Integrated Solutions




ENERPAC

Enerpac Integrated Solutions

With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of heavy loads.

This expertise has been acknowledged by the world's leading industrial professionals and has contributed to the successful movement of a number of the most recognizable structures on earth.

In addition to providing the most comprehensive line of globally-supplied, locally-supported products, Enerpac combines hydraulics, steel fabrication and electronic control with engineering and application knowledge, to design and manufacture solutions that ensure your projects are completed safely and efficiently.

EXPERIENCE and EXPERTISE

HYDRAULIC POWER UNITS

Enerpac designs, assembles and tests small to large hydraulic power units in-house. Power units range from ¼ to 320 hp and are tested with the system they are intended to operate.

STEEL FABRICATION

Enerpac has a dedicated facility for steel fabrication and welding. We design and manufacture custom structures used in demanding heavy-lifting applications.

ELECTRONICS

Enerpac designs all control systems in-house. This capability keeps control technology close to the design engineers who are developing the rest of the system. In doing so, we can tailor the control system to match unique project requirements.

ENGINEERING

Enerpac has a multi-disciplined engineering team capable of design and development of all aspects of an Integrated Solutions system. Leveraging design and application experience with the latest in computer software, rapid prototyping and analysis methods ensures delivery of the highest quality systems.

MACHINING

Enerpac utilizes the latest in CNC machining technologies and manufactures all large and special hydraulic cylinders in-house. We can machine diameters up to 50 inches with lengths to 240 inches.

FIELD SUPPORT

Enerpac Integrated Solutions is available to provide on-site support including training and troubleshooting of systems. We also stock repair parts and consumable items at several locations to ensure fast delivery and minimal downtime.

MAINTENANCE and REPAIR

Due to the unique nature of Enerpac's Integrated Solutions systems, we offer complete maintenance and repair services. Our **M&R** group is available to assist customers who do not have access to local service facilities qualified to work on these systems.

HYDRAULIC GANTRIES

The complete range of hydraulic gantries for your most demanding lifting and rigging operations

Hydraulic Gantries are a safe, efficient way to lift and position heavy loads in applications where traditional cranes will not fit and permanent overhead structures for job cranes are not an option.

Hydraulic Gantries are placed on skid tracks to provide a means for moving and placing heavy loads, many times with only one pick.

Enerpac offers three series of Hydraulic Gantry systems:

- the cost effective SL-Series offers entry level control and capacity
- the heavy duty SBL-Series offers capacities up to 1,200 tons and 3-stage lifting capability through the boom structure
- the MBL-Series incorporates all features of the SBL-Series and offers full lifting capacity over the full stroke. The MBL Gantries have been designed with increased footprint stability and can therefore lift using 2 legs as well as 4.

All Enerpac gantries are delivered with specific properties and control systems to ensure optimum stability and safety.

Hydraulic Gantries

Capacity *(with 4 towers)* (tons)			**Model Number**	Lift Height (in)			Weight *(per tower)* (lbs)
1st stage	2nd stage	3rd stage		1st stage	2nd stage	3rd stage	
67	67	n/a	**SL60**	133	195	n/a	2,315
141	141	n/a	**SL125**	182	264	n/a	4,696
441	441	215	**SL400**	193	266	335	11,464
573	573	330	**SBL500**	195	270	337	14,330
1,010	653	357	**SBL1000**	195	270	337	18,850
1,178	759	423	**SBL1100**	276	381	473	26,345
562	562	n/a	**MBL500**	n/a*	507	n/a*	43,541
674	674	n/a	**MBL600**	n/a*	573	n/a*	48,502

*Extends simultaneously through all stages with constant lifting capacity

OVERVIEW

Shown: SBL1100

KEY FEATURES:

- Self-contained hydraulics and electronics
- Intelli-Lift wireless control system
- Self-propelled wheels or tank rollers
- Foldable boom on **SBL1100, MBL500** and **MBL600**
- Full range of supplementary equipment: header beams, lifting lugs, side shift, skid tracks
- All gantries are ASME B30.1 compliant

STRAND JACKS

Compact high-capacity system for controlled lifting and lowering

A strand jack can be considered a linear winch. In a strand jack, a bundle of steel cables or strands are guided through a hydraulic cylinder. Above and below the cylinder are anchor systems with wedges that grip the strand bundle simultaneously, this is how the strand jack is able to carry a load. Lifting and lowering a load is achieved by hydraulically controlling the main jack and both mini jacks alternately.

Enerpac utilizes Smart Cylinder Control (SCC), ensuring full control of the lifting and lowering operation.

Today strand jacks are widely recognized as the most sophisticated heavy lifting solution. Strand jacks are used all over the world to erect bridges, load out offshore structures, and lift/lower heavy loads where the use of conventional cranes is neither economical nor practical.

Strand Jack				
Capacity (tons)	Strand Diameter (in)	**Model Number**	Number of Strands	Weight (lbs)
17	0.71	**HSL1507**	1	220
34	0.62	**HSL3006**	3	1,102
51	0.71	**HSL4507**	3	1,102
67	0.71	**HSL6007**	4	1,433
79	0.62	**HSL7006**	7	1,411
112	0.71	**HSL10007**	7	1,874
225	0.62	**HSL20006**	19	2,866
225	0.71	**HSL20007**	12	3,086
337	0.62	**HSL30006**	31	4,806
337	0.71	**HSL30007**	19	4,806
506	0.71	**HSL45007**	31	6,724
562	0.62	**HSL50006**	48	6,945
731	0.71	**HSL65007**	43	8,708
955	0.71	**HSL85007**	55	11,023
1,124	0.71	**HSL100007**	66	16,865
1,405	0.71	**HSL125007**	84	18,298

OVERVIEW

Shown: HSL85007

KEY FEATURES:

- Full control of lifting and lowering through SCC control
- Two sizes strand diameter: 0.62 in. and 0.71 in.
- Complete line of electric and diesel power packs
- Nickel plated telescopic pipes preventing bird caging
- Standard supplied with lifting anchor
- Automated locking – unlocking operation
- Special corrosion treated high endurance multi-use wedges
- Full range of accessories: strand dispenser, strand guide, re-coiler

SKIDDING SYSTEMS

An ancient technology meets the 21st century

The HSK skidding system is comprised of a series of skid-shoes powered by hydraulic push-pull cylinders, travelling over a pre-constructed track.

A series of special PTFE coated blocks are placed on the skid-tracks. The PTFE surface is matched with a sliding plate under the Enerpac skid shoes, designed to achieve minimum friction coefficients. The skid shoes are connected by hoses to a hydraulic electric or diesel driven power pack.

In addition to our standard skidding systems we have the capabilities to create customized skidding systems to meet your specific requirements.

Enerpac Skidding Systems are available in three versions:

- **HSK1250** with a capacity of 140 tons per skid unit
- **HSK2500** with a capacity of 280 tons per skid unit
- **HSKLH2000** with a capacity of 225 tons per skid unit and a lower collapsed height

The HSK1250 and HSK2500 skidding systems are available in 2 varieties: using a “skid shoe jack” or a “skid shoe beam”. The skid shoe jack includes an integrated lifting cylinder. A skid shoe beam is designed for skidding purposes only.

To calculate the minimum required capacity per shoe, the entire load has to be able to rest safely on 2 of the 4 shoes. To skid a load of 500 tons, the required skidding system is **HSK2500**.

Skidding Systems

Capacity *(per shoe)* (tons)	**Model Number**	Skid Shoe	Stroke Push/Pull Cylinders (in)	Stroke Lifting Cylinder (in)	Weight *(per shoe)* (lbs)
140	**HSK1250**	beam	24	n/a	1,631
		jack	24	6.9	1,742
280	**HSK2500**	beam	24	n/a	2,249
		jack	24	6.9	3,197
225	**HSKLH2000**	beam	24	n/a	750

OVERVIEW

Shown: HSK1250

KEY FEATURES:

- PTFE skid pads with dimpled surface for low friction and long lifetime
- Easy to replace skid pads, no tools necessary
- Unique gripper anchor system complete with lever for easy selection of skidding direction
- Double acting hydraulic cylinders with sufficient capacity in both push and pull direction. No need to turn the skid shoe for reverse skidding direction
- Large load support surface on the skid beam
- Bottom of skid shoes equipped with stainless steel sliding plates

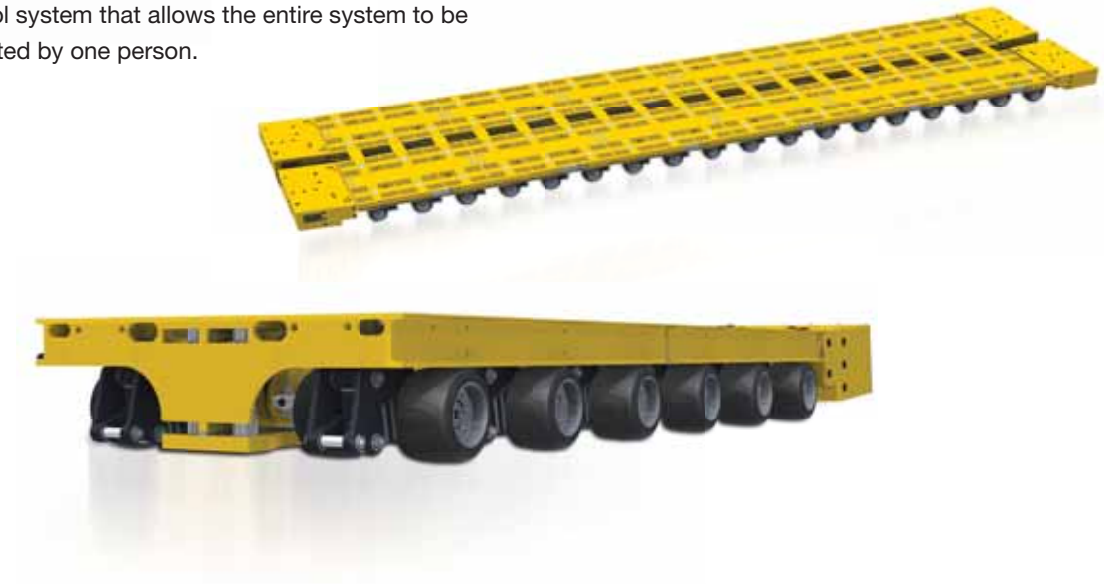
SELF-PROPELLED MODULAR TRAILER

Hydraulic strength in a linear drive transport system

The Enerpac Self Propelled Modular Trailer features a minimized height and slim design, which make it very easy to operate in confined spaces. Each trailer has 3 axles. Each wheel unit has a steering as well as a lifting cylinder at its disposal. Wheel propulsion is accomplished by hydraulic propulsion. The power pack has a 55 hp tier 4 driven engine.

The SPMT is controlled by Intelli-drive, a wireless control system that allows the entire system to be operated by one person.

One of the unique features of the system is that it is able to be containerized. Two trailers and a power pack can be shipped inside a 20 ft. container.



Self-Propelled Modular Trailer									
Capacity *(per unit)* (tons)	**Model Number**	Transport Speed *(1 unit)* unloaded (mph)	Transport Speed *(1 unit)* loaded (mph)	Steering Range degrees	Lifting Range (in)	Collapsed Height (in)	Length (in)	Width (in)	Weight (lbs)
67	**SPMT600**	2.1	0.9	-175º to +175º	14	30	121	91	15,101

OVERVIEW

Shown: SPMT600

KEY FEATURES:

- Multiple configurations possible
- Reduced height and slim design
- Intellidrive wireless control system
- Up to 3 trailers per power pack

SYNCHRONOUS LIFTING SYSTEMS

The combined strength of hydraulics and digital control

Enerpac's family of EVO synchronous lifting systems provides precision control and levels of force suitable for most lifting/lowering applications. We can also provide custom systems tailored to unique project requirements.

The standard EVO system can support up to 12 lifting points, or be networked up to 48 points, and includes features such as center of gravity and tilting/weighing capabilities. It is a comprehensive self-contained design that features simple to use software that is extremely efficient at completing basic to complex applications.

The modular EVO-B system is a modular design that allows for utilization of existing Enerpac pumps. EVO-B offers an economical solution to basic applications requiring a maximum of 8 lifting points.

SYNCHRONOUS LIFTING								
Lift Points	**Model Number**	Integrated Pump	Accuracy	Touch Screen Control	Options			
					Levelling	Weighing	CG	Expandable
4,8,12	**EVO**	yes	0.04	yes	yes	yes	yes	yes
4,8	**EVO-B**	no	0.04	yes	no	yes*	no	no

* 4-point system includes weighing function

OVERVIEW

Shown: EVO

KEY FEATURES:

- Modular lifting system to control 4, 8 or 12 lifting points
- Can be networked to link up to 4 systems together (requires separate master control box)
- Intuitive user interface provides easy set-up and control with multiple lifting options
- Accuracy of 0.040" between leading and lagging cylinders
- Data storage and recording capabilities
- For use with standard single- or double-acting cylinders
- Built in warning and stop alarms for optimum safety
- Variable frequency electric motor for optimal flow control
- Two flow groups available to operate a wide range of cylinders
- EVO-B is a modular design allowing for use of existing Enerpac pumps

CUSTOM SOLUTIONS

SYNCHRONOUS HOISTING

A unique crane product for below-the-hook positioning of heavy loads that require precision placement. May reduce the number of cranes needed and reduce the costs for multiple picks.

BRIDGE LAUNCHING

Providing a solution for the most complex and demanding bridge construction applications, Enerpac has over 20 years experience providing unique custom bridge launching systems.

STRAND JACK GANTRY

The strand jack gantry is a steel structure to facilitate lifting and skidding back, forth and sideways of heavy loads. The Enerpac strand jack gantry allows you to operate in confined spaces.

The system consists of 3 major components:

- Steel Construction
- Strand Jacks for vertical lifting
- Skidding System for horizontal skidding

This is powered by a hydraulic power unit that is situated on ground level. The capacity, height and width of the construction can be modified in cooperation with our engineering team.

SELF-ERECTING TOWER

The Enerpac Self-Erecting Tower (ESET) is a self-erecting tower lift system that enables you to build a free standing gantry from ground level. The Self-Erecting Tower can be supplied in various capacities and heights and is built with standard modular components, enabling a flexible solution to future project demands.

The Self-Erecting Tower enables moving the load in all directions: lifting, lowering, skidding back and forth, and has side shift capabilities. Lifting and skidding are achieved using standard Enerpac strand jacks that can also be used for other applications.

The Self-Erecting Tower is a versatile lift-system that can be used in a wide variety of applications, for example the installation of reactor vessels in a petrochemical plant or erecting a shipyard crane. When compared with large capacity cranes, the Self-Erecting Tower significantly reduces transportation and set up costs.

PROJECT GALLERY




INFRASTRUCTURE

- PROJECT — City Bridge Nijmegen
- LOCATION — Nijmegen, The Netherlands
- YEAR — 2012-2013
- EQUIPMENT — HSL-SERIES HEAVY LIFTING STRAND JACKS
  RR-SERIES HYDRAULIC CYLINDERS AND SPECIAL PUMPS

A new 0.9 mile long bridge connects the east and west sides of Nijmegen, the oldest city in the Netherlands. Construction required the lifting and precisely positioning of concrete and steel assemblies. During the concrete casting a series of linked Enerpac cylinders supported the formwork and concrete structures. Enerpac Strand Jacks were used to tension the arches of the bridge and to lift the 935 ft. long main span onto the structure of the bridge.

- PROJECT: San Francisco-Oakland Bay Bridge
- LOCATION: San Francisco, California, USA
- YEAR: 2005-2013
- EQUIPMENT: HSL-SERIES HEAVY LIFTING STRAND JACKS

State–of–the–art hydraulics are facilitating the construction of the new San Francisco – Oakland Bay Bridge. Enerpac Strand Jacks and Synchronous Lift Systems were used to erect key components of the bridge. The 1800 ton transition spans were lifted from a barge and raised to deck level using several 300 ton strand jacks. These spans link the east skyway to the self-anchored suspension (SAS) span. For the SAS tower, sections were raised into position using 650 ton strand jacks and then levelled using a 4 point synchronous lift system.

INFRASTRUCTURE

PROJECT	Millau Viaduct
LOCATION	France
YEAR	2001-2005
EQUIPMENT	INCREMENTAL LAUNCHING EQUIPMENT SYNCHRONOUS LIFTING EQUIPMENT

To create the world's tallest bridge, the construction partnership of Eiffage and Enerpac developed hydraulic construction and control solutions for incremental deck launching, deck nose recovery, and temporary pier erection. Enerpac supplied the equipment that was necessary to safely manage the 38,500 ton, 8,000 ft. long steel deck, situated 886 ft. in the air. It was launched around a 12 mile radius and positioned with millimeter precision.

POWER GENERATION

- PROJECT — Positioning Equipment Owen Springs Power Station
- LOCATION — Alice Springs, Australia
- YEAR — 2012
- EQUIPMENT — SBL-SERIES HYDRAULIC GANTRY

An SBL1100 hydraulic gantry was used to install diesel/gas generators and alternator sets each weighing hundreds of tons at the new Owen Springs Power Station near Alice Springs in the desert heart of Australia. The three, 14,000 hp diesel gas generators were unloaded onto their respective foundations in a single operation. The gantry's lifting height and side shift capability enabled the equipment to be maneuvered into their bays sideways.

POWER GENERATION

- PROJECT Steam Generator and Reactor Head Replacement
- LOCATION New Orleans, Louisiana, USA
- YEAR 2012
- EQUIPMENT SELF-PROPELLED MODULAR TRAILER SPMT600

To provide radiation shielding on the bottom of a Reactor Vessel Head Assembly, a 14 ft. diameter, 3 ft. thick steel plate needed to be transported through a narrow passage way of the reactor building equipment hatch. In order to avoid having to wait for a larger opening to become available, the SPMU600's size and load carrying capacity allowed for transporting the plate through the existing hatch, thus saving critical time on the project.

PROJECT	Napoli Vessel Salvage
LOCATION	English Channel, United Kingdom
YEAR	2009
EQUIPMENT	CHAIN PULLERS

The MCS Napoli was caught in a storm and was beached in Lyme Bay in 2007. The ship cracked and was broken up into sections. The 3,800 ton back of the ship, measuring 213 ft. by 118 ft., was hoisted onto two pontoons using 24 hydraulically operated chain pullers, each with a lifting capacity of 250 tons. Once on the pontoon, the wreck was sawn into pieces before being transported to land.

OFFSHORE

- PROJECT — Platform Recovery
- LOCATION — Germany
- YEAR — 2010
- EQUIPMENT — HSL-SERIES HEAVY LIFTING STRAND JACKS

A salvage contractor's offshore platform installation was unstable and at risk. Enerpac presented the contractor with a fully engineered recovery solution to lift the platform to safety. Enerpac later supplied them with 16 strand jacks and 130 tons of fabricated structures, and soon the platform was lifted to its required elevation and secured.

PROJECT	Adriatic LNG
LOCATION	Porto Levente, Italy
YEAR	2007
EQUIPMENT	HSK-SERIES SKIDDING SYSTEM HSL-SERIES HEAVY LIFTING STRAND JACKS

Construction of the world's first LGN regasifier, built with 118,000 cubic yards of cement and 33,000 tons of steel, required lifting and skidding solutions that could stand up to these extreme conditions. Enerpac HSK-Series skidding systems, in conjunction with HSL-Series heavy lifting strand jacks, provided the solution, which compensated for skidding on uneven ground, and lifting deck modules and equipment of up to 3,300 tons.

OIL and GAS

- PROJECT — Offshore Production Facility
- LOCATION — Gulf of Mexico
- YEAR — 2013
- EQUIPMENT — 4 x HSL6500 with 65kW HPUs and Controls

During construction of a Tension Leg Platform, which will serve as an offshore production facility in the Gulf of Mexico and is projected to be located in water depths of in excess of 5,000 ft., Enerpac strand jacks were utilized for loading out the utility, drilling, and process modules. Each of these modules weighed approximately 7,000 tons and required 1,500 tons of pulling force during the load-out procedure.

MINING

- PROJECT — Sino Iron Ore
- LOCATION — Cape Preston, Australia
- YEAR — 2009
- EQUIPMENT — HSL-SERIES HEAVY LIFTING STRAND JACKS

An Enerpac Strand Jack Lifting system was employed to construct Australia's largest ever magnetite mining and processing operation. With the HSL-series strand jack system, pairs of 800 ton iron ore mills and 1,540 ton autogenous mills were lifted and then lowered onto their bearings 70 ft. above the ground.

PROJECT	Dozer Track Maintenance
LOCATION	Alberta, Canada
YEAR	2012
EQUIPMENT	DOZER LIFT SYSTEM (DLS)

Enerpac's Dozer Lift System provides a safe, efficient, and flexible solution for conducting maintenance on dozers. It enables users to raise and lower the dozer from a safe distance while having the ability to stop in any position with the load mechanically locked in place. The lifting cylinders have the capability to remain under the dozer as jack stands while the control unit is disconnected and used for a second set of stands. The system has a customizable design which ensures proper fit and jacking heights.

MINING

- PROJECT — Electric Rope Shovel Maintenance
- LOCATION — Calama, Chile
- YEAR — 2009
- EQUIPMENT — SYNCHRONOUS LIFTING SYSTEM

Minimizing equipment downtime is critical to mining operations. Enerpac provided a solution for high capacity, safe, and efficient shovel maintenance lifting. The Enerpac Synchronous Lifting System automatically lifts and lowers cylinders in unison negating the need for multiple jack operators. Synchronized lifting has increased safety and productivity.

SHIPBUILDING

- PROJECT — Hoisting Ship Sections
- LOCATION — Williamstown, Australia
- YEAR — 2012
- EQUIPMENT — SHS-SERIES SYNCHRONOUS HOISTING SYSTEM

The Enerpac SyncHoist system enhances crane performance and safety, offering horizontal and vertical load maneuvering. A system of 4 x 110 metric ton cylinders with 1,500 mm stroke lengths was used with one crane to align the steel blocks of the ship's control tower sections. The SyncHoist system allowed a gradual lift of the load and dynamic adjustment in relation to the center of gravity during the lift.

- PROJECT Vegas High Roller Observation Wheel
- LOCATION Las Vegas, Nevada, USA
- YEAR 2014
- EQUIPMENT MECHANIZATION SYSTEM & HYDRAULIC ROTATING MECHANISM

The skyline in Las Vegas has changed thanks to the construction of the 550 ft. High Roller Observation Wheel. Enerpac supplied two major components for the wheel. The first and major component was the Mechanization System which is the primary system used to drive the wheel every day for the expected 50 year life span. The second component was the HRM (Hydraulic Rotating Mechanism) which was used to erect the rim of the wheel.

ENTERTAINMENT

- PROJECT — U2 360˚ Tour Stage
- LOCATION — Global
- YEAR — 2009
- EQUIPMENT — SYNCHRONOUS LIFTING SYSTEM

A Synchronous Lifting and Climbing System was used to assemble and dismantle the 230 ton stage construction for U2's 360˚ Tour. The steel construction consisted of a central block that rests upon four legs, each made up of six sections. The central block was gradually lifted off the ground in 38 steps and a section was added to each of the four legs after every 6 steps. The complete climbing system for each stage consisted of 16 lifting cylinders, 16 locking cylinders and 4 hydraulic power units. Enerpac's Synchronous Lifting System raised the modular stage construction to a height of 98 ft. quickly and safely.

PETROCHEMICAL

PROJECT	Hydro-Cracker Installation
LOCATION	Russia
YEAR	2014
EQUIPMENT	ENERPAC SELF-ERECTING TOWER (ESET)

Customer turned to Enerpac to discuss an alternative solution compared to cranes. Enerpac supplied its Enerpac Self-Erecting Tower (ESET) to lift and position the hydrocracker vessels. Providing a complete heavy lifting solution, the ESET combines Enerpac's heavy lifting strand jacks with gantry and skidding technologies—lifting up to 1,600 ton loads to a height up to 250 ft.

PETROCHEMICAL

- PROJECT — Hydro-Cracker Installation
- LOCATION — Alabama, USA
- YEAR — 2009
- EQUIPMENT — ENERPAC SELF-ERECTING TOWER (ESET)

The Enerpac Self-Erecting Tower is a system that enables building a free standing gantry from ground level with a compact footprint. This system was employed on a 1,600 ton x 250 ft. lifting solution for installing a hydro-cracker at a refinery. When compared with large capacity cranes, the Self-Erecting Tower provides a safe lifting solution at significantly reduced transportation and setup costs.

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