THE FUTURE OF PRECISION LIFTING IS HERE

Stocked and Distributed by Norman Equipment Company 800-323-2710
## Enerpac Pump Solutions

### Manual Metered

**MANUAL LIFTING**
- Composite and steel designs for rugged applications
- Lightweight, portable solution
- Ideal for applications with no power available
- Economical solution for basic lifting requirements

**POWERED**
- Battery, electric, air, and gasoline-powered pumps
- Great for applications requiring efficiency
- Different flow groups to match your cylinder extension requirements

### Controlled Flow

**VENTURI VALVE ASSISTED-RETURN**
- Electric pumps with exclusive Venturi Valve technology
- ZU4 and ZE platforms with manual and Venturi Valve
- Field Retrofit kits available to update your current Enerpac electric pumps
- Ideal solution for Single-Acting Spring and Gravity-Return Cylinders

**SPLIT-FLOW PUMPS**
- Controlled volume offers a level of synchronization to each cylinder, regardless of pressure at that lift point
- Requires fewer operators than manual systems
- Accuracy is 4% of the cylinder stroke
- Reduced system requirements, easier installation and set up
- Can be used to lift and lower, and operated with S/A and D/A cylinders
- Available in 2, 4, 6, and 8-point lifting configurations

### Synchronized Lifting

**EVOB SYNCHRONOUS LIFT SYSTEM**
- Intuitive user interface for easy set-up and control
- Built-in warning and stop alarms for optimum safety during lift and lower functions
- Available in 4- and 8-point configuration and three oil-flow options
- By monitoring cylinder stroke only, accuracies of +/- 0.040” maximum difference between lift points are maintained

**EVO SYNCHRONOUS LIFT SYSTEM**
- Intuitive user interface for easy set-up and control
- Built-in warning and stop alarms for optimum safety
- Available in 4-, 8- and 12-point configurations; can be linked to 48 points
- System accuracies of +/- 0.040” maximum difference between lift points
- Features load and stroke control, plus “tilting,” COG, stage lifting and weighing capabilities

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NEW PRODUCT RELEASE
See page 6.

2X Faster

Retraction Speed

1X

3X

Faster
For Precision Lifting

<table>
<thead>
<tr>
<th>Reservoir Capacity</th>
<th>Flow Control</th>
<th>Degree of Accuracy</th>
<th>Cylinder Compatibility</th>
<th>Recommended No. of Lifting Points</th>
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<tr>
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<tr>
<td>2 Gallon</td>
<td>Manual</td>
<td>15%</td>
<td>&lt;200 Tons</td>
<td>1 - 4 Points</td>
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<tr>
<td>10 Gallon</td>
<td>Manual</td>
<td>15%</td>
<td>&lt;500 Tons</td>
<td>1 - 4 Points</td>
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<tr>
<td>Controlled Flow</td>
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<td>2 - 8 Points</td>
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<tr>
<td>Synchronized Lifting</td>
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<td>10 Gallon</td>
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<td>&lt;500 Tons</td>
<td>4 - 8 Points</td>
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<tr>
<td>66 Gallon</td>
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<td>&lt;1000 Tons</td>
<td>4 - 48 Points</td>
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</table>

The large and heavy structures that our High-Tonnage Cylinders are required to lift or move are all extremely valuable and often irreplaceable pieces of equipment. Control and safety is paramount, especially when distributing the load over multiple points. To ensure that compatibility is guaranteed across all lifting cylinders, Enerpac offers a wide range of pump solutions for all of your lifting needs. Enerpac pumps and cylinders form a strong team for your heavy-lifting solution, allowing you to work in a safe, professional, and efficient manner.

HEAVY LIFTING REQUIRES A STRONG TEAM

Infrastructure
- Bridge construction and maintenance
- Foundation repairs
- Building construction and relocation
- Tunneling and box-jacking
- Skidding
- Concrete testing
- Structural and pile testing

Oil and Gas
- Offshore applications
- Platform lifting and weighing
- Load-out
- Decommissioning
- Center of Gravity determination

Power Generation
- Windmill foundation levelling
- Turbine installation and maintenance
- Transformer installation and maintenance
- Nuclear applications

Maintenance, Repair & Operation
- Machine moves
- Bearing replacement
- Tank lifting

Mining
- Undecking of excavators
- Heavy equipment maintenance
- Crusher installation and maintenance

Shipbuilding
- Segment positioning
- Center of Gravity determination
- Weighing
P-SERIES, HYDRAULIC LIGHTWEIGHT HAND PUMPS

- Durable glass-filled nylon reservoir and nylon encapsulated aluminum pump base for maximum corrosion resistance
- Two-speed operation on most models reduces handle strokes by as much as 78% over single speed pumps
- Lower handle effort to minimize operator fatigue
- Integral 4-way valve on P-842 for operation of double-acting cylinders
- Large oil capacities to power a wide range of cylinders or tools

P-SERIES, ULTIMA HYDRAULIC STEEL HAND PUMPS

- Hydraulic steel hand pumps are the solution for tough jobs
- All steel construction, chrome plated plunger and wiper system for durable, long lasting performance
- Reduced handle effort and ergonomic grip for less operator fatigue
- Two-speed operation for fast and easy operation
- Vent free reservoir eliminates spills
- Integral reservoir protects from over-pressurization

IDEAL APPLICATIONS

- Applications requiring < 4 lifting points
- Applications that are performed with low frequency
- Situations where power is not readily available
- Applications that are remotely located
- Applications requiring cylinders <200T

PUMP SELECTION GUIDE

<table>
<thead>
<tr>
<th>Capacity Stroke</th>
<th>5 Ton</th>
<th>10 Ton</th>
<th>15 Ton</th>
<th>25 Ton</th>
<th>30 Ton</th>
<th>50 Ton</th>
<th>60 Ton</th>
<th>75 Ton</th>
<th>100 Ton</th>
<th>150 Ton</th>
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<tr>
<td>&lt; 1.00</td>
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</table>

P392 P80 P462
**BATTERY**

- 28V Lithium-Ion batteries with ½ hp motor
- ½ gallon reservoir capacities
- Valve configuration for single-acting and double-acting cylinders
- Reliable, safe, and portable solution for remote lifting needs
- Ideal solution for remote applications without power

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**ELECTRIC PUMPS (PU, ZU4, ZE and 8000-Series)**

- Ratings from ½ hp to 7½ hp
- Flow rates from 20 in³/min to 2 gallon/min at 10,000 psi
- Reservoir capacities from ½ gallon to 25 gallon
- Valve configurations for all of your lifting and lowering needs
- Classic and Pro-Series available for enhanced functionality

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**GAS PUMPS (ZG and 8000-Series)**

- Ratings from 7 to 18 hp
- Flow rates from 100 in³/min to 1½ gallon/min at 10,000 psi
- Reservoir Capacities from 2½ gallon to 25 gallon
- Valve configurations for all of your lifting and lowering needs
- Briggs & Stratton® and Honda® engines

---

**SELECTION CHART**

<table>
<thead>
<tr>
<th></th>
<th>Low (20 in³/min)</th>
<th>Medium (60 to 200 in³/min)</th>
<th>High (463 in³/min)</th>
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<tr>
<td>Reservoir Oil Capacity</td>
<td>1 gallon</td>
<td>1 - 10 gallon</td>
<td>25 gallon</td>
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<td>Duty Cycle**</td>
<td>Intermittent</td>
<td>Intermittent</td>
<td>Extended</td>
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<tr>
<td>Portable / Stationary***</td>
<td>Portable</td>
<td>Stationary</td>
<td>Stationary</td>
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<tr>
<td>Recommended Series</td>
<td>Economy</td>
<td>Submerged</td>
<td>ZU4</td>
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<td>ZE3-6</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>8000-Series</td>
</tr>
</tbody>
</table>

*Flow Determined by motor size Directly affects electrical power requirements Determines cylinder or tool speed

**Duty Cycle** Extended applications require more than one hour of interrupted pump use Intermittent use - from 20 minutes to one hour, depending on reservoir capacity (contact Enerpac for details).

*** Portability

- **Portable**
  - Ergonomic handles
  - Flexible power requirements
- **Stationary**
  - Mounting options
  - Normally requires stable power
### Assisted-Return Pumps

**Assisted-Return Pumps Featuring Venturi Valve Technology**

- Improved Retraction Speed of S/A and Load Return Cylinder by 3X.
- Field Retrofit kits available for your existing inventory.
- Excellent Choice for improved efficiency when working with High-Tonnage Cylinders.

### Electric Assisted-Return Pumps

**Enerpac ZU4, ZE4, ZE5, and ZE6 Pumps**

- Ratings from 1½ hp to 7½ hp.
- Flow rates from 20 in³/min to 200 in³/min at 10,000 psi.
- Reservoir capacities from ½ gallon to 25 gallons.
- Assisted-return pumps are capable of improving single-acting cylinder retraction speed by 3X.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Flow Rate @ 10,000 psi</th>
<th>Valve Type</th>
<th>Pump Control</th>
<th>Pendant</th>
<th>Useable Oil Capacity (gal)</th>
<th>Voltage</th>
<th>LED Screen</th>
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<td>ZU41008LB</td>
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SFP-SERIES, 10,000 PSI SPLIT-FLOW HYDRAULIC PUMPS

The electric driven split-flow pump is an economical solution for multi-point controlled lifting and lowering applications.

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

Reservoir Capacity: 5, 10, or 40 gallons
Split-Flow Outlets: 2, 4, 6, or 8
Flow at Rated Pressure: 20 - 305 in³/min
Maximum Operating Pressure: 10,000 psi

- Multiple Outlets with Equal Oil Flow
- Individual or simultaneous operation of valves, with advance/hold/retract function
- For double- and single-acting cylinders
- Adjustable pressure relief valve per circuit

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.

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.

Lifting Cylinders

For a complete line of Enerpac cylinders, see the cylinder and lifting products in our catalog or go to www.enerpac.com
What is Synchronous Lifting?

To achieve high-precision movement of heavy objects it is necessary to control and synchronize the movements of multiple lifting points. The PLC-control uses feedback from multiple sensors to control the lifting, lowering and positioning of any large, heavy or complex structure, regardless of weight distribution. By varying the oil flow to each cylinder, the system maintains very accurate positional control. By eliminating manual intervention, the Sync Lift helps maintain structural integrity and increases the productivity and safety of the lift.

PLC-controlled Synchronous Lifting Systems reduce the risk of bending, twisting or tilting, due to uneven weight distribution or load-shifts between the lift points.

THE BASIC EVOB SYNCHRONOUS LIFT SYSTEM

Leveraging Enerpac’s market leading Z-Class pumps and components from the standard EVO, the EVOB offers an economical solution to basic applications requiring stroke only control for a maximum of 8 lifting points.

The EVO-System has three work modes. The operator can navigate to any of these menus:

1. Manual
2. Automatic
3. Depressurize

Multi-functional Sync Lift Systems

For applications requiring more than 8 lifting points, linking 4 systems together, and weighing systems, see the EVO-Standard Series.

Lifting Cylinders

For a complete line of Enerpac cylinders, see the cylinder and lifting products in our catalog or go to www.enerpac.com

Stroke Sensor and Cables

These accessories must be ordered separately and are required for each lifting point and stroke sensor.
THE STANDARD EVO SYNCHRONOUS LIFT SYSTEM

It's a comprehensive self-contained design that features simple to use software that is extremely efficient at completing basic to complex applications.

The EVO-System

- Utilizes feedback from pressure and stroke transducers to offer both stroke control and load monitoring
- Can be networked to link up to 4 systems together (requires separate master control box)
- Variable Frequency Drive (VFD) and PLC for precise synchronization and control of oil flow
- Data storage

The EVO-System has nine 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*

* Weighing option includes load cell inputs with special programming for calibration and center of gravity.

Reservoir Capacity: 10 or 66 gallons
No. of Lifting Points: 4, 8, or 12
Accuracy: 0.040 inch
Motor Size: 1 - 10 hp
Max. Operating Pressure: 10,000 psi

Lifting Cylinders
For a complete line of Enerpac cylinders, see the cylinder and lifting products in our catalog or go to www.enerpac.com

Ease of Operation
- A single operator controls the entire operation
- User friendly interface: visual screens, icons, symbols, and color coding.
In the exacting world in which we operate, the challenges are becoming ever more demanding. No matter the application, you can rely on Enerpac’s High-Tonnage Cylinders to meet all your heavy-lifting demands.

**DESIGNED FOR HEAVY LIFTING**

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<th>Corrosion resistance</th>
<th>HCG</th>
<th>HCR</th>
<th>HCL</th>
<th>LPL</th>
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<td>●</td>
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<tr>
<td>Mechanical load holding</td>
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<td>Side-load resistance</td>
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<td>●</td>
<td>●</td>
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<tr>
<td>Long-stroke applications</td>
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<td>●</td>
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<tr>
<td>Confined-space applications</td>
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**Summit Edition**

The Summit Edition provides superior durability and side-load resistance. Nitrocarburization treatment and advanced bearing and seal technology come standard on this series. This extends the boundaries for side-load, it improves cylinder life and enhances performance in harsh conditions.

- Interchangeable saddle prevents plunger damage. Integrated tilt saddle allows for up to 5 degrees of misalignment (LPL)
- Lock nut provides mechanical load holding (HCL and LPL)
- Certified lifting eyes
- Collar threads for versatile cylinder mounting (HCG and HCR)
- Safety valve prevents damage in case of over-pressurization (HCR)
- Low-friction wiper protects against contamination (HCG and HCR)
- Full load stop-ring (HCG and HCR)
- Base mounting holes for versatile cylinder mounting (except LPL)
- High-flow couplers for fast advance and retract
- Nitrocarburization surface treatment for improved wear resistance and corrosion protection
- Replaceable composite bearings surround the seal providing support for eccentric loads
- Low-wear, high-pressure seals provide longer service life
**Product Selection Worksheet**

### Cylinder Selection

<table>
<thead>
<tr>
<th>Question</th>
<th>Tips/help</th>
<th>Data</th>
<th>Model Number</th>
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<tbody>
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<td>Total force required in tons:</td>
<td>Total load</td>
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</tr>
<tr>
<td>Number of cylinders required:</td>
<td>Number of lifting points</td>
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<td></td>
</tr>
<tr>
<td>Force per cylinder in tons:</td>
<td>Should be 80% of total cylinder cap.</td>
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<td></td>
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<tr>
<td>Stroke required:</td>
<td>Plunger travel</td>
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<td></td>
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<tr>
<td>Single or double acting (D/A):</td>
<td>D/A used when pull force is required, or retract speed is critical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of plunger required:</td>
<td>Hollow or solid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collapsed height required:</td>
<td>Height with plunger fully retracted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional saddle required:</td>
<td>Tilt, Grooved, Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder base:</td>
<td>Improves stability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder attachments: (RC-series)</td>
<td>Expanded functions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Selected cylinder model:** ▶

**Including coupler model:**

### Pump Selection

The three most commonly selected pumps are hand pumps, electric pumps and air-driven pumps. Gas powered pumps, however can be selected in the same way.

<table>
<thead>
<tr>
<th>Available power source:</th>
<th>□ Manual □ Battery □ Electric □ Compressed Air □ Gasoline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand pump</td>
<td>Not for high-cycle applications</td>
</tr>
<tr>
<td>Single- or double-acting operation</td>
<td>Use 4-way valve for D/A applications</td>
</tr>
</tbody>
</table>

**Selected hand pump:** ▶

**Electric or compressed air pump**

| Need for portability: | Weight and power requirements |
| Duty cycle: | Intermittent or extended |
| Required usable oil capacity: | Intermittent =1.2 x cylinder oil capacity high cycle = 2 x cylinder oil capacity |
| Available voltage: | Single phase or Three phase |
| Lifting speed (Important/not important): | See speed chart in our IT catalog |
| Type of control: | Manual/remote pendant |
| Type of actuation/function: | Advance/hold/retract |
| Accessories: | Roll bar, Oil Filter kit, ... |

**Selected pump:** ▶

**To suit hose:** Oil connection

### System Components

| Number of hoses and length required: | |
| Selected hoses: | ▶

**Manifold or tee:**

**Extra hose per manifold (2):**

**Gauge (psi, lbs or tons scale):** GF-series glycerine for high cycle

**Gauge adaptor:**

**Fittings:**

**Pressure relief safety valve:**

**Load-holding valve(s):**

**Hydraulic oil:**
CONTROLLED HYDRAULIC MOVEMENT

At Enerpac, we specialize in designing high-pressure hydraulic systems required for the controlled movement of large, heavy structures.

Around the world, construction experts consult with Enerpac to develop heavy lifting hydraulic solutions for the relocation, positioning, raising and lowering of structures such as bridges, tunnels, buildings, ship modules and platforms.

Together, with your engineers and our hydraulic experience, we can develop the innovative solutions you need for the controlled hydraulic movement of those large, heavy burdens.

HEAVY-LIFTING TECHNOLOGY

- Synchronous Lifting Systems
- Jack-Up Systems
- Bridge Launching Systems
- Synchronous Hoisting Systems
- Telescopic Hydraulic Gantry
- Heavy-Lifting Strand Jacks
- Skidding Systems
- Self-Erecting Towers
- Chain Pulling Systems
- Self-Propelled Modular Transporter

POWERPACKS FOR LIFTING APPLICATIONS

SFP-Series
Split-Flow pumps distribute an equal amount of hydraulic oil to a maximum of 8 outlets. Smart valve technology allows both controlled lifting and lowering of heavy loads.

Assisted-Return Pumps
To improve productivity and plunger retraction Enerpac offers assisted-return on ZU4 and ZE-Series pumps featuring Enerpac Venturi valve technology, specifically to facilitate the faster return of single-acting, gravity-return cylinders. See www.enerpac.com for details.

EV08-Series
Basic PLC-controlled lifting systems using stroke sensors signals for synchronized lifting and lowering of multiple lifting points. Depending on model, this pump can control 4 or 8 lifting points.

EV0-Series
Multifunctional PLC-controlled lifting systems for up to 12 lifting points. Modular network capability between units to synchronize up to 48 points. Smart pump technology in combination with stroke and load monitoring per lifting point, provides high accuracy for lifting and lowering applications. Optional: Weighing and center of gravity determination.

HIGH-TONNAGE CYLINDERS FOR LIFTING APPLICATIONS

SUMMIT EDITION
Innovation is at the heart of the new Summit Edition of cylinders, delivering the high-quality construction that you expect from Enerpac. The durability ensures your job gets done safely and reliably.

The Enerpac High-Tonnage Cylinders are particularly suitable for (multipoint) lifting applications.

About Enerpac

Enerpac is the leading global provider of high-pressure hydraulic tools and solutions with a broad range of products, local expertise and worldwide distribution network. With a proven track record in a wide range of markets, Enerpac designs and manufactures high-quality tools and solutions for all industrial applications.

Enerpac has gained unique experience in delivering hydraulic solutions for the controlled movement and positioning of heavy objects. Enerpac supports your business by offering the right solutions and service to help you get your work done efficiently and safely.

Enerpac Worldwide Locations
For a complete list of addresses see: www.enerpac.com/en/contact-us