BOART LONGYEAR®

LM®PQ

UNDERGROUND CORING DRILL RIG

Technical Overview

TRUSTED AT EVERY TURN™

LM®PQ UNDERGROUND CORING DRILL

The LMPQ builds on the proven LM110 drill, with the addition of a 4-speed PQ Head fitted with a Nitro-Chuck®. This allows PQ tooling to pass through both the Chuck and Rod Holder.

As with all LM drills, the rig can be configured with a Pilot Hydraulics Control Panel or a DCi Control System. The DCi system has the added benefits of monitored drilling capability and the ability to complete a drill run while unattended during a break or shift change. This has been found to increase drill productivity by up to 14%. With DCi, a configurable perimeter laser system is used to halt the motion of moving parts when a beam is interrupted.

The LMPQ can be fitted with a rod handler to aid in lifting rods and tooling to and from the drill string. This drastically reduces the drillers' exposure to repetitive strain injuries associated with lifting and twisting. It also helps keep the operators away from the rod string when adding and removing rods.

If pilot hydraulic controls are used for the drill, a separate rod handler control panel will be needed. If the DCi System is used, the DCi Control Panel incorporates the Rod Handler controls, making the rig move quicker with fewer components.

1 PROPORTIONAL CONTROLS

Proportional controls are used for all rig functions, including the Rod Handler (optional). Load Sensing hydraulics are used to increase efficiency and reduce heat generation.

2 DIRECT COUPLED FEED FRAME

A direct coupled Feed Frame/Cylinder results in lower maintenance and smoother feed.

3 FALE SAFE ROD HOLDER

The Rod Holder is hydraulically opened, and spring closed, resulting in failsafe operation in use and when power is lost.

4 SEMI-AUTOMATED ROD HANDLING (OPTIONAL)

The optional Rod Handler makes handling of rods safer which greatly reduces risk of injuries.

For more information on the LMPQ, scan with a QR code reader on your smart phone.

Drill Depth Guidelines						
	Hole Depth			Hole Depth		
Drill Rod	**Metric (Meters)**			**U.S. (Feet)**		
	Up	Horizontal	Down	Up	Horizontal	Down
BRQ	402	2541	2276	1319	8337	7468
NRQ	251	1197	1686	824	3927	5531
NRW W-WALL	274	1306	1922	898	4283	6304
HRQ	121	874	1074	396	2868	3522
HRQ W-WALL	138	998	1341	452	3274	4398
PHD	33	445	624	108	1459	2047
PHD W-WALL	40	541	883	131	1775	2896

Drill Specification:		
Feed Frame	**Metric**	**U.S.**
Feed Stroke	1800 mm	70.87 in
Maximum rated push (Drilling)	47.67 kN @ 210 bar	10717 lbf @ 3045 psi
Maximum rated push (Handling)	63.56 kN @ 280 bar	14289 lbf @ 4061 psi
Maximum rated pull force (Handling/Drilling)	127.69 kN @ 280 bar	28706 lbf @ 4061 psi
Rated carriage speed	0.70 m/s per complete cycle	2.3 ft/s per complete cycle
Normal rod handling speed	Approximately 15 m/min.*	Approximately 50 ft/minute*
Actual Rod Handling speed may vary with working conditions and will decrease when the feed pressure approaches the Fast Feed Load Sense Relief settings.		
Chuck and Rod Holder	**PQ Chuck**	**PQ Rod Holder**
Maximum opening	127.6 mm (5.06 in)	124.7 mm (4.9 in)
Type	Hydraulically opened and closed with nitrogen assist close.	Spring closed, opened hydraulically. Automatic synchronization with chuck including manual override.
Jaws	7	3
Max. rated axial holding capacity	222.4 kN* (50000 lbf*)	130 kN* (29225 lbf*)

*The theoretical values in this table and have been calculated for a fluid filled hole and an effective rock tensile strength of 5 MPa. Actual drilling results may vary and will be affected by in-hole tool selection, fluid level in the hole, subsurface conditions, hole deviation, drilling techniques, additives and equipment used.

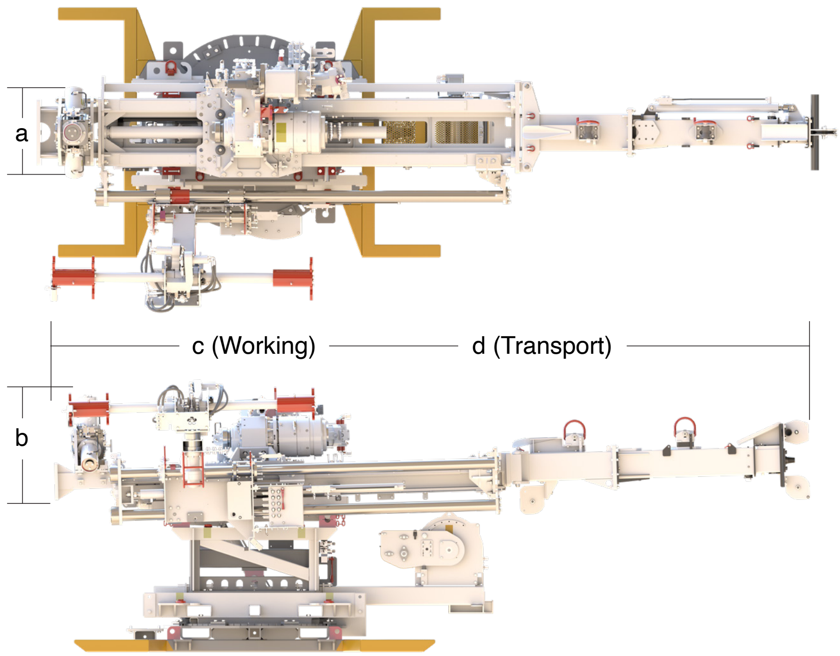
**Up hole calculated hole depths shown for comparative purposes, the standard LMPQ positioner maximum tilt up angle is 37 degrees.
***These depths are not intended to be interpreted as machine safety limits/ratings. More favorable hole conditions may allow drilling beyond these values.

PQ Drill Head		
Forward Rotation		
Rotation Motor	Bosch Rexroth variable displacement of 65 to 107cc/rev.	
Mechanical Transmission Ratios		
1st	6.27:1	
2nd	3.12:1	
3rd	1.75:1	
4th	1:1	
Rpm and Torque ratings	Speed (rpm)	Torque Nm (lbft)
1st	119 - 196	5 322 - 3 254 (3,925 - 2,400)
2nd	240 - 395	2 648 - 1 620 (1,963 - 1,195)
3rd	427 - 703	1 486 - 908 (1,096 - 670)
4th	747 -1230	849 - 519 (626 - 383)
Drill Head lubrication	Independent constant flow with force fed bearings and oil bath for gears.	
Drill Head filtration	149 micron pressure filter with two suction strainers.	

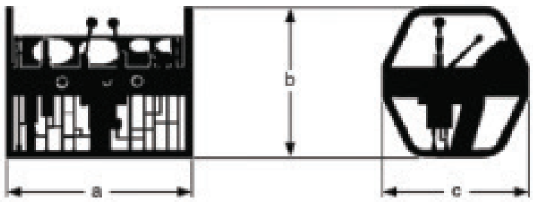
Drill Specification		
Power Pack	**Metric**	**U.S.**
LM110	110kW	147.5hp
Main Pump	**Metric**	**U.S.**
Type	190cc/rev variable displacement, axial piston with pressure compensated load sensing control.	
Maximum Main Pump system pressure	310 bar	4500 psi
Recirculation pump	Used for oil cooling and main pump suction charge pressure.	
Type	Gear, fixed displacement	
Electric Motor operating speed	1480 RPM @ 50 Hz 1760 RPM@ 60 Hz	
Hydraulic tank volume	60 L	15.8 Gal

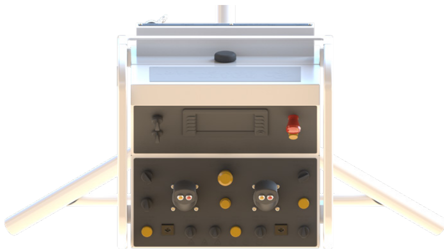
Wireline Hoist (optional)				
	Metric		U.S.	
Type	All hydraulic with proportional speed control, mechanical freewheel or electric on/off freewheel (DCi).			
Line Pull	6 mm	5 mm	6 mm	5 mm
Bare Drum	11.77 kN	9.2 kN	2649 lbf	2068 lbf
Full Drum	3.9 kN	3.1 kN	877 lbf	697 lbf
Line Speed				
Bare Drum	0 - 80 m/min		0 - 262 ft/min	
Full Drum	0 - 240 m/min		0 - 787 ft/min	
Drum Capacity				
5 mm	1500 m		4920 ft	
6 mm	1000 m		3280 ft	
1/4"	895 m		2930 ft	

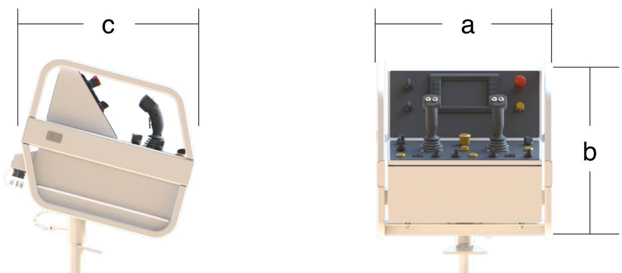
Feed Frame (1300 Series)
Positioner
Weight: 1605kg (3538 lbs)
Feed Frame
Weight: 1050 kg (2315 lbs)
Rotation Unit with Chuck
Weight: 700 kg (1543 lbs)
PQ Rod Holder Assembly
Weight: 351 kg (774 lbs)
a = 1900 mm (74.8 in) Positioner
a = 698 mm (27.50 in)
b = 851 mm (33.50 in)
c = 6760 mm (266.14 in) *Working length extended*
d = 4200 mm +mm (165.35 in) Transport length with cover folded (not including Rod Handler)

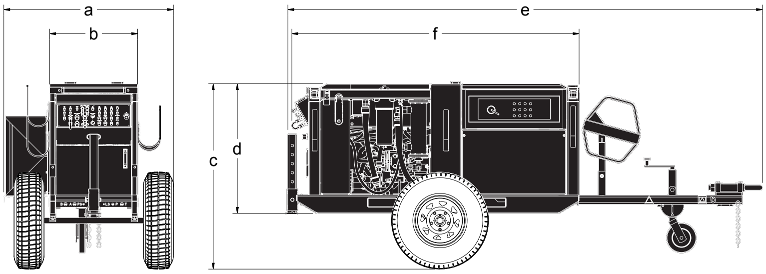


Control Panel
Pilot Control Panel
Weight: 46 kg (101 lbs) w/o hoses
Add 42 kg (92 lbs) for hoses
a = 575 mm (23 in)
b = 521 mm (20.50 in)
c = 480 mm (19 in)
DCi Control Panel
Weight: 52 kg (101 lbs)
a = 690 mm (27.17 in)
b = 500 mm (19.7 in)
c = 621 mm (24.45 in)







Power Pack	
Weight: 2150kg (4740 lbs) *Includes electric motor and starter, but without towing group*	
a = 1314 mm (51.73 in)	
b = 730 mm (29 in)	
c = 1540 mm (60.6 in)	
d = 1075 mm (42.3 in)	
e = 4125 mm (162.4 in)	
f = 3050 mm (120 in)	

Global Headquarters
Boart Longyear
2455 South 3600 West
Salt Lake City, UT 84119
United States of America
info@boartlongyear.com

Tel: +1 801 972 6430
Fax: +1 801 977 3374

Canada
Boart Longyear
2442 South Sheridan Way
Mississauga, Ontario
Canada L5J 2M7
info@boartlongyear.com

Tel: +1 905 822-7922
Fax: +1 905 822-7232

Africa
Boart Longyear
1067 Katrol Ave
Robertville, Roodepoort 1709
Johannesburg, South Africa
info@boartlongyear.com

Tel: +011 767 9300

Latin America
Boart Longyear
Av. Los Libertadores 16.500 - Sitio 1-A-2
Complejo Industrial Los Libertadores
Colina, Santiago-Chile
info@boartlongyear.com

Tel: +56 2 595 3300

Asia Pacific
Boart Longyear
26 Butler Boulevard
Adelaide, 5950
Australia
info@boartlongyear.com

Tel: +61 8 8375 8375
Fax: +61 8 8375 8497

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www.boartlongyear.com