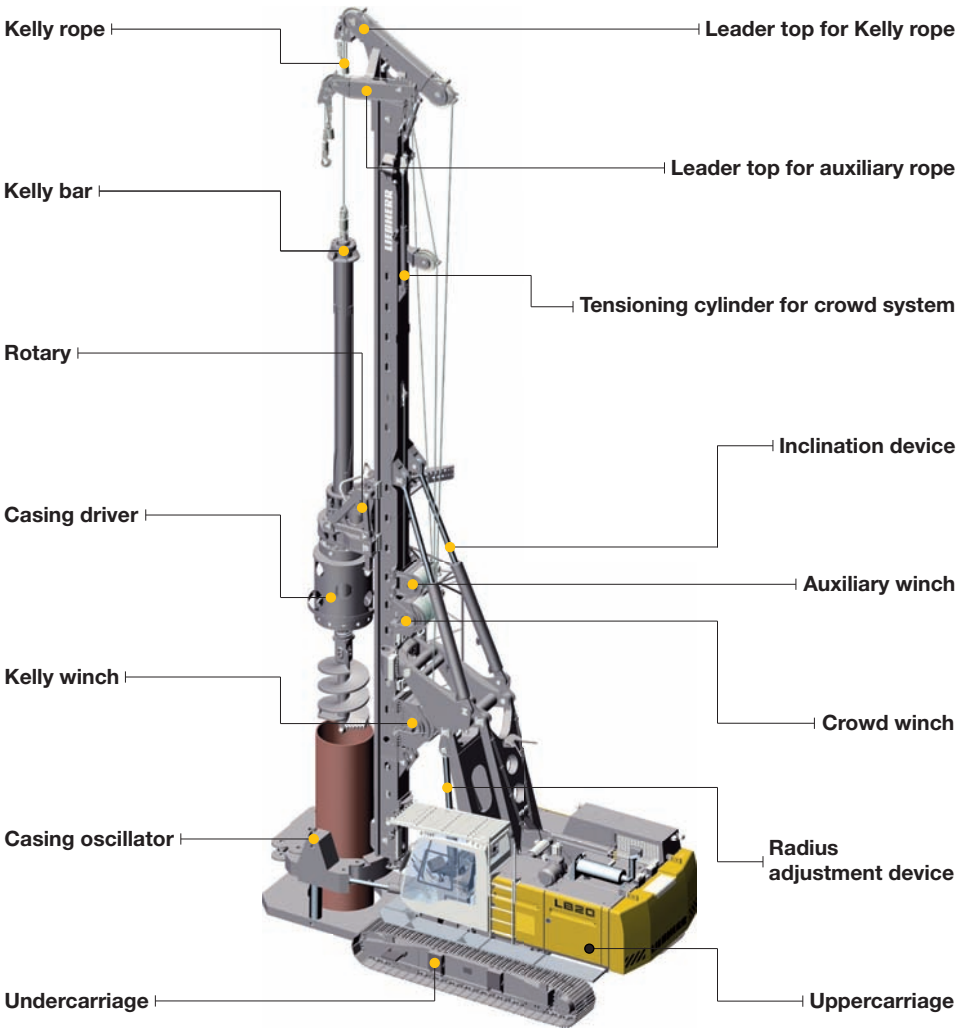
Technical data
Drilling rig

LB 20
Litronic®

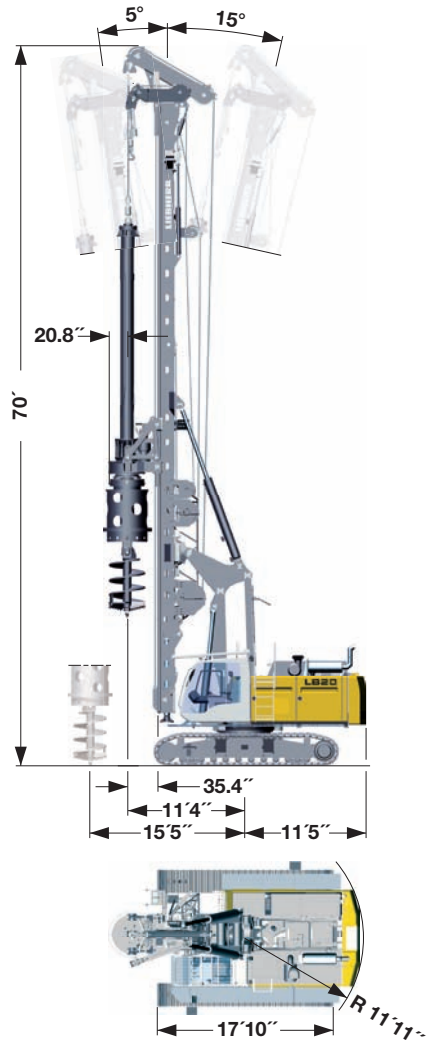
LIEBHERR

Concept and characteristics



- High engine output with automatic engine speed control
- Controlled entirely from cab
- Sturdy and solid rig design
- Solid parallel kinematics on the basic machine
- High pull and push forces
- High torque
- Completely self-rigging (no auxiliary machines required)
- Large range of working tools (all common drilling works can be performed)
- Stepless leader inclination 5° forward - 15° backward depending on type of equipment
- Automatic vertical alignment
- High alignment forces
- Simultaneous control of several movements via Load-sensing multi-circuit hydraulics
- Quick assembly of rotary possible through quick connection
- Equipment design according to latest European regulations and standards
- All components designed to fulfill the special requirements of a drilling rig
- High manufacturing quality through quality control by PDE®-system

Dimensions
Basic machine LB 20



Technical data

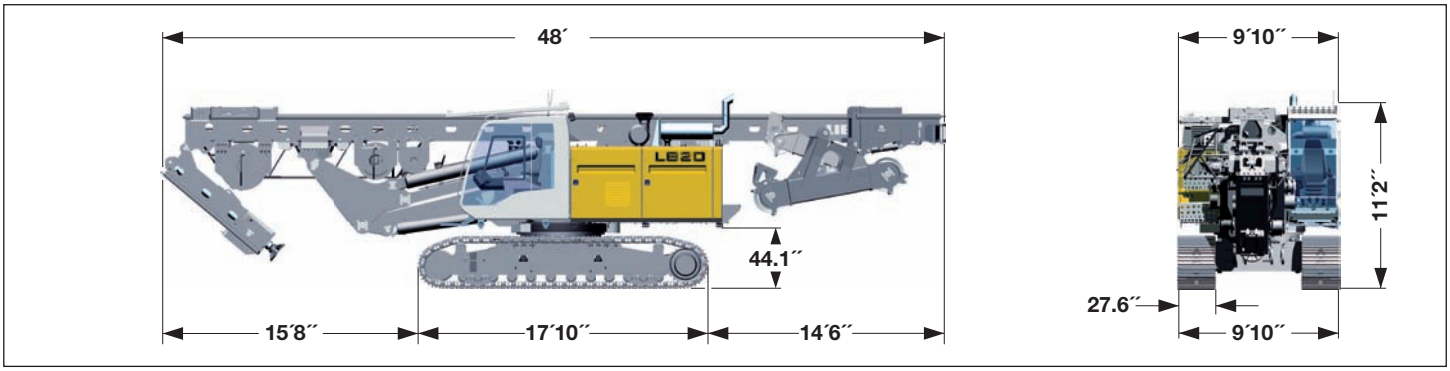
Total height	69.65 ft
Max. pull, leader on ground	67,450 lbs
Max. torque	154,150 lbf-ft
Stepless leader inclination	
Lateral inclination	± 8°
Forward inclination	5°
Backward inclination	15°

Operating weight

Total weight	with 27.6 inch 3–web grousers	151,050 lbs
	with 31.5 inch 3–web grousers	151,900 lbs

The operating weight includes the basic machine (with rotary and Kelly bar MD 20/3/24) and 17,650 lbs counterweight.

Transport dimensions and weights

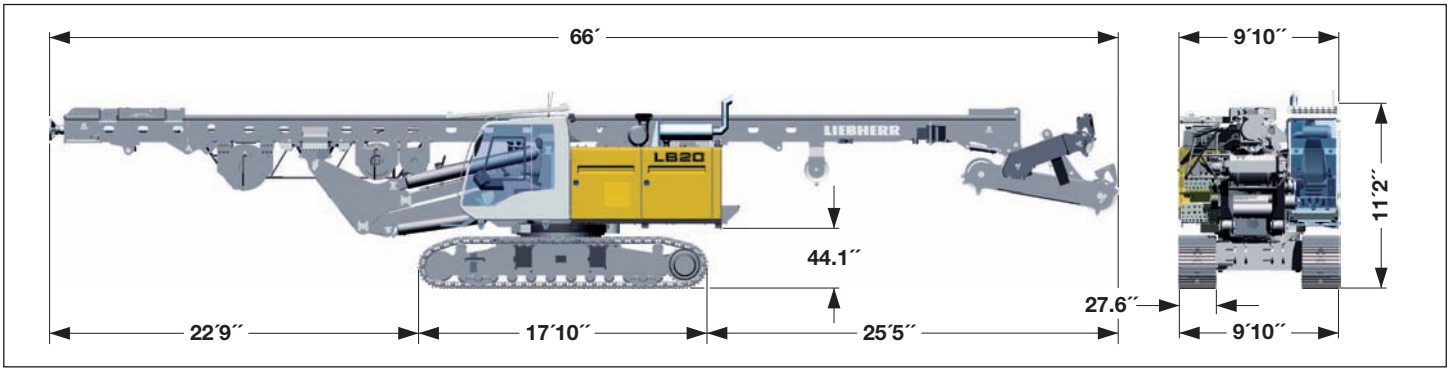


Transport - leader folded*

includes the basic machine (ready for operation) with leader, without working tools (such as rotary, Kelly bar etc.) and without counter-weight.

Dimensions and weights

Leader length	58.75 ft
Weight complete without counterweight	112,700 lbs

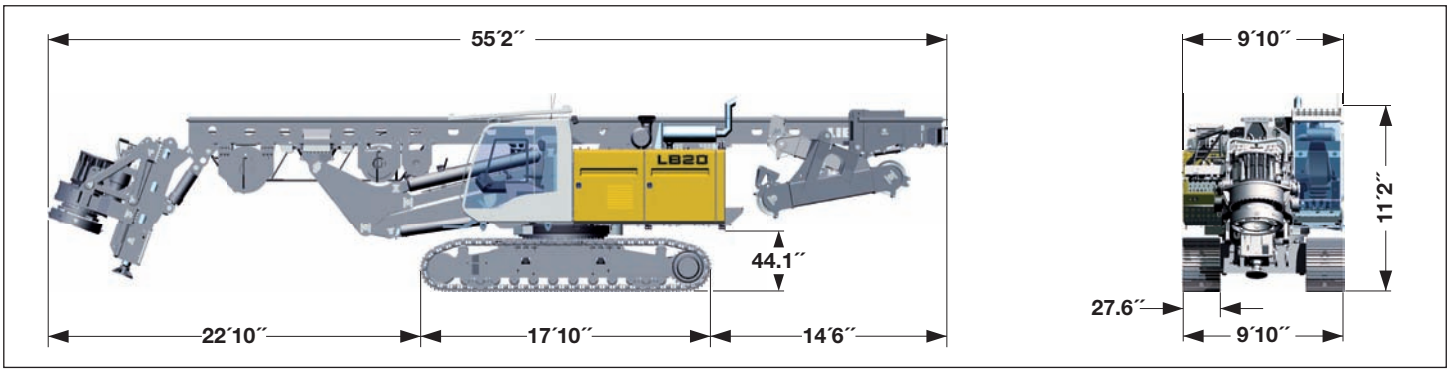


Transport - standard

includes the basic machine (ready for operation) with leader, without working tools (such as rotary, Kelly bar etc.) and without counter-weight.

Dimensions and weights

Leader length	58.75 ft
Weight complete without counterweight	112,700 lbs



Transport - leader folded with rotary**

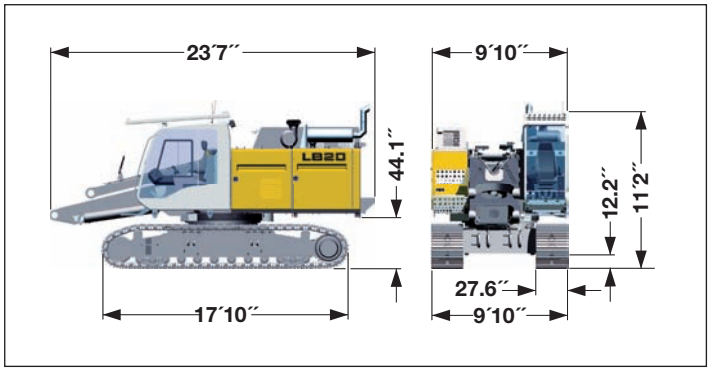
includes the basic machine (ready for operation) with leader and rotary, without other working tools (such as Kelly bar etc.) and without counter-weight.

Dimensions and weights

Leader length	58.75 ft
Weight complete, with rotary and without counterweight	125,500 lbs

*)Folding cylinder for leader top recommended, **) Folding cylinder for leader top and leader bottom required

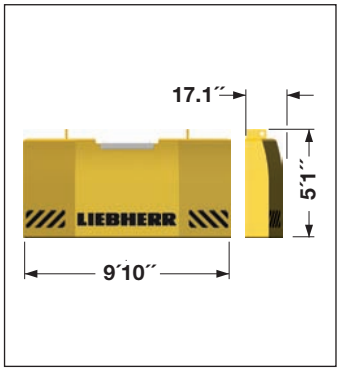
Transport dimensions and weights



Transport basic machine

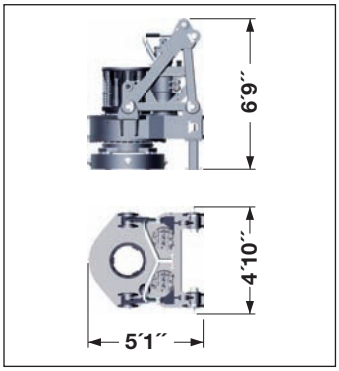
ready for operation, without counterweight.

Transport weight — 72,350 lbs



Counterweight

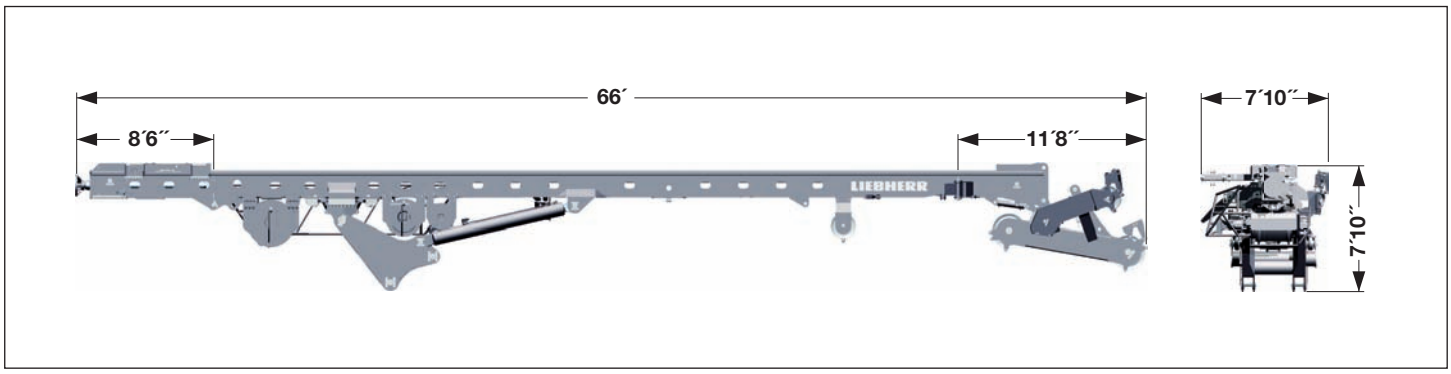
Weight — 17,750 lbs



Rotary

Transport weight

BA 200 — 17,700 lbs



Transport leader

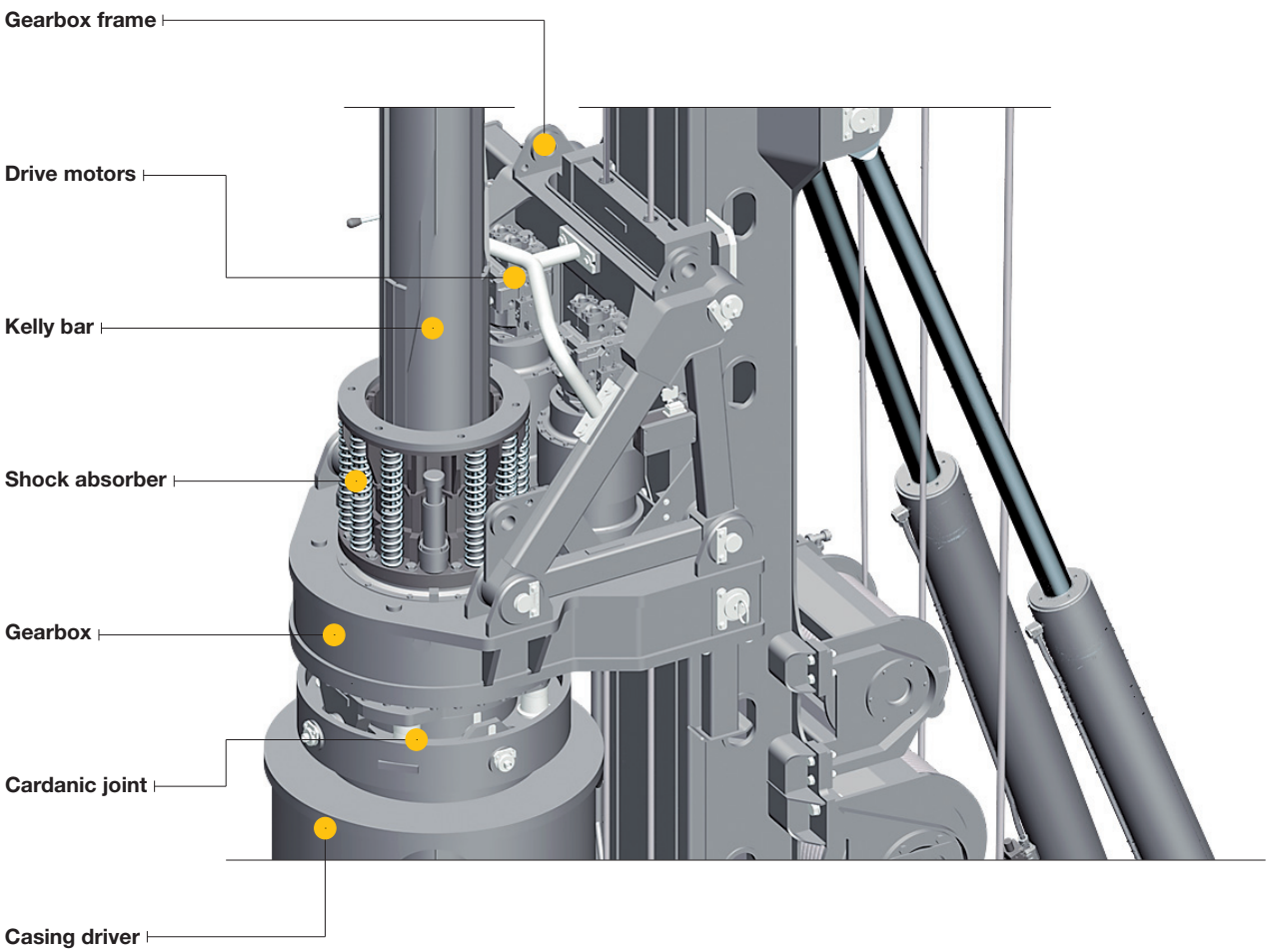
includes the leader without working tools (such as rotary, Kelly bar etc.).

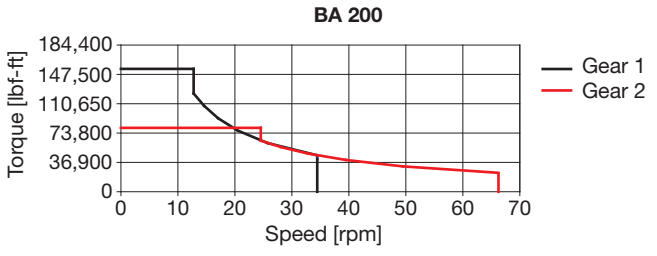
Weights can vary with the final configuration of the machine. The figures in this brochure may include options which are not within the standard scope of supply of the machine.

Dimensions and weights

Leader length	58.75 ft
Weight complete	40,350 lbs
Lower part of the leader	2,650 lbs
Upper part of the leader with leader top	4,650 lbs

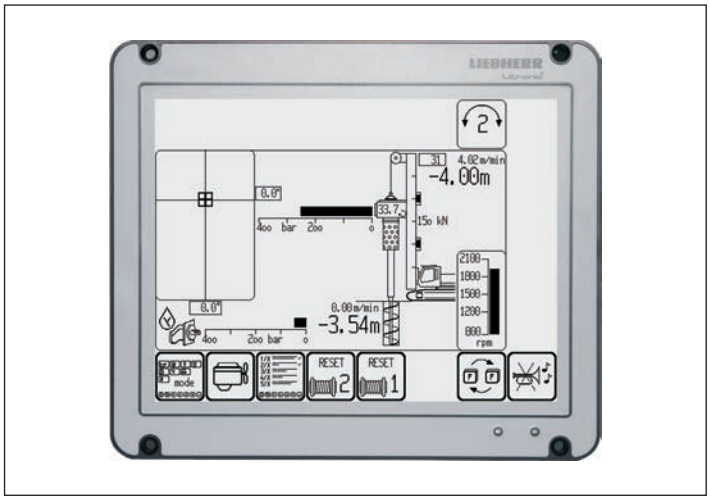
Rotary BA 200 with shock absorber





- 2-stage-gear drive for flexible adaptation to soil conditions
- Due to stepless speed control via joystick optimum and precise alignment and rock drilling is possible even at low speed levels; it is not required to preselect an operating mode
- Kelly shock absorber and rubber bearing relieve the material and reduce noise emission
- Thanks to the Kelly shock absorber the Kelly bar is guided at greater length
- Various drive adapters provide compatibility with other systems

Kelly drilling



Display for Kelly drilling

Technical data

Drilling drive - torque	1st gear	154,150	lbf-ft
Drilling drive - speed	1st gear	34	rpm
Drilling drive - torque	2nd gear	80,400	lbf-ft
Drilling drive - speed	2nd gear	66	rpm

Performance data

Max. drilling diameter*	4.9 ft uncased
Max. drilling diameter*	3.9 ft cased

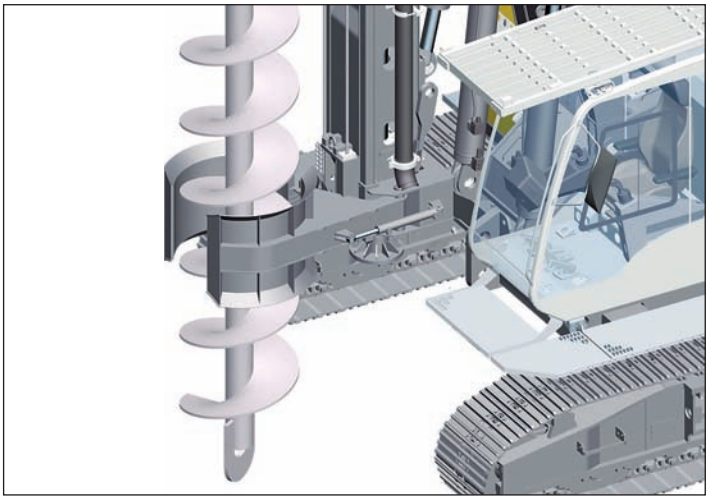
*) Other drilling diameters available on request.

Kelly bars

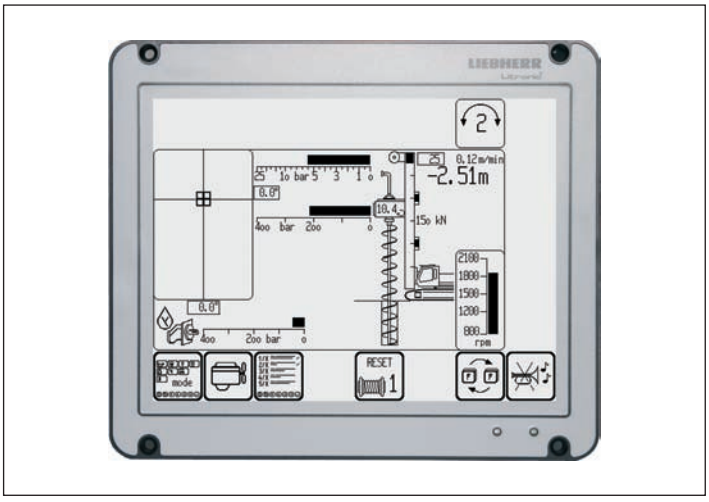
	A	X	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 20/3/24	32.1	22.6	73.2	9,040	14.5
MD 20/3/27	35.4	19.4	83.0	9,920	14.5
MD 20/3/30	38.7	16.1	92.8	10,580	14.5
MD 20/3/33	42.0	12.8	102.7	11,470	14.5
MD 20/4/36	37.3	17.7	112.5	13,900	14.5
MD 20/4/42	42.5	12.5	132.2	15,210	14.5
MD 20/4/48	47.4	7.5	151.9	16,755	14.5
MD 20/4/54	52.3	2.6	171.6	18,520	14.5

Other Kelly bars available on request.
When using a casing oscillator, value X has to be reduced by 4.9 ft.t

Continuous flight auger drilling



Auger with auger guide



Display for continuous flight auger drilling

Technical data

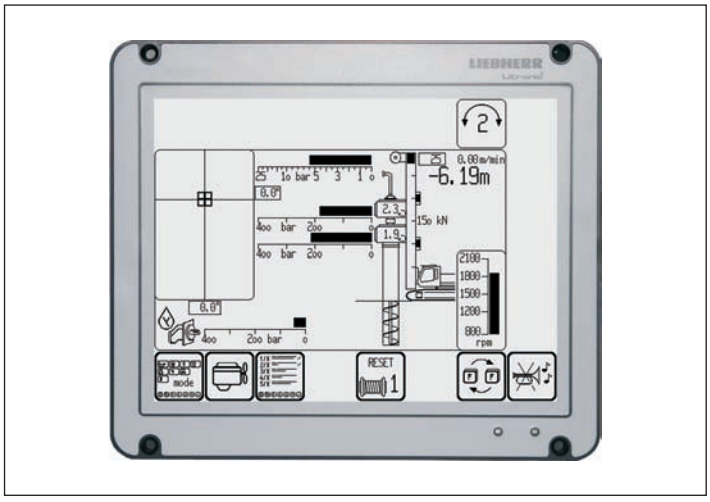
Drilling drive - torque	1st gear	154,150	lbf-ft
Drilling drive - speed	1st gear	34	rpm
Drilling drive - torque	2nd gear	80,400	kNm
Drilling drive - speed	2nd gear	66	rpm

Performance data

Drilling depth with auger cleaner*	42.7	ft
Drilling depth without auger cleaner*	44.6	ft
Drilling depth with 19.7 ft Kelly extension, without auger cleaner	64.3	ft
Max. pull force (crowd winch and Kelly winch)	148,400	lbf
Max. push force (weight of rotary and auger to be added)	33,700	lbf
Max. drilling diameter**	35.4	inch

*) Without Kelly extension
**) Other drilling diameters available on request.

Double rotary drilling
Model DBA 80



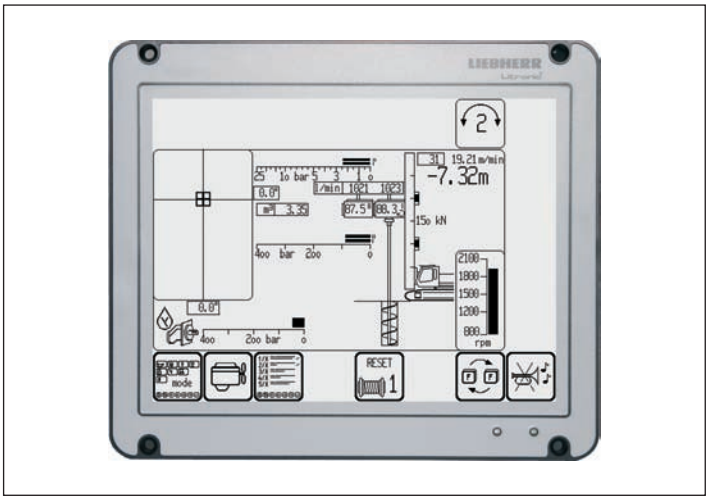
Display for double rotary drilling

Technical data

Drilling drive I - torque	1st gear	61,220	lbf-ft
Drilling drive I - speed	1st gear	14	rpm
Drilling drive I - torque	2nd gear	30,240	lbf-ft
Drilling drive I - speed	2nd gear	28	rpm
Drilling drive II - torque	1st gear	45,730	lbf-ft
Drilling drive II - speed	1st gear	19	rpm
Drilling drive II - torque	2nd gear	22,865	lbf-ft
Drilling drive II - speed	2nd gear	38	rpm
Max. drilling diameter*		24.4	inch
Max. drilling depth		44.6	ft
Max. pull force		112,400	lbf

*) Other drilling diameters available on request.

Twin mix equipment
Model DMA 35



Display for soil mixing

Technical data

Drilling drive - torque	1st gear	25,850 lbf-ft
Drilling drive - speed	1st gear	38 rpm
Drilling drive - torque	2nd gear	12,910 lbf-ft
Drilling drive - speed	2nd gear	76 rpm
Max. drilling depth		44.6 ft
Max. drilling diameter*		27.6 inch

*) Other diameters available on request.

Technical description

Engine

Power rating according to ISO 9249, 270 kW (362 hp) at 2000 rpm
Engine type — Liebherr D 936 L A6
Fuel tank — 185 gal capacity with continuous level indicator and reserve warning
Engine complies with NRMM exhaust certification EPA/CARB Tier 3 and 97/68 EC Stage III A.

Hydraulic system

The main pumps are operated by a distributor gearbox. Axial piston displacement pumps work in open circuits supplying oil only when needed (flow control on demand). The hydraulic pressure peaks are absorbed by the integrated automatic pressure compensation, which relieves the pump and saves fuel.

Pumps for working tools — 2x 63 gal/min
Separate pump for kinematics — 36 gal/min
Hydraulic oil tank — 159 gal
Max. working pressure — 5076 PSI

The cleaning of the hydraulic oils occurs via an electronically monitored pressure and return filter. Any clogging is shown on the monitor in the cab. 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 of telescopic undercarriage — 0 – 1.11 mph
Track force — 98,470 lbf
Width of 3-web grousers — 27.6 inch
Transport width — 9.8 ft

Option:
Width of 3-web grousers — 31.5 inch
Transport width — 11.15 ft

Swing

Consists of triple-row roller bearing with external teeth and one swing drive, fixed axial piston hydraulic motors, spring loaded and hydraulically released multi-disc holding brake, planetary gearbox and pinion.
Selector for 3 speed ranges to increase swing precision.
Swing speed from 0 – 3.5 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. A GSM modem allows for remote inquiry of machine data and error indications. 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.

Options:
- PDE: Process data recording
- GSM modem

Kelly winch with freewheeling

Line pull effective (2nd layer) — 40,500 lbf
Rope diameter — 28 mm
Line speed — 0-259 ft/min

Auxiliary winch

Line pull effective (1st layer) — 18,000 lbf
Rope diameter — 20 mm
Line speed — 0-233 ft/min

Rope crowd system

Crowd force (push/pull) — 67,500/67,500 lbf
Line pull (effective) — 33,750 lbf
Rope diameter — 24 mm
Travel of working tool — 47.6 ft
Line speed — 0-256 ft/min

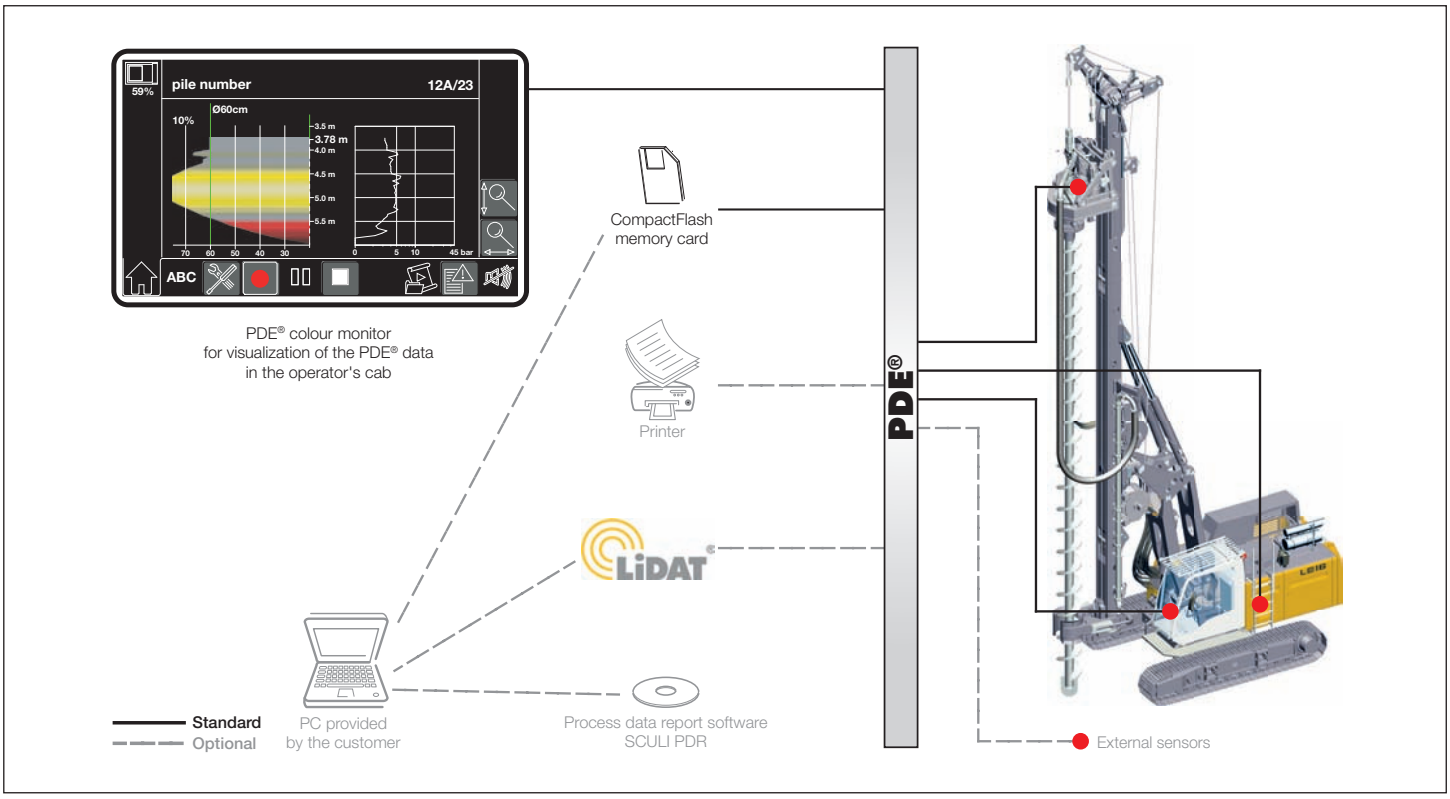
The winches are noted for compact, easily mounted design. Propulsion is via a maintenance-free planetary gearbox in oil bath.
Load support by the hydraulic system; additional safety factor by a spring-loaded, multi-disc holding brake. All line pull values are effective values. The efficiency factor of approx. 25% has already been deducted.

Noise emission

Noise emissions correspond with 2000/14/EC directive on noise emission by equipment used outdoors.

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, for the generation of a simple protocol as graphic file and/or for a printout directly in the operator‘s cab.

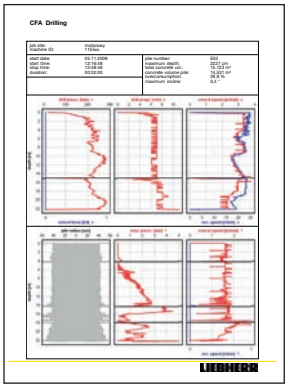
Process data reporting - PDR (additional equipment)

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

Recordings management - The recordings generated by the PDE® system can be imported and managed in SCULI 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 SCULI 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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