

Rotary drilling rigs

LB series



LIEBHERR

Efficient in every application

The conception of the Liebherr rotary drilling rigs (LB series) is based on Liebherr's many years of experience with deep foundation applications and considers even the heaviest demands, which are nowadays made on modern rotary drilling rigs.

Success through leading technology

Liebherr rotary drilling rigs achieve an excellent

level of performance in every situation due to

leading technology developed in-house. This includes the powerful drive technology, the solid leader design, the electronic control and the reliable machine and process data recording system. Thus, Liebherr defines new standards for rotary drilling rigs.



2

Performance and flexibility through innovation

Liebherr rotary drilling rigs offer a wide range of possible applications.

No existing standard concept was used for their development. The steel structure of the uppercarriage was newly designed to meet with the requirements. Many innovations from Liebherr's many years of experience with deep foundation applications were incorporated and all requirements for best performance were uncompromisingly fulfilled. Reliable Liebherr components as well as proven Liebherr technology were used to ensure the high quality and longevity of the drilling rigs.

3

Cost-effective operation

Economical transportation, quick and easy assembly as well as extremely low operating costs are decisive advantages of Liebherr rotary drilling rigs.

4

Higher productivity through better comfort

The ergonomically designed cab provides the operator with an unlimited view of the operating area. The standard equipment of the Liebherr rotary drilling rigs includes numerous innovative technical features ensuring ease of operation for the operator and thus maintaining his efficiency.

5

Reliable service

Thanks to low maintenance requirements, the possibility of remote diagnosis, quick assistance on site and an efficient spare parts supply, Liebherr guarantees the permanent availability of its products. For qualified service of the machines as well as comprehensive training of operating and maintenance personnel, state-of-the-art repair and training centres are available at the works in Nenzing as well as at other locations.





1

Success through leading technology

Thanks to the extremely robust leader and the parallel kinematics Liebherr rotary drilling rigs are enormously versatile and ideal for precise work. The rope crowd system featuring exceptionally high pull and push forces significantly enhances the rigs' performance. The Litronic control system does not only include programs for the application of the various drilling methods but also provides the operator with information on service requirements and possible defaults. The process data recording and evaluation systems are available as additional equipment. The reliable Liebherr diesel engines offer sufficient power and are particularly energy-saving.



Convincing leader concept

The higher the utilization of a drilling rig, the more profitable is its operation. Therefore the kinematics and leaders of Liebherr rotary drilling rigs are designed for a wide variety of applications.

More stability for maximum precision

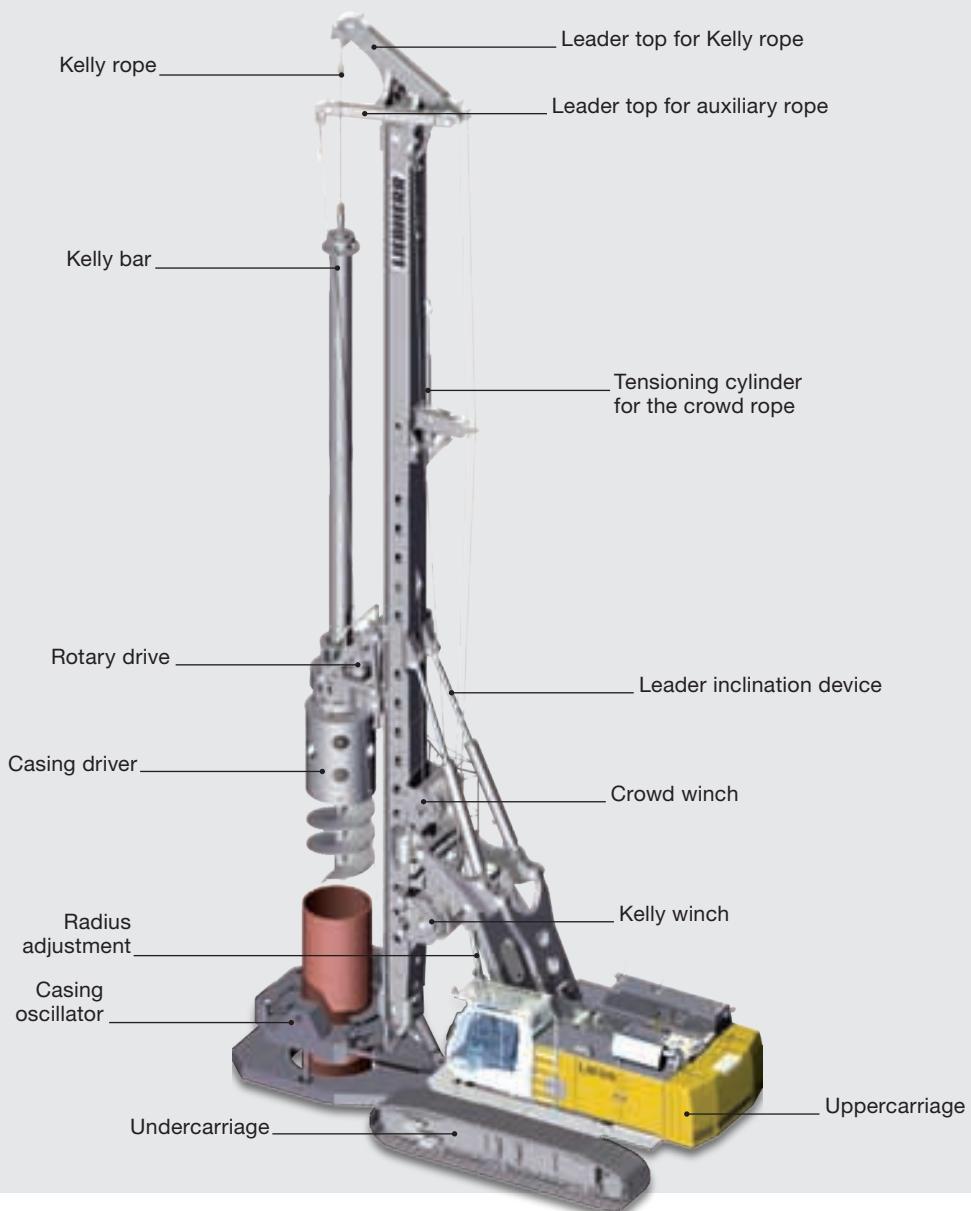
The parallel kinematics, which is exclusively applied in the Liebherr rotary drilling rigs, provides the unit with outstanding stability and high alignment forces. It only allows for minimum deformation and thus guarantees maximum precision, e.g. when installing foundation piles by drilling. Decisive advantages are due to the functions of radius adjustment without inclination adjustment and radius adjustment without rope movement. The latter is possible because all winches are mounted on the leader. Moreover, the rig has a larger operating area without repositioning the undercarriage.

Box design reinforces the leader

Since the leader is built in an especially rigid box design with a large cross section, it can absorb very high pull forces and torques. Thanks to this robust design deformations are reduced to a minimum and lower surface pressure is achieved leading to less wear and a longer service-life.

Rope crowd system for increased crowd force

For drilling operations the crowd force of the rig is of vital importance. Due to the high pull force of the LB rigs cased boreholes of greater length can be produced without casing oscillators. This saves time and money. Using the standard rope crowd system the rotary drive can travel over the complete leader length, thus allowing installation of longer casings. This saves time when connecting the pipes.





Electronic control

The core of the Liebherr rotary drilling rigs is the Litronic control system. Developed and manufactured by Liebherr, this comprehensive system encompasses all control and monitoring functions and is designed for extreme environmental conditions in tough assignments.

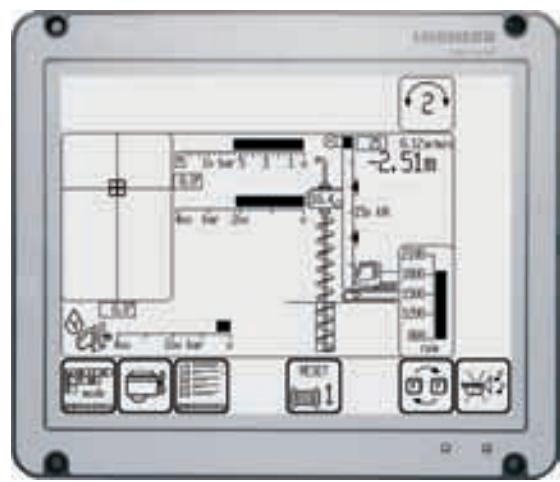
Operating comfort and information through Litronic

The Litronic control is based on a CAN-Bus system of the latest generation. All information required for the current rig operation such as information on the type of application, machine data, warnings and failure indications are displayed on the large touch screen. This allows optimum diagnosis and early detection and prevention of more serious defects.

High precision machine control

The electro-hydraulic proportional control enables several movements to be carried out simultaneously and with utmost precision. As a special operating comfort all leader functions can be controlled either via the additional control panel or via joystick. Thus, excellent positioning is provided in all fields of application.





Electronic evaluation

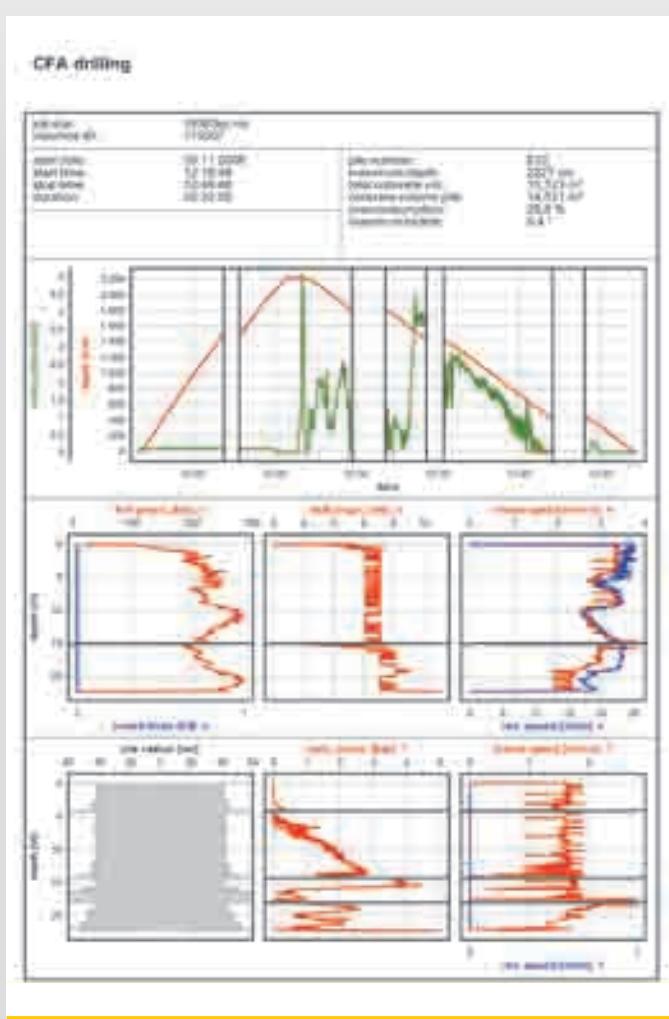
A modem for remote diagnosis as well as a process data recording system for documentation of the work carried out and a process data reporting software for evaluating the recorded data are available as cartridge.

Quality assurance through process data recording (PDE)

The process data is constantly measured during the working process. External sensors can also be connected to the system. Measurement data relevant to the working process is displayed on the monitor in the cab. The operator can then control all processes and, if necessary, correct them. The data is stored by the system and can be transferred to a computer using a CompactFlash card. Via GSM modem the data can be transferred.

Evaluation and visualisation through process data reporting (PDR)

The Liebherr software for process data reporting allows to further process the data on a PC, where they are directly stored, sorted and visualised. Thus, customer-specific evaluations can easily and quickly be created.



LIEBHERR





State-of-the-art drives

The series of Liebherr rotary drilling rigs is equipped with powerful diesel engines especially designed for heavy-duty construction tasks. Not only reliability, longevity and ease of service, but also environmental protection was a main focus during their development.

Fuel savings of up to 40%

The powerful Liebherr diesel engines, offering 180 – 350 kW depending on the machine class, allow operation of rotary drives, double rotary heads or soil mixing drives solely via the machine's on-board hydraulics. No additional power packs are needed. This saves fuel and thus operating costs. Directly compared with comparable competitors' products operated under the same conditions the LB series' diesel consumption is significantly lower.

Intelligent cooling system

Through its automatically adjusted ventilation speed, the temperature controlled cooling system withstands even extreme temperatures and thus reduces fuel consumption as well as noise emissions.

Automatic performance optimization

The Litronic control system, which serves to electronically control and monitor all machine data, precisely implements all entries, assists the operator and affords extraordinary ease of operation. Furthermore, the diagnostics system detects and localizes possible failures at an early stage, so the operator can react as early as possible.

Eco-friendly through particle filters

Liebherr also offers particle filters with continuously regenerative technology for its rotary drilling rigs. They can be retrofitted and make the rigs exceedingly eco-friendly - a prerequisite for their application in ecologically sensitive areas.





2

Performance and flexibility through innovation

Liebherr rotary drilling rigs were designed for heavy-duty construction tasks in the deep foundation industry and offer a wide range of possible applications. Kelly bars and rotary drives are available in various dimensions and thus ensure maximum utilization and flexibility of the LB series.

No existing standard concept was used for its development. The steel structure of the uppercarriage was newly designed to meet with the requirements. Many innovations from Liebherr's many years of experience with deep foundation applications were incorporated and all requirements for best performance were uncompromisingly fulfilled. Reliable Liebherr components as well as proven Liebherr technology were used to ensure the high quality and longevity of the drilling rigs.



Flexible drilling applications

For drilling applications, a robust and torsion resistant leader is most important. For the various drilling tasks powerful single or double rotary drives, Kelly bars, mixing drives as well as a wide range of accessories are available.

Flexibility through main winch

All winches of the Liebherr rotary drilling rigs are mounted on the leader. Thus, the leader can be adjusted without causing any rope movement. The powerful Kelly winch provides high efficiency during Kelly drilling applications and so offers decisive advantages especially when installing large diameter drilled piles. In case of heavy extraction work, e.g. during double rotary drilling, this winch is used in combination with the rope crowd system.

Powerful drive leads to high daily production

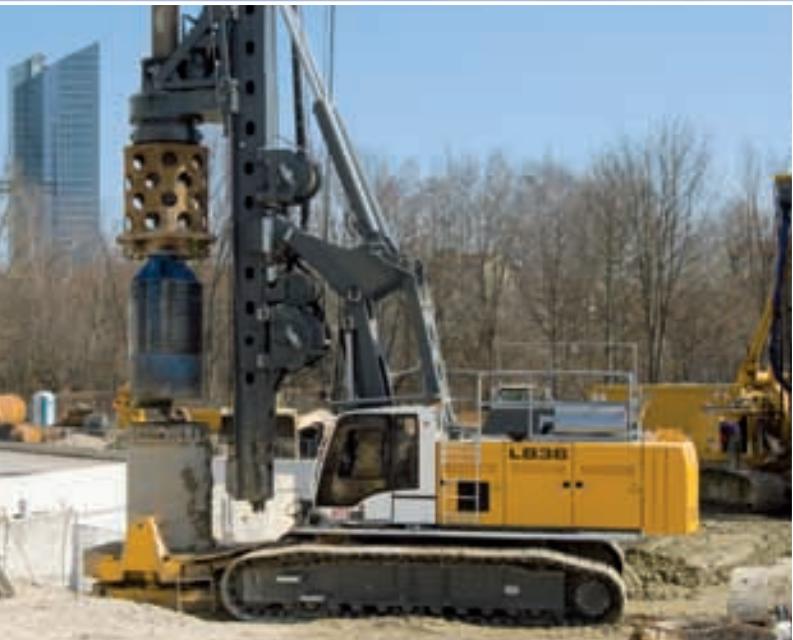
As several drives have to be fed with power simultaneously for drilling, the higher engine power directly influences productivity. The rig even offers enough power for further equipment such as casing oscillators.

More pull-down force for more displacement

The rope crowd system enables high pull-down force making the rotary drilling rig especially suitable for the installation of displacement piles.

Rigid leader design for utmost precision

Kelly drilling requires high directional precision of the casings. This requirement is ideally fulfilled by the leader which is built in an extraordinarily rigid box design.





Design features

The design of the Liebherr rotary drilling rigs especially focusses on fulfilling the high quality and performance requirements. Above all, the rigs excel in their stability, precision and longevity.

Steel structure

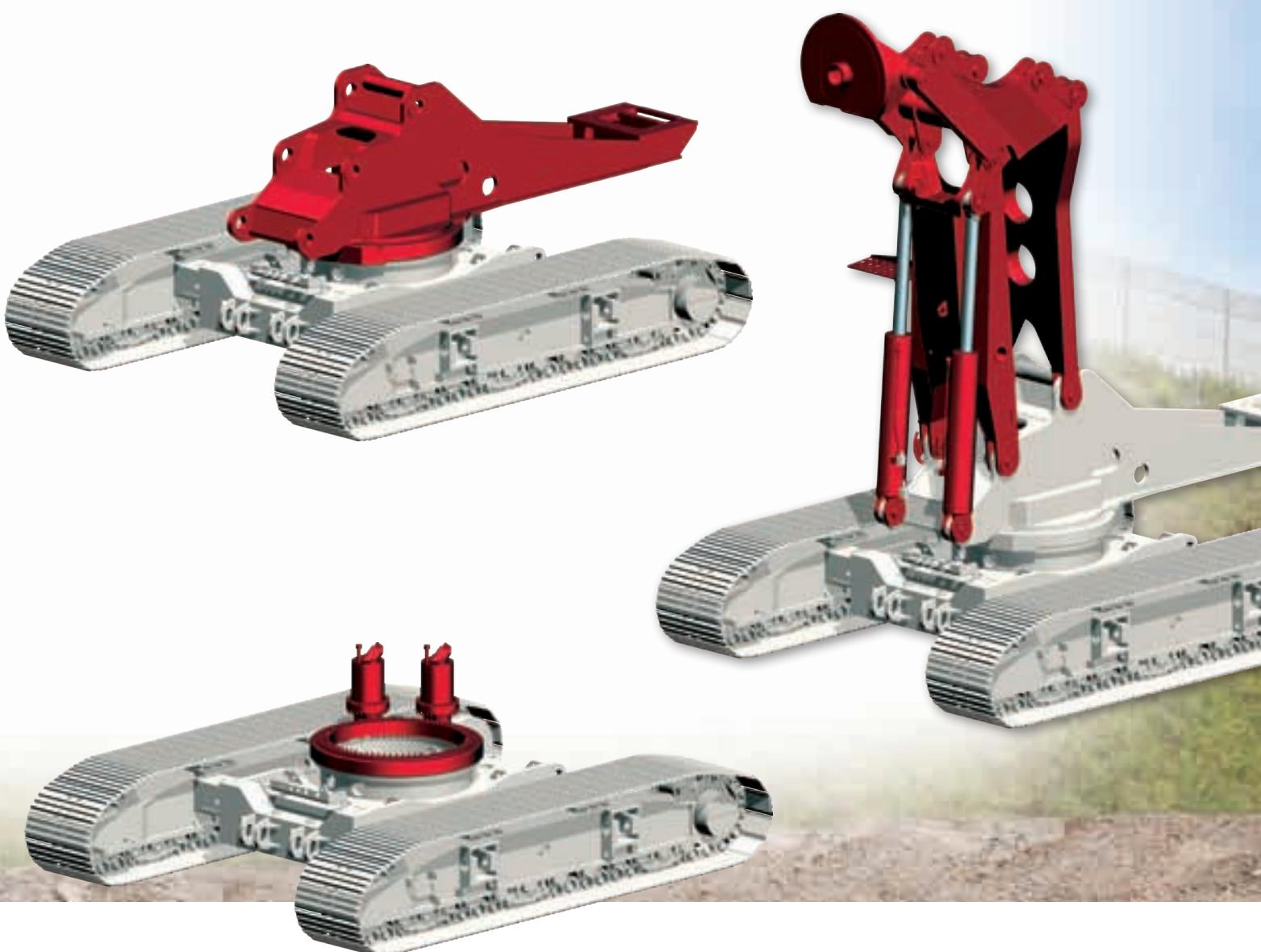
All steel components were newly developed and especially designed for the high demands of deep foundation applications. The large cross section allows for optimum force transmission providing less material wear and a longer service life.

Undercarriage

The undercarriage was adopted from the proven Liebherr duty cycle crawler cranes and is designed for toughest assignments.

Swing ring

Liebherr rotary drilling rigs are equipped with a triple-row roller bearing swing ring. The powerful swing mechanism features an eccentric flange to adjust the tooth flank clearance. Thus, the clearance between upper- and undercarriage is reduced to a minimum which enhances the stability during operation.





Systematic rotary drives

Liebherr rotary drives guarantee that the basic machines' excellent performance is ideally converted into high productivity.

Efficient rotary drive

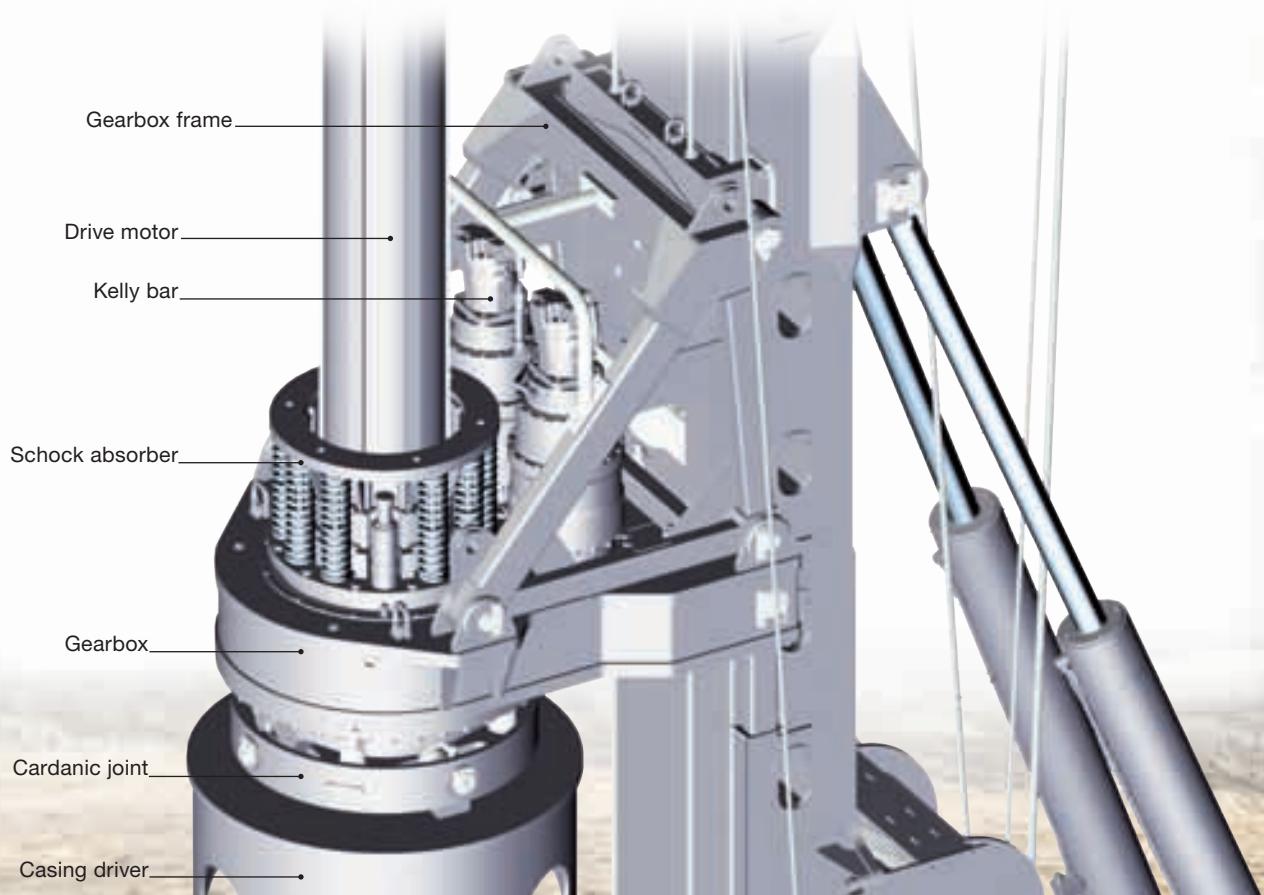
The rotary drives feature a two-stage gear drive. The drilling speed is continuously controlled by the operator via potentiometer. Thus, it is possible to react flexibly to changing soil conditions and to achieve optimum crowd force. Especially when positioning the casing on hard ground it is of vital importance to be able to reduce the drilling speed to a minimum.

Kelly shock absorber and drive adapter systems

The standard Kelly shock absorber with springs and hydraulic dampers protects the material and reduces noise emission. Exchangeable drive adapters provide compatibility with other Kelly bar dimensions.

Casing oscillator

Liebherr offers a wide range of hydraulic casing oscillators. These can be driven by the on-board hydraulics and controlled from the operator's cab or via radio remote control. Moreover, it is possible to equip the rigs with the customer's own casing oscillators.





Several newly developed features

Liebherr rotary drilling rigs are full of technical innovations resulting from Liebherr's many years of experience in deep foundation applications. They provide the rigs with excellent performance characteristics and allow for precise handling.

Automatic shake-off system

While Kelly drilling the auger is normally emptied by rotating it very quickly or through abrupt right-left-movements of the rotary drive. In order to assist the operator Liebherr has developed an automatic shake-off system. By moving the joystick in one direction the operator can directly activate the process of shaking off. The system then carries out a pre-set number of right-left-movements of the rotary drive until the auger is completely emptied.

Winch with free-wheeling

The free-wheeling function of the Kelly winch allows the Kelly rope to follow automatically without any slackening of the rope. First the load - i.e. the Kelly bar with the auger - can be decelerated in a controlled manner using the electric pedal in the operator's cab. Thereby the Kelly bar is lowered in the borehole with the free-wheeling function. As soon as it reaches the bottom of the borehole the Kelly winch stops and thus prevents the rope from slackening.

Automatic leader adjustment

In order to keep the inclination of the leader constant, the inclination can be pre-set to a certain target value. By pushing a button on the joystick the leader automatically adjusts to the pre-set inclination using the support cylinders. This automatic system works even during crawler and swing operation.

Leader control via joystick as special operating comfort

The leader can not only be adjusted via the additional control panel in the cab but also via joystick, which is an especially convenient alternative.

Retrofit kits for all purposes

Liebherr rotary drilling rigs include an extensive range of basic equipment. For special applications a multitude of retrofit kits are available, e.g. a leader ladder or a concrete supply line. These accessories can be mounted quickly and easily on the leader on site thanks to the standard flexible fastening system.





3

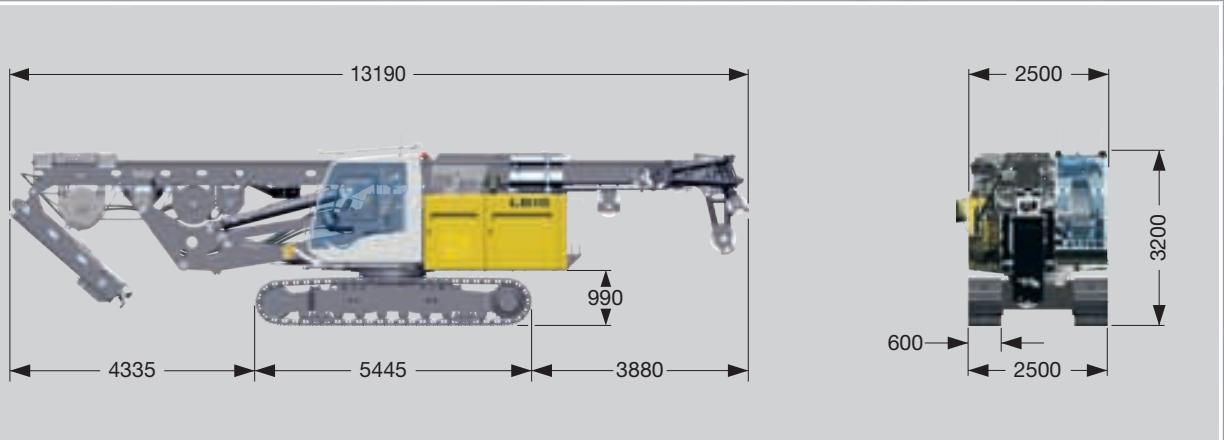
Cost-effective operation

Low weight and compact design are prerequisites for road transportation of the Liebherr rotary drilling rigs in one piece. This minimizes assembly work on the jobsite and saves time and money even before operation starts.

Moreover, for rig operation the costs per production unit have been reduced to a minimum. The result is reliable deep foundation machinery with maximum cost effectiveness.







Efficient transport

The quicker a rotary drilling rig can be transported and mobilized, the more economic is its operation – especially on small jobsites. Complete transportation of the rigs lays the foundation for fast and easy assembly. Due to their low weight and favourable dimensions, Liebherr rotary drilling rigs can be easily transported to the jobsite and are ready for operation within a very short period of time.

If required, Liebherr also offers self-assembly systems as an option. These provide fast assembly and disassembly of components such as counterweight, leader or crawlers.



Quick and easy assembly

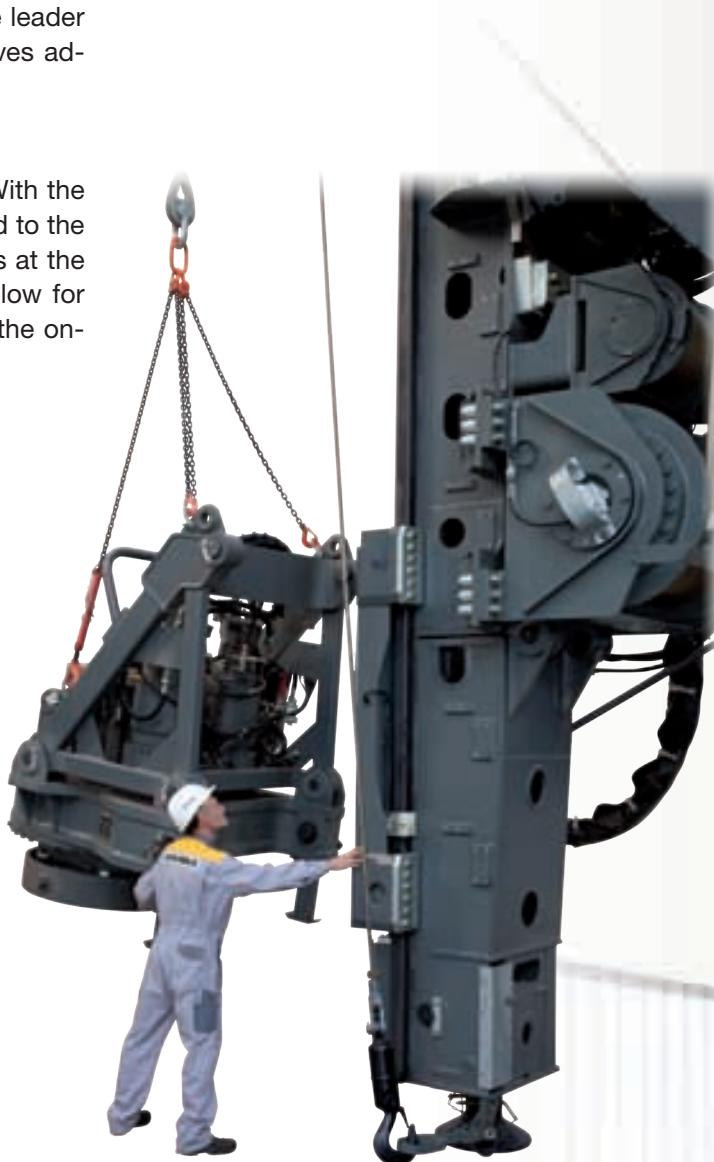
Due to their compact design Liebherr rotary drilling rigs can usually be transported in one piece which significantly accelerates their assembly on the jobsite.

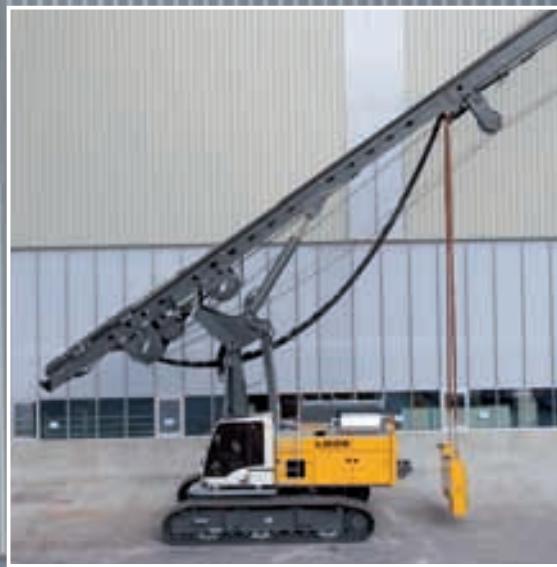
Assembly without auxiliary crane

If the counterweight of a larger unit is transported separately it can be assembled on site using the leader without the need for an auxiliary crane. This saves additional costs.

Rotary drive

Even the rotary drive can be mounted directly. With the help of a guide on the crowd carriage it is hitched to the upper pins and then secured with two more pins at the lower end of the carriage. Quick connections allow for fast, simple and safe hydraulic connection with the on-board hydraulics.





Cost-effective operation

The costs per performed production unit can be optimized either by increasing the hourly output or by reducing the costs per hour of operation. Liebherr rotary drilling rigs optimally combine both aspects through their exceptional performance and the low operational costs.

Well proven components

All applied components are designed for reliability and longevity in order to reduce periods of standstill and minimize repair costs. In addition to their excellent performance, Liebherr diesel engines are outstanding in their economical consumption.

Low maintenance requirements through versatile on-board hydraulics

Thanks to the powerful diesel engines additional power packs have become redundant. This reduces service costs by half and saves even more fuel. All equipment such as rotary drives as well as casing oscillators can be operated by the on-board hydraulics. Moreover, the permanently lubricated components of the undercarriage enormously reduce maintenance requirements.

Platform solution

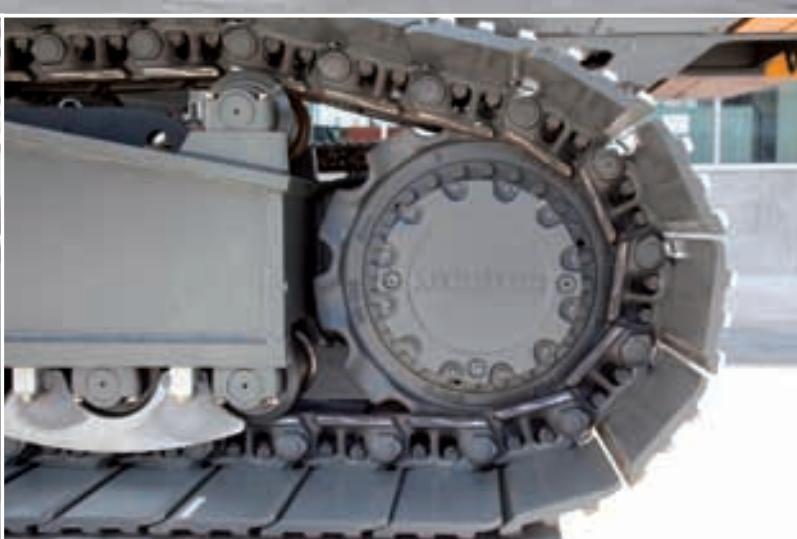
A platform solution was implemented during the development of the Liebherr rotary drilling rigs. Thus, a large number of shared components, e.g. uppercarriage, kinematics or leader, could be achieved. Many standard components originally come from the product range of the proven piling and drilling rigs as well as duty cycle crawler cranes. All classes of rotary drilling rigs are identical in their operation.



Platform 3
LB 16

Platform 2
LB 20 LB 24

Platform 1
LB 28 LB 36



4

Higher productivity through better comfort

The design of the operator's cab aims above all at facilitating the handling of the machine and enabling easy operation for the operator.

Ergonomic design

In the spacious cab featuring a seat with individual adjustments as well as air conditioning, all operating elements are clearly and ergonomically arranged. All machine movements are controlled proportionally and precisely by two joysticks and three foot pedals.

Optimum overview

An unobstructed view is elementary for precise and safe work. Generous all-round glazing ensures an unobstructed view of the entire working area, which, in addition, can be consistently illuminated when dark.

Operating comfort through Litronic control system

As most working processes take place below ground level in special deep foundation work, precise control and visualization are of utmost importance for the operator. The standard Litronic control system converts all operator commands into machine functions with utmost precision. All relevant information is displayed on the monitor. Automatic control systems are available as an option for especially difficult work cycles.





5

Reliable service

Permanent readiness for operation is a major prerequisite of the rotary drilling rigs to enable smooth and efficient application on the jobsite. Downtime is enormously expensive and has to be reduced to a minimum. A tight network of service stations with qualified contacts and well-trained Liebherr service personnel guarantees quick assistance at any time and any location throughout the world.

Moreover, failures can be detected and sometimes directly repaired via GSM/GPRS service modem and remote diagnosis. Software updates as well as maintenance work can be carried out with this modem. The periods of standstill are shortened and the rig is operational for a longer time.

Training centres for excellent qualifications

For qualified service of the rigs as well as comprehensive training of operating and maintenance personnel, state-of-the-art repair and training centres are available in the parent company itself as well as at other locations.



LiDAT Functions

Machine data capture

- Automatic recording of machine data
- Data transmission via GPRS or via data carriers according to availability

Machine data analysis

- Predefined reports on machine use, warnings and operating parameters
- Generating of reports via the LiDAT web portal

Fleet management

- For Liebherr machines and the machines of other manufacturers
- Efficient machine operation scheduling and machine management
- Construction site and operation planning with freely definable work areas and machine groups
- Analysis of machine utilisation efficiency
- Logging of machine use
- Restrictions of use by predefined work areas and global positioning of machines
- Database for optimised fleet management (e.g. reinvestment decision support)

Service

- Online notification of critical operating conditions
- Storing of important machine data
- Maintenance schedules coordinated with availability of machines
- Automatic service interval reminders
- Efficient service engineer planning due to fast, direct access to each machine
- Optimised spare parts management

(Please note: Data transmission is dependent on network coverage)

LiDAT Features

LiDAT is available in two basic packages: LiDAT Standard and LiDAT Plus. Each has its own special features and LiDAT Plus can also be complemented by additional packages. The basic LiDAT Standard package is designed for use both with Liebherr machines and the machines of other manufacturers. LiDAT Plus and its range of 'add-on' packages, on the other hand, have been specially developed for the extended technical possibilities of Liebherr machines.

Operating parameters	LiDAT Standard	LiDAT Plus
Machine position data	■	■
Operating times and assignment times	■	■
Service interval information	■	■
Machine assignment scheduling	■	■
Machine rental	■	■
Machine management	■	■
Monitoring of geographical operating area		■
Monitoring of operating times		■
Notification of critical operating situations*		■
Fuel consumption information*		■
Product-specific, application-specific and country-specific supplementary packages available		■
Data transmission intervals	daily	freely selectable (several times a day)

* Dependent on control system

Liebherr-Werk Nenzing GmbH



Printed in Germany by Typodruck BK-RP LWN 10533609-1-04.10_enGB

Subject to technical modifications.

Liebherr-Werk Nenzing GmbH
Postfach 10, A-6710 Nenzing
☎ +43 50809 41-473, Fax +43 50809 41-499
www.liebherr.com, E-Mail: crawler.crane@liebherr.com