EVO-Series

Synchronous Lifting Systems

Management of lifting operations from a central control system improves safety and operational productivity.

ENERPAC®

▼ **EVO-8** (shown with optional cylinders and wire stroke sensors)

The multi-functional synchronous lifting system

- **Lifting system to control 4, 8 or 12 lifting points (12 points for Standard EVO only)**
- **Intuitive user interface provides easy set-up and control with multiple lifting options**
- **Accuracy of up to 1 mm between leading and lagging cylinders**
- **For use with standard single- or double-acting cylinders**
- **Built in warning and stop alarms for optimum safety**
- **Available with several flow options for optimal lifting speed.**

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.

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.

▼ *3600 ton Tunnel Boring Machine lowered and tilted into its starting position with the EVO-Series Synchronous Lifting System.*

EVO-Series
Enerpac's family of EVO-Series synchronous lifting systems provides precision control suitable for most lifting and lowering applications. Custom systems tailored to unique project requirements are also available.

The Standard EVO-System
It is a comprehensive self-contained design that features simple to use software that is extremely efficient at completing basic to complex applications.

The Standard 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 *
9. Center of Gravity determination *

* Available in the EVO-W System with calibrated sensors, please contact Enerpac.

Features of the Standard 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 a separate master control box).
- Variable frequency drive (VFD) and PLC for precise synchronization and control of oil flow.
- Data storage and recording capabilities.

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

The Basic EVOB-System has three work modes. The operator can navigate to any of these menus:
1. Manual
2. Automatic
3. Depressurize.

EVO Series

Reservoir Capacity:
40 or 250 litres

Number of Lifting Points:
4, 8 or 12

Accuracy:
1,0 mm

Motor Size:
0,75 - 7,5 kW

Maximum Operating Pressure:
700 bar

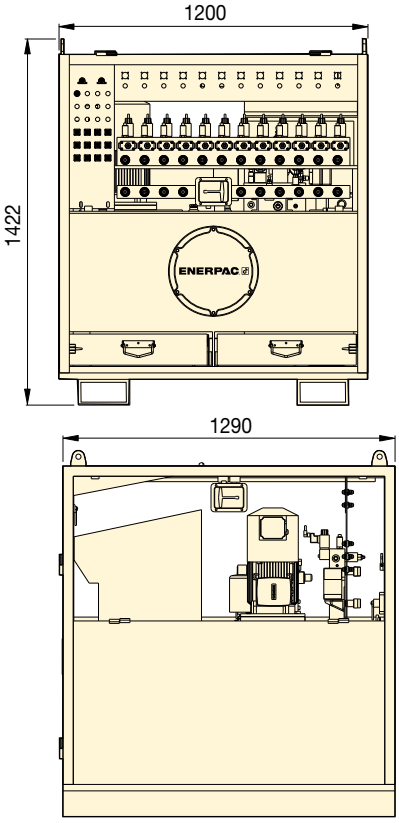
Lifting Cylinders
For a complete line of Enerpac cylinders, see the Cylinder and Lifting Products in our catalogue.

Ease of Operation
A single operator controls the entire operation. User friendly interface: visual screens, icons, symbols and color coding.

▼ *The superlifting and launch of a 43.000-ton floating oil production system in Malaysia for the Gumusut-Kakap offshore field has set high benchmarks for safety through its use of sophisticated EVO-Series synchronous hydraulics to lift, balance, weigh and smoothly launch massive resources structures.*

▼ *Synchronous lift system used to lift a 1000 ton building.*

▼ **EVO821460W**

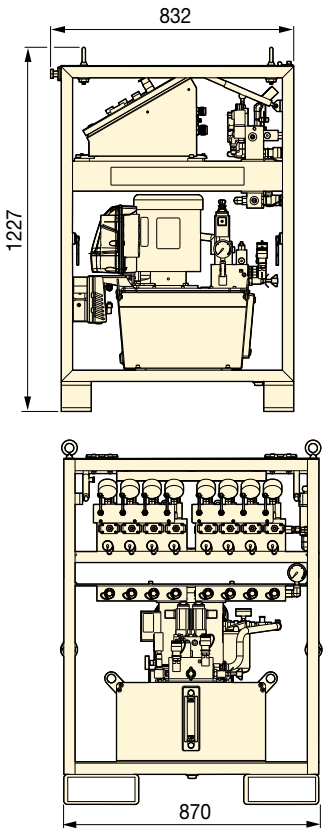


EVO Standard

Oil Flow Group	Motor Size (kW)	Variable Output Oil Flow * (l/min) Low Pressure (< 125 bar)	Variable Output Oil Flow * (l/min) High Pressure (> 125 bar)	Reservoir Capacity (litres)	(kg)
21	3,50	4,00 - 13,31	0,75 - 2,51	250	910
40	7,50	4,69 - 15,60	1,44 - 4,80	250	1000

* Output oil flow rate is variable and listed at 18 - 60 Hz.

▼ **EVOB816W**



EVO Basic (EVOB)

Oil Flow Group	Motor Size (kW)	Fixed Output Oil Flow at 50 Hz * (l/min) Low Pressure (< 80 bar)	Fixed Output Oil Flow at 50 Hz * (l/min) High Pressure (> 80 bar)	Reservoir Capacity (litres)	(kg)
05	0,75	6,15	0,55	40	274
08	1,12	8,88	0,82	40	278
16	2,24	11,61	1,64	40	284

* Oil flow will be approximimately 6/5 of these values at 60 Hz.

EVO Basic

CUSTOM BUILD YOUR OWN SYNCHRONOUS LIFTING SYSTEM

▼ This is how a SyncLift model number is built up.

EVO	12	40	460	W
1 Product Type	2 Lift Points	3 Flow Group	4 Voltage	5 Options

1 Product Type
EVO = Standard SyncLift System
EVOB = Basic SyncLift System

2 Lift Points
4 = 4 Lift Points
8 = 8 Lift Points
12 = 12 Lift Points (EVO only)

3 Flow Group
EVO
21 = 2,51 l/min
40 = 4,80 l/min
EVOB
05 = 0,55 l/min at 50 Hz
08 = 0,82 l/min at 50 Hz
16 * = 1,64 l/min at 50 Hz
* only available with 3 phase motor.

4 Voltage
EVO
380 = 380-415 V, 3 Ph, 50-60 Hz
460 = 460-480 V, 3 Ph, 50-60 Hz
EVOB
B = 115 V, 1 Ph, 50-60 Hz
E = 208-240 V, 1 Ph, 50-60 Hz
G = 208-240 V, 3 Ph, 50-60 Hz
W = 380-415 V, 3 Ph, 50-60 Hz
J = 460-480 V, 3 Ph, 50-60 Hz
R = 575 V, 3 Ph, 60 Hz.

5 Options
W = Weighing (only available with the EVO Standard SyncLift System). Weighing option includes load cell inputs with special programing for calibration and center of gravity.

Ordering Examples:
Model Number: EVO821460W
EVO has 8 lift points, 2,51 l/min, and voltage is 380-415 V, 3-Phase, 50-60 Hz with weighing option.

Model Number: EVOB408W
EVOB has 4 lift points, 0,82 l/min, and voltage is 380-415 V, 3-Phase, 50-60 Hz.

EVO Series

Reservoir Capacity:
40 or 250 litres

Number of Lifting Points:
4, 8 or 12

Accuracy:
1,0 mm

Motor Size:
0,75 - 7,5 kW

Maximum Operating Pressure:
700 bar

Contact Enerpac!
Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lifting System or visit us at: www.enerpac.com. Or ask Enerpac for assistance by email: **integratedsolutions@enerpac.com**

Wire Stroke Sensors

- **Ordered separately, requires one for each lifting point**
- **Provides stroke feedback to controls**
- **Includes magnets for mounting.**

Stroke Sensor Model Number	Measuring Range (mm)
EVO-WSS-500	500
EVO-WSS-1000	1000

Stroke Sensor Cables

- **Ordered separately, requires one for each stroke sensor**
- **Can be connected together for additional length.**

Sensor Cable Model Number	Cable Length (m)
EVO-SC-25	25
EVO-SC-50	50

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

▼ *The EVO-W Series provided the perfect solution for weighing the completed jack-up drilling rig cantilever and drill floor substructure.*

Synchronous Lifting Applications

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

The Enerpac EVO-Series, Synchronous Lifting Systems – the evolutionary result of more than 25 years experience in specialized hydraulic engineering and lifting technology using digitally controlled hydraulics.

The application possibilities are infinite with the EVO-Series, powering interlinked hydraulic cylinders. Our PLC-controlled Synchronous Lifting Systems provide hydraulic solutions to meet customer requirements for safe, precise control of movement and positioning.

BRIDGE LIFTING & LAUNCHING

Synchronous Lifting Systems used for incremental deck launching, incremental lifting (stage lifting) for temporary pier erection and deck nose recovery.

BRIDGE BEARING REPLACEMENT

A 200 ton bridge was lifted 22 inch using 8x CLRG10012 cylinders with an EVO-System. This SyncLift system was used to replace the old bearings. The accuracy during lifting was 0.4 inch between the leading and most lacking cylinder.

PRECISION LEVELLING CAISSON PIER BOX

Three EVO-Systems connected with 32 jacks lowered the 1100 ton bascule pier box. Utilizing the EVO system, customer was able to improve accuracy, productivity, and efficiency thus completing the caisson lowering and levelling in 3 working days.

BOX JACKING & TUNNEL PUSHING

Tunnel segments are pushed under the railway using a multi-point (35) synchronous lifting system.

INCREMENTAL LIFTING

Lift and crib: The 360 ton bridge was lifted to its final position. Four Enerpac BLS-Series climbing jacks were connected to the PLC-controlled Synchronous Lift System and operated with the stage lift work mode.

HORIZONTAL STAGE LIFTING

Long stroke RR-Series cylinders are attached to a sliding and guiding system, pulling the arched roof assembly of Athens Olympic Stadium step by step into the final position.

LIFTING & CLIMBING SYSTEM

The complete hoisting system for each stage therefore consists of 16 lifting cylinders, 16 locking cylinders and 4 PLC-controlled hydraulic units. The system is used to assemble and dismantle the 230 ton stage construction.

Synchronous Lifting Applications

WEIGHING & MANIPULATION SYSTEM

Five blocks are moved to build one ship of which the heaviest block weighs over 1400 ton. Enerpac's synchronous lifting system ensures that the desired load paths into the ship's hull structure are maintained during transport.

SUPERLIFT & LAUNCH

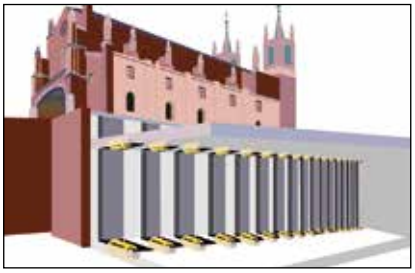
The lift and launch of 43.000 ton floating oil production system for the offshore field has set high benchmarks for safety through its use of sophisticated EVO-Series synchronous hydraulics to lift, balance, weigh and smoothly launch massive resources structures.

MULTI-POINT STAGE LIFTING

30 hydraulic climbing systems with 6 power units in a synchronous system to lift and lower the umbrella deck for casting concrete blocks. Each climbing unit consists of two push/pull cylinders and two locking cylinders.

FOUNDATION REPAIR

An Synchronous Lifting System was used to manage the lifting force and extension of 22 high tonnage double-acting hydraulic cylinders (CLRG-Series) to safely and accurately lift the foundation and building to the required position. Managing the lifting operation from one central control system improved safety and operational productivity.



MONITORING AND ADJUSTING

Enerpac SyncLift System monitors foundation movement between church, museum basement and surrounding buildings. All 34 CLL-500 ton lock nut jacks with class A load cells are positioned horizontally in two floor levels to support the concrete walls and floors.

MOVING, POSITIONING & MONITORING

Hydraulically monitor the movement and the forces that occurred during the movement this 1600 ton railway bridge. The synchronous hydraulic system offers an effective method for both vertical and horizontal movement and positioning.

PRECISION LIFT & BEARING ALIGNMENT

High precision lifting job with SyncLift system enabled exact aligning of bearings on the rail on which this 3500 ton mining dragline rotates. The PLC-controlled system simultaneously controlled 80 x 100-ton hydraulic cylinders.

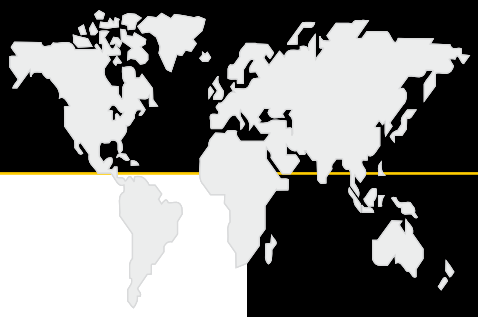
VERIFYING TRANSFORMER WEIGHT

The EVO-W weighing system and four RACL-Series lock nut cylinders were used to lift and weigh the transformer. Calibrated pressure transducers provided weigh data to the EVO system. Verifying the weight was under local shipping port weight limits saved the manufacturer significant freight costs.

LEVELING WIND TURBINES

Enerpac's SyncLift System used to level supporting cross piece accurately and in just a short time frame. Each foundation has 9x 100 ton cylinders and are connected to the EVO-System on board the installation vessel, which finally levels the supporting cross piece with one push of the button.

Synchronous Lifting Systems



The Industrial Tools Line

Cylinders and Lifting Products
- General Purpose
- Aluminium Lightweight
- Pancake
- Flat-Jac®, Low Height
- Pull
- Hollow Plunger
- Precision
- Long Stroke
- High Tonnage
- POWR'RISER® Lifting Jacks
- Jacks
- Cylinder-Pump Sets

Pumps
- Manual
- Cordless & Electric Driven
- Compressed Air Driven
- Petrol Driven

System Components
- Hoses, Couplers, Oil
- Gauges, Adaptors
- Manifolds, Fittings

Valves
- 3-and 4-Way Directional
- Pressure and Flow Control

Presses
- Bench, Workshop, Roll Frame
- Arbor and C-Clamps
- Tension Meters, Load Cells

Pullers
- Master Pullers Sets
- Multi Purpose Puller Sets
- Posi Lock® Pullers

Tools
- Maintenance Sets
- Punches
- Machine Lifts
- Lifting Wedge
- Load Skates
- Cutters
- Pipe Benders
- Wedgie, Spreaders

Bolting Tools
- Multipliers
- Torque Wrenches
- Impact Sockets
- Bolt Tensioners
- Wrench and Tensioner Pumps
- Flange Alignment Tools
- Flange Facing Tool
- Nut Splitters

Enerpac Bolting Service Van

Enerpac Worldwide Locations

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

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.

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Enerpac Integrated Solutions

Enerpac Integrated Solutions provides customers with tailored solutions, combining hydraulics, steel fabrication and electronic control technology. Global Leader providing best in class solutions for safe and precise positioning of heavy loads.

- Synchronous Lifting Systems
- Stage Lifting and Climbing Systems
- Bridge Launching Systems
- Synchronous Hoisting Systems
- Hydraulic Gantries
- Heavy-Lifting Strand Jacks
- Skidding Systems
- Self-Erecting Towers
- Chain Pulling Systems.

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