

DL431 UNDERGROUND DRILL RIG

TECHNICAL SPECIFICATION

DL431 is a fully-mechanized, highly versatile and compact electro-hydraulic top hammer longhole drill designed for underground mass mining in 3.2 x 3.2 m or larger production drifts. It is capable of drilling vertical and inclined fans and single or parallel Ø64...89 mm longholes up to 38 meters in depth, using T38, T45 and T51 MF-rods or Ø65 mm/T45 tube rods.

The DL431 is mounted on a 4-wheel drive frame-steered and diesel-powered carrier. It is equipped with the HL820ST hydraulic rock drill, LFRC700 drilling module, SB120P boom, TAS drilling control system and operator's safety cabin for high drilling capacity and maximum uptime. The 360° drilling module rotation and wide boom swing and tilt angles make the unit suitable for most mining methods and various service support applications. The CANbus based TAS drilling control system with the user-friendly operating interface and various instrumentation and automation levels allow maximum productivity and good drilling accuracy.

The layout of the NC7P carrier is designed for good visibility and stability, ensuring safe tramming in narrow mine drifts. The operating and maintenance interface are designed for easy access, safe operation and all service points are accessible from the ground level.

KEY FEATURES

Hydraulic rock drill	HL820ST (21kW)
Drilling module	LFRC700 (20 + 1 rods)
Rod length	4' - 6' (1 220 - 1 830 mm)
Boom	SB120P
Minimum drift size (H x W)	3.2 m to 3.8 m
Minimum drift width in T-section	3 700 mm
Boom coverage (vertical holes)	5 000 mm
Transport height (with cabin)	2 870 mm
Transport width	2 240 mm
Transport length	11 400 mm
Transport weight	22 100 kg

ROCK TOOLS AND HOLE LENGTH

Type	Rod Ø (mm)	Hole Ø (mm)	Maximum hole length (m)*		
			4' rods	5' rods	6' rods
T35	39	54			
T38	39	64			
T45	46	76	25.3	31.7	38.1
T45	65 (tube)	76			
T51	52	89			

**) Feed in contact with rock and front stinger retracted*



HYDRAULIC ROCK DRILL

Type of rock drill	HL820ST (TS2-214)
Percussion power	21 kW
Percussion pressure	Up to 200 bar
Percussion rate	42 - 52 Hz
Stabilizer	Sleeve type
Rotation speed	0 - 180 rpm (OMT250)
Rotation torque	1 335 Nm (OMT250)
Weight	260 - 305 kg
Length with shank adapter	1 241 mm

DRILLING MODULE

Type of drilling module	LFRC700 (TS2-341)
Rod length	1 220 - 1 830 mm (4' - 6')
Storing capacity	20 + 1 rods (all threads)
Retaining centralizer	Pito 7
Cuttings diverter	CC705
Set-off from stope face	800 mm (minimum)
Feed force	31 kN
Feed and return speed	0.3 m/s (fast feed)

DRILLING MODULE DIMENSIONS

Type	LFRC706 (standard)	LFRC705 (option)	LFRC704 (option)
Rod length	6' (1 830 mm)	5' (1 525 mm)	4' (1 220 mm)
Total length	3 550 mm	3 240 mm	2 940 mm

LONGHOLE BOOM

Telescopic boom	SB120P (TS2-317)
Boom swing	Left 45° / Right 45°
Drilling module roll-over	360°
Boom extension	1 200 mm
Drilling module travel	1 500 mm
Boom coverage (vertical holes)	5000 mm
Drilling coverage with stingers	Ø6 730 mm (6' rods)
Reach up with front stinger	9 300 mm (6' rods)
Front stinger	Mounted on the feed
Front stinger extension	1 700 mm (4') 2 000 mm (5' - 6')
Rear stinger	Mounted on feed cradle
Rear stinger extension	1 500 mm

HYDRAULIC SYSTEM

Type of hydraulic system	TPC LH
Operating principle	Electric pilot control
Powerpack	HPP1590 (90 kW)
Total installed power	119 kW
Filtration size (pressure / return)	20 µ / 10 µ
Oil tank volume	270 liters
Cooler for hydraulic oil	OW45 oil-to-water (45 kW)
Low oil level indication	Low level oil switch

DRILLING CONTROL SYSTEM

Type of control system	TAS
Operating principle	CANbus
Control panel	In safety cabin or canopy
Adjustable parameters	Full percussion Collaring Rotation / Threading Feed / Anti-jamming Flushing
Rotation pressure controlled feed	With one-hole automation
Diagnostics system	Interactive

ELECTRIC SYSTEM

Standard voltages	380 - 690 V (50 or 60 Hz)
Main switchgear	MSE 10
IP-classification	Specification TS2-132
Allowed voltage fluctuation	± 10%
Starting method	Star-Delta (380 - 690 V) Soft starter (575 V)
Automatic cable reel	TCR3E
Cable reel remote control	At operator station and cable reel
Front and rear lights (combined working and driving)	10 x 50 W LED
Carrier positioning lights	2 x Laser type
Rear parking / brake lights	2 x Red LED (24V)
Stair and service lights	LED (24V)
Sealed AGM batteries	2 x 12 V (100 Ah)

AIR AND WATER SYSTEM

Flushing of holes	By water
Water booster pump type	WBP3
Water pump capacity	215 l/min
Water pump inlet pressure	2 - 7 bar
Flushing water pressure	10 - 20 bar
Shank lubrication device	SLU1 (air / oil mist)
Air compressor	CTN10 (1.0 m³/min at 7 bar)
Rock drill air consumption	200 - 300 l/min
Rock drill oil consumption	200 - 500 g/h
Air cleaner for external air supply	IP5

OPERATOR'S SAFETY CABIN

Cabin certification	FOPS / ROPS (ISO 3449 / 3471)
Type of cabin	Standard height
Cabin height	2 870 mm
Cabin inside height	1 750 mm
Sound pressure level EN791	Cabin < 80 dB(A) Emitted 127 dB(A)
Operator's seat	Ergonomic T-back seat
Air conditioning system	For drilling and tramming
Cabin safety grill	For front screen
Audio system	CD/MP3-player, radio and loudspeakers and 12 V outlet
Cabin boot washer	At cabin entrance

CARRIER

Type of carrier	NC7P (frame-steered)
Carrier articulation	± 34°
Rear axle oscillation	± 10°
Ground clearance	320 mm
Diesel engine	M-B OM904LA (110 kW, Tier 3)
Exhaust catalyzer	Standard
Transmission	Hydrodynamic, Spicer T20 000
Axles	Spicer
Tires	12.00 - 20/20 RL
Service brakes	Hydraulically applied wet disc brakes
Parking / emergency brakes	SAHR type, fail safe wet disc brakes
Tramming speed	Horizontal (0%): 15 km/h 14% = 1:7 = 8°: 6.5 km/h
Gradeability / sideways tilt	Max. 15° / 5°
Carrier stabilization	2 x TJ40 telescopic jacks (front) 2 x TJ60 jacks (rear)
Fuel tank	140 liters
Hand throttle	Standard
Filling pump for hydraulic oil	Electric
Hand held fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Carrier centralized greasing points	Specification TS2-463
Tramming alarm	Standard
Tramming camera	Front, rear and side
Colour scheme	standard
Documentation	2 x Operator's manual 2 x Maintenance manual 2 x Technical manual (in English only) 2 x Parts manual (in English only) 1 x Toolman USB key

OPTIONAL ITEMS

Drilling system *HL710S rock drill Spare remote control panel Power extractor Rear stinger extension kit Conversion kit	With 55 kW or 90 kW powerpack For offboard use For HL710S or HL820ST Extension 1 000 mm From one rod/tube size to another
Hydraulic system *Oil-to-air cooler for hydraulic oil Vacuum pump	2 x OA30 (30 kW) in place of the water hose reel For hydraulic oil
Instrumentation Access detector or protector Drilling instrument Spirit level angle indicators	Mandatory in Europe (TS2-211) TMS DDS (TS2-187) 2 pcs (on feed)
Automation OptiMine® One-hole automation (incl. TMS) Teleremote drilling Mobile Teleremote drilling Data transfer	With configuration readiness Specification TS2-198 WLAN/USB, Incl. data transfer WLAN/USB, Incl. data transfer USB/WLAN (excluding drill plan software)
Cleaning system Low pressure system with reel High pressure system with reel	Up to 15 bar (TS2-343) Up to 220 bar (TS2-343)
Greasing systems Automatic system Manual system	Lincoln (carrier, boom and rod handler) Specification TS2-463

OPTIONAL ITEMS

Electric system	1 000 V (50 or 60 Hz) and DOL starter
*Voltage option	Site voltage 380 - 690 V (8 kW) excluding USA/CAN
Dewatering pumpoutlet readiness	Specification TS2-121
Electric cables	VYK
Ground fault and overcurrent unit	110 V (15 A / 1.6 kW)
Outlet (single-phase) on carrier	230 V (16 A / 2 kW)
Outlet (single-phase) on carrier	Joystick controlled
Remote working lights	LED (24 V)
Amber flashing light	On tripods, video display
Offboard camera and working lights	
Boom movement prevention	Switch and indicators lights
Battery jump start	CAT
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Air and water system	
*Air compressor	CT28 (2.8 m³/min, 18.5 kW) or 2 x CT28 (5.6 m³/min, 37 kW)
Air mist flushing kit	For external air and water supply
Compressed airoutlet	Quick coupling for pneumatic tools
1 x 60 liter air receiver	For end-of-hole flushing (requires CT28)
*Harsh water resistant water circuit	For basic and advanced packages
Water hose reel and hose	THR2.5E and Ø38 mm hose (length 65 m)
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Operator's safety cabin or canopy	
*Stainless steelcabin	FOPS (ISO3449)
*Safety canopy and safety grill	FOPS (ISO3449)
Cabin heating system	For drilling andtrammimg
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Fire suppression system	
Spare hand held fire extinguisher	7.7 or 9 kg (type ABC)
Fire suppression system	Eclipse™ (TS2-461) 6
Manual or automatic system	nozzles, Ansul (TS2-460)
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Carrier	
*Diesel engine	Cummins QSB4.5, 119 kW, Tier4i
Reduced trammingspeed	Cummins B4.5, 129 kW, Stage V
*Foam filled tires	3 rd gear lockout
Fast filling and evacuation system	4 pcs
Wheel chocksand holders	Wiggins (complete)
	2 pcs
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Extra items	
Spare rock drill	HL710S or HL820ST
Spare wheel assembly	Standard or foam filled tires
Special tools for rock drill	Field kit or complete set
Documentation Package:	Extra manuals
Country specific options	USC, AUS and EUR
Package: Harsh water	
Package: Onboard air supply	Basic or advanced (TS2-049)
	Specification TS2-328

*) Replaces standard feature