Power sources

Whether you need to run your parts once a day or 24 hours a day, Enerpac has the power source to help you get the job done. Power sources range from simple manual pumps to air operated, to fully customizable electric motor driven units.

With a wide variety of accessories to choose from, Enerpac power units are easily the most versatile and reliable in the industry.

Technical support

Refer to the “Yellow Pages” of this catalog for:

- Safety instructions
- Basic hydraulic information
- Advanced hydraulic technology
- FMS (Flexible Machining Systems) technology
- Conversion charts and hydraulic symbols
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<tr>
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<th>Page</th>
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<td>ZW</td>
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</tr>
<tr>
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<td>ZW</td>
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<td>Electric submerged pumps and ordering matrix</td>
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<td>Hand pumps</td>
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<td>113</td>
</tr>
<tr>
<td>Air-hydraulic boosters</td>
<td>AHB, B</td>
<td>114-115</td>
</tr>
<tr>
<td>Activator wand &amp; boosters</td>
<td>B, RA</td>
<td>116-117</td>
</tr>
<tr>
<td>Pressure intensifiers</td>
<td>PID</td>
<td>118-119</td>
</tr>
</tbody>
</table>
Quick and powerful hydraulic supply in an economical air-powered unit

- On-demand stall-restart operation maintains system pressure, providing clamping security
- External adjustable pressure relief valve (behind sight glass)
- Internal pressure relief valve provides overload protection
- Reduced noise level to 75 dBA
- Operating air pressure: 50-125 psi – enables pump to start at low air pressure
- Reinforced heavy-duty lightweight reservoir for applications in tough environments
- Five valve mounting options provide flexibility in setup and operation
- Fully serviceable air motor assembly

Turbo II air hydraulic pumps generate the hydraulic pressure you need using the air pressure you have available. The Air Saver Piston reduces air consumption and operating costs. They are ideal for providing the power and speed desired in simple clamping circuits. Turbo II air-hydraulic pumps are best suited to medium and lower cycle applications. At only 75 dBA, the Turbo II series help to keep noise level to a minimum.

Select the required output

3000 series
- Hydraulic to air ratio: 45:1

5000 series
- Hydraulic to air ratio: 60:1

** NOTE: From 50-125 psi air inlet pressure. Performance is significantly diminished below 50 psi. Performance may vary compared to listed values due to seal friction, internal pressure drops and manufacturing tolerances. Be sure to allow some flexibility on air inlet pressure.

Output oil flow
Select the required output:

**PATG series**
- Momentary air inlet treadle for operation of single-acting cylinders
- Provides advance, hold and retract functions

**PACG series**
- Momentary or continuous air inlet treadle
- A remote valve is required for operation of cylinders

**PASG series**
- Momentary or continuous air inlet treadle
- Suitable for mounting any single- or double-acting valve with a DO3 mounting configuration
- Available with multiple valve manifold

**PAMG series**
- Momentary or continuous air inlet treadle
- Manual 4-way, 3-position, tandem center valve for single- or double-acting operation

**PARG series**
- Includes 15 ft. air pendant for remote control of single-acting cylinders
- Provides advance, hold and retract functions

### Options

- Gauges and accessories
- Regulator-filter-lubricator

### Important

For high cycle applications electric pumps are recommended.
PA series  Dimensions & options

2-Liter reservoir

**PATG series**

- 3/8"-18 NPTF
- 2/3"-18 NPTF

**PACG series**

- 3/8"-18 NPTF
- 2/3"-18 NPTF

**PASG series**

- 3/8"-18 NPTF
- 2/3"-18 NPTF

**PAMG series**

- 3/8"-18 NPTF
- 2/3"-18 NPTF

**PARG series**

- 3/8"-18 NPTF
- 2/3"-18 NPTF

PACG series include pressure gauge G-2517L.

All dimensions in inches.

1. Auxiliary vent/tank fill port
2. Hydraulic output
3. Gauge mounting port
4. Swivel air input with filter
5. Filtered permanent tank vent
6. Adjustable pressure relief valve
7. Air pendant air input

**Product selection**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model numbers 3000 series</th>
<th>Model numbers 5000 series</th>
<th>Usable oil capacity</th>
<th>Air pressure range</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>horizontal mount</td>
<td>psi</td>
<td>scfm lbs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vertical mount</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand/foot 3-way</td>
<td>PATG-3102NB</td>
<td>PATG-5102NB</td>
<td>120 in³ min</td>
<td>50-125</td>
<td>12 19</td>
</tr>
<tr>
<td>Hand 4-way</td>
<td>PAMG-3402NB</td>
<td>PAMG-5402NB</td>
<td>120 in³ min</td>
<td>50-125</td>
<td>12 25</td>
</tr>
<tr>
<td>Remote 3-way pendant</td>
<td>PARG3102NB</td>
<td>PARG-5102NB</td>
<td>120 in³ min</td>
<td>50-125</td>
<td>12 23</td>
</tr>
</tbody>
</table>

**Factory supplied valves**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model numbers 3000 series</th>
<th>Model numbers 5000 series</th>
<th>Usable oil capacity</th>
<th>Air pressure range</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>horizontal mount</td>
<td>psi</td>
<td>scfm lbs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vertical mount</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**User supplied valves**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model numbers 3000 series</th>
<th>Model numbers 5000 series</th>
<th>Usable oil capacity</th>
<th>Air pressure range</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>horizontal mount</td>
<td>psi</td>
<td>scfm lbs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vertical mount</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) At 0 psi hydraulic and 100 psi air pressure.
2) Turbo air-hydraulic pumps are also available with 305 in³ reservoir. To order replace 2 in model number with 5.
## 2-Gallon reservoir

- **All models**
- **PACG series**
- **PAMG series**
- **PASG series**
- **PARG series**
- **PATG series**

### Options

#### Gauges and accessories

- **E154**

#### Regulator-filter-lubricator

- **E142**

Shown: PACG30S8S-WM10

### Product selection

<table>
<thead>
<tr>
<th>Description</th>
<th>Model numbers 3000 series</th>
<th>Model numbers 5000 series</th>
<th>Usable oil capacity</th>
<th>Air pressure range</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factory supplied valves</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand/foot 3-way</td>
<td>PATG-31SSN</td>
<td>PATG-51SSN</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Hand 4-way</td>
<td>PAMG-34SSN</td>
<td>PAMG-54SSN</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Remote 3-way pendant</td>
<td>PARG-31SSN</td>
<td>PARG-51SSN</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td><strong>User supplied valves</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote mount</td>
<td>PACG-30SSS</td>
<td>PACG-50SSS</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Pump mount, Single DO3 Valve</td>
<td>PAG-30SSS</td>
<td>PAG-50SSS</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Pump mount, Two DO3 Valves</td>
<td>PACG-30SSS-MB2</td>
<td>PACG-50SSS-MB2</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Pump mount, Four DO3 Valves</td>
<td>PACG-30SSS-MB4</td>
<td>PACG-50SSS-MB4</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
<tr>
<td>Pump mount, (1-8) VP Valves</td>
<td>PACG-30SSS-WM10</td>
<td>PACG-50SSS-WM10</td>
<td>462</td>
<td>50-125</td>
<td>12</td>
</tr>
</tbody>
</table>

*At 0 psi hydraulic and 100 psi air pressure.*
Portable air hydraulic power

- Patented air saver design - minimal air usage for lower cost operation
- Quiet internal air muffler 80 dBA
- 360° swivel oil and air fittings for easier system setup
- External adjustable relief valve
- Built-in 3-way, 2-position valve provides advance-retract cycle operation for single-acting cylinders

PA series

Compact, lightweight, air driven power source. Treadle start on pump activates pump operation. Best choice for single-acting cylinders.

These PA series air hydraulic pumps operate in all positions. Here, a PA-135 is mounted vertically to a clamping fixture.

Product selection

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>Max. oil flow</th>
<th>Max. hydraulic pressure</th>
<th>Model number</th>
<th>Valve function</th>
<th>Air pressure range</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>in³</td>
<td>in³/min</td>
<td>psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.6</td>
<td>60</td>
<td>5000</td>
<td>PA-135</td>
<td>Advance/Retract</td>
<td>60-100</td>
<td>20</td>
</tr>
<tr>
<td>36.6</td>
<td>120</td>
<td>3000</td>
<td>PA-136</td>
<td>Advance/Retract</td>
<td>60-100</td>
<td>12</td>
</tr>
</tbody>
</table>

* At 0 psi hydraulic pressure.
Note: Seal material: Buna-N, Teflon, Polyurethane.
## Select your pump type

### Air operated pump
Best choice for large circuits with intermittent or medium duty applications. Air operated pumps have lower flow rates than electric pumps, but are more economical.

### Electric operated pump
Best choice for large circuits with medium or high-duty applications. Electric operated pumps have the highest flow rates available and can be configured with many different accessories.

### Air hydraulic booster
Best choice for small circuits with intermittent or medium-duty applications. Air hydraulic boosters provide a single shot of oil to your circuit at high pressure.

### Oil to oil intensifier
Best choice for small circuits with medium- or high-duty applications. Oil to oil intensifiers use machine tool hydraulic pressure and boost it to higher clamping pressure directly on the fixture.

## Select your pump options

### Reservoir size
Choose a reservoir size that holds enough oil to fill all of your lines, manifolds and cylinders, with enough reserve for future needs. Each Enerpac cylinder has an oil capacity listed on its product page, and each power unit has a reservoir capacity listed.

### Valve type
Directional valves allow you control over what portion of the circuit receives oil. Valves can be operated manually, by electric solenoid or by air pilot pressure. Multiple valves can be used with one power unit to control multiple circuits.

### Accessories
For increased automation, electric pumps can be outfitted with additional accessories, including pressure switches, level switches, and control pendants. These options can either be factory installed or added to an existing power unit in the future.

## Options

- **Manual valves**
  - 127, 132-135

- **Electric valves**
  - 119, 120, 122-123

- **Air operated valves**
  - 126

## Important

- 231 cubic inches = 1 US gal.
- 61 cubic inches = 1 liter
- 1 US gallon = 3.785 liters

## Pressure
- 960-10,000 psi

## Flow rate
- 40-640 in³/min

## Reservoir
- Up to 10 gal
Z-Class electric pumps are designed for use in the harshest manufacturing environments. The pumps provide reliable and durable performance in a wide variety of configurations.

### Basic configurations

All pumps listed in this chart include LCD electrical box, 5 gallon reservoir, return line filter and either 0-6000 psi pressure gauge or pressure transducer (solenoid valve models). For additional options, see the complete pump matrix on page 106.

<table>
<thead>
<tr>
<th>ZW-Series with manifold</th>
<th>Pump type</th>
<th>Valve/manifold type</th>
<th>Motor voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Used when supplying pressure to multiple valve circuits</td>
<td>Pressure and tank ports</td>
<td>Enerpac VP-series</td>
<td>230 VAC, 3 ph</td>
</tr>
<tr>
<td>• Valves must be supplied separately</td>
<td>Single station DO3</td>
<td>Two station DO3</td>
<td>230 VAC, 3 ph</td>
</tr>
<tr>
<td></td>
<td>Enerpac VP-series</td>
<td>Four station DO3</td>
<td>230 VAC, 3 ph</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZW-Series with pallet de-coupling valve</th>
<th>4-way, 3-pos. solenoid operated</th>
<th>115 VAC, 1 ph</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides momentary pressure and flow to fixture</td>
<td>4-way, 3-pos. solenoid operated</td>
<td>230 VAC, 3 ph</td>
</tr>
<tr>
<td>• Ideal for pallet disconnect systems</td>
<td>4-way, 3-pos. solenoid operated</td>
<td>460 VAC, 3 ph</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZW-Series with continuous connection valve</th>
<th>4-way, 3-pos. solenoid operated</th>
<th>115 VAC, 1 ph</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides solenoid control of one single or double-acting circuit</td>
<td>4-way, 3-pos. solenoid operated</td>
<td>230 VAC, 3 ph</td>
</tr>
<tr>
<td>• Control valve supplied with integrated pilot operated check to ensure positive pressure holding</td>
<td>4-way, 3-pos. solenoid operated</td>
<td>460 VAC, 3 ph</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZW-Series with manual valve</th>
<th>4-way, 3-pos. manually operated</th>
<th>115 VAC, 1 ph</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides manual control of one single or double-acting circuit</td>
<td>4-way, 3-pos. manually operated</td>
<td>230 VAC, 3 ph</td>
</tr>
<tr>
<td>• Control valve supplied with center holding function to ensure positive position holding</td>
<td>4-way, 3-pos. manually operated</td>
<td>460 VAC, 3 ph</td>
</tr>
</tbody>
</table>

### The new standard for workholding applications

- Features Z-Class high-efficiency pump design; higher oil flow and by-pass pressure, cooler running and requires 18% less current than comparable pumps
- Totally enclosed, fan cooled industrial electric motors supply extended life and stand up to harsh industrial environments
- Multiple valve and reservoir configurations provide application specific models to match the most demanding workholding applications
- High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from coolant and contamination
Output oil flow and current draw

**Important**

Single-stage pumps provide constant flow throughout the entire pressure range via a radial piston pump. Two-stage pumps provide high flow via a gear pump until the bypass pressure is reached. At pressures above the bypass setting, the radial piston pump provides flow to the maximum pressure.

**ZW4 Series**
Output oil flow at 5000 psi
60 in³/min
LCD Electric Model Number

- ZW4020HG-FG01
- ZW4020HG-FG11
- ZW4020HG-FG12
- ZW4020HG-FG21
- ZW4020HG-FG41

- ZW4420DB-FT
- ZW4420DG-FT
- ZW4420DJ-FT

**ZW5 Series**
Output oil flow at 5000 psi
120 in³/min
LCD Electric Model Number

- ZW5020HG-FG01
- ZW5020HG-FG11
- ZW5020HG-FG12
- ZW5020HG-FG21
- ZW5020HG-FG41

- ZW5420DB-FT
- ZW5420DG-FT
- ZW5420DJ-FT

**Important**

All Z-Class electric pumps are CSA and CE compliant.

LCD electrical package is required for pumps utilizing electric valves, or optional accessories such as the pressure transducer, level switch, pressure switch or heat exchanger.
Electric pumps

*Dimensions & options*

Shown: ZW5020HB-FT01

- Efficient design reduces heat generation and reduces power consumption
- Balanced pump section reduces vibration improving durability and sound levels
- Optional back-lit LCD readout provides hour and cycle counts, low voltage warnings and pressure read-out when used with pressure transducer
- Low-voltage pendant on solenoid valve models with sealed switches improves operator safety
- **Z-Class** electric pumps are supplied with factory installed accessories such as valve manifold, pressure transducer, and return line filter, creating a complete power unit solution

**Options**

**User adjustable relief valve**

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

**Product dimensions** in inches [\(\text{E} \times \text{F}\)]

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>ZW Series pump dimensions (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>gal</td>
<td>A</td>
</tr>
<tr>
<td>1.0</td>
<td>5.6</td>
</tr>
<tr>
<td>2.0</td>
<td>8.1</td>
</tr>
<tr>
<td>2.5</td>
<td>6.1</td>
</tr>
<tr>
<td>5.0</td>
<td>7.1</td>
</tr>
<tr>
<td>10.0</td>
<td>10.6</td>
</tr>
</tbody>
</table>

**Product selection**

<table>
<thead>
<tr>
<th>Output flow rate in/min</th>
<th>Pump series</th>
<th>Motor size</th>
<th>Relief Valve adjustment range</th>
<th>Sound level</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 psi</td>
<td>ZW4</td>
<td>1.0</td>
<td>1,000-5,000</td>
<td>75</td>
</tr>
<tr>
<td>350</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>305</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>630</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>602</td>
<td>ZW5</td>
<td>1.5</td>
<td>1,000-5,000</td>
<td>75</td>
</tr>
<tr>
<td>123</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Motor: 1.0 & 1.5 hp
Reservoir: 2.5-10 gallon

- Flow rate: 60-120 in³/min
- Pressure: 5000 psi
- 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 (Optional w/manual valve)
- Heat Exchanger (Optional)
- Roll Bar (Optional)
- Return Line Filter (Optional)
- Skid Bar (Optional)
- Oil Drain
- Oil Level/Temperature Switch (Optional)
Return line filter and heat exchanger kits

ZPF, ZHE series

Extend life of hydraulic components

...increase system reliability

- 25 micron nominal filter cleans oil to increase system life
- Internal bypass valve to prevent damage if the filter is dirty
- All installation components included
- Kit assembles quickly and easily to Enerpac pump and manifold
- Maintenance indicator included

Product selection

<table>
<thead>
<tr>
<th>Nominal filtration</th>
<th>Model number</th>
<th>Maximum pressure</th>
<th>Maximum oil flow</th>
<th>Bypass pressure setting</th>
<th>Filter gauge service indicator</th>
<th>Pressure drop vs oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>micron</td>
<td></td>
<td>psi</td>
<td>gpm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>ZPF</td>
<td>200</td>
<td>12.0</td>
<td>25</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transfer: 900 Btu/h

Pressure: max. 300 psi

Voltage: 24V

Extends system life

- Electrical connector factory installed
- All installation components included
- Stabilizes oil temperature at a maximum of 130° F at 70° F ambient temperature
- Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components

Product selection

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Model number</th>
<th>Thermal transfer*</th>
<th>Amperage draw</th>
<th>Maximum pressure</th>
<th>Maximum oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC</td>
<td>ZHE-E10</td>
<td>900 Btu/h</td>
<td>.95 A</td>
<td>300</td>
<td>7.0 gpm</td>
</tr>
</tbody>
</table>

*At 0.5 g/min and ambient temperature of 70° F.
**Level/temp switch & pressure transducer**

**ZLS, ZPT series**

**Electronic level/temp switch for feedback on pump oil level**
- Drop-in design allows for easy installation to pump reservoir
- Electrical connector included
- Built-in thermal sensing provides feedback on oil temperature
- Senses low oil level in pump reservoir

**ZLS series**
Oil level indicator for pump reservoir. If the pump is mounted in a remote area that does not provide visual access to the external oil level sight glass, the level/temp switch will turn off the pump before internal damage can occur due to cavitations.

**Product Selection**

<table>
<thead>
<tr>
<th>Fixed temperature signal</th>
<th>Model number</th>
<th>Voltage</th>
<th>Thermostat rating setting</th>
<th>Maximum pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td></td>
<td></td>
<td>Amps</td>
<td>psi</td>
</tr>
<tr>
<td>175</td>
<td>ZLS-U4</td>
<td>24 VAC/DC</td>
<td>2.6</td>
<td>150</td>
</tr>
</tbody>
</table>

**Control your pump, monitor pressure**

**ZPT pressure transducer**
- More durable than analog gauges (against mechanical and hydraulic shock)
- More accurate than analog gauges (0.5% full scale)
- Calibration can be fine tuned for certification
- “Auto-mode” provides automatic pressure make-up
- Display pressure in psi, bar or MPa

**ZPT/ZPS series**
ZPT pressure transducer provides constant pressure monitoring for automated pump control. ZPS pressure switch shuts down motor at set pressure.

**Product Selection**

<table>
<thead>
<tr>
<th>Adjustable</th>
<th>Electrical specification</th>
<th>Model number</th>
<th>Accuracy (full scale)</th>
<th>Deadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td></td>
<td>ZPT-U4</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>50-10,000</td>
<td>4-20 mA</td>
<td>ZPT-U4</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>500-10,000</td>
<td>24 VAC/DC N.O.</td>
<td>ZPS-W4</td>
<td>2%</td>
<td>115-550</td>
</tr>
</tbody>
</table>

**Important**

The pressure transducer is factory installed in the “A” port on pumps supplied with valves, and in the “P” port on models with manifolds.

**Voltage:** 24 VAC/DC

**Temp. set point:** 175 °F

**E** Indicador del nivel/temp.

**F** Interrupteur de niveau/temp.

**D** Ölstand/Temperaturschalter

**E  Presión transductor**

**F  Pressostats**

**D  Druckschalter**

Note: Electrical harness included with kit. ZPS-W4 includes 0-6000 psi pressure gauge.
Valve manifold

**Pressure:** 5000 psi

**Stations:**
- 1-4 valves horizontal
- 1-8 valves vertical

**Options**
- Colectores
- Manifolds
- Verkettungsblöcke

**Increased flexibility for complex systems**
- Manifolds provide hydraulic connection to remote or pump mounted valves
- Used when multiple valves are required for controlling several independent circuits
- Available for 2 and 4 station DO3 as well as Enerpac VP series mounting
- Pressure and tank porting manifold available for use with remote valve sticks
- Manifolds include integrated relief valve for system pressure control

**Product Selection**

<table>
<thead>
<tr>
<th>Valve mounting pattern</th>
<th>Option code (see page 106)</th>
<th>Number of stations</th>
<th>Coverplate model number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porting manifold, SAE ports</td>
<td>01</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Enerpac VP Series</td>
<td>12</td>
<td>1-8</td>
<td>–</td>
</tr>
<tr>
<td>2 station DO3</td>
<td>21</td>
<td>2</td>
<td>MC-1</td>
</tr>
<tr>
<td>4 station DO3</td>
<td>41</td>
<td>4</td>
<td>MC-1</td>
</tr>
</tbody>
</table>
The new Enerpac Pallet De-Coupling Pump provides three modes of operation:

**Manual mode**
Pump runs as long as operator holds down pendant button.

**AUTO mode without timer**
Pump runs until user-adjustable pressure setting is reached.

**AUTO mode with timer**
Pump runs until pressure setting is reached, and adjustable timer runs out.

**Automatic pressure control for palletized fixtures**
- Programmable clamp and unclamp pressure settings increase automation capability
- Programmable dwell settings ensure desired pressure level is maintained on large circuits or circuits with accumulators
- Low-voltage pendant features sealed switches and operates at 15 VDC for improved operator safety
- Backlit LCD provides pump usage information, hour and cycle counts

**Example Circuits**
- Double-acting circuit
- Single-acting circuit

ZW5410DB-FT used to connect and disconnect a palletized fixture.

**Product selection**

<table>
<thead>
<tr>
<th>Output flow rate @ max. pressure</th>
<th>Motor size</th>
<th>Motor voltage</th>
<th>Model number</th>
<th>Pressure range</th>
<th>Sound level</th>
<th>Usable oil capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>gal/min</td>
<td>psi</td>
<td>dBA</td>
<td>gal</td>
<td>lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>1.0</td>
<td>115-1-60</td>
<td>ZW4410DB-FT</td>
<td>1000-5000</td>
<td>75</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>230-3-60</td>
<td>ZW4410DG-FT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>460-3-60</td>
<td>ZW4410DJ-FT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>1.5</td>
<td>115-1-60</td>
<td>ZW5410DB-FT</td>
<td>1000-5000</td>
<td>75</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>230-3-60</td>
<td>ZW5410DG-FT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>460-3-60</td>
<td>ZW5410DJ-FT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Efficient design reduces heat generation and power consumption
- Balanced pump section reduces vibration improving durability and sound levels
- Low-voltage pendant with sealed switches improves operator safety
- Available in wide variety of reservoirs sized from 1 to 10 gallons
- Extensive list of accessories including
  - Heat exchanger
  - Roll-bars
  - Pressure transducer
  - Level and temperature switches

**Operation – pallet de-coupling pump**

**Manual mode**
Motor and pump operate only when operator presses and holds the up (or down) arrow on the pendant. When button is released, pressure in the hoses is relieved.

**AUTO mode**
*With DWELL timer set equal to zero,* operator starts the motor by pressing and holding the up (or down) arrow on the pendant. Pump builds to pressure on the clamp (or unclamp) circuit until it reaches customer programmed setting. The motor immediately turns off and pressure in the hoses is relieved.

*With DWELL timer set greater than zero,* operator starts the motor by pressing the up (or down) arrow on the pendant. Once the pump reaches the programmed setting, the DWELL timer starts. When the timer runs out, the motor stops and pressure in the hoses is relieved.

---

**Important**
Enerpac recommends a pressure differential of no less than 200 psi for most applications. If you believe your application requires a tighter differential, please contact us directly.

---

**Options**
- Heat exchanger
- Level switch
- Pressure transducer
- Return line filter

**Product dimensions** in inches

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>Model number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>H</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>gal</td>
<td></td>
<td>5.6</td>
<td>11.0</td>
<td>6.0</td>
<td>20.2</td>
<td>86</td>
</tr>
<tr>
<td>ZW4</td>
<td>ZWxx04xx</td>
<td>5.6</td>
<td>11.0</td>
<td>6.0</td>
<td>20.2</td>
<td>86</td>
</tr>
<tr>
<td>ZW5</td>
<td>ZWxx08xx</td>
<td>8.1</td>
<td>11.0</td>
<td>8.1</td>
<td>22.6</td>
<td>93</td>
</tr>
</tbody>
</table>

**Important**
For complete ordering matrix of all factory-installed options visit www.enerpac.com
Continuous connection pumps  

**Application & selection**

Shown: ZW4420FB-FT

The new Enerpac Continuous Connection Pump provides two modes of operation:

**Manual mode**

Pump runs continuously, building pressure as long as operator holds down pendant button.

**AUTO mode**

Pump runs continuously, maintaining user-set pressure window on clamp circuit as long as necessary.

ZW4410FB-FT used to control clamping cycle on a horizontal machining center.

**Automatic pressure control for continuous connection fixtures**

- Programmable pressure setting allows pump to maintain system pressure continuously
- Includes pilot operated check valve ensuring pressure is maintained in circuit
- Z-Class high-efficiency pump design; featuring higher oil flow and by-pass pressure than comparable pumps
- High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh industrial environments

**Example Circuits**

- Double-acting circuit

**Product selection**

```
<table>
<thead>
<tr>
<th>Model number</th>
<th>Pressure range</th>
<th>Sound level</th>
<th>Usable oil capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZW4410FB-FT</td>
<td>1000-5000</td>
<td>75</td>
<td>2.5</td>
</tr>
<tr>
<td>ZW5410FB-FT</td>
<td>1000-5000</td>
<td>75</td>
<td>2.5</td>
</tr>
</tbody>
</table>
```

ZW4410FB-FT

ZW4410FG-FT

ZW4410FJ-FT

ZW5410FB-FT

ZW5410FG-FT

ZW5410FJ-FT

ZW5410FB-FT

ZW5410FG-FT

ZW5410FJ-FT

ZW5410FB-FT
Output oil flow and current draw

**ZW4 Oil flow & current vs hydraulic pressure**

**ZW5 Oil flow & current vs hydraulic pressure**

Operation – continuous connection pump

**Manual mode**
The operator turns the pump motor on, and then presses and holds the up arrow on the pendant. When the button is released, the valve shifts to neutral, but pressure is maintained in the clamp circuit by the pilot-operated check valve. When the operator presses and holds the down arrow on the pendant, pressure in the clamp circuit will release, and the fixture will unclamp.

**AUTO mode**
The operator turns the pump motor on, and then presses and holds the up arrow on the pendant. When the customer-programmed HI PRESS setting is reached, the valve shifts to neutral, but pressure is maintained in the clamp circuit by the pilot-operated check valve. If pressure drops below the LO PRESS setting, the valve will re-activate and build pressure in the clamp circuit again. The pump will maintain this cycle until the operator presses and holds the down arrow on the pendant. When the down arrow is pressed, pressure in the clamp circuit will release, and the fixture will unclamp.

**Important**
Enerpac recommends a pressure differential of no less than 200 psi for most applications. If you believe your application requires a tighter differential, please contact us directly.

**Options**
- Heat exchanger
- Level switch
- Pressure transducer
- Return line filter

**Product dimensions** in inches [E, F, G]

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>Model number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>D1</th>
<th>E</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>ZWxx10xx</td>
<td>6.1</td>
<td>16.5</td>
<td>12.0</td>
<td>15.1</td>
<td>14.6</td>
<td>11.0</td>
<td>23.6</td>
</tr>
<tr>
<td>5.0</td>
<td>ZWxx20xx</td>
<td>7.1</td>
<td>16.5</td>
<td>16.6</td>
<td>19.7</td>
<td>19.2</td>
<td>15.6</td>
<td>24.6</td>
</tr>
<tr>
<td>10.0</td>
<td>ZWxx40xx</td>
<td>10.6</td>
<td>15.7</td>
<td>19.9</td>
<td>22.7</td>
<td>22.5</td>
<td>18.9</td>
<td>28.1</td>
</tr>
</tbody>
</table>

**Important**
For complete ordering matrix of all factory-installed options visit www.enerpac.com

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Single station DO3 pumps

Industry standard mounting for electric or manual valves

- Highly efficient design provides increased flow rates, reduced heat generation and a decrease in power consumption
- Extensive list of accessories including
  - Heat exchanger
  - Roll-bars
  - Pressure transducer
  - Level and temperature switches
- Replaceable piston check-valves increase service life of major pump components
- Optional backlit LCD provides pump usage information, hour and cycle counts
- Also available with 2 station and 4 station manifolds

Operation – single station DO3 pumps

The Single Station DO3 pumps are supplied without the standard LCD electrical control. This configuration is intended to be used with user supplied controls. Control requirements include: Motor Starter or Contactor, and remote control of the pump mounted valve. Typical applications include: Special Machines and CNC Machines where the control of the pump and valve will be done by PLC or machine control.

The use of the ZPF Return Line Filter is recommended. If the pump is to be run at pressure at a relief valve setting, the ZHE-E10 Heat Exchanger is also recommended. For monitoring of the oil level and temperature, use the ZLS-U4 Level/Temp Switch. For pump shutdown at pressure, the ZPS-W4 Pressure Switch Kit can provide an input to the customer supplied controls. As these accessories are designed to be used with the standard Enerpac LCD control, the customer assumes responsibility to adapt the standard leads to their controls.

Important

Be aware of leakage rates of any valve installed on an Enerpac pump. Many standard spool valves have excessive leakage rates at higher pressures that can limit the performance of the electric pump. Be sure to consult Enerpac if you are unsure of your choice of valve.

ZW5020HB-F11 with customer installed valve used to provide pressure to a clamping fixture.

Product selection

<table>
<thead>
<tr>
<th>Output flow rate @ max pressure</th>
<th>Motor size</th>
<th>Motor voltage</th>
<th>Model number</th>
<th>Pressure range</th>
<th>Sound level</th>
<th>Usable oil capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>in³/min</td>
<td>CV</td>
<td>115-1-60</td>
<td>230-3-60</td>
<td>460-3-60</td>
<td>ZW4010GB-11</td>
<td>1000-5000</td>
</tr>
<tr>
<td>60</td>
<td>1.0</td>
<td>ZW4010GG-11</td>
<td>ZW4010GJ-11</td>
<td>460-3-60</td>
<td>1000-5000</td>
<td>75</td>
</tr>
<tr>
<td>120</td>
<td>1.5</td>
<td>ZW5010GB-FT</td>
<td>ZWS410FG-FT</td>
<td>ZWS410FJ-FT</td>
<td>1000-5000</td>
<td>75</td>
</tr>
</tbody>
</table>
**Output oil flow and current draw**

**Dimensios & options ZW series**

- **Flow:** 60-120 in³/min
- **Pressure:** 5000 psi max
- **Motor:** 1.0 or 1.5 hp
- **Reservoir:** 1.0-10 gallon

![ZW4 Oil flow & current vs hydraulic pressure](image1)

![ZW5 Oil flow & current vs hydraulic pressure](image2)

**Important**

Enerpac recommends a pressure differential of no less than 200 psi for most applications. If you believe your application requires a tighter differential, please contact us directly.

**Options**

- **Heat exchanger**
- **Level switch**
- **Pressure transducer**
- **Return-line filter**
- **VSS, VST solenoid valves**
- **VMM series manual valves**

**Product dimensions** in inches [cm]

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>Model number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>D1</th>
<th>E</th>
<th>H</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>gal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>ZWxx10xx</td>
<td>6.1</td>
<td>16.5</td>
<td>12.0</td>
<td>15.1</td>
<td>14.6</td>
<td>11.0</td>
<td>23.6</td>
<td>107</td>
</tr>
<tr>
<td>5.0</td>
<td>ZWxx20xx</td>
<td>7.1</td>
<td>16.5</td>
<td>16.6</td>
<td>19.7</td>
<td>19.2</td>
<td>15.6</td>
<td>24.6</td>
<td>134</td>
</tr>
<tr>
<td>10.0</td>
<td>ZWxx40xx</td>
<td>10.6</td>
<td>15.7</td>
<td>19.9</td>
<td>22.7</td>
<td>22.5</td>
<td>18.9</td>
<td>28.1</td>
<td>184</td>
</tr>
</tbody>
</table>

**Important**

For complete ordering matrix of all factory-installed options visit [www.enerpac.com](http://www.enerpac.com)
**Custom build your pump**

This is how a ZW series Model number is built:

```
Z W 4 0 20 H G - F G 0 1
```

<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>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product type</td>
<td>Motor type</td>
<td>Flow group</td>
<td>Valve type</td>
<td>Usable oil capacity</td>
<td>Valve operation</td>
<td>Power supply</td>
<td>Options</td>
<td>Manifold options</td>
</tr>
<tr>
<td>Z  = Z-Class Pump</td>
<td>W  = Workholding Electric</td>
<td>4  = 60 in³/min</td>
<td>6  = 3-way, 3-position, manual or solenoid valve</td>
<td>10 = 10 Liters (2.5 gallon)</td>
<td>D  = Solenoid valve (pallet de-coupling) with pendant and LCD (valve type 4)</td>
<td>Single Phase</td>
<td>Options</td>
<td>Options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5  = 120 in³/min</td>
<td>8  = 4-way, 3-position, tandem center w/P.O. check (manual only)</td>
<td>20 = 20 Liters (5 gallon)</td>
<td>F  = Return line filter, 25 micron</td>
<td></td>
<td>(Pump types G and H only)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6  = 3-way, 3-position, tandem center w/P.O. check (manual only)</td>
<td>40 = 40 Liters (10 gallon)</td>
<td>G  = Solenoid valve (continuous connection) with pendant and LCD (valve type 4)</td>
<td>Single Phase</td>
<td>Options</td>
<td>Options</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H  = Valve manifold without LCD (valve type 0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L  = Manual valve with LCD (without pendant, valve type 2, 3, 4, 6 or 8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M  = Manual valve without LCD (valve type 2, 3, 4, 6 or 8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N  = No valve, without LCD (valve type 0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W  = No valve with LCD (valve type 0)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Example

**ZW4020GB-FGS21** is a 60 in³/min, single-stage pump with a 2 station D03 manifold, standard electric, 5 gallon reservoir, 115 volt, 50/60 Hz motor, return line filter and 0-6000 psi pressure gauge.

**ZW4410DJ-T** is a 60 in³/min, 2-stage pump with a pallet de-coupling valve, LCD electrical box, 2.5 gallon reservoir, 460-480 volt 3-phase motor and pressure transducer.

**ZW5810LG-FT** is a 120 in³/min, 2-stage pump with a manual 4-way, 3 position tandem center valve, integrated P.O. check, LCD electrical box, 2.5 gallon reservoir, 208-240 volt 3-phase motor, return line filter and pressure transducer.
Customized to your application's requirements

- Custom-built power units and valve stacks provide the exact solution you need
- Ideal for control of multiple hydraulic circuits from one pump
- Designed and built to your specifications
- Available as electric or air-powered hydraulic pumps
- Remote or pump-mounted valve stacks

Select your pump type

**Air operated pump**
Best choice for small to medium circuits with intermittent duty requirements. Air operated pumps have lower flow rates than electric pumps, but are more economical.

**Electric operated pump**
Best choice for large circuits with high duty requirements. Electric pumps have the highest flow rates and can be configured with many different options.

Contact Enerpac to complete the design

Contact Enerpac at 1-800-433-2766 or at info@enerpac.com and ask to speak to one of our experienced application engineers. They will guide you through the power unit design process. Be prepared to provide answers to the following types of questions:

- What is the duty cycle requirement?
- How many circuits do you want to control?
- What clamping components are in each circuit?
- Do you need electrical controls provided by Enerpac?
The Economy pump is best suited to power small to medium size fixtures. 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.

**Heavy on performance, light on weight**
- Lightweight and compact design, 26 lbs
- Large easy-carry handle for maximum portability
- Two-speed operation reduces cycle times for improved productivity
- 115 VAC 50/60- or 220 VAC 50/60-cycle universal motor will operate on voltage as low as 60 volts
- 24 VDC 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

### WUD-1100 series
- Provides advance/auto-retract of single-acting cylinders
- 10-foot pendant controls motor and valve operation
- Use with AP500

### WUD-1300 series
- Provides advance/hold/retract of single-acting cylinders
- 10-foot pendant controls motor and valve operation
- Ideal for applications requiring remote valve operation
- Use with ACBS22 or ACBS202

### Product selection

<table>
<thead>
<tr>
<th>Model number</th>
<th>Used with cylinder</th>
<th>Pressure rating (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st stage</td>
<td>2nd stage</td>
</tr>
<tr>
<td>WUD-1100B</td>
<td>single-acting</td>
<td>200</td>
</tr>
<tr>
<td>WUD-1100E</td>
<td>single-acting</td>
<td>200</td>
</tr>
<tr>
<td>WUD-1300B</td>
<td>single-acting</td>
<td>200</td>
</tr>
<tr>
<td>WUD-1300E</td>
<td>single-acting</td>
<td>200</td>
</tr>
</tbody>
</table>
Dimensions & options

**WU series**

- **Flow:** 25 in³/min
- **Pressure:** 5000 psi max
- **Motor:** .5 hp
- **Reservoir:** 0.5-1 gallon

**Standard equipment**

- **Gauge, filter and pressure switch**
  - Pumps are supplied with a manifold mounted 6000 psi gauge for convenient reading of pump pressure.
  - A filter at the pressure port helps to protect the pump from contamination.
  - A manifold mounted adjustable pressure switch provides control of the pump shut-off pressure.

**Product dimensions in inches**

<table>
<thead>
<tr>
<th>Usable oil capacity</th>
<th>Model number</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>
</tr>
</thead>
<tbody>
<tr>
<td>gal</td>
<td></td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
<td>4.00</td>
<td>4.72</td>
<td>8.00</td>
<td>.40</td>
<td>5.25</td>
</tr>
<tr>
<td>.50</td>
<td>WUD-1100B</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
<td>4.00</td>
<td>4.72</td>
<td>8.00</td>
<td>.40</td>
<td>5.25</td>
</tr>
<tr>
<td>.50</td>
<td>WUD-1100E</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
<td>4.00</td>
<td>4.72</td>
<td>8.00</td>
<td>.40</td>
<td>5.25</td>
</tr>
<tr>
<td>.50</td>
<td>WUD-1300B</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
<td>4.00</td>
<td>4.72</td>
<td>8.00</td>
<td>.40</td>
<td>5.25</td>
</tr>
<tr>
<td>.50</td>
<td>WUD-1300E</td>
<td>9.62</td>
<td>9.62</td>
<td>14.25</td>
<td>4.00</td>
<td>4.72</td>
<td>8.00</td>
<td>.40</td>
<td>5.25</td>
</tr>
</tbody>
</table>

**Output flow rate**

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Current draw</th>
<th>Motor voltage</th>
<th>Sound level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st stage</td>
<td>2nd stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dump*</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
</tr>
<tr>
<td>Dump*</td>
<td>9.5</td>
<td>220</td>
<td>85</td>
</tr>
<tr>
<td>Dump and Hold</td>
<td>9.5</td>
<td>115</td>
<td>85</td>
</tr>
<tr>
<td>Dump and Hold</td>
<td>9.5</td>
<td>220</td>
<td>85</td>
</tr>
</tbody>
</table>

* Electric dump valve for auto-retract of cylinders.
**Best performance for mid-range cylinders**

- Reduce cycle times for improved productivity
- Two-speed pump unit provides rapid cylinder advance
- Submerged dual voltage induction motor, runs cooler and quieter
- Available with heat exchanger for higher duty cycle applications
- Externally adjustable relief valve – no need to open pump when reducing pressure
- Reservoir mounting holes for easy mounting to fixed surface
- Full length side tube for easy monitoring of oil level
- Auxiliary return port, eliminates the need for a separate adapter

**Product selection**

**WE series**
Enerpac two stage electric submerged pumps are a quiet, economical workholding power source. Submerged in oil the motor stays cooler when used on an intermittent basis.

**Select your pump type**

**WED-series with dump valve**
- For use when load holding is not required
- Ideal for palletized workholding
- Motor is on only during work cycle

**WEJ series with remote jog**
- Manual valve control
- Motor can be turned on and off by remote pendant for jogging capability

**WEM series with manual valve**
- Manual valve control
- Manual motor control
- Simple and economical solution to your workholding power source needs

**WER series with remote actuated solenoid**
- Solenoid directional with shear seal design
- Remote valve operation

**WES/WET series with pressure switch**
- Pressure switch turns motor on and off
- Used when pressure must be maintained over a period of time
- With pressure gauge

**Pressure switch specifications:**
- Classification: NEMA 1
- Pressure range: IC-51: 3000-7500 psi
  IC-31: 500-3500 psi

<table>
<thead>
<tr>
<th>Motor voltage</th>
<th>Motor capacity</th>
<th>Amperage draw</th>
<th>Maximum oil flow at 60 Hz</th>
<th>Pressure rating psi</th>
<th>Usable oil capacity</th>
<th>Adjustable relief valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>50/60 Hz</td>
<td>stage stage stage stage</td>
<td>1st 2nd 1st 2nd</td>
<td>gal psi lbs</td>
<td>1000 5000 1.5</td>
<td>1000 - 5000 63</td>
<td></td>
</tr>
<tr>
<td>115V-1ph</td>
<td>.50</td>
<td>13.5</td>
<td>150 40</td>
<td>1000 5000 1.5</td>
<td>1000 - 5000 63</td>
<td></td>
</tr>
<tr>
<td>230V-1ph</td>
<td>.50</td>
<td>6.75</td>
<td>150 40</td>
<td>1000 5000 1.5</td>
<td>1000 - 5000 63</td>
<td></td>
</tr>
</tbody>
</table>

1) Weight for WES and WET models is 83 lbs.
**Options**

- **G-series pressure gauges**
  - Flow: 40 in³/min
  - Pressure: 5,000 psi max
  - Motor: .5 hp
  - Reservoir: 1.5 gal

- **FL-series high-pressure filters**

- **FZ-series fittings**

- **HF-series hydraulic oil**

**Important**

Oil should be replaced every 500 working hours to ensure long life. Change filters when changing oil or 4 times a year whichever comes first.

Heat exchanger cools oil in pumps used in higher duty cycle applications.

Output flow rate should be matched to hydraulic components used in the system.

## WE-series Submerged

<table>
<thead>
<tr>
<th>Used with cylinder</th>
<th>Valve function</th>
<th>Valve type</th>
<th>Model number</th>
<th>Motor voltage</th>
<th>Heat exchanger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Acting</td>
<td>Advance / Retract</td>
<td>Dump</td>
<td>WED-1101B</td>
<td>115V</td>
<td></td>
</tr>
<tr>
<td>Single-Acting</td>
<td>Advance / Retract</td>
<td>Dump</td>
<td>WED-1101E</td>
<td>230V</td>
<td></td>
</tr>
<tr>
<td>Single-Acting</td>
<td>Advance / Retract</td>
<td>Jog</td>
<td>WEJ-1201B</td>
<td>115V</td>
<td></td>
</tr>
<tr>
<td>Double-Acting</td>
<td>Adv. / Hold / Retr.</td>
<td>Solenoid</td>
<td>WER-1401B</td>
<td>115V</td>
<td>●</td>
</tr>
<tr>
<td>Double-Acting</td>
<td>Adv. / Hold / Retr.</td>
<td>Solenoid</td>
<td>WER-1401D</td>
<td>115V</td>
<td>●</td>
</tr>
</tbody>
</table>
WE Electric submerged pumps ordering matrix

**Custom build your submerged pump**

▼ This is how a submerged pump model number is built up:

If the submerged pump that would best fit your application cannot be found in the chart on pages 110-111, you can easily build your custom submerged pump here.

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Motor Type</th>
<th>Pump Type</th>
<th>Pump Series</th>
<th>Valve Type</th>
<th>Res. Capacity</th>
<th>Motor Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>E</td>
<td>D</td>
<td>1</td>
<td>0</td>
<td>1.5 gallon</td>
<td></td>
</tr>
</tbody>
</table>

1  **Product Type**
- **W** = Workholding Pump
2  **Motor Type**
- **E** = Electric motor
3  **Pump Type**
- **D** = Dump
- **J** = Jog
- **M** = Manual
- **R** = Remote (solenoid)
- **S** = Pressure switch (IC-51)
- **T** = Pressure switch (IC-31)
4  **Pump Series**
- **1** = .5 hp 10,000 psi
5  **Valve Type**
- **0** = No valve (WER only)
- **1** = Dump
- **2** = 3-way, 2-position, normally open
- **3** = 3-way, 3-position, tandem center
- **4** = 4-way, 3-position, tandem center
- **5** = Custom VE-series valve (WER only)

See example 2 below.

6  **Reservoir Capacity**
- **01** = 1.5 gallon

7  **Motor Voltage and Heat Exchanger**
- **B** = 115 V, 1 Ph, 50/60 Hz
- **D** = 115 V, 1 Ph, 50/60 Hz with heat exchanger
- **E** = 230 V, 1 Ph, 50/60 Hz
- **F** = 230 V, 1 Ph, 50/60 Hz with heat exchanger
- **I** = 230 V, 1 Ph, 60 Hz*

* To order WER models, for 60 Hz applications, replace the “E” suffix for “I”.

**Important**

WER series pumps use the VE-series valves shown on page 109. WER-13 series uses VEF-series valve. WER-14 series uses VEC-series valve.

WES series pumps use IC-51 pressure switch, adjustable from 3000-7500 psi.

WET series pumps use IC-31 pressure switch, adjustable from 500-3500 psi.

**Examples**

**Ordering example 1**

Model number:
WER-1301B

The **WER-1301B** is a .5 hp, 5,000 psi, submerged electric pump, with 1.5 gallon usable oil capacity, a 3-way, 3-position modular, remote solenoid valve (VEF-series) and a 115 V, 1 Phase, 50/60 Hz motor.

**Ordering example 2**

Model number:
WER-1501B- VED15000D

The WER-1501B is a .5 hp, 5,000 psi, submerged electric pump, with 1.5 gallon usable oil capacity. The valve, model **VED15000D** is a 115 V, 60 Hz solenoid valve. (For details and options for all VE-series valves see page 128.)
Hand pumps

Exclusively from Enerpac
...to power single-acting cylinders

- Internal pressure relief valve (except SP-621) prevents over-pressurization
- Two speed operation reduces handle strokes by as much as 78% over single speed pumps
- Low handle effort minimizes operator fatigue
- Compact size – enables easy conversion of manual fixtures to hydraulic power

Options

<table>
<thead>
<tr>
<th>Fittings</th>
<th>157</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoses</td>
<td>156</td>
</tr>
<tr>
<td>Hydraulic oil</td>
<td>157</td>
</tr>
</tbody>
</table>

Important

P-141, P-142 and P-202 are designed for a maximum operating pressure of 10,000 psi.

Product selection

<table>
<thead>
<tr>
<th>Maximum hydraulic pressure</th>
<th>Usable oil capacity</th>
<th>Model number</th>
<th>Pressure rating</th>
<th>Oil volume per stroke</th>
<th>Piston stroke</th>
<th>Maximum handle effort</th>
<th>Dimensions in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>in³</td>
<td></td>
<td>1st stage</td>
<td>2nd stage</td>
<td>in³</td>
<td>in</td>
<td>A</td>
</tr>
<tr>
<td>3000</td>
<td>6.2</td>
<td>SP-621</td>
<td>–</td>
<td>–</td>
<td>.25</td>
<td>1.00</td>
<td>61</td>
</tr>
<tr>
<td>3000</td>
<td>50</td>
<td>P-51</td>
<td>–</td>
<td>–</td>
<td>.25</td>
<td>1.00</td>
<td>61</td>
</tr>
<tr>
<td>10,000</td>
<td>20</td>
<td>P-141</td>
<td>10,000</td>
<td>–</td>
<td>.055</td>
<td>.50</td>
<td>72</td>
</tr>
<tr>
<td>10,000</td>
<td>20</td>
<td>P-142</td>
<td>10,000</td>
<td>.221</td>
<td>.055</td>
<td>.50</td>
<td>78</td>
</tr>
<tr>
<td>10,000</td>
<td>55</td>
<td>P-202</td>
<td>200</td>
<td>10,000</td>
<td>.221</td>
<td>.055</td>
<td>63</td>
</tr>
</tbody>
</table>

1) Handle travel of SP-621 is 2.50 inches; 25 handle rotations displace 6.2 in³ of oil.
2) Handle effort on SP-621 is 60 ft.lbs at 3000 psi.

© 2008 Enerpac
For high production applications

- High speed operation
- Extended service life
- Constant hydraulic output
- Large oil delivery per stroke allows quick filling of cylinders for clamping or punching

AHB series boosters

- Fiberglass wound air chamber eliminates possibility of rust due to moisture in air system
- Designed for fully automated production applications
- Double-acting, one-shot, high speed operation of air piston

B series boosters

- One-shot spring return
- Aluminum construction
- Built-in stroke sensor for automatic cycle operation
  - 30 VDC switch closes 1” before end of full air piston stroke
- Internal self-bleeding
  - Automatically purges air from system when booster piston is at highest point in circuit

Hydraulic system schematics

Complete power systems eliminate the guesswork of selecting valves and other system components. Plug in your 15 to 115 psi shop air line and connect your hydraulic components for a total system.
Air valves

Regulator-filter-lubricator

Fittings

Boosters can provide high oil flow rates based on the volume of in-coming air. Do not exceed the flow rate requirements of the components being used.

For vertical mounting of booster, an elbow fitting is recommended for the oil reservoir.

**Important**

Ratio: 1:16-1:64

Pressure: 1600-5000 psi

Oil flow: 3.7-18.0 in³/stroke

Air: .95-2.2 scfm/cycle

### Selection chart

<table>
<thead>
<tr>
<th>Oil pressure at 75 psi air pressure</th>
<th>Oil volume per stroke</th>
<th>Air to oil pressure ratio</th>
<th>Model number</th>
<th>Air consumption per cycle @</th>
<th>Air piston diameter</th>
<th>Hydraulic piston diameter</th>
<th>Hydraulic stroke</th>
<th>Air operating pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>ft³</td>
<td>in²</td>
<td></td>
<td>at 85 psi air</td>
<td>in</td>
<td>in</td>
<td>in</td>
<td>psi</td>
</tr>
<tr>
<td>AHB series</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>2.2</td>
<td>8.00</td>
<td>1.16</td>
<td>AHB-17</td>
<td>2.2</td>
<td>8.00</td>
<td>2.00</td>
<td>5.71</td>
</tr>
<tr>
<td>2550</td>
<td>2.2</td>
<td>8.00</td>
<td>1.34</td>
<td>AHB-34</td>
<td>2.2</td>
<td>8.00</td>
<td>1.38</td>
<td>5.71</td>
</tr>
<tr>
<td>3450</td>
<td>2.2</td>
<td>8.00</td>
<td>1.46</td>
<td>AHB-46</td>
<td>2.2</td>
<td>8.00</td>
<td>1.18</td>
<td>5.71</td>
</tr>
<tr>
<td>4800</td>
<td>2.2</td>
<td>8.00</td>
<td>1.64</td>
<td>AHB-66</td>
<td>2.2</td>
<td>8.00</td>
<td>1.00</td>
<td>5.71</td>
</tr>
<tr>
<td>B series</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2250</td>
<td>.95</td>
<td>7.10</td>
<td>1.30</td>
<td>B-3006</td>
<td>.95</td>
<td>7.10</td>
<td>1.22</td>
<td>5.20</td>
</tr>
<tr>
<td>3750</td>
<td>.95</td>
<td>7.10</td>
<td>1.50</td>
<td>B-5003</td>
<td>.95</td>
<td>7.10</td>
<td>.94</td>
<td>5.20</td>
</tr>
</tbody>
</table>

1) One cycle = advance + retract stroke.

Note: Seal material: Buna-N, Polyurethane.

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**Activator wand and booster**

Shown: RA-1061, B81

---

**Contamination resistant closed hydraulic system**

- No-leak palletized system, eliminates oil loss at connection point
- Closed design prevents machining chips and coolant from entering the hydraulic circuit
- Booster can be mounted in either horizontal or vertical position for flexible fixture design

---

**Hydraulic system schematics**

The Activator Wand **RA-1061** is placed into the receiver booster **B-81** or **B-171**. The mechanical transfer of force from the activator wand plunger to the booster piston provides oil flow to the system.

---

**Product selection**

<table>
<thead>
<tr>
<th>Pressure ratio</th>
<th>Oil flow ratio</th>
<th>Oil volume per stroke</th>
<th>Stroke</th>
<th>Model number</th>
<th>Effective area</th>
<th>Operating pressure</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver booster</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:1</td>
<td>1.75:1</td>
<td>8.10</td>
<td>2.04</td>
<td><strong>B-81</strong></td>
<td>3.98</td>
<td>400-5000</td>
<td>12.7</td>
</tr>
<tr>
<td>2:1</td>
<td>1.75:1</td>
<td>17.10</td>
<td>4.30</td>
<td><strong>B-171</strong></td>
<td>3.98</td>
<td>400-5000</td>
<td>15.7</td>
</tr>
<tr>
<td>Activator wand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>9.90</td>
<td>4.44</td>
<td><strong>RA-1061</strong></td>
<td>2.23</td>
<td>800-10,000</td>
<td>11.3</td>
</tr>
</tbody>
</table>

---

**B and RA series**

Mechanical energy transfer system uses external cylinder to operate receiver booster.

---

*A slide places the wand into the fixture mounted booster in this automated application for machining castings.*
Dimensions & Options  B/RA series

Ratio: 2:1
Stroke: 2.04-4.44 in
Pressure: 400-5000 psi

E Multiplicadores
F Multiplicateur
D Betätigungszylinder und Druckverstärker

Options

Fittings  
Hoses

For 10,000 psi pumps, refer to the Enerpac Industrial Tools Catalog E325.

Existing fixtures with manual-connect single-acting circuits can be easily upgraded into the wand and booster.

Important

The activator wand has a 2 to 1 ratio of input pressure versus output pressure.

The booster output flow is 1.75 times the wand input flow.

Product dimensions in inches [□ □]

| Model  | A  | B  | C  | D  | D1 | E  | F  | H  | J  | J1 | K  | K1 | L  | L1 | L2 | S  |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| B-81   | 6.86 | 2.74 | 1.74 | 3.00 | –  | 4.00 | 3.25 | 1.12 | –  | –  | .41 | 2.26 | .41 | .62 | .42 | –  |
| B-171  | 9.12 | 2.74 | 1.74 | 3.00 | –  | 4.00 | 3.25 | 1.12 | –  | –  | .41 | 2.26 | .41 | .62 | .42 | –  |
| RA-1061| 11.62| 4.63|.19 | 2.25 | 3.00 | .75 | 2.32 | .75 | 3.02 | 1.53 | –  | –  | –  | –  | 2.75 |

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High flow units intensify low inlet oil pressure to high outlet pressure

- Internal bypass valving enables high output flow rates
- Wide range of intensification ratios allows for adapting to various operating pressure requirements
- Compact and self-contained design allows for ease of installation
- Include dump valve eliminating the need for an external pilot check valve
- Select fit of all internal components provides long operating life

**Intensifier principle**

- When oil is supplied to the inlet (IN) port it flows freely past the check valves (CV) and the dump valve to the cylinder and advances it.
- As the inlet pressure increases the oscillating pump (OP) automatically increases the outlet pressure by the chosen intensification.
- Once the maximum pressure is reached, the pump frequency lowers and balances at the maximum pressure.
- Free flow from the cylinder to tank occurs when the directional control valve is switched to supply the R-port.
- 10 micron filtration is required on all ports in the circuit to ensure trouble free operation. Filters and flow control included.

**Product selection**

<table>
<thead>
<tr>
<th>Maximum pressure</th>
<th>Pressure intensification ratio</th>
<th>Maximum input flow</th>
<th>Maximum output flow</th>
<th>Model number</th>
<th>Inlet pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>in³/min</td>
<td>in³/min</td>
<td></td>
<td></td>
<td>psi</td>
</tr>
<tr>
<td>10,000</td>
<td>1 : 3.2</td>
<td>610</td>
<td>150</td>
<td>PID-321F</td>
<td>300 - 1560</td>
</tr>
<tr>
<td>10,000</td>
<td>1 : 4.0</td>
<td>580</td>
<td>120</td>
<td>PID-401F</td>
<td>300 - 1250</td>
</tr>
<tr>
<td>10,000</td>
<td>1 : 5.0</td>
<td>550</td>
<td>95</td>
<td>PID-501F</td>
<td>300 - 1000</td>
</tr>
<tr>
<td>10,000</td>
<td>1 : 6.6</td>
<td>530</td>
<td>75</td>
<td>PID-661F</td>
<td>300 - 750</td>
</tr>
</tbody>
</table>

* Operating pressures above 5000 psi require high pressure fittings or intensifier models with BSPP ports. Contact Enerpac for details.
**Dimensions & Options**

**PID series**

<table>
<thead>
<tr>
<th>Ratio:</th>
<th>1:3.2-1:6.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow:</td>
<td>75-150 in³/min</td>
</tr>
<tr>
<td>Pressure:</td>
<td>960-10,000 psi</td>
</tr>
</tbody>
</table>

**Options**

- FL-series, high-pressure filters
- Directional valves
- FZ-series fittings

**Important**

- Do not exceed maximum allowable inlet pressure.
- 10 micron filtration is included to ensure trouble-free operation.
- Applications above 5000 psi require high pressure fittings or intensifier models with BSPP ports. Contact Enerpac for details.
- PID models with dump valve provide an economical means of relieving pressure from the system.
- Can be panel mounted into machine (M24x1,5 thread).

**System set-up information:**

**With dump valve (PID models)**

The intensifier with the dump valve is used to achieve high pressure on the advance side of a double-acting cylinder.

**With external dump valve**

In a circulating system where the pump’s oil flow is higher than the maximum inlet oil flow of the intensifier, an external check valve and flow control valve reduces the pump’s oil flow. This application can be set up when machines are equipped with low pressure hydraulics but the pressure to clamp the workpiece must be higher.

**Product dimensions in inches**

**PID series**

- **Dimensions:**
  - Inner Diameter: 0.74-0.76
  - Outer Diameter: 1.17-1.18
  - M24x1.5
  - SAE #4
- **Flow Path:**
  - 1.61
  - 3.34-3.35
  - 4.32-4.34
  - 1.08-1.10
  - SAE #4