

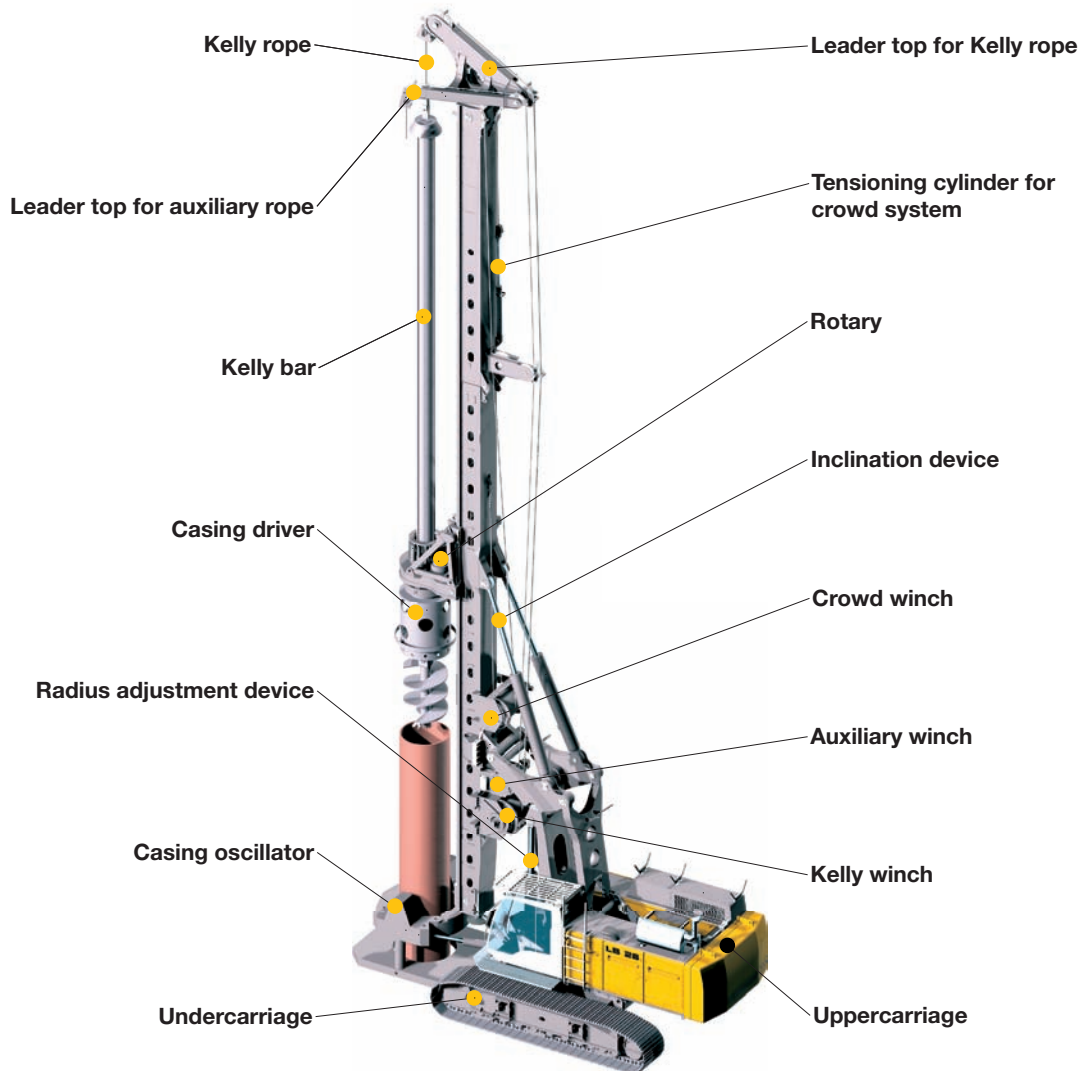
Technical data Drilling rig

LB 28
Litronic®



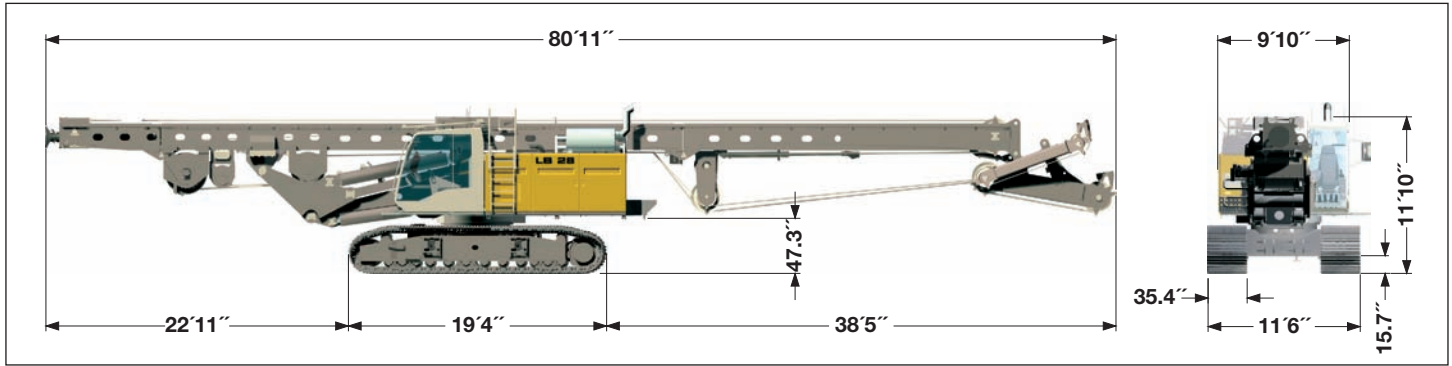
LIEBHERR

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 the PDE-system

Transport dimensions and weights

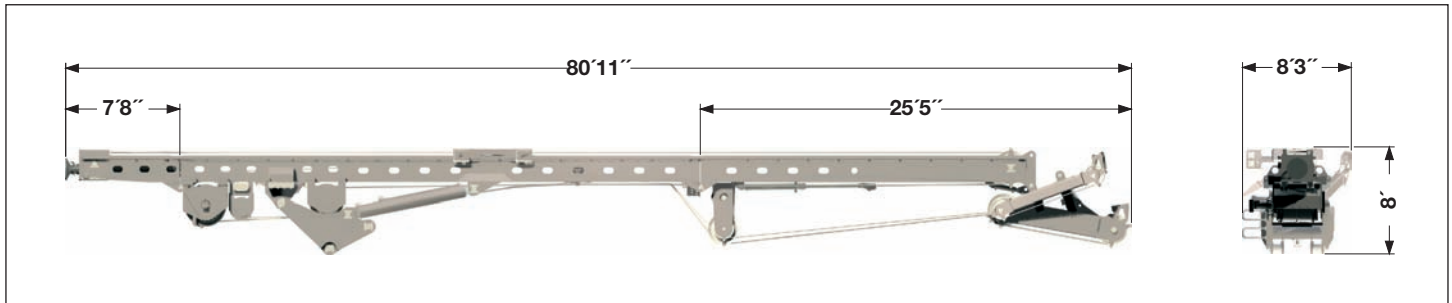


Transport with leader

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

Dimensions and weights

Leader length ————— 72.2 ft
Weight complete without counterweight ————— 150,355 lbs

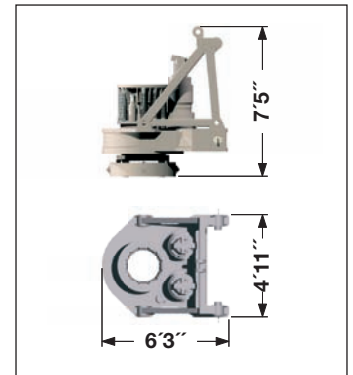
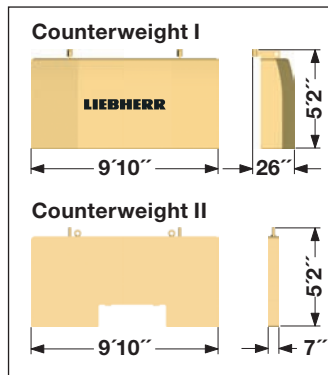
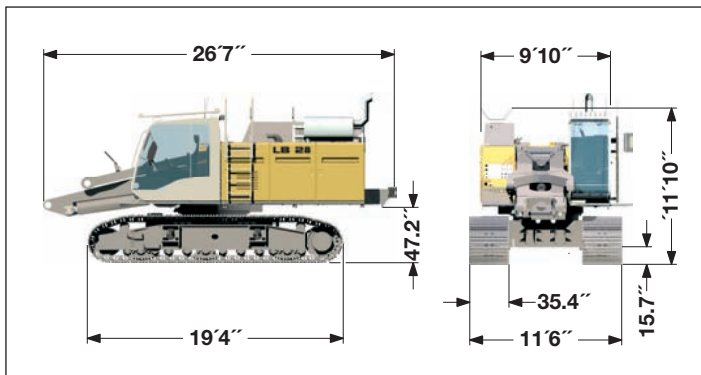


Transport leader

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

Dimensions and weights

Leader length ————— 72.2 ft
Weight complete ————— 53,350 lbs
Lower part of the leader ————— 3,310 lbs
Upper part of the leader with leader top ————— 10,140 lbs



Transport basic machine

ready for operation, without counterweight.

Transport weight ————— 97,000 lbs

Weights

Counterweight I — 22,500 lbs
Counterweight II — 11,500 lbs

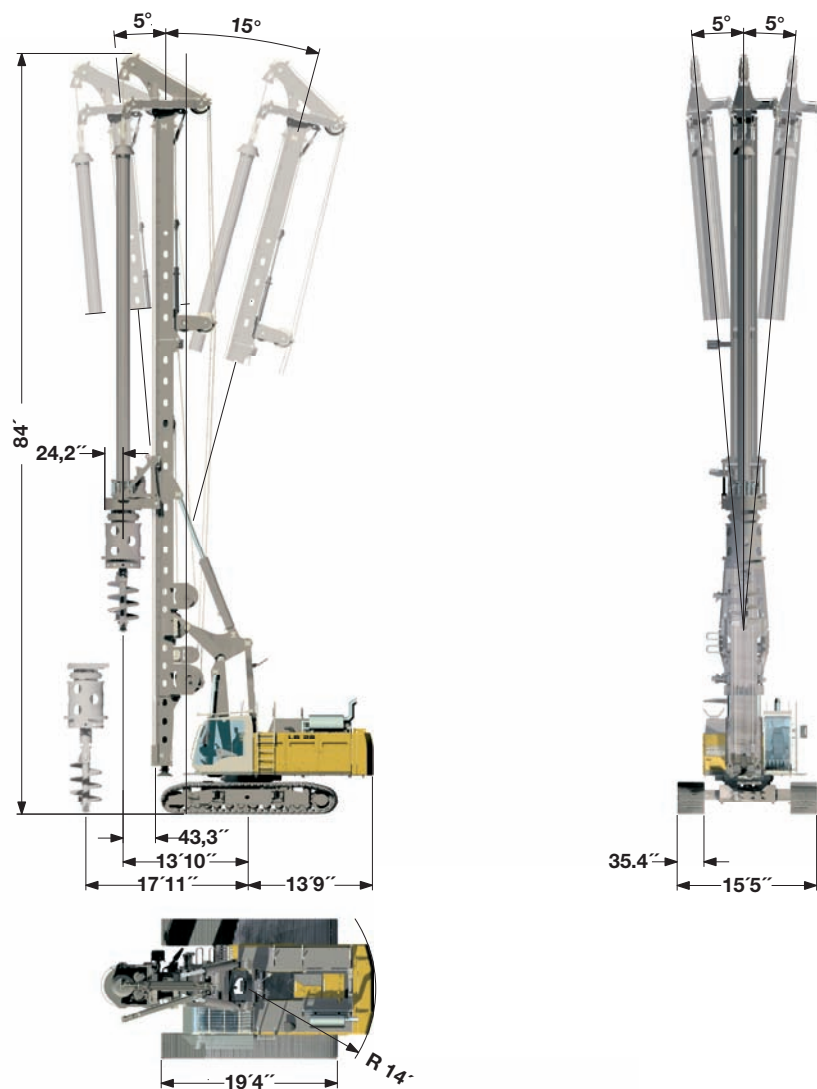
Rotary

Transport weight
BA 280 ————— 14,770 lbs

Weights can vary with the final configuration of the machine.

Dimensions

Basic machine LB 28



Technical data

Total height	84 ft
Max. pull, leader on ground	88,200 lbs
Max. torque	206,500 lbf-ft
Stepless lead inclination	
Lateral inclination	± 5°
Forward inclination	5°
Backward inclination	15°

Operating weight

Total weight with 31.5 inch 3-web shoes	210,800 lbs
Total weight with 35.4 inch 3-web shoes	212,100 lbs

The operating weight includes the basic machine LB 28 (with rotary and Kelly bar MD 28/3/30) and 33,730 lbs counterweight.

Technical description



Engine

Power rating according to ISO 9249, 350 kW (469 hp) at 1900 rpm

Engine type _____ Liebherr D 846 A7

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.



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 92 gal/min

Separate pump for kinematics _____ 47.5 gal/min

Hydraulic oil tank _____ 211 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 display 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 _____ 0 – 1.18 mph

Track force _____ 140,000 lbf

Width of 3-web track shoes _____ 35,4 inch



Swing

Consists of triple-row roller bearing with external teeth and two swing drives, fixed axial piston hydraulic motor, 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 – 2 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 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



Kelly winch with freewheeling

Line pull (effective) _____ 56,200 lbf

Rope diameter _____ 34 mm

Max. line speed _____ 0-259 ft/min



Auxiliary winch

Line pull (effective) _____ 22,480 lbf

Rope diameter _____ 20 mm

Drum diameter _____ 15,7 inch

Max. line speed _____ 0-321 ft/min



Rope crowd system

Crowd force push/pull _____ 90,000/90,000 lbf

Line pull (effective) _____ 45,000 lbf

Rope diameter _____ 28 mm

Travel of working tool _____ 60 ft

Max. line speed _____ 0-243 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

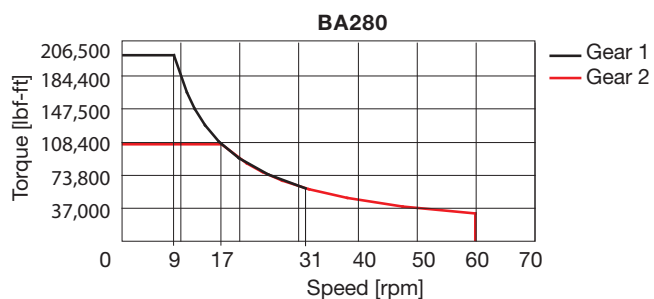
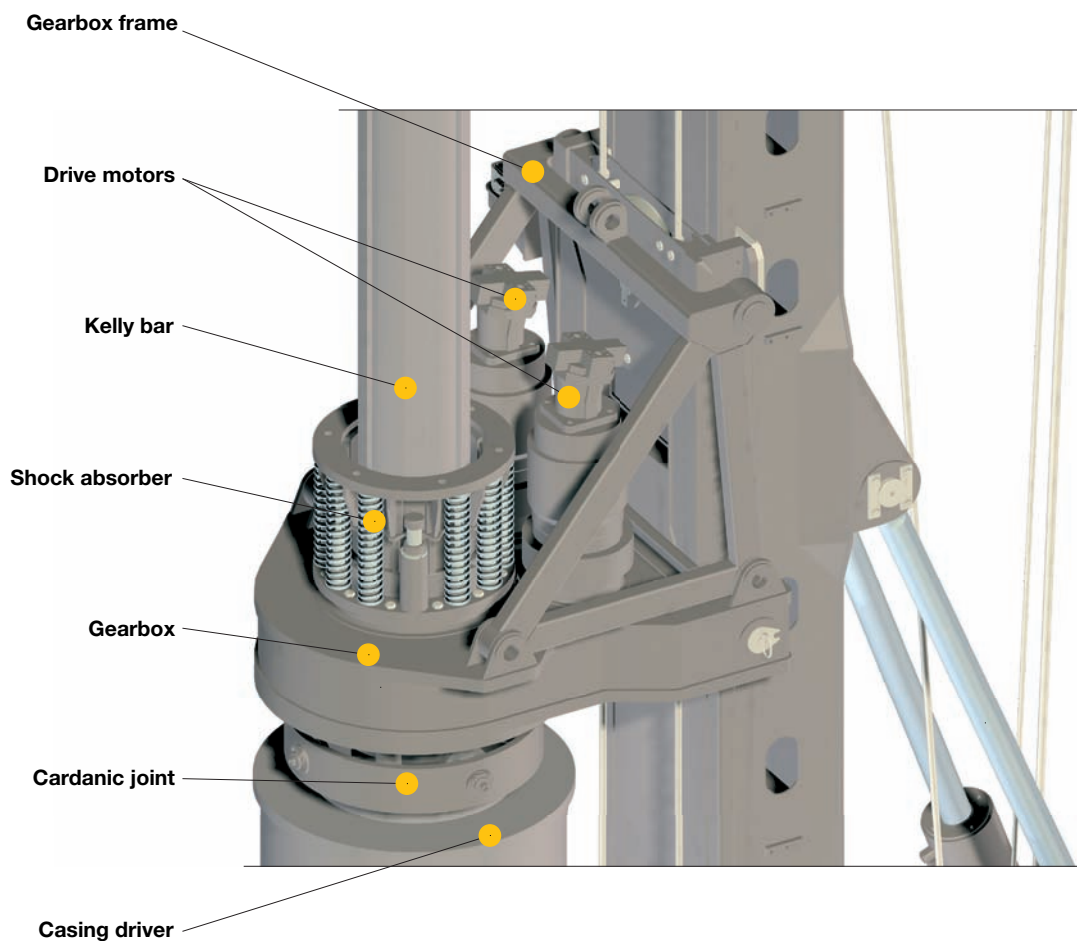
effective values. The efficiency factor of approx. 25% has already been deducted.



Noise emission

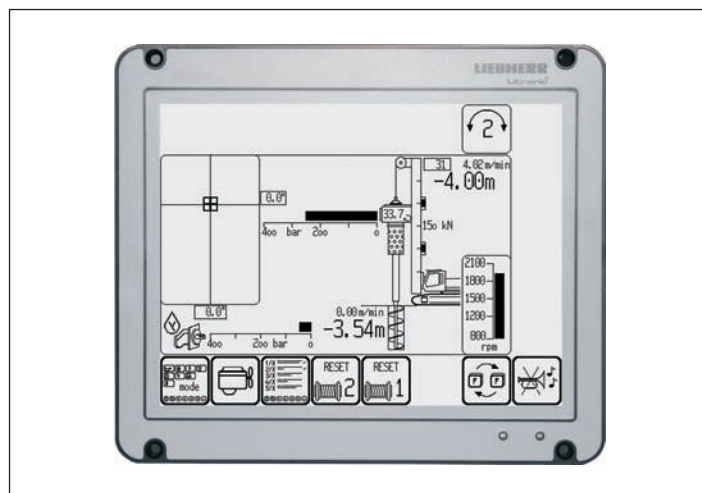
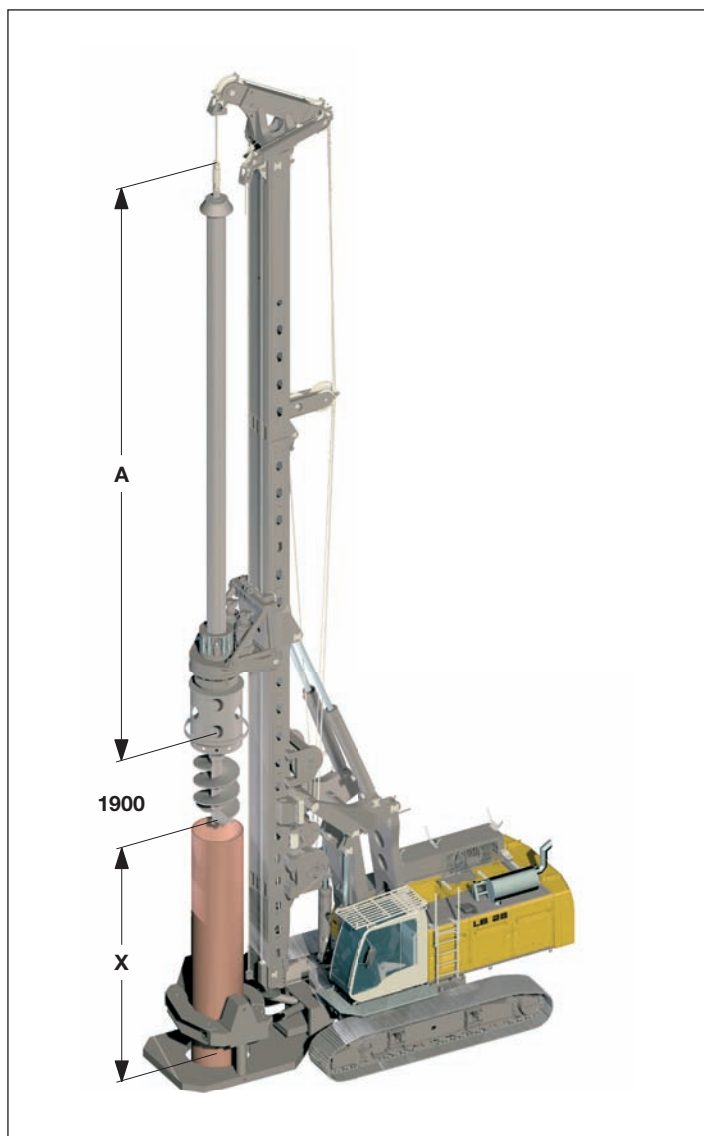
Noise emissions correspond with 2000/14/EC directive on noise emission by equipment used outdoors.

Rotary BA 280 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	1 st gear	206,500 lbf-ft
Drilling drive - speed	1 st gear	31 rpm
Drilling drive - torque	2 nd gear	108,400 lbf-ft
Drilling drive - speed	2 nd gear	60 rpm

Performance data

Max. drilling diameter*	6.2 ft uncased
Max. drilling diameter*	4.9 ft cased

*) Other drilling diameters available on request.

Other Kelly bars available on request.

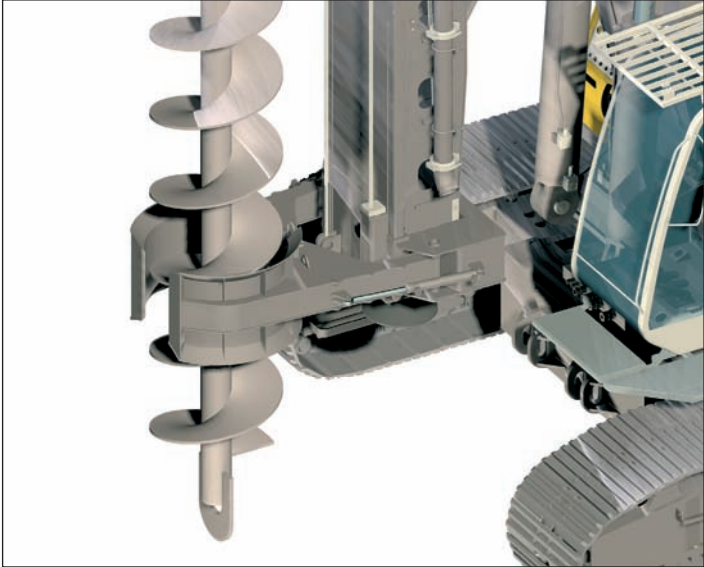
When using a casing oscillator, value X has to be reduced by 4.9 ft.

Kelly bars

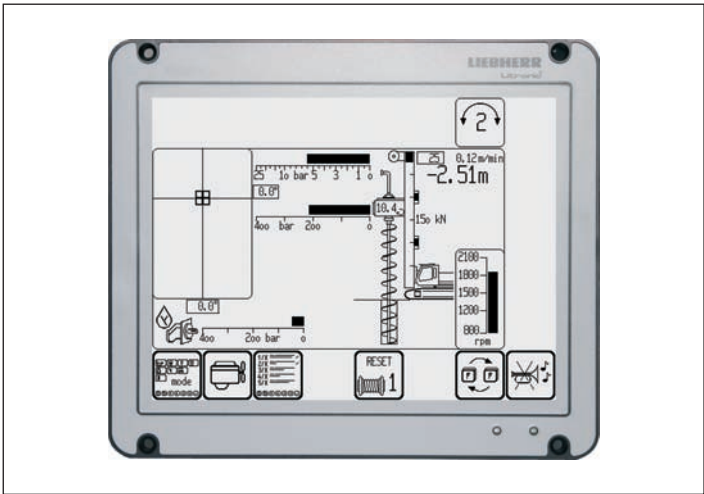
	A	X	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 28/3/24	32.4	37.4	73.5	11,050	16.5
MD 28/3/30	39.0	30.8	93.2	13,000	16.5
MD 28/3/36	45.5	24.3	112.9	15,000	16.5
MD 28/4/42	42.5	27.2	132.5	17,900	16.5
MD 28/4/48	47.4	22.3	152.2	19,850	16.5
MD 28/4/54	52.3	17.4	171.9	22,050	16.5
*MD 28/4/60	57.3	12.5	191.6	24,500	16.5
*MD 28/4/66	62.2	7.5	211.3	27,150	16.5
*MD 28/4/72	67.1	2.6	231.0	30,000	16.5

*) Only possible with specially adapted drilling rig

Continuous flight auger drilling



Auger with auger guide



Display for continuous flight auger drilling

Technical data

Drilling drive - torque	1 st gear	206,500 lbf-ft
Drilling drive - speed	1 st gear	31 rpm
Drilling drive - torque	2 nd gear	108,400 lbf-ft
Drilling drive - speed	2 nd gear	60 rpm

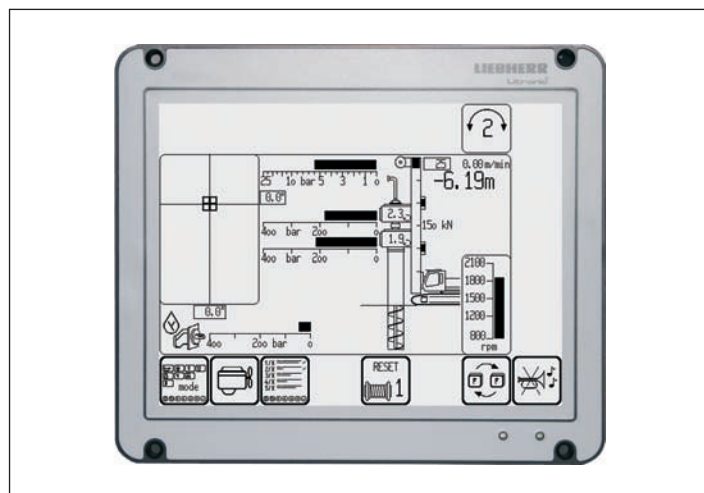
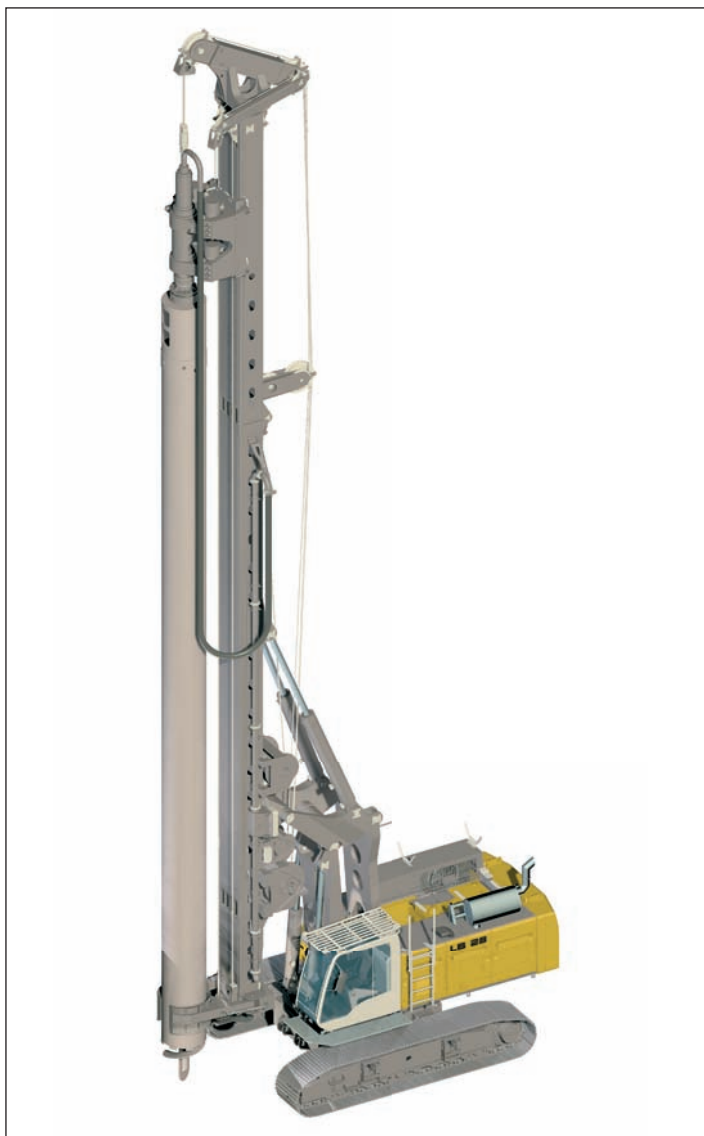
Performance data

Drilling depth with 26.2 ft Kelly extension, without auger cleaner	85.3 ft
Drilling depth without auger cleaner	60.7 ft
Drilling depth with auger cleaner	55.8 ft
Max. pull force (crowd winch and Kelly winch)	198,500 lbs
Max. push force (weight of rotary and auger to be added)	44,100 lbs
Max. drilling diameter*	3.3 ft

*) Other drilling diameters available on request

Double rotary drilling

Model DBA 300



Display for double rotary drilling

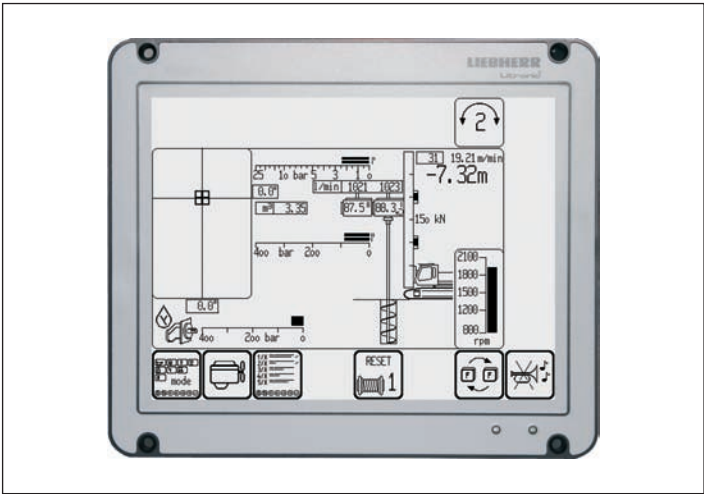
Technical data

Drilling drive I - torque	221,300 lbf-ft
Drilling drive I - speed	26 rpm
Drilling drive II - torque	110,650 lbf-ft
Drilling drive II - speed	31 rpm
Max. drilling diameter*	47,3 inch
Max. drilling depth	60.7 ft
Max. pull force	198,500 lbs

*) Other drilling diameters available on request

Twin mix equipment

Model DMA 35



Display for soil mixing

Technical data

Drilling drive - torque	1 st gear	25,800 lbf-ft
	2 nd gear	12,900 lbf-ft
Drilling drive - speed	1 st gear	60 rpm
	2 nd gear	120 rpm
Max. drilling depth		60.7 ft
Max. diameter*		27.6 inch

*) Other diameters available on request

PDE - Process data recording (Additional equipment)

This module constantly calculates and stores the current working processes.

Measurements

Measurements are constantly calculated during the working process. No special measuring process is required. External systems can also be connected to the system.

Display of measurement data

Measurement data relevant to the working process is displayed on the monitor in the cab. The operator can then control the process and, if necessary, correct it.

Working process interruption

The working process and the measurement can be interrupted at any time. The measurements are automatically continued upon resumption of work.

Storage of measurement and machine data

All data is stored on a memory card. This can be read via a PC. Thereby an evaluation and processing of data can also be performed at a later time. For example, for:

- client certifications
- conveying daily production data, down time, etc.
- Soil condition report

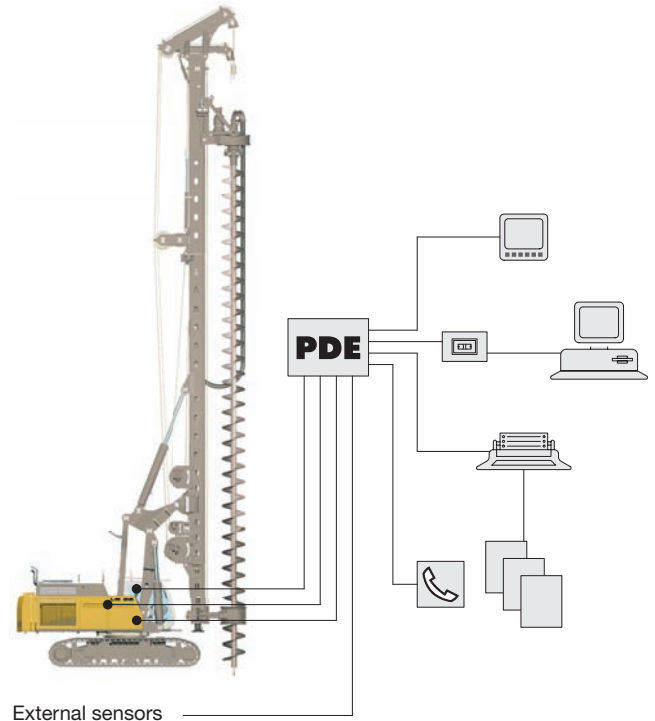
Printing data

A protocol can be printed out from the cab printer after each working process.

Data transmission

A GSM modem can be connected to the PDE making long distance data transmission possible.

PDE - diagram



Example of a protocol (in required language)

LIEBHERR

job site 11
pile number 06
start date 08.02.2005
start time 08:21:08
stop time 08:47:56
maximum depth [cm] 1946
total concrete [m³] 17.6400

