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# LM™ 90 UNDERGROUND CORING DRILL

Technical Overview

## LM<sup>TM</sup>90 UNDERGROUND CORING DRILL

The LM<sup>TM</sup>90 is the largest of Boart Longyear's underground diamond coring rigs and is suited for drilling deep holes.

Equipped with a 130kN feed frame, this drill provides high pullback force as well as a relatively quick rod-handling rate. The feed cylinder is reversible for increased up-hole drilling capacity.

The rig is modular in design with a number of options which make it easier to tailor to specific needs and to upgrade when requirements change. With the assistance of a positioner and a turntable the drill is capable of drilling holes in all angles from vertically up to vertically down. The drill uses an electric motor to power the hydraulics on the machine. The drill can be paired with an optional rod handler which reduces operator fatigue and can improve safety and productivity



**1 REVERSIBLE FEED CYLINDER**

The feed cylinder is reversible which increases up-hole drilling capacity

**2 SEMI-AUTOMATED ROD HANDLING (OPTIONAL)**

Semi-automated rod handler (optional) makes handling of rods safer and easier

**3 HIGH TORQUE BREAKOUT**

Automated high torque break out device breaks most rod joints automatically

**4 FAIL SAFE ROD CLAMP**

Hydraulic open and spring close rod clamp results in fail safe operation

**LOAD SENSING HYDRAULICS**

Load sensing hydraulics maximize efficiency and reduce heat

**PROPORTIONAL CONTROLS**

Proportional controls and lock levers provide optimum control of rpm and feed

**DIRECT COUPLED FEED FRAME**

Direct coupled feed frame results in lower maintenance and smoother feed transmission

# LM™90 TECHNICAL INFORMATION

Drill Depth Guidelines						
	Hole Depth			Hole Depth		
Drill Rod/Core Barrel	Metric			U.S.		
	Up	Horizontal	Down	Up	Horizontal	Down
ARQTK*	820	1500	1500	2700	4920	4920
BQ	430	1500	1350	1430	4920	4440
NQ	260	1190	990	870	3900	3260
HQ	130	610	610	430	2000	2010
Note	Depth capacity includes allowance for force required to break core using 10 MPa rock strength					
**	ARQ™TK capacity shown for comparison purposes only. It is not recommended drilling practice to drill over 1500 m ARQ™TK depth					

Drill Depth Guidelines with Cylinder Reversed		
	Hole Depth	Hole Depth
Drill Rod/Core Barrel	Metric	U.S.
	Up	Up
AQTK™	1500	4920
BQ™	930	3060
NQ™	620	2050
HQ™	360	1200
Note	Depth capacity includes allowance for force required to break core using 10 MPa rock strength	

Drill Specification:		
Feed Frame (1300 Series)	Metric	U.S.
Feed Stroke	1830 mm	72 in
Max. rated pushing force	63.56 kN @ 28 MPa	14289 lbf @ 4061 psi
Max. rated pulling force	127.69 kN @ 28 MPa	28706 lbf @ 4061 psi
Rated carriage speed	0.70 m/s per complete cycle	3 ft/s per complete cycle
Normal rod handling speed	Approximately 15 n/min.*	Approximately 50 ft/minute*
Note	The feed frame is reversible	
**	Actual rod handling speed may vary with working conditions	

<b>Chuck and Rod Holder</b>		
	<b>HQ™ Chuck</b>	<b>PQ™ Rod Holder</b>
Maximum opening	97.0 mm (3.82 in) Diameter corresponding to the ID of the HQ™ guide bush	125 mm (4.875 in) Diameter corresponding to the ID of the PQ™ guide bush
Type	Closed hydraulically Opened mechanically Automatic synchronization with rod holder	Closed mechanically Opened hydraulically Automatic synchronization with chuck Manual overdrive
Jaws	3 (same as used with chuck)	3 (same as used with chuck)
Max. rated axial holding capacity	85.0 kN* (19110 lbf*)	130 kN* (33750 lbf*)
Max. rated static torsional holding capacity	Forward and reverse rotation 3900 N-m (2870 lbf*)	Forward and reverse rotation 5800 N-m (4255 lbf*)
"**"	At 7 MPa (1015 psi) with new jaws and rods	
<b>HQ™ Drill Head, HI torque</b>		
<b>Forward Rotation</b>		
Chuck Speed	1330 RPM, continuously variable. Speeds will vary with oil type and temperature and are approximate	
Chuck torque output	371 N-m @ 1250 RPM	272 lb-ft @ 1250 RPM
	1030 N-m @ 500 RPM	757 lb-ft @ 500 RPM
<b>Reverse Rotation</b>		
Chuck Speed	100 RPM, fixed to help prevent rod thread damage	
Chuck Torque output	3770 Nm with break-out device @ 28.5 MPa	2780 lb-ft with break-out device @ 28.5 MPa

# LM™90 TECHNICAL INFORMATION

Hydrostatic Pumps		
Main Pump	Metric	U.S.
Type	Variable displacement, axial piston w/pressure compensated load sensing control	
Manufacturer	Rexroth (Hydromatik Gmbh)	
Operating conditions as used on LM90™ drill: Maximum pressure	31 MPa, forward rotation, reverse rotation, rod handling	4500 PSI, forward rotation, reverse rotation, rod handling
Recirculation pump	Oil cooling and charge pump	
Type	Gear, fixed displacement	
Manufacturer	Rexroth (Hydromatik Gmbh)	
Maximum pressure operating conditions as used on LM90™ drill	1-1.5 Bar	14.5-21.8 psi
Normal speed	1490 RPM @ 50 Hz 1790 RPM @ 60 Hz	
Hydraulic tank volume	60 L	15.8 Gal

Wireline Hoist (optional)		
	Metric	U.S.
Type	All hydraulic, with proportional spooling control power up, power down, hydraulically locked in neutral free wheel override, chain driven spooling device	
Line Pull		
Bare Drum	11.77 kN	2649 lb
Full Drum	4.51 kN	1015 lb
Line Speed		
Bare Drum	0 - 100 m/min	328 ft/min
Full Drum	0 - 254 m/min	833 ft/min
Drum Capacity		
5 mm	1400 m	4600 ft
6 mm	1000 m	3280 ft
1/4"	895 m	2930 ft

# DIMENSIONS AND WEIGHTS

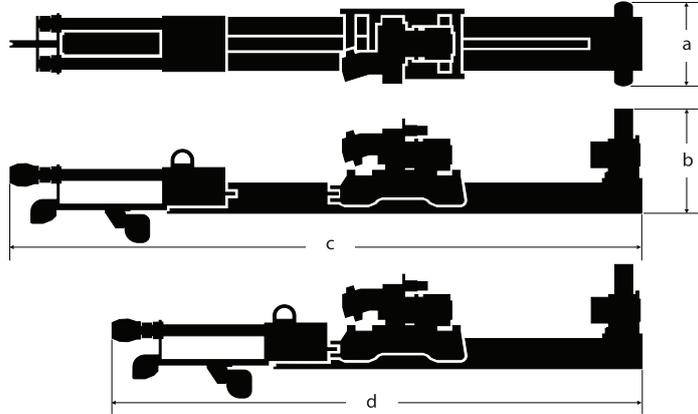
## Feed Frame (1300 Series)

Feed Frame  
Weight: 1520 kg (3344 lbs)

Rotation Unit w/chuck  
Weight: 235 kg (517 lbs)

PQ™ Rod Clamp Assembly  
Weight: 170 kg (374 lbs)

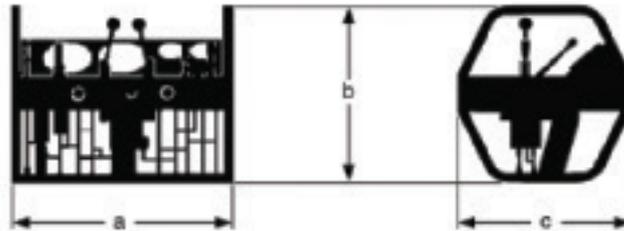
a = 698 mm (27.50 in)  
b = 851 mm (33.50 in)  
c = 4894 mm (193 in)  
Working length  
6410 mm (252.50 in)  
Working length fully extended  
d = 4108 mm (162.75 in)



## Control Panel

Weight: 46 kg (101 lbs) w/o hoses  
Add 42 kg (92 lbs) for hoses

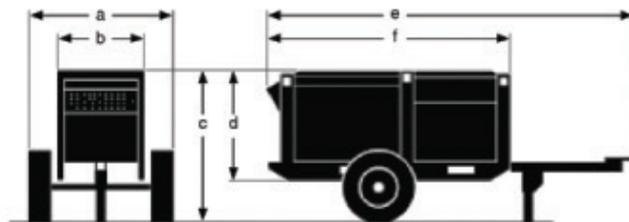
a = 575 mm (23 in)  
b = 521 mm (20.50 in)  
c = 480 mm (19 in)



## Power Pack

Weight: 1520 kg (3344 lbs)  
Includes electric motor and starter,  
but without towing group

a = 1318 mm (52 in)  
b = 730 mm (29 in)  
c = 1526 mm (60 in)  
d = 1033 mm (41 in)  
e = 3893 mm (153.25 in)  
f = 2230 mm (87.75 in)





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## MINING AND EXPLORATION DRILLING PRODUCTS



Coring Bits



Coring Rods



Surface Coring Rigs