contact Hi-Force for a first class calibration service at a competitive price.

Hi-Force is also able to offer a limited calibration service for other hydraulic and pneumatic tools. Contact your local Hi-Force Regional Office or distributor for more information.

Calibration of a hand torque wrench



Hydraulic torque wrench calibration



High Pressure Hydraulic Tools www.hi-force.com

Hi-Force Limited
Prospect Way, Daventry
Northamptonshire
NN11 8PL, England
Tel: +44 1327 301 000
Fax: +44 1327 708 555
Email: daventry@hi-force.com

Certificate of Calibration

Model Number: **TWH120N**
 Serial Number: **BC7936**
 Date of Calibration: **16 October 2014**

Customer:
 Maximum Torque Capacity (lbf ft): **10419**
 Maximum Oil Pressure (Bar): **700**

| Set Air Pressure (psi) | Nominal Torque (Lbf ft) | Tolerance +/- 3% | | Actual Readings | | | Actual % Tolerance | | |
|------------------------|-------------------------|------------------|-------|-----------------|-------|-------|--------------------|------|-------|
| | | Min | Max | | | | | | |
| 100 | 1488 | 1444 | 1533 | 1488 | 1493 | 1501 | 0.0% | 0.3% | 0.87% |
| 700 | 10419 | 10106 | 10731 | 10498 | 10462 | 10501 | 0.8% | 0.4% | 0.78% |

Maximum Torque Capacity (N m): **8037**
 Maximum Oil Pressure (Bar): **700**

| Set Air Pressure (bar) | Nominal Torque (N m) | Tolerance +/- 3% | | Actual Readings | | | Actual % Tolerance | | |
|------------------------|----------------------|------------------|-------|-----------------|-------|-------|--------------------|------|-------|
| | | Min | Max | | | | | | |
| 100 | 2049 | 1988 | 2110 | 2050 | 2057 | 2065 | 0.0% | 0.4% | 0.77% |
| 700 | 14349 | 13918 | 14779 | 14352 | 14376 | 14457 | 0.0% | 0.2% | 0.75% |

The presented extended uncertainty level was defined by coefficient of extension k = 2
 The extended uncertainty level was defined according to the norm EA 402
 The value of measured parameter lays in the confidence interval with circa 95% probability.
 The extended uncertainty level is less than 1% of the measured values.

The field equipment used in the performance of the above calibration has international traceability through the following calibration laboratory which is UKAS accredited to ISO 17025:2000

| | | | |
|----------------------|---------|-------------------|-------------------------|
| UKAS Laboratory No.: | 0265 | | |
| | Display | Torque Transducer | Oil Pressure Transducer |
| Serial No.: | WTT 2 | 58309 | 98 286 AA |

Registered No 5835526 **Hi-Force®** is a registered trade mark

Sample calibration certificate

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TESTING & SERVICE CONTRACTS

Targeted at companies with a wide variety or a considerable number of hydraulic and pneumatic tools, Hi-Force is able to negotiate and offer a regular on-site testing and service facility to customers, which ensures that their tool inventory is kept in first class working condition, fully tested and certified. This is particularly beneficial to tool users that are required to carry out planned plant maintenance shutdowns at their facilities, as this unique service, from Hi-Force, can be planned to coincide within a reasonable time period, prior to an upcoming shutdown.

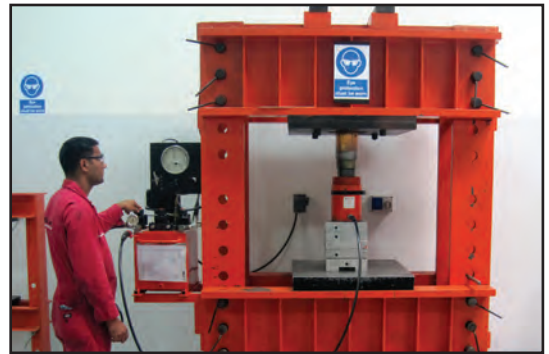
Within the UK, Hi-Force testing and service contracts are managed by our wholly owned distributor, H.E.S Sales Limited, who operate a fleet of dedicated, fully equipped, on-site mobile test vehicles ably supported by two strategically placed workshop service centres. All test vehicles are managed by a trained and qualified test engineer, who is fully conversant with all of the latest safety regulations related to hydraulic and pneumatic tools. Site visits are planned and pre-booked for mutually agreed date(s) so that clients can arrange to gather all of their tools, requiring test and inspection, to a central point, at their facilities, for our test inspector to carry out the testing.

A comprehensive test report is prepared by our test engineer, detailing all of the tools examined and tested, along with a report on all tools that fail the test. A copy of the report is handed over by our test engineer, prior to leaving site, for the client to assess and give any necessary authorisation for the tools to be removed from site for detailed examination and estimate for repair. Subject to client approval, our test engineer will deliver the tools to the nearest H.E.S. Sales Limited service centre, from where a comprehensive strip down, inspection, report and repair quotation will be promptly prepared and sent to the client in writing. Subject to approval of the repair costs, the client's tools will then receive the "first class" repair service, as detailed on page 178.

Alongside the testing service, many of our clients also negotiate a period contract covering both the on-site testing and repair service which usually results in more advantageous and competitive rates. For further information on our global testing and service capabilities please contact Hi-Force UK or one of our Regional Offices and Service Centres.



H.E.S Sales UK workshop



Hi-Force test facilities



Hi-Force service vehicle



Interior of Hi-Force test & service vehicle

INTRODUCTION

Hi-Force has been providing training courses in the safe and proper application, use, operation, service, maintenance and repair of hydraulic tools for several years, however in 2013 Hi-Force took its Training Package to a whole new level, with the addition of ECITB (Engineering Construction Industry Training Board) approved Training Courses. Formal approval was in fact granted by the ECITB towards the end of 2012, however with the opening of our brand new expanded Training School in mid-2013, demand for training from Hi-Force has grown significantly. The new Training School, occupying an area of 150 square metres, is located within a brand new, 2000 square metre Logistics Centre, built as part of our on-going expansion. This “state of the art” Training Facility comprises of a fully equipped classroom, product practical training area and a tool repair and service training workshop.



Hi-Force training courses combine first-class education with the most advanced practical training facilities available, within the hydraulic tool industry. Designed for a wide variety of delegates, Hi-Force training courses are suitable for Field Sales Engineers, Sales Office Supervisors, Service, Repair and Maintenance Engineers and Technicians, On-Site Engineers and Technicians and everyone else involved in the high pressure hydraulic tools industry.

With everything located under one roof, the Hi-Force Training School is fully equipped for putting the theory into practice, all in one course, within one designated area. Delegates are able to listen and learn theory and then proceed to practical in an interactive manner, both with the Trainer and other delegates. Our classroom training material includes high quality graphic images and animations of exactly how hydraulic tools operate. Our practical training area contains a complete range of Hi-Force products enabling delegates to operate “off the shelf” products and achieve a high level of confidence in the safe and proper use of hydraulic tools. Our Service and Repair Training facility is fully equipped with all the standard and special tools and test equipment for the service, maintenance and repair of the complete range of Hi-Force hydraulic tools.

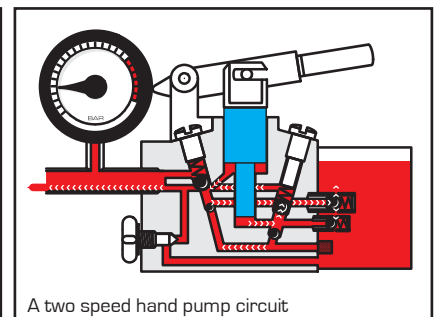
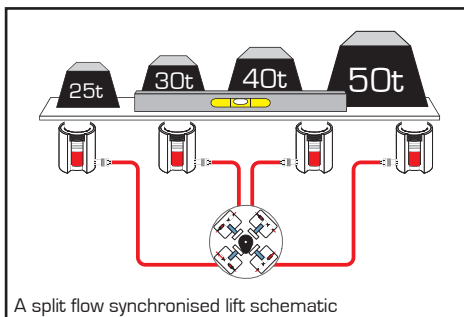
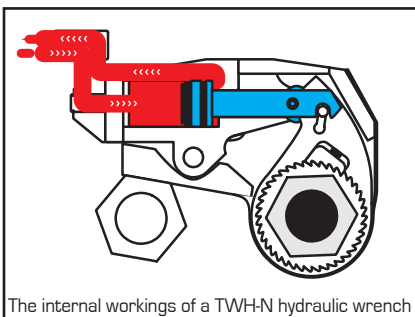
Hi-Force is totally committed to improving the technical knowledge of our own employees, those of our Distributors and of the many users of Hi-Force hydraulic tools, throughout the world. Hi-Force investment in this new Training School, is testament to our commitment to not only offer world class products, but to also ensure that our network of Regional Offices and Distributors are offering users the correct and proper technical advice whilst discussing individual customer specific requirements for hydraulic tools.

PRODUCT TRAINING COURSES

With our ever expanding network of Hi-Force regional offices and authorised distributors worldwide, Hi-Force has identified technical product and application training, as an essential core competency, for us to maintain our continued growth in the global market, for hydraulic tools.

The latest, updated version of our Product Training Course, is divided into various product groups, each of which cover all aspects of technical sales, industry specific application selling, special product design, practical and theoretical operation, health & safety and general maintenance. Hi-Force believes that our Product Training courses are at the leading edge of the high pressure hydraulic tools industry worldwide.

To cater for the large number of different countries in which our products are now distributed and sold, we have designed our Product Training Courses in such a way that moving graphics and pictorial examples, are used wherever possible, to minimise the need for sometimes, difficult to understand written words. This enables us to easily translate the text, of the various training modules, into different languages, to suit local market requirements. The moving graphics used within the Hi-Force Product Training Courses vary from a simple hand pump and cylinder, through to complex multiple lifting applications, using split flow pumps, hydraulic torque wrenches and stud bolt tensioners, all of which clearly demonstrate how our products operate, in a simple and straightforward way. When delegates experience the visual learning provided by these graphics and then move to the practical training area to put theory into practice by operating our tools in real and simulated situations, the retention of knowledge is far greater, than learning from presentation slides, or books, containing only text and pictures.



Hi-Force Product Training courses can be delivered from within our UK Training School, from any of our Regional Offices and even from a Hi-Force Distributor or End User premises, provided of course a suitable classroom and practical training area is available. It is also important to have a wide selection of Hi-Force products, readily available at the location of the training, for the practical use element of the course.

Hi-Force Product Training Courses can be tailored to suit individual needs and can be held for any number of days from one up to a full working week of five days. All Training Courses will incorporate a written and verbal exam, for all participating delegates, to ensure that the required level of learning is achieved. Delegates achieving the required minimum pass level will receive a Certificate, in recognition of their achievement.

Whilst primarily focussed on our Distributor sales personnel and of course any new or existing members, of our own global sales team, we are also more than happy to offer Hi-Force Product Training to end users of our products.



ECITB MECHANICAL JOINT INTEGRITY TRAINING COURSES

Hi-Force is approved by ECITB (Engineering Construction Industry Training Board) for the provision of Mechanical Joint Integrity (MJ) training courses in line with industry standards and practices.

Hi-Force's ECITB approved Trainers have the technical and practical knowledge, and understanding to deliver these training courses. These in-house trainers have many years of "hands on" experience in the Oil, Gas and Petrochemical industries (onshore & offshore), as well as Power Generation and a wide variety of construction industry applications, requiring bolted joint technology. They are, of course, also fully trained and competent in the use of the various mechanical and high pressure, hydraulic tools used to deliver the training courses, in terms of theoretical, practical and the required Technical Testing (TMJI) as specified and required by the ECITB, prior to the issue of a certificate of successful completion to the delegate.

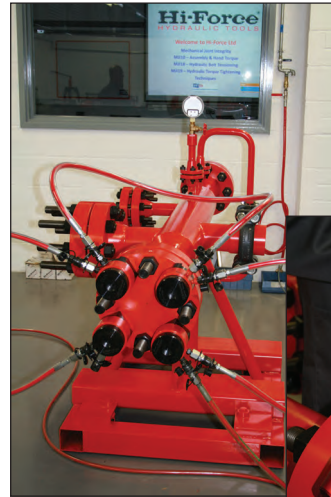
The technical content of the MJ training modules will include:

- >> Mechanical Joint integrity (Flange and Bolt Materials, Components, Lubricants, Dis-assembly, Inspection, Assembly)
- >> Safe use of high pressure hydraulic equipment
- >> General Tooling Maintenance
- >> Correct Tool selection

Hi-Force, as an approved ECITB Training Provider, will competently train all delegates that attend the training courses. All of these courses are most suited for delegates employed to carry out Mechanical Joint Integrity and Flange Management activities, that are or could be associated with potential work scopes to industry standards, or client specific requirements that follow industry guidelines.

Hi-Force can develop and provide training courses that will suit client specifications, if required and we will be happy to provide advice on any applicable industry standards. For further details please contact Hi-Force UK or the Regional Hi-Force Office or local Distributor.

Health and Safety is of paramount importance to Hi-Force, as we continuously strive to not only maintain the levels of competence of personnel in the bolting industry, but to further develop and improve these levels in order to reduce the potential risk of accidents or incidents wherever possible.



ecITB
Engineering Construction Industry Training Board
APPROVED PROVIDER



ECITB MECHANICAL JOINT INTEGRITY TRAINING COURSES

Hi-Force is a member of the ECITB and our Training School and Trainers are approved to deliver the following Training Courses and Technical Test Units.



Part 1 – Training - “Theoretical and Practical”

- >> MJ110 Hand Torque Bolted Connection Techniques
- >> MJ118 Hydraulically Tensioned Bolted Connection Techniques
- >> MJ119 Hydraulically Torqued Bolted Connection Techniques

Part 2 - Technical Tests - “Theoretical and Practical”

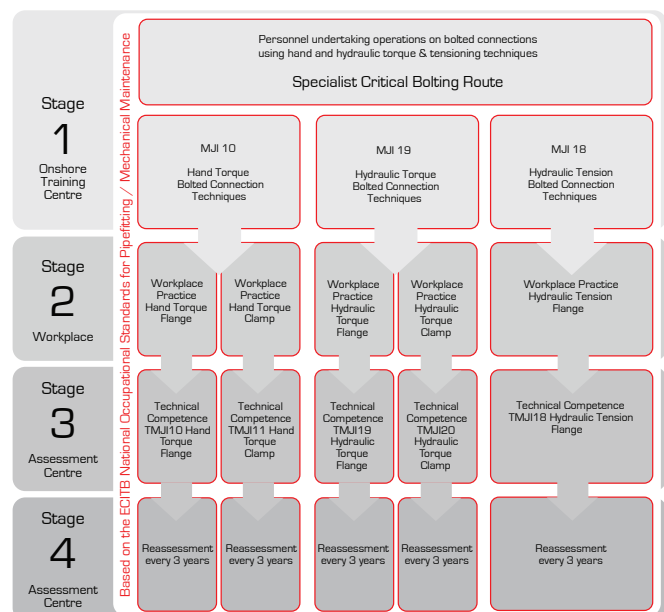
- >> TMJ110 Dismantle, Assemble and Hand Torque Flanged Joints
- >> TMJ111 Dismantle, Assemble and Hand Torque Clamp Connectors
- >> TMJ118 Dismantle, Assemble and Tension Bolted Connections (Hydraulic Tensioning)
- >> TMJ119 Dismantle, Assemble and Hydraulically Torque Flanged Joints
- >> TMJ120 Dismantle, Assemble and Hydraulically Torque Clamp Connector Joints

The Training and Technical Tests are provided as two separate elements of the overall course. The Technical Tests can be taken by the delegate, usually within 3 to 12 months, only after completion of workplace specific practical applications related to the new skills and knowledge obtained from the Training Course.

The ECITB training courses are fully documented and the details of the course content can be made available upon request.

The Future

Hi-Force continually monitors ASME and European standards and any changes that are introduced and implemented, will under guidance of the ECITB, be incorporated into our training modules and applied as required.



Industry Compliance

Hi-Force training modules comply with the following training standards and guidelines:

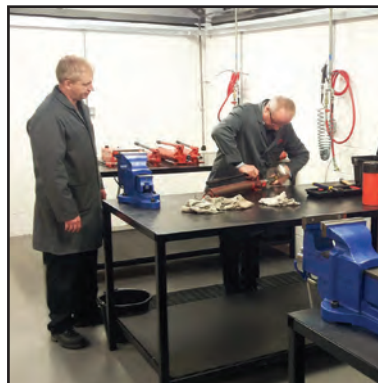
- >> ECITB MJ1 & TMJ1 training & Testing units
- >> Step Change in Safety Mechanical Joint Integrity Route to Competence Guidance
- >> ASME PCC-1-2010 Guidelines for Pressure Boundary Bolted Flange Joint Assembly
- >> Energy Institute Guidelines for the management of the integrity of bolted joint for pressurised systems
- >> EN 1515-1: 1999 Flanges and their joints - Bolting – Part 1
- >> EN 1591-2: 2008 Flanges and their joints - Design rules for gasketed circular flange connections - Part 2: Gasket parameters
- >> CEN/TS 1591-4: 2007 Flanges and their Joints – Part 4: Qualification of personnel competency in the assembly of bolted joints fitted to equipment subject to the PED

SERVICE & REPAIR TRAINING COURSES

As a rapidly expanding manufacturer and supplier of high pressure hydraulic tools, Hi-Force recognises the very important role that after sales service and repair plays in achieving future sales growth. Ultimately the entire success of the Hi-Force brand is dependent on, not only manufacturing and supplying tools of the highest quality and performance, but also ensuring that users of our products are able to access a high quality after sales service, with readily available spare parts, wherever they are in the world. To help Hi-Force achieve this high standard of expectation, from our customers, we are placing the establishment of fully equipped Hi-Force Service Centres, manned by fully trained service and repair technicians as a top priority. To ensure this is achieved, Hi-Force has invested in and is proud to offer, modular training courses, in the correct service and repair of our complete range of products.

Hi-Force Service and Repair Training Courses are primarily available to our Global Distributor Network and are designed, to enable our Distributors, to gain the highly prestigious, Hi-Force Authorised Service Centre accreditation. To achieve this, our Distributors need to send personnel for training and establish a fully equipped Service Centre facility, within their own premises. To help with this, the Hi-Force UK Service and Repair Training facility, is modelled on exactly how, an Authorised Hi-Force Service Centre should be set up, within the Distributors own facility. All Hi-Force offices globally, operate a fully equipped Service Centre facility and in the future certain elements of our Service and Repair Training Courses will be made available within our Regional Office network.

Establishing a Hi-Force Authorised Service Centre offers many advantages, to our Distributors, including an increased revenue stream, through chargeable service and repair work, greater customer loyalty, gained from the benefits of offering full after sales support, authorisation to carry out warranty work, on behalf of Hi-Force and of course the added opportunity to invest in Tool Rental services, given that a service centre is vital for supporting this additional activity. To help Hi-Force achieve our goals, of establishing a professional, worldwide network of Authorised Service Centres, we offer several financial incentives, to our Distributors, to assist them, with becoming an Authorised Hi-Force Service Centre.



We are also able to offer Service and Repair Training to end users, of our products, that prefer to have their own, in-house tool repair facilities. One of the major advantages of the modular design, of our Service and Repair Training courses, is that we can tailor courses to suit specific, individual requirements, of our end user customers. So if an end user customer is a major user of our bolting tools we can concentrate on the Service and Repair Training of hydraulic torque wrenches and stud bolt tensioners. Similarly if the customer is a user of our jacking systems we can focus the training on cylinders, pumps and accessories.

As with all of our Hi-Force training packages, we offer a mixture of theoretical classroom training with full hands on practical training, within the one designated Training School. Our Trainers are vastly experienced in all aspects of the courses we provide. Contact your local Hi-Force office for further details on all of our first class, training packages.

TRAINING



ADDITIONAL INFORMATION

Basic principles

Information on basic principles of hydraulics

Pages
188 - 191

Basic bolting principles

Information on basic principles of bolting tools and equipment

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INTRODUCTION

The basic principles of hydraulics are not difficult to understand, knowing how and why hydraulic tools work will help the user to select the most suitable Hi-Force tools for the job, ensuring maximum performance at the most economical cost.

If the “Basic Principles of Hydraulics” detailed in this section of the catalogue are of assistance to the reader, then its purpose of helping with the selection of the correct Hi-Force tool for the job has been achieved.

USING HYDRAULIC FLUID PRESSURE TO GENERATE A FORCE

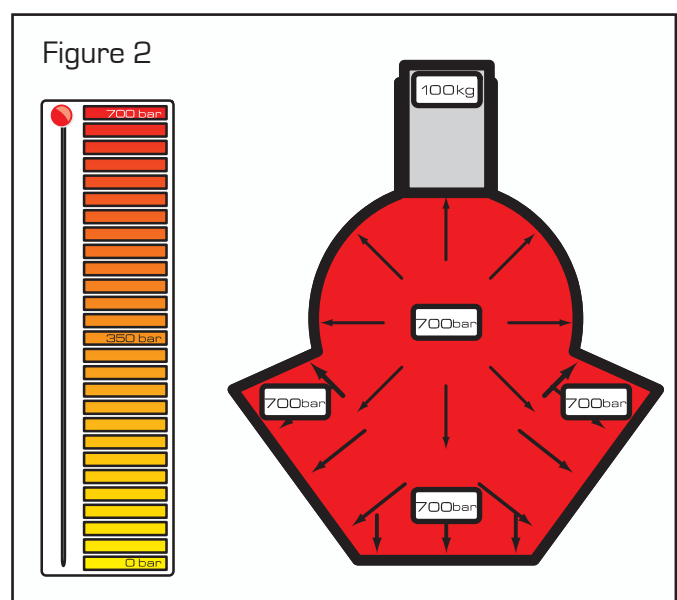
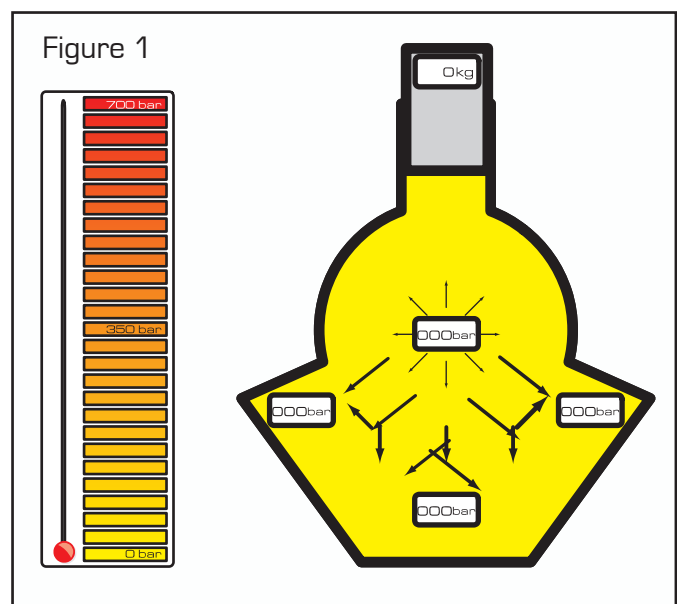
a) Hydraulic Pressure

Hydraulic power provides one of the simplest and most powerful forms of producing considerable amounts of force within a confined space using hydraulic fluid pressure to generate a force. Since the early inventions of low pressure, heavy hydraulic lifting jacks through to the latest state of the art high pressure hydraulic systems of today, hydraulic power remains an extensively used and widely respected assistant to mankind’s drive for even greater power and knowledge.

Pascal’s law states that pressure applied at any point upon a confined fluid (liquid) is transmitted undiminished in all directions within the fluid (see figure 1 & 2). This means that by using hydraulic pressure as a medium a small force can be converted into an appreciable multiple of itself.

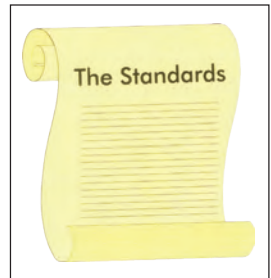
The actual fluid pressure involved plays a very important role in this “Multiplication of Force” and in this context there are two features of hydraulic pressure which are important to remember.

1. Hydraulic pressure is measured as a force per unit of area e.g. Bar (kg/cm^2) or PSI (Pounds per Square Inch).
2. The hydraulic pressure at any point within the fluid is the same in all directions provided of course that the fluid is static (non moving) - see figure 1 & 2.



b) The Industry Standard

The accepted International Standard for maximum working pressure in the high pressure hydraulic tools industry is 700 Bar (10,000 PSI) and the majority of the products detailed in this catalogue have a maximum working pressure of 700 Bar (10,000 PSI). Therefore where a particular cylinder is specified in this catalogue as having a 10 tonnes maximum capacity, it must be noted that the maximum capacity is calculated at the maximum working pressure.



c) Pressure and Force

The criteria for establishing the maximum output force of a hydraulic cylinder at 700 Bar pressure is the size of the effective area of the cylinder bore, i.e. the area to which the hydraulic fluid at a pressure of 700 Bar is being applied. Because of this simple criteria it is possible to manufacture cylinders in the Hi-Force range from 4.5 tonnes up to in excess of 500 tonnes capacity.

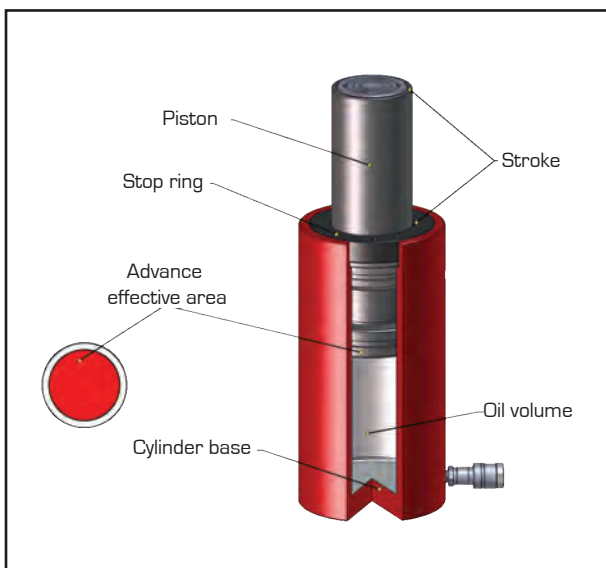
The equation for calculating the output force of a hydraulic cylinder, given that the effective area and design maximum working pressure are known, is simply :-

$$\frac{\text{Effective area (cm}^2\text{)} \times \text{Pressure (Bar)}}{981} = \text{Output Force (Tonnes)}$$

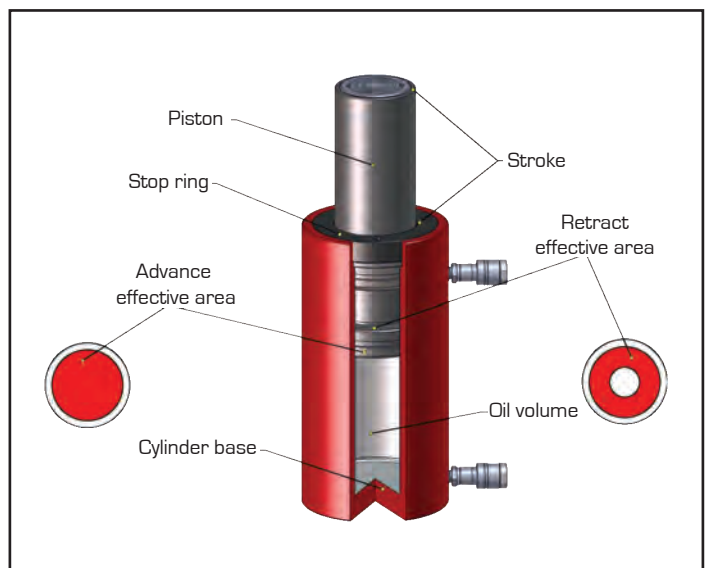
For example Hi-Force model reference HLS502 (page 13) has an effective area of 71.3 cm² and therefore a maximum working pressure of 700 Bar :-

$$\frac{71.3 \text{ (cm}^2\text{)} \times 700 \text{ (Bar)}}{981} = 50.88 \text{ Tonnes}$$

Single acting cylinder



Double acting cylinder

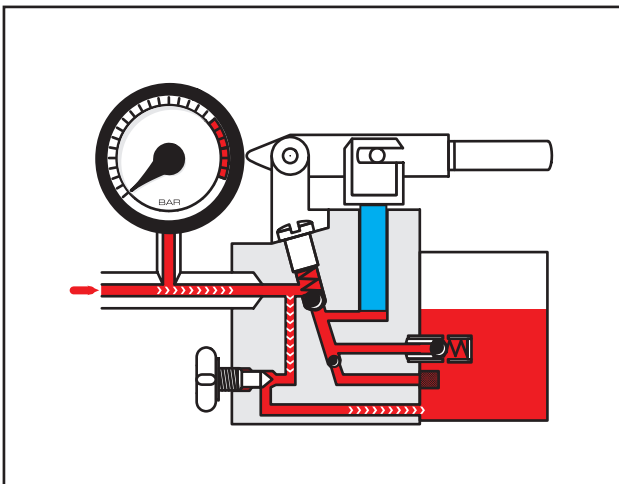


BASIC PRINCIPLES OF HYDRAULICS

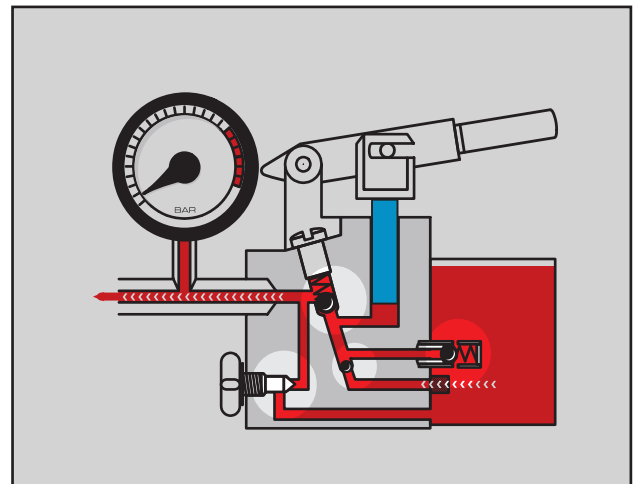
d) The Pump

Hydraulic pressure is provided by a hydraulic pump (manual or powered operation) that pumps the hydraulic fluid into the cylinder bore via a flexible hydraulic hose connected to the cylinder quick connect inlet coupling.

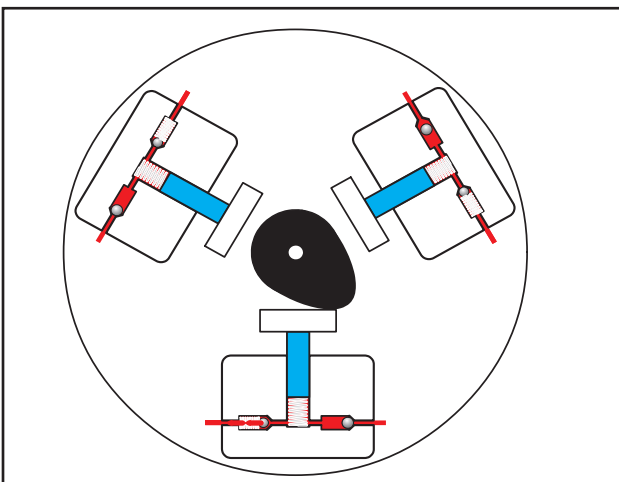
Hand operated pumps are the simplest form of pump and consist of a pumping piston, release valve, and suction and delivery check valves. The pump is operated by closing the valve and then raising and lowering the handle to pump fluid from the reservoir to the pump outlet connection. This action produces a steadily increasing fluid pressure generated by the downward leverage of the pump handle in conjunction with the opening and closing of the suction and delivery check valves. Power pumps replace hand leverage with a motive driven rotational force, i.e., electric, air or petrol engine driven motor.



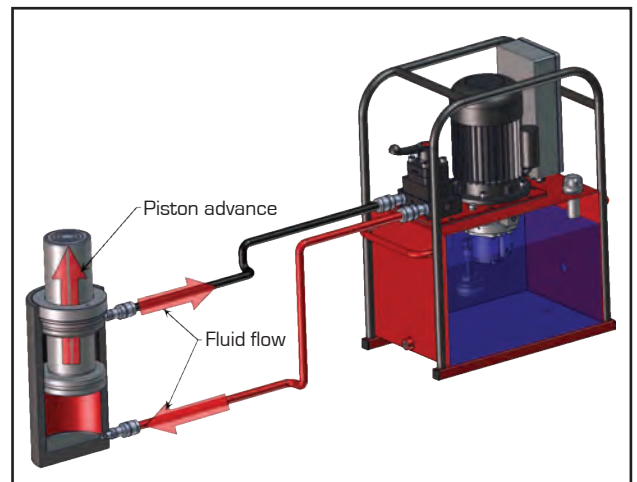
Single speed hand pump



Suction, delivery & release valve highlighted



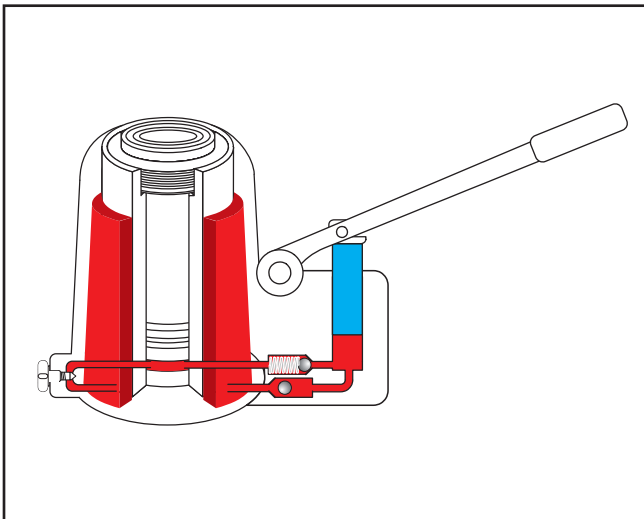
Multiple piston block powered pump



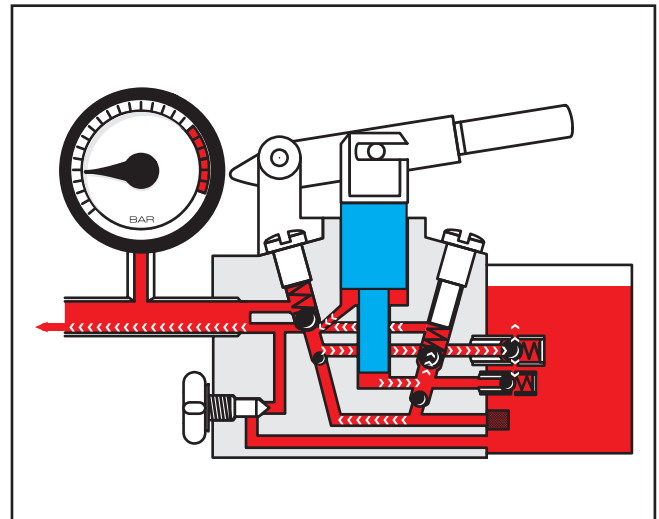
Double acting cylinder & powered pump set

BASIC PRINCIPLES OF HYDRAULICS

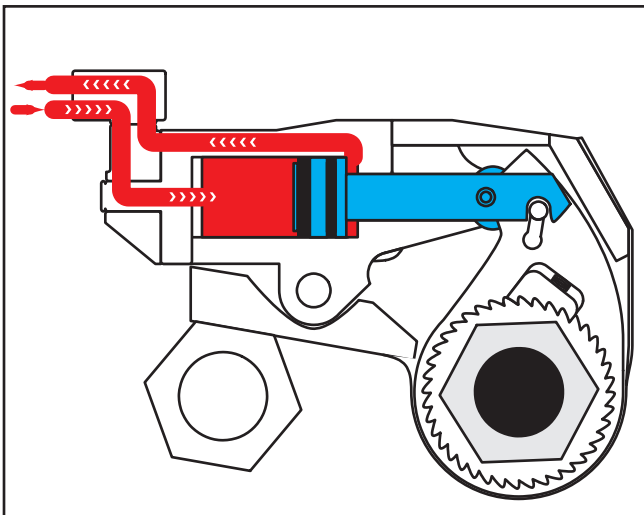
As the hydraulic fluid enters into the bore of the cylinder it forces the cylinder piston to move upwards. Any resistance to the upward movement of the piston, e.g. a load, will result in the fluid pressure increasing as the operator continues to actuate the pump lever up and down. The fluid pressure will continue to increase either until the piston overcomes the resistance (load) and moves upwards until it reaches the end of its designed stroke length or the fluid pressure reaches the maximum permissible pressure of 700 Bar and the pump safety pressure relief valve is activated preventing over pressurisation above 700 Bar.



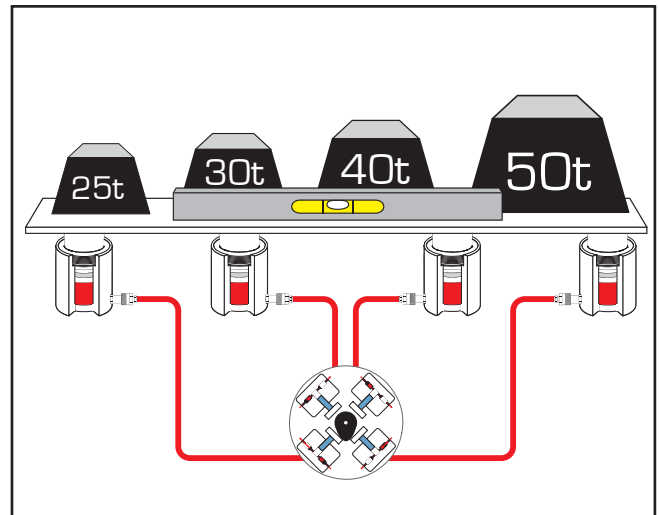
The internal workings of a hydraulic jack



A two speed hand pump circuit



The internal workings of a TWH-N hydraulic wrench

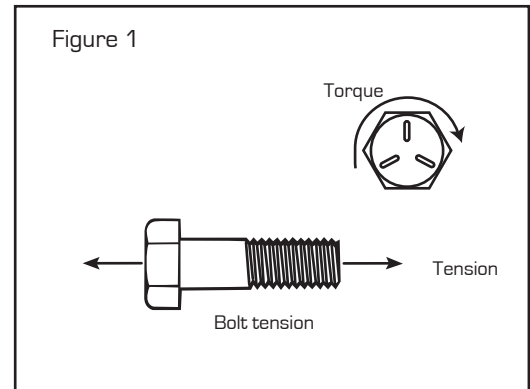


A split flow synchronised lift schematic

BASIC PRINCIPLES OF BOLTING TOOLS AND EQUIPMENT

Since the invention of using threaded bolts and nuts to join various components together was introduced centuries ago, the methods of bolt tensioning and the tool design technology have improved tremendously to the extent that Hi-Force offers the most comprehensive range of bolting products available from a single source anywhere in the world!

From basic high quality, calibrated hand torque wrenches to the latest “State of the Art” hydraulic torque wrenches and bolt tensioners, Hi-Force can deliver the right tool for the job on time, every time!



This section of the catalogue provides basic information about the methods of applying tension to a bolted connection. There are three possible methods to tighten threaded fasteners, by torque which is rotation of the nut or bolt head, by direct tension to stretch the fastener, or by heat to expand the fastener.

Torque and tensioning [see figure 1] probably covers 99% of bolting applications, and it is these two methods that are detailed in this catalogue.

What is tension and how does it affect a bolted fastener ?

As with most materials, steel which is predominantly used in the manufacture of bolts and nuts, has an inherent “elasticity” i.e. it can be stretched between two points. The tension that is imparted into the bolt acts as a clamping force to hold the bolted components together. Care must always be taken when stretching the bolt to ensure that its “yield point” is not exceeded which will cause the bolt to lose its physical properties of elasticity.

Hooke’s law states that the amount of distortion (lengthening, shortening, bending or twisting) applied will be directly proportional to the applied force, provided the applied force is kept within the material’s elastic limits. For most industrial applications, a fastener should be tightened until it has a retained tension of 40 to 60 percent of its elastic limit.

For a threaded fastener to correctly hold (clamp) components together it must be “stretched” (tensioned) to a known accurate amount. A threaded fastener that is under-tightened could work loose and come apart, resulting in a “shearing force” developing between the mating parts which could cut the bolt in two. A loose fastener may also lead to further mechanical looseness of surrounding machinery parts causing unnecessary vibration and wear. Fluid and gas leaks could also occur due to incorrect sealing in pressure joints, which could be extremely dangerous if any of the materials to be sealed are toxic, flammable or explosive.

An over-tightened fastener could cause damage to the bolted components, excessive over-tightening will cause the bolt and/or nut to deform causing loss of tension in the fastener as it exceeds its elastic limit (yield point).

For most industrial applications, the equipment manufacturers, as well as structural and piping component designers, will provide the torque or tension specifications for the relevant fastener(s) to be used to connect the component parts. It is vitally important to adhere to these specifications to ensure a correctly tensioned joint is achieved.

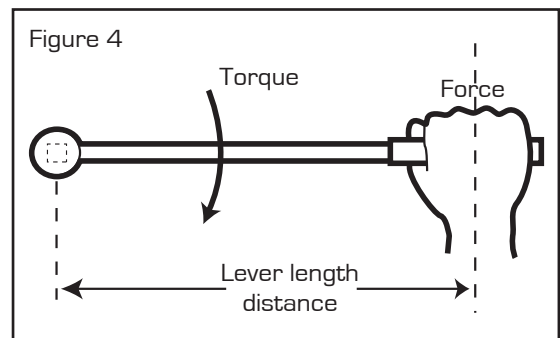
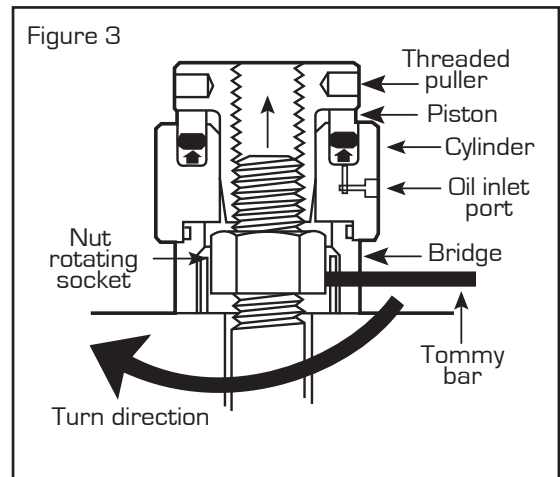
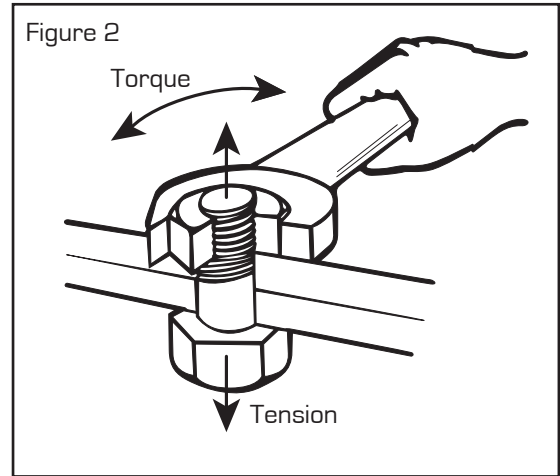
How do we generate tension in the bolt ?

As mentioned earlier the two most common methods to impart tension into a threaded fastener are by torque (see figure 2) or by direct tension (see figure 3).

Torque is defined as the turning or twisting force exerted on a nut or bolt head and it is the product of two measurements i.e. force and distance (see figure 4). Force is measured in units of Pounds or Newtons and is quite simply the amount of force applied at a given distance from the centre of the item being turned or twisted. Distance is measured in units of length i.e. inches, feet, centimetres or metres. Torque is expressed as a combination of the relevant units of force and distance i.e. pounds feet (lbf.ft) in the imperial system or Newton metres (Nm) in the metric system. Torque is applied to a threaded fastener by a variety of manual and power driven types of torque wrenches.

Newton's law states that for every applied force there is an equal and opposite reactive force. Therefore as the torque is applied to the nut, by turning it increases, it will create a tension in the bolt which will act as a "clamping force" within the effective thread length. Initially this clamping force will pull the two bolted components together and subsequently it will build up and retain a known tension (load) within the fastener to maintain the joint integrity.

The amount of torque to be applied to a threaded fastener will depend on several factors including the design application, type of joint, size, length and quantity of fasteners to be used and the type of thread lubricant. Ordinarily the torque applied should not be outside of the 40-60% of minimum yield range. Hi-Force BoltRight software programme (see page 118) assists the user to accurately calculate the required torque/ tension to achieve a successful joint bolt up.



Direct tension is applied to the fastener using a hydraulic tensioning device commonly known as a hydraulic bolt tensioner (see figure 3). This is a high pressure hydraulic cylinder, with accessories, designed to seat against the joint, grip the fastener thread using a compatible threaded puller, and via applied hydraulic pressure extend the cylinder piston against the puller, to pull (stretch) the bolt or stud to a known tension in tonnes or kN. When the pull force equals the desired bolt preload, plus an additional amount to compensate for bolt relaxation, the nut is run down the thread using a short tommy bar until it is tight against the joint face. The hydraulic pressure is then released and the threaded fastener is prevented from returning to its original length, by the tightened nut, subsequently leaving the required tension retained in the fastener.

BASIC PRINCIPLES OF BOLTING TOOLS AND EQUIPMENT

Hydraulic bolt tensioners are commonly used in multiples linked to a single hydraulic pump unit particularly in applications where reliable leak free joints are required. By using a number of tensioners simultaneously the operator is able to ensure an even pull down of the joint components, resulting in uniformity of gasket compression and consistent leak free joints. As with torque, the actual amount of tension to be directly applied to the threaded fastener by the hydraulic bolt tensioner, should be confirmed by the equipment manufacturer or designer. The majority of hydraulic bolt tensioners operate at a maximum hydraulic pressure of 1500 Bar and certainly this maximum pressure/tension load should never be exceeded.

Correct Tool Selection

Having now understood the two most common methods of applying tension to the fastener (torque or direct tension) let us now look at the various types of tools available to accurately and successfully complete the given task, along with other bolting products available from Hi-Force.

Hand Torque Wrenches

Probably the most commonly used tool, for accurately tightening threaded fasteners in the world!! Hand torque wrenches are designed and manufactured on the basis of Hooke's Law i.e. force x distance.

Hi-Force hand torque wrenches incorporate a reversible ratchet design drive head and a clear, easily adjustable torque setting scale. All Hi-Force hand torque wrenches are designed and manufactured to International Standard ISO 6789:2003. Each model is supplied marked with a unique serial number, traceable to an individual test and calibration certificate, and provides a repeatable accuracy of +/- 3% for TWM models and +/- 4% for the HTW-B models.

Hi-Force hand torque wrench models incorporate a clear, easily adjustable torque setting dual scale that gives accurate reading in Nm and PSI. Full technical specification on the Hi-Force range of hand torque wrenches can be found on pages 68 - 70 of this catalogue.



Mechanical Torque Multipliers

A mechanical torque multiplier is a mechanical device that multiplies the preset amount of input torque applied by the operator using a calibrated hand torque wrench. Hi-Force mechanical torque multipliers incorporate a single stage planetary gear in models up to 2800 Nm and a two stage planetary gear in models up to 10000 Nm. The greater the number of stages within the planetary gear train, the higher the output torque achieved, relative to the input torque applied. Due to the greater output torque produced using mechanical torque multipliers, it is necessary to incorporate an integral reaction arm to absorb the opposing reactive force generated (Hooke's Law). Great care must be taken to ensure that the reaction arm is correctly located against a suitably strong reaction point prior to operating the tool. Because the power output cannot exceed the power input, the number of output rotations will be lower than the number of input rotations. Hi-Force mechanical torque multipliers are available with multiplication ratios of 1:4, 1:5, 1:5.5, 1:16, 1:18 and 1:28.5 and full technical details can be found on page 71 of this catalogue.



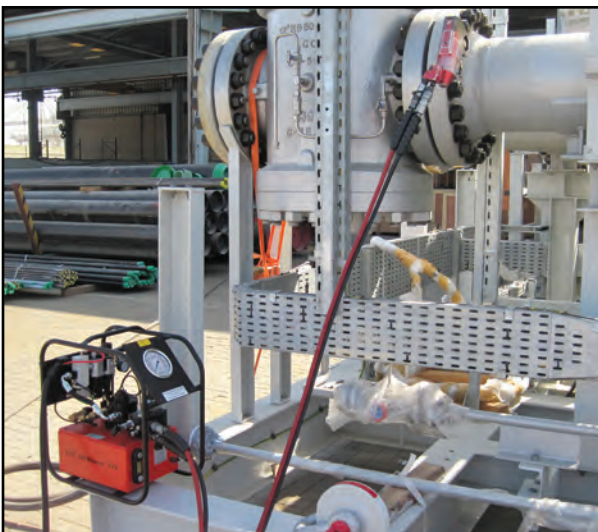
Pneumatic Torque Multipliers

A pneumatic torque multiplier operates in the same way as a mechanical torque multiplier except that the input motive force is provided by a pneumatically driven air motor instead of a manually operated manual torque wrench, making the tool both faster and easier to operate. Torque output is preset and adjusted by regulating the input air pressure, supplied to the pneumatic motor, which will control the amount of input torque applied to the planetary gear train. As the torque output increases the air motor will gradually slow down, until it eventually stalls i.e. the opposite reactive force generated becomes equivalent to the input torque of the air motor. Each tool is supplied with an airline filter, regulator, lubricator unit in a handy carrying frame with integral air line pressure gauge and 3 metre connecting hose. Repeatable accuracy of $\pm 5\%$ can easily be achieved in conjunction with the individual torque calibration chart supplied with each tool. Full technical details can be found on pages 72 - 73 of this catalogue.



Hydraulic Torque Wrenches

Hydraulic torque wrenches are specifically designed for applications where limitation of space and/or particularly high output torque is required. The design of a hydraulic torque wrench utilises the far higher leverage forces generated from a hydraulic piston, using high pressure hydraulic power supplied from an air or electric driven pump. The hydraulic piston is connected to a ratchet via a reaction pawl assembly which allows it to engage the ratchet teeth in the advance mode to rotate the nut or bolt head, and subsequently release during piston retraction to re-engage in the next forward push position. All Hi-Force hydraulic torque wrenches operate at 700 Bar maximum hydraulic pressure, incorporate a double acting heavy duty hydraulic piston for fast and easy operation, and can be used for accurately tightening or loosening nuts/bolts. A choice of standard square drive tools, suitable for use with a variety of sizes of torque wrench sockets, or hexagon drive cassette head tools that locate directly on to the nut/bolt are available. Full technical specifications can be found on pages 74 to 83 of this catalogue.



Hydraulic Bolt Tensioners

Hydraulic bolt tensioners provide the most consistent and accurate method of applying tension to bolted connections. Comprising of four component parts, i.e. bridge, nut rotating socket, threaded puller and load cell, hydraulic bolt tensioners offer a safe, accurate method of ensuring consistent joint integrity. Sub-sea tensioners consists of only two parts, i.e a bridge mounted load cell and a quick fit threaded puller. Designed to directly stretch the bolt by applying a known load to the fastener using a hydraulic load cell and threaded puller, the securing nut is rotated using a short tommy bar, whilst the thread is being stretched, until it is firmly tightened against the joint face. Immediately after the hydraulic pressure (load) is released, the bolt tension is retained because the threaded fastener is prevented from returning to its original length by the tightened nut. Hydraulic bolt tensioners can be linked together in multiples to ensure an even “pull down” or tension is applied to all bolts simultaneously. This is particularly critical in applications where a sealing gasket is used and consistent leak free connections are required. Full technical specification can be found on pages 93 to 114 of this catalogue.



Nut splitters

Hydraulic nut splitters provide the perfect answer for removal of worn, damaged or corroded fasteners that cannot be opened using torque or tensioning tools. The nut splitter design incorporates a powerful hydraulic piston to drive a precision engineered, angled splitting wedge into the flat face of the nut. The splitting wedge is manufactured from high grade tool steel for maximum life and can be easily removed for re-sharpening or replacement. The angled design of the splitting wedge allows the nut to be split with minimal damage to the threads on the bolt or stud. Full details can be found on pages 154 to 156 of this catalogue.



Impact Wrenches

Air driven (pneumatic) impact wrenches are probably one of the most commonly used tools in the bolting industry today. Ideally suited for run down or fast removal of bolted connections, all models operate using a standard 6 Bar air line pressure. Hi-Force industrial quality impact wrenches have a 4 position adjustable power output device, however torque accuracy cannot be measured or guaranteed due to the impact design of these tools. Full technical details can be found on page 91 of this catalogue.



Flange Spreaders

Flange spreaders provide the perfect answer for separating flange joints for maintenance etc..... after bolt removal. Hi-Force flange spreaders are available in both mechanical and hydraulic options. Full technical details can be found on pages 157 to 161 of this catalogue.



Sockets and Accessories

Most of the bolting products detailed in this catalogue will also require a selection of accessories to assist with the relevant bolting application. Hi-Force offers an extensive range of sockets, hexagon drives, hexagon reducer bushes and backup wrenches suitable for use with Hi-Force bolting tools. Full specifications and available options in both imperial and metric standard sizes are detailed on pages 76, 77, 78, 83, 84, 85 and 86 of this catalogue.



TIGHTENING SEQUENCE & BOLTING PROCEDURE FOR FLANGE BOLTS

As explained on page 193, the two most common methods for tightening of bolted flange joints are either by torque using torque wrenches or by direct tension using hydraulic bolt tensioners. Regardless of the method selected a pre-bolting inspection is essential if an accurate and leak free joint is to be achieved first time, every time. The inspection must include checking for any damage to the gasket and sealing surfaces, ensuring that the bolts and nuts are the correct size and material, are not damaged in any way and that the correct lubricant is to be used. In addition, it is vital that the two flanges are correctly aligned to each other and that the bolts can be easily fitted through the bolt holes. If any of the above checks are not satisfactory immediate remedial action must take place before starting to bolt up the joint.

Tightening using torque wrenches

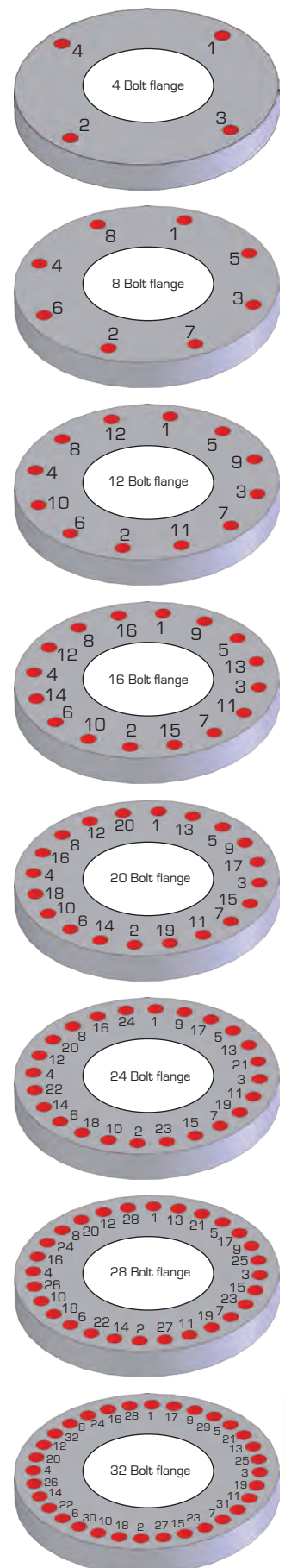
Insert the bolts through both flanges and hand tighten the nuts on both sides ensuring that there is full thread engagement on both nuts of every bolt. Square up the joint and ensure that all bolts are freely moving through the bolt holes and that the nuts are hand tightened against the outer flange faces. Number all bolts sequentially in a diametrically opposed fashion as shown in the illustrations on the right. Commence tightening of the bolts sequentially starting with a first pass at 25% of the final specified and required torque figure, a second pass at 50% and then a third pass at 100%. Finally a check pass should be carried out in either a clockwise or anti-clockwise direction at 100% of the required torque to ensure all bolts are uniformly tightened.

Tensioning procedure using hydraulic bolt tensioners

Insert the bolts through both flanges and hand tighten the nuts on both sides ensuring that there is full thread engagement on both sides. Take care to ensure that on the selected flange face, to which the tensioners are to be affixed, that there is at least 1 x diameter [*] of the bolt thread protruding above the nut face. This is required for the tensioner puller to attach correctly and if insufficient thread is exposed then the tensioning procedure must not proceed. The exact number and positioning of the hydraulic bolt tensioners must then be ascertained i.e. 25%, 33%, 50% or 100% simultaneous tensioning of all the bolts in the respective joint. After deciding the number of bolt tensioners to be used simultaneously, affix them to the exposed thread end of the bolts, equally spaced around the flange for 25%, 33% or 50% simultaneous tensioning, or on every bolt in the case of 100% simultaneous tensioning. Please refer to page 200 and to the Hi-Force operating manual for bolt tensioners for detailed instructions. After correctly assembling all of the bolt tensioners on to the flange, hook up the interconnecting hydraulic hoses and the mainline hose to the air driven pump unit and apply the applicable hydraulic pressure, as specified by either the joint equipment manufacturer or the BoltRight software (see page 118). In cases other than 100% simultaneous tensioning there will be two different hydraulic pump pressures to be applied to the bolt tensioners and these should be strictly adhered to. Once all of the bolts have been tensioned using the Hi-Force bolt tensioners the joint is ready for testing. Take note that it is normal to have to make 2 or 3 passes around the bolts when tensioning at 50% or less and usually the lower the number of tensioners being used simultaneously, the more passes that will need to be done and hence it will take more time to complete the joint tightening.

Whether tightening the bolts using a torque wrench or bolt tensioners it is a good idea to carry out a final check for tightness of all the bolts by simply tapping each nut with a hammer and listen to see if a high pitched ringing sound is achieved. A dull sound indicates that the respective bolt is still loose.

[*] For sub-sea tensioners, please see note on page 200.



TIGHTENING SEQUENCE & BOLTING PROCEDURE FOR FLANGE BOLTS

Hi-Force hydraulic bolt tensioners offer the quickest, safest and most accurate means of applying a specific residual load to bolts. Bolt tensioners can be used to easily achieve an accurate and pre-determined bolt loading in a single, simultaneous operation, providing the uniform gasket compression, essential for the integrity of critical bolted connections. Ideally all bolts in the joint should be tensioned simultaneously i.e. 100%, however 50%, 33% or even 25% simultaneous tensioning can be carried out, which then requires the operator to make two, three or four tensioning operations by moving around the bolts in diametrically opposed fashion. Whilst partial tensioning will take longer to complete the task, it enables the user to optimise between the cost of the equipment and the available time.

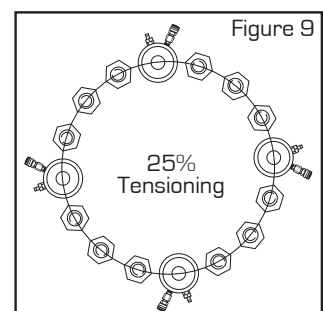
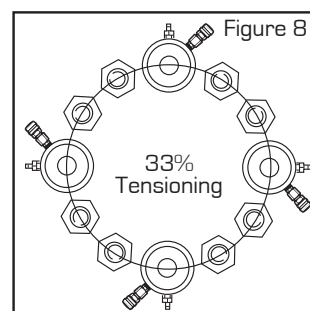
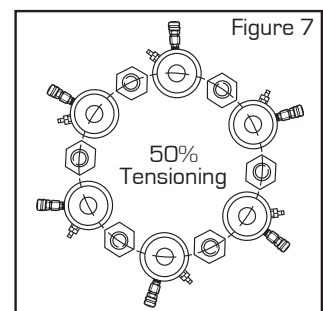
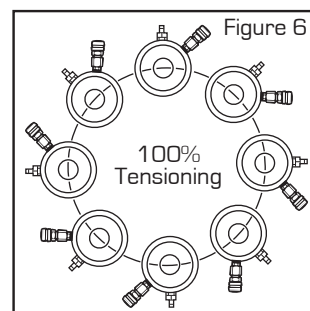
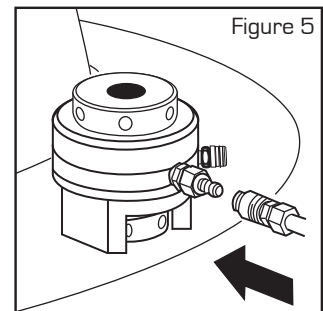
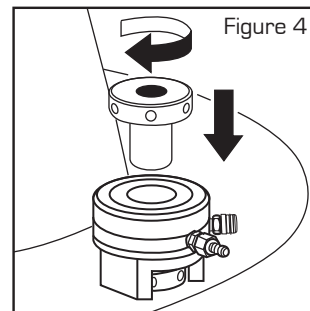
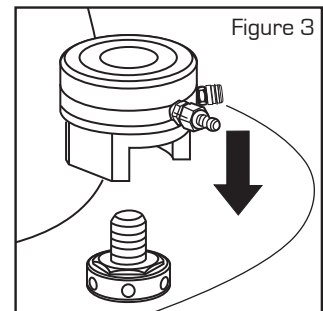
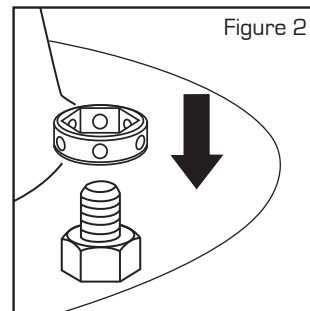
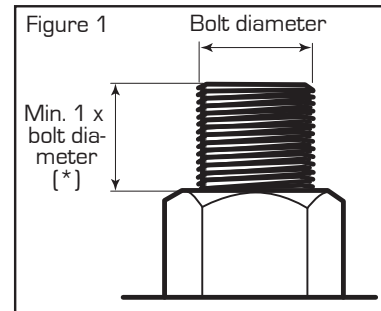
Hi-Force hydraulic bolt tensioners are designed to directly stretch the bolt by applying a known load to the fastener using a hydraulic cylinder and threaded puller. The securing nut is then rotated using a short tommy bar, whilst the thread is being stretched, until it is firmly tightened against the joint face. Immediately the hydraulic pressure (load) is released the bolt tension (residual load) is retained, within the clamp length of the bolt, because it is prevented from returning to its original length by the tightened nut.

To operate hydraulic bolt tensioners on bolted connections safely, an extra length of threaded stud above the nut, of at least 1x bolt diameter (*), is required to facilitate easy fitment of the equipment (see figure 1). Assembly of the tensioners to the bolt is quick and easy, provided of course that the bolts and nuts are clean, lubricated and in good condition (see figures 2-5).

Hi-Force has considerable experience in providing precise calculations of the correct bolt load to be applied to ensure an accurate residual load is imparted into the bolts, whether they be tightened using a 100%, 50%, 33% or 25% simultaneous tensioning procedure (see figures 6-9).

Please refer to page 118 for further details on the Hi-Force BoltRight software programme.

(*) Depending on the bolt size, sub-sea tensioners (STU Range) may require an extra length of threaded stud above the nut, up to 4.8 x the diameter.



Note: If 100% tensioning cannot be achieved by attaching all bolt tensioners to one side of the flange, due to a lack of space, then alternate the tensioners on opposite sides of the flange.

METRIC TO IMPERIAL CONVERSION CHART

| SI Unit System International | Conversion Factor | Imperial Equivalent | Conversion Factor | SI Unit System International |
|---------------------------------|----------------------|------------------------|----------------------|---------------------------------|
|---------------------------------|----------------------|------------------------|----------------------|---------------------------------|

Pressure

| | | | | |
|-----|---------|---------------------|----------|-----|
| Bar | x 14.5 | PSI | x 0.069 | Bar |
| Bar | x 14.5 | lbf.in ² | x 0.069 | Bar |
| kPA | x 0.145 | PSI | x 6.89 | kPa |
| mPA | x 145 | PSI | x .00689 | mPa |

Volume

| | | | | |
|-----------------|---------|-------------------|---------|-----------------|
| cm ³ | x 0.061 | inch ³ | x 16.4 | cm ³ |
| litre | x 61 | inch ³ | x 0.016 | litre |
| litre | x 0.22 | gallon | x 4.54 | litre |
| m ³ | x 1.3 | yard ³ | x 0.76 | m ³ |

Area

| | | | | |
|-----------------|-----------|-------------------|----------|-----------------|
| mm ² | x 0.00155 | inch ² | x 645 | mm ² |
| cm ² | x 0.155 | inch ² | x 6.45 | cm ² |
| m ² | x 10.8 | foot ² | x 0.0929 | m ² |

Length

| | | | | |
|----|-----------|------|---------|----|
| mm | x 0.03937 | inch | x 25.4 | mm |
| cm | x 0.3937 | inch | x 2.54 | cm |
| m | x 3.28 | foot | x 0.305 | m |

Force

| | | | | |
|----|---------|-------|-----------|----|
| N | x 0.225 | pound | x 4.45 | N |
| kN | x 225 | pound | x 0.00445 | kN |

Torque

| | | | | |
|-------|----------|--------|----------|-------|
| Nm | x 0.738 | lbf.ft | x 1.356 | Nm |
| Nm | x 8.9 | lbf.in | x 0.113 | Nm |
| kgf.m | x 7.2345 | lbf.ft | x 0.1382 | kgf.m |

Mass

| | | | | |
|----|----------|-------------|----------|----|
| g | x 0.035 | ounce | x 28.3 | g |
| kg | x 2.2046 | pound | x 0.4536 | kg |
| t | x 1.1 | ton [short] | x 0.907 | t |

Flow

| | | | | |
|----------------------|---------|------------------------|---------|----------------------|
| cm ³ /min | x 0.61 | inch ³ /min | x 16.4 | cm ³ /min |
| litres/min | x .2642 | gallon/min | x 3.785 | litres/min |

Power

| | | | | |
|----|---------|---------|---------|----|
| kw | x 1.34 | hp | x 0.746 | kw |
| kw | x 0.948 | Btu/s | x 1.055 | kw |
| w | x 0.74 | ft lb/s | x 1.36 | w |

Temperature

| | |
|--------------------------------------|---|
| To calculate Celsius to Fahrenheit : | $[^{\circ}\text{C} \times 1.8] + 32 = ^{\circ}\text{F}$ |
| To calculate Fahrenheit to Celsius : | $[^{\circ}\text{F} - 32] / 1.8 = ^{\circ}\text{C}$ |

RECOMMENDED TORQUE VALUE CHART

Use this chart as a guideline for the correct torque to be applied to standard size metric and imperial bolts in grades 8.8 (metric) and ASTM A193 grade B7 (imperial) or similar. The torque figures are calculated in both metric (Nm) and imperial (lb.ft.) values using a choice of three commonly used bolt thread lubricants. Always consider the coefficient of friction applicable for the chosen bolt lubricant. For grade 10.9 bolts add 47% and grade 12.9 bolts add 72% to the figure detailed against the relevant 8.8 grade metric bolt size.

Remember these torque values are for guidance purposes only! Always check the equipment/bolt manufacturer for the actual torque required and specified for bolted components within the particular equipment design.

| ALL VALUES ARE BASED ON 60% OF THE BOLT YIELD STRESS | | | | | | | | | |
|--|-----------------------------|--|--------|--|-------------|--------------------------------|--------|-------------------------------------|--------|
| Bolt diameter (see note 1) | Nut AF Size (see note 2) | Bolt tension (for grade ASTM A193 B7) (see note 3) | | Torque value (for grade B7 bolt) for specified lubricant | | | | | |
| | | | | Moly: f = 0.06 see note 4 | | Copper: f = 0.10 see note 4 | | Machine Oil: f = 0.15 see note 4 | |
| | | | | kN | (lbs.force) | Nm | lb.ft. | Nm | lb.ft. |
| 5/8" | 1 1/16" | 57 | 13044 | 99 | 73 | 149 | 110 | 211 | 156 |
| 3/4" | 1 1/4" | 82 | 18559 | 170 | 126 | 259 | 191 | 369 | 272 |
| 7/8" | 1 7/16" | 115 | 25830 | 270 | 199 | 411 | 303 | 587 | 433 |
| 1" | 1 5/8" | 171 | 38555 | 401 | 296 | 611 | 451 | 874 | 644 |
| 1 1/8" | 1 9/16" | 224 | 50247 | 574 | 423 | 882 | 650 | 1267 | 934 |
| 1 1/4" | 2" | 282 | 63487 | 790 | 583 | 1222 | 901 | 1762 | 1300 |
| 1 3/8" | 2 3/16" | 349 | 78271 | 1054 | 777 | 1640 | 1210 | 2373 | 1750 |
| 1 1/2" | 2 3/8" | 422 | 94602 | 1370 | 1011 | 2143 | 1581 | 3109 | 2293 |
| 1 5/8" | 2 9/16" | 501 | 112479 | 1744 | 1286 | 2739 | 2020 | 3983 | 2938 |
| 1 3/4" | 2 3/4" | 586 | 131904 | 2180 | 1608 | 3436 | 2535 | 5007 | 3693 |
| 1 7/8" | 2 15/16" | 680 | 152874 | 2682 | 1978 | 4243 | 3129 | 6193 | 4568 |
| 2" | 3 1/8" | 780 | 175389 | 3256 | 2402 | 5166 | 3810 | 7552 | 5570 |
| 2 1/4" | 3 1/2" | 1001 | 225061 | 4638 | 3420 | 7393 | 5453 | 10838 | 7994 |
| 2 1/2" | 3 7/8" | 1250 | 280917 | 6361 | 4692 | 10183 | 7510 | 14960 | 11034 |
| 2 3/4" | 4 1/4" | 1381 | 310296 | 8465 | 6244 | 13597 | 10029 | 20011 | 14760 |
| 3" | 4 3/8" | 1655 | 372024 | 10988 | 8104 | 17699 | 13054 | 26088 | 19241 |
| 3 1/4" | 5" | 1954 | 439349 | 13966 | 10301 | 22551 | 16633 | 33283 | 24548 |
| 3 1/2" | 5 3/8" | 2279 | 512269 | 17438 | 12862 | 28218 | 20812 | 41692 | 30750 |
| 3 3/4" | 5 3/4" | 2628 | 590785 | 21442 | 15815 | 34761 | 25638 | 51409 | 37917 |
| 4" | 6 1/8" | 3003 | 674898 | 26015 | 19188 | 42244 | 31157 | 62529 | 46119 |

| ALL VALUES ARE BASED ON 60% OF THE BOLT YIELD STRESS | | | | | | | | | |
|--|-----------------------------|---|--------|---|-------------|--------------------------------|--------|-------------------------------------|--------|
| Bolt diameter (see note 1) | Nut AF Size (see note 2) | Bolt tension (for grade 8.8) (see note 3) | | Torque value (for grade 8.8 bolt) for specified lubricant | | | | | |
| | | | | Moly: f = 0.06 see note 4 | | Copper: f = 0.10 see note 4 | | Machine Oil: f = 0.15 see note 4 | |
| | | | | kN | (lbs.force) | Nm | lb.ft. | Nm | lb.ft. |
| M16 | 24 | 51 | 13509 | 87 | 64 | 133 | 98 | 189 | 140 |
| M20 | 30 | 85 | 21197 | 171 | 126 | 259 | 191 | 370 | 273 |
| M24 | 36 | 136 | 30543 | 294 | 217 | 447 | 330 | 638 | 470 |
| M27 | 41 | 180 | 40417 | 425 | 314 | 653 | 481 | 937 | 691 |
| M30 | 46 | 219 | 49116 | 582 | 429 | 890 | 656 | 1275 | 940 |
| M33 | 50 | 273 | 61453 | 775 | 572 | 1193 | 880 | 1716 | 1266 |
| M36 | 55 | 321 | 72075 | 1005 | 741 | 1541 | 1137 | 2212 | 1632 |
| M39 | 60 | 387 | 86874 | 1284 | 947 | 1981 | 1461 | 2853 | 2104 |
| M42 | 65 | 443 | 99617 | 1601 | 1181 | 2463 | 1817 | 3540 | 2611 |
| M45 | 70 | 519 | 116703 | 1978 | 1459 | 3057 | 2255 | 4406 | 3250 |
| M48 | 75 | 583 | 131157 | 2405 | 1774 | 3708 | 2735 | 5337 | 3936 |
| M52 | 80 | 702 | 157758 | 3054 | 2253 | 4732 | 3490 | 6830 | 5037 |
| M56 | 85 | 809 | 181917 | 3817 | 2815 | 5907 | 4357 | 8519 | 6283 |
| M60 | 90 | 947 | 221649 | 4689 | 3459 | 7286 | 5374 | 10532 | 7768 |
| M64 | 95 | 1071 | 240948 | 5664 | 4178 | 8786 | 6480 | 12688 | 9358 |
| M68 | 100 | 1230 | 276631 | 6788 | 5006 | 10566 | 7793 | 15289 | 11276 |
| M72 | 105 | 1400 | 314641 | 8050 | 5937 | 12570 | 9271 | 18221 | 13439 |
| M76 | 110 | 1502 | 337437 | 9458 | 6976 | 14812 | 10925 | 21505 | 15861 |
| M80 | 115 | 1603 | 360234 | 11020 | 8128 | 17305 | 12763 | 25160 | 18557 |
| M90 | 130 | 2078 | 467173 | 15731 | 11603 | 24852 | 18330 | 36253 | 26739 |
| M100 | 145 | 2614 | 587739 | 21660 | 15975 | 34389 | 25364 | 50301 | 37100 |

- Notes: 1 = Bolt Material Grades 8.8 (Metric) and ASTM A193/BS4882 Grade B7 (Imperial) or similar
 2 = AF size based on heavy series nuts
 3 = Bolt tension equates to a bolt stress of 60% of the minimum yield strength
 4 = Torque figures detailed are based on 60% of the minimum bolt yield stress

NEW PRODUCTS

HHA - Hollow Piston Aluminium Cylinders



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HDA8006 & HDA10006 - High Tonnage Cylinders



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HFL4002 - Low Height Failsafe Lock Ring Cylinder



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HFG8006 & HFG10006 - Failsafe Lock Ring Cylinders



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HGG/HSG - Single Acting Load Return High Tonnage Cylinders



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HPX - Manually Operated Ultra High Pressure Pump



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HGD1 - Digital Pressure Gauge



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HDD / HPT - Digital display unit & Pressure transducer



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HMC-SU / HM-C-DU - Controlled Manifold Units



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TWM - Manual Torque Wrenches



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TWM - Manual Torque Wrenches Aluminium




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TWG - Mechanical Torque Multipliers



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TWP / TWP-OG - Pneumatic Torque Multipliers



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TPA / TPE - Torque Wrench Pumps Premium Line



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SBT - Spring Return Topside Bolt Tensioners




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HPX1500BTU - Manual Pump for Bolt Tensioners



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ITP / MTP - Bolt and Nut Protection Caps



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MHP - Manually Operated Hydrotest Pumps



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SPP - Heavy Duty Hydraulic Pullers



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HBR / HPR - Pin & Bush Replacement Tool Kits



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RKT / RKF - Roller Skate Kits



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RSN - Multi-purpose Skates



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RSA - Heavy Duty Skates



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RSG / RSD - Heavy Duty Skates with Grooved Guide



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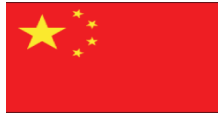
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Notes:

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