

DL421 UNDERGROUND DRILL RIG

TECHNICAL SPECIFICATION

DL421 is a fully-mechanized and compact electro-hydraulic top hammer longhole drill designed for underground mass mining in 3.6 x 3.6 m or larger production drifts. It is capable of drilling vertical and inclined fans and single or parallel Ø64...115 mm longholes up to 54 meters in depth, using T38, T45 and T51 MF-rods or Ø65 mm/T45, ST58 and ST68 tube rods. The DL421 is mounted on a 4-wheel drive frame-steered and diesel-powered carrier. It is equipped with the HL1560ST hydraulic rock drill, LFRC1600 drilling module, ZR30 telescopic boom, TAS drilling control system and FOPS / ROPS operator's safety canopy 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 NC7W carrier is designed for a good visibility and stability, ensuring fast and 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	HL1560ST (33kW)
Drilling module	LFRC1600 (29 + 1 rods)
Rod length	4' - 6' (1 220 - 1 830 mm)
Boom	ZR30 (on front stabilizer)
Minimum drift size (H x W)	3 560 - 4 170 mm
Drift width in T-section	4.0 m (minimum)
Pivot point height	1 565 - 2 100 mm
Boom coverage (vertical holes)	3 000 mm
Transport height (with cabin)	3 250 - 3 700 mm
Transport width	2 290 mm
Transport length	11 250 mm
Transport weight	22 000 kg

ROCK TOOLS AND HOLE LENGTH

Rod and holediameter			*Hole length(m)	Rock drill
Thread	Rod Ø(mm)	Hole Ø(mm)		
T38	39	64	37 ...54	HL820ST
T45	46	76		HL820ST
T45	65 (tube)	76 ...89		RD927L, HL820ST
T51	52	89		HL820ST
ST58	76 (tube)	89 ...102		HL1560ST, RD927L
ST68	87 (tube)	102 ...115		HL1560ST

*) Feed in contact with rock, front stinger retracted



HYDRAULIC ROCK DRILL

Type of rock drill	HL1560ST (TS2-319)
Percussion power	33 kW
Percussion pressure	Up to 200 bar
Percussion rate	30 - 40 Hz
Stabilizer	Sleeve type
Rotation speed	0 - 100 rpm (OMT500)
Rotation torque	2 330 Nm (OMT500)
Weight	490 kg
Length with shank adapter	1 505 mm

DRILLING MODULE

Type of drilling module	LFRC1600 (TS2-342)
Rod length	1 220 - 1 830 mm (4' - 6')
Storing capacity	29 + 1 rods (all threads)
Retaining centralizer	Pito 16
Cuttings diverter	CC1016
Set-off from stope face	2 056 mm
Feed force	31 kN
Feed and return speed	0.3 m/s

DRILLING MODULE DIMENSIONS

Type	Rod length	Total length
LFRC1604	1 220 mm	3 360 mm
LFRC1605	1 525 mm	3 665 mm
LFRC1606	1 830 mm	3 970 mm

LONGHOLE BOOM

Telescopic boom	ZR30 (TS2-288)
Boom swing	Left 44° / Right 44°
Boom (fan) tilt	Back 22° / Forward 53°
Drilling module roll-over	360°
Boom extension	565 mm
Drilling module travel	1 000 mm (4' rods)
	1 100 mm (5' rods)
	1 400 mm (6' rods)
Boom coverage (vertical holes)	3 000 mm
Pivot point height (boom vertical)	2 100 - 2 665 mm
Front and rear stinger	Mounted on the drilling module
Rear stinger extension	1 500 mm (4')
	1 700 mm (5' and 6')
Front stinger extension	1 700 mm (4')
	2 000 mm (5' and 6')

HYDRAULIC SYSTEM

Type of hydraulic system	TPCLH
Operating principle	Electric pilot control
Powerpack	HPP1590 (90 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 / Fan automation
Diagnostics system	Interactive

ELECTRIC SYSTEM

Standard voltages	380 - 690 V (50 or 60 Hz)
Total installed power	119 kW
Main switch gear	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	TCR4E
Cable reel remote control	At operator station and cable reel
Front and rear lights (combined working and driving)	10 x 50 W (24 V) 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 (145 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 oil consumption	200 - 500 g/h
Rock drill air consumption	300 - 400 l/min
Air cleaner for external air supply	IP5

OPERATOR'S SAFETY CABIN

Cabin certification	FOPS / ROPS (ISO 3449 / 3471)
Type of cabin	Standard height
Unit height in tramming	3 050 mm
Cabin inside height	2 000 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	Standard
Audio system	CD / MP3-player, radio and loudspeakers
Cabin boot washer	At cabin entrance

CARRIER

Type of carrier	NC7W (frame-steered)
Carrier articulation	± 40°
Rear axle oscillation	± 8°
Ground clearance	420 mm
Diesel engine	MB OM904LA (110kW, Tier 3)
Exhaust catalyzer	Standard
Transmission	Hydrodynamic, Spicer T20 000
Axles	Spicer
Tires	14.00 - 24
Service brakes	SAHR type, fail safe wet disc brakes
Parking / emergency brakes	SAHR type, fail safe wet disc brakes
Tramming speed	Horizontal (0%): 15 km/h 8°=1:7=14%: 5 km/h
Gradeability / sideways tilt	Max. 15° / 5°
Carrier stabilization	Front (horseshoe) stabilizer 2 x hydraulic jacks (rear)
Fuel tank	140 liters
Hand throttle	Standard
Filling pump for hydraulic oil	Electric
Hand held fire extinguisher	7.7 or 9 kg (type ABC)
Carrier centralized greasing points	Specification 5-2110
Tramming alarm	Standard
Tramming cameras	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 CD

OPTIONAL ITEMS

Drilling system	
*HL710S rock drill	With 55 kW or 90kW powerpack
*HL820ST rock drill	With 90kW powerpack
*RD927L rock drill	With 90 kW powerpack
*Power extractor	HL1560ST, HL820ST, HL710S, RD927L
Spare portable remote control panel	For offboard use
Horizontal zoom on ZR30	TS2-298
Long front frame	±45° feed tilt an longer feed cradle
Drilling module wear parts kit	For alternative tools
Bit changer	For LFRC1600 drilling module
Tube rod manipulator	For cabin units
Rear stinger extension kit	820 mm
Hydraulic system	
*Oil-to-air cooler for hydraulic oil	OA30 (30kW)
Vacuum pump	For hydraulic oil
Instrumentation	
Access detector, or protector	Mandatory in Europe (TS2-211)
Drilling instrument	TMS for DL400 series (TS2-122)
Spirit level angle indicators	3 pcs (on boom and feed)
OptiMine™ remote monitoring	For data management
Automation	
One-hole automation (including TMS)	Specification TS2-198
Tele-remote drilling (WLAN/LAN)	Including data transfer
Fan automation (including TMS)	Specification 5-9410
Data transfer	USB / WLAN (excluding drill plan software)

OPTIONAL ITEMS

Cleaning system	
Low pressure system with reel	Up to 15 bar (TS2-121)
High pressure system with reel	Up to 220 bar (TS2-121)
Greasing systems	
Automatic system	Lincoln (for carrier, boom and rod handler)
Manual system	Specification 5-2110
Electric system	
*Voltage option	1 000 V (50 or 60 Hz) and DOL starter
Dewatering pump outlet readiness	Site voltage 380 - 690 V (8 kW), excluding USA/CAN
Electric cables	Specification TS2-121
Ground fault and overcurrent unit	VYK
Power outlet on carrier	110 or 230 V (16 A), site voltage 380 - 690 V
Amber flashing light	LED (24 V)
Battery jumpstart	CAT
Air and water system	
*Air compressor	CT28 (2.8 m³/min, 18.5 kW)
Air mist flushing kit	For external air and water supply
Compressed air outlet	Quick coupling for pneumatic tools
1 x 60 liters air receiver	For end-of-hole flushing (requires CT28)
Water hose reel and hose	THR and Ø38 mm hose (length 65 m)
Operator's safety cabin or canopy	
*Stainless steel cabin	FOPS (ISO 3449)
*Safety canopy and safety grill	FOPS (ISO 3449)
Cabin heating system	For drilling and tramming
Fire suppression system	
Spare hand held extinguisher	7.7 or 9 kg (type ABC)
Automatic system	FS1000, (above 0°C) Ansul
Manual or automatic system	(6 nozzles)
Carrier	
Reduced tramming speed	3 rd gear lockout
Tramming camera	Rear, side and front
*Foam filled tires	4 pcs
Fast filling and evacuation system	Wiggins (complete)
Wheel chocks and holders	2 Sets
Extra items	
Spare rock drill	HL1560ST, HL820ST or HL710S
Spare wheel assembly	Standard or foam filled tires
Special tools for rock drill	Field kit or complete set
Documentation	Extra manuals
Package: Arctic	Please contact the product line
Warranty extension	One year (excl. Kazakhstan)
Package: Country specific options	USC, AUS and EUR
Package: Harsh water	Basic or advanced (TS2-049)
Package: Onboard air and water supply	Specification TS2-328

*) replaces standard feature