

## DS421 UNDERGROUND DRILL RIG

### TECHNICAL SPECIFICATION

DS421 is a rock reinforcement drill rig specialized for cement grouted cable bolt installation in the underground mines and tunnels.

DS421 is capable of installing up to 25 meter long cable bolts with several steel strands per hole. The drill rig is provided with an on board cement mixer, cement bag platform and steel strand reel. It is therefore autonomous for more than a shift.

The drill rod handling system has a capacity for 19 pieces of 1 1/4" diameter, round MF drill rods. The recommended drill hole size for this application is 51 mm. However alternative hole size can be selected with advice from your local Sandvik contact. The steel strand diameter is normally 15.2 mm, of either plain steel or bulb anchor strand.

The bolting operation is performed by a single operator located away from the drilling, grouting and cable installing module (CBH Cable Bolting Head). As all the drill rigs based on the NC7 carrier family, the DS421 is designed for safety.

For example, most of the daily and routine checks are done with both feet on the ground.

#### KEY FEATURES

Hydraulic rock drill	HL510 LH-38, 16kW
Bolting head	CBH
Bolting boom	TBR60
Cable bolt length	25 m
Turning width (T-section)	4 100 mm
Tramming / bolting width	2 735 mm / 3 975 mm
Tramming height	2 940 mm / 2 940 mm
Transport / bolting length	11 955 mm / 12 415 mm
Total weight	25 000 kg depending on options



## HYDRAULIC ROCK DRILL

Type of rock drill	HL510 LH-38 (TS2-237)
Percussion power	16 kW
Percussion pressure	Max. 175 bar
Percussion rate	59 Hz
Rotation speed	Max. 250 rpm (with OMS 80)
Rotation torque	630 Nm (with OMS 80)
Hole size (bolting)	51 - 64 mm
Recommended rod	R32 - T35
Shank adapter	R32 or T35 (male)
Weight	130 kg

## CABLE BOLTING HEAD

Type of bolting head	CBH (TS2-330)
Bolting head length	4', 5', 6'
Rod handling system	RC604, 5 or 6 19 + 1 rods
Centralizer	Pito 11LH
Cuttings collector	3 090 mm
Net weight	2 150 kg

## GROUTING AND CABLING SYSTEM

Cement mixer	TCM200 (incl. cement dust collector)
Cement pump	TP8
Cement bags platform	Max. weight 500 kg
Cement hose reel	35 m capacity

## BOLTING BOOM

Type of boom	TBR60 (TS2-327)
Boom extension	1 200 mm
Boom weight, net	2 200 kg
Roll-over angle	358°

## HYDRAULIC SYSTEM

Powerpack	HPP555 (1 x 55 kW)
Percussion pump	100 cc (variable)
Rotation pump	33 cc (gear)
Filtration size (pressure / return)	20 µ / 10 µ
Oil tank volume	270 liters
Oil tank filling pump	Electric
Oil cooler (water actuated)	OW30 oil-to-water (30 kW)

## CONTROL SYSTEM

Type of control system	TPC501 EW
Power control	Adjustable full power Adjustable collaring power
Anti-jamming control	Adjustable anti-jamming pressure
Rotation control	Adjustable rotation speed Reversible rotation
Flushing control	Water flushing flow and pressure control air-mist flushing, option

## ELECTRIC SYSTEM

Standard voltages	380 ... 690 V (± 10%), 50 or 60 Hz
Total installed power	75 kW
Main switch gear	MSE 10
IP classification	Specification TS2-132
Starting method	Star delta 380 V - 690 V Soft starter 575 V
Automatic cable reel	TCR3E
Cable reel control	Operator station and remote control at rear machine
Batteries	2 x 12 V, 145 Ah
Auxiliary outlet	1 x 110 V or 1 x 230 V, 16 A
Front lights (combined working and driving)	6 x 50 W LED (4 200 lm, 6 000 K)
Rear lights (combined working and driving)	4 x 50 W LED (4 200 lm, 6 000 K)
Remote search light	1 x 50 W LED (4 200 lm, 6 000 K)
Parking rear brake / park lights	2 x Red LED
Stair and service lights	LED (24 V)

## AIR AND WATER SYSTEM

Flushing	By water
Water pump type	WBP2
Water pump capacity	100 l/min
Water pump inlet pressure	2 bar (Min.)
Flushing water pressure	10 - 15 bar
Shank lubrication device	SLU1 (Air / oil mist)
Rock drill oil consumption	200 - 300 g/h
Rock drill air consumption	250 - 350 l/min
Air compressor	CTN10, 1 m³/min (7 bar)
Air cleaner for external air supply	IP5

## OPERATOR'S SAFETY CABIN

Safety cabin	FOPS / ROPS (ISO 3449 / 3471)
Operation	Seated drilling and tramming
Sound pressure level according to EN791	Operator station: 76 dB(A)
Seat	Ergonomic, adjustable for tramming and drilling including seat belt
Air conditioning system	For drilling and tramming
Audio system	CD / MP3-player, radio and loudspeakers
Boot washer	At cabin entrance
Cabin safety grill	Standard

## CARRIER

Type of carrier	NC7S (frame-steered)
Carrier articulation	± 35°
Rear axle oscillation	± 10°
Ground clearance	420 mm
Diesel engine	MB OM904LA, 110 kW, Tier 3, Stage IIIA
Exhaust catalyzer + muffler	Standard
Transmission	Hydrodynamic, Spicer T20 000
Axles	Dana Spicer
Tires	12.00-20
Service brakes	Hydraulic wet disc brakes
Parking and emergency brakes	SAHR type, fail safe wet disc brakes
Tramming speed	16 km/h (Horizontal) 5 km/h (14% = 1:7 = 8°)
Gradeability / sideways	Max. 15° / 5°
Fuel tank	140 liters
Carrier stabilization	2 x TJ40 (front) 2 x TJ60 (rear)
Hand throttle	Standard
Centralized greasing points	Specification 5-2110
Hand held fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Tramming alarm	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) 2 x Toolman CD

## OPTIONAL FEATURES AND PACKAGES

Rock drill	
*HL510-LH45 rock drill	with T35 (male) shank
Bolting option	
Bolting head oiler	For BC and BCS system (TS2-291)
Dry cement silo	400 kg, above right mud guard
Hydraulic system	
Vacuum pump	For hydraulic oil
Instrumentation	
Cable bolting instrumentation	TMS DDS
Access detector	Mandatory in Europe (TS2-211)
Automation	
OptiMine™ remote monitoring for data management	Option or std. in country package for certain areas

## OPTIONAL FEATURES AND PACKAGES

Air and water system	
*Air compressor	CT28, 2.8 m³/min (19 kW)
Water hose reel and hose	THR2.5E and Ø38 mm (1 ½"), 65 m
Compressed air outlet	Quick coupling for pneumatic tools
Cleaning system	
LP system with reel	Up to 15 bar (TS2-343)
HP system with reel	Up to 180 bar (TS2-343)
Bolting module continuous washing system	Remote controlled
Greasing systems	
Manual system	Specification 5-2110
Automatic system	Lincoln (complete)
Electric system	
*Voltage option	1 000 V (50 or 60 Hz) with Direct-On-Line starter
Electric cable	Specification TS2-121
Ground fault and overcurrent protection	VYK (excluded US/CAN)
Dewatering pump outlet	380 - 690 V (Max. 8 kW)
Battery jump start	Optional
Extra working lights	2 x 50 W LED (4 200 lm, 6 000 K)
Amber flashing light	LED (24 V)
Operator's safety cabin / canopy	
*Stainless steel cabin	FOPS (ISO 3449)
*Safety canopy with safety grill	FOPS (ISO 3449)
Cabin heating	During tramming and drilling
Fire suppression system	
Additional fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Manual or automatic system	Ansul, 6 nozzles
Fire suppression system	FS1000 (above 0°C)
Carrier	
Reduced tramming speed	3rd gear lockout
Tramming camera	Rear and side
Diesel engine	QSB4.5, 119 kW, tier 4i, Stage IIIB
*Foam filled tires	4 pcs
Fast filling systems	Complete
Wheel chocks and holders	2 Sets
Extra Item	
Spare rock drill	HL510 LH-38
Spare wheel assembly	12.00-20 or foam-filled
Special tools for rock drill	HL510 LH-38
Documentation	Extra, Catbase, Link one manuals
Warranty extension	One year (excl. Kazakhstan)
Package: Country specific options	USC, AUS, EUR
*Package: Harsh water	Basic or advanced (TS2-049)
*Package: Anti-freezing	Block heater for engine, heater for hydraulic oil, water circuit flushing with air, antifreeze adding in water circuit.

\*) replaces standard feature