

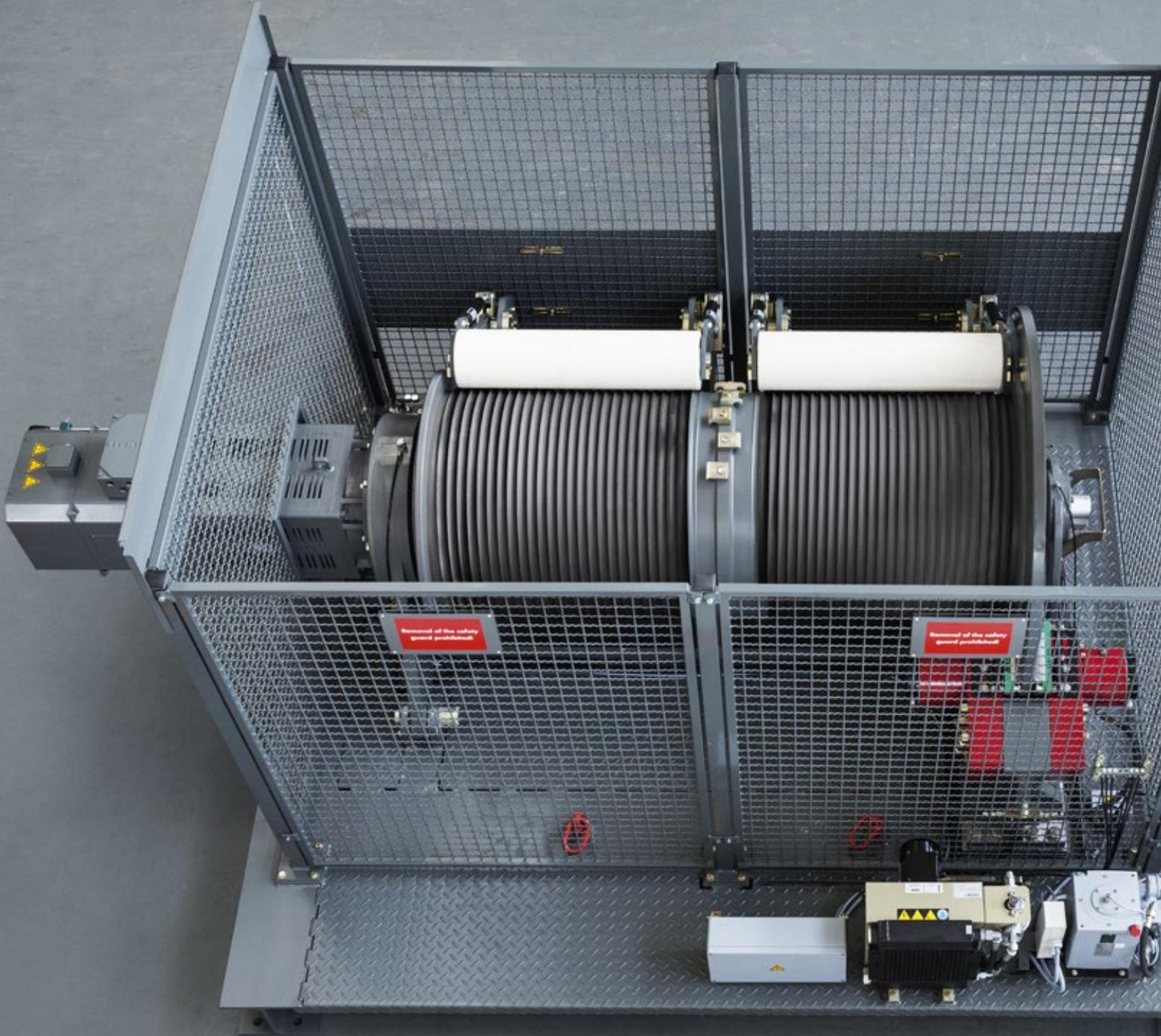
From a single source, modular, versatile
Winch Systems by Liebherr



LIEBHERR

Winch systems from Liebherr

Liebherr has been producing all the relevant components required for a lifting system for many years and now also provides complete winch systems on the market. The components are perfectly matched in their function. This results in convincing system solutions that can be integrated into a variety of applications.



Safe, robust, powerful

Modular system

Liebherr provides customised system solutions based on standard components for lifting applications that are characterised by scalability and simple integration and commissioning at the customer site -"plug & lift".

Everything from a single source

All essential components of the winch systems such as drum, planetary plug-in gear, asynchronous motor and switch cabinet are developed and produced in-house. With this prerequisite, it is possible to provide a modular system in which the individual components are perfectly matched with each other. The modular winch system is designed to cover a wide range of customer requirements and convinces with short time for development.

Simple assembly

Winch systems from Liebherr score mainly due to their short assembly time at the customer site. The complete winch is supplied pre-assembled on a frame, eliminating the need for time-consuming individual on-site assembly. The switch cabinet according to the customer's requirements is mounted on the winch frame and pre-wired. Alternatively the switch cabinet will be supplied as a separate unit. The control and power electronics are prepared in the factory according to the "connect & use" principle.

Service and Support

Liebherr Customer Service provides support as required when the winch system is installed and put into service at the customer site. For example, when the rope needs to be wound under pre-tension or the function of the system needs to be demonstrated for final acceptance.

Safety

A secondary brake, various sensors and optional integrated slack rope detection ensure the safe operation of the winch system. The appropriate monitoring program developed by Liebherr is shown on the switch cabinet display. It can be transferred to the customer via an interface to the higher-level process control system.

Gearbox

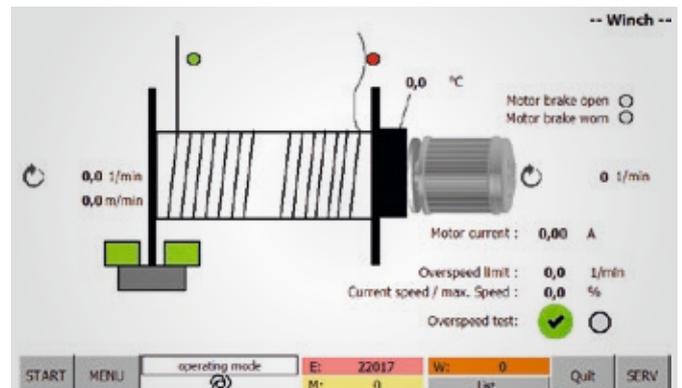
The gearbox is selected from Liebherr's proven product range of planetary plug-in gearboxes (PEG). This is impressive due to a robust and at the same time compact design. Oil cooling and oil heating for the gearbox are available as options.

Electric motor

The winches are driven via compact, air-cooled asynchronous squirrel-cage motors. These are available in the power range up to 250 kW and are designed for use under the harshest conditions. Efficiency is standard at Liebherr: The motors meet the requirements of efficiency class IE2 or higher in continuous operation. In addition, the motors allow a high degree of spreading. This means that the motor can be operated up to 3 times the rated speed at constant power in partial load operation (e.g. no load running). This enables the end application to achieve optimum economic efficiency.

Switchgear and control system

The switchgear and the entire control system are designed according to the EN13849 standard. Only robust products from well-known manufacturers are used for power and control electronics. Optionally there is the possibility of active power regeneration. For applications with frequent load cycles, an energy storage system based on double-layer capacitors is optionally available in order to increase the overall cost-effectiveness. The range is rounded off with an innovative controller that ensures effective and safe operation of the respective system.



Overview and performance spectrum

Under the listed boundary conditions, the modular winch system covers a wide performance spectrum with matched Liebherr standard components.

Control electronics and monitoring

- Control system according to EN13849
- Proven and robust PLC
- Functional safety
- Automatic process data acquisition and system monitoring (data logger)
- Standard module functions such as oil cooling or motor heating can be added to the software
- Bus interface for higher-level control system

Switch cabinet

- 7" display shows operating states and errors
- External controls for 2 directions with 2 speed setpoints each
- Power supply: 3-phase 400 V AC 50...60 Hz
- Type of power grid: TN system
- Ambient temperature: -20...+45 °C

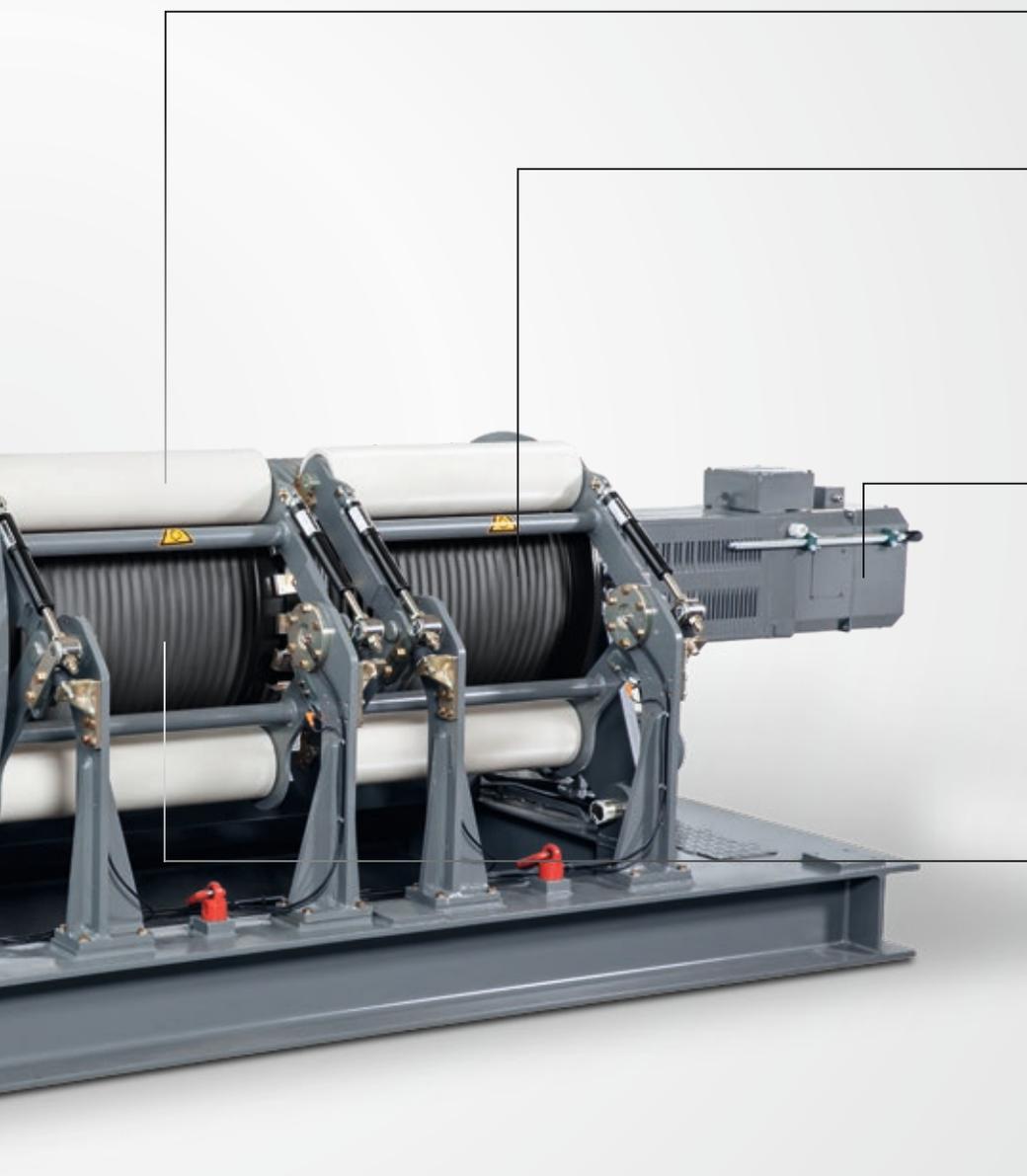
Power electronics

- Proven frequency converters from well-known manufacturers
- Special control of the asynchronous motor by the frequency converter for exact position and speed control even at zero speed passage
- Possibility of parametrisation for setting e.g. drum speed, start and stop ramps
- Possibility to synchronise multiple winch systems
- Optionally with regenerative unit (Active Front End)
- Possibility of connecting an energy storage device to cover power peaks



Customer-specific system solutions

In the case of different parameters or extended function requirements, a customer-specific solution can be realised on request in addition to the modular winch system. Liebherr provides customised development of the individual components as well as the control software to cover all customer needs.



Secondary Brake

- Second safety brake with “fail-safe closed” function to protect the electric-mechanical drive train

Slack Rope Detection (optional)

- Activates the winch safety shut-off if slack rope is detected

Planetary Plug-in Gearboxes (PEG)

- Standard series from PEG 300 to PEG 700
- Max. dynamic torque up to approx. 218.000 Nm
- Standard gear ratios for rope speeds from 4 to 120 m/min (< 4 and > 120 m/s on request)

Electric motor

- Asynchronous motors from in-house development and production
- Power range up to 124 kW in S1 operation according to IE2; short time up to 250 kW
- High spreading: up to 3 times the rated speed possible
- Ambient temperatures from -20 to +45 °C
- Motor brake and encoder as standard

Rope drum

- Wire rope hoist from 1 to 30 t
- Rope diameter from 10 to 40 mm
- Drum diameter from 420 to 820 mm
- Multilayer winding up to 7 layers
- Standard DIN groove for single layer winding
- Special groove for multilayer winding

Application examples

Liebherr winch systems are configured or modified according to the customer application based on Liebherr standard components. They can be used for a wide range of tasks in the area of lifting and conveyor technology as well as in adjustment systems. Accordingly, the target industries are also varied. Examples include mechanical and plant engineering, offshore, mining and raw material industries, steel hydraulic engineering, bridge construction and the amusement sector.



Lifting equipment for machinery and plant construction

Loading system for lime kilns

When loading lime kilns, Liebherr winch systems increase the productivity of the plants by increasing the speed up to three times during the no-load return stroke. Reliability under continuous loads and high levels of dirt as well as the guarantee of operational safety are only some of the requirements that are met without compromise.

Ship's lift

Due to the use of many identical drives, the regulation and control of the position and orientation of the ship's dock are particularly important. The same applies to the force distribution. The integration of the individual drives into a higher-level control system is already completed in the delivery condition and thus allows simple commissioning for the customer.





Gate control at hydro power plants

Vertically operated gates of hydro power plants can be operated with winch systems as a less expensive alternative to a solution with hydraulic cylinders. If more than one winch system is required for the actuation of a gate, the intelligent control system ensures perfect synchronisation of the rope drives to prevent the gate from tilting in its guide.

Screen cleaning system at hydro power plants

Winch systems as drives for screen cleaning systems provide our customers with the possibility of automation and the transfer of responsibility to one source. Furthermore, it is possible to integrate additional functions of the system into the control of the winch system.



Boom height adjustment of ship unloaders

The adjustment of the boom using a modular Liebherr winch system provides our customers with the possibility of concentrating on the core competences and reducing the complexity of auxiliary functions. The controller of the winch system ensures sensitive height adjustment of the boom.

Bridge building

As a restraint or pulling winch, e.g. for the construction of suspension bridges or for the longitudinal insertion method of pre-assembled bridge segments, monitoring of the rope tensile force and the position ensures exact positioning and maximum safety.

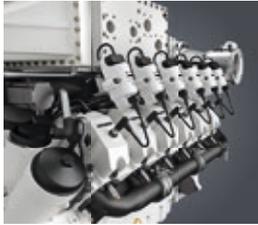
Amusement Rides

The control and design of Liebherr winch systems ensure functional safety in every operating situation when used in free fall towers or as a hoist for roller coaster carriages.



Lifting of gondolas from free fall towers

Liebherr Components



Gas engines



Diesel engines



Fuel injection systems



Axial piston hydraulics



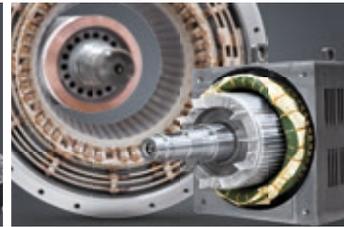
Hydraulic cylinders



Slewing bearings



Gearboxes and winches



Electric machines



Remanufacturing



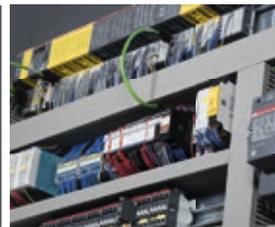
Human-machine interfaces and gateways



Control electronics and sensor technology



Power electronics



Control cabinets



Software

From A to Z – the components division of the Liebherr Group offers a broad range of solutions in the area of mechanical, hydraulic, electric and electronic drive system and control technology. The efficient components and systems are produced at a total of ten production sites around the world to the highest standards of quality. Central contact persons for all product lines are available to our customers at Liebherr-

Components AG and the regional sales and distribution branches.

Liebherr is your partner for joint success: from the product idea to development, manufacture and commissioning right through to customer service solutions like remanufacturing.

components.liebherr.com