

**ENERPAC** 

POWERFUL SOLUTIONS. GLOBAL FORCE.



US

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**INDUSTRIAL TOOLS**

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**Integrated Solutions**  
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**A** complete range of quality high force tools for all industrial applications, with local availability and after sale service anywhere in the world.... this is what has made Enerpac the undisputed global market leader in high pressure hydraulics.

Across every continent, Enerpac's network of authorized distributors and service centers can reach even the most remote locations, supplying and servicing products that are designed to enhance productivity and performance, while making the workplace safer.

With over 150 sales specialists and a network of service and engineering support in 17 countries across the globe, Enerpac has become the product of choice in industries such as manufacturing, construction, energy, oil & gas, shipbuilding, railroads, mining, and metals transformation.

Always at the leading edge of technology, Enerpac has continued to develop its range of time and cost-savings tools, utilizing modern engineered materials to improve productivity and minimize operator fatigue.

Enerpac's commitment to the continued development of quality high force tools ensures that the products you purchase are the best tools in the industry. We will continue to lead the way in the development of quality high force tools for all industrial applications.



# Class Brand

## 10 Reasons to Work with Enerpac

- Expert Design
- Highly Reliable
- Service Excellence
- Worldwide Experience
- Application Support
- Availability
- Quality
- Value
- Innovative Products
- Systems Solutions



### Total Quality

Our products are tested to the most exacting standards. These high standards guarantee the quality, price and performance requirements of the markets we serve around the globe.

### Global Network

Enerpac has an extensive network of authorized distributors and service centers located in more than 90 countries worldwide. You can rely on Enerpac for the products and technical support you need to get your job done, anywhere in the world.

### Logistics Excellence

Enerpac's mission is to maintain service excellence in the ever-changing world of modern distribution. Providing our extensive range of products to our thousands of distributors worldwide demands a logistic expertise only a market leader can provide.



### A Tradition of Innovation

Enerpac has a long history of finding new solutions to better meet the challenges of the industries we serve. We were the first to develop a composite hand pump and the first to offer a computerized lifting system. Our latest innovations include the XA-Series of air driven foot pumps, designed for less operator fatigue - with the unique XVARI® technology, delivering variable oil flow and fine metering for precise control, a full range of aluminum cylinders with the strength of steel and the advantages of aluminum and the Z-Class series of power pumps... pumps that were designed to run cooler, use less electricity and are easy to service.

To support the demands of the construction industry, Enerpac continues to develop Integrated Solutions capabilities. These capabilities include controlled hydraulic movement for your most challenging applications.



**ENERPAC**   
POWERFUL SOLUTIONS. GLOBAL FORCE.

**E**NERPAC hydraulic cylinders are available in hundreds of different configurations. Whatever the industrial application... lifting, pushing, pulling, bending, holding... whatever the force capacity, stroke length, or size restrictions... single- or double-acting, solid or hollow plunger, you can be sure that Enerpac has the cylinder to suit your high force application. Enerpac jacking cylinders fully comply to ASME B30.1 (except RD-Series).



### GR2 Bearing Technology

The exclusive GR2 is a unique bearing design on RC-Series DUO cylinders which absorbs eccentric load stresses to protect your cylinder against abrasion, over-extending or plunger blow-outs and jamming or top-end mushrooming. As a result, RC-Series DUO cylinders provide long, trouble-free operation.

**Easy assembly and disassembly** using only standard shop tools.

**Heavy-duty, pre-tensioned spring** improves retraction rate for enhanced productivity.



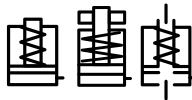



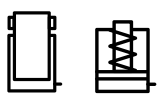



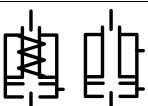














**Unique GR2 Bearing System** surrounds the seal of longer stroke models resulting in improved side-load resistance and extended operating life.

Additional shape and texture to the **cylinder thread protector** and pliable plug-in/pop-off coupler cap for easy operation with gloved and oily hands.



*Note: The cut-away drawing is representative of typical cylinder construction and may not represent all cylinders in this section.*

# Cylinder & Lifting Products Section Overview

| * Capacity (tons) | Stroke Range (in) | Cylinder Type and Functions   | Series              |   | Page                 |
|-------------------|-------------------|---|---------------------|---|----------------------|
| 5-100             | .63-14.25         | General Purpose Cylinders, Single-acting Cylinder Accessories                            | RC-DUO              |    | 6 ▶<br>10 ▶          |
| 20-150            | 1.97-7.87         | Aluminum Cylinders Single-Acting, Solid Plunger, Lock Nut, Hollow Plunger                 | RAC<br>RACL<br>RACH |    | 12 ▶<br>14 ▶<br>16 ▶ |
| 50-150            | 1.97-7.87         | Aluminum Cylinders Double-Acting Solid Plunger   | RAR                 |    | 18 ▶                 |
| 5-500             | .25-2.44          | Pancake and Low Height Cylinders, Single-Acting   | CLP<br>RSM<br>RCS   |    | 20 ▶<br>22 ▶<br>23 ▶ |
| 2.5-60            | 5.00-6.00         | Pull Cylinders, Single-Acting    | BRC<br>BRP          |    | 24 ▶                 |
| 12-150            | .31-10.13         | Hollow Plunger Cylinders Single- and Double-Acting                                        | RCH<br>RRH          |    | 26 ▶<br>28 ▶         |
| 4-25              | 1.13-10.25        | Precision Production Cylinders, Double-Acting   | RD                  |   | 30 ▶                 |
| 10-500            | 2.25-48.00        | Long Stroke Cylinders, Double-Acting   | RR                  |  | 32 ▶                 |
| 50-1000           | 1.97-11.81        | High Tonnage Cylinders Single-Acting (S/A), S/A with Mechanical Locknut, Double-Acting  | CLSG<br>CLRG<br>CLL |  | 36 ▶<br>40 ▶<br>44 ▶ |
| 1.5-150           | 3.00-20.00        | Aluminum and Steel Jacks Industrial Bottle Jack                                        | JHA/JH<br>BJ        |  | 48 ▶                 |
| 60-200            | 14.0-27.0         | POW'R-RISER® Lifting Jack   | PR                  |  | 50 ▶                 |
| 10-25             | 2.0-6.0           | Extreme Environment Products (Valves, cylinders, hand pumps)                           | RC<br>P<br>V        |  | 52 ▶                 |
| 5-100             | 1.50-14.25        | Cylinder - Pump Sets (Single-Acting)   | SC                  |  | 54 ▶                 |

\* All cylinder capacities are nominal values, unless otherwise stated. [Maximum] capacities are theoretical and may vary, depending on cylinder condition and application.

▼ Shown from left to right: RC-506, RC-50, RC-2510, RC-154, RC-10010, RC-55, RC-1010



- **Unique GR2 Bearing Design, reduces wear, extending life**
- **Collar threads, plunger threads and base mounting holes enable easy fixturing (on most models)**
- **Designed for use in all positions**
- **High strength alloy steel for durability**
- **Redesigned cylinder thread protector for ease of use**
- **Heavy-duty, pretensioned spring improves retraction speed**
- **Baked enamel finish for increased corrosion resistance**
- **CR-400 coupler and dust cap included on all models**
- **Plunger wiper reduces contamination, extending cylinder life**

▼ *Stage lifting set up in Greece, where assembled pipes, 82 feet in length, were stage lifted with six RC-2514 cylinders.*



## The Industry Standard General Purpose Cylinder



### Saddles

All **RC** cylinders are equipped with hardened removable grooved saddles. For tilt and flat saddles, see the RC-Series accessory page.

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### Base Plates

To ensure the stability of cylinders for lifting applications, base plates are available for 10, 25 and 50 ton RC cylinders.

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### Specialty Attachments

For solving all kinds of application problems, specialty attachments are available for 5, 10 and 25 ton RC cylinders.

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▼ *RC cylinder mounting attachments greatly extend the application possibilities (available for 5, 10, 15 and 25 ton cylinders).*



# Single-Acting, General Purpose Cylinders



## GR2 Bearing Technology

The exclusive GR2 is a unique bearing design on RC-Series DUO cylinders which absorbs eccentric load stresses to protect your cylinder against abrasion, over-extending or plunger blow-outs and jamming or top-end mushrooming. As a result, RC-Series DUO cylinders provide long, trouble-free operation.

### ▼ QUICK SELECTION CHART

For complete technical information see next page.

| Cylinder Capacity | Stroke | Model Number | Cylinder Effective Area | Oil Capacity       | Collapsed Height | Weight |
|-------------------|--------|--------------|-------------------------|--------------------|------------------|--------|
| tons (maximum)    | (in)   |              | (in <sup>2</sup> )      | (in <sup>3</sup> ) | (in)             | (lbs)  |
| 5<br>(4.9)        | .63    | RC-50**      | .99                     | .62                | 1.63             | 2.2    |
|                   | 1.00   | RC-51        | .99                     | .99                | 4.34             | 2.3    |
|                   | 3.00   | RC-53        | .99                     | 2.98               | 6.50             | 3.3    |
|                   | 5.00   | RC-55*       | .99                     | 4.97               | 8.50             | 4.1    |
|                   | 7.00   | RC-57        | .99                     | 6.96               | 10.75            | 5.3    |
|                   | 9.13   | RC-59        | .99                     | 9.07               | 12.75            | 6.1    |
| 10<br>(11.2)      | 1.00   | RC-101       | 2.24                    | 2.24               | 3.53             | 4.0    |
|                   | 2.13   | RC-102*      | 2.24                    | 4.75               | 4.78             | 5.1    |
|                   | 4.13   | RC-104       | 2.24                    | 9.23               | 6.75             | 7.2    |
|                   | 6.13   | RC-106*      | 2.24                    | 13.70              | 9.75             | 9.8    |
|                   | 8.00   | RC-108       | 2.24                    | 17.89              | 11.75            | 12.0   |
|                   | 10.13  | RC-1010*     | 2.24                    | 22.65              | 13.75            | 14.0   |
|                   | 12.00  | RC-1012      | 2.24                    | 26.84              | 15.75            | 15.0   |
|                   | 14.00  | RC-1014      | 2.24                    | 31.31              | 17.75            | 18.0   |
| 15<br>(15.7)      | 1.00   | RC-151       | 3.14                    | 3.14               | 4.88             | 7.2    |
|                   | 2.00   | RC-152       | 3.14                    | 6.28               | 5.88             | 9.0    |
|                   | 4.00   | RC-154*      | 3.14                    | 12.57              | 7.88             | 11.0   |
|                   | 6.00   | RC-156*      | 3.14                    | 18.85              | 10.69            | 15.0   |
|                   | 8.00   | RC-158       | 3.14                    | 25.13              | 12.69            | 18.0   |
|                   | 10.00  | RC-1510      | 3.14                    | 31.42              | 14.69            | 21.0   |
|                   | 12.00  | RC-1512      | 3.14                    | 37.70              | 16.69            | 24.0   |
|                   | 14.00  | RC-1514      | 3.14                    | 43.98              | 18.69            | 26.0   |
| 25<br>(25.8)      | 1.00   | RC-251       | 5.16                    | 5.16               | 5.50             | 13.0   |
|                   | 2.00   | RC-252*      | 5.16                    | 10.31              | 6.50             | 14.0   |
|                   | 4.00   | RC-254*      | 5.16                    | 20.63              | 8.50             | 18.0   |
|                   | 6.25   | RC-256*      | 5.16                    | 32.23              | 10.75            | 22.0   |
|                   | 8.25   | RC-258       | 5.16                    | 42.55              | 12.75            | 27.0   |
|                   | 10.25  | RC-2510      | 5.16                    | 52.86              | 14.75            | 31.0   |
|                   | 12.25  | RC-2512      | 5.16                    | 63.18              | 16.75            | 36.0   |
|                   | 14.25  | RC-2514*     | 5.16                    | 73.49              | 18.75            | 39.0   |
| 30 (32.4)         | 8.25   | RC-308       | 6.49                    | 53.56              | 15.25            | 40.0   |
| 50<br>(55.2)      | 2.00   | RC-502       | 11.04                   | 22.09              | 6.94             | 33.0   |
|                   | 4.00   | RC-504       | 11.04                   | 44.18              | 8.94             | 42.0   |
|                   | 6.25   | RC-506*      | 11.04                   | 69.03              | 11.13            | 51.0   |
|                   | 13.25  | RC-5013      | 11.04                   | 146.34             | 18.13            | 83.0   |
| 75 (79.5)         | 6.13   | RC-756       | 15.90                   | 97.41              | 11.25            | 65.0   |
|                   | 13.13  | RC-7513      | 15.90                   | 208.74             | 19.38            | 130.0  |
| 100<br>(103.1)    | 6.63   | RC-1006      | 20.63                   | 136.67             | 14.06            | 130.0  |
|                   | 10.25  | RC-10010     | 20.63                   | 211.45             | 17.69            | 160.0  |

\* Available as a set. See note on this page.

\*\* RC-50 cylinder has non-removable grooved saddle and no collar thread.

## RC Series



Capacity:

**5-100 tons**

Stroke:

**.63-14.25 inches**

Maximum Operating Pressure:

**10,000 psi**



**Think Safety**

Manufacturer's rating of load and stroke are maximum safe limits.

Good practice encourages using only 80% of these ratings!

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### RAC-Series, Single-Acting Cylinders

The lightweight general purpose spring return aluminum cylinders.

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### RC-Series DUO Cylinders

maintain external dimensions for use with existing fixtures.

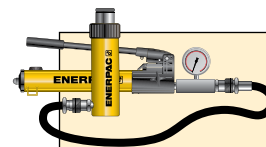


### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to

the System Components section for a full range of gauges.

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### Pump and Cylinder Sets

All cylinders marked with an \* are available as sets (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

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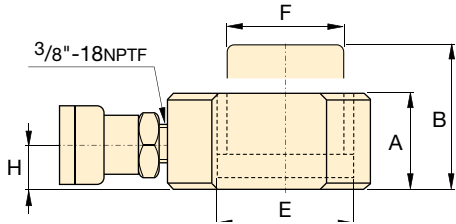
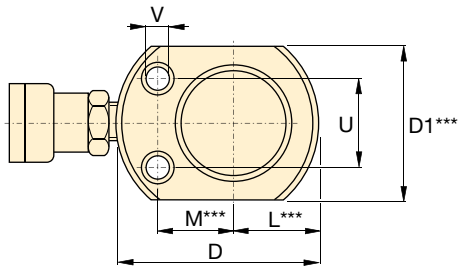
# RC-Series DUO Cylinders, Single-Acting



### Speed Chart

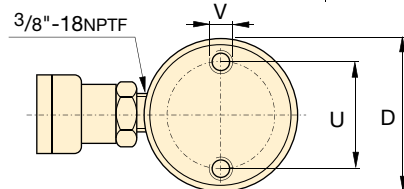
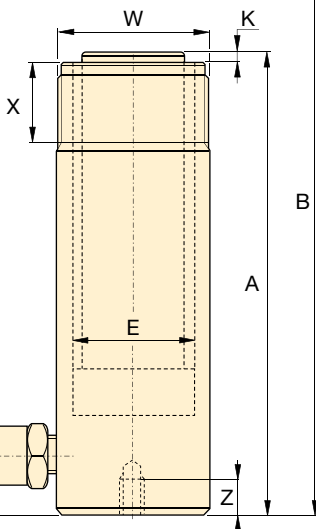
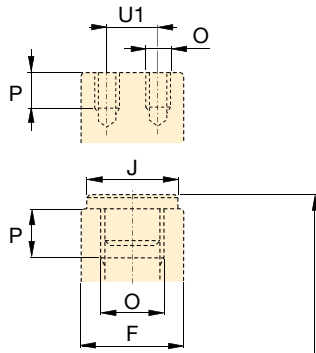
See the Enerpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

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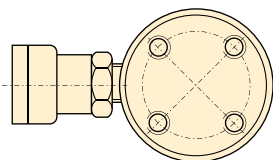


**RC-50**

**RC-101 only**  
(U1 = .75 inch)



**RC-51 to RC-5013 models**



**RC-1006 and RC-10010 models**

◀ For full features see page 6.

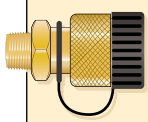
| Cylinder Capacity     | Stroke          | Model Number    | Cylinder Effective Area | Oil Capacity       | Collapsed Height | Extended Height | Outside Diameter |
|-----------------------|-----------------|-----------------|-------------------------|--------------------|------------------|-----------------|------------------|
| tons (maximum)        | (in)            |                 | (in <sup>2</sup> )      | (in <sup>3</sup> ) | A (in)           | B (in)          | D (in)           |
| <b>5</b><br>(4.9)     | .63             | <b>RC-50**</b>  | .99                     | .62                | 1.63             | 2.25            | 2.31             |
|                       | 1.00            | <b>RC-51</b>    | .99                     | .99                | 4.34             | 5.34            | 1.50             |
|                       | 3.00            | <b>RC-53</b>    | .99                     | 2.98               | 6.50             | 9.50            | 1.50             |
|                       | 5.00            | <b>RC-55*</b>   | .99                     | 4.97               | 8.50             | 13.50           | 1.50             |
|                       | 7.00            | <b>RC-57</b>    | .99                     | 6.96               | 10.75            | 17.75           | 1.50             |
| 9.13                  | <b>RC-59</b>    | .99             | 9.07                    | 12.75              | 21.88            | 1.50            |                  |
| <b>10</b><br>(11.2)   | 1.00            | <b>RC-101</b>   | 2.24                    | 2.24               | 3.53             | 4.53            | 2.25             |
|                       | 2.13            | <b>RC-102*</b>  | 2.24                    | 4.75               | 4.78             | 6.91            | 2.25             |
|                       | 4.13            | <b>RC-104</b>   | 2.24                    | 9.23               | 6.75             | 10.88           | 2.25             |
|                       | 6.13            | <b>RC-106*</b>  | 2.24                    | 13.70              | 9.75             | 15.88           | 2.25             |
|                       | 8.00            | <b>RC-108</b>   | 2.24                    | 17.89              | 11.75            | 19.75           | 2.25             |
|                       | 10.13           | <b>RC-1010*</b> | 2.24                    | 22.65              | 13.75            | 23.88           | 2.25             |
|                       | 12.00           | <b>RC-1012</b>  | 2.24                    | 26.84              | 15.75            | 27.75           | 2.25             |
| 14.00                 | <b>RC-1014</b>  | 2.24            | 31.31                   | 17.75              | 31.75            | 2.25            |                  |
| <b>15</b><br>(15.7)   | 1.00            | <b>RC-151</b>   | 3.14                    | 3.14               | 4.88             | 5.88            | 2.75             |
|                       | 2.00            | <b>RC-152</b>   | 3.14                    | 6.28               | 5.88             | 7.88            | 2.75             |
|                       | 4.00            | <b>RC-154*</b>  | 3.14                    | 12.57              | 7.88             | 11.88           | 2.75             |
|                       | 6.00            | <b>RC-156*</b>  | 3.14                    | 18.85              | 10.69            | 16.69           | 2.75             |
|                       | 8.00            | <b>RC-158</b>   | 3.14                    | 25.13              | 12.69            | 20.69           | 2.75             |
|                       | 10.00           | <b>RC-1510</b>  | 3.14                    | 31.42              | 14.69            | 24.69           | 2.75             |
|                       | 12.00           | <b>RC-1512</b>  | 3.14                    | 37.70              | 16.69            | 28.69           | 2.75             |
| 14.00                 | <b>RC-1514</b>  | 3.14            | 43.98                   | 18.69              | 32.69            | 2.75            |                  |
| <b>25</b><br>(25.8)   | 1.00            | <b>RC-251</b>   | 5.16                    | 5.16               | 5.50             | 6.50            | 3.38             |
|                       | 2.00            | <b>RC-252*</b>  | 5.16                    | 10.31              | 6.50             | 8.50            | 3.38             |
|                       | 4.00            | <b>RC-254*</b>  | 5.16                    | 20.63              | 8.50             | 12.50           | 3.38             |
|                       | 6.25            | <b>RC-256*</b>  | 5.16                    | 32.23              | 10.75            | 17.00           | 3.38             |
|                       | 8.25            | <b>RC-258</b>   | 5.16                    | 42.55              | 12.75            | 21.00           | 3.38             |
|                       | 10.25           | <b>RC-2510</b>  | 5.16                    | 52.86              | 14.75            | 25.00           | 3.38             |
|                       | 12.25           | <b>RC-2512</b>  | 5.16                    | 63.18              | 16.75            | 29.00           | 3.38             |
| 14.25                 | <b>RC-2514*</b> | 5.16            | 73.49                   | 18.75              | 33.00            | 3.38            |                  |
| <b>30</b> (32.4)      | 8.25            | <b>RC-308</b>   | 6.49                    | 53.56              | 15.25            | 23.50           | 4.00             |
| <b>50</b><br>(55.2)   | 2.00            | <b>RC-502</b>   | 11.04                   | 22.09              | 6.94             | 8.94            | 5.00             |
|                       | 4.00            | <b>RC-504</b>   | 11.04                   | 44.18              | 8.94             | 12.94           | 5.00             |
|                       | 6.25            | <b>RC-506*</b>  | 11.04                   | 69.03              | 11.13            | 17.38           | 5.00             |
| <b>75</b><br>(79.5)   | 13.25           | <b>RC-5013</b>  | 11.04                   | 146.34             | 18.13            | 31.38           | 5.00             |
|                       | 6.13            | <b>RC-756</b>   | 15.90                   | 97.41              | 11.25            | 17.38           | 5.75             |
| <b>100</b><br>(103.1) | 13.13           | <b>RC-7513</b>  | 15.90                   | 208.74             | 19.38            | 32.50           | 5.75             |
|                       | 6.63            | <b>RC-1006</b>  | 20.63                   | 136.67             | 14.06            | 20.69           | 7.00             |
|                       | 10.25           | <b>RC-10010</b> | 20.63                   | 211.45             | 17.69            | 27.94           | 7.00             |

\* Available as a set. See page 54.

\*\* RC-50 cylinder has non-removable grooved saddle and no collar thread.

\*\*\* D1 = 1.63 inch, L = .81 inch, M = 1.00 inch.

# Single-Acting, General Purpose Cylinders



**Couplers Included!**  
CR-400 couplers included on all models. Fits all HC-Series hoses.

Capacity:  
**5-100 tons**

Stroke:  
**.63-14.25 inches**

Maximum Operating Pressure:  
**10,000 psi**

**RC Series**



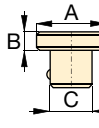
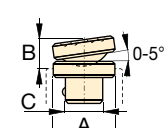
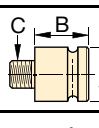
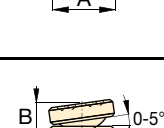
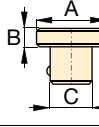
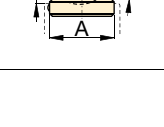
| Cylinder Bore Diam. | Plunger Diam. | Base to Adv. Port | Saddle Diam. | Saddle Protrusion from Plngr. | Plunger Internal Thread | Plunger Thread Length | Base Mounting Holes |               |                    | Collar Thread | Collar Thread Length | Weight (lbs) | Model Number |
|---------------------|---------------|-------------------|--------------|-------------------------------|-------------------------|-----------------------|---------------------|---------------|--------------------|---------------|----------------------|--------------|--------------|
|                     |               |                   |              |                               |                         |                       | Bolt Circle U (in)  | Thread V (in) | Thrd. Depth Z (in) |               |                      |              |              |
| E (in)              | F (in)        | H (in)            | J (in)       | K (in)                        | O (in)                  | P (in)                | U (in)              | V (in)        | Z (in)             | W (in)        | X (in)               |              |              |
| 1.13                | 1.00          | .75               | **           | **                            | **                      | **                    | 1.13                | .22           | —                  | —             | —                    | 2.2          | RC-50**      |
| 1.13                | 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .56                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 2.3          | RC-51        |
| 1.13                | 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .56                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 3.3          | RC-53        |
| 1.13                | 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .56                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 4.1          | RC-55*       |
| 1.13                | 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .63                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 5.3          | RC-57        |
| 1.13                | 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .63                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 6.1          | RC-59        |
| 1.69                | 1.50          | .75               | —            | —                             | #10-24UN                | .25                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.06                 | 4.0          | RC-101       |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.13                 | 5.1          | RC-102*      |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.06                 | 7.2          | RC-104       |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.13                 | 9.8          | RC-106*      |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.06                 | 12           | RC-108       |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.13                 | 14           | RC-1010*     |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.06                 | 15           | RC-1012      |
| 1.69                | 1.50          | .75               | 1.38         | .25                           | 1"- 8                   | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.06                 | 18           | RC-1014      |
| 2.00                | 1.63          | .75               | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 7.2          | RC-151       |
| 2.00                | 1.63          | .75               | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 9            | RC-152       |
| 2.00                | 1.63          | .75               | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 11           | RC-154*      |
| 2.00                | 1.63          | 1.00              | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 15           | RC-156*      |
| 2.00                | 1.63          | 1.00              | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 18           | RC-158       |
| 2.00                | 1.63          | 1.00              | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 21           | RC-1510      |
| 2.00                | 1.63          | 1.00              | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 24           | RC-1512      |
| 2.00                | 1.63          | 1.00              | 1.50         | .38                           | 1"- 8                   | 1.00                  | 1.88                | 3/8"-16UN     | .50                | 2 3/4"-16     | 1.19                 | 26           | RC-1514      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"-16               | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 13           | RC-251       |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 14           | RC-252*      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 18           | RC-254*      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 22           | RC-256*      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 27           | RC-258       |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 31           | RC-2510      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 36           | RC-2512      |
| 2.56                | 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 39           | RC-2514*     |
| 2.88                | 2.25          | 2.25              | 2.00         | .41                           | 1 1/2"- 16              | 1.00                  | —                   | —             | —                  | 3 5/16"-12    | 1.94                 | 40           | RC-308       |
| 3.75                | 3.13          | 1.31              | 2.81         | .11                           | —                       | —                     | 3.75                | 1/2"-13UN     | .75                | 5"-12         | 2.19                 | 33           | RC-502       |
| 3.75                | 3.13          | 1.31              | 2.81         | .11                           | —                       | —                     | 3.75                | 1/2"-13UN     | .75                | 5"-12         | 2.19                 | 42           | RC-504       |
| 3.75                | 3.13          | 1.38              | 2.81         | .11                           | —                       | —                     | 3.75                | 1/2"-13UN     | .75                | 5"-12         | 2.19                 | 51           | RC-506*      |
| 3.75                | 3.13          | 1.38              | 2.81         | .11                           | —                       | —                     | 3.75                | 1/2"-13UN     | .75                | 5"-12         | 2.19                 | 83           | RC-5013      |
| 4.50                | 3.75          | 1.19              | 2.81         | .23                           | —                       | —                     | —                   | —             | —                  | 5 3/4"-12     | 1.75                 | 65           | RC-756       |
| 4.50                | 3.75          | 1.19              | 2.81         | .23                           | —                       | —                     | —                   | —             | —                  | 5 3/4"-12     | 1.75                 | 130          | RC-7513      |
| 5.13                | 4.13          | 1.63              | 2.81         | .11                           | —                       | —                     | 5.50                | 3/4"-10UN     | 1.00               | 6 7/8"-12     | 1.75                 | 130          | RC-1006      |
| 5.13                | 4.13          | 1.63              | 2.81         | .11                           | —                       | —                     | 5.50                | 3/4"-10UN     | 1.00               | 6 7/8"-12     | 1.75                 | 160          | RC-10010     |

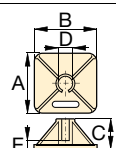
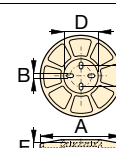
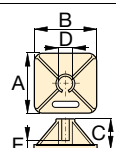
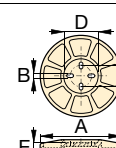
## ▼ SELECTION CHART

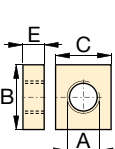
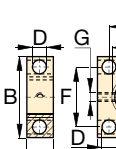
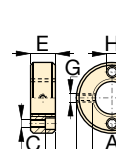
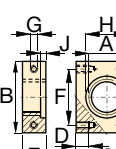
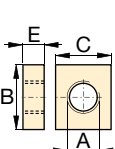
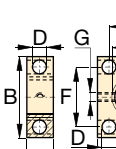
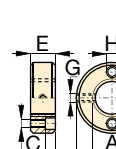
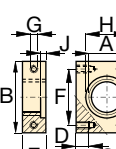
| For Use with Cylinder Capacity (tons) | Saddles                                   |                       |                      | Base Plate | Mounting Block  | Clevis Eyes         |                      |
|---------------------------------------|---|-----------------------|----------------------|------------|---|---------------------|----------------------|
|                                       | Flat                                      | Grooved <sup>1)</sup> | Tilt                 |            |   | Base <sup>4)</sup>  | Plunger              |
| 5                                     | A-53F <sup>2)</sup>                       | A-53G <sup>2)</sup>   | -                    | -          | RB-5 <sup>2)</sup> ,<br>AW-51 <sup>2)</sup> , AW-53 <sup>2)</sup> | REB-5 <sup>2)</sup> | REP-5 <sup>2)</sup>  |
| 10                                    | A-12 <sup>3)</sup> , A-102F <sup>3)</sup> | A-102G <sup>3)</sup>  | CAT-10 <sup>3)</sup> | JBI-10     | RB-10, AW-102   | REB-10              | REP-10 <sup>3)</sup> |
| 15                                    | -   | A-152G                | CAT-10               | -          | RB-15   | REB-15              | REP-10               |
| 25                                    | A-29                                      | A-252G                | CAT-50               | JBI-25     | RB-25   | REB-25              | REP-25               |
| 30                                    | A-29                                      | A-252G                | CAT-50               | -          | RB-25   | -                   | REP-25               |
| 50                                    | -   | -                     | CAT-100              | JBI-50     | -   | -                   | -                    |
| 75                                    | -   | -                     | CAT-100              | -          | -   | -                   | -                    |
| 100                                   | -   | -                     | CAT-100              | -          | -   | -                   | -                    |

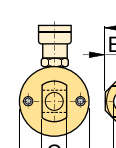
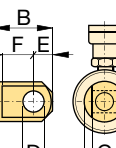
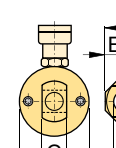
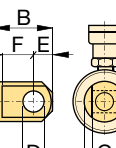
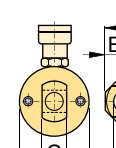
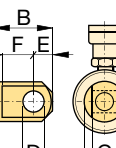
<sup>1)</sup> Standard on 5-30 ton RC-cylinders   <sup>2)</sup> Except RC-50   <sup>3)</sup> Except RC-101   <sup>4)</sup> Mounting screws are included.

## ▼ DIMENSION CHARTS

| Model Number   | Saddle Dimensions (in) |      |             |    | Model Number | Tilt Saddle Dimensions (in) |     |      |    |
|----------------|------------------------|------|-------------|---|--------------|-----------------------------|-----|------|---|
|                | A                      | B    | C           |   |              | A                           | B   | C    |   |
| <b>Flat</b>    |                        |      |             |   | <b>Tilt</b>  |                             |     |      |   |
| A-53F          | 1.00                   | .25  | .68         |   | CAT-10       | 1.38                        | .79 | .88  |   |
| A-102F         | 1.38                   | .24  | .88         |   | CAT-50       | 1.97                        | .83 | 1.40 |   |
| A-12           | 2.00                   | 1.88 | 1"-8UNC     |   |              |                             |     |      |   |
| A-29           | 2.00                   | 1.88 | 1 1/2"-16UN |   |              |                             |     |      |   |
| <b>Grooved</b> |                        |      |             |   | <b>Tilt</b>  |                             |     |      |   |
| A-53G          | 1.00                   | .25  | .68         |  | CAT-100      | 2.80                        | .98 | -    |  |
| A-102G         | 1.38                   | .24  | .88         |   |              |                             |     |      |   |
| A-152G         | 1.50                   | .37  | .88         |   |              |                             |     |      |   |
| A-252G         | 1.97                   | .37  | 1.40        |   |              |                             |     |      |   |

| Model Number | Base Plate Dimensions (in) |       |      |      |      |  |  |
|--------------|----------------------------|-------|------|------|------|---|---|
|              | A                          | B     | C    | D    | E    |   |   |
| JBI-10       | 9.00                       | 9.00  | 5.34 | 2.29 | .81  |  |  |
| JBI-25       | 11.00                      | 11.00 | 5.53 | 3.41 | 1.03 |   |   |
| JBI-50       | 12.00                      | .60   | 3.75 | 5.19 | 1.25 |   |   |

| Model Number | Mounting Block Dimensions (in) |      |      |     |      |      |          |      |  |  |  |  |
|--------------|--------------------------------|------|------|-----|------|------|----------|------|---|--|---|---|
|              | A                              | B    | C    | D   | E    | F    | G        | H    |   |  |   |   |
| RB-5         | 1 1/2"-16                      | 3.50 | 3.00 | -   | 1.00 | -    | -        | -    |  |  |  |  |
| AW-51        | 1 1/2"-16                      | 2.76 | 2.36 | .43 | .98  | 2.13 | 1/4"-20  | 1.62 |   |  |   |   |
| AW-53        | 1 1/2"-16                      | 2.87 | .28  | .31 | .75  | 2.25 | 1/4"-20  | .41  |   |  |   |   |
| RB-10        | 2 1/4"-14                      | 4.50 | 3.50 | -   | 1.00 | -    | -        | -    |   |  |   |   |
| AW-102       | 2 1/4"-14                      | 3.94 | 3.25 | .63 | 1.18 | 3.00 | 7/16"-20 | 2.31 |   |  |   |   |
| RB-15        | 2 3/4"-16                      | 4.00 | 4.50 | -   | 1.50 | -    | -        | -    |   |  |   |   |
| RB-25        | 3 5/16"-12                     | 5.00 | 6.50 | -   | 2.00 | -    | -        | -    |   |  |   |   |

| Type               | Model Number | Clevis Eye Dimensions (in) |      |      |      |      |      | Pin to Pin* (in) |  |  |
|--------------------|--------------|----------------------------|------|------|------|------|------|------------------|--|---|
|                    |              | A                          | B    | C    | D    | E    | F    |                  |  |   |
| Base <sup>4)</sup> | REB-5        | 1.75                       | 1.88 | .56  | .63  | .63  | 1.00 | 2.37             |  |  |
|                    | REB-10       | 2.50                       | 2.63 | 1.00 | .88  | 1.00 | 1.38 | 3.07             |  |   |
|                    | REB-15       | 3.00                       | 2.63 | 1.00 | .88  | 1.00 | 1.38 | 3.07             |  |   |
|                    | REB-25       | 3.75                       | 3.13 | 1.50 | 1.25 | 1.25 | 1.63 | 3.45             |  |   |
| Plunger            | REP-5        | 1.13                       | 1.62 | .56  | .63  | .63  | .75  | -                |  |  |
|                    | REP-10       | 1.69                       | 2.43 | 1.00 | .88  | 1.00 | 1.13 | -                |  |   |
|                    | REP-25       | 2.25                       | 2.93 | 1.50 | 1.25 | 1.25 | 1.38 | -                |  |   |

\* Pin to Pin- REB and REP Clevises fitted. Add cylinder collapsed height.

<sup>4)</sup> Mounting screws are included.

# The Enerpac Lightweight Aluminum Cylinders

▼ Shown: RAC, RACL, RACH, and RAR



- **Lightweight, easy to carry and position to allow a higher cylinder capacity-to-weight-ratio**
- **Non-corrosive by design, aluminum has always been a good material for use in many caustic environments**
- **Composite bearings on all moving surfaces guarantee NO metal-to-metal contact, to resist side loads and increase cylinder life**



- 1. Removable Hardened Saddle** protects plunger from being damaged by abrasive surface contact.
- 2. Stop Ring** on all models absorbs eccentric loading and prevents plunger over-extension.
- 3. Composite Bearing** material to prevent metal-to-metal contact, reducing side-load issues and increasing life.
- 4. Hard-coated Plunger and Base** resist wear and prevent galling.
- 5. 7075-T6 Aluminum Alloy Components** for maximum strength and minimum weight.
- 6. Plunger Return Spring** on all single-acting models for prompt cylinder return.
- 7. Standard Steel Base Plate** protects cylinder base from abrasive surfaces.

## RA Series

Capacity:

**20-150 tons**

Stroke:

**1.97-7.87 inches**

Maximum Operating Pressure:

**10,000 psi**



**Think Safety**

**Manufacturer's rating of load and stroke are maximum safe limits.**

**Good practice encourages using only 80% of these ratings!**

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### RAC-Series, Single-Acting Cylinders

The lightweight general purpose spring return aluminum cylinders.

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### RACL-Series, Lock Nut Cylinders

The lightweight spring return aluminum cylinders for mechanical load holding.

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### RACH-Series, Hollow Plunger Cylinders

For both push and pull forces with a single-acting cylinders.

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### RAR-Series, Double-Acting Cylinders

The lightweight aluminum cylinders for lifting and lowering.

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▼ Shown from left to right: RAC-508, RAC-1506, RAC-304, and RAC-206



- Composite bearings prevent metal-to-metal contact, increasing cylinder life and resistance to side-loads of up to 10%
- Hard coat finish on all surfaces resists damage and extends cylinder life
- Handles included on all models
- Steel baseplate and saddle for protection against load-induced damage
- Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity
- High-strength return spring for rapid cylinder retraction
- CR-400 coupler and dustcap included on all models
- All cylinders meet ASME B-30.1 and ISO 10100 standards



◀ Enerpac lightweight aluminum RAC-506 cylinders are ideal for wet environments such as this tunnel under the river (Holland High-Speed Train Line).

## Lightweight for Maximum Portability



### Saddles

All RAC cylinders are equipped with bolt-on removable saddles of hardened steel.



### Lightweight Hand Pumps

Enerpac hand pumps **P-392** or **P-802** make the optimal lightweight set.

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### Aluminum Lock Nut Cylinders

When positive mechanical load holding is required, the lightweight RACL-Series Aluminum Lock Nut cylinders are the ideal choice.

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| Cylinder Capacity<br>(tons)<br>[maximum] | Stroke*<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) |
|--|-----------------|--------------|---|
| 20<br>[24.1]                             | 1.97            | RAC-202      | 4.83  |
|  | 3.94            | RAC-204      | 4.83  |
|  | 5.91            | RAC-206      | 4.83  |
| 30<br>[34.2]                             | 1.97            | RAC-302      | 6.85  |
|  | 3.94            | RAC-304      | 6.85  |
|  | 5.91            | RAC-306      | 6.85  |
| 50<br>[54.9]                             | 1.97            | RAC-502      | 10.99   |
|  | 3.94            | RAC-504      | 10.99   |
|  | 5.91            | RAC-506      | 10.99   |
| 100<br>[110.9]                           | 3.94            | RAC-1004     | 22.19   |
|  | 5.91            | RAC-1006     | 22.19   |
|  | 7.87            | RAC-1008     | 22.19   |
| 150 [175.9]                              | 5.91            | RAC-1506     | 35.18   |

\* Custom strokes available.

# Single-Acting, Spring Return Cylinders



## Aluminum vs. Steel

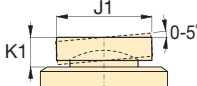
Aluminum cylinders, while offering the most lightweight solution for many lifting, stressing and lowering applications, also have some unique limitations due to material properties.

Aluminum differs from steel in that it has a lower finite fatigue life. This means aluminum cylinders should NOT be used in high-cycle applications such as production.

The Enerpac line of aluminum cylinders are designed to provide 5,000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

### Optional Bolt Tilt Saddle Dimensions (in)

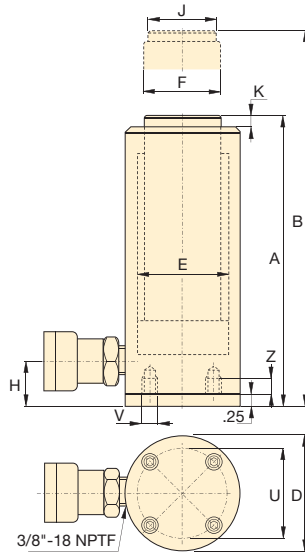
| Cylinder Model / Capacity (ton) | Model Number | Saddle Diameter J1 | Saddle Protrusion from Base K1 |
|---------------------------------|--------------|--------------------|--------------------------------|
| RAC-50                          | CATG-50      | 1.95               | 1.02                           |
| RAC-100                         | CATG-150     | 3.57               | 1.30                           |
| RAC-150                         | CATG-200     | 4.64               | 1.44                           |



### Steel Base Plate Mounting Holes

| Cylinder Model / Capacity (ton) | Bolt Circle U (in) | Thread V (mm) | Thread Depth <sup>1)</sup> Z (in) |
|---------------------------------|--------------------|---------------|-----------------------------------|
| RAC-20                          | 2.76               | M6            | .47                               |
| RAC-30                          | 3.15               | M6            | .47                               |
| RAC-50                          | 4.33               | M6            | .47                               |
| RAC-100                         | 5.90               | M10           | .47                               |
| RAC-150                         | 7.87               | M10           | .47                               |

<sup>1)</sup> Including Base Plate Height of .25 inches.  
Four (4) base plate bolts: M6



## RAC Series



Capacity:

**20-150 tons**

Stroke:

**1.97-7.87 inches**

Maximum Operating Pressure:

**10,000 psi**



### Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.

| Oil Capacity (in <sup>3</sup> ) | Collapsed Height A (in) | Extended Height B (in) | Outside Diameter D (in) | Cylinder Bore Diameter E (in) | Plunger Diameter F (in) | Base to Advance Port H (in) | Saddle Diameter J (in) | Saddle Protrusion from Plunger K (in) | Weight (lbs) | Model Number |
|---------------------------------|-------------------------|------------------------|-------------------------|-------------------------------|-------------------------|-----------------------------|------------------------|---------------------------------------|--------------|--------------|
| 9.51                            | 6.85                    | 8.82                   | 3.35                    | 2.48                          | 1.97                    | 1.07                        | 1.57                   | .12                                   | 7.9          | RAC-202      |
| 19.02                           | 8.82                    | 12.76                  | 3.35                    | 2.48                          | 1.97                    | 1.07                        | 1.57                   | .12                                   | 9.0          | RAC-204      |
| 28.52                           | 10.79                   | 16.69                  | 3.35                    | 2.48                          | 1.97                    | 1.07                        | 1.57                   | .12                                   | 10.1         | RAC-206      |
| 13.48                           | 7.13                    | 9.09                   | 3.94                    | 2.95                          | 2.36                    | 1.31                        | 1.57                   | .12                                   | 9.9          | RAC-302      |
| 26.97                           | 9.09                    | 13.03                  | 3.94                    | 2.95                          | 2.36                    | 1.31                        | 1.57                   | .12                                   | 11.5         | RAC-304      |
| 40.45                           | 11.06                   | 16.97                  | 3.94                    | 2.95                          | 2.36                    | 1.31                        | 1.57                   | .12                                   | 13.0         | RAC-306      |
| 21.63                           | 7.32                    | 9.29                   | 5.12                    | 3.74                          | 3.15                    | 1.19                        | 1.97                   | .12                                   | 18.7         | RAC-502      |
| 43.27                           | 9.29                    | 13.23                  | 5.12                    | 3.74                          | 3.15                    | 1.19                        | 1.97                   | .12                                   | 21.6         | RAC-504      |
| 64.90                           | 11.26                   | 17.17                  | 5.12                    | 3.74                          | 3.15                    | 1.19                        | 1.97                   | .12                                   | 24.5         | RAC-506      |
| 87.36                           | 10.67                   | 14.61                  | 7.09                    | 5.31                          | 4.33                    | 1.82                        | 3.70                   | .12                                   | 43.2         | RAC-1004     |
| 131.04                          | 12.64                   | 18.54                  | 7.09                    | 5.31                          | 4.33                    | 1.82                        | 3.70                   | .12                                   | 48.3         | RAC-1006     |
| 174.72                          | 14.61                   | 22.48                  | 7.09                    | 5.31                          | 4.33                    | 1.82                        | 3.70                   | .12                                   | 53.4         | RAC-1008     |
| 207.76                          | 13.49                   | 19.40                  | 9.06                    | 6.69                          | 5.51                    | 2.02                        | 4.45                   | .12                                   | 73.4         | RAC-1506     |

▼ Shown from left to right: RACL-1006, RACL-504 and RACL-506



- Aluminum Lock Nut provides mechanical load holding for extended periods
- Hardened steel stop ring increases cylinder life and resistance to side-loads of up to 5%
- Hard coat finish on all surfaces resists damage and extends cylinder life
- Composite bearings increase cylinder life and side load resistance
- Handles included on all models
- Steel base plate and saddle for protection against load-induced damage
- Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity
- High-strength return spring for rapid cylinder retraction
- CR-400 coupler and dustcap included on all models
- All cylinders meet ASME B-30.1 and ISO 10100 standards



◀ The portable Lock Nut cylinder RACL-1506 used for extended load support during epoxy injection for bridge reinforcement.

## To Secure Loads Mechanically



### Saddles

All RACL cylinders are equipped with bolt-on removable saddles of hardened steel. For tilt saddles see next page.

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### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment.

Refer to the System Components section for a full range of gauges.

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| Cylinder Capacity | Stroke* | Model Number | Cylinder Effective Area |
|-------------------|---------|--------------|-------------------------|
| ton (maximum)     | (in)    |              | (in <sup>2</sup> )      |
| 30 (34.2)         | 1.97    | RACL-302     | 6.85                    |
|                   | 3.94    | RACL-304     | 6.85                    |
|                   | 5.91    | RACL-306     | 6.85                    |
| 50 (54.9)         | 1.97    | RACL-502     | 10.99                   |
|                   | 3.94    | RACL-504     | 10.99                   |
|                   | 5.91    | RACL-506     | 10.99                   |
| 100 (110.9)       | 1.97    | RACL-1002    | 22.19                   |
|                   | 3.94    | RACL-1004    | 22.19                   |
|                   | 5.91    | RACL-1006    | 22.19                   |
| 150 (175.9)       | 1.97    | RACL-1502    | 35.18                   |
|                   | 3.94    | RACL-1504    | 35.18                   |
|                   | 5.91    | RACL-1506    | 35.18                   |

\* Custom strokes available.

# Single-Acting, Spring Return, Lock Nut Cylinders



## Aluminum vs. Steel

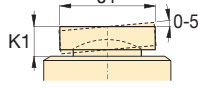
Aluminum cylinders, while offering the most lightweight solution for many lifting, stressing and lowering applications, also have some unique limitations due to material properties.

Aluminum differs from steel in that it has a lower finite fatigue life. This means aluminum cylinders should NOT be used in high-cycle applications such as production.

The Enerpac line of aluminum cylinders are designed to provide 5,000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

### Optional Bolt On Tilt Saddle Dimensions (in)

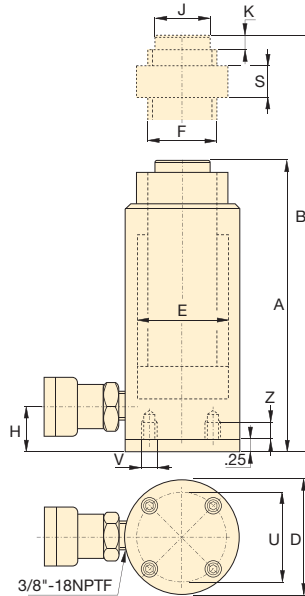
| Cylinder Model / Capacity (ton) | Model Number | Saddle Diameter J1 | Saddle Protrusion from Base K1 |
|---------------------------------|--------------|--------------------|--------------------------------|
| RACL-50                         | CATG-50      | 1.95               | 1.02                           |
| RACL-100                        | CATG-150     | 3.57               | 1.30                           |
| RACL-150                        | CATG-200     | 4.64               | 1.44                           |



### Steel Base Plate Mounting Holes

| Cylinder Model / Capacity (ton) | Bolt Circle U (in) | Thread V (mm) | Thread Depth <sup>1)</sup> Z (in) |
|---------------------------------|--------------------|---------------|-----------------------------------|
| RACL-30                         | 3.15               | M6            | .24                               |
| RACL-50                         | 4.33               | M6            | .47                               |
| RACL-100                        | 5.90               | M10           | .47                               |
| RACL-150                        | 7.87               | M10           | .47                               |

<sup>1)</sup> Including Base Plate Height of .25 inches. Four (4) base plate bolts: M6



## RACL Series



Capacity:  
**30-150 tons**

Stroke:  
**1.97-5.91 inches**

Maximum Operating Pressure:  
**10,000 psi**



### Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.



### Lifting an Unbalanced Load

When lifting an unbalanced load Enerpac Synchronous Lift Systems can be the solution with multiple lift point capabilities from 4 to 64 points.

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| Oil Capacity (in <sup>3</sup> ) | Collapsed Height A (in) | Extended Height B (in) | Outside Diameter D (in) | Cylinder Bore Diameter E (in) | Plunger Diameter (Threaded) F (in) | Base to Advance Port H (in) | Saddle Diameter J (in) | Saddle Protrusion from Plunger K (in) | Lock Nut Height S (in) | Weight (lbs) | Model Number |
|---------------------------------|-------------------------|------------------------|-------------------------|-------------------------------|------------------------------------|-----------------------------|------------------------|---------------------------------------|------------------------|--------------|--------------|
| 13.48                           | 9.10                    | 11.07                  | 3.94                    | 2.95                          | 2.36                               | 1.31                        | 1.58                   | .12                                   | 1.97                   | 11.9         | RACL-302     |
| 26.97                           | 11.07                   | 15.01                  | 3.94                    | 2.95                          | 2.36                               | 1.31                        | 1.58                   | .12                                   | 1.97                   | 13.4         | RACL-304     |
| 40.45                           | 13.04                   | 18.95                  | 3.94                    | 2.95                          | 2.36                               | 1.31                        | 1.58                   | .12                                   | 1.97                   | 14.9         | RACL-306     |
| 21.63                           | 9.29                    | 11.26                  | 5.12                    | 3.74                          | 3.15                               | 1.19                        | 1.97                   | .12                                   | 1.97                   | 20.5         | RACL-502     |
| 43.27                           | 11.26                   | 15.20                  | 5.12                    | 3.74                          | 3.15                               | 1.19                        | 1.97                   | .12                                   | 1.97                   | 23.4         | RACL-504     |
| 64.90                           | 13.23                   | 19.13                  | 5.12                    | 3.74                          | 3.15                               | 1.19                        | 1.97                   | .12                                   | 1.97                   | 26.2         | RACL-506     |
| 43.68                           | 11.65                   | 13.62                  | 7.09                    | 5.31                          | 4.33                               | 1.82                        | 3.70                   | .12                                   | 2.95                   | 48.2         | RACL-1002    |
| 87.36                           | 13.62                   | 17.56                  | 7.09                    | 5.31                          | 4.33                               | 1.82                        | 3.70                   | .12                                   | 2.95                   | 53.3         | RACL-1004    |
| 131.14                          | 15.59                   | 21.50                  | 7.09                    | 5.31                          | 4.33                               | 1.82                        | 3.70                   | .12                                   | 2.95                   | 58.4         | RACL-1006    |
| 69.25                           | 12.72                   | 14.69                  | 9.06                    | 6.69                          | 5.51                               | 2.02                        | 4.45                   | .12                                   | 3.15                   | 71.0         | RACL-1502    |
| 138.61                          | 14.69                   | 18.62                  | 9.06                    | 6.69                          | 5.51                               | 2.02                        | 4.45                   | .12                                   | 3.15                   | 79.8         | RACL-1504    |
| 207.91                          | 16.65                   | 22.56                  | 9.06                    | 6.69                          | 5.51                               | 2.02                        | 4.45                   | .12                                   | 3.15                   | 88.6         | RACL-1506    |



▼ Shown from left to right: RACH-1508, RACH-304 and RACH-208



- Hollow plunger design allows for both pull and push forces
- Composite bearings increase cylinder life and side load resistance
- Hard coat finish on all surfaces resists damage and extends cylinder life
- Handles included on all models
- Floating center tube increases seal life
- Steel baseplate and saddle for protection against load-induced damage
- Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity
- High-strength return spring for rapid cylinder retraction



◀ An RACH-306, powered by a P-392 hand pump, is used to extract corroded carriage pins from refuse collection vehicles.

## The Lightweight Solution for Tensioning and Testing



### Saddles

All RACH-cylinders are equipped with bolt-on removable hardened steel hollow saddles.



### Lightweight Hand Pumps

Enerpac hand pumps P-392 or P-802 make the optimal lightweight set.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment.

Refer to the System Components section for a full range of gauges.

Page: 113



### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: 114

| Cylinder Capacity | Stroke* | Model Number     | Cylinder Effective Area |
|-------------------|---------|------------------|-------------------------|
| ton<br>[maximum]  | (in)    |                  | (in <sup>2</sup> )      |
| 20 [25.3]         | 1.97    | <b>RACH-202</b>  | 5.07                    |
|                   | 5.91    | <b>RACH-206</b>  | 5.07                    |
| 30 [39.6]         | 1.97    | <b>RACH-302</b>  | 7.92                    |
|                   | 5.91    | <b>RACH-306</b>  | 7.92                    |
| 60 [65.6]         | 3.94    | <b>RACH-604</b>  | 13.13                   |
|                   | 5.91    | <b>RACH-606</b>  | 13.13                   |
| 100 [127.5]       | 5.91    | <b>RACH-1006</b> | 25.51                   |

\* Custom strokes available.

# Single-Acting, Spring Return, Hollow Plunger Cylinders



## Aluminum vs. Steel

Aluminum cylinders, while offering the most lightweight solution also have some unique limitations due to material properties. It differs from steel in that it has a lower finite fatigue life.

Aluminum cylinders should NOT be used in high-cycle applications such as production.

These cylinders are designed to provide 5000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

## RACH Series



Capacity:  
**20-100 tons**

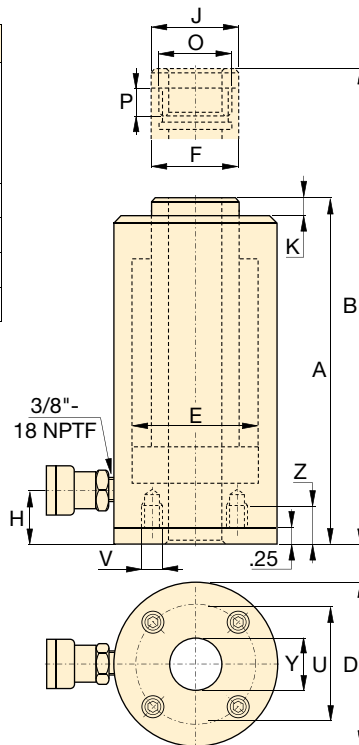
Stroke:  
**1.97-5.91 inches**

Center Hole Diameter:  
**1.06-3.11 inches**

Maximum Operating Pressure:  
**10,000 psi**

| Steel Base Plate Mounting Holes |                    |               |                                   |
|---------------------------------|--------------------|---------------|-----------------------------------|
| Cylinder Model / Capacity (ton) | Bolt Circle U (in) | Thread V (mm) | Thread Depth <sup>1)</sup> Z (in) |
| RACH-20                         | 3.15               | M6            | .47                               |
| RACH-30                         | 4.33               | M6            | .47                               |
| RACH-60                         | 6.29               | M6            | .47                               |
| RACH-100                        | 9.05               | M6            | .47                               |

<sup>1)</sup> Including Base Plate Height of .25 inches.  
Four (4) baseplate bolts: M6



### Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.



### Standard Features

- CR-400 coupler and dust cap
- All cylinders meet ASME B-30.1 and ISO 10100 standards.

| Oil Capacity (in <sup>3</sup> ) | Collapsed Height A (in) | Extended Height B (in) | Outside Diameter D (in) | Cylinder Bore Diameter E (in) | Plunger Diameter F (in) | Base to Advance Port H (in) | Saddle Diameter J (in) | Saddle Protrusion from Plunger K (in) | Center Hole Diameter Y (in) | Weight (lbs) | Model Number |
|---------------------------------|-------------------------|------------------------|-------------------------|-------------------------------|-------------------------|-----------------------------|------------------------|---------------------------------------|-----------------------------|--------------|--------------|
| 9.98                            | 7.41                    | 9.37                   | 3.94                    | 2.95                          | 2.17                    | 1.14                        | 2.17                   | .39                                   | 1.06                        | 11.5         | RACH-202     |
| 29.94                           | 12.41                   | 18.32                  | 3.94                    | 2.95                          | 2.17                    | 1.14                        | 2.17                   | .39                                   | 1.06                        | 15.7         | RACH-206     |
| 15.59                           | 8.20                    | 10.17                  | 5.12                    | 3.74                          | 2.76                    | 1.14                        | 2.76                   | .39                                   | 1.34                        | 17.6         | RACH-302     |
| 46.77                           | 13.12                   | 19.02                  | 5.12                    | 3.74                          | 2.76                    | 1.14                        | 2.76                   | .39                                   | 1.34                        | 24.7         | RACH-306     |
| 51.69                           | 12.41                   | 16.34                  | 7.09                    | 5.12                          | 3.94                    | 2.41                        | 3.94                   | .47                                   | 2.13                        | 43.0         | RACH-604     |
| 77.53                           | 14.97                   | 20.87                  | 7.09                    | 5.12                          | 3.94                    | 2.41                        | 3.94                   | .47                                   | 2.13                        | 50.3         | RACH-606     |
| 150.64                          | 15.39                   | 21.31                  | 9.84                    | 7.28                          | 5.71                    | 2.41                        | 5.71                   | .55                                   | 3.11                        | 101.9        | RACH-1006    |

▼ Shown from left to right: RAR-506, RAR-508, RAR-302



## The Lightweight Solution for Double-Acting Applications



### Saddles

All RAR-cylinders are equipped with bolt-on removable hardened steel saddles. For tilt

saddles see next page.

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### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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### Optimum Performance

Enerpac's range of ZU4 electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with RAR cylinders.

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- Double-acting for rapid retraction, regardless of hose lengths and system losses
- Composite bearings increase cylinder life and side load resistance
- Hard coat finish on all surfaces resists damage and extends cylinder life
- Handles included on all models
- Steel base plate and saddle for protection against load-induced damage
- Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity
- Built-in safety valve prevents accidental over-pressurization

▼ An RAR-506 was easy to position under a bulldozer for repair of frame member.



| Cylinder Capacity<br>(ton) | Stroke*<br>(in) | Model Number | Maximum Cylinder Capacity<br>(ton) |      | Cylinder Effective Area<br>(in <sup>2</sup> ) |       | Oil Capacity<br>(in <sup>3</sup> ) |        |
|----------------------------|-----------------|--------------|------------------------------------|------|---|-------|------------------------------------|--------|
|                            |                 |              | Push                               | Pull | Push  | Pull  | Push                               | Pull   |
| 50                         | 1.97            | RAR-502      | 55                                 | 21   | 10.99   | 4.14  | 21.63                              | 8.15   |
|                            | 3.94            | RAR-504      | 55                                 | 21   | 10.99   | 4.14  | 43.25                              | 16.30  |
|                            | 5.91            | RAR-506      | 55                                 | 21   | 10.99   | 4.14  | 64.88                              | 24.44  |
| 100                        | 3.94            | RAR-1004     | 111                                | 62   | 22.19   | 12.33 | 87.35                              | 48.53  |
|                            | 5.91            | RAR-1006     | 111                                | 62   | 22.19   | 12.33 | 131.02                             | 72.79  |
|                            | 7.87            | RAR-1008     | 111                                | 62   | 22.19   | 12.33 | 174.70                             | 97.05  |
| 150                        | 5.91            | RAR-1506     | 176                                | 102  | 35.18   | 20.45 | 207.77                             | 120.78 |

\* Custom strokes available.

# Double-Acting, Aluminum Cylinders



## Aluminum vs. Steel

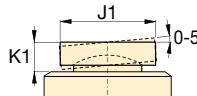
Aluminum cylinders, while offering the most lightweight solution also have some unique limitations due to material properties.

It differs from steel in that it has a lower finite fatigue life. Aluminum cylinders should NOT be used in high-cycle applications such as production.

These cylinders are designed to provide 5000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

### Optional Bolt On Tilt Saddle Dimensions (in)

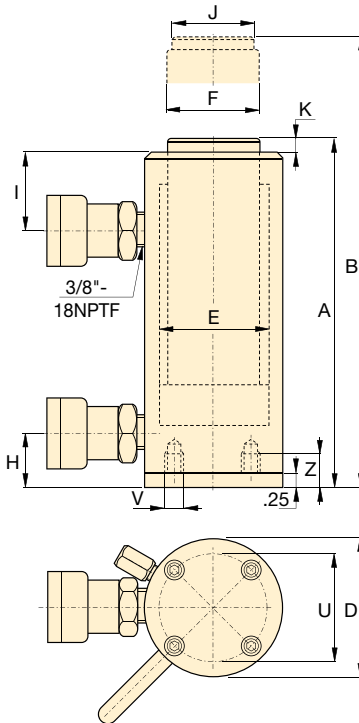
| Cylinder Model / Capacity (ton) | Model Number | Saddle Diameter J1 | Saddle Protrusion from Base K1 |
|---------------------------------|--------------|--------------------|--------------------------------|
| RAR-50                          | CATG-50      | 1.95               | 1.02                           |
| RAR-100                         | CATG-100     | 2.81               | 1.22                           |
| RAR-150                         | CATG-150     | 3.57               | 1.30                           |



### Steel Base Plate Mounting Holes

| Cylinder Model / Capacity (ton) | Bolt Circle U (in) | Thread V (mm) | Thread Depth <sup>1)</sup> Z (in) |
|---------------------------------|--------------------|---------------|-----------------------------------|
| RAR-50                          | 4.33               | M6            | .47                               |
| RAR-100                         | 6.50               | M6            | .47                               |
| RAR-150                         | 7.87               | M6            | .47                               |

<sup>1)</sup> Including Base Plate Height of .25 inch.  
Four (4) base plate bolts: M6



## RAR Series



Capacity:

**50-150 tons**

Stroke:

**1.97-7.87 inches**

Maximum Operating Pressure:

**10,000 psi**



### Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.



### Standard Features

- CR-400 coupler and dust cap
- All cylinders meet ASME B-30.1 and ISO 10100 standards.

| Collapsed Height | Extended Height | Outside Diameter | Cylinder Bore Diameter | Plunger Diameter | Base to Advance Port | Top to Retract Port | Saddle Diameter | Saddle Protrusion from Plunger | Weight (lbs) | Model Number |
|------------------|-----------------|------------------|------------------------|------------------|----------------------|---------------------|-----------------|--------------------------------|--------------|--------------|
| A (in)           | B (in)          | D (in)           | E (in)                 | F (in)           | H (in)               | I (in)              | J (in)          | K (in)                         |              |              |
| 7.91             | 9.88            | 5.71             | 3.74                   | 2.95             | 1.19                 | 2.20                | 1.97            | .12                            | 24.5         | RAR-502      |
| 9.88             | 13.82           | 5.71             | 3.74                   | 2.95             | 1.19                 | 2.20                | 1.97            | .12                            | 28.0         | RAR-504      |
| 11.85            | 17.76           | 5.71             | 3.74                   | 2.95             | 1.19                 | 2.20                | 1.97            | .12                            | 31.5         | RAR-506      |
| 11.85            | 15.79           | 7.28             | 5.31                   | 3.54             | 1.70                 | 3.15                | 2.95            | .12                            | 42.6         | RAR-1004     |
| 13.82            | 19.72           | 7.28             | 5.31                   | 3.54             | 1.70                 | 3.15                | 2.95            | .12                            | 48.9         | RAR-1006     |
| 15.79            | 23.66           | 7.28             | 5.31                   | 3.54             | 1.70                 | 3.15                | 2.95            | .12                            | 55.3         | RAR-1008     |
| 13.71            | 19.60           | 9.06             | 6.69                   | 4.33             | 1.50                 | 2.95                | 3.70            | .12                            | 73.2         | RAR-1506     |

▼ Shown from left to right: CLP-2002, CLP-5002



## The Shortest Power Lifter

- Flat design for use in confined areas
- Safety lock nut for mechanical load holding
- Single-acting load return
- Special bearing design resists sideload forces
- Overflow port functions as a stroke limiter
- CR-400 coupler and dust cap included on all models



### Saddles

All CLP-Series cylinders include integral tilt saddles with maximum tilt angles up to 5°.



### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the

System Components section for a full range of gauges.

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### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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▼ Only the extreme low height CLP-cylinder fits in this confined area to lift the construction. The V-82 needle valve is used to control cylinder speed during lifting and lowering.



| Cylinder Capacity<br>(ton)<br>[maximum] | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) |
|---|----------------|--------------|---|------------------------------------|
| 60 [67.1]                               | 1.97           | CLP-602      | 13.42   | 26.42                              |
| 100 [113.7]                             | 1.97           | CLP-1002     | 22.75   | 44.78                              |
| 160 [179.2]                             | 1.77           | CLP-1602     | 35.85   | 63.51                              |
| 200 [221.3]                             | 1.77           | CLP-2002     | 44.27   | 78.43                              |
| 250 [284.2]                             | 1.77           | CLP-2502     | 56.85   | 100.72                             |
| 400 [433.6]                             | 1.77           | CLP-4002     | 86.72   | 153.64                             |
| 500 [566.2]                             | 1.77           | CLP-5002     | 113.25  | 200.63                             |

# Single-Acting, Pancake Lock Nut Cylinders



## Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

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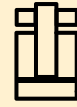


## Longer Stroke Lock Nut Cylinders

For lock nut applications that require longer stroke lengths, see **CLL-Series** cylinders.

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## CLP Series



Capacity:

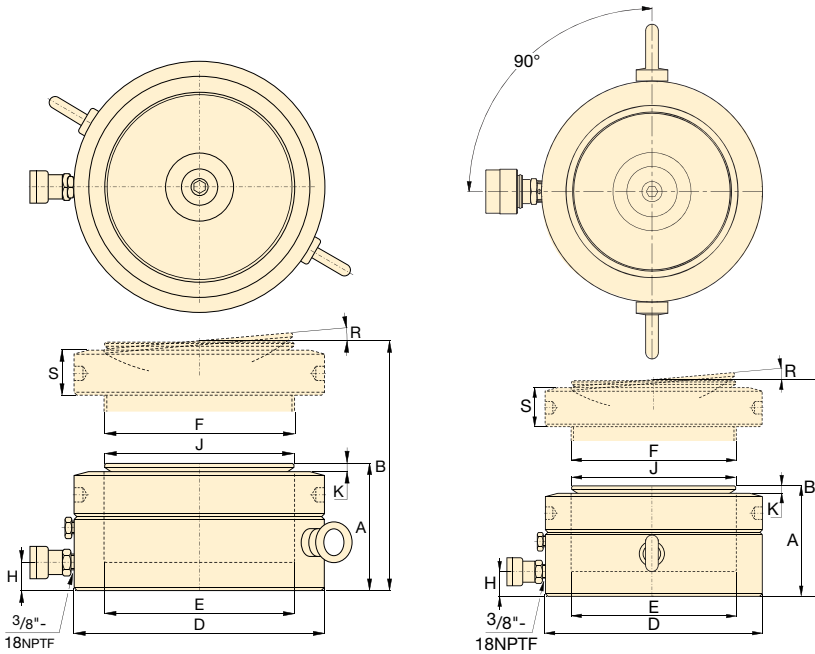
**60-500 tons**

Stroke:

**1.77-1.97 inches**

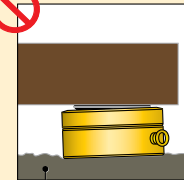
Maximum Operating Pressure:

**10,000 psi**

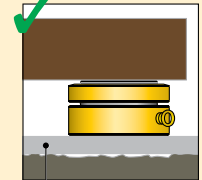


All CLP-series cylinders require a solid lifting surface for correct support.

Use of pancake cylinders on surfaces such as sand, mud or dirt may result in cylinder damage!



Rough soil



Flat lifting surface

For more safety instructions see our "Yellow Pages".

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| Collapsed Height | Extended Height | Outside Diameter | Cyl. Bore Diameter | Plunger Diameter | Base to Advance Port | Saddle Diameter | Saddle Protrusion from Plng. | Saddle Max. Tilt Angle | Lock Nut Height | Weight | Model Number |
|------------------|-----------------|------------------|--------------------|------------------|----------------------|-----------------|------------------------------|------------------------|-----------------|--------|--------------|
| A (in)           | B (in)          | D (in)           | E (in)             | F (mm)           | H (in)               | J (in)          | K (in)                       | R                      | S (in)          | (lbs)  |              |
| 4.92             | 6.89            | 5.51             | 4.13               | Tr 104 x 4       | .75                  | 3.78            | .24                          | 5°                     | 1.10            | 33     | CLP-602      |
| 5.39             | 7.36            | 6.89             | 5.38               | Tr 136 x 6       | .83                  | 4.96            | .31                          | 5°                     | 1.22            | 57     | CLP-1002     |
| 5.83             | 7.60            | 8.66             | 6.76               | Tr 171 x 6       | 1.06                 | 6.30            | .35                          | 5°                     | 1.57            | 97     | CLP-1602     |
| 6.10             | 7.87            | 9.65             | 7.51               | Tr 190 x 6       | 1.18                 | 7.09            | .39                          | 5°                     | 1.69            | 125    | CLP-2002     |
| 6.26             | 8.03            | 10.83            | 8.51               | Tr 216 x 6       | 1.26                 | 7.87            | .43                          | 5°                     | 1.73            | 163    | CLP-2502     |
| 7.01             | 8.78            | 13.78            | 10.51              | Tr 266 x 6       | 1.54                 | 9.84            | .43                          | 4°                     | 2.17            | 295    | CLP-4002     |
| 7.56             | 9.33            | 15.75            | 12.01              | Tr 305 x 6       | 1.89                 | 11.42           | .39                          | 3°                     | 2.44            | 416    | CLP-5002     |

▼ Shown from left to right: RSM-1000, RSM-300, RSM-50, RCS-1002, RCS-302



## Maximum Power to Height Ratio



### Saddles

All RCS-Series cylinders have plunger mounting holes for installation of tilt saddles. See table for selection and dimensional information.

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### Low Clearance Lifting

The LW-16 Lifting Wedge and SOH-Series Machine Lifts are the perfect choices for lifting loads that have low clearance.

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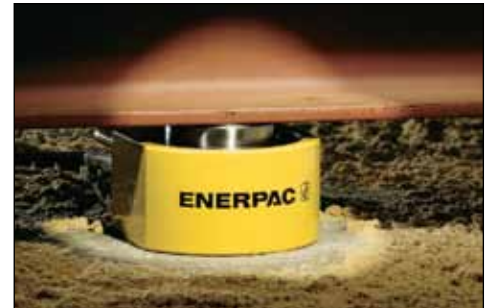
### RSM-Series, Flat-Jac® Cylinders

- Compact, flat design for use where other cylinders will not fit
- RSM-750, 1000 and 1500 have handles for easy carrying
- Mounting holes permit easy fixturing
- Baked enamel finish for increased corrosion resistance
- CR-400 coupler and dust cap included on all models\*
- Hard chrome plated high-quality steel plungers
- Grooved plunger ends require no saddle
- Single-acting spring return

### RCS-Series, Low Height Cylinders

- Lightweight, low profile design for use in confined spaces
- Baked enamel finish for increased corrosion resistance
- Plunger wiper reduces contamination, extending cylinder life
- CR-400 coupler and dust cap included on all models
- Grooved plunger end with threaded holes for mounting tilt saddles
- Integral handle on RCS-1002 for easy carrying
- Plated steel plungers
- Single-acting spring return

▼ Only a couple of inches are needed for an RSM-cylinder to lift this large steel construction.

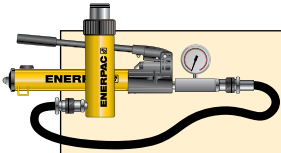


| Cylinder Capacity | Stroke | Model Number | Cyl. Effect. Area  | Oil Cap.           |
|-------------------|--------|--------------|--------------------|--------------------|
| (tons)<br>[max.]  | (in)   |              | (in <sup>2</sup> ) | (in <sup>3</sup> ) |
| 5 [4.9]           | .25    | RSM-50*      | .99                | .25                |
| 10 [11.2]         | .44    | RSM-100      | 2.24               | .98                |
| 20 [22.1]         | .44    | RSM-200      | 4.43               | 1.94               |
| 30 [32.4]         | .50    | RSM-300      | 6.49               | 3.25               |
| 50 [48.1]         | .63    | RSM-500      | 9.62               | 6.01               |
| 75 [79.5]         | .63    | RSM-750      | 15.90              | 9.94               |
| 100 [98.1]        | .63    | RSM-1000     | 19.63              | 12.27              |
| 150 [153.4]       | .63    | RSM-1500     | 30.68              | 19.17              |
| 10 [11.2]         | 1.50   | RCS-101**    | 2.24               | 3.35               |
| 20 [22.1]         | 1.75   | RCS-201**    | 4.43               | 7.75               |
| 30 [32.4]         | 2.44   | RCS-302**    | 6.49               | 15.82              |
| 50 [48.1]         | 2.38   | RCS-502**    | 9.62               | 22.85              |
| 100 [98.1]        | 2.25   | RCS-1002**   | 19.63              | 44.18              |

\* RSM-50 is fitted with an AR-400 coupler.

\*\* Available as a set. See note on next page.

# Single-Acting, Low Height Cylinders



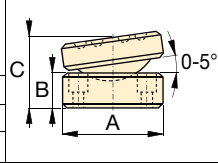
## Pump and Cylinder Sets

All cylinders marked with an \*\* are available as **sets** (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

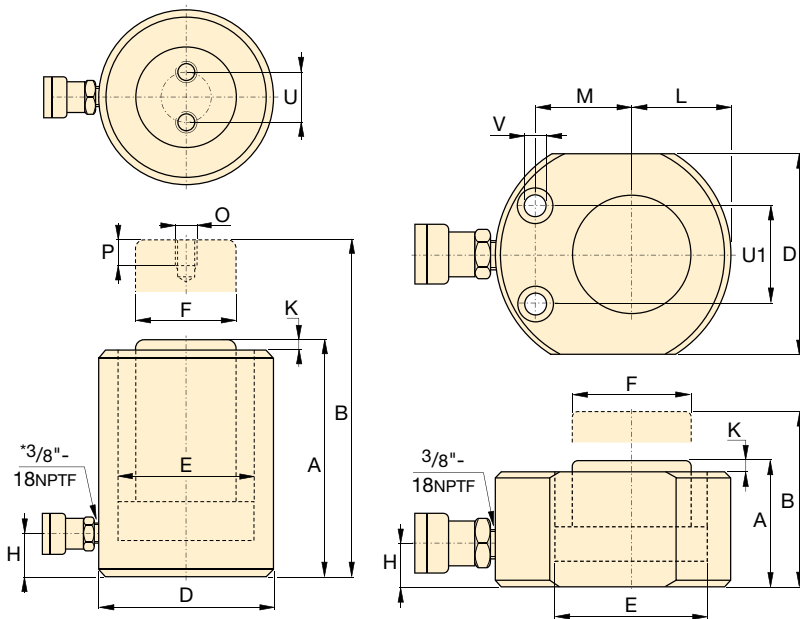
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### Optional Bolt On Tilt Saddle Dimensions (in)

| For cylinder model: | Model Number | A    | B   | C*   |
|---------------------|--------------|------|-----|------|
| RCS-101             | CAT-11       | 1.38 | .43 | .83  |
| RCS-201, -302, -502 | CAT-51       | 1.97 | .59 | 1.14 |
| RCS-1002            | CAT-101      | 2.80 | .67 | 1.39 |



\* "C" dimension equals saddle protrusion from plunger. Mounting screws are included.



RCS-Series

RSM-Series

\* 5° angle position of coupler on RCS-101, 201, 302.

## RSM RCS Series



Capacity:

**5-150 tons**

Stroke:

**.25-2.44 inches**

Maximum Operating Pressure:

**10,000 psi**

### RSM Cylinder Mounting Hole Dimensions (in)

| Model Number | Hole Pitch U1 | Hole Diam. V | Counter Bore Diam. | Counter Bore Depth |
|--------------|---------------|--------------|--------------------|--------------------|
| RSM-50       | 1.12          | .20          | .312               | .17                |
| RSM-100      | 1.44          | .28          | .422               | .31                |
| RSM-200      | 1.94          | .40          | .594               | .39                |
| RSM-300      | 2.06          | .40          | .625               | .44                |
| RSM-500      | 2.62          | .47          | .750               | .50                |
| RSM-750      | 3.00          | .53          | .812               | .56                |
| RSM-1000     | 3.00          | .53          | .812               | .56                |
| RSM-1500     | 4.62          | .53          | .812               | .56                |

| Collapsed Height | Extended Height | Outside Diameter | Cylinder Bore Diameter | Plunger Diameter | Base to Advance Port | Plunger Protrusion from Base | Plunger to Base | Plunger to Mtg. Hole | Thread | Thread Depth | Bolt Circle | Weight | Model Number |
|------------------|-----------------|------------------|------------------------|------------------|----------------------|------------------------------|-----------------|----------------------|--------|--------------|-------------|--------|--------------|
| A (in)           | B (in)          | D (in)           | E (in)                 | F (in)           | H (in)               | K (in)                       | L (in)          | M (in)               | O (mm) | P (in)       | U (in)      | (lbs)  |              |
| 1.28             | 1.53            | 2.31 x 1.63      | 1.13                   | 1.00             | .63                  | .04                          | .81             | .88                  | -      | -            | -           | 2.3    | RSM-50*      |
| 1.69             | 2.13            | 3.25 x 2.19      | 1.69                   | 1.50             | .75                  | .04                          | 1.09            | 1.34                 | -      | -            | -           | 3.1    | RSM-100      |
| 2.03             | 2.47            | 4.00 x 3.00      | 2.38                   | 2.00             | .75                  | .04                          | 1.56            | 1.56                 | -      | -            | -           | 6.8    | RSM-200      |
| 2.31             | 2.81            | 4.63 x 3.75      | 2.88                   | 2.50             | .75                  | .08                          | 1.88            | 1.75                 | -      | -            | -           | 10     | RSM-300      |
| 2.63             | 3.25            | 5.50 x 4.50      | 3.50                   | 2.75             | .75                  | .08                          | 2.25            | 2.13                 | -      | -            | -           | 15     | RSM-500      |
| 3.13             | 3.75            | 6.50 x 5.50      | 4.50                   | 3.25             | .75                  | .08                          | 2.75            | 2.63                 | -      | -            | -           | 25     | RSM-750      |
| 3.38             | 4.00            | 7.00 x 6.00      | 5.00                   | 3.63             | .75                  | .08                          | 3.00            | 2.94                 | -      | -            | -           | 32     | RSM-1000     |
| 3.94             | 4.56            | 8.50 x 7.50      | 6.25                   | 4.50             | .94                  | .08                          | 3.75            | 3.25                 | -      | -            | -           | 58     | RSM-1500     |
| 3.47             | 4.97            | 2.75             | 1.69                   | 1.50             | .69                  | .20                          | -               | -                    | M4     | .32          | 1.03        | 9      | RCS-101**    |
| 3.88             | 5.63            | 3.63             | 2.38                   | 2.00             | .69                  | .13                          | -               | -                    | M5     | .32          | 1.57        | 11     | RCS-201**    |
| 4.63             | 7.06            | 4.00             | 2.88                   | 2.62             | .75                  | .13                          | -               | -                    | M5     | .32          | 1.57        | 15     | RCS-302**    |
| 4.81             | 7.19            | 4.88             | 3.50                   | 2.75             | .94                  | .08                          | -               | -                    | M5     | .32          | 1.57        | 24     | RCS-502**    |
| 5.56             | 7.81            | 6.50             | 5.00                   | 3.63             | 1.25                 | .06                          | -               | -                    | M8     | .40          | 2.17        | 50     | RCS-1002**   |



▼ Shown from left to right: BRC-25, BRC-46, BRP-306, BRP-606, BRP-106C

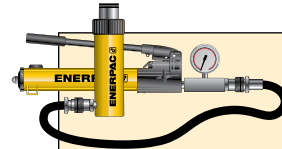


- High strength alloy steel construction
- Plunger blow-out protection to prevent over-extension
- Hard chrome-plated plunger for long life
- Baked enamel finish for increased corrosion resistance
- CR-400 coupler and dust cap included on all models
- Plunger wiper reduces contamination, extending cylinder life
- Single-acting spring-return
- Replaceable links on BRP-models

▼ Ship building, welding and Enerpac pull cylinders go hand in hand.



## The Ultimate in Pulling Power



### Pump and Cylinder Sets

All cylinders marked with an \* are available as sets (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the

System Components section for a full range of gauges.

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### Attachments and Accessories

The BRC-25 and BRC-46 units have base, collar and plunger threads to affix

a range of optional attachments and accessories, such as chains, saddles and extension tubes.

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▼ To lift a load bearing mast into place, BRP cylinders were used to tension the supporting cables.



# Single-Acting, Pull Cylinders

| Model Number   | Base Mounting Hole<br>V | Collar Thread<br>W | Collar Thread Length<br>X | Mtg. Thread Length<br>Z |
|----------------|-------------------------|--------------------|---------------------------|-------------------------|
| <b>BRC-25</b>  | 3/4"-14 NPT             | 1 1/2"-16 UN       | .98                       | .67                     |
| <b>BRC-46</b>  | 1 1/4"-11 1/2" NPT      | 2 1/4"-14 UN       | 1.06                      | .98                     |
| <b>BRC-106</b> | M30 x 2                 | M85 x 2            | 1.02                      | .98                     |

**BRC  
BRP  
Series**



Capacity:

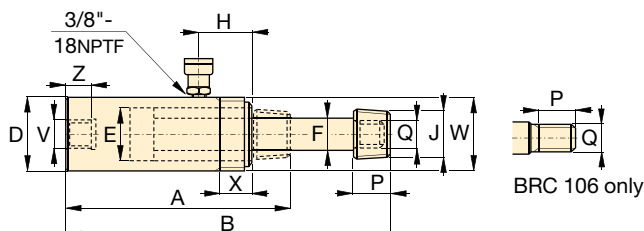
**2.5-60 tons**

Stroke:

**5.00-6.00 inches**

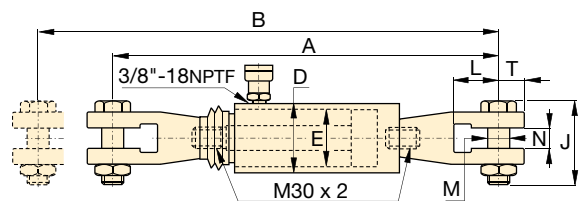
Maximum Operating Pressure:

**10,000 psi**

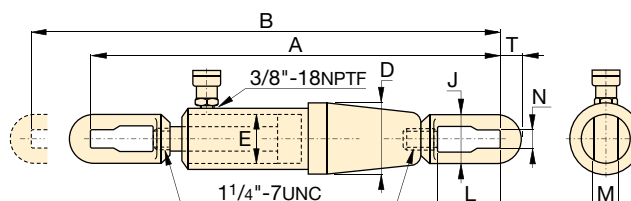


**BRC-25 to BRC-106**

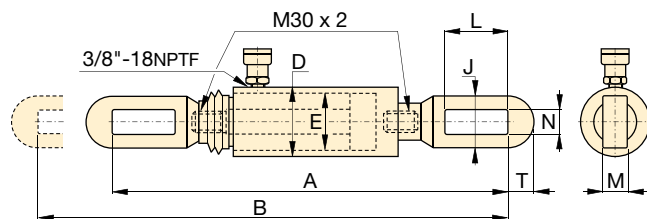
| Cylinder Capacity<br>(tons)<br>[maximum] | Stroke<br>(in) | Model Number   | Cyl. Effect. Area<br>(in <sup>2</sup> ) | Oil Cap.<br>(in <sup>3</sup> ) | Collap. Height<br>A<br>(in) | Ext. Height<br>B<br>(in) | Outside Diam.<br>D<br>(in) | Cyl. Bore Diam.<br>E<br>(in) | Plgr. Diam.<br>F<br>(in) | Top to Inlet Port<br>H<br>(in) | Saddle Diameter<br>J<br>(in) | Plunger Thread Length<br>P<br>(in) | Plunger Outside Thread<br>Q | Weight<br>(lbs) |
|--|----------------|----------------|---|--------------------------------|-----------------------------|--------------------------|----------------------------|------------------------------|--------------------------|--------------------------------|------------------------------|------------------------------------|-----------------------------|-----------------|
| <b>2.5</b> [2.7]                         | 5.00           | <b>BRC-25</b>  | .55                                     | 2.76                           | 10.44                       | 15.44                    | 1.89                       | 1.13                         | .75                      | 1.77                           | 3/4"-14 NPT                  | 1.13                               | 1 1/16"-24                  | 4               |
| <b>5</b> [5.6]                           | 5.50           | <b>BRC-46</b>  | 1.13                                    | 6.21                           | 11.88                       | 17.38                    | 2.25                       | 1.69                         | 1.19                     | 1.69                           | 1 1/4"-11 1/2" NPT           | 1.25                               | 1 3/16"-16                  | 10              |
| <b>10</b> [11.6]                         | 5.95           | <b>BRC-106</b> | 2.32                                    | 13.80                          | 11.38                       | 17.33                    | 3.35                       | 2.13                         | 1.25                     | 1.57                           | -                            | 1.02                               | M30x2                       | 21              |



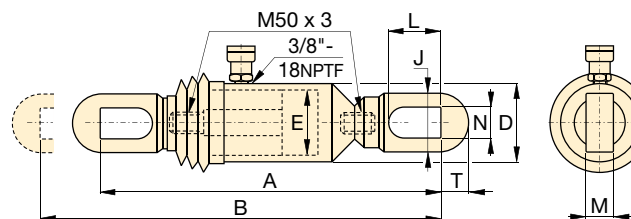
**BRP-106C**



**BRP-306**



**BRP-106L**



**BRP-606**

| Cylinder Capacity<br>(tons)<br>[maximum] | Stroke<br>(in) | Model Number     | Cyl. Effect. Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) | Collap. Height<br>A<br>(in) | Ext. Height<br>B<br>(in) | Outside Diam.<br>D<br>(in) | Cyl. Bore Diam.<br>E<br>(in) | Link Height<br>J<br>(in) | Link Opening<br>L<br>(in) | Link Thickness<br>M<br>(in) | Link Width<br>N<br>(in) | Slot to Link End<br>T<br>(in) | Weight<br>(lbs) |
|--|----------------|------------------|---|------------------------------------|-----------------------------|--------------------------|----------------------------|------------------------------|--------------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|-----------------|
| <b>10</b> [11.6]                         | 6.00           | <b>BRP-106C*</b> | 2.32                                    | 13.80                              | 23.11                       | 29.06                    | 3.35                       | 2.13                         | 4.72                     | 2.44                      | 1.19                        | 1.38                    | 1.26                          | 35              |
|  | 6.00           | <b>BRP-106L*</b> | 2.32                                    | 13.80                              | 22.24                       | 28.19                    | 3.35                       | 2.13                         | 2.64                     | 4.53                      | 0.88                        | 1.19                    | 1.26                          | 24              |
| <b>30</b> [36.1]                         | 6.00           | <b>BRP-306*</b>  | 7.22                                    | 43.27                              | 42.72                       | 48.82                    | 5.39                       | 3.50                         | 4.49                     | 5.71                      | 1.38                        | 1.57                    | 1.97                          | 106             |
| <b>60</b> [58.8]                         | 6.00           | <b>BRP-606*</b>  | 11.78                                   | 70.43                              | 28.34                       | 34.32                    | 5.51                       | 4.33                         | 5.13                     | 5.90                      | 1.57                        | 1.97                    | 2.76                          | 118             |

Note: BRP-106C, BRP-106L and BRP-606 are fitted with rubber bellows for rod protection.

\*Available as a set. See note on previous page. Please refer to drawings above for BRP-106C and BRP-106L.

▼ Shown from left to right: RCH-306, RCH-120, RCH-1003

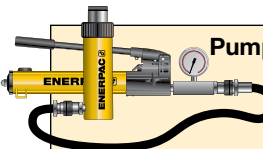


- Hollow plunger design allows for both pull and push forces
- Single-acting spring return
- Nickel-plated, floating center tube on models over 20 tons increases product life
- Baked enamel finish for increased corrosion resistance
- Collar threads for easy fixturing
- RCH-120 includes AR-630 coupler and has 1/4 NPTF port
- RCH-121 and RCH-1211 have FZ-1630 reducer and AR-630 coupler, all other models feature CR-400 coupler


▼ Hollow plunger cylinder RCH-1003 used in an application for intermediate boom suspension on a dragline.




## Versatility in Testing, Maintenance and Tensioning Applications



**Pump and Cylinder Sets**  
All cylinders marked with an \* are available as sets (cylinder, gauge, couplers, hose and pump) for your ordering convenience.  
**Page: 54**



**Lightweight Aluminum Hollow Plunger Cylinders**  
If you need a higher cylinder capacity-to-weight ratio the lightweight RACH-Series Aluminum Hollow Plunger Cylinders are the perfect choice.  
**Page: 16**



**Saddles**  
Most RCH-Series cylinders are equipped with smooth saddles. See table at next page for optional threaded saddles and all dimensional information.  
**Page: 27**

| Cylinder Capacity<br>(tons)<br>[maximum] | Stroke<br>(in) | Model Number | Cyl. Effect. Area<br>(in <sup>2</sup> ) | Oil Cap.<br>(in <sup>3</sup> ) |
|--|----------------|--------------|---|--------------------------------|
| 12<br>[13.8]                             | 0.31           | RCH-120      | 2.76                                    | 0.86                           |
|  | 1.63           | RCH-121*     | 2.76                                    | 4.49                           |
|  | 1.63           | RCH-1211     | 2.76                                    | 4.49                           |
|  | 3.00           | RCH-123      | 2.76                                    | 8.29                           |
| 20<br>[23.6]                             | 2.00           | RCH-202*     | 4.73                                    | 9.46                           |
|  | 6.10           | RCH-206      | 4.73                                    | 28.67                          |
| 30<br>[36.1]                             | 2.50           | RCH-302*     | 7.22                                    | 18.05                          |
|  | 6.13           | RCH-306      | 7.22                                    | 44.23                          |
| 60<br>[63.6]                             | 3.00           | RCH-603*     | 12.73                                   | 38.20                          |
|  | 6.00           | RCH-606      | 12.73                                   | 76.41                          |
| 100 [103.1]                              | 3.00           | RCH-1003*    | 20.63                                   | 61.88                          |

\* Available as a set. See note on this page.

# Single-Acting, Hollow Plunger Cylinders

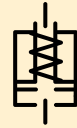


## Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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## RCH Series



Capacity:

**12-100 tons**

Stroke:

**.31-6.13 inches**

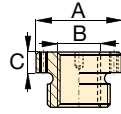
Center Hole Diameter:

**.77-3.11 inches**

Maximum Operating Pressure:

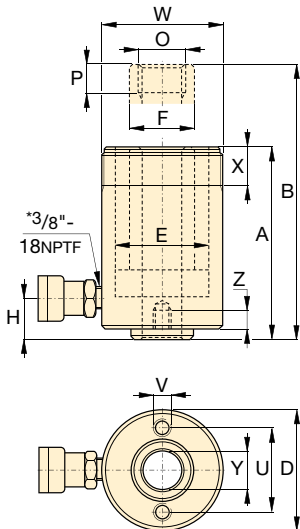
**10,000 psi**

| Optional Heat Treated Hollow Saddles |                    |                  |                        |         |     |
|--------------------------------------|--------------------|------------------|------------------------|---------|-----|
| Saddle Type                          | Cylinder Model No. | Saddle Model No. | Saddle Dimensions (in) |         |     |
|                                      |                    |                  | A                      | B       | C   |
| Threaded Hollow                      | RCH-202, 206       | HP-2015          | 2.11                   | 1"-8    | .38 |
|                                      | RCH-302, 306       | HP-3015          | 2.49                   | 1¼"-7   | .38 |
|                                      | RCH-603, 606       | HP-5016          | 3.61                   | 1½"-5½" | .50 |
|                                      | RCH-1003           | HP-10016         | 4.97                   | 2½"-8   | .51 |

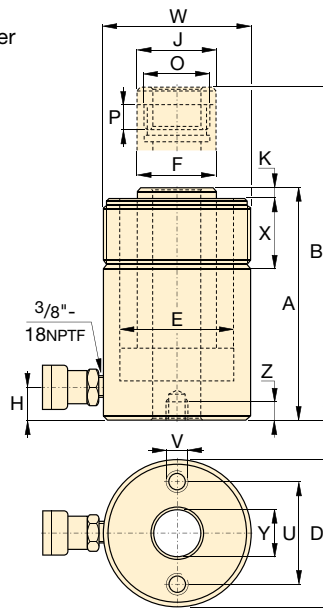


Smooth hollow saddles are standard on all RCH-models (12-ton models are not equipped with saddles).

RCH-121 and RCH-1211 have a 1.88" diameter boss that protrudes 0.25" from base.



RCH-120 to RCH-123 models



RCH-202 to RCH-1003 models

\* 1/4" NPT for RCH-120 only

| Base Mounting Hole Dimensions (in) |             |              |              |
|------------------------------------|-------------|--------------|--------------|
| Model Number                       | Bolt Circle | Thread       | Thread Depth |
|                                    | U           | V            | Z            |
| RCH-120                            | 2.00        | 5/16"-18 UNC | .35          |
| RCH-121                            | -           | -            | -            |
| RCH-1211                           | -           | -            | -            |
| RCH-123                            | 2.00        | 5/16"-18 UNC | .50          |
| RCH-202                            | 3.25        | 3/8"-16 UNC  | .37          |
| RCH-206                            | 3.25        | 3/8"-16 UNC  | .37          |
| RCH-302                            | 3.63        | 3/8"-16 UNC  | .55          |
| RCH-306                            | 3.63        | 3/8"-16 UNC  | .55          |
| RCH-603                            | 5.13        | 1/2"-13 UNC  | .55          |
| RCH-606                            | 5.13        | 1/2"-13 UNC  | .55          |
| RCH-1003                           | 7.00        | 5/8"-11 UNC  | .75          |

| Collap. Height | Ext. Height | Outside Diam. | Cyl. Bore Diam. | Plngr. Diam. | Cyl. Base to Advance Port | Saddle Diameter | Saddle Protrusion from Plngr. | Plunger Internal Thread | Plunger Thread Length | Collar Thread | Collar Thread Length | Center Hole Diam. | Weight | Model Number |
|----------------|-------------|---------------|-----------------|--------------|---------------------------|-----------------|-------------------------------|-------------------------|-----------------------|---------------|----------------------|-------------------|--------|--------------|
| A (in)         | B (in)      | D (in)        | E (in)          | F (in)       | H (in)                    | J (in)          | K (in)                        | O (in)                  | P (in)                | W (in)        | X (in)               | Y (in)            | (lbs)  |              |
| 2.19           | 2.50        | 2.75          | 2.13            | 1.38         | .38                       | -               | -                             | 3/4"-16 UN              | .63                   | 2¼"-16        | 1.19                 | .77               | 3.2    | RCH-120      |
| 4.75           | 6.38        | 2.75          | 2.13            | 1.38         | .98                       | -               | -                             | -                       | -                     | 2¼"-16        | 1.19                 | .77               | 6.2    | RCH-121*     |
| 4.75           | 6.38        | 2.75          | 2.13            | 1.38         | .98                       | -               | -                             | 3/4"-16 UN              | .63                   | 2¼"-16        | 1.19                 | .77               | 6.2    | RCH-1211     |
| 7.25           | 10.25       | 2.75          | 2.13            | 1.38         | .98                       | -               | -                             | -                       | -                     | 2¼"-16        | 1.19                 | .77               | 9.8    | RCH-123      |
| 6.38           | 8.38        | 3.88          | 2.88            | 2.13         | .75                       | 2.13            | .27                           | 19/16"-16 UN            | .75                   | 37/8"-12      | 1.50                 | 1.06              | 17     | RCH-202*     |
| 12.05          | 18.11       | 3.88          | 2.88            | 2.13         | .75                       | 2.13            | .27                           | 19/16"-16 UN            | .75                   | 37/8"-12      | 1.50                 | 1.06              | 31     | RCH-206      |
| 7.03           | 9.53        | 4.50          | 3.50            | 2.50         | .85                       | 2.50            | .38                           | 113/16"-16 UN           | .88                   | 4½"-12        | 1.66                 | 1.31              | 24     | RCH-302*     |
| 13.00          | 19.13       | 4.50          | 3.50            | 2.50         | 1.00                      | 2.50            | .38                           | 113/16"-16 UN           | .88                   | 4½"-12        | 1.66                 | 1.31              | 48     | RCH-306      |
| 9.75           | 12.75       | 6.25          | 4.88            | 3.63         | 1.25                      | 3.61            | .50                           | 2¾"-16 UN               | .75                   | 6¼"-12        | 1.91                 | 2.12              | 62     | RCH-603*     |
| 12.75          | 18.75       | 6.25          | 4.88            | 3.63         | 1.25                      | 3.61            | .50                           | 2¾"-16 UN               | .75                   | 6¼"-12        | 1.91                 | 2.12              | 78     | RCH-606      |
| 10.00          | 13.00       | 8.38          | 6.50            | 5.00         | 1.50                      | 4.97            | .50                           | 4"-16 UN                | 1.00                  | 87/8"-12      | 2.38                 | 3.11              | 132    | RCH-1003*    |

▼ Shown from left to right: RRH-3010, RRH-1001, RRH-6010



## Versatility in Testing, Maintenance and Tensioning Applications



### Pump Selection

A double-acting cylinder must be powered by a pump with a 4-way valve.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

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### Saddles

All RRH-Series cylinders are equipped with smooth saddles. See table on next page for optional threaded saddles and all dimensional information.

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- Relief valves prevent damage in case of over-pressurization
- Baked enamel finish for increased corrosion resistance
- Collar threads enable easy fixturing (except RRH-1001 and RRH-1508)
- Double-acting operation for fast retraction
- Nickel-plated, floating center tube increases product life
- Hollow plunger allows for both pull and push forces
- CR-400 couplers and dust caps included on all models
- Plunger wiper reduces contamination, extending cylinder life

▼ Double-acting hollow plunger cylinders are applied for bridge launching systems.



| Cylinder Capacity<br>(ton) | Stroke<br>(in) | Model Number | Max. Cylinder Capacity<br>(ton) |         | Cylinder Effective Area<br>(in <sup>2</sup> ) |         | Oil Capacity<br>(in <sup>3</sup> ) |         |
|----------------------------|----------------|--------------|---------------------------------|---------|---|---------|------------------------------------|---------|
|                            |                |              | Advance                         | Retract | Advance                                       | Retract | Advance                            | Retract |
| 30                         | 7.00           | RRH-307      | 36                              | 24      | 7.22  | 4.71    | 50.55                              | 32.99   |
|                            | 10.13          | RRH-3010     | 36                              | 24      | 7.22  | 4.71    | 73.12                              | 47.71   |
| 60                         | 3.50           | RRH-603      | 64                              | 42      | 12.73   | 8.37    | 44.57                              | 29.21   |
|                            | 6.50           | RRH-606      | 64                              | 42      | 12.73   | 8.37    | 82.77                              | 54.24   |
|                            | 10.12          | RRH-6010     | 64                              | 42      | 12.73   | 8.37    | 128.94                             | 84.49   |
| 100                        | 1.50           | RRH-1001     | 103                             | 68      | 20.63   | 13.54   | 30.94                              | 20.32   |
|                            | 3.00           | RRH-1003     | 103                             | 68      | 20.63   | 13.54   | 61.88                              | 40.64   |
|                            | 6.00           | RRH-1006     | 103                             | 68      | 20.63   | 13.54   | 123.76                             | 81.29   |
|                            | 10.13          | RRH-10010    | 103                             | 68      | 20.63   | 13.54   | 208.84                             | 137.17  |
| 150                        | 8.00           | RRH-1508     | 158                             | 80      | 31.62   | 15.91   | 252.97                             | 127.23  |

# Double-Acting, Hollow Plunger Cylinders

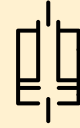


## Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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## RRH Series



Capacity:

**30-150 tons**

Stroke:

**1.50-10.13 inches**

Center Hole Diameter:

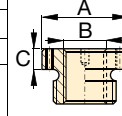
**1.31-3.13 inches**

Maximum Operating Pressure:

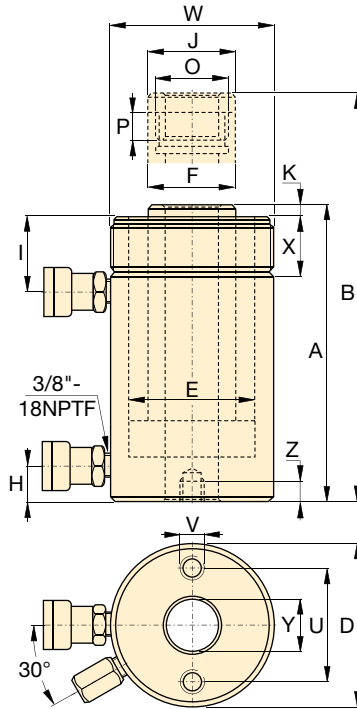
**10,000 psi**

### Optional Heat Treated Saddles

| Saddle Type     | Cylinder Model Number           | Saddle Model No. | Saddle Dimensions (in) |              |     |
|-----------------|---------------------------------|------------------|------------------------|--------------|-----|
|                 |                                 |                  | A                      | B            | C   |
| Threaded Hollow | RRH-307, 3010                   | HP-3015          | 2.49                   | 1 1/4"-7     | .38 |
|                 | RRH-603, 606, 6010              | HP-5016          | 3.61                   | 1 5/8"-5 1/2 | .50 |
|                 | RRH-1001, 1003, RRH-1006, 10010 | HP-10016         | 4.97                   | 2 1/2"-8     | .51 |



Smooth hollow saddles are standard on all RRH-models.



### Base Mounting Hole Dimensions (in)

| Model Number | Bolt Circle U | Thread V  | Thread Depth Z |
|--------------|---------------|-----------|----------------|
|              |               |           |                |
| RRH-3010     | 3.63          | 3/8" - 16 | .62            |
| RRH-603      | 5.12          | 1/2" - 13 | .55            |
| RRH-606      | 5.12          | 1/2" - 13 | .55            |
| RRH-6010     | 5.12          | 1/2" - 13 | .55            |
| RRH-1001     | 7.00          | 5/8" - 11 | .75            |
| RRH-1003     | 7.00          | 5/8" - 11 | .75            |
| RRH-1006     | 7.00          | 5/8" - 11 | .75            |
| RRH-10010    | 7.00          | 5/8" - 11 | .75            |
| RRH-1508     | -             | -         | -              |

| Collap. Height | Ext. Height | Out. Diam. | Cyl. Bore Diam. | Plngr. Diam. | Cyl. Base to Adv. Port | Cyl. Top to Return Port | Saddle Diam. | Saddle Protrusion from Plngr. | Thread      | Plunger Thread Length | Collar Thread | Collar Thread Length | Center Hole Diam. | Wt.   | Model Number |
|----------------|-------------|------------|-----------------|--------------|------------------------|-------------------------|--------------|-------------------------------|-------------|-----------------------|---------------|----------------------|-------------------|-------|--------------|
| A              | B           | D          | E               | F            | H                      | I                       | J            | K                             | O           | P                     | W             | X                    | Y                 | (lbs) |              |
| 13.00          | 20.00       | 4.50       | 3.50            | 2.50         | 1.00                   | 2.38                    | 2.50         | .38                           | 1 13/16"-16 | .88                   | 4 1/2"-12     | 1.66                 | 1.31              | 48    | RRH-307      |
| 17.00          | 27.13       | 4.50       | 3.50            | 2.50         | 1.00                   | 2.38                    | 2.50         | .38                           | 1 13/16"-16 | .88                   | 4 1/2"-12     | 1.66                 | 1.31              | 60    | RRH-3010     |
| 9.75           | 13.25       | 6.25       | 4.88            | 3.63         | 1.25                   | 2.63                    | 3.61         | .50                           | 2 3/4"-16   | .75                   | 6 1/4"-12     | 1.91                 | 2.13              | 62    | RRH-603      |
| 12.75          | 19.25       | 6.25       | 4.88            | 3.63         | 1.25                   | 2.63                    | 3.61         | .50                           | 2 3/4"-16   | .75                   | 6 1/4"-12     | 1.91                 | 2.13              | 78    | RRH-606      |
| 17.25          | 27.38       | 6.25       | 4.88            | 3.63         | 1.25                   | 2.63                    | 3.61         | .50                           | 2 3/4"-16   | .75                   | 6 1/4"-12     | 1.91                 | 2.13              | 101   | RRH-6010     |
| 6.50           | 8.00        | 8.38       | 6.50            | 5.00         | 1.50                   | 1.75                    | 4.97         | .50                           | 4"-16       | 1.00                  | -             | -                    | 3.13              | 85    | RRH-1001     |
| 10.00          | 13.00       | 8.38       | 6.50            | 5.00         | 1.50                   | 3.38                    | 4.97         | .50                           | 4"-16       | 1.00                  | 8 3/8"-12     | 2.38                 | 3.13              | 135   | RRH-1003     |
| 13.50          | 19.50       | 8.38       | 6.50            | 5.00         | 1.50                   | 3.38                    | 4.97         | .50                           | 4"-16       | 1.00                  | 8 3/8"-12     | 2.38                 | 3.13              | 175   | RRH-1006     |
| 18.13          | 28.25       | 8.38       | 6.50            | 5.00         | 1.50                   | 3.38                    | 4.97         | .50                           | 4"-16       | 1.00                  | 8 3/8"-12     | 2.38                 | 3.13              | 235   | RRH-10010    |
| 13.75          | 21.75       | 9.75       | 7.50            | 6.00         | 1.50                   | 2.38                    | 5.00         | .19                           | 4 1/4"-12   | 1.00                  | -             | -                    | 3.13              | 245   | RRH-1508     |

▼ Shown from left to right: RD-2510, RD-96, RD-256, RD-41, RD-166



## High Precision and High Cycle Performance



### Speed Chart

See the Enerpac Cylinder Speed Chart in our 'Yellow Pages' to determine your approximate cylinder speed.

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- Designed for long life, the best choice for production applications
- Unique mounting configurations simplify fixturing
- Baked enamel finish for increased corrosion resistance
- Double-acting operation develops force in both directions, providing maximum versatility
- Plunger wiper reduces contamination, extending cylinder life

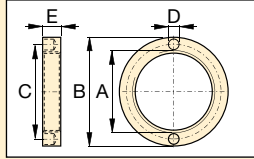
▼ Clamping application using Enerpac RD cylinders (with clevis eye attachments on both ends) for their high-pressure capability and mounting flexibility.



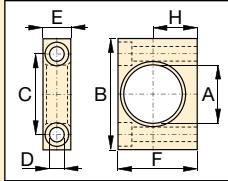
| Cylinder Capacity<br>(tons) | Stroke<br>(in) | Model Number | Max. Cylinder Capacity<br>(tons) |         | Cylinder Effective Area<br>(in <sup>2</sup> ) |         | Oil Capacity<br>(in <sup>3</sup> ) |         | Collap. Height<br>A<br>(in) | Ext. Height<br>B<br>(in) | Body Length<br>C<br>(in) | Outside Diam.<br>D<br>(in) | Cylinder Bore Diam.<br>E<br>(in) | Plunger Diam.<br>F<br>(in) |
|-----------------------------|----------------|--------------|----------------------------------|---------|---|---------|------------------------------------|---------|-----------------------------|--------------------------|--------------------------|----------------------------|----------------------------------|----------------------------|
|                             |                |              | Advance                          | Retract | Advance                                       | Retract | Advance                            | Retract |                             |                          |                          |                            |                                  |                            |
|                             |                |              |                                  |         |   |         |                                    |         |                             |                          |                          |                            |                                  |                            |
| 4                           | 1.13           | RD-41        | 4                                | 2       | .79   | .34     | .88                                | .39     | 7.31                        | 8.44                     | 6.38                     | 2.00                       | 1.00                             | .75                        |
|                             | 3.13           | RD-43        | 4                                | 2       | .79   | .34     | 2.45                               | 1.07    | 9.31                        | 12.44                    | 8.38                     | 2.00                       | 1.00                             | .75                        |
|                             | 6.13           | RD-46        | 4                                | 2       | .79   | .34     | 4.81                               | 2.10    | 12.31                       | 18.44                    | 11.38                    | 2.00                       | 1.00                             | .75                        |
| 9                           | 1.13           | RD-91        | 9                                | 5       | 1.77  | .98     | 1.99                               | 1.10    | 8.75                        | 9.88                     | 7.80                     | 2.50                       | 1.50                             | 1.00                       |
|                             | 3.13           | RD-93        | 9                                | 5       | 1.77  | .98     | 5.52                               | 3.07    | 10.78                       | 13.91                    | 9.80                     | 2.50                       | 1.50                             | 1.00                       |
|                             | 6.13           | RD-96        | 9                                | 5       | 1.77  | .98     | 10.82                              | 6.01    | 13.78                       | 19.91                    | 12.80                    | 2.50                       | 1.50                             | 1.00                       |
|                             | 10.13          | RD-910       | 9                                | 5       | 1.77  | .98     | 17.89                              | 9.94    | 17.78                       | 27.91                    | 16.81                    | 2.50                       | 1.50                             | 1.00                       |
| 16                          | 6.25           | RD-166       | 16                               | 8       | 3.14  | 1.66    | 19.63                              | 10.35   | 15.31                       | 21.56                    | 14.13                    | 3.00                       | 2.00                             | 1.38                       |
|                             | 10.25          | RD-1610      | 16                               | 8       | 3.14  | 1.66    | 32.20                              | 16.98   | 19.31                       | 29.56                    | 18.11                    | 3.00                       | 2.00                             | 1.38                       |
| 25                          | 6.25           | RD-256       | 25                               | 11      | 4.91  | 2.15    | 30.68                              | 13.42   | 16.69                       | 22.94                    | 15.63                    | 3.63                       | 2.50                             | 1.88                       |
|                             | 10.25          | RD-2510      | 25                               | 11      | 4.91  | 2.15    | 50.31                              | 22.01   | 20.69                       | 30.94                    | 19.61                    | 3.63                       | 2.50                             | 1.88                       |

# Double-Acting, Precision Production Cylinders

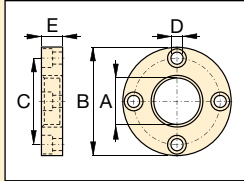
## ▼ RD CYLINDER ATTACHMENTS



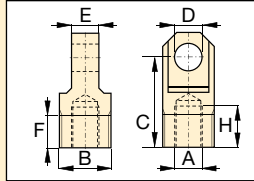
**Retainer Nut**  
For locking foot or flange mountings. Tightens onto cylinder collar threads (included with foot and flange mounting kits)



**Foot Mounting**  
Mounts onto cylinder collar. Mounting screws not included.



**Flange Mounting**  
Mounts onto cylinder collar. Mounting screws not included.



**Clevis Eye**  
Threads onto plunger or into cylinder base

| Model Number                             | RD-Cyl: (tons) | Dimensions (in) |               |      |      |      |      |      |
|--|----------------|-----------------|---------------|------|------|------|------|------|
|  |                | A               | B             | C    | D    | E    | F    | H    |
| <b>Foot Mounting with Retainer Nut</b>   |                |                 |               |      |      |      |      |      |
| AD-141                                   | 4              | 1.38            | 3.00          | 2.00 | .41  | .75  | 2.25 | 1.25 |
| AD-171                                   | 9              | 2.00            | 4.00          | 2.88 | .53  | 1.00 | 3.25 | 1.75 |
| AD-181                                   | 16             | 2.63            | 5.00          | 3.75 | .78  | 1.38 | 4.00 | 2.06 |
| AD-191                                   | 25             | 3.25            | 6.25          | 4.62 | 1.03 | 1.75 | 4.88 | 2.50 |
| <b>Flange Mounting with Retainer Nut</b> |                |                 |               |      |      |      |      |      |
| AD-142                                   | 4              | 1.38            | 3.88          | 3.09 | .41  | .75  | -    | -    |
| AD-172                                   | 9              | 2.00            | 4.75          | 3.88 | .41  | 1.00 | -    | -    |
| AD-182                                   | 16             | 2.63            | 5.63          | 4.56 | .53  | 1.38 | -    | -    |
| AD-192                                   | 25             | 3.25            | 6.50          | 5.34 | .66  | 1.75 | -    | -    |
| <b>Retainer Nut</b>                      |                |                 |               |      |      |      |      |      |
| AD-143                                   | 4              | 1.375-12 UNF    | 2.25          | 1.81 | .25  | .38  | -    | -    |
| AD-173                                   | 9              | 2.000-12 UN     | 3.00          | 2.50 | .27  | .50  | -    | -    |
| AD-183                                   | 16             | 2.625-16 UN     | 3.63          | 3.12 | .27  | .75  | -    | -    |
| AD-193                                   | 25             | 3.250-16 UN     | 4.25          | 3.75 | .27  | 1.00 | -    | -    |
| <b>Clevis Eye</b>                        |                |                 |               |      |      |      |      |      |
| AD-150                                   | 4              | .500-20 UNF     | 1.125-20 UN   | 2.06 | .63  | .62  | .75  | .94  |
| AD-151                                   | 9              | .750-16 UNF     | 1.688-18 UNEF | 2.25 | .75  | 1.00 | 1.00 | .94  |
| AD-152                                   | 16             | 1.125-12 UNF    | 2.188-16 UNS  | 3.06 | 1.00 | 1.25 | 1.00 | 1.19 |
| AD-153                                   | 25             | 1.500-12 UNF    | 2.750-16      | 3.06 | 1.25 | 1.50 | 1.00 | 1.06 |

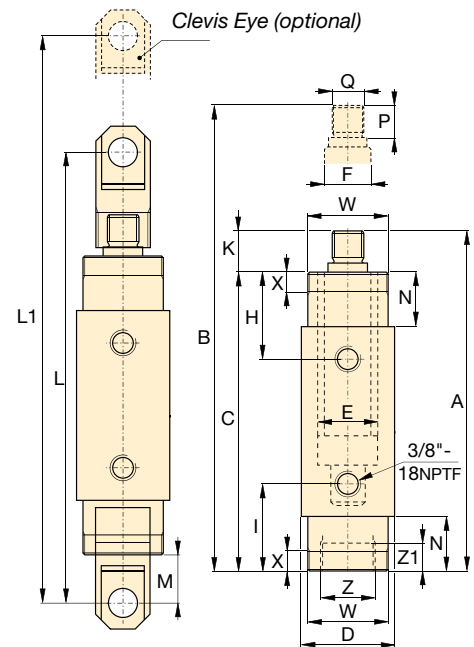
## RD Series



Capacity:  
**4-25 tons**

Stroke:  
**1.13-10.25 inches**

Maximum Operating Pressure:  
**10,000 psi**



| Top to Ret. Port | Bottom to Adv. Port | Plunger Protrusion | Clevis Eye Mounting Dimensions |         |        | Neck Length | Plunger Thread Length | Plunger External Thread | Cylinder Mounting Dimensions (in) |                      |                  |                         | Wt. (lbs) | Model Number |
|------------------|---------------------|--------------------|--------------------------------|---------|--------|-------------|-----------------------|-------------------------|-----------------------------------|----------------------|------------------|-------------------------|-----------|--------------|
|                  |                     |                    | L                              | L1      | M      |             |                       |                         | Collar Thread                     | Collar Thread Length | Int. Base Thread | Int. Base Thread Length |           |              |
| H (in)           | I (in)              | K (in)             | L (in)                         | L1 (in) | M (in) | N (in)      | P (in)                | Q (in)                  | W                                 | X                    | Z                | Z1                      |           |              |
| 1.88             | 1.88                | .94                | 10.12                          | 11.25   | 1.61   | 1.13        | .75                   | 1/2"-20                 | 1 3/8"-12                         | .44                  | 1 1/8"-20        | .35                     | 4.8       | RD-41        |
| 1.88             | 1.88                | .94                | 12.12                          | 15.25   | 1.61   | 1.13        | .75                   | 1/2"-20                 | 1 3/8"-12                         | .44                  | 1 1/8"-20        | .35                     | 6.4       | RD-43        |
| 1.88             | 1.88                | .94                | 15.12                          | 21.25   | 1.61   | 1.13        | .75                   | 1/2"-20                 | 1 3/8"-12                         | .44                  | 1 1/8"-20        | .35                     | 9.0       | RD-46        |
| 2.27             | 2.27                | .98                | 11.61                          | 12.76   | 1.50   | 1.50        | .75                   | 3/4"-16                 | 2"-12                             | .56                  | 1 1/16"-18       | .55                     | 9.0       | RD-91        |
| 2.27             | 2.27                | .98                | 13.66                          | 16.79   | 1.50   | 1.50        | .75                   | 3/4"-16                 | 2"-12                             | .56                  | 1 1/16"-18       | .55                     | 11.0      | RD-93        |
| 2.27             | 2.27                | .98                | 16.66                          | 22.79   | 1.50   | 1.50        | .75                   | 3/4"-16                 | 2"-12                             | .56                  | 1 1/16"-18       | .55                     | 14.0      | RD-96        |
| 2.27             | 2.27                | .98                | 20.66                          | 30.79   | 1.50   | 1.50        | .75                   | 3/4"-16                 | 2"-12                             | .56                  | 1 1/16"-18       | .55                     | 19.0      | RD-910       |
| 2.90             | 2.90                | 1.19               | 19.32                          | 25.57   | 2.05   | 2.13        | 1.00                  | 1 1/8"-12               | 2 5/8"-16                         | .88                  | 2 3/16"-16       | .94                     | 22.0      | RD-166       |
| 2.90             | 2.90                | 1.19               | 23.32                          | 33.57   | 2.05   | 2.13        | 1.00                  | 1 1/8"-12               | 2 5/8"-16                         | .88                  | 2 3/16"-16       | .94                     | 29.0      | RD-1610      |
| 3.50             | 3.50                | 1.06               | 20.86                          | 27.11   | 2.09   | 2.75        | 1.00                  | 1 1/2"-12               | 3 1/4"-16                         | 1.13                 | 2 3/4"-16        | 1.02                    | 36.0      | RD-256       |
| 3.50             | 3.50                | 1.08               | 24.86                          | 35.11   | 2.09   | 2.75        | 1.00                  | 1 1/2"-12               | 3 1/4"-16                         | 1.13                 | 2 3/4"-16        | 1.02                    | 46.0      | RD-2510      |



▼ Shown from left to right: RR-10013, RR-1502, RR-20013, RR-1010, RR-7513



- Collar threads, plunger threads and base mounting holes for easy fixturing (on most models)
- Baked enamel finish for increased corrosion resistance
- Removable hardened saddles protect plunger during lifting and pressing
- Built-in safety valve prevents accidental over-pressurization
- CR-400 couplers included on all models
- Plunger wiper reduces contamination, extending cylinder life

▼ These long stroke RR-cylinders are attached to a sliding and guiding system pulling the arched roof assembly of Athen's Olympic Stadium step by step into the final position.



## Most Versatile Performers

Rugged enough for the toughest job site uses and precision designed for high-cycle industrial uses.



### Pump Selection

A double-acting cylinder must be powered by a pump with a 4-way valve.

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### Saddles

RR-Series cylinders up to 75-ton have plunger thread for installation of CAT-Series tilt saddles.

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### Optimum Performance

Enerpac's range of Z-Class electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with RR cylinders.

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▼ RR-cylinders provide power and precision in a special hydraulic press.



# Double-Acting Long Stroke Cylinders

## ▼ QUICK SELECTION CHART

For complete technical information see next page.

| Cylinder Capacity<br>(tons) | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) |       | Oil Capacity<br>(in <sup>3</sup> ) |        | Collap. Height<br>(in) |
|-----------------------------|----------------|--------------|---|-------|------------------------------------|--------|------------------------|
|                             |                |              | Push  | Pull  | Push                               | Pull   |                        |
|                             |                |              | 10  | 10.00 | RR-1010*                           | 2.23   |                        |
|                             | 12.00          | RR-1012*     | 2.23  | .80   | 26.80                              | 9.00   | 18.00                  |
| 30                          | 8.25           | RR-308*      | 6.51  | 3.00  | 53.67                              | 25.00  | 15.25                  |
|                             | 14.50          | RR-3014*     | 6.51  | 3.00  | 92.70                              | 43.00  | 21.63                  |
| 50                          | 6.13           | RR-506       | 11.06   | 3.40  | 67.77                              | 21.00  | 13.06                  |
|                             | 13.13          | RR-5013      | 11.06   | 3.40  | 145.17                             | 44.00  | 20.06                  |
|                             | 20.13          | RR-5020      | 11.06   | 3.40  | 222.56                             | 68.00  | 28.88                  |
| 75                          | 6.13           | RR-756       | 15.92   | 4.90  | 97.58                              | 29.00  | 13.69                  |
|                             | 13.13          | RR-7513      | 15.92   | 4.90  | 209.00                             | 64.00  | 20.69                  |
| 100                         | 6.63           | RR-1006      | 20.65   | 9.60  | 136.93                             | 63.00  | 14.06                  |
|                             | 13.13          | RR-10013     | 20.65   | 9.60  | 271.17                             | 126.00 | 20.63                  |
|                             | 18.13          | RR-10018     | 20.65   | 9.60  | 374.44                             | 174.00 | 27.06                  |
| 150                         | 2.25           | RR-1502      | 30.71   | 14.80 | 69.11                              | 33.00  | 7.72                   |
|                             | 6.13           | RR-1506      | 30.71   | 14.80 | 188.28                             | 91.00  | 15.19                  |
|                             | 13.13          | RR-15013     | 30.71   | 14.80 | 403.27                             | 194.00 | 22.20                  |
|                             | 32.13          | RR-15032     | 30.71   | 14.80 | 986.84                             | 475.00 | 43.94                  |
| 200                         | 6.00           | RR-2006      | 44.21   | 22.50 | 265.28                             | 135.00 | 16.94                  |
|                             | 13.00          | RR-20013     | 44.21   | 22.50 | 574.78                             | 293.00 | 23.94                  |
|                             | 18.00          | RR-20018     | 44.21   | 22.50 | 795.85                             | 396.00 | 30.13                  |
|                             | 24.00          | RR-20024     | 44.21   | 22.50 | 1,061                              | 528.00 | 36.13                  |
|                             | 36.00          | RR-20036     | 44.21   | 22.50 | 1,592                              | 792.00 | 48.13                  |
|                             | 48.00          | RR-20048     | 44.21   | 22.50 | 2,122                              | 1,056  | 60.13                  |
| 300                         | 6.00           | RR-3006      | 70.93   | 38.00 | 425.56                             | 228.00 | 19.13                  |
|                             | 12.00          | RR-30012     | 70.93   | 38.00 | 851.12                             | 456.00 | 25.13                  |
|                             | 18.00          | RR-30018     | 70.93   | 38.00 | 1,277                              | 684.00 | 31.13                  |
|                             | 24.00          | RR-30024     | 70.93   | 38.00 | 1,702                              | 912.00 | 37.13                  |
|                             | 36.00          | RR-30036     | 70.93   | 38.00 | 2,553                              | 1,368  | 49.13                  |
|                             | 48.00          | RR-30048     | 70.93   | 38.00 | 3,405                              | 1,824  | 61.13                  |
| 400                         | 6.00           | RR-4006      | 95.09   | 51.00 | 570.51                             | 306.00 | 21.19                  |
|                             | 12.00          | RR-40012     | 95.09   | 51.00 | 1,141                              | 612.00 | 27.19                  |
|                             | 18.00          | RR-40018     | 95.09   | 51.00 | 1,712                              | 918.00 | 33.19                  |
|                             | 24.00          | RR-40024     | 95.09   | 51.00 | 2,282                              | 1,224  | 39.19                  |
|                             | 36.00          | RR-40036     | 95.09   | 51.00 | 3,423                              | 1,836  | 51.19                  |
|                             | 48.00          | RR-40048     | 95.09   | 51.00 | 4,564                              | 2,448  | 63.19                  |
| 500                         | 6.00           | RR-5006      | 113.15  | 63.00 | 678                                | 378.00 | 22.75                  |
|                             | 12.00          | RR-50012     | 113.15  | 63.00 | 1,358                              | 756.00 | 28.75                  |
|                             | 18.00          | RR-50018     | 113.15  | 63.00 | 2,037                              | 1,134  | 34.75                  |
|                             | 24.00          | RR-50024     | 113.15  | 63.00 | 2,716                              | 1,512  | 40.75                  |
|                             | 36.00          | RR-50036     | 113.15  | 63.00 | 4,074                              | 2,264  | 52.75                  |
|                             | 48.00          | RR-50048     | 113.15  | 63.00 | 5,431                              | 3,024  | 64.75                  |

## RR Series



Capacity:

**10-500 tons**

Stroke:

**2.25-48.00 inches**

Maximum Operating Pressure:

**10,000 psi**



### Energpac CLRG-Series

If you do not have a high cycle application, Energpac CLRG-Series cylinders may be the right alternative.

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### Speed Chart

See the Energpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

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### Optional Snap-in Saddles

Optional snap-in saddles for RR-Series double-acting cylinders:

| Saddle Type | Cylinder Model Number | Saddle Model Number |
|-------------|-----------------------|---------------------|
| Flat        | RR-1010, 1012         | A-102F              |
| Tilt        | RR-1010, 1012         | CAT-10              |
|             | RR-308, 3014          | CAT-50              |
|             | RR-506, 5013          | CAT-100             |
|             | RR-5020, 756          |                     |
|             | RR-7513               |                     |

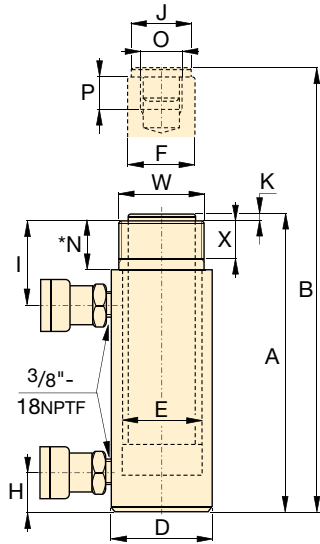
### Standard Saddles

| Saddle Type | Cylinder Model Number | Saddle Model Number |
|-------------|-----------------------|---------------------|
| Grooved     | RR-1010, 1012         | A-102G              |
|             | RR-308, 3014          | A-252G              |

For additional information on saddles:

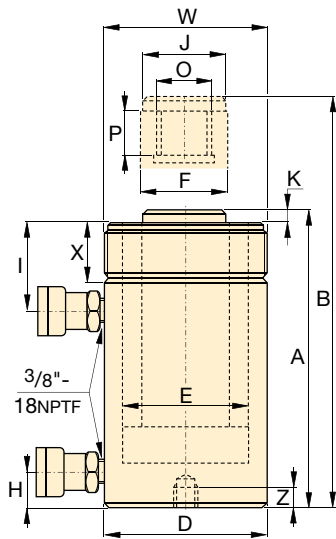
Page: 10

# RR-Series, Double-Acting Cylinders

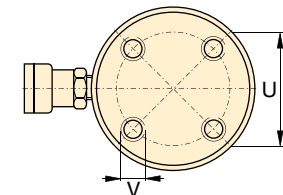


### RR-1010 to RR-3014 models

\* For RR-1010 and RR-1012:  
N = 1.26 inch; for RR-308 and  
RR-3014: N = 2.20 inch.



### RR-506 to RR-50048 models



### RR-1006 to RR-30048

**No mounting holes:**  
RR-506, 5013  
RR-756, 7513  
RR-1502, 15032



Cylinder retract capacity for certain RR cylinders may be less than theoretical values, as a result of reduced relief valve pressure settings:

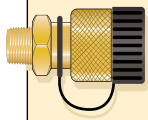
RR-308/3014: 4000 psi  
RR-506/5013/5020: 6950 psi  
RR-756/7513: 7200 psi

◀ For full features see page 32.

| Cylinder Capacity<br>(ton) | Stroke<br>(in) | Model Number | Max. Cylinder Capacity<br>(tons) |        | Cylinder Effective Area<br>(in <sup>2</sup> ) |       | Oil Capacity<br>(in <sup>3</sup> ) |        | Collap. Height | Ext. Height | Outside Diam. |
|----------------------------|----------------|--------------|----------------------------------|--------|---|-------|------------------------------------|--------|----------------|-------------|---------------|
|                            |                |              | Push                             | Pull   | Push  | Pull  | Push                               | Pull   | A              | B           | D             |
|                            |                |              |                                  |        |   |       |                                    |        | (in)           | (in)        | (in)          |
| 10                         | 10.00          | RR-1010*     | 11.1                             | 4.0    | 2.23  | .80   | 22.33                              | 8.00   | 16.13          | 26.13       | 2.88          |
|                            | 12.00          | RR-1012*     | 11.1                             | 4.0    | 2.23  | .80   | 26.80                              | 9.00   | 18.00          | 30.00       | 2.88          |
| 30                         | 8.25           | RR-308*      | 32.5                             | 6.0    | 6.51  | 3.00  | 53.67                              | 25.00  | 15.25          | 23.50       | 4.00          |
|                            | 14.50          | RR-3014*     | 32.5                             | 6.0    | 6.51  | 3.00  | 92.70                              | 43.00  | 21.63          | 36.13       | 4.00          |
| 50                         | 6.13           | RR-506       | 55.3                             | 11.8   | 11.06   | 3.40  | 67.77                              | 21.00  | 13.06          | 19.19       | 5.00          |
|                            | 13.13          | RR-5013      | 55.3                             | 11.8   | 11.06   | 3.40  | 145.17                             | 44.00  | 20.06          | 33.19       | 5.00          |
|                            | 20.13          | RR-5020      | 55.3                             | 11.8   | 11.06   | 3.40  | 222.56                             | 68.00  | 28.88          | 49.00       | 5.00          |
| 75                         | 6.13           | RR-756       | 79.6                             | 17.6   | 15.92   | 4.90  | 97.58                              | 29.00  | 13.69          | 19.81       | 5.75          |
|                            | 13.13          | RR-7513      | 79.6                             | 17.6   | 15.92   | 4.90  | 209.00                             | 64.00  | 20.69          | 33.81       | 5.75          |
| 100                        | 6.63           | RR-1006      | 103.2                            | 48.0   | 20.65   | 9.60  | 136.93                             | 63.00  | 14.06          | 20.69       | 7.00          |
|                            | 13.13          | RR-10013     | 103.2                            | 48.0   | 20.65   | 9.60  | 271.17                             | 126.00 | 20.63          | 33.75       | 7.00          |
|                            | 18.13          | RR-10018     | 103.2                            | 48.0   | 20.65   | 9.60  | 374.44                             | 174.00 | 27.06          | 45.19       | 7.00          |
| 150                        | 2.25           | RR-1502      | 153.5                            | 30.0   | 30.71   | 14.80 | 69.11                              | 33.00  | 7.19           | 9.44        | 8.00          |
|                            | 6.13           | RR-1506      | 153.5                            | 74.0   | 30.71   | 14.80 | 188.28                             | 91.00  | 15.19          | 21.31       | 8.00          |
|                            | 13.13          | RR-15013     | 153.5                            | 74.0   | 30.71   | 14.80 | 403.27                             | 194.00 | 22.20          | 35.31       | 8.00          |
|                            | 32.13          | RR-15032     | 153.5                            | 74.0   | 30.71   | 14.80 | 986.84                             | 475.00 | 43.94          | 76.06       | 8.00          |
| 200                        | 6.00           | RR-2006      | 221.0                            | 112.5  | 44.21   | 22.50 | 265.28                             | 135.00 | 16.94          | 22.94       | 9.75          |
|                            | 13.00          | RR-20013     | 221.0                            | 112.5  | 44.21   | 22.50 | 574.78                             | 293.00 | 23.94          | 36.94       | 9.75          |
|                            | 18.00          | RR-20018     | 221.0                            | 112.5  | 44.21   | 22.50 | 795.85                             | 396.00 | 30.13          | 48.13       | 9.75          |
|                            | 24.00          | RR-20024     | 221.0                            | 112.5  | 44.21   | 22.50 | 1,061                              | 528.00 | 36.13          | 60.13       | 9.75          |
|                            | 36.00          | RR-20036     | 221.0                            | 112.5  | 44.21   | 22.50 | 1,592                              | 792.00 | 48.13          | 84.13       | 9.75          |
| 300                        | 48.00          | RR-20048     | 221.0                            | 112.5  | 44.21   | 22.50 | 2,122                              | 1,056  | 60.13          | 108.13      | 9.75          |
|                            | 6.00           | RR-3006      | 354.6                            | 190.0  | 70.93   | 38.00 | 425.56                             | 228.00 | 19.13          | 25.13       | 12.25         |
|                            | 12.00          | RR-30012     | 354.6                            | 190.0  | 70.93   | 38.00 | 851.12                             | 456.00 | 25.13          | 37.13       | 12.25         |
|                            | 18.00          | RR-30018     | 354.6                            | 190.0  | 70.93   | 38.00 | 1,277                              | 684.00 | 31.13          | 49.13       | 12.25         |
|                            | 24.00          | RR-30024     | 354.6                            | 190.0  | 70.93   | 38.00 | 1,702                              | 912.00 | 37.13          | 61.13       | 12.25         |
| 400                        | 36.00          | RR-30036     | 354.6                            | 190.0  | 70.93   | 38.00 | 2,553                              | 1368   | 49.13          | 85.13       | 12.25         |
|                            | 48.00          | RR-30048     | 354.6                            | 190.0  | 70.93   | 38.00 | 3,405                              | 1824   | 61.13          | 109.13      | 12.25         |
|                            | 6.00           | RR-4006      | 475.4                            | 255.0  | 95.09   | 51.00 | 570.51                             | 306.00 | 21.19          | 27.19       | 14.13         |
|                            | 12.00          | RR-40012     | 475.4                            | 255.0  | 95.09   | 51.00 | 1,141                              | 612.00 | 27.19          | 39.19       | 14.13         |
|                            | 18.00          | RR-40018     | 475.4                            | 255.0  | 95.09   | 51.00 | 1,712                              | 918.00 | 33.19          | 51.19       | 14.13         |
| 500                        | 24.00          | RR-40024     | 475.4                            | 255.0  | 95.09   | 51.00 | 2,282                              | 1224   | 39.19          | 63.19       | 14.13         |
|                            | 36.00          | RR-40036     | 475.4                            | 255.0  | 95.09   | 51.00 | 3,423                              | 1836   | 51.19          | 87.19       | 14.13         |
|                            | 48.00          | RR-40048     | 475.4                            | 255.0  | 95.09   | 51.00 | 4,564                              | 2448   | 63.19          | 111.19      | 14.13         |
|                            | 6.00           | RR-5006      | 565.7                            | 315.0  | 113.15  | 63.00 | 678.92                             | 378.00 | 22.75          | 28.75       | 15.63         |
|                            | 12.00          | RR-50012     | 565.7                            | 315.0  | 113.15  | 63.00 | 1,358                              | 756.00 | 28.75          | 40.75       | 15.63         |
| 500                        | 18.00          | RR-50018     | 565.7                            | 315.0  | 113.15  | 63.00 | 2,037                              | 1134   | 34.75          | 52.75       | 15.63         |
|                            | 24.00          | RR-50024     | 565.7                            | 315.0  | 113.15  | 63.00 | 2,716                              | 1512   | 40.75          | 64.75       | 15.63         |
|                            | 36.00          | RR-50036     | 565.7                            | 315.0  | 113.15  | 63.00 | 4,074                              | 2268   | 52.75          | 88.75       | 15.63         |
| 48.00                      | RR-50048       | 565.7        | 315.0                            | 113.15 | 63.00   | 5,431 | 3024                               | 64.75  | 112.75         | 15.63       |               |

\* For RR-1010 and RR-1012: N = 1.26 inch; for RR-308 and RR-3014: N = 2.20 inch.

# Double-Acting Long Stroke Cylinders



**Couplers Included!**  
CR-400 couplers included on all models. Fits all HC-Series hoses.

Capacity:  
**10-500 tons**

Stroke:  
**2.25-48.00 inches**

Maximum Operating Pressure:  
**10,000 psi**

**RR Series**



| Cylinder Bore Diameter | Plunger Diameter | Base to Adv. Port | Top to Return Port | Saddle Diameter | Saddle Protrusion from Plngr. | Plunger Internal Thread | Plunger Thread Length | Base Mounting Holes |         |              | Collar Thread | Collar Thread Length | Weight (lbs) | Model Number |
|------------------------|------------------|-------------------|--------------------|-----------------|-------------------------------|-------------------------|-----------------------|---------------------|---------|--------------|---------------|----------------------|--------------|--------------|
|                        |                  |                   |                    |                 |                               |                         |                       | Bolt Cir. Diam.     | Thread  | Thread Depth |               |                      |              |              |
| E (in)                 | F (in)           | H (in)            | I (in)             | J (in)          | K (in)                        | O (in)                  | P (in)                | U (in)              | V (in)  | Z (in)       | W (in)        | X (in)               |              |              |
| 1.69                   | 1.38             | 1.44              | 2.25               | 1.38            | .24                           | 1-8                     | 1.00                  | -                   | -       | -            | 2 1/4-14      | 1.06                 | 28           | RR-1010*     |
| 1.69                   | 1.38             | 1.44              | 2.25               | 1.38            | .24                           | 1-8                     | 1.00                  | -                   | -       | -            | 2 1/4-14      | 1.06                 | 31           | RR-1012*     |
| 2.88                   | 2.13             | 1.44              | 3.19               | 2.00            | .41                           | 1 1/2-16                | 1.00                  | -                   | -       | -            | 3 5/16-12     | 1.94                 | 40           | RR-308*      |
| 2.88                   | 2.13             | 1.56              | 3.19               | 2.00            | .41                           | 1 1/2-16                | 1.00                  | -                   | -       | -            | 3 5/16-12     | 1.94                 | 64           | RR-3014*     |
| 3.75                   | 3.13             | 1.13              | 3.00               | 2.81            | .11                           | 1-12                    | 1.00                  | -                   | -       | -            | 5-12          | 2.00                 | 67           | RR-506       |
| 3.75                   | 3.13             | 1.13              | 3.00               | 2.81            | .11                           | 1-12                    | 1.00                  | -                   | -       | -            | 5-12          | 2.00                 | 115          | RR-5013      |
| 3.75                   | 3.13             | 2.25              | 3.00               | 2.81            | .11                           | 1-12                    | 1.00                  | 3.00                | -       | -            | 5-12          | 2.00                 | 150          | RR-5020      |
| 4.50                   | 3.75             | 1.19              | 3.00               | 2.81            | .25                           | 1-12                    | 1.50                  | -                   | -       | -            | 5 3/4-12      | 1.50                 | 92           | RR-756       |
| 4.50                   | 3.75             | 1.19              | 3.19               | 2.81            | .25                           | 1-12                    | 1.50                  | -                   | -       | -            | 5 3/4-12      | 1.50                 | 150          | RR-7513      |
| 5.13                   | 3.75             | 1.50              | 2.81               | 3.00            | .13                           | 1 3/4-12                | 1.38                  | 5.50                | 3/4-10  | 1.00         | 6 7/8-12      | 2.00                 | 135          | RR-1006      |
| 5.13                   | 3.75             | 1.50              | 2.81               | 3.00            | .13                           | 1 3/4-12                | 1.38                  | 5.50                | 3/4-10  | 1.00         | 6 7/8-12      | 2.00                 | 205          | RR-10013     |
| 5.13                   | 3.75             | 1.63              | 3.63               | 3.00            | .13                           | 1 3/4-12                | 1.38                  | 5.50                | 3/4-10  | 1.00         | 6 7/8-12      | 2.00                 | 260          | RR-10018     |
| 6.25                   | 4.50             | .88               | 2.63               | 3.67            | .06                           | -                       | -                     | -                   | -       | -            | -             | -                    | 110          | RR-1502      |
| 6.25                   | 4.50             | 1.94              | 3.31               | 4.49            | .75                           | 3 3/8-16                | 1.38                  | 6.25                | 3/4-16  | 1.00         | 8-12          | 2.36                 | 205          | RR-1506      |
| 6.25                   | 4.50             | 1.94              | 3.31               | 4.49            | .75                           | 3 3/8-16                | 1.38                  | 6.25                | 3/4-16  | 1.00         | 8-12          | 2.36                 | 275          | RR-15013     |
| 6.25                   | 4.50             | 3.31              | 3.31               | 4.49            | .75                           | 3 3/8-16                | 1.38                  | -                   | -       | -            | 8-12          | 2.36                 | 525          | RR-15032     |
| 7.50                   | 5.25             | 2.25              | 3.81               | 5.25            | .88                           | -                       | -                     | 5.00                | 1-8     | 1.00         | -             | -                    | 325          | RR-2006      |
| 7.50                   | 5.25             | 2.25              | 3.81               | 5.25            | .88                           | 2 1/2-12                | 2.50                  | 5.00                | 1-8     | 1.00         | 9 3/4-12      | 2.13                 | 440          | RR-20013     |
| 7.50                   | 5.25             | 3.38              | 4.00               | 5.25            | .88                           | 2 1/2-12                | 2.50                  | 5.00                | 1-8     | 1.00         | 9 3/4-12      | 2.13                 | 450          | RR-20018     |
| 7.50                   | 5.25             | 3.38              | 4.00               | 5.25            | .88                           | 2 1/2-12                | 2.50                  | 5.00                | 1-8     | 1.00         | 9 3/4-12      | 2.13                 | 616          | RR-20024     |
| 7.50                   | 5.25             | 3.38              | 4.00               | 5.25            | .88                           | 2 1/2-12                | 2.50                  | 5.00                | 1-8     | 1.00         | 9 3/4-12      | 2.13                 | 845          | RR-20036     |
| 7.50                   | 5.25             | 3.38              | 4.00               | 5.25            | .88                           | 2 1/2-12                | 2.50                  | 5.00                | 1-8     | 1.00         | 9 3/4-12      | 2.13                 | 1065         | RR-20048     |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 441          | RR-3006      |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 608          | RR-30012     |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 776          | RR-30018     |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 1034         | RR-30024     |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 1385         | RR-30036     |
| 9.50                   | 6.50             | 3.50              | 4.50               | 6.50            | 1.13                          | 2 1/2-12                | 3.25                  | 6.25                | 1 1/4-7 | 1.75         | 12 1/4-12     | 2.31                 | 1720         | RR-30048     |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 670          | RR-4006      |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 880          | RR-40012     |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 1000         | RR-40018     |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 1317         | RR-40024     |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 1746         | RR-40036     |
| 11.00                  | 7.50             | 4.25              | 5.25               | 7.50            | 1.13                          | 3-12                    | 3.75                  | 8.00                | 1 1/2-6 | 2.00         | 14 1/8-8      | 2.56                 | 2162         | RR-40048     |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 953          | RR-5006      |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 1300         | RR-50012     |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 1500         | RR-50018     |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 1800         | RR-50024     |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 2210         | RR-50036     |
| 12.00                  | 8.00             | 4.75              | 6.00               | 8.00            | 1.13                          | 3 1/4-12                | 4.25                  | 8.00                | 1 3/4-5 | 2.12         | 15 5/8-8      | 3.13                 | 2700         | RR-50048     |

▼ Shown from left to right: CLSG-1506, CLSG-2006, CLSG-506



## The Single-Acting Heavy Lifting Solution with Integral Stop Ring

- Integral stop ring provides piston blow-out protection
- Baked enamel outside finish and plated pistons provide superior corrosion protection
- Base mounting holes standard on all models
- Plunger wiper reduces contamination, extending cylinder life
- Single-acting load return

▼ Eight CLSG-2506 cylinders equipped with tilting saddles lifted the planking of the bridge as the pier heads were being rebuilt.



### Saddles

All CLSG-Series cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see selection chart.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

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### Optimum Performance

Enerpac's range of Z-Class electric pumps, fitted with manual or solenoid operated 3-way valves, offer optimum combinations with CLSG cylinders.

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### Low Height - High Tonnage

When low height with high force is required, CLP-Series Pancake Cylinders with lock nut offer the solution to lift the first few inches.

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# Single-Acting, High Tonnage Cylinders

## ▼ QUICK SELECTION CHART

For complete technical information see next page.

| Cylinder Capacity<br>(ton)<br>[maximum] | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) | Collapsed Height<br>(in) | Weight<br>(lbs) |
|---|----------------|--------------|---|------------------------------------|--------------------------|-----------------|
| 50<br>[59.1]                            | 1.97           | CLSG-502     | 11.81   | 23.25                              | 6.38                     | 37              |
|   | 3.94           | CLSG-504     | 11.81   | 46.50                              | 8.35                     | 44              |
|   | 5.91           | CLSG-506     | 11.81   | 69.75                              | 10.31                    | 51              |
|   | 7.87           | CLSG-508     | 11.81   | 93.00                              | 12.28                    | 60              |
|   | 9.84           | CLSG-5010    | 11.81   | 116.25                             | 14.25                    | 68              |
|   | 11.81          | CLSG-5012    | 11.81   | 139.50                             | 16.22                    | 75              |
| 100<br>[102.9]                          | 1.97           | CLSG-1002    | 20.57   | 40.50                              | 7.16                     | 42              |
|   | 3.94           | CLSG-1004    | 20.57   | 81.00                              | 9.13                     | 64              |
|   | 5.91           | CLSG-1006    | 20.57   | 121.50                             | 11.09                    | 88              |
|   | 7.87           | CLSG-1008    | 20.57   | 162.00                             | 13.06                    | 110             |
|   | 9.84           | CLSG-10010   | 20.57   | 202.50                             | 15.03                    | 134             |
|   | 11.81          | CLSG-10012   | 20.57   | 242.99                             | 17.00                    | 157             |
| 150<br>[153.9]                          | 1.97           | CLSG-1502    | 30.78   | 60.58                              | 7.72                     | 86              |
|   | 3.94           | CLSG-1504    | 30.78   | 121.17                             | 9.69                     | 115             |
|   | 5.91           | CLSG-1506    | 30.78   | 181.75                             | 11.65                    | 143             |
|   | 7.87           | CLSG-1508    | 30.78   | 242.33                             | 13.62                    | 172             |
|   | 9.84           | CLSG-15010   | 30.78   | 302.92                             | 15.59                    | 203             |
|   | 11.81          | CLSG-15012   | 30.78   | 363.50                             | 17.56                    | 231             |
| 200<br>[206.1]                          | 1.97           | CLSG-2002    | 41.22   | 81.13                              | 8.50                     | 121             |
|   | 5.91           | CLSG-2006    | 41.22   | 243.40                             | 12.44                    | 201             |
|   | 11.81          | CLSG-20012   | 41.22   | 486.79                             | 18.35                    | 322             |
| 250<br>[284.0]                          | 1.97           | CLSG-2502    | 56.80   | 111.81                             | 9.25                     | 196             |
|   | 5.91           | CLSG-2506    | 56.80   | 335.42                             | 13.19                    | 300             |
|   | 11.81          | CLSG-25012   | 56.80   | 670.84                             | 19.09                    | 456             |
| 300<br>[353.6]                          | 1.97           | CLSG-3002    | 70.71   | 139.19                             | 12.28                    | 406             |
|   | 5.91           | CLSG-3006    | 70.71   | 417.56                             | 16.22                    | 511             |
|   | 11.81          | CLSG-30012   | 70.71   | 835.11                             | 22.13                    | 668             |
| 400<br>[433.9]                          | 1.97           | CLSG-4002    | 86.78   | 170.84                             | 14.74                    | 595             |
|   | 5.91           | CLSG-4006    | 86.78   | 512.51                             | 18.68                    | 728             |
|   | 11.81          | CLSG-40012   | 86.78   | 1025.02                            | 24.59                    | 928             |
| 500<br>[566.3]                          | 1.97           | CLSG-5002    | 113.25  | 222.92                             | 16.50                    | 884             |
|   | 5.91           | CLSG-5006    | 113.25  | 668.77                             | 20.43                    | 1058            |
|   | 11.81          | CLSG-50012   | 113.25  | 1337.55                            | 26.34                    | 1321            |
| 600<br>[662.9]                          | 1.97           | CLSG-6002    | 132.57  | 260.97                             | 16.89                    | 1045            |
|   | 5.91           | CLSG-6006    | 132.57  | 782.90                             | 20.83                    | 1246            |
|   | 11.81          | CLSG-60012   | 132.57  | 1565.81                            | 26.73                    | 1545            |
| 800<br>[911.6]                          | 1.97           | CLSG-8002    | 182.32  | 358.91                             | 18.66                    | 1634            |
|   | 5.91           | CLSG-8006    | 182.32  | 10776.72                           | 22.60                    | 1941            |
|   | 11.81          | CLSG-80012   | 182.32  | 2153.44                            | 28.50                    | 2332            |
| 1000<br>[1136]                          | 1.97           | CLSG-10002   | 227.19  | 447.23                             | 22.20                    | 2341            |
|   | 5.91           | CLSG-10006   | 227.19  | 1341.68                            | 26.14                    | 2674            |
|   | 11.81          | CLSG-100012  | 227.19  | 2683.35                            | 32.05                    | 3172            |

## CLSG Series



Capacity:

**50-1,000 tons**

Stroke:

**1.97-11.81 inches**

Maximum Operating Pressure:

**10,000 psi**



### Standard Features

- Interchangeable, hardened grooved saddles
- CR-400 Coupler and dust cap
- Top and side mount lifting eye capability
- All cylinders meet ASME B-30.1 and ISO 10100 Standards



### Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact Enerpac for ordering information and dimensional details.



### Lifting an Unbalanced Load

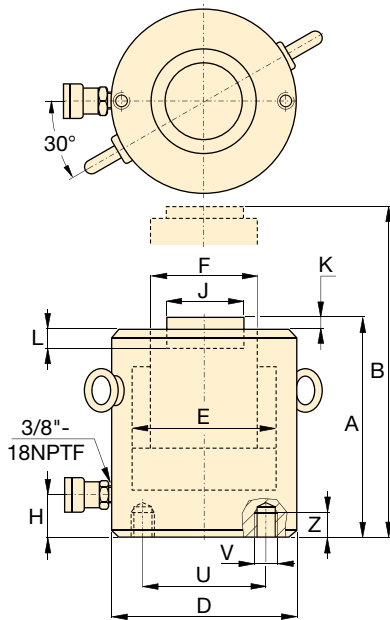
When lifting an unbalanced load **Enerpac Synchronous Lift Systems** can be the solution with multiple lift point capabilities from 4 to 64 points. See our "Yellow Pages" for multi-cylinder set-ups.

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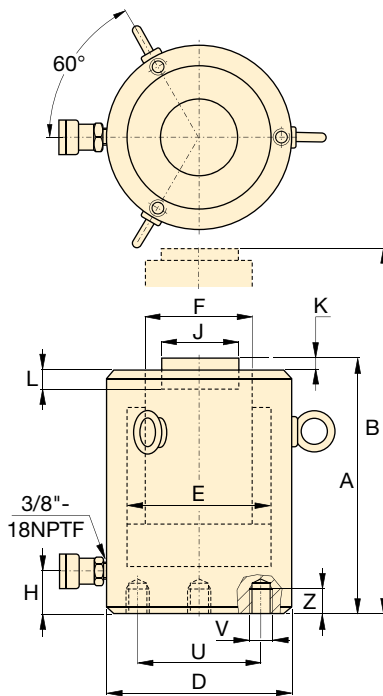


### Mounting Hole Orientation

Top mounting hole orientation is maintained to port location. Base mounting hole orientation is not maintained to port location.



CLSG-50 to CLSG-150 models



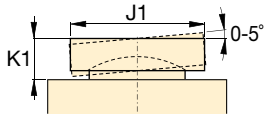
CLSG-200 to CLSG-1000 models

◀ For full features see page 36.

| Cylinder Capacity<br>(ton)<br>[maximum] | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) | Collapsed Height |        | Extended Height<br>B (in) | Outside Diam.<br>D (in) |
|---|----------------|--------------|---|------------------------------------|------------------|--------|---------------------------|-------------------------|
|   |                |              |   |                                    | A (in)           | B (in) |                           |                         |
| 50<br>[59.1]                            | 1.97           | CLSG-502     | 11.81   | 23.25                              | 6.38             | 8.35   | 5.12                      |                         |
|   | 3.94           | CLSG-504     | 11.81   | 46.50                              | 8.35             | 12.28  | 5.12                      |                         |
|   | 5.91           | CLSG-506     | 11.81   | 69.75                              | 10.31            | 16.22  | 5.12                      |                         |
|   | 7.87           | CLSG-508     | 11.81   | 93.00                              | 12.28            | 20.16  | 5.12                      |                         |
|   | 9.84           | CLSG-5010    | 11.81   | 116.25                             | 14.25            | 24.09  | 5.12                      |                         |
|   | 11.81          | CLSG-5012    | 11.81   | 139.50                             | 16.22            | 28.03  | 5.12                      |                         |
| 100<br>[102.9]                          | 1.97           | CLSG-1002    | 20.57   | 40.50                              | 7.16             | 9.13   | 6.50                      |                         |
|   | 3.94           | CLSG-1004    | 20.57   | 81.00                              | 9.13             | 13.06  | 6.50                      |                         |
|   | 5.91           | CLSG-1006    | 20.57   | 121.50                             | 11.09            | 17.00  | 6.50                      |                         |
|   | 7.87           | CLSG-1008    | 20.57   | 162.00                             | 13.06            | 20.94  | 6.50                      |                         |
|   | 9.84           | CLSG-10010   | 20.57   | 202.50                             | 15.03            | 24.87  | 6.50                      |                         |
|   | 11.81          | CLSG-10012   | 20.57   | 242.99                             | 17.00            | 28.81  | 6.50                      |                         |
| 150<br>[153.9]                          | 1.97           | CLSG-1502    | 30.78   | 60.58                              | 7.72             | 9.69   | 8.07                      |                         |
|   | 3.94           | CLSG-1504    | 30.78   | 121.17                             | 9.69             | 13.62  | 8.07                      |                         |
|   | 5.91           | CLSG-1506    | 30.78   | 181.75                             | 11.65            | 17.56  | 8.07                      |                         |
|   | 7.87           | CLSG-1508    | 30.78   | 242.33                             | 13.62            | 21.50  | 8.07                      |                         |
|   | 9.84           | CLSG-15010   | 30.78   | 302.92                             | 15.59            | 25.43  | 8.07                      |                         |
|   | 11.81          | CLSG-15012   | 30.78   | 363.50                             | 17.56            | 29.37  | 8.07                      |                         |
| 200<br>[206.1]                          | 1.97           | CLSG-2002    | 41.22   | 81.13                              | 8.50             | 10.47  | 9.25                      |                         |
|   | 5.91           | CLSG-2006    | 41.22   | 243.40                             | 12.44            | 18.35  | 9.25                      |                         |
|   | 11.81          | CLSG-20012   | 41.22   | 486.79                             | 18.35            | 30.16  | 9.25                      |                         |
| 250<br>[284.0]                          | 1.97           | CLSG-2502    | 56.80   | 111.81                             | 9.25             | 11.22  | 10.83                     |                         |
|   | 5.91           | CLSG-2506    | 56.80   | 335.42                             | 13.19            | 19.09  | 10.83                     |                         |
|   | 11.81          | CLSG-25012   | 56.80   | 670.84                             | 19.09            | 30.91  | 10.83                     |                         |
| 300<br>[353.6]                          | 1.97           | CLSG-3002    | 70.71   | 139.19                             | 12.28            | 14.25  | 12.20                     |                         |
|   | 5.91           | CLSG-3006    | 70.71   | 417.56                             | 16.22            | 22.13  | 12.20                     |                         |
|   | 11.81          | CLSG-30012   | 70.71   | 835.11                             | 22.13            | 33.94  | 12.20                     |                         |
| 400<br>[433.9]                          | 1.97           | CLSG-4002    | 86.78   | 170.84                             | 14.74            | 16.71  | 13.78                     |                         |
|   | 5.91           | CLSG-4006    | 86.78   | 512.51                             | 18.68            | 24.59  | 13.78                     |                         |
|   | 11.81          | CLSG-40012   | 86.78   | 1025.02                            | 24.59            | 36.40  | 13.78                     |                         |
| 500<br>[566.3]                          | 1.97           | CLSG-5002    | 113.25  | 222.92                             | 16.50            | 18.46  | 15.75                     |                         |
|   | 5.91           | CLSG-5006    | 113.25  | 668.77                             | 20.43            | 26.34  | 15.75                     |                         |
|   | 11.81          | CLSG-50012   | 113.25  | 1337.55                            | 26.34            | 38.15  | 15.75                     |                         |
| 600<br>[662.9]                          | 1.97           | CLSG-6002    | 132.57  | 260.97                             | 16.89            | 18.86  | 16.93                     |                         |
|   | 5.91           | CLSG-6006    | 132.57  | 782.90                             | 20.83            | 26.73  | 16.93                     |                         |
|   | 11.81          | CLSG-60012   | 132.57  | 1565.81                            | 26.73            | 38.54  | 16.93                     |                         |
| 800<br>[911.6]                          | 1.97           | CLSG-8002    | 182.32  | 358.91                             | 18.66            | 20.63  | 19.88                     |                         |
|   | 5.91           | CLSG-8006    | 182.32  | 1076.72                            | 22.60            | 28.50  | 19.88                     |                         |
|   | 11.81          | CLSG-80012   | 182.32  | 2153.44                            | 28.50            | 40.31  | 19.88                     |                         |
| 1000<br>[1136]                          | 1.97           | CLSG-10002   | 227.19  | 447.23                             | 22.20            | 24.17  | 22.05                     |                         |
|   | 5.91           | CLSG-10006   | 227.19  | 1341.68                            | 26.14            | 32.05  | 22.05                     |                         |
|   | 11.81          | CLSG-100012  | 227.19  | 2683.35                            | 32.05            | 43.86  | 22.05                     |                         |

# Single-Acting, High Tonnage Cylinders

## Optional Tilt Saddle \*



Capacity:  
**50-1,000 tons**

Stroke:  
**1.97-11.81 inches**

Maximum Operating Pressure:  
**10,000 psi**

**CLSG**  
Series



| Cylinder Bore Diam.<br>E<br>(in) | Plunger Diam.<br>F<br>(in) | Base to Advance Port<br>H<br>(in) | Standard Saddle Diam.<br>J<br>(in) | Saddle Protrusion from Plngr.<br>K<br>(in) | Depth of Plunger Hole<br>L<br>(in) | Base Mounting Holes          |                     |                           | Weight<br>(lbs) | Model Number | * Optional Tilt Saddle |                      |              |
|----------------------------------|----------------------------|-----------------------------------|------------------------------------|--|------------------------------------|------------------------------|---------------------|---------------------------|-----------------|--------------|------------------------|----------------------|--------------|
|                                  |                            |                                   |                                    |  |                                    | Bolt Cir. Diam.<br>U<br>(in) | Thread<br>V<br>(mm) | Thread Depth<br>Z<br>(in) |                 |              | Diam.<br>J1<br>(in)    | Height<br>K1<br>(in) | Model Number |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 37              | CLSG-502     | 1.95                   | .94                  | CATG-50      |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 44              | CLSG-504     | 1.95                   | .94                  | CATG-50      |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 51              | CLSG-506     | 1.95                   | .94                  | CATG-50      |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 60              | CLSG-508     | 1.95                   | .94                  | CATG-50      |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 68              | CLSG-5010    | 1.95                   | .94                  | CATG-50      |
| 3.88                             | 2.76                       | 2.05                              | 1.97                               | .04  | .75                                | 2.56                         | M12                 | .87                       | 75              | CLSG-5012    | 1.95                   | .94                  | CATG-50      |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 42              | CLSG-1002    | 2.86                   | 1.14                 | CATG-100     |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 64              | CLSG-1004    | 2.86                   | 1.14                 | CATG-100     |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 88              | CLSG-1006    | 2.86                   | 1.14                 | CATG-100     |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 110             | CLSG-1008    | 2.86                   | 1.14                 | CATG-100     |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 134             | CLSG-10010   | 2.86                   | 1.14                 | CATG-100     |
| 5.12                             | 3.74                       | 2.13                              | 2.95                               | .04  | .75                                | 3.74                         | M12                 | .87                       | 157             | CLSG-10012   | 2.86                   | 1.14                 | CATG-100     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 86              | CLSG-1502    | 3.56                   | 1.21                 | CATG-150     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 115             | CLSG-1504    | 3.56                   | 1.21                 | CATG-150     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 143             | CLSG-1506    | 3.56                   | 1.21                 | CATG-150     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 172             | CLSG-1508    | 3.56                   | 1.21                 | CATG-150     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 203             | CLSG-15010   | 3.56                   | 1.21                 | CATG-150     |
| 6.26                             | 4.49                       | 2.40                              | 3.70                               | .04  | .75                                | 5.12                         | M12                 | .87                       | 231             | CLSG-15012   | 3.56                   | 1.21                 | CATG-150     |
| 7.24                             | 5.24                       | 2.62                              | 4.45                               | .04  | .94                                | 6.50                         | M12                 | .87                       | 121             | CLSG-2002    | 4.64                   | 1.37                 | CATG-200     |
| 7.24                             | 5.24                       | 2.62                              | 4.45                               | .04  | .94                                | 6.50                         | M12                 | .87                       | 201             | CLSG-2006    | 4.64                   | 1.37                 | CATG-200     |
| 7.24                             | 5.24                       | 2.62                              | 4.45                               | .04  | .94                                | 6.50                         | M12                 | .87                       | 322             | CLSG-20012   | 4.64                   | 1.37                 | CATG-200     |
| 8.50                             | 6.50                       | 2.87                              | 5.71                               | .04  | .94                                | 7.48                         | M12                 | .87                       | 196             | CLSG-2502    | 5.60                   | 1.81                 | CATG-250     |
| 8.50                             | 6.50                       | 2.87                              | 5.71                               | .04  | .94                                | 7.48                         | M12                 | .87                       | 300             | CLSG-2506    | 5.60                   | 1.81                 | CATG-250     |
| 8.50                             | 6.50                       | 2.87                              | 5.71                               | .04  | .94                                | 7.48                         | M12                 | .87                       | 456             | CLSG-25012   | 5.60                   | 1.81                 | CATG-250     |
| 9.49                             | 7.76                       | 3.98                              | 6.97                               | .04  | .75                                | 7.09                         | M16                 | 1.42                      | 406             | CLSG-3002    | 6.30                   | 2.42                 | CATG-300     |
| 9.49                             | 7.76                       | 3.98                              | 6.97                               | .04  | .75                                | 7.09                         | M16                 | 1.42                      | 511             | CLSG-3006    | 6.30                   | 2.42                 | CATG-300     |
| 9.49                             | 7.76                       | 3.98                              | 6.97                               | .04  | .75                                | 7.09                         | M16                 | 1.42                      | 668             | CLSG-30012   | 6.30                   | 2.42                 | CATG-300     |
| 10.51                            | 8.50                       | 4.49                              | 7.72                               | .12  | 1.06                               | 8.07                         | M16                 | 1.42                      | 595             | CLSG-4002    | 7.59                   | 2.00                 | CATG-400     |
| 10.51                            | 8.50                       | 4.49                              | 7.72                               | .12  | 1.06                               | 8.07                         | M16                 | 1.42                      | 728             | CLSG-4006    | 7.59                   | 2.00                 | CATG-400     |
| 10.51                            | 8.50                       | 4.49                              | 7.72                               | .12  | 1.06                               | 8.07                         | M16                 | 1.42                      | 928             | CLSG-40012   | 7.59                   | 2.00                 | CATG-400     |
| 12.01                            | 9.76                       | 4.49                              | 8.98                               | .12  | 1.06                               | 9.84                         | M24                 | 1.50                      | 884             | CLSG-5002    | 8.98                   | 2.48                 | CATG-500     |
| 12.01                            | 9.76                       | 4.49                              | 8.98                               | .12  | 1.06                               | 9.84                         | M24                 | 1.50                      | 1058            | CLSG-5006    | 8.98                   | 2.48                 | CATG-500     |
| 12.01                            | 9.76                       | 4.49                              | 8.98                               | .12  | 1.06                               | 9.84                         | M24                 | 1.50                      | 1321            | CLSG-50012   | 8.98                   | 2.48                 | CATG-500     |
| 12.99                            | 10.51                      | 4.49                              | 9.72                               | .12  | 1.06                               | 10.83                        | M24                 | 1.50                      | 1045            | CLSG-6002    | 9.47                   | 2.99                 | CATG-600     |
| 12.99                            | 10.51                      | 4.49                              | 9.72                               | .12  | 1.06                               | 10.83                        | M24                 | 1.50                      | 1246            | CLSG-6006    | 9.47                   | 2.99                 | CATG-600     |
| 12.99                            | 10.51                      | 4.49                              | 9.72                               | .12  | 1.06                               | 10.83                        | M24                 | 1.50                      | 1545            | CLSG-60012   | 9.47                   | 2.99                 | CATG-600     |
| 15.24                            | 12.48                      | 5.87                              | 11.69                              | .12  | 1.06                               | 12.99                        | M24                 | 1.50                      | 1634            | CLSG-8002    | 11.28                  | 2.94                 | CATG-800     |
| 15.24                            | 12.48                      | 5.87                              | 11.69                              | .12  | 1.06                               | 12.99                        | M24                 | 1.50                      | 1914            | CLSG-8006    | 11.28                  | 2.94                 | CATG-800     |
| 15.24                            | 12.48                      | 5.87                              | 11.69                              | .12  | 1.06                               | 12.99                        | M24                 | 1.50                      | 2332            | CLSG-80012   | 11.28                  | 2.94                 | CATG-800     |
| 17.01                            | 13.50                      | 6.85                              | 12.72                              | .12  | 1.06                               | 14.76                        | M24                 | 1.50                      | 2341            | CLSG-10002   | 12.35                  | 3.65                 | CATG-1000    |
| 17.01                            | 13.50                      | 6.85                              | 12.72                              | .12  | 1.06                               | 14.76                        | M24                 | 1.50                      | 2674            | CLSG-10006   | 12.35                  | 3.65                 | CATG-1000    |
| 17.01                            | 13.50                      | 6.85                              | 12.72                              | .12  | 1.06                               | 14.76                        | M24                 | 1.50                      | 3172            | CLSG-100012  | 12.35                  | 3.65                 | CATG-1000    |



▼ Shown from left to right: CLRG-506, CLRG-2006, CLRG-1506



## Double-Acting Power Lifters



### Saddles

All CLRG cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see selection chart.

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### Safety Device

A pilot-operated check valve (**V-42**) can be inserted between cylinder ports.

This valve provides a safety lock on the cylinder under load at any position and remote control for unlocking.

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### Optimum Performance

Enerpac's range of Z-Class electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with CLRG cylinders.

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- Integral stop ring provides piston blow-out protection
- Double-acting for positive retraction
- Baked enamel outside finish and plated pistons provide superior corrosion resistance
- Safety valve in retract side of cylinder helps to prevent damage in case of accidental over-pressurization
- Interchangeable, hardened grooved saddles are standard
- Plunger wiper reduces contamination, extending cylinder life

▼ CLRG-Series cylinders supported and positioned these automobile deck elements.



▼ Replacing adjustment rolls under a fly-over with CLRG cylinders, for controlled lifting and lowering.



# Double-Acting, High Tonnage Cylinders

## ▼ QUICK SELECTION CHART

For complete technical information see next page.

| Cylinder Capacity<br>(ton) | Stroke<br>(in) | Model Number | Cylinder Effective Area |       | Oil Capacity       |        | Collapsed Height<br>(in) |
|----------------------------|----------------|--------------|-------------------------|-------|--------------------|--------|--------------------------|
|                            |                |              | (in <sup>2</sup> )      |       | (in <sup>3</sup> ) |        |                          |
|                            |                |              | Push                    | Pull  | Push               | Pull   |                          |
| 50                         | 1.97           | CLRG-502     | 11.81                   | 5.85  | 23.25              | 11.51  | 6.38                     |
|                            | 3.94           | CLRG-504     | 11.81                   | 5.85  | 46.50              | 23.02  | 8.35                     |
|                            | 5.91           | CLRG-506     | 11.81                   | 5.85  | 69.75              | 34.52  | 10.31                    |
|                            | 7.87           | CLRG-508     | 11.81                   | 5.85  | 93.00              | 46.03  | 12.28                    |
|                            | 9.84           | CLRG-5010    | 11.81                   | 5.85  | 116.25             | 57.54  | 14.25                    |
|                            | 11.81          | CLRG-5012    | 11.81                   | 5.85  | 139.50             | 69.05  | 16.22                    |
| 100                        | 1.97           | CLRG-1002    | 20.57                   | 9.59  | 40.50              | 18.87  | 7.16                     |
|                            | 3.94           | CLRG-1004    | 20.57                   | 9.59  | 81.00              | 37.74  | 9.13                     |
|                            | 5.91           | CLRG-1006    | 20.57                   | 9.59  | 121.50             | 56.61  | 11.09                    |
|                            | 7.87           | CLRG-1008    | 20.57                   | 9.59  | 162.00             | 75.49  | 13.06                    |
|                            | 9.84           | CLRG-10010   | 20.57                   | 9.59  | 202.50             | 94.36  | 15.03                    |
|                            | 11.81          | CLRG-10012   | 20.57                   | 9.59  | 242.99             | 113.23 | 17.00                    |
| 150                        | 1.97           | CLRG-1502    | 30.78                   | 14.96 | 60.58              | 29.44  | 7.72                     |
|                            | 3.94           | CLRG-1504    | 30.78                   | 14.96 | 121.17             | 58.88  | 9.69                     |
|                            | 5.91           | CLRG-1506    | 30.78                   | 14.96 | 181.75             | 88.32  | 11.65                    |
|                            | 7.87           | CLRG-1508    | 30.78                   | 14.96 | 242.33             | 117.76 | 13.62                    |
|                            | 9.84           | CLRG-15010   | 30.78                   | 14.96 | 302.92             | 147.20 | 15.59                    |
|                            | 11.81          | CLRG-15012   | 30.78                   | 14.96 | 363.50             | 176.64 | 17.56                    |
| 200                        | 1.97           | CLRG-2002    | 41.22                   | 19.68 | 81.13              | 38.74  | 8.50                     |
|                            | 5.91           | CLRG-2006    | 41.22                   | 19.68 | 243.40             | 116.23 | 12.44                    |
|                            | 11.81          | CLRG-20012   | 41.22                   | 19.68 | 486.79             | 232.46 | 18.35                    |
| 250                        | 1.97           | CLRG-2502    | 56.80                   | 23.65 | 111.81             | 46.56  | 9.25                     |
|                            | 5.91           | CLRG-2506    | 56.80                   | 23.65 | 335.42             | 139.69 | 13.19                    |
|                            | 11.81          | CLRG-25012   | 56.80                   | 23.65 | 670.84             | 279.39 | 19.09                    |
| 300                        | 1.97           | CLRG-3002    | 70.71                   | 23.46 | 139.19             | 46.18  | 12.28                    |
|                            | 5.91           | CLRG-3006    | 70.71                   | 23.46 | 417.56             | 138.55 | 16.22                    |
|                            | 11.81          | CLRG-30012   | 70.71                   | 23.46 | 835.11             | 277.10 | 22.13                    |
| 400                        | 1.97           | CLRG-4002    | 86.79                   | 29.99 | 170.84             | 59.03  | 14.74                    |
|                            | 5.91           | CLRG-4006    | 86.79                   | 29.99 | 512.51             | 177.09 | 18.68                    |
|                            | 11.81          | CLRG-40012   | 86.79                   | 29.99 | 1,025              | 354.18 | 24.59                    |
| 500                        | 1.97           | CLRG-5002    | 113.25                  | 38.37 | 222.92             | 75.54  | 16.50                    |
|                            | 5.91           | CLRG-5006    | 113.25                  | 38.37 | 668.77             | 226.61 | 20.43                    |
|                            | 11.81          | CLRG-50012   | 113.25                  | 38.37 | 1,338              | 453.22 | 26.34                    |
| 600                        | 1.97           | CLRG-6002    | 132.57                  | 45.79 | 260.97             | 90.13  | 16.89                    |
|                            | 5.91           | CLRG-6006    | 132.57                  | 45.79 | 782.90             | 270.39 | 20.83                    |
|                            | 11.81          | CLRG-60012   | 132.57                  | 45.79 | 1,566              | 540.79 | 26.73                    |
| 800                        | 1.97           | CLRG-8002    | 182.32                  | 59.99 | 358.91             | 118.09 | 18.66                    |
|                            | 5.91           | CLRG-8006    | 182.32                  | 59.99 | 1,077              | 354.28 | 22.60                    |
|                            | 11.81          | CLRG-80012   | 182.32                  | 59.99 | 2,153              | 708.57 | 28.50                    |
| 1000                       | 1.97           | CLRG-10002   | 227.19                  | 83.97 | 447.23             | 165.29 | 22.20                    |
|                            | 5.91           | CLRG-10006   | 227.19                  | 83.97 | 1,342              | 495.87 | 26.14                    |
|                            | 11.81          | CLRG-100012  | 227.19                  | 83.97 | 2,683              | 991.75 | 32.05                    |

## CLRG Series



Capacity:

**50-1,000 tons**

Stroke:

**1.97-11.81 inches**

Maximum Operating Pressure:

**10,000 psi**



### Standard Features

- Interchangeable, hardened grooved saddles
- CR-400 Coupler and dust cap
- Top and side mount lifting eye capability
- All cylinders meet ASME B-30.1 and ISO 10100 Standards



### Pump Selection

A double-acting cylinder must be powered by a pump with a 4-way valve.

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### RR-Series

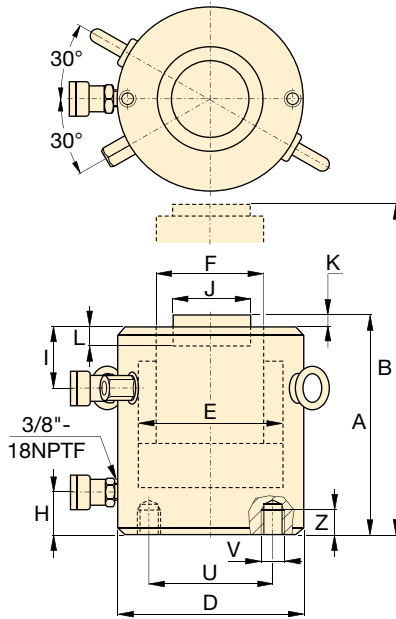
For higher cycle applications, Enerpac RR cylinders are a good alternative.

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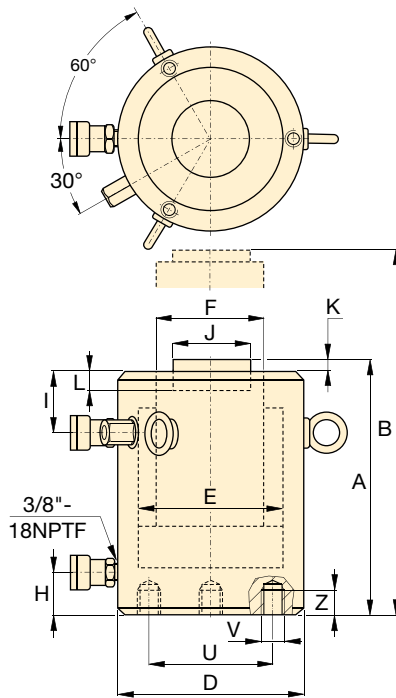


### Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact Enerpac for ordering information.



CLRG-50 to CLRG-150 models



CLRG-200 to CLRG-1000 models



### Mounting Hole Orientation

Top mounting hole orientation is maintained to port location. Base mounting hole orientation is not maintained to port location.

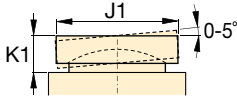
◀ For full features see page 40.

| Cylinder Capacity<br>(ton) | Stroke<br>(in) | Model Number | Maximum Cylinder Capacity<br>(ton) |      | Cylinder Effective Area<br>(in <sup>2</sup> ) |       | Oil Capacity<br>(in <sup>3</sup> ) |        |
|----------------------------|----------------|--------------|------------------------------------|------|---|-------|------------------------------------|--------|
|                            |                |              | Push                               | Pull | Push  | Pull  | Push                               | Pull   |
| 50                         | 1.97           | CLRG-502     | 59.1                               | 29   | 11.81   | 5.85  | 23.25                              | 11.51  |
|                            | 3.94           | CLRG-504     | 59.1                               | 29   | 11.81   | 5.85  | 46.50                              | 23.02  |
|                            | 5.91           | CLRG-506     | 59.1                               | 29   | 11.81   | 5.85  | 69.75                              | 34.52  |
|                            | 7.87           | CLRG-508     | 59.1                               | 29   | 11.81   | 5.85  | 93.00                              | 46.03  |
|                            | 9.84           | CLRG-5010    | 59.1                               | 29   | 11.81   | 5.85  | 116.25                             | 57.54  |
|                            | 11.81          | CLRG-5012    | 59.1                               | 29   | 11.81   | 5.85  | 139.50                             | 69.05  |
| 100                        | 1.97           | CLRG-1002    | 102.9                              | 48   | 20.57   | 9.59  | 40.50                              | 18.87  |
|                            | 3.94           | CLRG-1004    | 102.9                              | 48   | 20.57   | 9.59  | 81.00                              | 37.74  |
|                            | 5.91           | CLRG-1006    | 102.9                              | 48   | 20.57   | 9.59  | 121.50                             | 56.61  |
|                            | 7.87           | CLRG-1008    | 102.9                              | 48   | 20.57   | 9.59  | 162.00                             | 75.49  |
|                            | 9.84           | CLRG-10010   | 102.9                              | 48   | 20.57   | 9.59  | 202.50                             | 94.36  |
|                            | 11.81          | CLRG-10012   | 102.9                              | 48   | 20.57   | 9.59  | 242.99                             | 113.23 |
| 150                        | 1.97           | CLRG-1502    | 153.9                              | 75   | 30.78   | 14.96 | 60.58                              | 29.44  |
|                            | 3.94           | CLRG-1504    | 153.9                              | 75   | 30.78   | 14.96 | 121.17                             | 58.88  |
|                            | 5.91           | CLRG-1506    | 153.9                              | 75   | 30.78   | 14.96 | 181.75                             | 88.32  |
|                            | 7.87           | CLRG-1508    | 153.9                              | 75   | 30.78   | 14.96 | 242.33                             | 117.76 |
|                            | 9.84           | CLRG-15010   | 153.9                              | 75   | 30.78   | 14.96 | 302.92                             | 147.20 |
|                            | 11.81          | CLRG-15012   | 153.9                              | 75   | 30.78   | 14.96 | 363.50                             | 176.64 |
| 200                        | 1.97           | CLRG-2002    | 206.1                              | 98   | 41.22   | 19.68 | 81.13                              | 38.74  |
|                            | 5.91           | CLRG-2006    | 206.1                              | 98   | 41.22   | 19.68 | 243.40                             | 116.23 |
|                            | 11.81          | CLRG-20012   | 206.1                              | 98   | 41.22   | 19.68 | 486.79                             | 232.46 |
| 250                        | 1.97           | CLRG-2502    | 284.0                              | 118  | 56.80   | 23.65 | 111.81                             | 46.56  |
|                            | 5.91           | CLRG-2506    | 284.0                              | 118  | 56.80   | 23.65 | 335.42                             | 139.69 |
|                            | 11.81          | CLRG-25012   | 284.0                              | 118  | 56.80   | 23.65 | 670.84                             | 279.39 |
| 300                        | 1.97           | CLRG-3002    | 353.6                              | 117  | 70.71   | 23.46 | 139.19                             | 46.18  |
|                            | 5.91           | CLRG-3006    | 353.6                              | 117  | 70.71   | 23.46 | 417.56                             | 138.55 |
|                            | 11.81          | CLRG-30012   | 353.6                              | 117  | 70.71   | 23.46 | 835.11                             | 277.10 |
| 400                        | 1.97           | CLRG-4002    | 433.9                              | 150  | 86.79   | 29.99 | 170.84                             | 59.03  |
|                            | 5.91           | CLRG-4006    | 433.9                              | 150  | 86.79   | 29.99 | 512.51                             | 177.09 |
|                            | 11.81          | CLRG-40012   | 433.9                              | 150  | 86.79   | 29.99 | 1,025                              | 354.18 |
| 500                        | 1.97           | CLRG-5002    | 566.3                              | 192  | 113.25  | 38.37 | 222.92                             | 75.54  |
|                            | 5.91           | CLRG-5006    | 566.3                              | 192  | 113.25  | 38.37 | 668.77                             | 226.61 |
|                            | 11.81          | CLRG-50012   | 566.3                              | 192  | 113.25  | 38.37 | 1,338                              | 453.22 |
| 600                        | 1.97           | CLRG-6002    | 662.9                              | 229  | 132.57  | 45.79 | 260.97                             | 90.13  |
|                            | 5.91           | CLRG-6006    | 662.9                              | 229  | 132.57  | 45.79 | 782.90                             | 270.39 |
| 800                        | 1.97           | CLRG-8002    | 911.6                              | 300  | 182.32  | 59.99 | 358.91                             | 118.09 |
|                            | 5.91           | CLRG-8006    | 911.6                              | 300  | 182.32  | 59.99 | 1,077                              | 354.28 |
|                            | 11.81          | CLRG-80012   | 911.6                              | 300  | 182.32  | 59.99 | 2,153                              | 708.57 |
| 1000                       | 1.97           | CLRG-10002   | 1136                               | 420  | 227.19  | 83.97 | 447.23                             | 165.29 |
|                            | 5.91           | CLRG-10006   | 1136                               | 420  | 227.19  | 83.97 | 1,342                              | 495.87 |
|                            | 11.81          | CLRG-100012  | 1136                               | 420  | 227.19  | 83.97 | 2,683                              | 991.75 |

| Base Mounting Hole Dimensions (in) |               |                    |                        |
|------------------------------------|---------------|--------------------|------------------------|
| Model / Capacity ton               | Bolt Circle U | Thread Size V (mm) | Minimum Thread Depth Z |
| CLRG-50                            | 2.56          | M12                | .87                    |
| CLRG-100                           | 3.74          | M12                | .87                    |
| CLRG-150                           | 5.12          | M12                | .87                    |
| CLRG-200                           | 6.50          | M12                | .87                    |
| CLRG-250                           | 7.48          | M12                | .87                    |
| CLRG-300                           | 7.09          | M16                | 1.42                   |
| CLRG-400                           | 8.07          | M16                | 1.42                   |
| CLRG-500                           | 9.84          | M24                | 1.50                   |
| CLRG-600                           | 10.83         | M24                | 1.50                   |
| CLRG-800                           | 12.99         | M24                | 1.50                   |
| CLRG-1000                          | 14.76         | M24                | 1.50                   |

# Double-Acting, High Tonnage Cylinders

## \* Optional Tilt Saddle



Capacity:

**50-1,000 tons**

Stroke:

**1.97-11.81 inches**

Maximum Operating Pressure:

**10,000 psi**

**CLRG**  
Series



| Collap. Height | Ext. Height | Outside Diam. | Cyl. Bore Diam. | Plunger Diam. | Base to Advance Port | Top to Retract Port | Standard Saddle Diam. | Saddle Protrusion from Plngr. | Depth of Plunger Hole | Weight | Model Number | *Optional Tilt Saddle |         |              |
|----------------|-------------|---------------|-----------------|---------------|----------------------|---------------------|-----------------------|-------------------------------|-----------------------|--------|--------------|-----------------------|---------|--------------|
|                |             |               |                 |               |                      |                     |                       |                               |                       |        |              | Diam.                 | Height  | Model Number |
| A (in)         | B (in)      | D (in)        | E (in)          | F (in)        | H (in)               | I (in)              | J (in)                | K (in)                        | L (in)                | (lbs)  |              | J1 (in)               | K1 (in) |              |
| 6.38           | 8.35        | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 37     | CLRG-502     | 1.95                  | .94     | CATG-50      |
| 8.35           | 12.28       | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 44     | CLRG-504     | 1.95                  | .94     | CATG-50      |
| 10.31          | 16.22       | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 51     | CLRG-506     | 1.95                  | .94     | CATG-50      |
| 12.28          | 20.16       | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 60     | CLRG-508     | 1.95                  | .94     | CATG-50      |
| 14.25          | 24.09       | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 68     | CLRG-5010    | 1.95                  | .94     | CATG-50      |
| 16.22          | 28.03       | 5.12          | 3.88            | 2.76          | 1.65                 | 1.29                | 1.97                  | .04                           | .75                   | 75     | CLRG-5012    | 1.95                  | .94     | CATG-50      |
| 7.16           | 9.13        | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 42     | CLRG-1002    | 2.86                  | 1.14    | CATG-100     |
| 9.13           | 13.06       | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 64     | CLRG-1004    | 2.86                  | 1.14    | CATG-100     |
| 11.09          | 17.00       | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 88     | CLRG-1006    | 2.86                  | 1.14    | CATG-100     |
| 13.06          | 20.94       | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 110    | CLRG-1008    | 2.86                  | 1.14    | CATG-100     |
| 15.03          | 24.87       | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 134    | CLRG-10010   | 2.86                  | 1.14    | CATG-100     |
| 17.00          | 28.81       | 6.50          | 5.12            | 3.74          | 2.13                 | 1.89                | 2.95                  | .04                           | .75                   | 157    | CLRG-10012   | 2.86                  | 1.14    | CATG-100     |
| 7.72           | 9.69        | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 86     | CLRG-1502    | 3.56                  | 1.21    | CATG-150     |
| 9.69           | 13.62       | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 115    | CLRG-1504    | 3.56                  | 1.21    | CATG-150     |
| 11.65          | 17.56       | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 143    | CLRG-1506    | 3.56                  | 1.21    | CATG-150     |
| 13.62          | 21.50       | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 172    | CLRG-1508    | 3.56                  | 1.21    | CATG-150     |
| 15.59          | 25.43       | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 203    | CLRG-15010   | 3.56                  | 1.21    | CATG-150     |
| 17.56          | 29.37       | 8.07          | 6.26            | 4.49          | 2.40                 | 2.22                | 3.70                  | .04                           | .75                   | 231    | CLRG-15012   | 3.56                  | 1.21    | CATG-150     |
| 8.50           | 10.47       | 9.25          | 7.24            | 5.24          | 2.62                 | 2.22                | 4.45                  | .04                           | .94                   | 121    | CLRG-2002    | 4.64                  | 1.37    | CATG-200     |
| 12.44          | 18.35       | 9.25          | 7.24            | 5.24          | 2.62                 | 2.22                | 4.45                  | .04                           | .94                   | 201    | CLRG-2006    | 4.64                  | 1.37    | CATG-200     |
| 18.35          | 30.16       | 9.25          | 7.24            | 5.24          | 2.62                 | 2.22                | 4.45                  | .04                           | .94                   | 322    | CLRG-20012   | 4.64                  | 1.37    | CATG-200     |
| 9.25           | 11.22       | 10.83         | 8.50            | 6.50          | 2.87                 | 3.07                | 5.71                  | .04                           | .94                   | 196    | CLRG-2502    | 5.60                  | 1.81    | CATG-250     |
| 13.19          | 19.09       | 10.83         | 8.50            | 6.50          | 2.87                 | 3.07                | 5.71                  | .04                           | .94                   | 300    | CLRG-2506    | 5.60                  | 1.81    | CATG-250     |
| 19.09          | 30.91       | 10.83         | 8.50            | 6.50          | 2.87                 | 3.07                | 5.71                  | .04                           | .94                   | 456    | CLRG-25012   | 5.60                  | 1.81    | CATG-250     |
| 12.28          | 14.25       | 12.20         | 9.49            | 7.76          | 3.98                 | 2.95                | 6.97                  | .04                           | .75                   | 406    | CLRG-3002    | 6.30                  | 2.42    | CATG-300     |
| 16.22          | 22.13       | 12.20         | 9.49            | 7.76          | 3.98                 | 2.95                | 6.97                  | .04                           | .75                   | 511    | CLRG-3006    | 6.30                  | 2.42    | CATG-300     |
| 22.13          | 33.94       | 12.20         | 9.49            | 7.76          | 3.98                 | 2.95                | 6.97                  | .04                           | .75                   | 668    | CLRG-30012   | 6.30                  | 2.42    | CATG-300     |
| 14.74          | 16.71       | 13.78         | 10.51           | 8.50          | 4.49                 | 4.13                | 7.72                  | .12                           | 1.06                  | 595    | CLRG-4002    | 7.59                  | 2.00    | CATG-400     |
| 18.68          | 24.59       | 13.78         | 10.51           | 8.50          | 4.49                 | 4.13                | 7.72                  | .12                           | 1.06                  | 728    | CLRG-4006    | 7.59                  | 2.00    | CATG-400     |
| 24.59          | 36.40       | 13.78         | 10.51           | 8.50          | 4.49                 | 4.13                | 7.72                  | .12                           | 1.06                  | 928    | CLRG-40012   | 7.59                  | 2.00    | CATG-400     |
| 16.50          | 18.46       | 15.75         | 12.01           | 9.76          | 4.49                 | 5.31                | 8.98                  | .12                           | 1.06                  | 884    | CLRG-5002    | 8.98                  | 2.48    | CATG-500     |
| 20.43          | 26.34       | 15.75         | 12.01           | 9.76          | 4.49                 | 5.31                | 8.98                  | .12                           | 1.06                  | 1058   | CLRG-5006    | 8.98                  | 2.48    | CATG-500     |
| 26.34          | 38.15       | 15.75         | 12.01           | 9.76          | 4.49                 | 5.31                | 8.98                  | .12                           | 1.06                  | 1321   | CLRG-50012   | 8.98                  | 2.48    | CATG-500     |
| 16.89          | 18.86       | 16.93         | 12.99           | 10.51         | 4.49                 | 5.31                | 9.72                  | .12                           | 1.06                  | 1045   | CLRG-6002    | 9.47                  | 2.99    | CATG-600     |
| 20.83          | 26.73       | 16.93         | 12.99           | 10.51         | 4.49                 | 5.31                | 9.72                  | .12                           | 1.06                  | 1246   | CLRG-6006    | 9.47                  | 2.99    | CATG-600     |
| 26.73          | 38.54       | 16.93         | 12.99           | 10.51         | 4.49                 | 5.31                | 9.72                  | .12                           | 1.06                  | 1545   | CLRG-60012   | 9.47                  | 2.99    | CATG-600     |
| 18.66          | 20.63       | 19.88         | 15.24           | 12.48         | 5.87                 | 5.31                | 11.69                 | .12                           | 1.06                  | 1634   | CLRG-8002    | 11.28                 | 2.94    | CATG-800     |
| 22.60          | 28.50       | 19.88         | 15.24           | 12.48         | 5.87                 | 5.31                | 11.69                 | .12                           | 1.06                  | 1914   | CLRG-8006    | 11.28                 | 2.94    | CATG-800     |
| 28.50          | 40.31       | 19.88         | 15.24           | 12.48         | 5.87                 | 5.31                | 11.69                 | .12                           | 1.06                  | 2332   | CLRG-80012   | 11.28                 | 2.94    | CATG-800     |
| 22.20          | 24.17       | 22.05         | 17.01           | 13.50         | 6.85                 | 6.69                | 12.72                 | .12                           | 1.06                  | 2341   | CLRG-10002   | 12.35                 | 3.65    | CATG-1000    |
| 26.14          | 32.05       | 22.05         | 17.01           | 13.50         | 6.85                 | 6.69                | 12.72                 | .12                           | 1.06                  | 2674   | CLRG-10006   | 12.35                 | 3.65    | CATG-1000    |
| 32.05          | 43.86       | 22.05         | 17.01           | 13.50         | 6.85                 | 6.69                | 12.72                 | .12                           | 1.06                  | 3172   | CLRG-100012  | 12.35                 | 3.65    | CATG-1000    |

▼ Shown from left to right: CLL-1006, CLL-2506, CLL-1506, CLL-506



- Safety Lock Nut for mechanical load holding
- Baked enamel outside finish and plated pistons provide superior corrosion resistance
- Overflow port functions as a stroke limiter
- Interchangeable, hardened grooved saddles are standard
- CR-400 coupler and dust cap included on all models
- Single-acting load return

▼ For this curved bridge, CLL-Series cylinders were used to support the concrete beams to level the pierhead and to place 4000 ton slide bearings between pier and pierhead.



## To Secure Loads Mechanically



### Saddles

All CLL cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see the selection chart.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

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### Low Height - High Tonnage

When low height with high force is required, pancake cylinders with lock nut offer the solution to lift the first few inches.

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▼ CLL cylinder, mechanically locked, after positioning the curved bridge.



# Single-Acting, Lock Nut Cylinders

## ▼ QUICK SELECTION CHART

For complete technical information see next page.

| Cylinder Capacity<br>(ton)<br>[maximum] | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) | Collapsed Height<br>(in) | Weight<br>(lbs) |
|---|----------------|--------------|---|------------------------------------|--------------------------|-----------------|
| <b>50</b><br>[59.1]                     | 1.97           | CLL-502      | 10.99   | 21.63                              | 6.46                     | 35              |
|   | 3.94           | CLL-504      | 10.99   | 43.25                              | 8.43                     | 46              |
|   | 5.91           | CLL-506      | 10.99   | 64.88                              | 10.39                    | 57              |
|   | 7.87           | CLL-508      | 10.99   | 86.51                              | 12.36                    | 68              |
|   | 9.84           | CLL-5010     | 10.99   | 108.14                             | 14.33                    | 79              |
|   | 11.81          | CLL-5012     | 10.99   | 129.76                             | 16.30                    | 90              |
| <b>100</b><br>[102.9]                   | 1.97           | CLL-1002     | 20.57   | 40.50                              | 7.36                     | 68              |
|   | 3.94           | CLL-1004     | 20.57   | 81.00                              | 9.33                     | 87              |
|   | 5.91           | CLL-1006     | 20.57   | 121.50                             | 11.30                    | 106             |
|   | 7.87           | CLL-1008     | 20.57   | 162.00                             | 13.27                    | 125             |
|   | 9.84           | CLL-10010    | 20.57   | 202.50                             | 15.24                    | 143             |
|   | 11.81          | CLL-10012    | 20.57   | 242.99                             | 17.20                    | 162             |
| <b>150</b><br>[153.9]                   | 1.97           | CLL-1502     | 30.78   | 60.58                              | 8.23                     | 117             |
|   | 3.94           | CLL-1504     | 30.78   | 121.17                             | 10.20                    | 146             |
|   | 5.91           | CLL-1506     | 30.78   | 181.75                             | 12.17                    | 174             |
|   | 7.87           | CLL-1508     | 30.78   | 242.33                             | 14.13                    | 203             |
|   | 9.84           | CLL-15010    | 30.78   | 302.92                             | 16.10                    | 231             |
|   | 11.81          | CLL-15012    | 30.78   | 363.50                             | 18.07                    | 260             |
| <b>200</b><br>[206.1]                   | 1.97           | CLL-2002     | 41.17   | 81.04                              | 9.57                     | 183             |
|   | 5.91           | CLL-2006     | 41.17   | 243.13                             | 13.50                    | 260             |
|   | 11.81          | CLL-20012    | 41.17   | 486.27                             | 19.41                    | 376             |
| <b>250</b><br>[284.0]                   | 1.97           | CLL-2502     | 56.75   | 111.70                             | 9.80                     | 256             |
|   | 5.91           | CLL-2506     | 56.75   | 335.11                             | 13.74                    | 359             |
|   | 11.81          | CLL-25012    | 56.75   | 670.22                             | 19.65                    | 515             |
| <b>300</b><br>[353.6]                   | 1.97           | CLL-3002     | 70.71   | 139.19                             | 11.61                    | 382             |
|   | 5.91           | CLL-3006     | 70.71   | 417.56                             | 15.55                    | 514             |
|   | 11.81          | CLL-30012    | 70.71   | 835.11                             | 21.46                    | 712             |
| <b>400</b><br>[433.9]                   | 1.97           | CLL-4002     | 86.79   | 170.84                             | 13.19                    | 553             |
|   | 5.91           | CLL-4006     | 86.79   | 512.51                             | 17.13                    | 721             |
|   | 11.81          | CLL-40012    | 86.79   | 1025.02                            | 23.03                    | 972             |
| <b>500</b><br>[566.3]                   | 1.97           | CLL-5002     | 113.25  | 222.99                             | 14.76                    | 809             |
|   | 5.91           | CLL-5006     | 113.25  | 668.77                             | 18.70                    | 1029            |
|   | 11.81          | CLL-50012    | 113.25  | 1337.55                            | 24.61                    | 1360            |
| <b>600</b><br>[662.9]                   | 1.97           | CLL-6002     | 132.57  | 260.97                             | 15.55                    | 985             |
|   | 5.91           | CLL-6006     | 132.57  | 782.90                             | 19.49                    | 1241            |
|   | 11.81          | CLL-60012    | 132.57  | 1565.81                            | 25.39                    | 1625            |
| <b>800</b><br>[911.6]                   | 1.97           | CLL-8002     | 182.42  | 359.09                             | 17.91                    | 1565            |
|   | 5.91           | CLL-8006     | 182.42  | 1077.27                            | 21.85                    | 1918            |
|   | 11.81          | CLL-80012    | 182.42  | 2154.55                            | 27.76                    | 2446            |
| <b>1000</b><br>[1136]                   | 1.97           | CLL-10002    | 227.30  | 447.43                             | 19.49                    | 2094            |
|   | 5.91           | CLL-10006    | 227.30  | 1342.30                            | 23.43                    | 2517            |
|   | 11.81          | CLL-100012   | 227.30  | 2684.59                            | 29.33                    | 3151            |

## CLL Series



Capacity:

**50-1,000 tons**

Stroke:

**1.97-11.81 inches**

Maximum Operating Pressure:

**10,000 psi**



### Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact

Enerpac for ordering information and dimensional details.



### Lifting an Unbalanced Load?

See our "Yellow Pages" for multi-cylinder set ups.

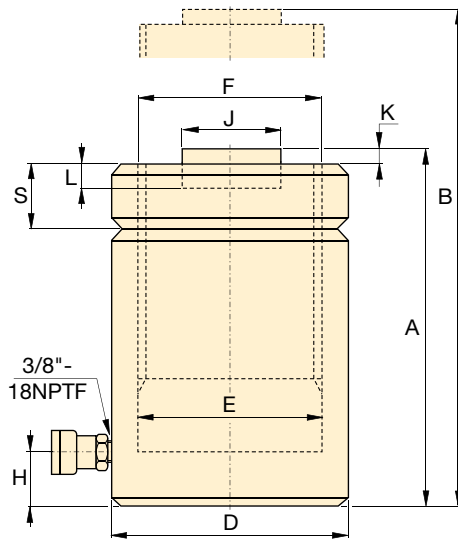
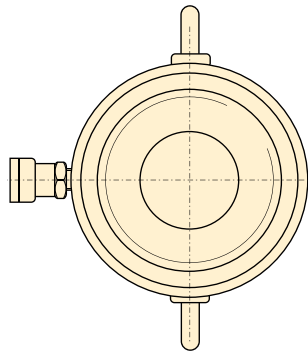
Page: **242**



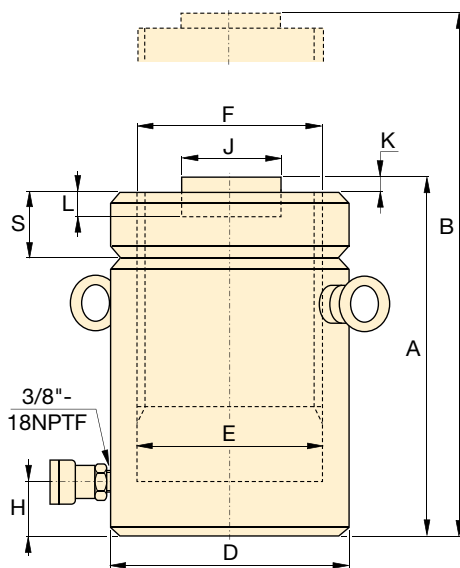
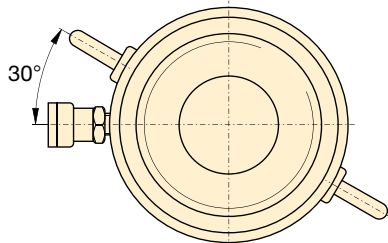
### Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" section.

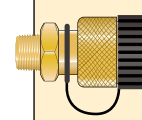
Page: **251**



CLL-50 to CLL-250 models



CLL-300 to CLL-1000 models



**Coupler Included!**

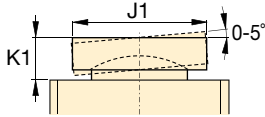
CR-400 coupler included on all models.  
Fits all HC-Series hoses.

◀ For full features see page 44.

| Cylinder Capacity<br>(ton)<br>[maximum] | Stroke<br>(in) | Model Number | Cylinder Effective Area<br>(in <sup>2</sup> ) | Oil Capacity<br>(in <sup>3</sup> ) |
|---|----------------|--------------|---|------------------------------------|
| 50<br>[59.1]                            | 1.97           | CLL-502      | 10.99   | 21.63                              |
|   | 3.94           | CLL-504      | 10.99   | 43.25                              |
|   | 5.91           | CLL-506      | 10.99   | 64.88                              |
|   | 7.87           | CLL-508      | 10.99   | 86.51                              |
|   | 9.84           | CLL-5010     | 10.99   | 108.14                             |
|   | 11.81          | CLL-5012     | 10.99   | 129.76                             |
| 100<br>[102.9]                          | 1.97           | CLL-1002     | 20.57   | 40.50                              |
|   | 3.94           | CLL-1004     | 20.57   | 81.00                              |
|   | 5.91           | CLL-1006     | 20.57   | 121.50                             |
|   | 7.87           | CLL-1008     | 20.57   | 162.00                             |
|   | 9.84           | CLL-10010    | 20.57   | 202.50                             |
|   | 11.81          | CLL-10012    | 20.57   | 242.99                             |
| 150<br>[153.9]                          | 1.97           | CLL-1502     | 30.78   | 60.58                              |
|   | 3.94           | CLL-1504     | 30.78   | 121.17                             |
|   | 5.91           | CLL-1506     | 30.78   | 181.75                             |
|   | 7.87           | CLL-1508     | 30.78   | 242.33                             |
|   | 9.84           | CLL-15010    | 30.78   | 302.92                             |
|   | 11.81          | CLL-15012    | 30.78   | 363.50                             |
| 200<br>[206.1]                          | 1.97           | CLL-2002     | 41.17   | 81.04                              |
|   | 5.91           | CLL-2006     | 41.17   | 243.13                             |
|   | 11.81          | CLL-20012    | 41.17   | 486.27                             |
| 250<br>[284.0]                          | 1.97           | CLL-2502     | 56.75   | 111.70                             |
|   | 5.91           | CLL-2506     | 56.75   | 335.11                             |
|   | 11.81          | CLL-25012    | 56.75   | 670.22                             |
| 300<br>[353.6]                          | 1.97           | CLL-3002     | 70.71   | 139.19                             |
|   | 5.91           | CLL-3006     | 70.71   | 417.56                             |
|   | 11.81          | CLL-30012    | 70.71   | 835.11                             |
| 400<br>[433.9]                          | 1.97           | CLL-4002     | 86.79   | 170.84                             |
|   | 5.91           | CLL-4006     | 86.79   | 512.51                             |
|   | 11.81          | CLL-40012    | 86.79   | 1025.02                            |
| 500<br>[566.3]                          | 1.97           | CLL-5002     | 113.25  | 222.99                             |
|   | 5.91           | CLL-5006     | 113.25  | 668.77                             |
|   | 11.81          | CLL-50012    | 113.25  | 1337.55                            |
| 600<br>[662.9]                          | 1.97           | CLL-6002     | 132.57  | 260.97                             |
|   | 5.91           | CLL-6006     | 132.57  | 782.90                             |
|   | 11.81          | CLL-60012    | 132.57  | 1565.81                            |
| 800<br>[911.6]                          | 1.97           | CLL-8002     | 182.42  | 359.09                             |
|   | 5.91           | CLL-8006     | 182.42  | 1077.27                            |
|   | 11.81          | CLL-80012    | 182.42  | 2154.55                            |
| 1000<br>[1136]                          | 1.97           | CLL-10002    | 227.30  | 447.43                             |
|   | 5.91           | CLL-10006    | 227.30  | 1342.30                            |
|   | 11.81          | CLL-100012   | 227.30  | 2684.59                            |

# Single-Acting, Lock Nut Cylinders

## \*Optional Tilt Saddle



Capacity:  
**50-1,000 tons**

Stroke:  
**1.97-11.81 inches**

Maximum Operating Pressure:  
**10,000 psi**

**CLL**  
Series



| Collap. Height | Ext. Height | Outside Diam. | Cyl. Bore Diam. | Plunger Diameter (threaded) | Base to Advance Port | Stand. Saddle Diam. | Saddle Protrusion from Plgr. | Depth of Plunger Hole | Lock Nut Height | Weight | Model Number | * Optional Tilt Saddle |         |              |
|----------------|-------------|---------------|-----------------|-----------------------------|----------------------|---------------------|------------------------------|-----------------------|-----------------|--------|--------------|------------------------|---------|--------------|
|                |             |               |                 |                             |                      |                     |                              |                       |                 |        |              | Diam.                  | Height  | Model Number |
| A (in)         | B (in)      | D (in)        | E (in)          | F (mm)                      | H (in)               | J (in)              | K (in)                       | L (in)                | S (in)          | (lbs)  |              | J1 (in)                | K1 (in) |              |
| 6.46           | 8.43        | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 35     | CLL-502      | 2.80                   | .94     | CAT-100      |
| 8.43           | 12.36       | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 46     | CLL-504      | 2.80                   | .94     | CAT-100      |
| 10.39          | 16.30       | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 57     | CLL-506      | 2.80                   | .94     | CAT-100      |
| 12.36          | 20.24       | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 68     | CLL-508      | 2.80                   | .94     | CAT-100      |
| 14.33          | 24.17       | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 79     | CLL-5010     | 2.80                   | .94     | CAT-100      |
| 16.30          | 28.11       | 4.92          | 3.74            | Tr 95 x 4                   | 1.18                 | 2.80                | .08                          | .51                   | 1.42            | 90     | CLL-5012     | 2.80                   | .94     | CAT-100      |
| 7.36           | 9.33        | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 68     | CLL-1002     | 2.80                   | .94     | CAT-100      |
| 9.33           | 13.27       | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 87     | CLL-1004     | 2.80                   | .94     | CAT-100      |
| 11.30          | 17.20       | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 106    | CLL-1006     | 2.80                   | .94     | CAT-100      |
| 13.27          | 21.14       | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 125    | CLL-1008     | 2.80                   | .94     | CAT-100      |
| 15.24          | 25.08       | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 143    | CLL-10010    | 2.80                   | .94     | CAT-100      |
| 17.20          | 29.02       | 6.50          | 5.12            | Tr 130 x 6                  | 1.18                 | 2.80                | .08                          | .51                   | 1.73            | 162    | CLL-10012    | 2.80                   | .94     | CAT-100      |
| 8.23           | 10.20       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 117    | CLL-1502     | 5.12                   | .79     | CAT-200      |
| 10.20          | 14.13       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 146    | CLL-1504     | 5.12                   | .79     | CAT-200      |
| 12.17          | 18.07       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 174    | CLL-1506     | 5.12                   | .79     | CAT-200      |
| 14.13          | 22.01       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 203    | CLL-1508     | 5.12                   | .79     | CAT-200      |
| 16.10          | 25.94       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 231    | CLL-15010    | 5.12                   | .79     | CAT-200      |
| 18.07          | 29.88       | 8.07          | 6.26            | Tr 159 x 6                  | 1.54                 | 5.12                | .08                          | .98                   | 1.73            | 260    | CLL-15012    | 5.12                   | .79     | CAT-200      |
| 9.57           | 11.54       | 9.25          | 7.24            | Tr 184 x 6                  | 1.97                 | 5.12                | .08                          | .98                   | 1.97            | 183    | CLL-2002     | 5.12                   | .79     | CAT-200      |
| 13.50          | 19.41       | 9.25          | 7.24            | Tr 184 x 6                  | 1.97                 | 5.12                | .08                          | .98                   | 1.97            | 260    | CLL-2006     | 5.12                   | .79     | CAT-200      |
| 19.41          | 31.22       | 9.25          | 7.24            | Tr 184 x 6                  | 1.97                 | 5.12                | .08                          | .98                   | 1.97            | 376    | CLL-20012    | 5.12                   | .79     | CAT-200      |
| 9.80           | 11.77       | 10.83         | 8.50            | Tr 216 x 6                  | 1.97                 | 5.91                | .08                          | .98                   | 2.20            | 256    | CLL-2502     | 5.91                   | .83     | CAT-250      |
| 13.74          | 19.65       | 10.83         | 8.50            | Tr 216 x 6                  | 1.97                 | 5.91                | .08                          | .98                   | 2.20            | 359    | CLL-2506     | 5.91                   | .83     | CAT-250      |
| 19.65          | 31.46       | 10.83         | 8.50            | Tr 216 x 6                  | 1.97                 | 5.91                | .08                          | .98                   | 2.20            | 515    | CLL-25012    | 5.91                   | .83     | CAT-250      |
| 11.61          | 13.58       | 12.20         | 9.49            | Tr 241 x 6                  | 2.32                 | 5.47                | .20                          | .98                   | 2.36            | 382    | CLL-3002     | 7.68                   | 2.95    | CAT-300      |
| 15.55          | 21.46       | 12.20         | 9.49            | Tr 241 x 6                  | 2.32                 | 5.47                | .20                          | .98                   | 2.36            | 514    | CLL-3006     | 7.68                   | 2.95    | CAT-300      |
| 21.46          | 33.27       | 12.20         | 9.49            | Tr 241 x 6                  | 2.32                 | 5.47                | .20                          | .98                   | 2.36            | 712    | CLL-30012    | 7.68                   | 2.95    | CAT-300      |
| 13.19          | 15.16       | 13.78         | 10.51           | Tr 266 x 6                  | 2.76                 | 6.26                | .20                          | .98                   | 2.76            | 553    | CLL-4002     | 8.86                   | 3.35    | CAT-400      |
| 17.13          | 23.03       | 13.78         | 10.51           | Tr 266 x 6                  | 2.76                 | 6.26                | .20                          | .98                   | 2.76            | 721    | CLL-4006     | 8.86                   | 3.35    | CAT-400      |
| 23.03          | 34.84       | 13.78         | 10.51           | Tr 266 x 6                  | 2.76                 | 6.26                | .20                          | .98                   | 2.76            | 972    | CLL-40012    | 8.86                   | 3.35    | CAT-400      |
| 14.76          | 16.73       | 15.75         | 12.01           | Tr 305 x 6                  | 3.15                 | 7.05                | .20                          | .98                   | 3.15            | 809    | CLL-5002     | 9.84                   | 3.58    | CAT-500      |
| 18.70          | 24.61       | 15.75         | 12.01           | Tr 305 x 6                  | 3.15                 | 7.05                | .20                          | .98                   | 3.15            | 1029   | CLL-5006     | 9.84                   | 3.58    | CAT-500      |
| 24.61          | 36.42       | 15.75         | 12.01           | Tr 305 x 6                  | 3.15                 | 7.05                | .20                          | .98                   | 3.15            | 1360   | CLL-50012    | 9.84                   | 3.58    | CAT-500      |
| 15.55          | 17.52       | 16.93         | 12.99           | Tr 330 x 6                  | 3.35                 | 7.64                | .20                          | .98                   | 3.35            | 985    | CLL-6002     | 10.83                  | 3.78    | CAT-600      |
| 19.49          | 25.39       | 16.93         | 12.99           | Tr 330 x 6                  | 3.35                 | 7.64                | .20                          | .98                   | 3.35            | 1241   | CLL-6006     | 10.83                  | 3.78    | CAT-600      |
| 25.39          | 37.20       | 16.93         | 12.99           | Tr 330 x 6                  | 3.35                 | 7.64                | .20                          | .98                   | 3.35            | 1625   | CLL-60012    | 10.83                  | 3.78    | CAT-600      |
| 17.91          | 19.88       | 19.88         | 15.24           | Tr 387 x 6                  | 3.94                 | 8.82                | .20                          | .98                   | 3.94            | 1565   | CLL-8002     | 12.60                  | 4.84    | CAT-800      |
| 21.85          | 27.76       | 19.88         | 15.24           | Tr 387 x 6                  | 3.94                 | 8.82                | .20                          | .98                   | 3.94            | 1918   | CLL-8006     | 12.60                  | 4.84    | CAT-800      |
| 27.76          | 39.57       | 19.88         | 15.24           | Tr 387 x 6                  | 3.94                 | 8.82                | .20                          | .98                   | 3.94            | 2446   | CLL-80012    | 12.60                  | 4.84    | CAT-800      |
| 19.49          | 21.46       | 22.05         | 17.01           | Tr 432 x 6                  | 4.33                 | 9.80                | .20                          | .98                   | 4.33            | 2094   | CLL-10002    | 14.17                  | 5.35    | CAT-1000     |
| 23.43          | 29.33       | 22.05         | 17.01           | Tr 432 x 6                  | 4.33                 | 9.80                | .20                          | .98                   | 4.33            | 2517   | CLL-10006    | 14.17                  | 5.35    | CAT-1000     |
| 29.33          | 41.14       | 22.05         | 17.01           | Tr 432 x 6                  | 4.33                 | 9.80                | .20                          | .98                   | 4.33            | 3151   | CLL-100012   | 14.17                  | 5.35    | CAT-1000     |



▼ Shown from left to right: JHA-356, JHA-156



## JH, JHA Series

Capacity:  
**7-150 tons**

Stroke:  
**3.00-6.13 inches**

Maximum Operating Pressure:  
**10,000 psi**

- All-directional operation on 7, 15 and 35 ton models (JHA- Series)
- Internal relief valve to prevent overloading
- Machined flat front and bottom surfaces permit flush alignment in tight corners
- All models include pumping handle
- Chrome plated plungers
- Automatic by-pass port to prevent over-extension (JH-Series)



### Lifting Wedge and Machine Lifts

Ideal to lift the load the first few inches. The **LW-16** Lifting Wedge requires a very small access gap of only .39 inch.

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### Load Skates

For moving heavy loads easily and safely.

Page: 170

| Style         | Jack Capacity<br>(ton) | Stroke<br>(in) | Model Number | Jack Effective Area<br>(in <sup>2</sup> ) | Collapsed Height<br>(in) | Extended Height<br>(in) | Bottom Plate Dimensions<br>(W x L)<br>(in) | Plunger Diameter<br>(in) | Pump Speed | Weight<br>(lbs) |
|---------------|------------------------|----------------|--------------|---|--------------------------|-------------------------|--|--------------------------|------------|-----------------|
| Aluminum Jack | 7                      | 3.00           | JHA-73       | 1.49                                      | 5.25                     | 8.25                    | 2.88 x 6.25                                | 1.19                     | Single     | 11              |
|               | 15                     | 6.06           | JHA-156      | 3.14                                      | 9.75                     | 15.81                   | 3.63 x 9.38                                | 1.63                     | Single     | 29              |
|               | 35                     | 6.13           | JHA-356      | 7.07                                      | 10.13                    | 16.25                   | 4.63 x 10.00                               | 2.13                     | Single     | 40              |
|               | 75                     | 6.06           | JHA-756      | 15.90                                     | 11.25                    | 17.31                   | 6.88 x 12.81                               | 4.50                     | Single     | 94              |
|               | 150                    | 6.13           | JHA-1506     | 30.68                                     | 12.88                    | 19.00                   | 9.50 x 16.06                               | 6.25                     | 2-Speed    | 210             |
| Steel Jack    | 30                     | 6.13           | JH-306       | 5.94                                      | 10.00                    | 16.13                   | 3.75 x 9.56                                | 2.75                     | Single     | 59              |
|               | 50                     | 6.09           | JH-506       | 9.62                                      | 10.25                    | 16.34                   | 5.00 x 10.19                               | 3.50                     | 2-Speed    | 90              |
|               | 100                    | 6.06           | JH-1006      | 20.63                                     | 11.31                    | 17.37                   | 7.13 x 12.94                               | 5.12                     | 2-Speed    | 184             |

# Industrial Bottle Jacks

▼ Shown: GBJ-010, GBJ-030, GBJ-003



## GBJ Series

Capacity:

**2-100 tons**

Stroke:

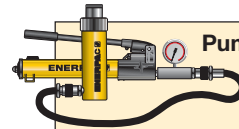
**2.44-18.11 inches**

- Lower handle effort reduces operator fatigue
- Fully serviceable
- High-strength beam and pump linkage for long life
- Pumping handle included on all models
- Safety relief valve to prevent overload
- Automatic by-pass port to prevent over-extension
- Wiper seal for extended life
- Thick base material with large area for increased strength and stability during lifting



### Screw Feature

Heat treated, adjustable extension screw with cleated saddle on selected GBJ models helps adjusting and prevents slipping.



### Pump and Cylinder Sets

As an alternative to Industrial Bottle Jacks where the operator is required to stand remote from the jacking point, see the range of pump and cylinder sets.

Page: 54

| Jack Capacity | Stroke | Model Number | Screw Extension | Minimum Height | Maximum Height | Plunger Diameter | Saddle Diameter | Base Dimensions L x W | Weight |
|---------------|--------|--------------|-----------------|----------------|----------------|------------------|-----------------|-----------------------|--------|
| (ton)         | (in)   |              | (in)            | (in)           | (in)           | (in)             | (in)            | (in)                  | (lbs)  |
| 2             | 18.11  | GBJ002L      | -               | 22.44          | 40.55          | 1.14             | -               | 5.00 x 5.00           | 13.2   |
| 2             | 3.94   | GBJ002       | 1.97            | 6.30           | 12.20          | 0.83             | 0.83            | 3.74 x 4.37           | 7.9    |
| 3             | 4.13   | GBJ003       | 2.56            | 6.61           | 13.31          | 0.94             | 0.94            | 3.74 x 4.57           | 8.6    |
| 5             | 5.91   | GBJ005       | 2.95            | 8.35           | 17.20          | 1.14             | 1.14            | 3.74 x 4.84           | 11.0   |
| 8             | 5.91   | GBJ008       | 2.95            | 8.62           | 17.48          | 1.30             | 1.46            | 3.74 x 5.43           | 13.0   |
| 10            | 5.91   | GBJ010       | 2.95            | 8.62           | 17.48          | 1.46             | 1.46            | 3.74 x 5.59           | 14.3   |
| 10            | 2.44   | GBJ010S      | 1.18            | 5.16           | 8.78           | 1.46             | 1.46            | 3.74 x 5.59           | 12.1   |
| 15            | 5.91   | GBJ015       | 2.95            | 8.98           | 17.83          | 1.75             | 1.73            | 4.41 x 6.42           | 19.8   |
| 20            | 5.91   | GBJ020       | 2.95            | 9.21           | 18.07          | 2.01             | 2.28            | 5.00 x 6.73           | 26.7   |
| 20            | 4.13   | GBJ020S      | 2.17            | 7.48           | 13.78          | 2.01             | 2.28            | 5.00 x 6.73           | 22.0   |
| 30            | 5.91   | GBJ030       | 2.95            | 9.53           | 18.39          | 2.26             | 2.56            | 5.59 x 7.72           | 34.2   |
| 50            | 5.91   | GBJ050       | -               | 9.92           | 15.83          | 3.15             | 3.15            | 7.09 x 9.06           | 62.8   |
| 100           | 5.91   | GBJ100       | -               | 11.81          | 17.72          | 4.33             | 3.70            | 11.65 x 13.11         | 191.8  |

All GBJ Jacks meet or exceed: ANSI, PALD, CE

▼ Shown: PRASA10027L



## Safe, Efficient, Mobile Load Lifting

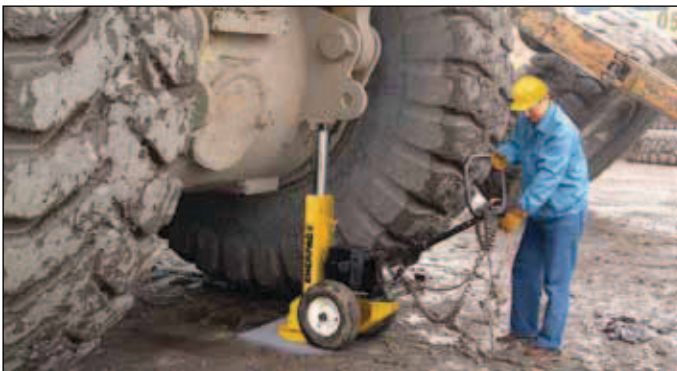
- 60, 100, 150 and 200-ton capacities with pneumatic or electric pumps for the toughest jobs
- 4" ground clearance for transport over rail and rough terrain
- Three position handle provides easy tilt back and transport
- Complies with ASME/ANSI B30.1 specifications
- Easy to change external filter minimizes down time
- Rugged, fully enclosed 24" wide frame with no exposed fittings or hoses
- SUP-R-STACK™ Extension System allows lifting at all heights without blocking.



### Pendant Cord

Standard 12' pendant cord for air driven units with pneumatic valves and 20' pendant cord for electric driven units keeps operator away from the load.

▼ Versatility for rail maintenance. One jack for all cars from Intermodal to High Hopper with 28 heights in between.



| Capacity | Stroke | Electric Pump Model Number | Weight |
|----------|--------|----------------------------|--------|
| (ton)    | (in)   | (115 VAC)                  | (lbs)  |
| 60       | 14     | PREMB06014L                | 390    |
|          | 27     | PREMB06027L                | 600    |
| 100      | 16     | PREMB10016L                | 510    |
|          | 27     | PREMB10027L                | 600    |
|          | 16     | -                          | -      |
| 150      | 27     | -                          | -      |
|          | 15.5   | -                          | -      |
|          | 26.5   | -                          | -      |
|          | 15.5   | PREMB15016L                | 570    |
| 200      | 26.5   | PREMB15027L                | 708    |
|          | 15.5   | -                          | -      |
|          | 26.5   | -                          | -      |

(PR-Series not available in Canada. Contact Enerpac.)

# POW'R-RISER® Lifting Jack



## SUP-R-STACK™ Extensions

Increase useful height from 5" to 18".

| Model No. | Size (in)                                       | Model No. | Size (in) |
|-----------|---|-----------|-----------|
| PRE5      | 5   | PRE11     | 11        |
| PRE7      | 7   | PRE14     | 14        |
| PRE9      | 9   | PRE18     | 18        |
| PRES6024  | Extension set includes PRE5, PRE7, PRE11, PRE18 |           |           |



## Spacers

Fine tune your Extension stack height.

| Model No. | Size (in)                                    | Model No. | Size (in) |
|-----------|--|-----------|-----------|
| PRS1      | 1  | PRS3      | 3         |
| PRS2      | 2  | -         | -         |
| PRS4      | Set includes (2) PRS1, (1) PRS2 and (1) PRS3 |           |           |

## PR Series



Rated Lifting Capacity:

**60-200 tons**

Stroke:

**14-27 inches**

Maximum Operating Pressure:

**10,000 psi**



### WARNING!

**Extensions:** Any two Extensions may be stacked for loads up to 60 tons. For loads over 60 tons or strokes over 14" only one Extension and one Spacer can be used.

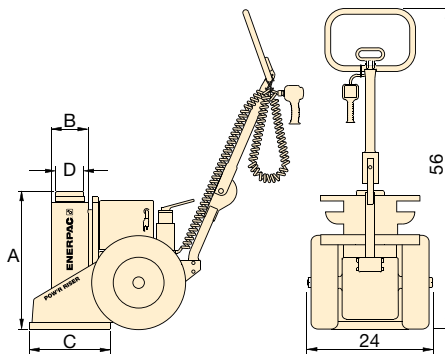
**Spacers:** Never exceed 3" in total Spacer height.

| Cap. (ton) | Swivel Load Cap | Locking U-Rings |        |           |           |         | Set Model Number | Locking U-Ring Sets Include  |         |        |        |
|------------|-----------------|-----------------|--------|-----------|-----------|---------|------------------|------------------------------|---------|--------|--------|
|            |                 | 1 in.           | 3 in.  | 4 1/4 in. | 5 1/2 in. | 10 in.  |                  | (quantity and model numbers) |         |        |        |
|            |                 |                 |        |           |           |         |                  | 2X                           | 1X      | 2X     | 1X     |
| 60         | PRTS60          | PRU11           | PRU13  | PRU14     | -         | PRU110  | 1) PRUS126       | PRU11                        | PRU13   | PRU14  | -      |
|            |                 |                 |        |           |           |         | 2) PRUS137       | PRU11                        | PRU13   | PRU14  | PRU10  |
| 100        | PRTS60          | PRU11           | PRU13  | PRU14     | -         | PRU110  | 1) PRUS126       | PRU11                        | PRU13   | PRU14  | -      |
|            |                 |                 |        |           |           |         | 2) PRUS137       | PRU11                        | PRU13   | PRU14  | PRU110 |
| 150        | PRTS150         | PRU151          | PRU153 | -         | PRU155    | PRU1510 | 3) PRUS1526      | PRU151                       | PRU153  | PRU155 | -      |
|            |                 |                 |        |           |           |         | 2) PRUS1537      | PRU151                       | PRU1510 | PRU155 | -      |
| 200        | PRTS200         | PRU201          | PRU203 | -         | PRU205    | PRU2010 | 3) PRUS2026      | PRU201                       | PRU203  | PRU205 | -      |
|            |                 |                 |        |           |           |         | 2) PRUS2037      | PRU201                       | PRU2010 | PRU205 | -      |

<sup>1)</sup> For 14 and 16" stroke models

<sup>2)</sup> For 27" stroke models

<sup>3)</sup> For 15.5" stroke models



| Air Pump    | Weight (lbs) | A (in) | B (in) | C (in) | D (in) | Max. Additional Stack Height Using Optional Ext. System (in) | Valve Type |
|-------------|--------------|--------|--------|--------|--------|--|------------|
| PRAMA06014L | 390          | 24     | 6.4    | 14     | 4      | 32*  | Manual     |
| PRAMA06027L | 600          | 37     | 6.4    | 14     | 4      | 11   |            |
| PRAMA10016L | 510          | 26     | 7.0    | 18     | 4      | 21**   | Pneumatic  |
| PRAMA10027L | 600          | 37     | 7.0    | 18     | 4      | 11   |            |
| PRASA10016L | 510          | 26     | 7.0    | 18     | 4      | 21**   |            |
| PRASA10027L | 600          | 37     | 7.0    | 18     | 4      | 11   |            |
| PRASA15016L | 570          | 26     | 8.0    | 18     | 5      | 21**   | Pneumatic  |
| PRASA15027L | 708          | 37     | 8.0    | 18     | 5      | 11   |            |
| -           | -            | 26     | 8.0    | 18     | 5      | 21**   | Manual     |
| -           | -            | 37     | 8.0    | 18     | 5      | 11   |            |
| PRASA20016L | 640          | 26     | 9.5    | 18     | 6      | 21**   | Pneumatic  |
| PRASA20027L | 825          | 37     | 9.5    | 18     | 6      | 11   |            |

\* Based on one 18" and one 11" Extension and one 3" Spacer.

\*\* Based on one 18" Extension and one 3" Spacer.

For power source, the following characters should be inserted in the 5th space of the model number.

### Ordering Example:

**Model No. PREMI06014L** is a 14" stroke, 60 ton model, with a manual valve and a 208-240 VAC, 1-ph electric motor.

- A Air Pump, 50 scfm, 80 psi
- B 115 VAC, 1-ph., 50-60 Hz, 20 A
- E 208-240 VAC, 1-ph., 50-60 Hz, Euro Plug, 10 A
- I 208-240 VAC, 1-ph., 50-60 Hz, USA Plug, 10 A
- G <sup>1)</sup>208-240 VAC, 3-ph., 50-60 Hz
- W <sup>1)</sup>380-415 VAC, 3-ph., 50-60 Hz
- J <sup>1)</sup>440-480 VAC, 3-ph., 50-60 Hz
- R <sup>1)</sup>575 VAC, 3-ph., 50-60 Hz

<sup>1)</sup> Not available for 60-ton capacity

▼ Shown from left to right: P-142ALSS, P-392ALSS, V-152NV, V-66NV, RC256NV, RC-106NV, RC-53NV



## Maximum Corrosion Resistance



### Applications

Use Enerpac **Extreme Environment Products** in wet environments such as food processing, pulp and paper, mining, construction and applications in high temperature or in welding areas.

- Corrosion resistant, nickel-plated valves and cylinders
- Stainless steel pump inserts will not corrode
- Viton® Seals provide heat and chemical resistance
- Anodized aluminum pump reservoirs and plastic encapsulated pump bodies resist wet environments
- Two-speed operation reduces pump handle strokes 78% compared to single-speed pumps
- Pump handles lock for easy carrying



### 700, 900 Series Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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### ▼ CYLINDER CHART



| Cylinder Capacity | Stroke | Model Number | Oil Capacity       | Pressure Rating | Port Dimension | Collapsed Height | Extended Height | Outside Diameter |
|-------------------|--------|--------------|--------------------|-----------------|----------------|------------------|-----------------|------------------|
| (ton)             | (in)   |              | (in <sup>3</sup> ) | (psi)           | (in)           | A (in)           | B (in)          | D (in)           |
| 5                 | 3.0    | RC-53NV      | 2.98               | 10,000          | 3/8"-18 NPTF   | 6.50             | 9.50            | 1.50             |
| 10                | 2.0    | RC-102NV     | 4.75               | 10,000          | 3/8"-18 NPTF   | 4.78             | 6.91            | 2.25             |
| 10                | 6.0    | RC-106NV     | 13.70              | 10,000          | 3/8"-18 NPTF   | 9.75             | 15.88           | 2.25             |
| 25                | 6.0    | RC-256NV     | 32.23              | 10,000          | 3/8"-18 NPTF   | 10.75            | 17.00           | 3.38             |

### ▼ HAND PUMP CHART



| Pump Type | Oil Capacity       | Model Number | Pressure Rating | Oil Displacement per Stroke | Port Dimension | Piston Stroke |
|-----------|--------------------|--------------|-----------------|-----------------------------|----------------|---------------|
|           | (in <sup>3</sup> ) |              | (psi)           | (in <sup>3</sup> )          | (in)           | (in)          |
| Two Speed | 20                 | P-142ALSS    | 200/10,000      | 0.221/0.055                 | 1/4"-18 NPTF   | .50           |
|           | 55                 | P-392ALSS    | 200/10,000      | 0.687/0.151                 | 3/8"-18 NPTF   | 1.00          |

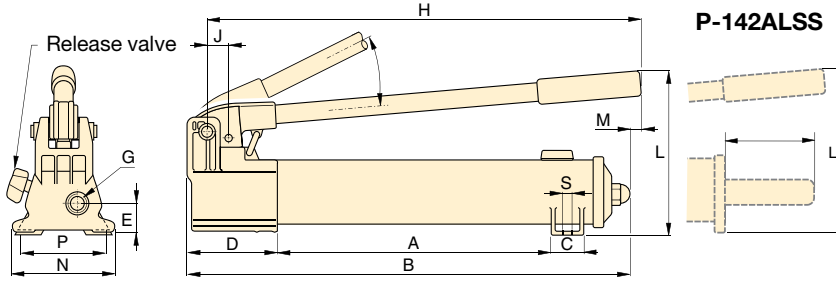
### ▼ VALVE CHART\*



| Valve Type            | Model Number | Pressure Function  | Pressure Rating (psi) |
|-----------------------|--------------|--------------------|-----------------------|
| Manual Check Valve    | V-66NV       | Check              | 10,000                |
| Pressure Relief Valve | V-152NV      | + 3% Repeatability | 800-10,000            |

\* See page 128 for valve function information of standard model products.

## P-392ALSS



## RC P V Series

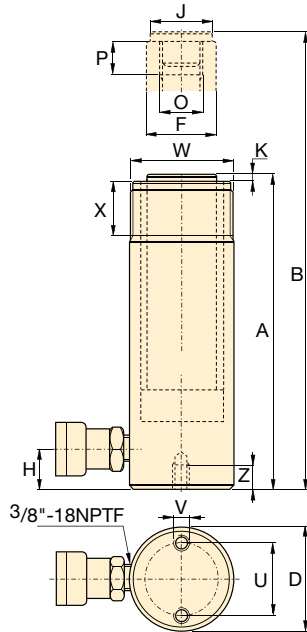


Cylinder Capacity:  
**5-25 tons**

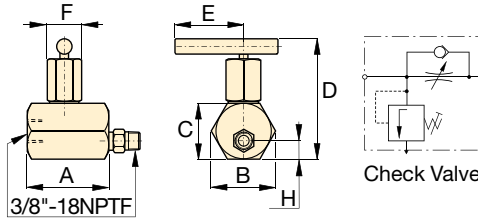
Stroke:  
**2-6 inches**

Maximum Operating Pressure:  
**10,000 psi**

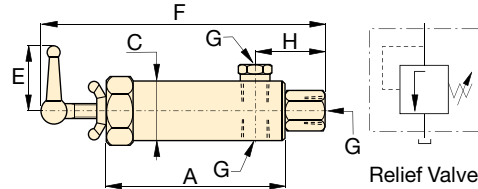
## RC-102NV, RC-106NV, RC-256NV



## V-66NV



## V-152NV



### Multifluid Hand Pumps

**MP-Series** corrosion resistant hand pumps for low pressure filling and high pressure testing

applications, suitable for a wide range of fluids.

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| Plunger Diam. | Base to Adv. Port | Saddle Diam. | Saddle Protrusion from Plngr. | Plunger Internal Thread | Plunger Thread Length | Base Mounting Holes |               |                    | Collar Thread | Collar Thread Length | Weight (lbs) | Model Number |
|---------------|-------------------|--------------|-------------------------------|-------------------------|-----------------------|---------------------|---------------|--------------------|---------------|----------------------|--------------|--------------|
|               |                   |              |                               |                         |                       | Bolt Circle U (in)  | Thread V (in) | Thrd. Depth Z (in) |               |                      |              |              |
| F (in)        | H (in)            | J (in)       | K (in)                        | O (in)                  | P (in)                | U (in)              | V (in)        | Z (in)             | W (in)        | X (in)               |              |              |
| 1.00          | .75               | 1.00         | .25                           | 3/4"-16                 | .56                   | 1.00                | 1/4"-20UN     | .56                | 1 1/2"-16     | 1.13                 | 3.3          | RC-53NV      |
| 1.50          | .75               | 1.38         | .25                           | 1"-8                    | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.13                 | 5.1          | RC-102NV     |
| 1.50          | .75               | 1.38         | .25                           | 1"-8                    | .75                   | 1.56                | 5/16"-18UN    | .50                | 2 1/4"-14     | 1.13                 | 9.8          | RC-106NV     |
| 2.25          | 1.00              | 2.00         | .41                           | 1 1/2"-16               | 1.00                  | 2.31                | 1/2"-13UN     | .75                | 3 5/16"-12    | 1.94                 | 22.0         | RC-256NV     |

| Pump Dimensions (in) |       |      |      |      |              |       |      |      |     |      |      |     | Weight (lbs) | Model Number |
|----------------------|-------|------|------|------|--------------|-------|------|------|-----|------|------|-----|--------------|--------------|
| A                    | B     | C    | D    | E    | G            | H     | J    | L    | M   | N    | P    | S   |              |              |
| 7.31                 | 13.25 | 1.13 | 3.37 | 1.13 | 1/4"-18 NPTF | 12.56 | .75  | 5.63 | -   | 3.75 | 3.18 | .28 | 4.5          | P-142ALSS    |
| 13.56                | 21.00 | 1.44 | 3.93 | 1.31 | 3/8"-18 NPTF | 20.56 | 1.19 | 7.00 | .63 | 4.75 | -    | -   | 9.0          | P-392ALSS    |

| Valve Dimensions (in) |      |      |      |      |      |              |      |     | Weight (lbs) | Model Number |
|-----------------------|------|------|------|------|------|--------------|------|-----|--------------|--------------|
| A                     | B    | C    | D    | E    | F    | G            | H    |     |              |              |
| 3.50                  | 2.25 | 2.00 | 4.00 | 2.00 | 0.87 | 3/8"-18 NPTF | 1.00 | 3.9 | V-66NV       |              |
| 4.53                  | -    | 1.50 | -    | 3.12 | 7.62 | 3/8"-18 NPTF | 1.53 | 3.5 | V-152NV      |              |

▼ Shown cylinder-pump set: SCR-1010H



## The Quickest and Easiest Way to Start Working Right Away





- Optimum match of individual components
- Sets include 6 foot safety hose, calibrated gauge with gauge adaptor
- All hand pumps are two-speed



### Speed Chart

See the Enerpac Cylinder Speed Chart in our “Yellow Pages” section.

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| 1 Cylinder Selection<br>(See Cylinder Section of this catalog for full product descriptions)   |          | Nominal Set Capacity<br>(ton) | Cylinder Model No. | Stroke<br>(in) | Collapsed Height<br>(in) |
|--|----------|-------------------------------|--------------------|----------------|--------------------------|
|  <p><b>Single-acting, General Purpose Cylinders:</b><br/>For maximum versatility.<br/><b>RC-Series DUO</b></p>  | Page: 6  | 5                             | RC-55              | 5.00           | 8.50                     |
|  |          | 10                            | RC-102             | 2.13           | 4.78                     |
|  |          |                               | RC-106             | 6.13           | 9.75                     |
|  |          |                               | RC-1010            | 10.13          | 13.75                    |
|  |          | 15                            | RC-154             | 4.00           | 7.88                     |
|  |          |                               | RC-156             | 6.00           | 10.69                    |
|  |          | 25                            | RC-252             | 2.00           | 6.50                     |
|  |          |                               | RC-254             | 4.00           | 8.50                     |
|  |          |                               | RC-256             | 6.25           | 10.75                    |
|  |          |                               | RC-2514            | 14.25          | 18.75                    |
| 50   | RC-506   | 6.25                          | 11.13              |                |                          |
|  <p><b>Single-acting, Low Height Cylinders:</b><br/>Ideal where space is restricted.<br/><b>RCS-Series</b></p>  | Page: 22 | 10                            | RCS-101            | 1.50           | 3.47                     |
|  |          | 20                            | RCS-201            | 1.75           | 3.88                     |
|  |          | 30                            | RCS-302            | 2.44           | 4.63                     |
|  |          | 50                            | RCS-502            | 2.38           | 4.81                     |
|  |          | 100                           | RCS-1002           | 2.25           | 5.56                     |
|  <p><b>Single-acting, Hollow Cylinders:</b><br/>For pushing and pulling applications.<br/><b>RCH-Series</b></p> | Page: 26 | 12                            | RCH-121            | 1.63           | 4.75                     |
|  |          | 20                            | RCH-202            | 2.00           | 6.31                     |
|  |          | 30                            | RCH-302            | 2.50           | 7.03                     |
|  |          | 60                            | RCH-603            | 3.00           | 9.75                     |
|  |          | 100                           | RCH-1003           | 3.00           | 10.00                    |
|  <p><b>Pull Cylinders:</b><br/>The ultimate in pulling power.<br/><b>BRP-Series</b></p>                         | Page: 24 | 10                            | BRP-106C           | 5.95           | 23.11                    |
|  |          |                               | BRP-106L           | 5.95           | 21.33                    |
|  |          | 30                            | BRP-306            | 6.10           | 42.72                    |
|  |          | 60                            | BRP-606            | 5.98           | 28.34                    |
|  |          | -                             | -                  | -              | -                        |

# Single-Acting, Cylinder Pump Sets

- SET SELECTION:**
- 1 Select the cylinder
  - 2 Select the pump
  - 3 Find the set model number in the blue field of the matrix

## SELECTION EXAMPLE

### Selected cylinder:

- RC-106, Single-acting cylinder with 6.13" stroke

### Selected pump:

- P-392, Lightweight hand pump

### Set model number:

- SCR-106H

### Included:

- HC-7206 hose
- GF-10P gauge
- GA-2 adaptor

## SC Series



Capacity:

**5-100 tons**

Stroke:

**1.50-14.25 inches**

Maximum Operating Pressure:

**10,000 psi**

| Pump selection (See Pump Section of this catalog for full product descriptions) |           |           |            |                          | Accessories Included |                 |                         |
|---|-----------|-----------|------------|--------------------------|----------------------|-----------------|-------------------------|
| Hand Pump   | Hand Pump | Hand Pump | Foot Pump  | XA-Series Air Pump       | Hose Model No.       | Gauge Model No. | Gauge Adaptor Model No. |
| P-142   | P-392     | P-80      | P-392FP    | XA-11                    |                      |                 |                         |
|   |           |           |            |                          |                      |                 |                         |
| SCR-55H   | -         | -         | -          | -                        | HC-7206              | GP-10S          | GA-4                    |
| -   | SCR-102H  | -         | SCR-102FP  | SCR-102XA                | HC-7206              | GF-10P          | GA-2                    |
| -   | SCR-106H  | -         | SCR-106FP  | SCR-106XA                | HC-7206              | GF-10P          | GA-2                    |
| -   | SCR-1010H | -         | SCR-1010FP | SCR-1010XA               | HC-7206              | GF-10P          | GA-2                    |
| -   | SCR-154H  | -         | SCR-154FP  | SCR-154XA                | HC-7206              | GP-10S          | GA-2                    |
| -   | SCR-156H  | -         | SCR-156FP  | SCR-156XA                | HC-7206              | GP-10S          | GA-2                    |
| -   | SCR-252H  | -         | SCR-252FP  | SCR-252XA                | HC-7206              | GF-20P          | GA-2                    |
| -   | SCR-254H  | -         | SCR-254FP  | SCR-254XA                | HC-7206              | GF-20P          | GA-2                    |
| -   | SCR-256H  | -         | SCR-256FP  | SCR-256XA                | HC-7206              | GF-20P          | GA-2                    |
| -   | -         | SCR-2514H | -          | SCR-2514XA <sup>1)</sup> | HC-7206              | GF-20P          | GA-2                    |
| -   | -         | SCR-506H  | -          | SCR-506XA <sup>1)</sup>  | HC-7206              | GF-50P          | GA-2                    |
| -   | SCL-101H  | -         | SCL-101FP  | SCL-101XA                | HC-7206              | GF-10P          | GA-2                    |
| -   | SCL-201H  | -         | SCL-201FP  | SCL-201XA                | HC-7206              | GF-230P         | GA-2                    |
| -   | SCL-302H  | -         | SCL-302FP  | SCL-302XA                | HC-7206              | GF-230P         | GA-2                    |
| -   | SCL-502H  | -         | SCL-502FP  | SCL-502XA                | HC-7206              | GF-510P         | GA-2                    |
| -   | -         | SCL-1002H | -          | -                        | HC-7206              | GF-510P         | GA-2                    |
| SCH-121H  | -         | -         | -          | -                        | HB-7206              | GF-120P         | GA-4                    |
| -   | SCH-202H  | -         | SCH-202FP  | SCH-202XA                | HC-7206              | GF-813P         | GA-3                    |
| -   | SCH-302H  | -         | SCH-302FP  | SCH-302XA                | HC-7206              | GF-813P         | GA-3                    |
| -   | -         | SCH-603H  | -          | SCH-603XA <sup>1)</sup>  | HC-7206              | GF-813P         | GA-3                    |
| -   | -         | SCH-1003H | -          | -                        | HC-7206              | GP-10S          | GA-2                    |
| -   | SCP-106CH | -         | SCP-106CFP | -                        | HC-7206              | GP-10S          | GA-2                    |
| -   | SCP-106LH | -         | SCP-106LFP | -                        | HC-7206              | GP-10S          | GA-2                    |
| -   | -         | SCP-306H  | -          | -                        | HC-7206              | GP-10S          | GA-2                    |
| -   | -         | SCP-606H  | -          | -                        | HC-7206              | GP-10S          | GA-2                    |
| -   | -         | -         | -          | -                        | -                    | -               | -                       |

<sup>1)</sup> XA-12



**E**NERPAC hydraulic pumps are available in over 1,000 different configurations. Whatever your high pressure needs are... speed, control, intermittent or heavy-duty performance... you can be sure that Enerpac has the pump to suit the application.

Featuring Hand, Battery, Electric, Air and Gasoline powered models, with multiple reservoir and valve configurations, Enerpac offers the most comprehensive high pressure pump line available.



### Pump Selection

For help in selecting the correct pump for your application, please review our “Yellow Pages.” If you require further assistance, contact the Enerpac office located near you.

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### Torque Wrench Pumps

System matched air and electric pumps provide control to operate Enerpac Torque Wrenches.

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# Pumps and Directional Control Valves Section Overview

| Power Source                      | Pump Types  | Maximum Reservoir Capacity   | Max. Flow at Rated Pressure (in <sup>3</sup> /min) | Series      | Image   | Page  |
|-----------------------------------|---|------------------------------|--|-------------|---|-------|
| Manual                            | <b>Lightweight Hand Pumps</b><br>Exclusively from Enerpac                                 | 155 in <sup>3</sup>          | .15<br>(in <sup>3</sup> /stroke)                   | P           |    | 58 ▶  |
|                                   | <b>ULTIMA Steel Hand Pumps</b>  | 453 in <sup>3</sup>          | .29<br>(in <sup>3</sup> /stroke)                   | P           |    | 60 ▶  |
|                                   | <b>Low Pressure Hand Pumps</b>  | 200 in <sup>3</sup>          | .58<br>(in <sup>3</sup> /stroke)                   | P           |   | 62 ▶  |
|                                   | <b>Foot Pump</b><br>For Hands Free Operation  | 38 in <sup>3</sup>           | .15<br>(in <sup>3</sup> /stroke)                   | P           |    | 64 ▶  |
|                                   | <b>Multifluid Hand Pumps</b><br>Pumping Fluids up to 14,500 psi                           | –                            | 1.28<br>(in <sup>3</sup> /stroke)                  | MP          |    | 65 ▶  |
|                                   | <b>Ultra-High Pressure Hand Pumps</b><br>Pressure up to 40,000 psi                        | 60 in <sup>3</sup>           | .15<br>(in <sup>3</sup> /stroke)                   | P/11        |    | 66 ▶  |
| Electric                          | <b>Battery Powered Hydraulic Pump</b><br>Cordless Hydraulic Power                         | 1 gal.                       | 15   | BP          |    | 68 ▶  |
|                                   | <b>Economy Series</b><br>Compact and Portable   | 1 gal.                       | 20   | PU          |    | 70 ▶  |
|                                   | <b>Submerged Series</b><br>Powerful and Low-Noise   | 1.5 gal.                     | 20   | PE          |   | 72 ▶  |
|                                   | <b>Z-Class</b> Portable and Powerful  | 10 gal.                      | 60<br>200  | ZU<br>ZE    |  | 78 ▶  |
|                                   |   |                              |  |             |   | 84 ▶  |
|                                   | <b>8000-Series</b><br>The Maximum Flow Pump   | 25 gal.                      | 462  | PE          |  | 90 ▶  |
| Air                               | <b>ZA4 Air Hydraulic Pumps</b><br>The Standard for Air-Hydraulic Pumps                    | 10 gal.                      | 80   | ZA          |  | 92 ▶  |
|                                   | <b>XA-Series Air Hydraulic Pumps</b><br>XVARI® Technology for Productivity and Ergonomics | 122 in <sup>3</sup>          | 15   | XA          |  | 94 ▶  |
|                                   | <b>Turbo II Air Hydraulic Pumps</b><br>Compact Air Over Hydraulic                         | 305 in <sup>3</sup>          | 10   | PA          |  | 96 ▶  |
|                                   | <b>Air Hydraulic Pumps</b><br>Single and Twin-Air Motor                                   | 80 in <sup>3</sup><br>2 gal. | 8<br>9   | PA<br>PAM   |  | 98 ▶  |
|                                   |   |                              |  | 99 ▶        |   |       |
| Gasoline                          | <b>ZG5/ZG6 Gasoline Hydraulic Pumps</b><br>Gas Powered High Flow Pumps                    | 10 gal.                      | 200  | ZG5/<br>ZG6 |  | 100 ▶ |
|                                   | <b>Atlas Series</b><br>Small and Lightweight  | 2 gal.                       | 40   | PGM         |  | 102 ▶ |
|                                   | <b>8000-Series Gasoline Pumps</b><br>For the Largest Jobs                                 | 25 gal.                      | 1.5<br>(gal/min)                                   | EGM         |  | 103 ▶ |
| <b>Directional Control Valves</b> |   |                              |  |             |  | 104 ▶ |

▼ Pumps shown, from top to bottom: P-802, P-842, P-202, P-142



- Lightweight and compact design
- Durable glass-filled nylon reservoir and nylon encapsulated aluminum pump base for maximum corrosion resistance
- Two-speed operation on most models reduces handle strokes by as much as 78% over single speed pumps
- Lower handle effort to minimize operator fatigue
- Integral 4-way valve on P-842 for operation of double-acting cylinders
- Handle lock and lightweight construction for easy carrying
- Large oil capacities to power a wide range of cylinders or tools
- Non-conductive fiberglass handle for operator safety
- Internal pressure relief valve for overload protection

▼ P-392 in action with RC-256 cylinders.



## Exclusively from Enerpac



### Cylinder Matching Chart

For help in selecting the correct hand pump for your application, please refer to the Cylinder Matching Chart located in the “Yellow Pages”.

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### Speed Chart

To determine how a specific pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the “Yellow Pages”.

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### Tank Kits

When a return-to-tank port is required, the Tank Kits provide a 7/16-20 port at the rear of the reservoir.

**PC-20** Fits P-141, P-142

**PC-25** Fits P-202, P-391, P-392



### LX-101 Hand Pump Oil

A medium viscosity oil specially formulated for hand pumps. Performs well in low temperatures and requires less pumping effort than standard Enerpac HF blue oil.

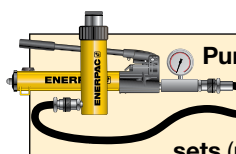
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| Pump Type    | Usable Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Pressure Rating*      |                       | Oil Displacement per Stroke |                       | Max. Handle Effort<br>(lbs) |
|--------------|---|--------------|-----------------------|-----------------------|-----------------------------|-----------------------|-----------------------------|
|              |   |              | (psi)                 |                       | (in <sup>3</sup> )          |                       |                             |
|              |   |              | 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage | 1 <sup>st</sup> stage       | 2 <sup>nd</sup> stage |                             |
| Single speed | 20  | P-141        | N/A                   | 10,000                | N/A                         | .055                  | 72                          |
|              | 55  | P-391        | N/A                   | 10,000                | N/A                         | .151                  | 85                          |
| Two speed    | 20  | P-142**      | 200                   | 10,000                | .221                        | .055                  | 78                          |
|              | 55  | P-202        | 200                   | 10,000                | .221                        | .055                  | 63                          |
|              | 55  | P-392**      | 200                   | 10,000                | .687                        | .151                  | 93                          |
|              | 155                                       | P-802        | 400                   | 10,000                | 2.40                        | .151                  | 95                          |
|              | 155                                       | P-842***     | 400                   | 10,000                | 2.40                        | .151                  | 95                          |

\* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.

\*\* Available as set, see note on top of next page.

\*\*\* For use with double-acting cylinders.



**Pump and Cylinder Sets**  
Pumps marked with an \*\* are available as sets (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

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## P Series



Reservoir Capacity:  
**20-155 in<sup>3</sup>**


Flow at Rated Pressure:  
**.055-.15 in<sup>3</sup>/stroke**

Maximum Operating Pressure:  
**10,000 psi**




**Hoses**  
Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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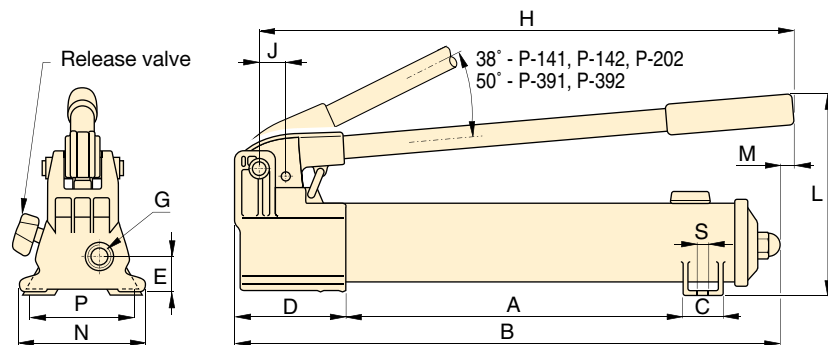


**Gauges**  
Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

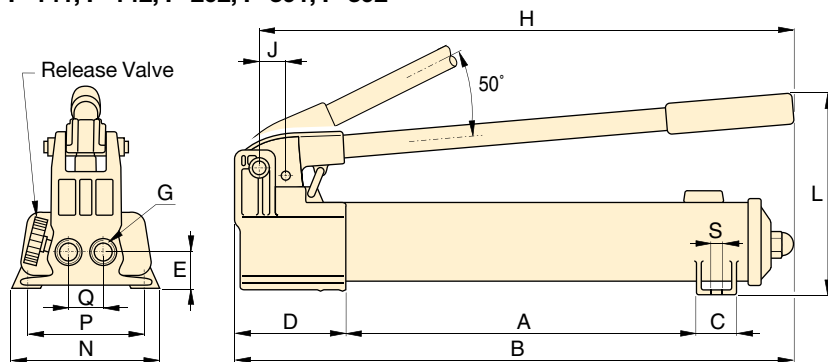
Page: 113



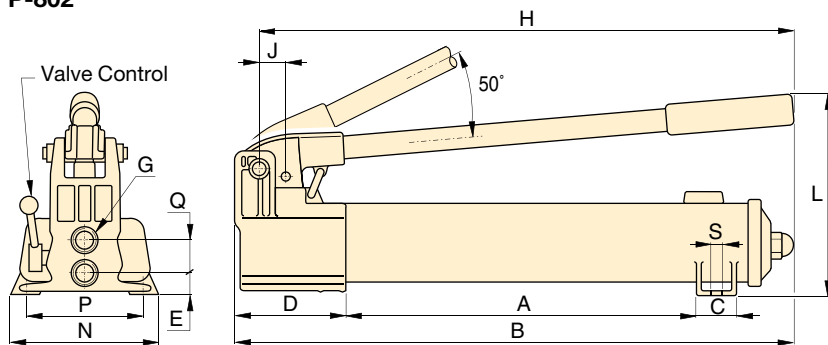
**Aluminum Reservoir**  
For applications where composite reservoirs may not be suitable, the **P-392AL** utilizes an extruded aluminum reservoir. Also included is a second handle for two-hand use. Contact Enerpac for details.



**P-141, P-142, P-202, P-391, P-392**



**P-802**



**P-842**

| Piston Stroke | Dimensions (in) |       |      |      |      |              |       |      |      |     |      |      |      |     |      | Weight (lbs)    | Model Number |
|---------------|-----------------|-------|------|------|------|--------------|-------|------|------|-----|------|------|------|-----|------|-----------------|--------------|
|               | (in)            | A     | B    | C    | D    | E            | G     | H    | J    | L   | M    | N    | P    | Q   | S    |                 |              |
| .50           | 7.31            | 13.25 | 1.13 | 3.37 | 1.13 | 1/4"-18 NPTF | 12.56 | .75  | 5.63 | -   | 3.75 | 3.25 | -    | .28 | 5.3  | <b>P-141</b>    |              |
| 1.00          | 13.56           | 21.00 | 1.44 | 3.93 | 1.31 | 3/8"-18 NPTF | 20.56 | 1.19 | 7.00 | .63 | 4.75 | -    | -    | -   | 9.0  | <b>P-391</b>    |              |
| .50           | 7.31            | 13.25 | 1.13 | 3.37 | 1.13 | 1/4"-18 NPTF | 12.56 | .75  | 5.63 | -   | 3.75 | 3.25 | -    | .28 | 5.3  | <b>P-142**</b>  |              |
| .50           | 13.56           | 20.06 | 1.44 | 3.37 | 1.13 | 1/4"-18 NPTF | 15.75 | .75  | 5.69 | .63 | 3.75 | -    | -    | -   | 7.5  | <b>P-202</b>    |              |
| 1.00          | 13.56           | 21.00 | 1.44 | 3.93 | 1.31 | 3/8"-18 NPTF | 20.56 | 1.19 | 7.00 | .63 | -    | -    | -    | -   | 9.0  | <b>P-392**</b>  |              |
| 1.00          | 13.30           | 21.75 | 1.78 | 5.25 | 1.39 | 3/8"-18 NPTF | 20.75 | 2.19 | 9.00 | -   | 7.12 | 6.02 | 1.40 | .41 | 18.0 | <b>P-802</b>    |              |
| 1.00          | 13.30           | 21.75 | 1.78 | 5.25 | .81  | 3/8"-18 NPTF | 20.75 | 2.19 | 9.00 | -   | 7.12 | 6.02 | 1.44 | .41 | 22.0 | <b>P-842***</b> |              |

▼ Shown from left to right: P-77, P-80, P-84, P-801, P-39



## The Solution for Tough Jobs



### Two Speed Pumps

Recommended for applications where cylinder plunger must advance rapidly to contact load, and applications where greater oil capacities are required, such as multiple cylinder hook-ups.



### Foot Pump Conversion Kits

Convert your **P18, P39, P77, P80, or P801** to foot power with the **PC-11 Kit**.

Includes instructions for easy conversion.



### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the

System Components section for a full range of gauges.

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### 4-Way Control Valve

P-84 and P-464 feature a manual 4-way control valve, designed for use with one

double-acting or two single-acting cylinders. For system set-up information:

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- Reduced handle effort and ergonomic grip for less operator fatigue
- Two-speed operation for fast and easy operation (except P-39)
- Vent free reservoir eliminates spills
- Quick grip handle allows for easy transport
- Integral reservoir over-pressurization protection
- All steel construction, chrome plated plunger and wiper system for durable, long lasting performance
- 4-way valving on the P84 and P-464 for operation of double-acting cylinders

▼ In the absence of a power supply, the P-80 Hand Pump offers a powerful solution.

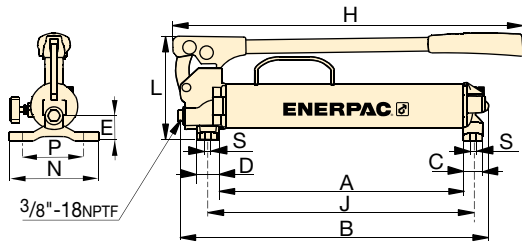


| Pump Type | Usable Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Pressure Rating*      |                       | Oil Displacement per Stroke<br>(in <sup>3</sup> ) |                       | Max. Handle Effort<br>(lbs) |
|-----------|---|--------------|-----------------------|-----------------------|---|-----------------------|-----------------------------|
|           |   |              | (psi)                 |                       | (in <sup>3</sup> )                                |                       |                             |
|           |   |              | 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage | 1 <sup>st</sup> stage                             | 2 <sup>nd</sup> stage |                             |
| Single    | 47  | P-39         | N/C                   | 10,000                | N/C   | .15                   | 85                          |
| Two-speed | 47  | P-77         | 500                   | 10,000                | 1.00  | .15                   | 88                          |
|           | 134                                       | P-80**       | 500                   | 10,000                | 1.00  | .15                   | 77                          |
|           | 250                                       | P-801        | 500                   | 10,000                | 1.00  | .15                   | 77                          |
|           | 134                                       | P-84***      | 500                   | 10,000                | 1.00  | .15                   | 77                          |
|           | 453                                       | P-462        | 200                   | 10,000                | 7.69  | .29                   | 110                         |
|           | 453                                       | P-464***     | 200                   | 10,000                | 7.69  | .29                   | 110                         |

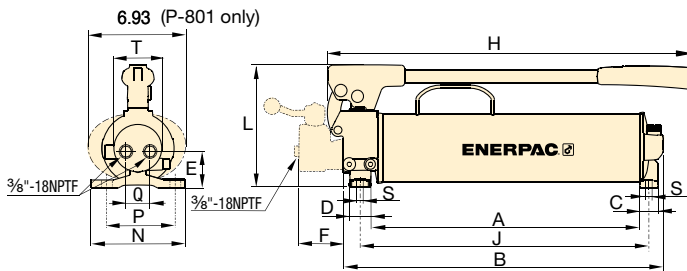
\* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.

\*\* Available as a set, see note on next page.

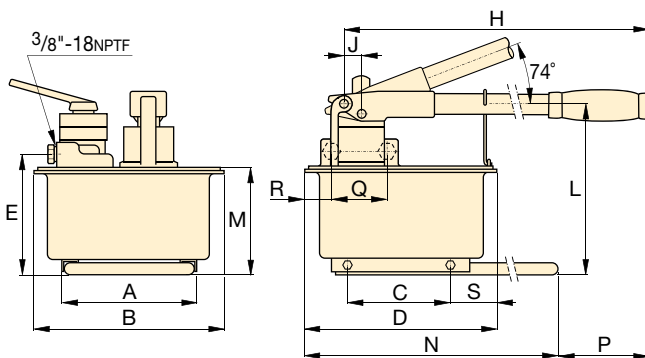
\*\*\* For use with double-acting cylinders.



**P-39, P-77**



**P-80, P-801, P-84**



**P-462, P-464**

## P Series



Reservoir Capacity:  
**47-453 in<sup>3</sup>**

Flow at Rated Pressure:  
**.15-.29 in<sup>3</sup>/stroke**

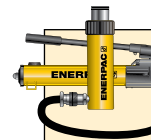
Maximum Operating Pressure:  
**10,000 psi**



### Extra Capacity Hand Pumps

**P-462 and P-464** feature extra large reservoirs and a high first-stage flow rate.

These pumps are ideally suited for powering high-capacity cylinders.



### Pump and Cylinder Sets

P-80 is also available as a **set** (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

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### Cylinder Matching Chart

For help in selecting the correct hand pump for your application, please refer to the Cylinder Matching Chart located in the "Yellow Pages."

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| Piston Stroke | Dimensions (in) |       |      |       |      |      |       |       |       |      |      |      |      |      |      |      | Weight (lbs) | Model Number    |
|---------------|-----------------|-------|------|-------|------|------|-------|-------|-------|------|------|------|------|------|------|------|--------------|-----------------|
|               | (in)            | A     | B    | C     | D    | E    | F     | H     | J     | L    | M    | N    | P    | Q    | R    | S    |              |                 |
| 1.00          | 15.09           | 18.91 | 1.18 | 1.38  | 1.48 | -    | 21.63 | 16.37 | 6.39  | -    | 5.51 | 4.37 | -    | -    | 0.33 | -    | 13.6         | <b>P-39</b>     |
| 1.00          | 15.39           | 19.19 | 1.18 | 1.38  | 1.86 | -    | 21.63 | 16.67 | 6.39  | -    | 5.51 | 4.37 | -    | -    | 0.33 | -    | 15.6         | <b>P-77</b>     |
| 1.00          | 16.83           | 20.12 | 1.18 | 1.38  | 2.17 | -    | 23.50 | 18.11 | 7.65  | -    | 5.91 | 4.76 | 1.65 | -    | 0.33 | 2.93 | 23.6         | <b>P-80**</b>   |
| 1.00          | 16.83           | 20.12 | 1.18 | 1.38  | 2.17 | -    | 23.50 | 18.11 | 7.65  | -    | 5.91 | 4.76 | 1.65 | -    | 0.33 | 2.93 | 31.0         | <b>P-801</b>    |
| 1.00          | 16.83           | 20.06 | 1.18 | 1.38  | 2.30 | 2.77 | 22.78 | 18.11 | 7.65  | -    | 5.91 | 4.76 | 1.50 | -    | 0.33 | 2.93 | 26.0         | <b>P-84***</b>  |
| 1.50          | 8.25            | 12.13 | 6.42 | 12.63 | 7.68 | -    | 26.44 | .98   | 10.63 | 6.89 | 25.6 | 3.63 | -    | -    | 3.13 | -    | 61.0         | <b>P-462</b>    |
| 1.50          | 8.35            | 12.13 | 6.42 | 12.63 | 7.68 | -    | 26.44 | .98   | 10.63 | 6.89 | 25.6 | 3.63 | 3.50 | 2.68 | 3.13 | -    | 61.0         | <b>P-464***</b> |

▼ Shown from left to right: P-25, P-51, P-18



## When Less Than 10,000 psi is All You Need

- P-25 and P-50 pump oil in both forward and reverse handle movement improving overall efficiency, ideal when mounting space is restricted
- External load-release valve
- Internal pressure-relief valve for overload protection
- P-51 can be operated in horizontal and vertical position with pump head and oil outlet facing downwards



### LX-101 Hand Pump Oil

A medium viscosity oil specially formulated for hand pumps. Performs well in low temperatures and requires less pumping effort than standard Enerpac HF blue oil.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

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▼ P-18 hand pump used for locking the rotating table for marble polishing.



| Pump Type    | Usable Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Pressure Rating<br>(psi) | Oil Displacement per Stroke<br>(in <sup>3</sup> ) | Max. Handle Effort<br>(lbs) |
|--------------|---|--------------|--------------------------|---|-----------------------------|
| Single-speed | 22  | P-18         | 2,850                    | 0.15  | 34                          |
|              | 200                                       | P-25         | 2,500                    | 0.58  | 60                          |
|              | 200                                       | P-50         | 5,000                    | 0.29  | 60                          |
|              | 50  | P-51         | 3,000                    | 0.25  | 61                          |

# Low Pressure Hand Pumps

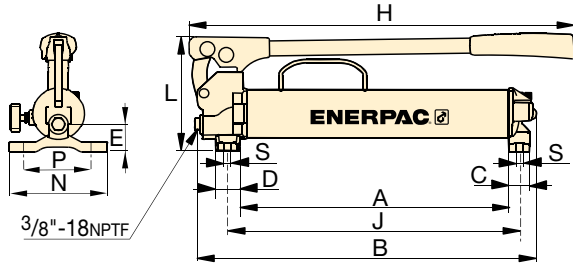
## P Series



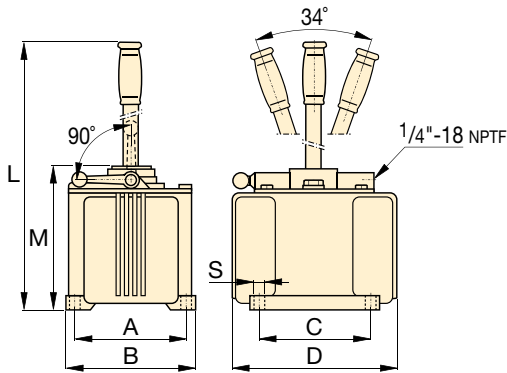
Reservoir Capacity:  
**22-200 in<sup>3</sup>**

Flow at Rated Pressure:  
**.15-.58 in<sup>3</sup>/stroke**

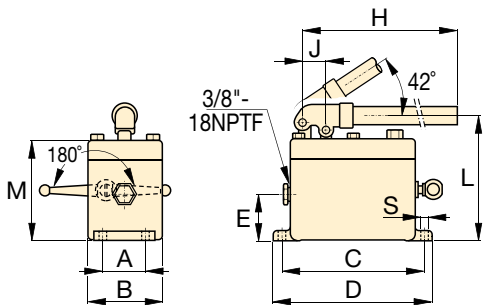
Maximum Operating Pressure:  
**2,500-5,000 psi**



**P-18**



**P-25, P-50**



**P-51**

*P-51 hand pumps used with RC-series cylinders to keep wooden layers under pressure during lamination of plates.*



### Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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| Piston Stroke | Dimensions (in) |       |      |      |      |       |      |       |      |      |      |     | Weight (lbs) | Model Number |
|---------------|-----------------|-------|------|------|------|-------|------|-------|------|------|------|-----|--------------|--------------|
|               | (in)            | A     | B    | C    | D    | E     | H    | J     | L    | M    | N    | P   |              |              |
| 1.00          | 8.70            | 12.44 | 1.18 | 1.38 | 1.48 | 15.17 | 9.98 | 6.39  | –    | 5.51 | 4.37 | .33 | 11           | <b>P-18</b>  |
| 1.50          | 6.00            | 6.82  | 6.00 | 9.43 | –    | –     | –    | 26.94 | 7.88 | –    | –    | .40 | 36           | <b>P-25</b>  |
| 1.50          | 6.00            | 6.82  | 6.00 | 9.43 | –    | –     | –    | 26.94 | 7.88 | –    | –    | .40 | 37           | <b>P-50</b>  |
| 1.00          | 2.06            | 3.63  | 7.12 | 7.88 | 2.25 | 24.00 | 1.16 | 6.31  | 5.06 | –    | –    | .34 | 12           | <b>P-51</b>  |



# Lightweight Hydraulic Foot Pump

▼ Shown: P-392FP



- **Robust, durable and compact**
  - Steel frame for maximum stability
  - Steel pumping handle
  - Aluminium reservoir
- **Foot pedal lock and lightweight construction for portability**
- **Two-speed operation reduces foot pedal strokes**
- **Large foot-pad release valve for controlling load descent**
- **Internal pressure relief valve for overload protection**

▼ P-392FP offers the advantage of hands free operation to handle and control the tool or cylinder.



## P Series

Reservoir Capacity:

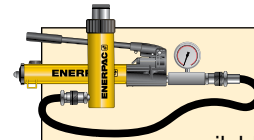
**38 in<sup>3</sup>**

Flow at Rated Pressure:

**.151 in<sup>3</sup>/stroke**

Maximum Operating Pressure:

**10,000 psi**



### Pump and Cylinder Sets

The P-392FP is available as sets (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

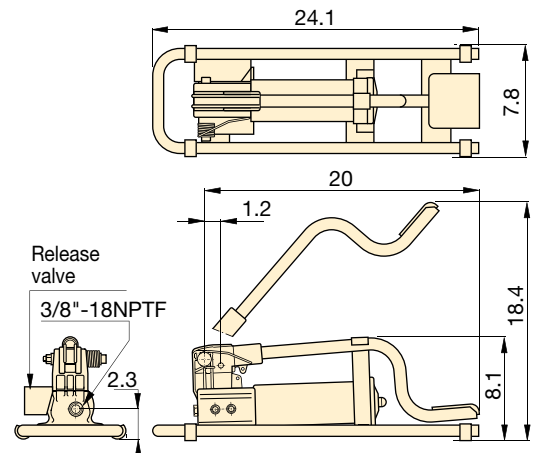
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### Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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| Usable Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Pressure Rating<br>(psi) |           | Oil Displacement per Stroke<br>(in <sup>3</sup> ) |           | Max. Handle Effort<br>(lbs) | Piston Stroke<br>(in) | Weight<br>(lbs) |
|---|--------------|--------------------------|-----------|---|-----------|-----------------------------|-----------------------|-----------------|
|   |              | 1st stage                | 2nd stage | 1st stage   | 2nd stage |                             |                       |                 |
| 38  | P-392FP *    | 200                      | 10,000    | .687  | .151      | 125                         | 1                     | 16              |

\* Available as set, see note on this page.

# Multifluid Hand Pumps

▼ Shown: MP-110



## MP Series

Reservoir Capacity:

**2 gal. (optional)**

Flow at Rated Pressure:

**.12-1.28 in<sup>3</sup>/stroke**

Maximum Operating Pressure:

**1,500-14,500 psi**

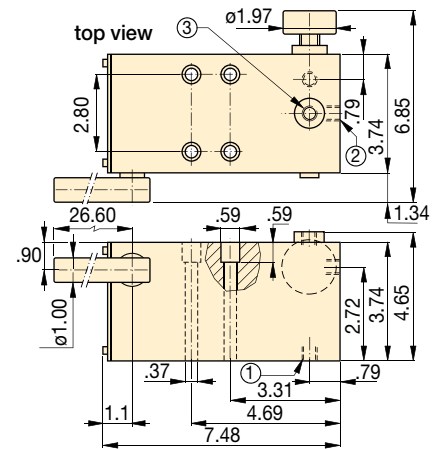


### Optional Reservoir Kit

The 2 gallon reservoir kit **MP-10T\*** includes tank with skid frame, top plate with reservoir seal, suction pipe and mounting bolts. Useable oil capacity is 1.5 gal.

\*For use with mineral oil applications only.

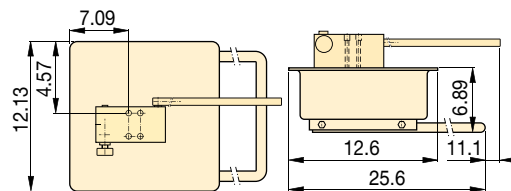
- Superior corrosion resistance
- Impregnated aluminum anodized pump housing with stainless steel internal pumping components
- Standard Nitrile seals – excellent for demineralized water, oil/water emulsions, water glycols, mineral oils, hydraulic fluids
- Custom EPDM seals available for use with Skydrol® or brake fluids
- Two speed pumps up to 14,500 psi pressure
- Externally adjustable pressure relief valve
- 1/4" NPTF gauge port



### MP-110, 350, 700, 1000

- ① Suction / Tank return port 3/8"-18 NPTF
- ② Pressure port 3/8"-18 NPTF
- ③ Gauge port 1/4"-18 NPTF

▼ MP-Series pumps are ideal for testing and filling applications.



MP-10T

| Pump Type | Usable Oil Capacity (in <sup>3</sup> ) | Model Number | Pressure Rating (psi) |           | Oil Displacement per Stroke (in <sup>3</sup> ) |           | Max. Handle Effort (lbs) | Piston Stroke (in) | Weight (lbs) |
|-----------|--|--------------|-----------------------|-----------|--|-----------|--------------------------|--------------------|--------------|
|           |  |              | 1st stage             | 2nd stage | 1st stage                                      | 2nd stage |                          |                    |              |
| Two Speed | *                                      | MP-110       | 500                   | 1500      | 3.2  | 1.28      | 99                       | 1.04               | 14.5         |
|           | *                                      | MP-350       | 500                   | 5000      | 3.2  | .43       | 99                       | 1.04               | 14.5         |
|           | *                                      | MP-700       | 500                   | 10,000    | 3.2  | .18       | 99                       | 1.04               | 14.5         |
|           | *                                      | MP-1000      | 500                   | 14,500    | 3.2  | .12       | 99                       | 1.04               | 14.5         |

Note: MP-Pump includes .060 in. thick gasket for reservoir mounting.

\* MP-Series pumps require the use of an external reservoir.

▼ Shown from left to right: 11-100, P-2282



## Ultra-High Pressure up to 40,000 psi



### 2-Way Shut-Off Valve 72-750

For 40,000 psi applications requiring a shut-off valve or gauge snubber. Made of 318 Stainless Steel and utilizing .38 inch cone fittings, it is the perfect selection for use with your Ultra-High Pressure Hand Pump.

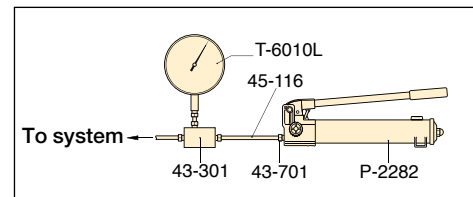


### Test System Gauges

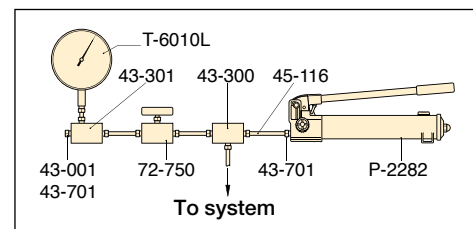
Ideal for monitoring pressure in your hydraulic circuit, Test System Gauges, such as the T-6010L, are available with cone threads or NPTF threads and in a variety of pressure ranges.

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- Two-speed operation on the P-2282 allows for faster fill, reducing cycle times for many testing applications
- 303 Stainless steel construction on the 11-100 and 11-400 models enable use with many different fluids, such as distilled water, alcohol, diesters, silicones, soluble oils and petroleum
- Large release knob for improved control of pressure release
- Outlet ports are 3/4"-16 cone for 40,000 psi rating



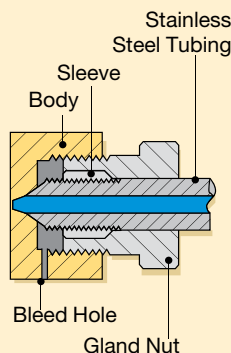
▲ Typical Test System



▲ Test System with Gauge and Snubber

### Cone Seal

Stainless Steel High Pressure fittings seal on a "cone" surface and do not require pipe sealer. The Gland Nut holds the sleeve and tubing tight against the cone surface to provide a 40,000 psi seal.



| Pump Type    | Usable Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Pressure Rating*<br>(psi) |           | Oil Displacement per Stroke<br>(in <sup>3</sup> ) |           | Max. Handle Effort<br>(lbs) |
|--------------|---|--------------|---------------------------|-----------|---|-----------|-----------------------------|
|              |   |              | 1st stage                 | 2nd stage | 1st stage   | 2nd stage |                             |
| Two-speed    | 60  | P-2282       | 200                       | 40,000    | .99   | .037      | 106                         |
| Single-speed | 45  | 11-100       | N/C                       | 10,000    | N/C   | .152      | 120                         |
|              | 45  | 11-400       | N/C                       | 40,000    | N/C   | .038      | 120                         |

\* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.

# Ultra-High Pressure Hand Pumps

## ▼ Optional Ultra-High Pressure Fittings and Tubing

| Description            | Connection  | Model No.                  |
|------------------------|---|----------------------------|
| <b>40,000 psi</b>      |   |                            |
| Gland Nut Plug         | .38" cone   | 43-001                     |
| Elbow                  | .38" cone   | 43-200                     |
| Tee                    | .38" cone   | 43-300                     |
| Gauge Tee              | .38" cone side/<br>.25" cone gauge port                               | 43-301                     |
| Gauge Adaptor          | .38" cone side/<br>.25" cone gauge port                               | 83-011                     |
| Coupling               | .38" cone   | 43-400                     |
| Cross                  | .38" cone   | 43-600                     |
| Gland Nut with Sleeve  | .38" cone   | 43-701                     |
| Gauge Connector        | .25" cone   | 43-704                     |
| Tubing                 | 4" tube, O.D. .38" *<br>8" tube, O.D. .38" *<br>12" tube, O.D. .38" * | 45-116<br>45-126<br>45-136 |
| <b>10,000 psi only</b> |   |                            |
| Adaptor                | .38" F cone to 1/4" M NPTF  | 41-146                     |
|                        | .38" F cone to 3/8" M NPTF  | 41-166                     |
| Adaptor                | .38" F cone to 1/4" F NPTF  | 41-246                     |
|                        | .38" F cone to 3/8" F NPTF  | 41-266                     |
| Adaptor                | .38" M cone to 3/8" F NPTF  | 41-366                     |

Note: .25" cone fittings use 9/16"-18 threads, 3/8" cone fittings use 3/4"-16 threads.

\* Actual tubing lengths are .75" less than nominal size shown. These dimensions make distance between centers of valves and fittings multiples of 4" spaces.

## P/11 Series



Reservoir Capacity:

**45-60 in<sup>3</sup>**

Flow at Rated Pressure:

**.037-.152 in<sup>3</sup>/stroke**

Maximum Operating Pressure:

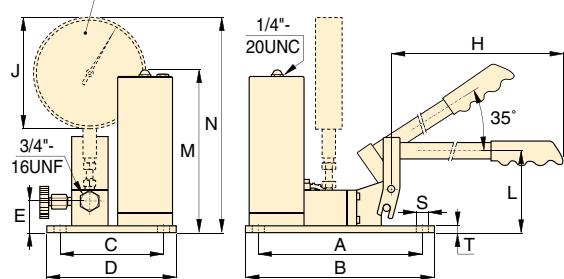
**10,000-40,000 psi**



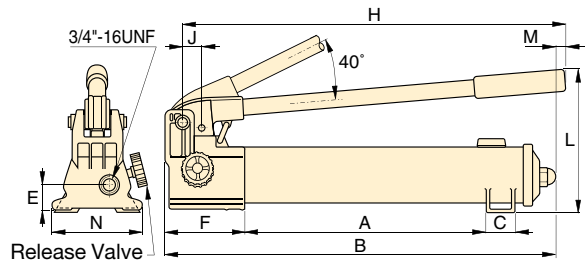
### Stainless Steel Construction

Ultra-high Pressure Fittings feature all stainless steel construction except adaptor 41-366, which features nickel plated carbon steel construction.

Optional T-Series gauge and fitting



11-100, 11-400



P-2282

| Piston Stroke | Dimensions (in) |       |      |      |      |      |       |      |      |      |       |     |     |    | Weight (lbs) | Model Number |
|---------------|-----------------|-------|------|------|------|------|-------|------|------|------|-------|-----|-----|----|--------------|--------------|
|               | (in)            | A     | B    | C    | D    | E    | F     | H    | J    | L    | M     | N   | S   | T  |              |              |
| 1.00          | 13.56           | 22.00 | 1.40 | -    | 1.24 | 5.25 | 20.75 | 1.16 | 9.00 | .28  | 4.74  | -   | -   | 14 | P-2282       |              |
| .78           | 9.45            | 10.50 | 5.98 | 7.00 | 1.77 | -    | 25.00 | 6.41 | 4.50 | 9.33 | 12.38 | .31 | .37 | 22 | 11-100       |              |
| .78           | 9.45            | 10.50 | 5.98 | 7.00 | 1.77 | -    | 25.00 | 6.41 | 4.50 | 9.33 | 12.38 | .31 | .37 | 22 | 11-400       |              |

▼ Shown: BP-122



## Cordless Hydraulic Power



### 28-Volt Lithium-Ion Battery

Heavy-duty construction with easy to operate latches. Fuel gauge LEDs show remaining charge.

| Number of illuminated LEDs | Charge Remaining |
|----------------------------|------------------|
| 4 ■■■■                     | 100%-78%         |
| 3 ■■■                      | 77%-56%          |
| 2 ■■                       | 55%-34%          |
| 1 ■                        | 33%-10%          |
| Flashing                   | less than 10%    |

- Lightweight, compact design with integrated handle for maximum portability
- Dual power selection and variable speed for preferred flow and precise control
- Heavy-duty 28 volt Lithium-Ion battery pack delivers constant fade-free power
- Immediate charging after use — a quick one hour charge
- Pump model includes two 3.0 amp-hour battery packs and quick charger



### G2535L Gauge

Minimize the risk of overloading and ensure long dependable service from your cordless pump.

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### Help Keep Our Environment Clean

Battery packs contain no cadmium, so they are environmentally friendly. Enerpac encourages recycling.



◀ Take the battery pump anywhere without any power cords or air hoses.

# Battery Powered Hydraulic Pump



## Battery Powered Pump

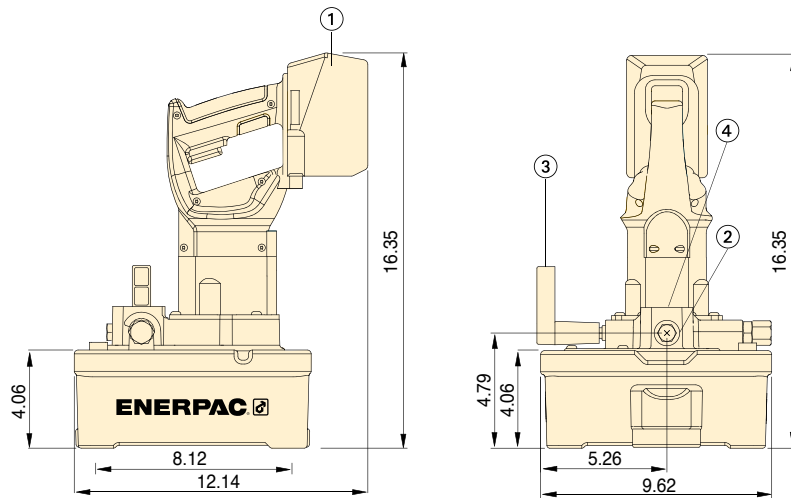
The BP cordless pump is best suited for small to medium size cylinders or hydraulic tools, or wherever portable cordless hydraulic power is needed.

Powerful for everyday use, its lightweight and ergonomic design is ideal for both remote job sites or wherever a cord gets in the way.

The Lithium-Ion battery operates at peak performance under extreme conditions to get more work completed. The battery pack provides the power to run the cordless pump at maximum pressure for over six minutes. Numerous applications are easily and safely performed using the cordless pump powered by the Lithium-Ion battery pack.\*

- 130 cuts of 3/8-inch reinforcing bar using the WHC750 Cutter
- 75 lifts with a WR5 Spreader
- Safely remove thirty 1-inch nuts using the NC3241 Nut Splitter
- Lift loads multiple times using 5–100 ton jacks

\*Actual number of cycles will depend on condition of tool, battery, and ambient conditions.



- ① 28-Volt Lithium-Ion battery
- ② 3/8"-18 NPTF oil outlet
- ③ 3-way, 2-position valve
- ④ 1/4"-18 NPTF gauge port

### SELECTION CHART

| Usable Oil Capacity<br>(gal) | Model Number | Output Flow Rate<br>(in <sup>3</sup> /min) |            | Valve Function | Charger Voltage<br>(VAC) | Weight<br>(lbs) |
|------------------------------|--------------|--|------------|----------------|--------------------------|-----------------|
|                              |              | 200 psi                                    | 10,000 psi |                |                          |                 |
| 0.5                          | BP-122       | 120  | 15         | 3-way, 2-pos.  | 115                      | 21.2            |
| 1.0                          | BP-124       | 120  | 15         | 3-way, 2-pos.  | 115                      | 24.0            |
| 0.5                          | BP-122E      | 120  | 15         | 3-way, 2-pos.  | 230                      | 21.2            |
| 1.0                          | BP-124E      | 120  | 15         | 3-way, 2-pos.  | 230                      | 24.0            |

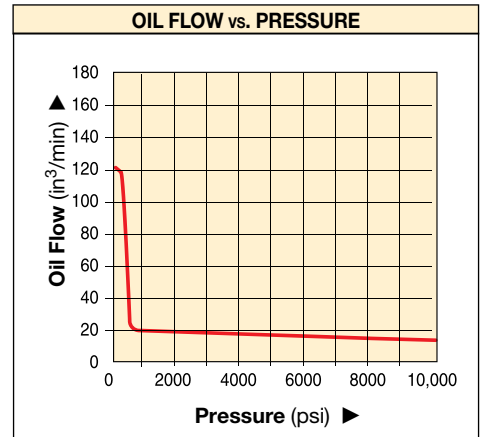
## BP Series



Reservoir Capacity:  
**.5-1.0 gal.**

Flow at Rated Pressure:  
**15 in<sup>3</sup>/min.**

Maximum Operating Pressure:  
**10,000 psi**



▼ Cordless power and simplicity for the toughest jobs: BP122 battery pump used to operate an RCS-1002 low height cylinder.



▼ Shown: PUJ-1200B



## Heavy on Performance, Light on Weight

- Lightweight and compact design
- Large easy-carry handle for maximum portability
- Two-speed operation reduces cycle times for improved productivity
- 115 VAC 50/60-cycle universal motor will operate on voltages as low as 60 volts
- 24 VAC remote motor control, 10-ft length for operator safety
- Starts under full load
- High strength molded shroud with integral handle, protects motor from contamination and damage
- Designed for intermittent duty cycle



### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. For use with the Economy pump the **G-2535L** gauge and **GA-3** gauge adaptor are suggested.

For a full range of gauges, please refer to the System Components section.

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### Speed Chart

To determine how the 0.5 hp Economy pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

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▼ An Economy Pump PUJ-1200B is used with an RC-2514 to reposition a stamping die to simplify maintenance.



| Used with Cylinder | Usable Oil Capacity<br>(gal) | Model Number* | Pressure Rating       |                       |
|--------------------|------------------------------|---------------|-----------------------|-----------------------|
|                    |                              |               | (psi)                 |                       |
|                    |                              |               | 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage |
| Single-acting      | .50                          | PUD-1100B     | 200                   | 10,000                |
|                    | 1.00                         | PUD-1101B     | 200                   | 10,000                |
|                    | .50                          | PUD-1300B     | 200                   | 10,000                |
|                    | 1.00                         | PUD-1301B     | 200                   | 10,000                |
|                    | .50                          | PUJ-1200B     | 200                   | 10,000                |
|                    | 1.00                         | PUJ-1201B     | 200                   | 10,000                |
| Double-acting      | .50                          | PUJ-1400B     | 200                   | 10,000                |
|                    | 1.00                         | PUJ-1401B     | 200                   | 10,000                |



## About the Economy Pump

The Economy pump is best suited to power small to medium size cylinders

or hydraulic tools. Its lightweight and compact design makes it ideal for applications which require easy transport of the pump.

The Universal motor works well on long extension cords or generator-driven electrical power supplies.

For further application assistance refer to the "Yellow Pages".

### PUD-1100 Series

- Provides advance/auto-retract of single-acting cylinders
- Ideal for punching applications

- For applications not requiring load holding
- 10-ft pendant controls motor and valve operation

### PUD-1300 Series

- Provides advance/hold/retract of single-acting cylinders
- 10-foot pendant controls motor and valve operation
- Ideal for applications requiring remote valve operation.

### PUJ-Series

- Available with 3- and 4-way valves for single- or double-acting cylinders
- 10-ft pendant controls the motor operation
- Manual valves provide advance/retract tool control



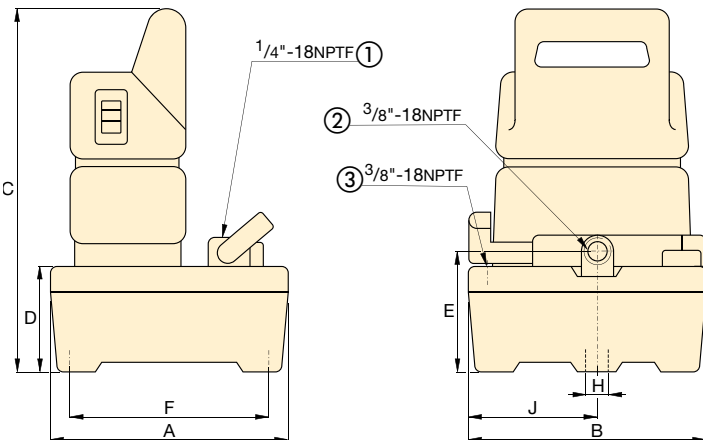
## PU Series

Reservoir Capacity:  
**0.5-1.0 gal.**

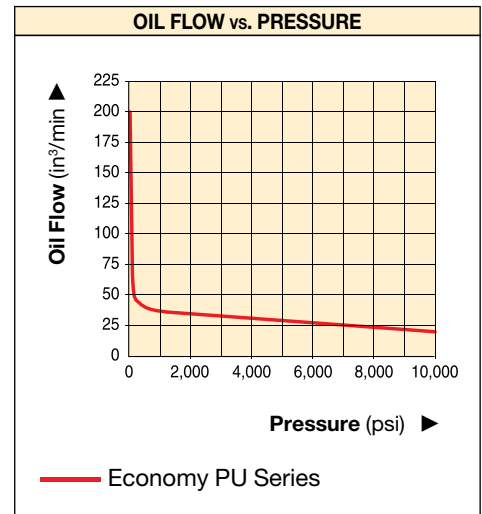
Flow at Rated Pressure:  
**20 in<sup>3</sup>/min.**

Motor Size:  
**.5 hp**

Maximum Operating Pressure:  
**10,000 psi**



- ① Gauge Port (PUJ-1200/1201 only)
- ② Outlet Port
- ③ Tank Port



| Output Flow Rate      |                       | Valve Type    | Current Draw | Motor Voltage | Sound Level | Dimensions (in) |       |       |      |      |       |     |      | Weight | Model Number* |
|-----------------------|-----------------------|---------------|--------------|---------------|-------------|-----------------|-------|-------|------|------|-------|-----|------|--------|---------------|
| 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage |               |              |               |             | A               | B     | C     | D    | E    | F     | H   | J    |        |               |
| 200                   | 20                    | Dump **       | 9.5          | 115           | 85          | 9.62            | 9.62  | 14.25 | 4.00 | 4.72 | 8.00  | .40 | 5.25 | 26     | PUD-1100B     |
| 200                   | 20                    |               | 9.5          | 115           | 85          | 14.50           | 12.18 | 14.72 | 4.15 | 5.12 | 12.74 | .40 | 5.62 | 35     | PUD-1101B     |
| 200                   | 20                    | Dump and Hold | 9.5          | 115           | 85          | 9.62            | 9.62  | 14.25 | 4.00 | 4.72 | 8.00  | .40 | 5.25 | 26     | PUD-1300B     |
| 200                   | 20                    |               | 9.5          | 115           | 85          | 14.50           | 12.18 | 14.72 | 4.15 | 5.12 | 12.74 | .40 | 5.62 | 35     | PUD-1301B     |
| 200                   | 20                    | 3-way, 2-pos. | 9.5          | 115           | 85          | 9.62            | 9.62  | 14.25 | 4.00 | 4.72 | 8.00  | .40 | 5.25 | 24     | PUJ-1200B     |
| 200                   | 20                    |               | 9.5          | 115           | 85          | 14.50           | 12.18 | 14.72 | 4.15 | 5.12 | 12.74 | .40 | 5.62 | 31     | PUJ-1201B     |
| 200                   | 20                    | 4-way, 3-pos. | 9.5          | 115           | 85          | 9.62            | 9.62  | 14.25 | 4.00 | 4.72 | 8.00  | .40 | 5.25 | 29     | PUJ-1400B     |
| 200                   | 20                    |               | 9.5          | 115           | 85          | 14.50           | 12.18 | 14.72 | 4.15 | 5.12 | 12.74 | .40 | 5.62 | 36     | PUJ-1401B     |

\* For 230 volt applications replace "B" suffix with "E".  
\*\* Electric dump valve for auto-retract of cylinders.



▼ Shown: PEJ-1401B



## Best Performance for Mid-Range Cylinders and Tools

### ▼ SELECTION CHART

For more technical information see next page.

#### 5 BASIC PUMP TYPES

Select the model that suits your application. For special requirements see **page 73** or contact your Enerpac office.

#### **PED-Series: with Dump Valve**

- Ideal for punching, crimping and cutting
- For use when load holding is not required
- Control pendant with 10 ft. cord controls valve and motor

#### **PEM-Series: with Manual Valve**

- Ideal choice for most applications
- Manual valve control, for both single-acting and double-acting applications
- Manual motor control

#### **PER-Series: with Solenoid Valve**

- Ideal for production and lifting
- All valves are 3-position for Advance/Hold/Retract
- Control pendant with 10 ft. cord for remote valve operation

#### **PEJ-Series: with Remote Jog**

- For light production and lifting applications
- Manual valve control for single-acting or double-acting cylinders
- Control pendant with 10 ft. cord for remote motor operation

#### **PES-Series: with Pressure Switch**

- Designed for maintaining pressure applications, such as clamping, workholding and testing
- All versions include manual valves for directional control

- Two-speed operation reduces cycle times for improved productivity
- Powerful .5 hp induction motor is submerged in the oil reservoir to run cooler, protect the motor, simplify the pump interface, save space and reduce noise
- Large 1.5 gallon reservoir allows operation of a wide range of cylinders
- 24 VDC remote pendant control on certain models for safer operation
- Externally adjustable relief valve allows control of operating pressure without opening the pump
- 40-micron internal return line filter keeps oil clean, promoting longer pump life
- Full length side tube for easy monitoring of oil level



◀ The Remote Jog model of the Submerged Pump simplifies repair on this construction crane.

\* Contact Enerpac for details on VM style valves.

# Submerged Electric Pumps



## Submerged Pump Application

The Submerged pump is best suited to power small to medium size cylinders or hydraulic tools, or whenever a quiet, intermittent duty cycle is needed. With its low sound level and the addition of the optional oil cooler, the Submerged pump is suited to light production work as well.

Its lightweight and compact design also make it ideal for applications which require some transport of the pump.

For further application assistance see the "Yellow Pages" or contact your local Enerpac office.

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## PE Series



Reservoir Capacity:

**1.5 gal.**

Flow at Rated Pressure:

**20 in<sup>3</sup>/min.**

Motor Size:

**.5 hp**

Maximum Operating Pressure:

**10,000 psi**

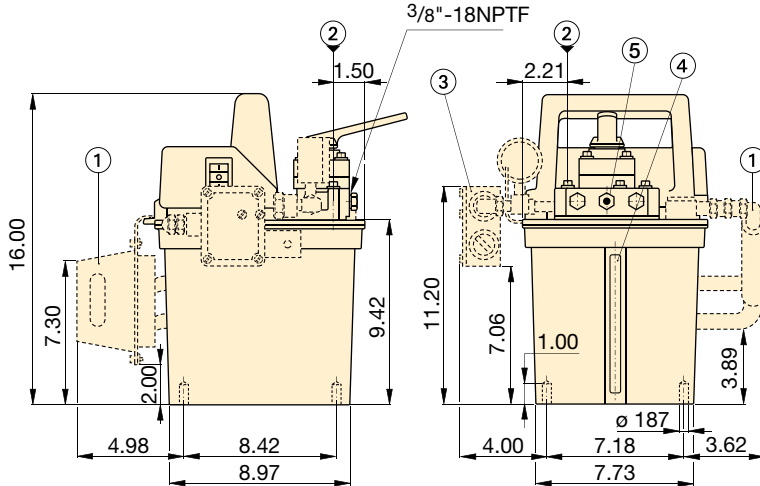
| Pump Type | Used with Cylinder | Valve Function       | Valve Type*           | Usable Oil Capacity (gal) | Model Number<br>115 VAC, 1 ph | Weight (lbs) |
|-----------|--------------------|----------------------|-----------------------|---------------------------|-------------------------------|--------------|
|           | Single-acting      | Advance/Retract      | Dump                  | 1.5                       | <b>PE-1101B</b>               | 55           |
|           |                    |                      |                       |                           |                               |              |
|           |                    |                      |                       |                           |                               |              |
|           |                    |                      |                       |                           |                               |              |
|           | Single-acting      | Advance/Retract      | Manual VMP 10000D     | 1.5                       | <b>PEM-1201B</b>              | 53           |
|           | Single-acting      | Advance/Hold/Retract | Manual VMF 10000D     | 1.5                       | <b>PEM-1301B</b>              | 53           |
|           | Double-acting      | Advance/Hold/Retract | Manual VMC 10000D     | 1.5                       | <b>PEM-1401B</b>              | 53           |
|           |                    |                      |                       |                           |                               |              |
|           | Single-acting      | Advance/Hold/Retract | Solenoid (VEF-15500D) | 1.5                       | <b>PER-1301B</b>              | 65           |
|           | Double-acting      | Advance/Hold/Retract | Solenoid (VEC-15600D) | 1.5                       | <b>PER-1401B</b>              | 65           |
|           |                    |                      |                       |                           |                               |              |
|           |                    |                      |                       |                           |                               |              |
|           | Single-acting      | Advance/Retract      | Manual VMP 10000D     | 1.5                       | <b>PEJ-1201B</b>              | 55           |
|           | Single-acting      | Advance/Hold/Retract | Manual VMF 10000D     | 1.5                       | <b>PEJ-1301B</b>              | 55           |
|           | Double-acting      | Advance/Hold/Retract | Manual VMC 10000D     | 1.5                       | <b>PEJ-1401B</b>              | 55           |
|           |                    |                      |                       |                           |                               |              |
|           | Single-acting      | Advance/Retract      | Manual VMP 10000D     | 1.5                       | <b>PES-1201B</b>              | 62           |
|           | Double-acting      | Advance/Hold/Retract | Manual VMC 10000D     | 1.5                       | <b>PES-1401B</b>              | 62           |
|           |                    |                      |                       |                           |                               |              |
|           |                    |                      |                       |                           |                               |              |

◀ For full features see page 72.

| Submerged Pump Performance |                       |                       |                        |                       |  |             |                               |
|----------------------------|-----------------------|-----------------------|------------------------|-----------------------|--|-------------|-------------------------------|
| Motor Size                 | Pressure Rating       |                       | Output Flow Rate**     |                       | Motor Electrical Specifications*       | Sound Level | Relief Valve Adjustment Range |
|                            | (psi)                 |                       | (in <sup>3</sup> /min) |                       |  |             |                               |
|                            | 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage | 1 <sup>st</sup> stage  | 2 <sup>nd</sup> stage |  |             |                               |
| 0.5                        | 1,000                 | 10,000                | 150                    | 20                    | 13 @ 115-1-50/60<br>6.75 @ 230-1-50/60 | 62-70       | 1,000-10,000                  |

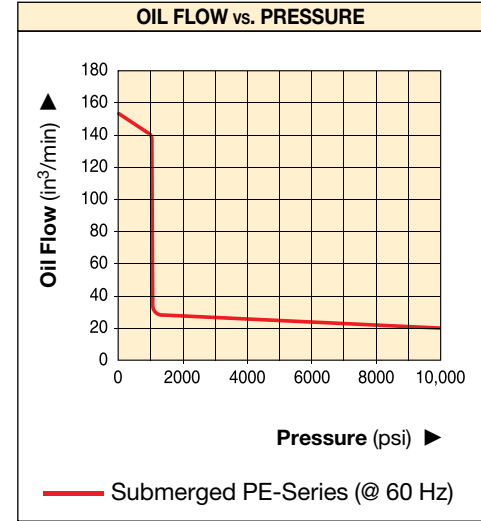
\* At bypass and maximum pressure. See matrix footnotes on next page for Hz limitations.

\*\* All flow data at 60 Hz, 50 Hz data will be 5/6 th this number.



Dimensions shown in inches.

- ① Heat Exchanger (optional for all models)
- ② Fill Port
- ③ Pressure Switch (PES-Series, optional for other models)
- ④ Oil Level Indicator
- ⑤ Adjustable Relief Valve



### Speed Chart

To determine how a submerged pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

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◀ This PED-1101B Submerged pump quickly and quietly powers a hydraulic nut cutter in this bucket maintenance application.

# Submerged Electric Pumps Ordering Matrix

## CUSTOM BUILD YOUR SUBMERGED PUMP

If the Submerged Pump that would best fit your application cannot be found in the chart on page 72, you can easily build your custom submerged pump here.

▼ This is how a Submerged Pump Model Number is built up:

|                      |                    |                   |          |                     |                    |                        |                       |
|----------------------|--------------------|-------------------|----------|---------------------|--------------------|------------------------|-----------------------|
| <b>P</b>             | <b>E</b>           | <b>M</b>          | <b>-</b> | <b>1</b>            | <b>3</b>           | <b>01</b>              | <b>B</b>              |
| 1<br>Product<br>Type | 2<br>Motor<br>Type | 3<br>Pump<br>Type |          | 4<br>Pump<br>Series | 5<br>Valve<br>Type | 6<br>Reservoir<br>Size | 7<br>Motor<br>Voltage |

### 1 Product Type

**P** = Pump

### 2 Motor Type

**E** = Electric motor

### 3 Pump Type

**D** = Dump

**J** = Jog

**M** = Manual

**R** = Remote (Solenoid)<sup>1) 2)</sup>

**S** = Pressure switch

### 4 Pump Series

**1** = .5 hp, 10,000 psi

### 5 Valve Type

**0** = No valve (PER only)

**1** = Dump

**2** = 3-way, 2-position, normally open

**3** = 3-way, 3-position, tandem center

**4** = 4-way, 3-position, tandem center

**5** = Modular valve (PER only)

### 6 Reservoir Size

**01** = 1.5 gallon

### 7 Motor Voltage and Heat Exchanger

**B** = 115 V, 1 Ph, 60 Hz <sup>1)</sup>

**D** = 115 V, 1 Ph, 60 Hz <sup>1)</sup>

with heat exchanger

**E** = 230 V, 1 Ph, 50 Hz <sup>2)</sup>

**F** = 230 V, 1 Ph, 50 Hz <sup>2)</sup>

with heat exchanger

**I** = 230 V, 1 Ph, 60 Hz

<sup>1)</sup> Solenoid valves operate only at 60 Hz.  
Can also run at 50 Hz with manual valve

<sup>2)</sup> Solenoid valves operate only at 50 Hz.  
Can also run at 60 Hz with manual valve

## Ordering Example

### Model Number: PER-1301B

The PER-1301B is a .5 hp, 10,000 psi, submerged electric pump, with 1.5 gallon usable oil capacity, a 3-way, 3-position modular, remote solenoid valve and a 115 V, 1 Phase, 60 Hz motor.

## PE Series



Reservoir Capacity:

**1.5 gal.**

Flow at Rated Pressure:

**20 in<sup>3</sup>/min.**

Motor Size:

**.5 hp**

Maximum Operating Pressure:

**10,000 psi**



### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

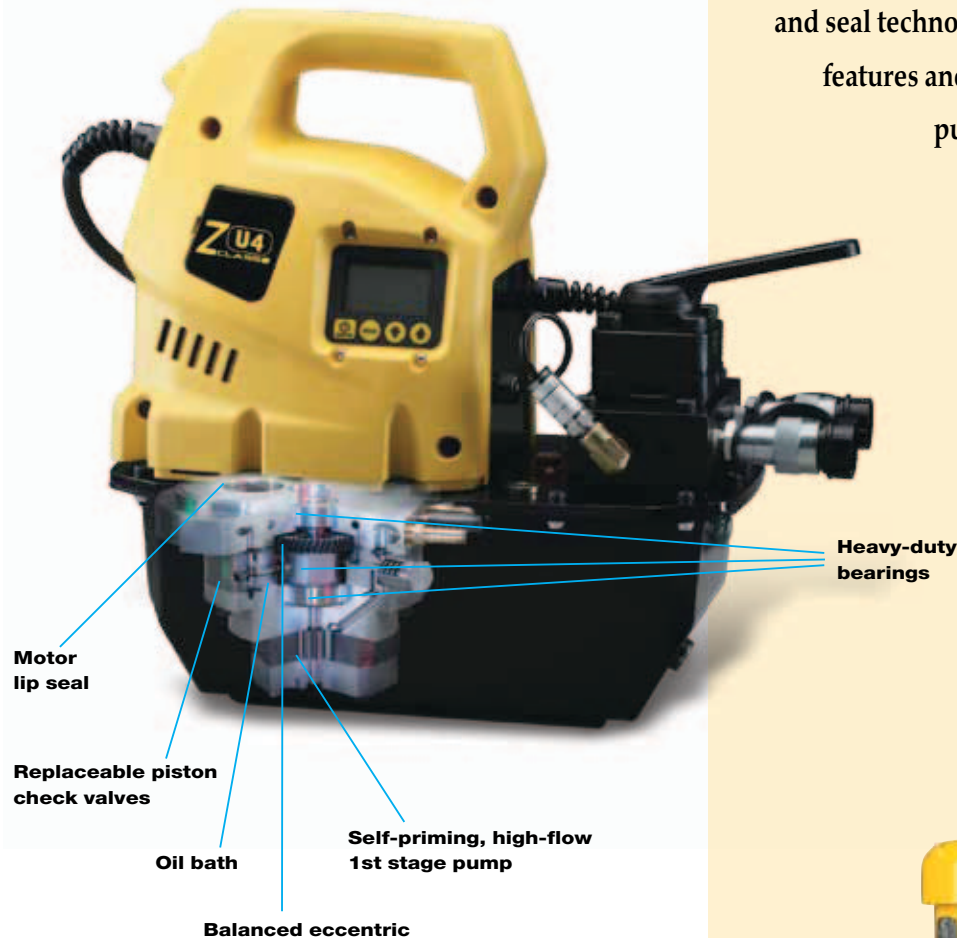
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The **PER-1301B**, **PER-1401B**, **PER-1301D** and **PER-1401D** include a Modular (solenoid) Valve and pilot operating check.

Page: **110**

Introducing the *Z-Class* power pumps from Enerpac – pumps that run cooler, use less electricity and are easy to service.



Enerpac has used the latest metallurgical, bearing and seal technologies to produce a pump whose features and benefits far surpass the electric pumps that are available today. By reducing the number of moving parts, improving flow dynamics and decreasing friction, *Z-Class* pumps will stay on the job longer, require less energy to operate and when needed, have lower service costs.

*Z-Class* electric pumps from Enerpac – simply the best pump you will ever use.



**Z** Tough.  
Dependable.  
Innovative.  
**ZCLASS**

## Z-Class Pumping Element – The Heart of Your Hydraulic System

**Highly efficient design** provides increased flow rates, reduced heat generation and a decrease in power consumption. This means improved tool speed and increased service life – which results in higher productivity and lower operating costs.

**Heavy-duty bearings** extend pump life by reducing friction, reducing surface-loading and lowering bearing stresses.

**Pump cavity oil bath** extends pump life by reducing heat, improving lubrication and reducing wear.

**Self-priming, high-flow 1st stage pump** increases pump performance by super-charging the 2nd stage piston pump – improving oil flow in both hot and cold weather operation.

**Balanced rotating components reduce vibration** creating a smoother running pump – reducing wear, friction and sound levels.

**Replaceable piston check-valves** increase service life of major pump components.

**Ergonomic low-voltage pendant** features sealed switches and operates at 24 VDC for improved operator safety.

### Z-Class factory installed options & accessories

Extensive list of accessories including heat exchanger, roll-bars, skid bar, pressure transducer, return line filter and level and temperature switches, allow complete pump control over a wide range of industrial applications.

### Z-Class electric pumps for your application

Available in one flow range for universal motor and 4 flow ranges for induction motor. Choose from single or two-stage models to provide the optimum cylinder and tool performance for almost any industrial application.

| Pump Series | Motor Size (hp) | Flow @ 10,000 psi (in <sup>3</sup> /min) |
|-------------|-----------------|--|
| ZU4         | 1.7             | 60                                       |
| ZE3         | 1.0             | 40                                       |
| ZE4         | 1.5             | 60                                       |
| ZE5         | 3.0             | 120                                      |
| ZE6         | 7.5             | 200                                      |

### Back-lit LCD on select Z-Class pumps

- pump usage information, hour and cycle counts
- low-voltage warning and recording
- offers self-test and diagnostic capabilities
- information displayed in 6 languages
- pressure read-out (when used with the optional pressure transducer)
- adjustable trigger pressure setting (when used with the optional pressure transducer)



Back-lit LCD available on ZU and ZE-Series Electric Pumps ▶



### ZU4 Series Pump Applications

- **Mobile:** when frequent pump transport is required and/or on remote locations
- **Universal motor:** 1-phase, runs well under poor voltage supply, using generator power supply or using long extension cord
- **Duty-cycle:** for intermittent applications
- **Cylinders and tools:** for medium to large size single and double-acting applications and high speed.



### ZE Series Pump Applications

- **Stationary:** when pump remains in one location
- **Induction motor:** 1 and 3-phase for high-cycle usage
- **Duty-cycle:** for heavy-duty, extended cycle application
- **Cylinders and tools:** for medium to large size single- and double-acting applications and high speed

▼ Shown from left to right: ZU4304MB, ZU4420SB-H, ZU4304PB-K



**Z** Tough.  
Dependable.  
Innovative.  
**CLASS**

- Features **Z-Class** high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps
- Powerful 1.7 hp universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics
- High-strength, molded composite shroud protects motor and electronics, while providing an ergonomic, non-conductive handle for easy transport
- Low-voltage pendant provides additional safety for the operator (remote control units)

**Pro Series pump only**

- LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump
- AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (pump can be used with or without auto cycle feature)



◀ *Designed to be tough, the ZU4-Series with steel reservoirs will take the abuse of today's construction sites. The ZU4908JE is the ideal pump for post tensioning applications. For post tensioning tools see page 180.*

▼ **COMMON PUMP MODELS**

For technical information and other options see next page.

|                                  |  |
|----------------------------------|--|
| <b>BASIC PUMP TYPES</b>          | Select the model that suits your application. For special requirements contact your Enerpac office.  |
| <b>Manual Valve</b>              | <ul style="list-style-type: none"> <li>• Ideal choice for most applications</li> <li>• Manual valve control, for single-acting or double-acting applications</li> <li>• Motor control on shroud</li> </ul>   |
| <b>Manual Valve with Pendant</b> | <ul style="list-style-type: none"> <li>• For light production and lifting applications</li> <li>• Manual valve control for single-acting or double-acting cylinders</li> <li>• Low-voltage control pendant with 10-ft. cord for remote motor operation</li> </ul>  |
| <b>Dump Valve</b>                | <ul style="list-style-type: none"> <li>• Ideal for punching, crimping and cutting</li> <li>• For use when load-holding is not required</li> <li>• Low-voltage control pendant with 10-ft. cord controls valve and motor</li> </ul>   |
| <b>Solenoid Valve</b>            | <ul style="list-style-type: none"> <li>• Ideal for lifting applications and where remote control is required</li> <li>• Motor runs continuously on pumps with VE33 and VE43 valves. With VE32 valve, motor only runs during the advance function, while holding and retracting, the motor is off</li> <li>• Low-voltage control pendant with 10 ft. cord for remote motor and valve operation</li> </ul> |



## Z-Class – A Pump For Every Application

Patented Z-Class pump technology provides high

by-pass pressures for increased productivity—important in applications using long hose runs and high pressure-drop circuits, like heavy lifting or certain double-acting tools.

Enerpac ZU4 Hydraulic Pumps are built to power small to large-sized cylinders or hydraulic tools, or wherever high-speed, intermittent duty, remote hydraulic power is needed.

### Classic Electric Pump

- The *Classic* has traditional electro-mechanical components (transformers, relays and switches) in place of solid-state electronics. The *Classic* delivers durable, safe

and efficient hydraulic power for demanding markets like construction, post-tensioning and foundation repair.

### Standard Electric Pump

- For applications that do not require digital display features of the Premium Pump. Available in all manual or jog versions.

### Pro Electric Pump

- Digital (LCD) display features a built-in hour meter and shows self-diagnostic, cycle-count and low voltage warning information. Pressure can also be displayed when the pump is equipped with an optional pressure transducer.



## ZU Series



Reservoir Capacity:

**1.0-10.0 gal.**

Flow at Rated Pressure:

**60 in<sup>3</sup>/min.**

Motor Size:

**1.7 hp**

Maximum Operating Pressure:

**10,000 psi**

| Pump Type | Used with Cylinder |   | Valve Function |   |   | Valve Type <sup>2)</sup> | Pump Control  | Usable Oil Capacity (gal) | Model Number 115 VAC <sup>3)</sup> 1 Phase |              |              | Pro Product Weight with oil <sup>4)</sup> (lbs) |
|-----------|--------------------|---|----------------|---|---|--------------------------|---------------|---------------------------|--|--------------|--------------|---|
|           |                    |   |                |   |   |                          |               |                           | Classic                                    | STD Electric | Pro Electric |   |
|           | ●                  |   | ●              |   | ● | VM22                     | Manual        | 1.0                       | ZU4704RB                                   | ZU4704MB     | ZU4704LB     | 59  |
|           | ●                  |   | ●              |   | ● | VM22                     | Manual        | 2.0                       | ZU4708RB                                   | ZU4708MB     | ZU4708LB     | 69  |
|           | ●                  |   | ●              | ● | ● | VM33                     | Manual        | 2.0                       | ZU4308RB                                   | ZU4308MB     | ZU4308LB     | 70  |
|           | ●                  |   | ●              | ● | ● | VM33                     | Manual        | 5.0                       | ZU4320RB                                   | ZU4320MB     | ZU4320LB     | 109   |
|           |                    | ● | ●              | ● | ● | VM43                     | Manual        | 2.0                       | ZU4408RB                                   | ZU4408MB     | ZU4408LB     | 70  |
|           |                    | ● | ●              | ● | ● | VM43                     | Manual        | 5.0                       | ZU4420RB                                   | ZU4420MB     | ZU4420LB     | 109   |
|           | ●                  |   | ●              |   | ● | VM22                     | Remote (Man.) | 1.0                       | ZU4704PB                                   | ZU4204JB     | ZU4204KB     | 60  |
|           | ●                  |   | ●              |   | ● | VM22                     | Remote (Man.) | 2.0                       | ZU4708PB                                   | ZU4208JB     | ZU4208KB     | 70  |
|           | ●                  |   | ●              |   | ● | VM22                     | Remote (Man.) | 5.0                       | ZU4720PB                                   | ZU4220JB     | ZU4220KB     | 109   |
|           | ●                  |   | ●              | ● | ● | VM33                     | Remote (Man.) | 2.0                       | ZU4308PB                                   | ZU4308JB     | ZU4308KB     | 71  |
|           |                    | ● | ●              | ● | ● | VM43                     | Remote (Man.) | 2.0                       | ZU4408PB                                   | ZU4408JB     | ZU4408KB     | 71  |
|           |                    | ● | ●              | ● | ● | VM43                     | Remote (Man.) | 5.0                       | ZU4420PB                                   | ZU4420JB     | ZU4420KB     | 110   |
|           | ●                  |   | ●              |   | ● | VE32D                    | Remote        | 1.0                       | N/A  | N/A          | ZU4104DB     | 63  |
|           | ●                  |   | ●              |   | ● | VE32D                    | Remote        | 2.0                       | N/A  | N/A          | ZU4108DB     | 73  |
|           | ●                  |   | ●              |   | ● | VE32D                    | Remote        | 5.0                       | N/A  | N/A          | ZU4120DB     | 112   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |
|           | ●                  |   | ●              | ● | ● | VE32                     | Remote        | 1.0                       | N/A  | N/A          | ZU4204SB     | 63  |
|           | ●                  |   | ●              | ● | ● | VE32                     | Remote        | 2.0                       | N/A  | N/A          | ZU4208SB     | 73  |
|           | ●                  |   | ●              | ● | ● | VE33                     | Remote        | 2.0                       | N/A  | N/A          | ZU4308SB     | 85  |
|           |                    | ● | ●              | ● | ● | VE43                     | Remote        | 2.0                       | N/A  | N/A          | ZU4408SB     | 85  |
|           |                    | ● | ●              | ● | ● | VE43                     | Remote        | 5.0                       | N/A  | N/A          | ZU4420SB     | 124   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |
|           |                    |   |                |   |   | -                        | -             | -                         | -  | -            | -            | -   |

<sup>1)</sup> All models meet CE safety requirements. "E" voltage versions also meet all requirements of the European EMC-Directive.

<sup>2)</sup> See valves section for technical information on valve types.

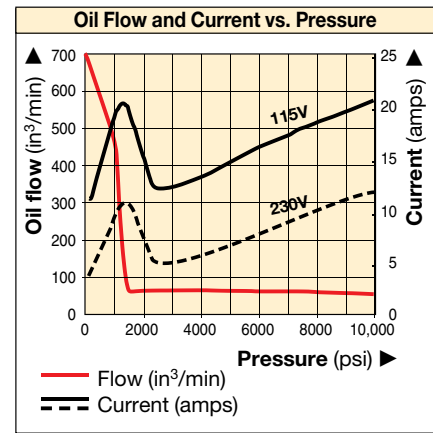
<sup>3)</sup> See custom order matrix for other voltage options.

<sup>4)</sup> Subtract 3 lbs. for STD Electric models.

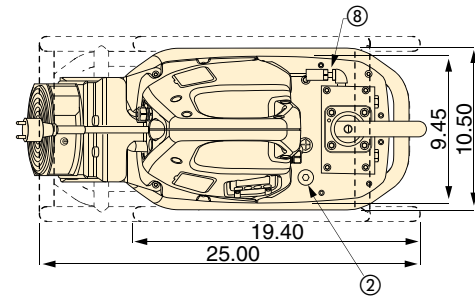
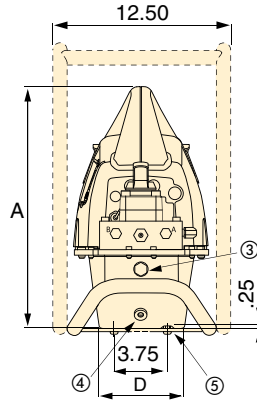
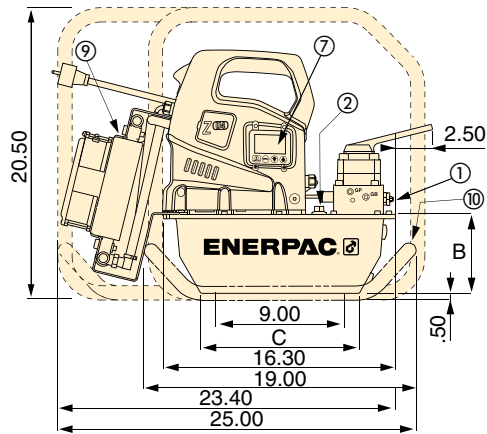


# ZU Series, Specifications and Dimensions

| ZU4 Performance |   |         |         |          |  |                   |                                     |
|-----------------|---|---------|---------|----------|--|-------------------|-------------------------------------|
| Motor Size      | Output Flow Rate (in <sup>3</sup> /min) |         |         |          | Motor Electrical Specification (volts-ph-Hz) | Sound Level (dBA) | Relief Valve Adjustment Range (psi) |
|                 | (hp)                                    | 100 psi | 700 psi | 5000 psi |  |                   |                                     |
| 1.7             | 700                                     | 535     | 76      | 60       | 115-1-50/60<br>230-1-50/60                   | 85-90             | 2,000-10,000                        |

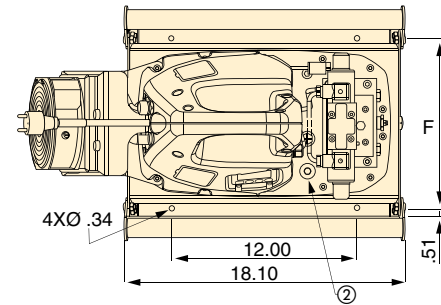
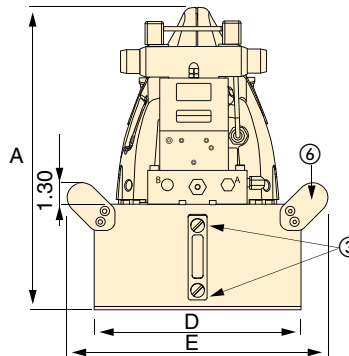
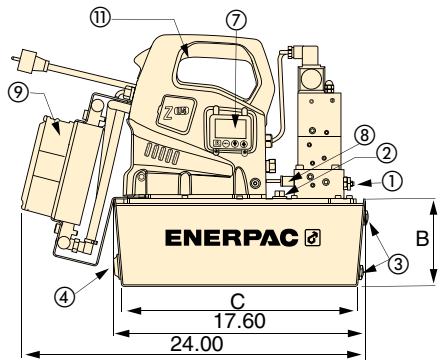


## ZU-4 Series with 1 and 2 gallon reservoirs



## ZU-4 Series with 2.5, 5.0 and 10.0 gallon reservoirs

(Left view shown without side handle)



- ① User adjustable relief valve
- ② Oil fill port, SAE#10
- ③ Oil level sight gauge
- ④ Oil Drain, 1/2" NPTF
- ⑤ M8 x 1.25
- ⑥ Handles on all 2.5, 5.0, and 10.0 gallon reservoirs

### Factory installed features and options

- ⑦ Back-lit LCD Electric
- ⑧ Pressure transducer
- ⑨ Heat exchanger
- ⑩ Skid bar
- ⑪ Handle guard installed on all 2.5, 5, and 10 gallon reservoirs
- ⑫ Reservoir handles included on all 2.5, 5 and 10 gallon pumps



◀ Increased output flow and extended brush life increase productivity for post-tensioning applications.

| Usable Reservoir Capacity (gal) | Pump Dimensions (in) |      |      |      |      |      |
|---------------------------------|----------------------|------|------|------|------|------|
|                                 | A                    | B    | C    | D    | E    | F    |
| 1.0                             | 16.7                 | 5.6  | 11.0 | 6.0  | -    | -    |
| 2.0                             | 16.7                 | 5.6  | 11.0 | 8.1  | -    | -    |
| 2.5                             | 17.3                 | 6.2  | 16.5 | 12.0 | 15.1 | 11.0 |
| 5.0                             | 18.3                 | 7.1  | 16.5 | 16.6 | 19.7 | 15.6 |
| 10.0                            | 21.7                 | 10.6 | 15.7 | 19.9 | 22.7 | 18.9 |

## CUSTOM BUILD YOUR ZU4 SERIES PUMP

If the ZU4 Series pump that would best fit your application cannot be found in the chart on page 79, you can easily build your custom ZU4 Series pump here.

▼ This is how a ZU-Series pump model number is built up:

|              |            |            |            |                |                 |          |                         |          |          |          |  |
|--------------|------------|------------|------------|----------------|-----------------|----------|-------------------------|----------|----------|----------|--|
| <b>Z</b>     | <b>U</b>   | <b>4</b>   | <b>4</b>   | <b>08</b>      | <b>L</b>        | <b>B</b> | <b>-</b>                | <b>H</b> | <b>K</b> | <b>T</b> |  |
| 1            | 2          | 3          | 4          | 5              | 6               | 7        |                         |          | 8        |          |  |
| Product Type | Motor Type | Flow Group | Valve Type | Reservoir Size | Valve Operation | Voltage  | Options and Accessories |          |          |          |  |

### 1 Product Type

**Z** = Pump Series

### 2 Motor Type

**U** = Universal electric motor

### 3 Flow Group

**4** = 60 in<sup>3</sup>/min @ 10,000 psi

### 4 Valve Type (see page 110 for more details)

- 1 Dump (VE32D)
- 2 3 way/2 position manual or electric (VM32 or VE32)
- 3 3 way/3 position manual or electric (VM33 or VE33)
- 4 4 way/3 position manual or electric (VM43 or VE43)
- 6 3 way/3 position locking manual w/po check (VM33-L)
- 7 3 way/2 position manual (VM22)
- 8 4 way/3 position locking manual w/po check (VM43-L)
- 9 4 way/3 position manual w/power seating (VM43-LPS)

### 5 Reservoir Size (useable capacity)

- 04** = 1.0 gallon
- 08** = 2.0 gallon
- 10** = 2.5 gallon (includes side handles)
- 20** = 5.0 gallon (includes side handles)
- 40** = 10.0 gallon (includes side handles)

### 6 Valve Operation

- D** = Dump (solenoid valve w/pendant and LCD Electric)
- J** = Jog (manual valve w/pendant and Standard Electric (i.e. w/o LCD)
- K** = Jog (manual valve w/pendant and LCD Electric)
- L** = Manual valve w/LCD Electric (w/o pendant)
- P** = Manual valve w/pendant and classic electric (i.e. w/o LCD)
- R** = Manual valve w/Classic electric (i.e. w/o LCD) [w/o pendant]
- M** = Manual valve w/Standard Electric (i.e. w/o LCD) [w/o pendant]
- S** = Solenoid valve w/pendant and LCD Electric

### 7 Voltage

- B** = 115V, 1 ph, 50/60Hz
- E** = 208-240V, 1 ph, 50/60 Hz (w/European plug and CE EMC compliant)
- I** = 208-240V, 1 ph, 50/60 Hz (w/NEMA 6-15 plug)

### 8 Options and Accessories (see page 82 for possibilities)

- F** = Filter
- G** = 0-15,000 psi gauge (2 1/2")<sup>1)</sup>
- H** = Heat exchanger
- K** = Skidbar (1 and 2 gallon reservoirs only)
- L** = Level/temp switch<sup>2)3)</sup>
- N** = No reservoir handles (includes lifting eyes)
- R** = Roll cage
- T** = Pressure transducer<sup>2)</sup>
- U** = Foot switch

<sup>1)</sup> Pressure gauge not available on pump models with pressure transducer

<sup>2)</sup> These options require LCD electric

<sup>3)</sup> Not available on 1 and 2 gallon reservoirs

## ZU Series



Reservoir Capacity:

**1.0-10.0 gal.**

Flow at Rated Pressure:

**60 in<sup>3</sup>/min.**

Motor Size:

**1.7 hp**

Maximum Operating Pressure:

**10,000 psi**



### Speed Chart

To determine how a "Z" pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: **251**



### Ordering Example

**Model Number:**  
**ZU4408LB-HKT**

ZU4408LB-HKT is a 60 in<sup>3</sup>/min at 10,000 psi pump with a 4-way, 3-position manual valve, a 2 gal. (8-liter) reservoir, operates on 115V, 1ph, 50/60 Hz and is specified with optional LCD electrical panel, heat exchanger, pressure transducer and skidbar.



### Torque Wrench Pumps

System matched air and electric pumps provide control to operate Enerpac Torque Wrenches.

Page: **204**



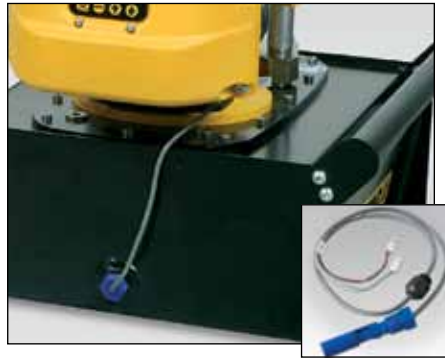
## Pressure Transducer\*

- More durable than analog gauges (against mechanical and hydraulic shock)
- More accurate than analog gauges (0.5% full scale of pump)
- Calibration can be fine tuned for certification
- “Set pressure” feature turns off motor at user defined pressure (or shifts valve to neutral on models with VE33/VE43 valves)
- Display pressure in psi, bar, or MPa

\* Requires LCD Electric

| Accessory Kit Model Number | Adjustable Pressure Range (psi) | Switch-point repeatability | Dead-band (psi) |
|----------------------------|---------------------------------|----------------------------|-----------------|
| ZPT-U4 *                   | 50-10,000                       | ± 0,5%                     | 50              |

\* Add suffix T for factory installation.



## Level/Temperature Switch

- Ensures feedback on pump oil level and temperature
- Drop-in design allows for easy installation to pump reservoir
- Plugs directly into pump electrical enclosure
- Built-in thermal sensing shuts off pump when unsafe operating temperature is reached
- Oil level switch shuts down pump before oil reaches an unsafe operating level

| Model Number | Operating Temperature (° F) | Maximum Pressure (psi) | Weight (lbs) |
|--------------|-----------------------------|------------------------|--------------|
| ZLS-U4       | 40-230                      | 150                    | .11          |

\* Add suffix L for factory installation.



## Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

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## Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 113



## Foot Switch

- Hands-free remote control on solenoid dump and 3-position valves
- With 10 foot cord

| Accessory Kit No. | Can be used on ZU4 Pumps with |
|-------------------|-------------------------------|
| ZCF-2 *           | Solenoid VE-Series valves     |

\* Add suffix U for factory installation.



## Roll Cage

- Protects pump
- Provides greater pump stability

| Accessory Kit Number | Fits on Reservoir            |
|----------------------|------------------------------|
| ZRC-04 *             | 1 and 2 gallon <sup>1)</sup> |
| ZRC-04H *            | 1 and 2 gallon <sup>2)</sup> |
| ZRB-10 *             | 2.5 gallon                   |
| ZRB-20 *             | 5 gallon                     |
| ZRB-40 *             | 10 gallon                    |

\* Add suffix R for factory installation.

<sup>1)</sup>Without heat exchanger <sup>2)</sup>With heat exchanger

Ordering Example:

Model No. ZU4208BB-QR



## Skidbar\*

- Provides easy two-hand lift
- Provides greater pump stability on soft or uneven surfaces
- Also available as an add-on kit (model number SBZ-4)

\* 1 and 2 gallon reservoirs only

| Accessory Kit No. | For ZU-Series Pumps with Reservoir | Wt. (lbs) |
|-------------------|------------------------------------|-----------|
| SBZ-4 *           | 1-2 gal. w/o heat exchanger        | 4.9       |
| SBZ-4L *          | 1-2 gal. with heat exchanger       | 5.5       |

\* Add suffix K for factory installation.

# ZU-Series Factory Installed Options and Accessories



## ZU4-Series Options

Accessory Kits can be installed by the customer.

See chart below for all possible options on ZU4-Series pumps:

- Classic Electric,
  - Standard (STD) Electric (no LCD)
  - Pro Electric (with LCD).
- Refer to page 81 for ordering matrix.

| ZU4-Series Options       | Factory Installed |                   |              | Accessory Kits   |                   |              |
|--------------------------|-------------------|-------------------|--------------|------------------|-------------------|--------------|
|                          | Classic Electric  | Standard Electric | Pro Electric | Classic Electric | Standard Electric | Pro Electric |
| Return Line Filter       | F                 | F                 | F            | ZPF              | ZPF               | ZPF          |
| Skid Bar <sup>1)</sup>   | K                 | K                 | K            | SBZ              | SBZ               | SBZ          |
| Roll Cage                | R                 | R                 | R            | ZRC              | ZRC               | ZRC          |
| Heat Exchanger           | H                 | H                 | H            | ZHE              | ZHE               | ZHE          |
| Pressure Gauge           | G                 | G                 | G            | G                | G                 | G            |
| Pressure Transducer      | -                 | -                 | T            | -                | -                 | ZPT-U4       |
| Level/Temperature Switch | -                 | -                 | L            | -                | -                 | ZLS-U4       |
| Foot Switch              | -                 | -                 | U            | -                | -                 | ZCF-2        |

<sup>1)</sup> Skid Bar not in combination with Roll Cage.

## ZU Series



Reservoir Capacity:

**1.0-10.0 gal.**

Flow at Rated Pressure:

**60 in<sup>3</sup>/min.**

Motor Size:

**1.7 hp**

Maximum Operating Pressure:

**10,000 psi**



### Return Line Filter

- 25 micron nominal filter removes contaminants from return oil flow before allowing it back into tank
- Internal by-pass valve prevents damage if filter is dirty
- With maintenance indicator

| Accessory Kit Model Number | Maximum Pressure (psi) | Maximum Oil Flow (GPM) | By-pass Setting (psi) |
|----------------------------|------------------------|------------------------|-----------------------|
| ZPF *                      | 200                    | 12.0                   | 25                    |

\* Add suffix F for factory installation.



### Heat Exchanger

- Removes heat from the bypass oil to provide cooler operation
- Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components

| Accessory Kit No. * | Can be used on |
|---------------------|----------------|
| ZHE-U115            | 115V pumps     |
| ZHE-U230            | 230V pumps     |

\* Add suffix H for factory installation.



### Heat Exchanger

- Extends system life
- Stabilizes oil temperature at a maximum of 130° F at 70° F ambient temperature.

Do not exceed maximum oil flow and pressure ratings. Heat exchanger is not suitable for water-glycol or high water based fluids.

| Thermal Transfer * (Btu/h) | Maximum pressure (psi) | Maximum oil flow (GPM) | Voltage (VDC) |
|----------------------------|------------------------|------------------------|---------------|
| 900                        | 900                    | 7.0                    | 12            |

\* At GPM at 70 °F ambient temperature.

▼ Shown from left to right: ZE3304MB-K, ZE4110DB-FHR



## Z-Class

### The New Standard for Industrial Applications



#### Oil Level Indicators

All ZE pumps feature an oil level indicator—sight glasses on the 1 and 2 gallon reservoirs and oil level gauges on the 2.5, 5 and 10 gallon reservoirs.

#### ▼ SELECTION CHART \*

| BASIC PUMP CONFIGURATIONS<br>Select your ZE pump model here for most applications. For special requirements, see the ZE Pump ordering matrix.   |   | Pump Type | Used with Cylinder   |   | Valve Function |      |   | Valve** Model Number | Useable Oil Capacity (gal) |
|---|---|-----------|----------------------|---|----------------|------|---|----------------------|----------------------------|
|   |   |           |                      |   |                |      |   |                      |                            |
| MANUAL VALVE CONTROL  | <b>Manual Valve without electric box or LCD</b> <ul style="list-style-type: none"> <li>Ideal choice for most applications</li> <li>Manual valve control, for both single-acting or double-acting applications</li> <li>Manual motor control</li> <li>On/off switch on 1-phase electric motor</li> </ul> |           | ●                    | —   | ●              | —    | ● | VM32                 | 2.0                        |
|   |   |           | ●                    | —   | ●              | ●    | ● | VM33                 | 2.0                        |
|   |   |           | ●                    | —   | ●              | ●    | ● | VM33                 | 5.0                        |
|   |   |           | ●                    | —   | ●              | ●    | ● | VM33                 | 10.0                       |
|   |   |           | —                    | ●   | ●              | ●    | ● | VM43                 | 2.0                        |
|   |   |           | —                    | ●   | ●              | ●    | ● | VM43                 | 5.0                        |
|   |   |           | —                    | ●   | ●              | ●    | ● | VM43                 | 10.0                       |
|   | <b>Manual Valve with electric box and LCD</b> <ul style="list-style-type: none"> <li>Ideal choice for most applications</li> <li>Manual valve control, for both single-acting or double-acting applications</li> <li>Manual motor control</li> </ul>  |           | ●                    | —   | ●              | —    | ● | VM32                 | 2.0                        |
|   |   |           | ●                    | —   | ●              | —    | ● | VM32                 | 2.5                        |
|   |   |           | ●                    | —   | ●              | ●    | ● | VM33                 | 5.0                        |
|   |   |           | ●                    | —   | ●              | ●    | ● | VM33                 | 10.0                       |
|   |   |           | —                    | ●   | ●              | ●    | ● | VM43                 | 5.0                        |
|   |   |           | —                    | ●   | ●              | ●    | ● | VM43                 | 10.0                       |
|   |   |           | REMOTE VALVE CONTROL | <b>Solenoid Dump Valve with electric box and LCD</b> <ul style="list-style-type: none"> <li>Ideal for punching, crimping and cutting</li> <li>For use when load holding is not required</li> <li>Push-button control pendant with 10 ft. cord controls the valve and motor</li> </ul> |                | ●    | — | ●                    | —                          |
| ●   | —   | ●         |                      |   |                | —    | ● | VE32D                | 2.0                        |
| ●   | —   | ●         |                      |   |                | —    | ● | VE32D                | 2.5                        |
| ●   | —   | ●         |                      |   |                | —    | ● | VE32D                | 5.0                        |
| —   | —   | —         |                      |   |                | —    | — |                      |                            |
| <b>Solenoid 3-position Valve with Electric Box and LCD</b> <ul style="list-style-type: none"> <li>Ideal for production and lifting applications</li> <li>All valves are 3-position for Advance-Hold-Retract</li> <li>Push-button control pendant with 10 ft. cord controls the valve and motor</li> </ul> |   | ●         |                      | —   | ●              | ●    | ● | VE33                 | 2.0                        |
|   |   | ●         |                      | —   | ●              | ●    | ● | VE33                 | 2.5                        |
|   |   | ●         |                      | —   | ●              | ●    | ● | VE33                 | 5.0                        |
|   |   | —         |                      | ●   | ●              | ●    | ● | VE43                 | 2.0                        |
|   |   | —         |                      | ●   | ●              | ●    | ● | VE43                 | 2.5                        |
| —   | ●   | ●         | ●                    | ●   | VE43           | 5.0  |   |                      |                            |
| —   | ●   | ●         | ●                    | ●   | VE43           | 10.0 |   |                      |                            |

\* Models in this chart are 115 VAC, 1-phase at 50/60 Hz for ZE3-4 or 220 VAC, 3 phase at 50/60 Hz for ZE5-6. For other options, please refer to the ZE Pump ordering matrix. \*\* See Valve Section for technical information.

# ZE-Series Electric Pumps

- Features **Z-Class** high-efficiency pump design; higher oil flow and by-pass pressure, cooler running and requires 18% less current draw than comparable pumps
- Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments
- Low-voltage pendant, on certain models, provides additional safety for the operator
- Multiple valve and reservoir configurations provide application specific models to match the most demanding industrial applications
- High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh industrial environments
- LCD readout provides a number of diagnostic and readout capabilities never before offered on an industrial pump (included with electric valve models, optional on other models)

**ZE Series**



Reservoir Capacity:

**1.0-10.0 gal.**

Flow at Rated Pressure:

**40-200 in<sup>3</sup>/min**

Motor Size:

**1.0-7.5 hp**

Maximum Operating Pressure:

**10,000 psi**



### User Adjustable Relief Valve

All VM and VE-Series have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.



### Locking Valves

For applications requiring positive load holding, VM-Series valves (except VM32) are available with a pilot-operated check valve. This provides hydraulic locking of the load until the valve is shifted into the retract position. To order this feature on your ZE-series pump see the valve type in the order matrix.

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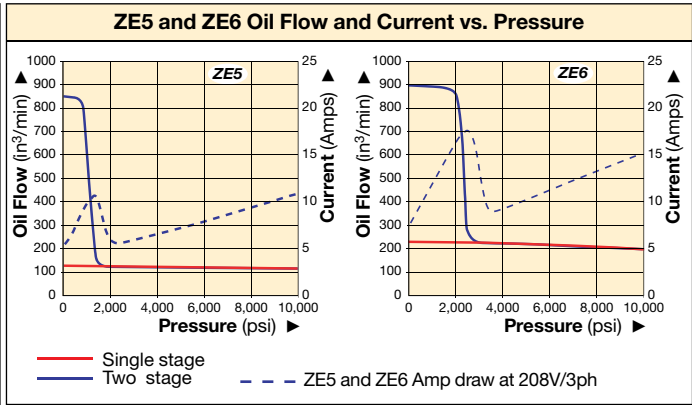
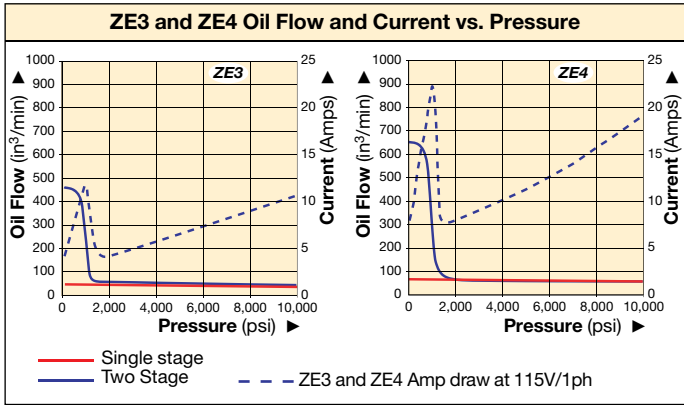
### Single-Stage or Two-Stage

Choose single-stage pumps for applications that require constant flow regardless of pressure, such as testing or clamping. Two-stage pumps have an increased output flow at low pressure to allow fast movement towards the load, for reduced cycle times and increased productivity. To specify a single-stage pump, place the letter "S" at the end of the model number.

For example: **ZE5320LG-S**

| ZE3 Series (1.0 hp)<br>Output Flow Rate at 10,000 psi: 40 in <sup>3</sup> /min |           | ZE4 Series (1.5 hp)<br>Output Flow Rate at 10,000 psi: 60 in <sup>3</sup> /min |           | ZE5 Series (3.0 hp)<br>Output Flow Rate at 10,000 psi: 120 in <sup>3</sup> /min |           | ZE6 Series (7.5 hp)<br>Output Flow Rate at 10,000 psi: 200 in <sup>3</sup> /min |           |
|--|-----------|--|-----------|---|-----------|---|-----------|
| Model Number   | Wt. (lbs) | Model Number   | Wt. (lbs) | Model Number  | Wt. (lbs) | Model Number  | Wt. (lbs) |
| ZE3208MB   | 91        | ZE4208MB   | 100       | -   | -         | -   | -         |
| ZE3308MB   | 92        | ZE4308MB   | 101       | -   | -         | -   | -         |
| ZE3320MB   | 132       | ZE4320MB   | 141       | ZE5320MG  | 152       | ZE6320MG  | 191       |
| ZE3340MB   | 183       | ZE4340MB   | 192       | ZE5340MG  | 203       | ZE6340MG  | 242       |
| ZE3408MB   | 92        | ZE4408MB   | 101       | -   | -         | -   | -         |
| ZE3420MB   | 132       | ZE4420MB   | 141       | ZE5420MG  | 152       | ZE6420MG  | 191       |
| ZE3440MB   | 183       | ZE4440MB   | 192       | ZE5440MG  | 203       | ZE6440MG  | 242       |
| ZE3208LB   | 96        | ZE4208LB   | 105       | -   | -         | -   | -         |
| ZE3210LB   | 109       | ZE4210LB   | 112       | ZE5210LG  | 132       | ZE6210LG  | 171       |
| ZE3320LB   | 138       | ZE4320LB   | 146       | ZE5320LG  | 160       | ZE6320LG  | 199       |
| ZE3340LB   | 188       | ZE4340LB   | 197       | ZE5340LG  | 210       | ZE6340LG  | 249       |
| ZE3420LB   | 138       | ZE4420LB   | 145       | ZE5420LG  | 160       | ZE6420LG  | 199       |
| ZE3440LB   | 189       | ZE4440LB   | 197       | ZE5440LG  | 210       | ZE6440LG  | 250       |
| ZE3104DB   | 94        | ZE4104DB   | 103       | -   | -         | -   | -         |
| ZE3108DB   | 105       | ZE4108DB   | 109       | -   | -         | -   | -         |
| ZE3110DB   | 114       | ZE4110DB   | 122       | ZE5110DG  | 136       | ZE6110DG  | 175       |
| ZE3120DB   | 141       | ZE4120DB   | 149       | ZE5120DG  | 163       | ZE6120DG  | 202       |
| ZE3140DB   | 190       | -  | -         | -   | -         | -   | -         |
| ZE3308SB   | 112       | ZE4308SB   | 121       | -   | -         | -   | -         |
| ZE3310SB   | 125       | ZE4310SB   | 134       | ZE5310SG  | 147       | ZE6310SG  | 187       |
| ZE3320SB   | 152       | ZE4320SB   | 161       | ZE5320SG  | 174       | ZE6320SG  | 213       |
| ZE3408SB   | 112       | ZE4408SB   | 121       | -   | -         | -   | -         |
| ZE3410SB   | 125       | ZE4410SB   | 134       | ZE5410SG  | 147       | ZE6410SG  | 187       |
| ZE3420SB   | 152       | ZE4420SB   | 161       | ZE5420SG  | 174       | ZE6420SG  | 213       |
| ZE3440SB   | 203       | ZE4440SB   | 212       | ZE5440SG  | 225       | ZE6440SG  | 264       |

\* All models in this chart are 115 VAC, 1-phase at 50/60 Hz. For other options please refer to the ZE Pump ordering matrix.

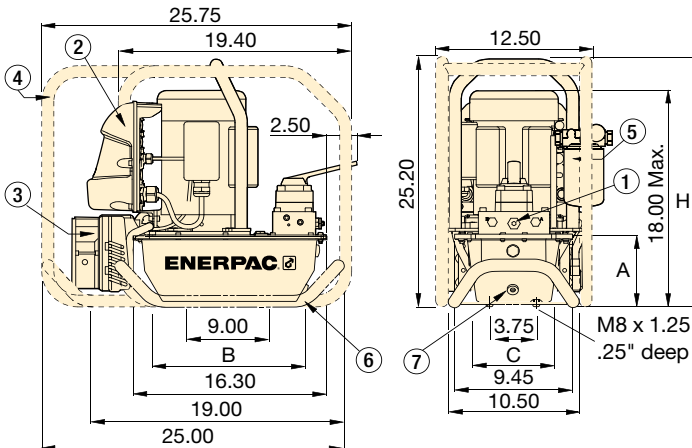


## ▼ PERFORMANCE CHART

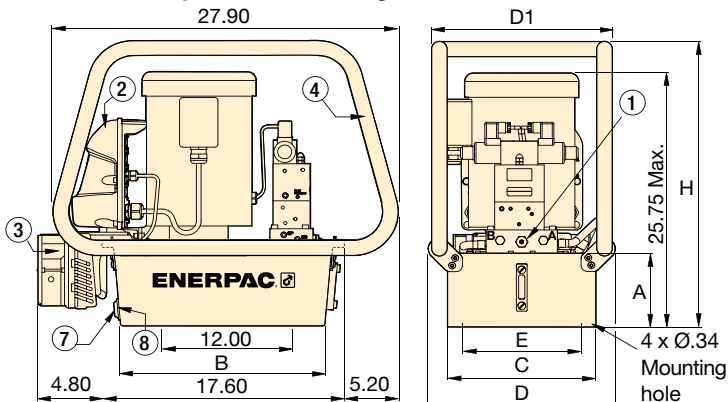
| Pump Series | Operation    | Output Flow Rate (in <sup>3</sup> /min) |         |           |            | Available Reservoir Sizes (useable oil) (gal) | Motor Size |      | Relief Valve Adjustment Range (psi) | Sound Level (dBA) |
|-------------|--------------|---|---------|-----------|------------|---|------------|------|-------------------------------------|-------------------|
|             |              | 100 psi                                 | 700 psi | 5,000 psi | 10,000 psi |   | hp         | RPM  |                                     |                   |
| ZE3         | Single-stage | 43                                      | 43      | 42        | 40         | 1, 2, 2.5, 5, 10                              | 1.0        | 1750 | 1000-10,000                         | 75                |
|             | Two-stage    | 450                                     | 385     | 42        | 40         |   |            |      |                                     |                   |
| ZE4         | Single-stage | 64                                      | 64      | 62        | 60         | 1, 2, 2.5, 5, 10                              | 1.5        | 1750 | 1000-10,000                         | 75                |
|             | Two-stage    | 650                                     | 600     | 62        | 60         |   |            |      |                                     |                   |
| ZE5         | Single-stage | 128                                     | 126     | 123       | 120        | 2.5, 5, 10                                    | 3.0        | 1750 | 1000-10,000                         | 75                |
|             | Two-stage    | 850                                     | 825     | 123       | 120        |   |            |      |                                     |                   |
| ZE6         | Single-stage | 220                                     | 215     | 210       | 200        | 2.5, 5, 10                                    | 7.5        | 3450 | 1000-10,000                         | 80                |
|             | Two-stage    | 900                                     | 890     | 210       | 200        |   |            |      |                                     |                   |

Output flow rate is listed at 60 Hz. Flow rate will be approximately <sup>5</sup>/<sub>6</sub> of these values at 50 Hz. IP 54 rated for water and dust protection.

### ZE-Series Pumps with 1 and 2 gallon reservoir



### ZE-Series Pumps with 2.5, 5, 10 gallon reservoir



**Single-Stage or Two-Stage Pumps**

Choose single-stage pumps for applications that require constant flow regardless of pressure, such as testing or clamping.

Two-stage pumps have an increased output flow at low pressure to allow fast movement towards the load, for reduced cycle times and increased productivity.

- ① User adjustable relief valve on all manual and solenoid valves:  
3/8" NPTF on A and B ports  
1/4" NPTF on auxiliary ports
- ② Electric Box (Optional w/manual valve)
- ③ Heat Exchanger (Optional)
- ④ Roll Bar (Optional)
- ⑤ Return Line Filter (Optional)
- ⑥ Skid Bar (Optional)
- ⑦ Oil Drain
- ⑧ Oil Level/Temperature Switch (Optional)

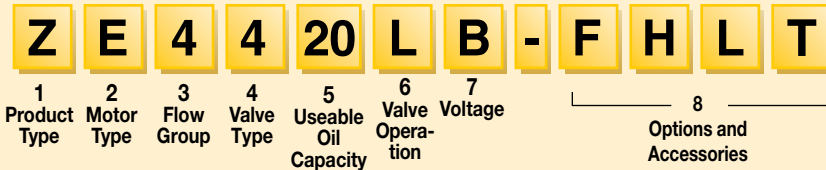
| Reservoir Size (useable oil) (gal) | ZE-Series Pump Dimensions (in) |      |      |      |      |      |      |
|------------------------------------|--------------------------------|------|------|------|------|------|------|
|                                    | A                              | B    | C    | D    | D1   | E    | H    |
| 1.0                                | 5.6                            | 11.0 | 6.0  | -    | -    | -    | 20.2 |
| 2.0                                | 5.6                            | 11.0 | 8.1  | -    | -    | -    | 20.2 |
| 2.5                                | 6.2                            | 16.5 | 12.0 | 15.1 | 14.6 | 11.0 | 23.6 |
| 5.0                                | 7.1                            | 16.5 | 16.6 | 19.7 | 19.2 | 15.6 | 24.6 |
| 10.0                               | 10.6                           | 15.7 | 19.9 | 22.7 | 22.5 | 18.9 | 28.1 |

# ZE Series Electric Pump Ordering Matrix

## CUSTOM BUILD YOUR ZE SERIES PUMP

If the ZE Series pump that would best fit your application cannot be found in the chart on page 85, you can easily build your custom ZE Series pump here.

▼ This is how a ZE Series Pump model is built up:



### 1 Product Type

**Z** = Pump Class

### 2 Prime movers

**E** = Induction Electric Motor

### 3 Flow Group

- 3** = 40 in<sup>3</sup>/min @ 10,000 psi
- 4** = 60 in<sup>3</sup>/min @ 10,000 psi
- 5** = 120 in<sup>3</sup>/min @ 10,000 psi<sup>1)</sup>
- 6** = 200 in<sup>3</sup>/min @ 10,000 psi<sup>1)</sup>

### 4 Valve Types

- 0** = No valve w/coverplate
- 1** = Dump (VE32D)
- 2** = 3 way/2 position manual (VM32)
- 3** = 3 way/3 position manual or electric (VM33 or VE33)
- 4** = 4 way/3 position manual or electric (VM43 or VE43)
- 6\*** = 3 way/3 position locking manual w/po check (VM33L)
- 7** = 3 way/2 position manual (VM22)
- 8** = 4 way/3 position locking manual w/po check (VM43L)

### 5 Useable Oil Capacity

- 04** = 1.0 gallon<sup>2)</sup>
- 08** = 2.0 gallon<sup>2)</sup>
- 10** = 2.5 gallon
- 20** = 5.0 gallon
- 40** = 10.0 gallon

### 6 Valve Operation

- D** = Dump valve (w/ pendant and LCD)
- L** = Manual valve (w/o pendant, w/ LCD)
- M** = Manual valve<sup>6)</sup> (w/o pendant or LCD)
- N** = No valve<sup>6)</sup> (no electrical box)
- S** = Solenoid valve (w/ pendant and LCD)
- W** = No valve (w/o pendant and LCD)

### 7 Voltages

- Single Phase
- B** = 115V 1 ph 50-60Hz<sup>3)</sup>
  - E** = 208-240V 1 ph 50-60 Hz European Plug
  - I** = 208-240V 1 ph 50-60 Hz USA Plug
- Three Phase<sup>6)</sup>
- M** = 190-200V 3ph 50-60Hz
  - G** = 208-240V 3ph 50-60Hz
  - W** = 380-415V 3ph 50-60Hz
  - K** = 440V 3ph 50-60Hz
  - J** = 460-480V 3ph 50-60Hz
  - R** = 575V 3ph 60Hz

### 8 Options and Accessories (see page 88 for possibilities)

- F** = Filter
- G** = 0-15,000 psi gauge (2 1/2")<sup>7)</sup>
- H** = Heat exchanger<sup>4)</sup>
- K** = Skidbar (1 and 2 gal. reservoirs only)
- L** = Level/temp switch<sup>4) 5)</sup>
- N** = No reservoir handles (includes lifting eyes)
- P** = Pressure switch<sup>4)</sup>
- R** = Roll cage
- S** = Single stage
- T** = Pressure transducer<sup>4) 7)</sup>
- U** = Foot switch<sup>4)</sup>

- 1) ZE5 and ZE6 series pumps only available with 3-phase motors.
- 2) 1 and 2 gallon reservoirs only available on ZE3 and ZE4 series pumps.
- 3) 115 volt pumps are supplied with 15 amp plug for intermittent use. 20 amp circuit recommended for frequent full pressure use.
- 4) These options require LCD electrical package. Pressure switch option only available on manual valves without locking valve. The LCD electrical package can accept either a pressure switch or pressure transducer, but not both.
- 5) Not available with 1 and 2 gallon reservoirs.
- 6) Standard Electric models with 3-phase motors are shipped without cord, motor starter or overload protection.
- 7) Pressure gauge not available on pump models with pressure transducer. Pressure transducer provides digital pressure readout on LCD display.

\* Not available on ZE6 Series Pumps

## ZE Series



Reservoir Capacity:

**1.0-10.0 gal.**

Flow at Rated Pressure:

**40-200 in<sup>3</sup>/min.**

Motor Size:

**1.0-7.5 hp**

Maximum Operating Pressure:

**10,000 psi**



### Ordering Example 1

#### Model Number: ZE4420MB

ZE4420MB is a 60 in<sup>3</sup>/min, 10,000 psi pump with a 4 way, 3-position manual valve, a 5 gallon reservoir, operates on a 115 VAC 1 ph 50/60 Hz motor and includes standard electrical package.

### Ordering Example 2

#### Model Number: ZE6440SG-HNU

ZE6440SG-HNU is a 200 in<sup>3</sup>/min, 10,000 psi pump with a 4 way, 3-position electric valve, a 10 gallon reservoir, operates on a 230 VAC 3 ph 50/60 Hz motor. It includes LCD electrical package and foot switch on 10 ft cord, no reservoir handles and the optional heat exchanger.



### Pendants

When ordering Enerpac VE-Series solenoid valve for use on "W" type valve operation (no Valve, with Electric Box [LCD], without pendant) the pendant must be ordered separately. Pendant connection to be plugged into electric box.





## Electric Box <sup>1)</sup>

- Back-lit LCD
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Pressure read-out <sup>2)</sup>
- Auto-mode pressure setting <sup>2)</sup>
- Information can be displayed in six languages <sup>3)</sup>

<sup>1)</sup> Included on pumps with solenoid valves. Can be factory installed on pumps with manual valve

<sup>2)</sup> When used with optional pressure transducer

<sup>3)</sup> English, French, German, Italian, Spanish and Portuguese



## Level/Temperature Switch <sup>4)</sup>

- Shuts down pump before oil level reaches an unsafe level, avoiding damage due to cavitation
- Shuts down pump when unsafe oil temperature is reached
- Ideal if pump is used in remote area without visual access to oil level

<sup>4)</sup> 24 V, requires Electric Box. Available for 2.5, 5 and 10 gallon reservoirs

| Accessory Kit Model Number | Fixed Temperature Signal (°F) | Operating Temperature (°F) | Max. Pressure (psi) |
|----------------------------|-------------------------------|----------------------------|---------------------|
| ZLS-U4 *                   | 75                            | 40 - 230                   | 150                 |

\* Add suffix **L** for factory installation, see ordering matrix.



## Return Line Filter

- 25 micron nominal filter removes contaminants from return oil flow before allowing it back into tank
- Internal by-pass valve prevents damage if filter is dirty
- With maintenance indicator
- Replaceable filter element PF25

| Accessory Kit Model Number | Maximum Pressure (psi) | Maximum Oil Flow (GPM) | By-pass Setting (psi) |
|----------------------------|------------------------|------------------------|-----------------------|
| ZPF *                      | 200                    | 12.0                   | 25                    |

\* Add suffix **F** for factory installation, see ordering matrix.



## Roll Cage

- For easy portability and hoisting
- Protects pump and electric box
- Available for all reservoir sizes

| Accessory Kit Number | Fits on Reservoir            |
|----------------------|------------------------------|
| ZRC-04 *             | 1 and 2 gallon <sup>1)</sup> |
| ZRC-04H *            | 1 and 2 gallon <sup>2)</sup> |
| ZRB-10 *             | 2.5 gallon                   |
| ZRB-20 *             | 5 gallon                     |
| ZRB-40 *             | 10 gallon                    |

\* Add suffix **R** for factory installation, see ordering matrix.  
<sup>1)</sup> Without heat exchanger <sup>2)</sup> With heat exchanger



## Skid Bar

- Provides easy two-hand lift
- Provides greater pump stability on soft or uneven surfaces

| Accessory Kit Number | For ZE-Series Pumps with Reservoir | Weight (lbs) |
|----------------------|------------------------------------|--------------|
| SBZ-4 *              | 1-2 gal. w/o heat exchanger        | 4.9          |
| SBZ-4L *             | 1-2 gal. with heat exchanger       | 5.5          |

\* 1 and 2 gallon reservoirs only. Add suffix **K** for factory installation, see ordering matrix.



## Foot Switch <sup>5)</sup>

- Hands-free remote control on solenoid dump and 3-position valves
- With 10 foot cord

<sup>5)</sup> 15 V, requires Electric Box

| Accessory Kit Number | Can be used on ZE-Series Pumps with |
|----------------------|-------------------------------------|
| ZCF-2 *              | Solenoid VE-Series valves           |

\* Add suffix **U** for factory installation, see ordering matrix.

# ZE-Series, Factory Installed Options & Accessories



## Pressure Transducer <sup>1)</sup>

- Displays pressure on LCD in bar, MPa or psi
- More accurate than analog gauge
- Calibration can be fine-tuned for certification
- Easy-viewing variable rate display
- “Set pressure” feature turns off motor at user defined pressure (or shifts valve to neutral on models with VE33/ VE43 valves)

<sup>1)</sup> 24 V, requires Electric Box

| Accessory Kit Model number | Adjustable Pressure Range (psi) | Switch-point Repeatability | Dead-band (psi) |
|----------------------------|---------------------------------|----------------------------|-----------------|
| ZPT-U4 *                   | 50-10,000                       | ± 0,5%                     | 50              |

\* Add suffix **T** for factory installation, see ordering matrix.



## Pendants <sup>3)</sup>

- For pump types with valve operation “W” (No Valve, with Electric Box, without pendant)

<sup>3)</sup> When ordering Enerpac VE-Series solenoid valve, the pendant must be ordered separately. Pendant connection to be plugged into electric box

| Pendant Model Number | To be used with Solenoid Valve: |
|----------------------|---------------------------------|
| ZCP-1                | VE32D                           |
| ZCP-3                | VE32, VE33, VE43                |



## Pressure Switch <sup>2)</sup>

- Controls pump, monitors system
- Adjustable pressure 500-10,000 psi
- Includes glycerine filled 15,000 psi pressure gauge G2536L
- Accuracy ± 1,5% of full scale

<sup>2)</sup> 24 V, requires Electric Box. Not available in combination with pressure transducer.

| Accessory Kit Model number | Switch-point Repeatability | Deadband (psi) | Oil Ports (NPT) |
|----------------------------|----------------------------|----------------|-----------------|
| ZPS-E3 *                   | ± 2%                       | 115-550        | 3/8"            |

\* Add suffix **P** for factory installation, see ordering matrix.



## Heat Exchanger <sup>4)</sup>

- Removes heat from bypass oil to provide cooler operation
- Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components.

<sup>4)</sup> 24 VDC, requires electric box

| Accessory Kit Model number | Fits on Reservoir     | Weight (lbs) |
|----------------------------|-----------------------|--------------|
| ZHE-E04 *                  | 1 and 2 gallon        | 9.0          |
| ZHE-E10 *                  | 2.5, 5, and 10 gallon | 9.0          |

\* Add suffix **H** for factory installation, see ordering matrix.



### Options

Accessory Kits can be installed by customer. See chart below for options on Standard Electric (without electric box) or LCD Electric (with electric box). Refer to page 87 for ordering matrix.

| ZE-Series Options                 | Factory Installed |             | Accessory Kits |             |
|-----------------------------------|-------------------|-------------|----------------|-------------|
|                                   | Std. Electr.      | LCD Electr. | Std. Electr.   | LCD Electr. |
| Return Line Filter                | F                 | F           | ZPF            | ZPF         |
| Skid Bar <sup>1)</sup>            | K                 | K           | SBZ            | SBZ         |
| Roll Cage                         | R                 | R           | ZRB            | ZRB         |
| Single-stage                      | S                 | S           | -              | -           |
| Heat Exchanger                    | -                 | H           | -              | ZHE         |
| Pressure Gauge <sup>2)</sup>      | G                 | G           | -              | -           |
| Pressure Switch <sup>3)</sup>     | -                 | P           | -              | ZPS-E3      |
| Pressure Transducer <sup>4)</sup> | -                 | T           | -              | ZPT-U4      |
| Level/Temp Switch <sup>5)</sup>   | -                 | L           | -              | ZLS-U4      |
| Foot Switch <sup>6)</sup>         | -                 | U           | -              | ZCF-2       |

<sup>1)</sup> Available for 1 and 2 gallon reservoirs.

<sup>2)</sup> Not available on pumps with pressure transducer.

<sup>3)</sup> Includes 14,500 psi gauge. Only available on manual valves without locking feature.

<sup>4)</sup> Electric box can accept either pressure switch or pressure transducer, but not both.

<sup>5)</sup> Available for 2.5, 5, 10, gallon reservoirs.

<sup>6)</sup> For control of solenoid dump and 3-position valves.



### ZPT-U4 Pressure Transducer

More durable against mechanical and hydraulic shock than analog gauges.

- Digital pressure read-out provides accuracy of 5% of full scale.
- Easy-viewing variable rate display automatically varies increments between 44, 203, 508 and 2103 psi as rate of pressure change increases.
- “Set pressure” feature turns off motor at user defined pressure (or shifts valve to neutral on VE33 and VE43 valves).



### ZHE-Series Heat Exchangers

Heat exchanger stabilizes oil temperature at 130° F at 70° F ambient temperature. Thermal transfer at 5 GPM and 70° F ambient temperature: 900 Btu/hour.

Do not exceed maximum oil flow of 7.0 GPM and maximum pressure of 300 psi. Not suitable for water-glycol or high water based fluids.

▼ Shown: PEM-8418



- Panel-mounted pressure gauge and adjustable relief valve for system pressure control
- Two-speed pump design, with high by-pass pressure, for rapid cylinder advance
- Dual voltage motor (230/460 VAC, 3 phase, 60 Hz)
- Full length reservoir sight tube with integral thermometer for ease in monitoring oil level and temperature

## The Largest Pump for the Largest Jobs



### Locking Valves

Pumps with VM-4 manual valves are available with VM-4L manual valves for positive load holding. Add suffix "L" to pump model number.

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### FS-34 Foot Control Switch

This 3-position switch allows hands-free control of the solenoid valve on the pump. Operates 24V and

115V valves that use the square electrical connector.



### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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◀ With similar specifications, a gasoline powered EGM-8000 Series is shown here performing a synchronized lift.



## About the 8000 Series

The 8000 Series is the largest pump in the Enerpac line and the best choice to power most large size cylinders, multiple cylinder circuits, and applications where the need for high speed requires high flow rates.

The 8000 Series, with its large reservoir capacity, is best suited for large jobs and may be the only solution because of the required oil capacity.

For further application assistance see our "Yellow Pages", or consult your local Enerpac office.

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## PE Series



Reservoir Capacity:

**25 gal.**

Flow at Rated Pressure:

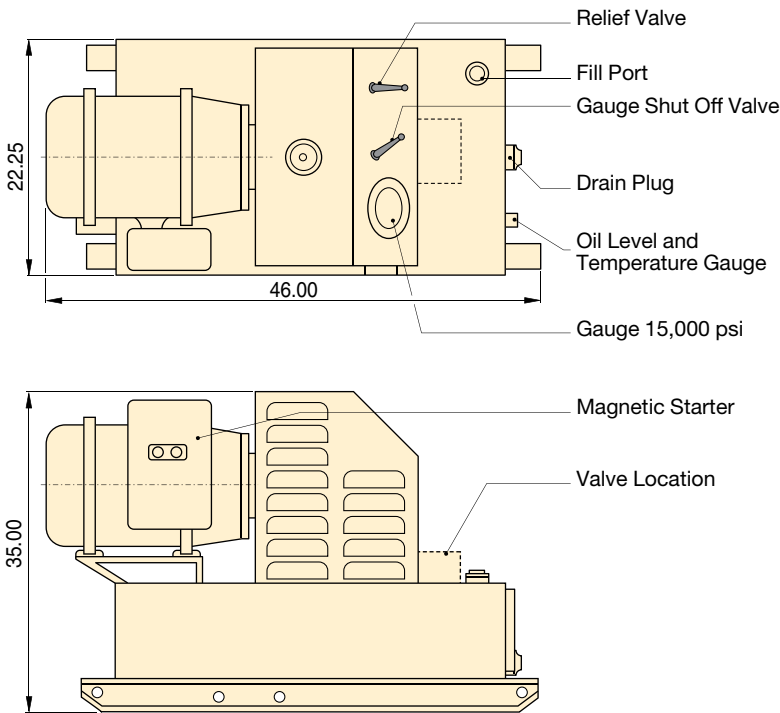
**2.0 gal/min.**

Motor Size:

**12.5 hp**

Maximum Operating Pressure:

**10,000 psi**



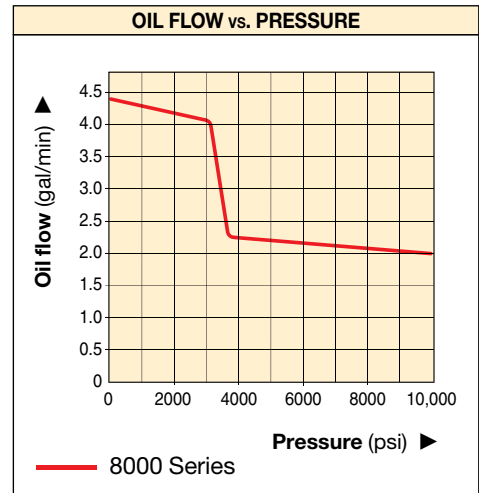
Dimensions shown in inches.



## Speed Chart

To determine how an 8000 Series pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

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| Used with Cylinder | Usable Oil Capacity (gal) | Model Number | Pressure Rating (psi) |           | Output Flow Rate (gal/min) |           | Valve Type      | Valve Function | Current Draw (Amps) | Motor Voltage* (VAC) | Sound Level (dBA) | Weight (lbs) |
|--------------------|---------------------------|--------------|-----------------------|-----------|----------------------------|-----------|-----------------|----------------|---------------------|----------------------|-------------------|--------------|
|                    |                           |              | 1st stage             | 2nd stage | 1st stage                  | 2nd stage |                 |                |                     |                      |                   |              |
| Single-acting      | 18                        | PEM-8218     | 3,700                 | 10,000    | 4.4                        | 2.0       | Manual (VM-2)   | 3-way, 2-pos.  | 33.0                | 230                  | 78-84             | 720          |
|                    | 18                        | PEM-8218C    | 3,700                 | 10,000    | 4.4                        | 2.0       |                 |                | 16.5                | 460                  | 78-84             | 720          |
| Double-acting      | 18                        | PEM-8418     | 3,700                 | 10,000    | 4.4                        | 2.0       | Manual (VM-4)   | 4-way, 3-pos.  | 33.0                | 230                  | 78-84             | 720          |
|                    | 18                        | PEM-8418C    | 3,700                 | 10,000    | 4.4                        | 2.0       |                 |                | 16.5                | 460                  | 78-84             | 720          |
|                    | 18                        | PER-8418     | 3,700                 | 10,000    | 4.4                        | 2.0       | Solenoid (VE43) | 4-way, 3-pos.  | 33.0                | 230                  | 78-84             | 765          |
|                    | 18                        | PER-8418C    | 3,700                 | 10,000    | 4.4                        | 2.0       |                 |                | 16.5                | 460                  | 78-84             | 765          |

\* Consult Enerpac for availability of other voltages.

▼ Shown: **ZA4208MX, ZA4420MX**



## Z Tough. Dependable. Innovative. CLASSIC



### ATEX Certified

See explanation of ATEX certification in the “Yellow Pages.”



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### Speed Chart

To determine how a ZA Series pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the “Yellow Pages”.

Page: 251

- Features Z-Class high efficiency pump design, higher oil flow and bypass pressure
- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Internal relief valves. One is factory set for overload protection while the second is user adjustable for pre-setting maximum system pressure
- Sight gauge on 1 and 2 gallon and level gauge on 2.5, 5 and 10 gallon reservoirs allow quick and easy oil level monitoring
- Optional heat exchanger warms exhaust air to prevent freezing and cools the oil



### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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| ZA4 Performance            |                 |             |
|----------------------------|-----------------|-------------|
| Dynamic Air Pressure Range | Air Consumption | Sound Level |
| (psi)                      | (scfm)          | (dBA)       |
| 60-100                     | 20-100          | 94-97       |

| Used with Cylinder | Usable Oil Capacity (gal) | Valve Model Number <sup>2)</sup> | Valve Function       | Model Number | Output Flow Rate <sup>1)</sup> |         |           |            |
|--------------------|---------------------------|----------------------------------|----------------------|--------------|--------------------------------|---------|-----------|------------|
|                    |                           |                                  |                      |              | (in <sup>3</sup> /min)         |         |           |            |
|                    |                           |                                  |                      |              | 100 psi                        | 700 psi | 5,000 psi | 10,000 psi |
| Single-acting      | 1.0                       | Manual VM32                      | Advance/Retract      | ZA4204MX     | 850                            | 675     | 110       | 80         |
|                    | 1.75                      |                                  |                      | ZA4208MX     | 850                            | 675     | 110       | 80         |
|                    | 5.0                       |                                  |                      | ZA4220MX     | 850                            | 675     | 110       | 80         |
| Double-acting      | 1.0                       | Manual VM43                      | Advance/Hold/Retract | ZA4404MX     | 850                            | 675     | 110       | 80         |
|                    | 1.75                      |                                  |                      | ZA4408MX     | 850                            | 675     | 110       | 80         |
|                    | 2.5                       |                                  |                      | ZA4410MX     | 850                            | 675     | 110       | 80         |
|                    | 5.0                       |                                  |                      | ZA4420MX     | 850                            | 675     | 110       | 80         |
|                    | 10.0                      |                                  |                      | ZA4440MX     | 850                            | 675     | 110       | 80         |

1) Actual flow will vary with air supply

2) See valve section for hydraulic symbols and details

# ZA-Series Air Hydraulic Pump Ordering Matrix

## CUSTOM BUILD YOUR ZA4 AIR PUMP

▼ This is how a ZA-Series Pump model number is built up:



|              |            |            |            |                     |                 |         |         |  |
|--------------|------------|------------|------------|---------------------|-----------------|---------|---------|--|
| 1            | 2          | 3          | 4          | 5                   | 6               | 7       | 8       |  |
| Product Type | Motor Type | Flow group | Valve Type | Usable oil capacity | Valve Operation | Voltage | Options |  |

### 1 Product Type

Z = Pump class

### 2 Motor Type

A = Air motor

### 3 Flow Group

4 = 80 in<sup>3</sup>/min@10,000 psi

### 4 Valve Type

- 0 = No valve with coverplate
- 2 = 3-way, 2-position (VM32)
- 3 = 3-way, 3-position (VM33)
- 4 = 4-way, 3-position (VM43)
- 6 = 3-way, 3-position, locking (VM33L)
- 7 = 3-way, 2-position (VM22)
- 8 = 4-way, 3-position, locking (VM43L)

### 5 Usable Oil Capacity

- 04 = 1.0 gallon
- 08 = 1.75 gallon
- 10 = 2.5 gallon
- 20 = 5.0 gallon
- 40 = 10.0 gallon

### 6 Valve Operation

- M = Manual valve
- N = No valve

### 7 Voltage

- X = Not applicable

### 8 Options

(Specify in alphabetical order)

- F = Filter
- G = 0-15,000 psi gauge (2 1/2")
- H = Heat exchanger\*
- K = Skidbar\*
- N = No reservoir handles (includes lifting eyes; 2.5, 5, 10 gallon only)
- R = Roll bars

\* (1 and 2 gallon reservoirs only)

### Ordering Example

**Model Number: ZA4208MX-FHK**

ZA4208MX-FHK is an air operated pump with a 3-way, 2-position manual valve, a 2.0 gallon reservoir, filter, heat exchanger and skid bar.

## ZA Series



Reservoir Capacity:

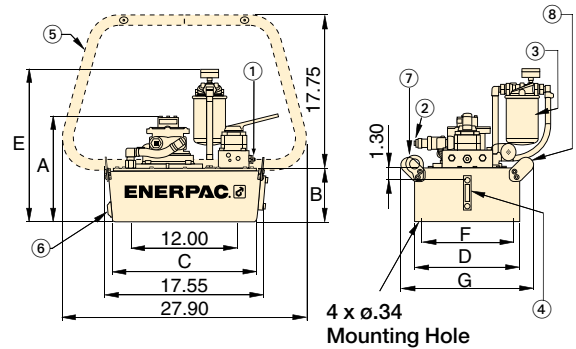
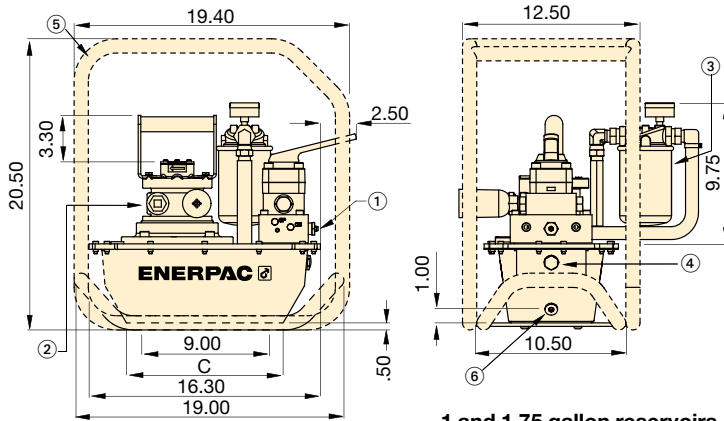
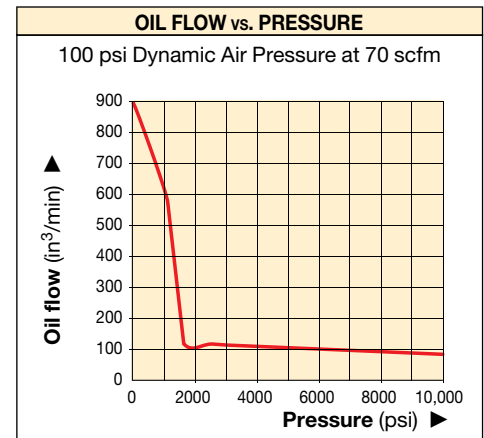
**1.0-10.0 gal.**

Flow at Rated Pressure:

**80 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**10,000 psi**




| Dimensions (in) |      |      |      |      |      |      | Weight (incl. oil) (lbs) |
|-----------------|------|------|------|------|------|------|--------------------------|
| A               | B    | C    | D    | E    | F    | G    |                          |
| 11.6            | 5.6  | 11.0 | 6.0  | 15.4 | -    | -    | 65.5                     |
| 11.6            | 5.6  | 11.0 | 8.1  | 15.4 | -    | -    | 75.7                     |
| 13.0            | 7.1  | 16.5 | 16.6 | 16.0 | 15.6 | 18.4 | 112.7                    |
| 11.6            | 5.6  | 11.0 | 6.0  | 15.4 | -    | -    | 66.7                     |
| 11.6            | 5.6  | 11.0 | 8.1  | 15.4 | -    | -    | 76.9                     |
| 12.0            | 6.1  | 16.5 | 12.0 | 16.0 | 11.0 | 15.1 | 87.1                     |
| 13.0            | 7.1  | 16.5 | 16.6 | 16.9 | 15.6 | 18.4 | 113.9                    |
| 16.5            | 10.6 | 15.7 | 19.9 | 20.4 | 18.9 | 23.0 | 164.6                    |

- ① User adjustable relief valve on all manual valves
  - ② Air inlet 1/2" NPTF
  - ③ Return Line Filter (optional)
  - ④ Oil Sight Gauge
  - ⑤ Roll Cage (optional)
  - ⑥ Oil Drain
  - ⑦ Lifting eyes (4) (optional)
  - ⑧ Handles
- Skid Bar (Model No. SBZ-4) (optional)

▼ Shown: **XA11G**



- Higher oil flow for increased productivity
- Variable oil flow and fine metering for precise control
- Ergonomic design for less operator fatigue
- Closed hydraulic system prevents contamination and allows pump usage in any position
- Pedal lock function for retract position
- External adjustable pressure setting valve
- ATEX Certified.\* Includes ground screw for explosion protection

\*  II 2 GD ck T4 See explanation of ATEX Certification in "Yellow Pages."

▼ Easily operated by foot. No need to fully lift up foot - rest body weight on heel, resulting in a hands-free and stable working position.



## XVARI<sup>®</sup> TECHNOLOGY

### Productivity and Ergonomics



#### Optional Pressure Gauge

Integrated gauge with calibrated scale reading in psi, bar and MPa for actual pressure reading.



#### Optional 4-Way 3-Position Valve

For powering double-acting hydraulic cylinders and tools.



#### Optional 1/2 Gallon Reservoir

Double oil capacity for powering larger hydraulic cylinders and tools.



#### Pedal Safety Guard

Customer installed frame protects both pedals against accidental activation.

Order model number <sup>1)</sup>

**XPG1**



#### "Joy-stick" Lever Kit

Customer installed set of handles for manual operation of both pedals.

Order model number <sup>1)</sup>

**XLK1**



#### Hydraulic Swivel Connector

Customer installed swivel connector for optimal orientation of the hydraulic hose.

Order model number <sup>1)</sup>

**XSC1**

<sup>1)</sup> Accessories must be ordered separately.

# XVARI® Technology, Air Driven Hydraulic Pumps



## XVARI® TECHNOLOGY

### Production Application

XA11 pump is used with a 13-ton hollow cylinder to compress and position diesel engine valve springs.

The operator benefits from the fine metering capacities of the XVARI® Technology to apply the mandatory precise stroke and force.

## XA Series



Reservoir Capacity:

**61-122 in<sup>3</sup>**

Flow at Rated Pressure:

**15 in<sup>3</sup>/min.**

Air Consumption:

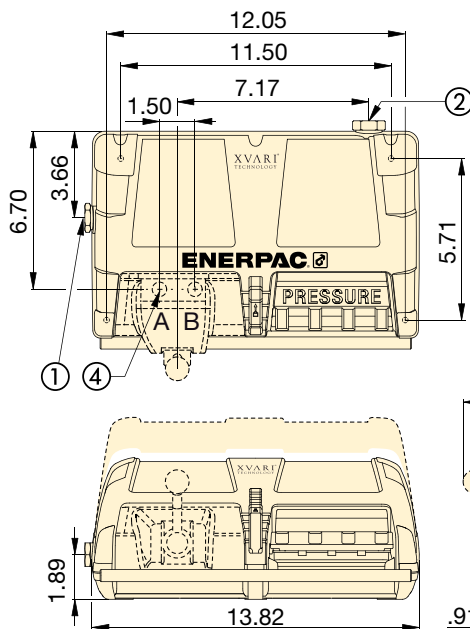
**10-35 scfm**

Maximum Operating Pressure:

**10,000 psi**

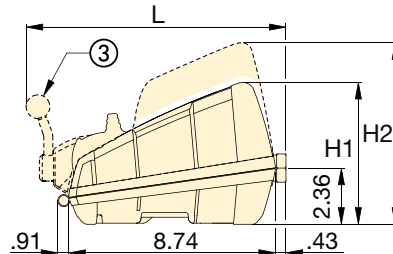
### ▼ XA-SERIES PERFORMANCE CHART

| Maximum Pressure<br>(psi) | Output Flow Rate<br>(in <sup>3</sup> /min) |      | Pump Series | Valve Function       | Dynamic Air Pressure<br>(psi) |
|---------------------------|--|------|-------------|----------------------|-------------------------------|
|                           | No load                                    | Load |             |                      |                               |
| 10,000                    | 120  | 15   | XA1         | Advance/Hold/Retract | 30-125                        |



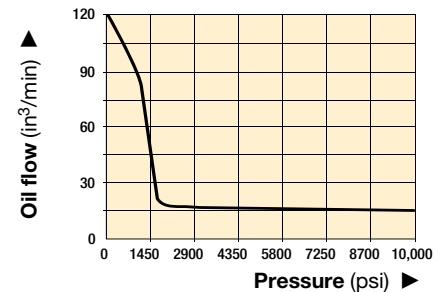
- ① 3/8"-18 NPTF Oil Outlet
- ② 1/4"-18NPTF Air Inlet
- ③ 4/3 Optional Control Valve
- ④ 3/8"-18 NPTF Oil Outlet

Dimensions shown in inches.



### OIL FLOW vs. PRESSURE

at 100 psi dynamic air pressure



### Regulator-Filter-Lubricator

Recommended for use with all XA-Series Air pumps. Provides clean, lubricated air and allows for air pressure adjustment.

Order model number <sup>1)</sup>

**RFL102**

### ▼ SELECTION CHART

| For Use With Cylinder Tool | Usable Oil Capacity<br>(in <sup>3</sup> ) | Model No. <sup>1)</sup> | Pressure Gauge | 3-Way, 3-Position Valve | 4-Way, 3-Position Valve | Dimensions (in) |      |       | Weight<br>(lbs) |
|----------------------------|---|-------------------------|----------------|-------------------------|-------------------------|-----------------|------|-------|-----------------|
|                            |   |                         |                |                         |                         | H1              | H2   | L     |                 |
| Single-acting              | 61  | XA11 <sup>2)</sup>      | –              | •                       | –                       | 5.98            | –    | –     | 19.0            |
|                            | 122                                       | XA12 <sup>2)</sup>      | –              | •                       | –                       | –               | 6.69 | –     | 22.4            |
| Single-acting              | 61  | XA11G                   | •              | •                       | –                       | 5.98            | –    | –     | 19.4            |
|                            | 122                                       | XA12G                   | •              | •                       | –                       | –               | 6.69 | –     | 22.9            |
| Double-acting              | 61  | XA11V                   | –              | –                       | •                       | 5.98            | –    | 10.98 | 22.3            |
|                            | 122                                       | XA12V                   | –              | –                       | •                       | –               | 6.69 | 10.98 | 25.7            |
| Double-acting              | 61  | XA11VG                  | •              | –                       | •                       | 5.98            | –    | 10.98 | 22.7            |
|                            | 122                                       | XA12VG                  | •              | –                       | •                       | –               | 6.69 | 10.98 | 26.2            |

<sup>1)</sup> High-flow coupler CR400 and accessories must be ordered separately.

<sup>2)</sup> Available as cylinder pump set, see page 54.



▼ Shown left to right: PAMG-1402N, PATG-1102N, PARG-1102N, PATG-1105N



- High efficiency cast aluminum air motor for increased life and reduced air consumption
- Fully serviceable air motor assembly
- Reinforced heavy-duty reservoir for applications in tough environments
- New generation air saver piston with rugged one-piece design reduces air consumption and operating costs
- Return-to-tank port for use in remote valve applications
- Quiet – only 76 dBA with low air consumption of 12 scfm
- Operating air pressure: 40-125 psi, enables pump to start at extremely low pressure
- Internal pressure relief valve provides overload protection

▼ Easily operated by hand or by foot.



## Compact Air Over Hydraulic



### RFL-102 Regulator-Filter-Lubricator

Recommended for use with all air pumps. Provides clean, lubricated air and allows for air pressure adjustment. Steel bowl guards are standard.

Order model number <sup>1)</sup>

**RFL102**



### Large Reservoir Models

The Turbo II Air Pump is also available with a larger reservoir: **PATG-1105N**, **PAMG-1405N**, and **PARG-1105N**.



### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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| Used with Cylinder | Usable Oil Capacity (in <sup>3</sup> ) | Model Number |
|--------------------|--|--------------|
| Single-acting      | 127                                    | PATG-1102N*  |
|                    | 230                                    | PATG-1105N   |
|                    | 127                                    | PARG-1102N   |
|                    | 230                                    | PARG-1105N   |
| Double-acting      | 127                                    | PAMG-1402N   |
|                    | 230                                    | PAMG-1405N   |

\* Available as set. See note on next page.

# Turbo II Air Hydraulic Pumps

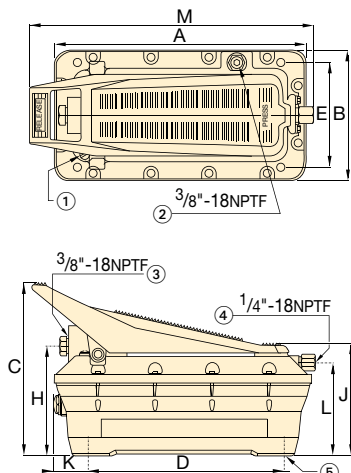
## PATG PARG PAMG Series



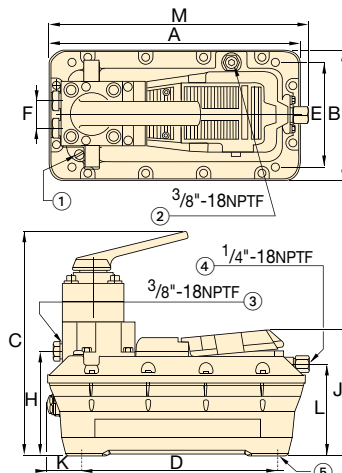
Reservoir Capacity:  
**150-305 in<sup>3</sup>**

Flow at Rated Pressure:  
**5-10 in<sup>3</sup>/min.**

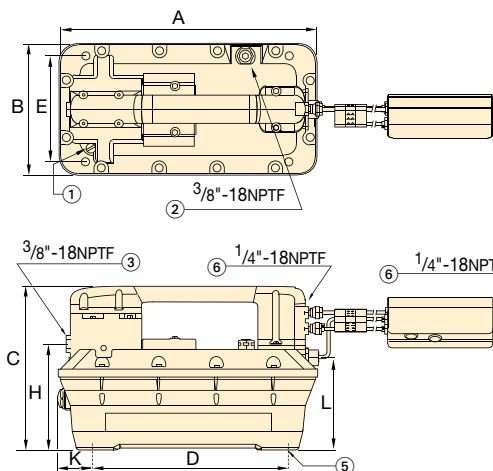
Maximum Operating Pressure:  
**10,000 psi**



**PATG-1102N and PATG-1105N**



**PAMG-1402N and PAMG-1405N**



**PARG-1102N and PARG-1105N**

- ① Filtered "Permanent" Tank Vent
- ② Return-to-Tank/Auxiliary Vent/Fill Tank Port
- ③ Hydraulic Output
- ④ Swivel Air Input with Filter
- ⑤ 4 Mounting Holes for #10 thread forming screw. Max.depth into reservoir = .75"
- ⑥ Air Input Options

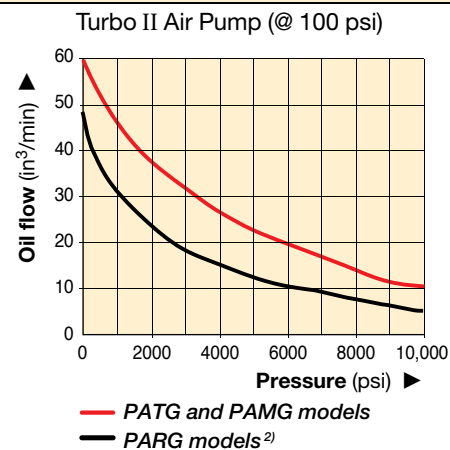


The PATG-models use a foot or hand operated treadle to control air and valve functions.

The PAMG-models use a treadle with a locking feature and a 4-way manual valve.

The PARG-models use a 15 ft. pendant hose for convenient one-man operation.

### OIL FLOW vs. PRESSURE



| Pressure Rating<br>(psi) | Output Flow Rate<br>(in <sup>3</sup> /min) |                 | Model Number | Valve Function               | Air Pressure Range<br>(psi) | Air Consumption<br>(scfm) | Sound Level<br>(dBA) |
|--------------------------|--|-----------------|--------------|------------------------------|-----------------------------|---------------------------|----------------------|
|                          | No load                                    | Load            |              |                              |                             |                           |                      |
| 10,000                   | 60   | 10              | PATG & PAMG  | Advance/<br>Hold/<br>Retract | 40-125                      | 12                        | 76                   |
| 10,000                   | 51 <sup>1)</sup>                           | 6 <sup>1)</sup> |              |                              | 40-125                      | 12                        | 76                   |
| 10,000                   | 48 <sup>2)</sup>                           | 5 <sup>2)</sup> | PARG         |                              | 40-125                      | 8                         | 76                   |

<sup>1)</sup> Air supply connected at pendant. <sup>2)</sup> Air supply connected at pump shown on flow curve.

| Dimensions |      |       |      |      |      |      |      |      |      |       | Weight<br>(lbs) | Model Number |
|------------|------|-------|------|------|------|------|------|------|------|-------|-----------------|--------------|
| A          | B    | C     | D    | E    | F    | H    | J    | K    | L    | M     |                 |              |
| 12.33      | 6.49 | 8.29  | 9.04 | 4.00 | —    | 5.15 | 5.75 | 1.65 | 4.43 | 13.62 | 18              | PATG-1102N*  |
| 15.60      | 7.92 | 8.22  | 9.04 | 4.00 | —    | 5.08 | 5.75 | 3.28 | 4.41 | 17.20 | 22              | PATG-1105N   |
| 12.33      | 6.49 | 7.88  | 9.04 | 4.00 | —    | 5.15 | —    | 1.65 | 4.43 | —     | 22              | PARG-1102N   |
| 15.60      | 7.92 | 7.88  | 9.04 | 4.00 | —    | 5.08 | —    | 3.28 | 4.41 | —     | 26              | PARG-1105N   |
| 12.33      | 6.49 | 10.50 | 9.04 | 4.00 | 1.42 | 5.23 | 6.00 | 1.65 | 4.43 | 12.60 | 24              | PAMG-1402N   |
| 15.60      | 7.92 | 10.50 | 9.04 | 4.00 | 1.42 | 5.19 | 6.00 | 3.28 | 4.41 | 15.94 | 28              | PAMG-1405N   |

▼ Shown from top to bottom: PA-1150, PA-133



## PA Series

Reservoir Capacity:

**36-80 in<sup>3</sup>**

Flow at Rated Pressure:

**8 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**10,000 psi**

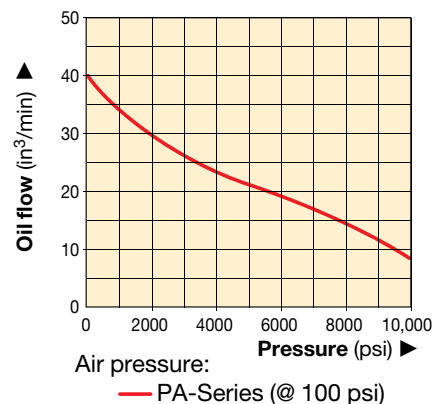


### PC-66 Reservoir Conversion Kit

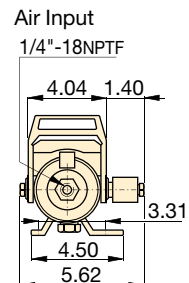
Double the reservoir capacity of your existing PA-133 with this easy to install conversion kit.

- Rugged construction – built for long life and easy service
- Swivel coupling simplifies hydraulic connection and pump operation
- Three-position treadle provides cylinder advance, hold and retract operation
- PA-133 operates in all positions for increased versatility in use and mounting
- Base mounting slots provided on PA-133

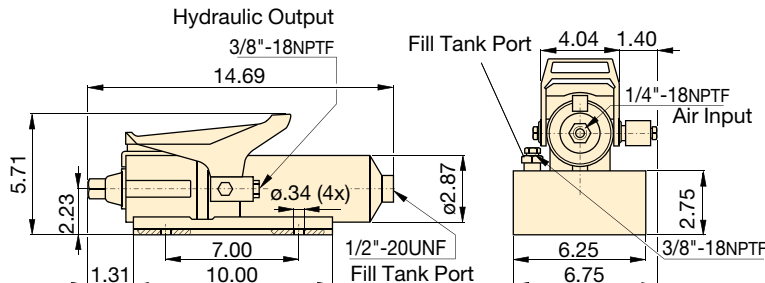
OIL FLOW vs. PRESSURE



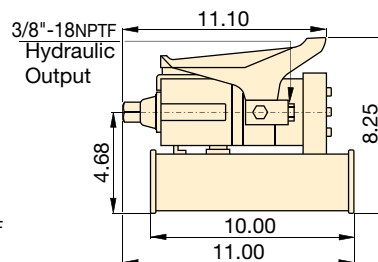
Dimensions shown in inches.



PA-133



PA-1150



| Used with Cylinder | Usable Oil Capacity (in <sup>3</sup> ) | Model Number | Pressure Rating (psi) | Output Flow Rate (in <sup>3</sup> /min) |      | Valve Function       | Air Pressure Range* (psi) | Air Consumption (scfm) | Sound Level (dBA) | Weight (lbs) |
|--------------------|--|--------------|-----------------------|---|------|----------------------|---------------------------|------------------------|-------------------|--------------|
|                    |  |              |                       | No load                                 | Load |                      |                           |                        |                   |              |
| Single-acting      | 36                                     | PA-133       | 10,000                | 40                                      | 8    | Advance/Hold/Retract | 60-120                    | 9                      | 85                | 12           |
|                    | 80                                     | PA-1150      | 10,000                | 40                                      | 8    | Advance/Hold/Retract | 60-120                    | 9                      | 85                | 18           |

\* Recommended Regulator-Filter-Lubricator: RFL-102

# PAM-Series, Air Hydraulic Pumps

▼ Shown: PAM-1041



## PAM Series

Reservoir Capacity:  
**1.0-2.0 gal.**

Flow at Rated Pressure:  
**9 in<sup>3</sup>/min.**

Maximum Operating Pressure:  
**10,000 psi**

- Twin air motor configuration delivers high-flow performance in first stage, up to 200 psi, for rapid cylinder advance
- 1 and 2 gallon reservoirs for use with a wide range of cylinders
- Integral shroud protects air motors and provides easy portability



### Locking Valves

Pumps with VM-4 manual valves are available with VM-4L manual locking valves instead. Add suffix "L" to pump model number.

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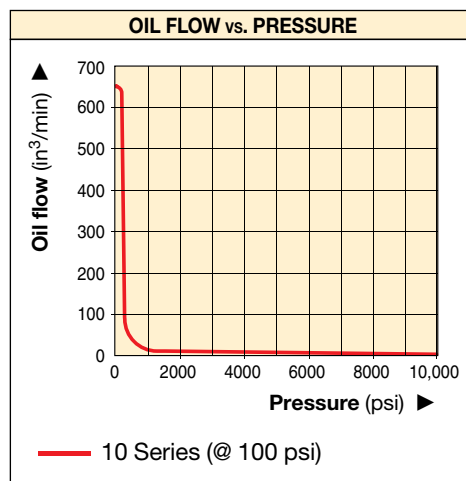
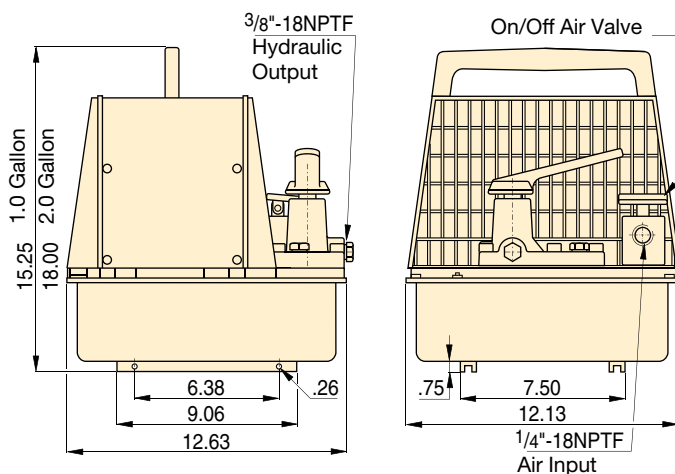


### Remote Air Valve

For remote operation of PAM-10 series air pumps. Permits either hand or foot operation.

Model number <sup>1)</sup>

VA-2



| Used with Cylinder | Usable Oil Capacity (gal) | Model Number (with Shroud) | Pressure Rating (psi) | Output Flow Rate (in <sup>3</sup> /min) |                       | Valve Function | Valve Model | Air Pressure Range* (psi) | Air Consumption (scfm) | Sound Level (dBA) | Weight (lbs) |
|--------------------|---------------------------|----------------------------|-----------------------|---|-----------------------|----------------|-------------|---------------------------|------------------------|-------------------|--------------|
|                    |                           |                            |                       |   | 2 <sup>nd</sup> stage |                |             |                           |                        |                   |              |
| Single-acting      | 0.7                       | PAM-1021                   | 10,000                | 650                                     | 9                     | Adv/Hold/Ret   | VM-2        | 60-120                    | 18                     | 87                | 50           |
|                    | 2.0                       | PAM-1022                   | 10,000                | 650                                     | 9                     | Adv/Hold/Ret   | VM-2        | 60-120                    | 18                     | 87                | 60           |
| Double-acting      | 0.7                       | PAM-1041                   | 10,000                | 650                                     | 9                     | Adv/Hold/Ret   | VM-4        | 60-120                    | 18                     | 87                | 50           |
|                    | 2.0                       | PAM-1042                   | 10,000                | 650                                     | 9                     | Adv/Hold/Ret   | VM-4        | 60-120                    | 18                     | 87                | 60           |

\* Recommended Regulator-Filter-Lubricator: RFL-102

▼ Shown from left to right: ZG6440MX-BCFH, ZG5420MX-B



# Z

Tough.  
Dependable.  
Innovative.

## CLASS



### User Adjustable Relief Valve

All VM-Series directional valves have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.



### High Pressure Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

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### Other Options Available

The ZG5/ZG6 pumps are available in a wide range of configurations and options. Contact Enerpac for further information.

- Features Z-Class high efficiency pump design, higher oil flow and bypass pressure
- Two-speed operation reduces cycle time for improved productivity
- Full sight oil level glass on all reservoirs allow quick and easy oil level monitoring
- Sturdy wheeled cart for ZG6 allows transport over uneven terrain and features collapsible handles for easy storage
- Dual forced air heat exchangers on ZG6 stabilizes hydraulic oil temperature
- ZG5 is available in two 4-cycle engine sizes: 7.1 ft.lbs Honda and 8.5 ft.lbs Briggs & Stratton
- ZG6 has Briggs & Stratton 17 ft.lbs engine with electric start, pressurized oil and 16-amp charge output for accessories

### ▼ SELECTION CHART

| Used with Cylinder | Usable Oil Capacity (gal) | Valve Model Number | Valve Function               | Model Number | Motor Manufacturer* | Motor Size (Ft.lbs) | Weight (lbs) |
|--------------------|---------------------------|--------------------|------------------------------|--------------|---------------------|---------------------|--------------|
| Single-Acting      | 2.5                       | VM33               | Advance/<br>Hold/<br>Retract | ZG5310MX-R   | Honda               | 7.1                 | 113.6        |
|                    | 5.0                       |                    |                              | ZG5320MX-R   |                     |                     | 140.9        |
| Double-Acting      | 2.5                       | VM43               |                              | ZG5410MX-R   |                     |                     | 113.6        |
|                    | 5.0                       |                    |                              | ZG5420MX-R   |                     |                     | 141.0        |
| Single-Acting      | 2.5                       | VM33               |                              | ZG5310MX-BR  | Briggs & Stratton   | 8.5                 | 111.0        |
|                    | 5.0                       |                    |                              | ZG5320MX-BR  |                     |                     | 138.3        |
| Double-Acting      | 2.5                       | VM43               |                              | ZG5410MX-BR  |                     |                     | 111.1        |
|                    | 5.0                       |                    |                              | ZG5420MX-BR  |                     |                     | 138.4        |
|                    | 10.0                      | VM43               | ZG6440MX-BCFH                | 17.0         | 334.0               |                     |              |

\*To order Briggs & Stratton motor, place a "B" suffix in the model number.

# Gasoline Hydraulic Pumps

## ZG5/ ZG6 Series



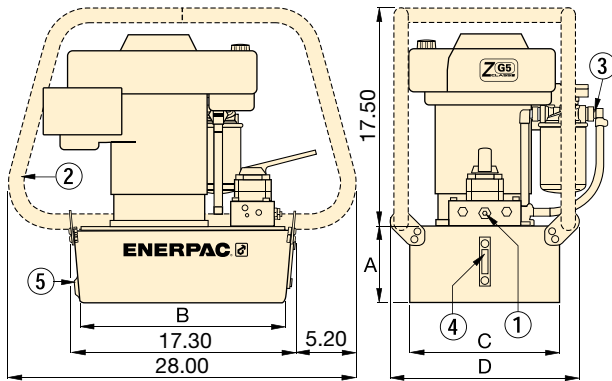
Reservoir Capacity:  
**2.5-10 gal.**

Flow at Rated Pressure:  
**100-200 in<sup>3</sup>/min.**

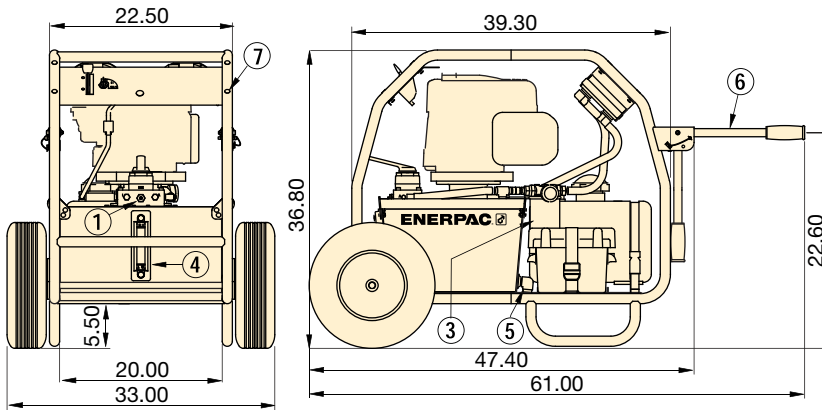
Engine Size:  
**7.1, 8.5 and 17.0 Ft.lbs**

Maximum Operating Pressure:  
**10,000 psi**

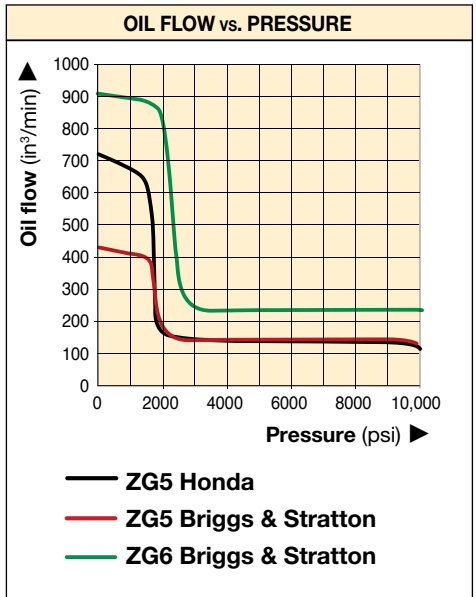
### ZG5



### ZG6



- ① User adjustable relief valve on all manual valves. 3/8" NPTF on A and B ports; 1/4" NPTF on auxiliary ports.
- ② Roll Bar (optional)
- ③ Return Line Filter (optional on ZG5, Standard on ZG6)
- ④ Oil Level Gauge
- ⑤ Oil Drain
- ⑥ Collapsible handles (ZG6 only)
- ⑦ Cart (standard on ZG6 only)



| Motor Size |      | Output Flow Rate       |         |           |            | Relief Valve Adjustment Range | Sound Level |
|------------|------|------------------------|---------|-----------|------------|-------------------------------|-------------|
|            |      | (in <sup>3</sup> /min) |         |           |            |                               |             |
| (Ft.lbs)   | RPM  | 100 psi                | 700 psi | 5,000 psi | 10,000 psi | (psi)                         | (dBA)       |
| 7.1        | 2500 | 700                    | 650     | 110       | 100        | 1000 - 10,000                 | 88 - 93     |
| 8.5        | 3600 | 400                    | 380     | 110       | 100        |                               | 91 - 95     |
| 17.0       | 3600 | 900                    | 885     | 225       | 200        |                               | 91 - 95     |

| ZG5 Dimensions (in) |      |      |      |      |
|---------------------|------|------|------|------|
| Reservoir Size      | A    | B    | C    | D    |
| (gal)               |      |      |      |      |
| 2.5                 | 6.1  | 16.5 | 12.0 | 15.1 |
| 5.0                 | 7.1  | 16.3 | 16.6 | 19.7 |
| 10.0                | 10.6 | 15.7 | 19.9 | 22.7 |

▼ Shown: PGM-2408R



## PGM Series

Reservoir Capacity:  
**1-2 gallons**

Flow at Rated Pressure:  
**40 in<sup>3</sup>/min.**

Motor Size:  
**4.2 Ft.lbs**

Maximum Operating Pressure:  
**10,000 psi**



### Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the

System Components section for a full range of gauges.

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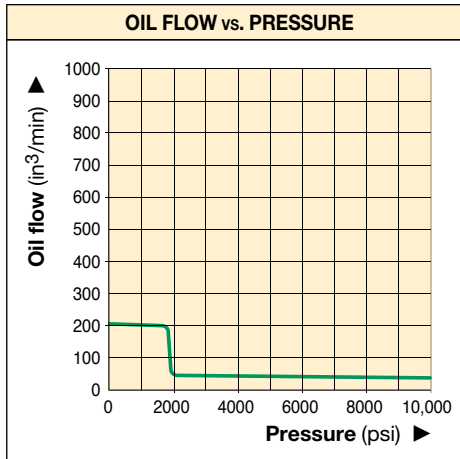
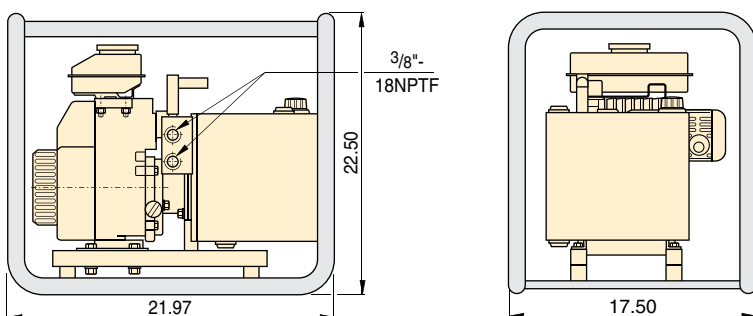
### Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system,

specify only genuine Enerpac hydraulic hoses.

Page: 114

- **Patented Genesis Technology**
  - coaxial piston design ensures high performance
  - first-stage piston pump for improved efficiency
- **High by-pass pressures improve productivity**
- **All Atlas pumps feature sturdy roll cage for use in tough environments**
- **Four-cycle Honda motor**



| Used with Cylinder | Usable Oil Capacity (gal) | Model Number | Output Flow Rate** (in <sup>3</sup> /min) |                       | Pressure Rating (psi) | Valve Type        | Valve Function        | Motor Manufacturer | Motor Size (Ft.lbs) | Weight (lbs) |
|--------------------|---------------------------|--------------|---|-----------------------|-----------------------|-------------------|-----------------------|--------------------|---------------------|--------------|
|                    |                           |              | 1 <sup>st</sup> stage                     | 2 <sup>nd</sup> stage |                       |                   |                       |                    |                     |              |
| Single-acting      | 1.0                       | PGM-2304R*   | 200                                       | 40                    | 10,000                | 3-way, 3-position | Advance/ Hold/Retract | Honda              | 4.2 at 3600 rpm     | 55           |
|                    | 2.0                       | PGM-2308R*   | 200                                       | 40                    | 10,000                | 3-way, 3-position |                       |                    |                     | 72           |
| Double-acting      | 1.0                       | PGM-2404R*   | 200                                       | 40                    | 10,000                | 4-way, 3-position |                       |                    |                     | 55           |
|                    | 2.0                       | PGM-2408R*   | 200                                       | 40                    | 10,000                | 4-way, 3-position |                       |                    |                     | 72           |

\* Note: PGM-20 Series are available with a carrying handle instead of a Roll Cage. For ordering omit the 'R' from the model number.

\*\* Nominal values—may vary based on motor speed.

# 8000-Series Gasoline Pumps

▼ Shown: **EGM-8418**



## EGM Series

Reservoir Capacity:

**25 gal.**

Flow at Rated Pressure:

**1.5 gal/min.**

Motor Size:

**18 hp**

Maximum Operating Pressure:

**10,000 psi**

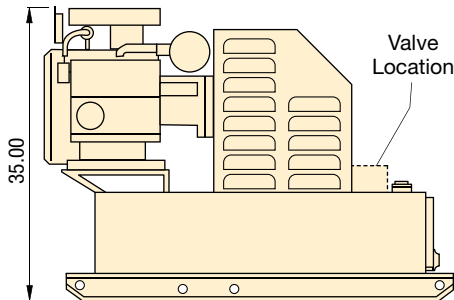
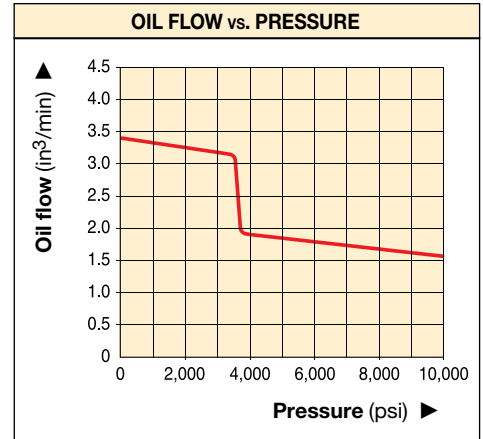


### Locking Valves

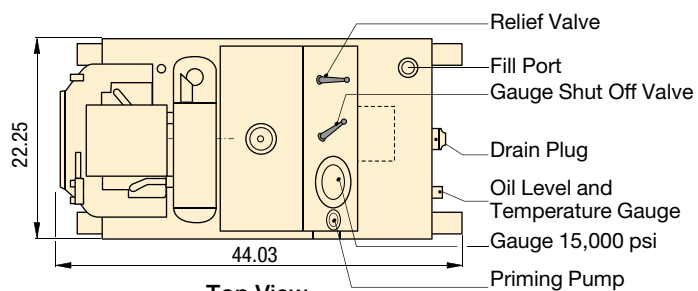
Pumps with VM-4 manual valves are available with VM-4L manual valves for positive load holding. Add suffix "L" to pump model number.

Page: **108**

- Industrial grade 18 hp twin-cylinder motor
- Panel mounted pressure gauge and adjustable relief valve for system pressure control
- Two-speed pump design with high by-pass pressure for rapid cylinder advance
- Built in oil temperature and oil level gauge
- External adjustable relief valve (1,200-10,000 psi) allows control of operating pressure without opening the pump
- Integral priming circuit guarantees quick starts after transport



Side View



Top View

| Used with Cylinder | Usable Oil Capacity (gal) | Model Number | Pressure Rating (psi) |                       | Output Flow Rate (gal/min) |                       | Valve Type    | Valve Function  | Sound Level (dBA) | Weight (lbs) |
|--------------------|---------------------------|--------------|-----------------------|-----------------------|----------------------------|-----------------------|---------------|-----------------|-------------------|--------------|
|                    |                           |              | 1 <sup>st</sup> stage | 2 <sup>nd</sup> stage | 1 <sup>st</sup> stage      | 2 <sup>nd</sup> stage |               |                 |                   |              |
| Single-acting      | 18                        | EGM-8218     | 3,700                 | 10,000                | 3.4                        | 1.5                   | 3-way, 2-pos. | Adv./Retr.      | 94                | 890          |
| Double-acting      | 18                        | EGM-8418     | 3,700                 | 10,000                | 3.4                        | 1.5                   | 4-way, 3-pos. | Adv./Hold/Retr. | 94                | 890          |



**E**NERPAC hydraulic valves are available in a wide variety of models and configurations.

Whatever your requirements... directional control, flow control, or pressure control... you can be sure that Enerpac has the correct valve to match your application exactly.

Designed and manufactured for safe operation up to 10,000 psi, the range of Enerpac valves allows for direct pump mounting, remote mounting, manual or solenoid actuation, and in-line installation, giving you flexible solutions to control your hydraulic system.



### Pressure and Flow Control Valves

For more hydraulic system control with pressure relief valves, shut-off valves, check valves and sequence valves see our "System Components" section.

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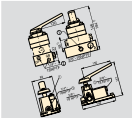

### Valving Help

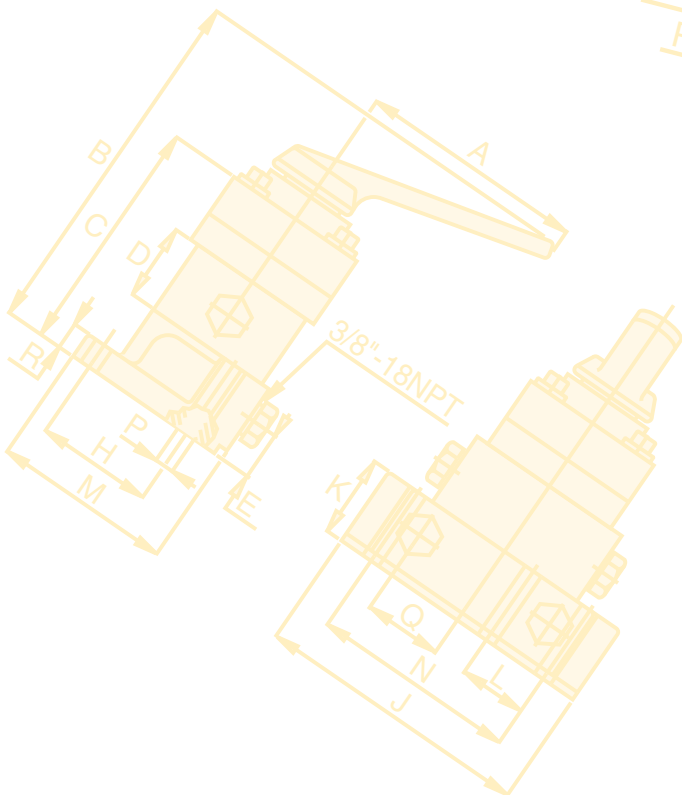
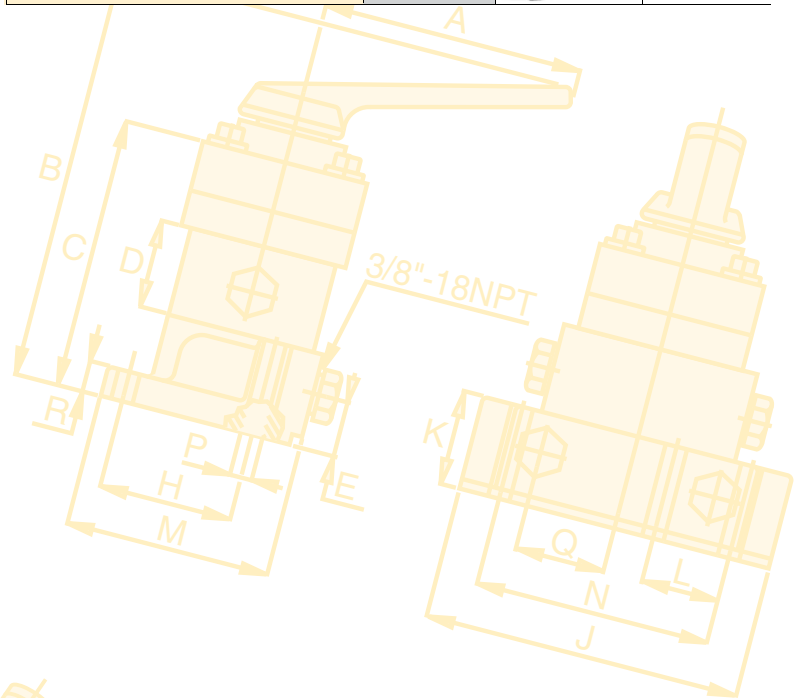
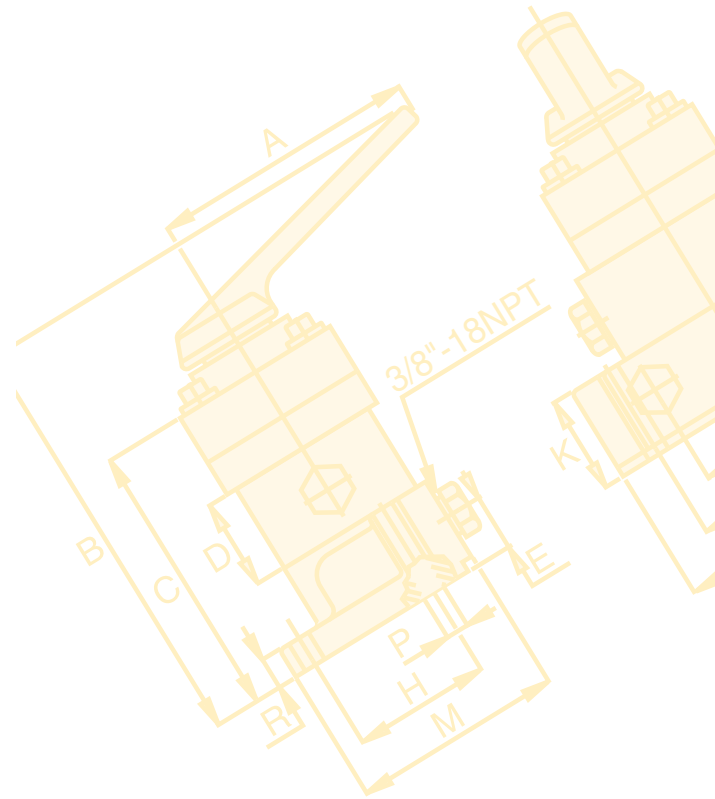
See Basic System Set-Up and Valve Information in our 'Yellow Pages'

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# Directional Control Valves Section Overview

| Valve Type   | Series     |   | Page  |
|--|------------|---|-------|
| Pump-Mounted Directional Control Valves              | VM, VE     |  | 106 ▶ |
| Remote-Manual Directional Control Valves             | VC         |  | 108 ▶ |
| Valve Dimensions                                     | VC, VM, VE |  | 109 ▶ |
| Modular/Solenoid Operated Directional Control Valves | VE         |  | 110 ▶ |



▼ Shown from left to right: VM32, VE33, VM33, VM43L, VE43-115



- Advance/Retract and Advance/Hold/Retract operation of single-acting and double-acting cylinders
- Manual or solenoid operation
- Pump mounting will retrofit on most Enerpac pumps
- Available “locking” option on VM Series valves for load-holding applications
- Standard “locking” feature on VE Series 3-position valves
- User adjustable relief valves allow the operator to easily set the working pressure

▼ ZE4420SB-FH Z-Class pump is mounted next to an Enerpac H-frame press, includes VE43 electric valve to control cylinder operation.



## For Reliable Control of Single and Double-Acting Cylinders

| Valve Operation     | Used with Cylinder | Valve Type  |  |
|---------------------|--------------------|---|--|
| Manual              | Single-acting      | 3-Way<br>2 Position                               |  |
| Manual              | Single-acting      | 3-Way<br>2 Position                               |  |
| Manual              | Single-acting      | 3-Way<br>3 Position,<br>Tandem Center             |  |
| Manual              | Double-acting      | 4-Way<br>3 Position,<br>Tandem Center             |  |
| Manual              | Single-acting      | 3-Way<br>3 Position,<br>Tandem Center,<br>Locking |  |
| Manual              | Double-acting      | 4-Way<br>3 Position,<br>Tandem Center,<br>Locking |  |
| Solenoid<br>24 VDC  | Single-acting      | 3-Way<br>2 Position                               |  |
| Solenoid<br>24 VDC  | Single-acting      | 3-Way<br>2 Position,<br>Dump                      |  |
| Solenoid<br>24 VDC  | Single-acting      | 3-Way,<br>3 Position,<br>Tandem Center            |  |
| Solenoid<br>115 VAC | Single-acting      | 3-Way,<br>3 Position,<br>Tandem Center            |  |
| Solenoid 24<br>VDC  | Double-acting      | 4-Way,<br>3 Position,<br>Tandem Center            |  |
| Solenoid<br>115 VAC | Double-acting      | 4-Way,<br>3 Position,<br>Tandem Center            |  |

For remote valve applications, see page 108.

# Pump Mounted Directional Control Valves



All valves feature several gauge ports for “system”, A port and B port pressure monitoring. User-adjustable relief valves are included on all models to allow the operator to easily set the optimum working pressure for each application. VM33 and VE43 valves include “System Check” feature, for more precise pressure holding and improved system control. The VM33 has improved porting which provides faster cylinder retraction while motor is running.

## VM, VE Series



Flow Capacity:

**4.5 gal/min.**

Maximum Operating Pressure:

**10,000 psi**



### High-Pressure Hoses

VE33-115 and VE43-115 electric valves are supplied with IC400 control station. These valves include an 8 ft. power cord, and can be used on any Enerpac pump. They require a separate 115 volt power supply to operate.



### Locking Valves

For applications that require positive load holding, VM Series valves (except the VM22 and VM32 valve) are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

To order this feature, place an “L” at the end of the model number.



### Pendants for VE-Series Solenoid Valves

When ordering Enerpac VE-Series solenoid valves, the pendant must be ordered separately for Z-Class pumps. Pendant connection to be plugged into electric box of pump.

| To be used with solenoid valves: | Pendant |
|----------------------------------|---------|
| VE32D                            | ZCP-1   |
| VE32, VE33, VE43                 | ZCP-3   |

| Model Number | Hydraulic Symbol | Schematic Flowpath |      |         | Weight (lbs) |
|--------------|------------------|--------------------|------|---------|--------------|
|              |                  | Advance            | Hold | Retract |              |
| VM22         |                  |                    |      |         | 5.6          |
| VM32         |                  |                    |      |         | 5.6          |
| VM33         |                  |                    |      |         | 6.7          |
| VM43         |                  |                    |      |         | 6.8          |
| VM33L        |                  |                    |      |         | 10.7         |
| VM43L        |                  |                    |      |         | 10.8         |
| VE32         |                  |                    |      |         | 8.7          |
| VE32D        |                  |                    |      |         | 8.7          |
| VE33         |                  |                    |      |         | 20.3         |
| VE33-115     |                  |                    |      |         | 20.3         |
| VE43         |                  |                    |      |         | 20.3         |
| VE43-115     |                  |                    |      |         | 20.3         |

See page 109 for product dimensions.

▼ Shown from left to right: VC-20, VC-4L



## Reliable Remote Control



### Locking Valves

For applications that require positive load holding, VC and VM Series valves are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

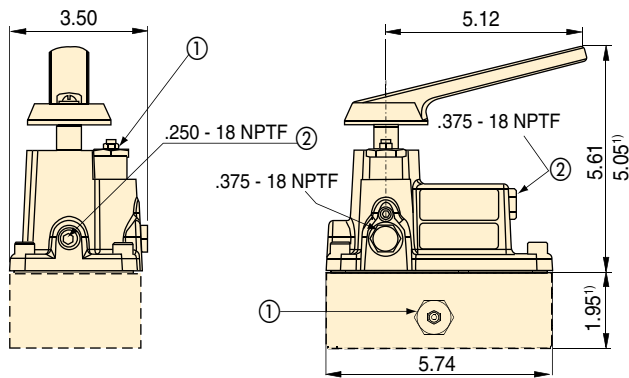
- Advance/Hold/Retract operation for use with single-acting or double-acting cylinders

| Valve Operation | Used with Cylinder | Valve Type                                | Model Number  | Hydraulic Symbol | Schematic Flowpath |      |         | Weight (lbs) |
|-----------------|--------------------|---|---------------|------------------|--------------------|------|---------|--------------|
|                 |                    |   |               |                  | Advance            | Hold | Retract |              |
| Manual          | Single Acting      | 3-Way, 3 Position, Tandem Center          | <b>VC-3</b>   |                  |                    |      |         | 6.4          |
| Manual          | Single Acting      | 3-Way, 3 Position, Tandem Center, Locking | <b>VC-3L</b>  |                  |                    |      |         | 10.3         |
| Manual          | Single Acting      | 3-Way, 3 Position, Closed Center          | <b>VC-15</b>  |                  |                    |      |         | 6.4          |
| Manual          | Single Acting      | 3-Way, 3 Position, Closed Center, Locking | <b>VC-15L</b> |                  |                    |      |         | 10.3         |
| Manual          | Double Acting      | 4-Way, 3 Position, Tandem Center          | <b>VC-4</b>   |                  |                    |      |         | 6.4          |
| Manual          | Double Acting      | 4-Way, 3 Position, Tandem Center, Locking | <b>VC-4L</b>  |                  |                    |      |         | 10.3         |
| Manual          | Double Acting      | 4-Way, 3 Position, Closed Center          | <b>VC-20</b>  |                  |                    |      |         | 6.4          |
| Manual          | Double Acting      | 4-Way, 3 Position, Closed Center, Locking | <b>VC-20L</b> |                  |                    |      |         | 10.3         |

Return line kit included with remote valves

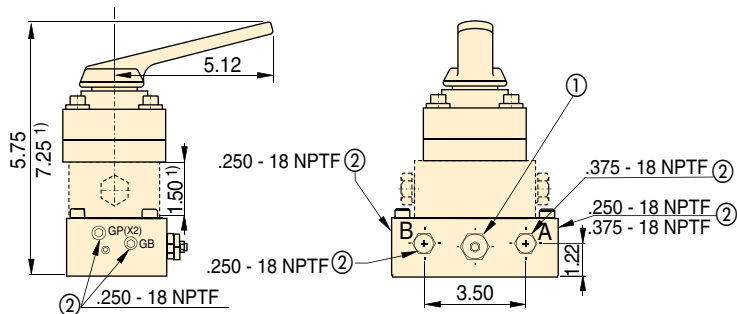
# Directional Control Valves Dimensions

Valve dimensions in inches.



## VM22, VM32

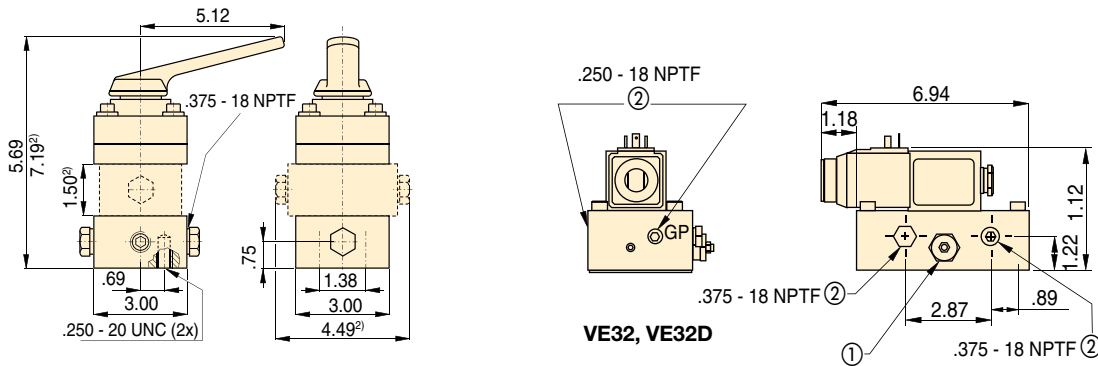
<sup>1)</sup> VM22 only



## VM33, VM33L

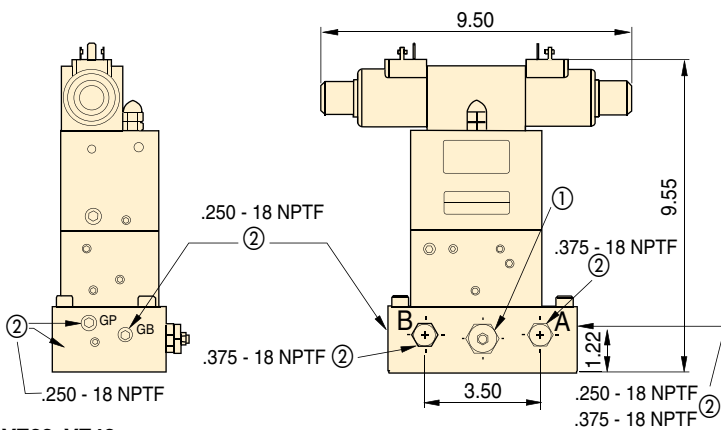
## VM43, VM43L

<sup>1)</sup> VM33L and VM43L only



## VC3, VC3L, VC-15, VC15L, VC-4, VC4L, VC20, VC20L

<sup>2)</sup> VC3L, VC15L, VC4L and VC20L only



## VE33, VE43

## VC, VM, VE Series



Flow Capacity:

**4.5 gal/min.**

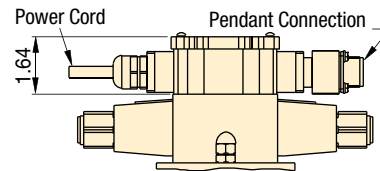
Maximum Operating Pressure:

**10,000 psi**



### User Adjustable Relief Valve

All VM- and VE-Series have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.



## VE33-115 VE43-115

① User Adjustable Relief Valve

② Auxiliary Port

▼ Shown top to bottom: VEC-15600D, VEK-15000B, VEC-15000B



## Unmatched Combinations and Possibilities

- Ideal for independent control of multiple cylinders or functions
- Relief valve and pilot-operated check accessory valves are stackable between manifold and valve body
- Remote and pump mounting



### 3-Way Check Valve

Use a **VS-51** 3-way pilot operated check valve assembly to convert your 3-way modular valve into a load-holding valve.



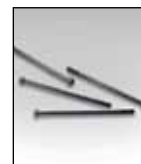
### 4-Way Check Valve

Use a **VS-61** 4-way pilot operated check valve assembly to convert your 4-way modular valve into a load-holding valve.



### System Pressure Control

To add system pressure control to your modular valve, order **VS-11 Relief Valve** assembly.



### Bolt Kits for Accessory Valves With No Manifold

Order Bolt Kit **BK-2** when adding one of the accessory valves. Order Bolt Kit **BK-3** when adding any combination of two accessory valves.

| Valve Flow Path                             | Used with Cylinder | Valve Code | Hydraulic Symbol |
|---|--------------------|------------|------------------|
| 4-Way, 3-Position (4/3)<br>Open Center      | Double-acting      | <b>A</b>   |                  |
| 4-Way, 3-Position (4/3)<br>Closed Center    | Double-acting      | <b>B</b>   |                  |
| 4-Way, 3-Position (4/3)<br>Tandem Center    | Double-acting      | <b>C</b>   |                  |
| 4-Way, 3-Position (4/3)<br>Float Center     | Double-acting      | <b>D</b>   |                  |
| 4-Way, 2-Position (4/2)<br>Crossover Offset | Double-acting      | <b>E</b>   |                  |
| 3-Way, 3-Position (3/3)<br>Tandem Center    | Single-acting      | <b>F</b>   |                  |
| 3-Way, 3-Position (3/3)<br>Closed Center    | Single-acting      | <b>G</b>   |                  |
| 2-Way, 2-Position (2/2)<br>Normally Closed  | System             | <b>H*</b>  |                  |
| 2-Way, 2-Position (2/2)<br>Normally Open    | Un-loading         | <b>K*</b>  |                  |
| 4-Way, 2-Position (4/2)<br>Float Offset     | Double-acting      | <b>M</b>   |                  |
| 3-Way, 2-Position (3/2)<br>Normally Open    | Single-acting      | <b>P</b>   |                  |

\* Requires use of tank port for dump or unloading.

### How to order one of the 1,300 possible model numbers?

With over 1,300 possible model numbers, Enerpac has the perfect valve for you. Use the "chart" to build your own valve for the specific application you require. This is the complete guide to all the Modular valves that are available.

# Solenoid Operated Modular Valves

## CUSTOM BUILD YOUR MODULAR VALVES

▼ This is how a Modular Valve Model Number is built up:



1 Solenoid Operated Valve  
2 Valve Flow Path  
3 Flow Capacity  
4 Voltage  
5 Accessory Valves  
6 Manifold

### 1 Product Type

**VE** = Solenoid Operated Valve

### 2 Valve Code

**A** = 4/3 Open Center  
**B** = 4/3 Closed Center  
**C** = 4/3 Tandem Center  
**D** = 4/3 Float Center  
**E** = 4/2 Crossover Offset  
**F** = 3/3 Tandem Center  
**G** = 3/3 Closed Center  
**H** = 2/2 Normally Closed  
**K** = 2/2 Normally Open  
**M** = 4/2 Float Offset  
**P** = 3/2 Normally Open

### 3 Flow Capacity

**1** = 4 gallons per minute

### 4 Voltage

**1** = 24 VDC  
**2** = 220/240 V, 1 ph, 50 Hz  
**5** = 115 V, 1 ph, 60 Hz  
**6** = 230 V, 1 ph, 60 Hz

### 5 Accessory Valves

**000** = No accessory valves  
**100** = Relief Valve only  
**150** = Relief Valve and 3-way pilot operated check valve  
**Only for VEF/VEG**  
**160** = Relief Valve and 4-way pilot operated check valve  
**Only for VEA/VEB/VEC/VED**  
**500** = 3-way pilot operated check valve  
**Only for VEF/VEG**  
**600** = 4-way pilot operated check valve  
**Only for VEA/VEB/VEC/VED**

### 6 Manifold

**A** = No manifold\*\*  
**B** = Remote Mounted  
**D** = Pump Mounted\*

\* Only for valve code: **VEA/VEC/VEF**  
\*\* Must order Bolt Kit separately.

## VE Series



Flow Capacity:

**4 gal/min.**

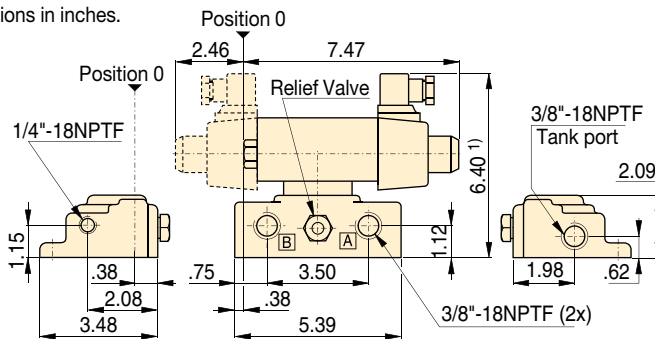
Maximum Operating Pressure:

**10,000 psi**

### Example: VEA-15600-D

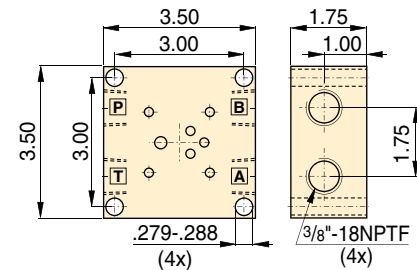
VEA-15600-D is a Modular Valve with a 4-way, 3-position open center flowpath, 115 VAC, and an integral pilot-operated check valve, for mounting on an Enerpac pump.

Valve dimensions in inches.



Modular Valve Pump Mounted

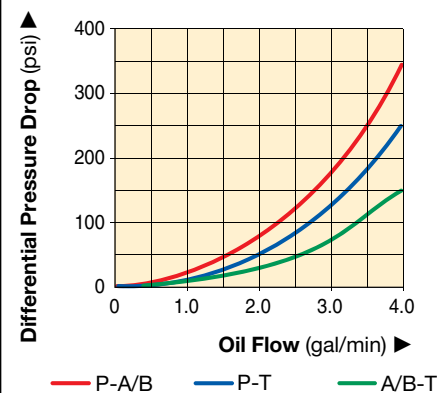
<sup>1)</sup> add 1.85 inch for each Accessory Valve



Modular Valve Remote Mount Manifold

| Maximum Operating Pressure (psi) | Amperage Draw    |                  |                 | Seal Material           | Valve Plug   |
|----------------------------------|------------------|------------------|-----------------|-------------------------|--------------|
|                                  | 24 VDC           | 115 VAC<br>60 Hz | 230 V<br>60 Hz  |                         |              |
| 0 - 10,000                       | N/A<br>Inrush    | 3.6 A<br>Inrush  | 1.8 A<br>Inrush | Buna-N,<br>Polyurethane | DIN<br>43650 |
|                                  | 2.5 A<br>Holding | 1.0 A<br>Holding | .5 A<br>Holding |                         |              |

### Pressure Drop versus Oil Flow





## ENERPAC System Components –

All the additional components you need to complete your high pressure hydraulic system. Engineered to work with your Enerpac cylinders, pumps and tools.

All Enerpac components are designed and manufactured to the most exacting standards.

With this complete line of hydraulic hoses, couplers, fittings, manifolds, oil and gauges Enerpac has the accessories to compliment your system and ensure the efficient operation, long life, and safety of your hydraulic equipment.



### Yellow Pages

For sample system set-ups and how to correctly specify your system components, please view the Enerpac **Yellow Pages**.

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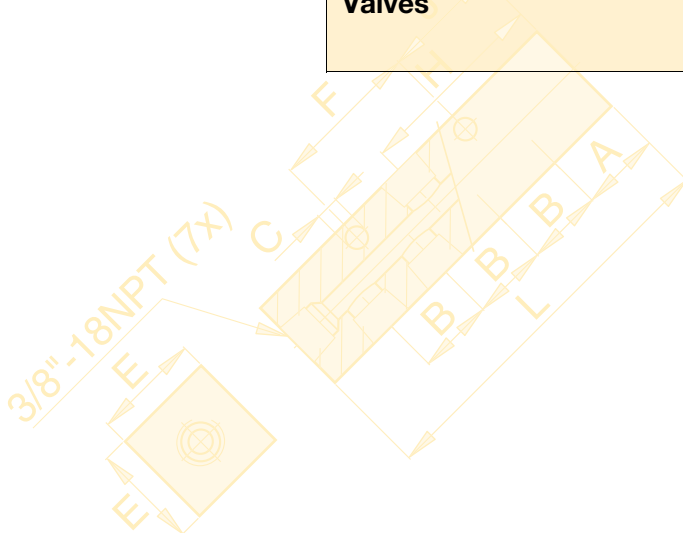
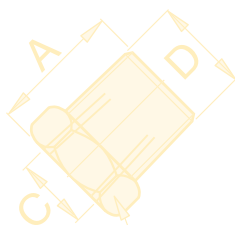
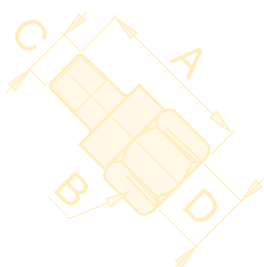
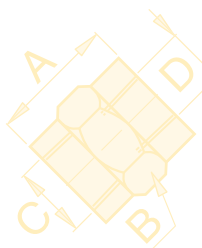
### Maintain System Integrity

Use Enerpac System Components, designed to interface with Enerpac Cylinders, Pumps and Tools to ensure your system operates at peak performance.



# System Components and Control Valves Section Overview

| Component Type                    | Series        |   | Page  |
|-----------------------------------|---------------|---|-------|
| Hoses                             | 700<br>900    |    | 114 ▶ |
| Couplers                          | A, C,<br>F, Z |    | 116 ▶ |
| Hydraulic Oil                     | HF<br>LX      |    | 118 ▶ |
| Manifolds                         | A<br>AM       |    | 118 ▶ |
| Fittings                          | FZ            |    | 119 ▶ |
| Hydraulic Force & Pressure Gauges | GF<br>GP      |    | 120 ▶ |
| Hydraulic Pressure Gauges         | G, H          |   | 122 ▶ |
| Test System Gauges                | T             |  | 124 ▶ |
| Digital Gauges                    | DGR           |  | 125 ▶ |
| Gauge Accessories                 | GA, NV,<br>V  |  | 126 ▶ |
| Flow and Pressure Control Valves  | V             |  | 128 ▶ |



▼ Shown from top to bottom: HC-7206, HC-7210, HC-9206



## Emphasize Safety and Quality



To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

### WARNING !

- Do not exceed 10,000 psi maximum pressure.
- Do not handle hoses while under pressure.

More safety instructions in our "Yellow Pages".

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**Crimped-on rubber strain relief for improved life and durability on all models.**

### Thermo-plastic Hoses (700-Series)

- For demanding applications, featuring a 4:1 design factor
- Maximum working pressure of 10,000 psi
- Two layers of steel wire braids
- Outside jacket is polyurethane, to provide maximum abrasion resistance
- Exhibits low volumetric expansion under pressure to enhance overall system efficiency

### Heavy-duty Rubber Hoses (900-Series)

- The most complete offering: 35 models up to 50 feet in length
- Rubber coated with two layers of steel wire braids
- Designed to comply with Material Handling Institute IJ-100 hose specification
- Flexible, with little "memory", is the best choice for long hose runs



◀ To prevent back pressure and to increase cylinder retraction speed, when using long hoses, the Enerpac HC-7300 range of hoses with increased internal diameter is the best choice.

### ▼ Hose End Couplings

|           |   |
|-----------|---|
| 1/4" NPTF |   |
| 3/8" NPTF |  |
| A-604     |  |
| A-630     |  |
| AH-604    |  |
| AH-630    |  |
| C-604     |  |
| CH-604    |  |

# High Pressure Hydraulic Hoses

**700  
900  
Series**



Inside Diameter:

**.25 and .38 inch**

Length:

**2-50 feet**

Maximum Operating Pressure:

**10,000 psi**

| Internal Dia.<br>(in) | Hose End Assemblies and Couplers* |                  | Hose Length<br>(ft) | 700-Series Thermo-plastic |                 | 900-Series Heavy-duty Rubber |                 |                 |     |
|-----------------------|-----------------------------------|------------------|---------------------|---------------------------|-----------------|------------------------------|-----------------|-----------------|-----|
|                       | End one                           | End two          |                     | Model Number              | Wt. (lbs)       | Model Number                 | Wt. (lbs)       |                 |     |
| <b>.25</b>            | <b>1/4" NPTF</b>                  | <b>1/4" NPTF</b> | 6                   | -                         |                 | <b>H-9206Q</b>               | 2.6             |                 |     |
|                       |                                   | <b>3/8" NPTF</b> | 6                   | -                         |                 | <b>H-9206S</b>               | 2.6             |                 |     |
|                       |                                   | <b>A-630</b>     | 6                   | <b>HB-7206QB</b>          | 2.4             | <b>HB-9206QB</b>             | 3.1             |                 |     |
|                       |                                   | <b>AH-630</b>    | 6                   | -                         |                 | <b>HB-9206Q</b>              | 2.9             |                 |     |
|                       |                                   | <b>CH-604</b>    | 6                   | <b>HC-7206Q</b>           | 2.3             | <b>HC-9206Q</b>              | 3.0             |                 |     |
|                       | <b>3/8" NPTF</b>                  | <b>A-604</b>     |                     | 2                         | <b>H-7202</b>   | 1.2                          | <b>H-9202</b>   | 1.6             |     |
|                       |                                   |                  |                     | 3                         | <b>H-7203</b>   | 1.5                          | <b>H-9203</b>   | 1.9             |     |
|                       |                                   |                  |                     | 6                         | <b>H-7206</b>   | 2.0                          | <b>H-9206</b>   | 2.6             |     |
|                       |                                   |                  |                     | 10                        | <b>H-7210</b>   | 3.0                          | <b>H-9210</b>   | 3.9             |     |
|                       |                                   |                  |                     | 20                        | <b>H-7220</b>   | 6.2                          | <b>H-9220</b>   | 8.0             |     |
|                       |                                   |                  |                     | 30                        | <b>H-7230</b>   | 10.0                         | <b>H-9230</b>   | 13.0            |     |
|                       |                                   |                  |                     | 50                        | <b>H-7250</b>   | 15.4                         | <b>H-9250</b>   | 22.0            |     |
|                       |                                   |                  |                     | 6                         | <b>HA-7206B</b> | 2.5                          | <b>HA-9206B</b> | 3.2             |     |
|                       |                                   |                  | 10                  | -                         |                 | <b>HA-9210B</b>              | 4.5             |                 |     |
|                       |                                   | <b>AH-604</b>    |                     | 3                         | -               |                              | <b>HA-9203</b>  | 2.1             |     |
|                       |                                   |                  |                     | 6                         | <b>HA-7206</b>  | 2.2                          | <b>HA-9206</b>  | 2.9             |     |
|                       |                                   |                  |                     | 10                        | <b>HA-7210</b>  | 3.2                          | <b>HA-9210</b>  | 4.2             |     |
|                       |                                   |                  | <b>AH-630</b>       |                           | 6               | <b>HB-7206</b>               | 2.2             | <b>HB-9206</b>  | 2.9 |
|                       |                                   |                  |                     |                           | 3               | <b>HC-7203B</b>              | 2.2             | <b>HC-9203B</b> | 2.9 |
|                       |                                   |                  | <b>C-604</b>        |                           | 6               | <b>HC-7206B</b>              | 2.8             | <b>HC-9206B</b> | 3.7 |
|                       |                                   |                  |                     | 10                        | <b>HC-7210B</b> | 3.9                          | <b>HC-9210B</b> | 5.0             |     |
|                       |                                   | 3                |                     | <b>HC-7203</b>            | 1.7             | <b>HC-9203</b>               | 2.2             |                 |     |
|                       | <b>CH-604</b>                     |                  | 6                   | <b>HC-7206</b>            | 2.3             | <b>HC-9206</b>               | 3.0             |                 |     |
|                       |                                   |                  | 10                  | <b>HC-7210</b>            | 3.3             | <b>HC-9210</b>               | 4.3             |                 |     |
|                       |                                   |                  | 20                  | <b>HC-7220</b>            | 6.4             | <b>HC-9220</b>               | 8.3             |                 |     |
|                       |                                   |                  | 6                   | <b>HC-7206C</b>           | 2.4             | <b>HC-9206C</b>              | 3.1             |                 |     |
|                       | <b>CH-604</b>                     | <b>CH-604</b>    |                     | 50                        | <b>HC-7250C</b> | 15.4                         | <b>HC-9250C</b> | 20.0            |     |
|                       |                                   |                  |                     | 6                         | <b>H-7306</b>   | 3.5                          | <b>H-9306</b>   | 4.6             |     |
| <b>.38</b>            | <b>3/8" NPTF</b>                  | <b>3/8" NPTF</b> |                     | 10                        | <b>H-7310</b>   | 5.4                          | <b>H-9310</b>   | 7.0             |     |
|                       |                                   |                  |                     | 20                        | <b>H-7320</b>   | 10.0                         | <b>H-9320</b>   | 13.0            |     |
|                       |                                   |                  |                     | 30                        | <b>H-7330</b>   | 16.2                         | <b>H-9330</b>   | 21.0            |     |
|                       |                                   |                  |                     | 50                        | <b>H-7350</b>   | 15.2                         | <b>H-9350</b>   | 33.0            |     |
|                       |                                   |                  |                     | 6                         | <b>HC-7306</b>  | 3.4                          | <b>HC-9306</b>  | 4.9             |     |
|                       |                                   | <b>CH-604</b>    |                     | 8                         | -               |                              | <b>HC-9308</b>  | 6.2             |     |
|                       |                                   |                  |                     | 10                        | <b>HC-7310</b>  | 5.6                          | <b>HC-9310</b>  | 7.3             |     |
|                       |                                   |                  |                     | 20                        | <b>HC-7320</b>  | 11.2                         | <b>HC-9320</b>  | 14.6            |     |

\* For technical information on couplers see next page.



### Torque Wrenches Hoses

Use Enerpac 3.5:1 twin safety hoses with double-acting wrenches to ensure the integrity of your hydraulic system. See Selection Matrix.

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### Fittings

For additional fittings see the fitting page of the System Components section.

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### Hose Oil Capacity

When using long hose lengths, it is sometimes necessary to fill the pump reservoir after filling the hoses. To determine the hose oil capacity, use the following:

For .25" internal diameter hoses:  
Capacity (in<sup>3</sup>) = .5892 x Length (ft)

For .38" internal diameter hoses:  
Capacity (in<sup>3</sup>) = 1.3608 x Length (ft)

▼ Shown: FH-604, FR-400, A-630 disassembled, C-604, AH-604, AR-400



## Quick Connection of Hydraulic Lines



### Thread Sealer

To seal NPTF threads use one of the new anaerobic thread sealers or Teflon paste. When using Teflon tape, apply the tape one thread back from the end of a fitting to prevent it from entering the hydraulic system.



### WARNING!

**Couplers should be pressurized only when completely connected, and should not be coupled or uncoupled when pressurized.**

More safety instructions in our "Yellow Pages".

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### S- and W-Series Torque Wrench Couplers

S- and W-Series Torque Wrenches require 1/4" spin-on couplers and THQ hoses.

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### 3/8" High Flow Couplers

- Standard equipment on most Enerpac cylinders
- Recommended for use on all Enerpac pumps and cylinders where space and porting permits
- Include "2-in-1" dust cap for use on male and female coupler halves

### 3/8" High Flow "Flush-face" Couplers

- Featuring "Push-to-connect" operation, to guarantee good connection every time
- Flush-face, zero-leak operation for minimal spillage
- HTMA\* recognized for safety and performance

### 3/8" Regular Spee-D-Coupler®

- For medium duty applications; for use with hand pumps
- Includes female steel dust cap

### 1/4" Regular Coupler

- For use with small cylinders and hand pumps
- Includes female steel dust cap

\* Hydraulic Tool Manufacturers Association

▼ With the use of Enerpac High Flow Couplers, hoses are easily installed for multiple hydraulic line connections in this 34 points PLC-controlled lifting system.



# Hydraulic Couplers



## F-Series

Flush-faced couplers provide reduced pressure drop versus other types and are preferred in dirty, grimy construction and mining environments due to easy clean, non-dirt trapping faces.



## Metal Dust Caps

Steel dust caps are available for the C-604 series couplers. Order model number: **CD-411M** for female half **CD-415M** for male half

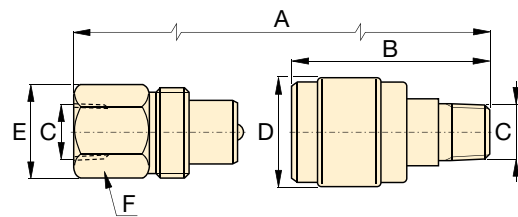
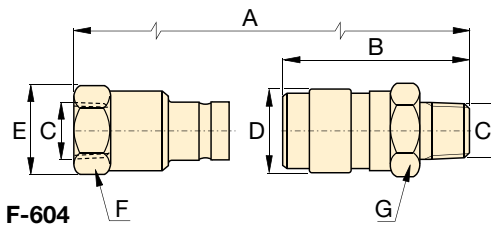
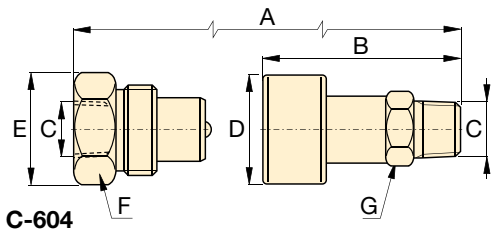
## A C F Series



Maximum Flow Capacity:  
**2,500 in<sup>3</sup>/min.**

Thread:  
**1/4" and 3/8" NPTF**

Maximum Operating Pressure:  
**10,000 psi**



## CT-604 Safety Tool

Use the Enerpac CT-604 to relieve hydraulic back pressure by safely bleeding the hydraulic coupler. Minimize injuries from

projectile parts and under-skin hydraulic fluid injections by eliminating unsafe coupler bleeding practices. The CT-604 is Enerpac-engineering safe for use at 10,000 psi (700 bar).

NOTE: C-Series only.

A-604, A-630

| Maximum Flow Capacity (in <sup>3</sup> /min) | Coupler Type            | Model Numbers |             |           | Dimensions (in) |      |           |      |      |      |      | Dust Cap(s)                   |
|--|-------------------------|---------------|-------------|-----------|-----------------|------|-----------|------|------|------|------|-------------------------------|
|  |                         | Complete Set  | Female Half | Male Half | A*              | B    | C         | D    | E    | F    | G    |                               |
| 2,500  | High Flow Coupler       | C-604         | CR-400      | CH-604    | 3.26            | 2.87 | 3/8" NPTF | 1.38 | 1.38 | 1.25 | 1.00 | (2x) CD-411<br>Included       |
|  |                         |               |             |           |                 |      |           |      |      |      |      |                               |
| 2,500  | Flush-face coupler      | F-604         | FR-400      | FH-604    | 4.36            | 2.85 | 3/8" NPTF | 1.23 | 1.23 | 1.06 | 1.12 | -                             |
|  |                         |               |             |           |                 |      |           |      |      |      |      |                               |
| 462  | Regular Spee-D-Coupler® | A-604         | AR-400      | AH-604    | 3.09            | 2.53 | 3/8" NPTF | 1.12 | .94  | .94  | .73  | Z-410 female only<br>Included |
|  |                         |               |             |           |                 |      |           |      |      |      |      |                               |
| 462  | Regular Coupler         | A-630         | AR-630      | AH-630    | 2.61            | 1.72 | 1/4" NPTF | .87  | .81  | .75  | .57  | Z-640 female only<br>Included |
|  |                         |               |             |           |                 |      |           |      |      |      |      |                               |

\* Value A is total length when male and female halves are connected.

▼ Shown top to bottom: HF-101, HF-100, HF-102, LX-101, A65, and FZ1055



## Enerpac System Components

### Hydraulic Oil

| Contents   | Model Number  | High viscosity index ensures maximum lubricity over a wide range of operation temperatures. |
|------------|---------------|---|
| 1 Quart    | <b>HF-100</b> |   |
| 1 Gallon   | <b>HF-101</b> |   |
| 5 Gallons* | <b>HF-102</b> |   |
| 55 Gallons | <b>HF-104</b> |   |
| 1 Gallon** | <b>LX-101</b> |   |

\* Packed in two 2½ gallon cans.

\*\* Hand pump oil.

### HF Oil

- Specially formulated for power pumps
  - maximum volumetric efficiency
  - maximum heat transfer
  - prevents cavitation
  - anti-sludge, anti-rust, anti-foam additives
- Maximum film protective lubricity
  - anti-oxidation additives

### LX Hand Pump Oil

- Specially formulated for hand pumps
  - anti-sludge, anti-rust additives
- Reduced handle effort over HF oil
  - good low temperature performance
- Not for use in power pumps

### ▼ Oil Specifications Chart

|                       | LX Oil       | HF Oil       |
|-----------------------|--------------|--------------|
| ISO Grade             | 15           | 32           |
| Viscosity Index       | 105 min      | 100 min      |
| Viscosity at 210 °F   | 38 S.U.S.    | 44 S.U.S.    |
| Viscosity at 100 °F   | 82 S.U.S.    | 164 S.U.S.   |
| Viscosity at 0 °F     | <1635 S.U.S. | <7236 S.U.S. |
| API Gravity           | 34.2         | 31.0/33.0    |
| Flash, C.O.C. °F      | 375          | 400          |
| Pour Point, °F        | -45          | -45          |
| Paraffinic Base Color | Yellow       | Blue         |

NOTE: SAE grades do not apply to hydraulic oil.

## Manifolds

| Description  |  | Model No.                    | Dimensions (in) |
|--|--|------------------------------|-----------------|
| <b>7" Long Manifold</b> with 7 female ports.   |  | <b>A-64</b>                  |                 |
| <b>14" Long Manifold</b> that allows direct mounting of control valves to the manifold. 7 female ports.  |  | <b>A-65</b>                  |                 |
| <b>6-Port Hexagon Manifold</b><br>Plugs furnished for all ports<br>3/8"-18 NPTF.   |  | <b>A-66</b>                  |                 |
| <b>Premounted Manifold</b><br>Functions as split-flow valve to control 2 to 4 single-acting cylinders simultaneously.<br>All ports 3/8"-18 NPTF. |  | <b>AM-21</b><br><b>AM-41</b> |                 |

# Hydraulic Oil, Manifolds and Fittings

## Recommended Tubing for Hand Plumbing Applications

Enerpac does not supply high-pressure pipe or tubing but recommends the use of cold drawn steel tubing instead of regular pipe in the following dimensions:

In place of 1/4" pipe use 3/8" tubing with a 0.065" minimum wall thickness.

For 3/8" pipe use schedule 80 as a minimum or 1/2" with a 0.095" minimum wall thickness.

For 1/2" pipe use schedule 80 as a minimum or 3/4" tubing with a 0.135" minimum wall thickness.

All tubing wall thicknesses based on a 55,000 psi minimum tensile strength.

**A, AM  
FZ,  
HF, LX  
Series**



| Description   |              | Model Number | Dimensions (in) |      |              |              | Diagram |
|---|--------------|--------------|-----------------|------|--------------|--------------|---------|
|   |              |              | A               | B    | C            | D            |         |
| <b>Street Elbow</b><br>From: 3/8"-NPTF Male<br>To: 3/8"-NPTF Female         |              | FZ-1616      | .94             | 1.30 | 3/8"-18 NPTF | 3/8"-18 NPTF |         |
|   |              |              |                 |      |              |              |         |
| <b>Reducing Connector</b><br>From: 3/8"-NPTF Female<br>To: 1/4"-NPTF Female |              | FZ-1615      | 1.13            | 1.00 | 3/8"-18 NPTF | 1/4"-18 NPTF |         |
| From: 1/2"-NPTF Female<br>To: 3/8"-NPTF Female                              |              | FZ-1625      | 1.88            | 1.14 | 1/2"-18 NPTF | 3/8"-18 NPTF |         |
| <b>Hex Nipple</b><br>From: 1/4"-NPTF Male<br>To: 1/4"-NPTF Male             |              | FZ-1608      | 1.50            | .63  | 1/4"-18 NPTF | 1/4"-18 NPTF |         |
| From: 3/8"-NPTF Male<br>To: 3/8"-NPTF Male                                  |              |              |                 |      |              |              |         |
| <b>Coupling</b><br>From: 3/8"-NPTF Female<br>To: 3/8"-NPTF Female           |              | FZ-1614      | 1.13            | 1.00 | 3/8"-18 NPTF | 3/8"-18 NPTF |         |
|   |              | FZ-1605      | 1.13            | .75  | 1/4"-18 NPTF | 1/4"-18 NPTF |         |
| <b>Cross</b><br>From: 3/8"-NPTF Female<br>To: 3/8"-NPTF Female              |              | FZ-1613      | 1.77            | 1.00 | 3/8"-18 NPTF | -            |         |
|   |              |              |                 |      |              |              |         |
| <b>Tee</b><br>From: 3/8"-NPTF Female<br>To: 3/8"-NPTF Female                |              | FZ-1612      | 1.77            | 1.00 | 3/8"-18 NPTF | -            |         |
|   |              |              |                 |      |              |              |         |
| <b>Elbow</b><br>From: 3/8"-NPTF Female<br>To: 3/8"-NPTF Female              |              | FZ-1610      | 1.38            | .88  | 3/8"-18 NPTF | -            |         |
|   |              |              |                 |      |              |              |         |
| <b>Bushing</b><br>From: 3/8"-NPTF Male<br>To: 1/4"-NPTF Female              |              | FZ-1630      | .75             | .75  | 1/4"-18 NPTF | 3/8"-18 NPTF |         |
|   |              |              |                 |      |              |              |         |
| <b>Swivel Fitting</b><br>From: 3/8"-NPTF Male<br>To: 3/8"-NPTF Female       |              | FZ-1660      | 1.56            | .88  | 3/8"-18 NPTF | 3/8"-18 NPTF |         |
|   |              |              |                 |      |              |              |         |
| <b>Adaptor</b> Female   | Male         | FZ-1055      | 1.75            | .94  | 1/4"-18 NPTF | 3/8"-18 NPTF |         |
| 3/8"-18 NPTF  | 1/4"-18 NPTF |              |                 |      |              |              |         |
| 1/2"-14 NPTF  | 1/4"-18 NPTF |              |                 |      |              |              |         |
| 1/2"-14 NPTF  | 3/8"-18 NPTF | FZ-1633      | 1.69            | 1.13 | 1/4"-18 NPTF | 1/2"-14 NPTF |         |
|   |              | FZ-1634      | 1.69            | 1.13 | 3/8"-18 NPTF | 1/2"-14 NPTF |         |



▼ Shown: GF-871P, GP-10S



- GF-Series gauges are calibrated with dual scale reading for pressure and force
- Excellent readability; 4 inch diameter gauge face
- Fast, easy installation
- GF-Series gauges are glycerine filled
- Stainless steel gauge cases for corrosion resistance
- GP-Series gauges are calibrated with dual scale reading for psi and bar

▼ A GP-10S gauge is used on this press to check the hydraulic pressure required to bend flat steel bar.



## Visual References for System Pressure and Force



### Auto-Damper Valve

For automatic control of gauge fluctuations, the V-10 Auto-Damper Valve controls the movement of the gauge needle by restricting oil flow in and out of the gauge. No adjustments needed.



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### Snubber Valve

Infinitely adjustable for metering oil out of a gauge. The V-91 Snubber Valve is also suitable as a shut-off valve to protect the gauge during high cycle applications.

Page: 129

| Used With   |                            |
|---|----------------------------|
|  | All Cylinders              |
|   | All Cylinders              |
|   | All 5 ton RC Cylinders     |
|   | All 10 ton RC Cylinders    |
|   | All 25 ton RC Cylinders    |
|   | RC and RR 50 ton Cylinders |
|   | 12 ton RCH-Series          |
|   | RCH/RRH-20, 30 and 60 ton  |
| RCS-201, 302  |                            |
| RCS-502, 1002   |                            |
|  | 25 ton Presses             |
|   | 50 ton Presses             |
|   | 25-50 ton Presses          |
|   | 100 ton Presses            |
|   | 150-200 ton Presses        |

# Hydraulic Force and Pressure Gauges



## Maximum Indicator Pointer

Indicator retains peak readings of pressure or force generated by the system.

Order model number: **H-4000G**.

Can easily be installed on GP-Series dry gauges.



## Load Gauges

To measure external load supported by a cylinder or jack. For pressing parts together under pre-determined loads, weighing, testing, etc.

## Pressure Gauges

To measure the input pressure into cylinders, jacks or high pressure systems. Also for all testing applications.

**GP-Series** gauges are dry gauges.

**GF-Series** gauges are glycerine filled.

## GF GP Series



Pressure Range:

**0-15,000 psi**

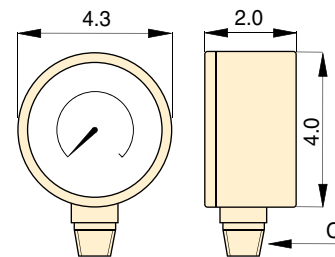
Face Diameter:




**4 inch**

Accuracy, % of full scale:

**± 1%**

## All Models



| Gauge Type and Calibration  |        |   |           |                | Units per Division        | Model Number*  | Thread C<br>(in) | Gauge Adaptor   |      |   |
|---|--------|---|-----------|----------------|---------------------------|----------------|------------------|---|------|---|
|  |        |  |           |                |                           |                |                  |  |      |   |
| psi   | bar    | psi   | lbs       | tons           |                           |                | Required         |   |      |   |
|   |        |   |           |                |                           |                | GA-1             | GA-2  | GA-3 |   |
| 0-10,000  | 0-700  | -   | -         | -              | 100 psi, 10 bar           | <b>GP-10S</b>  | 1/2 NPTF         | ●   | ●    |   |
| 0-15,000  | 0-1000 | -   | -         | -              | 200 psi, 10 bar           | <b>GP-15S</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-10,000  | 0-5            | 100 psi, 100 lbs, .1 ton  | <b>GF-5P</b>   | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-22,200  | 0-11           | 100 psi, 200 lbs, .2 ton  | <b>GF-10P</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-51,500  | 0-25.5         | 100 psi, 500 lbs, .5 ton  | <b>GF-20P</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-110,000 | 0-55           | 100 psi, 1000 lbs, 1 ton  | <b>GF-50P</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-27,000  | 0-13.5         | 100 psi, 200 lbs, .25 ton | <b>GF-120P</b> | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | -         | 0-23.5/36/65   | 100 psi, .5/.5/1 ton      | <b>GF-813P</b> | 1/4 NPTF         |   |      | ● |
| -   | -      | 0-10,000  | -         | 0-22/32        | 100 psi, .5/.5 ton        | <b>GF-230P</b> | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | -         | 0-50/100       | 100 psi, 1/1 ton          | <b>GF-510P</b> | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-51,500  | 0-25.5         | 100 psi, 500 lbs, .5 ton  | <b>GF-20P</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | 0-11,000  | 0-55           | 100 psi, 1000 lbs, 1 ton  | <b>GF-50P</b>  | 1/2 NPTF         | ●   | ●    |   |
| -   | -      | 0-10,000  | -         | 0-25.5/32.5/55 | 100 psi, .5/.5/.5 ton     | <b>GF-835P</b> | 1/4 NPTF         |   |      | ● |
| -   | -      | 0-10,000  | -         | 0-79/103       | 100 psi, 1/1 ton          | <b>GF-871P</b> | 1/4 NPTF         |   |      | ● |
| -   | -      | 0-10,000  | -         | 0-150/200      | 100 psi, 5/5 ton          | <b>GF-200P</b> | 1/4 NPTF         |   |      | ● |

\* Metric scale Force Gauges are available by changing the "P" suffix to "B".

▼ Shown: H-4049L, G-2534R, G-4089L, G-2535L, G-4040L



## Visual References for System Pressure



### Gauge Adaptor

For easy gauge installation into almost any system, Enerpac offers a complete line of gauge adaptors.

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### Snubber Valve

Infinitely adjustable for metering oil out of a gauge. The V-91 Snubber Valve is also suitable as a shut-off valve to protect the gauge during high-cycle applications.

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### Glycerine Filled (G-Series)

- Calibrated in dual scale reading in psi and bar
- All pressure sensing parts sealed and dampened by glycerine for long life
- Includes safety blow-out disk and pressure equalizing membrane
- Gauge snubbers or needle valves recommended for high cycle applications

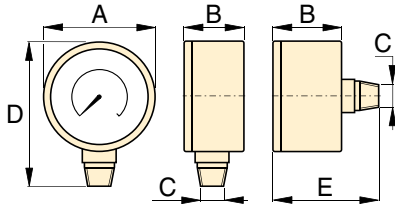
### High Cycle (H-Series)

- Calibrated in dual scale reading in psi and bar
- Ideal for use in many applications, specifically for high cycle and harsh environments
- Gauge snubbers or needle valves recommended to shut off gauge when not in use



◀ When lifting or pressing, always use a gauge. A gauge is your "window" to the system—it lets you see what's going on.

# Hydraulic Pressure Gauges



| Dimensions (in) |             |      |      |         |      |      |
|-----------------|-------------|------|------|---------|------|------|
| Face Diam.      | Connection  | A    | B    | C       | D    | E    |
| 2.5             | Lower Mount | 2.50 | 1.46 | ¼" NPTF | 3.31 | –    |
| 2.5             | Center Rear | 2.50 | 1.46 | ¼" NPTF | –    | 2.48 |
| 4.0             | Lower Mount | 4.0  | 1.15 | ¼" NPTF | 4.80 | –    |
| 4.0             | Lower Mount | 4.0  | 1.93 | ½" NPTF | 5.38 | –    |

Note: dimensions for reference only.

## G H Series



Pressure Range:

**0-15,000 psi**

Face Diameter:

**2.5-4 inches**

Accuracy, % of full scale:

**±1% and 1½%**



### Maximum Indicating Pointer

Indicator retains peak readings of pressure or force generated by the system.

Order model number: **H-4000G**.

Note: For use on H-Series gauges only.

## ▼ SELECTION CHART

| Gauge Series | Pressure Range |        | Model Number                   |                                |                              |                              | Major Graduation |      | Minor Graduation |      | Major Graduation |      | Minor Graduation |      |
|--------------|----------------|--------|--------------------------------|--------------------------------|------------------------------|------------------------------|------------------|------|------------------|------|------------------|------|------------------|------|
|              |                |        | Face ø 2.5" ¼ NPTF Lower Mount | Face ø 2.5" ¼ NPTF Center Rear | Face ø 4" ¼ NPTF Lower Mount | Face ø 4" ½ NPTF Lower Mount |                  |      |                  |      |                  |      |                  |      |
|              |                |        | Accuracy ±1½%                  | Accuracy ±1½%                  | Accuracy ±1%                 | Accuracy ±1%                 | (psi)            |      |                  |      | (bar)            |      |                  |      |
|              | (psi)          | (bar)  |                                |                                |                              |                              | (2.5")           | (4") | (2.5")           | (4") | (2.5")           | (4") | (2.5")           | (4") |
| G-Series     | 0-100          | 0-7    | G2509L                         | –                              | –                            | –                            | 10               | –    | 2                | –    | 1                | –    | 0,01             | –    |
|              | 0-160          | 0-11   | G2510L                         | –                              | –                            | –                            | 10               | –    | 2                | –    | 1                | –    | 0,02             | –    |
|              | 0-200          | 0-14   | G2511L                         | –                              | –                            | –                            | 50               | –    | 5                | –    | 1                | –    | 0,02             | –    |
|              | 0-300          | 0-20   | G2512L                         | –                              | –                            | –                            | 50               | –    | 5                | –    | 5                | –    | 0,50             | –    |
|              | 0-600          | 0-40   | G2513L                         | –                              | –                            | –                            | 100              | –    | 10               | –    | 10               | –    | 1                | –    |
|              | 0-1,000        | 0-70   | G2514L                         | G2531R                         | –                            | –                            | 100              | –    | 20               | –    | 10               | –    | 1                | –    |
|              | 0-2,000        | 0-140  | G2515L                         | –                              | –                            | –                            | 500              | –    | 50               | –    | 10               | –    | 2                | –    |
|              | 0-3,000        | 0-200  | G2516L                         | –                              | –                            | –                            | 500              | –    | 50               | –    | 50               | –    | 5                | –    |
|              | 0-6,000        | 0-400  | G2517L                         | G2534R                         | –                            | –                            | 1000             | –    | 100              | –    | 100              | –    | 10               | –    |
|              | 0-10,000       | 0-700  | G2535L                         | G2537R                         | G4088L                       | G4039L                       | 2000             | 1000 | 200              | 100  | 100              | 100  | 10               | 10   |
| 0-15,000     | 0-1000         | G2536L | G2538R                         | G4089L                         | G4040L                       | 3000                         | 3000             | 200  | 200              | 100  | 100              | 20   | 20               |      |
| H-Series     | 0-10,000       | 0-700  | –                              | –                              | H4049L                       | H4071L                       | –                | 1000 | –                | 100  | –                | 100  | –                | 10   |

▼ Gauge shown: T-6003L



- Calibrated for dual scale reading in psi and bar
- All gauges have spring-loaded backs with rubber blow-out plugs to protect case assembly in case of over-pressurization
- 40,000 and 50,000 psi models include flange mounting
- 1/2" NPTF versions are made of high strength alloy steel
- .25" cone models are made of 316 stainless steel, with 403 stainless steel on 40,000 and 50,000 psi models
- Integral maximum indicator pointer standard on all gauges

## T Series

Pressure Range:

**0-50,000 psi**

Face Diameter:

**6.4 inches**

Accuracy, % of full scale:

**± 1/2% and ± 1 1/2%**



### Cone Mount Gauge Adaptor

Contains fittings to connect .25" cone fitting gauge to .38" cone system.

Kit includes **43-301** tee and **43-704** gauge adaptor.

Order model number: **83-011**.

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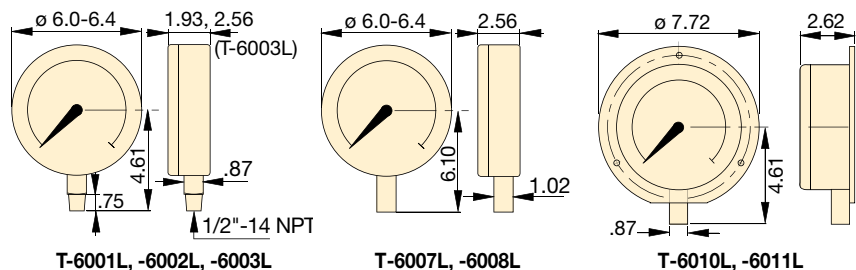
### Cone Mount Gauge Connector

For connecting gauges with .25" cone fitting directly to model number 11-100 or 11-400 pump. May be used with other .25" cone systems.

Order model number: **43-704**

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▼ An Enerpac P-2282 hand pump equipped with a T-6011L test system gauge is used for proof pressure testing of hydraulic valves.



| Pressure Range<br>(psi) | Pressure Range<br>(bar) | Model Number             |                              | Number Intervals<br>(psi) | Graduation Intervals<br>(psi) | Number Intervals<br>(bar) | Graduation Intervals<br>(bar) |
|-------------------------|-------------------------|--------------------------|------------------------------|---------------------------|-------------------------------|---------------------------|-------------------------------|
|                         |                         | Alloy Steel<br>1/2" NPTF | Stainless Steel<br>.25" Cone |                           |                               |                           |                               |
| 0-1,000*                | 0-70                    | <b>T-6001L</b>           | -                            | 100                       | 10                            | 10                        | 1                             |
| 0-5,000*                | 0-350                   | <b>T-6002L</b>           | -                            | 500                       | 50                            | 50                        | 5                             |
| 0-10,000*               | 0-700                   | <b>T-6003L</b>           | <b>T-6007L</b>               | 1,000                     | 100                           | 100                       | 10                            |
| 0-20,000*               | 0-1400                  | -                        | <b>T-6008L</b>               | 1,000                     | 100                           | 200                       | 20                            |
| 0-40,000**              | 0-2800                  | -                        | <b>T-6010L</b>               | 5,000                     | 200                           | 500                       | 20                            |
| 0-50,000**              | 0-3500                  | -                        | <b>T-6011L</b>               | 5,000                     | 500                           | 500                       | 50                            |

\* Accuracy: ± 1/2%

\*\* Accuracy: ± 1 1/2%

# Digital, Hydraulic Pressure Gauges

▼ Gauge shown: **DGR-2**



- Rated for system pressure up to 20,000 psi
- Displays in multiple units: psi, bar, mPA, kg/cm<sup>2</sup> (user selectable)
- Zero reset – ensures that gauge reads actual system pressure
- Batteries included, condition indicator on readout
- IP65 rated case design
- Shut off selectable – menu driven
- UL listed, CE and RoHS compliant

## DGR Series

Pressure Range:

**0-20,000 psi**

Voltage:

**3 VDC (battery)**

Accuracy, % of full scale:

**± 0.25%**



### Back-lit Readout

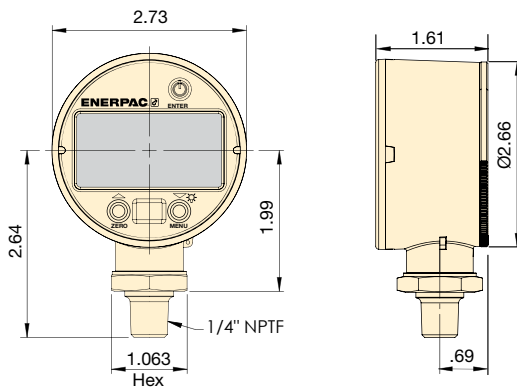
Back-lit readout allows easy reading in less than ideal lighting.



### Gauge Adaptor

For easy gauge installation into almost any system, Enerpac offers a complete line of gauge adaptors.

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▼ Greater accuracy and easier to read: enhance your ability to monitor and control hydraulic system pressure up to 20,000 psi.



| Pressure Rating (psi) |          | Model Number | Pressure Rating (bar) |          | Pressure Rating (MPa) |          | Pressure Rating (Kg/cm <sup>2</sup> ) |          | Weight (lbs) |
|-----------------------|----------|--------------|-----------------------|----------|-----------------------|----------|---------------------------------------|----------|--------------|
| Range                 | Interval |              | Range                 | Interval | Range                 | Interval | Range                                 | Interval |              |
| 0-20,000              | 1        | <b>DGR-2</b> | 0-1380                | 0.07     | 0-140                 | 0.01     | 0-1400                                | .07      | 0.5          |

▼ Shown left to right: GA-3, V-91, GA-1, GA-2, GA-4, NV-251, GA-918







## GA, NV, V Series

Operating Pressure:  
**10,000 psi**

▼ A gauge is easily installed into your hydraulic system using a gauge adaptor.

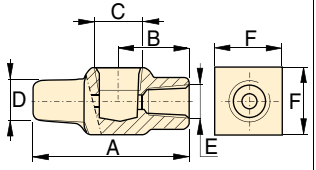


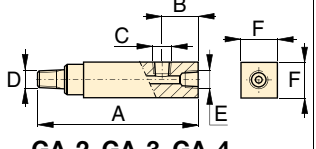
**Gauge Adaptors (GA-Series)**

- For easy mounting of a pressure gauge into your system
- Male end screws into pump or cylinder port, female end accepts hose or coupler, third port is for gauge connection
- GA-918 provides for swivel connection
- Simplifies gauge installation and reading


| Model Number | Gauge Port (NPTF) | Male End (NPTF) | Female End (NPTF) | Dimensions (in) |      |           |           |           |      |
|--------------|-------------------|-----------------|-------------------|-----------------|------|-----------|-----------|-----------|------|
|              |                   |                 |                   | A               | B    | C         | D         | E         | F    |
| GA-1         | 1/2" NPTF         | 3/8" NPTF       | 3/8"              | 2.81            | 1.24 | 1/2" NPTF | 3/8" NPTF | 3/8" NPTF | 1.25 |
| GA-2         | 1/2" NPTF         | 3/8" NPTF       |                   | 6.10            | 1.38 | 1/2" NPTF | 3/8" NPTF | 3/8" NPTF | 1.25 |
| GA-3         | 1/4" NPTF         | 3/8" NPTF       |                   | 5.25            | 1.38 | 1/4" NPTF | 3/8" NPTF | 3/8" NPTF | 1.25 |
| GA-4         | 1/2" NPTF         | 1/4" NPTF       |                   | 4.38            | 1.38 | 1/2" NPTF | 1/4" NPTF | 3/8" NPTF | 1.25 |



**GA-1**



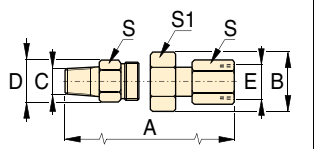
**GA-2, GA-3, GA-4**





**Swivel Adaptor (GA-918)**

- Simplifies gauge installation and reading

| Model Number | Dimensions (in) |      |           |      |           |      |      |
|--------------|-----------------|------|-----------|------|-----------|------|------|
|              | A               | B    | C         | D    | E         | S    | S1   |
| GA-918       | 4.62            | 1.72 | 1/2" NPTF | 1.30 | 1/2" NPTF | 1.13 | 1.50 |

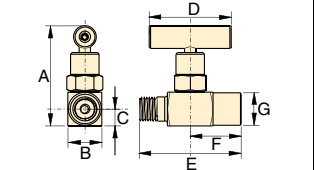


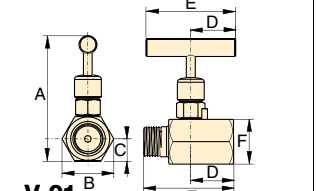
**Needle Valves (NV- and V-Series)**

- Both NV-251 and V-91 provide positive shut-off
- 316 stainless steel stem, 24 threads/in.

| Model Number | Orifice | Thread Size | Dimensions (in) |      |     |      |      |      |     |
|--------------|---------|-------------|-----------------|------|-----|------|------|------|-----|
|              |         |             | A               | B    | C   | D    | E    | F    | G   |
| NV-251       | .17     | 1/4" NPT    | 2.22            | .75  | .38 | 1.81 | 2.25 | 1.13 | .72 |
| V-91         | .19     | 1/2" NPT    | 3.50            | 1.44 | .63 | 1.25 | 2.50 | 1.25 | —   |



**NV-251**



**V-91**

By using only Enerpac Branded Oil and Couplers, you are protecting the integrity of your system with components that are designed to work with your Enerpac Rams, Cylinders, Pumps and Tools. Protect your investment and personnel, demand only Enerpac accessories.

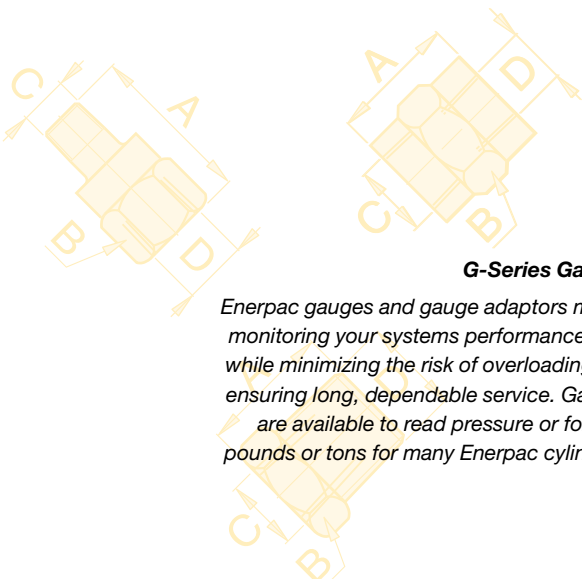
## **H-Series Hydraulic Hoses**

*Enerpac H-Series hydraulic hoses are designed to provide the best performance of your Enerpac products. Available in Thermoplastic or Rubber construction, a number of lengths and internal diameters, and with a number of end-configurations, there will be an Enerpac hose to perfectly match your exact application.*



## **C-Series Couplers**

*Enerpac C-Series Couplers provide easy hose and tool connectivity while providing correct performance and pressure ratings to operate most all Enerpac products.*



## **G-Series Gauges**

*Enerpac gauges and gauge adaptors makes monitoring your systems performance easy while minimizing the risk of overloading and ensuring long, dependable service. Gauges are available to read pressure or force in pounds or tons for many Enerpac cylinders.*





▼ Shown from left to right: V-152, V-66, V-82, V-161, V-42, V-17



## Your Hydraulic Control Solution

▼ The V-152 Pressure Relief Valve limits the pressure or force developed in the hydraulic system.



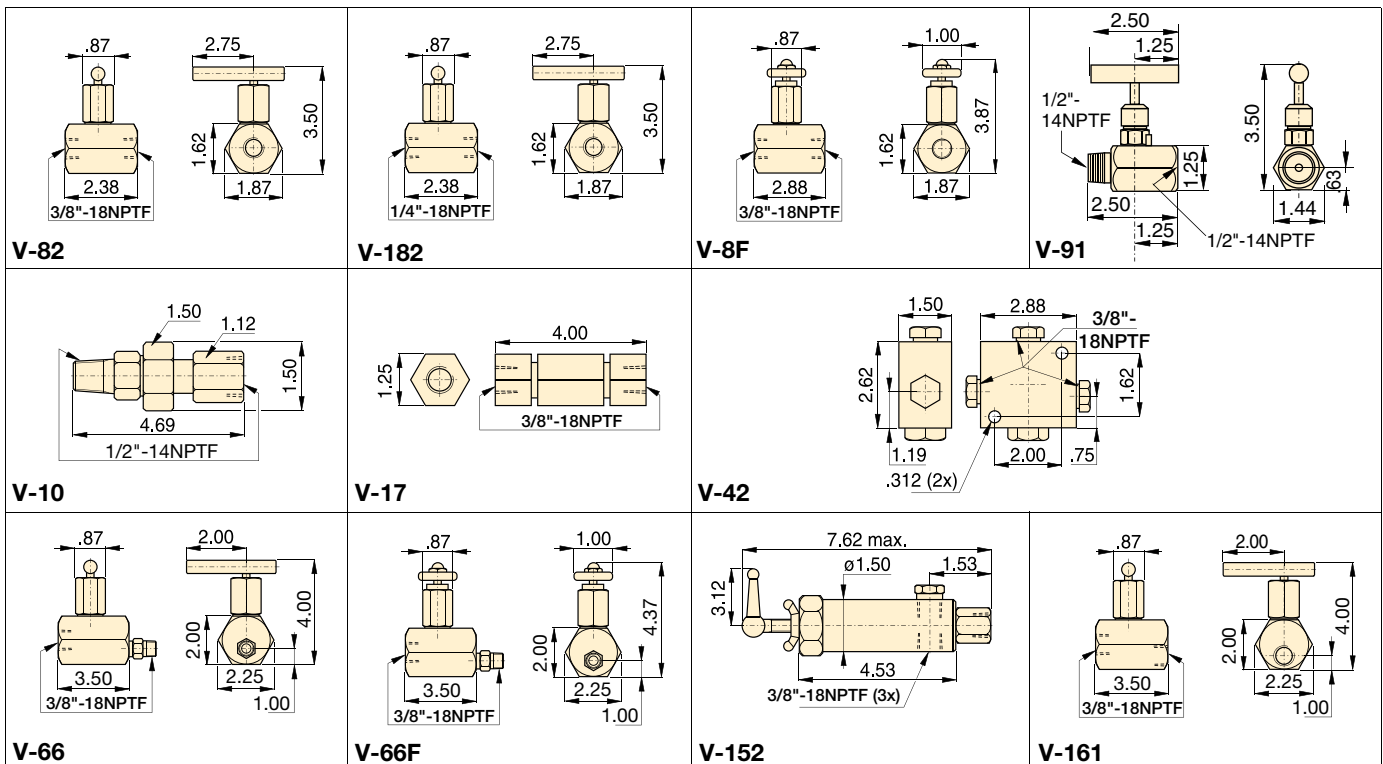
- All valves are rated for 10,000 psi operating pressure
- All valves feature NPTF porting to insure against leakage at rated pressure
- All valves are painted, coated, or plated for corrosion resistance



### Valve Applications

To see these valves used in typical hydraulic circuits, please see our "Yellow Pages".

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Valve Dimensions in inches.

# Flow and Pressure Control Valves



## Premounted Manifold

For two or four port manifold with integral flow control valves, see the manifold page of the System Components section.

System Components section.

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## Fittings


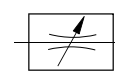

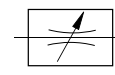

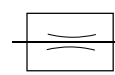

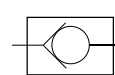

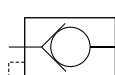

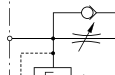

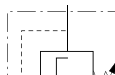

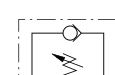
For additional fittings see the fitting page of the System Components section.

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## V Series



Maximum Operating Pressure:  
**10,000 psi**

| Valve Type and Model Number  | Description   | Hydraulic Symbol  |
|--|---|---|
| <b>Needle Valve</b><br><b>V-82</b><br><b>V-182F</b><br><b>V-8F</b>   |  <p><b>V-82:</b> To control cylinder speed. Can also be used as shut-off valve for temporary load holding. <math>\frac{3}{8}</math>" NPTF female ports.<br/> <b>V-182:</b> Same as V-82, but with <math>\frac{1}{4}</math>" NPTF female ports. Also suitable for gauge snubbing.<br/> <b>V-8F:</b> Similar to V-82, but with very fine metering for precise flow control.<br/> <b>Not recommended as shut-off valve.</b></p>           |    |
| <b>Snubber Valve</b><br><b>V-91</b>                                  |  <p><b>V-91:</b> Adjustable for metering oil out of a gauge to prevent snapping of gauge pointer when load or pressure is suddenly released. Also suitable as shut-off valve to protect the gauge during high cycling applications. <math>\frac{1}{2}</math>" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.</p>   |    |
| <b>Auto Damper® Valve</b><br><b>V-10</b>                             |  <p><b>V-10:</b> To be used when gauge pressure must be monitored during high cycle applications. Creates a flow resistance when load is released suddenly. No adjustments are necessary. <math>\frac{1}{2}</math>" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.</p>  |   |
| <b>Check Valve</b><br><b>V-17</b>                                    |  <p><b>V-17:</b> Ruggedly built to resist shock and operate with low pressure drop. Closes smoothly without pounding. <math>\frac{3}{8}</math>" NPTF female ports.</p>   |  |
| <b>Pilot Operated Check Valve</b><br><b>V-42</b>                     |  <p><b>V-42:</b> Can be mounted at the cylinder to hold the load in case of system pressure loss. Normally used with double-acting cylinders where pilot port receives pressure from a Tee-fitting in the cylinder retract line. <math>\frac{3}{8}</math>" NPTF female ports. Pilot pressure ratio 14% (6.5:1).</p>  |  |
| <b>Manually Operated Check Valve</b><br><b>V-66*</b><br><b>V-66F</b> |  <p><b>V-66:</b> Used for load holding applications with single and double acting cylinders. Valve is manually opened to allow oil to flow back to tank when cylinder retracts.<br/> <b>V-66F:</b> Similar to V-66, but with very fine metering capability for precise flow control. Not designed for load holding applications.</p>   |  |
| <b>Pressure Relief Valve</b><br><b>V-152*</b>                        |  <p><b>V-152:</b> Limits pressure developed by the pump in hydraulic circuit, thus limiting the force created by other components. Valve opens whenever preset pressure is reached. To increase pressure setting, turn handle clockwise. Includes:<br/> <ul style="list-style-type: none"> <li>• 3 ft return line hose kit</li> <li>• <math>\pm 3\%</math> repeatability</li> <li>• 800-10,000 psi adjustment range.</li> </ul> </p> |  |
| <b>Sequence Valve</b><br><b>V-161</b>                                |  <p><b>V-161:</b> To control oil flow to a secondary circuit. Flow is blocked until system pressure rises to the V-161 setting. When this pressure level is reached, the V-161 opens to allow flow to the secondary circuit. A pressure differential is always maintained between the primary and secondary circuit.<br/> <b>Min. operating pressure: 2000 psi.</b></p>  |  |

\* See page 52-53 for more information on extreme pressure and flow control valves.

**E**NERPAC Hydraulic Presses are available in a wide variety of standard capacities and configurations, or you can “build your own” with the easy-to-use matrix.

The press frames are a welded construction for maximum strength and durability, and when combined with the power of high pressure hydraulics, will provide years of safe and dependable service in your workshop.

Enerpac press capacities range from 10-ton to 200-ton and are available in Bench, C-Frame, Arbor, H-Frame and Roll-Frame models.



**These Press features increase productivity and broaden the range of applications:**

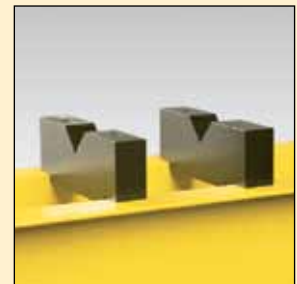
Standard on many Enerpac IP Presses, the exclusive Hydra-Lift™ offers effortless adjustment to the press daylight by use of a hydraulic lift.












Easy horizontal cylinder position is achieved with the unique “roller-head” cylinder mounting block, standard on most Enerpac IP Presses.

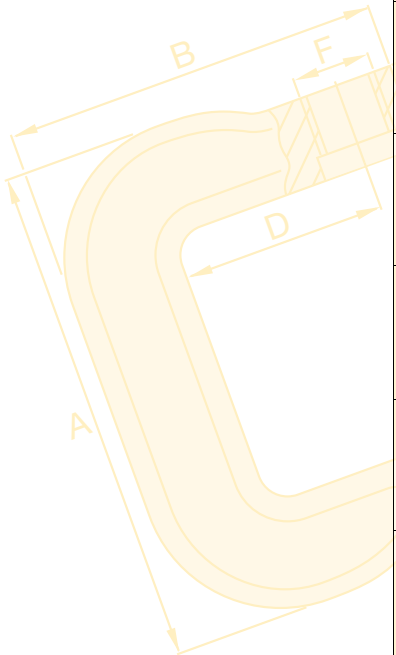


Optional “V-blocks” for positioning of complex parts are designed with high-strength steel for long life.



# Press Section Overview

| Capacity (tons) | Press Type and Functions               | Series   |   | Page  |
|-----------------|--|----------|---|-------|
| 10-200          | H-Frame Presses                        | IP       |    | 132 ▶ |
| 50-200          | Roll Frame Presses                     | IPR      |    | 136 ▶ |
| 5-20            | C-Clamp Presses                        | A        |    | 138 ▶ |
| 10-30           | Arbor Presses                          | A        |    | 138 ▶ |
| 10              | Bench Frame Press                      | A<br>IP  |    | 138 ▶ |
| 10-200          | Press Accessories<br>Press Speed Chart |          |    | 140 ▶ |
| 10-200          | Custom Built Presses                   | IP       |   | 141 ▶ |
| 5<br>1-100      | Tension Meter<br>Load Cells            | TM<br>LH |  | 142 ▶ |
|                 | Press Application Ideas                |          |  | 143 ▶ |



▼ Press shown: IPE-5060



- Quality welded frame for maximum strength and long life
- Exclusive “Hydra-Lift™” bed for effortless adjustment of the vertical daylight (10-ton models are manual)
- Roller head design is standard to allow movement and locking of the cylinder from side to side (10-ton, 25-ton and 30-ton are manual)
- All models in the Quick Selection Chart have been matched to a pump, cylinder, hoses and gauge, offering the complete package



◀ An Enerpac H-Frame press quickly removes the shaft from this assembly.

## Setting the Industry Standard



### Cylinder Mounting Block

Allows cylinder mounting into a press frame, while also allowing side to side adjustment of cylinder position.

Page: 140



### Hydra-Lift™

Allows easy, effortless daylight adjustment. Standard on most H-Frame presses.

Page: 140



### Pump Mounting Bracket

Heavy-duty steel brackets allow mounting of one of the Enerpac Power Sources to power your press.

Page: 140



### Gauge Included

All standard press models include a gauge and gauge adaptor, matching the press capacity.

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### V-Blocks

These optional V-Blocks are designed for easy fixturing of round stock and other non-uniform materials. Featuring precise fit into the press bolster.

Page: 140



### Ordering Variations

Any variations to a listed part number must be ordered as two separate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 141 and the electric pump from the modular matrix on page 87 (electric) or page 93 (air).

Any questions should be directed to our Technical Service Department.

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### Cylinder Types



= Single-acting, Spring Return



= Double-acting, Hydraulic Return

## IP Series



Capacity:

**10-200 tons**

Maximum Daylight and Width:

**54.50 & 48.00 inches**

Maximum Operating Pressure:

**10,000 psi**

### ▼ QUICK SELECTION CHART

For more technical information see next page.

| Press Capacity<br>(tons) | Maximum Vertical Daylight<br>(in) | Maximum Bed Width<br>(in) | Power Source |       |     |       |       | Press Model Number | Cylinder       |               |          | Speed<br>(sec/in)* |  |
|--------------------------|-----------------------------------|---------------------------|--------------|-------|-----|-------|-------|--------------------|----------------|---------------|----------|--------------------|--|
|                          |                                   |                           | Type         |       |     | Valve |       |                    | Stroke<br>(in) | Rapid Advance | Pressing |                    |  |
|                          |                                   |                           | Man.         | Elec. | Air | Man.  | Elec. |                    |                |               |          |                    |  |
| 10                       | 40.00                             | 18.63                     |              | ●     |     | ●     |       | ●                  |                | 10            | 0.90     | 6.70               |  |
|                          | 40.00                             | 18.63                     |              |       | ●   | ●     |       | ●                  |                | 10            | 2.20     | 13.40              |  |
|                          | 40.00                             | 18.63                     | ●            |       |     | ●     |       | ●                  |                | 10            | {4}      | {15}               |  |
|                          | 40.00                             | 18.63                     | ●            |       |     | ●     |       |                    | ●              | 10            | {2}      | {15}               |  |
|                          | 40.00                             | 18.63                     |              |       | ●   | ●     |       |                    | ●              | 10            | 2.20     | 13.40              |  |
| 25                       | 54.50                             | 29.00                     |              | ●     |     | ●     |       | ●                  |                | 6             | 1.50     | 15.40              |  |
|                          | 54.50                             | 29.00                     |              | ●     |     |       | ●     | ●                  |                | 14            | .70      | 7.70               |  |
|                          | 54.50                             | 29.00                     |              |       | ●   | ●     |       | ●                  |                | 14            | 5.20     | 30.90              |  |
|                          | 54.50                             | 29.00                     | ●            |       |     | ●     |       | ●                  |                | 14            | {5}      | {34}               |  |
| 30                       | 54.50                             | 29.00                     |              |       | ●   | ●     |       |                    | ●              | 14            | .60      | 43.00              |  |
|                          | 54.50                             | 29.00                     |              | ●     |     |       | ●     |                    | ●              | 14            | .90      | 9.80               |  |
|                          | 54.50                             | 29.00                     | ●            |       |     | ●     |       |                    | ●              | 14            | {7}      | {34}               |  |
| 50                       | 48.56                             | 28.75                     |              | ●     |     |       | ●     | ●                  |                | 13            | 1.02     | 11.04              |  |
|                          | 48.56                             | 28.75                     |              |       | ●   | ●     |       | ●                  |                | 6             | 1.00     | 74.00              |  |
|                          | 48.56                             | 28.75                     | ●            |       |     | ●     |       | ●                  |                | 6             | {2}      | {38}               |  |
|                          | 48.56                             | 28.75                     | ●            |       |     | ●     |       | ●                  |                | 6             | {11}     | {73}               |  |
|                          | 48.56                             | 28.75                     |              | ●     |     | ●     |       | ●                  |                | 6             | 2.90     | 28.90              |  |
|                          | 48.56                             | 28.75                     |              |       | ●   | ●     |       |                    | ●              | 13            | 1.00     | 22.20              |  |
|                          | 48.56                             | 28.75                     |              | ●     |     |       | ●     |                    | ●              | 13            | 1.00     | 11.00              |  |
|                          | 48.56                             | 28.75                     | ●            |       |     | ●     |       |                    | ●              | 13            | {2}      | {38}               |  |
| 100                      | 42.50                             | 35.00                     |              |       | ●   | ●     |       | ●                  |                | 10            | 1.90     | 41.20              |  |
|                          | 42.50                             | 35.00                     |              | ●     |     |       | ●     | ●                  |                | 10            | 1.90     | 20.60              |  |
|                          | 42.50                             | 35.00                     | ●            |       |     | ●     |       | ●                  |                | 10            | {3}      | {70}               |  |
|                          | 42.50                             | 35.00                     |              | ●     |     |       | ●     |                    | ●              | 13            | 1.90     | 20.60              |  |
|                          | 42.50                             | 35.00                     | ●            |       |     | ●     |       |                    | ●              | 6             | {3}      | {70}               |  |
| 150                      | 48.50                             | 48.00                     |              | ●     |     |       | ●     | ●                  |                | 13            | 2.20     | 15.40              |  |
| 200                      | 48.50                             | 48.00                     |              | ●     |     |       | ●     | ●                  |                | 13            | 3.10     | 22.10              |  |

\* {--} Speed in strokes per inch plunger travel

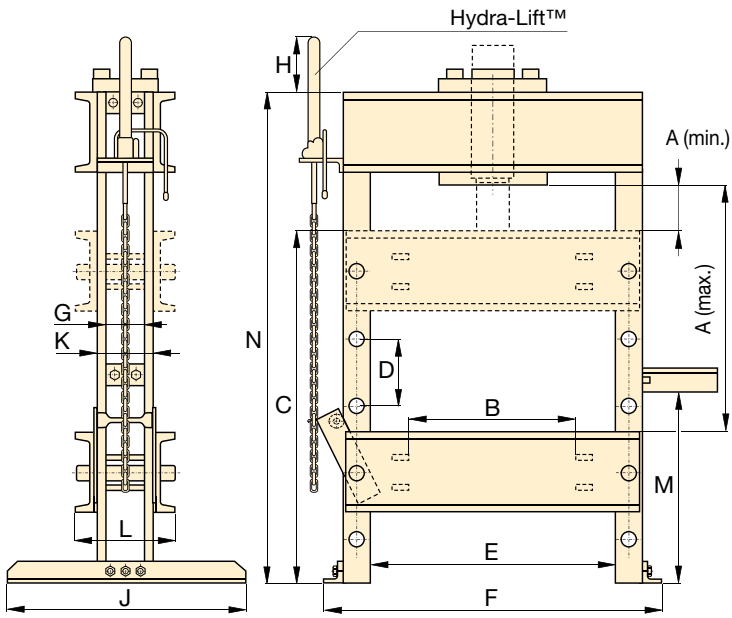
The moveable  
“cylinder mounting  
block” allows the  
user to quickly  
adapt the press  
to a specific job.▶



◀ For full features see page 132.

| Press Capacity (tons) | Press Model Number | Pump Model Number | Page: | Cylinder Model Number | Page: | H-Frame Press Dimensions (in) |         |       |       |       |       |
|-----------------------|--------------------|-------------------|-------|-----------------------|-------|-------------------------------|---------|-------|-------|-------|-------|
|                       |                    |                   |       |                       |       | A (max)                       | A (min) | B     | C     | D     | E     |
| 10                    | IPE-1215           | PEM-1201B         | 73    | RC-1010               | 6     | 40.00                         | 2.44    | –     | 46.75 | 5.00  | 18.63 |
|                       | IPA-1220           | XA-11             | 94    | RC-1010               | 6     | 40.00                         | 2.44    | –     | 46.75 | 5.00  | 18.63 |
|                       | IPH-1240           | P-392             | 58    | RC-1010               | 6     | 40.00                         | 2.44    | –     | 46.75 | 5.00  | 18.63 |
|                       | IPH-1234           | P-84              | 60    | RR-1010               | 32    | 40.00                         | 2.44    | –     | 46.75 | 5.00  | 18.63 |
|                       | IPA-1244           | XA-11V            | 94    | RR-1010               | 32    | 40.00                         | 2.44    | –     | 46.75 | 5.00  | 18.63 |
| 25                    | IPE-2505           | PUJ-1200B         | 70    | RC-256                | 6     | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
|                       | IPE-2510           | ZE3310SB-N        | 84    | RC-2514               | 6     | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
|                       | IPA-2520           | XA-12             | 94    | RC-2514               | 6     | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
|                       | IPH-2531           | P-80              | 60    | RC-2514               | 6     | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
| 30                    | IPA-3071           | PAM-1042          | 99    | RR-3014               | 32    | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
|                       | IPE-3060           | ZE3410SB-N        | 85    | RR-3014               | 32    | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
|                       | IPH-3080           | P-84              | 60    | RR-3014               | 32    | 54.50                         | 7.00    | –     | 57.00 | 11.88 | 29.00 |
| 50                    | IPE-5010           | ZE4320SB-N        | 85    | RC-5013               | 6     | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPA-5021           | PAM-1022          | 99    | RC-506                | 6     | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPH-5030           | P-462             | 60    | RC-506                | 6     | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPH-5031           | P-80              | 60    | RC-506                | 6     | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPE-5005           | PUJ-1200B         | 70    | RC-506                | 6     | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPA-5073           | ZA4208MX          | 92    | RR-5013               | 32    | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPE-5060           | ZE4420SB-N        | 85    | RR-5013               | 32    | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
|                       | IPH-5080           | P-464             | 60    | RR-5013               | 32    | 48.56                         | 7.06    | 18.76 | 54.00 | 10.38 | 28.75 |
| 100                   | IPA-10023          | ZA4208MX          | 92    | RC-10010              | 6     | 42.50                         | 7.00    | 20.00 | 51.00 | 11.69 | 35.00 |
|                       | IPE-10010          | ZE4320SB-N        | 85    | RC-10010              | 6     | 42.50                         | 7.00    | 20.00 | 51.00 | 11.69 | 35.00 |
|                       | IPH-10030          | P-462             | 60    | RC-10010              | 6     | 42.50                         | 7.00    | 20.00 | 51.00 | 11.69 | 35.00 |
|                       | IPE-10060          | ZE4420SB-N        | 85    | RR-10013              | 32    | 42.50                         | 7.00    | 20.00 | 51.00 | 11.69 | 35.00 |
|                       | IPH-10080          | P-464             | 60    | RR-1006               | 32    | 42.50                         | 7.00    | 20.00 | 51.00 | 11.69 | 35.00 |
| 150                   | IPE-15065          | ZE5420SG-N        | 85    | RR-15013              | 32    | 48.50                         | 12.50   | 28.00 | 54.50 | 10.00 | 48.00 |
| 200                   | IPE-20065          | ZE5420SG-N        | 85    | RR-20013              | 32    | 48.50                         | 12.50   | 28.00 | 54.50 | 10.00 | 48.00 |

# H-Frame Presses



## IP Series



Capacity:  
**10-200 tons**

Maximum Daylight and Width:  
**54.50 & 48.00 inches**

Maximum Operating Pressure:  
**10,000 psi**



### H-Frame Press Gauges

All standard press models include a gauge and gauge adaptor, matching the press capacity:

| H-Frame Press Dimensions (in) |      |       |       |       |       |       |       | Weight<br>(lbs) | Press Model Number |
|-------------------------------|------|-------|-------|-------|-------|-------|-------|-----------------|--------------------|
| F                             | G    | H     | J     | K     | L     | M     | N     |                 |                    |
| 24.88                         | -    | -     | 29.75 | 4.25  | 7.44  | 35.00 | 52.00 | 298             | IPE-1215           |
| 24.88                         | -    | -     | 29.75 | 4.25  | 7.44  | 35.00 | 52.00 | 160             | IPA-1220           |
| 24.88                         | -    | -     | 29.75 | 4.25  | 7.44  | 35.00 | 52.00 | 158             | IPH-1240           |
| 24.88                         | -    | -     | 29.75 | 4.25  | 7.44  | 35.00 | 52.00 | 189             | IPH-1234           |
| 24.88                         | -    | -     | 29.75 | 4.25  | 7.44  | 35.00 | 52.00 | 163             | IPA-1244           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 605             | IPE-2505           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 697             | IPE-2510           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 610             | IPA-2520           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 620             | IPH-2531           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 684             | IPA-3071           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 722             | IPE-3060           |
| 40.50                         | 4.00 | 13.25 | 30.00 | 5.25  | 10.69 | 26.50 | 76.00 | 664             | IPH-3080           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 1,040           | IPE-5010           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 968             | IPA-5021           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 968             | IPH-5030           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 926             | IPH-5031           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 930             | IPE-5005           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 1,057           | IPA-5073           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 1,051           | IPE-5060           |
| 42.75                         | 5.00 | 8.75  | 36.00 | 7.25  | 14.38 | 30.75 | 76.00 | 1,003           | IPH-5080           |
| 51.00                         | 6.75 | 8.75  | 36.00 | 8.75  | 17.25 | 33.13 | 76.00 | 1,650           | IPA-10023          |
| 51.00                         | 6.75 | 8.75  | 36.00 | 8.75  | 17.25 | 33.13 | 76.00 | 1,722           | IPE-10010          |
| 51.00                         | 6.75 | 8.75  | 36.00 | 8.75  | 17.25 | 33.13 | 76.00 | 1,656           | IPH-10030          |
| 51.00                         | 6.75 | 8.75  | 36.00 | 8.75  | 17.25 | 33.13 | 76.00 | 1,743           | IPE-10060          |
| 51.00                         | 6.75 | 8.75  | 36.00 | 8.75  | 17.25 | 33.13 | 76.00 | 1,665           | IPH-10080          |
| 67.17                         | 9.12 | 3.09  | 44.00 | 13.12 | 21.85 | 47.75 | 90.00 | 3,906           | IPE-15065          |
| 67.17                         | 9.12 | 3.09  | 44.00 | 13.12 | 21.85 | 47.75 | 90.00 | 3,906           | IPE-20065          |

| Press Capacity<br>(tons) | Gauge Model Number | Adaptor Model Number |
|--------------------------|--------------------|----------------------|
| 10                       | GF-10P             | GA-2                 |
| 25                       | GF-20P             | GA-2                 |
| 30                       | GF-835P            | GA-3                 |
| 50                       | GF-50P             | GA-2                 |
| 100                      | GF-871P            | GA-3                 |
| 150                      | GF-200P            | GA-3                 |
| 200                      | GF-200P            | GA-3                 |

For more information on gauges, please refer to the System Components section.

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### Ordering Variations

Any variations to a listed part number must be ordered as two separate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 141 and the electric pump from the modular matrix on page 87 (electric) or page 93 (air).

Any questions should be directed to our Technical Service Department.

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▼ Shown: IPR-10075



- Quality welded frame for maximum strength and long life
- Frame rolls easily on four steel roller bearings
- Hydraulic clamp cylinders lock frame into position
- Exclusive “Hydra-Lift™” bolster for effortless adjustment of the vertical daylight
- Standard roller head design allows movement of the cylinder from side to side
- All models in the Quick Selection Chart have been matched to a pump, cylinder, hoses and gauge, offering the complete package
- Roll Frame design features a stationary bed with the ability to support heavy loads

## The One and Only



### Cylinder Mounting Block

Allows cylinder mounting into a press frame, while also allowing side to side adjustment of cylinder position.

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### Pump Mounting Bracket

Heavy duty steel brackets to allow conversion to one of the Enerpac Power Sources to power your press.

Page: 140



### Hydra-Lift™

Allows easy, effortless daylight adjustment.

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### Optional V-Blocks

These V-Blocks, 200 ton only, are designed for easy fixturing of round stock and other non-uniform materials. Featuring precise fit into the press bolster.

Page: 140

| Press Capacity<br>(tons) | Vertical Daylight A (in) |         | Horizontal Daylight E (in) | Pump Model Number | Press Model Number | Cylinder, Double-Acting Hydraulic Return |              |       |               | Speed (sec/in) |     |      |
|--------------------------|--------------------------|---------|----------------------------|-------------------|--------------------|--|--------------|-------|---------------|----------------|-----|------|
|                          | minimum                  | maximum |                            |                   |                    | Stroke (in)                              | Model Number | Page: | Rapid Advance | Pressing       |     |      |
| 50                       | 6.00                     | 37.12   | 28.75                      | ZE4420SB-N        | 85                 | IPR-5075                                 | ●            | 13.13 | RR-5013       | 33             | 1.0 | 11.1 |
| 100                      | 6.28                     | 41.28   | 35.00                      | ZE5420SG-N        | 85                 | IPR-10075                                | ●            | 13.13 | RR-10013      | 33             | 1.5 | 10.3 |
| 200                      | 11.00                    | 51.00   | 48.00                      | ZE5420SG-N        | 85                 | IPR-20075                                | ●            | 13.00 | RR-20013      | 33             | 3.1 | 22.1 |

# Roll Frame Presses

▼ An IPR-20075 Roll Frame Press is used to remove a large shaft from this pillow-block assembly. The Roll Frame design allows this heavy part to be safely loaded with an overhead crane.



## IPR Series



Capacity:  
**50-200 tons**

Maximum Daylight and Width:  
**51.00 & 48.00 inches**

Maximum Operating Pressure:  
**10,000 psi**

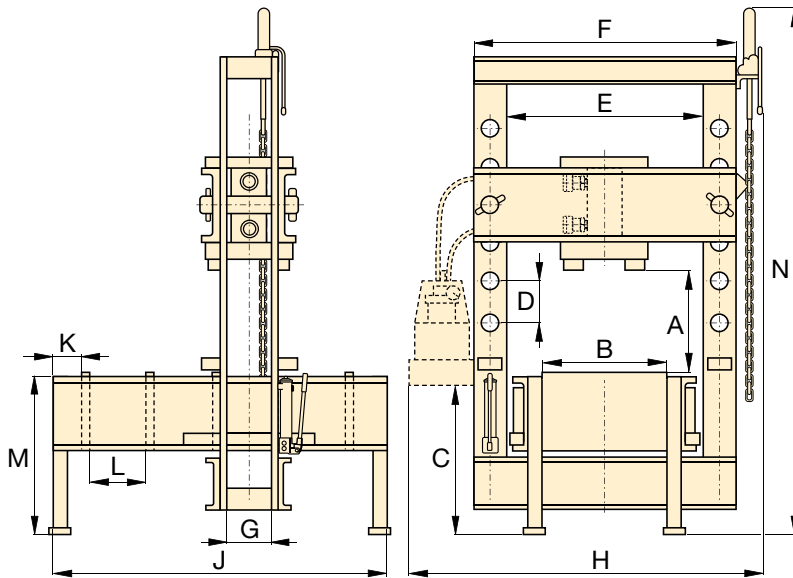


**Roll Frame Press Gauges**  
All standard press models include a gauge and gauge adaptor, matching the press capacity:

| Press Capacity<br>(tons) | Gauge Model Number | Adaptor Model Number |
|--------------------------|--------------------|----------------------|
| 50                       | GF-50P             | GA-2                 |
| 100                      | GF-871P            | GA-3                 |
| 200                      | GF-200P            | GA-3                 |

For more information on gauges, please refer to the System Components section.

Page: 113



### Ordering Variations

Any variations to a listed part number must be ordered as two separate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 141 and the electric pump from the modular matrix on page 87 (electric) or page 93 (air).

Any questions should be directed to our Technical Service Department.


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| Roll Frame Press Dimensions (in) |       |       |       |      |       |       |      |       |       |        |       | Weight<br>(lbs) | Press Model Number |
|----------------------------------|-------|-------|-------|------|-------|-------|------|-------|-------|--------|-------|-----------------|--------------------|
| B                                | C     | D     | F     | G    | H     | J     | K    | L     | M     | N      |       |                 |                    |
| 20.71                            | 38.25 | 10.38 | 36.75 | 5.00 | 55.92 | 64.00 | 8.00 | 10.63 | 30.00 | 112.96 | 1,961 | IPR-5075        |                    |
| 26.50                            | 38.00 | 8.75  | 45.00 | 5.75 | 63.19 | 66.00 | 8.00 | 10.63 | 32.00 | 118.94 | 3,849 | IPR-10075       |                    |
| 38.75                            | 36.75 | 10.00 | 64.00 | 9.12 | 84.63 | 86.50 | 8.00 | 15.00 | 36.00 | 125.96 | 7,869 | IPR-20075       |                    |


▼ Shown from left to right: A-220, A-330 and A-258



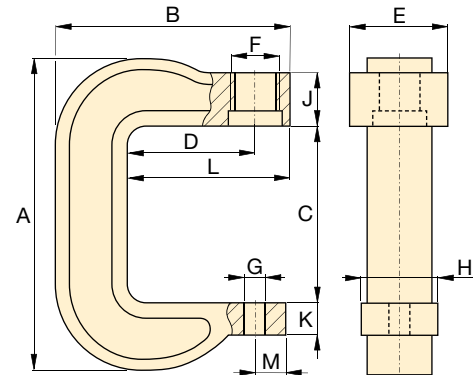
## The Standard In Workshop Tools



**Push Pin A-183**  
For applications requiring precision pressing, such as shaft removal and insertion. This attachment fits 10 ton cylinders and requires the use of a threaded adaptor saddle (A-13).



**Smooth Saddle A-185**  
For pressing applications of delicate parts, such as aluminum castings, this saddle decreases surface marks during the pressing application. Requires 10 ton cylinder and threaded adaptor saddle (A-13).



C-Clamp Press A-205, A-210, A-220

### C-Clamp Press

- 5, 10 and 20 ton capacity
- Operational in all positions

### Arbor Press

- Foot mounting holes for horizontal or vertical positioning
- Machined work surfaces for easier fixturing
- Slotted back to simplify loading and unloading of longer parts

### Bench Frame Press

- Cylinder mounting adaptor allows lateral positioning along rails
- Mounting holes for easy mounting to fixed surface



◀ A-310 Arbor Press used for compacting powder at 10 tons.

| Press Type | Press Capacity<br>(tons) | Maximum Vertical Daylight<br>(in) | Maximum Bed Width<br>(in) | Cylinder Series Number* | Press Model Number | Weight<br>(lbs) |
|------------|--------------------------|-----------------------------------|---------------------------|-------------------------|--------------------|-----------------|
| Arbor      | 10                       | 8.94                              | 5.31                      | RC-10-x                 | A-310*             | 62              |
|            | 30                       | 10.25                             | 7.00                      | RC-30-x                 | A-330*             | 220             |
| C-Clamp    | 5                        | 6.50                              | 2.00                      | RC-5-x                  | A-205*             | 14              |
|            | 10                       | 9.00                              | 3.25                      | RC-10-x                 | A-210*             | 37              |
|            | 20                       | 11.88                             | 3.75                      | **                      | A-220**            | 83              |
| Bench      | 10                       | 15.38                             | 15.00                     | -                       | A-258*             | 103             |
|            | 10                       | 15.38                             | 15.00                     | RC-1010                 | IPA-1022***        | 140             |
|            | 10                       | 15.38                             | 15.00                     | RC-1010                 | IPH-1040***        | 135             |

\* Requires RC cylinder listed, see page 7 for specifications.

\*\* Requires RC-25 ton cylinder, limited to 20 tons.

\*\*\* Complete set includes cylinder and pump.

# C-Clamp, Arbor and Bench Frame Presses

▼ A perfect example of the force and versatility of the Enerpac A-220 C-Clamp press.



## A IP Series



Capacity:

**5-30 ton**

Maximum Daylight and Width:

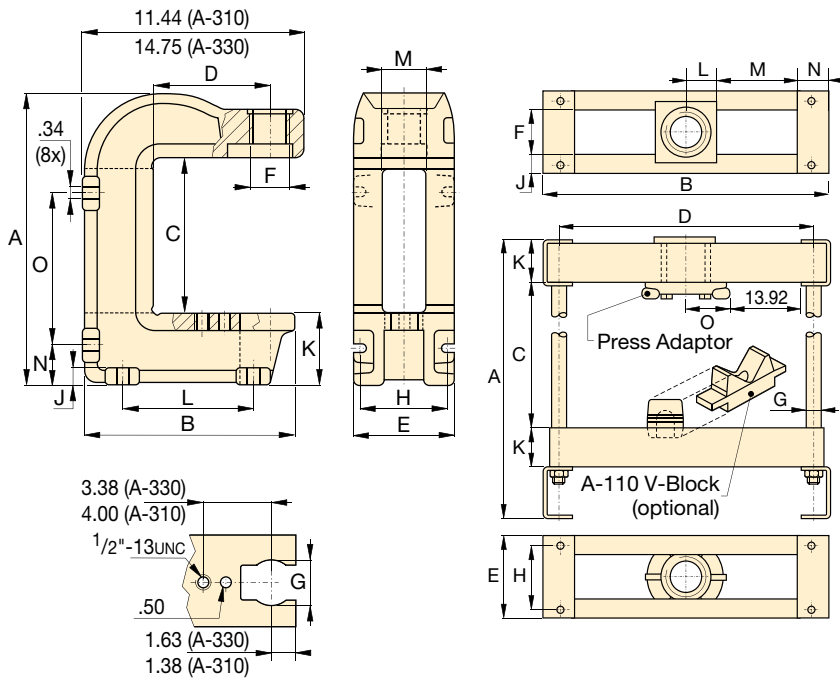
**15.38 and 15.00 inches**

Mounting Capabilities:

**Fixed or Portable**

Maximum Operating Pressure:

**10,000 psi**



Arbor Press A-310, A-330

Bench Press Frame A-258





For high-cycle production applications, C-Clamp and Arbor presses should be limited in their capacity.

Consult Enerpac Technical Services for specific application details.



Enerpac cylinders and power sources for C-Clamp and Arbor presses must be ordered separately.

| Press Dimensions (in) |       |       |       |      |                         |      |      |      |      |      |      |      |       |          | Press Model Number |
|-----------------------|-------|-------|-------|------|-------------------------|------|------|------|------|------|------|------|-------|----------|--------------------|
| A                     | B     | C     | D     | E    | F                       | G    | H    | J    | K    | L    | M    | N    | O     |          |                    |
| 16.31                 | 11.06 | 8.94  | 6.00  | 5.31 | 2 $\frac{1}{4}$ -14 UN  | 2.50 | 4.81 | .75  | 3.81 | 6.88 | 2.56 | 2.13 | 8.63  | A-310    |                    |
| 21.94                 | 13.88 | 10.25 | 6.00  | 7.00 | 3 $\frac{3}{16}$ -12 UN | 2.50 | 5.50 | 1.00 | 6.50 | 8.00 | 2.63 | 3.88 | 10.88 | A-330    |                    |
| 11.44                 | 8.00  | 6.50  | 3.75  | 2.88 | 1 $\frac{1}{2}$ -16 UN  | 1.02 | 2.00 | 2.50 | 1.06 | 4.75 | 1.00 | -    | -     | A-205    |                    |
| 16.00                 | 11.13 | 9.00  | 6.00  | 3.25 | 2 $\frac{1}{4}$ -14 UN  | 1.02 | 2.25 | 2.50 | 1.69 | 7.63 | 1.13 | -    | -     | A-210    |                    |
| 21.25                 | 13.63 | 11.88 | 6.00  | 4.76 | 3 $\frac{5}{16}$ -12 UN | 1.02 | 2.75 | 2.75 | 1.88 | 8.38 | 1.13 | -    | -     | A-220    |                    |
| 25.63                 | 18.75 | 16.50 | 16.00 | 5.75 | 3.25                    | 1.00 | 4.50 | 1.25 | 2.75 | 1.88 | 5.30 | 2.20 | 2.63  | A-258    |                    |
| 25.63                 | 18.75 | 16.50 | 16.00 | 5.75 | 3.25                    | 1.00 | 4.50 | 1.25 | 2.75 | 1.88 | 5.30 | 2.20 | 2.63  | IPA-1022 |                    |
| 25.63                 | 18.75 | 16.50 | 16.00 | 5.75 | 3.25                    | 1.00 | 4.50 | 1.25 | 2.75 | 1.88 | 5.30 | 2.20 | 2.63  | IPH-1040 |                    |

| Description                    | Frame Capacity  | Model Number   |   | Features  |
|--------------------------------|---|--|---|---|
| <b>Cylinder Mounting Block</b> | 10 ton Bench<br>10 ton H-Frame<br>25 and 30 ton H-Frame<br>50 ton H-Frame<br>100 ton H-Frame<br>200 ton H-Frame   | AD-175<br>IPK-1012<br>IPK-3012<br>PK-501<br>PK-1002<br>PK-2002 |   | <ul style="list-style-type: none"> <li>AD-175 converts the Bench press to use an RD-9 ton cylinder</li> <li>All mounting blocks allow horizontal movement of cylinder</li> </ul>            |
| <b>V- Blocks</b>               | 10 ton Bench Press<br>10 ton H-Frame<br>25 and 30 ton H-Frame<br>50 ton H-Frame<br>100 ton H-Frame<br>150 & 200 ton H-Frame<br>200 ton Roll Frame   | A-110<br>A-136<br>A-130<br>A-150<br>A-175<br>A-200<br>A-200R   |   | <ul style="list-style-type: none"> <li>Machined from high strength steel for long life</li> <li>A-110 includes one V-block</li> <li>All other model numbers include two V-blocks</li> </ul> |
| <b>Hydra-Lift™</b>             | 25-100 ton H-Frame<br>150-200 ton H-Frame<br>50 and 100 ton Roll Frame<br>200 ton Roll Frame  | IPL-100<br>IPL-101<br>IPLR-100<br>IPLR-200                     |   | <ul style="list-style-type: none"> <li>Allows easy, effortless daylight adjustments</li> <li>Includes accessory chain</li> </ul>  |
| <b>Pump Mounting Bracket</b>   | Hand operated and small Air Pumps; P-80, P-84, P-142, P-392, PA-133, , XA, Turbo II pumps<br><br>Electric, large Hand Pumps, and ZA4 Air Pumps; ZE Series, P-462, P-464, 10/90 Series Air Pumps | PMB-1<br><br>PMB-2   |  | <ul style="list-style-type: none"> <li>Both mounting brackets are pre-drilled to accept a number of different pump models</li> </ul>  |

## Cylinder Speed

This chart will help you calculate the time required for an Enerpac cylinder to extend when powered by a 10,000 psi Enerpac hydraulic pump. The Cylinder Speed Chart can also be used to determine the pump type and model best suited for an application when you know the plunger speed required.

### Cylinder and Pump Selection Chart

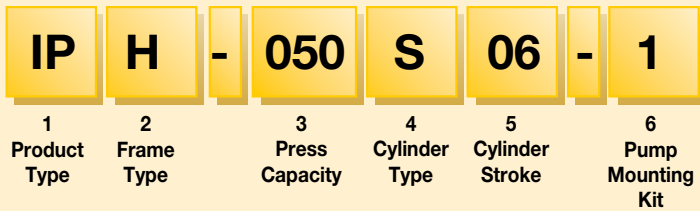
| Cylinder Capacity<br>(tons) | Cylinder Load | Hand Operated Pumps                |           |           |             | Electric Pumps                     |            |            |            |            | Air Pumps    |        |               |       |
|-----------------------------|---------------|------------------------------------|-----------|-----------|-------------|------------------------------------|------------|------------|------------|------------|--------------|--------|---------------|-------|
|                             |               | Strokes per inch of plunger travel |           |           |             | Seconds per inch of plunger travel |            |            |            |            | @100 psi air |        |               |       |
|                             |               | Single Speed<br>P-391              | Two-Speed |           |             | ½ HP Port.                         | ½ HP Subm. | ZE3 Series | ZE4 Series | ZE5 Series | XA           | PA-133 | PAM 10 Series | ZA4   |
|                             |               |                                    | P-392     | P-80 P-84 | P-462 P-464 |                                    |            |            |            |            |              |        |               |       |
| 10                          | No load       | 15                                 | 4         | 2         | 1           | .7                                 | .9         | .3         | .2         | .2         | 1.10         | 2.70   | .21           | .16   |
|                             | Load          | 15                                 | 15        | 15        | 8           | 6.7                                | 6.7        | 3.4        | 2.2        | 1.1        | 9.00         | 16.80  | 14.90         | 4.50  |
| 25                          | No load       | 34                                 | 8         | 5         | 1           | 1.5                                | 2.1        | .7         | .5         | .4         | 2.60         | 6.20   | .48           | .36   |
|                             | Load          | 34                                 | 34        | 34        | 18          | 15.5                               | 15.5       | 7.7        | 5.2        | 2.6        | 20.60        | 38.60  | 34.30         | 10.30 |
| 30                          | No load       | 43                                 | 10        | 7         | 1           | 1.9                                | 2.6        | .9         | .6         | .5         | 3.20         | 7.50   | .60           | .46   |
|                             | Load          | 43                                 | 43        | 43        | 23          | 19.5                               | 19.5       | 9.80       | 6.5        | 3.3        | 26.00        | 48.70  | 43.30         | 13.00 |
| 50                          | No load       | 73                                 | 16        | 11        | 2           | 3.3                                | 4.4        | 1.50       | 1.0        | .8         | 5.50         | 13.30  | 1.00          | .80   |
|                             | Load          | 73                                 | 73        | 73        | 38          | 33.2                               | 33.2       | 16.6       | 11.0       | 5.5        | 44.20        | 82.92  | 73.70         | 22.10 |
| 100                         | No load       | 137                                | 30        | 21        | 3           | 6.2                                | 8.3        | 2.8        | 1.9        | 1.5        | 10.30        | 24.80  | 1.90          | 1.50  |
|                             | Load          | 137                                | 137       | 137       | 71          | 61.9                               | 61.9       | 31.0       | 20.7       | 10.3       | 82.50        | 154.70 | 137.50        | 41.30 |

Note: Values are approximate. Cylinder speed may vary in actual application.

## CUSTOM BUILD YOUR OWN PRESS

If the press that would best fit your application cannot be found in the charts, you can easily build your custom press here. All presses must be ordered with cylinders. The pump is ordered separately.

▼ This is how a press model number is built up



### 1 Product Type

IP = Industrial Press

### 2 Frame Type

B = Bench<sup>2)</sup>  
H = H-Frame  
R = Roll Frame<sup>1)</sup>

### 3 Press Capacity

010 = 10 ton  
025 = 25 ton  
030 = 30 ton  
050 = 50 ton  
100 = 100 ton  
150 = 150 ton  
200 = 200 ton

### 4 Cylinder Type

S = Single-Acting (RC-Series)  
D = Double-Acting (RR-Series)

### 5 Cylinder Stroke (in)

- 10 ton S/A: **06, 08, 10, 12, 14**  
10 ton D/A: **10, 12**  
- 25 ton S/A: **06, 08, 10, 12, 14**  
- 30 ton S/A: **08**  
30 ton D/A: **08, 14**  
- 50 ton S/A: **06, 13**  
50 ton D/A: **06, 13, 20**  
- 100 ton S/A: **06, 10**  
100 ton D/A: **06, 13, 18**  
- 150 ton D/A: **06, 13, 32**  
- 200 ton D/A: **13, 18, 24**

### 6 Pump Mounting Kit<sup>3)</sup>

0 = No mounting kit  
1 = Hand operated and small air pumps: P-80, P-84, P-141, P-142, P-202, P-391, P-392, PA-133 and all Turbo II Air pumps  
2 = Electric, large hand operated and modular air pumps: PUJ-12, PEM-12, ZE3-6 Series P-462, P-464 PAM-10 and -90 Series

<sup>1)</sup> Roll Frame Press: 50-, 100- and 200-ton press capacity only. (Assembly required)

<sup>2)</sup> Bench Press: 10-ton press capacity S/A only. Convert A258 bench press to D/A using AD175 and RD910

<sup>3)</sup> Includes hoses for press, except for option 0.

### Ordering Example

#### Model number: IPH-050S06-2

IPH-050S06-2 is a 50-ton H-Frame press with a single-acting, 6 inch stroke cylinder (RC-506). It has a pump mounting kit (for an electric Pump or a Modular Air Pump).

See the cylinder and pump selection chart on previous page for selecting the proper pump.

## IP Series



Capacity:

**10-200 tons**

Maximum Daylight and Width:

**54.50 & 48.00 inches**

Maximum Operating Pressure:

**10,000 psi**



“No Load” indicates the plunger speed as it extends toward the load (1st stage).

“Load” indicates the plunger speed as the load is applied at a system pressure of 10,000 psi (2nd stage).

#### Formula $V = A \div Q$

$V$  (sec/in) =  $A$  (in<sup>2</sup>) ÷  $Q$  (in<sup>3</sup>/min)

$V$  = Cylinder plunger speed in seconds per inch

$A$  = Cylinder effective area in square inches (in<sup>2</sup>)

$Q$  = Pump oil flow in cubic inches (in<sup>3</sup>)

|                                 |   |  |   |                                       |   |                            |
|---------------------------------|---|--|---|---------------------------------------|---|----------------------------|
| Cylinder Plunger Speed (sec/in) | = | Cylinder Effective Area (in <sup>2</sup> ) | ÷ | Pump Flow Rate (in <sup>3</sup> /min) | x | $\frac{60 \text{ sec}}{1}$ |
|---------------------------------|---|--|---|---------------------------------------|---|----------------------------|

▼ Shown: LH-102 and TM-5 (in middle)



## TM, LH Series

Capacity:  
**2,000 to 200,000 lbs.**

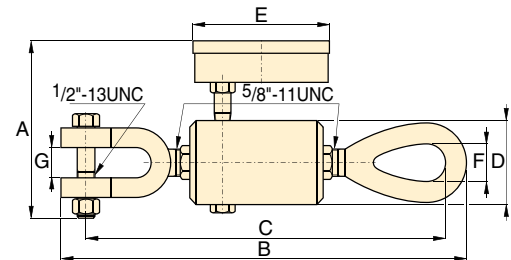
Accuracy, % of full scale:  
**± 2%**



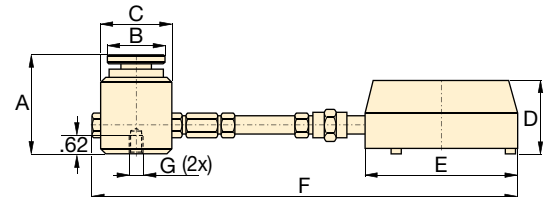
TM and LH models are 100% tested to verify accuracy within a ± 2% range.

If your application requires a calibrated tool, it must be submitted for certification testing.

Certification is NOT available from Enerpac.



TM-5



LH-Series

### Tension Meter TM-5

- Accuracy, ± 2% of full scale
- Zinc and bronze plated to resist rust and corrosion
- Dual-range readout in kilograms and pounds
- Cushioned metal case provides safe storage and transport
- Maximum indicating pointer reading for pre-selected forces or to maintain maximum force readings

### Load Cells LH Series

- Accuracy, ± 2% of full scale
- Swivel loading pad reduces eccentric loading for improved accuracy
- Maximum indicating pointer reading for pre-selected forces or to maintain maximum force readings
- Dual-range readout in kilograms and pounds

| Type                           | Gauge Capacity |       | Model Number | Minimum Reading |       | Gauge Increments |      | Dimensions (in) |      |      |      |      |       |                   |
|--------------------------------|----------------|-------|--------------|-----------------|-------|------------------|------|-----------------|------|------|------|------|-------|-------------------|
|                                | (lbs)          | (kg)  |              | (lbs)           | (kg)  | (lbs)            | (kg) | A               | B    | C    | D    | E    | F     | G                 |
| Direct Mounted                 | 10,000         | 4500  | TM-5         | 1,000           | 500   | 100              | 100  | 4.75            | 9.75 | 9.29 | 2.00 | 4.00 | .88   | .75               |
| Direct Load Cell Mounted       | 2,000          | 900   | LH-10        | 200             | 100   | 20               | 20   | 3.06            | 1.75 | 2.25 | 2.38 | 4.00 | 10.00 | 1/4"-20, 1.75" BC |
|                                | 10,000         | 4500  | LH-50        | 1,000           | 500   | 100              | 100  | 3.06            | 1.75 | 2.25 | 2.38 | 4.00 | 10.00 | 1/4"-20, 1.75" BC |
| Remote Mounted with 2 ft. Hose | 2,000          | 900   | LH-102       | 200             | 100   | 20               | 20   | 3.06            | 1.75 | 2.25 | 2.38 | 5.81 | 33.31 | 1/4"-20, 1.75" BC |
|                                | 10,000         | 4500  | LH-502       | 1,000           | 500   | 100              | 100  | 3.06            | 1.75 | 2.25 | 2.38 | 5.81 | 33.10 | 1/4"-20, 1.75" BC |
|                                | 20,000         | 9000  | LH-1002      | 2,000           | 1000  | 200              | 200  | 3.06            | 1.75 | 2.25 | 2.38 | 5.81 | 33.10 | 1/4"-20, 1.75" BC |
| Remote Mounted with 6 ft. Hose | 50,000         | 21000 | LH-2506      | 5,000           | 2500  | 500              | 500  | 4.00            | 2.75 | 3.38 | 2.38 | 5.81 | 82.44 | 3/8"-24, 2.5" BC  |
|                                | 100,000        | 45000 | LH-5006      | 5,000           | 2500  | 1,000            | 1000 | 5.22            | 4.00 | 5.00 | 2.38 | 5.81 | 84.06 | 3/8"-24, 3.5" BC  |
|                                | 200,000        | 90000 | LH-10006     | 20,000          | 10000 | 2,500            | 1000 | 6.22            | 5.00 | 6.25 | 2.38 | 5.81 | 85.31 | 3/8"-24, 4.0" BC  |

**E**NERPAC hydraulics power many custom press applications. By providing reliable and safe high-pressure solutions, Enerpac can solve your custom press application.

### **Fully Automated PLC-Controlled 1800 Ton High-Accuracy Press**

*The pressing and heating cycle, during the production of magnetic acceleration coils, required high force and high-accuracy to ensure absolute quality.*

*Enerpac was consulted to assist in the design of a high accuracy production press. Control of the press force is monitored along with the temperature of the coils during forming by a PLC Control System.*



### **600 Ton High-Accuracy Collar Press**

*For production of accelerator coils, sheet metal needs to be formed into a specific shape and size. The end product of this forming is a cylindrical collar, which has a very solid structure, specific shape, and a tight tolerance for circularity and concentricity.*

*The Enerpac team was consulted to accomplish this task using proven high-pressure technology. The 600-ton press consisted of two separate hydraulic systems. The first system featured eight 25-ton cylinders, to position the sheets, while the second system featured eight 75-ton cylinders, to press the sheets into the correct shape.*

*The results were a hydraulic press system that increased productivity and lowered operating costs.*

### **1000 Ton Cold Forming Press**

*A manufacturer of diesel engines needed to work-harden aluminum for crankshaft bearing inserts. Working with a customer-hired Systems Integrator, Enerpac provided a 1000-ton cylinder and hydraulic power supply, to the specifications required by the Integrator, to fit into his custom frame and operate with his control system. The Enerpac solution included a 50-series electric pump and 4-way electric solenoid valve.*

*The final products allowed the end user to quickly, accurately, and safely manufacture crankshaft bearings with an efficient production cycle.*





**E**NERPAC offers a complete line of pullers with the widest range of sizes, capacities and styles. Whether your application requires mechanical, hydraulic or the patented Posi Lock® system, Enerpac can satisfy your requirements. Made of high strength steel alloys, you can depend on Enerpac pullers to provide years of trouble-free operation, even in the harshest environments.



### Hydraulic Pullers

These hydraulic pullers eliminate time-consuming and unsafe hammering, heating or prying. Damage to parts is minimized through the use of controlled hydraulic power.



### Posi Lock® Pullers

The puller that meets the safety challenge. A control cage holds the pulling jaws securely in working position. This patented feature reduces the possibility of the puller jaws slipping off the work surface thereby increasing

productivity and tool life while reducing dangerous situations for the user. The Posi Lock® feature is available in mechanical or hydraulic versions.



#### WARNING

Do not exceed 50% of the rated puller capacity when using a double crosshead (2 griparms) or when using puller legs in combination with bearing puller attachment.



#### CAUTION!

Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.



Always wear Safety Goggles and Gloves while using pullers.

When selecting a puller it is important to consider three basic specifications:

### 1. Capacity:

The amount of force the puller is capable of producing.

Typically, the capacity required for a job can be determined by using the shaft diameter of the part being pulled.

For manual pullers, the center bolt diameter of the puller should be at least half the diameter of the shaft being pulled from.

For hydraulic pullers, the capacity in tons should be 7 to 10 times the shaft diameter. Use the following chart:

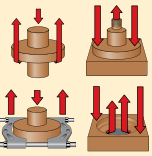

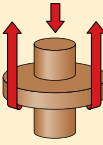

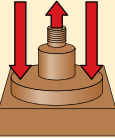

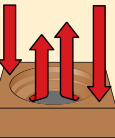

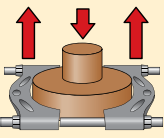

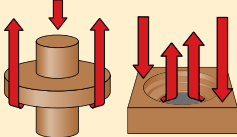

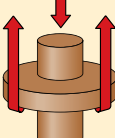

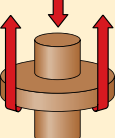

| Shaft Diameter | Puller Capacity |
|----------------|-----------------|
| 0" to 1"       | 10 ton          |
| 1" to 2"       | 20 ton          |
| 2" to 3.5"     | 30 ton          |
| 3.5" to 5.5"   | 50 ton          |

### 2. Reach:

The distance between the bottom of the base and the jaw flats. The puller's reach must equal or exceed the same distance of the part being pulled.

### 3. Spread:

The distance between the jaws. The puller's spread needs to be greater than the width of the part being pulled.

| Puller Function   | Capacity (tons) | Puller Type   | Series                     |   | Page  |
|---|-----------------|---|----------------------------|---|-------|
|    | 8-50            | <b>Master Puller Sets</b><br>Max. Reach: 27.56 in.<br>Max. Spread: 43.30 in.            | <b>BHP</b>                 |    | 146 ▶ |
|    | 8-50            | <b>Grip Puller Sets</b><br>Max. Reach: 27.56 in.<br>Max. Spread: 43.30 in.              | <b>BHP</b>                 |    | 147 ▶ |
|    | 8-50            | <b>Cross-Bearing Puller Sets</b><br>Max. Reach: 34.00 in.<br>Max. Spread: 22.46 in.     | <b>BHP</b>                 |    | 148 ▶ |
|    | 8-50            | <b>Bearing Cup Pullers</b><br>Max. Reach: 5.71 in.<br>Max. Spread 14.17 in.             | <b>BHP</b>                 |    | 149 ▶ |
|   | 8-50            | <b>Bearing Pullers</b><br>Max. Spread: 9.65 in.<br>Max. Width 11.50 in.                 | <b>BHP</b>                 |   | 149 ▶ |
|  | 2-40            | <b>Posi Lock® Mechanical Pullers</b><br>Max. Reach: 14.00 in.<br>Max. Spread: 25.00 in. | <b>EP, EPP, EPPMI, EPX</b> |  | 150 ▶ |
|  | 10-50           | <b>Posi Lock® Hydraulic Pullers</b><br>Max. Reach: 14.00 in.<br>Max. Spread: 25.00 in.  | <b>EPH, EPHR, EPHS</b>     |  | 154 ▶ |
|  | 100             | <b>Posi Lock® Hydraulic Pullers</b><br>Max. Reach: 48.0 in.<br>Max. Spread: 70.0 in.    | <b>EPH EPHT</b>            |  | 157 ▶ |

▼ Shown: Master Puller Set BHP-3751G



## BHP Series

Capacity:

**8, 20, 30 and 50 tons**



**CAUTION!**

Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

- Supplied with a full hydraulic set including pump, hose, cylinder, gauge and gauge adaptor in a storage case
- High quality, forged steel components provide superior reliability and service
- Sets include speed crank and adjusting screw for fast contact to work before hydraulics are applied
- All Master Puller Sets include a Grip Puller, a Cross Bearing Puller, a Bearing Cup Puller and a Bearing Puller which can be ordered separately. See items 10, 20, 30 and 40

▼ Maintenance engineers throughout the industry greatly appreciate Enerpac Master Puller sets.



▼ SELECTION CHART

| Master Puller Set Capacity        | 8 ton            | 20 ton           | 30 ton           | 50 ton           | Page Number  |
|-----------------------------------|------------------|------------------|------------------|------------------|--------------|
| Model Number ►                    | <b>BHP-1752*</b> | <b>BHP-2751G</b> | <b>BHP-3751G</b> | <b>BHP-5751G</b> |              |
| Included Hydraulics: set weight ► | 82 lbs           | 198 lbs          | 380 lbs          | 657 lbs          |              |
| Hand Pump                         | P-142            | P-392            | P-392            | P-80             | <b>59</b> ►  |
| Cylinder                          | RWH-121          | RCH-202          | RCH-302          | RCH-603          | <b>26</b> ►  |
| Saddle                            | –                | HP-2015          | HP-3015          | HP-5016          | <b>27</b> ►  |
| Hose                              | HB-7206QB        | HC-7206          | HC-7206          | HC-7206          | <b>114</b> ► |
| Gauge                             | GF-120P          | GF-813P          | GF-813P          | GF-813P          | <b>121</b> ► |
| Gauge Adaptor                     | GA-4             | GA-3             | GA-3             | GA-3             | <b>126</b> ► |
| <b>Included Pullers:</b>          |                  |                  |                  |                  |              |
| <b>10</b> Grip Puller             | BHP-1762         | BHP-252          | BHP-352          | BHP-552          | <b>147</b> ► |
| <b>20</b> Cross Bearing Puller    | BHP-1772         | BHP-262          | BHP-362          | BHP-562          | <b>148</b> ► |
| <b>30</b> Bearing Cup Puller      | BHP-180          | BHP-280          | BHP-380          | BHP-580          | <b>149</b> ► |
| <b>40</b> Bearing Puller          | BHP-181          | BHP-282          | BHP-382          | BHP-582          | <b>149</b> ► |
| Storage Case                      | CM-6             | CW-166           | CW-550           | CW-750           |              |

\* Includes FZ-1630 Adaptor.

▼ Shown: Grip Puller Set BHP-351G



- Precise hydraulic control allows fast, efficient and safe pulling
- High quality, forged steel components provide superior reliability and service
- Available with and without full hydraulic set
- Wooden case supplied standard

## ▼ SELECTION CHART

| Grip Puller Set Capacity |                       | 8 ton            | 20 ton          | 30 ton          | 50 ton          |
|--------------------------|-----------------------|------------------|-----------------|-----------------|-----------------|
| Model Number             | Included ▶            | BHP-152***       | BHP-251G        | BHP-351G        | BHP-551G        |
| <b>Hydraulics:</b>       | <b>set weight ▶</b>   | 48 lbs           | 123 lbs         | 200 lbs         | 353 lbs         |
| Hand Pump                |                       | P-142            | P-392           | P-392           | P-80            |
| Cylinder                 |                       | RWH-121          | RCH-202         | RCH-302         | RCH-603         |
| Saddle                   |                       | -                | HP-2015         | HP-3015         | HP-5016         |
| Hose                     |                       | HB-7206QB        | HC-7206         | HC-7206         | HC-7206         |
| Gauge                    |                       | GF-120P          | GF-813P         | GF-813P         | GF-813P         |
| Gauge Adaptor            |                       | GA-4             | GA-3            | GA-3            | GA-3            |
| <b>10 Grip Puller</b>    | <b>Model Number ▶</b> | <b>BHP-1762*</b> | <b>BHP-252*</b> | <b>BHP-352*</b> | <b>BHP-552*</b> |
| Maximum Spread**         | 2-jaw                 | 9.84             | 15.75           | 23.38           | 35.43           |
|                          | 3-jaw                 | 9.84             | 19.68           | 31.50           | 43.30           |
| Maximum Reach**          | 2-jaw                 | 9.92             | 11.81           | 15.25           | 27.56           |
|                          | 3-jaw                 | 9.92             | 11.81           | 15.25           | 27.56           |
| Jaw**                    | Thickness             | .59              | .79             | .98             | 1.18            |
|                          | Width                 | .94              | 1.10            | 1.50            | 1.57            |
| Adjusting Screw**        | Thread                | ¾"-16 UNF        | 1"-8 UNC        | 1¼"-7 UNC       | 1½"-5.5 NS      |
|                          | Length                | 15.75            | 20.00           | 24.00           | 30.00           |
| Wooden Case              |                       | CW-166           | CW-166          | CW-350          | CW-750          |

\* Grip Puller model number without hydraulics.

\*\* Dimensions in inches.

\*\*\* Includes FZ-1630 Adaptor.

## BHP Series

Capacity:

**8, 20, 30 and 50 tons**

Maximum Reach:

**9.92-27.56 inches**

Maximum Spread:

**9.84-43.30 inches**

Maximum Operating Pressure:

**10,000 psi**



### CAUTION!

Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

### Ordering Example

#### Model Number BHP-251G:

Includes Grip Puller BHP-252 and a full hydraulic set. (Hand pump, cylinder, saddle, hose, gauge and gauge adaptor.)

#### Model Number BHP-252:

Includes Grip Puller mechanical parts **only**, for use with your existing hydraulics.

▼ Shown: Cross Bearing Puller Set BHP-361G



## BHP Series

Capacity:

**8, 20, 30 and 50 tons**

Maximum Reach:

**14.0-34.00 inches**

Maximum Spread:

**10.50-22.46 inches**

Maximum Operating Pressure:

**10,000 psi**



**CAUTION!**

Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

- Precise hydraulic control allows fast, efficient and safe pulling
- High quality, forged steel components provide superior reliability and service
- The Cross Bearing Puller without hydraulics, Bearing Cup Puller and Bearing Puller may be ordered separately. See items 20, 30 and 40.

▼ SELECTION CHART

| Cross Bearing Puller Set Capacity |  | 8 ton            | 20 ton          | 30 ton          | 50 ton          |
|-----------------------------------|--|------------------|-----------------|-----------------|-----------------|
| Model Number ►                    |  | <b>BHP-162**</b> | <b>BHP-261G</b> | <b>BHP-361G</b> | <b>BHP-561G</b> |
| Included Hydraulics: set weight ► |  | 57 lbs           | 137 lbs         | 267 lbs         | 408 lbs         |
| Hand Pump                         |  | P-142            | P-392           | P-392           | P-80            |
| Cylinder                          |  | RWH-121          | RCH-202         | RCH-302         | RCH-603         |
| Saddle                            |  | –                | HP-2015         | HP-3015         | HP-5016         |
| Hose                              |  | HB-7206QB        | HC-7206         | HC-7206         | HC-7206         |
| Gauge                             |  | GF-120P          | GF-813P         | GF-813P         | GF-813P         |
| Gauge Adaptor                     |  | GA-4             | GA-3            | GA-3            | GA-3            |
| <b>20</b>                         | <b>Cross Bearing Puller Model Number ►</b> | <b>BHP-1772</b>  | <b>BHP-262</b>  | <b>BHP-362</b>  | <b>BHP-562</b>  |
| Spread*                           | Maximum                                    | 10.5             | 13.83           | 17.9            | 22.46           |
|                                   | Minimum                                    | 4.2              | 5.5             | 7.08            | 8.66            |
| Reach*                            | Maximum                                    | 14.0             | 22.5            | 28              | 34              |
|                                   | Adjusting Screw*                           | Diameter         | ¾"-16 UNF       | 1"-8 UNC        | 1¼"-7 UNC       |
| Leg*                              | Length                                     | 15.75            | 20              | 24              | 30              |
|                                   |  | 4.13             | 9.43            | 8               | 24              |
|                                   | Length                                     | 14.2             | 16.52           | 18              | 34              |
|                                   |  | –                | 22.5            | 28              | –               |
| Upper Leg Ends*                   | Thread                                     | –                | 4.5             | –               | –               |
|                                   |  | ¾"-16x1.0        | ¾"-16x1.0       | 1"-14x1.38      | 1¼"-12x1.50     |
| Lower Leg Ends*                   | Thread                                     | ⅝"-18x1.0        | ⅝"-18x1.0       | 1"-14x1.06      | 1¼"-12x1.50     |
| <b>30</b>                         | <b>Bearing Cup Puller Model Number ►</b>   | <b>BHP-180</b>   | <b>BHP-280</b>  | <b>BHP-380</b>  | <b>BHP-580</b>  |
| <b>40</b>                         | <b>Bearing Puller Model Number ►</b>       | <b>BHP-181</b>   | <b>BHP-282</b>  | <b>BHP-382</b>  | <b>BHP-582</b>  |
| Wooden Case Model Number ►        |  | <b>CW-166</b>    | <b>CW-166</b>   | <b>CW-550</b>   | <b>CW-750</b>   |

\* Dimensions in inches.

\*\* Includes FZ-1630 Adaptor.

# Bearing Cup and Bearing Pullers

▼ Shown: **BHP-380**



## Bearing Cup Puller

- Made of high strength steel alloy
- Easily adapted to Cross Bearing Pullers for fast and efficient removal of the most difficult parts
- Adjustable to fit a variety of bearings and seals

## BHP Series

Puller Set Capacity:

**8, 20, 30 and 50 tons**

Maximum Reach:

**4.33-5.71 inches**

Maximum Spread:

**4.33-14.17 inches**

Maximum Operating Pressure:

**10,000 psi**

### ▼ SELECTION CHART

| Puller Set Capacity**        |                     | 8 ton       | 20 ton   | 30 ton       | 50 ton         |
|------------------------------|---------------------|-------------|----------|--------------|----------------|
| <b>30 Bearing Cup Puller</b> |                     |             |          |              |                |
| Model Number ▶               |                     | BHP-180     | BHP-280  | BHP-380      | BHP-580        |
| Spread*                      | Max.                | 4.33        | 8.66     | 14.17        | 14.17          |
|                              | Min.                | 1.06        | .98      | 1.97         | 1.97           |
| Reach*                       | Max.                | 4.33        | 5.51     | 5.71         | 5.71           |
|                              | Center Screw Thread | 3/4"-16 UNF | 1"-8 UNC | 1 1/4"-7 UNC | 1 5/8"-5.50 NS |

\* Dimensions in inches.

\*\* Puller capacity, not attachment capacity. See Warning box!



### WARNING!

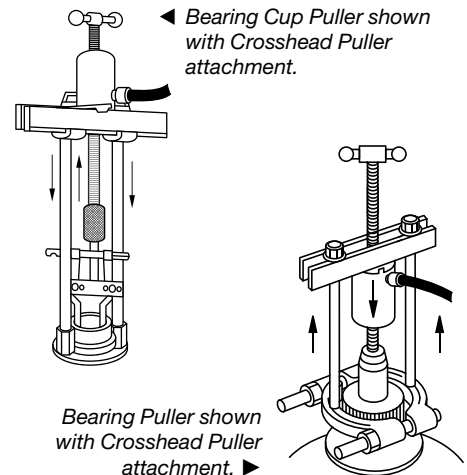
Do not exceed 50% of the rated puller capacity when using a double crosshead (2 griparms) or when using puller legs in combination with bearing puller attachment.

▼ Shown: **BHP-382**



## Bearing Puller

- Made of high strength steel alloy
- Wedge-shaped edges allow removal of the most hard-to-grip components
- Easily adapted to Cross Bearing Pullers for fast and efficient removal of the most difficult parts

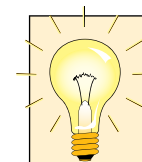


### ▼ SELECTION CHART

| Puller Set Capacity**    |      | 8 ton       | 20 ton      | 30 ton    | 50 ton        |
|--------------------------|------|-------------|-------------|-----------|---------------|
| <b>40 Bearing Puller</b> |      |             |             |           |               |
| Model Number ▶           |      | BHP-181     | BHP-282     | BHP-382   | BHP-582       |
| Spread*                  | Max. | 4.09        | 5.12        | 9.65      | 9.65          |
|                          | Min. | .98         | .39         | .67       | .67           |
| Width*                   |      | 4.96        | 5.91        | 11.50     | 11.50         |
| Thread                   |      | 5/8"-18 UNF | 5/8"-18 UNF | 1"-14 UNF | 1 1/4"-12 UNF |

\* Dimensions in inches.

\*\* Puller capacity, not attachment capacity. See Warning!



### Bearing Puller

Bearing Puller has wedge shaped edges for placing puller behind hard to reach bearings, gears, etc., where clearance prevents direct application of grip puller arms.

The Bearing Puller can be used with the Cross Bearing Puller or the Grip Puller.

▼ Shown from left to right: EP-206, EP-108



## For Safer and Faster Pulling

### Long Jaws



Long Jaws are used to increase the reach and spread of manual pullers. They maintain the same pulling capacity as the standard jaws, but reduce clamping force to 25%.

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### Shaft Attachments



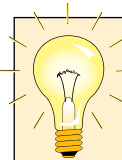
Shaft protectors and extenders are live centers that fit over the standard puller shaft for tip protection and additional reach.

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- Patented “Safety Cage” jaw retention system
- Roll threaded shafts for less effort when applying high torque
- Slim tapered jaws for improved gripping in tight spots
- Available in 2 and 3 jaw design and inside and outside pulling configuration
- More efficient pulling, as one man can do the job where manual pullers often require two operators



◀ Positioning an EP-104, 3-jaw puller on the accessory drive of a diesel engine.



### Application Tip

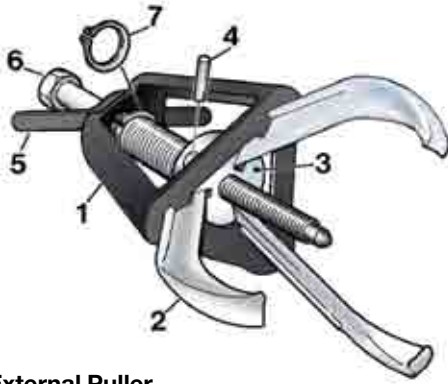
In determining the correct manual puller capacity for your application, use the following rule:

The center bolt diameter of the puller should be at least 1/2 the diameter of the shaft being pulled on.

#### Example:

A part being pulled from a shaft with a diameter of 1.5" would require a puller with a center bolt diameter of at least .75".

# Posi Lock® Mechanical Grip Pullers



**External Puller**

- 1 Patented "Safety Cage" guides jaws, holding them securely onto the part.
- 2 Durable forged jaws provide positive grip.
- 3 Jaw head provides pivot and reaction point for jaws.
- 4 Pin, for easy jaw removal and replacement.
- 5 T-handle provides control of the puller jaws.
- 6 Drive bolt with rolled threads for increased force with reduced input torque.
- 7 Snap-ring retains cage to drive bolt and provides quick removal for easy service.

## EP EPPMI Series



Capacity:  
**2-40 tons**

Maximum Reach:  
**4.00-14.00 inches**

Maximum Spread:  
**0.50-25.00 inches**

### ▼ QUICK SELECTION CHART EXTERNAL PULLERS

For full technical information see next page.

| Number of Jaws | Maximum Reach (in) | Spread Range (in) | Capacity (tons) | Model Number | Center Bolt Diameter (in) | Weight (lbs) |
|----------------|--------------------|-------------------|-----------------|--------------|---------------------------|--------------|
| 2              | 4.00               | .5-5              | 2               | EP-204       | .56                       | 3            |
| 3              | 4.00               | .5-5              | 5               | EP-104       | .56                       | 4            |
| 2              | 6.00               | .5-7.0            | 6               | EP-206       | .66                       | 7            |
| 3              | 6.00               | .5-7.0            | 10              | EP-106       | .66                       | 8            |
| 2              | 8.00               | .75-12            | 12              | EP-208       | .79                       | 12           |
| 3              | 8.00               | .75-12            | 17              | EP-108       | .79                       | 14           |
| 2              | 9.67               | 1.0-15            | 14              | EP-210       | .79                       | 13           |
| 3              | 9.67               | 1.0-15            | 20              | EP-110       | .79                       | 16           |
| 2              | 12.00              | 2.5-18            | 25              | EP-213       | 1.17                      | 38           |
| 3              | 12.00              | 2.5-18            | 30              | EP-113       | 1.17                      | 44           |
| 2              | 14.00              | 3.0-25            | 35              | EP-216       | 1.23                      | 57           |
| 3              | 14.00              | 3.0-25            | 40              | EP-116       | 1.23                      | 68           |



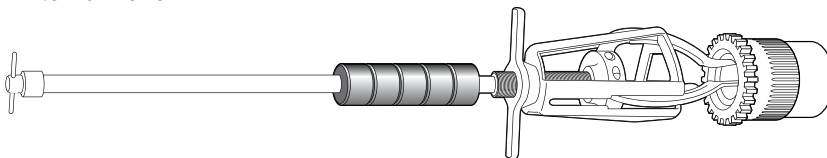
**Always wear Safety Goggles and Gloves while using pullers.**



#### Application Tip

Because of the unique Safety Cage design, Posi Lock® pullers will grip on surfaces where normal pullers would slip off; e.g. tapered bearings.

**Internal Puller**

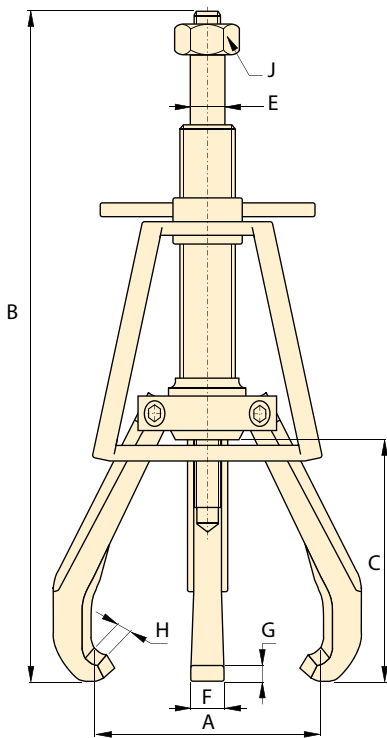


### ▼ QUICK SELECTION CHART INTERNAL PULLERS

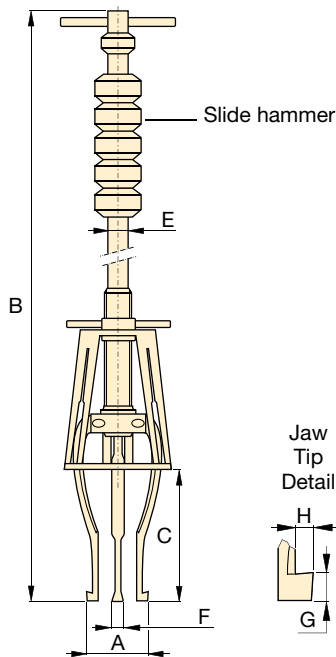
For full technical information see next page.

| Number of Jaws | Maximum Reach (in) | Spread Range (in) | Jaw Style | Model Number | Jaw Length (in) | Weight (lbs) |
|----------------|--------------------|-------------------|-----------|--------------|-----------------|--------------|
| 3              | 5.87               | .56-4.00          | Standard  | EPPMI-6      | 6.62            | 8.6          |
|                | 7.70               | 1.0-5.25          | Long      |              | 8.62            | 8.6          |





**2- and 3-Jaw External Puller  
EP-Series**



**Internal Puller EPPMI-Series**



▲ EP-204 2-jaw puller positioned to pull a water pump drive pulley.

▼ **SELECTION CHART EXTERNAL PULLERS**

| Number of Jaws | Maximum Reach<br>(in) | Spread Range<br>(in) | Capacity<br>(tons) | Model Number | Center Bolt Diameter<br>(in) | Maximum Torque<br>(ft.lb) |
|----------------|-----------------------|----------------------|--------------------|--------------|------------------------------|---------------------------|
| 2              | 4.00                  | .5-5.0               | 2                  | EP-204       | .56                          | 20                        |
| 3              | 4.00                  | .5-5.0               | 5                  | EP-104       | .56                          | 40                        |
| 2              | 6.00                  | .5-7.0               | 6                  | EP-206       | .66                          | 75                        |
| 3              | 6.00                  | .5-7.0               | 10                 | EP-106       | .66                          | 130                       |
| 2              | 8.00                  | .75-12.0             | 12                 | EP-208       | .79                          | 150                       |
| 3              | 8.00                  | .75-12.0             | 17                 | EP-108       | .79                          | 220                       |
| 2              | 9.67                  | 1.0-15.0             | 14                 | EP-210       | .79                          | 175                       |
| 3              | 9.67                  | 1.0-15.0             | 20                 | EP-110       | .79                          | 275                       |
| 2              | 12.00                 | 2.5-18.0             | 25                 | EP-213       | 1.17                         | 475                       |
| 3              | 12.00                 | 2.5-18.0             | 30                 | EP-113       | 1.17                         | 600                       |
| 2              | 14.00                 | 3.0-25.0             | 35                 | EP-216       | 1.23                         | 800                       |
| 3              | 14.00                 | 3.0-25.0             | 40                 | EP-116       | 1.23                         | 850                       |

▼ **SELECTION CHART INTERNAL PULLERS**

| Number of Jaws | Maximum Reach<br>(in) | Spread Range<br>(in) | Jaw Style | Model Number | Jaw Length<br>(in) | Slide-hammer Weight<br>(lbs) |
|----------------|-----------------------|----------------------|-----------|--------------|--------------------|------------------------------|
| 3              | 5.87                  | .56-4.00             | Standard  | EPPMI-6      | 6.62               | 2.5                          |
|                | 7.70                  | 1.00-5.25            | Long      |              | 8.62               | 2.5                          |

# Posi Lock® Mechanical Grip Pullers



## Shaft Protectors and Extenders

Shaft Protectors and Extenders are live centers that fit over the puller end for tip protection and added reach.



## Long Jaws

Long jaws are used for added reach and spread. They have the same capacity as standard jaws, but reduce the clamping force to 25%.

## EP EPPMI Series



Capacity:

**2-40 tons**

Maximum Reach:

**4.00-14.00 inches**

Maximum Spread:

**0.50-25.00 inches**

| Length<br>(in) | Diameter<br>(in) | Increases<br>Center Bolt<br>Length<br>(in) | Order:<br>Model<br>Number |
|----------------|------------------|--|---------------------------|
| 1.00           | 0.75             | 0.38                                       | <b>EPP-4</b>              |
| 1.97           | 0.75             | 1.50                                       | <b>EPX-4</b>              |
| 1.22           | 0.87             | 0.50                                       | <b>EPP-6</b>              |
| 1.97           | 0.87             | 1.50                                       | <b>EPX-6</b>              |
| 1.22           | 1.00             | 0.50                                       | <b>EPP-10</b>             |
| 1.97           | 1.00             | 1.50                                       | <b>EPX-10</b>             |
| 2.00           | 1.38             | 0.83                                       | <b>EPP-1316</b>           |

Note: See the chart below to reference matching pullers for these accessories.

| Spread<br>(in) | Reach<br>(in) | Order:<br>Model<br>Number |
|----------------|---------------|---------------------------|
| 1.5-15         | 9.67          | <b>EP-11054</b>           |
| 1.5-22         | 15.78         | <b>EP-11054L</b>          |
| 1.5-30         | 20            | <b>EP-11354L</b>          |
| 1.0-5.26       | 8.62          | <b>EP-10554L*</b>         |

\* EPPMI-6 only

| Dimensions      |                |                  |                            |              |                  |              |                       |                     | Model<br>Number | ▼ Optional Accessories |                  |  |
|-----------------|----------------|------------------|----------------------------|--------------|------------------|--------------|-----------------------|---------------------|-----------------|------------------------|------------------|--|
| Spread<br>Range | Overall Length | Maximum<br>Reach | Center<br>Bolt<br>Diameter | Jaw<br>Width | Tip<br>Clearance | Tip<br>Depth | Hex<br>Socket<br>Size |                     |                 |                        |                  |  |
| A               | B              | C                | D                          | E            | F                | G            | H                     | Shaft<br>Protectors |                 | Extenders              | Long Jaws        |  |
| .5-5.0          | 9.68-12.75     | 4.00             | .56                        | .54          | .16              | .18          | 7/8                   | <b>EP-204</b>       | <b>EPP-4</b>    | <b>EPX-4</b>           | -                |  |
| .5-5.0          | 9.68-12.75     | 4.00             | .56                        | .54          | .16              | .18          | 7/8                   | <b>EP-104</b>       | <b>EPP-4</b>    | <b>EPX-4</b>           | -                |  |
| .5-7.0          | 12.75-18.75    | 6.00             | .66                        | .75          | .32              | .24          | 1 1/16                | <b>EP-206</b>       | <b>EPP-6</b>    | <b>EPX-6</b>           | -                |  |
| .5-7.0          | 12.75-18.75    | 6.00             | .66                        | .75          | .32              | .24          | 1 1/16                | <b>EP-106</b>       | <b>EPP-6</b>    | <b>EPX-6</b>           | -                |  |
| .75-12.0        | 16.25-24.25    | 8.00             | .79                        | .77          | .25              | .36          | 1                     | <b>EP-208</b>       | <b>EPP-10</b>   | <b>EPX-10</b>          | <b>EP-11054</b>  |  |
| .75-12.0        | 16.25-24.25    | 8.00             | .79                        | .77          | .25              | .36          | 1                     | <b>EP-108</b>       | <b>EPP-10</b>   | <b>EPX-10</b>          | <b>EP-11054</b>  |  |
| 1.0-15.0        | 19.25-29.00    | 9.67             | .79                        | .77          | .25              | .36          | 1                     | <b>EP-210</b>       | <b>EPP-10</b>   | <b>EPX-10</b>          | <b>EP-11054L</b> |  |
| 1.0-15.0        | 19.25-29.00    | 9.67             | .79                        | .77          | .25              | .36          | 1                     | <b>EP-110</b>       | <b>EPP-10</b>   | <b>EPX-10</b>          | <b>EP-11054L</b> |  |
| 2.5-18.0        | 26.00-38.00    | 12.00            | 1.17                       | 1.25         | .50              | .38          | 1 1/16                | <b>EP-213</b>       | <b>EPP-1316</b> | -                      | <b>EP-11354L</b> |  |
| 2.5-18.0        | 26.00-38.00    | 12.00            | 1.17                       | 1.25         | .50              | .38          | 1 1/16                | <b>EP-113</b>       | <b>EPP-1316</b> | -                      | <b>EP-11354L</b> |  |
| 3.0-25.0        | 31.50-45.50    | 14.00            | 1.23                       | 1.44         | .53              | .46          | 1 3/16                | <b>EP-216</b>       | <b>EPP-1316</b> | -                      | -                |  |
| 3.0-25.0        | 31.50-45.50    | 14.00            | 1.23                       | 1.44         | .53              | .46          | 1 3/16                | <b>EP-116</b>       | <b>EPP-1316</b> | -                      | -                |  |

Note: Overall length (B) is dependent on position of center bolt.

| Dimensions (in)       |                   |                  |                       |              |                  |              | Model<br>Number |
|-----------------------|-------------------|------------------|-----------------------|--------------|------------------|--------------|-----------------|
| Spread<br>min. - max. | Overall<br>Length | Maximum<br>Reach | Slide Rod<br>Diameter | Jaw<br>Width | Tip<br>Clearance | Tip<br>Depth |                 |
| A                     | B                 | C                | E                     | F            | G                | H            |                 |
| .56-4.00              | 29.00             | 5.87             | .52                   | .33          | .12              | .06          | <b>EPPMI-6</b>  |
| 1.00-5.25             | 31.00             | 7.70             | .52                   | .33          | .30              | .18          |                 |

▼ Shown: EPHR-110



- Patented “Safety Cage” jaw retention system
- High force hydraulic system for effortless pulling of large components
- Slim tapered jaws for better gripping in tight spots
- Available in 2 and 3 jaw design
- More efficient pulling, as one man can do the job where normal pullers often require two operators

## High-Tech Pulling



### Transport and Store

Conveniently store and transport hydraulic pullers and accessories. Order the **EPT-2550** Storage Cart and make your job easier to do!



### Long Jaws

Used to increase the reach and spread of pullers. They maintain the same pulling capacity as the standard jaws, but reduce clamping force to 25%.

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### Application Tip

Because of the unique safety cage design, Posi Lock® pullers will grip on surfaces where normal pullers would slip off; e.g. tapered bearings.



◀ An EPHR-116, 50-ton hydraulic Posi Lock® puller easily removes the main drive gear from this metal forming brake press.

Basic Pullers only, cylinder not included.

| Number of Jaws | Max. Spread (in) | Capacity (ton) | Model Number* |
|----------------|------------------|----------------|---------------|
| 2              | 12.00            | 10             | EPH-208       |
| 3              | 12.00            |                | EPH-108       |
| 2              | 15.00            | 15             | EPH-210       |
| 3              | 15.00            |                | EPH-110       |
| 2              | 18.00            | 25             | EPH-213       |
| 3              | 18.00            |                | EPH-113       |
| 2              | 25.00            | 50             | EPH-216       |
| 3              | 25.00            |                | EPH-116       |

\*Cylinder is not included.

# Posi Lock® Hydraulic Grip Pullers

## ▼ SETS SELECTION CHART

| Style        | Capacity (ton) | Basic Puller | Cylinder | Stroke (in) | Pump Set | Set Model Number | Weight (lbs) |
|--------------|----------------|--------------|----------|-------------|----------|------------------|--------------|
| 2 Jaw Puller | 10             | EPH-208      | RC-106   | 6           | -        | EPHR208          | 24           |
|              | 10             | EPH-208      | RC-106   | 6           | EP-1     | EPHS208          | 60           |
|              | 15             | EPH-210      | RC-1510  | 10          | -        | EPHR210          | 49           |
|              | 15             | EPH-210      | RC-1510  | 10          | EP-1     | EPHS210          | 85           |
|              | 25             | EPH-213      | RC-2514  | 14.25       | -        | EPHR213          | 98           |
|              | 25             | EPH-213      | RC-2514  | 14.25       | EP-1     | EPHS213          | 118          |
| 3 Jaw Puller | 50             | EPH-216      | RC-5013  | 13.25       | -        | EPHR216          | 192          |
|              | 10             | EPH-108      | RC-106   | 6           | -        | EPHR108          | 26           |
|              | 10             | EPH-108      | RC-106   | 6           | EP-1     | EPHS108          | 62           |
|              | 15             | EPH-110      | RC-1510  | 10          | -        | EPHR110          | 52           |
|              | 15             | EPH-110      | RC-1510  | 10          | EP-1     | EPHS110          | 88           |
|              | 25             | EPH-113      | RC-2514  | 14.25       | -        | EPHR113          | 106          |
|              | 25             | EPH-113      | RC-2514  | 14.25       | EP-1     | EPHS113          | 126          |
| 50           | EPH-116        | RC-5013      | 13.25    | -           | EPHR116  | 202              |              |

## EPH Series



Capacity:

**10-50 tons**

Maximum Reach:

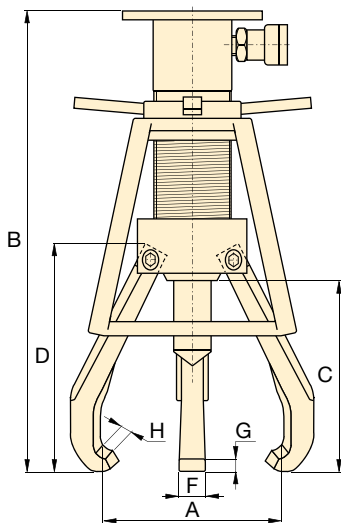
**8.0-14.0 inches**

Maximum Spread:

**0.75-25.0 inches**

Maximum Operating Pressure:

**10,000 psi**






### Pump Sets

All Posi Lock Hydraulic Puller Sets that include 115 VAC pumps will feature the following components:

|       | EP-1 Pump Set |
|-------|---------------|
| Pump  | PUJ-1200B     |
| Hose  | HC-9210       |
| Gauge | G-2535L       |

Components for 230 VAC pumps are available on request.




### ▼ \*Optional Accessory

| Dimensions (in) |                |              |            |           |               |           | Weight (lbs) | Model Number |  |  |  |
|-----------------|----------------|--------------|------------|-----------|---------------|-----------|--------------|--------------|---|---|---|
| Spread Range    | Overall Length | Reach (max.) | Jaw Length | Jaw Width | Tip Clearance | Tip Depth |              |              |   |   |   |
| A               | B              | C            | D          | F         | G             | H         |              |              |   |   |   |
| .75-12.0        | 19.61          | 8.00         | 9.34       | .88       | .29           | .27       | 14           | EPH-208      | EPH-155   | EPH-11052   | EP-11054  |
| .75-12.0        | 19.61          | 8.00         | 9.34       | .88       | .29           | .27       | 16           | EPH-108      | EPH-155   | EPH-11052   | EP-11054  |
| 1.0-15.0        | 26.19          | 10.00        | 10.64      | 1.00      | .441          | .36       | 22           | EPH-210      | EPH-155   | EPH-11052   | EPH-11054L  |
| 1.0-15.0        | 26.19          | 10.00        | 10.64      | 1.00      | .441          | .36       | 25           | EPH-110      | EPH-155   | EPH-11052   | EPH-11054L  |
| 2.5-18.0        | 33.31          | 12.00        | 13.72      | 1.25      | .508          | .38       | 47           | EPH-213      | EPH-257   | EPH-11352   | EP-11354L   |
| 2.5-18.0        | 33.31          | 12.00        | 13.72      | 1.25      | .508          | .38       | 55           | EPH-113      | EPH-257   | EPH-11352   | EP-11354L   |
| 3.0-25.0        | 36.19          | 14.00        | 16.29      | 1.44      | .598          | .46       | 90           | EPH-216      | EPH-508   | EPH-11652   | EPH-21654L  |
| 3.0-25.0        | 36.19          | 14.00        | 16.29      | 1.44      | .598          | .46       | 100          | EPH-116      | EPH-508   | EPH-11652   | EPH-11654L  |

For full details on puller accessories see page 156.

\* Long Jaws are available as optional accessories.

## ▼ RAM POINT SETS SELECTION CHART

| Fits Model Number | EPH-208 EPH-108<br>EPH-210 EPH-110  | EPH-213<br>EPH-113  | EPH-216<br>EPH-116  |
|-------------------|---|---|---|
|                   |  |  |  |
| Set Number        | EPH-155   | EPH-257   | EPH-508   |
| Set Includes      | Dia. x Length (in)  | Dia. x Length (in)  | Dia. x Length (in)  |
| Flat Ram Point    | 1 x 1   | 1.5 x 2.25  | 2 x 3   |
|                   | 1 x 3   | 2 x 2.25  | 2.75 x 3  |
|                   | –   | 2 x 4   | 2.75 x 5  |
| Tapered Ram Point | 1 x 1.5   | 1.5 x 2.5   | 2 x 3.75  |
|                   | 1 x 3.5   | 2 x 2.5   | 2 x 3.75  |
|                   | –   | 2 x 4.5   | 2.75 x 5.5  |
| Ram Point Adaptor | –   | –   | 2.75 x 2.25   |



Always wear Safety Goggles and Gloves while using pullers.

## ▼ LIFT PLATE SELECTION CHART

| Fits Puller Set Model Number | Model Number * | Thickness (in) | Diameter (in) |
|------------------------------|----------------|----------------|---------------|
| EPH-208                      | EPH-11052      | .25            | 6             |
| EPH-108                      | EPH-11052      | .25            | 6             |
| EPH-210                      | EPH-11052      | .25            | 6             |
| EPH-110                      | EPH-11052      | .25            | 6             |
| EPH-213                      | EPH-11352      | .38            | 8             |
| EPH-113                      | EPH-11352      | .38            | 8             |
| EPH-216                      | EPH-11652      | .38            | 10            |
| EPH-116                      | EPH-11652      | .38            | 10            |



▲ EPHR-116 used to remove electric motor pulleys. Puller is positioned using the Lift Plate.

\* Mounting screws included. Lifting plates are standard included with EPH-Series Pullers.

## ▼ LONG JAW SELECTION CHART

| Model Number | Fits Puller Set Model Number | No. of Jaws Required | Spread Dimensions (in) | Reach (in) | Weight (each) (lbs) |
|--------------|------------------------------|----------------------|------------------------|------------|---------------------|
| EP-11054     | EPH-208                      | 2                    | 2.25 - 15.0            | 9.7        | 2.5                 |
|              | EPH-108                      | 3                    |                        |            |                     |
| EPH-11054L   | EPH-210                      | 2                    | 1.5 - 22.0             | 15.8       | 5.5                 |
|              | EPH-110                      | 3                    |                        |            |                     |
| EP-11354L    | EPH-213                      | 2                    | 1.5 - 30.0             | 20.0       | 10.5                |
|              | EPH-113                      | 3                    |                        |            |                     |



◀ **EPH-11054L**  
Long Jaws are used for added reach and spread. They have the same load capacity as standard jaws with 25% of the clamping force.

# Posi Lock® 100 Ton Hydraulic Grip Pullers

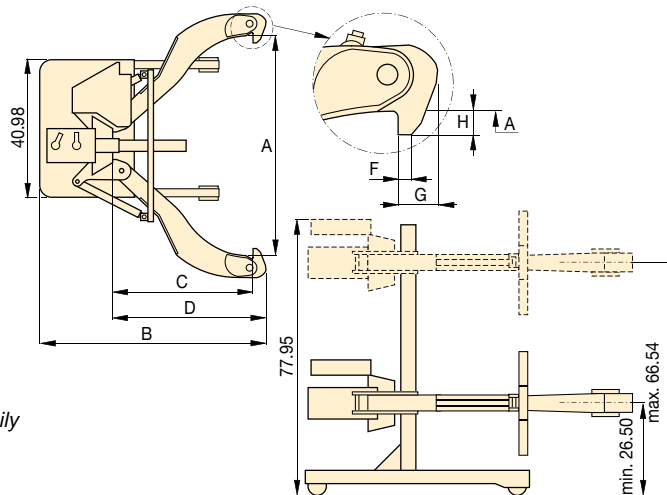
▼ EPH-1003



- Roller cart with power lift
- Adjustable jaw tips
- Puller easily detaches from cart
- Self-contained unit
- Puller height range 26.5" to 66.5"



◀ The EPH-1002 quickly and easily removes this drive coupler from its shaft.



## EPH Series

Capacity:  
**100 tons**

Maximum Reach:  
**48 inches**

Maximum Spread:  
**70 inches**

Maximum Operating Pressure:  
**10,000 psi**



### Pushing Adaptors

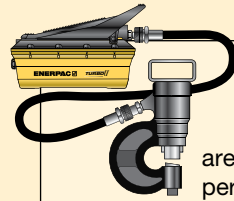
All Posi Lock 100 Ton Hydraulic Pullers include (3) pushing adaptors.

| Diameter (in) | Overall Length (in) | Model Number |
|---------------|---------------------|--------------|
| 3.5           | 29                  | EPHT-1162    |
| 3.5           | 19                  | EPHT-1163    |
| 3.5           | 9                   | EPHT-1164    |

| Number of Jaws | Max. Spread (in) | Capacity (tons) | Model Number | Dimensions (in) |                |              |            |           |               |           | Weight (lbs) |
|----------------|------------------|-----------------|--------------|-----------------|----------------|--------------|------------|-----------|---------------|-----------|--------------|
|                |                  |                 |              | Spread Range    | Overall Length | Reach (max.) | Jaw Length | Jaw Width | Tip Clearance | Tip Depth |              |
|                |                  |                 |              | A               | B              | C            | D          | F         | G             | H         |              |
| 2              | 70.00            | 100             | EPH-1002     | 10.5-70.0       | 77.00          | 48.00        | 53.00      | 1.25      | 3.5           | 3.5       | 1700         |
| 3              | 70.00            |                 | EPH-1003     | 10.5-70.0       | 77.00          | 48.00        | 53.00      | 1.25      | 3.5           | 3.5       | 1950         |

**E**NERPAC offers an extensive range of dedicated tools for a variety of specific and flexible applications. Whatever your requirement... cutting, punching, spreading or bending... you can be sure that Enerpac has the correct tool to do your job safely and efficiently.

Featuring maintenance sets, machine lifts and load skates, as well as hole punches, pipe benders and cable cutters, Enerpac has the tools to ensure that even your most demanding applications can be undertaken with the highest degree of safety and accuracy.



### Pump and Tool Sets

Selected hydraulic tools in this section are available in sets, for a perfect tool-pump match.



### Hydraulic System Set-up

Check out our "Yellow Pages" section for help on system set-ups and valving configurations.

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### Bolting Tools

More Enerpac Tools can be found in the Bolting Tools section of this catalog.

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| Capacity (tons)                            | Tool Type and Functions           | Series          |   | Page  |
|--|-----------------------------------|-----------------|---|-------|
| 2.5-12.5                                   | Maintenance Sets                  | MS              |    | 160 ▶ |
| 35-50                                      | Punches                           | SP              |    | 164 ▶ |
| 16   | Lifting Wedge                     | LW              |    | 168 ▶ |
| 20   | Hydraulic Machine Lifts           | SOH             |    | 169 ▶ |
| 1-80                                       | Load Skates                       | ELP<br>ER<br>ES |    | 170 ▶ |
| .67-16 (ft <sup>3</sup> )                  | Storage Cases                     | CM              |   | 172 ▶ |
| .75-1.00                                   | Hydraulic Wedgie Spread Cylinders | A, WR           |  | 173 ▶ |
| 3-20                                       | Hydraulic Cutterheads             | WHC<br>WHR      |  | 174 ▶ |
| 3-20                                       | Self-Contained Hydraulic Cutters  | WMC             |  | 175 ▶ |
| Nominal Bore<br>1/2" - 4 inches            | Pipe Benders                      | STB             |  | 176 ▶ |
| Strand Diameter<br>.5 - .6 inch            | PocketShear®                      | PS              |  | 178 ▶ |
| 20-30<br>Strand Diameter<br>3/8" - .6 inch | Mono-strand Post Tensioning Tools | DA,<br>PTJ      |  | 180 ▶ |



▼ Shown: **MS2-10**



- All sets include Enerpac pump, hose, cylinder and gauge
- Lock-on or threaded connectors
- Complete set for almost every maintenance application



◀ *Clamping a workpiece is just one of the many applications for the Enerpac maintenance sets.*

## The Universal Hydraulic Tool Box



### Maintenance Sets

Enerpac Maintenance sets are a complete assortment of accessories matched to hydraulic powered tools. Using these sets allows you to quickly configure a unique tool to meet your most difficult jobs.

Built around the Enerpac lightweight hand pump, hose and cylinder, these sets enable you to push, pull, lift, press, straighten, spread and clamp with forces up to 12.5 tons.



### More Information

For detailed information on all included attachments, see the following pages.

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### ▼ QUICK SELECTION CHART

| Capacity using attachments*<br>(tons) | Set Model Number |  |  |  |  |  | Number of Attachment Components | Weight<br>(lbs) |
|---------------------------------------|------------------|---|---|---|--|---|---------------------------------|-----------------|
| 2.5                                   | <b>MS2-4</b>     | P-142   | HC-7206   | RC-55   | GP-10S   | GA-4  | 34                              | 59              |
| 2.5                                   | <b>MSFP-5**</b>  | P-142   | HC-7206   | RC-55   | G2535L   | GA-3  | 24                              | 44              |
| 5                                     | <b>MSFP-10</b>   | P-392   | HC-7206   | RC-106  | G2535L   | GA-3  | 22                              | 105             |
| 5                                     | <b>MS2-10</b>    | P-392   | HC-7206   | RC-106  | GP-10S   | GA-2  | 35                              | 140             |
| 12.5                                  | <b>MS2-20</b>    | P-392   | HC-7206   | RC-256  | GP-10S   | GA-2  | 13                              | 210             |
| 5-12.5                                | <b>MS2-1020</b>  | P-392   | HC-7206   | RC-102, -106, -256  | GP-10S   | GA-2  | 53                              | 350             |

\* If no attachments are being used, capacity is double these values. Maximum operating pressure is then 10,000 psi.

\*\* This set also includes the FZ-1055 Adaptor.



**CAUTION!**

When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (5,000 psi).



**WARNING!**

Only use attachments provided with set. Non-Enerpac attachments and longer extension tubes will reduce column strength, potentially creating unsafe conditions.

## MS Series



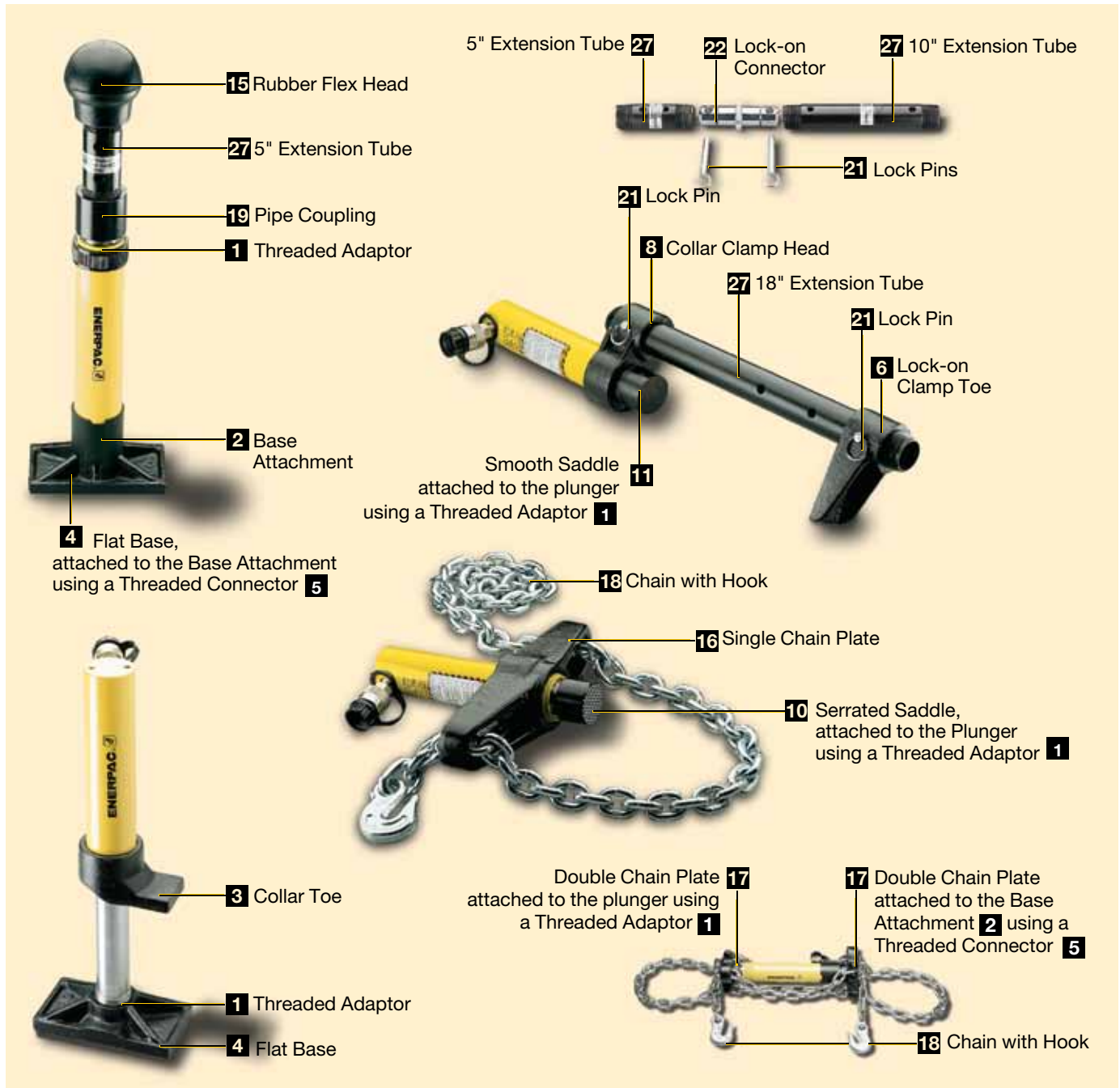
Capacity (using attachments):

**2.5-12.5 tons**

Max. Operating Pressure (using attachments):

**5,000 psi**

**▼ APPLICATION EXAMPLES**





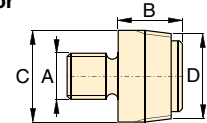
**CAUTION!** When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (5,000 psi).

Note: All dimensions in inches.

| Set Model No.                                   | MS2-4                             | MSFP-5      | MSFP-10     | MS2-10      | MS2-20    | MS2-1020               |
|---|-----------------------------------|-------------|-------------|-------------|-----------|------------------------|
| <b>Base/Collar/<br/>Plunger<br/>Attachments</b> | <b>Capacity Using Attachments</b> |             |             |             |           |                        |
|   | 2.5 tons                          | 2.5 tons    | 5.0 tons    | 5.0 tons    | 12.5 tons | 5-12.5 tons            |
| <b>Cylinder Series</b>                          | RC-5                              | RC-5        | RC-10       | RC-10       | RC-25     | RC-10, RC-25           |
| <b>1</b>  | A-23                              | A-23        | A-13        | A-13        | A-28      | A-13 / A-28            |
| <b>2</b>  | A-25                              | A-25        | A-21        | A-21        | A-27      | A-21 / A-27            |
| <b>3</b>  | A-1034                            | A-1034      | A-20        | A-20        | A-595     | A-20 / A-595           |
| <b>4</b>  | MZ-4010                           | MZ-4010     | A-14        | A-14        | A-243     | A-14 / A-243           |
| <b>5</b>  | A-545                             | A-545       | A-10        | A-10        | —         | A-10(2x)               |
| <b>6</b>  | —                                 | —           | —           | A-8         | —         | A-8                    |
| <b>7</b>  | A-530                             | A-530       | A-6         | A-6         | —         | A-6                    |
| <b>8</b>  | MZ-4011                           | —           | —           | A-192       | —         | A-192                  |
| <b>9</b>  | —                                 | —           | —           | A-305       | —         | A-305                  |
| <b>10</b>                                       | A-531                             | A-531       | A-18        | A-18        | —         | A-18                   |
| <b>11</b>                                       | —                                 | —           | —           | A-185       | —         | A-185                  |
| <b>12</b>                                       | A-532                             | A-532       | A-15        | A-15        | —         | A-15                   |
| <b>13</b>                                       | —                                 | —           | —           | —           | A-607     | A-607                  |
| <b>14</b>                                       | A-629                             | A-629       | A-129       | A-129       | —         | A-129                  |
| <b>15</b>                                       | A-539                             | A-539       | A-128       | A-128       | —         | A-128                  |
| <b>Chains and Attachments for Pulling</b>       | 2.5 tons                          | 2.5 tons    | 5.0 tons    | 5.0 tons    | 12.5 tons | 5-12.5 tons            |
| <b>Cylinder Series</b>                          | RC-5                              | RC-5        | RC-10       | RC-10       | RC-25     | RC-10, RC-25           |
| <b>16</b>                                       | A-558                             | —           | —           | A-132       | A-238     | A-132, -238            |
| <b>17</b>                                       | —                                 | —           | —           | A-5 (2x)    | —         | A-5(2x)                |
| <b>18</b>                                       | A-557(2x)                         | —           | —           | A-141(2x)   | A-218(2x) | A-141(2x) / A-218(2x)  |
| <b>Tubes, Connectors and Adaptors</b>           | 2.5 tons                          | 2.5 tons    | 5.0 tons    | 5.0 tons    | 12.5 tons | 5-12.5 tons            |
| <b>Cylinder Series</b>                          | RC-5                              | RC-5        | RC-10       | RC-10       | RC-25     | RC-10, RC-25           |
| <b>19</b>                                       | A-544                             | —           | —           | A-19(2x)    | A-242(2x) | A-19(2x) and A-242(2x) |
| <b>20</b>                                       | WR-5                              | WR-5        | WR-5        | A-92        | —         | A-92                   |
| <b>21</b>                                       | MZ-4013(4x)                       | MZ-4013(4x) | A-16(4x)    | A-16(4x)    | —         | A-16(4x)               |
| <b>22</b>                                       | MZ-4007(3x)                       | MZ-4007(3x) | MZ-1050(3x) | MZ-1050(2x) | —         | MZ-1050(3x)            |
| <b>23</b>                                       | MZ-4008(2x)                       | —           | —           | MZ-1051     | —         | MZ-1051(2x)            |
| <b>24</b>                                       | MZ-4009                           | MZ-4009     | MZ-1052     | MZ-1052     | —         | MZ-1052                |
| <b>25</b>                                       | —                                 | —           | —           | A-285       | —         | A-285                  |
| <b>26</b>                                       | A-650                             | —           | —           | —           | —         | —                      |
| <b>Length: 3"</b>                               | MZ-4002                           | MZ-4002     | —           | —           | —         | —                      |
|   | 5"                                | MZ-4003     | MZ-4003     | MZ-1002     | MZ-1002   | MZ-1002                |
|   | 10"                               | MZ-4004     | MZ-4004     | MZ-1003     | MZ-1003   | A-239<br>and A-239     |
|   | 18"                               | MZ-4005(2x) | MZ-4005     | MZ-1004     | MZ-1004   | A-240<br>and A-240     |
|   | 23"                               | MZ-4006(1x) | MZ-4006     | —           | —         | —                      |
|   | 30"                               | —           | —           | MZ-1005     | MZ-1005   | A-241<br>and A-241     |
| <b>Case</b>                                     | CM-6                              | CM-6        | CW-166      | CW-166      | CW-166    | CW-350                 |
| <b>Weight</b>                                   | 59 lbs.                           | 44 lbs.     | 105 lbs.    | 140 lbs.    | 210 lbs.  | 350 lbs.               |

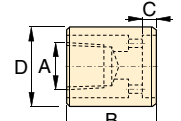
## Base/Collar/Plunger Attachments

### 1 Threaded Adaptor



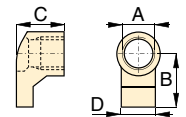
| Tons | Model No. | A            | B    | C    | D                 |
|------|-----------|--------------|------|------|-------------------|
| 2.5  | A-23      | 3/4"-16 UN   | 1.13 | 1.05 | 3/4"-14 NPT       |
| 5.0  | A-13      | 1"-8 UN      | 1.25 | 2.19 | 1 1/4"-11 1/2 NPT |
| 12.5 | A-28      | 1 1/2"-16 UN | 1.87 | 2.75 | 2"-11 1/2 NPT     |

### 2 Base Attachment



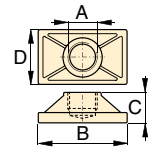
| Tons | Model No. | A                 | B    | C   | D    |
|------|-----------|-------------------|------|-----|------|
| 2.5  | A-25      | 3/4"-14 NPT       | 2.00 | .50 | 1.75 |
| 5.0  | A-21      | 1 1/4"-11 1/2 NPT | 2.25 | .50 | 2.56 |
| 12.5 | A-27      | 2"-11 1/2 NPT     | 2.50 | .50 | 3.88 |

### 3 Collar Toe



| Tons | Model No. | A             | B    | C    | D    |
|------|-----------|---------------|------|------|------|
| 2.5  | A-1034    | 1 1/2"-16 NPT | 2.13 | 1.97 | 1.25 |
| 5.0  | A-20      | 2 1/4"-14 NPT | 3.16 | 2.25 | 2.25 |
| 12.5 | A-595     | 2 5/8"-12 NPT | 4.06 | 2.03 | 3.18 |

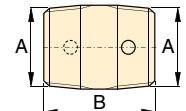
### 4 Flat Base



| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 2.5  | MZ-4010   | 3/4"-14 NPT       | 4.50 | 1.25 | 2.50 |
| 5.0  | A-14      | 1 1/4"-11 1/2 NPT | 6.50 | 1.38 | 3.50 |
| 12.5 | A-243*    | 2"-11 1/2 NPT     | 6.50 | 2.31 | 6.50 |

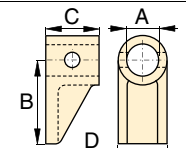
\* A-243 is a round base model

### 5 Threaded Connector



| Tons | Model No. | A                 | B    |
|------|-----------|-------------------|------|
| 2.5  | A-545     | 3/4"-14 NPT       | 1.38 |
| 5.0  | A-10      | 1 1/4"-11 1/2 NPT | 1.63 |

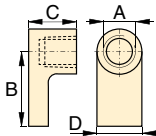
### 6 Lock-on Clamp To



| Tons | Model No. | A    | B    | C    | D    |
|------|-----------|------|------|------|------|
| 5.0  | A-8       | 1.69 | 4.13 | 2.00 | 2.25 |

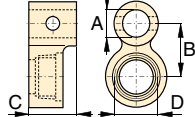
# MS-Series, Maintenance Sets

## 7 Threaded Plunger Toe



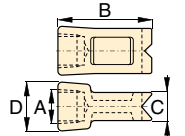
| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 2.5  | A-530     | 3/4"-14 NPT       | 2.25 | 1.00 | 1.33 |
| 5.0  | A-6       | 1 1/4"-11 1/2 NPT | 3.12 | 1.25 | 2.25 |

## 8 Collar Clamp Head



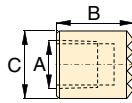
| Tons | Model No. | A           | B    | C    | D           |
|------|-----------|-------------|------|------|-------------|
| 2.5  | MZ-4011   | 3/4"-14 NPT | 1.95 | 3.00 | 1 1/2-16 UN |
| 5.0  | A-192     | 1.69        | 2.50 | 2.00 | 2 1/4-14 UN |

## 9 Spreader Toe



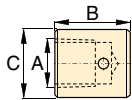
| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 5.0  | A-305     | 1 1/4"-11 1/2 NPT | 4.50 | 1.00 | 2.00 |

## 10 Serrated Saddle



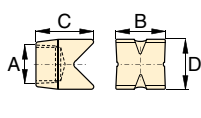
| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 2.5  | A-531     | 3/4"-14 NPT       | 1.25 | 1.09 |
| 5.0  | A-18      | 1 1/4"-11 1/2 NPT | 2.00 | 1.50 |

## 11 Smooth Saddle



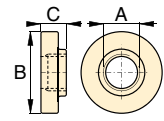
| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 5.0  | A-185     | 1 1/4"-11 1/2 NPT | 1.50 | 2.00 |

## 12 90° V-Base



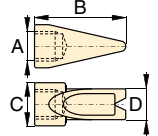
| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 2.5  | A-532     | 3/4"-14 NPT       | 1.50 | 1.88 | 1.00 |
| 5.0  | A-15      | 1 1/4"-11 1/2 NPT | 2.13 | 2.25 | 2.13 |

## 13 Plunger Base



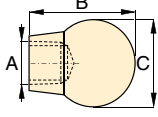
| Tons | Model No. | A             | B    | C    |
|------|-----------|---------------|------|------|
| 12.5 | A-607     | 2"-11 1/2 NPT | 6.56 | 1.53 |

## 14 Wedge Head



| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 2.5  | A-629     | 3/4"-14 NPT       | 2.75 | 1.31 | 1.13 |
| 5.0  | A-129     | 1 1/4"-11 1/2 NPT | 4.00 | 2.00 | 1.75 |

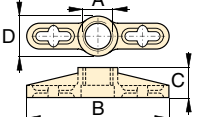
## 15 Rubber Flex-Head



| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 2.5  | A-539     | 3/4"-14 NPT       | 1.75 | 2.75 |
| 5.0  | A-128     | 1 1/4"-11 1/2 NPT | 3.40 | 3.40 |

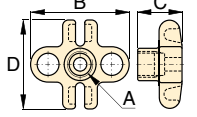
## Chains and Attachments for Pulling

### 16 Single Chain Plate



| Tons | Model No. | A             | B     | C    | D    |
|------|-----------|---------------|-------|------|------|
| 2.5  | A-588     | 1 1/2"-16 UN  | 7.75  | 1.56 | 1.75 |
| 5.0  | A-132     | 2 1/4"-14 UN  | 12.12 | 2.50 | 3.12 |
| 12.5 | A-238     | 3 5/16"-12 UN | 17.75 | 4.03 | 4.93 |

### 17 Double Chain Plate



| Tons | Model No. | A                 | B    | C    | D    |
|------|-----------|-------------------|------|------|------|
| 5.0  | A-5       | 1 1/4"-11 1/2 NPT | 6.18 | 2.00 | 4.96 |

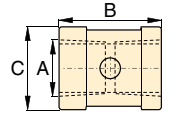
### 18 Chain with Hook



| Tons | Model No. | Chain Length |
|------|-----------|--------------|
| 2.5  | A-557     | 5 feet       |
| 5.0  | A-141     | 6 feet       |
| 12.5 | A-218     | 8 feet       |

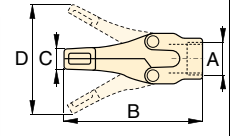
## Tubes, Connectors and Adaptors

### 19 Pipe Coupling



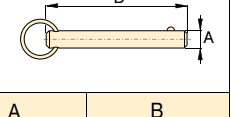
| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 2.5  | A-544     | 3/4"-14 NPT       | 1.69 | 1.31 |
| 5.0  | A-19      | 1 1/4"-11 1/2 NPT | 1.94 | 2.15 |
| 12.5 | A-242     | 2"-11 1/2 NPT     | 3.50 | 3.25 |

## 20 Spreader



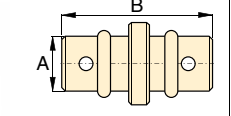
| Tons | Model No. | A            | B    | C    | D    |
|------|-----------|--------------|------|------|------|
| 1.0  | WR-5      | —            | 8.78 | .50  | 3.70 |
| 1.0  | A-92      | 2 1/4"-14 UN | 9.63 | 1.38 | 6.25 |

## 21 Lock Pin



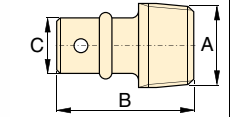
| Tons | Model No. | A   | B    |
|------|-----------|-----|------|
| 2.5  | MZ-4013   | .25 | 2.38 |
| 5.0  | A-16      | .44 | 3.25 |

## 22 Lock-on Connector



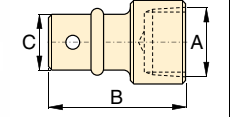
| Tons | Model No. | A    | B    |
|------|-----------|------|------|
| 2.5  | MZ-4007   | .75  | 3.12 |
| 5.0  | MZ-1050   | 1.31 | 5.00 |

## 23 Male Lock-on Adaptor



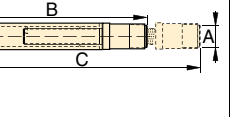
| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 2.5  | MZ-4008   | 3/4"-14 NPT       | 2.38 | .75  |
| 5.0  | MZ-1051   | 1 1/4"-11 1/2 NPT | 3.56 | 1.31 |

## 24 Female Lock-on Adaptor



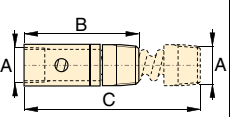
| Tons | Model No. | A                 | B    | C    |
|------|-----------|-------------------|------|------|
| 2.5  | MZ-4009   | 3/4"-14 NPT       | 2.56 | .75  |
| 5.0  | MZ-1052   | 1 1/4"-11 1/2 NPT | 3.81 | 1.31 |

## 25 Adjustable Extension



| Tons | Model No. | A                 | B     | C     | D    |
|------|-----------|-------------------|-------|-------|------|
| 5.0  | A-285     | 1 1/4"-11 1/2 NPT | 13.20 | 17.37 | 1.30 |

## 26 Slip-Lock Extension



| Tons | Model No. | A           | B    | C     |
|------|-----------|-------------|------|-------|
| 2.5  | A-650     | 3/4"-14 NPT | 7.88 | 14.37 |

▼ Shown: SP-35S



## Much Faster than Drilling...



### Tool Kit SPK-10

Included with all 35 ton punches, this tool kit is used to remove and install the punch into the head.

Can be ordered as a replacement under model number **SPK-10**.



### Ordering Information

The 35-ton hydraulic punch may be ordered by itself or as a set, including an electric, air or hand pump.

Please refer to the Quick Selection Chart information on next page.

A punch and die may also be ordered as a matched set.

- .50" thick mild steel maximum capacity
- Round, oblong and square punches and dies are available to solve your punching applications
- Long life Enerpac single-acting, spring return design
- Durable steel case keeps tools and dies together and provides for easy carrying and storage
- CR-400 female coupler included

### ▼ STANDARD PUNCH AND DIE SETS SELECTION CHART

| Hole Shape | Imperial*      |                | Metric*        |                |
|------------|----------------|----------------|----------------|----------------|
|            | Hole Size (in) | Bolt Size (in) | Hole Size (mm) | Bolt Size (mm) |
| ●          | .31            | 1/4            | 7,9            | –              |
| ●          | .38            | 5/16           | 9,5            | M8             |
| ●          | .44            | 3/8            | 11,1           | M10            |
| ●          | .53            | 7/16           | 13,5           | M12            |
| ●          | .56            | 1/2            | 14,3           | –              |
| ●          | .69            | 5/8            | 17,5           | M16            |
| ●          | .78            | –              | 19,8           | M18            |
| ●          | .81            | 3/4            | 20,6           | –              |
| ■          | .31            | 1/4            | 7,9            | –              |
| ■          | .38            | 5/16           | 9,5            | M8             |
| ■          | .44            | 3/8            | 11,1           | M10            |
| ■          | .50            | 7/16           | 12,7           | M12            |
| ○          | .31 x .75      | 1/4            | 7,9 x 19       | –              |
| ○          | .38 x .75      | 5/16           | 9,5 x 19       | M8             |
| ○          | .44 x .75      | 3/8            | 11,1 x 19      | M10            |
| ○          | .50 x .75      | 7/16           | 12,7 x 19      | M12            |


\* Material thickness should **not** exceed hole diameter.



◀ This PUD-1100B is shown with the 35 ton punch and optional gauge.

# Single-Acting, Spring Return Hydraulic Punch

## ▼ QUICK SELECTION CHART

|  | Included          |            |            |         | Model Number | Weight<br><br>(lbs) |
|---|-------------------|------------|------------|---------|--------------|---------------------|
|   | Punch and Die Set | Pump       | Pump Type* | Hose    |              |                     |
| SP-35   | -                 | -          | -          | -       | SP-35        | 35                  |
| SP-35   | Standard**        | -          | -          | -       | SP-35S       | 40                  |
| SP-35   | Standard**        | PUD-1100B  | E          | HC-7206 | SP-35SP      | 70                  |
| SP-35   | Metric***         | -          | -          | -       | MSP-351      | 40                  |
| SP-35   | Standard**        | P-392      | H          | HC-7206 | STP-35H      | 55                  |
| SP-35   | Standard**        | PATG-1102N | A          | HC-7206 | STP-35A      | 63                  |

\* Punch oil capacity: 4.58 in<sup>3</sup>

Includes the following punch and die sets:

\*\* SPD-438, SPD-688, SPD-563 and SPD-813

\*\*\* SPD-375, SPD-531, SPD-438 and SPD-688

\* E = Electric

H = Hand

A = Air operated

## SP Series



Capacity:

### 35 tons

Hole Sizes:

### 0.31-0.81 inch

Maximum Operating Pressure:

### 10,000 psi



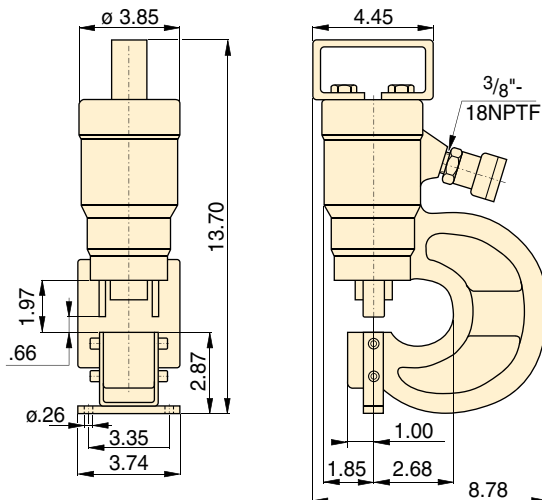
### CAUTION!


Chart below is for reference only! Maximum allowable material thickness to be punched varies with set wear.



### CAUTION!

Material thickness should not exceed hole diameter.



|  | Maximum Allowable Material Thickness To Be Punched |     |     |     |     |     |     |     |     |     |     |
|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|   | (in)   |     |     |     |     |     |     |     |     |     |     |
| Model No.   | 1  | 2)  | 3)  | 4)  | 5)  | 6)  | 7)  | 8)  | 9)  | 10) | 11) |
| SPD-313   | .31  | .31 | .25 | .25 | .25 | .25 | .13 | .19 | .25 | .25 | .25 |
| SPD-375   | .38  | .38 | .31 | .31 | .31 | .31 | .19 | .25 | .31 | .31 | .31 |
| SPD-438   | .44  | .44 | .38 | .38 | .38 | .31 | .19 | .31 | .31 | .31 | .31 |
| SPD-531   | .50  | .50 | .44 | .44 | .44 | .38 | .25 | .31 | .38 | .38 | .38 |
| SPD-563   | .50  | .50 | .50 | .44 | .50 | .44 | .25 | .38 | .44 | .44 | .44 |
| SPD-688   | .50  | .50 | .50 | .44 | .50 | .40 | .25 | .31 | .40 | .40 | .40 |
| SPD-781   | .50  | .50 | .50 | .44 | .50 | .38 | .25 | .31 | .38 | .39 | .38 |
| SPD-813   | .50  | .50 | .50 | .44 | .50 | .31 | .19 | .31 | .31 | .31 | .31 |
| SPD-458   | .31  | .31 | .25 | .25 | .25 | .25 | .13 | .19 | .25 | .25 | .25 |
| SPD-549   | .38  | .38 | .31 | .31 | .31 | .31 | .19 | .25 | .31 | .31 | .31 |
| SPD-639   | .44  | .44 | .38 | .38 | .38 | .31 | .19 | .31 | .31 | .31 | .31 |
| SPD-728   | .50  | .50 | .44 | .44 | .44 | .38 | .25 | .31 | .38 | .38 | .34 |
| SPD-106   | .31  | .31 | .25 | .25 | .25 | .25 | .13 | .19 | .25 | .25 | .25 |
| SPD-125   | .38  | .38 | .31 | .31 | .31 | .31 | .19 | .25 | .31 | .31 | .31 |
| SPD-188   | .44  | .44 | .38 | .38 | .38 | .31 | .19 | .31 | .31 | .31 | .31 |
| SPD-250   | .50  | .50 | .44 | .44 | .44 | .38 | .25 | .31 | .38 | .38 | .38 |

### Steel Qualities (see table):

- 1) Mild A-7
- 2) Boiler Plate
- 3) Structural A-36
- 4) Struct Corten (ASTM A242)
- 5) Cold Rolled C-1018
- 6) Hot Rolled C-1050
- 7) Hot Rolled C-1095
- 8) Hot Rolled C-1095 Annealed
- 9) Stainless Annealed
- 10) Stainless 304 Hot Rolled
- 11) Stainless 316 Cold Rolled

▼ Shown: SP-50100



- Available as a complete set including electric pump and hoses
- Double-acting cylinder design for fast cycle times
- Punch and die changeover tools included
- Lifting handle for easy carrying
- Adjustable power stripper prevents movement of the metal during stripping
- CR-400 female couplers included



◀ Save time using this 50-ton Enerpac Punch.

## Cuts the Time Spent Forming Holes



### Depth Stop

For simplified repetitive punching applications an adjustable Depth Stop is available.

Order model number: **SP-110.**



### Foot Mounting Kit

A foot mounting kit for easy mounting of the 50 ton punch to workbench or fixture is available.

Please order: **SP-120.**



### Ordering Information


The 50-ton Hydraulic Punch may be ordered by itself or as a set with an electric pump. A punch and die may be ordered as a matched set. Please refer to the selection chart information.

▼ Shown below is the 50 ton punch with SP-120 and SP-110 assembled.



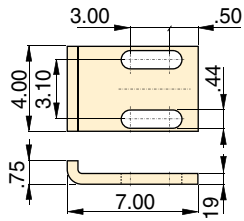
# 50 Ton Hydraulic Punch

## ▼ QUICK SELECTION CHART PUNCH SETS

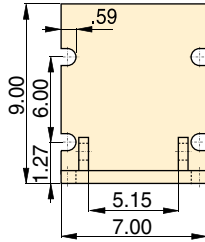
| Model Number<br>Punch* | Included  |            |           | Set Model Number | Weight<br><br>(lbs) |
|------------------------|---|------------|-----------|------------------|---------------------|
|                        | Punch & Die Sets<br> | Pump       | Hose (2x) |                  |                     |
| SP-50                  | All**   | -          | -         | SP-50100         | 255                 |
| SP-50                  | All**   | ZE4410SB-N | HC-7206   | SP-5000          | 384                 |

\* Punch Oil Capacity:  
Advance: 17 in<sup>3</sup>  
Retract: 14 in<sup>3</sup>

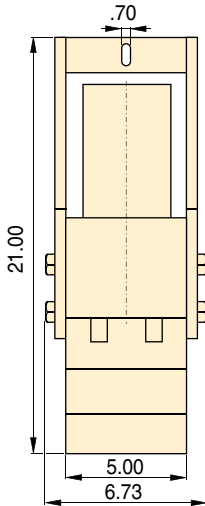
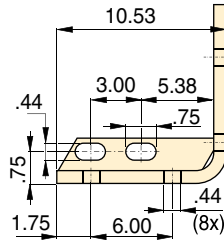
\*\* All standard sets from chart below.



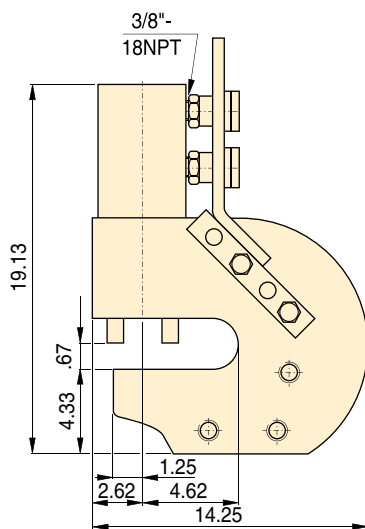
SP-110



SP-120



SP-50



## SP Series



Capacity:

**50 tons**

Hole Sizes:

**0.53-1.03 inches**

Maximum Operating Pressure:

**10,000 psi**



### CAUTION!

Material thickness should not exceed hole diameter.




### CAUTION!

Chart below is for reference only! Maximum allowable material thickness to be punched varies with set wear.

### Steel Qualities (see table below):

- 1) Mild A-7
- 2) Boiler Plate
- 3) Structural A-36
- 4) Struct Corten (ASTM A242)
- 5) Cold Rolled C-1018
- 6) Hot Rolled C-1050
- 7) Hot Rolled C-1095
- 8) Hot Rolled C-1095 Annealed
- 9) Stainless Annealed
- 10) Stainless 304 Hot Rolled
- 11) Stainless 316 Cold Rolled

## ▼ STANDARD PUNCH AND DIE SELECTION CHART

| Hole Shape | Hole Size<br><br>(in) | Bolt Size<br><br>(in) | Standard Punch and Die Set<br><br><br>Model Numbers | Maximum Allowable Material Thickness<br>To Be Punched<br><br>(in) |     |     |     |     |     |     |     |     |     |     |
|------------|-----------------------|-----------------------|--|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|            |                       |                       |  | 1)  | 2)  | 3)  | 4)  | 5)  | 6)  | 7)  | 8)  | 9)  | 10) | 11) |
| ●          | .53                   | 1/2                   | SP-150   | .53   | .53 | .53 | .53 | .53 | .49 | .32 | .40 | .49 | .49 | .49 |
| ●          | .66                   | 5/8                   | SP-170   | .56   | .56 | .56 | .50 | .56 | .51 | .32 | .40 | .51 | .51 | .51 |
| ●          | .78                   | 3/4                   | SP-190   | .56   | .56 | .56 | .50 | .56 | .49 | .32 | .40 | .49 | .50 | .49 |
| ●          | .91                   | 7/8                   | SP-121   | .56   | .56 | .56 | .50 | .56 | .35 | .22 | .35 | .35 | .35 | .35 |
| ●          | 1.03                  | 1                     | SP-123   | .56   | .56 | .56 | .44 | .56 | .31 | .19 | .31 | .31 | .31 | .31 |



▼ Shown: LW-16 with SB-2 and optional LWB-1



## LW Series

Minimum Clearance:

**.39 inches**

Maximum Lift Height:

**2.02\*-2.72\* inches**

Maximum Force:

**16 tons**

Maximum Operating Pressure:

**10,000 psi**



### ER-Series Load Skates

In combination with the Enerpac Lifting Wedge we recommend Load Skates for moving heavy loads.

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### Split-Flow Manifolds

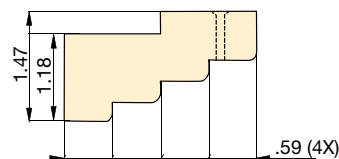
Split Flow Valves to control two or four lifting wedges simultaneously.

AM-21 with 3 ports 3/8" NPTF.

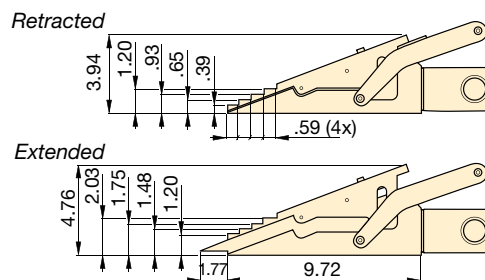
AM-41 with 5 ports 3/8" NPTF.

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- Requires .39 inch access gap
- Lifting force 16 ton at 10,000 psi hydraulic pressure
- Automatic mechanical retraction (single acting)
- Securely raises or lowers 16 tons with no slippage
- Lifting wedge LW-16 includes safety block SB-2
- Use in tandem to lift 32 tons, or 64 tons
- .83 inch of vertical lift from each step (maximum lift to 2.72 inches with optional LWB-1 stepped block)



### ▲ Optional LWB-1 Stepped Block



### LW-16

| Max. Lifting Force (ton) | Model No. | Minimum Clearance Gap (in) | Max. Lift per Stage (in) | Max. Lifting Height (in) | Max. Lifting Height Using Stepped Block (in) | Oil Capacity (in <sup>3</sup> ) | Weight (lbs) |
|--------------------------|-----------|----------------------------|--------------------------|--------------------------|--|---------------------------------|--------------|
| 16                       | LW-16     | .39                        | .83                      | 2.02                     | 2.72   | 4.75                            | 15.4         |

\*Use optional stepped block LWB-1 to increase wedge lifting height 1.18 inches.

▼ For lifting heavy equipment with minimum floor clearance the LW-16 is the ideal tool.



▼ Shown from left to right: SOH-10-6, SOH-23-6



## SOH Series

Lifting Capacity:

**8.5-20 tons**

Stroke:

**5.39-6.18 inches**

Toe Clearance:

**0.79-1.18 inches**

Maximum Operating Pressure:

**10,000 psi**

- For lifting heavy equipment with minimum available access
- Remote operation of hydraulic pump enhances safety
- Low-height lifting toe
- Precision guided to reduce friction and isolate cylinder from side-loads
- Two extendable support feet provide extra stability
- Includes RC-Series cylinder with CR-400 coupler



### RSM Flat-Jac®

Low height, single acting spring-return cylinders are ideal for space restricted applications.

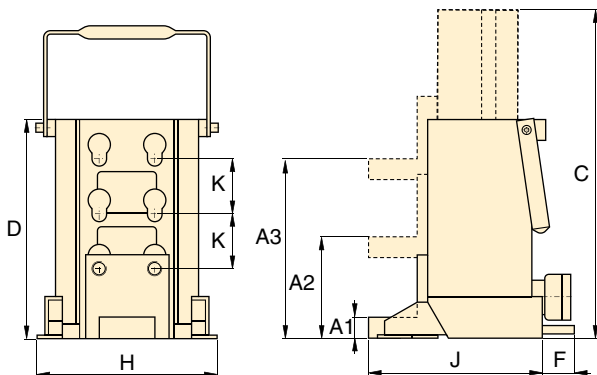
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### Best Match Manual Pump

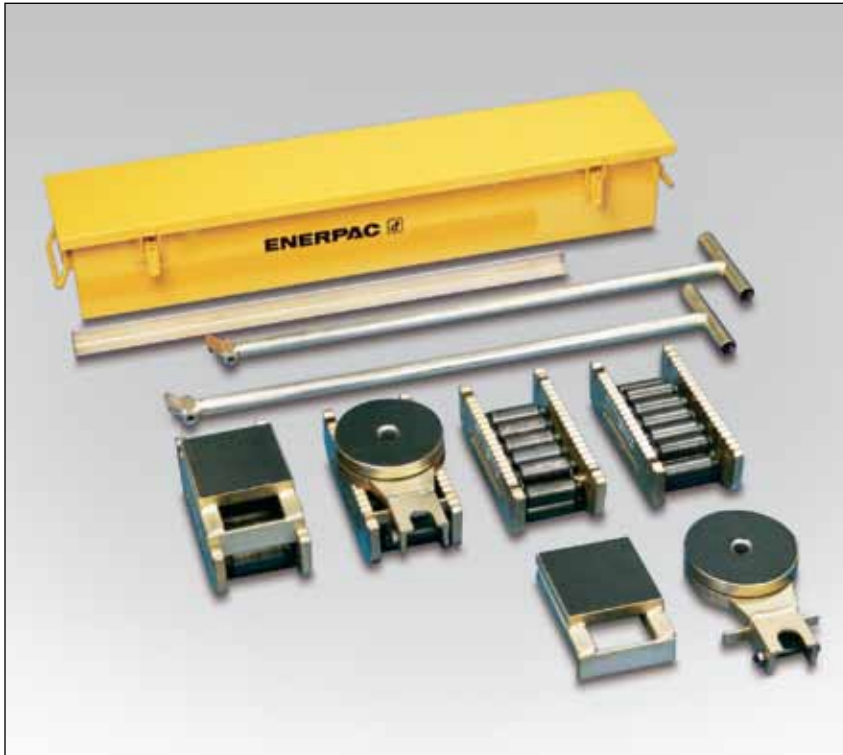
To power your Enerpac Lifting Wedge, The Enerpac P-392 Hand Pump or P-392FP Foot Pump is an ideal choice.

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| Capacity<br>(ton) | Toe Clearance with Cylinder Retracted<br>(in) |               |               | Stroke<br>(in) | Model<br>Number | Oil<br>Capacity<br>(in <sup>3</sup> ) | Dimensions (in)           |                           |                 |       |       | Weight<br>(lbs) |       |
|-------------------|---|---------------|---------------|----------------|-----------------|---------------------------------------|---------------------------|---------------------------|-----------------|-------|-------|-----------------|-------|
|                   | Minimum<br>A1                                 | Central<br>A2 | Maximum<br>A3 |                |                 |                                       | Total Ext.<br>Height<br>C | Total Body<br>Height<br>D | F               | H     | J     |                 | K     |
|                   | <b>8.5</b>                                    | .79           | 3.74          |                |                 |                                       | 6.69                      | 5.39                      | <b>SOH-10-6</b> | 13.7  | 17.00 |                 | 11.61 |
| <b>20</b>         | 1.18  | 4.33          | 7.48          | 6.18           | <b>SOH-23-6</b> | 32.0                                  | 18.58                     | 12.40                     | 2.56            | 10.24 | 9.84  | 3.15            | 99.2  |

▼ Shown: Set ERS-20



## Move Heavy Loads Easily and Safely



Sets (see table) include all components necessary to handle a variety of applications. Two **ELB-1** link-up bars, two **ERH-1** handles (34.6" long) and one **EMB-1** metal box are included. Optional long handle **ERH-2** (46") also available.



### Lifting Wedge and Machine Lifts

To place the Load Skates, the load must first be lifted. This can be done easily and safely using Enerpac Lifting Wedge or Machine Lifts.

- Rugged and sturdy construction for long life
- Low profile construction for increased stability
- Low rolling-resistance allows for easy load movement
- Attachable load leveling plates and swivel turntables for turning corners

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▼ Load Skates may be ordered separately or as a matched set.

| Set Capacity*<br>(tons) | Set Model Number | Load Skates (4)  | Turntable Swivels (2)   | Leveling Plates (2)   | Weight Including handles and metal box<br>(lbs) |
|-------------------------|------------------|--|---|---|---|
|                         |                  |  |  |  |   |
| 20                      | ERS-20           | ER-10  | ES-10   | ELP-10  | 110   |
| 30                      | ERS-30           | ER-15  | ES-15   | ELP-15  | 123   |
| 60                      | ERS-60           | ER-30  | ES-30   | ELP-30  | 167   |

\* Sets are designed to enable two skates to take full load for extra safety on uneven floor surfaces

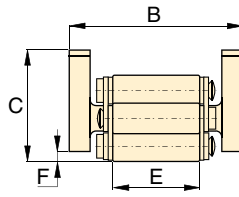
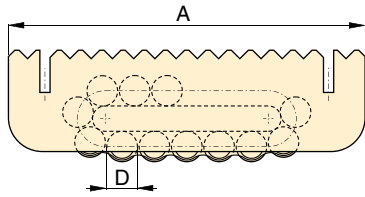
◀ Heavy transport using Load Skates. The machine is first lifted, using SOH-Series Enerpac Machine Lifts.

# Heavy-Duty Caterroller™ Load Skates

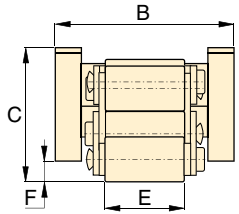
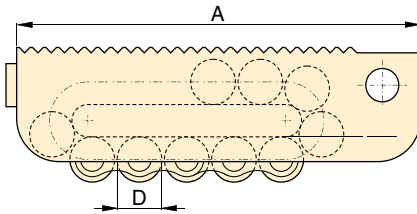
**ELP,  
ER,  
ES  
Series**



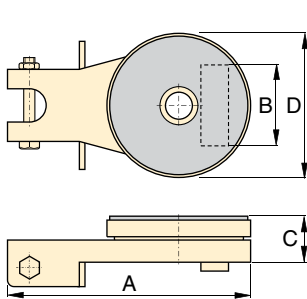
Maximum Carrying Capacity:  
**80 tons**



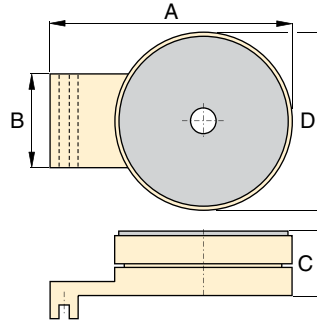
**ER-1, ER-10, ER-15, ER-30**



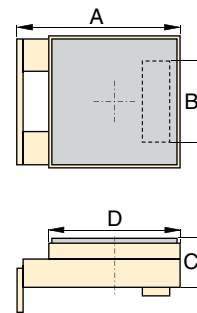
**ER-60, ER-80**



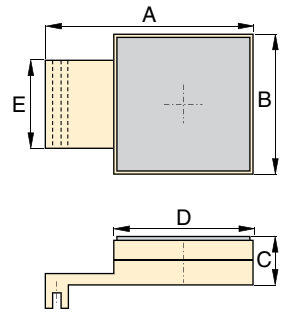
**Turntable Swivel  
ES-1, ES-10, ES-15, ES-30**





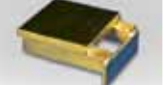
**Turntable Swivel  
ES-60, ES-80**



**Leveling Plate  
ELP-10  
ELP-15  
ELP-30**



**Leveling Plate  
ELP-60  
ELP-80**

|  | Capacity<br>(ton) | Model<br>Number | Dimensions (inch) |      |      |      |      |     | Contact<br>Rolls per<br>Skate | Rollers per<br>Skate | Weight<br>(lbs) |
|--|-------------------|-----------------|-------------------|------|------|------|------|-----|-------------------------------|----------------------|-----------------|
|  |                   |                 | A                 | B    | C    | D    | E    | F   |                               |                      |                 |
| <b>Load<br/>Skates</b><br>      | 1                 | ER-1            | 6.30              | 3.94 | 2.56 | .71  | 2.00 | .16 | 4                             | 11                   | 8.4             |
|  | 10                | ER-10           | 8.27              | 3.94 | 2.63 | .71  | 2.00 | .24 | 5                             | 15                   | 11.5            |
|  | 15                | ER-15           | 8.69              | 4.45 | 2.95 | .94  | 2.38 | .39 | 4                             | 13                   | 16.0            |
|  | 30                | ER-30           | 10.63             | 5.13 | 3.63 | 1.18 | 2.69 | .39 | 4                             | 13                   | 28.6            |
|  | 60                | ER-60           | 15.00             | 6.63 | 4.94 | 1.65 | 3.00 | .63 | 4                             | 13                   | 70.4            |
|  | 80                | ER-80           | 20.88             | 7.19 | 5.75 | 1.97 | 3.38 | .75 | 6                             | 17                   | 134.2           |
| <b>Turntable<br/>Swivel</b><br> | 1                 | ES-1            | 8.15              | 3.42 | 1.02 | 3.54 | -    | -   | -                             | -                    | 2.4             |
|  | 10                | ES-10           | 8.66              | 2.87 | 1.65 | 5.12 | -    | -   | -                             | -                    | 8.1             |
|  | 15                | ES-15           | 8.66              | 3.38 | 1.65 | 5.12 | -    | -   | -                             | -                    | 8.1             |
|  | 30                | ES-30           | 9.87              | 3.78 | 1.89 | 5.91 | -    | -   | -                             | -                    | 11.7            |
|  | 60                | ES-60           | 10.83             | 4.50 | 2.40 | 7.48 | -    | -   | -                             | -                    | 30.1            |
|  | 80                | ES-80           | 14.19             | 5.06 | 2.40 | 8.66 | -    | -   | -                             | -                    | 41.6            |
| <b>Leveling<br/>Plate</b><br>   | 10                | ELP-10          | 5.87              | 2.87 | 1.65 | 4.72 | -    | -   | -                             | -                    | 8.1             |
|  | 15                | ELP-15          | 5.87              | 3.38 | 1.65 | 4.72 | -    | -   | -                             | -                    | 8.1             |
|  | 30                | ELP-30          | 7.00              | 3.78 | 1.89 | 5.31 | -    | -   | -                             | -                    | 11.6            |
|  | 60                | ELP-60          | 10.63             | 4.50 | 2.40 | 7.09 | 4.49 | -   | -                             | -                    | 30.4            |
|  | 80                | ELP-80          | 13.78             | 5.06 | 2.40 | 7.87 | 5.04 | -   | -                             | -                    | 41.4            |

▼ Shown: **CM-16**



- Protect your equipment from dust, water, grease and dirt
- Reduce losses on the jobsite, maintenance area or shop
- Durable steel, painted with rust-resistant primer and finished in durable enamel
- Heavy duty hinges and lifting handles
- Lockable

▼ When not storing the lifting system, this heavy-duty storage case doubles as a work station.



## CM Series

Case Size:

**.67-16 Cubic Ft.**

## Protect your Equipment



### Maintenance Sets

Enerpac Maintenance sets are a complete assortment of accessories matched to hydraulic powered tools. Using these sets allows you to quickly configure a unique tool to meet your most difficult jobs.

Built around the Enerpac lightweight hand pump, hose and cylinder, these sets enable you to push, pull, lift, press, straighten, spread and clamp with forces up to 12.5 tons.



### Hydraulic Pullers

These hydraulic pullers eliminate time-consuming and unsafe hammering, heating or prying.

Damage to parts is minimized through the use of controlled hydraulic power.

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| Case Size          | Model Number | Dimensions<br>L x W x H | Thickness | Weight |
|--------------------|--------------|-------------------------|-----------|--------|
| (ft <sup>3</sup> ) |              | (in)                    | (in)      | (lb)   |
| .67                | <b>CM-6</b>  | 23.5 x 7 x 7            | .035      | 15.4   |
| 1.13               | <b>CM-1</b>  | 25 x 11.5 x 6.6         | .035      | 17.6   |
| 4.50               | <b>CM-4</b>  | 31 x 18 x 14            | .059      | 35.3   |
| 7.50               | <b>CM-7</b>  | 47.5 x 15 x 18          | .074      | 125.7  |
| 16.00              | <b>CM-16</b> | 48 x 24 x 24            | .059      | 121.3  |

# Hydraulic Wedgie and Spread Cylinders

▼ Shown clockwise from top: WR-5, A-92, WR-15



## A, WR Series

Capacity:  
**0.75-1.00 ton**

Tip Clearance:  
**0.50-1.38 inches**

Maximum Spread Range:  
**3.70-11.50 inches**

Maximum Operating Pressure:  
**10,000 psi**



**RC-Series DUO Cylinders**  
10 ton RC-Series DUO cylinders (except RC-101) fit into A-92 Spreader Attachment.

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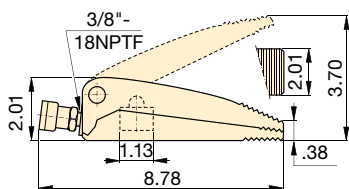


**Best Match Hand Pump**  
To power your WR5 and WR15 the P-392 hand pump is an ideal choice.

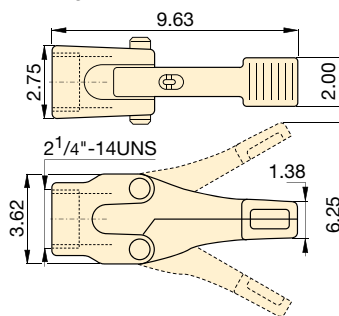
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- Single-acting, spring return
- WR-15: For long stroke spreading applications
- WR-5: For use in very confined work areas
- A-92: Spreader attachment screws onto RC-Series 10 ton cylinders (except RC-101)

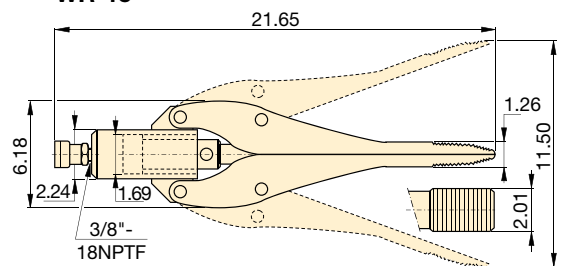
WR-5



A-92



WR-15



◀ A WR-5 wedgie cylinder is used to position a concrete block on a construction site.

| Spreader Capacity | Tip Clearance | Model Number | Maximum Spread | Cylinder Effective Area | Oil Capacity       | Wt.   |
|-------------------|---------------|--------------|----------------|-------------------------|--------------------|-------|
| (ton)             | (in)          |              | (in)           | (in <sup>2</sup> )      | (in <sup>3</sup> ) | (lbs) |
| 1.00              | .50           | WR-5         | 3.70           | 1.00                    | .61                | 5.0   |
| .75               | 1.26          | WR-15        | 11.50          | 2.25                    | 3.91               | 25.0  |
| 1.00              | 1.38          | A-92         | 6.25           | -                       | -                  | 8.0   |

▼ Shown from left to right: **WHC-3380, WHC-750**



- Single acting, spring return on all models, except WHR-1250
- Guillotine action for efficient operation
- Lifting handles on larger models
- Carrying bag included for easy carrying and tool protection
- Ideal for use with most Enerpac pumps featuring 3-way valve or dump valve and 10,000 psi pressure rating (except WHR-1250, which requires 4-way valve)
- CR-400 coupler and dust cap included on all models

## WHC, WHR Series

Capacity:

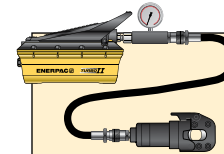
**3-20 tons**

Cutting Capacity:

**0.50-4 inches**

Maximum Operating Pressure:

**10,000 psi**



### Cutterhead Sets

Hydraulic Cutterheads are available as sets (pump, tool and hose).

| Cutter Model Number | Pump Model Number | Set Model Number * |
|---------------------|-------------------|--------------------|
| WHC-750             | P-392             | <b>STC-750H</b>    |
| WHC-750             | P-392FP           | <b>STC-750FP</b>   |
| WHC-750             | PATG-1102N        | <b>STC-750A</b>    |
| WHC-1250            | P-392             | <b>STC-1250H</b>   |
| WHC-1250            | P-392FP           | <b>STC-1250FP</b>  |
| WHC-1250            | PATG-1102N        | <b>STC-1250A</b>   |

\*H = Hand Pump, A = Air Operated Pump  
FP = Foot Pump

▼ Steel rope is easily cut with the smooth guillotine action of an Enerpac cutterhead.



### ▼ Selection Chart Maximum Cutting Capacities (diameter in inches)

| Cutter Head Operation | Capacity (ton) | Model Number | Oil Capacity (in <sup>3</sup> ) | Length (in) | Steel Wire Rope, Hemp-core or IWRC<br>6x7<br>6x12<br>6x19 | Round Bar          |                      |                  |                 | Wire Strand              |                            |      | Cable                  |                     | Wt. (lbs) | Replacement Blades |                           |
|-----------------------|----------------|--------------|---------------------------------|-------------|---|--------------------|----------------------|------------------|-----------------|--------------------------|----------------------------|------|------------------------|---------------------|-----------|--------------------|---------------------------|
|                       |                |              |                                 |             |   | Copper Wire or Bar | Aluminum Wire or Bar | Soft Steel Bolts | Reinforcing Bar | Bare Copper Wire Strands | Bare Aluminum Wire Strands | ACSR | Guy Steel Wire Strands | Telephone Cable CPP |           |                    | Underground Cable (Power) |
| Single-acting         | 4              | WHC-750*     | 1.2                             | 5.0         | .63   | .75                | .75                  | .75              | .50***          | .75                      | .75                        | .75  | .63                    | ☆                   | ☆         | 7                  | WCB-750                   |
|                       | 20             | WHC-1250*    | 8.2                             | 11.00       | 1.25  | 1.13               | 1.25                 | 1.13             | 1.00            | 1.25                     | 1.25                       | 1.25 | .88                    | ☆                   | ☆         | 25                 | WCB-1250                  |
|                       | 13             | WHC-2000     | 7.3                             | 15.00       | 1.00  | 1.25               | 1.25                 | .88              | ☆               | 2.00                     | 2.00                       | 2.00 | .75                    | ☆                   | 2.00      | 23                 | WCB-2000                  |
|                       | 3              | WHC-3380     | 4.0                             | 19.00       | ☆   | ☆                  | ☆                    | ☆                | ☆               | 1.63                     | 1.69                       | ☆    | ☆                      | 3.38                | 3.38      | 20                 | WCB-3380                  |
|                       | 8              | WHC-4000     | 8.4                             | 24.00       | ☆   | ☆                  | ☆                    | ☆                | ☆               | ☆                        | ☆                          | ☆    | ☆                      | 4.00                | 4.00      | 32                 | WCB-4000                  |
| D/A**                 | 20             | WHR-1250     | 7.5                             | 16.50       | 1.25  | 1.25               | 1.25                 | 1.13             | 1.00            | 1.25                     | 1.25                       | 1.25 | .88                    | ☆                   | ☆         | 26                 | WCB-1250                  |

\* Available in sets. \*\* D/A = Double-acting \*\*\* Low Alloy

☆ Will not cut designated material

# Self-Contained Hydraulic Cutters

▼ Shown from left to right: **WMC-2000, WMC-750**



## WMC Series

Capacity:

**3-20 tons**

Maximum Material Diameter:

**0.38-3.38 inches**

Maximum Operating Pressure:

**10,000 psi**



### Replacement Blades

To order 60-62HRc hardened replacement blades use one of the model numbers shown below.

| For Cutter Model Number | Order Blade Model Number |
|-------------------------|--------------------------|
| WMC-580                 | <b>WCB-750</b>           |
| WMC-750                 | <b>WCB-750</b>           |
| WMC-1000                | <b>WCB-1000</b>          |
| WMC-1250                | <b>WCB-1250</b>          |
| WMC-1580                | <b>WCB-1580</b>          |
| WMC-2000                | <b>WCB-2000</b>          |
| WMC-3380                | <b>WCB-3380</b>          |

- Rotating heads for operator convenience
- Guillotine action (except WMC-1000) for efficient operation
- Carrying bag included for easy carrying and tool protection
- Velcro straps to secure handles on larger models for easy transportation
- Spring return on all models
- Lightweight, self-contained tool, can be used anywhere



### Caution!

A “☆” in the charts on these pages means that this hydraulic cutter is not designed to cut this size or type of material. Any attempt to do so may result in personal injury and damage to the unit and will void the warranty.

### ▼ Selection Chart Maximum Cutting Capacities (diameter in inches)

| Capacity<br>(ton) | Model Number     | Length<br>(in) | Steel Wire Rope, Hemp-core or IWRC<br>6x7<br>6x12<br>6x19 | Round Bar          |                      |                  |                 | Wire Strand              |                                   |                   |                               |                                | Cable               |                           | Weight<br>(lbs) |
|-------------------|------------------|----------------|---|--------------------|----------------------|------------------|-----------------|--------------------------|-----------------------------------|-------------------|-------------------------------|--------------------------------|---------------------|---------------------------|-----------------|
|                   |                  |                |   | Copper Wire or Bar | Aluminum Wire or Bar | Soft Steel Bolts | Reinforcing Bar | Bare Copper Wire Strands | Bare Aluminum Wire Strands<br>6x7 | ACSR Wire Strands | Guy Steel Wire Strands<br>1x7 | Guy Steel Wire Strands<br>1x19 | Telephone Cable CPP | Underground Cable (Power) |                 |
| 4                 | <b>WMC-580</b>   | 15.00          | .63   | .63                | .63                  | .63              | .38             | .63                      | .63                               | .63               | .56                           | .56                            | ☆                   | .63                       | 8               |
| 4                 | <b>WMC-750</b>   | 15.00          | .63   | .69                | .69                  | .69              | .50***          | .75                      | .75                               | .75               | .56                           | .56                            | ☆                   | .68                       | 8               |
| 20                | <b>WMC-1000*</b> | 26.75          | ☆   | .75                | .75                  | .75              | .75             | ☆                        | ☆                                 | ☆                 | ☆                             | ☆                              | ☆                   | ☆                         | 25              |
| 20                | <b>WMC-1250</b>  | 26.75          | 1.25  | 1.13               | 1.25                 | 1.25             | .88             | 1.25                     | 1.25                              | 1.25              | .88                           | 1.00                           | ☆                   | ☆                         | 23              |
| 6                 | <b>WMC-1580</b>  | 22.00          | .75   | .75                | .75                  | .75              | ☆               | 1.50                     | 1.63                              | 1.63              | .63                           | .63                            | ☆                   | 1.63                      | 15              |
| 13                | <b>WMC-2000</b>  | 24.75          | 1.00  | 1.25               | 1.25                 | .88              | ☆               | 2.00                     | 2.00                              | 2.00              | .75                           | .75                            | ☆                   | 2.00                      | 24              |
| 3                 | <b>WMC-3380</b>  | 26.00          | ☆   | ☆                  | ☆                    | ☆                | ☆               | 1.83                     | 1.69                              | ☆                 | ☆                             | ☆                              | 3.37                | 3.38                      | 22              |

\* Cuts .50" alloy chain grade 70 (type G7 transport or tie-down) or grade 80 (for overhead lifting applications)

☆ Will not cut designated material

\*\*\* Low Alloy



▼ Shown: **STB-101H**



## Quick, Safe and Wrinkle-free Bending

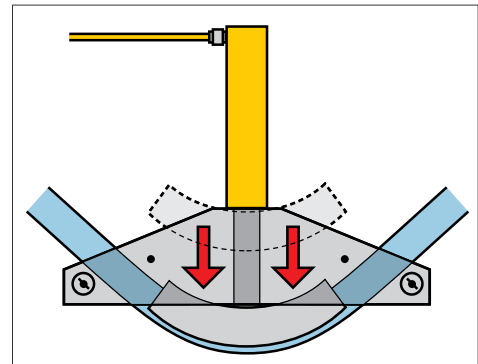


### 'One Shot' and 'Sweep'

One shot shoes give up to a 90° bend without resetting.




Sweep shoes are used where increased radii are required for multiple parallel pipe installations.

- Makes smooth, wrinkle-free bends
- Sets include cylinder, hose and manual, air or electric pump
- Sets are also available without hydraulics
- Bending shoes and bending frame are lightweight, heat-treated aluminum
- All sets include sturdy steel storage case
- All sets include BZ-12091 angle indicator for accurate bending
- BZ-12377 Shoe Lock Pin included in every set
- Eject-O-Matic™ benders (STB-202 models) use a double-acting cylinder to eject pipe from the bending shoe



▲ Typical one shot bending operation.

### ▼ SELECTION CHART

| Pipe Range |        | Set Model Number       | Hand Pump*  | Air Pump*   | Electric Pump*  | Cylinder* | Hose*        | Steel Case* | Saddle | Weight (includes steel case) |
|------------|--------|------------------------|---|---|---|-----------|--------------|-------------|--------|------------------------------|
| One Shot   | Sweep  |                        |  |  |  |           |              |             |        |                              |
| ½ - 2      | -      | STB-101X               | -   | -   | -   | -         | -            | CM-4        | A-12   | 88                           |
|            |        | STB-101N               | -   | -   | -   | RC-1010   | HC-7206      | CM-4        | A-12   | 105                          |
|            |        | STB-101H               | P-392   | -   | -   | RC-1010   | HC-7206      | CM-4        | A-12   | 114                          |
|            |        | STB-101A               | -   | PATG-1102N  | -   | RC-1010   | HC-7206      | CM-4        | A-12   | 119                          |
|            |        | STB-101B               | -   | -   | PUJ-1200B <sup>2)</sup>   | RC-1010   | HC-7206      | CM-4        | A-12   | 127                          |
| 1 - 2      | 2½ - 4 | STB-221X               | -   | -   | -   | -         | -            | CM-7        | A-29   | 229                          |
|            |        | STB-221N               | -   | -   | -   | RC-2510   | HC-7206      | CM-7        | A-29   | 263                          |
|            |        | STB-221H               | P-80  | -   | -   | RC-2510   | HC-7206      | CM-7        | A-29   | 286                          |
| 1¼ - 4     | -      | STB-202X <sup>1)</sup> | -   | -   | -   | -         | -            | CM-7        | A-29   | 316                          |
|            |        | STB-202N <sup>1)</sup> | -   | -   | -   | RR-3014   | HC-7206 (2x) | CM-7        | A-29   | 383                          |
|            |        | STB-202B <sup>1)</sup> | -   | -   | ZU4408SB <sup>2)</sup>  | RR-3014   | HC-7206 (2x) | CM-7        | A-29   | 467                          |

\* See corresponding sections of this catalog for more detailed specifications.

<sup>1)</sup> Eject-O-Matic™    <sup>2)</sup> For 230 volt applications change the last digit of Set Model Number from "B" to "E".

# Pipe Bender Sets

| Nominal pipe size (outside dia.)<br>(in) | Wall Thickness<br>(in) | Schedule Pipe * | Pipe Bend Inside Radius<br>(in) | STB-101          | STB-221                         | STB-202            | One Shot Bending Shoe Model Number | Sweep Bending Shoe Model Number |
|--|------------------------|-----------------|---------------------------------|------------------|---------------------------------|--------------------|------------------------------------|---------------------------------|
|  |                        |                 |                                 | 1/2 - 2 One Shot | 1-2 One Shot<br>2 1/2 - 4 Sweep | 1 1/4 - 4 One Shot |                                    |                                 |
| 1/2<br>(.840)                            | .109                   | 40              | 2 7/8                           | Yes              | -                               | -                  | BZ-12011                           | -                               |
|  | .147                   | 80              |                                 | Yes              | -                               | -                  |                                    |                                 |
|  | .187                   | 160             |                                 | WS               | -                               | -                  |                                    |                                 |
|  | .294                   | DEH             |                                 | WS               | -                               | -                  |                                    |                                 |
| 3/4<br>(1.050)                           | .113                   | 40              | 4                               | Yes              | -                               | -                  | BZ-12021                           | -                               |
|  | .154                   | 80              |                                 | Yes              | -                               | -                  |                                    |                                 |
|  | .218                   | 160             |                                 | WS               | -                               | -                  |                                    |                                 |
|  | .308                   | DEH             |                                 | WS               | -                               | -                  |                                    |                                 |
| 1<br>(1.315)                             | .133                   | 40              | 5 1/8                           | Yes              | Yes                             | -                  | BZ-12031                           | -                               |
|  | .179                   | 80              |                                 | Yes              | Yes                             | -                  |                                    |                                 |
|  | .250                   | 160             |                                 | WS               | WS                              | -                  |                                    |                                 |
|  | .358                   | DEH             |                                 | -                | WS                              | -                  |                                    |                                 |
| 1 1/4<br>(1.660)                         | .140                   | 40              | 6 7/8                           | Yes              | Yes                             | Yes                | BZ-12041                           | -                               |
|  | .191                   | 80              |                                 | Yes              | Yes                             | Yes                |                                    |                                 |
|  | .250                   | 160             |                                 | WS               | WS                              | Yes                |                                    |                                 |
|  | .342                   | DEH             |                                 | -                | WS                              | WS                 |                                    |                                 |
| 1 1/2<br>(1.900)                         | .145                   | 40              | 7 7/8                           | Yes              | Yes                             | Yes                | BZ-12051                           | -                               |
|  | .200                   | 80              |                                 | Yes              | Yes                             | Yes                |                                    |                                 |
|  | .281                   | 160             |                                 | WS               | WS                              | Yes                |                                    |                                 |
|  | .400                   | DEH             |                                 | -                | WS                              | WS                 |                                    |                                 |
| 2<br>(2.375)                             | .154                   | 40              | 8 5/8                           | Yes              | Yes                             | Yes                | BZ-12061                           | -                               |
|  | .218                   | 80              |                                 | -                | Yes                             | Yes                |                                    |                                 |
|  | .343                   | 160             |                                 | -                | WS                              | Yes                |                                    |                                 |
| 2 1/2<br>(2.875)                         | .203                   | 40              | 9 1/2                           | -                | Yes                             | Yes                | BZ-12341                           | BZ-12382                        |
|  | .276                   | 80              |                                 | -                | WS                              | Yes                |                                    |                                 |
|  | .375                   | 160             |                                 | -                | WS                              | Yes                |                                    |                                 |
| 3<br>(3.500)                             | .216                   | 40              | 11 1/4                          | -                | Yes                             | Yes                | BZ-12351                           | BZ-12383                        |
|  | .300                   | 80              |                                 | -                | WS                              | Yes                |                                    |                                 |
| 3 1/2<br>(4.000)                         | .226                   | 40              | 15 1/2                          | -                | Yes                             | Yes                | BZ-12391                           | BZ-12384                        |
|  | .318                   | 80              |                                 | -                | WS                              | Yes                |                                    |                                 |
| 4<br>(4.500)                             | .237                   | 40              | 17 3/4                          | -                | Yes                             | Yes                | BZ-12392                           | BZ-12385                        |
|  | .337                   | 80              |                                 | -                | -                               | Yes                |                                    |                                 |

\*Schedule Pipe: 40 = Standard; 80 = Extra Heavy; 160 = Double Extra Heavy;  
 DEH = Double Extra Heavy (slightly thicker than 160);  
 WS = Can be bent by using wider spacing for swivel shoes.

## STB Series



Nominal Pipe Size:

**0.5-4 inches**

Maximum Bend Angle:

**90°**

Maximum Operating Pressure:

**10,000 psi**



All bender sets are designed to bend mild steel pipe. For other material please consult Enerpac.

| Frame Assembly | Pivot Pin (2x incl) | Pivot Shoes (2x incl) | One Shot or Sweep <sup>3)</sup> Bending Shoes included |          |          |          |                        |                        |                        |                        |                        | Set Model Number       |                        |
|----------------|---------------------|-----------------------|--|----------|----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        |                        |                        |
| BZ-12371       | BZ-12375            | BZ-12071              | BZ-12011   | BZ-12021 | BZ-12031 | BZ-12041 | BZ-12051               | BZ-12061               | -                      | -                      | STB-101X               |                        |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        | STB-101N               |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        |                        | STB-101H               |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        |                        | STB-101A               |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        |                        | STB-101B               |
| BZ-12372       | BZ-12376            | BZ-13401              | BZ-12031   | BZ-12041 | BZ-12051 | BZ-12061 | BZ-12382 <sup>3)</sup> | BZ-12383 <sup>3)</sup> | BZ-12384 <sup>3)</sup> | BZ-12385 <sup>3)</sup> | STB-221X               |                        |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        | STB-221N               |                        |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        | STB-221H               |                        |
| BZ-12374       | BZ-12376            | BZ-13401              | -  | BZ-12041 | BZ-12051 | BZ-12061 | BZ-12341               | BZ-12351               | BZ-12391               | BZ-12392               | STB-202X <sup>1)</sup> |                        |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        | STB-202N <sup>1)</sup> |                        |
|                |                     |                       |  |          |          |          |                        |                        |                        |                        |                        |                        | STB-202B <sup>1)</sup> |

<sup>3)</sup> Shoes are Sweep, all other shoes are One Shot.

▼ Shown: PSH05-O and PSB05-TH



## Cut PT Tendons in the Pocket with Hydraulic or Battery Power



### Shear Pump

To power the hydraulic version, the Enerpac ZUPS-0208SB Shear Pump is the perfect choice.



### Replacement Blades

Order the correct blades to match your Shear from the table shown below.

- Available in battery or hydraulic versions and sizes to cut .5 inch or .6 inch strand sizes
- Reversible, hardened blades extend life and provide over 2,000 cuts
- Shear tendons inside the pocket, providing controlled tendon length without applying heat to the anchorage
- Battery models include two industrial 28 VDC battery packs and fast charger
- Battery models shipped in durable product case for protection and easy transport
- Eliminates the need for Hot Work Permits on the job when cutting tendon tails
- Provides quick and effortless tendon cutting with no risk of abrasive saw kick-back

| For PocketShear® Blade |            |                      |                 |
|------------------------|------------|----------------------|-----------------|
| Power Type             | Blade Type | Strand Diameter (in) | Order Model No. |
| Hydraulic              | Fixed      | .5                   | PSBF-05H        |
|                        | Fixed      | .6                   | PSBF-06H        |
|                        | Rotating   | .5                   | PSBR-05H        |
|                        | Rotating   | .6                   | PSBR-06H        |
| Battery                | Fixed      | .6                   | PSBF-05B        |
|                        | Fixed      | .5                   | PSBF-06B        |
|                        | Rotating   | .6                   | PSBR-05B        |
|                        | Rotating   | .5                   | PSBR-06B        |



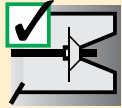
◀ The hydraulic PocketShear® makes quick and easy work of shearing tails on this elevated slab.



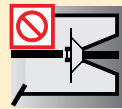
### Additional Protection

After shearing the tendon, the PocketCap® is the perfect way to seal the pocket and reduce the chance for corrosion in the anchorage zone.

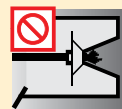
# Hydraulic and Battery Powered Shears



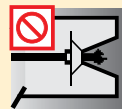
Only the PocketShear® can guarantee adequate concrete cover, no heating of the tendon or wedge set, and a clean cut end.



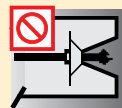
Cut-off saws cannot cut the tendon inside the pocket, leaving the tendon end exposed to moisture, creating the chance for corrosion.



Oxyacetylene torches heat the tendon and the wedge when cut deep inside the pocket.



Even if the tendon is cut at the correct depth, the tendon is still heated and the end is left jagged, preventing re-gripping for possible future lift-off.



Without controls, there is little chance for correct coverage of the tendon, leading to future corrosion.

## PS Series



Strand Capacity:

**0.5-0.6 inch**

Powered:

**Hydraulic and Battery**

Maximum Operating Pressure:

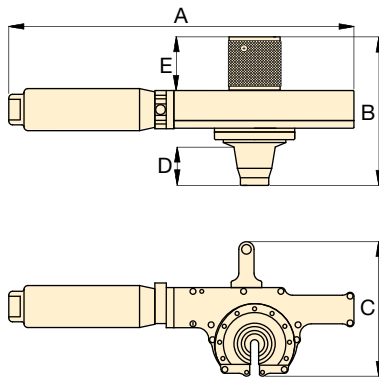
**3,000 psi**



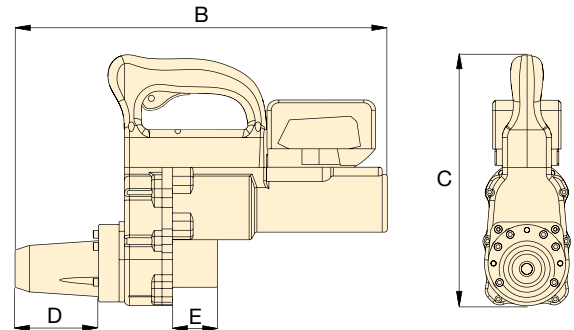
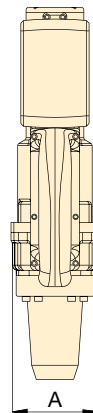
### Open Throat Design

The Hydraulic PocketShear® features an Open-Throat design that allows easy insertion of the strand into the tool. This makes the

Shear easier to position and operate on elevated applications.



Hydraulic Version



Battery Version

### ▼ SELECTION CHART\*

| Strand Diameter | Power Type | Model Number    | Throat Style <sup>1)</sup> | Operating Pressure | Length | Depth  | Height | Nose Depth | Clamp Depth | Weight |
|-----------------|------------|-----------------|----------------------------|--------------------|--------|--------|--------|------------|-------------|--------|
| (in)            |            |                 |                            | (psi)              | A (in) | B (in) | C (in) | D (in)     | E (in)      | (lbs)  |
| 0.5             | Battery    | <b>PSB05-TH</b> | Through                    | n/a                | 4.25   | 17.99  | 12.12  | 4.03       | 2.17        | 29.1   |
| 0.6             | Battery    | <b>PSB06-TH</b> | Through                    | n/a                | 5.75   | 18.10  | 13.50  | 4.13       | 2.13        | 37.7   |
| 0.5             | Hydraulic  | <b>PSH05-O</b>  | Open                       | 3000               | 22.60  | 9.80   | 8.80   | 2.51       | 3.50        | 27     |
| 0.6             | Hydraulic  | <b>PSH06-O</b>  | Open                       | 3000               | 28.60  | 10.70  | 10.20  | 3.02       | 3.50        | 35     |

<sup>1)</sup> May be special ordered with other throat styles, consult with Enerpac.

\* Values subject to change.

▼ Shown: PTJ5S and 5DA1



## Field-proven Tools for Mono-Strand Tensioning

- Durable, field-proven designs, with “soft-grip” ergonomic handles reduce operator fatigue
- Single-acting *PTJ* models, with spring-seating and optional power-seating are equipped with the new Enerpac *RC* Post-tensioning cylinders with a 10" stroke, ideal for slab-on-grade applications
- Double-acting *DA* models have an 8.5" stroke and are machined from a steel billet; feature standard power-seating and “gun-drilled” internal hydraulic passages
- All jacks have a standard 3" nose assembly. Longer nose assemblies are available as accessories for all models
- A full line of grippers is available to tension common strand diameters
- Complete offering of Enerpac parts and soft kits allow quick and easy service



### SCJ Short Cable Jack

For pulling applications where the tendons are shortened, the SCJ Jack only requires 4" of exposed cable.

Uses standard 10" stroke single-acting cylinders, other strokes available upon request.

Contact Enerpac for details.



### RC-1010PT and RC-1510PT Cylinders

Longer spring life and improved retraction are the benefits from these specially designed cylinders.



### 5DA1-AL Reduced Weight Jack

With a 17% weight reduction, this jack increases operator safety by reducing fatigue, while still having all the durability of a SURE-LOCK® product.

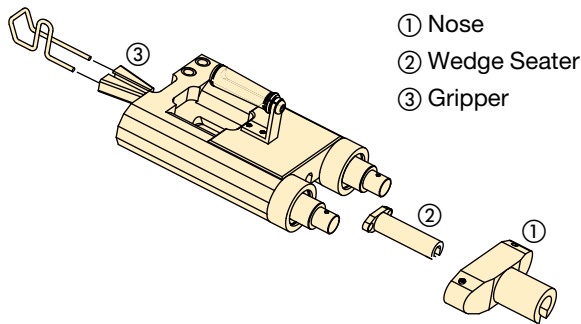
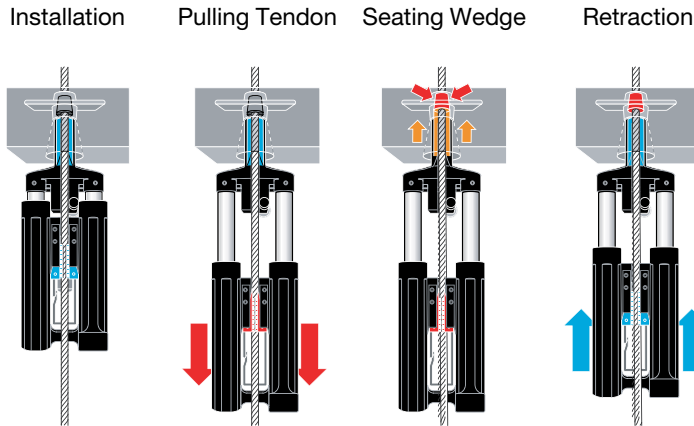
### ▼ TOOL SELECTION CHART

| Tool Capacity<br>(ton) | Seater Type | Strand Diameter Standard<br>(in) | Model Number | Tool Operation | Stroke<br>(in) | Oil Capacity<br>(in <sup>3</sup> ) | Tool Effective Area<br>(in <sup>2</sup> ) | Max. Pressure<br>(psi) | Weight<br>(lbs) |
|------------------------|-------------|----------------------------------|--------------|----------------|----------------|------------------------------------|---|------------------------|-----------------|
| 20                     | Spring      | 0.50-0.52                        | PTJ5S        | S/A            | 10.0           | 45.3                               | 4.48                                      | 10,000                 | 55              |
| 20                     | Power       | 0.50-0.52                        | PTJ5P        | S/A            | 10.0           | 45.3                               | 4.48                                      | 10,000                 | 55              |
| 20                     | Power       | 0.50-0.52                        | 5DA1-AL      | D/A            | 8.50           | 53.0                               | 6.28                                      | 6,500                  | 35              |
| 20                     | Power       | 0.50-0.52                        | 5DA1         | D/A            | 8.50           | 53.0                               | 6.28                                      | 6,500                  | 42              |
| 30                     | Spring      | 0.60-0.62                        | PTJ6S        | S/A            | 10.0           | 62.8                               | 6.28                                      | 10,000                 | 76              |
| 30                     | Power       | 0.60-0.62                        | PTJ6P        | S/A            | 10.0           | 62.8                               | 6.28                                      | 10,000                 | 76              |
| 26                     | Power       | 0.60-0.62                        | 6DA1         | D/A            | 8.50           | 67.6                               | 7.95                                      | 6,500                  | 52              |

# Mono-Strand Stressing Tools

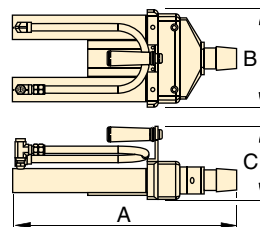
## Mono-Strand Tensioning Tool Operational Sequence

The sequence of operation of the double-acting 5DA1 tool is illustrated. Single-acting, spring-seat models are similar.



- ① Nose
- ② Wedge Seater
- ③ Gripper

| Dimensions (in) |      |      |     |
|-----------------|------|------|-----|
| Model No.       | A    | B    | C   |
| PTJ5            | 21.0 | 9.0  | 6.5 |
| PTJ6            | 22.0 | 10.2 | 7.0 |
| 5DA1            | 18.5 | 7.5  | 6.5 |
| 6DA1            | 18.5 | 8.5  | 6.5 |



3/8" NPTF ports; PTJ and DA power seat models include FZ-1055 fitting.

**DA,  
PTJ  
Series**



Capacity:

**20-30 tons**

Stroke:

**8.5-10 inches**

Strand Diameters:

**.375-.60 inch**

Maximum Operating Pressure:

**6,500-10,000 psi**



### Multi-Strand Stressing Jacks

For applications requiring multi-strand stressing, contact Enerpac *Integrated-Solutions* for information on Enerpac's multi-strand tensioning jacks.



### Jack Feet

Two required per jack. Used in place of a nose to react on either side of wedge pocket.

| Model Number | Used with Jack |
|--------------|----------------|
| 402000       | 5DA1           |
| 403325       | 6DA1           |

## ▼ Optional and Replacement Accessories Selection Chart

| Nose    |        | Wedge Seater |        | Gripper Set Diameter |        |         |         |        |        |        |        |
|---------|--------|--------------|--------|----------------------|--------|---------|---------|--------|--------|--------|--------|
| 3"      | 6"     | 3"           | 6"     | 0.38"                | 0.43"  | 0.50"   | 0.62"   | 4 mm   | 5 mm   | 6 mm   | 7 mm   |
|         |        |              |        |                      |        |         |         |        |        |        |        |
| 400740* | 401180 | 305340*      | 401200 | 400900               | 400880 | 400850* | N/A     | 400930 | 400940 | 400950 | 400960 |
| 400740* | 401180 | 305340*      | 401200 | 400900               | 400880 | 400850* | N/A     | 400930 | 400940 | 400950 | 400960 |
| 401520* | 401840 | 305360*      | 305365 | 401652               | 401655 | 401660* | N/A     | -      | 401670 | -      | -      |
| 401520* | 401840 | 305360*      | 305365 | 401652               | 401655 | 401660* | N/A     | -      | 401670 | -      | -      |
| 400740* | 401180 | 305340*      | 401200 | 400900               | 400880 | 400850  | 400980* | 400930 | 400940 | 400950 | 400960 |
| 400740* | 401180 | 305340*      | 401200 | 400900               | 400880 | 400850  | 400980* | 400930 | 400940 | 400950 | 400960 |
| 403180* | 403220 | 403140*      | 403165 | 400988               | N/A    | 400986  | 400990* | -      | -      | -      | -      |

\*Shipped with tool.

**E**NERPAC'S *Bolting Solutions* caters to the complete bolting work-flow, ensuring joint integrity in a variety of applications throughout industry:

### Joint Assembly

From simple pipe alignment to complex joint positioning of large structural assemblies, our comprehensive line of joint assembly products range from hydraulic to mechanical alignment tools.

### Controlled Tightening

Enerpac offers a variety of controlled tightening options to best meet the requirements of your application. From mechanical torque multipliers to hydraulically driven square drive wrenches, and low profile torque wrenches, we offer the products you need for accurate and simultaneous tightening of multiple bolts.

### Joint Separation

Enerpac also provides hydraulic nut splitters and a variety of mechanical and hydraulic spreading tools for joint separation during inspection, maintenance and decommissioning operations.

High-quality bolting solutions from the brand you can trust.

See how Enerpac can make your bolting work-flow more accurate, safer and efficient.



### Bolting Integrity Software

Visit [www.enerpac.com](http://www.enerpac.com) to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings. A combined application data sheet and joint completion report is also available.




















### Torque Tightening

See our "Yellow Pages" for information on torque tightening.

Page: 253



# Bolting Tools and Pumps Section Overview

|  | Capacity   | Tool Type and Functions                             | Series      |   | Page           |
|--|--|---|-------------|---|----------------|
| <b>Controlled Tightening and Loosening</b>   | 750-8000 Ft.lbs  | Manual Torque Multipliers                           | E           |    | 184 ▶          |
|  | 1400-25,140 Ft.lbs   | Square Drive Hydraulic Torque Wrenches-Steel        | S           |    | 186 ▶          |
|  | 3/4 - 6-1/8 in.  | Heavy-duty Impact Sockets<br>Square Drive           | BSH         |    | 190 ▶          |
|  | 2000-35,000 Ft.lbs   | Low Profile Hydraulic Torque Wrenches-Steel         | W           |    | 192 ▶          |
|  |  | Selection Matrix<br>Torque Wrenches - Pumps - Hoses | Matrix      |    | 204 ▶          |
|  | Flow<br>20 in <sup>3</sup> /min.   | Portable Electric Torque Wrench Pumps               | PMU         |    | 205 ▶          |
|  | Flow<br>60 in <sup>3</sup> /min.   | Electric Torque Wrench Pumps                        | ZU4         |    | 206 ▶          |
|  | Flow<br>60-120 in <sup>3</sup> /min.   | Electric Torque Wrench Pumps                        | ZE          |   | 210 ▶          |
|  | Flow<br>20 in <sup>3</sup> /min.   | Compact Air Driven Torque Wrench Pumps              | PTA         |  | 212 ▶          |
|  | Flow<br>60 in <sup>3</sup> /min.   | Air Driven Torque Wrench Pumps                      | ZA4         |  | 214 ▶          |
|  | Flow<br>8-20 in <sup>3</sup> /min.   | Electric Tensioning Pump                            | ZUTP        |  | 218 ▶          |
|  | Flow<br>4 in <sup>3</sup> /min.  | High Pressure Air Pump                              | ATP         |  | 220 ▶          |
| <b>Joint Assembly /<br/>Joint Separation</b> | 1/2 - 2 <sup>7</sup> / <sub>8</sub> A/F<br>2 <sup>3</sup> / <sub>4</sub> - 5 <sup>3</sup> / <sub>8</sub> A/F | Hydraulic Nut Cutters<br>Hydraulic Nut Splitters    | NC<br>NS    |  | 221 ▶<br>222 ▶ |
|  | 5-10 tons  | Pin-type Hydraulic Flange Spreaders                 | FS          |  | 224 ▶          |
|  | 8-14 tons  | Step-type Industrial Spreader                       | FSM/<br>FSH |  | 225 ▶          |
|  | 0.3-5.0 tons   | Flange Alignment Tools                              | ATM         |  | 226 ▶          |
|  | 1-12 in. flange  | Mechanical Flange Face Tool                         | FF          |  | 227 ▶          |



▼ Shown from left to right: E291, E393, E494



## Accurate, Efficient Torque Multiplication

When accurate make-up or break-out of stubborn fasteners requires high torque

- High-efficiency planetary gear sets achieve high output torque from low input torque
- Most models operator protected by anti-backlash device
- Multiplier output accuracy  $\pm 5\%$  of input torque
- Reversible, tighten or loosen bolts
- Reaction bar or reaction plate type
- Angle-of-turn protractor standard on E300 series models
- Reaction plate models offer increased versatility with reaction point locations
- E300 and E400 series replaceable shear drives provide overload protection of internal power train (one replacement shear drive is included)



### Typical Torque Multiplier Applications

- Locomotives
- Power plants
- Pulp and paper mills
- Refineries
- Chemical plants
- Mining and construction
- Off-road equipment
- Shipyards
- Cranes



### MTW-250 Manual Torque Wrench

Available to power manual torque multipliers.

Technical information:

- 1/2" Square Drive
- 45-250 Ft-lbs. (60-330 Nm)



◀ Enerpac Reaction Bar Torque Multiplier E393 used to manually torque bolts up to 3,200 ft-lbs.

### ▼ SELECTION CHART

| Torque Multiplier Type    | Output Torque Capacity |       | Model Number    |
|---------------------------|------------------------|-------|-----------------|
|                           | (Ft.lbs)               | (Nm)  |                 |
| Reaction Bar Multiplier   | 750                    | 1015  | <b>E290PLUS</b> |
|                           | 1000                   | 1355  | <b>E291</b>     |
|                           | 1200                   | 1625  | <b>E391</b>     |
|                           | 2200                   | 2980  | <b>E392</b>     |
|                           | 3200                   | 4340  | <b>E393</b>     |
| Reaction Plate Multiplier | 2200                   | 2980  | <b>E492</b>     |
|                           | 3200                   | 4340  | <b>E493</b>     |
|                           | 5000                   | 6780  | <b>E494</b>     |
|                           | 8000                   | 10845 | <b>E495</b>     |



## Manual Torque Multipliers

Enerpac manual torque multipliers provide efficient

torque multiplication in wide clearance applications and when external power sources are not available.

Manual torque multipliers are used in most industrial, construction, and equipment maintenance applications. Hydraulic torque wrenches are better suited for tight tolerance, flange and repetitious bolting applications.

### Use Reaction Bar Models:

- where space is limited
- where multiple reaction points are available
- when portability is desirable

### Use Reaction Plate Models:

- above 3200 Ft.-lbs. output torque
- on flanges and applications where neighboring bolt or nut is available to react against
- when extreme reaction forces are generated

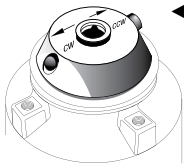
## E Series



Maximum Output Torque:  
**750-8000 Ft.lbs**

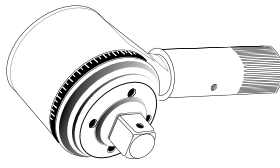
Torque Ratio:  
**3:1-52:1**

Multiplier Output Ratio Accuracy:  
**± 5 %**



### Selector Pawl

Models with anti-backlash protection have directional selector pawls. Set the pawl for clockwise or counter-clockwise rotation.



### Angle-of-Turn Protractor

E391, E392 and E393 models include an angle-of-turn protractor (scale) to tighten fasteners using a "torque turn" method. Allows accurate measuring a specific number of degrees of rotation.



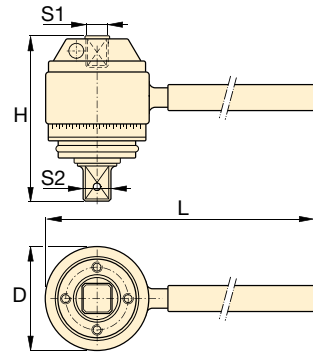
### Shearable Square Drive

Provides overload protection on E300- and E400-series multiplier's power train by shearing at 103-110% of rated capacity. Internal shear pin prevents tool from falling off bolt.

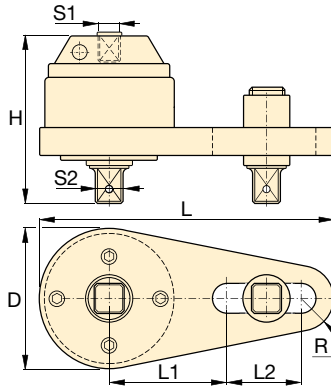


### CAUTION!

Never use impact type air tools for power driving torque multipliers. Torque multiplier drive train damage will occur.



Reaction Bar Type <sup>1)</sup>



Reaction Plate Type <sup>1)</sup>



### Hydraulic Torque Wrenches

Enerpac offers a complete range of square drive and hexagon cassette torque wrenches.

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### BSH-Series Sockets

Heavy-Duty Impact Sockets for power driven torquing equipment.

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| Input Torque<br>(Ft.lbs) | Torque Ratio<br>(Nm) | Torque Ratio | Input Female Square Drive<br>S1 (in) | Output Male Square Drive<br>S2 (in) | Replaceable Shear Drive Model No. | Over-load Protection | Anti-Back-lash | Dimensions (in) |      |      |     |     |     | Wt. (lbs) | Model Number |
|--------------------------|----------------------|--------------|--------------------------------------|-------------------------------------|-----------------------------------|----------------------|----------------|-----------------|------|------|-----|-----|-----|-----------|--------------|
|                          |                      |              |                                      |                                     |                                   |                      |                | D               | H    | L    | L1  | L2  | R   |           |              |
| 250                      | 338                  | 3 : 1        | 1/2                                  | 3/4                                 | -                                 | No                   | No             | 2.8             | 3.3  | 8.6  | -   | -   | -   | 4.0       | E290PLUS     |
| 333                      | 451                  | 3 : 1        | 1/2                                  | 3/4                                 | -                                 | No                   | No             | 2.8             | 3.3  | 17.4 | -   | -   | -   | 5.5       | E291         |
| 200                      | 271                  | 6 : 1        | 1/2                                  | 3/4                                 | E391SDK                           | Yes                  | No             | 3.9             | 4.0  | 19.6 | -   | -   | -   | 13.8      | E391         |
| 162                      | 219                  | 13.6 : 1     | 1/2                                  | 1                                   | E392SDK                           | Yes                  | Yes            | 4.1             | 5.7  | 19.6 | -   | -   | -   | 18.3      | E392         |
| 173                      | 234                  | 18.5 : 1     | 1/2                                  | 1                                   | E393SDK                           | Yes                  | Yes            | 4.1             | 6.5  | 19.6 | -   | -   | -   | 15.2      | E393         |
| 162                      | 219                  | 13.6 : 1     | 1/2                                  | 1                                   | E392SDK                           | Yes                  | Yes            | 4.9             | 5.5  | 14.0 | 5.5 | 4.9 | 1.3 | 17.2      | E492         |
| 173                      | 234                  | 18.5 : 1     | 1/2                                  | 1                                   | E393SDK                           | Yes                  | Yes            | 4.9             | 6.4  | 14.0 | 5.5 | 4.9 | 1.3 | 23.4      | E493         |
| 189                      | 256                  | 26.5 : 1     | 1/2                                  | 1 1/2                               | E494SDK                           | Yes                  | Yes            | 5.6             | 8.7  | 14.9 | 7.0 | 3.5 | 1.7 | 34.0      | E494         |
| 154                      | 208                  | 52 : 1       | 1/2                                  | 1 1/2                               | E495SDK                           | Yes                  | Yes            | 5.8             | 10.7 | 15.2 | 7.0 | 3.5 | 1.9 | 50.3      | E495         |

<sup>1)</sup> E200 and E400-series do not have an Angle-of-Turn Protractor (scale).

User must verify manual torque wrench accuracy prior to use to ensure accurate final output torque.

▼ From left to right: S3000, S6000, S1500



## Rigid Steel Design

## The *Professional* Square Drive Solution



### S-Series, Square Drive Wrenches

This product range has been designed using state-of-the-art CAD techniques to bring you the most advanced square drive torque wrench on the market.

To ensure that the tools you buy meet our own exacting requirements, during the design process every prototype was put through finite element stress analysis, photo-elastic modeling, rigorous cyclic testing and strain gauging.

### Simplicity

- 360° click-on, multi-position reaction arm
- Push button square drive release for quickly reversing the square drive for tightening or loosening
- Fine tooth ratchet prevents tool “lock-on”
- Single 360° hydraulic swivel manifold, complete with screw lock couplings, increases wrench and hose maneuverability

### Design

- Compact, high-strength uni-body construction for a small operating radius
- Robust design with minimal parts enables easy on-site maintenance without special tools
- Lightweight, ergonomic design for easy handling and an easy fit, even in applications where access is limited
- Optimised strength-to-weight ratio
- Fast operation due to the large nut rotation per wrench cycle (35 degree rotation angle) and rapid return stroke

### Reliability

- All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments

### Accuracy

- Constant torque output provides high accuracy across the full stroke
- Accuracy of +/-3% can be achieved because the Uni-Body construction reduces internal deflections



### TSP - Pro Series Swivel

Featuring Tilt & Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

### How to Order

Order as an accessory which can be fitted to existing S-Series wrenches.

Factory fitted to new S-Series wrenches: Suffix the wrench model number with “-P” e.g.: **S1500-P**.

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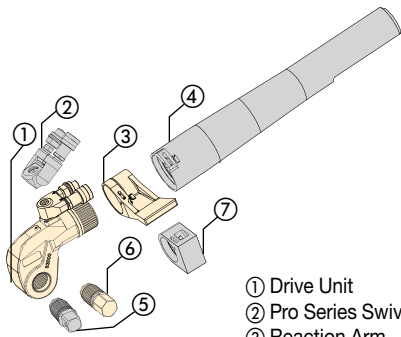


### Torque Wrench Hoses

Use Enerpac THQ-700 Series torque wrench hoses with S-Series torque wrenches to ensure the integrity of your hydraulic system.

|                         |                 |
|-------------------------|-----------------|
| 19.5 feet long, 2 hoses | <b>THQ-706T</b> |
| 39 feet long, 2 hoses   | <b>THQ-712T</b> |

# Double-Acting Square Drive Hydraulic Torque Wrenches



- ① Drive Unit
- ② Pro Series Swivel
- ③ Reaction Arm
- ④ Extended Reaction Arm
- ⑤ Square Drive
- ⑥ Allen Drive
- ⑦ Short Reaction Arm



## Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

## S Series



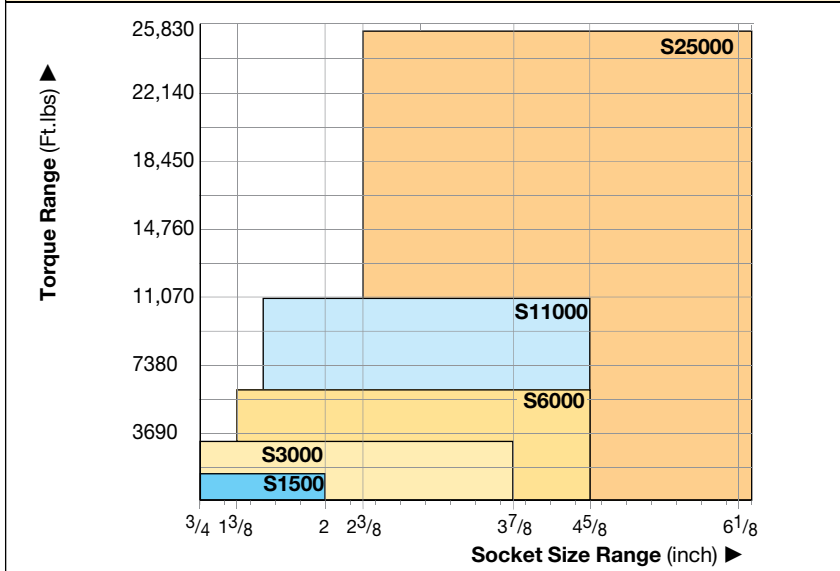
Maximum Torque at 10,000 psi:  
**25,140 Ft.lbs**

Square Drive Range:  
**3/4-2 1/2 inch**

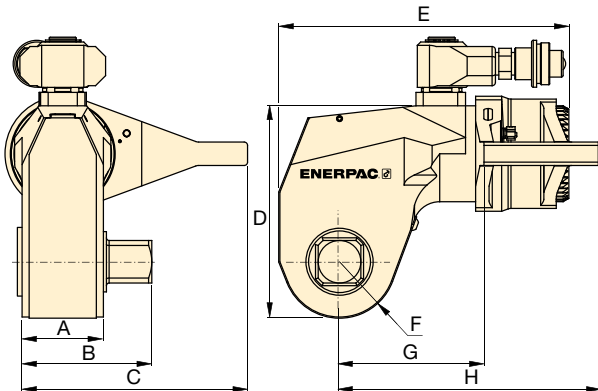
Nose Radius:  
**.99-2.50 inch**

Maximum Operating Pressure:  
**10,000**

### \*TORQUE WRENCH SELECTION (based on socket size range)



\*Additional socket sizes available upon request.



The rigid steel design of S-Series torque wrenches guarantee durability, reliability and safety. These wrenches can be powered by the portable ZU4T-Series pumps.



### Torque Wrench and Pump Selection Matrix

For optimum speed and performance see the torque wrench and pump matrix.

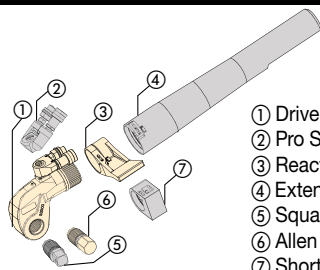
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| Maximum Torque at 10,000 psi |        | Square Drive |                                  | Torque Wrench Model No. | Dimensions (in) |      |      |      |       |      |      |       | Weight (lbs) |
|------------------------------|--------|--------------|----------------------------------|-------------------------|-----------------|------|------|------|-------|------|------|-------|--------------|
|                              |        | Size (in)    | Model No. (included with wrench) |                         | A               | B    | C    | D    | E     | F    | G    | H     |              |
| (Ft.lbs)                     | (Nm)   |              |                                  |                         |                 |      |      |      |       |      |      |       |              |
| 1400                         | 1898   | 3/4"         | SD15-012                         | <b>S1500</b>            | 1.54            | 2.55 | 4.24 | 3.74 | 5.35  | 0.99 | 2.72 | 4.69  | 5.95         |
| 3200                         | 4339   | 1"           | SD30-100                         | <b>S3000</b>            | 1.89            | 3.13 | 5.28 | 4.96 | 6.77  | 1.30 | 3.54 | 6.26  | 11.02        |
| 6010                         | 8144   | 1 1/2"       | SD60-108                         | <b>S6000</b>            | 2.15            | 3.63 | 6.59 | 6.09 | 7.60  | 1.61 | 4.41 | 7.32  | 18.74        |
| 11,000                       | 14,914 | 1 1/2"       | SD110-108                        | <b>S11000</b>           | 2.80            | 4.49 | 7.72 | 7.38 | 9.02  | 1.98 | 5.20 | 8.90  | 33.07        |
| 25,140                       | 34,079 | 2 1/2"       | SD250-208                        | <b>S25000</b>           | 3.48            | 5.63 | 9.61 | 9.53 | 11.26 | 2.55 | 7.17 | 11.46 | 68.34        |

See "Yellow Pages" section for torque conversions.

To order a S-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., S1500-P.



- ① Drive Unit
- ② Pro Series Swivel
- ③ Reaction Arm
- ④ Extended Reaction Arm
- ⑤ Square Drive
- ⑥ Allen Drive
- ⑦ Short Reaction Arm

Maximum Torque at 10,000 psi:

**25,140 Ft.lbs.**

Hexagon Size Allen Drive:

**1/2-2 1/2 in. (14-85 mm)**

For  
**S**  
Series



▼ SELECTION CHART

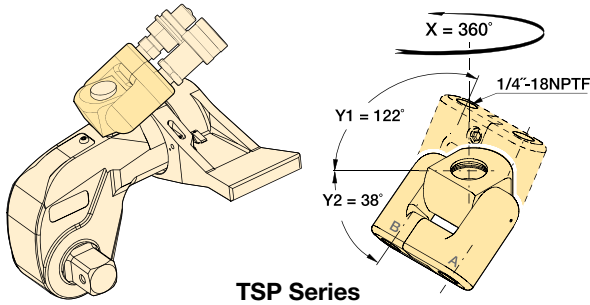
| TORQUE WRENCH                    | OPTIONAL ALLEN DRIVES, IMPERIAL |                         |              |              | OPTIONAL ALLEN DRIVES, METRIC |                         |              |              | SHORT REACTION ARM FOR ALLEN DRIVES |                          |      |
|----------------------------------|---------------------------------|-------------------------|--------------|--------------|-------------------------------|-------------------------|--------------|--------------|-------------------------------------|--------------------------|------|
|                                  | Hexagon Size (in)               | Maximum Torque (Ft.Lbs) | Model Number | Dim. B1 (in) | Hexagon Size (mm)             | Maximum Torque (Ft.lbs) | Model Number | Dim. B1 (in) | Model Number                        | Dimensions (in)<br>C1 H1 |      |
| <b>S1500</b><br>(1400 Ft-lbs)    | 1/2                             | 355                     | SDA15-008    | 2.6          | 14                            | 475                     | SDA15-14     | 2.60         | <b>SRA15</b>                        | 2.66                     | 2.56 |
|                                  | 5/8                             | 690                     | SDA15-010    | 2.6          | 17                            | 850                     | SDA15-17     | 2.68         |                                     |                          |      |
|                                  | 3/4                             | 1195                    | SDA15-012    | 2.8          | 19                            | 1184                    | SDA15-19     | 2.76         |                                     |                          |      |
|                                  | 7/8                             | 1400                    | SDA15-014    | 2.9          | 22                            | 1399                    | SDA15-22     | 2.87         |                                     |                          |      |
|                                  | 1                               | 1400                    | SDA15-100    | 3.0          | 24                            | 1399                    | SDA15-24     | 2.91         |                                     |                          |      |
| <b>S3000</b><br>(3200 Ft-lbs)    | 5/8                             | 690                     | SDA30-010    | 3.0          | 17                            | 850                     | SDA30-17     | 3.03         | <b>SRA30</b>                        | 3.15                     | 2.91 |
|                                  | 3/4                             | 1195                    | SDA30-012    | 3.1          | 19                            | 1185                    | SDA30-19     | 3.11         |                                     |                          |      |
|                                  | 7/8                             | 1895                    | SDA30-014    | 3.3          | 22                            | 1835                    | SDA30-22     | 3.23         |                                     |                          |      |
|                                  | 1                               | 2825                    | SDA30-100    | 3.4          | 24                            | 2385                    | SDA30-24     | 3.31         |                                     |                          |      |
|                                  | 1 1/8                           | 3200                    | SDA30-102    | 3.5          | 27                            | 3200                    | SDA30-27     | 3.35         |                                     |                          |      |
|                                  | 1 1/4                           | 3200                    | SDA30-104    | 3.5          | 30                            | 3200                    | SDA30-30     | 3.43         |                                     |                          |      |
|                                  | -                               | -                       | -            | -            | 32                            | 3200                    | SDA30-32     | 3.46         |                                     |                          |      |
| <b>S6000</b><br>(6000 Ft-lbs)    | 5/8                             | 690                     | SDA60-010    | 3.3          | 17                            | 850                     | SDA60-17     | 3.39         | <b>SRA60</b>                        | 3.60                     | 3.50 |
|                                  | 3/4                             | 1195                    | SDA60-012    | 3.5          | 19                            | 1185                    | SDA60-19     | 3.46         |                                     |                          |      |
|                                  | 7/8                             | 1895                    | SDA60-014    | 3.6          | 22                            | 1835                    | SDA60-22     | 3.58         |                                     |                          |      |
|                                  | 1                               | 2825                    | SDA60-100    | 3.7          | 24                            | 2385                    | SDA60-24     | 3.66         |                                     |                          |      |
|                                  | 1 1/8                           | 4025                    | SDA60-102    | 3.8          | 27                            | 3395                    | SDA60-27     | 3.70         |                                     |                          |      |
|                                  | 1 1/4                           | 5520                    | SDA60-104    | 3.9          | 30                            | 4655                    | SDA60-30     | 3.78         |                                     |                          |      |
|                                  | -                               | -                       | -            | -            | 32                            | 5650                    | SDA60-32     | 3.82         |                                     |                          |      |
| <b>S11000</b><br>(11,000 Ft-lbs) | 1 1/4                           | 5520                    | SDA110-104   | 4.5          | 30                            | 4655                    | SDA110-30    | 4.41         | <b>SRA110</b>                       | 5.02                     | 4.17 |
|                                  | 1 3/8                           | 7345                    | SDA110-106   | 4.6          | 32                            | 5650                    | SDA110-32    | 4.49         |                                     |                          |      |
|                                  | 1 1/2                           | 9535                    | SDA110-108   | 4.6          | 36                            | 8040                    | SDA110-36    | 4.61         |                                     |                          |      |
|                                  | 1 5/8                           | 11,000                  | SDA110-110   | 4.8          | 41                            | 11,000                  | SDA110-41    | 4.76         |                                     |                          |      |
|                                  | 1 3/4                           | 11,000                  | SDA110-112   | 4.9          | 46                            | 11,000                  | SDA110-46    | 5.00         |                                     |                          |      |
| <b>S25000</b><br>(25,000 Ft-lbs) | 1 1/2                           | 9535                    | SDA250-108   | 5.5          | 36                            | 8040                    | SDA250-36    | 5.51         | <b>SRA250</b>                       | 6.24                     | 5.31 |
|                                  | 1 5/8                           | 12,120                  | SDA250-110   | 5.7          | 41                            | 11,880                  | SDA250-41    | 5.67         |                                     |                          |      |
|                                  | 1 3/4                           | 15,135                  | SDA250-112   | 5.8          | 46                            | 16,775                  | SDA250-46    | 5.83         |                                     |                          |      |
|                                  | 1 7/8                           | 18,620                  | SDA250-114   | 5.9          | 50                            | 21,545                  | SDA250-50    | 5.94         |                                     |                          |      |
|                                  | 2                               | 22,595                  | SDA250-200   | 5.9          | 55                            | 25,150                  | SDA250-55    | 6.06         |                                     |                          |      |
|                                  | 2 1/4                           | 25,150                  | SDA250-204   | 6.0          | 60                            | 25,150                  | SDA250-60    | 6.22         |                                     |                          |      |
|                                  | -                               | -                       | -            | -            | 65                            | 25,150                  | SDA250-65    | 6.34         |                                     |                          |      |
|                                  | -                               | -                       | -            | -            | 70                            | 25,150                  | SDA250-70    | 6.46         |                                     |                          |      |
|                                  | -                               | -                       | -            | -            | 75                            | 25,150                  | SDA250-75    | 6.61         |                                     |                          |      |
| -                                | -                               | -                       | -            | 85           | 25,150                        | SDA250-85               | 6.89         |              |                                     |                          |      |

# Accessories for S-Series Torque Wrenches

## TSP-Series, Pro Series Swivels

- Featuring Tilt and Swivel technology
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement

**TSP  
RTE  
SRS  
Series**



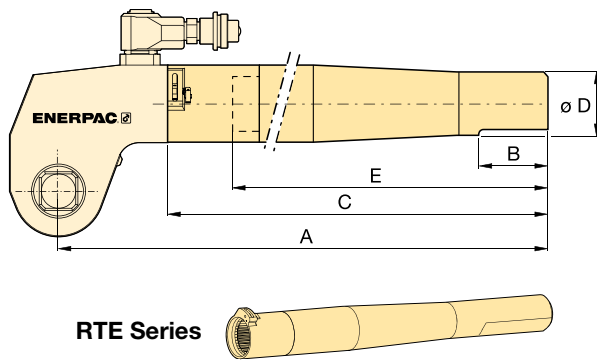
TSP Series

| Torque Wrench Model Number | Model * Number | Maximum Pressure (psi) | Wt. (lbs) |
|----------------------------|----------------|------------------------|-----------|
| S1500, S3000               | <b>TSP100</b>  | 10,000                 | 0.4       |
| S6000, S11000, S25000      | <b>TSP200</b>  | 10,000                 | 0.4       |

To order an S-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **S1500-P**.

\*TSP-swivel does not include couplers except when ordered wrench mounted.

## RTE-Series, Reaction Tube Extensions



RTE Series

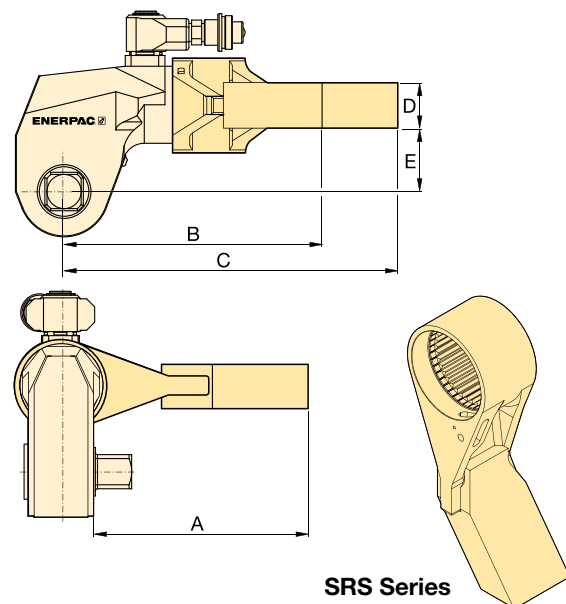
- Full torque rated
- Increases tool fit in restricted access areas

| Torque Wrench Model Number | Model Number  | Dimensions (in) |      |       |      |       | Wt. (lbs)* |
|----------------------------|---------------|-----------------|------|-------|------|-------|------------|
|                            |               | A               | B    | C     | D    | E     |            |
| S1500                      | <b>RTE15</b>  | 27.80           | 5.98 | 25.04 | 2.28 | 23.62 | 10.1       |
| S3000                      | <b>RTE30</b>  | 28.86           | 5.98 | 25.47 | 2.24 | 23.62 | 12.1       |
| S6000                      | <b>RTE60</b>  | 29.41           | 5.98 | 25.94 | 2.56 | 23.62 | 17.0       |
| S11000                     | <b>RTE110</b> | 30.28           | 5.98 | 26.57 | 2.99 | 23.62 | 24.7       |
| S25000                     | <b>RTE250</b> | 32.01           | 5.98 | 26.97 | 3.94 | 23.62 | 38.1       |

\*Weights indicated are for the accessories only and do not include the wrench.

## SRS-Series, Extended Reaction Arms

- Lightweight interchangeable design



SRS Series

| Wrench Model | Max. Torque (Ft-lbs) | Model Number   | Dimensions (in) |       |       |      |      | Wt. (lbs)* |
|--------------|----------------------|----------------|-----------------|-------|-------|------|------|------------|
|              |                      |                | A               | B     | C     | D    | E    |            |
| S1500        | 1328                 | <b>SRS151</b>  | 3.81            | 3.43  | 5.04  | 0.94 | 1.34 | 1.8        |
|              | 1210                 | <b>SRS152</b>  | 4.80            | 3.86  | 5.47  | 0.94 | 1.34 | 2.2        |
|              | 1131                 | <b>SRS153</b>  | 5.79            | 4.29  | 5.90  | 0.94 | 1.34 | 2.6        |
| S3000        | 2890                 | <b>SRS301</b>  | 4.37            | 4.09  | 6.69  | 1.34 | 1.89 | 3.5        |
|              | 2738                 | <b>SRS302</b>  | 5.39            | 4.69  | 7.28  | 1.34 | 1.89 | 4.4        |
|              | 2636                 | <b>SRS303</b>  | 6.38            | 5.24  | 7.87  | 1.34 | 1.89 | 5.5        |
| S6000        | 5784                 | <b>SRS601</b>  | 5.83            | 5.28  | 7.80  | 1.54 | 2.44 | 5.1        |
|              | 5498                 | <b>SRS602</b>  | 6.81            | 5.87  | 8.39  | 1.54 | 2.44 | 6.0        |
|              | 5292                 | <b>SRS603</b>  | 7.80            | 6.42  | 8.98  | 1.54 | 2.44 | 7.5        |
| S11000       | 10805                | <b>SRS1101</b> | 5.94            | 6.22  | 233   | 1.81 | 2.99 | 9.7        |
|              | 10294                | <b>SRS1102</b> | 6.93            | 6.81  | 9.17  | 1.81 | 2.99 | 11.2       |
|              | 9877                 | <b>SRS1103</b> | 7.91            | 7.36  | 10.31 | 1.81 | 2.99 | 12.8       |
| S25000       | 24736                | <b>SRS2501</b> | 7.20            | 8.86  | 12.36 | 1.97 | 3.94 | 16.8       |
|              | 23638                | <b>SRS2502</b> | 8.19            | 9.45  | 12.95 | 1.97 | 3.94 | 18.1       |
|              | 22680                | <b>SRS2503</b> | 9.17            | 10.00 | 13.54 | 1.97 | 3.94 | 22.0       |

\*Weights indicated are for the accessories only and do not include the wrench.

- Heavy-duty impact sockets
- Supplied with "Pin and Ring"

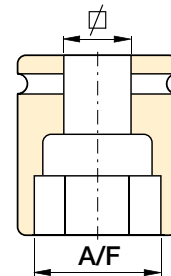
Hexagon Sizes:

**3/4 - 6 1/8 inch**  
**19 - 155 mm**



| IMPERIAL SOCKETS  |          |                 |          |              |          |                     |          |              |          |                     |          |              |          |
|-------------------|----------|-----------------|----------|--------------|----------|---------------------|----------|--------------|----------|---------------------|----------|--------------|----------|
| 3/4" Square Drive |          | 1" Square Drive |          |              |          | 1 1/2" Square Drive |          |              |          | 2 1/2" Square Drive |          |              |          |
| Model Number      | A/F (in) | Model Number    | A/F (in) | Model Number | A/F (in) | Model Number        | A/F (in) | Model Number | A/F (in) | Model Number        | A/F (in) | Model Number | A/F (in) |
| BSH7519           | 3/4"     | BSH1019         | 3/4"     | BSH10231     | 2 5/16"  | BSH15144            | 1 7/16"  | BSH15281     | 2 13/16" | BSH25244            | 2 7/16"  | BSH25419     | 4 13/16" |
| BSH75088          | 7/8"     | BSH10088        | 7/8"     | BSH10238     | 2 3/8"   | BSH1538             | 1 1/2"   | BSH15288     | 2 7/8"   | BSH25250            | 2 1/2"   | BSH25425     | 4 1/4"   |
| BSH75094          | 15/16"   | BSH10094        | 15/16"   | BSH10244     | 2 7/16"  | BSH15156            | 1 9/16"  | BSH1575      | 2 15/16" | BSH2565             | 2 9/16"  | BSH25110     | 4 5/16"  |
| BSH7527           | 1 1/16"  | BSH1027         | 1 1/16"  | BSH10250     | 2 1/2"   | BSH15163            | 1 5/8"   | BSH15300     | 3"       | BSH25263            | 2 5/8"   | BSH25438     | 4 3/8"   |
| BSH7530           | 1 3/16"  | BSH1030         | 1 3/16"  | BSH1065      | 2 9/16"  | BSH1543             | 1 11/16" | BSH15306     | 3 1/16"  | BSH25269            | 2 11/16" | BSH25450     | 4 1/2"   |
| BSH75125          | 1 1/4"   | BSH10125        | 1 1/4"   | BSH10263     | 2 5/8"   | BSH15175            | 1 3/4"   | BSH15313     | 3 1/8"   | BSH2570             | 2 3/4"   | BSH25463     | 4 5/8"   |
| BSH75131          | 1 5/16"  | BSH10131        | 1 5/16"  | BSH10269     | 2 11/16" | BSH1546             | 1 13/16" | BSH15319     | 3 3/16"  | BSH25281            | 2 13/16" | BSH25475     | 4 3/4"   |
| BSH7535           | 1 3/8"   | BSH1035         | 1 3/8"   | BSH1070      | 2 3/4"   | BSH15188            | 1 7/8"   | BSH15325     | 3 1/4"   | BSH25288            | 2 7/8"   | BSH25488     | 4 7/8"   |
| BSH75144          | 1 7/16"  | BSH10144        | 1 7/16"  | BSH10281     | 2 13/16" | BSH15194            | 1 15/16" | BSH15338     | 3 3/8"   | BSH2575             | 2 15/16" | BSH25500     | 5"       |
| BSH7538           | 1 1/2"   | BSH1038         | 1 1/2"   | BSH10288     | 2 7/8"   | BSH15200            | 2"       | BSH15350     | 3 1/2"   | BSH25300            | 3"       | BSH25513     | 5 1/8"   |
| BSH75156          | 1 9/16"  | BSH10156        | 1 9/16"  | BSH1075      | 2 15/16" | BSH15206            | 2 1/16"  | BSH15363     | 3 5/8"   | BSH25306            | 3 1/16"  | BSH25519     | 5 3/16"  |
| BSH75163          | 1 5/8"   | BSH10163        | 1 5/8"   | BSH10300     | 3"       | BSH15213            | 2 1/8"   | BSH1595      | 3 3/4"   | BSH25313            | 3 1/8"   | BSH25525     | 5 1/4"   |
| BSH7543           | 1 11/16" | BSH1043         | 1 11/16" | BSH10306     | 3 1/16"  | BSH15219            | 2 3/16"  | BSH15388     | 3 7/8"   | BSH25319            | 3 3/16"  | BSH25538     | 5 3/8"   |
| BSH75175          | 1 3/4"   | BSH10175        | 1 3/4"   | BSH10313     | 3 1/8"   | BSH15225            | 2 1/4"   | BSH15100     | 3 15/16" | BSH25325            | 3 1/4"   | BSH25140     | 5 1/2"   |
| BSH7546           | 1 13/16" | BSH1046         | 1 13/16" | BSH10319     | 3 3/16"  | BSH15231            | 2 5/16"  | BSH15400     | 4"       | BSH25338            | 3 3/8"   | BSH25575     | 5 3/4"   |
| BSH75188          | 1 7/8"   | BSH10188        | 1 7/8"   | BSH10325     | 3 1/4"   | BSH15238            | 2 3/8"   | BSH15105     | 4 1/8"   | BSH25350            | 3 1/2"   | BSH25150     | 5 7/8"   |
| BSH75194          | 1 15/16" | BSH10194        | 1 15/16" | BSH10338     | 3 3/8"   | BSH15244            | 2 7/16"  | BSH15419     | 4 3/16"  | BSH25363            | 3 5/8"   | BSH25600     | 6"       |
| BSH75200          | 2"       | BSH10200        | 2"       | BSH10350     | 3 1/2"   | BSH15250            | 2 1/2"   | BSH15425     | 4 1/4"   | BSH2595             | 3 3/4"   | BSH25613     | 6 1/8"   |
|                   |          | BSH10206        | 2 1/16"  | BSH10363     | 3 5/8"   | BSH1565             | 2 9/16"  | BSH15110     | 4 5/16"  | BSH25388            | 3 7/8"   |              |          |
|                   |          | BSH10213        | 2 1/8"   | BSH1095      | 3 3/4"   | BSH15263            | 2 5/8"   | BSH15438     | 4 3/8"   | BSH25100            | 3 15/16" |              |          |
|                   |          | BSH10219        | 2 3/16"  | BSH10388     | 3 7/8"   | BSH15269            | 2 11/16" | BSH15450     | 4 1/2"   | BSH25400            | 4"       |              |          |
|                   |          | BSH10225        | 2 1/4"   |              |          | BSH1570             | 2 3/4"   | BSH15463     | 4 5/8"   | BSH25105            | 4 1/8"   |              |          |

| METRIC SOCKETS    |          |                 |          |                     |          |                     |          |
|-------------------|----------|-----------------|----------|---------------------|----------|---------------------|----------|
| 3/4" Square Drive |          | 1" Square Drive |          | 1 1/2" Square Drive |          | 2 1/2" Square Drive |          |
| Model Number      | A/F (mm) | Model Number    | A/F (mm) | Model Number        | A/F (mm) | Model Number        | A/F (mm) |
| BSH7519           | 19       | BSH1019         | 19       | BSH1536             | 36       | BSH2565             | 65       |
| BSH7524           | 24       | BSH1024         | 24       | BSH15163            | 41       | BSH2570             | 70       |
| BSH7527           | 27       | BSH1027         | 27       | BSH1546             | 46       | BSH2575             | 75       |
| BSH7530           | 30       | BSH1030         | 30       | BSH1550             | 50       | BSH2580             | 80       |
| BSH7532           | 32       | BSH1032         | 32       | BSH1555             | 55       | BSH2585             | 85       |
| BSH7536           | 36       | BSH1036         | 36       | BSH1560             | 60       | BSH2590             | 90       |
| BSH75163          | 41       | BSH10163        | 41       | BSH1565             | 65       | BSH2595             | 95       |
| BSH7546           | 46       | BSH1046         | 46       | BSH1570             | 70       | BSH25100            | 100      |
| BSH7550           | 50       | BSH1050         | 50       | BSH1575             | 75       | BSH25105            | 105      |
|                   |          | BSH1055         | 55       | BSH1580             | 80       | BSH25110            | 110      |
|                   |          | BSH1060         | 60       | BSH1585             | 85       | BSH25115            | 115      |
|                   |          | BSH1065         | 65       | BSH1590             | 90       | BSH25120            | 120      |
|                   |          | BSH1070         | 70       | BSH1595             | 95       | BSH25125            | 125      |
|                   |          | BSH1075         | 75       | BSH15100            | 100      | BSH25135            | 135      |
|                   |          | BSH1080         | 80       | BSH15105            | 105      | BSH25140            | 140      |
|                   |          | BSH1085         | 85       | BSH15110            | 110      | BSH25145            | 145      |
|                   |          | BSH1090         | 90       | BSH15115            | 115      | BSH25150            | 150      |
|                   |          | BSH1095         | 95       |                     |          | BSH25155            | 155      |
|                   |          | BSH10100        | 100      |                     |          |                     |          |



**Pin and Ring**

All sockets are supplied with a "Pin and Ring" to hold the socket in place on the square drive of the tool.



**Select the Right Torque**

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

**E**NERPAC professional series steel torque wrenches provide reliable controlled tightening solutions across many industries.

### **S3000 Square Drive Torque Wrench on Wind Turbine Assembly and Maintenance**

S3000 used to connect wind turbine segments during assembly and maintenance. A robust but compact solution is required for bolt tightening on wind tower sections. Large numbers of fasteners require precise application of torque to ensure joint integrity is achieved and maintained.

*The Enerpac S-Series wrench offers simple and reliable operation while providing accurate and repeatable results.*



### **W4000 Low Profile Torque Wrench on an ANSI Pipe Flange**

Throughout the Oil and Gas, Petrochemical and Processing Industries, pipeline joints, valves, pumps and machinery present challenges for controlled bolting.

*The restricted access on this pipeline elbow was easily overcome with an Enerpac W-Series Torque Wrench. The W Wrenches offer reliability and control, ensuring even and consistent torque is applied to all bolts.*

### **S6000 on a High Volume Pump Unit**

High vibration requires long studs to be accurately tightened to the calculated preload.

*During maintenance, quick turnaround times are essential; S Series wrenches provide a large angle of nut rotation per stroke, offering speed and accuracy in a compact ergonomic tool.*





▼ Shown: Drive units with interchangeable cassettes



## Rigid Steel Design

## The *Professional* Low Profile Solution



### W-Series, Low Profile Torque Wrenches

This product range has been designed using state-of-the-art CAD techniques to bring you the most advanced low profile torque wrench on the market. Safety, quality, toughness and reliability are built in.

During the design process every prototype was put through finite element stress analysis, photo-elastic modelling, rigorous cyclic testing and strain gauging.

### Simplicity

- No tools are needed for changing the hexagon cassettes
- Innovative, pinless wrench construction incorporates quick release cylinder and automatic crank engagement
- Single 360° hydraulic swivel manifold complete with screw lock couplings increases wrench and hose maneuverability

### Design

- Cylinders and low profile cassettes have been engineered to give ultra slim, compact low clearance tooling with a small nose radius
- Robust design with minimal parts enables easy on-site maintenance without special tools
- Nut sizes covered range from 1 1/8 - 6 1/8 inch (30 - 155 mm)
- Optimized strength-to-weight ratio
- Fast operation due to the large nut rotation per wrench cycle (30 degree rotation angle) and rapid return stroke

### Reliability

- All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments
- All wrenches are fitted with bronze bushings to ensure the ratchet will never seize in the sideplates, thus eliminating costly repairs

### Accuracy

- Constant torque output provides accuracy  $\pm 3\%$  across the full stroke
- In-line reaction foot ensures accuracy by reducing internal deflections



### TSP - Pro Series Swivel

Featuring Tilt and Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

#### How to Order

Order as an accessory which can be fitted to existing W-Series wrenches.

Factory fitted to new W-Series wrenches: Suffix the wrench model number with "-P" e.g.: **W2000-P**.

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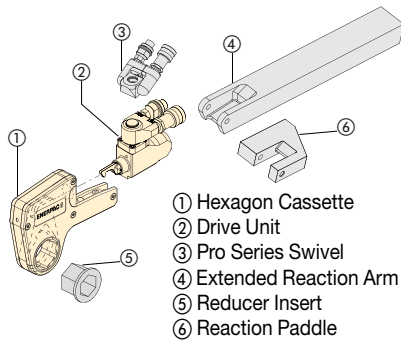


### Torque Wrench Hoses

Use Enerpac THQ-700 Series hoses with W-Series torque wrenches to ensure the integrity of your hydraulic system.

|                         |                 |
|-------------------------|-----------------|
| 19.5 feet long, 2 hoses | <b>THQ-706T</b> |
| 39 feet long, 2 hoses   | <b>THQ-712T</b> |

# Double-Acting Hydraulic Hexagon Torque Wrenches



- ① Hexagon Cassette
- ② Drive Unit
- ③ Pro Series Swivel
- ④ Extended Reaction Arm
- ⑤ Reducer Insert
- ⑥ Reaction Paddle



## Hexagon Cassettes and Reducer Inserts

Maximum versatility with the full range of interchangeable hexagon cassettes and hexagon reducing inserts is available in metric and inch sizes.

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## W Series



Maximum Torque at 10,000 psi:  
**35,000 Ft.lbs**

Hexagon Range:  
**1 1/8 - 6 1/8 inch**

Nose Radius:  
**1.22-4.52 inch**

Maximum Operating Pressure:  
**10,000 psi**

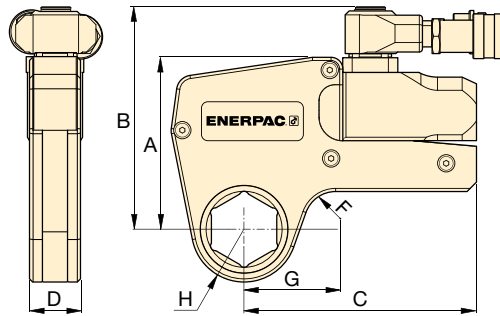
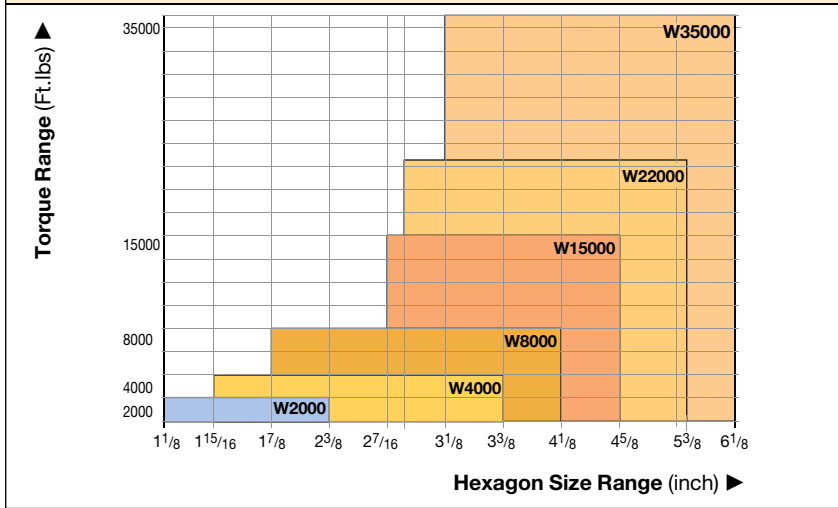


## Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench and pump matrix.

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## DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



▼ These rigid steel wrenches with low profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications.

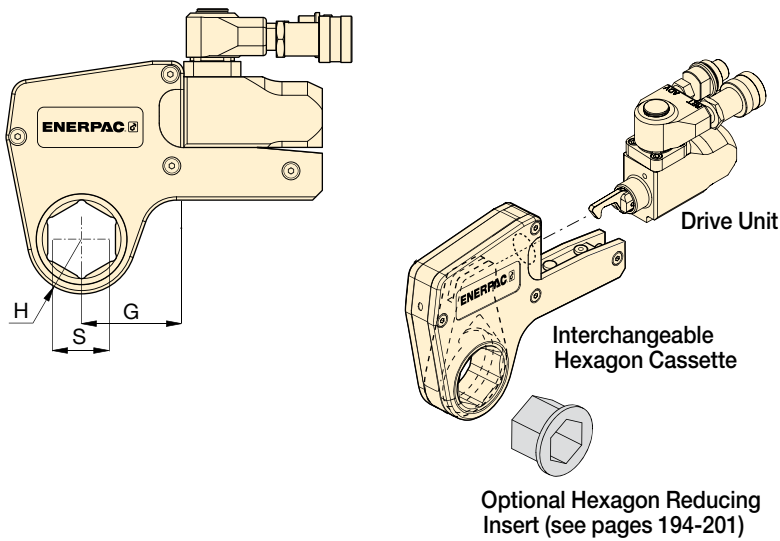


## ▼ SELECTION CHART

| Hexagon Range * |          | Maximum Torque at 10,000 psi |        | Drive Unit Model Number ** | Minimum Torque |      | Dimensions (in) |       |       |      |      | Weight (Drive unit without hexagon cassette) (lbs) |
|-----------------|----------|------------------------------|--------|----------------------------|----------------|------|-----------------|-------|-------|------|------|--|
| (in)            | (mm)     | (Ft.lbs)                     | (Nm)   |                            | (Ft.lbs)       | (Nm) | A               | B     | C     | D    | F    |  |
| 1 1/8 - 2 3/8   | 30 - 60  | 2000                         | 2712   | W2000                      | 200            | 271  | 4.29            | 5.55  | 5.83  | 1.26 | .79  | 3.04   |
| 1 5/16 - 3 3/8  | 36 - 85  | 4000                         | 5423   | W4000                      | 400            | 542  | 5.35            | 6.57  | 7.01  | 1.61 | .79  | 4.44   |
| 1 7/8 - 4 1/8   | 50 - 105 | 8000                         | 10.846 | W8000                      | 800            | 1084 | 6.77            | 8.07  | 8.19  | 2.07 | .98  | 6.59   |
| 2 7/16 - 4 5/8  | 65 - 115 | 15,000                       | 20.337 | W15000                     | 1500           | 2033 | 8.15            | 9.45  | 9.96  | 2.48 | .79  | 10.72  |
| 2 5/16 - 5 3/8  | 75 - 135 | 22,500                       | 30.510 | W22000                     | 2250           | 3050 | 8.94            | 10.46 | 11.69 | 3.03 | 1.38 | 16.98  |
| 3 1/8 - 6 1/8   | 80-155   | 35,000                       | 47.453 | W35000                     | 3500           | 4745 | 10.54           | 11.94 | 13.60 | 3.57 | 1.98 | 25.14  |

\* With in-line reaction foot.

\*\* To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., W2000-P.



## W Series



Maximum Torque at 10,000 psi:  
**2000 Ft.lbs**

Hexagon Range:  
**1 1/8-2 3/8 inch**

Maximum Operating Pressure:  
**10,000 psi**






### Metric Sizes

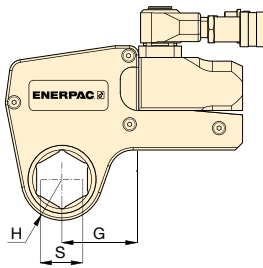
For metric sizes of hexagon cassettes and reducer inserts see:

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### ▼ SELECTION CHART

| Drive Unit Model Number | Hexagon Size | Nose Radius | Dim. G (in)  | Model Number | Weight (lbs) |  |                  |  |                  |  |                  |
|-------------------------|--------------|-------------|--------------|--------------|--------------|---|------------------|---|------------------|---|------------------|
|                         |              |             |              |              |              | Hexagon Reducer (in)  | Model Number     | Hexagon Reducer (in)  | Model Number     | Hexagon Reducer (in)  | Model Number     |
| <b>W2000</b>            | 1 1/8        | 1.22        | 2.11         | <b>W2102</b> | 4.19         | -   | -                | -   | -                | -   | -                |
|                         | 1 3/16       | 1.22        | 2.11         | <b>W2103</b> | 4.19         | -   | -                | -   | -                | -   | -                |
|                         | 1/4          | 1.22        | 2.11         | <b>W2104</b> | 4.19         | -   | -                | -   | -                | -   | -                |
|                         | 1 5/16       | 1.22        | 2.11         | <b>W2105</b> | 4.48         | -   | -                | -   | -                | -   | -                |
|                         | 1 3/8        | 1.22        | 2.11         | <b>W2106</b> | 4.43         | -   | -                | -   | -                | -   | -                |
|                         | 1 7/16       | 1.22        | 2.11         | <b>W2107</b> | 4.37         | 1 7/16 - 1 1/8  | <b>W2107R102</b> | -   | -                | -   | -                |
|                         | 1 1/2        | 1.32        | 2.29         | <b>W2108</b> | 4.51         | -   | -                | -   | -                | -   | -                |
|                         | 1 9/16       | 1.32        | 2.29         | <b>W2109</b> | 4.44         | -   | -                | -   | -                | -   | -                |
|                         | 1 5/8        | 1.32        | 2.29         | <b>W2110</b> | 4.38         | 1 5/8 - 1 1/4   | <b>W2110R104</b> | 1 5/8 - 1 3/16  | <b>W2110R103</b> | -   | -                |
|                         | 1 11/16      | 1.44        | 2.38         | <b>W2111</b> | 4.63         | -   | -                | -   | -                | -   | -                |
|                         | 1 3/4        | 1.44        | 2.38         | <b>W2112</b> | 4.57         | -   | -                | -   | -                | -   | -                |
|                         | 1 13/16      | 1.44        | 2.38         | <b>W2113</b> | 4.46         | 1 13/16 - 1 7/16  | <b>W2113R107</b> | 1 13/16 - 1 1/4   | <b>W2113R104</b> | -   | -                |
|                         | 1 7/8        | 1.54        | 2.48         | <b>W2114</b> | 4.69         | -   | -                | -   | -                | -   | -                |
|                         | 1 15/16      | 1.54        | 2.48         | <b>W2115</b> | 4.64         | -   | -                | -   | -                | -   | -                |
|                         | 2            | 1.54        | 2.48         | <b>W2200</b> | 4.54         | 2 - 1 5/8   | <b>W2200R110</b> | 2 - 1 7/16  | <b>W2200R107</b> | -   | -                |
|                         | 2 1/16       | 1.65        | 2.70         | <b>W2201</b> | 4.83         | -   | -                | -   | -                | -   | -                |
|                         | 2 1/8        | 1.65        | 2.70         | <b>W2202</b> | 4.74         | -   | -                | -   | -                | -   | -                |
|                         | 2 3/16       | 1.65        | 2.70         | <b>W2203</b> | 4.64         | 2 3/16 - 1 13/16  | <b>W2203R113</b> | 2 3/16 - 1 5/8  | <b>W2203R110</b> | 2 3/16 - 1 7/16   | <b>W2203R107</b> |
|                         | 2 1/4        | 1.75        | 2.55         | <b>W2204</b> | 4.94         | -   | -                | -   | -                | -   | -                |
|                         | 2 5/16       | 1.75        | 2.55         | <b>W2205</b> | 4.84         | -   | -                | -   | -                | -   | -                |
| 2 3/8                   | 1.75         | 2.55        | <b>W2206</b> | 4.72         | 2 3/8 - 2    | <b>W2206R200</b>  | 2 3/8 - 1 7/8    | <b>W2206R114</b>  | 2 3/8 - 1 13/16  | <b>W2206R113</b>  |                  |
| -                       | -            | -           | -            | -            | -            | 2 3/8 - 1 1/2   | <b>W2206R108</b> | 2 3/8 - 1 7/16  | <b>W2206R107</b> | 2 3/8 - 1 5/8   | <b>W2206R110</b> |

# W4000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:

**4000 Ft.lbs**

Hexagon Range:

**1<sup>5</sup>/<sub>16</sub>-3<sup>3</sup>/<sub>8</sub> inch**

Maximum Operating Pressure:

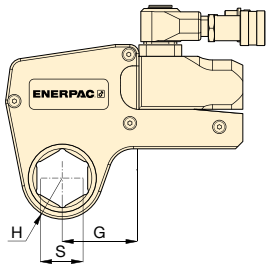
**10,000 psi**

**W**  
Series



▼ SELECTION CHART

| Drive Unit<br>Model<br>Number  | Hexagon<br>Size                 | Nose<br>Radius | Dim.<br>G<br>(in) | Model<br>Number | Weight<br>(lbs)   | Hexagon Reducer  |  | Hexagon Reducer  |  | Hexagon Reducer  |                 |
|--------------------------------|---------------------------------|----------------|-------------------|-----------------|---|--|--|--|--|--|-----------------|
|                                |                                 |                |                   |                 |   | Hexagon<br>Reducer<br>(in)                                       | Model<br>Number  | Hexagon<br>Reducer<br>(in)                                       | Model<br>Number  | Hexagon<br>Reducer<br>(in)                                       | Model<br>Number |
| W4000                          | 1 <sup>5</sup> / <sub>16</sub>  | 1.46           | 2.40              | W4105           | 8.15  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>3</sup> / <sub>8</sub>   | 1.46           | 2.40              | W4106           | 8.15  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>7</sup> / <sub>16</sub>  | 1.46           | 2.40              | W4107           | 8.15  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>1</sup> / <sub>2</sub>   | 1.46           | 2.40              | W4108           | 8.31  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>9</sup> / <sub>16</sub>  | 1.46           | 2.40              | W4109           | 8.22  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>5</sup> / <sub>8</sub>   | 1.46           | 2.40              | W4110           | 8.15  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>11</sup> / <sub>16</sub> | 1.56           | 2.52              | W4111           | 8.43  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>3</sup> / <sub>4</sub>   | 1.56           | 2.52              | W4112           | 8.35  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>13</sup> / <sub>16</sub> | 1.56           | 2.52              | W4113           | 8.25  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>7</sup> / <sub>8</sub>   | 1.63           | 2.63              | W4114           | 8.45  | -  | -  | -  | -  | -  | -               |
|                                | 1 <sup>15</sup> / <sub>16</sub> | 1.63           | 2.63              | W4115           | 8.39  | -  | -  | -  | -  | -  | -               |
|                                | 2                               | 1.63           | 2.63              | W4200           | 8.28  | 2 - 1 <sup>7</sup> / <sub>8</sub>                                | W4200R107  | -  | -  | -  | -               |
|                                | 2 <sup>1</sup> / <sub>16</sub>  | 1.73           | 2.89              | W4201           | 8.65  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>1</sup> / <sub>8</sub>   | 1.73           | 2.89              | W4202           | 8.53  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>3</sup> / <sub>16</sub>  | 1.73           | 2.89              | W4203           | 8.42  | 2 <sup>3</sup> / <sub>16</sub> - 1 <sup>5</sup> / <sub>8</sub>   | W4203R110  | 2 <sup>3</sup> / <sub>16</sub> - 1 <sup>7</sup> / <sub>16</sub>  | W4203R107  | 2 <sup>3</sup> / <sub>16</sub> - 1 <sup>1</sup> / <sub>4</sub>   | W4203R104       |
|                                | 2 <sup>1</sup> / <sub>4</sub>   | 1.83           | 2.78              | W4204           | 8.73  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>5</sup> / <sub>16</sub>  | 1.83           | 2.78              | W4205           | 8.61  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>3</sup> / <sub>8</sub>   | 1.83           | 2.78              | W4206           | 8.47  | 2 <sup>3</sup> / <sub>8</sub> - 2                                | W4206R200  | 2 <sup>3</sup> / <sub>8</sub> - 1 <sup>13</sup> / <sub>16</sub>  | W4206R113  | 2 <sup>3</sup> / <sub>8</sub> - 1 <sup>7</sup> / <sub>16</sub>   | W4206R107       |
|                                | -                               | -              | -                 | -               | -   | 2 <sup>3</sup> / <sub>8</sub> - 1 <sup>3</sup> / <sub>8</sub>    | W4206R106  | -  | -  | -  | -               |
|                                | 2 <sup>7</sup> / <sub>16</sub>  | 1.95           | 3.00              | W4207           | 8.96  | 2 <sup>7</sup> / <sub>16</sub> - 2                               | W4207R200  | -  | -  | -  | -               |
|                                | 2 <sup>1</sup> / <sub>2</sub>   | 1.95           | 3.00              | W4208           | 8.86  | 2 <sup>1</sup> / <sub>2</sub> - 2                                | W4208R200  | 2 <sup>1</sup> / <sub>2</sub> - 1 <sup>13</sup> / <sub>16</sub>  | W4208R113  | 2 <sup>1</sup> / <sub>2</sub> - 2 <sup>1</sup> / <sub>16</sub>   | W4208R201       |
|                                | 2 <sup>9</sup> / <sub>16</sub>  | 1.95           | 3.00              | W4209           | 8.67  | 2 <sup>9</sup> / <sub>16</sub> - 2 <sup>3</sup> / <sub>16</sub>  | W4209R203  | 2 <sup>9</sup> / <sub>16</sub> - 2 <sup>1</sup> / <sub>8</sub>   | W4209R202  | -  | -               |
|                                | -                               | -              | -                 | -               | -   | 2 <sup>9</sup> / <sub>16</sub> - 2                               | W4209R200  | 2 <sup>9</sup> / <sub>16</sub> - 1 <sup>13</sup> / <sub>16</sub> | W4209R113  | -  | -               |
|                                | 2 <sup>5</sup> / <sub>8</sub>   | 2.07           | 3.08              | W4210           | 9.14  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>11</sup> / <sub>16</sub> | 2.07           | 3.08              | W4211           | 9.03  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>3</sup> / <sub>4</sub>   | 2.07           | 3.08              | W4212           | 8.84  | 2 <sup>3</sup> / <sub>4</sub> - 2 <sup>3</sup> / <sub>8</sub>    | W4212R206  | 2 <sup>3</sup> / <sub>4</sub> - 2 <sup>3</sup> / <sub>16</sub>   | W4212R203  | 2 <sup>3</sup> / <sub>4</sub> - 2 <sup>1</sup> / <sub>8</sub>    | W4212R202       |
|                                | 2 <sup>13</sup> / <sub>16</sub> | 2.18           | 3.21              | W4213           | 9.32  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>7</sup> / <sub>8</sub>   | 2.18           | 3.21              | W4214           | 9.17  | -  | -  | -  | -  | -  | -               |
|                                | 2 <sup>15</sup> / <sub>16</sub> | 2.18           | 3.21              | W4215           | 8.96  | 2 <sup>15</sup> / <sub>16</sub> - 2 <sup>9</sup> / <sub>16</sub> | W4215R209  | 2 <sup>15</sup> / <sub>16</sub> - 2 <sup>3</sup> / <sub>8</sub>  | W4215R206  | 2 <sup>15</sup> / <sub>16</sub> - 2 <sup>9</sup> / <sub>16</sub> | W4215R203       |
|                                | -                               | -              | -                 | -               | -   | 2 <sup>15</sup> / <sub>16</sub> - 2                              | W4215R200  | -  | -  | -  | -               |
|                                | 3                               | 2.30           | 3.29              | W4300           | 9.51  | 3 - 2 <sup>9</sup> / <sub>16</sub>                               | W4300R203  | -  | -  | -  | -               |
|                                | 3 <sup>1</sup> / <sub>16</sub>  | 2.30           | 3.29              | W4301           | 9.42  | -  | -  | -  | -  | -  | -               |
| 3 <sup>1</sup> / <sub>8</sub>  | 2.30                            | 3.29           | W4302             | 9.16            | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>15</sup> / <sub>16</sub> | W4302R215  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>4</sub>  | W4302R212  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>9</sup> / <sub>16</sub> | W4302R209  |                 |
| -                              | -                               | -              | -                 | -               | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>5</sup> / <sub>8</sub>   | W4302R206  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>5</sup> / <sub>16</sub> | W4302R205  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>1</sup> / <sub>4</sub>  | W4302R204  |                 |
| -                              | -                               | -              | -                 | -               | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>16</sub>  | W4302R203  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>1</sup> / <sub>8</sub>  | W4302R202  | 3 <sup>1</sup> / <sub>8</sub> - 2                              | W4302R200  |                 |
| 3 <sup>3</sup> / <sub>16</sub> | 2.44                            | 3.37           | W4303             | 9.92            | -   | -  | -  | -  | -  | -  |                 |
| 3 <sup>1</sup> / <sub>4</sub>  | 2.44                            | 3.37           | W4304             | 9.92            | -   | -  | -  | -  | -  | -  |                 |
| 3 <sup>5</sup> / <sub>16</sub> | 2.44                            | 3.37           | W4305             | 9.92            | -   | -  | -  | -  | -  | -  |                 |
| 3 <sup>3</sup> / <sub>8</sub>  | 2.44                            | 3.37           | W4306             | 9.92            | -   | -  | -  | -  | -  | -  |                 |



Maximum Torque at 10,000 psi:

**8000 Ft.lbs**

Hexagon Range:

**1<sup>7</sup>/<sub>8</sub> - 4<sup>1</sup>/<sub>8</sub> inch**


Maximum Operating Pressure:

**10,000 psi**

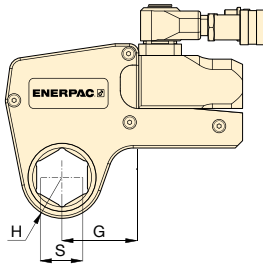
**W Series**



▼ SELECTION CHART

| Drive Unit Model Number         | Hexagon Size                    | Nose Radius | Dim.          | Model Number  | Weight  | Hexagon Reducer   |   | Hexagon Reducer  |                  | Hexagon Reducer  |                  |
|---------------------------------|---------------------------------|-------------|---------------|---|---|---|---|--|------------------|--|------------------|
|                                 |                                 |             |               |   |   | Hexagon Reducer (in)  | Model Number  | Hexagon Reducer (in)   | Model Number     | Hexagon Reducer (in)   | Model Number     |
| <b>W8000</b>                    | S (in)                          | H (in)      | G (in)        |  | (lbs)   |   |   |  |                  |  |                  |
|                                 | 1 <sup>7</sup> / <sub>8</sub>   | 1.77        | 3.08          | <b>W8114</b>  | 17.97   | -   | -   | -  | -                | -  | -                |
|                                 | 1 <sup>15</sup> / <sub>16</sub> | 1.77        | 3.08          | <b>W8115</b>  | 17.89   | -   | -   | -  | -                | -  | -                |
|                                 | 2                               | 1.77        | 3.08          | <b>W8200</b>  | 17.75   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>1</sup> / <sub>16</sub>  | 1.89        | 3.15          | <b>W8201</b>  | 17.52   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>1</sup> / <sub>8</sub>   | 1.89        | 3.15          | <b>W8202</b>  | 17.36   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>3</sup> / <sub>16</sub>  | 1.89        | 3.15          | <b>W8203</b>  | 17.22   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>1</sup> / <sub>4</sub>   | 2.01        | 3.25          | <b>W8204</b>  | 17.92   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>5</sup> / <sub>16</sub>  | 2.01        | 3.25          | <b>W8205</b>  | 17.76   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>3</sup> / <sub>8</sub>   | 2.01        | 3.25          | <b>W8206</b>  | 17.59   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>7</sup> / <sub>16</sub>  | 2.07        | 3.38          | <b>W8207</b>  | 17.65   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>1</sup> / <sub>2</sub>   | 2.07        | 3.38          | <b>W8208</b>  | 17.52   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>9</sup> / <sub>16</sub>  | 2.07        | 3.38          | <b>W8209</b>  | 17.29   | 2 <sup>9</sup> / <sub>16</sub> - 2                              | <b>W8209R200</b>  | -  | -                | -  | -                |
|                                 | 2 <sup>5</sup> / <sub>8</sub>   | 2.20        | 3.34          | <b>W8210</b>  | 17.50   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>11</sup> / <sub>16</sub> | 2.20        | 3.34          | <b>W8211</b>  | 17.36   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>3</sup> / <sub>4</sub>   | 2.20        | 3.34          | <b>W8212</b>  | 17.12   | 2 <sup>3</sup> / <sub>4</sub> - 2 <sup>3</sup> / <sub>16</sub>  | <b>W8212R203</b>  | -  | -                | -  | -                |
|                                 | 2 <sup>13</sup> / <sub>16</sub> | 2.28        | 3.35          | <b>W8213</b>  | 17.57   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>7</sup> / <sub>8</sub>   | 2.28        | 3.35          | <b>W8214</b>  | 17.38   | -   | -   | -  | -                | -  | -                |
|                                 | 2 <sup>15</sup> / <sub>16</sub> | 2.28        | 3.35          | <b>W8215</b>  | 17.11   | 2 <sup>15</sup> / <sub>16</sub> - 2 <sup>3</sup> / <sub>8</sub> | <b>W8215R206</b>  | 2 <sup>15</sup> / <sub>16</sub> - 2 <sup>3</sup> / <sub>16</sub> | <b>W8215R203</b> | -  | -                |
|                                 | 3                               | 2.38        | 3.52          | <b>W8300</b>  | 17.77   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>1</sup> / <sub>16</sub>  | 2.38        | 3.52          | <b>W8301</b>  | 17.65   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>1</sup> / <sub>8</sub>   | 2.38        | 3.52          | <b>W8302</b>  | 17.33   | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>9</sup> / <sub>16</sub>  | <b>W8302R209</b>  | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>8</sub>    | <b>W8302R206</b> | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>16</sub> | <b>W8302R203</b> |
|                                 | -                               | -           | -             | -   | -   | 3 <sup>1</sup> / <sub>8</sub> - 2                               | <b>W8302R200</b>  | -  | -                | -  | -                |
|                                 | 3 <sup>3</sup> / <sub>16</sub>  | 2.60        | 3.63          | <b>W8303</b>  | 18.99   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>1</sup> / <sub>4</sub>   | 2.60        | 3.63          | <b>W8304</b>  | 18.72   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>5</sup> / <sub>16</sub>  | 2.60        | 3.63          | <b>W8305</b>  | 18.54   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>3</sup> / <sub>8</sub>   | 2.60        | 3.63          | <b>W8306</b>  | 18.36   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>7</sup> / <sub>16</sub>  | 2.60        | 3.63          | <b>W8307I</b>   | 18.11   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>1</sup> / <sub>2</sub>   | 2.60        | 3.63          | <b>W8308</b>  | 17.81   | 3 <sup>1</sup> / <sub>2</sub> - 3                               | <b>W8308R300</b>  | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>15</sup> / <sub>16</sub>  | <b>W8308R215</b> | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>3</sup> / <sub>4</sub>  | <b>W8308R212</b> |
|                                 | 3 <sup>9</sup> / <sub>16</sub>  | 2.91        | 4.05          | <b>W8309</b>  | 20.36   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>5</sup> / <sub>8</sub>   | 2.91        | 4.05          | <b>W8310</b>  | 20.18   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>11</sup> / <sub>16</sub> | 2.91        | 4.05          | <b>W8311</b>  | 19.93   | -   | -   | -  | -                | -  | -                |
|                                 | 3 <sup>3</sup> / <sub>4</sub>   | 2.91        | 4.05          | <b>W8312</b>  | 19.71   | 3 <sup>3</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>8</sub>   | <b>W8312R302</b>  | 3 <sup>3</sup> / <sub>4</sub> - 2 <sup>15</sup> / <sub>16</sub>  | <b>W8312R215</b> | 3 <sup>3</sup> / <sub>4</sub> - 2 <sup>3</sup> / <sub>4</sub>  | <b>W8312R212</b> |
|                                 | 3 <sup>13</sup> / <sub>16</sub> | 2.91        | 4.05          | <b>W8313</b>  | 19.46   | -   | -   | -  | -                | -  | -                |
| 3 <sup>7</sup> / <sub>8</sub>   | 2.91                            | 4.05        | <b>W8314</b>  | 19.10   | 3 <sup>7</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>8</sub> | <b>W8314R302</b>  | 3 <sup>7</sup> / <sub>8</sub> - 2 <sup>15</sup> / <sub>16</sub> | <b>W8314R215</b>   | -                | -  |                  |
| 3 <sup>15</sup> / <sub>16</sub> | 3.13                            | 4.33        | <b>W8315</b>  | 20.31   | -   | -   | -   | -  | -                | -  |                  |
| 4                               | 3.13                            | 4.33        | <b>W8400</b>  | 20.04   | -   | -   | -   | -  | -                | -  |                  |
| 4 <sup>1</sup> / <sub>16</sub>  | 3.13                            | 4.33        | <b>W8401I</b> | 19.80   | -   | -   | -   | -  | -                | -  |                  |
| 4 <sup>1</sup> / <sub>8</sub>   | 3.13                            | 4.33        | <b>W8402</b>  | 19.39   | -   | -   | -   | -  | -                | -  |                  |

# W15000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:

**15,000 Ft.lbs**

Hexagon Range:

**2<sup>7</sup>/<sub>16</sub>-4<sup>5</sup>/<sub>8</sub> inch**

Maximum Operating Pressure:

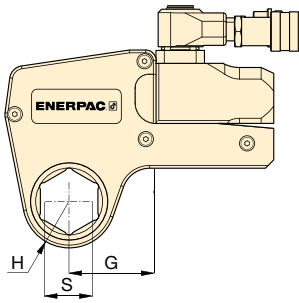
**10,000 psi**

**W**  
Series



▼ SELECTION CHART

| Drive Unit<br>Model<br>Number  | Hexagon<br>Size                 | Nose<br>Radius | Dim.      | Model<br>Number | Weight  | Hexagon Reducer   |   | Hexagon Reducer   |   | Hexagon Reducer   |                 |
|--------------------------------|---------------------------------|----------------|-----------|-----------------|---|---|---|---|---|---|-----------------|
|                                |                                 |                |           |                 |   | Hexagon<br>Reducer<br>(in)                                      | Model<br>Number   | Hexagon<br>Reducer<br>(in)                                      | Model<br>Number   | Hexagon<br>Reducer<br>(in)                                    | Model<br>Number |
| W15000                         | S<br>(in)                       | H<br>(in)      | G<br>(in) |                 | (lbs)   |   |   |   |   |   |                 |
|                                | 2 <sup>7</sup> / <sub>16</sub>  | 2.32           | 3.49      | W15207          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>1</sup> / <sub>2</sub>   | 2.32           | 3.49      | W15208          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>9</sup> / <sub>16</sub>  | 2.32           | 3.49      | W15209          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>5</sup> / <sub>8</sub>   | 2.32           | 3.49      | W15210          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>11</sup> / <sub>16</sub> | 2.32           | 3.49      | W15211          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>3</sup> / <sub>4</sub>   | 2.32           | 3.49      | W15212          | 30.72   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>13</sup> / <sub>16</sub> | 2.44           | 3.56      | W15213          | 30.62   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>7</sup> / <sub>8</sub>   | 2.44           | 3.56      | W15214          | 30.39   | -   | -   | -   | -   | -   | -               |
|                                | 2 <sup>15</sup> / <sub>16</sub> | 2.44           | 3.56      | W15215          | 30.08   | -   | -   | -   | -   | -   | -               |
|                                | 3                               | 2.54           | 3.66      | W15300          | 30.86   | 3 - 2 <sup>1</sup> / <sub>8</sub>                               | W15300R202  | -   | -   | -   | -               |
|                                | 3 <sup>1</sup> / <sub>16</sub>  | 2.54           | 3.66      | W15301          | 30.71   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>1</sup> / <sub>8</sub>   | 2.54           | 3.66      | W15302          | 30.34   | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>9</sup> / <sub>16</sub>  | W15302R209  | -   | -   | -   | -               |
|                                | 3 <sup>3</sup> / <sub>16</sub>  | 2.74           | 3.80      | W15303          | 32.38   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>1</sup> / <sub>4</sub>   | 2.74           | 3.80      | W15304          | 32.07   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>5</sup> / <sub>16</sub>  | 2.74           | 3.80      | W15305          | 31.85   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>3</sup> / <sub>8</sub>   | 2.74           | 3.80      | W15306          | 31.63   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>7</sup> / <sub>16</sub>  | 2.74           | 3.80      | W15307I         | 31.32   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>1</sup> / <sub>2</sub>   | 2.74           | 3.80      | W15308          | 30.98   | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>15</sup> / <sub>16</sub> | W15308R215  | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>3</sup> / <sub>4</sub>   | W15308R212  | -   | -               |
|                                | 3 <sup>9</sup> / <sub>16</sub>  | 2.95           | 4.01      | W15309          | 31.70   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>5</sup> / <sub>8</sub>   | 2.95           | 4.01      | W15310          | 31.70   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>11</sup> / <sub>16</sub> | 2.95           | 4.01      | W15311          | 31.70   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>3</sup> / <sub>4</sub>   | 2.95           | 4.01      | W15312          | 31.70   | 3 <sup>3</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>8</sub>   | W15312R302  | 3 <sup>3</sup> / <sub>4</sub> - 2 <sup>15</sup> / <sub>16</sub> | W15312R215  | -   | -               |
|                                | 3 <sup>13</sup> / <sub>16</sub> | 2.95           | 4.01      | W15313          | 31.70   | -   | -   | -   | -   | -   | -               |
|                                | 3 <sup>7</sup> / <sub>8</sub>   | 2.95           | 4.01      | W15314          | 31.70   | 3 <sup>7</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>8</sub>   | W15314R302  | 3 <sup>7</sup> / <sub>8</sub> - 2 <sup>15</sup> / <sub>16</sub> | W15314R215  | -   | -               |
|                                | 3 <sup>15</sup> / <sub>16</sub> | 3.17           | 4.06      | W15315          | 34.02   | -   | -   | -   | -   | -   | -               |
|                                | 4                               | 3.17           | 4.06      | W15400          | 33.70   | -   | -   | -   | -   | -   | -               |
|                                | 4 <sup>1</sup> / <sub>16</sub>  | 3.17           | 4.06      | W15401I         | 33.41   | -   | -   | -   | -   | -   | -               |
|                                | 4 <sup>1</sup> / <sub>8</sub>   | 3.17           | 4.06      | W15402          | 33.09   | 4 <sup>1</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>2</sub>   | W15402R308  | 4 <sup>1</sup> / <sub>8</sub> - 3 <sup>5</sup> / <sub>16</sub>  | W15402R305  | 4 <sup>1</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>4</sub> | W15402R304      |
|                                | 4 <sup>3</sup> / <sub>16</sub>  | 3.17           | 4.06      | W15403I         | 32.81   | -   | -   | -   | -   | -   | -               |
|                                | 4 <sup>1</sup> / <sub>4</sub>   | 3.17           | 4.06      | W15404          | 32.29   | 4 <sup>1</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>2</sub>   | W15404R308  | 4 <sup>1</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>8</sub>   | W15404R302  | -   | -               |
|                                | 4 <sup>5</sup> / <sub>16</sub>  | 3.44           | 4.52      | W15405          | 35.61   | -   | -   | -   | -   | -   | -               |
| 4 <sup>3</sup> / <sub>8</sub>  | 3.44                            | 4.52           | W15406    | 35.32           | -   | -   | -   | -   | -   | -   |                 |
| 4 <sup>7</sup> / <sub>16</sub> | 3.44                            | 4.52           | W15407    | 34.99           | -   | -   | -   | -   | -   | -   |                 |
| 4 <sup>1</sup> / <sub>2</sub>  | 3.44                            | 4.52           | W15408I   | 34.63           | -   | -   | -   | -   | -   | -   |                 |
| 4 <sup>9</sup> / <sub>16</sub> | 3.44                            | 4.52           | W15409I   | 34.28           | -   | -   | -   | -   | -   | -   |                 |
| 4 <sup>5</sup> / <sub>8</sub>  | 3.44                            | 4.52           | W15410I   | 33.72           | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>15</sup> / <sub>16</sub> | W15410R315  | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>7</sup> / <sub>8</sub> | W15410R314  | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>3</sup> / <sub>4</sub> | W15410R312  |                 |
| -                              | -                               | -              | -         | -               | -   | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>2</sub>   | W15410R308  | -   | -   | -   |                 |



Maximum Torque at 10,000 psi:

**22,500 Ft.lbs**

Hexagon Range:

**2<sup>3</sup>/<sub>16</sub> - 5<sup>3</sup>/<sub>8</sub> inch**




Maximum Operating Pressure:

**10,000 psi**

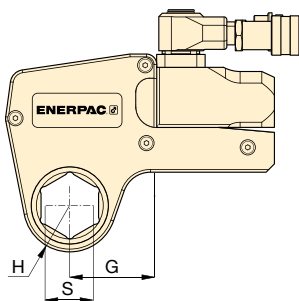
**W Series**



▼ SELECTION CHART

| Drive Unit Model Number            | Hexagon Size                        | Nose Radius | Dim.          | Model Number  | Weight  |  |   |  |   |  |                   |
|------------------------------------|-------------------------------------|-------------|---------------|---------------|---|---|---|---|---|---|-------------------|
|                                    |                                     |             |               |               |   | Hexagon Reducer (in)  | Model Number  | Hexagon Reducer (in)  | Model Number  | Hexagon Reducer (in)  | Model Number      |
| <b>W22000</b>                      | <b>2<sup>15</sup>/<sub>16</sub></b> | 2.64        | 4.02          | <b>W22215</b> | 48.72   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3</b>                            | 2.64        | 4.02          | <b>W22300</b> | 48.40   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>1</sup>/<sub>16</sub></b>  | 2.64        | 4.02          | <b>W22301</b> | 48.22   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>1</sup>/<sub>8</sub></b>   | 2.64        | 4.02          | <b>W22302</b> | 47.78   | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>8</sub>                     | <b>W22302R206</b>   | 3 <sup>1</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>16</sub>                      | <b>W22302R203</b>   | -   | -                 |
|                                    | <b>3<sup>3</sup>/<sub>16</sub></b>  | 2.85        | 4.23          | <b>W22303</b> | 50.58   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>1</sup>/<sub>4</sub></b>   | 2.85        | 4.23          | <b>W22304</b> | 50.19   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>5</sup>/<sub>16</sub></b>  | 2.85        | 4.23          | <b>W22305</b> | 49.92   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>3</sup>/<sub>8</sub></b>   | 2.85        | 4.23          | <b>W22306</b> | 49.66   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>7</sup>/<sub>16</sub></b>  | 2.85        | 4.23          | <b>W22307</b> | 50.29   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>1</sup>/<sub>2</sub></b>   | 2.85        | 4.23          | <b>W22308</b> | 48.87   | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>3</sup> / <sub>4</sub>                     | <b>W22308R212</b>   | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>9</sup> / <sub>16</sub>                      | <b>W22308R209</b>   | 3 <sup>1</sup> / <sub>2</sub> - 2 <sup>3</sup> / <sub>8</sub>                       | <b>W22308R206</b> |
|                                    | <b>3<sup>9</sup>/<sub>16</sub></b>  | 3.07        | 4.45          | <b>W22309</b> | 51.58   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>5</sup>/<sub>8</sub></b>   | 3.07        | 4.45          | <b>W22310</b> | 51.30   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>11</sup>/<sub>16</sub></b> | 3.07        | 4.45          | <b>W22311</b> | 50.93   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>3</sup>/<sub>4</sub></b>   | 3.07        | 4.45          | <b>W22312</b> | 50.62   | 3 <sup>3</sup> / <sub>4</sub> - 2 <sup>15</sup> / <sub>16</sub>                   | <b>W22312R215</b>   | -   | -   | -   | -                 |
|                                    | <b>3<sup>13</sup>/<sub>16</sub></b> | 3.07        | 4.45          | <b>W22313</b> | 50.24   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>3<sup>7</sup>/<sub>8</sub></b>   | 3.07        | 4.45          | <b>W22314</b> | 49.77   | 3 <sup>7</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>8</sub>                     | <b>W22314R302</b>   | 3 <sup>7</sup> / <sub>8</sub> - 2 <sup>15</sup> / <sub>16</sub>                     | <b>W22314R215</b>   | 3 <sup>7</sup> / <sub>8</sub> - 2 <sup>3</sup> / <sub>4</sub>                       | <b>W22314R212</b> |
|                                    | <b>3<sup>15</sup>/<sub>16</sub></b> | 3.35        | 4.72          | <b>W22315</b> | 53.57   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4</b>                            | 3.35        | 4.72          | <b>W22400</b> | 53.19   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>1</sup>/<sub>16</sub></b>  | 3.35        | 4.72          | <b>W22401</b> | 52.82   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>1</sup>/<sub>8</sub></b>   | 3.35        | 4.72          | <b>W22402</b> | 52.43   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>3</sup>/<sub>16</sub></b>  | 3.35        | 4.72          | <b>W22403</b> | 52.09   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>1</sup>/<sub>4</sub></b>   | 3.35        | 4.72          | <b>W22404</b> | 51.48   | 4 <sup>1</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>2</sub>                     | <b>W22404R308</b>   | 4 <sup>1</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>8</sub>                       | <b>W22404R302</b>   | 4 <sup>1</sup> / <sub>4</sub> - 2 <sup>15</sup> / <sub>16</sub>                     | <b>W22404R215</b> |
|                                    | <b>4<sup>5</sup>/<sub>16</sub></b>  | 3.54        | 4.92          | <b>W22405</b> | 54.26   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>3</sup>/<sub>8</sub></b>   | 3.54        | 4.92          | <b>W22406</b> | 53.91   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>7</sup>/<sub>16</sub></b>  | 3.54        | 4.92          | <b>W22407</b> | 53.50   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>1</sup>/<sub>2</sub></b>   | 3.54        | 4.92          | <b>W22408</b> | 53.06   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>9</sup>/<sub>16</sub></b>  | 3.54        | 4.92          | <b>W22409</b> | 52.64   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>5</sup>/<sub>8</sub></b>   | 3.54        | 4.92          | <b>W22410</b> | 51.99   | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>7</sup> / <sub>8</sub>                     | <b>W22410R314</b>   | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>3</sup> / <sub>4</sub>                       | <b>W22410R312</b>   | 4 <sup>5</sup> / <sub>8</sub> - 3 <sup>1</sup> / <sub>2</sub>                       | <b>W22410R308</b> |
|                                    | <b>4<sup>3</sup>/<sub>4</sub></b>   | 3.74        | 5.12          | <b>W22412</b> | 54.54   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>4<sup>7</sup>/<sub>8</sub></b>   | 3.74        | 5.12          | <b>W22414</b> | 53.60   | -   | -   | -   | -   | -   | -                 |
|                                    | <b>5</b>                            | 3.74        | 5.12          | <b>W22500</b> | 52.37   | 5 - 4 <sup>1</sup> / <sub>4</sub>   | <b>W22500R404</b>   | 5 - 4 <sup>1</sup> / <sub>8</sub>   | <b>W22500R402</b>   | 5 - 3 <sup>7</sup> / <sub>8</sub>   | <b>W22500R314</b> |
|                                    | <b>5<sup>1</sup>/<sub>8</sub></b>   | 3.94        | 5.31          | <b>W22502</b> | 55.10   | -   | -   | -   | -   | -   | -                 |
| <b>5<sup>3</sup>/<sub>16</sub></b> | 3.94                                | 5.31        | <b>W22503</b> | 54.71         | -   | -   | -   | -   | -   | -   |                   |
| <b>5<sup>1</sup>/<sub>4</sub></b>  | 3.94                                | 5.31        | <b>W22504</b> | 54.05         | -   | -   | -   | -   | -   | -   |                   |
| <b>5<sup>3</sup>/<sub>8</sub></b>  | 3.94                                | 5.31        | <b>W22506</b> | 52.77         | 5 <sup>3</sup> / <sub>8</sub> - 4 <sup>5</sup> / <sub>8</sub> | <b>W22506R410</b>   | 5 <sup>3</sup> / <sub>8</sub> - 4 <sup>1</sup> / <sub>4</sub> | <b>W22506R404</b>   | 5 <sup>3</sup> / <sub>8</sub> - 4 <sup>1</sup> / <sub>8</sub> | <b>W22506R402</b>   |                   |
| -                                  | -                                   | -           | <b>W22506</b> | 52.77         | 5 <sup>3</sup> / <sub>8</sub> - 3 <sup>7</sup> / <sub>8</sub> | <b>W22506R314</b>   | -   | -   | -   | -   |                   |

# W35000 Series Imperial Cassettes & Reducer Inserts



## ▼ SELECTION CHART

| Drive Unit Model Number | Hexagon Size | Nose Radius | Dim.   | Model Number | Weight        | Image             |              |
|-------------------------|--------------|-------------|--------|--------------|---------------|-------------------|--------------|
|                         |              |             |        |              |               | Hexagon Reducer   | Model Number |
|                         | S (in)       | H (in)      | G (in) |              | (lbs)         | (in)              |              |
| W35000                  | 3 1/8        | 3.02        | 4.99   | W35302       | 72.30         | 3 1/8 - 2         | W35302R200   |
|                         | 3 3/16       | 3.02        | 4.99   | W35303       | 72.10         | -                 | -            |
|                         | 3 1/4        | 3.02        | 4.99   | W35304       | 71.70         | -                 | -            |
|                         | 3 5/16       | 3.02        | 4.99   | W35305       | 71.40         | -                 | -            |
|                         | 3 3/8        | 3.02        | 4.99   | W35306       | 71.00         | -                 | -            |
|                         | 3 7/16       | 3.02        | 4.99   | W35307       | 70.50         | -                 | -            |
|                         | 3 1/2        | 3.02        | 4.99   | W35308       | 70.10         | 3 1/2 - 2 5/16    | W35308R205   |
|                         | 3 9/16       | 3.23        | 5.22   | W35309       | 71.40         | -                 | -            |
|                         | 3 5/8        | 3.23        | 5.22   | W35310       | 73.40         | -                 | -            |
|                         | 3 11/16      | 3.23        | 5.22   | W35311       | 73.00         | -                 | -            |
|                         | 3 3/4        | 3.23        | 5.22   | W35312       | 72.50         | -                 | -            |
|                         | 3 13/16      | 3.23        | 5.22   | W35313       | 72.10         | -                 | -            |
|                         | 3 7/8        | 3.23        | 5.22   | W35314       | 71.40         | 3 7/8 - 2 11/16   | W35314R211   |
|                         | 3 15/16      | 3.45        | 5.39   | W35315       | 70.80         | 3 15/16 - 2 13/16 | W35315R213   |
|                         | 4            | 3.45        | 5.39   | W35400       | 74.70         | -                 | -            |
|                         | 4 1/16       | 3.45        | 5.39   | W35401       | 74.30         | -                 | -            |
|                         | 4 1/8        | 3.45        | 5.39   | W35402       | 73.90         | -                 | -            |
|                         | 4 3/16       | 3.45        | 5.39   | W35403       | 73.40         | -                 | -            |
|                         | 4 1/4        | 3.45        | 5.39   | W35404       | 72.80         | 4 1/4 - 3 1/16    | W35404R301   |
|                         | 4 5/16       | 3.69        | 5.63   | W35405       | 76.90         | -                 | -            |
|                         | 4 3/8        | 3.69        | 5.63   | W35406       | 76.50         | -                 | -            |
|                         | 4 7/16       | 3.69        | 5.63   | W35407       | 76.10         | -                 | -            |
|                         | 4 1/2        | 3.69        | 5.63   | W35408       | 75.60         | -                 | -            |
|                         | 4 9/16       | 3.69        | 5.63   | W35409       | 75.20         | -                 | -            |
|                         | 4 5/8        | 3.69        | 5.63   | W35410       | 74.50         | 4 5/8 - 3 5/8     | W35410R310   |
|                         | 4 3/4        | 3.91        | 5.85   | W35412       | 78.50         | 4 3/4 - 3 3/4     | W35412R312   |
|                         | 4 7/8        | 3.91        | 5.85   | W35414       | 76.90         | -                 | -            |
|                         | 5            | 3.91        | 5.85   | W35500       | 75.60         | 5 - 4             | W35500R400   |
|                         | 5 1/8        | 4.09        | 6.02   | W35502       | 78.90         | 5 1/8 - 4 1/8     | W35502R402   |
|                         | 5 3/16       | 4.09        | 6.02   | W35503       | 78.50         | -                 | -            |
|                         | 5 1/4        | 4.09        | 6.02   | W35504       | 77.60         | -                 | -            |
|                         | 5 3/8        | 4.09        | 6.02   | W35506       | 76.30         | 5 3/8 - 4 5/16    | W35506R405   |
| 5 1/2                   | 4.31         | 6.24        | W35508 | 79.80        | -             | -                 |              |
| 5 9/16                  | 4.31         | 6.24        | W35509 | 79.40        | -             | -                 |              |
| 5 5/8                   | 4.31         | 6.24        | W35510 | 78.50        | -             | -                 |              |
| 5 3/4                   | 4.31         | 6.24        | W35512 | 76.90        | 5 3/4 - 4 3/4 | W35512R412        |              |
| 5 7/8                   | 4.52         | 6.46        | W35514 | 80.90        | 5 7/8 - 4 7/8 | W35514R414        |              |
| 6                       | 4.52         | 6.46        | W35600 | 79.60        | -             | -                 |              |
| 6 1/8                   | 4.52         | 6.46        | W35602 | 77.80        | 6 1/8 - 5 1/8 | W35602R502        |              |

## W Series



Maximum Torque at 10,000 psi:

**35,000 Ft.lbs**

Hexagon Range:

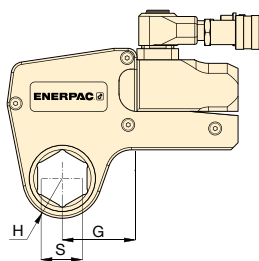
**3 1/8 - 6 1/8 inches**

Maximum Operating Pressure:

**10,000 psi**



# W Series Metric Cassettes and Reducer Inserts








Hexagon Range:  
**30-105 mm**

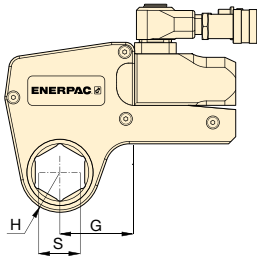
Maximum Operating Pressure:  
**10,000 psi (700 bar)**



▼ SELECTION CHART

| Drive Unit Model Number   | Hexagon Size | Nose Radius | Dim.         | Model Number  | Weight |  |                   |  |                   |  |                   |   |
|---|--------------|-------------|--------------|---|--------|---|-------------------|---|-------------------|---|-------------------|---|
|   |              |             |              |   |        | Hexagon Reducer (mm)  | Model Number      | Hexagon Reducer (mm)  | Model Number      | Hexagon Reducer (mm)  | Model Number      |   |
|  | S (mm)       | H (in)      | G (in)       |  | (lbs)  |   |                   |   |                   |   |                   |   |
| <b>W2000</b>  | 30           | 1.22        | 2.11         | <b>W2103</b>  | 4.19   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 32           | 1.22        | 2.11         | <b>W2104</b>  | 4.19   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 36           | 1.22        | 2.11         | <b>W2107</b>  | 4.19   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 38           | 1.32        | 2.29         | <b>W2108</b>  | 4.51   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 41           | 1.32        | 2.29         | <b>W2110</b>  | 4.38   | 41 - 32   | <b>W2110R104</b>  | 41 - 30   | <b>W2110R103</b>  | 41 - 24   | <b>W2110R024M</b> |   |
|   | 46           | 1.44        | 2.38         | <b>W2113</b>  | 4.69   | 46 - 36   | <b>W2113R107</b>  | 46 - 32   | <b>W2113R104</b>  | -   | -                 |   |
|   | 50           | 1.54        | 2.48         | <b>W2200</b>  | 4.54   | 50 - 41   | <b>W2200R110</b>  | 50 - 36   | <b>W2200R107</b>  | -   | -                 |   |
|   | 55           | 1.65        | 2.70         | <b>W2203</b>  | 4.64   | 55 - 46   | <b>W2203R113</b>  | 55 - 41   | <b>W2203R110</b>  | 55 - 36   | <b>W2203R107</b>  |   |
|   | 60           | 1.75        | 2.55         | <b>W2206</b>  | 4.72   | 60 - 50   | <b>W2206R200</b>  | 60 - 46   | <b>W2206R113</b>  | 60 - 41   | <b>W2206R110</b>  |   |
|   | -            | -           | -            | -   | -      | -   | 60 - 36           | <b>W2206R107</b>  | -                 | -   | -                 |   |
| <b>W4000</b>  | 36           | 1.46        | 2.40         | <b>W4107</b>  | 7.72   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 41           | 1.46        | 2.40         | <b>W4110</b>  | 7.72   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 46           | 1.56        | 2.52         | <b>W4113</b>  | 7.94   | -   | -                 | -   | -                 | -   | -                 |   |
|   | 50           | 1.63        | 2.63         | <b>W4200</b>  | 8.28   | 50 - 36   | <b>W4200R107</b>  | -   | -                 | -   | -                 |   |
|   | 55           | 1.73        | 2.89         | <b>W4203</b>  | 8.42   | 55 - 41   | <b>W4203R110</b>  | 55 - 36   | <b>W4203R107</b>  | 55 - 32   | <b>W4203R104</b>  |   |
|   | 60           | 1.83        | 2.78         | <b>W4206</b>  | 8.47   | 60 - 50   | <b>W4206R200</b>  | 60 - 46   | <b>W4206R113</b>  | 60 - 36   | <b>W4206R107</b>  |   |
|   | 65           | 1.95        | 3.00         | <b>W4209</b>  | 8.67   | 65 - 55   | <b>W4209R203</b>  | 65 - 50   | <b>W4209R200</b>  | 65 - 46   | <b>W4209R113</b>  |   |
|   | 70           | 2.07        | 3.08         | <b>W4212</b>  | 8.84   | 70 - 60   | <b>W4212R206</b>  | 70 - 55   | <b>W4212R203</b>  | -   | -                 |   |
|   | 75           | 2.18        | 3.21         | <b>W4215</b>  | 8.96   | 75 - 65   | <b>W4215R209</b>  | 75 - 60   | <b>W4215R206</b>  | -   | -                 |   |
|   | -            | -           | -            | -   | -      | -   | 75 - 55           | <b>W4215R203</b>  | 75 - 50           | <b>W4215R200</b>  | -                 | - |
|   | 80           | 2.30        | 3.29         | <b>W4302</b>  | 9.16   | 80 - 75   | <b>W4302R215</b>  | 80 - 70   | <b>W4302R212</b>  | 80 - 65   | <b>W4302R209</b>  |   |
|   | -            | -           | -            | -   | -      | -   | 80 - 55           | <b>W4302R203</b>  | 80 - 50           | <b>W4302R200</b>  | -                 |   |
| <b>W8000</b>  | 50           | 1.77        | 3.08         | <b>W8200</b>  | 17.75  | -   | -                 | -   | -                 | -   | -                 |   |
|   | 55           | 1.89        | 3.15         | <b>W8203</b>  | 17.22  | -   | -                 | -   | -                 | -   | -                 |   |
|   | 60           | 2.01        | 3.25         | <b>W8206</b>  | 17.59  | -   | -                 | -   | -                 | -   | -                 |   |
|   | 65           | 2.07        | 3.38         | <b>W8209</b>  | 17.29  | 65 - 50   | <b>W8209R200</b>  | -   | -                 | -   | -                 |   |
|   | 70           | 2.07        | 3.34         | <b>W8212</b>  | 17.12  | 70 - 55   | <b>W8212R203</b>  | -   | -                 | -   | -                 |   |
|   | 75           | 2.28        | 3.35         | <b>W8215</b>  | 17.11  | 75 - 60   | <b>W8215R206</b>  | 75 - 55   | <b>W8215R203</b>  | -   | -                 |   |
|   | 80           | 2.38        | 3.52         | <b>W8302</b>  | 17.33  | 80 - 65   | <b>W8302R209</b>  | 80 - 60   | <b>W8302R206</b>  | 80 - 55   | <b>W8302R203</b>  |   |
|   | -            | -           | -            | -   | -      | -   | 80 - 50           | <b>W8302R200</b>  | -                 | -   | -                 |   |
|   | 85           | 2.60        | 3.63         | <b>W8085M</b>   | 18.42  | 85 - 70   | <b>W8085R070M</b> | 85 - 65   | <b>W8085R065M</b> | 85 - 60   | <b>W8085R060M</b> |   |
|   | -            | -           | -            | -   | -      | -   | 85 - 55           | <b>W8085R055M</b>   | -                 | -   | -                 |   |
|   | 90           | 2.91        | 4.05         | <b>W8090M</b>   | 20.46  | 90 - 75   | <b>W8090R075M</b> | -   | -                 | -   | -                 |   |
|   | 95           | 2.91        | 4.05         | <b>W8312</b>  | 19.71  | 95 - 80   | <b>W8312R302</b>  | 95 - 75   | <b>W8312R215</b>  | -   | -                 |   |
|   | 100          | 3.13        | 4.33         | <b>W8315</b>  | 20.31  | -   | -                 | -   | -                 | -   | -                 |   |
| 105   | 3.13         | 4.33        | <b>W8402</b> | 19.39   | -      | -   | -                 | -   | -                 | -   |                   |   |

# W Series Metric Cassettes and Reducer Inserts



Hexagon Range:  
**65-155 mm**

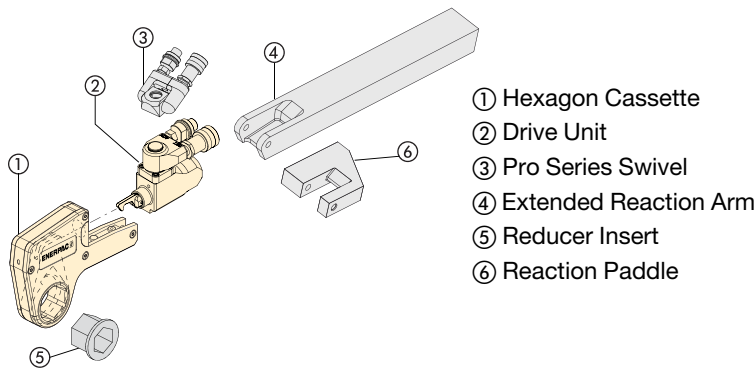
Maximum Operating Pressure:  
**10,000 psi (700 bar)**

**W**  
Series



## ▼ SELECTION CHART

| Drive Unit<br>Model<br>Number | Hexagon<br>Size | Nose<br>Radius | Dim.      | Model<br>Number | Weight | Hexagon Reducer            |                    | Hexagon Reducer            |                    |
|-------------------------------|-----------------|----------------|-----------|-----------------|--------|----------------------------|--------------------|----------------------------|--------------------|
|                               |                 |                |           |                 |        | Hexagon<br>Reducer<br>(mm) | Model<br>Number    | Hexagon<br>Reducer<br>(mm) | Model<br>Number    |
|                               | S<br>(mm)       | H<br>(in)      | G<br>(in) |                 | (lbs)  |                            |                    |                            |                    |
| <b>W15000</b>                 | 65              | 2.32           | 3.49      | <b>W15209</b>   | 30.72  | -                          | -                  | -                          | -                  |
|                               | 70              | 2.32           | 3.49      | <b>W15212</b>   | 30.72  | -                          | -                  | -                          | -                  |
|                               | 75              | 2.44           | 3.56      | <b>W15215</b>   | 30.08  | -                          | -                  | -                          | -                  |
|                               | 80              | 2.54           | 3.66      | <b>W15302</b>   | 30.34  | 80-65                      | <b>W15302R209</b>  | -                          | -                  |
|                               | 85              | 2.74           | 3.80      | <b>W15085M</b>  | 31.70  | 85-70                      | <b>W15085R070M</b> | -                          | -                  |
|                               | 90              | 2.95           | 4.01      | <b>W15090M</b>  | 33.32  | 90-75                      | <b>W15090R075M</b> | -                          | -                  |
|                               | 95              | 2.95           | 4.01      | <b>W15312</b>   | 31.70  | 95-80                      | <b>W15312R302</b>  | 95 - 75                    | <b>W15312R215</b>  |
|                               | 100             | 3.17           | 4.06      | <b>W15315</b>   | 34.02  | -                          | -                  | -                          | -                  |
|                               | 105             | 3.17           | 4.06      | <b>W15402</b>   | 33.09  | 105-90                     | <b>W15402R090M</b> | -                          | -                  |
|                               | 110             | 3.44           | 4.52      | <b>W15405</b>   | 35.61  | 110-95                     | <b>W15110R095M</b> | -                          | -                  |
|                               | 115             | 3.44           | 4.52      | <b>W15115M</b>  | 34.48  | 115-100                    | <b>W15115R100M</b> | -                          | -                  |
| <b>W22000</b>                 | 75              | 2.64           | 4.02      | <b>W22215</b>   | 48.72  | -                          | -                  | -                          | -                  |
|                               | 80              | 2.64           | 4.02      | <b>W22302</b>   | 47.78  | 80-60                      | <b>W22302R206</b>  | 80 - 55                    | <b>W22302R203</b>  |
|                               | 85              | 2.85           | 4.23      | <b>W22085M</b>  | 49.74  | 85-65                      | <b>W22085MR209</b> | 85 - 60                    | <b>W22085MR206</b> |
|                               | 90              | 3.07           | 4.45      | <b>W22090M</b>  | 51.72  | 90-70                      | <b>W22090M212</b>  | 90 - 60                    | <b>W22090MR206</b> |
|                               | 95              | 3.07           | 4.45      | <b>W22312</b>   | 50.62  | 95-75                      | <b>W22312R215</b>  | -                          | -                  |
|                               | 100             | 3.35           | 4.72      | <b>W22315</b>   | 53.57  | -                          | -                  | -                          | -                  |
|                               | 105             | 3.35           | 4.72      | <b>W22402</b>   | 52.09  | -                          | -                  | -                          | -                  |
|                               | 110             | 3.54           | 4.92      | <b>W22404</b>   | 51.48  | -                          | -                  | -                          | -                  |
|                               | 115             | 3.54           | 4.92      | <b>W22115M</b>  | 52.88  | -                          | -                  | -                          | -                  |
|                               | 120             | 3.74           | 5.12      | <b>W22412</b>   | 54.54  | -                          | -                  | -                          | -                  |
|                               | 123             | 3.74           | 5.12      | <b>W22123M</b>  | 53.80  | -                          | -                  | -                          | -                  |
|                               | 130             | 3.94           | 5.31      | <b>W22502</b>   | 55.10  | -                          | -                  | -                          | -                  |
|                               | 135             | 3.94           | 5.31      | <b>W22506</b>   | 52.77  | 135 - 105                  | <b>W22506R402</b>  | -                          | -                  |
| <b>W35000</b>                 | 80              | 3.02           | 5.08      | <b>W35302</b>   | 72.30  | 80-50                      | <b>W35302R200</b>  | -                          | -                  |
|                               | 85              | 3.02           | 5.08      | <b>W35085M</b>  | 33.10  | -                          | -                  | -                          | -                  |
|                               | 90              | 3.23           | 5.33      | <b>W35090M</b>  | 34.30  | 90-60                      | <b>W35090R206</b>  | -                          | -                  |
|                               | 95              | 3.23           | 5.30      | <b>W35312</b>   | 72.50  | -                          | -                  | -                          | -                  |
|                               | 100             | 3.45           | 5.48      | <b>W35315</b>   | 70.80  | -                          | -                  | -                          | -                  |
|                               | 105             | 3.45           | 5.48      | <b>W35402</b>   | 73.90  | -                          | -                  | -                          | -                  |
|                               | 110             | 3.69           | 5.75      | <b>W35405</b>   | 76.90  | 110-85                     | <b>W35405R085M</b> | -                          | -                  |
|                               | 115             | 3.69           | 5.75      | <b>W35115M</b>  | 77.10  | -                          | -                  | -                          | -                  |
|                               | 120             | 3.91           | 6.01      | <b>W35412</b>   | 78.50  | 120-95                     | <b>W35412R312</b>  | -                          | -                  |
|                               | 123             | 3.91           | 6.01      | <b>W35123M</b>  | 78.90  | -                          | -                  | -                          | -                  |
|                               | 130             | 4.09           | 6.30      | <b>W35502</b>   | 78.90  | 130-105                    | <b>W35502R402</b>  | -                          | -                  |
|                               | 135             | 4.09           | 6.30      | <b>W35506</b>   | 76.30  | 135-110                    | <b>W35506R405</b>  | -                          | -                  |
|                               | 140             | 4.31           | 6.43      | <b>W35508</b>   | 79.80  | 140-115                    | <b>W35508R115M</b> | -                          | -                  |
|                               | 145             | 4.31           | 6.43      | <b>W35512</b>   | 76.90  | 145-120                    | <b>W35512R412</b>  | -                          | -                  |
|                               | 150             | 4.52           | 6.67      | <b>W35514</b>   | 80.90  | -                          | -                  | -                          | -                  |
|                               | 151             | 4.52           | 6.67      | <b>W35151M</b>  | 82.10  | -                          | -                  | -                          | -                  |
|                               | 155             | 4.52           | 6.67      | <b>W35602</b>   | 77.80  | 155-130                    | <b>W35602R502</b>  | -                          | -                  |

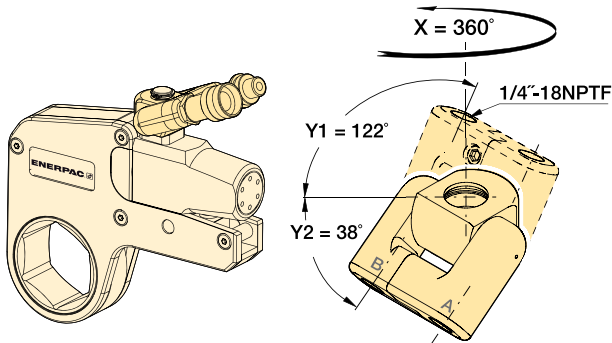


- ① Hexagon Cassette
- ② Drive Unit
- ③ Pro Series Swivel
- ④ Extended Reaction Arm
- ⑤ Reducer Insert
- ⑥ Reaction Paddle

## TSP WTE WRP Series



### TSP-Series, Pro Series Swivels



TSP-Series

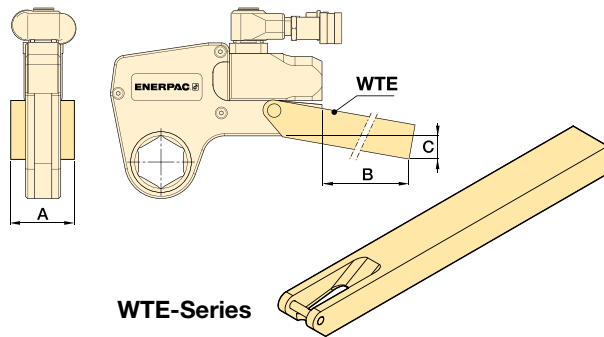
- Featuring Tilt and Swivel technology
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement

| Torque Wrench Model Number    | Model Number  | Maximum Pressure (psi) | Wt. (lbs) |
|-------------------------------|---------------|------------------------|-----------|
| W2000, W4000                  | <b>TSP100</b> | 10,000                 | .44       |
| W8000, W15000, W22000, W35000 | <b>TSP200</b> | 10,000                 | .44       |

To order a W-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **W2000-P**.

\*TSP-swivel does not include couplers except when ordered wrench mounted.

### WTE-Series, Extended Reaction Arm



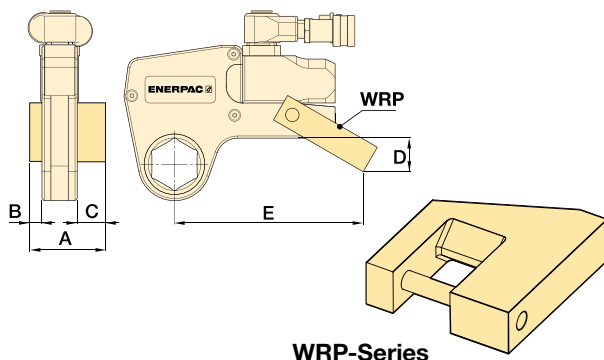
WTE-Series

- Full torque rated
- Increases tool fit in restricted access areas

| Torque Wrench Model Number | Model Number  | Dimensions (in) |       |      | Wt.* (lbs) |
|----------------------------|---------------|-----------------|-------|------|------------|
|                            |               | A               | B     | C    |            |
| W2000                      | <b>WTE20</b>  | 2.20            | 15.67 | 2.99 | 5.73       |
| W4000                      | <b>WTE40</b>  | 2.60            | 17.17 | 2.91 | 10.14      |
| W8000                      | <b>WTE80</b>  | 3.35            | 17.68 | 2.60 | 16.75      |
| W15000                     | <b>WTE150</b> | 4.02            | 19.61 | 2.84 | 26.46      |
| W35000                     | <b>WTE350</b> | 5.00            | 16.48 | 5.23 | 39.17      |

\* Weights indicated are for the accessories only and do not include the wrench.

### WRP-Series, Low Profile Reaction Paddles



WRP-Series

- Lightweight interchangeable design
- Allows for offset reaction when in-line reaction is not available

| Torque Wrench Model No. | Model Number  | Dimensions (in) |      |      |      |       | Wt.* (lbs) |
|-------------------------|---------------|-----------------|------|------|------|-------|------------|
|                         |               | A               | B    | C    | D    | E     |            |
| W2000                   | <b>WRP20</b>  | 3.31            | 0.62 | 1.38 | 1.77 | 5.83  | .88        |
| W4000                   | <b>WRP40</b>  | 4.29            | 0.83 | 1.85 | 2.32 | 7.48  | 1.76       |
| W8000                   | <b>WRP80</b>  | 5.39            | 1.02 | 2.24 | 2.71 | 8.78  | 4.41       |
| W15000                  | <b>WRP150</b> | 6.50            | 1.26 | 2.71 | 3.43 | 10.12 | 8.60       |
| W35000                  | <b>WRP350</b> | 8.84            | 1.65 | 3.57 | 7.15 | 14.44 | 23.35      |

\* Weights indicated are for the accessories only and do not include the wrench.

**E**NERPAC S-Series and W-Series Torque Wrenches provide high accuracy across the full stroke for safety critical applications.

**W4000 Low Profile Torque Wrench used in a set of four to simultaneously tighten a flange**

Sometimes some creativity is needed to tighten a joint that must be brought together by tightening multiple bolts at the same time. By combining four Enerpac W-Series wrenches with a 4-port manifold on an Enerpac ZE-Series pump this specialty task can be done safely and quickly.

This simple adaptation provides even and accurate torque across the flange four times faster than using only one W4000 at a time.



**S1500 Square Drive Wrench with twice the flexibility**

When looking to tighten the bolts on a large specialized piece of machining equipment the need for a unique tool was requested by the customer. A double-headed Reaction Arm and double-sided Square Drive was the answer to the situation.

Although in most instances the Enerpac product in the catalog can solve a customers requirements there are occasions where something custom is required. Enerpac has the capabilities to provide those solutions.

**S8000 Low Profile Torque Wrench tightening the bolts on turbine.**














Using the strength and accuracy of a steel wrench to tighten highly stressed bolts on a turbine is the safe way to handle a critical application.

All of Enerpac's W-Series and S-Series Wrenches are made of high-strength steel which gives you additional stiffness that other alloys cannot provide. This added stiffness translates into a stronger and more durable tool.



## Optimum Torque Wrench and Pump Combinations

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations.

|  | ELECTRIC PUMPS  |  |  |  | AIR DRIVEN PUMPS  |  | TWIN HOSES                               |
|--|---|--|--|--|---|--|--|
|  | PMU-Series  | ZU4-Series   | ZE4/5-Series   | PTA-Series   | ZA4-Series  | THQ-Series<br>THC-Series   |  |
|  | <br><br><br><br><br> | <br>Page: 205 | <br>Page: 206 | <br>Page: 210 | <br>Page: 212 | <br>Page: 214 |  |
| <b>10,000 psi Torque Wrenches</b><br>Model No.   | Flow at rated pressure:<br>20 in <sup>3</sup> /min<br>115V, 1 ph  | Flow at rated pressure:<br>20 in <sup>3</sup> /min<br>230V, 1 ph                               | Flow at rated pressure:<br>60 in <sup>3</sup> /min<br>115V, 1 ph                               | Flow at rated pressure:<br>60-120 in <sup>3</sup> /min<br>115V, 230V,<br>380V, 3 ph            | Flow at rated pressure:<br>20 in <sup>3</sup> /min  | Flow at rated pressure:<br>60 in <sup>3</sup> /min   |  |
|  186  | S1500<br>S3000  | PMU-10427-Q  | PMU-10422-Q  | Any ZU4-Series pump may be used.   | Any ZE-Series pump may be used.   | Any ZA4-Series pump may be used.   | THQ-706T (19.5 ft)<br>THQ-712T (39.0 ft) |
|  | S6000<br>S11000<br>S25000   | -  | -  |  |   |  |  |
|  192 | W2000<br>W4000  | PMU-10427-Q  | PMU-10422-Q  |  |   |  |  |
|  | W8000<br>W15000<br>W22000<br>W35000   | -  | -  |  |   |  |  |



### ZU4-Series Electric Torque Wrench Pump

Utilizing a universal motor, the ZU4-Series has excellent low voltage characteristics. It works well with long extension cords or generator driven electrical power supplies. A field proven, efficient design ensures this pump is dependable and will draw less current — lowering your operating cost. The pumps are available in Pro and Classic formats. *ZU4 Pro* pumps have an LCD feature to display torque or pressure, selectable torque wrench, and self diagnostics – premium features not available on any other pump. *ZU4 Classic* pumps feature an analog gauge and a basic electrical package to deliver durable, safe and efficient hydraulic power.

### ZE-Series Electric Torque Wrench Pump

The ZE-Series features premium options, such as the LCD to display torque or pressure values, and self diagnostics. These pumps utilize an induction motor, making the ZE-Series the coolest and quietest pumps in their class.

### ZA-Series Air Torque Wrench Pump

Utilizing the highly efficient design of the *Z-Class* pumping element, this air driven pump is best suited to power medium to large size torque wrenches.



### 11,600 psi (800 bar) Torque Wrench Pumps

11,600 psi (800 bar) pumps are available for higher pressure wrenches. See pump product pages.



### IMPORTANT!

Always make sure that the torque scale on the pump matches the torque wrench size for accurate torque settings.



### Call Enerpac!

For other combinations, consult your Enerpac bolting expert or your authorized Enerpac distributor.

# Portable Electric Torque Wrench Pumps

▼ Shown: PMU-10427



## PMU Series

Reservoir Capacity:

**0.5-1 gal.**

Flow at 10,000 psi:

**20 in<sup>3</sup>/min.**

Motor Size:

**0.5 hp**

Maximum Operating Pressure:

**10,000 and 11,600 psi**



### Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

- Powerful two-speed pump is lightweight and easy to carry
- Standard heat exchanger package keeps pump cool under extreme use
- Glycerin filled gauge with scales reading in psi and bar
- Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference
- Universal motor for a high power-to-weight ratio; generates full pressure on as little as 50% of the rated line voltage
- Adjustable pressure relief valve for accurate torque adjustments and precise repeatability



### Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

| 10,000 psi              |                 |
|-------------------------|-----------------|
| 19.5 feet long, 2 hoses | <b>THQ-706T</b> |
| 39 feet long, 2 hoses   | <b>THQ-712T</b> |
| 11,600 psi              |                 |
| 19.5 feet long, 2 hoses | <b>THC-7062</b> |
| 39 feet long, 2 hoses   | <b>THC-7122</b> |

### ▼ SELECTION CHART

| For Use With Torque Wrenches |                  | Maximum Pressure Rating (psi) |                       | Oil Flow Rate (in <sup>3</sup> /min) |                       | Model Number | Useable Oil Capacity (gal) | Electric Motor      | Dimensions L x W x H (in) | Weight (lbs) |
|------------------------------|------------------|-------------------------------|-----------------------|--------------------------------------|-----------------------|--------------|----------------------------|---------------------|---------------------------|--------------|
|                              |                  | 1 <sup>st</sup> stage         | 2 <sup>nd</sup> stage | 1 <sup>st</sup> stage                | 2 <sup>nd</sup> stage |              |                            |                     |                           |              |
| S1500<br>S3000               | W2000<br>W4000   | 700                           | 10,000                | 200                                  | 20                    | PMU-10427-Q  | .50                        | 115V- 1 ph -50/60Hz | 17 x 11 x 15              | 53           |
|                              |                  | 700                           | 10,000                | 200                                  | 20                    | PMU-10447-Q  | 1.0                        | 115V- 1 ph -50/60Hz | 17 x 13 x 15              | 60           |
|                              |                  | 700                           | 10,000                | 200                                  | 20                    | PMU-10422-Q  | .50                        | 230V- 1 ph -50/60Hz | 17 x 11 x 15              | 53           |
|                              |                  | 700                           | 10,000                | 200                                  | 20                    | PMU-10442-Q  | 1.0                        | 230V- 1 ph -50/60Hz | 17 x 13 x 15              | 60           |
| SQD-25-I<br>SQD-50-I         | HXD-30<br>HXD-60 | 700                           | 11,600                | 200                                  | 20                    | PMU-10427    | .50                        | 115V- 1 ph -50/60Hz | 17 x 11 x 15              | 53           |
|                              |                  | 700                           | 11,600                | 200                                  | 20                    | PMU-10447    | 1.0                        | 115V- 1 ph -50/60Hz | 17 x 13 x 15              | 60           |
|                              |                  | 700                           | 11,600                | 200                                  | 20                    | PMU-10422    | .50                        | 230V- 1 ph -50/60Hz | 17 x 11 x 15              | 53           |
|                              |                  | 700                           | 11,600                | 200                                  | 20                    | PMU-10442    | 1.0                        | 230V- 1 ph -50/60Hz | 17 x 13 x 15              | 60           |

▼ Shown: ZU4204TB-Q and ZU4204BB-Q



## Z Tough. Dependable. Innovative. Z CLASS



### FIRMWARE for Pro-Series

- Display torque in Ft.lbs. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- “Auto cycle” setting easily programmable



### Classic Electrical

Basic electrical package includes mechanical contactor, ON/OFF toggle switch, pendant with electro-mechanical pushbuttons, 24V transformer timer and operator accessible circuit breaker.



### Back-lit LCD, for Pro-Series

- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges

- Features **Z-Class** high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps
- Powerful 1.7 hp universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics
- High-strength, molded composite shroud protects motor and electrical components, while providing an ergonomic, non-conductive handle for easy transport
- Low-voltage pendant provides additional safety for the operator
- Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability

### Pro-Series

- LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump
- Auto cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without auto cycle feature)

▼ Any brand of hydraulic torque wrench can be powered by the portable ZU4-Series torque wrench pump.





## Z-Class – A Pump For Every Application

Patented Z-Class pump technology provides

high by-pass pressures for increased productivity—important in applications using long hose runs and high pressure-drop circuits, like heavy lifting or certain double-acting tools.

Enerpac ZU4 Hydraulic Pumps are built to power small to large torque wrenches. Choosing the right ZU4 torque wrench pump for your application is easy.

### Classic Electric Torque Wrench Pump

- The Classic has an analog gauge and traditional electro-mechanical components (transformers, relays and switches) in place of solid-

state electronics. The Classic delivers durable, safe and efficient hydraulic power.

### Pro Series Electric Torque Wrench Pump

- Digital (LCD) display features a built-in hour meter, pressure and torque display, and shows self-diagnostic, cycle-count and low voltage warning information. These premium features are not available on any other pump—anywhere!

AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without AutoCycle feature).

## ZU4 Series



Reservoir Capacity:

**1 and 1.75 gal.**

Flow at 10,000 psi:

**60 in<sup>3</sup>/min.**

Motor Size:

**1.7 hp**

Maximum Operating Pressure:

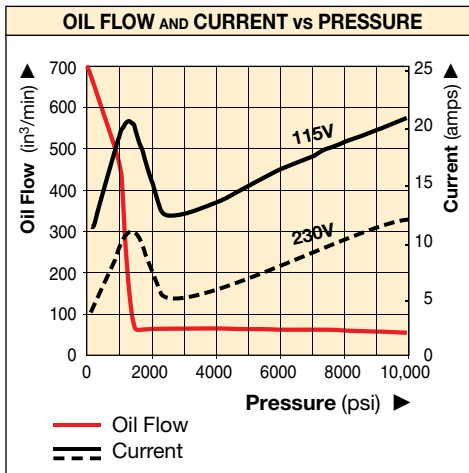
**10,000 and 11,600 psi**



### Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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## COMMON PUMP MODELS

|            | For Use With Torque Wrenches | Model Number <sup>1) 4)</sup> | Motor Electrical Specification | Usable Oil Capacity (gal) | Weight with Oil (lbs) |
|------------|------------------------------|-------------------------------|--------------------------------|---------------------------|-----------------------|
| Pro Series | All wrenches                 | ZU4204TB-Q                    | 115 V-1 ph                     | 1.0                       | 70                    |
|            |                              | ZU4208TB-Q                    | 115 V-1 ph                     | 1.75                      | 76                    |
|            |                              | ZU4204TE-Q <sup>2)</sup>      | 208-240 V-1 ph                 | 1.0                       | 70                    |
|            |                              | ZU4208TE-Q <sup>2)</sup>      | 208-240 V-1 ph                 | 1.75                      | 76                    |
|            |                              | ZU4204TI-Q <sup>3)</sup>      | 208-240 V-1 ph                 | 1.0                       | 70                    |
|            |                              | ZU4208TI-Q <sup>3)</sup>      | 208-240 V-1 ph                 | 1.75                      | 76                    |
| Classic    | All wrenches                 | ZU4204BB-QH                   | 115 V-1 ph                     | 1.0                       | 82                    |
|            |                              | ZU4204BB-Q                    | 115 V-1 ph                     | 1.0                       | 73                    |
|            |                              | ZU4208BE-QH <sup>2)</sup>     | 208-240 V-1 ph                 | 1.75                      | 83                    |
|            |                              | ZU4204BE-Q <sup>2)</sup>      | 208-240 V-1 ph                 | 1.0                       | 74                    |
|            |                              | ZU4208BI-QH                   | 208-240 V-1 ph                 | 1.75                      | 88                    |
|            |                              | ZU4208BI-Q                    | 208-240 V-1 ph                 | 1.75                      | 79                    |



## Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

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### Gauge Overlay Kit

Gauge overlay kits are also available separately. **GT-4015-Q** includes overlays for all S- and W-Series torque wrenches.

- All models meet CE safety requirements and all TÜV requirements
- European plug and CE EMC directive compliant
- With NEMA 6-15 plug
- Select -E suffixed pumps for Enerpac SQD and HXD 11,600 psi torque wrenches



# ZU4 Ordering Matrix and Specifications

▼ This is how a ZU4 Series pump model number is built up:

|              |            |            |            |                |                 |          |                |          |          |          |
|--------------|------------|------------|------------|----------------|-----------------|----------|----------------|----------|----------|----------|
| <b>Z</b>     | <b>U</b>   | <b>4</b>   | <b>2</b>   | <b>08</b>      | <b>T</b>        | <b>E</b> | <b>-</b>       | <b>Q</b> | <b>H</b> | <b>M</b> |
| 1            | 2          | 3          | 4          | 5              | 6               | 7        | 8              | 8        | 8        |          |
| Product Type | Motor Type | Flow Group | Valve Type | Reservoir Size | Valve Operation | Voltage  | Must be E or Q | Options  | Options  |          |

### 1 Product Type

**Z** = Pump series

### 2 Motor Type

**U** = Universal electric motor

### 3 Flow Group

**4** = 60 in<sup>3</sup>/min @ 10,000 psi

### 4 Valve Type

**2** = Torque wrench valve

### 5 Reservoir Size (useable capacity)

**04** = 1.0 gallon  
**08** = 1.75 gallons

### 6 Valve Operation

**T** = Solenoid valve with pendant, LCD Electric and pressure transducer.  
**B** = Solenoid valve with pendant, classic electrical

### 7 Voltage

**B** = 115V, 1 ph, 50/60 Hz  
**E** = 208-240V, 1 ph, 50/60 Hz (with European plug CE RF compliant)  
**I** = 208-240V, 1 ph, 50/60 Hz (with NEMA 6-15 plug)

### 8 Factory installed features and options

**E** = 11,600 coupler for use with HXD-, SQD-Series or other wrenches  
**Q** = 10,000 coupler for use with S- and W-Series or other wrenches  
**H** = Heat exchanger  
**K** = Skidbar  
**M** = 4-wrench manifold  
**R** = Roll cage



How to order your ZU4-Series torque wrench pump

### Ordering Example 1

#### Model No. ZU4208TB-QMHK

10,000 psi pump for use with Enerpac S- and W-Series and other 10,000 psi torque wrenches, 115V motor, 1.75 gallon reservoir, 4-wrench manifold, heat exchanger and skidbar.

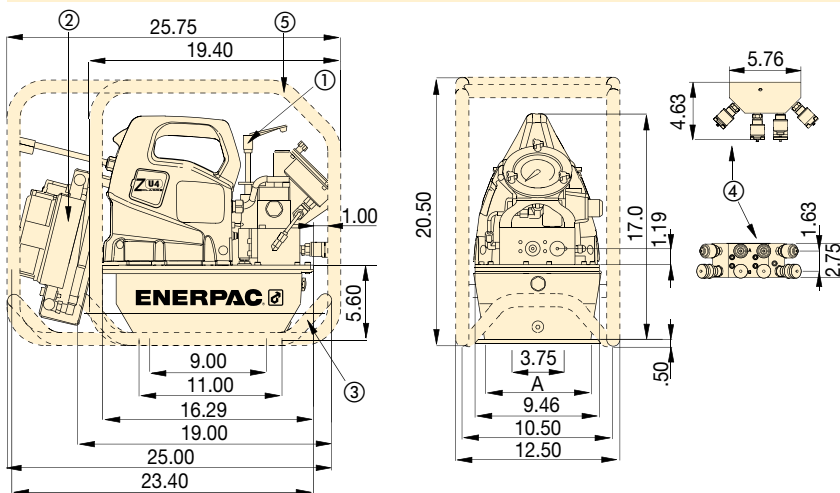
Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.



### Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

| 10,000 psi              |                 |
|-------------------------|-----------------|
| 19.5 feet long, 2 hoses | <b>THQ-706T</b> |
| 39 feet long, 2 hoses   | <b>THQ-712T</b> |
| 11,600 psi              |                 |
| 19.5 feet long, 2 hoses | <b>THC-7062</b> |
| 39 feet long, 2 hoses   | <b>THC-7122</b> |



### ZU4-Series Torque Wrench Pumps

| Reservoir Size (useable gallons) | A (in) |
|----------------------------------|--------|
| 1                                | 6.0    |
| 1.75                             | 8.1    |

Dimensions shown in inches

- ① User adjustable relief valve
- ② Heat exchanger (optional)
- ③ Skidbar (optional)
- ④ 4-wrench manifold (optional)
- ⑤ Roll cage (optional)

| ZU4 Performance |   |         |           |            |                                    |                   |                                     |
|-----------------|---|---------|-----------|------------|------------------------------------|-------------------|-------------------------------------|
| Motor Size (hp) | Output Flow Rate (in <sup>3</sup> /min) |         |           |            | *Motor Electrical Specification    | Sound Level (dBA) | Relief Valve Adjustment Range (psi) |
|                 | 100 psi                                 | 700 psi | 5,000 psi | 10,000 psi |                                    |                   |                                     |
| 1.7             | 700                                     | 535     | 76        | 60         | 115 VAC, 1-ph<br>208-240 VAC, 1-ph | 85-90             | 1,800-10,000**                      |

\* 50/60 HZ

\*\* Pump type (-Q) shown, (-E) range is 1,800 - 11,600 psi.



# ZU4 Torque Wrench Pump Options



## Heat Exchanger

- Removes heat from the bypass oil to provide cooler operation
- Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components

| Accessory Kit No. * | Can be used with: |
|---------------------|-------------------|
| ZHE-U115            | 115V pumps        |
| ZHE-U230            | 230V pumps        |

\* Add suffix **H** to pump model number for factory installation. Heat Exchanger adds 9.1 lbs. to pump weight.

**Ordering Example:**  
Model No. ZU4208TB-H



## Skidbar

- Provides greater pump stability on soft or uneven surfaces
- Provides easy two-handed lift

| Accessory Kit No. * | Can be used on ZU4-Series torque wrench pumps |
|---------------------|---|
| SBZ-4               | 1 and 2 gallon <sup>1)</sup>                  |
| SBZ-4L              | 1 and 2 gallon <sup>2)</sup>                  |

\* Add suffix **K** to pump model number for factory installation.

<sup>1)</sup> Without heat exchanger 4.9 lbs.

<sup>2)</sup> With heat exchanger 7.0 lbs.

**Ordering Example:**  
Model No. ZU4208TB-QK



## Roll Cage

- Protects pump
- Provides greater pump stability

| Accessory Kit No. * | Can be used on ZU4-Series torque wrench pumps |
|---------------------|---|
| ZRC-04              | 1 and 2 gallon reservoir <sup>1)</sup>        |
| ZRC-04H             | 1 and 2 gallon reservoir <sup>2)</sup>        |

\* Add suffix **R** for factory installation.

<sup>1)</sup> Without heat exchanger

<sup>2)</sup> With heat exchanger

**Ordering Example:**  
Model No. ZU4208BB-QR

## ZU4 Series



Reservoir Capacity:  
**1 and 1.75 gal.**

Flow at 10,000 psi:  
**60 in<sup>3</sup>/min.**

Motor Size:  
**1.7 hp**

Maximum Operating Pressure:  
**10,000 and 11,600 psi**



## 4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately

| Accessory Kit No. * | Can be used on ZU4-Series torque wrench pumps |
|---------------------|---|
| ZTM-E               | for 11,600 psi torque wrenches                |
| ZTM-Q               | for 10,000 psi torque wrenches                |

\* Add suffix **M** to pump model number for factory installation.

**Ordering Example:**  
Model No. ZU4208TB-QM

▼ Shown: ZE4204TB-QHR



**Z** Tough.  
Dependable.  
Innovative.  
**CLASS**

- Features **Z-Class** high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps
- Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments
- Low-voltage pendant provides additional safety for the operator
- High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh environments
- LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump
- Auto cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (Pump can be used with or without auto cycle feature)
- Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability



#### FIRMWARE 7.0

- Display torque in Ft.lb. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- “Auto cycle” setting easily programmable



#### Back-lit LCD

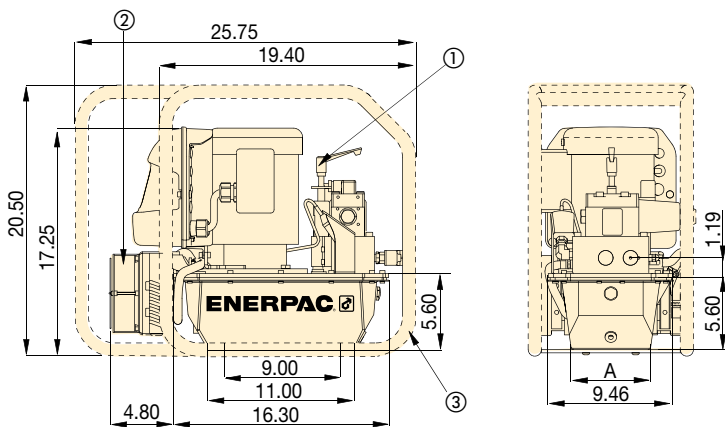
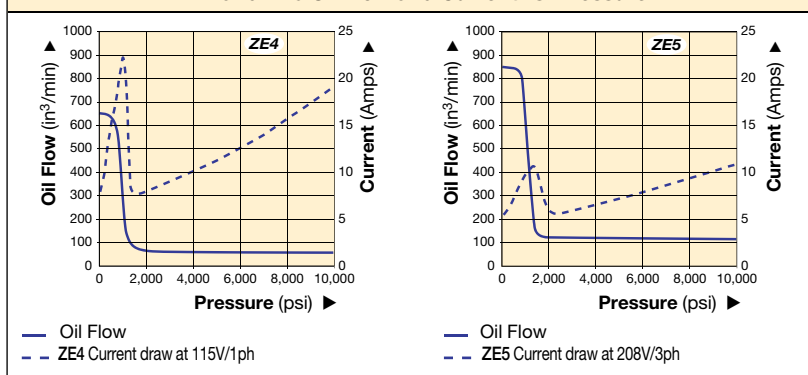
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges

▼ The ZE4 torque wrench pumps are perfectly matched for this W2000 wrench.



# ZE Series Electric Torque Wrench Pumps

ZE4 and ZE5 Oil Flow and Current vs. Pressure



| Reservoir Size<br>(useable gallons) | A<br>(in) |
|-------------------------------------|-----------|
| 1                                   | 6.0       |
| 1.75                                | 8.1       |

Dimensions shown in inches.  
 ① User adjustable relief valve  
 ② Heat Exchanger (optional)  
 ③ Roll cage (optional)

## ZE Series



Reservoir Capacity:

**1.0 gal.**

Flow at 10,000 psi:

**60-120 in<sup>3</sup>/min.**

Motor Size:

**1.5-3.0 hp**

Maximum Operating Pressure:

**10,000 and 11,600 psi**



All Z-Class electric pumps are TÜV and CE compliant.



### Accessory Options

A full list of optional accessories can be found in the ZU4 section.

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### ▼ COMMON PUMP MODELS

| For Use With Torque Wrenches    | Max. Operating Pressure<br>(psi) | Model Number | Motor Electrical Specification | Usable Oil Capacity <sup>1)</sup><br>(gal) | Weight with Oil<br>(lbs) |
|---------------------------------|----------------------------------|--------------|--------------------------------|--|--------------------------|
| All S- and W-Series Wrenches    | 10,000                           | ZE4204TB-QHR | 115 V-1 ph                     | 1  | 129                      |
|                                 | 10,000                           | ZE4204TE-QHR | 230 V-1 ph                     | 1  | 129                      |
|                                 | 10,000                           | ZE4204TG-QHR | 230 V-3 ph                     | 1  | 131                      |
|                                 | 10,000                           | ZE5204TW-QHR | 400 V-3 ph                     | 1  | 131                      |
| All SQD and HXD-Series Wrenches | 11,600                           | ZE4204TB-EHR | 115 V-1 ph                     | 1  | 129                      |
|                                 | 11,600                           | ZE4204TE-EHR | 230 V-1 ph                     | 1  | 129                      |
|                                 | 11,600                           | ZE4204TG-EHR | 230 V-3 ph                     | 1  | 132                      |
|                                 | 11,600                           | ZE5204TW-EHR | 400 V-3 ph                     | 1  | 132                      |

<sup>1)</sup> Larger reservoirs (2, 2.5, 5, 10 gallon) are available. Contact Enerpac.

### ▼ PERFORMANCE CHART

| Pump Series | Output Flow Rate<br>(in <sup>3</sup> /min) |         |           |            | Motor Size |      | Relief Valve Adjustment Range<br>(psi) | Sound Level<br>(dBA) |
|-------------|--|---------|-----------|------------|------------|------|--|----------------------|
|             | 100 psi                                    | 700 psi | 5,000 psi | 10,000 psi | hp         | RPM  |  |                      |
| ZE4         | 650  | 600     | 62        | 60         | 1.5        | 1750 | 1000 - 11,600                          | 75                   |
| ZE5         | 850  | 825     | 123       | 120        | 3.0        | 1750 | 1000 - 11,600                          | 75                   |

Flow rate will be approximately 5/6 of these values at 50 Hz.

▼ Shown: PTA-1404



## Two-Stage Power in a Portable Design



### Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

- Compact and portable
- Handle located directly over pump's center of gravity for greater ease in carrying
- High bypass (1800 psi) for faster torque cycles
- High power-to-weight ratio suits all Enerpac torque wrenches
- Glycerine filled pressure gauge with scales reading in psi/bar
- Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference
- Internal safety relief valve, factory preset
- 15 ft. air pendant assembly enables easy maneuvering at the job site



### Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

| 10,000 psi              |                 |
|-------------------------|-----------------|
| 19.5 feet long, 2 hoses | <b>THQ-706T</b> |
| 39 feet long, 2 hoses   | <b>THQ-712T</b> |
| 11,600 psi              |                 |
| 19.5 feet long, 2 hoses | <b>THC-7062</b> |
| 39 feet long, 2 hoses   | <b>THC-7122</b> |

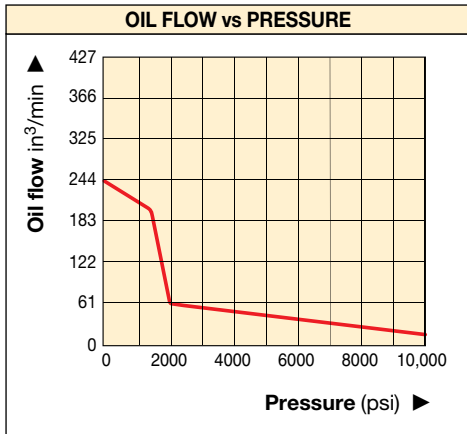


### Gauge Overlay Kit

Gauge overlay kits are also available separately.

**GT-4015-Q** includes overlays for all S- and W-Series torque wrenches.

# Compact Pneumatic Torque Wrench Pump



## PTA Series



Reservoir Capacity:

**1 gal.**

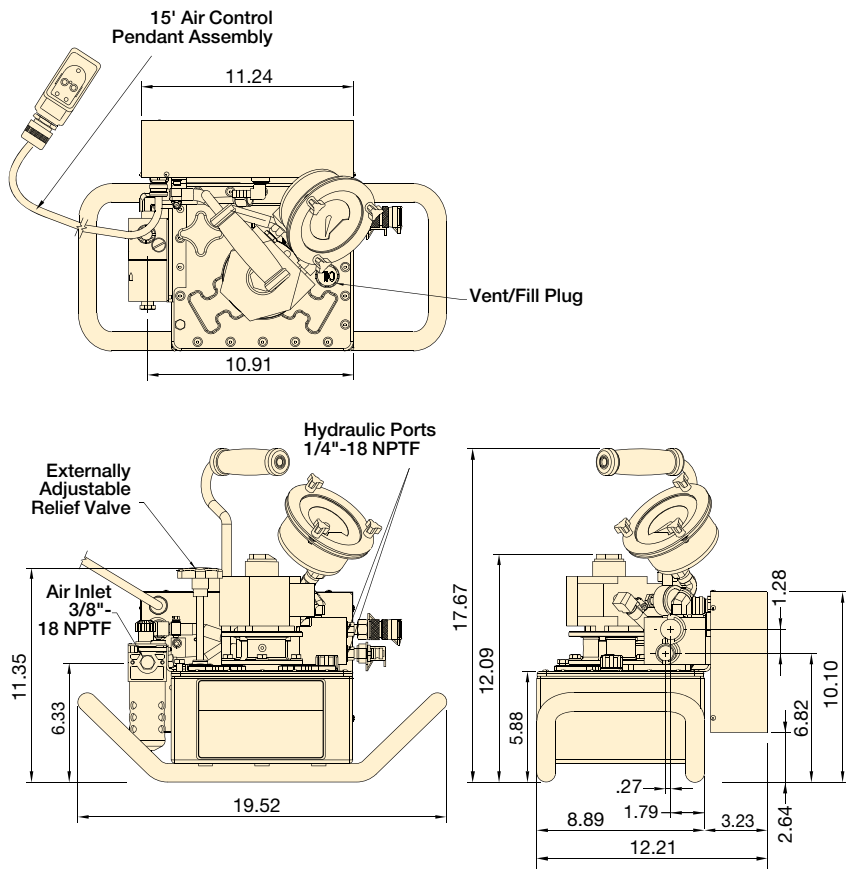
Flow at 10,000 psi:

**20 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**10,000 and 11,600 psi**

Dimensions shown in inches.



### Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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## ▼ SELECTION CHART

| For Use With Torque Wrenches |                  | Pressure Rating<br>(psi) | Model Number      | Reservoir Capacity<br>(gal) | Useable Oil Capacity<br>(gal) | Pump Flow Rates<br>(in <sup>3</sup> ) |                       | Air Consumption<br>@ 100 psi<br>(scfm) | Air Pressure Range<br>(psi) | Weight with Oil<br>(lbs) |
|------------------------------|------------------|--------------------------|-------------------|-----------------------------|-------------------------------|---------------------------------------|-----------------------|--|-----------------------------|--------------------------|
|                              |                  |                          |                   |                             |                               | 1 <sup>st</sup> stage                 | 2 <sup>nd</sup> stage |  |                             |                          |
| S1500<br>S3000               | W2000<br>W4000   | 10,000                   | <b>PTA-1404-Q</b> | 1.0                         | 0.5                           | 240                                   | 20                    | 40                                     | 49-101                      | 54                       |
| SQD-25-I<br>SQD-50-I         | HXD-30<br>HXD-60 | 11,600                   | <b>PTA-1404</b>   | 1.0                         | 0.5                           | 240                                   | 20                    | 40                                     | 49-101                      | 54                       |

▼ Shown: ZA4204TX-QR



**Z** Tough.  
Dependable.  
Innovative.  
**CLASS**

- Features **Z-Class** high-efficiency pump design; higher oil flow and bypass pressure
- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Heat exchanger warms exhaust air to prevent freezing and cools the oil
- Ergonomic pendant allows remote operation up to 20 feet
- Glycerin filled pressure gauge with transparent overlays in Ft.lbs and Nm for Enerpac torque wrenches provide a quick torque reference
- Regulator-Filter-Lubricator with removable bowls and auto drain is standard
- Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability



#### Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.



#### Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

| 10,000 psi              |          |
|-------------------------|----------|
| 19.5 feet long, 2 hoses | THQ-706T |
| 39 feet long, 2 hoses   | THQ-712T |
| 11,600 psi              |          |
| 19.5 feet long, 2 hoses | THC-7062 |
| 39 feet long, 2 hoses   | THC-7122 |



◀ Most hydraulic torque wrenches can be powered by the Enerpac ZA4-Series torque wrench pump.



## ZA4-Series Pump Applications

The ZA4-Series pump is best suited to power medium to large size torque wrenches.

Patent-pending Z-Class technology provides high by-pass pressures for increased productivity. Its high

power-to-weight ratio and compact design make it ideal for applications which require easy transport of the pump.

For further application assistance contact your local Enerpac office.

## ZA4 Series



Reservoir Capacity:

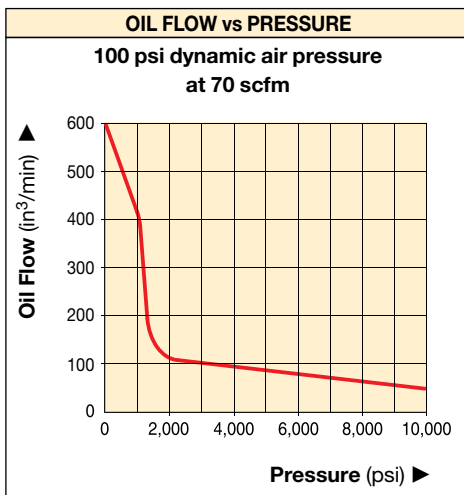
**1 and 1.75 gal.**

Flow at 10,000 psi:

**60 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**10,000 and 11,600 psi**



### ATEX Certified

The ZA-series pumps are tested and certified according to the Equipment Directive 94 / 9 / EC "ATEX Directive". The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. The ZA-series pumps are marked with: Ex II 2 GD ck T4.



### Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench, pump and hose selection matrix.

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### ▼ COMMON PUMP MODELS

| For Use With Torque Wrenches                    |                    | Maximum Operating Pressure (psi) | Model Number <sup>1)</sup> | Usable Oil Capacity (gal) | Weight with Oil (lbs) |
|---|--------------------|----------------------------------|----------------------------|---------------------------|-----------------------|
| S1500 S11000<br>S3000 S25000<br>S6000           | W2000              | 10,000                           | ZA4204TX-Q                 | 1.0                       | 94                    |
|   | W4000              |                                  | ZA4208TX-Q                 | 1.75                      | 100                   |
|   | W8000<br>W15000    |                                  | ZA4204TX-QR                | 1.0                       | 101                   |
| SQD-75-I<br>SQD-100-I<br>SQD-160-I<br>SQD-270-I | HXD-120<br>HXD-240 | 11,600                           | ZA4204TX-E                 | 1.0                       | 94                    |
|   |                    | 11,600                           | ZA4208TX-E                 | 1.75                      | 100                   |
|   |                    | 11,600                           | ZA4204TX-ER                | 1.0                       | 101                   |

<sup>1)</sup> All models meet CE safety requirements and all TÜV requirements.



### Accessory Options

Available by placing the following additional suffix at the end of the model number:

- K** = Skidbar
- M** = 4-wrench manifold
- R** = Roll cage

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# ZA4T Ordering Matrix and Specifications

▼ This is how a ZA4-Series pump model number is built up:



|              |            |            |            |                |                 |         |                |         |         |
|--------------|------------|------------|------------|----------------|-----------------|---------|----------------|---------|---------|
| 1            | 2          | 3          | 4          | 5              | 6               | 7       | 8              | 8       | 8       |
| Product Type | Motor Type | Flow Group | Valve Type | Reservoir Size | Valve Operation | Voltage | Must be E or Q | Options | Options |

**1 Product Type**

Z = Pump Series

**2 Motor Type**

A = Air motor

**3 Flow Group**

4 = 60 in<sup>3</sup>/min @ 10,000 psi

**4 Valve Type**

2 = Torque Wrench Valve

**5 Reservoir Size (useable capacity)**

04 = 1.0 gallon  
08 = 1.75 gallons

**6 Valve Operation**

T = Air operated valve with pendant

**7 Voltage**

X = Not applicable

**8 Factory installed features and options**

E = 11,600 psi coupler for use with HXD- and SQD-Series wrenches  
Q = 10,000 psi coupler for use with S- and W-Series or other wrenches  
K = Skidbar  
M = 4-wrench manifold  
R = Roll cage



How to order your ZA4-Series torque wrench pump

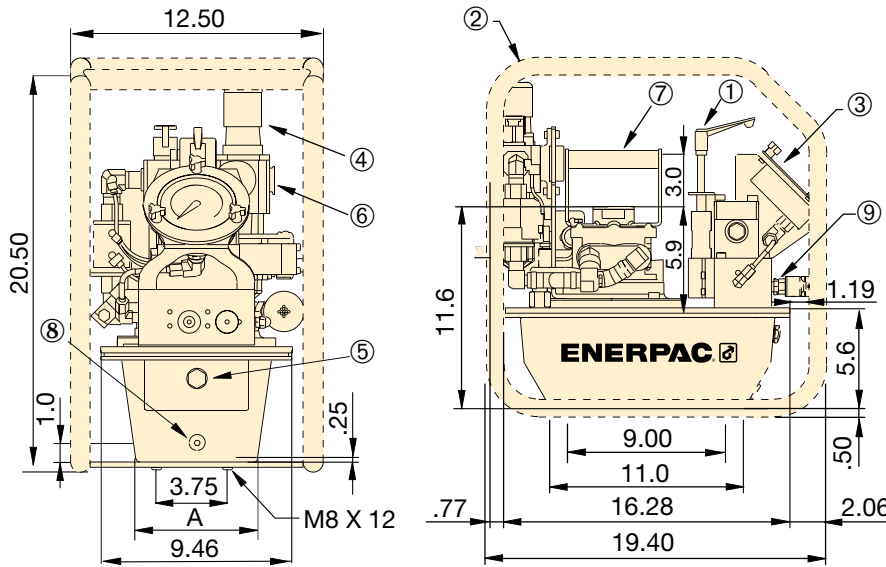
**Ordering Example 1**

**Model No. ZA4208TX-QMR**

10,000 psi pump for use with Enerpac S- and W-Series and other 10,000 psi torque wrenches, 1.75 gallon reservoir, 4-wrench manifold, and roll cage.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.

Dimensions shown in inches.



**ZA4-Series Torque Wrench Pumps**

| Reservoir Size<br>(useable gallons) | A<br>(in) |
|-------------------------------------|-----------|
| 1                                   | 6.0       |
| 1.75                                | 8.1       |

- ① User adjustable relief valve
- ② Roll bar cage (optional)
- ③ Gauge with overlays
- ④ Filter/lubricator/regulator
- ⑤ Oil level sight gauge
- ⑥ Air input 1/2" NPTF
- ⑦ Standard handle
- ⑧ Oil drain
- ⑨ 1/4"-18 NPTF Oil Outlet

| ZA4 Performance        |         |           |            |            |                            |                 |                                |                               |       |        |
|------------------------|---------|-----------|------------|------------|----------------------------|-----------------|--------------------------------|-------------------------------|-------|--------|
| Output Flow Rate       |         |           |            |            | Dynamic Air Pressure Range | Air Consumption | Sound Level at 100 psi Dynamic | Relief Valve Adjustment Range |       |        |
| (in <sup>3</sup> /min) |         |           |            |            |                            |                 |                                |                               | (psi) | (scfm) |
| 100 psi                | 700 psi | 5,000 psi | 10,000 psi | 11,600 psi |                            |                 |                                |                               |       |        |
| 600                    | 500     | 80        | 60         | 55         | 60-100                     | 20-100          | 80-95                          | 1,400-10,000*                 |       |        |

# ZA4 Torque Wrench Pump Options



## Skidbar

- Provides greater pump stability on soft or uneven surfaces
- Provides two-handed lift

| Accessory Kit No. * | Can be used on ZA4-Series torque wrench pumps |
|---------------------|---|
| SBZ-4               | 1 and 2 gallon reservoir                      |

\* Add suffix **K** for factory installation. Skidbar weight 4.9 lbs.

### Ordering Example:

Model No. ZA4208TX-QK



## 4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately

| Accessory Kit No. * | Can be used on ZA4-Series torque wrench pumps |
|---------------------|---|
| ZTM-E               | for 11,600 psi torque wrenches                |
| ZTM-Q               | for 10,000 psi torque wrenches                |

\* Add suffix **M** for factory installation.

### Ordering Example:

Model No. ZA4208TX-QM

## ZA4 Series



Reservoir Capacity:

**1 and 1.75 gal.**

Flow at 10,000 psi:

**60 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**10,000 and 11,600 psi**



## Gauge Overlay Kit

Gauge overlay kits are also available separately.

**GT-4015** includes overlays for all SQD and HXD torque wrenches. **GT-4015-Q**

includes overlays for all S- and W-Series torque wrenches.



## Roll Cage

- Protects pump
- Provides greater pump stability

| Accessory Kit No. * | Can be used on ZA4-Series torque wrench pumps |
|---------------------|---|
| ZRC-04              | 1 and 2 gallon reservoir                      |

\* Add suffix **R** for factory installation. Roll bar cage weight 7.5 lbs.

### Ordering Example:

Model No. ZA4208TX-QR



## Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

| 10,000 psi              |          |
|-------------------------|----------|
| 19.5 feet long, 2 hoses | THQ-706T |
| 39 feet long, 2 hoses   | THQ-712T |
| 11,600 psi              |          |
| 19.5 feet long, 2 hoses | THC-7062 |
| 39 feet long, 2 hoses   | THC-7122 |

▼ Shown: ZUTP-1500204HB, ZUTP-1500B



## Reliability, Power and Precision

- High efficiency Universal Motor draws lower amps for superior performance in remote locations
- Panel mounted 6" pressure gauge, with polycarbonate cover, for improved visibility and safety
- Panel mounted user adjustable valve for safe and precise pressure control
- Compact and lightweight design fits through tight openings and provides easy handling
- Safety relief valve limits output pressure for additional operator safety

### Remote Controlled ZUTP

- 20 foot pendant cord provides remote control of motor and valve for hassle-free operation and increased productivity
- 3 piston, 2 stage pump design powers bolt tensioners up to two times faster than competitive pumps



#### Heat Exchanger

Removes heat from the bypass oil to provide cooler operation and extend system life. (Remote control version only.)

\*Add H suffix for factory installation.

**Ordering Example:**  
**ZUTP1500204HB-H**



#### Applications

The Enerpac ZUTP-Series electric pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.



◀ In remote locations working off a generator the reliable Enerpac ZUTP1500 delivers the ultra high pressure needed for tensioning applications.

# ZUTP-Series, Electric Tensioning Pump



## ZUTP Series

### Remote Controlled Valve

The ZUTP1500 series with remote controlled valve is ideal for wind turbine bolt tensioning applications as it allows for single-person operation. It is the only Electric Tensioner Pump on the market to feature a remote controlled electric valve and universal motor without a hydraulic intensifier. The resulting pump is rugged, lightweight, compact for tight openings, and delivers hassle-free operation of bolt tensioners in

remote locations up to two times faster than competitive pumps.

### Manual Valve

The ZUTP1500 series with manual valve provides higher flow rates than air-driven tensioner pumps for a fast and economic solution ideal for bolt tensioning applications not requiring single-person operation.

## ZUTP Series



Reservoir Capacity:

**1 gallon**

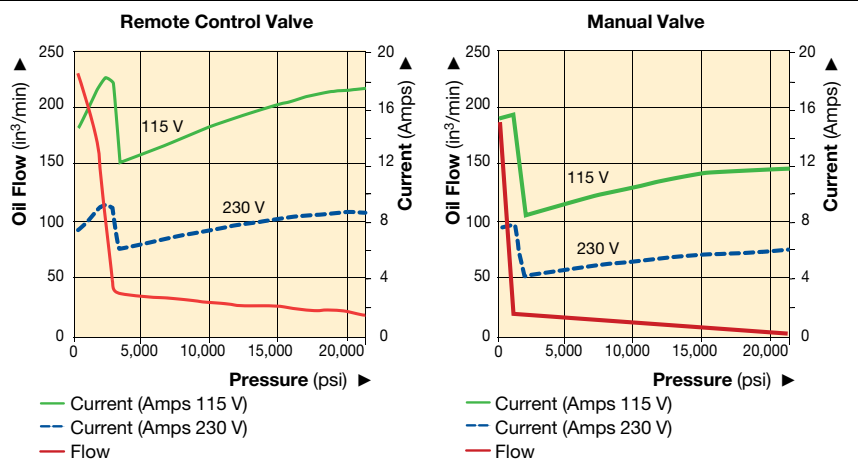
Flow at Rated Pressure:

**8.0-20 in<sup>3</sup>/min.**

Maximum Operating Pressure:

**21,750 psi**

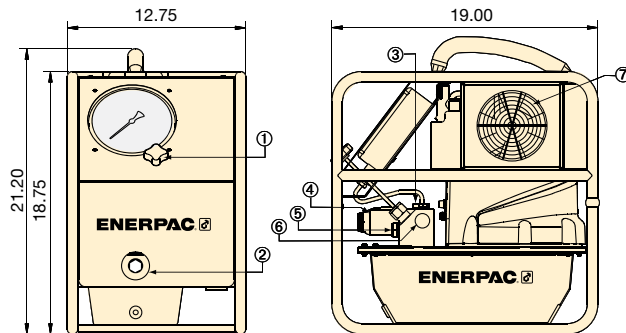
Oil Flow and Current vs. Pressure



This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

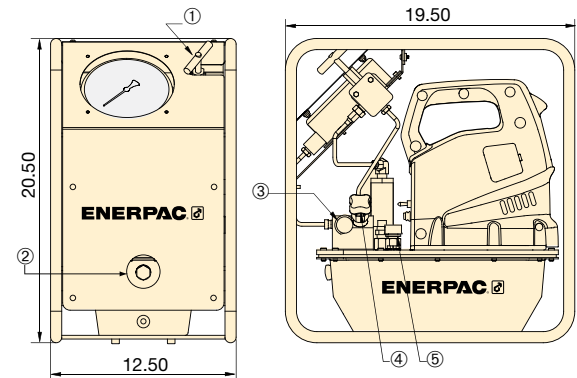
Page: 220

### Remote Control Valve



- ① User Adjustable Pressure Control Valve
- ② Sight Glass
- ③ Cartridge Check Valve
- ④ Release Valve
- ⑤ Cartridge Filter
- ⑥ 1/4" BSPM Outlet Port
- ⑦ Optional Heat Exchanger

### Manual Valve



- ① Release Valve
- ② Sight Glass
- ③ 1/4" BSPM Outlet Port
- ④ User Adjustable Pressure Control Valve
- ⑤ Breather

| Pump Type     | Useable Oil Capacity (gal) | Valve Type     | Model Number <sup>1)</sup>   | Output Flow Rate at 0 psi (in <sup>3</sup> /min) | Output Flow Rate at 21,750 psi (in <sup>3</sup> /min) | Motor Electrical Specification | Sound Level (dBA) | Weight with oil (lbs) |
|---------------|----------------------------|----------------|------------------------------|--|---|--------------------------------|-------------------|-----------------------|
| High pressure | 1.0                        | Remote Control | ZUTP-1500204HB               | 230  | 20  | 115 VAC, 1-ph                  | 89                | 75                    |
|               |                            |                | ZUTP-1500204HE <sup>2)</sup> |  |   | 230 VAC, 1-ph                  |                   |                       |
|               |                            |                | ZUTP-1500204HI <sup>3)</sup> |  |   | 230 VAC, 1-ph                  |                   |                       |
| High pressure | 1.0                        | Manual         | ZUTP-1500B                   | 180  | 8   | 115 VAC, 1-ph                  | 89                | 65                    |
|               |                            |                | ZUTP-1500E <sup>2)</sup>     |  |   | 230 VAC, 1-ph                  |                   |                       |
|               |                            |                | ZUTP-1500I <sup>3)</sup>     |  |   | 230 VAC, 1-ph                  |                   |                       |

<sup>1)</sup> All models meet CE safety requirements and all TÜV requirements.  
<sup>2)</sup> European plug and CE EMC directive compliant.

<sup>3)</sup> With NEMA 6-15 plug.  
<sup>4)</sup> Add suffix "H" for factory installation of Heat Exchanger.

▼ Shown: ATP-1500



## ATP Series

Reservoir Capacity:

**1.0 gallon**

Flow at Rated Pressure:

**4 in<sup>3</sup>/min.**

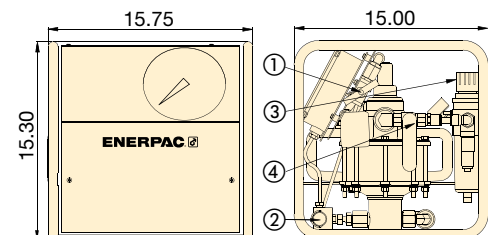
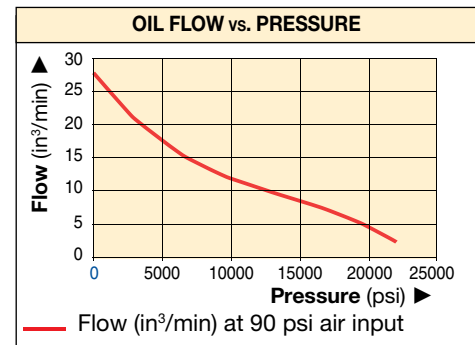
Maximum Operating Pressure:

**21,750 psi**



These products operate at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

- General purpose, high pressure air driven pump unit for products requiring up to 21,750 psi hydraulic pressure
- Compact, lightweight, rugged steel frame for protection and easy handling
- Prelubricated pump element, does not require an airline lubricator
- Easily adjustable output pressure control
- Integrated and protected easy to read glycerin filled gauge
- Safety relief valve limits output pressure



- ① HPT Shut-off Valve
- ② 1/4" BSPP HPT Out Port
- ③ Filter/Regulator
- ④ Air On/Off Valve

### ▼ HOSES

| Model Number | End 1              | End 2              | Length (ft) |
|--------------|--------------------|--------------------|-------------|
| HT-1503      | 1/4 BSPM 120° Cone | 1/4 BSPM 120° Cone | 3.28        |
| HT-1510      | 1/4 BSPM 120° Cone | 1/4 BSPM 120° Cone | 9.84        |
| HT-1503HR*   | BH150              | BR150              | 3.28        |
| HT-1510HR*   | BH150              | BR150              | 9.84        |

\* Includes dust caps

### ▼ FITTINGS

| Description                               | Complete Set | Female Half | Male Half |
|---|--------------|-------------|-----------|
| Quick Disconnect Coupler*                 | B150         | BR150       | BH150     |
| Quick Disconnect Coupler and Adaptor Kit* | BW150AW      | —           | —         |
| Quick Disconnect Blanking Coupler Set*    | B150B        | —           | —         |

\* Includes dust caps

| Pump Type     | Useable Oil Capacity (gal) | Model Number    | Pressure Rating (psi) | Output Flow Rate at 0 psi (in <sup>3</sup> /min) | Output Flow Rate at 21,750 psi (in <sup>3</sup> /min) | Air Pressure Range (psi) | Air Consumption (sfcms) | Sound Level (dBA) | Weight (lbs) |
|---------------|----------------------------|-----------------|-----------------------|--|---|--------------------------|-------------------------|-------------------|--------------|
| High pressure | 1.0                        | <b>ATP-1500</b> | 21,750                | 26   | 4   | 80-90                    | 70                      | 70                | 65           |

# Hydraulic Nut Cutters

▼ Shown from left to right: NC-3241, NC-1319, NC-1924



## NC Series



Capacity:  
**5-90 tons**

Hexagon Nut Range:  
**0.5-2.88 inches**

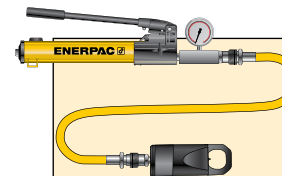
Maximum Operating Pressure:  
**10,000 psi**



### Enerpac Nut Cutters

Nut Cutters include a spare chisel, a spare set screw and the wrench used to secure the chisel. A CR-400 coupler is standard.

- Compact and ergonomic design, easy to use
- Unique angled head allows flush access
- Single-acting, spring return cylinder
- Heavy-duty chisels can be reground
- Applications include servicing trucks, piping industry, tank cleaning, petrochemical, steel construction and mining



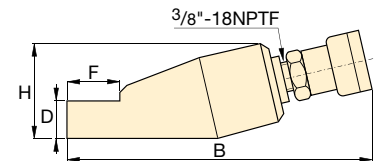
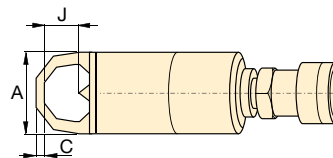
### Nut Cutter Sets

Hydraulic Nut Cutters are available as sets (pump, tool, gauge, adaptor and hose).

| Set Model Number | Splitter Model Number | Pump Model Number |
|------------------|-----------------------|-------------------|
| STN-1924H        | NC-1924               | P-392             |
| STN-2432H        | NC-2432               | P-392             |
| STN-3241H        | NC-3241               | P-392             |



◀ Easily removing rusty nuts during railroad construction is just one of many application examples for the Enerpac Nut Cutters.



| Hexagon Nut Range<br>(in) | Bolt Range<br>(in) | Capacity<br>(ton) | Oil Capacity<br>(in <sup>3</sup> ) | Model Number | Dimensions (in) |       |      |      |      |      |      | Weight<br>(lbs) | Replacement Chisel Model Number |
|---------------------------|--------------------|-------------------|------------------------------------|--------------|-----------------|-------|------|------|------|------|------|-----------------|---------------------------------|
|                           |                    |                   |                                    |              | A               | B     | C    | D    | F    | H    | J    |                 |                                 |
| .50-.75                   | .31-.50            | 5                 | .92                                | NC-1319      | 1.57            | 7.87  | .24  | .75  | 1.10 | 1.89 | .83  | 1.8             | NCB-1319                        |
| .75-.94                   | .50-.63            | 10                | 1.22                               | NC-1924*     | 2.17            | 8.94  | .32  | .98  | 1.50 | 2.80 | 1.00 | 4.4             | NCB-1924                        |
| .94-1.13                  | .63-.88            | 15                | 3.66                               | NC-2432*     | 2.60            | 10.24 | .39  | 1.22 | 1.93 | 2.99 | 1.30 | 6.6             | NCB-2432                        |
| 1.13-1.56                 | .88-1.13           | 20                | 4.88                               | NC-3241*     | 2.95            | 11.26 | .59  | 1.38 | 2.60 | 3.50 | 1.69 | 9.7             | NCB-3241                        |
| 1.56-2.00                 | 1.13-1.38          | 35                | 9.46                               | NC-4150      | 3.78            | 12.80 | .83  | 1.77 | 2.87 | 4.29 | 2.13 | 18.0            | NCB-4150                        |
| 2.00-2.25                 | 1.38-1.50          | 50                | 14.64                              | NC-5060      | 4.17            | 14.41 | 1.06 | 2.13 | 3.63 | 4.96 | 2.38 | 26.0            | NCB-5060                        |
| 2.38-2.88                 | 1.50-1.88          | 90                | 30.00                              | NC-6075      | 6.14            | 14.43 | 1.06 | 2.95 | 4.33 | 7.09 | 3.07 | 75.1            | NCB-6075                        |

Ordering Notes: Maximum allowable hardness to split is HRc-44. Not to be used on square nuts. Larger sizes available upon request.

\* Available as Tool-Pump set, see note on this page.

▼ Shown: NS-7080, NS-70105



- Specially designed to suit standard ANSI B16.5 / BS1560 flanges
- Single-acting, spring return cylinder
- Tri-blade technology provides three cutting surfaces on a single blade
- Interchangeable heads provide maximum nut range flexibility
- Preset scale allows controlled blade extension, which avoids damage to bolt threads
- Grip tape and handle included for more secure maneuverability
- Nickel-plated cylinder body for excellent corrosion protection and improved durability in harsh environments
- Internal Pressure Relief Valve for overload protection



◀ Heavily corroded and weathered nuts are quickly split and removed using an NS-Series Nut Splitter.

## Power and Precision

### High Performance Nut Splitter



#### Blade Cutting Depth Scale

Adjustable cutting depth scale for controlled blade extension, which avoids damage to bolt threads.

The scale indicates the bolt range in metric and imperial values on each cutting head.

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#### Hydraulic Nut Cutters

The NC-Series models are available featuring an angle-head design for 0.50"-2.88" hexagon nuts.

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#### FS-Series Spreaders

FS-Series Flange Spreaders provide quick and easy joint separation using hydraulic or mechanical force.

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#### ATM Flange Alignment Tools

The ATM series provides safe high-precision flange alignment tools that fit most commonly used ANSI, API, BS, and DIN flanges.

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# Hydraulic Nut Splitters



## Nut Splitter Sets

To provide maximum flexibility, NS-Series Nut Splitters can also be ordered in sets (NS-xxxSy).

Select Nut Splitter size and pump style from the chart below.

To order additional Cutting Heads (NSH-xxxxxx), Cylinders (NSC-xxx) or Replacement Blades (NSB-xxx), see Selection Chart below.

### SET SELECTION:

- 1 Select your Nut Splitter
- 2 Select your pump type

## NS Series



Capacity:

**103.2-192.5 tons**

Hexagon Nut Range:

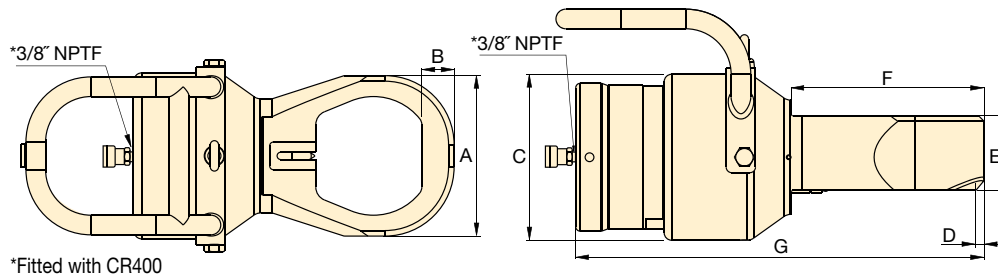
**2.75-5.38 inches**

Maximum Operating Pressure:

**10,000 psi**

| Set Model Number | Nut Splitter Model Number | Pump Options        |                    |                         | Accessories Included    |                 |                |                        |
|------------------|---------------------------|---------------------|--------------------|-------------------------|-------------------------|-----------------|----------------|------------------------|
|                  |                           | Hand Pump Model No. | Air Pump Model No. | Electric Pump Model No. | Gauge Adaptor Model No. | Gauge Model No. | Hose Model No. | Storage Case Model No. |
|                  |                           |                     |                    |                         |                         |                 |                |                        |
| NS-70105SH       | NS-70105                  | P392                | -                  | -                       | GA-2                    | GP-10S          | HC-7206        | CM-4                   |
| NS-70105SA       | NS-70105                  | -                   | XA-11G             | -                       | -                       | integrated*     | HC-7206        | CM-4                   |
| NS-70105SE       | NS-70105                  | -                   | -                  | PUD-1100B               | GA-2                    | GP-10S          | HC-7206        | CM-7                   |
| NS-110130SH      | NS-110130                 | P802                | -                  | -                       | GA-2                    | GP-10S          | HC-7206        | CM-4                   |
| NS-110130SA      | NS-110130                 | -                   | XA-11G             | -                       | -                       | integrated*     | HC-7206        | CM-4                   |
| NS-110130SE      | NS-110130                 | -                   | -                  | PUD-1100B               | GA-2                    | GP-10S          | HC-7206        | CM-7                   |

\*XA-11G air pump features an integrated pressure gauge.



### SELECTION CHART

| Hexagon Nut Range**<br>(in) | Bolt Range<br>(in) | Cap.<br>(ton) | Oil Cap.<br>(in <sup>3</sup> ) | Model Number* | Dimensions (in) |     |     |     |     |     |      | Weight<br>(lbs) | NS Cylinder | NS Cutting Head | Replacement Blade |
|-----------------------------|--------------------|---------------|--------------------------------|---------------|-----------------|-----|-----|-----|-----|-----|------|-----------------|-------------|-----------------|-------------------|
|                             |                    |               |                                |               | A               | B   | C   | D   | E   | F   | G    |                 |             |                 |                   |
| 2.75-3.13                   | 1.75-2.00          | 103.2         | 23.0                           | NS-7080       | 5.2             | 1.1 | 7.1 | 0.3 | 3.2 | 7.3 | 16.2 | 81.4            | NSC-70      | NSH-7080        | NSB-70            |
| 2.75-3.50                   | 1.75-2.25          | 103.2         | 23.0                           | NS-7085       | 5.7             | 1.2 | 7.1 | 0.3 | 3.2 | 7.7 | 16.6 | 82.7            | NSC-70      | NSH-7085        | NSB-70            |
| 2.75-3.88                   | 1.75-2.50          | 103.2         | 23.0                           | NS-7095       | 6.3             | 1.3 | 7.1 | 0.3 | 3.2 | 7.9 | 17   | 84.9            | NSC-70      | NSH-7095        | NSB-70            |
| 2.75-4.25                   | 1.75-2.75          | 103.2         | 23.0                           | NS-70105      | 6.9             | 1.4 | 7.1 | 0.4 | 3.2 | 8.2 | 17.5 | 87.1            | NSC-70      | NSH-70105       | NSB-70            |
| 4.25-4.63                   | 2.75-3.00          | 192.5         | 50.0                           | NS-110115     | 7.4             | 1.4 | 9.2 | 0.1 | 4.4 | 9.2 | 18.6 | 151.6           | NSC-110     | NSH-110115      | NSB-110           |
| 4.25-5.38                   | 2.75-3.50          | 192.5         | 50.0                           | NS-110130     | 8.6             | 1.6 | 9.2 | 0.1 | 4.4 | 9.5 | 19.4 | 158.3           | NSC-110     | NSH-110130      | NSB-110           |

\* NS-Series Nut Splitters ship in two cases: One containing the NSC Cylinder and one containing the NSH Cutting Head. Assembly required.

\*\* Maximum allowable hardness to split is HRC-44.



# Pin Type Hydraulic Flange Spreaders

▼ Shown: FS-56

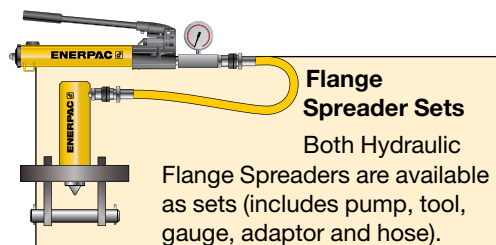


## FS Series



Capacity:  
**5-10 tons**

Maximum Operating Pressure:  
**10,000 psi**



### Flange Spreader Sets

Both Hydraulic Flange Spreaders are available as sets (includes pump, tool, gauge, adaptor and hose).

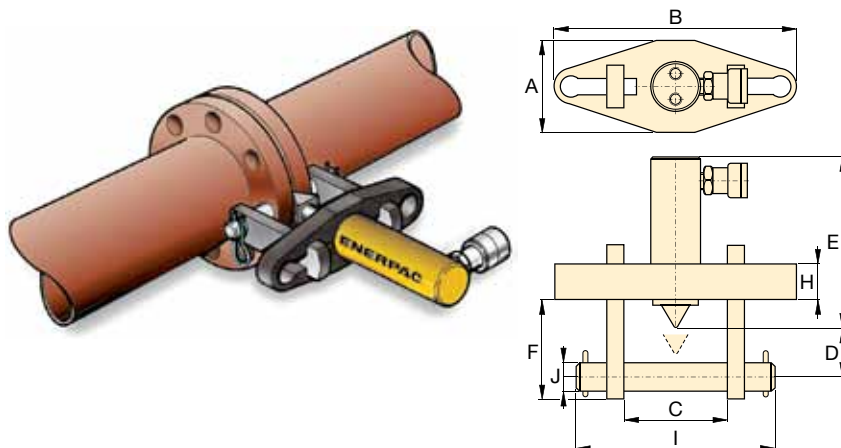
| Set Model Number | Spreader Model Number | Pump Model Number |
|------------------|-----------------------|-------------------|
| STF-56H          | FS-56                 | P-392             |
| STF-109H         | FS-109                | P-392             |
| STF-109A         | FS-109                | PATG-1102N        |

- Lightweight, ergonomic design for ease of use
- Adjustable jaw widths from 2.75" to 8.50" for a wide range of applications
- Single-acting, spring return RC Series cylinders for fast trouble-free operation

### Wedge Spreaders

Friction-free, smooth and parallel wedge movement with unique interlock wedge design. Eliminates flange damage and risk of spreading arm failure.

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### Flange Spreader Matching Chart

| ASA Rating (psi) | Pipe Size (in) |        |
|------------------|----------------|--------|
|                  | FS-56          | FS-109 |
| 150              | 5-20           | 22-42  |
| 300              | 2.50-14        | 16-28  |
| 400              | 2.50-12        | 14-24  |
| 500              | 2.50-10        | 12-20  |
| 900              | .50-6          | 8-16   |
| 1500             | .50-3.50       | 4-8    |
| 2500             | .50-2.50       | 3-4    |

| Maximum Flange Thickness (in) | Stud Size (in) | Standard Wedge (in) | Cap. (ton) | Stroke (in) | Oil Cap. (in <sup>3</sup> ) | Model Number | Dimensions (in) |       |      |      |      |      |      |      |       |      | Weight (lbs) |
|-------------------------------|----------------|---------------------|------------|-------------|-----------------------------|--------------|-----------------|-------|------|------|------|------|------|------|-------|------|--------------|
|                               |                |                     |            |             |                             |              | A               | B     | C    |      | D    | E    | F    | H    | I     | J    |              |
|                               |                |                     |            |             |                             |              |                 |       | Min. | Max. |      |      |      |      |       |      |              |
| 2 x 2.25                      | .75-1.13       | .13-1.13            | 5          | 1.50        | 1.50                        | FS-56        | 3.00            | 8.25  | 2.75 | 6.10 | 1.28 | 7.71 | 3.45 | 1.00 | 8.10  | .75  | 26           |
| 2 x 3.63                      | 1.25-1.63      | .13-1.13            | 10         | 2.13        | 4.80                        | FS-109       | 4.25            | 11.00 | 4.10 | 8.50 | 1.98 | 6.00 | 4.50 | 1.50 | 10.75 | 1.25 | 40           |

# Hydraulic and Mechanical Industrial Spreaders

▼ Shown: FSH-14 and FSM-8 with safety blocks SB1



## FSM/FSH Series

Tip Clearance / Maximum Spread\*:  
**0.24/3.16 inches**

Maximum Spread Force:  
**8-14 tons**

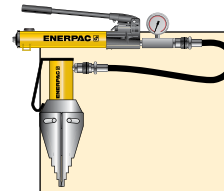
Maximum Operating Pressure:  
**10,000 psi (FSH-14)**



### Stepped Blocks FSB-1

Use this pair of stepped blocks to increase wedge opening up to 3.16 in. (81 mm). Fits both FSH-14 and FSM-8.

- Integrated wedge concept: friction-free, smooth, parallel wedge movement eliminates flange damage and spreading arm failure
- Unique interlocking wedge design: no first step bending and risk of slipping out of joint
- Requires very small access gap of only .24 in. (6 mm)
- Stepped spreader arm design: each step can spread under full load
- Few moving parts means durability and low maintenance
- Safety block SB-1 and ratchet spanner SW-22 included with FSM-8
- Safety block and Enerpac RC-102 cylinder included with FSH-14

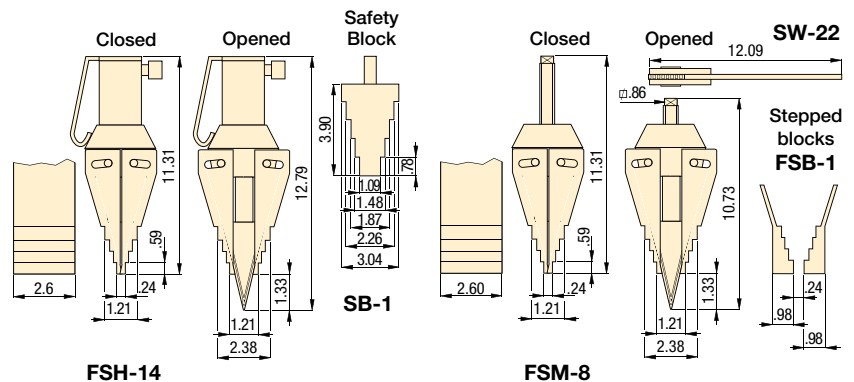


### Flange Spreader Sets

Hydraulic FSH-14 is available as a set (pump, tool, gauge, adaptor and hose).

| Set Model Number | Set Includes: |        |
|------------------|---------------|--------|
| STF-14H          | FSH-14        | GA-2   |
|                  | P-392         | GP-10S |
|                  | HC-7206       | -      |

▼ Two FSH-14 spreaders used simultaneously with Enerpac handpump, hoses and AM-21 split-flow manifold.



| Max. Spreading Force (ton) | Model Number | Tip Clearance (in) | Max. Spread* (in) | Type       | Oil Capacity (in <sup>3</sup> ) | Weight (lbs) |
|----------------------------|--------------|--------------------|-------------------|------------|---------------------------------|--------------|
| 8                          | FSM-8        | .24                | 3.16              | Mechanical | -                               | 14.3         |
| 14                         | FSH-14       | .24                | 3.16              | Hydraulic  | 4.76                            | 15.7         |

\* Using stepped blocks FSB-1.

▼ From left to right: **ATM-3, ATM-1, ATM-5**



## ATM Series

Bolt Hole Range:  
**1<sup>1</sup>/<sub>16</sub> - 2<sup>1</sup>/<sub>8</sub> inches**

Flange Wall Thickness:  
**1<sup>1</sup>/<sub>16</sub> - 8 inches**

Maximum Force:  
**0.3 - 5.5 tons**



### Adjustable Reach-on ATM-3

The highly adjustable reach of the wing, the reversible lift hook and manual torque wrench **TW-22** (3/8" drive) allow precise alignment.

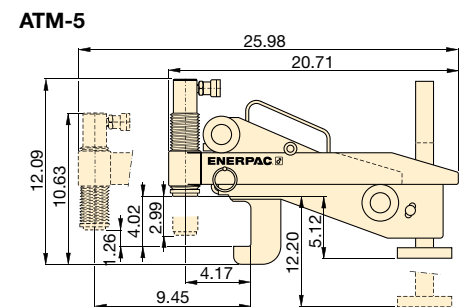
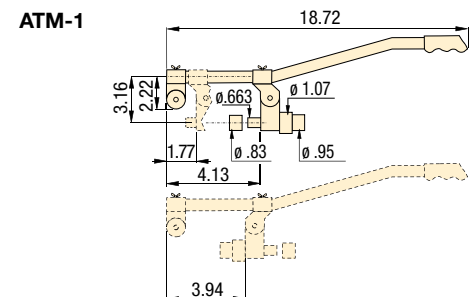


### ATM-5 Including Hydraulics

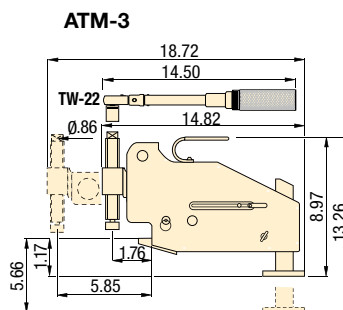
Including 10,000 psi hydraulics: RC-53 single-acting cylinder, P-142 two-speed hand pump and 6 ft. long safety hose (HC-7206C).

- Rectifies twist and rotational misalignment without additional stress in pipe lines
- For most commonly used ANSI, API, BS and DIN flanges
- No slings, hooks, or lifting gear. Extremely safe, high precision
- ATM-1 supplied with three bushings for different bolt hole sizes. Can be used in reversed position.
- ATM-3 fits when flange joint is:
  - between 1.18 - 5.23 inches apart and
  - bolt hole size 0.95 inches or greater
- ATM-5 fits when flange joint is:
  - between 3.75 - 9 inches apart and
  - bolt hole size 1.25 inches or greater
- Can be installed and used in any position and any location
- Stays stable in position under full load

All dimensions shown in inches.



▼ The Enerpac ATM-3 used to align a large ANSI flange.



| Maximum Lifting Force (ton) | Model Number | Bolt Hole Range |           | Flange Wall Thickness |          | Weight (lbs) |
|-----------------------------|--------------|-----------------|-----------|-----------------------|----------|--------------|
|                             |              | (in)            | (mm)      | (in)                  | (mm)     |              |
| 0.3                         | ATM-1        | 11/16 - 11/8    | 17 - 27,2 | 11/16 - 2             | 17 - 50  | 4.4          |
| 3.3                         | ATM-3        | 1 - 2 1/8       | 25 - 54   | 13/16 - 4 1/2         | 30 - 115 | 21.4         |
| 5.5                         | ATM-5 *      | ≥ 1 1/4         | ≥ 31,5    | 3 1/8 - 8             | 80 - 203 | 35.7         |

\* At 10,000 psi maximum operating pressure.

ATM-5 weight including hydraulic cylinder. Total set weight 62 lbs.

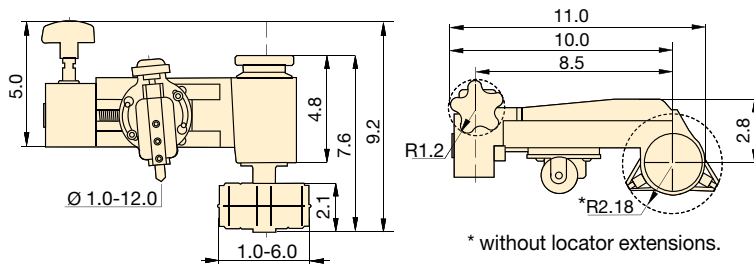
# FF-Series, Mechanical Flange Face Tool

▼ Shown: FF-120



- Refacing made easy — hand-operated machine tool can be set up anywhere without the need for air, electric or hydraulic power support
- Lightweight and portable — easily transported to remote locations for increased productivity
- Adjustable cutting range for flange diameters between 1-12 inches [25,4-304,8 mm]
- Interchangeable collets for ID mounting range from 1-6 inches allowing the user to work on many different flanges with minimal time between set-ups
- Interchangeable lead screws suitable for refacing damaged raised-face (RF), flat-face (FF) or lens-ring joint flanges
- Tool body with expanding collets centers itself providing real concentric operation

Dimensions shown in inches.



## ▼ TOOL SELECTION CHART

| Pipe Flange Cutting Diameter Range |            | Internal Pipe Mounting Diameter Range |            | Average Roughness (Ra) |            | Model Number | Wt. (lbs) |
|------------------------------------|------------|---------------------------------------|------------|------------------------|------------|--------------|-----------|
| (in)                               | (mm)       | (in)                                  | (mm)       | ( $\mu$ in)            | ( $\mu$ m) |              |           |
| 1.0-12.0                           | 25,4-304,8 | 1.0-6.0                               | 25,4-152,4 | 125-250                | 3,18-6,35  | FF-120       | 15        |
|                                    |            |                                       |            | 60-100*                | 1,52-2,54* |              |           |

\* When using fine thread feed screw, FF120FSF.

## FF Series

Pipe Flange Cutting Diameter Range:  
**1-12 in (25,4-304,8 mm)**

Internal Pipe Mounting Diameter Range:  
**1-6 in (25,4-152,4 mm)**

Average Roughness:  
**125-250  $\mu$ in (3,18-6,35)  $\mu$ m**



### Joint Separation Tools

**FS and FSH-Series** parallel wedge spreaders provide quick and easy joint separation using hydraulic or mechanical force.

225



### Joint Assembly Tools

Rectify twist and rotational alignment without additional stress in pipe lines using the **ATM-Series** flange alignment tools.

Page: 226



### Fine Thread Feed Screw

Accessory Kit **FF120FSF** is included as standard and provides a fine thread feed screw, 1/2"-20 UNF, and delivers a Ra of: 60-100  $\mu$ in (1,52-2,54  $\mu$ m)

▼ The Enerpac FF120 Quick Face has same precision and quality of finish as powered machines.

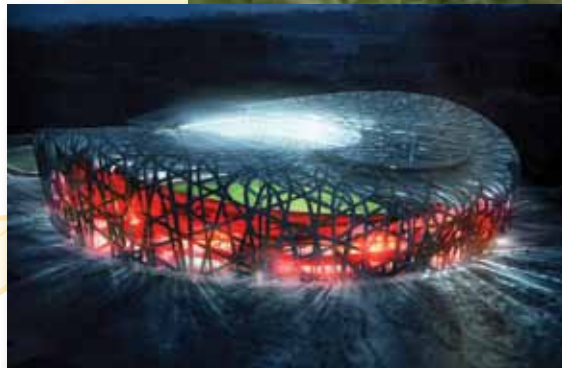


With more than 50 years supporting industrial markets, Enerpac has gained the unique and in-depth expertise that is respected by industrial professionals around the world. Across every continent, Enerpac's network of application engineers, authorized distributors and technical service centers can reach any location, and deliver innovative solutions, technical assistance and quality products.

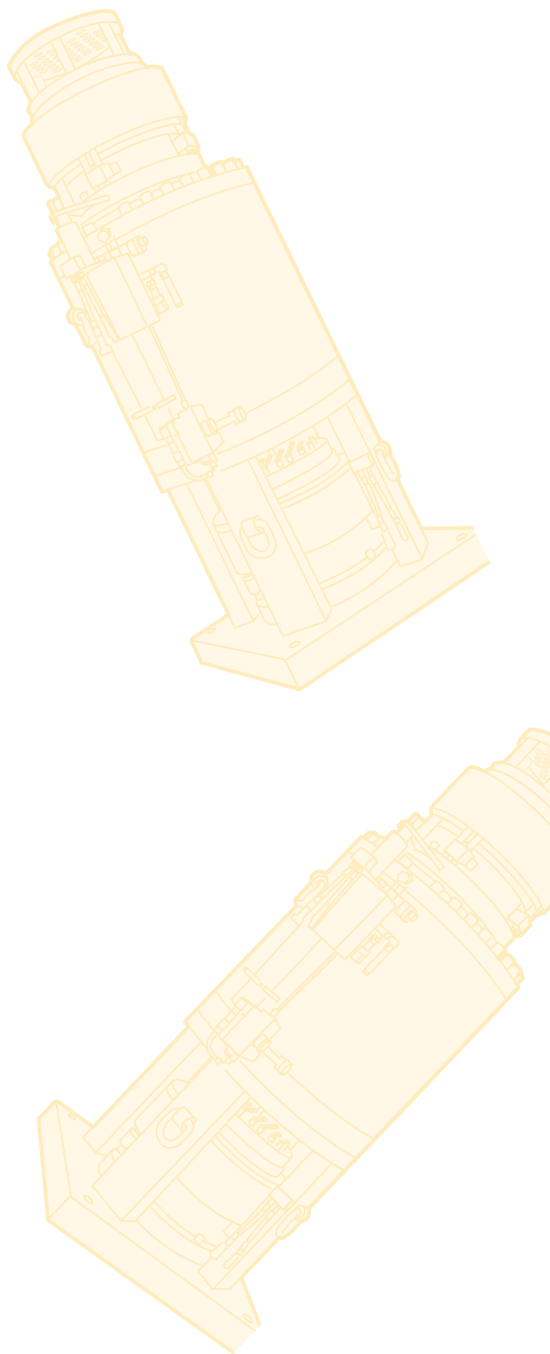
Enerpac's complete line of standard and customized products and a unique systems approach offers the benefits of safety and efficiency to applications where high forces are required. Whether constructing a signature bridge across a deep valley, lifting a national landmark for seismic retrofit or simultaneously testing hundreds of foundation pilings to support a new building, Enerpac will supply the high-force solutions to get the job done.



Courtesy of Caltrans



# Integrated Solutions Section Overview



| Capacity (tons) | Capabilities                | Series   |   | Page  |
|-----------------|-----------------------------|----------|---|-------|
| 67-1200         | Hydraulic Gantries          | SL SBL   |    | 230 ▶ |
| 34-1125         | Strand Jacks                | HSL      |    | 231 ▶ |
| 140-675         | Skidding Systems            | HSK      |    | 232 ▶ |
| 67              | Self-propelled Modular Unit | SPMU     |    | 233 ▶ |
| N/A             | Synchronous Lifting Systems | SLCG ESS |    | 234 ▶ |
|                 | Custom Solutions            |          |   | 235 ▶ |
| .025-250        | Uni-Lift Actuators          | M, B     |  | 236 ▶ |

**ENERPAC** INDUSTRIAL TOOLS | INTEGRATED SOLUTIONS | PRODUCTS | RESOURCES & OPERATIONS | ABOUT US | NEWS | CONTACT US

**Integrated Solutions**

Enerpac Integrated Solutions provides high level system solutions to meet customer requirements for safe, precise control of massive loads including, but not limited to, steel fabrication, bridge fabrication, general crane operation in existing hydraulic systems for the construction and processing industries.

In addition to providing the most comprehensive line of globally supported, heavy-duty products, Enerpac provides hydraulic, steel fabrication and structural steel site engineering and construction knowledge to design and manufacture solutions that ensure your projects are completed safely and efficiently.

- Hydraulic Gantries**  
Heavy lifting solutions for steel fabrication and assembly lines in confined spaces.
- Strand Jacks**  
Stacked jack systems that provide fully controlled precise lifting.
- Skidding Systems**  
A system comprised of a series of steel rollers positioned by hydraulic power to transport, leveling over a low resistance track.
- Self-Propelled Modular Trailer (SPMT)**  
A trailer with a 20m design to transport large and heavy objects.
- Synchronous Lifting Systems**  
High precision hydraulic controlled self-centering automatic monitoring systems for precise lifting applications.
- Custom Solutions**  
A combination of hydraulic steel fabrication and systems tailored to provide solutions for the most demanding industrial applications.

**POWERFUL SOLUTIONS. GLOBAL FORCE.**

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| Industrial Tools   | Integrated Solutions   | Resources & Literature  |
|--|--|---|
| <ul style="list-style-type: none"> <li>Rolling</li> <li>Concrete Stepping Products</li> <li>Cylinders, Lifting Products and Systems</li> <li>Interconnect Solutions</li> </ul> | <ul style="list-style-type: none"> <li>Hydraulic Gantries</li> <li>Strand Jacks</li> <li>Skidding System</li> <li>Self-Propelled Modular Trailer (SPMT)</li> </ul> | <ul style="list-style-type: none"> <li>Literature Request Form</li> <li>Equipment List</li> <li>Learning Center</li> <li>Repair Videos &amp; Instruction Manuals</li> </ul> |



### Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal solution or visit us on the web: [www.enerpac.com](http://www.enerpac.com).

You can also ask Enerpac for assistance by e-mail at [integratedsolutions@enerpac.com](mailto:integratedsolutions@enerpac.com).

▼ Shown: SBL1100 Hydraulic Gantry



## SL/SBL Series

Capacity:  
**67-1200 tons**

Lift Height:  
**11-40 feet**

Hydraulic Gantries are a safe, efficient way to lift and position heavy loads in applications where traditional cranes will not fit and permanent overhead structures for job cranes are not an option.

When used with rail systems, Gantry Cranes also provide a means for moving and placing heavy loads, many times with only one pick. Enerpac offers two series of Hydraulic Gantry systems: the cost effective SL Series that offers entry level control and capacity and the heavy duty SBL Series that offers capacities up to 1,200 tons and 3-stage lifting capability.

All Enerpac gantries are delivered with specific properties and control systems to ensure optimum stability and safety.

- Self-contained hydraulics and controls
- Intellilift wireless control system
- Self-propelled wheels or tank rollers
- Foldable boom on SBL1100 ton unit
- Optional accessories:
  - header beams
  - skid tracks
  - lifting lugs
  - side shift



◀ SBL Series Gantry used for load out operation.

▼ Shown: HSL500 Ton Strand Jack



## HSL Series

Capacity:

**34-1125 tons**

Lifting Speed:

**16-40 ft/hour**

A strand jack can be considered a linear winch. In a strand jack, a bundle of steel cables or strands are guided through a hydraulic cylinder, above and below the cylinder are anchor systems with wedges that grip the strand bundle. By stroking the cylinder in and out while the grips are engaged in the anchors, a lifting or lowering movement is achieved.

Strand jacks were developed in the early 1970's and today are widely recognized as the most sophisticated and highest capacity heavy lifting solution.

- **Two strand sizes: .62" (15.7mm) and .71" (18 mm) diameter**
- **Full control of lifting and lowering through SCC control system**
- **Complete line of electric and diesel power pumps**
- **Nickel plated telescopic pipes preventing bird caging**
- **Standard supplied with lifting anchor**
- **Optional accessories**
  - Strand guide
  - Strand recoiler
  - Strand dispenser



◀ HSL-Series Strand Jack used for heavy lifting market.



▼ Shown: 125 Ton Skid Shoe Beam and Track



## HSK Series

Capacity:

**140-280 tons**

Stroke:

**24 inches**

Taking technology used in the construction of the ancient pyramids and applying high-pressure hydraulics and computer controls is just what you have with the Enerpac HSK-Series Skidding Systems.

The skidding system is comprised of a series of skid-shoes powered by hydraulic push-pull cylinders, travelling over a pre-constructed track and computer-controlled to monitor and keep everything in proper position.

- Full control of skidding with SCC Control System
- Available in two configurations
  - Skid shoe beam for skidding only
  - Skid shoe jack for lifting and skidding
- Complete with Power Units
- Skid tracks available



◀ A side shift in use, enabling a load of max 600 T to be skidded aside, all perfectly synchronized and controlled.

# Self-Propelled Modular Unit

▼ Shown: 12 Unit Configuration



## SPMU Series

Capacity:

**22.5 tons (per axle line)**

Transport Speed:

**3 mph (unloaded)**

The Enerpac Self-Propelled Modular Unit (SPMU) features a minimized height and slim design, which make it very easy to operate in confined spaces. Each wheel unit has a steering as well as a lifting cylinder at its disposal. Wheel propulsion is established by hydraulic propulsion.

The unit is controlled by Intellidrive, a wireless control system that allows the entire system to be operated by one person.

- Multiple configurations possible
- Minimized height and slim design
- Intellidrive wireless control system
- One power pack per 3 units maximum
- Connect up to 12 units



◀ A SPMU used to transport a cargo container in a confined area.

▼ Shown: 4-point ESS Standard Synchronous Lifting System



- Control up to 12 lifting points
- Stroke and load controlled movement for positioning and weighing
- Accuracy of 0.040" between leading and lagging cylinders
- Data storage and recording capabilities
- Load and stroke alarms for optimal safety
- For use with standard single- or double-acting cylinders
- Integrated 10,000 psi hydraulic pump and controls

## SLCG & ESS Series

Number of Lift Points:

**4-12 points**

Accuracy Over Full Stroke:

**Up to 0.040"**

Enerpac features two standard synchronized lifting systems, providing the level of force and control for most applications. We can also provide customer systems tailored to unique project requirements.

The modular SLCG system allows customers to use their existing standard Enerpac pumps and cylinders, providing an economical solution to basic lift/lower applications.

For more complex and demanding applications, the ESS system offers additional features including greater number of lift points, center of gravity, and tilting/weighing capabilities.

▼ Lifting a 3500 ton dragline was successfully done with an Enerpac synchronous lifting system. This operation provided for exact alignment of the bearing on the rail.



▼ SLCG8 used to lift and level buildings.



When your application requires something other than our standard product offering, look to Enerpac's Integrated Solutions Team. Our group of Engineers, Designers and Specialist, will work with you to understand your specific application and provide a turn-key solution that will exceed your expectations.

## STEEL FABRICATION



Enerpac has a dedicated facility for steel fabrication and welding. We can design, procure and manufacture custom structures used in demanding heavy-lifting application.

## ENGINEERING



Enerpac has a multi-disciplined engineering team capable of design and development of all aspects of an Integrated Solutions system. Leveraging design and application experience with the latest in computer software, rapid prototyping and analysis methods insures delivery of the highest quality systems.

## ELECTRONICS



Enerpac designs all control systems in-house. This capability keeps control technology close to the design engineers who are developing the rest of the system. In doing so, we can tailor the control system to match unique project requirements.

## HYDRAULIC POWER SUPPLIES



Enerpac designs, assembles and tests small to large hydraulic power units in-house. Power units range from .67 hp to 321 hp and are tested with the system they are intended to operate.

## MACHINING



Enerpac utilizes the latest in CNC machining technologies and manufactures all large and special hydraulic cylinders in-house. We can machine diameters up to 39 inches with lengths to 236 inches.

## SYNCHRONOUS HOISTING



A unique crane product for below-the-hook positioning of heavy loads that require precision placement. May reduce the number of cranes needed and reduce the costs for multiple picks.

## STRAND JACK GANTRY



The strand jack gantry is a steel structure to facilitate erection and skidding back, forth and sideways of heavy loads up to 1102. The Enerpac strand jack gantry allows you to operate in confined spaces.

The system consists of 3 major components:

- Steel Construction
- Strand Jacks for Vertical Lifting (HSL-Series)

- Skidding System for Horizontal Skidding (HSK1250). This is powered by a hydraulic power unit that is situated on ground level.

The capacity, height and width of the construction can be modified in cooperation with our engineering team.

## BRIDGE LAUNCHING



Providing a solution for the most complex and demanding bridge construction applications, Enerpac has over 20 years providing unique customer bridge launching systems.

## SELF-ERECTING TOWER



The Enerpac Self Erecting Tower is a self-erecting-tower-lift system that enables you to build a free standing gantry from ground level. The Self Erecting Tower can be supplied in various capacities and heights and built with standard modular components, enabling a flexible solution to future project demands.

The Self Erecting Tower enables moving the load in all directions: lifting, lowering, skidding back and forth, and side shift capabilities. Lifting and skidding are achieved using standard Enerpac strand jacks that can also be used for other applications.

The Self Erecting Tower is a versatile lift-system that can be used in a wide variety of operations, for example the installation of reactor vessels in a petrochemical plants or erecting a shipyard crane. When compared with large capacity cranes, the Self Erecting Tower significantly reduces transportation and set up costs.

▼ Shown: Mechanical Actuators



## Precision Positioning and Control in a Mechanical Package

- Machine screw versions up to 250 tons for low-cycle, high-load applications and positive load holding
- Ball-Screw versions up to 100 tons for high-cycle, high-speed applications
- Electro-Mechanical Drive System can be interlinked and easily synchronized
- Precision rolled load screws Class 3 fit for additional strength
- Preloaded tapered roller bearings tolerate high thrust loads and minimize side loading
- Precision worm gear sets provide minimum backlash while reducing wear
- Wide variety of base mounting and screw end configurations



### Maximize Your System Control

Custom control boxes designed to meet your specific application requirements.

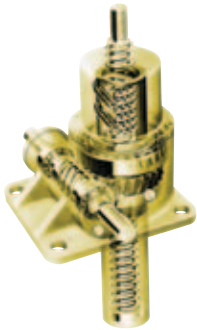


### System Accessories

Enerpac offers a large array of motors, drive components, and boots to meet any demanding project.



◀ *Uni-Lift® Actuators were the ideal choice to position and adjust the complex scaffolding for aircraft maintenance. Precision movement and flexibility was an asset in getting the job done efficiently and safely.*



**Ball Screw Cutaway**



**Machine Screw Cutaway**

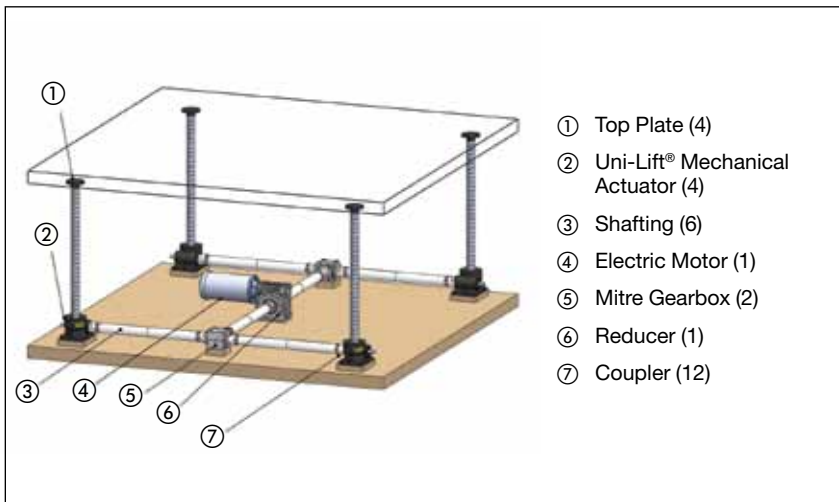
**Design Features:**

- Available with translating, rotating and keyed load screw designs
- High-strength rolled load screws provides maximum durability
- Rugged aluminum alloy and ductile iron housings for demanding or rigorous environment
- Corrosion resistant zinc plating is standard on most units
- The widest range options gear ratios are available to meet all application requirements
- Speeds up to 175 inches per minute

**Actuator Accessories:**

- High-quality bellow boots for added loadscrew protection
- Easy mounting of optional screw ends are available in plain, top plate and clevis design
- Wide selection of motors and C-face adaptors
- Limit switches and encoders for complete system control
- Couplers and shafting available for individual system requirements
- A large choice of mitre gear boxes and reducers provide maximum system design flexibility
- Custom built control boxes to meet your specific need

**Typical Mechanical Actuator Set-Up**



**B, M Series**



Capacity:  
**.25-250 tons**

Maximum Stroke:  
**15-230 inches**

Types:  
**Machine & Ball Screw**



Over-travel Stop Nuts provide a mechanical stop and are used to prevent the ejection of the power screw from the actuator.



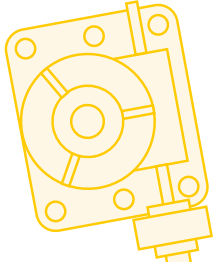
**Contact Enerpac!**

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lift System. You can also ask Enerpac for assistance by e-mail at [integratedsolutions@enerpac.com](mailto:integratedsolutions@enerpac.com).



**CAD Modeling Software**

Our experienced sales team and application engineers will deliver the precise support you need to meet the most demanding and unique requirements. State-of-the art CAD modeling software offers the needed flexibility to design custom built "special" screw jacks to suit all customer needs.



Engineers utilized two (2) Uni-Lift® 100-ton actuators with 15' of travel to raise and lower the ramp on each ferry dock along the Mississippi River, USA. The Department of Transportation engineers needed a way of lifting and lowering ramps during high and low tide conditions, while holding up to the harsh environmental conditions of the gulf coast.



When engineers needed a quick and compact way of opening the large doors of these large plating tanks, they contacted Uni-Lift® for help. This application utilizes two 5-ton double-clevis actuators, with a motor and a limit switch box mounted on each actuator. The operator just pushes a button to open the doors, and pushes another button to close them. This method greatly enhances operator safety and helps prevent cross contamination between tanks.

Uni-Lift® screw jacks are used extensively in a variety of material handling applications. Whether used in positioning conveyer belts, placing tension on overhead beams or moving heavy-duty equipment, Uni-Lift® actuators are the ideal solution for many jackings, tensionings, and positioning applications. Whether you have one lifting point or multiple lifting points, Uni-Lift® actuators are the perfect solution for many different OEM motion control applications.







## Configuring Your UNI-LIFT Actuator On-Line



**www.enerpac.com/unilift**  
for latest Enerpac Uni-Lift® information

Visit the Enerpac Web Site and use the UNI-LIFT® Configurator to properly select the type, ratio, and size of the machine or ball screw actuator for your application.

- Provides instant results that are downloadable in 2D and 3D CAD
- Configuration snapshot is generated from your selection input
- Supports imperial and metric units
- Informative help topics guide you through the entire process

### ▼ Sample 3D File



### ▼ Sample Configuration Report

Configuration Report  
Uni-Lift  
For contact information visit [www.enerpac.com](http://www.enerpac.com)

Project: E501 Example Date:  
Prepared By:

Uni-Lift Order Number Matrix:

| Uni-Lift # | Model | Size | Mtg Style | Scr Cfg | ESL (in) | Ratio | End Cfg | Boot | Stop Nut | Mtr Ada | Limit SW |
|------------|-------|------|-----------|---------|----------|-------|---------|------|----------|---------|----------|
| 1          | M     | 4    | U         | T       | 20.0     | L     | TP      |      |          |         |          |
| 2          | M     | 4    | U         | T       | 20.0     | L     | TP      |      |          |         |          |
| 3          | M     | 4    | U         | T       | 20.0     | L     | TP      |      |          |         |          |
| 4          | M     | 4    | U         | T       | 20.0     | L     | TP      |      |          |         |          |

**Input Data**

|                             |             |            |
|-----------------------------|-------------|------------|
| # of Uni-Lifts:             | 4           |            |
| The Load is                 | Guided      |            |
| The Load is in              | Compression |            |
| Load Screw Travel:          | 20.0        | Inches     |
| Balanced:                   | Yes         |            |
| Max Load on One Lift:       | 7,500       | Pounds     |
| Total Static Load:          | 30,000      | Pounds     |
| Total Running Load:         | 30,000      | Pounds     |
| Factor of Safety Required:  | 2.0         |            |
| Slenderness Ratio Required: | 400         |            |
| Ambient Temperature:        | 80          | Fahrenheit |
| Required Cycles/Hour:       | 3           | Cycles     |
| Motor Speed:                | 1,725       | RPM        |
| Reducer Ratio:              | 7.50:1      |            |
| Gear Ratio:                 | 5.3:1       |            |
| Turns Per Inch (TPI):       | 16          |            |

**Results**

|                         | English |         | Metric |
|-------------------------|---------|---------|--------|
| Input Speed:            | 230     | RPM     | 230    |
| Linear Velocity:        | 14.38   | In/Min  | 365.1  |
| One-Way Travel Time:    | 1.39    | Minutes | 1.39   |
| Max Cycles/Hour:        | 12.23   | Cycles  | 12.23  |
| Horse Power:            | 3.80    | HP      | 2.84   |
| Motor Starting Torque:  | 241     | In-Lbs  | 27.17  |
| Motor Running Torque:   | 139     | In-Lbs  | 15.69  |
| Unit Run Torque:        | 188     | In-Lbs  | 21.25  |
| Slenderness Ratio Calc: | 39      |         |        |
| Factor of Safety Calc:  | 2.1     |         | 2.1    |
| Key Torque:             | 1,312   | In-Lbs  | 148.21 |
|                         |         | N-m     |        |

Uni-Lift  
For contact information visit [www.enerpac.com](http://www.enerpac.com)  
[Contact Us](#)



## Enerpac "Yellow Pages" stand for Hydraulic Information!

If selecting hydraulic equipment is not your daily routine then you will appreciate these pages. The "Yellow Pages" are designed to help you work with hydraulics. They will help you to better understand the basics of hydraulics, of system set-ups and of the most commonly used hydraulic techniques. The better your choice of equipment, the better you will appreciate hydraulics. Take the time to go through these "Yellow Pages" and you will benefit even more from Enerpac High Pressure Hydraulics.

| Section                                   |  | Page             |
|---|--|------------------|
| <b>Safety Instructions</b>                |  | <b>242-243</b> ▶ |
| <b>Product Selection &amp; Worksheet</b>  |  | <b>244-245</b> ▶ |
| <b>Basic System Set-ups</b>               |  | <b>246-247</b> ▶ |
| <b>Basic Hydraulics</b>                   |  | <b>248-249</b> ▶ |
| <b>Conversion Tables and Speed Charts</b> |  | <b>250-251</b> ▶ |
| <b>Valve Information</b>                  |  | <b>252</b> ▶     |
| <b>Torque Tightening</b>                  |  | <b>253-254</b> ▶ |

### GLOBAL LIFETIME WARRANTY STATEMENT



**www.enerpac.com**

Visit our web site for the complete Global Lifetime Warranty or call your Authorized Service Center.

Enerpac products are warranted to be free of defects in materials and workmanship. Any product that does not conform to specification will be repaired or replaced at Enerpac's expense, anywhere in the world; simple as that!

This warranty does not cover ordinary wear and tear, abuse, misuse, alterations, or the use of improper fluids. Determination of the authenticity of a warranty claim will be made only by Enerpac or its Authorized Service Centers.

Enerpac is certified for several quality standards. These standards require compliance with standards for management, administration, product development and manufacturing.



Enerpac works hard to maintain the ISO 9001 quality rating, in its ongoing pursuit of excellence.

### CE Marking & Conformity

Enerpac provides Declarations of Conformity, Declarations of Incorporation, and CE marking for products that conform to the European Community Directives.



Where specified, Enerpac electric power units meet the design, assembly and test requirements of The Standards Council of Canada (CAN C22.2 No. 68-92), and UL73 for the United States. Units were tested and certified for both USA and Canada by TUV, a nationally recognized testing laboratory.

### EMC Directive 2004/108/EC

Where specified, Enerpac electric power pumps meet the requirements for Electromagnetic Compatibility per EMC Directive 2004/108/EC.



ZA and XA-Series pumps are tested and certified according to the Directive 94 / 9 / EC "ATEX Directive". The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. ZA and XA-Series pumps are marked with: Ex II 2 GD ck T4.

### ASME B30.1-2004

Our cylinders fully comply with the criteria set forth by the American Society of Mechanical Engineers (except RD series).

### DIN 20024

Enerpac thermoplastic hoses are related to the criteria set forth in Deutsche Industrie Norm 20024.

### Product Design Criteria

All hydraulic components are designed and tested to be safe for use at maximum 10,000 psi unless otherwise specifically noted.



# Safety Instructions



- Lift slowly and check often
- Avoid standing in the line of force
- Anticipate possible problems and take steps to avoid them

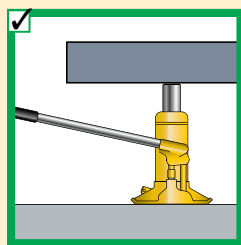
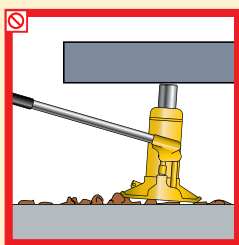
When used correctly, hydraulic power is one of the safest methods of applying force to your work. To that end we offer some DO's and DON'Ts, simple common sense points which apply to practically all Enerpac hydraulic products.

The illustrations and application photos of Enerpac products throughout this catalog are used to portray how some of our customers

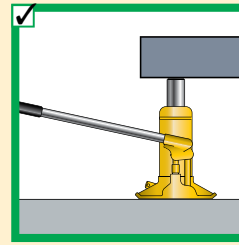
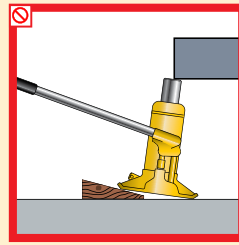
have used hydraulics in industry. In designing similar systems, care must be taken to select the proper components that provide safe operation and fit your needs. Check to see if all safety measures have been taken to avoid the risk of injury and property damage from your application or system. Enerpac cannot be held responsible for damage or injury caused by unsafe use, maintenance or application of its products.

Please contact the Enerpac office or a representative for guidance when you are in doubt as to the proper safety precautions to be taken in designing and setting up your particular system.

In addition to these tips, every Enerpac product comes with specific safety information and instructions. Please read them carefully.



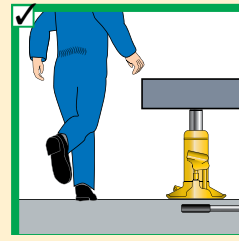
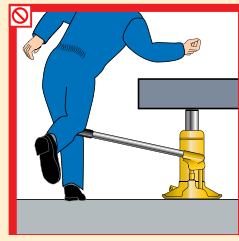
Provide a level and solid support for the entire jack base area.



The entire jack saddle must be in contact with the load. Movement of the load must be in the same direction as jack plunger.

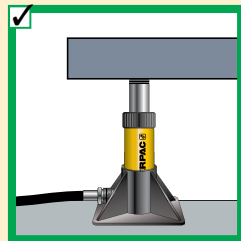
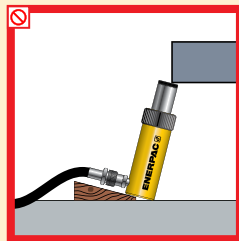


Never place any part of your body under the load. Ensure the load is on a solid support before venturing under.

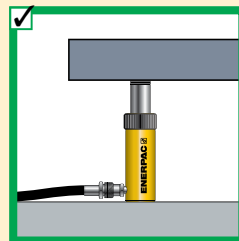
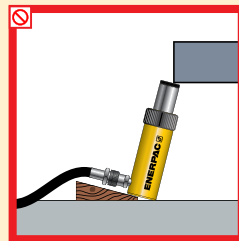


Remove the jack handle when it is not being used.

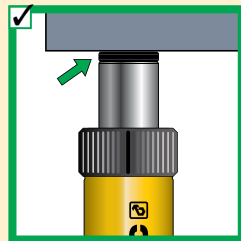
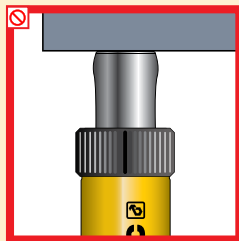
## Cylinders



Provide a solid support for the entire cylinder base area. Use cylinder base attachment for more stability.



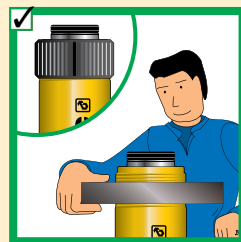
The entire cylinder saddle must be in contact with the load. Movement of the cylinder must be parallel with the movement of the load.



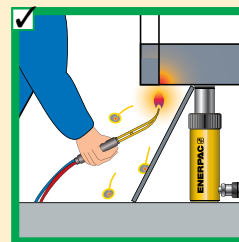
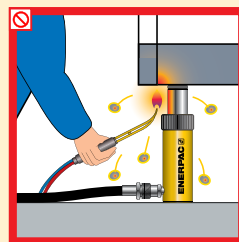
Do not use cylinder without saddle. This will cause plunger to "mushroom". Saddles distribute load evenly on the plunger.



As with jacks, never place any part of your body under the load. Load must be on cribbing before venturing under.



Always protect cylinder threads for use with attachments.

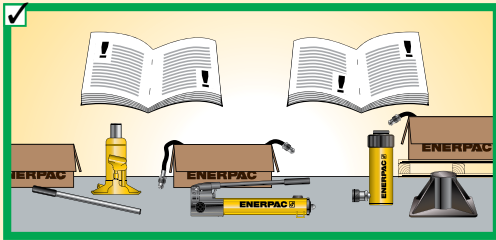


Keep hydraulic equipment away from open fire and temperatures above 150 °F (65 °C).

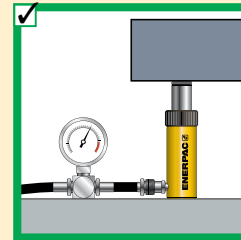
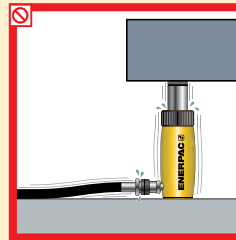


## General

**80%** Manufacturer's rating of load and stroke are maximum safe limits. **80%**  
**Good practice encourages using only 80% of these ratings!**

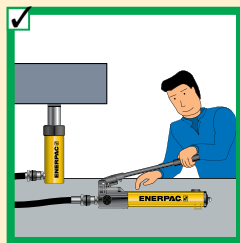
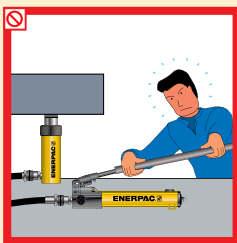


Always read instructions and safety warnings that come with your Enerpac hydraulic equipment.

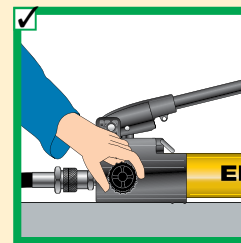
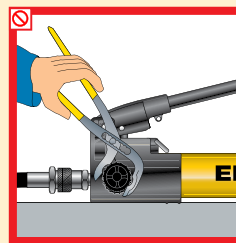


Don't override the factory setting of relief valves. Always use a gauge to check system pressure.

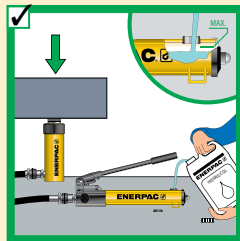
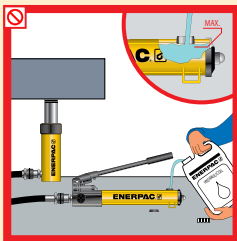
## Pumps



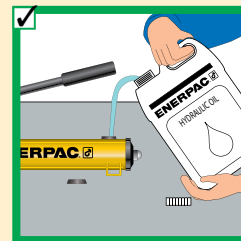
Don't use handle extenders. Hand pumps should be easy to operate when used correctly.



Close release valve finger tight. Using force will ruin the valve.

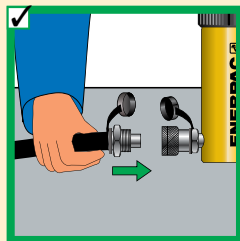
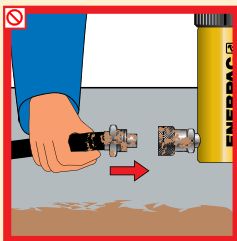


Fill pump only to recommended level. Fill only when connected cylinder is fully retracted.

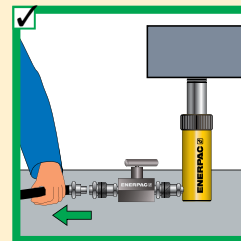
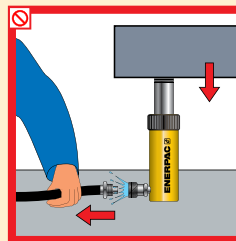


Use only genuine Enerpac hydraulic oil. The wrong fluid can destroy your seals and pump and will render your warranty null and void.

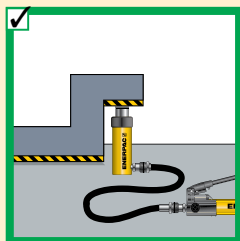
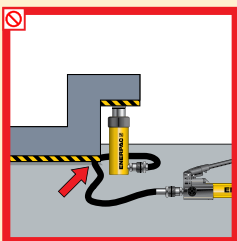
## Hoses and couplers



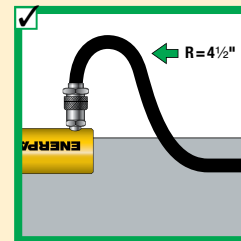
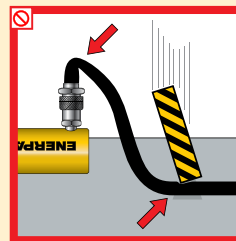
Clean both coupler parts before connecting. Use dust caps when coupler parts are not connected.



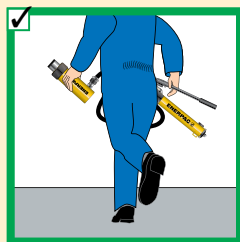
Detach cylinder only when fully retracted or use shut-off valves or safety valves to lock-in cylinder pressure.



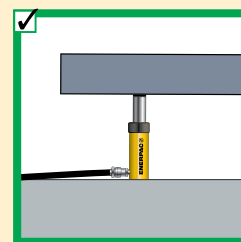
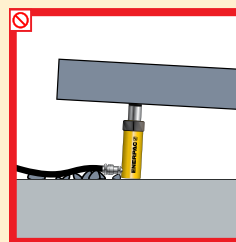
Keep hoses away from the area beneath loads.



Don't kink hoses. Bending radius should be at least 4 1/2 inch. Don't drive over or drop heavy objects on hoses.







Don't lift hydraulic equipment by the hoses.



Never allow the cylinder to be lifted off of the ground through the couplers.








## ▼ HAND PUMP AND SINGLE-ACTING CYLINDER MATCHING CHART

| Capacity (tons) ▶<br>▼ Stroke (inches)  | 5               | 10 | 15              | 25 | 30              | 50 | 60 | 75 | 100 | 150 |
|---|-----------------|----|-----------------|----|-----------------|----|----|----|-----|-----|
| < 1.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 1.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 2.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 3.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 4.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 5.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 6.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 7.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 8.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 9.00  |                 |    |                 |    |                 |    |    |    |     |     |
| 10.00   |                 |    |                 |    |                 |    |    |    |     |     |
| 12.00   |                 |    |                 |    |                 |    |    |    |     |     |
| 13.00   |                 |    |                 |    |                 |    |    |    |     |     |
| 14.00   |                 |    |                 |    |                 |    |    |    |     |     |
|     | <b>P-392</b>    |    | <b>P-80</b>     |    | <b>P-462</b>    |    |    |    |     |     |
|   | <i>Page:</i> 58 |    | <i>Page:</i> 60 |    | <i>Page:</i> 60 |    |    |    |     |     |

Note: Selection based on oil capacity requirements of cylinders.

## ▼ POWER PUMP SELECTION CHART

| Flow*                  | Low<br>(20 in <sup>3</sup> /min)  |   | Medium<br>(60 to 200 in <sup>3</sup> /min)   |   | High<br>(463 in <sup>3</sup> /min)  |
|------------------------|---|---|--|---|---|
| Reservoir Oil Capacity | 0.5-1 gal.  | 1.5 gal.  | 1.0-10 gal.  | 1.0-10 gal.   | 25 gal.   |
| Duty Cycle**           | Intermittent  | Extended  | Intermittent   | Extended  | Extended  |
| Portable/Stationary*** | Portable  | Stationary  | Portable   | Stationary  | Stationary  |
| Recommended Series     | <b>Economy</b>  | <b>Submerged</b>  | <b>ZU4</b>   | <b>ZE3-6</b>  | <b>8000 Series</b>  |
|                        |  |  |  |  |  |
|                        | <i>Page:</i> 70   | <i>Page:</i> 72   | <i>Page:</i> 78  | <i>Page:</i> 84   | <i>Page:</i> 90   |

\* Flow

- Determined by motor size
- Directly affects electrical power requirements
- Determines cylinder or tool speed

\*\* Duty Cycle

- Extended applications require more than one hour of uninterrupted pump use
- Intermittent use – from 20 minutes to one hour, depending on reservoir capacity (contact Enerpac for details)

\*\*\* Portability

- |   |   |
|---|---|
| <p><u>Portable</u></p> <ul style="list-style-type: none"> <li>• Ergonomic handles</li> <li>• Flexible power requirements</li> </ul> | <p><u>Stationary</u></p> <ul style="list-style-type: none"> <li>• Mounting options</li> <li>• Normally requires stable power</li> </ul> |
|---|---|

# Product Selection Worksheet



▼ Complete the following information to select the right products:

| Cylinder Selection | Question:                         | Tips/help  | Data | Model Number |
|--------------------|-----------------------------------|--|------|--------------|
|                    | Total force required in tons:     | Total load   |      |              |
|                    | Number of cylinders required:     | Number of lifting points   |      |              |
|                    | Force per cylinder in tons:       | Should be 80% of total cylinder cap.                               |      |              |
|                    | Stroke required:                  | Plunger travel   |      |              |
|                    | Single or double acting (D/A):    | D/A used when pull force is required, or retract speed is critical |      |              |
|                    | Type of plunger required:         | Hollow or solid  |      |              |
|                    | Collapsed height required:        | Height with plunger fully retracted                                |      |              |
|                    | Optional saddle required:         | Tilt, Grooved, Flat  |      |              |
|                    | Cylinder base:                    | Improves stability   |      |              |
|                    | Cylinder attachments: (RC-series) | Expanded functions   |      |              |
|                    | Selected cylinder model:          |  |      | ▶            |
|                    | Including coupler model:          |  |      |              |

## Pump Selection

The three most commonly selected pumps are hand pumps, electric pumps and air-driven pumps. Gas powered pumps, however can be selected in the same way.

Available power source:  Manual  Battery  Electric  Compressed Air  Gasoline

Hand pump  
 Single- or double-acting operation  
 Not for high-cycle applications  
 Use 4-way valve for D/A applications  
 Check speed chart on page 251 for number of strokes per inch

Selected hand pump: ▶

Electric or compressed air pump  
 Need for portability:  
 Duty cycle:  
 Required usable oil capacity:  
 Available voltage:  
 Lifting speed (Important/not important): Use speed chart on page 251  
 Type of control:  
 Type of actuation/function:  
 Accessories:  
 Weight and power requirements  
 Intermittent or extended  
 Intermittent = 1.2 x cylinder oil capacity  
 high cycle = 2 x cylinder oil capacity  
 Single phase or Three phase

Selected pump: ▶

To suit hose: Oil connection

## System Components

Number of hoses and length required:

Selected hoses: ▶

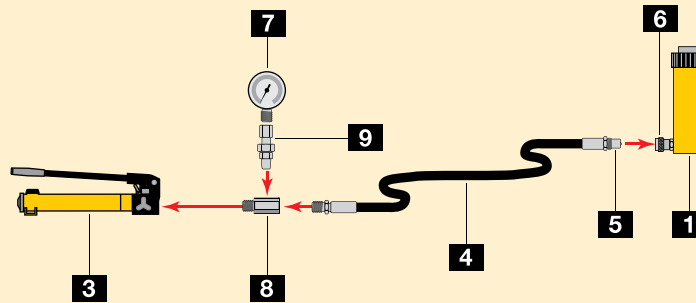
Manifold or tee: ▶  
 Extra hose per manifold (2): ▶  
 Gauge (psi, lbs or tons scale): Glycerine for high cycle ▶  
 Gauge adaptor: ▶  
 Fittings: ▶  
 Pressure relief safety valve: ▶  
 Load-holding valve(s): ▶  
 Hydraulic oil: ▶



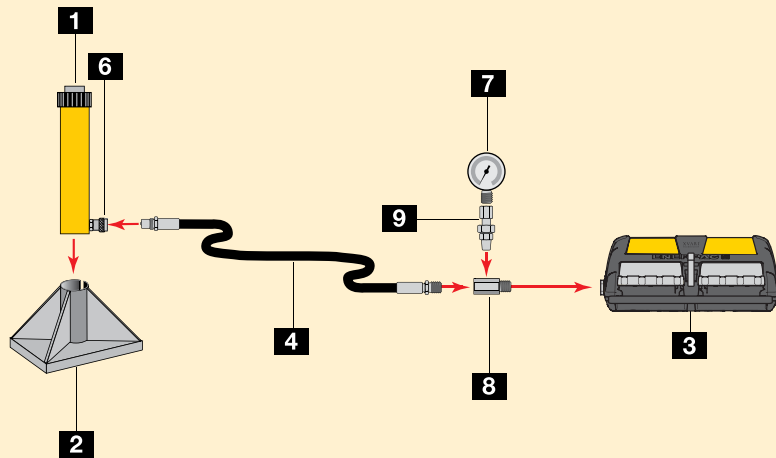
- 1 Cylinder**  
Applies hydraulic force.  
Page 5
- 2 Cylinder Base Plate**  
For applications such as lifting where additional cylinder stability is required.  
Page 10
- 3 Pump**  
Provides hydraulic flow.  
Page 56
- 4 Hose**  
Transports hydraulic fluid.  
Page 114-115
- 5 Male Coupler**  
For quick connection of the hose to system components.  
Page 116-117
- 6 Female Coupler**  
For quick connection of the hose end to the system components.  
Page 116-117
- 7 Gauge**  
To monitor pressure of the hydraulic circuit.  
Page 120-123
- 8 Gauge Adaptor**  
For quick and easy gauge installation.  
Page 126
- 9 Swivel Connector**  
Allows proper alignment of valves and/or gauges. Used when units being connected cannot be rotated.  
Page 126
- 10 Auto-damper Valve V-10**  
Used to protect gauge from damage due to sudden pulses in the system. Needs no adjustment and allows correct positioning of gauge, prior to tightening.  
Page 129

**Single-acting push application, such as in a press.**  
The hand pump offers controlled cylinder advance, but may require many hand pump strokes in longer stroke applications when the cylinder capacity is 25 ton or above.

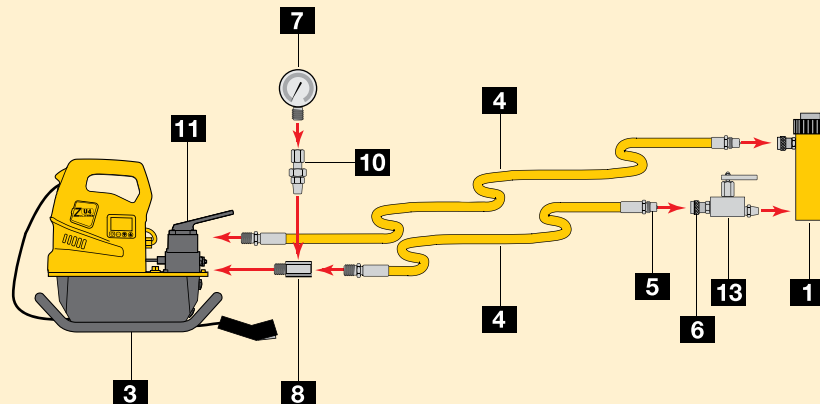
Examples of pump, hose and cylinder sets can be found on page 55.



**Single-acting cylinder with longer stroke used for lifting applications.**

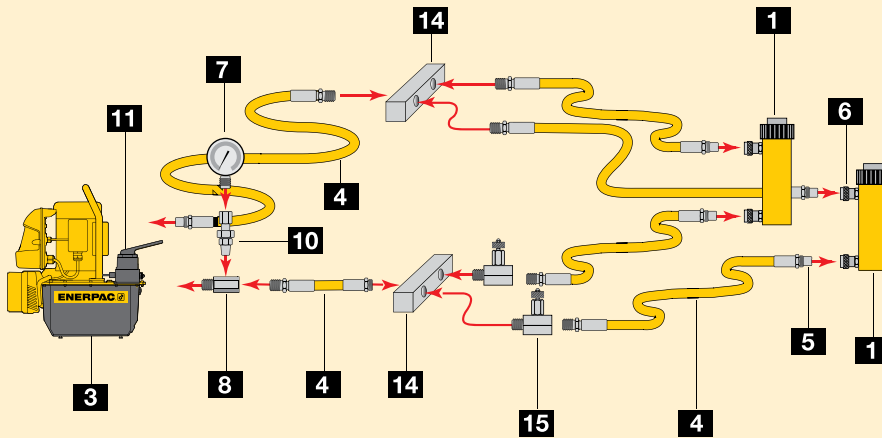


**Double-acting cylinder set-up used for lifting applications where a slow controlled descent of the load must be maintained.**





Double-acting cylinder set-up used in a push/pull application.



**11 4-Way Directional Control Valve**  
Controls the direction of hydraulic fluid in a double-acting system.  
Page 106

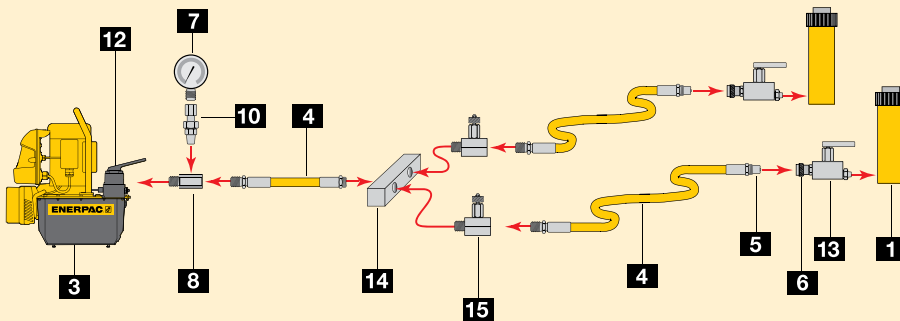
**12 3-Way Directional Control Valve**  
Controls the direction of hydraulic fluid in a single-acting system.  
Page 106

**13 Safety Holding Valve**  
Controls load descent in lifting applications.  
Page 129

**14 Manifold**  
Allows distribution of hydraulic fluid from one power source to several cylinders  
Page 118

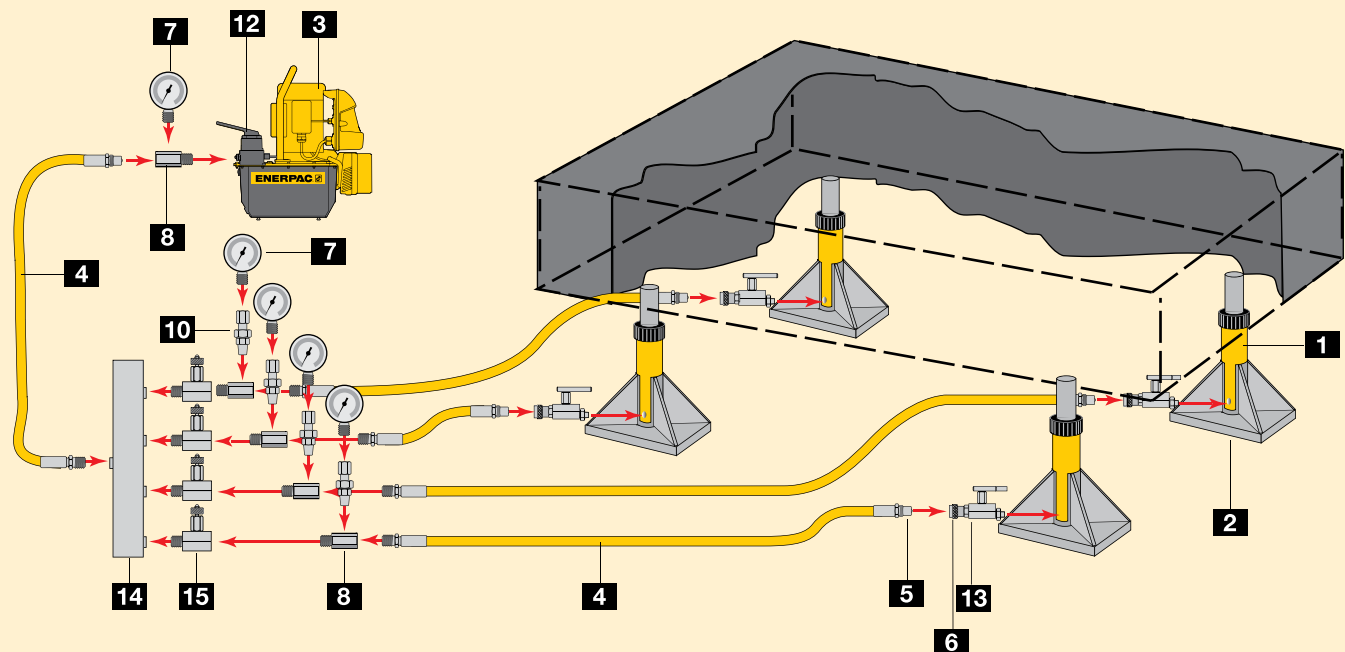
**15 Needle Valve**  
Regulates the flow of hydraulic fluid to or from the cylinders.  
Page 129

Two point lifting set-up using single-acting cylinders.



**www.enerpac.com**  
Visit our web site to learn more about hydraulics and system set-ups.

Four point lifting set-up, using single-acting cylinders, flow control valves and safety valves.

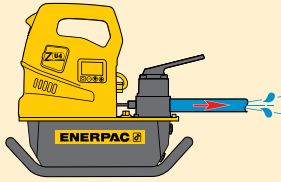






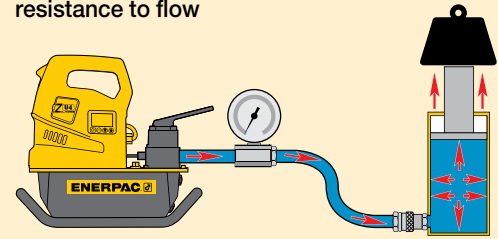
## Flow

A hydraulic pump produces flow



## Pressure

Pressure occurs when there is resistance to flow



## Pascal's Law

Pressure applied at any point upon a confined liquid is transmitted undiminished in all directions (Fig.1).

This means that when more than one hydraulic cylinder is being used, each cylinder will lift at its own rate, depending on the force required to move the load at that point (Fig. 2).

Cylinders with the lightest load will move first, and cylinders with the heaviest load will move last (Load A), as long as the cylinders have the same capacity.

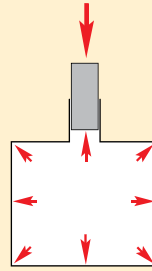


Figure 1

To have all cylinders operate uniformly so that the load is being lifted at the same rate at each point, either control valves (see Valve section) or Synchronous Lift System components (see Cylinder section) must be added to the system (Load B).

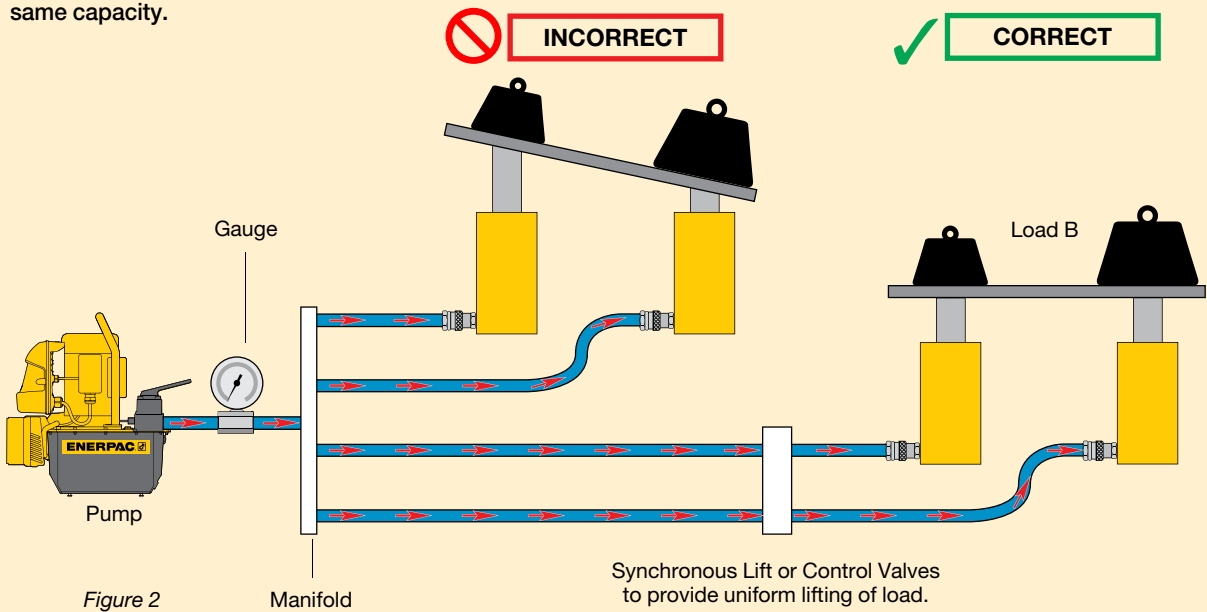


Figure 2



### CAUTION!

**When lifting or pressing, always use a gauge.**

A gauge is your "window" to the system. It lets you see what's going on. You will find the gauges in the System Components section.



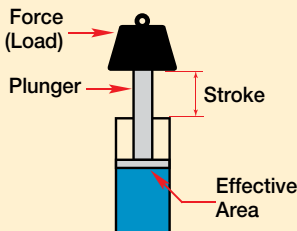
### Learn more about hydraulics

Visit [www.enerpac.com](http://www.enerpac.com) to learn more about hydraulics and system set-ups.



## Force

The amount of force a hydraulic cylinder can generate is equal to the hydraulic pressure times the “effective area” of the cylinder (see cylinder selection charts).



|       |   |                            |   |                         |
|-------|---|----------------------------|---|-------------------------|
| Force | = | Hydraulic Working Pressure | x | Cylinder Effective Area |
| F     | = | P                          | x | A                       |

Use this formula to determine either force, pressure or effective area if two of the variables are known.

### Example 1

An RC-106 cylinder with 2.24 in<sup>2</sup> effective area operating at 8,000 psi will generate what force?  
**Force = 8,000 psi x 2.24 in<sup>2</sup> = 17,920 lbs.**

### Example 2

An RC-106 cylinder lifting 14,000 lbs will require what pressure?  
**Pressure = 14,000 lbs ÷ 2.24 in<sup>2</sup> = 6,250 psi.**

### Example 3

An RC-256 cylinder with 5.15 in<sup>2</sup> effective area is required to produce a force of 41,000 lbs. What pressure is required?  
**Pressure = 41,000 lbs. ÷ 5.15 in<sup>2</sup> = 7961 psi.**

### Example 4

Four RC-308 cylinders each with 6.49 in<sup>2</sup> effective area are required to produce a force of 180,000 lbs. What pressure is required?  
**Pressure = 180,000 lbs ÷ (4 x 6.49 in<sup>2</sup>) = 6933 psi.**  
 Remember, since four cylinders are used together, the area for one cylinder must be multiplied by the number of cylinders used.

### Example 5

A CLL-2506 cylinder with 56.79 in<sup>2</sup> effective area is going to be used with a power source that is capable of 7,500 psi. What is the theoretical force available from that cylinder?  
**Force = 7,500 psi x 56.79 in<sup>2</sup> = 425,925 lbs.**

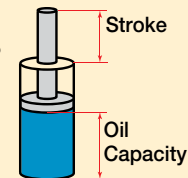
## Cylinder Oil Capacity

The volume of oil required for a cylinder (cylinder oil capacity) is equal to the effective area of the cylinder times the stroke\*.

|                       |   |                         |   |                 |
|-----------------------|---|-------------------------|---|-----------------|
| Cylinder Oil Capacity | = | Cylinder Effective Area | x | Cylinder Stroke |
|-----------------------|---|-------------------------|---|-----------------|

### Example 1

An RC-158 cylinder with 3.14 in<sup>2</sup> effective area and an 8 in. stroke will require what volume of oil?  
**Oil Capacity = 3.14 in<sup>2</sup> x 8 in = 25.12 in<sup>3</sup>**



### Example 2

An RC-5013 cylinder has an effective area of 11.05 in<sup>2</sup> and a stroke of 13.25 in. How much oil will be required?  
**Oil Capacity = 11.05 in<sup>2</sup> x 13.25 in = 146.41 in<sup>3</sup>**

### Example 3

An RC-10010 cylinder has an effective area of 20.63 in<sup>2</sup> and a stroke of 10.25 in. How much oil will it require?  
**Oil Capacity = 20.63 in<sup>2</sup> x 10.25 in = 211.46 in<sup>3</sup>**

### Example 4

Four RC-308 cylinders are being used, each with an effective area of 6.49 in<sup>2</sup> and stroke of 8.25 in. How much oil will be required?  
**Oil Capacity = 6.49 in<sup>2</sup> x 8.25 in = 53.54 in<sup>3</sup> for one cylinder**  
 Multiply by four to obtain the required capacity: **214.17 in<sup>3</sup>**

\* Note: these are theoretical examples and do not take into account the compressibility of oil under high pressure.

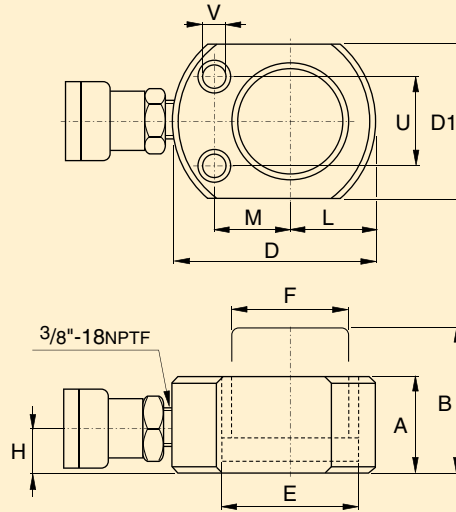
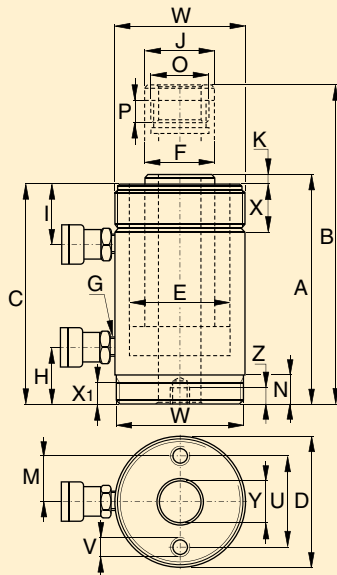


**Enerpac oil will compress 2.28% at 5,000 psi and 4.1% at 10,000 psi.**



## Key to cylinder dimensions

Dimensions shown in the Selection Charts of the cylinder section are identified on the relevant drawings by the capital letter references listed here: A for collapsed height through Z for depth of internal base thread.



- A = Collapsed height
- B = Extended height
- C = Cylinder body length
- D = Cylinder outside diameter
- D1 = Cylinder width
- E = Cylinder inside diameter (bore)
- F = Plunger rod diameter
- G = Oil inlet thread
- H = Cylinder bottom to advance port
- I = Cylinder top to retract port
- J = Saddle outside diameter
- K = Cylinder rod protrusion at collapsed height
- L = Plunger center to side of base
- M = Mounting holes to plunger center
- N = Length of smaller cylinder part
- O = Plunger hole or thread of saddle
- P = Plunger thread length
- Q = Plunger outside thread (pull cylinders only)
- U = Bolt circle diameter of mounting holes
- V = Thread of cylinder mounting holes
- W = Collar thread
- X = Collar thread length
- Y = Center hole diameter (hollow cylinders only)
- Z = Depth of internal base thread

## Key to measurements

All capacities and measurements in the catalog are expressed in uniform values.

The conversion chart provides helpful information for their translation into equivalent systems.

You can also visit our website at [www.enerpac.com](http://www.enerpac.com) to download **Conpaq**, a FREE conversion calculator.

### Pressure:

- 1 psi = .069 bar
- 1 bar = 14.50 psi
- 1 kPa = .145 psi

### Volume:

- 1 in<sup>3</sup> = 16.387 cm<sup>3</sup>
- 1 cm<sup>3</sup> = .061 in<sup>3</sup>
- 1 liter = 61.02 in<sup>3</sup>
- 1 liter = .264 gal
- 1 US gal = 3,785 cm<sup>3</sup>
- = 3.785 l
- = 231 in<sup>3</sup>

### Weight:

- 1 pound (lb) = .4536 kg
- 1 kg = 2.205 lbs
- 1 metric ton = 2,205 lbs
- 1 ton (short) = 2,000 lbs
- 1 ton (short) = 907.18 kg

### Temperature:

- To convert °F to °C:  
 $T_{°C} = (T_{°F} - 32) \div 1.8$
- To convert °C to °F:  
 $T_{°F} = (T_{°C} \times 1.8) + 32$

### Other measurements:

- 1 in = 25.4 mm
- 1 mm = .039 in
- 1 in<sup>2</sup> = 6.452 cm<sup>2</sup>
- 1 cm<sup>2</sup> = .155 in<sup>2</sup>
- 1 hp = .735 kW
- 1 kW = 1.359 hp
- 1 Nm = .73756 Ft.lbs
- 1 Ft.lbs = 1.355818 Nm

### Imperial to metric

| Inches | Decimal | mm    |
|--------|---------|-------|
| 1/16   | .06     | 1.59  |
| 1/8    | .13     | 3.18  |
| 3/16   | .19     | 4.76  |
| 1/4    | .25     | 6.35  |
| 5/16   | .31     | 7.94  |
| 3/8    | .38     | 9.53  |
| 7/16   | .44     | 11.11 |
| 1/2    | .50     | 12.70 |
| 9/16   | .56     | 14.29 |
| 5/8    | .63     | 15.88 |
| 11/16  | .69     | 17.46 |
| 3/4    | .75     | 19.05 |
| 13/16  | .81     | 20.64 |
| 7/8    | .88     | 22.23 |
| 15/16  | .94     | 23.81 |
| 1      | 1.00    | 25.40 |

# Cylinder Speed Charts



## Cylinder Speed

This chart will help you calculate the time required for an Enerpac cylinder to lift a load when powered by a 10,000 psi Enerpac hydraulic pump.

The Cylinder Speed Chart can also be used to determine the pump type and model best suited for an application when you know the plunger speed required.

To determine:

### Cylinder plunger speed

An RC-308 cylinder (30 ton) is powered by a ZE-5 pump. While lifting the load, the cylinder plunger will require 3.2 seconds to travel 1 inch.

| 25 ton  |      | 30 ton  |      | 50 ton  |      | 75 ton  |       | 100 ton |       | Pump Type          |
|---------|------|---------|------|---------|------|---------|-------|---------|-------|--------------------|
| No Load | Load | No Load | Load | No Load | Load | No Load | Load  | No Load | Load  |                    |
| 1.5     | 15.5 | 1.9     | 19.5 | 3.3     | 33.2 | 4.8     | 47.7  | 6.2     | 61.9  | 0.5 hp Economy     |
| .44     | 5.2  | .65     | 6.5  | .95     | 11.1 | 1.4     | 15.9  | 1.8     | 20.7  | ZU4 Series         |
| 2.1     | 15.5 | 2.6     | 19.5 | 4.4     | 33.2 | 6.4     | 47.7  | 8.3     | 61.9  | 0.5 hp Submerged   |
| .69     | 7.7  | .87     | 8.7  | 1.5     | 16.6 | 2.1     | 23.9  | 2.8     | 30.9  | ZE3 Series         |
| .48     | 5.2  | .69     | 6.9  | 1.0     | 11.1 | 1.5     | 15.9  | 1.9     | 20.6  | ZE4 Series         |
| .38     | 2.8  | .48     | 3.2  | .65     | 6.5  | .95     | 9.5   | 1.2     | 12.4  | ZE5 Series         |
| .34     | 1.5  | .43     | 1.9  | .74     | 3.3  | 1.1     | 4.8   | 1.4     | 6.2   | ZE6 Series         |
| .30     | .67  | .38     | .84  | .65     | 1.4  | .94     | 2.1   | 1.2     | 2.7   | 8000-Series        |
| .26     | 20.6 | 3.2     | 26.0 | 5.5     | 44.2 | 8.0     | 63.6  | 10.3    | 82.5  | XA Series          |
| 5.2     | 30.9 | 6.5     | 39.0 | 11.0    | 66.3 | 15.9    | 95.5  | 20.6    | 123.9 | Turbo II Pump      |
| 6.2     | 38.6 | 7.8     | 48.7 | 13.3    | 82.9 | 19.1    | 119.3 | 24.8    | 154.7 | PA-133             |
| .48     | 34.3 | .69     | 43.3 | 1.0     | 73.7 | 1.5     | 106.0 | 1.9     | 137.5 | PAM 10-Series      |
| .36     | 3.9  | .46     | 4.8  | .78     | 8.3  | 1.1     | 11.9  | 1.5     | 15.5  | ZA4 Series         |
| 1.5     | 7.7  | 1.9     | 9.7  | 3.3     | 16.6 | 4.8     | 23.9  | 6.2     | 30.9  | PGM2 Atlas         |
| 0.44    | 3.1  | 0.56    | 3.9  | 0.95    | 6.6  | 1.4     | 9.5   | 1.8     | 12.4  | ZG5 Series, Briggs |
| 0.77    | 3.1  | 0.97    | 3.9  | 1.7     | 6.6  | 2.4     | 9.5   | 3.1     | 12.4  | ZG5 Series, Honda  |
| 0.34    | 1.5  | 0.43    | 1.9  | 0.74    | 3.3  | 1.1     | 4.8   | 1.4     | 6.2   | ZG6 Series         |

To determine:

### Best matching pump

Your 30 ton cylinder needs to move a load at a speed of 6.50 sec/in. Simply go down from the top of the chart, to the value of 6.50 sec/in. Then follow the chart to the right to find that

the ZE4 pump or ZU4 is most suitable for your application.

| 15 ton  |      | 25 ton  |      | 30 ton  |      | 50 ton  |      | 75 ton  |       | 100 ton |       | Pump Type          |
|---------|------|---------|------|---------|------|---------|------|---------|-------|---------|-------|--------------------|
| No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load  | No Load | Load  |                    |
| .94     | 9.4  | 1.5     | 15.5 | 1.9     | 19.5 | 3.3     | 33.2 | 4.8     | 47.7  | 6.2     | 61.9  | 0.5 hp Economy     |
| .27     | 3.1  | .44     | 5.2  | .65     | 6.5  | .95     | 11.1 | 1.4     | 15.9  | 1.8     | 20.7  | ZU4 Series         |
| 1.3     | 9.4  | 2.1     | 15.5 | 2.6     | 19.5 | 4.4     | 33.2 | 6.4     | 47.7  | 8.3     | 61.9  | 0.5 hp Submerged   |
| .42     | 4.7  | .69     | 7.7  | .87     | 8.7  | 1.5     | 16.6 | 2.1     | 23.9  | 2.8     | 30.9  | ZE3 Series         |
| .39     | 3.1  | .48     | 5.2  | .69     | 6.9  | 1.0     | 11.1 | 1.5     | 15.9  | 1.9     | 20.6  | ZE4 Series         |
| .29     | 1.6  | .38     | 2.8  | .48     | 3.2  | .65     | 6.5  | .95     | 9.5   | 1.2     | 12.4  | ZE5 Series         |
| .21     | .94  | .34     | 1.5  | .43     | 1.9  | .74     | 3.3  | 1.1     | 4.8   | 1.4     | 6.2   | ZE6 Series         |
| .18     | .41  | .30     | .67  | .38     | .84  | .65     | 1.4  | .94     | 2.1   | 1.2     | 2.7   | 8000-Series        |
| 1.8     | 12.6 | 2.6     | 20.6 | 3.2     | 26.0 | 5.5     | 44.2 | 8.0     | 63.6  | 10.3    | 82.5  | XA Series          |
| 3.1     | 19.3 | 5.2     | 39.0 | 6.5     | 39.0 | 11.0    | 66.3 | 15.9    | 95.5  | 20.6    | 123.9 | Turbo II Pump      |
| 3.8     | 23.6 | 6.2     | 38.6 | 7.8     | 48.7 | 13.3    | 82.9 | 19.1    | 119.3 | 24.8    | 154.7 | PA-133             |
| .39     | 20.9 | .48     | 34.3 | .69     | 43.3 | 1.0     | 73.7 | 1.5     | 106.0 | 1.9     | 137.5 | PAM 10-Series      |
| .22     | 2.4  | .36     | 3.9  | .46     | 4.8  | .78     | 8.3  | 1.1     | 11.9  | 1.5     | 15.5  | ZA4 Series         |
| 0.9     | 4.7  | 1.5     | 7.7  | 1.9     | 9.7  | 3.3     | 16.6 | 4.8     | 23.9  | 6.2     | 30.9  | PGM2 Atlas         |
| 0.27    | 1.9  | 0.44    | 3.1  | 0.56    | 3.9  | 0.95    | 6.6  | 1.4     | 9.5   | 1.8     | 12.4  | ZG5 Series, Briggs |
| 0.47    | 1.9  | 0.77    | 3.1  | 0.97    | 3.9  | 1.7     | 6.6  | 2.4     | 9.5   | 3.1     | 12.4  | ZG5 Series, Honda  |
| 0.21    | 0.94 | 0.34    | 1.5  | 0.43    | 1.9  | 0.74    | 3.3  | 1.1     | 4.8   | 1.4     | 6.2   | ZG6 Series         |

## Number of Pump Handle Strokes per Inch of Cylinder Plunger Travel

| Cyl. Capacity ▶                 | 5 ton   |      | 10 ton  |      | 15 ton  |      | 25 ton  |      | 30 ton  |      | 50 ton  |      | 75 ton  |      | 100 ton |      | Pump Type          | Page      |
|---------------------------------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|--------------------|-----------|
|                                 | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load |                    |           |
| ▼ Power Source<br><b>Manual</b> | 7       | 7    | 15      | 15   | 21      | 21   | 34      | 34   | 43      | 43   | 73      | 73   | 105     | 105  | 137     | 137  | <b>P-391</b>       | <b>62</b> |
|                                 | 2       | 7    | 4       | 15   | 5       | 21   | 8       | 34   | 10      | 43   | 16      | 73   | 24      | 105  | 30      | 137  | <b>P-392</b>       | <b>62</b> |
|                                 | 1       | 7    | 2       | 15   | 3       | 21   | 5       | 34   | 7       | 43   | 11      | 73   | 16      | 105  | 21      | 137  | <b>P-80/84/801</b> | <b>64</b> |
|                                 | 1       | 7    | 1       | 15   | 1       | 21   | 2       | 34   | 3       | 43   | 5       | 73   | 7       | 105  | 9       | 137  | <b>P-802/842</b>   | <b>62</b> |
|                                 | 1       | 3    | 1       | 8    | 1       | 11   | 1       | 18   | 1       | 23   | 2       | 38   | 2       | 55   | 3       | 71   | <b>P-462/464</b>   | <b>64</b> |

## Seconds per Inch of Cylinder Plunger Travel

| Cyl. Capacity ▶   | 5 ton   |      | 10 ton  |      | 15 ton  |      | 25 ton  |      | 30 ton  |      | 50 ton  |      | 75 ton  |       | 100 ton |                   | Pump Type                 | Page       |
|---|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|-------|---------|-------------------|---------------------------|------------|
|   | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load | No Load | Load  | No Load | Load              |                           |            |
| ▼ Power Source<br><b>Electric</b><br>(speed based on 60 Hz) | .30     | 3.0  | .67     | 6.7  | .94     | 9.4  | 1.5     | 15.5 | 1.9     | 19.5 | 3.3     | 33.2 | 4.8     | 47.7  | 6.2     | 61.9              | <b>0.5 hp Economy</b>     | <b>74</b>  |
|   | .08     | 1.0  | .19     | 2.2  | .27     | 3.1  | .44     | 5.2  | 5.6     | 6.5  | .95     | 11.1 | 1.4     | 15.9  | 1.8     | 20.7              | <b>ZU4 Series</b>         | <b>82</b>  |
|   | .40     | 3.0  | .90     | 6.7  | 1.3     | 9.4  | 2.1     | 15.5 | 2.6     | 19.5 | 4.4     | 33.2 | 6.4     | 47.7  | 8.3     | 61.9              | <b>0.5 hp Submerged</b>   | <b>76</b>  |
|   | .13     | 1.5  | .30     | 3.4  | .42     | 4.7  | .69     | 7.7  | .87     | 9.7  | 1.5     | 16.6 | 2.1     | 23.9  | 2.8     | 30.9              | <b>ZE3 Series</b>         | <b>88</b>  |
|   | .09     | 1.0  | .21     | 2.2  | .29     | 3.1  | .48     | 5.2  | .60     | 6.5  | 1.0     | 11.1 | 1.5     | 15.9  | 1.9     | 20.6              | <b>ZE4 Series</b>         | <b>88</b>  |
|   | .07     | .50  | .16     | 1.12 | .22     | 1.6  | .36     | 2.6  | .46     | 3.2  | .78     | 5.5  | 1.1     | 8.0   | 1.5     | 10.3              | <b>ZE5 Series</b>         | <b>88</b>  |
|   | .07     | .30  | .15     | .67  | .21     | .94  | .34     | 1.5  | .43     | 1.9  | .74     | 3.3  | 1.1     | 4.8   | 1.4     | 6.2               | <b>ZE6 Series</b>         | <b>88</b>  |
| ▼ Power Source<br><b>Air</b><br>(speed based on 60 Hz)      | .06     | .13  | .13     | .29  | .19     | .41  | .30     | .67  | .38     | .84  | .65     | 1.4  | .94     | 2.1   | 1.2     | 2.7               | <b>8000-Series</b>        | <b>94</b>  |
|   | .05     | 4.0  | 1.1     | 9.0  | 1.6     | 12.6 | 2.6     | 20.6 | 3.2     | 26.0 | 5.5     | 44.2 | 8.0     | 63.6  | 10.3    | 82.5              | <b>XA Series</b>          | <b>96</b>  |
|   | 1.0     | 5.9  | 2.2     | 13.4 | 3.1     | 18.8 | 5.2     | 30.9 | 6.5     | 39.0 | 11.0    | 66.3 | 15.9    | 95.5  | 20.6    | 123.9             | <b>Turbo II Pump</b>      | <b>98</b>  |
|   | 1.2     | 7.4  | 2.7     | 16.8 | 3.8     | 23.6 | 6.2     | 38.6 | 7.8     | 48.7 | 13.3    | 82.9 | 19.1    | 119.3 | 24.8    | 154.7             | <b>PA-133</b>             | <b>100</b> |
|   | .09     | 6.6  | .21     | 14.9 | .29     | 20.9 | .48     | 34.3 | .60     | 43.3 | 1.0     | 73.7 | 1.5     | 106.0 | 1.9     | 137.5             | <b>PAM 10-Series</b>      | <b>101</b> |
| ▼ Power Source<br><b>Gasoline</b>                           | .07     | .74  | .16     | 1.7  | .22     | 2.4  | .36     | 3.9  | .46     | 4.9  | .78     | 8.3  | 1.1     | 11.9  | 1.5     | 15.5              | <b>ZA4 Series</b>         | <b>102</b> |
|   | 0.3     | 1.5  | 0.7     | 3.4  | 0.9     | 4.7  | 1.5     | 7.7  | 1.9     | 9.7  | 3.3     | 16.6 | 4.8     | 23.9  | 6.2     | 30.9              | <b>PGM2 Atlas</b>         | <b>105</b> |
|   | 0.08    | 0.59 | 0.19    | 1.3  | 0.27    | 1.9  | 0.44    | 3.1  | 0.56    | 3.9  | 0.95    | 6.6  | 1.4     | 9.5   | 1.8     | 12.4              | <b>ZG5 Series, Briggs</b> | <b>106</b> |
|   | 0.15    | 0.59 | 0.34    | 1.3  | 0.47    | 1.9  | 0.77    | 3.1  | 0.97    | 3.9  | 1.7     | 6.6  | 2.4     | 9.5   | 3.1     | 12.4              | <b>ZG5 Series, Honda</b>  | <b>106</b> |
| 0.07  | 0.30    | 0.15 | 0.67    | 0.21 | 0.94    | 0.34 | 1.5     | 0.43 | 1.9     | 0.74 | 3.3     | 1.1  | 4.8     | 1.4   | 6.2     | <b>ZG6 Series</b> | <b>106</b>                |            |

**No Load** indicates the plunger speed as the plunger extends toward the load (1st stage).

**Load** indicates the plunger speed as the load is lifted at a system pressure of 10,000 psi (2nd stage).

**Formula V = A ÷ Q**

**V** (sec/in) = **A** (in<sup>2</sup>) ÷ **Q** (in<sup>3</sup>/min)

**V** = Cylinder plunger speed in seconds per inch

**A** = Cylinder effective area in square inches

**Q** = Pump oil flow in cubic inches

**Example**

At what speed (V) will the RC-308 (30 ton) cylinder move when powered by a ZE3 electric driven pump?

ZE3 pump:

Oil flow Q, (no load) is 450 in<sup>3</sup>/min

RC-308 cylinder:

Effective area A is 6.50 in<sup>2</sup>

**V** = 6.50 in<sup>2</sup> ÷ 450 in<sup>3</sup>/min x 60 = **.87 sec/in**

$$\text{Cylinder Plunger Speed (sec/in)} = \frac{\text{Cylinder Effective Area}}{\text{Pump Flow Rate}} \times \frac{60 \text{ sec}}{1}$$



## Ways

The (oil) ports on a valve.

A 3-way valve has 3 ports: pressure (P), tank (T), and cylinder (A).

A 4-way valve has 4 ports: pressure (P), tank (T), advance (A) and retract (B).

**Single-acting** cylinders require at least a 3-way valve, and can, under certain instances, be operated with a 4-way valve.

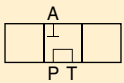
**Double-acting** cylinders require a 4-way valve, providing control of the flow to each cylinder port.

## Positions

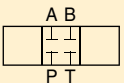
The number of control points a valve can provide. A 2-position valve has the ability to control only the advance or retraction of the cylinder. To be able to control the cylinder with a hold position, the valve requires a 3rd position.

## Center Configuration

The center position of a valve is the position at which there is no movement required of the hydraulic component, whether a tool or cylinder.

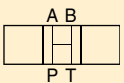


The most common is the **Tandem Center**. This configuration provides for little to no movement of the cylinder and the unloading of the pump. This provides for minimum heat build-up.

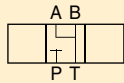


The next most common is the **Closed Center** configuration, which is used mostly for independent control of multi-cylinder applications. This configuration again provides for little to no movement of the cylinder, but also dead-heads the pump, isolating it from the circuit. Use of this type of valve may require some means of unloading the pump to prevent heat build-up.

There are many more types of valves, such as Open Center and Float Center. These valves are used mostly in complex hydraulic circuits and require other special considerations.



Open Center

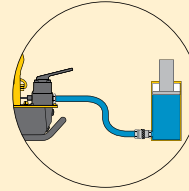


Float Center

## Directional Control Valves

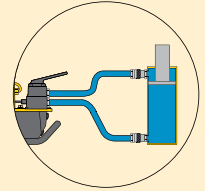
### 3-Way Valves

are used with single-acting cylinders



### 4-Way Valves

are used with double-acting cylinders

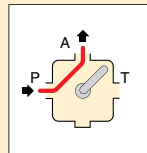


|  |                              |                              |
|--|------------------------------|------------------------------|
| Valves may be either pump mounted or remote mounted. | <b>Pump Mounted</b><br>      | <b>Remote Mounted</b><br>    |
|  | <b>Manually Operated</b><br> | <b>Solenoid Operated</b><br> |

## Advance Hold Retract

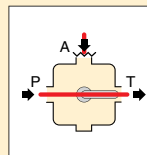
### Single-acting cylinder

Controlled by a 3-way, 3-position valve.



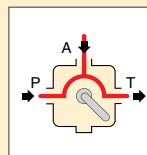
#### Advance

The oil flows from the pump pressure port P to the cylinder port A: the cylinder plunger will extend.



#### Hold

The oil flows from the pump pressure port P to the tank T. The cylinder port A is closed: the cylinder plunger will maintain its position.

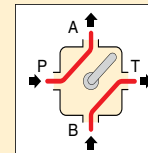


#### Retract

The oil flows from the pump port P and cylinder port A to the tank T: the cylinder plunger will retract.

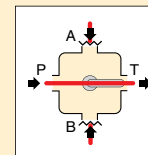
### Double-acting cylinder

Controlled by a 4-way, 3-position valve.



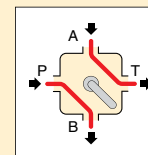
#### Advance

The oil flows from the pump pressure port P to the cylinder port A, and from cylinder port B to tank T: the cylinder plunger will extend.



#### Hold

The oil flows from the pump pressure port P to the tank T. The cylinder ports A and B are closed: the cylinder plunger will maintain position.



#### Retract

The oil flows from the pump pressure port P to cylinder port B, and from cylinder port A to tank T: the cylinder plunger will retract.



## Tightening Methods

Principally there are two modes of tightening: "Uncontrolled" and "Controlled".

### Uncontrolled tightening

Uses equipment and/or procedures that cannot be measured. Preload is applied to a bolt and nut assembly using a hammer and spanner or other types of impact tools.

### Controlled tightening

Employs calibrated and measurable equipment, follows prescribed procedures and is carried out by trained personnel.



For further information on Torque Tightening or other controlled tightening methods, please visit [www.enerpac.com](http://www.enerpac.com).

## Advantages of Controlled Tightening

### Known, controllable and accurate bolt loads

Employs tooling with controllable outputs and adopts calculation to determine the required tool settings.

### Uniformity of bolt loading

Especially important on gasketed joints as an even and consistent compression is required for the gasket to be effective.

### Safe operation following prescribed procedures

Eliminates the dangerous activities of manual uncontrolled tightening and requires that the operators be skilled and follow procedures.

### Reduces operational time resulting in increased productivity

Reduces tightening time and operator fatigue by replacing manual effort with the use of controlled tooling.

### Reliable and repeatable results

Using calibrated, tested equipment, following procedures and employing skilled operators achieves known results consistently.

### The right results first time

Many of the uncertainties surrounding in-service joint failures are removed by ensuring the correct assembly and tightening of the joint are carried out the first time.

## What is Torque?

It is a measure of how much force acting on an object which causes that object to rotate.

## What is Torque Tightening?

The application of preload to a fastener by the turning of the fastener's nut.

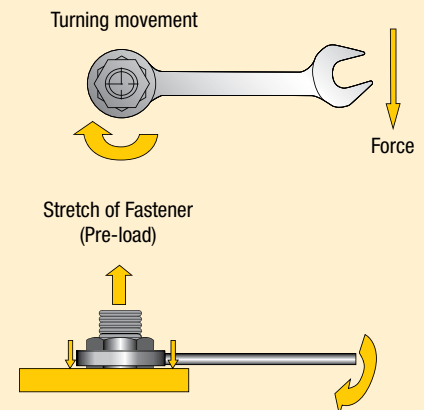
## Torque Tightening and Preload

The amount of preload created when torqueing is largely dependant on the effects of friction.

Principally there are three different "torque components":

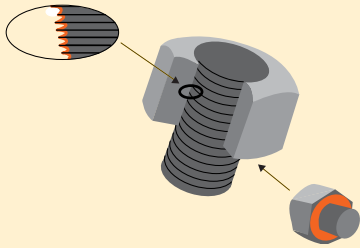
- torque to stretch the bolt
- torque to overcome the friction in bolt and nut threads
- torque to overcome friction at the nut spot face (bearing contact surface).

## Torque Tightening



Visit [www.enerpac.com](http://www.enerpac.com) to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings.

A combined application data sheet and joint completion report is also available.



Friction points should always be lubricated when using the torque tightening method.

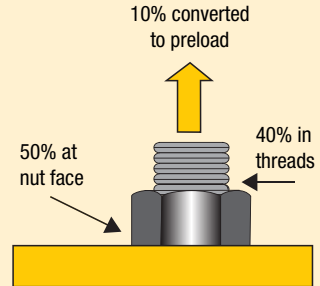


**Preload (residual load) = Applied Torque *minus* Frictional Losses**

### Lubrication Reduces Friction

Lubrication reduces the friction during tightening, decreases bolt failure during installation and increases bolt service life. Variation in friction coefficients affect the amount of preload achieved at a specified torque. Higher friction results in less conversion of torque to preload. The value for the friction coefficient provided by the lubricant manufacturer must be known to accurately establish the required torque value.

### Frictional Losses



**Frictional Losses (dry steel bolt)**

Lubricant or anti-seizure compounds should be applied to both the nut bearing surface and the male threads.



### Select the Right Wrench

Choose your Enerpac torque wrench using the untightening rule of thumb:

- When loosening a nut or bolt more torque is usually required than when tightening.
- For general conditions it can take up to 2½ times the input torque to breakout.
- Do not apply more than 75% of the maximum torque output of the tool when loosening nuts or bolts.

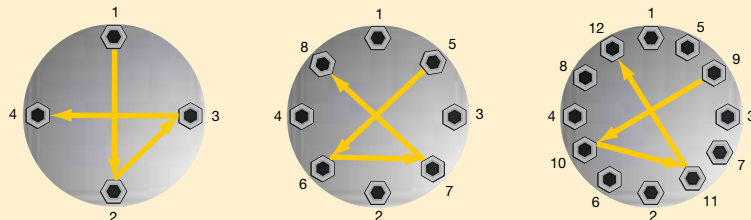
### Conditions of bolted joints

- Humidity corrosion (rust) requires up to twice the torque required for tightening.
- Sea water and chemical corrosion requires up to 2½ times the torque required for tightening.
- Heat corrosion requires up to 3 times the torque required for tightening.

### Torque Procedure

When torquing it is common to tighten only one bolt at a time, this can result in Point Loading and Load Scatter. To avoid this, torque is applied in stages following a prescribed pattern:

### Torque Sequence



- Step 1** Spanner tight ensuring that 2 - 3 threads extend above nut
- Step 2** Tighten each bolt to **one-third** of the final required torque following the pattern as shown above.
- Step 3** Increase the torque to **two-thirds** following the pattern shown above.

- Step 4** Increase the torque to **full torque** following the pattern shown above.
- Step 5** Perform one final pass on each bolt working clockwise from bolt 1, at the full final torque.



### Breakout Torque

When loosening bolts a torque value higher than the tightening torque is normally required. This is mainly due to corrosion and deformations in the bolt and nut threads.

Breakout torque cannot be accurately calculated, however, depending on conditions it can take up to 2½ times the input torque to breakout.

The use of penetrating oils or anti-seize products is always recommended when performing breakout operations.



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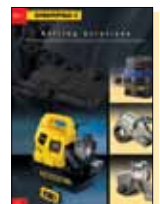
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