Enerpac hydraulic pumps are available in over 1,000 different configurations. Whatever your high pressure pump 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.

**Torque Wrench Pumps**
System matched air and electric pumps provide control to operate Enerpac Torque Wrenches.
# Pumps and Directional Control Valves Section Overview

<table>
<thead>
<tr>
<th>Power Source</th>
<th>Pump Types</th>
<th>Maximum Reservoir Capacity</th>
<th>Max. Flow at Rated Pressure (in³/min)</th>
<th>Series</th>
<th>Page</th>
</tr>
</thead>
</table>
| Manual       | Lightweight Hand Pumps
Exclusively from Enerpac | 155 in³ | 0.15 | P | 86 |
|              | ULTIMA Steel Hand Pumps
Low-Pressure Hand Pumps | 453 in³<br>200 in³ | 0.29<br>0.58 | P<br>P | 88<br>90 |
|              | Foot Pump
For Hands-Free Operation | 38 in³ | 0.15 | P | 92 |
|              | Multifluid Hand Pumps
Pumping Fluids up to 14,500 psi | – | 1.28 | MP | 93 |
|              | Ultra-High Pressure Hand Pumps
Pressure up to 40,000 psi | 60 in³ | 0.15 | P/11 | 94 |
| Battery      | Battery Powered Hydraulic Pump
Cordless Hydraulic Power | 120 in³ | 15 | XC | 96 |
|              | Cordless Hydraulic Pump
High-Performance Battery Power | 60-120 in³ | 32 | ZC | 98 |
| Electric     | Economy Series
Compact and Portable | 1 gal. | 20 | PU | 100 |
|              | Electric Hydraulic Pumps, E-pulse®
The Heart of the System | 0.8 gal. | 32 | E | 102 |
|              | Z-Class Portable and Powerful | 10 gal. | 60<br>200 | ZU<br>ZE | 104<br>112 |
|              | 8000-Series
The Maximum Flow Pump | 25 gal. | 462 | PEM<br>PER | 118 |
| Air          | Air Hydraulic Pumps
Single and Twin-Air Motor | 80 in³<br>2 gal. | 8<br>9 | PA<br>PAM | 120<br>121 |
|              | Turbo II Air Hydraulic Pumps
Compact Air Over Hydraulic | 305 in³ | 10 | PA | 122 |
|              | XA-Series Air Hydraulic Pumps
Control and Ergonomics | 122 in³ | 15 | XA | 124 |
|              | ZA4 Air Hydraulic Pumps
The Standard for Air-Hydraulic Pumps | 10 gal. | 80 | ZA | 126 |
| Gasoline     | ZG5/ZG6 Gasoline Hydraulic Pumps
Gas Powered High-Flow Pumps | 10 gal. | 200 | ZG5<br>ZG6 | 128<br>130 |
|              | 8000-Series Gasoline Pumps
For the Largest Jobs | 25 gal. | 1.5 | (gal/min) | EGM | 131 |
| Controlled   | Split Flow Pump
Multi-point Lifting & Lowering | 40 gal. | 1.5 | (gal/min) | SFP | 132 |
|              | Synchronized Lifting System
Computer Controlled Monitoring for Precise Lifting | 66 gal. | 1.25 | (gal/min) | EVO | 136 |

## Directional Control Valves

---

**Note:**
- Series codes are as follows: PU, E, ZU, XA, ZE, ZAM, PA, PAM, EGM, SFP, EVO.
P-Series, Lightweight Hand Pumps

- 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 P842 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

Pumps shown, from top to bottom: P802, P842, P202, P142

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”.

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

Tank Kits
When a return-to-tank port is required, the Tank Kits provide a ¼"-20 port at the rear of the reservoir.

LX101 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.

Pumps shown, from top to bottom: P802, P842, P202, P142

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating* (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single speed</td>
<td>20</td>
<td>P141</td>
<td>N/A</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>P391</td>
<td>N/A</td>
<td>N/A</td>
<td>85</td>
</tr>
<tr>
<td>Two speed</td>
<td>20</td>
<td>P142**</td>
<td>200</td>
<td>0.221</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>P202</td>
<td>200</td>
<td>0.221</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>P392**</td>
<td>200</td>
<td>0.687</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>155</td>
<td>P802</td>
<td>400</td>
<td>2.40</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>155</td>
<td>P842**</td>
<td>400</td>
<td>2.40</td>
<td>95</td>
</tr>
</tbody>
</table>

* 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.
Lightweight Hand Pumps

Pump and Cylinder Sets

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

Page: 62

Reservoir Capacity:

20 - 155 in³

Flow at Rated Pressure:

0.055 - 0.15 in³/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.

Page: 148

GA45GC Gauge Adaptor

Protect yourself from system overloading by simply ordering one part number for a pre-assembled gauge, adaptor block and coupler.

Page: 162

Aluminum Reservoir

For applications where composite reservoirs may not be suitable, the P392AL utilizes an extruded aluminum reservoir. Also included is a second handle for two-hand use. Contact Enerpac for details.

<table>
<thead>
<tr>
<th>Dimensions (in)</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston Stroke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(in)</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0.50</td>
<td>7.31</td>
<td>13.25</td>
</tr>
<tr>
<td>1.00</td>
<td>13.56</td>
<td>21.00</td>
</tr>
<tr>
<td>0.50</td>
<td>7.31</td>
<td>13.25</td>
</tr>
<tr>
<td>0.50</td>
<td>13.56</td>
<td>20.06</td>
</tr>
<tr>
<td>1.00</td>
<td>13.56</td>
<td>21.00</td>
</tr>
<tr>
<td>1.00</td>
<td>13.30</td>
<td>21.75</td>
</tr>
<tr>
<td>1.00</td>
<td>13.30</td>
<td>21.75</td>
</tr>
</tbody>
</table>
P-Series, ULTIMA Steel Hand Pumps

- Reduced handle effort and ergonomic grip for less operator fatigue
- Two-speed operation for fast and easy operation (except P39)
- 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 P464 for operation of double-acting cylinders

In the absence of a power supply, the P80 Hand Pump offers a powerful solution.

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 P39, P77, P80, or P801 to foot power with the PC11 Kit. Includes instructions for easy conversion.

GA45GC Gauge Adaptor
Protect yourself from system overloading by simply ordering one part number for a pre-assembled gauge, adaptor block and coupler.

4-Way Control Valve
P84 and P464 feature a manual 4-way control valve, designed for use with one double-acting or two single-acting cylinders. For system set-up information:

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating* (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>41</td>
<td>P39</td>
<td>N/C</td>
<td>N/C</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>P77</td>
<td>500</td>
<td>10,000</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>134</td>
<td>P80**</td>
<td>500</td>
<td>10,000</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>P801</td>
<td>500</td>
<td>10,000</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>134</td>
<td>P84***</td>
<td>500</td>
<td>10,000</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>453</td>
<td>P462</td>
<td>200</td>
<td>10,000</td>
<td>7.69</td>
</tr>
<tr>
<td></td>
<td>453</td>
<td>P464***</td>
<td>200</td>
<td>10,000</td>
<td>7.69</td>
</tr>
</tbody>
</table>

* 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.
Steel Hand Pumps

P Series

Reservoir Capacity: 41 - 453 in³
Flow at Rated Pressure: 0.15 - 0.29 in³/stroke
Maximum Operating Pressure: 10,000 psi

Extra Capacity Hand Pumps
P462 and P464 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
P80 is also available as a set (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

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.”

<table>
<thead>
<tr>
<th>Piston Stroke (in)</th>
<th>Dimensions (in)</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>1.50</td>
<td>8.35</td>
<td>12.13</td>
<td>6.42</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.12</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.06</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.12</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.12</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>15.39</td>
<td>19.19</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>15.39</td>
<td>19.19</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.12</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>16.83</td>
<td>20.12</td>
<td>1.18</td>
</tr>
<tr>
<td>1.00</td>
<td>15.09</td>
<td>18.91</td>
<td>1.18</td>
</tr>
</tbody>
</table>
P-Series, Low Pressure Hand Pumps

• P25 and P50 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
• For use with single-acting cylinders and tools
• P18 vertical operation requires pump head facing down
• P25, P50 vertical operation requires pump vent side facing up
• P51 for horizontal operation only

▼ P18 hand pump used for locking the rotating table for marble polishing.

When Less Than 10,000 psi is All You Need

LX101 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.

GA45GC Gauge Adaptor
Protect yourself from system overloading by simply ordering one part number for a pre-assembled gauge, adaptor block and coupler.

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-speed</td>
<td>18 P18</td>
<td>2,850</td>
<td>0.16</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>200 P25</td>
<td>2,500</td>
<td>0.58</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>200 P50</td>
<td>5,000</td>
<td>0.29</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 P51</td>
<td>3,000</td>
<td>0.25</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>

▼ Shown from left to right: P25, P51, P18
Low Pressure Hand Pumps

**P Series**

Reservoir Capacity:

18 - 200 in³

Flow at Rated Pressure:

0.16 - 0.58 in³/stroke

Maximum Operating Pressure:

2,500 - 5,000 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.

**MP-Series Multifluid Hand Pumps**

Corrosion resistant hand pumps for low pressure filling and high pressure testing applications, suitable for a wide range of fluids.

<table>
<thead>
<tr>
<th>Piston Stroke</th>
<th>Dimensions (in)</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>(in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td>8.70</td>
<td>12.44</td>
<td>1.18</td>
</tr>
<tr>
<td>1.50</td>
<td>6.00</td>
<td>6.82</td>
<td>6.00</td>
</tr>
<tr>
<td>1.50</td>
<td>6.00</td>
<td>6.82</td>
<td>6.00</td>
</tr>
<tr>
<td>1.00</td>
<td>2.06</td>
<td>3.63</td>
<td>7.12</td>
</tr>
</tbody>
</table>

P51 hand pumps used with RC-series cylinders to keep wooden layers under pressure during lamination of plates.
Lightweight Hydraulic Foot Pump

- Robust, durable and compact
  - Steel frame for maximum stability
  - Steel pumping handle
  - Aluminum 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

P392FP offers the advantage of hands-free operation to handle and control the tool or cylinder.

**P Series**

Reservoir Capacity:
38 in³

Flow at Rated Pressure:
0.151 in³/ 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.

**Pump and Cylinder Sets**

The P392FP is available as sets (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

<table>
<thead>
<tr>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
<th>Piston Stroke (in)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>P392FP *</td>
<td>200</td>
<td>1st stage: 10,000</td>
<td>0.687</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd stage:</td>
<td>2nd stage:</td>
<td>0.151</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Available as set, see note on this page.
MP-Series pumps are ideal for testing and filling applications.

MP-Series, Multifluid Hand Pumps

- 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

Optional Reservoir Kit
The two-gallon reservoir kit MP10T* 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.

MP10T

MP110, 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

<table>
<thead>
<tr>
<th>MP Type</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
<th>Piston Stroke (in)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Speed</td>
<td>*</td>
<td>MP110</td>
<td>500</td>
<td>1500</td>
<td>3.2</td>
<td>1.28</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>MP350</td>
<td>500</td>
<td>5000</td>
<td>3.2</td>
<td>0.43</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>MP700</td>
<td>500</td>
<td>10,000</td>
<td>3.2</td>
<td>0.18</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>MP1000</td>
<td>500</td>
<td>14,500</td>
<td>3.2</td>
<td>0.12</td>
<td>99</td>
</tr>
</tbody>
</table>

Note: MP-Pump includes 0.060 in. thick gasket for reservoir mounting.

* MP-Series pumps require the use of an external reservoir.
Ultra-High Pressure up to 40,000 psi

- Two-speed operation on the P2282 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

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.

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Usable Oil Capacity</th>
<th>Model Number</th>
<th>Pressure Rating* (psi)</th>
<th>Oil Displacement per Stroke (in³)</th>
<th>Max. Handle Effort (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>First stage</td>
<td>Second stage</td>
<td>First stage</td>
</tr>
<tr>
<td>Two-speed</td>
<td>60  P2282</td>
<td>200</td>
<td>40,000</td>
<td>0.99</td>
<td>0.037</td>
</tr>
<tr>
<td>Single-speed</td>
<td>45  11-100</td>
<td>N/C</td>
<td>10,000</td>
<td>N/C</td>
<td>0.152</td>
</tr>
</tbody>
</table>

* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.
<table>
<thead>
<tr>
<th>Description</th>
<th>Connection</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gland Nut Plug</td>
<td>0.38&quot; cone</td>
<td>43-001</td>
</tr>
<tr>
<td>Elbow</td>
<td>0.38&quot; cone</td>
<td>43-200</td>
</tr>
<tr>
<td>Tee</td>
<td>0.38&quot; cone</td>
<td>43-300</td>
</tr>
<tr>
<td>Gauge Tee</td>
<td>0.38&quot; cone side/ 0.25&quot; cone gauge port</td>
<td>43-301</td>
</tr>
<tr>
<td>Gauge Adaptor</td>
<td>0.38&quot; cone side/ 0.25&quot; cone gauge port</td>
<td>83-011</td>
</tr>
<tr>
<td>Coupling</td>
<td>0.38&quot; cone</td>
<td>43-400</td>
</tr>
<tr>
<td>Cross</td>
<td>0.38&quot; cone</td>
<td>43-600</td>
</tr>
<tr>
<td>Gland Nut with Sleeve</td>
<td>0.38&quot; cone</td>
<td>43-701</td>
</tr>
<tr>
<td>Gauge Connector</td>
<td>0.25&quot; cone</td>
<td>43-704</td>
</tr>
<tr>
<td>Tubing</td>
<td>4&quot; tube, O.D. 0.38&quot; *</td>
<td>45-116</td>
</tr>
<tr>
<td></td>
<td>8&quot; tube, O.D. 0.38&quot; *</td>
<td>45-126</td>
</tr>
<tr>
<td></td>
<td>12&quot; tube, O.D. 0.38&quot; *</td>
<td>45-136</td>
</tr>
<tr>
<td>Adaptor</td>
<td>0.38&quot; F cone to ⅛ M NPTF</td>
<td>41-146</td>
</tr>
<tr>
<td></td>
<td>0.38&quot; F cone to ⅜ M NPTF</td>
<td>41-166</td>
</tr>
<tr>
<td>Adaptor</td>
<td>0.38&quot; F cone to ¼&quot; F NPTF</td>
<td>41-246</td>
</tr>
<tr>
<td></td>
<td>0.38&quot; F cone to ⅛&quot; F NPTF</td>
<td>41-266</td>
</tr>
<tr>
<td>Adaptor</td>
<td>0.38&quot; M cone to ⅜&quot; F NPTF</td>
<td>41-366</td>
</tr>
</tbody>
</table>

Note: 0.25" cone fittings use ⅜"-18 threads, ⅜" cone fittings use ¾"-16 threads.

* Actual tubing lengths are 0.75" less than nominal size shown. These dimensions make distance between centers of valves and fittings multiples of 4" spaces.

**WARNING:** Maximum working pressure: 10,000 psi only

---

### Optional Ultra-High Pressure Fittings and Tubing

#### Reservoir Capacity:
45 - 60 in³

#### Flow at Rated Pressure:
0.037 - 0.152 in³/stroke

#### Maximum Operating Pressure:
10,000 - 40,000 psi

---

### Ultra-High Pressure pumps

DO NOT have an internal safety pressure relief valve.

---

### Stainless Steel Construction

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

---

### Dimensions (in)

<table>
<thead>
<tr>
<th>Piston Stroke</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>J</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>S</th>
<th>T</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>13.56</td>
<td>22.00</td>
<td>1.40</td>
<td>–</td>
<td>1.24</td>
<td>5.25</td>
<td>20.75</td>
<td>1.16</td>
<td>9.00</td>
<td>0.28</td>
<td>4.74</td>
<td>–</td>
<td>–</td>
<td>14</td>
<td>P2282</td>
</tr>
<tr>
<td>0.78</td>
<td>9.45</td>
<td>10.50</td>
<td>5.98</td>
<td>7.00</td>
<td>1.77</td>
<td>–</td>
<td>25.00</td>
<td>6.41</td>
<td>4.50</td>
<td>9.33</td>
<td>12.38</td>
<td>0.31</td>
<td>0.37</td>
<td>22</td>
<td>11-100</td>
</tr>
<tr>
<td>0.78</td>
<td>9.45</td>
<td>10.50</td>
<td>5.98</td>
<td>7.00</td>
<td>1.77</td>
<td>–</td>
<td>25.00</td>
<td>6.41</td>
<td>4.50</td>
<td>9.33</td>
<td>12.38</td>
<td>0.31</td>
<td>0.37</td>
<td>22</td>
<td>11-400</td>
</tr>
</tbody>
</table>
**Performance of a Powered Pump**

**Portability of a Hand Pump**

- Lightweight design with integrated handle and carrying strap for portability
- Bladder reservoir prevents contamination and allows pump usage in any position
- Powerful ½ horsepower motor and 28-volt Lithium-Ion battery deliver exceptional speed and run time
- High-strength fiberglass reinforced composite shroud for superior durability in demanding job site environments
- Cordless technology eliminates tripping hazards found in other electric or air powered pumps
- Available in torque wrench, dump and hold, single-acting and double-acting valve configurations

---

**GA45GC Gauge Adaptor**
Protect yourself from system overloading by simply ordering one part number for a pre-assembled gauge, adaptor block and coupler.

**28-Volt Battery**
The XC28V with Lithium-Ion technology for maximum battery performance.

**Roll Cage**
Optional Roll Cage XC-Series pumps. Please order model number XCRCTK.

**Interactive Pendant**
An interactive pendant is available on the XC1302S dump and hold models and XC1502T torque wrench models. Operation, programming, and diagnostic status are provided to the user with yellow, green, and red LED as well as vibration pulses. The XC1302S models can easily toggle between "jog operation" to "dump system pressure" and the XC1502T models allow "manual" and "auto cycle" mode.

---

Power and simplicity for the toughest jobs.
XC-Series Cordless Hydraulic Pump

The XC-Series cordless pump is ideal for jobs that require a combination of portability, speed, and safety. These cordless pumps are perfect for remote locations without access to power, but also indoors where trip hazards, ergonomics or size is a concern. The XC-Series cordless pump is compatible with all Enerpac hydraulic tools and small to medium sized cylinders.

The Lithium-Ion battery provides superior run time.

- 279 cuts of 3/8 inch reinforcing bar using the WHC750 Cutter
- 112 lifts with the WR5 Spreader
- 44 splits on 1-inch, grade 8 nuts using the NC3241 Nut Splitter
- 28 lifts of an RC104

*Actual number of cycles per charge will vary depending on condition of tool, battery and ambient conditions. Battery life with double-acting tools is approximately 75% of that for comparable, single-acting tools.

Reservoir Capacity: 60 - 120 in³
Flow at Rated Pressure: 15 in³/min.
Maximum Operating Pressure: 10,000 psi

OIL FLOW vs. PRESSURE

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

### Pump Types (Used with Cylinder)

<table>
<thead>
<tr>
<th>Pump Types (Used with Cylinder)</th>
<th>Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Output (in³/min)</th>
<th>Flow Rate (in³/min)</th>
<th>Valve Function</th>
<th>Charger Voltage (VAC)</th>
<th>Wt. (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>60</td>
<td>XC1201MB</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1202MB</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>XC1201ME</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>23.8</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1202ME</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>23.8</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>XC1201M</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1202M</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>23.8</td>
</tr>
<tr>
<td>Single-acting</td>
<td>120</td>
<td>XC1302SB</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1302SE</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1302S</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>–</td>
<td>25</td>
</tr>
<tr>
<td>Double-acting</td>
<td>60</td>
<td>XC1401MB</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>22.3</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1402MB</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>24.2</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>XC1401ME</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>115</td>
<td>22.3</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1402ME</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>230</td>
<td>24.2</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>XC1401M</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>–</td>
<td>22.3</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>XC1402M</td>
<td>125</td>
<td>30</td>
<td>15</td>
<td>–</td>
<td>24.2</td>
</tr>
</tbody>
</table>

1) Available as a cylinder-pump set, see page 62.
2) Batteries and charger not included.
3) Includes oil and battery
**Productivity, Performance, Safety**

- High-flow cordless solution saves users time and money by eliminating the need for using a generator and extension cords.
- Brushless 1.4 hp motor and 3-stage pump maximizes pump and tool productivity while minimizing heat buildup and downtime.
- The Lithium-Ion battery provides superior run time, even under extreme job site conditions, running approximately 50 cycles on a RC1006 and approximately 90 cycles on a RC504 cylinder on a single charge.
- Convenient 10 ft. pendant cord for hassle-free operation.
- Reduce noise level, 80 dba maximum.
- Zero emission hydraulic power pack.

**Charger**

<table>
<thead>
<tr>
<th>Charger</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZC115VC</td>
<td>115V</td>
</tr>
<tr>
<td>ZC230VC</td>
<td>230V</td>
</tr>
</tbody>
</table>

**Battery**

<table>
<thead>
<tr>
<th>Battery</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZC82V4NA</td>
<td>82V</td>
</tr>
<tr>
<td>ZC82V4EUAU</td>
<td>82V</td>
</tr>
</tbody>
</table>

*NA is North America and EUAU is European and Australia.

**Gauges**

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

**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.

▲ Special Enerpac ZC3-Series pump used for rail stressing applications.
ZC-Series Cordless Hydraulic Pump

The Enerpac ZC-Series pump combines the performance of an electric pump with the convenience and portability of a battery pump. This quiet, cordless solution is ideal for applications where emission and noise are a concern, or when electricity or air is not readily available.

Power for the pump is supplied by a rechargeable 82V Lithium-ion battery. The Lithium-ion battery is capable of providing impressive run times, even under extreme job site conditions.

Valve Options
• 4-way/3-position manual control valve used with double-acting cylinders
• 3-way/3-position manual control valve used with single-acting cylinders
• 4-way/3-position manual control valve with locking and power seat functions used in post tensioning concrete applications

Applications
• High-flow cordless solution for industrial applications
• Foundation repair
• Rail industry
• Post-tensioning concrete

OIL FLOW vs. PRESSURE

<table>
<thead>
<tr>
<th>Oil Capacity (gal)</th>
<th>Output Flow Rate (in³/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>@ no load</td>
</tr>
<tr>
<td>Single-Acting Cylinder</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>VM33</td>
</tr>
<tr>
<td></td>
<td>ZC3308JB</td>
</tr>
<tr>
<td></td>
<td>ZC3308JE</td>
</tr>
<tr>
<td>Double-Acting Cylinder</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>VM43</td>
</tr>
<tr>
<td></td>
<td>ZC3408JB</td>
</tr>
<tr>
<td></td>
<td>ZC3408JE</td>
</tr>
<tr>
<td>Power Seater Post-Tensioning Tools</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>VM43LPS</td>
</tr>
<tr>
<td></td>
<td>ZC3908JB</td>
</tr>
<tr>
<td></td>
<td>ZC3908JE</td>
</tr>
</tbody>
</table>

* All models meet CE safety requirements and all TUV requirements. Pump includes one charger and battery.
** Weight including oil and battery. Battery weight = 5.7 lbs.
PU-Series, Economy Electric Pumps

- 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

An Economy Pump, PUJ1200B, is used with an RCS302 to reposition a Scissor lift to simplify maintenance.

Heavy on Performance, Light on Weight

Gauges
Minimize the risk of overloading and ensure long, dependable service from your equipment. For use with the Economy pump, the G2535L gauge and GA3 gauge adaptor are suggested.

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

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

Hoses

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Pressure Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUJ1200B</td>
<td>10,000</td>
</tr>
<tr>
<td>PUJ1300B</td>
<td>10,000</td>
</tr>
<tr>
<td>PUJ1400B</td>
<td>10,000</td>
</tr>
</tbody>
</table>

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”.

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Oil Capacity</th>
<th>Model Number</th>
<th>Pressure Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(gal)</td>
<td></td>
<td>1st stage</td>
</tr>
<tr>
<td>Single-acting</td>
<td></td>
<td>PU1100B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU1101B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU1300B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PU1301B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUJ1200B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUJ1201B</td>
<td>200</td>
</tr>
<tr>
<td>Double-acting</td>
<td></td>
<td>PUJ1400B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUJ1401B</td>
<td>200</td>
</tr>
</tbody>
</table>

An Economy Pump, PUJ1200B, is used with an RCS302 to reposition a Scissor lift to simplify maintenance.
**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”.

**PU-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 cord controls the motor operation
- Manual valves provide advance/retract tool control

---

### PU-Series

**Reservoir Capacity:**

0.5 - 1.0 gallon

**Flow at Rated Pressure:**

20 in³/min.

**Motor Size:**

0.5 hp

**Maximum Operating Pressure:**

10,000 psi

---

#### Oil Flow vs. Pressure

---

<table>
<thead>
<tr>
<th>Reservoir Capacity: 0.5 - 1.0 gallon</th>
<th>Flow at Rated Pressure: 20 in³/min.</th>
<th>Motor Size: 0.5 hp</th>
<th>Maximum Operating Pressure: 10,000 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dump **</td>
<td>Economy PU-Series</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Table: Output Flow Rate vs. Valve Type

<table>
<thead>
<tr>
<th>Output Flow Rate</th>
<th>Valve Type</th>
<th>Current Draw</th>
<th>Motor Voltage</th>
<th>Sound Level</th>
<th>Dimensions (in)</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Amps)</td>
<td>(VAC)</td>
<td>(dBA)</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>1st stage 2nd stage</td>
<td></td>
<td>(in³/min)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>Dump **</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
</tr>
<tr>
<td>200</td>
<td>Dump Hold</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
<td>14.50</td>
<td>12.18</td>
<td>14.72</td>
</tr>
<tr>
<td>200</td>
<td>3-way, 2-pos.</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
</tr>
<tr>
<td>200</td>
<td>4-way, 3-pos.</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
<td>14.50</td>
<td>12.18</td>
<td>14.72</td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

* For 230 volt applications replace “B” suffix with “E”. (CE conformity marking only applies to pumps with an “E” suffix.)

** Electric dump valve for auto-retract of cylinders.
E-Series, E-Pulse® Electric Hydraulic Pumps

The Heart of the System

**Performance**
- Smart controls enable motor to maintain constant power across the pressure range
- Speed control with dial adjustment for precise operation
- 24V DC power regulator minimizes effects of poor power supply
- Six-piston block design provides even flow for smooth operation of tool

**Durability**
- High-efficiency permanent magnet, direct drive motor enables continuous use and long service life
- System components enclosed for protection
- Built-in thermal protection
- IP Rating: 54 on the Pump, 67 on the Pendant

**Convenience**
- Pendant and cord management system
- Draining oil not required for pump element maintenance
- Convenient oil fill port, oil level indicator, and automatic breather

**Four Valve Options**
- 3/2 manual
- 4/3 manual
- 3/2 dump
- 3/2 dump and hold

**Typical E-Pulse Pump Applications**
- Lifting
- Spreading
- Cutting
- Pulling
- Crimping
- Pressing
- Bending
- Punching

**FLOW vs. PRESSURE**

![Graph showing flow vs. pressure for E-Pulse pump, 1 hp pump, and 0.5 hp pump.](image)

**Shown:** EP3404JE-G
E-Pulse® Pumps
The Enerpac E-Pulse drives high productivity through its innovative design. Smart controls enable the motor to maintain constant power providing higher flow than “traditional” ½ hp pumps. Adjustable speed control enables precision as required.

Interactive Pendant
• Operation, programming and diagnostics status provided to operator with yellow, green, and red LED as well as vibration pulses
• Fault codes warn operators of any issues related to voltage, temperature, button controls, or if professional service is required

E-Pulse is designed for convenience. Features include a cord management system and integrated pendant control with a magnet that fits securely into the handle of the pump. The durable aluminum housing is designed to give easy access for serviceability. E-Pulse is the heart to any hydraulic system, ensuring high performance and providing ultimate convenience.

3/2 Jog, 3/2 Dump, 4/3 Jog
10-ft. cord

3/2 Dump and Hold
10-ft. cord

Useable Reservoir Capacity:
0.8 gallon

Flow at Rated Pressure:
32 in³/min.

Motor Size:
0.85 hp

Maximum Operating Pressure:
10,000 psi
Z-Class hydraulic 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-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 accessories
Extensive list of accessories including heat exchanger, roll-bar, 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 four flow ranges for induction motor.

Back-lit LCD on Pro Z-Class pumps
- pump usage information, hour and cycle counts
- low-voltage warning and recording
- offers self-test and diagnostic capabilities
- information displayed in six languages
- pressure read-out (when used with pressure transducer)
- adjustable pressure setting (when used with 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

<table>
<thead>
<tr>
<th>Oil Flow Rate @ 10,000 psi (m³/min)</th>
<th>Z-Class Pump Series*</th>
<th>Electric Motor Size (hp)</th>
<th>Air Motor Consumption (scfm)</th>
<th>Gasoline Engine Size** (ft.lbs)</th>
<th>Page:</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>ZC3*</td>
<td>1.4</td>
<td>—</td>
<td>—</td>
<td>98</td>
</tr>
<tr>
<td>40</td>
<td>ZE3</td>
<td>1.0</td>
<td>—</td>
<td>—</td>
<td>112</td>
</tr>
<tr>
<td>60</td>
<td>ZE4(T)</td>
<td>1.5</td>
<td>—</td>
<td>—</td>
<td>112, 302</td>
</tr>
<tr>
<td>60</td>
<td>ZU4(T)</td>
<td>1.7</td>
<td>100</td>
<td>—</td>
<td>106, 300</td>
</tr>
<tr>
<td>80</td>
<td>ZA4(T)</td>
<td>—</td>
<td>126</td>
<td>—</td>
<td>126, 306</td>
</tr>
<tr>
<td>100</td>
<td>ZG5**</td>
<td>—</td>
<td>128</td>
<td>—</td>
<td>128</td>
</tr>
<tr>
<td>120</td>
<td>ZE5(T)</td>
<td>3.0</td>
<td>—</td>
<td>—</td>
<td>112, 302</td>
</tr>
<tr>
<td>200</td>
<td>ZE6</td>
<td>7.5</td>
<td>—</td>
<td>—</td>
<td>112</td>
</tr>
<tr>
<td>200</td>
<td>ZG6</td>
<td>—</td>
<td>17</td>
<td>—</td>
<td>130</td>
</tr>
</tbody>
</table>

* ZC3 battery powered cordless pumps. ZU4T, ZE4T, ZE5T and ZA4T-Series are Torque Wrench Pumps.
** ZG5 is available in two 4-cycle engine sizes: 7.1 Ft.lbs Honda and 8.5 Ft.lbs Briggs & Stratton.
ZU-Series, Electric Pumps

- Features Z-Class high-efficiency two-stage 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 pumps only
- LCD readout provides pressure and a number of diagnostic and readout capabilities on a portable electric pump
  - pump usage information, hour and cycle counts
  - self-test, diagnostic and read-out capabilities
  - pressure readout and auto-mode pressure settings

ZU Series

Reservoir Capacity:
1.2 - 10.3 gallon

Flow at Rated Pressure:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 psi

Assisted Return Pumps with Venturi Valve Technology
To improve productivity and plunger retraction, Enerpac offers valve configurations designed to accelerate your cylinder retraction speeds, ZU4-Series pumps feature Venturi Valve Technology to facilitate the faster return of single-acting gravity return cylinders.
See details in the “Directional Control Valve” section.

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

Designed to be tough, the ZU4-Series with steel reservoirs will take the abuse of today’s construction sites.
## ZU Series Specifications and Dimensions

### ZU4 Performance

<table>
<thead>
<tr>
<th>Motor Size (hp)</th>
<th>Output Flow Rate (in³/min)</th>
<th>Motor Electrical Specification (volts-ph-Hz)</th>
<th>Sound Level (dBA)</th>
<th>Relief Valve Adjustment Range (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7</td>
<td>700</td>
<td>115-1-50/60</td>
<td>85-90</td>
<td>2,000-10,000</td>
</tr>
<tr>
<td></td>
<td>700</td>
<td>230-1-50/60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ZU4 Series with 1.2 and 1.8 gallon reservoirs

![ZU4 Series diagram]

- **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 5.2 and 10.3 gallon reservoirs
- **⑦** Back-lit LCD Electric
- **⑧** Pressure transducer
- **⑨** Heat exchanger
- **⑩** Skid bar
- **⑪** Handle guard installed on all 5.2 and 10.3 gallon reservoirs
- **⑫** Reservoir handles (not shown) included on all 5.2 and 10.3 gallon pumps

### ZU-4 Series with 5.2 and 10.3 gallon reservoirs

(Left view shown without side handle)

![ZU-4 Series diagram]

### Oil Flow and Current vs. Pressure

![Graph]

### Pump Dimensions (in)

<table>
<thead>
<tr>
<th>Reservoir Capacity (gal)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>16.7</td>
<td>5.6</td>
<td>11.0</td>
<td>6.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1.8</td>
<td>16.7</td>
<td>5.6</td>
<td>11.0</td>
<td>8.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.2</td>
<td>18.3</td>
<td>7.1</td>
<td>16.5</td>
<td>16.6</td>
<td>19.7</td>
<td>15.6</td>
</tr>
<tr>
<td>10.3</td>
<td>21.7</td>
<td>10.6</td>
<td>15.7</td>
<td>19.9</td>
<td>22.7</td>
<td>18.9</td>
</tr>
</tbody>
</table>

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

**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 a pressure transducer.

### ZU-Series Ordering Guide

**Reservoir Capacity:**
- **1.2 - 10.3 gallon**

**Flow at Rated Pressure:**
- **60 in³/min.**

**Motor Size:**
- **1.7 hp**

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

### STEP 1: Select a pump from the Pump Ordering Matrix.

The functionality of the pump can be determined by the model number. Utilize the guide below to select the best pump for the application from the pump matrix.

<table>
<thead>
<tr>
<th>Z</th>
<th>U</th>
<th>4</th>
<th>4</th>
<th>08</th>
<th>J</th>
<th>B</th>
<th>H</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Type</strong></td>
<td><strong>Motor Type</strong></td>
<td><strong>Flow Group</strong></td>
<td><strong>Valve Type</strong></td>
<td><strong>Reservoir Size</strong></td>
<td><strong>Valve Operation</strong></td>
<td><strong>Voltage</strong></td>
<td><strong>Factory Installed Accessories</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1</strong></td>
<td><strong>Z</strong> = Pump Series</td>
<td><strong>2</strong></td>
<td><strong>U</strong> = Universal electric motor</td>
<td><strong>3</strong></td>
<td><strong>4</strong> = 60 in³/min @ 10,000 psi</td>
<td><strong>5</strong></td>
<td><strong>6</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>Valve Type</strong></td>
<td><strong>5</strong></td>
<td><strong>Reservoir Capacity</strong></td>
<td><strong>6</strong></td>
<td><strong>Valve Operation</strong></td>
<td><strong>7</strong></td>
<td><strong>Voltage</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1</strong></td>
<td>Dump (VE32D)</td>
<td><strong>04</strong> = 1.2 gallon</td>
<td><strong>D</strong> = Dump solenoid valve with pendant and LCD Electric</td>
<td><strong>B</strong> = 115V, 1 ph, 50/60Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>3 way/2 position manual or electric (VM32 or VE32)</td>
<td><strong>08</strong> = 1.8 gallon</td>
<td><strong>J</strong> = Jog manual valve with pendant (w/o LCD)</td>
<td><strong>E</strong> = 208-240V, 1 ph, 50/60 Hz (w/European plug and CE EMC compliant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>3 way/3 position manual or electric (VM33 or VE33)</td>
<td><strong>20</strong> = 5.2 gallon (includes side handles)</td>
<td><strong>L</strong> = Manual valve w/LCD Electric (w/o pendant)</td>
<td><strong>I</strong> = 208-240V, 1 ph, 50/60 Hz (w/NEMA 6-15 plug)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>4 way/3 position manual or electric (VM43 or VE43)</td>
<td><strong>40</strong> = 10.3 gallon (includes side handles)</td>
<td><strong>M</strong> = Manual valve (without pendant and LCD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>3 way/3 position locking manual w/power seating (VM33LPS)</td>
<td><strong>6 Valve Operation</strong></td>
<td><strong>P</strong> = Manual valve with pendant (w/o LCD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6</strong></td>
<td>3 way/3 position locking manual w/power check (VM32D)</td>
<td><strong>F</strong> = Return Line Filter</td>
<td><strong>S</strong> = Solenoid valve with pendant and LCD Electric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>3 way/2 position manual (VM22)</td>
<td><strong>G</strong> = Gauge</td>
<td><strong>T</strong> = Pressure transducer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8</strong></td>
<td>4 way/3 position manual locking manual w/power check (VM43L)</td>
<td><strong>H</strong> = Heat exchanger</td>
<td><strong>U</strong> = Foot switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9</strong></td>
<td>4 way/3 position manual w/power seating (VM43LPS)</td>
<td><strong>L</strong> = Level/Temperature Switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10</strong></td>
<td>3 way/3 position manual, Venturi-Valve (VM33VAC)</td>
<td><strong>K</strong> = Skid Bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11</strong></td>
<td>3 way/3 position electric, Venturi-Valve (VE33VAC)</td>
<td><strong>T</strong> = Pressure transducer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### STEP 2 Factory Installed Accessories

Select factory installed accessories and add to the pump model number after the hyphen. The example above shows that a Roll Cage (**R**) and Heat Exchanger (**H**) have been added to the pump.

**Factory installed accessories include the following:**

- **F** = Return Line Filter
- **G** = Gauge
- **H** = Heat exchanger
- **L** = Level/Temperature Switch
- **N** = Lifting Eyes (no reservoir handles)
- **R** = Roll cage
- **K** = Skid Bar
- **T** = Pressure transducer
- **U** = Foot switch
ZU-SERIES PRO SOLENOID VALVE MODELS WITH PENDANT AND LCD ELECTRIC

<table>
<thead>
<tr>
<th>S/A or D/A</th>
<th>Neutral</th>
<th>Valve Type</th>
<th>Reservoir Capacity</th>
<th>Unit Weight w/o Oil</th>
<th>Model Number 115 VAC, 1 Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VE32D</td>
<td>VE32</td>
<td>1.2 (gal)</td>
<td>63 (lbs)</td>
<td>ZU4104DB (I, E)</td>
</tr>
<tr>
<td></td>
<td>VE32D</td>
<td>VE32</td>
<td>1.8 (gal)</td>
<td>69 (lbs)</td>
<td>ZU4106DB (I, E)</td>
</tr>
<tr>
<td></td>
<td>VE32D</td>
<td>VE32</td>
<td>5.2 (gal)</td>
<td>112 (lbs)</td>
<td>ZU4120DB (I, E)</td>
</tr>
</tbody>
</table>

DUMP VALVE MODELS

- Ideal for punching, crimping and cutting
- For use when load-holding is not required

SINGLE AND DOUBLE ACTING MODELS

- Ideal for lifting applications and where remote control is required
- 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 on/off
- Venturi Valve technology (VE33VAC) for faster retract of single-acting cylinders

1) S/A or D/A = Single acting or double-acting pumps
2) Additional details can be found in the Directional Control Valve section
3) "I" indicates 115 VAC pump is available in 208-240V, 1-phase, 50/60 Hz with European plug and CE CMC compliant. Model number order example: ZU4208MI.
4) "E" indicates pump is available in 208-240V, 1-phase, 50/60 Hz with European plug and CE CMC compliant. Model number order example: ZU4208ME.

Roll Cage (R)
• Protects and stabilizes the pump

Foot Switch (U)
• 10 ft. cord, hands-free control

Heat Exchanger (H)
• Removes heat from bypass oil
• Increases oil life, reduces wear on hydraulic components

Pressure Transducer (T)
• More durable than analog gauges
• Displays psi, bar or Mpa
• Motor shutoff or shift to neutral at set pressure

Popular Pump Models with Factory Installed Roll Cages
- ZU4108DBR (I, E)
- ZU4208JBR (I, E)
- ZU4220JBR (I, E)
- ZU4208SBR (I, E)
- ZU4308JBR (I, E)
- ZU4320JBR (I, E)
- ZU4308SBR (I, E)
- ZU4320SBR (I, E)
- ZU4108DBU (I, E)
- ZU4208SBU (I, E)
- ZU4220SBU (I, E)
- ZU4320SBU (I, E)
- ZU4408SBU (I, E)
- ZU4420SBU (I, E)
- ZU4108DBH (I, E)
- ZU4208SBH (I, E)
- ZU4308SBH (I, E)
- ZU4408SBH (I, E)
- ZU4420SBH (I, E)
- ZU4108DBT (I, E)
- ZU4208SBT (I, E)
- ZU4308SBT (I, E)
- ZU4408SBT (I, E)
- ZU4420SBT (I, E)

Popular Pump Models with Factory Installed Foot Switch
- ZU4108DBU (I, E)
- ZU4208SBU (I, E)
- ZU4220SBU (I, E)
- ZU4320SBU (I, E)
- ZU4408SBU (I, E)
- ZU4420SBU (I, E)

Popular Pump Models with Factory Installed Heat Exchanger
- ZU4108DBH (I, E)
- ZU4208SBH (I, E)
- ZU4308SBH (I, E)
- ZU4408SBH (I, E)
- ZU4420SBH (I, E)

Popular Pump Models with Factory Installed Pressure Transducer, Requires LCD Electric Pump
- ZU4108DBT (I, E)
- ZU4208SBT (I, E)
- ZU4308SBT (I, E)
- ZU4408SBT (I, E)
- ZU4420SBT (I, E)

Accessory Kit No.
- Fits on Reservoir
- ZRC-04 1.2 and 1.8 gallon
- ZRC-04H 2.2 and 1.8 gallon
- ZRB-20 5.2 gallon
- ZRB-40 10.3 gallon

Accessory Kit No.
- Can be used on ZU4 Pumps with solenoid dump and 3-position valves, LCD electric
- ZCF-2 Solenoid VE-Series valves

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

Adjustable
Pressure
Range (psi)
Switch-
Point
Repeatability
(%) Dead-
band
(psi)
- ZPT-U4 50-10,000 ± 0.5% 50
ZU-Series Accessories

Level/Temperature Switch (L)
- Shuts off pump when high operating temperature or low oil is reached
- Plugs directly into pump electrical enclosure
- Easy installation to pump reservoir
- Requires LCD electric

Return Line Filter (F)
- 25 micron filter removes contaminants from return oil flow
- Internal by-pass valve prevents damage if filter is dirty
- Features maintenance indicator

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

Skidbar (K)
- Provides easy two-hand lift
- Provides greater pump stability on soft or uneven surfaces
- Cannot be used in combination with roll cage

Gauge (G)
- Minimize risk of overloading to ensure long life of equipment
- 2.5" face diameter, glycerin filled
- Dual Scale, PSI and Bar

Accessory Kit No. | For ZU-Series Pumps with 1.2 and 1.8 Gallon Reservoir | Wt. (lbs) |
--- | --- | ---
SBZ-4 | 1.2-1.8 gal. w/o heat exchanger | 4.9 |
SBZ-4L | 1.2-1.8 gal. with heat exchanger | 5.5 |

ZU Series

Reservoir Capacity:
1.2 - 10.3 gallon

Flow at Rated Pressure:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 psi

Heat Exchanger
- Stabilizes oil temperature at a maximum of 130° F at 70° F ambient temperature.
- Not suitable for water-glycol or water based fluid.

<table>
<thead>
<tr>
<th>Btu/h</th>
<th>Maximum pressure (psi)</th>
<th>Maximum oil flow (GPM)</th>
<th>Voltage (VDC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>900</td>
<td>300</td>
<td>7.0</td>
<td>12</td>
</tr>
</tbody>
</table>

* At GPM at 70 °F ambient temperature.
The Standard for Industrial Applications

- 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 on electric valve models provides a number of diagnostic and readout capabilities
- IP54 Rating for superior dust and water protection

ZE Series

- Reservoir Capacity: 1.2 - 10.3 gallon
- Flow at Rated Pressure: 40 - 200 in³/min
- Motor Size: 1.0 - 7.5 hp
- Maximum Operating Pressure: 10,000 psi

Assisted Return Pumps with Venturi Valve Technology
To improve productivity and plunger retraction, Enerpac offers valve configurations designed to accelerate your cylinder retraction speeds. ZE-Series pumps feature Venturi Valve Technology to facilitate the faster return of single-acting gravity return cylinders. See valve type in ordering matrix and details in the "Directional Control Valve" section.

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.
Output flow rate is listed at 60 Hz. Flow rate will be approximately 5/6 of these values at 50 Hz.

### ZE-Series Pumps with 1.2 and 1.8 gallon reservoir

<table>
<thead>
<tr>
<th>Pump Series</th>
<th>Operation</th>
<th>Output Flow Rate (in³/min)</th>
<th>Available Reservoir Sizes (gal)</th>
<th>Motor Size</th>
<th>Relief Valve Adjustment Range (psi)</th>
<th>Sound Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZE3</td>
<td>Single-stage</td>
<td>43 43 42 40</td>
<td>1.2, 1.8, 2.6, 5.2, 10.3</td>
<td>1.5</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>450 385 42 40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE4</td>
<td>Single-stage</td>
<td>64 64 62 60</td>
<td>1.2, 1.8, 2.6, 5.2, 10.3</td>
<td>1.5</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>650 600 62 60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE5</td>
<td>Single-stage</td>
<td>128 126 123 120</td>
<td>2.6, 5.2, 10.3</td>
<td>3.0</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>850 825 123 120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE6</td>
<td>Single-stage</td>
<td>220 215 210 200</td>
<td>2.6, 5.2, 10.3</td>
<td>7.5</td>
<td>1000–10,000</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>900 890 210 200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Output flow rate is listed at 60 Hz. Flow rate will be approximately 5/6 of these values at 50 Hz.

### ZE-Series Pumps with 2.6, 5.2, 10.3 gallon reservoir

<table>
<thead>
<tr>
<th>Pump Series</th>
<th>Operation</th>
<th>Output Flow Rate (in³/min)</th>
<th>Available Reservoir Sizes (gal)</th>
<th>Motor Size</th>
<th>Relief Valve Adjustment Range (psi)</th>
<th>Sound Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZE3</td>
<td>Single-stage</td>
<td>43 43 42 40</td>
<td>1.2, 1.8, 2.6, 5.2, 10.3</td>
<td>1.5</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>450 385 42 40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE4</td>
<td>Single-stage</td>
<td>64 64 62 60</td>
<td>1.2, 1.8, 2.6, 5.2, 10.3</td>
<td>1.5</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>650 600 62 60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE5</td>
<td>Single-stage</td>
<td>128 126 123 120</td>
<td>2.6, 5.2, 10.3</td>
<td>3.0</td>
<td>1000–10,000</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>850 825 123 120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZE6</td>
<td>Single-stage</td>
<td>220 215 210 200</td>
<td>2.6, 5.2, 10.3</td>
<td>7.5</td>
<td>1000–10,000</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Two-stage</td>
<td>900 890 210 200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PERFORMANCE CHART

- **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.

- **User-adjustable relief valve on all manual and solenoid valves:**
  - 3/8” NPTF on A and B ports
  - 1/4” NPTF on auxiliary ports

- **Electric Box**
- **Heat Exchanger**
- **Roll Bar**
- **Return Line Filter**
- **Skid Bar**
- **Oil Drain**
- **Oil Level/Temperature Switch**

### ZE-Series Pump Dimensions

<table>
<thead>
<tr>
<th>Reservoir Capacity (gal)</th>
<th>ZE-Series Pump Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1.2</td>
<td>5.6</td>
</tr>
<tr>
<td>1.8</td>
<td>5.6</td>
</tr>
<tr>
<td>2.6</td>
<td>6.2</td>
</tr>
<tr>
<td>5.2</td>
<td>7.1</td>
</tr>
<tr>
<td>10.3</td>
<td>10.6</td>
</tr>
</tbody>
</table>
STEP 1: Select a Pump from the Pump Ordering Matrix.

The functionality of the pump can be determined by the model number. Utilize the guide below to select the best pump for the application from the pump matrix.

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Motor Type</th>
<th>Flow Group</th>
<th>Valve Type</th>
<th>Reservoir Capacity</th>
<th>Valve Operation</th>
<th>Voltage</th>
<th>Factory Installed Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>E</td>
<td>4</td>
<td>4</td>
<td>20</td>
<td>M</td>
<td>B</td>
<td>F</td>
</tr>
</tbody>
</table>

1. **Product Type**
   - **Z** = Pump Class
2. **Motor Type**
   - **E** = Induction Electric Motor
3. **Flow Group**
   - 3 = 40 in³/min @ 10,000 psi
   - 4 = 60 in³/min @ 10,000 psi
   - 5 = 120 in³/min @ 10,000 psi
   - 6 = 200 in³/min @ 10,000 psi
4. **Valve Types**
   - 0 = No valve w/cover plate
   - 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)
   - 10 = 3-way/3-position manual, Venturi-Valve (VM33VAC) 6)
   - 11 = 3-way/3-position electric, Venturi-Valve (VE33VAC) 6)
5. **Reservoir Capacity**
   - 04 = 1.2 gallon
   - 08 = 1.8 gallon
   - 10 = 2.6 gallon
   - 20 = 5.2 gallon
   - 40 = 10.3 gallon
6. **Valve Operation**
   - **D** = Dump valve (w/ pendant and LCD)
   - **L** = Manual valve (w/o pendant, w/ LCD)
   - **M** = Manual valve 3) (w/o pendant or LCD)
   - **N** = No valve 3) (no electrical box)
   - **S** = Solenoid valve (w/ pendant and LCD)
7. **Voltage**
   - Single Phase
     - **B** = 115V 1 ph 50-60Hz 1)
     - **E** = 208-240V 1 ph 50-60 Hz European Plug
     - **I** = 208-240V 1 ph 50-60 Hz USA Plug
   - Three Phase 3)
     - **G** = 208-240V 3ph 50-60Hz
     - **J** = 460-480V 3ph 50-60Hz
     - **W** = 380-415V 3ph 50-60Hz

**Factory Installed Accessories**

- **F** = Filter
- **G** = 0-15,000 psi gauge (2½") 4)
- **H** = Heat exchanger 2)
- **K** = Skid bar (1.2 and 1.8 gal. reservoirs only)
- **L** = Level/Temp switch 2)
- **N** = No reservoir handles (includes lifting eyes)
- **R** = Roll cage
- **S** = Single stage 5)
- **T** = Pressure transducer 2) 4)
- **U** = Foot switch 2)

1) 115-volt pumps are supplied with 15-amp plug for intermittent use. 20-amp circuit recommended for frequent full pressure use.
2) These accessories 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.
3) Standard Electric models with 3-phase motors are shipped without cord, motor starter or overload protection.
4) Pressure gauge not available on pump models with pressure transducer. Pressure transducer provides digital pressure readout on LCD display.
5) Not available on Valve Types 10, 11
6) Not available on ZE3

STEP 2: Factory Installed Accessories

Select factory installed accessories and add to the pump model number after the hyphen. The example above shows that a Return Line Filter (F) and Heat Exchanger (H) have been added to the pump.

8 Factory installed accessories include the following:

- **F** = Filter
- **G** = 0-15,000 psi gauge (2½") 4)
- **H** = Heat exchanger 2)
- **K** = Skid bar (1.2 and 1.8 gal. reservoirs only)
- **L** = Level/Temp switch 2)
- **N** = No reservoir handles (includes lifting eyes)
- **R** = Roll cage
- **S** = Single stage 5)
- **T** = Pressure transducer 2) 4)
- **U** = Foot switch 2)

**Manual Valve without electric box or LCD**

- Ideal choice for most applications
- Manual valve control, for both single-acting or double-acting applications
- Venturi Valve Technology (VM33VAC) for faster retract of single-acting cylinders
- Manual motor control
- On/off switch on 1-phase electric motor

**Solenoid Dump Valve with electric box and LCD**

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

**Solenoid 3-position Valve with Electric Box**

- Ideal for production and lifting applications
- All valves are 3-position for Advance-Hold-Retract
- Venturi Valve Technology (VM33VAC) for faster retract of single-acting cylinders
- Push-button control pendant with 10-ft. cord controls the valve and motor
## ZE-Series Pump Ordering Matrix

<table>
<thead>
<tr>
<th>S/A or D/A ¹</th>
<th>Hold Type ²</th>
<th>Reservoir Capacity (gal)</th>
<th>ZE3 Series (1.0 hp)</th>
<th>ZE4 Series (1.5 hp)</th>
<th>ZE5 Series (3.0 hp)</th>
<th>ZE6 Series (7.5 hp)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VM22</td>
<td>5.2</td>
<td>ZE3008MB (I, E, W, J, G)</td>
<td>1.8</td>
<td>ZE3010MB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>VM32</td>
<td>1.2</td>
<td>ZE3204MB (E)</td>
<td>1.8</td>
<td>ZE3208MB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VM32</td>
<td>ZE3040MB (I, E, W, J, G)</td>
<td>10.3</td>
<td>ZE3042MB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VM33</td>
<td>ZE3308MB (I, E, W, J, G)</td>
<td>1.8</td>
<td>ZE3310MB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VM33</td>
<td>ZE3320MB (I, E, W, J, G)</td>
<td>10.3</td>
<td>ZE3340MB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VM33</td>
<td>ZE3340MB (E)</td>
<td>1.8</td>
<td>ZE3408MB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VM33L</td>
<td>ZE3608MB (I, E, W, J, G)</td>
<td>1.8</td>
<td>ZE3620MB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>D/A</td>
<td>VM33L</td>
<td>ZE3620MB (E)</td>
<td>1.2</td>
<td>ZE3640MB (E)</td>
<td>1.2</td>
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<tr>
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<td>D/A</td>
<td>VM33</td>
<td>ZE3808MB (I, E, W, J, G)</td>
<td>1.8</td>
<td>ZE3820MB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>D/A</td>
<td>VM33</td>
<td>ZE3840MB (I, E, W, J, G)</td>
<td>10.3</td>
<td>ZE3840MB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VE32D</td>
<td>ZE3104DB (I, E, W, J, G)</td>
<td>1.2</td>
<td>ZE3110DB (I, E, W, J, G)</td>
<td>2.6</td>
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<tr>
<td></td>
<td>S/A</td>
<td>VE32D</td>
<td>ZE31120DB (I, E, W, J, G)</td>
<td>5.2</td>
<td>ZE3120DB (I, E, W, J, G)</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VE33</td>
<td>ZE3304SB (I, E, W, J, G)</td>
<td>1.2</td>
<td>ZE3308SB (I, E, W, J, G)</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VE33</td>
<td>ZE3310SB (I, E, W, J, G)</td>
<td>2.6</td>
<td>ZE3320SB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VE33</td>
<td>ZE3340SB (I, E, W, J, G)</td>
<td>10.3</td>
<td>ZE3408SB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>S/A</td>
<td>VE33</td>
<td>ZE3408SB (I, E, W, J, G)</td>
<td>1.8</td>
<td>ZE3410SB (I, E, W, J, G)</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>D/A</td>
<td>VE33</td>
<td>ZE3420SB (I, E, W, J, G)</td>
<td>5.2</td>
<td>ZE3420SB (I, E, W, J, G)</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>D/A</td>
<td>VE33</td>
<td>ZE3440SB (I, E, W, J, G)</td>
<td>10.3</td>
<td>ZE3440SB (I, E, W, J, G)</td>
<td>10.3</td>
</tr>
</tbody>
</table>

1) S/A = Single acting / D/A = Double acting
2) See Valve Section for technical information.
3) “B” suffix model numbers shown are 115VAC, 1-phase, 50/60 Hz

Other voltages available as shown. Replace “B” voltage suffix with selected voltage character. Model number order example: ZE4108Di is 208-240V, 1 phase, 50/60 Hz. See Ordering Guide page for voltage descriptions

Note: Voltage options K (440V, 3-phase, 50/60Hz) and R (575V, 3-phase, 60 Hz) are available on select models. Contact your local representative for availability.

Note: Valve Operation L available on Manual Pumps. Substitute “L” for “M” Valve Operation

---

**ZE-Series Pump Ordering Matrix**

- **Model**
  - **Output Flow Rate at 10,000 psi: 40 in³/min**
  - **Output Flow Rate at 10,000 psi: 60 in³/min**
  - **Output Flow Rate at 10,000 psi: 120 in³/min**
  - **Output Flow Rate at 10,000 psi: 200 in³/min**

---

**Note:** Voltage options K (440V, 3-phase, 50/60Hz) and R (575V, 3-phase, 60 Hz) are available on select models. Contact your local representative for availability.

---

**See Ordering Guide page for voltage descriptions**

**Note:** Voltage options K (440V, 3-phase, 50/60Hz) and R (575V, 3-phase, 60 Hz) are available on select models. Contact your local representative for availability.

**Note:** Valve Operation L available on Manual Pumps. Substitute “L” for “M” Valve Operation
ZE-Series Accessories

Electric Box ¹)
- Back-lit LCD
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Pressure read-out ²)
- Auto-mode pressure setting ²)
- Information can be displayed in six languages ³)

¹) Included on pumps with solenoid valves
²) When used with pressure transducer
³) English, French, German, Italian, Spanish and Portuguese

Level/Temperature Switch ⁴)
- 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

⁴) 24V, requires Electric Box. Available for 2.6, 5.2 and 10.3 gallon reservoirs

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

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

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

Foot Switch ⁵)
- Hands-free remote control on solenoid dump and 3-position valves
- With 10-foot cord

⁵) 15V, requires Electric Box

---

<table>
<thead>
<tr>
<th>Accessory Kit Model Number</th>
<th>Maximum Pressure (psi)</th>
<th>Maximum Oil Flow (GPM)</th>
<th>By-pass Setting (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZPF</td>
<td>200</td>
<td>12.0</td>
<td>25</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Accessory Kit Number</th>
<th>Fits on Reservoir</th>
<th>For ZE-Series Pumps with Reservoir</th>
<th>Wt. (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZRBC-04</td>
<td>1.2 and 1.8 gallon¹</td>
<td>1.2 &amp; 1.8 gal. w/o heat exchanger</td>
<td>4.9</td>
</tr>
<tr>
<td>ZRC0-4H</td>
<td>1.2 and 1.8 gallon²</td>
<td>1.2 &amp; 1.8 gal. with heat exchanger</td>
<td>5.5</td>
</tr>
<tr>
<td>ZRB-10</td>
<td>2.6 gallon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZRB-20</td>
<td>5.2 gallon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZRB-40</td>
<td>10.3 gallon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Without heat exchanger
² With heat exchanger

---

<table>
<thead>
<tr>
<th>Accessory Kit Number</th>
<th>Can be used on ZE-Series Pumps with Solenoid VE-Series valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZCF-2</td>
<td></td>
</tr>
</tbody>
</table>
Pressure Transducer 1)
- 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)

Pressure Switch 2) 3) 4)
- Controls pump, monitors system
- Adjustable pressure 500-10,000 psi
- Includes glycerin filled, 15,000 psi pressure gauge, G2536L
- Accuracy ± 1.5% of full scale

Heat Exchanger 5)
- Removes heat from bypass oil to provide cooler operation
- Stabilizes oil viscosity, increasing oil life, and reduces wear of pump and other hydraulic components

<table>
<thead>
<tr>
<th>Accessory Kit Model number</th>
<th>Adjustable Pressure Range (psi)</th>
<th>Switch-point Repeat-ability</th>
<th>Dead-band (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZPT-U4</td>
<td>50-10,000</td>
<td>± 0.5%</td>
<td>50</td>
</tr>
<tr>
<td>ZPS-E3</td>
<td>± 2%</td>
<td>115-550</td>
<td>3/8&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessory Kit Model number</th>
<th>Fits on Reservoir</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZHE-E04</td>
<td>1.2 and 1.8 gallon</td>
<td>9.0</td>
</tr>
<tr>
<td>ZHE-E10</td>
<td>2.6, 5.2 and 10.3 gallon</td>
<td>9.0</td>
</tr>
</tbody>
</table>
8000-Series Electric Pumps

The Largest Pump for the Largest Jobs

- 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
- Low voltage controls to protect the pump operator

![PEM8418 Pumps with VM4 manual valves are available with VM4L manual valves for positive load holding. Add suffix “L” to pump model number. Page: 140](image)

Finishing a job with similar specifications, a gasoline-powered EGM8000 Series is shown here performing a synchronized lift. [Page: 148]
**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.

---

**Dimensions shown in inches.**

---

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Usable Oil Capacity (gal)</th>
<th>Pressure Rating (psi)</th>
<th>Output Flow Rate (gal/min)</th>
<th>Valve Type</th>
<th>Valve Function</th>
<th>Current Draw (Amps)</th>
<th>Motor Voltage (VAC)</th>
<th>Sound Level (dBA)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>18 PEM8218</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Manual</td>
<td>3-way, 2-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>720</td>
</tr>
<tr>
<td></td>
<td>18 PEM8218C</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Manual</td>
<td>4-way, 3-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>720</td>
</tr>
<tr>
<td>Double-acting</td>
<td>18 PEM8418</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Manual</td>
<td>4-way, 3-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>765</td>
</tr>
<tr>
<td></td>
<td>18 PEM8418C</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Solenoid</td>
<td>4-way, 3-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>765</td>
</tr>
<tr>
<td></td>
<td>18 PER8418</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Solenoid</td>
<td>4-way, 3-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>765</td>
</tr>
<tr>
<td></td>
<td>18 PER8418C</td>
<td>3,700 10,000</td>
<td>4.4 2.0</td>
<td>Solenoid</td>
<td>4-way, 3-pos.</td>
<td>33.0</td>
<td>230</td>
<td>78-84</td>
<td>765</td>
</tr>
</tbody>
</table>

* Consult Enerpac for availability of other voltages.
PA-Series, Air Hydraulic Pumps

• 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
• PA133 operates in all positions for increased versatility in use and mounting
• Base mounting slots provided on PA133

Shown from top to bottom: PA1150, PA133

PA Series

Reservoir Capacity:
36 - 80 in³

Flow at Rated Pressure:
8 in³/min.

Maximum Operating Pressure:
10,000 psi

PC66 Reservoir Conversion Kit
Double the reservoir capacity of your existing PA133 with this easy to install conversion kit.

Model number
PC66

Dimensions shown in inches.

Air Input
1/4"-18NPTF

4.04 1.40

3.31 5.62

Hydraulic Output
3/8"-18NPTF

14.69

7.00 10.00

Fill Tank Port
1/2"-20UNF

2.87

6.25

6.75

11.10

10.00

3/8"-18NPTF

PA133

PA1150

OIL FLOW vs. PRESSURE

Air pressure:

PA-Series (@ 100 psi)

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
<th>Pressure Rating (psi)</th>
<th>Output Flow Rate (in³/min)</th>
<th>Valve Function</th>
<th>Air Pressure Range* (psi)</th>
<th>Air Consumption (scfm)</th>
<th>Sound Level (dBA)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>36</td>
<td>PA133</td>
<td>10,000</td>
<td>40</td>
<td>8</td>
<td>Advance/Hold/Retract</td>
<td>60-120</td>
<td>9</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>PA1150</td>
<td>10,000</td>
<td>40</td>
<td>8</td>
<td>Advance/Hold/Retract</td>
<td>60-120</td>
<td>9</td>
<td>85</td>
</tr>
</tbody>
</table>

* Recommended Regulator-Filter-Lubricator: RFL102.
• 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

PAM Series

Reservoir Capacity:
1.0 - 2.0 gallon

Flow at Rated Pressure:
9 in³/min.

Maximum Operating Pressure:
10,000 psi

Locking Valves
Pumps with VM4 manual valves are available with VM4L manual locking valves instead. Add suffix “L” to pump model number.

Remote Air Valve
For remote operation of PAM10 series air pumps. Permits either hand or foot operation.

OIL FLOW vs. PRESSURE

<table>
<thead>
<tr>
<th>Pressure (psi)</th>
<th>Oil flow (in³/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>800</td>
<td>400</td>
</tr>
<tr>
<td>1000</td>
<td>500</td>
</tr>
</tbody>
</table>

Model number 1)

<table>
<thead>
<tr>
<th>10 Series (@ 100 psi)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (gal)</th>
<th>Model Number (with Shroud)</th>
<th>Pressure Rating (psi)</th>
<th>Output Flow Rate (in³/min)</th>
<th>Valve Function</th>
<th>Valve Model</th>
<th>Air Pressure Range* (psi)</th>
<th>Air Consumption (scfm)</th>
<th>Sound Level (dBA)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>0.7</td>
<td>PAM1021</td>
<td>10,000</td>
<td>650</td>
<td>Adv/Hold/Ret</td>
<td>VM2</td>
<td>60-120</td>
<td>18</td>
<td>87</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>PAM1022</td>
<td>10,000</td>
<td>650</td>
<td>Adv/Hold/Ret</td>
<td>VM2</td>
<td>60-120</td>
<td>18</td>
<td>87</td>
<td>60</td>
</tr>
<tr>
<td>Double-acting</td>
<td>0.7</td>
<td>PAM1041</td>
<td>10,000</td>
<td>650</td>
<td>Adv/Hold/Ret</td>
<td>VM4</td>
<td>60-120</td>
<td>18</td>
<td>87</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>PAM1042</td>
<td>10,000</td>
<td>650</td>
<td>Adv/Hold/Ret</td>
<td>VM4</td>
<td>60-120</td>
<td>18</td>
<td>87</td>
<td>60</td>
</tr>
</tbody>
</table>

* Recommended Regulator-Filter-Lubricator: RFL102
PA-Series, Turbo II Air Hydraulic Pumps

- 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
- Mounting Bracket Kit (MTB1) available to mount pumps to horizontal or vertical surfaces

Compact Air Over Hydraulic

![RFL102 Regulator-Filter-Lubricator](image)
Recommended for use with all air pumps. Provides clean, lubricated air and allows for air pressure adjustment. Steel bowl guards are standard.

![Large Reservoir Models](image)
The Turbo II Air Pump is also available with a larger reservoir: PATG1105N, PAMG1405N, and PARG1105N.

![Hoses](image)
Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>127</td>
<td>PATG1102N</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>PATG1105N</td>
</tr>
<tr>
<td></td>
<td>127</td>
<td>PARG1102N</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>PARG1105N</td>
</tr>
<tr>
<td>Double-acting</td>
<td>127</td>
<td>PAMG1402N</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>PAMG1405N</td>
</tr>
</tbody>
</table>

Page: 148

▼ Shown left to right: PAMG1402N, PATG1102N, PARG1102N, PATG1105N

▼ Easily operated by hand or by foot.
Turbo II Air Hydraulic Pumps

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**

Turbo II Air Pump (@ 100 psi)

![Graph showing oil flow vs. pressure for Turbo II Air Pump](image)

**PATG PARG PAMG Series**

Reservoir Capacity: 150 - 305 in³

Flow at Rated Pressure: 5 - 10 in³/min.

Maximum Operating Pressure: 10,000 psi

**Speed Chart**

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

**Dimensions (in)**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>Weight (lbs)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.33</td>
<td>6.49</td>
<td>8.29</td>
<td>9.04</td>
<td>4.00</td>
<td>0</td>
<td>5.15</td>
<td>5.75</td>
<td>1.65</td>
<td>4.43</td>
<td>13.62</td>
<td>18</td>
<td>PATG1102N</td>
</tr>
<tr>
<td>15.60</td>
<td>7.92</td>
<td>8.22</td>
<td>9.04</td>
<td>4.00</td>
<td>0</td>
<td>5.08</td>
<td>5.75</td>
<td>3.28</td>
<td>4.41</td>
<td>17.20</td>
<td>22</td>
<td>PATG1105N</td>
</tr>
<tr>
<td>12.33</td>
<td>6.49</td>
<td>7.88</td>
<td>9.04</td>
<td>4.00</td>
<td>0</td>
<td>5.15</td>
<td>0</td>
<td>1.65</td>
<td>4.43</td>
<td>22</td>
<td>PARG1102N</td>
<td></td>
</tr>
<tr>
<td>15.60</td>
<td>7.92</td>
<td>7.88</td>
<td>9.04</td>
<td>4.00</td>
<td>0</td>
<td>5.08</td>
<td>0</td>
<td>3.28</td>
<td>4.41</td>
<td>22</td>
<td>PARG1105N</td>
<td></td>
</tr>
<tr>
<td>12.33</td>
<td>6.49</td>
<td>10.50</td>
<td>9.04</td>
<td>4.00</td>
<td>1.42</td>
<td>5.23</td>
<td>6.00</td>
<td>1.65</td>
<td>4.43</td>
<td>12.60</td>
<td>24</td>
<td>PAMG1402N</td>
</tr>
<tr>
<td>15.60</td>
<td>7.92</td>
<td>10.50</td>
<td>9.04</td>
<td>4.00</td>
<td>1.42</td>
<td>5.19</td>
<td>6.00</td>
<td>3.28</td>
<td>4.41</td>
<td>15.94</td>
<td>28</td>
<td>PAMG1405N</td>
</tr>
</tbody>
</table>
Control and Ergonomics

- 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
  * See explanation of ATEX Certification in "Yellow Pages".

"Joy-stick" Lever Kit
Customer installed set of handles for manual operation of both pedals.

Order model number 1) XLK1

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

Order model number 1) XSC1

1) Accessories must be ordered separately.

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.
Air Driven Hydraulic Pumps

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 capabilities to apply the mandatory precise stroke and force.

▼ XA-SERIES PERFORMANCE CHART

<table>
<thead>
<tr>
<th>Maximum Pressure (psi)</th>
<th>Output Flow Rate (in³/min)</th>
<th>Pump Series</th>
<th>Valve Function</th>
<th>Dynamic Air Pressure (psi)</th>
<th>Sound Level (dba)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000</td>
<td></td>
<td>XA1</td>
<td>Advance/Hold/Retract</td>
<td>30-125</td>
<td>88</td>
</tr>
</tbody>
</table>

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

Reservoir Capacity: 61 - 122 in³
Flow at Rated Pressure: 15 in³/min.
Air Consumption: 10 - 35 scfm
Maximum Operating Pressure: 10,000 psi

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 ① RFL102

▼ SELECTION CHART

<table>
<thead>
<tr>
<th>For Use With Cylinder Tool</th>
<th>Usable Oil Capacity (in³)</th>
<th>Model No. ①</th>
<th>Pressure Gauge</th>
<th>3-Way, 3-Position Valve</th>
<th>4-Way, 3-Position Valve</th>
<th>Dimensions (in)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>61</td>
<td>XA11 ①</td>
<td>–</td>
<td>•</td>
<td>–</td>
<td>H1 5.98, H2 6.69</td>
<td>L 19.0</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>XA12 ②</td>
<td>–</td>
<td>•</td>
<td>–</td>
<td>– 6.69</td>
<td>22.4</td>
</tr>
<tr>
<td>Single-acting</td>
<td>61</td>
<td>XA11G</td>
<td>•</td>
<td>•</td>
<td>–</td>
<td>– 6.69</td>
<td>19.4</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>XA12G</td>
<td>•</td>
<td>•</td>
<td>–</td>
<td>– 6.69</td>
<td>22.9</td>
</tr>
<tr>
<td>Double-acting</td>
<td>61</td>
<td>XA11V</td>
<td>–</td>
<td>–</td>
<td>•</td>
<td>5.98 10.98</td>
<td>22.3</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>XA12V</td>
<td>–</td>
<td>–</td>
<td>•</td>
<td>6.69 10.98</td>
<td>25.7</td>
</tr>
<tr>
<td>Double-acting</td>
<td>61</td>
<td>XA11VG</td>
<td>•</td>
<td>–</td>
<td>•</td>
<td>5.98 10.98</td>
<td>22.7</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>XA12VG</td>
<td>•</td>
<td>–</td>
<td>•</td>
<td>6.69 10.98</td>
<td>26.2</td>
</tr>
</tbody>
</table>

① High-flow coupler CR400 and accessories must be ordered separately.
② Available as cylinder pump set, see page 63.
ZA-Series, Air Hydraulic Pumps

- 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 1.2 and 1.8-gallon and level gauge on 2.6, 5.2 and 10.3-gallon reservoirs allow quick and easy oil level monitoring
- Optional heat exchanger warms exhaust air to prevent freezing and cools the oil

**ZA4 Performance**

<table>
<thead>
<tr>
<th>Valve Function</th>
<th>Usable Oil Capacity (gal)</th>
<th>Valve Model Number</th>
<th>Model Number</th>
<th>Output Flow Rate (in³/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100 psi</td>
</tr>
<tr>
<td>Single-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advance/Retract</td>
<td>1.2</td>
<td>Manual VM32</td>
<td>ZA4204MX</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>1.8</td>
<td></td>
<td>ZA4208MX</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td>ZA4420MX</td>
<td>850</td>
</tr>
<tr>
<td>Double-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advance/ Hold/ Retract</td>
<td>1.2</td>
<td>Manual VM43</td>
<td>ZA4404MX</td>
<td>850</td>
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<tr>
<td></td>
<td>1.8</td>
<td></td>
<td>ZA4408MX</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td></td>
<td>ZA4410MX</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td>ZA4420MX</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>10.3</td>
<td></td>
<td>ZA4440MX</td>
<td>850</td>
</tr>
</tbody>
</table>

1) Actual flow will vary with air supply
2) See valve section for hydraulic symbols and details
ZA-Series, Air Hydraulic Pump Ordering Matrix

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

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>A</td>
<td>4</td>
<td>2</td>
<td>08</td>
<td>M</td>
<td>X -</td>
<td>F</td>
</tr>
</tbody>
</table>

1. **Product Type**
   - **Z** = Pump class

2. **Motor Type**
   - **A** = Air motor

3. **Flow Group**
   - **4** = 80 in³/min @10,000 psi

4. **Valve Type**
   - **0** = No valve with cover plate
   - **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** = 4-way, 3-position, locking (VM43L)

5. **Usable Oil Capacity**
   - **04** = 1.2 gallon
   - **08** = 1.8 gallon
   - **10** = 2.6 gallon
   - **20** = 5.2 gallon
   - **40** = 10.3 gallon

6. **Valve Operation**
   - **M** = Manual valve
   - **N** = No valve

7. **Voltage**
   - **X** = Not applicable

8. **Options**
   - **F** = Filter
   - **G** = 0-15,000 psi gauge (2 1/2")
   - **H** = Heat exchanger*
   - **K** = Skid bar*
   - **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: ZA4208MXFHK

ZA4208MXFHK is an air operated pump with a 3-way, 2-position manual valve, a 1.8 gallon reservoir, filter, heat exchanger and skid bar.

**Reservoir Capacity:**

- 1.2 - 10.3 gallon

**Flow at Rated Pressure:**

- 80 in³/min.

**Maximum Operating Pressure:**

- 10,000 psi

- 0.50
- 1.00
- 1.50
- 2.00
- 2.50
- 3.00
- 3.50
- 4.00
- 4.50
- 5.00
- 5.50
- 6.00
- 6.50
- 7.00
- 7.50
- 8.00
- 8.50
- 9.00
- 9.50
- 10.00
- 10.50
- 11.00
- 11.50
- 12.00
- 12.50
- 13.00
- 13.50
- 14.00
- 14.50
- 15.00
- 15.50
- 16.00
- 16.50
- 17.00
- 17.50
- 18.00
- 18.50
- 19.00
- 19.50
- 20.00

- 900
- 800
- 700
- 600
- 500
- 400
- 300
- 200
- 100
- 0

**Dimensions (in)**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>(lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.6</td>
<td>5.6</td>
<td>11.0</td>
<td>6.0</td>
<td>15.4</td>
<td>-</td>
<td>-</td>
<td>65.5</td>
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<tr>
<td>11.6</td>
<td>5.6</td>
<td>11.0</td>
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<td>15.4</td>
<td>-</td>
<td>-</td>
<td>75.7</td>
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<tr>
<td>13.0</td>
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<td>16.6</td>
<td>16.0</td>
<td>15.6</td>
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<td>112.7</td>
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<tr>
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<td>5.6</td>
<td>11.0</td>
<td>6.0</td>
<td>15.4</td>
<td>-</td>
<td>-</td>
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<tr>
<td>11.6</td>
<td>5.6</td>
<td>11.0</td>
<td>8.1</td>
<td>15.4</td>
<td>-</td>
<td>-</td>
<td>76.9</td>
</tr>
<tr>
<td>12.0</td>
<td>6.1</td>
<td>16.5</td>
<td>12.0</td>
<td>16.0</td>
<td>11.0</td>
<td>15.1</td>
<td>87.1</td>
</tr>
<tr>
<td>13.0</td>
<td>7.1</td>
<td>16.5</td>
<td>16.6</td>
<td>16.9</td>
<td>15.6</td>
<td>18.4</td>
<td>113.9</td>
</tr>
<tr>
<td>16.5</td>
<td>10.6</td>
<td>15.7</td>
<td>19.9</td>
<td>20.4</td>
<td>18.9</td>
<td>23.0</td>
<td>164.6</td>
</tr>
</tbody>
</table>

**Weight (incl. oil)**

- User adjustable relief valve on all manual valves
- Air inlet 1/2" NPTF
- Return Line Filter (optional)
- Oil Sight Gauge
- Roll Cage (optional)
- Oil Drain
- Lifting eyes (4) (optional)
- Handles
- Skid Bar (Model No. SBZ4) (optional)

**100 psi Dynamic Air Pressure at 70 scfm**

**OIL FLOW vs. PRESSURE**
• 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
• ZG5 is available in two 4-cycle engine sizes: 7.1 ft.lbs Honda and 8.5 ft.lbs Briggs & Stratton

**SELECTION CHART**

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (gal)</th>
<th>Valve Model Number</th>
<th>Valve Function</th>
<th>Model Number with Roll Cage</th>
<th>Output Flow Rate (in³/min) at 100 psi</th>
<th>Output Flow Rate (in³/min) at 700 psi</th>
<th>Output Flow Rate (in³/min) at 5000 psi</th>
<th>Output Flow Rate (in³/min) at 10,000 psi</th>
<th>Sound Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Acting</td>
<td>2.6</td>
<td>VM33</td>
<td>Advance/Hold/Retract</td>
<td>ZG5310MX-R</td>
<td>700</td>
<td>650</td>
<td>110</td>
<td>100</td>
<td>88 - 93</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td></td>
<td>ZG5320MX-R</td>
<td>700</td>
<td>650</td>
<td>110</td>
<td>100</td>
<td>88 - 93</td>
</tr>
<tr>
<td>Double-Acting</td>
<td>2.6</td>
<td>VM43</td>
<td></td>
<td>ZG5410MX-R</td>
<td>700</td>
<td>650</td>
<td>110</td>
<td>100</td>
<td>88 - 93</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td></td>
<td>ZG5420MX-R</td>
<td>700</td>
<td>650</td>
<td>110</td>
<td>100</td>
<td>88 - 93</td>
</tr>
<tr>
<td>Single-Acting</td>
<td>2.6</td>
<td>VM33</td>
<td></td>
<td>ZG5310MX-BR</td>
<td>400</td>
<td>380</td>
<td>110</td>
<td>100</td>
<td>91 - 95</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td></td>
<td>ZG5320MX-BR</td>
<td>400</td>
<td>380</td>
<td>110</td>
<td>100</td>
<td>91 - 95</td>
</tr>
<tr>
<td>Double-Acting</td>
<td>2.6</td>
<td>VM43</td>
<td></td>
<td>ZG5410MX-BR</td>
<td>400</td>
<td>380</td>
<td>110</td>
<td>100</td>
<td>91 - 95</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td></td>
<td></td>
<td>ZG5420MX-BR</td>
<td>400</td>
<td>380</td>
<td>110</td>
<td>100</td>
<td>91 - 95</td>
</tr>
<tr>
<td></td>
<td>10.3</td>
<td>VM43L</td>
<td></td>
<td>ZG5840MX-BR</td>
<td>400</td>
<td>380</td>
<td>110</td>
<td>100</td>
<td>91 - 95</td>
</tr>
</tbody>
</table>

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

**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.

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

**ZG-Series, Gasoline Pump Performance**
Elevation can affect the performance of any gasoline engine. ZG-Series pumps are designed to develop rated performance at elevations up to 4921 ft. For applications above this elevation please consult your Enerpac office.
Gasoline Hydraulic Pumps

CUSTOM BUILD YOUR ZG AIR PUMP
✓ This is how a ZG-Series Pump model number is built up:

1 Product Type
Z = Pump class
2 Motor Type
G = Gasoline Engine
3 Flow Group
5 = 100 in³/min@10,000 psi
6 = 200 in³/min@10,000 psi (see page 130)
4 Valve Type
0 = No valve with coverplate 1)
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)
8 = 4-way, 3-position, locking (VM43L)

1) For remote valve mounting order BSS1090 high pressure connecting plate.
5 Usable Oil Capacity (Reservoir Size)
10 = 2.6 gallon
20 = 5.2 gallon
40 = 10.3 gallon
6 Valve Operation
M = Manual valve
N = No valve
7 Voltage
X = Not applicable
8 Options
(Specify in alphabetical order)
B = Briggs & Stratton gasoline engine
F = Return Line Filter
G = 15,000 psi gauge
N = No reservoir handle (includes lifting eyes; 2.5, 5, 10 gallon only)
R = Roll bars

Ordering Example
Model Number: ZG5420MXFR
This is a 10,000 psi hydraulic pump, with a 4/3 manual valve, 2.6 gallon reservoir, with a 7.1 ft-lbs Honda gasoline engine pump, return-line filter and roll bar.

Engine Size:
7.1 and 8.5 Ft.lbs

Maximum Operating Pressure:
10,000 psi

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.

ZG6-Series 17.0 Ft-lb Pump
The ZG6 pump has a 200 in³/min. oil flow at 10,000 psi, Briggs & Stratton 4-cycle gasoline engine with electric start and 12 volt charge output for accessories.

Page: 148

OIL FLOW vs. PRESSURE

ZG5 Honda
ZG5 Briggs & Stratton
ZG6 Briggs & Stratton
ZG6 Series, Gasoline Hydraulic Pumps

- Features Z-Class high-efficiency pump design:
  - higher oil flow and bypass pressure
  - patented balanced rotating pump components to reduce vibration
  - replaceable piston check valves that increase service life of pump components
- 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 allows transport over uneven terrain and features collapsible handles
- Dual forced-air heat exchangers stabilizes hydraulic oil temperature
- Roll cage for easy portability and hoisting, protects pump
- Briggs & Stratton 17 ft.lbs engine with electric start, pressurized oil and 16-amp charge output for accessories

---

**ZG6 Series**

- **Reservoir Capacity:** 10.3 gallon
- **Flow at Rated Pressure:** 200 in³/min.
- **Engine Size:** 17.0 Ft.lbs
- **Sound Level:** 88 - 93 dBA
- **Maximum Operating Pressure:** 10,000 psi

---

**Other Options Available**

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

**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.

---

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (gal)</th>
<th>Valve Model Number</th>
<th>Valve Function</th>
<th>Model Number</th>
<th>Motor Manufacturer*</th>
<th>Motor Size (Ft.lbs)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double-Acting</td>
<td>10.3</td>
<td>VM43</td>
<td>Advance/Hold/Retract</td>
<td>ZG6440MX-BCFH</td>
<td>Briggs &amp; Stratton</td>
<td>17.0</td>
<td>334.0</td>
</tr>
</tbody>
</table>
**EGM Series**

- Reservoir Capacity: 25 gallon
- Flow at Rated Pressure: 1.5 gal/min.
- Motor Size: 18 hp
- Maximum Operating Pressure: 10,000 psi

**Locking Valves**
Pumps with VM4 manual valves are available with VM4L manual valves for positive load holding. Add suffix “L” to pump model number.

**8000-Series Gasoline Pumps**

- 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

**OIL FLOW vs. PRESSURE**

<table>
<thead>
<tr>
<th>Pressure (psi)</th>
<th>0</th>
<th>2,000</th>
<th>4,000</th>
<th>6,000</th>
<th>8,000</th>
<th>10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil flow (gal/min)</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Used with Cylinder**

<table>
<thead>
<tr>
<th>Used with Cylinder</th>
<th>Usable Oil Capacity (gal)</th>
<th>Model Number</th>
<th>Pressure Rating (psi)</th>
<th>Output Flow Rate (gal/min)</th>
<th>Valve Type</th>
<th>Valve Function</th>
<th>Sound Level (dBA)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-acting</td>
<td>18</td>
<td>EGM8218</td>
<td>3,700 10,000</td>
<td>3.4 1.5</td>
<td>3-way, 2-pos.</td>
<td>Adv./Retr.</td>
<td>94</td>
<td>890</td>
</tr>
<tr>
<td>Double-acting</td>
<td>18</td>
<td>EGM8418</td>
<td>3,700 10,000</td>
<td>3.4 1.5</td>
<td>4-way, 3-pos.</td>
<td>Adv./Hold/Retr.</td>
<td>94</td>
<td>890</td>
</tr>
</tbody>
</table>
SFP-Series, Split-Flow Pumps

Multiple Outlets with Equal Flow for Lifting and Lowering

- 2, 4, 6 or 8 split-flow outlets
- Individual or simultaneously operation of valves, with advance/hold/retract function
- Joystick (manual) controlled or pendant (solenoid) controlled valves
- Flow per outlet ranging from 20 to 305 in³/min at 10,000 psi
- For double- and single-acting cylinders
- Adjustable pressure relief valve per circuit
- Reservoir: 5, 10 or 40 gallons
- All models include pressure gauges


Typical Split-Flow Pump Applications

For lifting and lowering applications on multiple points, Split-Flow Pumps are a far better alternative than using independently operated pumps. Where synchronization of maximum 4% is acceptable, Split-Flow Pumps are a safe and economical solution.

The SFP-Series pumps feature both single and synchronized multiple outlet control either through joystick or pendant operation.

Application examples:
- Bridge deck lifting for bearing maintenance
- Stage lifting in construction and shipbuilding
- Skidding to move structures and buildings
- Levelling of constructions like wind turbines

Remote Control Pendant

Split-Flow Pumps with solenoid valves include a remote pendant with selector switches for each individual outlet, allowing single or multiple cylinder operation.

Hoses and Couplers

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac System Components.
10,000 psi, Split-Flow Pumps

SFP Series

Reservoir Capacity:
5, 10 or 40 gallon

Split-Flow Outlets:
2, 4, 6 or 8 outlets

Flow at Rated Pressure:
20 - 305 in³/min

Maximum Operating Pressure:
10,000 psi

Lifting Cylinders
For a complete line of Enerpac cylinders, see the Cylinder and Lifting Products in our catalog.

Motor Voltage
Motor voltage is specified by the last letter in the model number. Other motor voltages are available from Enerpac. Change "J" in the model as follows for other options:

J = 460-480V, 3 ph, 50-60 Hz
G = 208-240V, 3 ph, 50-60 Hz
W = 380-415V, 3 ph, 50-60 Hz

<table>
<thead>
<tr>
<th>Number of Split-Flow Outlets</th>
<th>Reservoir Size (gal)</th>
<th>Oil Flow per Outlet @ 10,000 psi (in³/min)</th>
<th>Pump Model Number</th>
<th>4/3 Valve Operation</th>
<th>Motor Size 460 V - 3ph 60 Hz (hp)</th>
<th>Dimensions (in)</th>
<th>WL (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>20</td>
<td>SFP 202MB*</td>
<td>–</td>
<td>1.0*</td>
<td>29.5, 17.7, 27.6</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>94</td>
<td>SFP 213MJ</td>
<td>SFP 213SJ</td>
<td>7.5</td>
<td>40.0, 25.2, 38.2</td>
<td>485</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>203</td>
<td>SFP 228MJ</td>
<td>SFP 228SJ</td>
<td>10</td>
<td>53.4, 23.8, 45.7</td>
<td>1309</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>305</td>
<td>SFP 242MJ</td>
<td>SFP 242SJ</td>
<td>15</td>
<td>53.4, 23.8, 45.7</td>
<td>1173</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>33</td>
<td>SFP 404MJ</td>
<td>SFP 404SJ</td>
<td>7.5</td>
<td>40.0, 25.2, 38.2</td>
<td>567</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>65</td>
<td>SFP 409MJ</td>
<td>SFP 409SJ</td>
<td>7.5</td>
<td>53.4, 23.8, 45.7</td>
<td>1065</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>101</td>
<td>SFP 414MJ</td>
<td>SFP 414SJ</td>
<td>10</td>
<td>53.4, 23.8, 45.7</td>
<td>1314</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>153</td>
<td>SFP 421MJ</td>
<td>SFP 421SJ</td>
<td>15</td>
<td>53.4, 23.8, 45.7</td>
<td>1314</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>33</td>
<td>SFP 604MJ</td>
<td>SFP 604SJ</td>
<td>7.5</td>
<td>40.0, 25.2, 38.2</td>
<td>637</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>94</td>
<td>–</td>
<td>SFP 613SJ</td>
<td>15</td>
<td>53.4, 31.7, 47.2</td>
<td>1239</td>
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<td>8</td>
<td>40</td>
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<td>–</td>
<td>SFP 813SJ</td>
<td>20</td>
<td>53.4, 31.7, 47.2</td>
<td>1327</td>
</tr>
</tbody>
</table>

* 115V-1 ph, 60 Hz
Connecting Split-Flow Pumps for more lift points and greater accuracy

- Control multiple Split-Flow Pumps with one control unit
- Pumps can be closer to the lifting points, requiring shorter hoses and increasing accuracy
- Synchronize all lift points to within 0.04 inch (1.0 mm)
- Network control boxes expand the number of lifting points by combining up to four split-flow pumps together, simplifying lifting operations by using a single operator station
- Plug and play synchronous lift upgrade kits limit initial investment and provide everyday flexibility to tailor the controls to the applications needs

Split Flow Pumps Kits
SFP Series kits are customized from standard components to meet the needs of your unique applications. On the next page is the guide to help you choose the right components to upgrade or expand your equipment based on your application needs. Contact your regional Enerpac representative / territory manager for support with your specific project.

Split-Flow Pump Network Kits
Split-Flow Pump Network Kits connect multiple Split-Flow Pumps under one control system.

Split-Flow Pump Synchro Kits
Split-Flow Pump Synchro Kits connect and electronically synchronize each lift point of a single Split-Flow Pump or multiple Split-Flow Pumps under one control system.

Junction Box
SFPKSS4 and SFPKSS8 junction boxes consolidate the signals from pressure and stroke sensors, allowing the master control box to synchronize the lifting operation.

SFPKMN, Master Control Box
All SFP-Series Synchro Kits include a master control box to allow the operator to easily monitor and control a multi-point synchronized lift and adjust individual lift points as needed. All master control boxes feature an industrial grade touch screen and a user-friendly interface.

EVO-SC-25, Stroke Sensor Cable, 82 feet
Can be connected together for additional length. Ordered separately, requires one for each stroke sensor.

EVO-WSS, Wire Stroke Sensors
Provides stroke feedback to controls. Includes magnets for mounting. Ordered separately, requires one sensor for each lifting point. Available in measuring range from 3.9 to 49.2 in.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Range (in)</th>
<th>Model Number</th>
<th>Range (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVO-WSS-100</td>
<td>3.9</td>
<td>EVO-WSS-750</td>
<td>29.5</td>
</tr>
<tr>
<td>EVO-WSS-125</td>
<td>4.9</td>
<td>EVO-WSS-1000</td>
<td>39.4</td>
</tr>
<tr>
<td>EVO-WSS-375</td>
<td>14.8</td>
<td>EVO-WSS-1250</td>
<td>49.2</td>
</tr>
<tr>
<td>EVO-WSS-500</td>
<td>19.7</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Communication Cables
EVO-COMM-Series communication cables transfer information about the synchronized lift operation from the master control panel to each of the connected split-flow pumps.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Length (ft)</th>
<th>Model Number</th>
<th>Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVO-COMM-25</td>
<td>82</td>
<td>EVO-COMM-75</td>
<td>246</td>
</tr>
<tr>
<td>EVO-COMM-50</td>
<td>164</td>
<td>EVO-COMM-100</td>
<td>328</td>
</tr>
</tbody>
</table>
Upgrading Split-Flow Pumps
To network multiple SFP-pumps together with standard function see drawing and table ①.
To upgrade a single SFP-pump to synchronous lift capability, see drawing and table ②.
To upgrade and network multiple SFP-pumps together with synchronous lift capabilities, see drawing and table ③.

① Networked SFP-Pumps in Standard Operation

② Single SFP-Pump in Multiple-Point Synchronous Lifting Operation

③ Networked Pumps in Multiple-Point Synchronous Lifting Operation

**SFP Series**

**Multiple Pumps in Network System:**

**1 - 4 Pumps**

**Maximum Lifting Points:**

**32x Cylinders**

① **Networked SFP-Pumps in Standard Operation**

<table>
<thead>
<tr>
<th>No.</th>
<th>Qty.</th>
<th>Model No. &amp; Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4x</td>
<td>SFP...SW Pumps with solenoid valves</td>
</tr>
<tr>
<td>2</td>
<td>4x</td>
<td>SFPKSN Junction Box, 1x per pump</td>
</tr>
<tr>
<td>3</td>
<td>4x</td>
<td>SFCOMM25 Communication Cable, 1x per pump</td>
</tr>
<tr>
<td>4</td>
<td>1x</td>
<td>SFPKMN Master Control Box</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>HC-700-Series, Hydraulic Hoses</td>
</tr>
</tbody>
</table>

② **Single SFP-Pump in Multiple-Point Synchronous Lifting Operation**

<table>
<thead>
<tr>
<th>No.</th>
<th>Qty.</th>
<th>Model No. &amp; Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1x</td>
<td>SFP...SW Pump with solenoid valves</td>
</tr>
<tr>
<td>2</td>
<td>1x</td>
<td>SFPKSS4 Junction Box for 2-4 lifting points or SFPKSS8 for 6-8 lifting points</td>
</tr>
<tr>
<td>3</td>
<td>1x</td>
<td>SFCOMM25 Communication Cable</td>
</tr>
<tr>
<td>4</td>
<td>1x</td>
<td>SFPSCC Single Slave Control Box</td>
</tr>
<tr>
<td>5</td>
<td>1x</td>
<td>SFPKPT Pressure Transducer Kit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1x per cylinder A-port)</td>
</tr>
<tr>
<td>6</td>
<td>1x</td>
<td>EVO-WSS-XXX Stroke Sensor, 1x per cylinder</td>
</tr>
<tr>
<td>7</td>
<td>1x</td>
<td>EVO-SC25 Stroke Sensor Cable, 1x per cylinder</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>HC-700-Series, Hydraulic Hoses</td>
</tr>
</tbody>
</table>

③ **Networked Pumps in Multiple-Point Synchronous Lifting Operation**

<table>
<thead>
<tr>
<th>No.</th>
<th>Qty.</th>
<th>Model No. &amp; Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4x</td>
<td>SFP...SW Pumps with solenoid valves</td>
</tr>
<tr>
<td>2</td>
<td>4x</td>
<td>SFPKSS4 Junction Box, 1x per pump, for 2-4 lifting points or SFPKSS8 Junction Box for 6-8 lifting points</td>
</tr>
<tr>
<td>3</td>
<td>4x</td>
<td>EVO-COMM-XXX Communication Cable, 1x per pump</td>
</tr>
<tr>
<td>4</td>
<td>1x</td>
<td>EVOMASTER Master Control Box</td>
</tr>
<tr>
<td>5</td>
<td>1x</td>
<td>SFPKPT Pressure Transducer Kit, 1x per cylinder A-port</td>
</tr>
<tr>
<td>6</td>
<td>1x</td>
<td>EVO-WSS-XXX Stroke Sensor, 1x per cylinder</td>
</tr>
<tr>
<td>7</td>
<td>1x</td>
<td>EVO-SC25 Stroke Sensor Cable, 1x per cylinder</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>HC700-Series, Hydraulic Hoses</td>
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</tbody>
</table>
EVO-Series, Synchronous Lifting Systems

- Modular lifting pumps to control 4, 8 or 12 lifting points
- Can be connected to single- or double-acting cylinders with the same or different lifting capacities
- PLC-controlled system with integrated 10,000 psi hydraulic power unit and 66-gallon reservoir
- Network capability to link up to 4 EVO units (HPUs) to a separate EVO master-control box via wireless control
- Intuitive user interface providing easy set up, control and navigation
- Data storage and recording capabilities
- Variable frequency drive motor (VFD) and PLC for precise synchronization and oil flow control

Shown: 3600-ton tunnel boring machine lowered and tilted into its starting position with the EVO-Series Synchronous Lifting System.

The Multi-Functional Synchronous Lifting System

EVO-System Work Modes
The application possibilities are infinite with the standard EVO-System, powering interlinked hydraulic cylinders – single or double-acting, push or pull, stage lift, hollow plunger or lock nut cylinders. The EVO-System has 9 work modes. The operator can navigate to any of these menus:
1. Manual
2. Pre-Load
3. Automatic
4. Retract Fast
5. Depressurize
6. Tilting
7. Stage Lift
8. Weighing *
9. Center of Gravity determination *

* Available in the EVO-W-models.

Typical Synchronous Lifting Applications
- Bridge lifting and repositioning
- Bridge launching
- Bridge maintenance
- Incremental launching and box jacking
- Lifting and lowering of heavy equipment
- Lifting, lowering, levelling and weighing of heavy structures and buildings
- Structural and pile testing
- Lifting and weighing of oil platforms
- Foundation levelling of onshore and offshore wind turbines
- De-propping/load transfer from temporary steel work
- Foundation shoring
Synchronous Lifting Systems

Benefits of the EVO-Series System

Precise control of multiple lift points
- Comprehensive understanding and management of a lifting operation from a central control system improves safety and operational productivity
- Programmable synchronized lifting
- Automatic stop at pre-set cylinder stroke or load limit

Safe and efficient movement of loads
- System secured with warning and stop features to realize optimal safety

High accuracy
- Variable frequency drive (VFD) and PLC for precise synchronization and control of oil flow, stroke and speed
- Depending the cylinder capacities used, an accuracy of 0.040 inches between lifting points is achieved

Ease of operation
- User friendly interface: visual screens, icons, symbols and color coding

- A single operator controls the entire operation

Monitoring and Data Recording
- Displays data of the operation.
- Data recording at user-defined intervals
- Data storage and read-out for reporting

Network capability
- Ethernet IP protocol for communication between hydraulic power units, allow easy “plug and play”

EVOW Weighing System
Weighing applications with 1\% accuracy
- Includes calibrated sensors and auto-calibration of external load cells
- Center of gravity determination functionality
- Parameters for “waiting time for stabilization” and “number of cycles”.

Global standardized system
- Enerpac global coverage ensures local support

EVO-Series (Standard)

<table>
<thead>
<tr>
<th>Lifting Points</th>
<th>Variable Oil Flow (in³/min)</th>
<th>Model Number 460-480V, 3ph, 50-60Hz</th>
<th>Usable Oil Capacity (gal)</th>
<th>Motor Size (hp)</th>
<th>Motor Speed (rpm)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(≤ 1,800 psi)</td>
<td>(≥ 1,800 psi)</td>
<td>EVO 421460</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2000</td>
</tr>
<tr>
<td>4</td>
<td>243-812</td>
<td>EVO 421460 W 1)</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2000</td>
</tr>
<tr>
<td>4</td>
<td>285-951</td>
<td>EVO 440460</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2210</td>
</tr>
<tr>
<td>4</td>
<td>285-951</td>
<td>EVO 440460 W 1)</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2210</td>
</tr>
<tr>
<td>8</td>
<td>243-812</td>
<td>EVO 821460</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2000</td>
</tr>
<tr>
<td>8</td>
<td>285-951</td>
<td>EVO 821460 W 1)</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2000</td>
</tr>
<tr>
<td>8</td>
<td>285-951</td>
<td>EVO 840460</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2210</td>
</tr>
<tr>
<td>8</td>
<td>285-951</td>
<td>EVO 840460 W 1)</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2210</td>
</tr>
<tr>
<td>12</td>
<td>243-812</td>
<td>EVO 1221460</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2025</td>
</tr>
<tr>
<td>12</td>
<td>285-951</td>
<td>EVO 1221460 W 1)</td>
<td>66</td>
<td>4</td>
<td>VFD</td>
<td>2025</td>
</tr>
<tr>
<td>12</td>
<td>285-951</td>
<td>EVO 1240460</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2250</td>
</tr>
<tr>
<td>12</td>
<td>285-951</td>
<td>EVO 1240460 W 1)</td>
<td>66</td>
<td>10</td>
<td>VFD</td>
<td>2250</td>
</tr>
</tbody>
</table>

1) Model numbers with suffix W are pumps for weighing systems.
2) VFD = Variable Frequency Drive 18-60 Hz.

EVO Series

Number of Lifting Points: 4, 8, 12 (up to 48)

Reservoir Capacity: 66 gallon

Flow at Rated Pressure: 46 - 292 in³/min.

Motor Size: 4 - 10 hp

Maximum Operating Pressure: 10,000 psi

Stroke Sensors and Cables
Optional accessories required for each lifting point and stroke sensor.

EVO-Master Control Box
Required to link up to 4 standard EVO-pumps together to achieve a maximum of 48 lifting points. Contact Enerpac for more information.

Precision levelling caisson pier box: 3 EVO-Systems connected with 32 jacks lowered the 1100-ton bascule pier box.
Enerpac offers a wide variety of hydraulic pumps for all your custom needs.

Hydraulic pumps are at the heart of any hydraulic system. Different systems require different flow, pressure and control. Enerpac offers a wide variety of hydraulic pumps from small hand-operated pumps to large gasoline powered pumps. Still many applications require a customized pump to operate the system. These may include larger reservoir capacity, custom valve configurations or added electrical controls.

Enerpac also specializes in power units and controls used for synchronous lifting/lowering of multiple jacking points.

CUSTOMIZABLE FEATURES:
- Reservoir and Frame
- Valve Configurations
- Controls
- Oil Types
- Seals
- Pressure and Flow
- Coolers and Heaters
- Paint
- Motor Type
- Human Machine Interface (HMI)

Private labeled electric torque wrench pumps for OEMs.

Custom pumps with control packages.

Pumps with custom valve manifolds and circuits.
Enerpac 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.

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Series</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump-Mounted Directional Control Valves</td>
<td>VM, VE</td>
<td>140</td>
</tr>
<tr>
<td>Remote-Manual Directional Control Valves</td>
<td>VC</td>
<td>142</td>
</tr>
<tr>
<td>Valve Dimensions</td>
<td>VC, VM, VE</td>
<td>143</td>
</tr>
<tr>
<td>Modular/Solenoid Operated Directional Control Valves</td>
<td>VE</td>
<td>144</td>
</tr>
</tbody>
</table>

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.

Valving Help
See Basic System Set-Up and Valve Information in our ‘Yellow Pages’
VM, VE-Series, Directional Control Valves

Shown from left to right: VM32, VE33, VM33, VM43L, VE43

- 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

Venturi Valve Technology
- For fast return of single-acting gravity and spring-return cylinders
- Available as manual or solenoid valve on ZU4- and ZE-Series electric pumps
- Retrofit Venturi valve kits for field installation on existing ZU4- and ZE-Series electric pumps

For Reliable Control of Single and Double-Acting Cylinders

<table>
<thead>
<tr>
<th>Valve Operation</th>
<th>Used with Cylinder</th>
<th>Valve Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>Single-acting</td>
<td>3-Way 2 Position</td>
</tr>
<tr>
<td>Manual</td>
<td>Single-acting</td>
<td>3-Way 2 Position</td>
</tr>
<tr>
<td>Manual</td>
<td>Single-acting</td>
<td>3-Way 3 Position, Tandem Center</td>
</tr>
<tr>
<td>Manual</td>
<td>Single-acting ONLY</td>
<td>3-Way 3 Position, Tandem Center, Venturi Return Assist</td>
</tr>
<tr>
<td>Manual</td>
<td>Double-acting</td>
<td>4-Way 3 Position, Tandem Center</td>
</tr>
<tr>
<td>Manual</td>
<td>Single-acting</td>
<td>3-Way 3 Position, Tandem Center, Locking</td>
</tr>
<tr>
<td>Manual</td>
<td>Double-acting</td>
<td>4-Way 3 Position, Tandem Center, Locking</td>
</tr>
<tr>
<td>Solenoid 24 VDC</td>
<td>Single-acting</td>
<td>3-Way 2 Position</td>
</tr>
<tr>
<td>Solenoid 24 VDC</td>
<td>Single-acting</td>
<td>3-Way 2 Position, Dump</td>
</tr>
<tr>
<td>Solenoid 24 VDC</td>
<td>Single-acting ONLY</td>
<td>3-Way 3 Position, Tandem Center, Venturi Return Assist</td>
</tr>
<tr>
<td>Solenoid 24 VDC</td>
<td>Single-acting</td>
<td>3-Way 3 Position, Tandem Center</td>
</tr>
<tr>
<td>Solenoid 115 VAC</td>
<td>Single-acting</td>
<td>3-Way 3 Position, Tandem Center</td>
</tr>
<tr>
<td>Solenoid 24 VDC</td>
<td>Double-acting</td>
<td>4-Way 3 Position, Tandem Center</td>
</tr>
<tr>
<td>Solenoid 115 VAC</td>
<td>Double-acting</td>
<td>4-Way 3 Position, Tandem Center</td>
</tr>
</tbody>
</table>

For remote valve applications, see page 142.

Adjustable Relief Valve
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.

Locking Valves
For applications that require positive load holding, VM-Series valves (except VM22 and VM32) 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.
Assisted Return Pumps
To improve productivity and plunger retraction, Enerpac offers valve configurations designed to accelerate your cylinder retraction speeds. ZU and ZE-Series pumps feature Venturi valve technology to facilitate the faster return of single-acting gravity return cylinders. See details on [www.enerpac.com](http://www.enerpac.com).

### Pump Mounted Directional Control Valves

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Hydraulic Symbol</th>
<th>Schematic Flowpath</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM22</td>
<td><img src="schematic1.png" alt="Schematic" /></td>
<td><img src="flowpath1.png" alt="Flowpath" /></td>
<td>5.6</td>
</tr>
<tr>
<td>VM32</td>
<td><img src="schematic2.png" alt="Schematic" /></td>
<td><img src="flowpath2.png" alt="Flowpath" /></td>
<td>5.6</td>
</tr>
<tr>
<td>VM33</td>
<td><img src="schematic3.png" alt="Schematic" /></td>
<td><img src="flowpath3.png" alt="Flowpath" /></td>
<td>6.7</td>
</tr>
<tr>
<td>VM33VAC</td>
<td><img src="schematic4.png" alt="Schematic" /></td>
<td><img src="flowpath4.png" alt="Flowpath" /></td>
<td>7.5</td>
</tr>
<tr>
<td>VM43</td>
<td><img src="schematic5.png" alt="Schematic" /></td>
<td><img src="flowpath5.png" alt="Flowpath" /></td>
<td>6.8</td>
</tr>
<tr>
<td>VM33L</td>
<td><img src="schematic6.png" alt="Schematic" /></td>
<td><img src="flowpath6.png" alt="Flowpath" /></td>
<td>10.7</td>
</tr>
<tr>
<td>VM43L</td>
<td><img src="schematic7.png" alt="Schematic" /></td>
<td><img src="flowpath7.png" alt="Flowpath" /></td>
<td>10.8</td>
</tr>
<tr>
<td>VE32 1)</td>
<td><img src="schematic8.png" alt="Schematic" /></td>
<td><img src="flowpath8.png" alt="Flowpath" /></td>
<td>8.7</td>
</tr>
<tr>
<td>VE32D 1)</td>
<td><img src="schematic9.png" alt="Schematic" /></td>
<td><img src="flowpath9.png" alt="Flowpath" /></td>
<td>8.7</td>
</tr>
<tr>
<td>VE33VAC 1)</td>
<td><img src="schematic10.png" alt="Schematic" /></td>
<td><img src="flowpath10.png" alt="Flowpath" /></td>
<td>22</td>
</tr>
<tr>
<td>VE33 1)</td>
<td><img src="schematic11.png" alt="Schematic" /></td>
<td><img src="flowpath11.png" alt="Flowpath" /></td>
<td>20.3</td>
</tr>
<tr>
<td>VE33-115</td>
<td><img src="schematic12.png" alt="Schematic" /></td>
<td><img src="flowpath12.png" alt="Flowpath" /></td>
<td>20.3</td>
</tr>
<tr>
<td>VE43 1)</td>
<td><img src="schematic13.png" alt="Schematic" /></td>
<td><img src="flowpath13.png" alt="Flowpath" /></td>
<td>20.3</td>
</tr>
<tr>
<td>VE43-115</td>
<td><img src="schematic14.png" alt="Schematic" /></td>
<td><img src="flowpath14.png" alt="Flowpath" /></td>
<td>20.3</td>
</tr>
</tbody>
</table>

1) When ordering Enerpac VE-Series solenoid valves, the pendant must be ordered separately for Z-Class Pumps. See page 143 for product dimensions.

### VM, VE Series

**Flow Capacity:**
4.5 gal/min.

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

**Assisted Return Pumps with Venturi Valve Technology**
To improve productivity and plunger retraction, Enerpac offers valve configurations designed to accelerate your cylinder retraction speeds. ZU and ZE-Series pumps feature Venturi Valve Technology to facilitate the faster return of single-acting gravity return cylinders. See valve type in ZU4 and ZE-pump ordering matrix on pages 109 and 115.

**Venturi Valve Retrofit Kits**
For field installation on existing ZU4, ZE and ZA-Series pumps, Retrofit Kits are available for manual and solenoid operated valves.

<table>
<thead>
<tr>
<th>For Valve Model</th>
<th>For Valve Operation</th>
<th>Pendant</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM33, VM33L</td>
<td>Manual</td>
<td>VM33RVK</td>
</tr>
<tr>
<td>VE33</td>
<td>Solenoid</td>
<td>VUV5</td>
</tr>
</tbody>
</table>
- Advance/Hold/Retract operation for use with single-acting or double-acting cylinders
- Return line kit included with remote valves

<table>
<thead>
<tr>
<th>Valve Operation</th>
<th>Used with Cylinder</th>
<th>Valve Type</th>
<th>Model Number</th>
<th>Hydraulic Symbol</th>
<th>Schematic Flowpath</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>Single Acting</td>
<td>3-Way, 3 Position, Tandem Center</td>
<td>VC3</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>6.4</td>
</tr>
<tr>
<td>Manual</td>
<td>Single Acting</td>
<td>3-Way, 3 Position, Tandem Center, Locking</td>
<td>VC3L</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>10.3</td>
</tr>
<tr>
<td>Manual</td>
<td>Single Acting</td>
<td>3-Way, 3 Position, Closed Center</td>
<td>VC15</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>6.4</td>
</tr>
<tr>
<td>Manual</td>
<td>Single Acting</td>
<td>3-Way, 3 Position, Closed Center, Locking</td>
<td>VC15L</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>10.3</td>
</tr>
<tr>
<td>Manual</td>
<td>Double Acting</td>
<td>4-Way, 3 Position, Tandem Center</td>
<td>VC4</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>6.4</td>
</tr>
<tr>
<td>Manual</td>
<td>Double Acting</td>
<td>4-Way, 3 Position, Tandem Center, Locking</td>
<td>VC4L</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>10.3</td>
</tr>
<tr>
<td>Manual</td>
<td>Double Acting</td>
<td>4-Way, 3 Position, Closed Center</td>
<td>VC20</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>6.4</td>
</tr>
<tr>
<td>Manual</td>
<td>Double Acting</td>
<td>4-Way, 3 Position, Closed Center, Locking</td>
<td>VC20L</td>
<td><img src="image" alt="Hydraulic Symbol" /></td>
<td><img src="image" alt="Schematic Flowpath" /></td>
<td>10.3</td>
</tr>
</tbody>
</table>

Return line kit included with remote valves
Pump Mounted Directional Control Valves

Valve dimensions in inches.

1) User Adjustable Relief Valve
2) Auxiliary Port

VM22, VM32

VM33, VM33L, VM43, VM43L

1) VM33VAC, VM33L and VM43L only

Remote Manual Directional Control Valves

VC3, VC3L, VC15, VC15L
VC4, VC4L, VC20, VC20L

2) VC3L, VC15L, VC4L and VC20L only

Valves, VM, VE-Series

Flow Capacity:
4.5 gal/min.

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.

Fittings
For additional fittings see the fitting page of the System Components section.

Valving Help
See Basic System Set-Up and Valve Information in our ‘Yellow Pages’
VE-Series, Solenoid Operated Modular Valves

• 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

<table>
<thead>
<tr>
<th>Valve Flow Path</th>
<th>Used with Cylinder</th>
<th>Valve Code</th>
<th>Hydraulic Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Way, 3-Position (4/3) Open Center</td>
<td>Double-acting</td>
<td>A</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>4-Way, 3-Position (4/3) Closed Center</td>
<td>Double-acting</td>
<td>B</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>4-Way, 3-Position (4/3) Tandem Center</td>
<td>Double-acting</td>
<td>C</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>4-Way, 3-Position (4/3) Float Center</td>
<td>Double-acting</td>
<td>D</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>4-Way, 2-Position (4/2) Crossover Offset</td>
<td>Double-acting</td>
<td>E</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>3-Way, 3-Position (3/3) Tandem Center</td>
<td>Single-acting</td>
<td>F</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>3-Way, 3-Position (3/3) Closed Center</td>
<td>Single-acting</td>
<td>G</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>2-Way, 2-Position (2/2) Normally Closed</td>
<td>System</td>
<td>H*</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>2-Way, 2-Position (2/2) Normally Open</td>
<td>Un-loading</td>
<td>K*</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>4-Way, 2-Position (4/2) Float Offset</td>
<td>Double-acting</td>
<td>M</td>
<td>![Hydraulic Symbol]</td>
</tr>
<tr>
<td>3-Way, 2-Position (3/2) Normally Open</td>
<td>Single-acting</td>
<td>P</td>
<td>![Hydraulic Symbol]</td>
</tr>
</tbody>
</table>

*Requires use of tank port for dump or unloading.

Unmatched Combinations and Possibilities

3-Way Check Valve
Use a VS51 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 VS61 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 VS11 Relief Valve assembly.

Bolt Kits for Accessory Valves With No Manifold
Order Bolt Kit BK2 when adding one of the accessory valves. Order Bolt Kit BK3 when adding any combination of two accessory valves.

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.

Shown top to bottom: VEC15600D, VEK15000B, VEC15000B

www.enerpac.com
### CUSTOM BUILD YOUR MODULAR VALVES

This is how a Modular Valve Model Number is built up:

<table>
<thead>
<tr>
<th>Solenoid Operated Valve (VE)</th>
<th>Valve Flow Path (A)</th>
<th>Flow Capacity (1)</th>
<th>Voltage (4)</th>
<th>Accessory Valves (5)</th>
<th>Manifold (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>VE</td>
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</tr>
</tbody>
</table>

#### 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

#### 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**

### Pressure Drop versus Oil Flow

- Graph showing differential pressure drop vs. oil flow.

### Example: VEA15600-D

VEA15600-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.

### Modular Valve Pump Mounted

- 1/4"-18NPTF
- Position 0
- Relief Valve
- 3/8"-18NPTF Tank port
- 1.00 0.62 0.38
- 3.50 2.09 1.12
- 0.38 0.75 2.08
- 3.48 3.00 2.46

### Modular Valve Remote Mount Manifold

- 1.75 3.50 0.75
- 1.75 0.75 1.25

### Maximum Operating Pressure

<table>
<thead>
<tr>
<th>Amperage Draw</th>
<th>Seal Material</th>
<th>Valve Plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC 115 VAC 60 Hz</td>
<td>230 V 60 Hz</td>
<td>N/A Inrush 3.6 A Inrush 1.8 A Inrush</td>
</tr>
<tr>
<td>0 - 10,000</td>
<td></td>
<td>2.5 A Holding 1.0 A Holding 0.5 A Holding</td>
</tr>
</tbody>
</table>