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**fds**

Drill Rig **LB 24-270** Liebherr



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**FDS Foundation Drilling Services Inc.**

**Delivering Certainty**

Drilling Rig

# LB 24-270

Litronic®

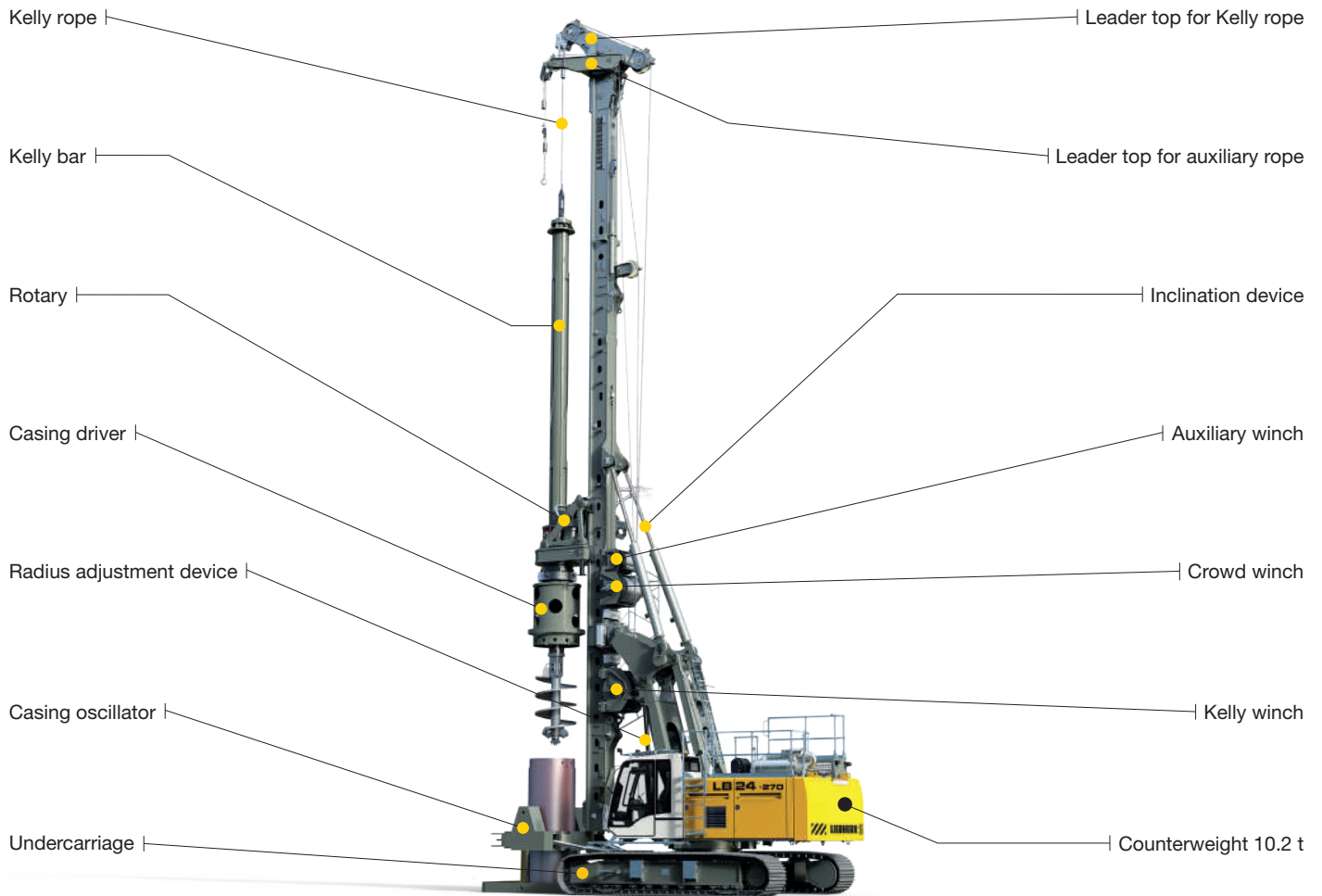
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LB 2003.05



# LIEBHERR

# Concept and characteristics



LB24-270

## The robust universal machine for a wide variety of applications:

- Kelly drilling
- Auger drilling
- Full displacement drilling
- Double rotary drilling

The solid undercarriage offers excellent stability and low ground bearing pressure.

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.

All winches are mounted on the leader, which provides a direct view of the main winch from the operator's cab.

The rotary drive of the BAT series combines exceptional torque with optimum operating comfort.

The powerful Liebherr diesel engine is low in emission and economical through SCR technology.



The Litronic control with assistance systems supports the operator:

- Cruise Control for the drilling process
- Joystick control for all machine functions
- Automatic shake-off function for working tools
- Leader inclination memory etc.

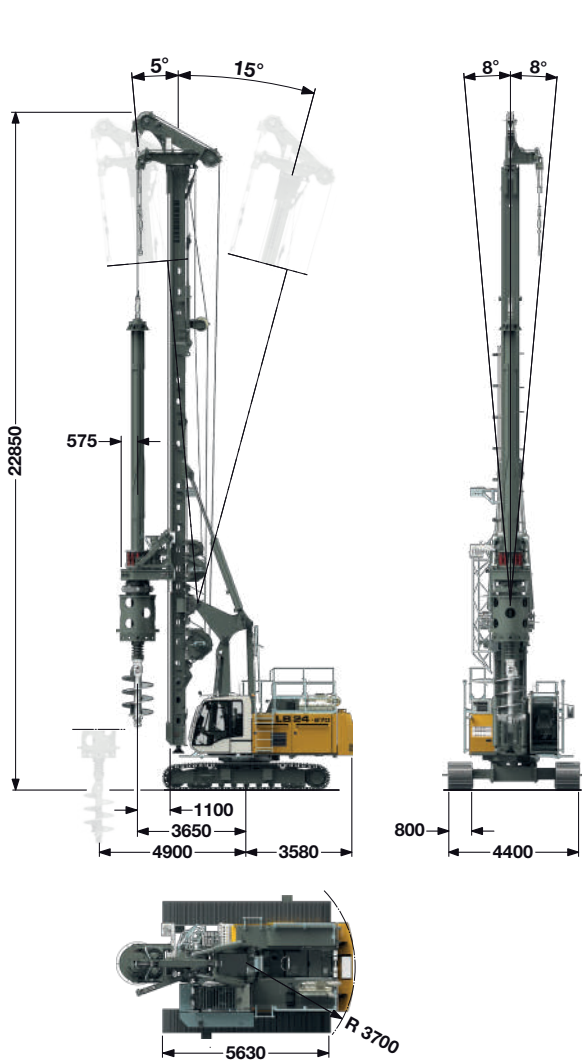
Sophisticated solutions provide safe operation and maintenance of the machine:

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

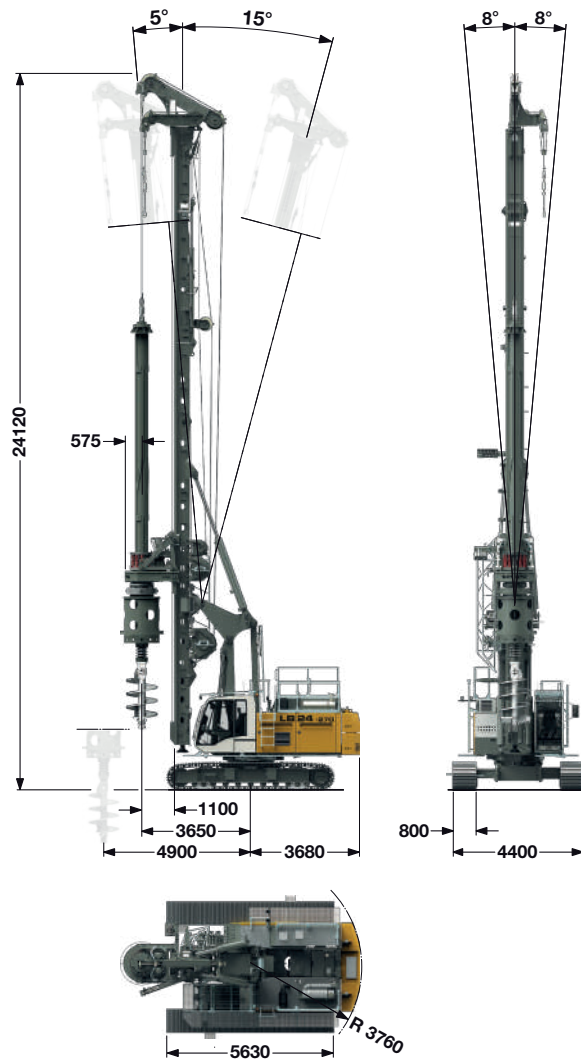
Liebherr Kelly bars feature strongly overlapping elements resulting in less wear.

Precise and robust Liebherr casings and drilling tools provide excellent drilling performance.

# Dimensions



LB 24-270



LB 24-270 with optional equipment

## Technical data LB 24-270

Total height	22.85 m
Continuous rig inclination adjustment	
Lateral inclination	± 8°
Forward inclination	5°
Backward inclination	15°

## Technical data LB 24-270 with optional equipment

Total height	24.12 m
Continuous rig inclination adjustment	
Lateral inclination	± 8°
Forward inclination	5°
Backward inclination	15°

## Operating weight LB 24-270

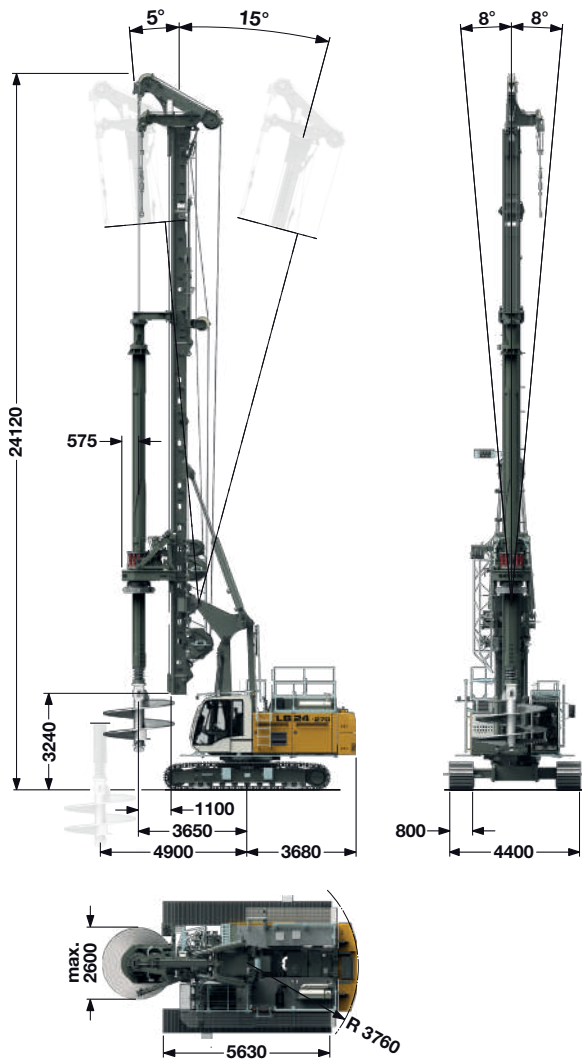
Total weight with 700 mm 3-web shoes	75.9 t
Total weight with 800 mm 3-web shoes	76.4 t
Total weight with 900 mm 3-web shoes	77.0 t

The operating weight includes the basic machine LB 24-270 (with rotary and Kelly bar MD 28/3/24) and 10.2 t counterweight, without equipment for casing oscillator.

## Operating weight LB 24-270 with optional equipment

Total weight with 700 mm 3-web shoes	78.6 t
Total weight with 800 mm 3-web shoes	79.1 t
Total weight with 900 mm 3-web shoes	79.7 t

The operating weight includes the basic machine LB 24-270 (with long leader, rotary and Kelly bar MD 28/3/24) and 2x 6 t counterweight, without equipment for casing oscillator.



LB 24-270 with optional equipment and short leader lower part

### Technical data LB 24-270 with optional equipment

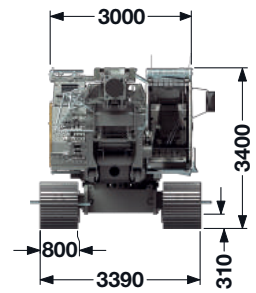
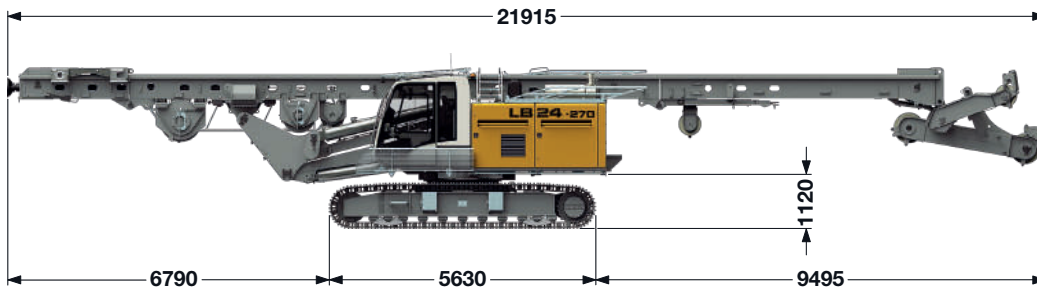
Total height	24.12 m
Continuous rig inclination adjustment	
Lateral inclination	± 8°
Forward inclination	5°
Backward inclination	15°

### Operating weight LB 24-270 with optional equipment

Total weight with 700 mm 3-web shoes	77.5 t
Total weight with 800 mm 3-web shoes	78.0 t
Total weight with 900 mm 3-web shoes	78.6 t

The operating weight includes the basic machine LB 24-270 (with long leader and short leader lower part, rotary and Kelly bar MD 28/3/24) and 2x 6 t counterweight, without equipment for casing oscillator.

# Transport dimensions and weights



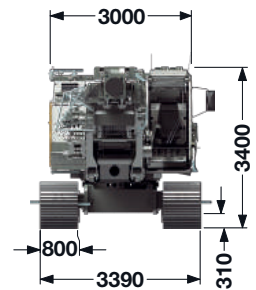
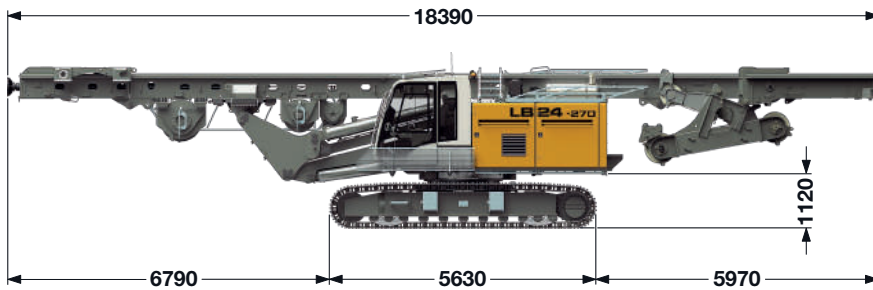
## Transport standard

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

## Dimensions and weights

Length ————— 21.92 m

Weight complete without counterweight ————— 54.8 t



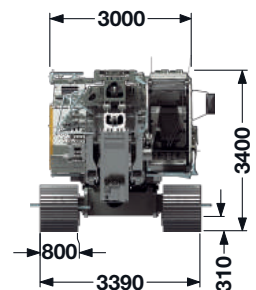
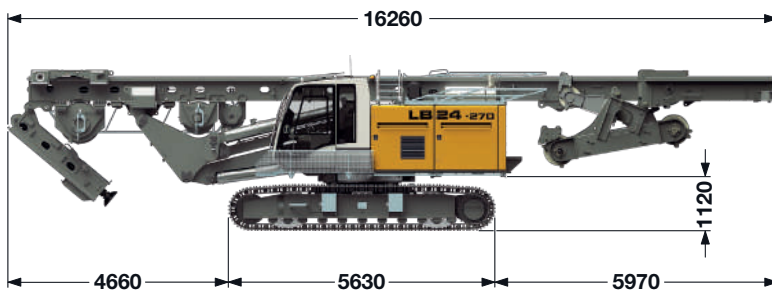
## Transport with optional equipment

includes the basic machine (ready for operation) with long leader (leader upper part folded), without attachment (such as rotary, Kelly bar etc.) and without counterweight.

## Dimensions and weights

Length ————— 18.39 m

Weight complete without counterweight ————— 55.7 t



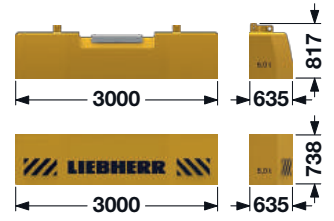
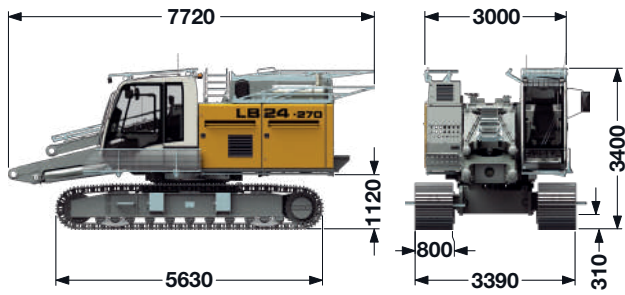
## Transport with optional equipment (leader lower part folded)

includes the basic machine (ready for operation) with long leader (leader upper part and lower part folded), without attachment (such as rotary, Kelly bar etc.) and without counterweight.

## Dimensions and weights

Length ————— 16.26 m

Weight complete without counterweight ————— 55.7 t



### Transport basic machine

ready for operation, without counterweight

Transport weight ————— 36.4 t

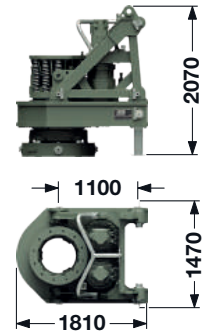
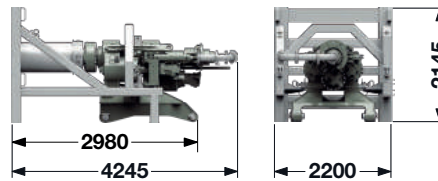
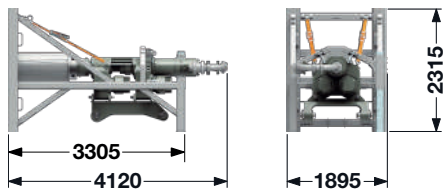
### Counterweight (standard)

Counterweight ————— 10.2 t

### Counterweight (optional equipment)

Counterweight (upper section) – 6 t

Counterweight (lower section) – 6 t



### Double rotary drive DBA 80

Transport weight

DBA 80 ————— 5.8 t

### Double rotary drive DBA 160

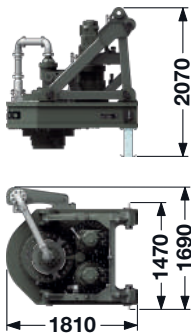
Transport weight

DBA 160 ————— 8.1 t

### Rotary BAT 270

Transport weight

BAT 270 ————— 6.4 t



### MAT 100

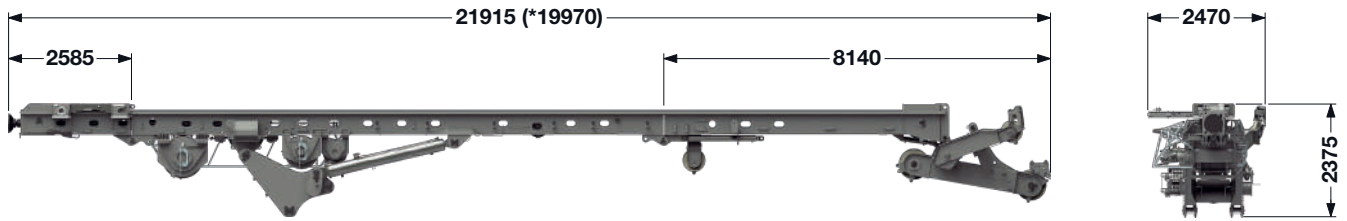
Transport weight

MAT 100 ————— 5.6 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.



# Transport dimensions and weights



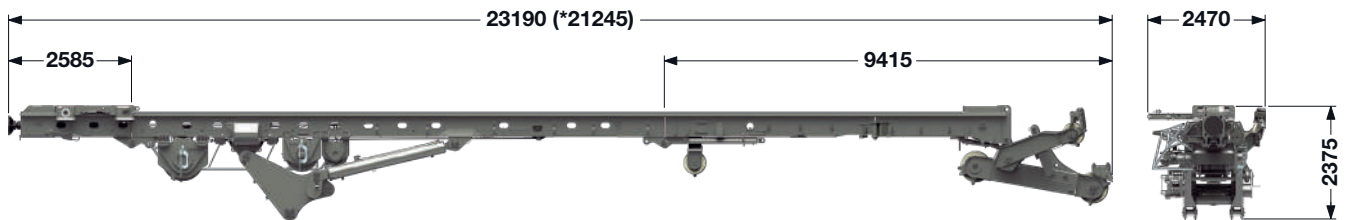
## Transport leader

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

\* Possible variation: leader with short leader lower part.

## Dimensions and weights

Length	21.92 m
Weight complete	18.4 t
Leader lower part	1.2 t
Leader upper part with leader top	3.3 t



## Transport long leader

includes the long leader without attachment (such as rotary, Kelly bar etc.).

\* Possible variation: long leader with short leader lower part.

## Dimensions and weights

Length	23.19 m
Weight complete	19.3 t
Leader lower part	1.2 t
Leader upper part with leader top	4.2 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.

# Technical data

## Engine

Power rating according to ISO 9249, 320 kW (429 hp) at 1700 rpm  
 Engine type ————— Liebherr D 936 A7 - 04  
 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 when needed (flow control 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 270 l/min  
 Separate pump for kinematics ————— 130 l/min  
 Hydraulic oil tank ————— 600 l  
 Max. working pressure ————— 350 bar

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 multi-disc brake, maintenance-free crawler tracks, hydraulic chain tensioning device.

Drive speed ————— 0 – 1.45 km/h  
 Track force ————— 694 kN  
 Width of 3-web grousers ————— 800 mm  
 Transport width ————— 3400 mm

Option:  
 Width of 3-web grousers ————— 700 mm  
 Transport width ————— 3000 mm  
 Width of 3-web grousers ————— 900 mm  
 Transport width ————— 3500 mm

## Noise emission

Noise emissions correspond with 2000/14/EC directive.  
 Guaranteed average sound pressure level  $L_{PA}$  in the cabin — 74.9 dB(A)

Guaranteed sound power level  $L_{WA}$  ————— 109 dB(A)  
 Option: Eco-Silent Mode  
 Reduction of guaranteed sound power level  $L_{WA}$  ————— 4 dB(A)

Vibration transmitted to the hand-arm system of the machine operator ————— < 2.5 m/s<sup>2</sup>  
 Vibration transmitted to the whole body of the machine operator ————— < 0.5 m/s<sup>2</sup>

## Swing

Consists of triple-row roller bearing with external teeth and two swing drives, fixed axial piston hydraulic motor, hydraulically released multi-disc holding brake, planetary gearbox and pinion. Selector for 3 speed ranges to increase swing precision.  
 Swing speed from 0 – 3.4 rpm 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. Options:

PDE®: Process data recording

## Kelly winch with freewheeling

Line pull effective (1<sup>st</sup> layer) ————— 210 kN  
 Rope diameter ————— 28 mm  
 Rope speed ————— 0 – 85 m/min

Option (only enabled in the operating mode “Kelly drilling”):

Line pull effective (1<sup>st</sup> layer) ————— 230 kN  
 Rope diameter ————— 28 mm  
 Rope speed ————— 0 – 85 m/min

## Auxiliary winch

Line pull effective (1<sup>st</sup> layer) ————— 80 kN  
 Rope diameter ————— 20 mm  
 Rope speed ————— 0 – 82.5 m/min

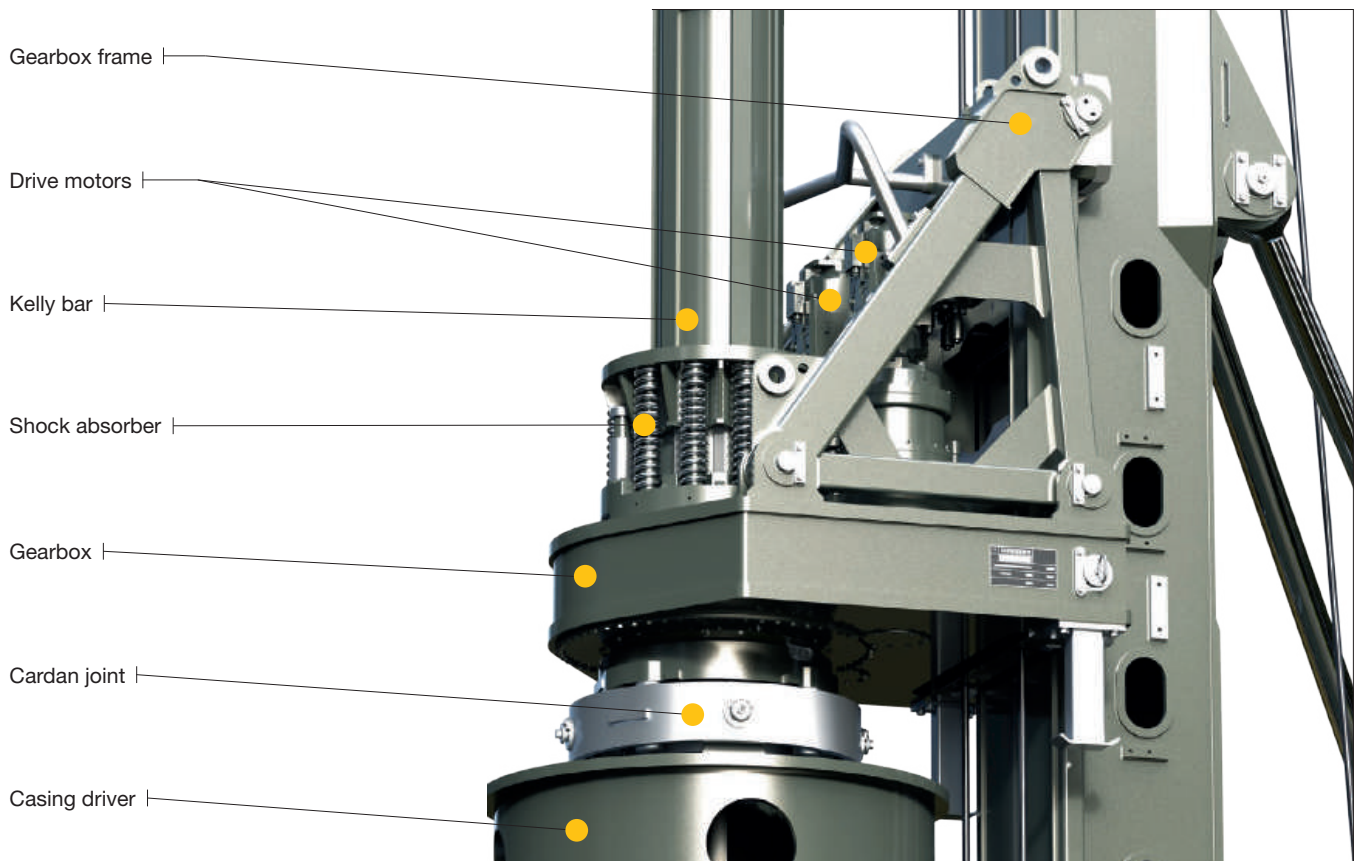
## Rope crowd system

Crowd force (push/pull) ————— 320/320 kN  
 Line pull (effective) ————— 160 kN  
 Rope diameter ————— 24 mm  
 Travel (standard leader) ————— 16.2 m  
 Travel (long leader) ————— 17.5 m  
 Travel reduction (with short leader lower part) ————— 1.6 m  
 Rope speed ————— 0 – 88 m/min

The winches are outstanding in their compact design and easy assembly. 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.

# Rotary BAT 270 with shock absorber



## Automatic gearbox for best operating comfort

- No stopping required to change gears
- No interruption of the drilling process
- Automatic torque adjustment
- Continuous optimization of speed
- Four electronically adjustable speed ranges

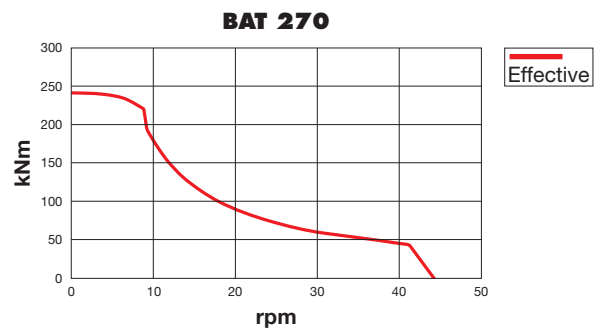
## Highest availability through easy set-up

- No mechanical shift gearbox
- Higher availability thanks to less moving parts
- Less maintenance required

- No pressure lubrication necessary
- No interferences through defective lubrication pump
- Simplified hydraulics
- Lower risk of hydraulics leakages

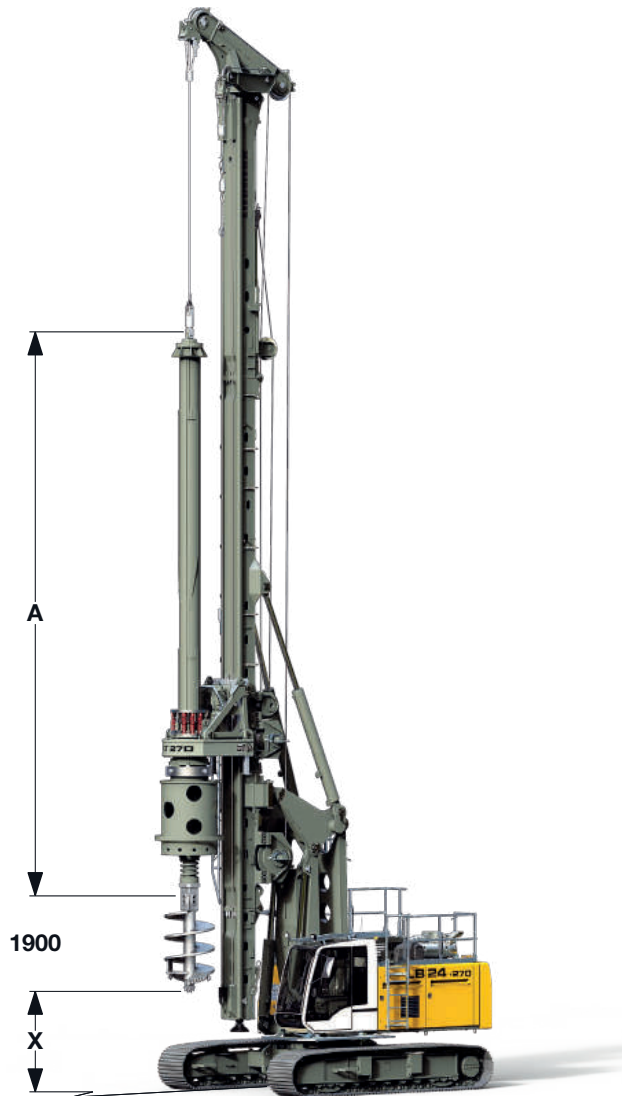
## Flexibility through modular design

- Exchangeable drive adapters for use of other Kelly bars
- Exchangeable cardan joint for other casing drivers
- Quickly exchangeable equipment for other methods of operation

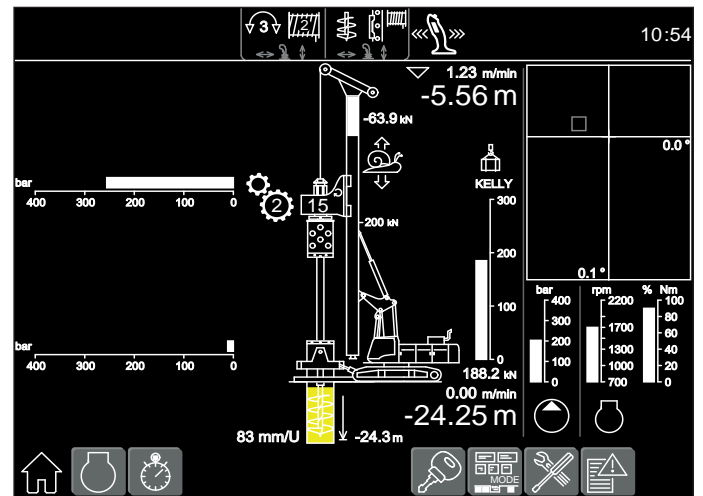


# Kelly drilling

LB 24-270



LB 24-270



Display for Kelly drilling

## Technical data

Rotary drive - torque	0 – 270 kNm
Rotary drive - speed	0 – 46 rpm

## Performance data

Max. drilling diameter*	1900 mm uncased
Max. drilling diameter*	1500 mm cased

\*) Other drilling diameters on request. Other Kelly bars available on request.

1) When using a casing oscillator, value X has to be reduced by 1500 mm.  
When using a Kelly bar guide, value X has to be reduced by 550 mm.

2) Installation only possible using auxiliary equipment.

## Kelly bars

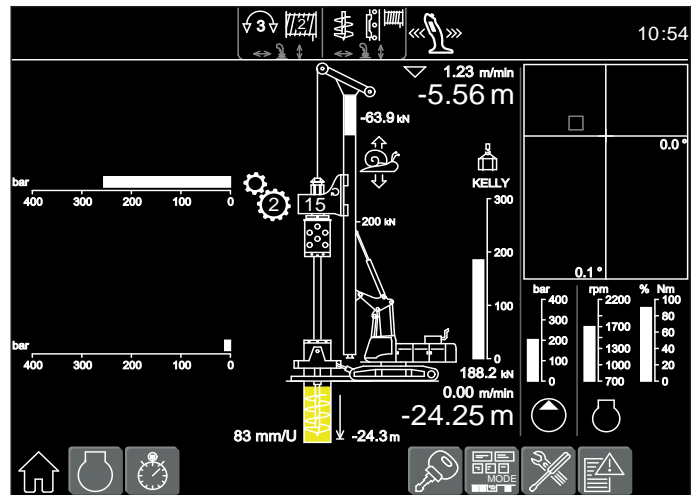
	A	X <sup>1</sup>	Drilling depth	Weight	Kelly Ø
	(mm)	(mm)	(m)	(t)	(mm)
MD 28/3/24	9880	8500	22.5	5.0	419
MD 28/3/27	10880	7500	25.5	5.8	419
MD 28/3/30	11880	6500	28.5	6.4	419
MD 28/3/33	12880	5500	31.5	6.7	419
MD 28/3/36	13880	4500	34.5	7.3	419
MD 28/4/36	11450	6900	34.6	7.7	419
MD 28/4/42	12950	5400	40.6	8.7	419
MD 28/4/48	14450	3900	46.6	9.6	419
MD 28/4/54	15950	2400	52.6	10.6	419
MD 28/4/60 <sup>2</sup>	17450	900	58.6	11.6	419

# Kelly drilling

LB 24-270 with optional equipment and automatic casing driver



LB 24-270 with optional equipment and automatic casing driver



Display for Kelly drilling

## Technical data

Rotary drive - torque	0 – 270 kNm
Rotary drive - speed	0 – 46 rpm

## Performance data

Max. drilling diameter*	1900 mm uncased
Max. drilling diameter*	1500 mm cased

\*) Other drilling diameters on request. Other Kelly bars available on request.

1) When using a casing oscillator, value X has to be reduced by 1500 mm. When using a Kelly bar guide, value X has to be reduced by 550 mm.

2) Installation only possible using auxiliary equipment.

## Kelly bars

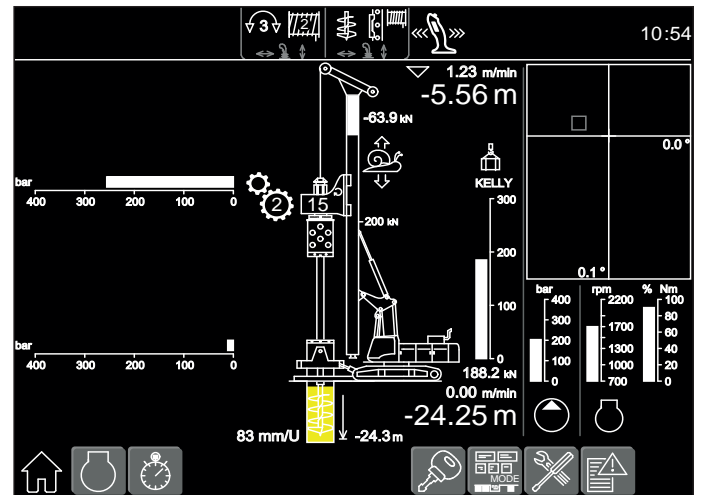
	A	X <sup>1</sup>	Drilling depth	Weight	Kelly Ø
	(mm)	(mm)	(m)	(t)	(mm)
MD 28/3/24	9880	9700	22.5	5.0	419
MD 28/3/27	10880	8700	25.5	5.8	419
MD 28/3/30	11880	7700	28.5	6.4	419
MD 28/3/33	12880	6700	31.5	6.7	419
MD 28/3/36	13880	5700	34.5	7.3	419
MD 28/4/36	11450	8200	34.6	7.7	419
MD 28/4/42	12950	6700	40.6	8.7	419
MD 28/4/48	14450	5200	46.6	9.6	419
MD 28/4/54	15950	3700	52.6	10.6	419
MD 28/4/60	17450	2200	58.6	11.6	419
MD 28/4/66 <sup>2</sup>	18950	600	64.6	12.6	419

# Kelly drilling

LB 24-270 with optional equipment and short leader lower part



LB 24-270 with optional equipment and short leader lower part



Display for Kelly drilling

## Technical data

Rotary drive - torque	0 – 270 kNm
Rotary drive - speed	0 – 46 rpm

## Performance data

Max. drilling diameter*	2800 mm uncased
Max. drilling diameter*	1500 mm cased

\*) Other drilling diameters on request. Other Kelly bars available on request.

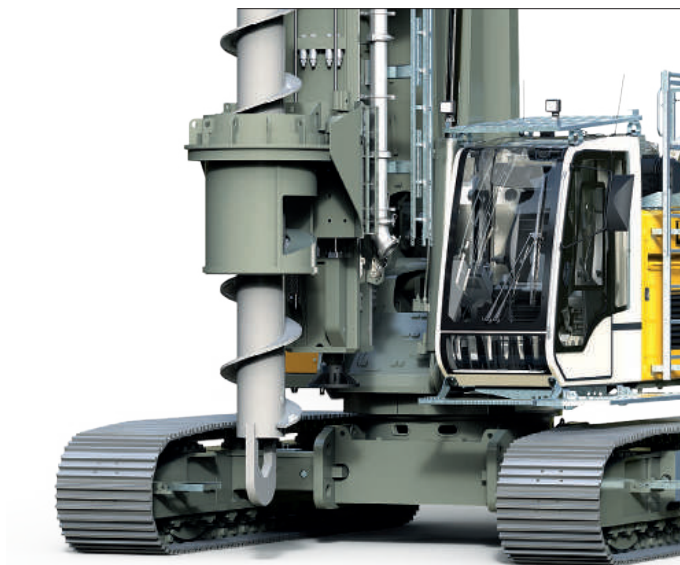
1) When using a casing oscillator, value X has to be reduced by 1500 mm.  
When using a Kelly bar guide, value X has to be reduced by 550 mm.

2) Installation only possible using auxiliary equipment.

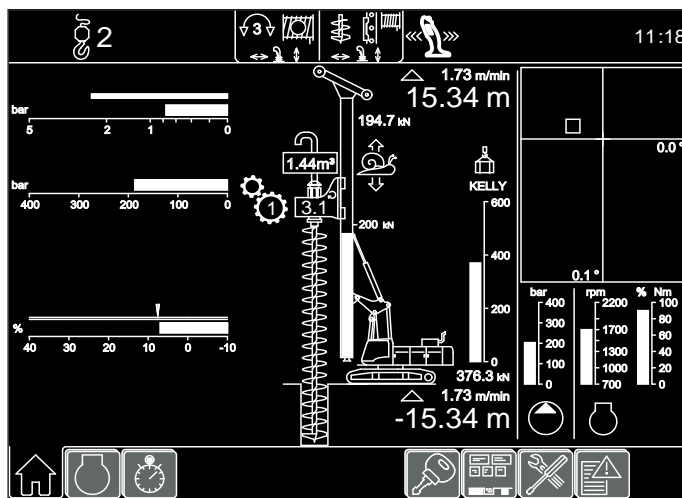
## Kelly bars

	A	X <sup>1</sup>	Drilling depth	Weight	Kelly Ø
	(mm)	(mm)	(m)	(t)	(mm)
MD 28/3/24	9880	9700	20.9	5.0	419
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MD 28/3/30	11880	7700	26.9	6.4	419
MD 28/3/33	12880	6700	29.9	6.7	419
MD 28/3/36	13880	5700	32.9	7.3	419
MD 28/4/36	11450	8200	33.0	7.7	419
MD 28/4/42	12950	6700	39.0	8.7	419
MD 28/4/48	14450	5200	45.0	9.6	419
MD 28/4/54	15950	3700	51.0	10.6	419
MD 28/4/60	17450	2200	57.0	11.6	419
MD 28/4/66 <sup>2</sup>	18950	600	63.0	12.6	419

# Continuous flight auger drilling



Auger with auger cleaner



Display for continuous flight auger drilling

## Technical data

Rotary drive - torque	0 – 270 kNm
Rotary drive - speed	0 – 46 rpm

## Performance data

Drilling depth without Kelly extension, with auger cleaner	14.6 / 15.9*
Drilling depth with 6 m Kelly extension, with auger cleaner	20.6 / 21.9*
Drilling depth with 8 m Kelly extension, with auger cleaner	22.6 / 23.9*
Max. pull force (crowd winch and Kelly winch)	720 kN
Max. drilling diameter**	1000 mm

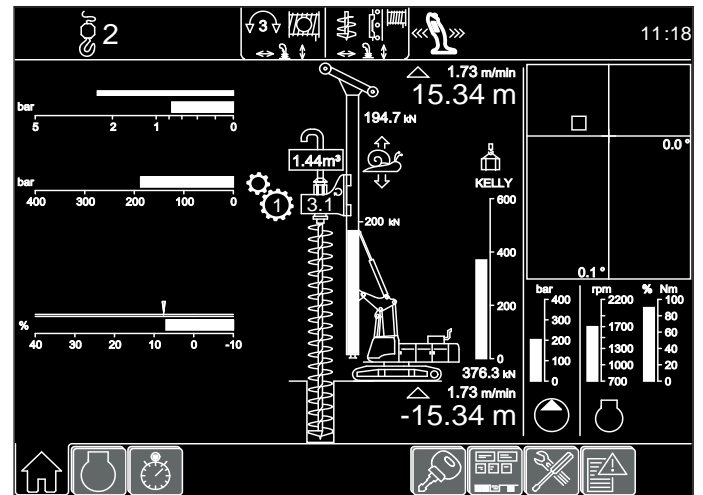
\*) With optional equipment

\*\*) Other drilling diameters available on request

# Full displacement drilling



Full displacement tool with auger guide



Display for full displacement drilling

## Technical data

Rotary drive - torque	0 – 270 kNm
Rotary drive - speed	0 – 30 rpm

## Performance data

Drilling depth	15.2 / 16.5* m
Drilling depth with 6 m Kelly extension	21.2 / 22.5* m
Drilling depth with 8 m Kelly extension	23.2 / 24.5* m
Max. pull force	720 kN
Max. drilling diameter**	600 mm

\*) With optional equipment

\*\*) Other drilling diameters available on request

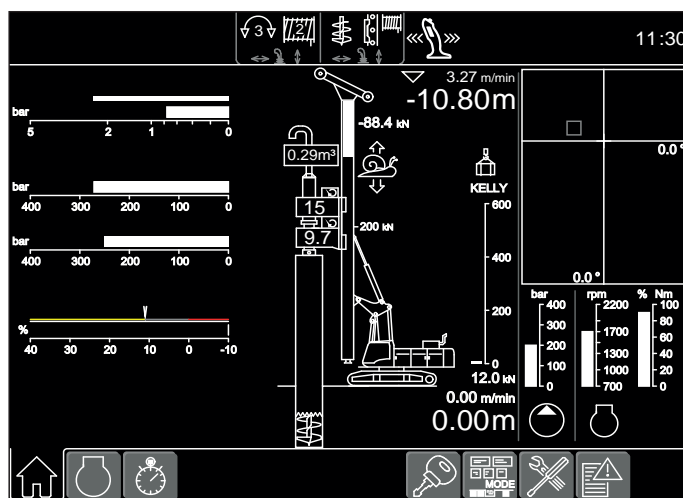


# Double rotary drilling

Model DBA 80 / DBA 160



DBA 160 with protective hose



Display for double rotary drilling

## Technical data DBA 80

Drilling drive I – torque	1 <sup>st</sup> gear	83 kNm
Drilling drive I – speed	1 <sup>st</sup> gear	16 rpm
Drilling drive I – torque	2 <sup>nd</sup> gear	41 kNm
Drilling drive I – speed	2 <sup>nd</sup> gear	32 rpm
Drilling drive II – torque	1 <sup>st</sup> gear	62 kNm
Drilling drive II – speed	1 <sup>st</sup> gear	21.5 rpm
Drilling drive II – torque	2 <sup>nd</sup> gear	31 kNm
Drilling drive II – speed	2 <sup>nd</sup> gear	43 rpm

## Performance data DBA 80

Max. drilling depth without protective hose	15.2 / 16.5* m
Max. pull force	320 kN
Max. drilling diameter**	620 mm

## Technical data DBA 160

Drilling drive I – torque	0 – 160 kNm
Drilling drive I – speed	0 – 16 rpm
Drilling drive II – torque	0 – 105 kNm
Drilling drive II – speed	0 – 28 rpm

## Performance data DBA 160

Max. drilling depth***	15.2 / 16.5* m
Max. pull force	520 kN
Max. drilling diameter**	750 mm

\*) With optional equipment

\*\*) Other drilling diameters available on request

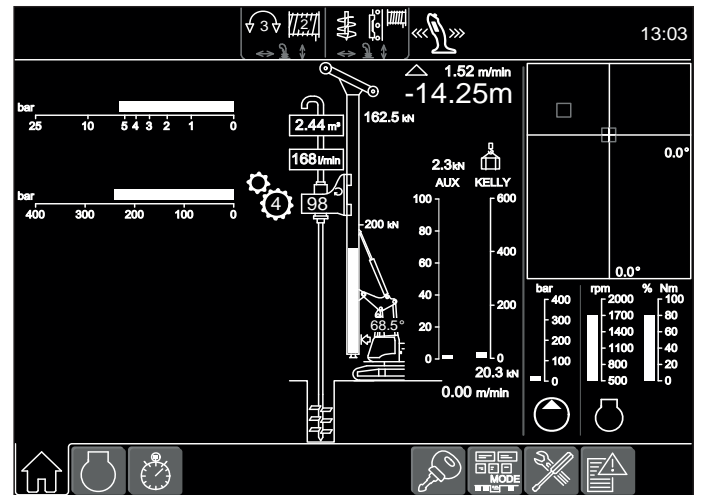
\*\*\*) When using a protective hose, the maximum drilling depth has to be reduced by 500 mm. When using the pulling device, the max. drilling depth decreases by 1000 mm.

# Soil mixing

Model MAT 100



Soil mixing



Display for soil mixing

## Technical data

Mixing drive - torque	0 – 95 kNm
Mixing drive - speed	0 – 100 rpm

## Performance data

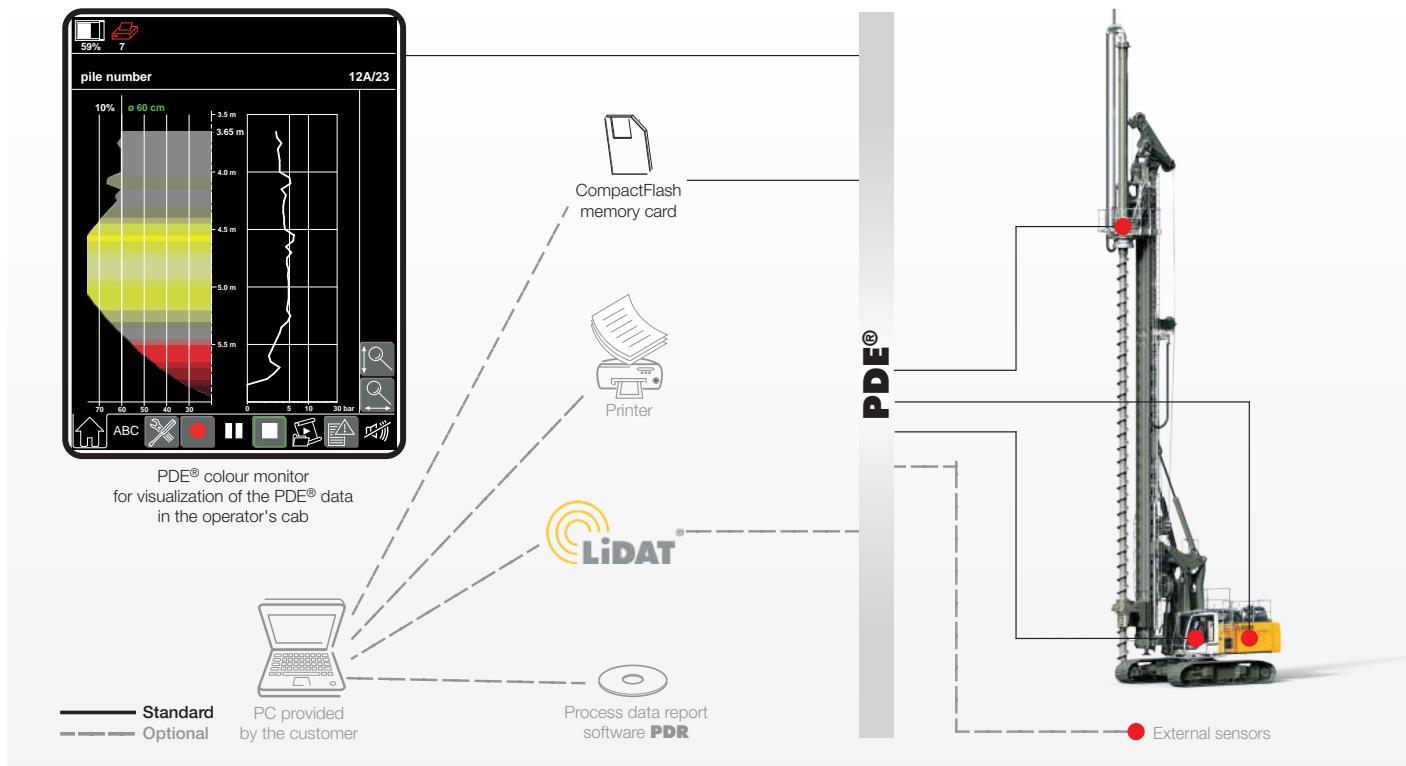
Max. mixing depth	15.2 / 16.5* m
Max. mixing diameter**	1500 mm

\*) With optional equipment

\*\*) Other mixing diameters on request

# 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.

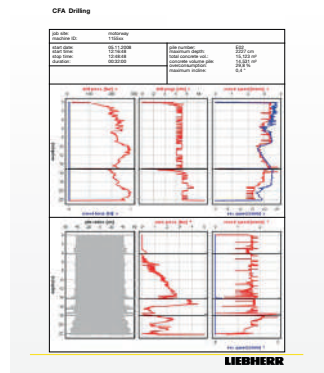
## Process data reporting - PDR (additional equipment)

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

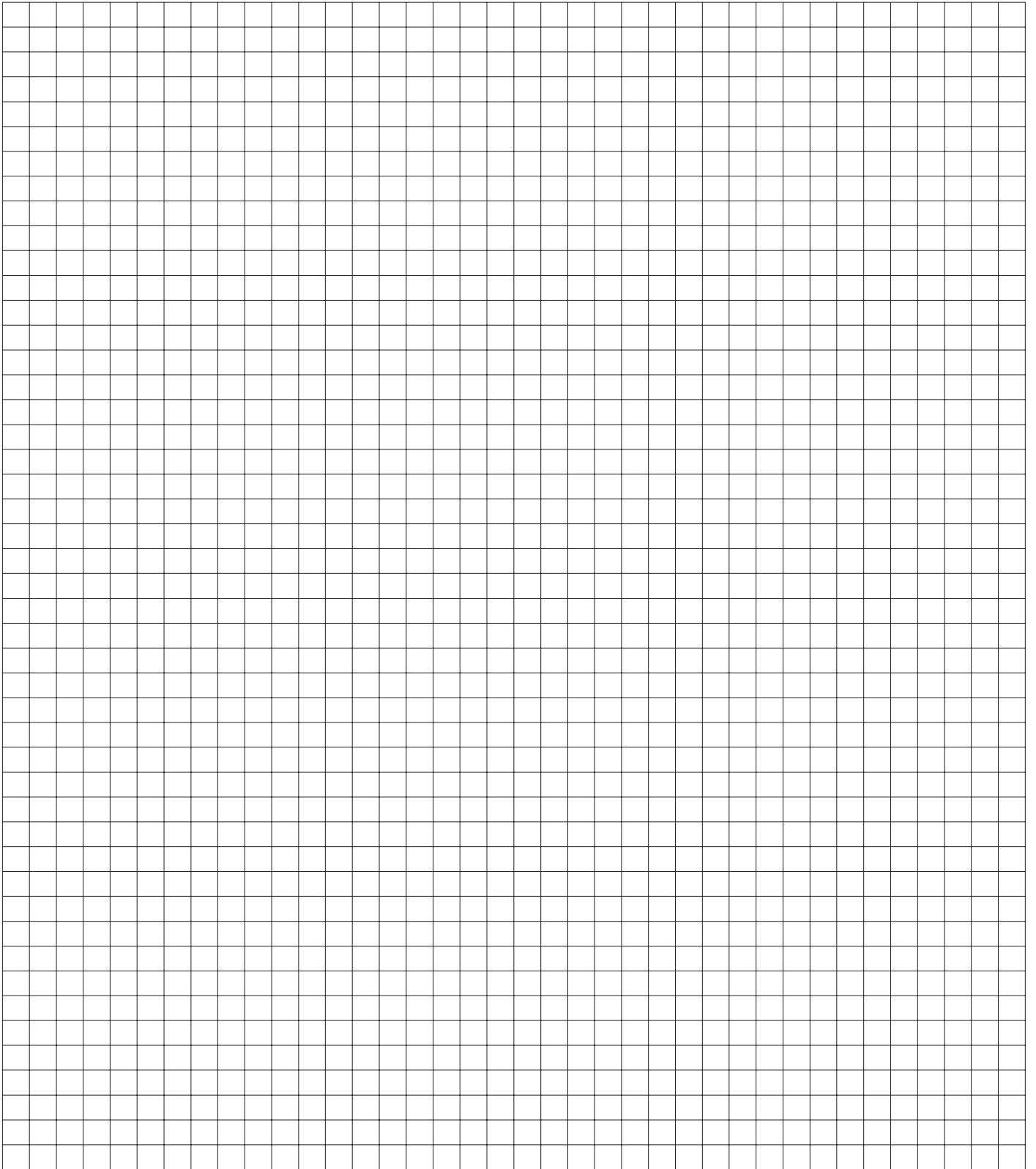
**Recordings management** - The recordings generated by the PDE® system can be imported and managed in PDR. The data can be imported directly from the CompactFlash card or via the Liebherr telematics system LiDAT. Certain recordings, e.g. for a particular day or jobsite, can be found using filter functions.

**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.



# Notes



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