Piling and drilling rig

LRB 16

Litronic®

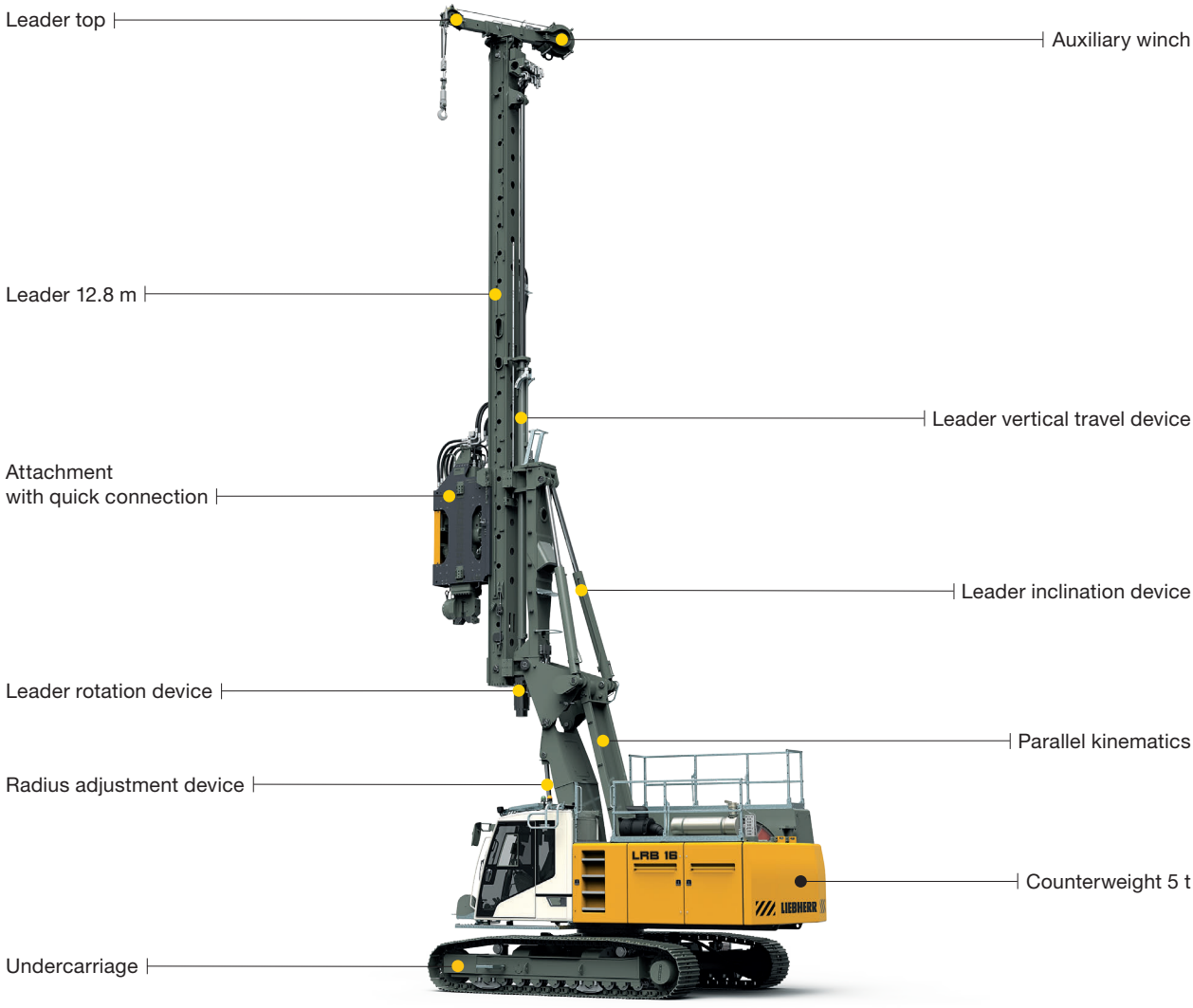
EN

LRB 2501.06

LIEBHERR

Concept and characteristics

LRB 16



The robust universal machine for a wide variety of applications:

- Vibrator slim design
- Pre-drill
- Ring vibrator
- Hydraulic hammer
- Double rotary drilling
- Kelly drilling
- Continuous flight auger drilling
- Soil mixing

The solid undercarriage offers excellent stability and low ground bearing pressure, and the uppercarriage, with its small swing radius, enables operation in restricted space.

Parallel kinematics with a large working area allow to fold the leader back. The rigid leader absorbs high torque and is fitted with a rope crowd system for high pull forces. Rapid mounting or changing of attachments is provided through the quick change system.

The powerful Liebherr diesel engine is low in emission and economical thanks to SCR technology. For additional reduction of fuel consumption and noise emission the Eco-Silent Mode is available as an option.

The Litronic control with assistance systems supports the operator:

- Joystick control for all machine functions
- Leader inclination memory
- Centrifugal governor for vibrator
- Cruise Control for the drilling process etc.

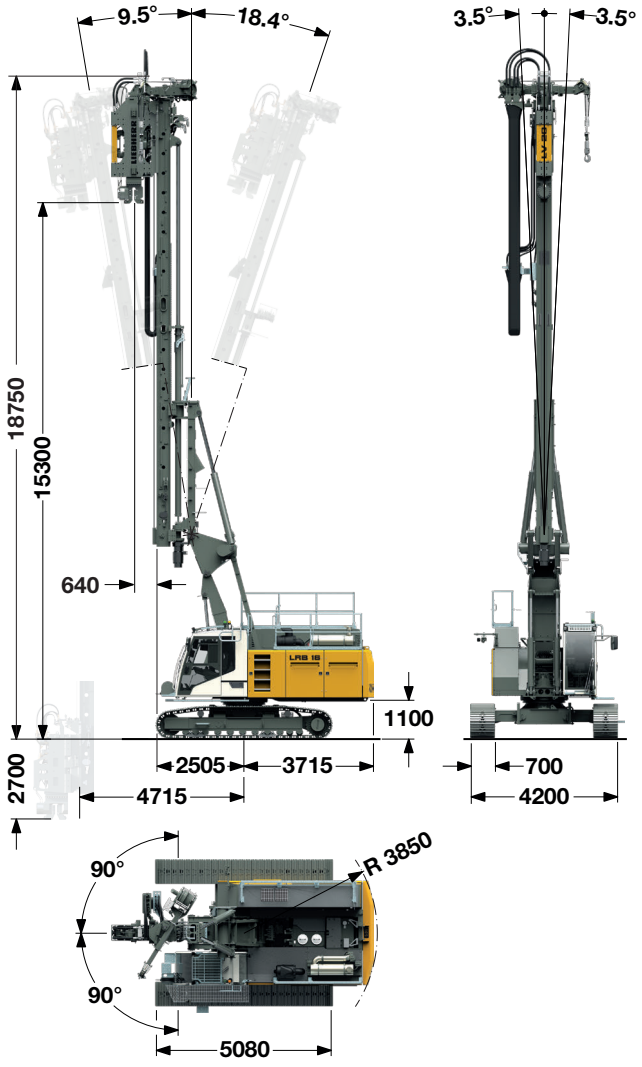
The PDE process data recording system creates the basis for a complete documentation of the working processes carried out. Using the PDR evaluation software this documentation is given the desired form.

Sophisticated solutions provide safe operation and maintenance of the machine:

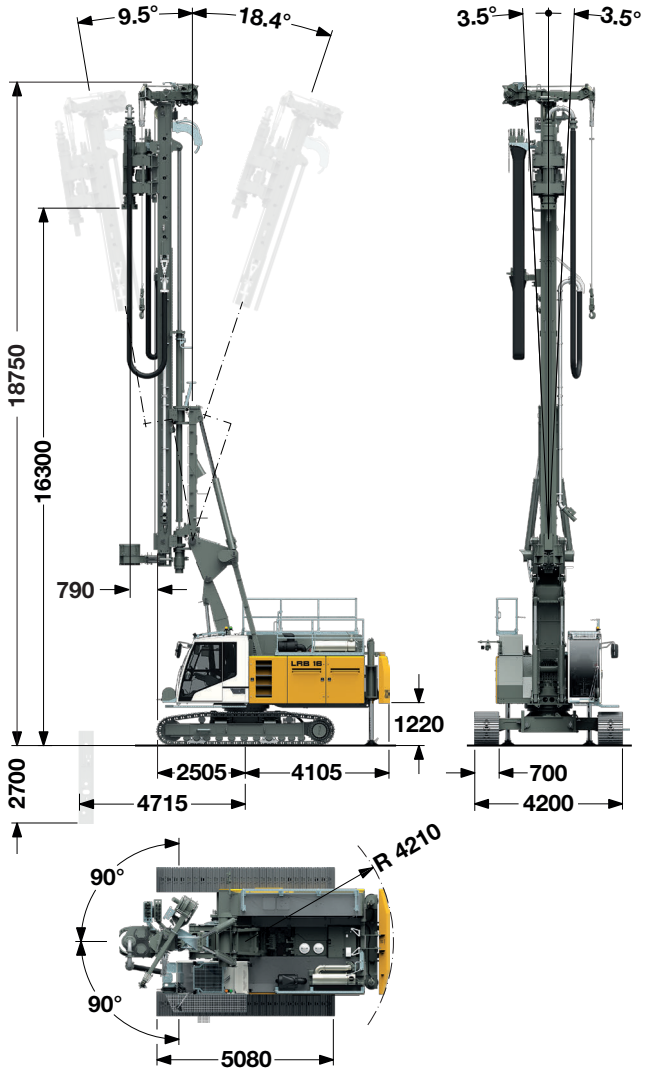
- Cab design for optimum visibility
- Acoustic and optic warnings
- Safety rails on top of the uppercarriage
- Rear and side view cameras etc.

Dimensions and weights

LRB 16 standard



LRB 16 with rear support unit



Technical data (standard)

Leader length LRB 16	12.8 m
Max. pull	200 kN
Max. torque	120 kNm
Working radius machine	
Centre of rotation — front edge leader	2.51 — 4.72 m
Stepless rig inclination adjustment	
Lateral inclination	± 3.5°
Forward inclination	9.5°
Backward inclination	18.4°
Vertical leader adjustment above ground level (depending on radius)	5.5 m
Leader swing range	± 90°

LRB 16 – Operating weight and ground pressure

Telescopic undercarriage with 700 mm 3–web grousers	50 t – 0.86 kg/cm²

The operating weight includes the basic machine LRB 16 with vibrator slim design LV 20.
Weights can vary depending on the final configuration of the machine.

Technical data (with rear support unit)

Leader length LRB 16	12.8 m
Max. pull	200 kN
Max. torque	120 kNm
Working radius machine	
Centre of rotation — front edge leader	2.51 — 4.72 m
Stepless rig inclination adjustment	
Lateral inclination	± 3.5°
Forward inclination	9.5°
Backward inclination	18.4°
Vertical leader adjustment above ground level (depending on radius) without auger guide	5.5 m
ground level (depending on radius) with auger guide	5.1 m
Leader swing range	± 90°

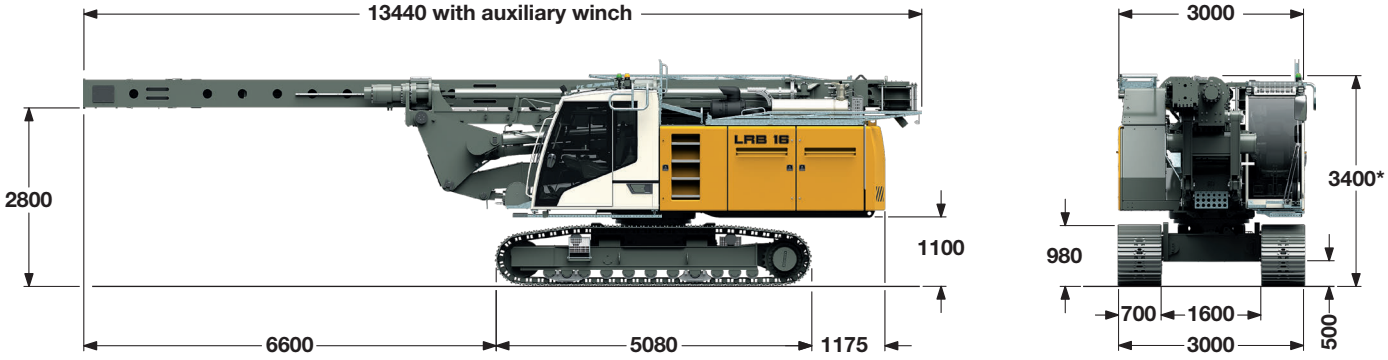
LRB 16 – Operating weight and ground pressure

Telescopic undercarriage with 700 mm 3–web grousers	51.6 t – 0.89 kg/cm²

The operating weight includes the basic machine LRB 16 with rear support unit and DBA 90. Weights can vary depending on the final configuration of the machine.

Transport dimensions and weights

LRB 16

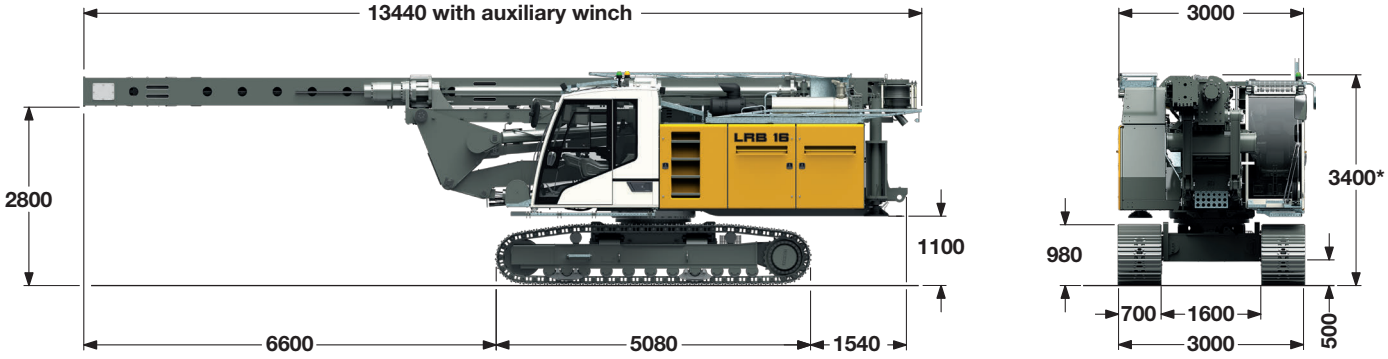


Transport weight

Without attachment, with telescopic undercarriage and counterweight	45.4 t
Without attachment and counterweight, with telescopic undercarriage	40.4 t

Weights can vary with the final configuration of the machine. The figures in this brochure may include options which are not within the standard scope of supply of the machine.

*) The transport height with mounted concrete supply line is 3500 mm (large pipe bend dismounted, small pipe bend turned to the side).



Transport weight with rear support unit

Without attachment and counterweight with telescopic undercarriage and rear support unit	42.2 t

Weights can vary with the final configuration of the machine. The figures in this brochure may include options which are not within the standard scope of supply of the machine.

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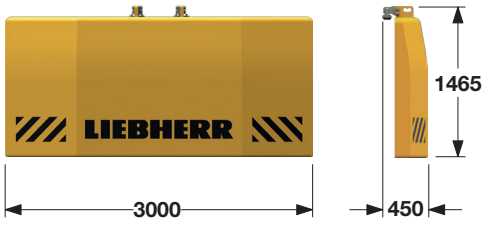


Counterweight

Counterweight	5 t

Technical description

Engine

Engine type — Liebherr D 946 A7–04
Power rating according to ISO 9249 – 390 kW (523 hp) at 1700 rpm
Fuel tank — 700 l capacity with continuous level indicator and reserve warning
Engine complies with 97/68 EC Stage IV and NRMM exhaust certification EPA/CARB Tier 4f.

Hydraulic system

The main pumps are operated by a distributor gearbox. Axial piston variable displacement pumps work in open circuits, supplying oil only on demand. Hydraulic pressure peaks are absorbed by the integrated automatic pressure compensation, which relieves the pumps and saves fuel.

Pumps for working tools — 2x 350 l/min
Separate pumps for kinematics — 2x 180 l/min
Hydraulic oil tank — 800 l
Max. working pressure — 350 bar

No auxiliary power packs are required as application specific hydraulics supply power to all components.
A system of electronically monitored pressure and return filters cleans the hydraulic oil. Any clogging is displayed in the cabin. The use of synthetic environmentally friendly oil is also possible.

Crawlers

Propulsion through axial piston motor, hydraulically released spring loaded multi–disc brake, maintenance-free crawler tracks, hydraulic chain tensioning device.

Drive speed — 0 – 2.3 km/h
Track force — 459 kN
Width of 3-web grousers — 700 mm

Swing

Consists of single row ball bearing, fixed axial piston hydraulic motor, spring loaded and hydraulically released multi–disc holding brake, planetary gearbox and pinion.
Swing speed from 0 – 3.3 rpm is continuously variable.

Control

The control system – developed and manufactured by Liebherr – is designed to withstand extreme temperatures and the many heavy–duty construction tasks for which this machine has been designed. Complete machine operating data are displayed on a high resolution monitor screen. A GSM/GPRS telematics module allows for remote inquiry of machine data and operational conditions. To ensure clarity of the information on display, different levels of data are shown in enlarged lettering and symbols.
Control and monitoring of the sensors are also handled by this high technology system. Error indications are automatically displayed on the monitor in clear text. The machine is equipped with proportional control for all movements, which can be carried out simultaneously.
Two joysticks are required for operation. Pedal control can be changed to hand control.
Option:
PDE®: Process data recording

Auxiliary winch

Line pull effective (3rd layer) — 50 kN
Rope diameter — 17 mm
Rope speed — 0-54 m/min
The winch is noted for compact, easily mounted design.
Propulsion is via a maintenance-free planetary gearbox in oil bath.
Load support by the hydraulic system; additional safety factor by a spring–loaded, multi–disc holding brake.

Rope crowd system

Crowd force push/pull — 150/200 kN
Line pull (nominal load) — 100 kN
Rope diameter — 18/20 mm
The ropes are actuated by a powerful hydraulic cylinder.

Noise emission

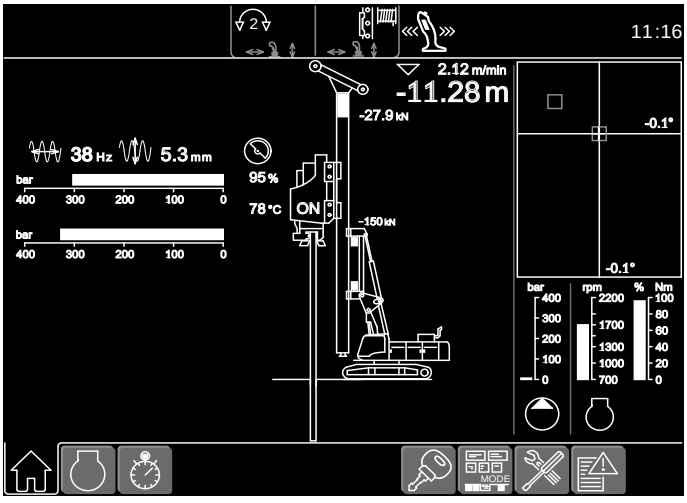
Noise emissions correspond with 2000/14/EC directive.
Guaranteed average sound pressure level L_{PA} in the cabin — 77.1 dB(A)
Guaranteed sound power level L_{WA} — 110 dB(A)
Vibration transmitted to the hand-arm system of the machine operator — < 2.5 m/s²
Vibration transmitted to the whole body of the machine operator — < 0.5 m/s²

Vibrator slim design

LV 20

Max. pile length 15.2 m

Vibrating of a single pile between two other piles



Display for vibrating

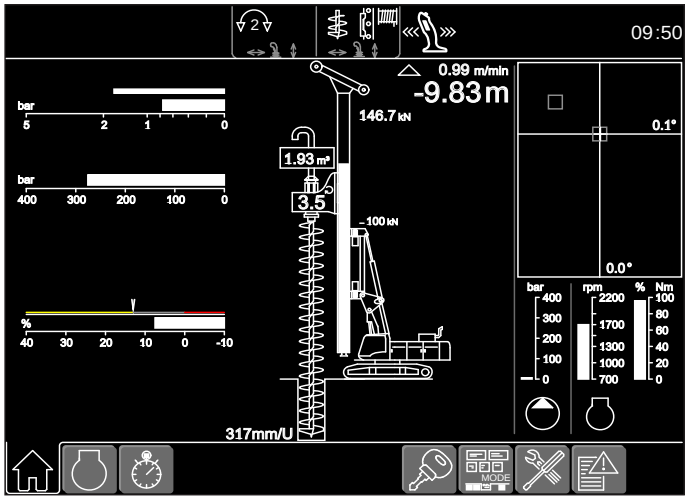
Technical data

Static moment at 2300 rpm	0 – 20 kgm
Max. speed	2300 rpm
Max. centrifugal force	1160 kN
Max. peak-to-peak amplitude with clamp	12.9 mm
Total weight with clamp	4600 kg
Dynamic weight with clamp	3100 kg

Pre-drill

BA 45

Max. drilling depth 15.2 m



Display for continuous flight auger drilling

Technical data

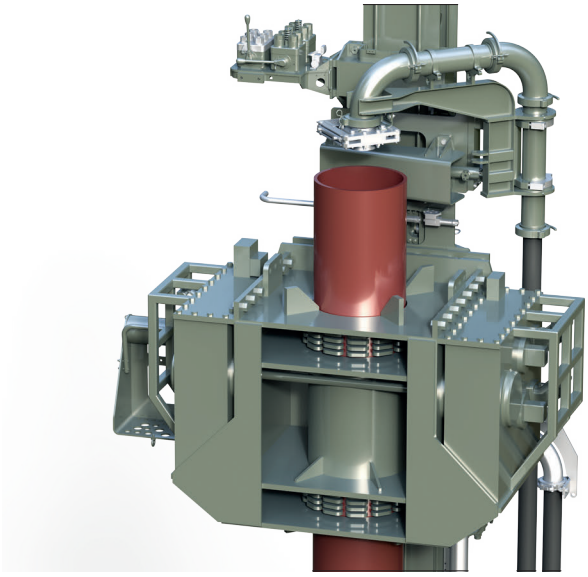
Rotary drive – torque	0 – 45 kNm
Rotary drive – speed	0 – 95 rpm
Max. drilling diameter*	500 mm

*) Other drilling diameters on request

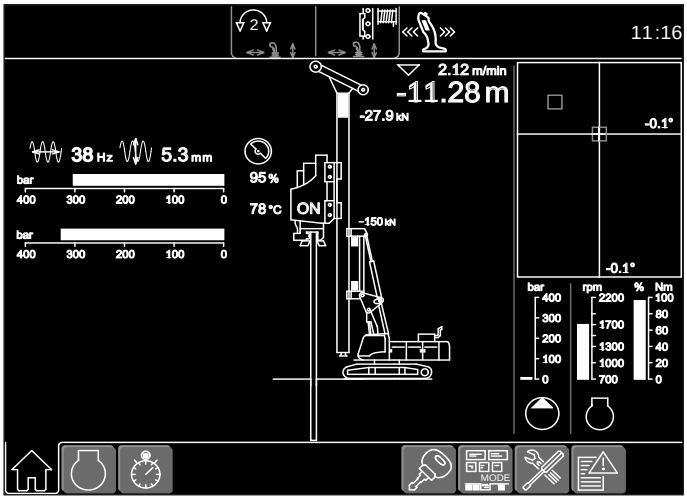
Ring vibrator

20 VMR

Max. pipe length 25 m



Concrete supply system



Display for vibrating

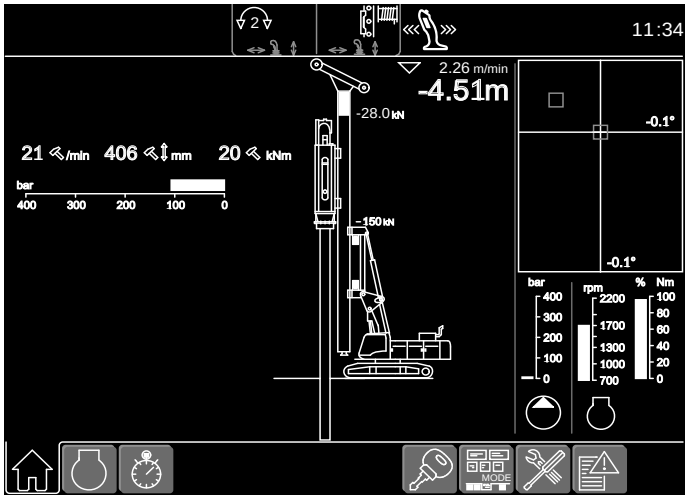
Technical data

Static moment	0 – 20 kgm
Max. speed	2300 rpm
Max. centrifugal force	1160 kN
Diameter	356 – 508 mm
Total weight	7400 kg

Hydraulic hammer

H 6

Max. pile length 14.4 m



Display for impact driving

Technical data

Drop weight (3000 kg add. weight 3x 1000 kg) max.	6000 kg
Max. rated energy	72 kNm
Blow rate max. energy	50 blows/min
Max. blow rate	150 blows/min
Basic hammer weight with 6000 kg drop weight	9000 kg

Technical data H6

Hammer type	H 6	H 6	H 6	H 6
Drop weight	3000 kg	4000 kg	5000 kg	6000 kg
Max. rated energy	36 kNm	48 kNm	60 kNm	72 kNm
Blow rate - blows/min	50-150	50-150	50-150	40-150
Hammer weight incl. pile helmet and dolly	6150 kg	7150 kg	8150 kg	9150 kg

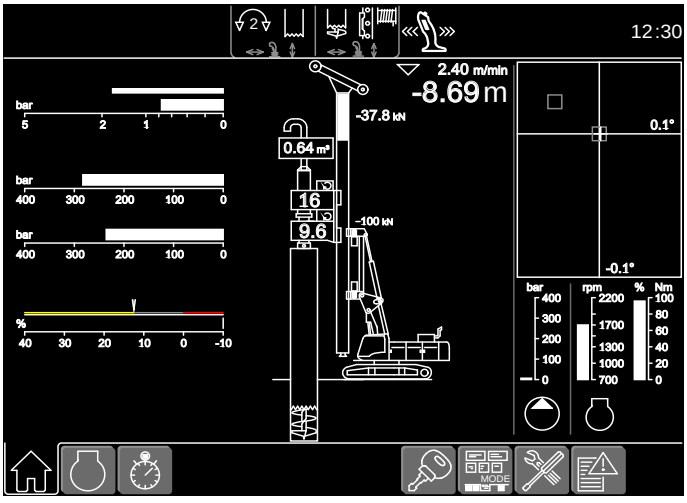
Various pile helmet sizes available on request (max. diameter 640 mm).

Double rotary drilling

DBA 90

Max. drilling depth 15.6 m

Rear support unit



Display for double rotary drilling

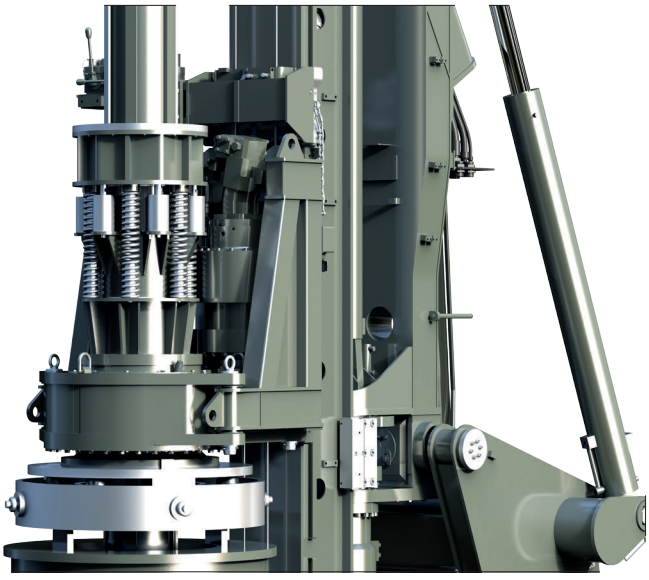
Technical data

Rotary drive I - torque	0 – 90	kNm
Rotary drive I - speed	0 – 21	rpm
Rotary drive II - torque	0 – 68	kNm
Rotary drive II - speed	0 – 28	rpm
Max. drilling diameter	620	mm

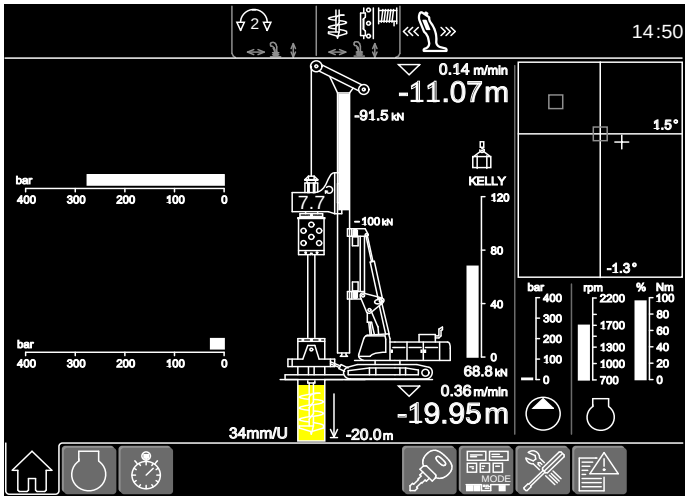
Kelly drilling

BA 120 and Kelly bar MD 12/3/20

LRB 16



Shock absorber for Kelly bar



Display for Kelly drilling

Technical data

Drilling drive – torque	1st gear	0 – 120 kNm
Drilling drive – speed	1st gear	0 – 27 rpm
Drilling drive – torque	2nd gear	0 – 60 kNm
Drilling drive – speed	2nd gear	0 – 54 rpm

Technical data Kelly bar

Diameter	305 mm
Number of sections	3
Extended length	20.5 m
Retracted length	8.5 m
Drive stub	200 mm
Weight	3200 kg

Technical data Kelly winch

Line pull (effective)	110 kN
Winch speed	0 – 75 m/min

*) Other Kelly bars on request

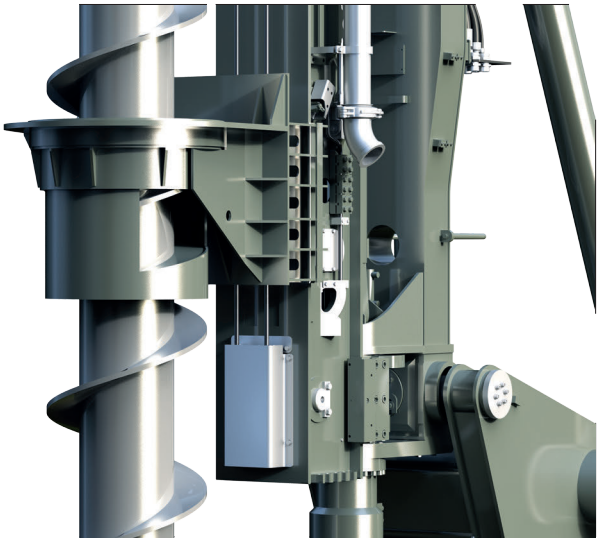
Performance data

Max. drilling diameter	1200 mm	cased
Max. drilling diameter	1400 mm	uncased
Max. drilling depth with tool length 1.9 m*	20.4 m	
Max. clearance below drilling tool (1.9 m)	6 m	

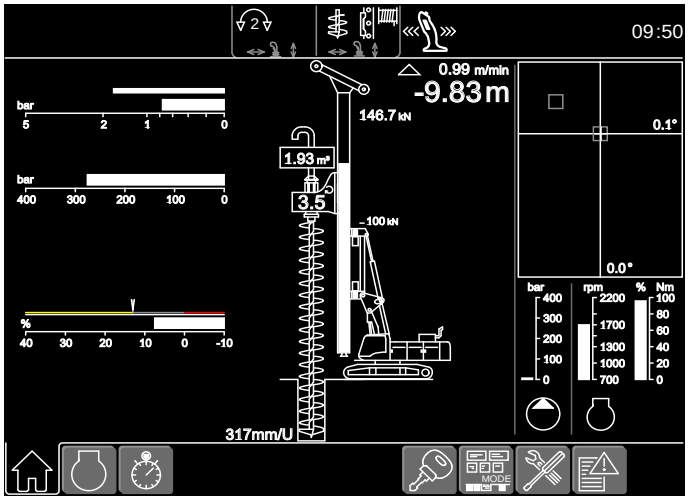
Continuous flight auger drilling

BA 120

Max. drilling depth 14.3 m with auger cleaner, without Kelly extension.
Max. drilling depth 18.3 m with auger cleaner and Kelly extension.



Auger with hydraulic auger cleaner



Display for continuous flight auger drilling

Technical data

Drilling drive – torque	1st gear	0 – 120	kNm
Drilling drive – speed	1st gear	0 – 27	rpm
Drilling drive – torque	2nd gear	0 – 60	kNm
Drilling drive – speed	2nd gear	0 – 54	rpm
Kelly extension		4	m
Max. drilling diameter*		600	mm

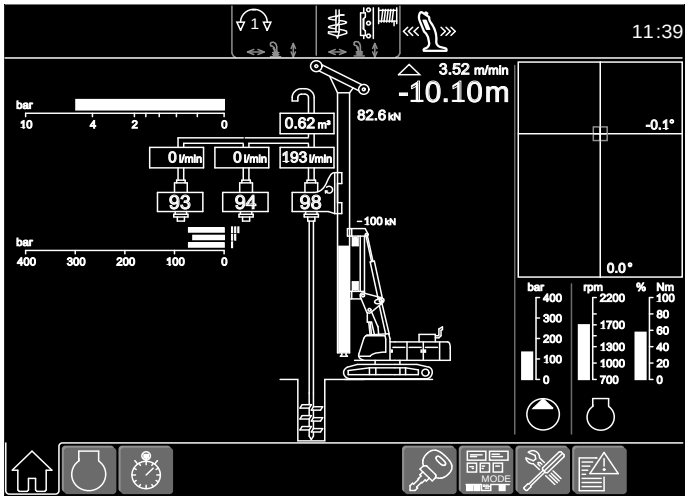
*) Other drilling diameters on request

Soil mixing equipment

3MA 35*

Max. drilling depth 14.9 m
The max. mixing depth can vary depending on the mixing tool.

Set-up for operation on dams



Display for soil mixing

Technical data

Drilling drive – torque	1st gear	0 – 35	kNm
Drilling drive – speed	1st gear	0 – 47	rpm
Drilling drive – torque	2nd gear	0 – 17.5	kNm
Drilling drive – speed	2nd gear	0 – 95	rpm

*) Single, twin and triple mixing equipment available.
Twin and triple mixing equipment available for longitudinal or transverse mounting.

Full displacement drilling

BA 120

Max. drilling depth 15 m without Kelly extension.
Max. drilling depth 19 m with Kelly extension.

Display for full displacement drilling

Technical data

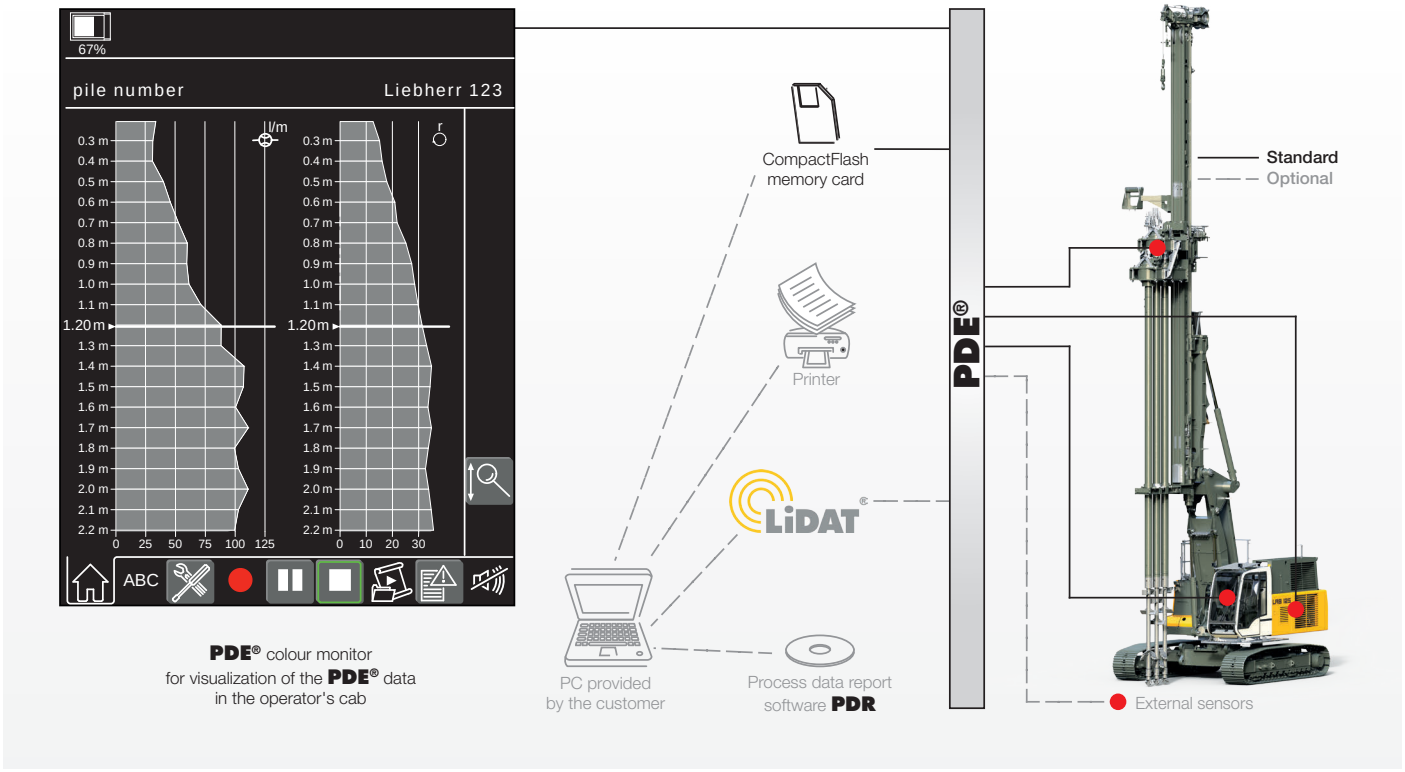
Drilling drive – torque	1st gear	0 – 120	kNm
Drilling drive – speed	1st gear	0 – 27	rpm
Drilling drive – torque	2nd gear	0 – 60	kNm
Drilling drive – speed	2nd gear	0 – 54	rpm
Kelly extension		4	m
Max. drilling diameter*		600	mm

*) Other drilling diameters on request

Notes

Process data recording system - PDE® (additional equipment)

The Liebherr process data recording system PDE® constantly records the relevant process data during the working process.



Depending on the application the recorded and processed data are displayed on the PDE® touchscreen in the operator‘s cab, e.g. in the form of an online cast-in-place pile.

At the same time the PDE® is operated using this touchscreen. The operator can enter various details (e.g. jobsite name, pile number, etc.) and start and stop recordings. A recording of every start-stop cycle carried out in the PDE® is established on a CompactFlash memory card.

The PDE® can be configured in a number of ways, e.g. for the connection of external sensors and/or for the generation of a simple protocol as graphic file.

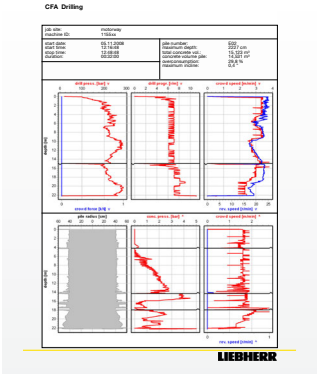
Process data reporting - PDR (additional equipment)

Comprehensive data evaluation and generation of reports on a PC is possible using the software PDR.

Recordings management - The recordings generated by the PDE® system can be imported and managed in PDR. The data can be imported directly from the CompactFlash card or via the Liebherr telematics system LiDAT. Certain recordings, e.g. for a particular day or jobsite, can be found using filter functions.

Viewing data - The data in each record is displayed tabularly. Combining several recordings provides results, for example, regarding the total concrete consumption or the average depth. Furthermore, a diagram editor is available for quick analysis.

Generating reports - A vital element of PDR is the report generator, which allows for the generation of individual reports. These can be printed out directly or stored as pdf files. In the process the size, colour, line thickness or even the desired logo can be configured. Moreover, the reports can be displayed in different languages, e.g. in English and in the national language.



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