

# DL311 TOP HAMMER LONGHOLE DRILL

## TECHNICAL SPECIFICATION

Sandvik DL311 is a fully-mechanized 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 tube rods.

The DL311 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, ZR20 telescopic boom, TAS drilling control system, remote control panel and FOPS operator's (tramming) 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 NC5 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 and all service points are accessible from ground level.

### KEY FEATURES

Hydraulic rock drill	HL820ST (21 kW)
Drilling module	LFRC700 (20 + 1 rods)
Rod length	4' - 6' (1 220 - 1 830 mm)
Telescopic boom	ZR20 (on front stabilizer)
Minimum drift size (H and W)	3 150 - 3 750 mm
Drift width in T-section	3.2 m (minimum)
Pivot point height	1 615 - 2 100 mm
Boom coverage (vertical holes)	2 000 mm
Transport height	2 830 mm
Transport width	1 990 mm
Transport length	8 900 mm
Transport weight	17 000 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*



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## HYDRAULIC ROCK DRILL

Type of rock drill	HL820ST (TS2-301)
Percussion power	21 kW
Percussion pressure	Up to 200 bar
Percussion rate	42 - 52 Hz
Stabilizer	Sleeve type
Rotation speed	0 - 180 rpm (OMT200)
Rotation torque	1 095 Nm (OMT200)
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	530 mm (minimum)
Feed force	31 kN
Feed and return speed	0.3 m/s (fast feed)
Front stinger extension	2 000 mm

## DRILLING MODULE DIMENSIONS

Type	Rod length	Total length
LFRC704	1 220 mm	2 940 mm
LFRC705	1 525 mm	3 240 mm
LFRC706	1 830 mm	3 550 mm

## LONGHOLE BOOM

Telescopic boom	ZR20 (TS2-287)
Boom swing	Left 38° / right 38°
Boom (fan) tilt	Back 45° / Forward 30°
Drilling module roll-over	360°
Boom extension	485 mm
	985 mm (4' rods)
Drilling module travel	1 050 mm (5' rods)
	1 200 mm (6' rods)
Boom coverage (vertical holes)	2 000 mm
Pivot point height (boom vertical)	1 615 - 2 100 mm
Rear stinger	Mounted on feed cradle
Rear stinger extension	1 500 mm
Laser distance from drill center	880 mm (vertical holes)

## HYDRAULIC SYSTEM

Type of hydraulic system	TPC LH
Operating principle	Electric pilot control
Power pack	HPP875 (75 kW)
Filtration (pressure / return)	20 µ / 10µ
Oil tank volume	180 liters
Cooler for hydraulic oil	OW45 oil-to-water (45 kW)
Low oil level indication	Low oil level switch

## DRILLING CONTROL SYSTEM

Type of control system	TAS
Operating principle	CANbus
Control panel	Portable remote panel
	Cable length 20 m
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	92 kW
Main switch gear	MSE / MSC
IP-classification	Specification TS2-132
Allowed voltage fluctuation	± 10%
Starting method	Star-Delta (380 - 690 V)
Automatic cable reel	TCR1
Cable reel remote control	At operator station and cable reel
Front and rear lights	8 x 50 W (24 V) LED
Pedestal lights	2 x 50 W (24 V) LED
Carrier positioning lights	2 x Laser type
Sealed AGM batteries	2 x 12 V (85 Ah)

## AIR AND WATER SYSTEM

Flushing of holes	By water
Water booster pump type	WBP2 (4 kW / 50 Hz)
Water pump capacity	100 l/min at 15 bar (inlet pressure = 4 bar)
Water pump inlet pressure	2 - 7 bar
Flushing water pressure	10 - 20 bar
Air compressor	CTN10 (1.0 m³/min at 7 bar)
Shank lubrication device	SLU1 (air / oil mist)
Rock drill air consumption	200 - 300 l/min
Rock drill oil consumption	250 - 550 g/h
Air cleaner for external air supply	IP5 including connection

## OPERATOR'S SAFETY CANOPY

FOPS safety canopy	FOPS (ISO3449)
Unit height in tramming	2 830 mm
Sound pressure level EN 791	Canopy < 97 dB(A) Emitted 115 dB(A)
Operator's seat	Ergonomic T-back seat

## CARRIER

Type of carrier	NC5 (frame-steered)
Carrier articulation	± 40°
Rear axle oscillation	± 10°
Ground clearance	320 mm
Diesel engine	Deutz TCD2012 (74 kW, Tier 3)
Exhaust catalyzer	Standard
Transmission	Hydrostatic
Axles	Spicer 112 and 123
Tires	12.00–20
Service brakes	Hydraulically applied disc brakes
Parking / emergency brakes	SAHR fail safe type wet disc brakes
Tramming speed	Horizontal (0%): 12 km/h 8°=1:7=14%: 5 km/h
Gradeability / sideways tilt	Max. 15° / 5°
Carrier stabilization	2 x hydraulic outriggers (front) 2 x hydraulic jacks (rear)
Fuel tank	80 liters
Tramming oil tank	55 liters
Filling pump for hydraulic oil	Electric
Hand held fire extinguisher	7.7 or 9 kg (type ABC)
Brake release	By manual hand pump
Tramming alarm	Standard
Trammin cameras	Front, side and rear
Knowledge Box™	Connectivity solution (TS2-535)
Colour scheme	Sandvik
Documentation	1 x Operator's manual 1 x Maintenance manual 1 x Technical manual (in English only) 1 x Parts manual (in English only) 2 x Toolman USB key

## OPTIONAL ITEMS

### Drilling system

*HL710S rock drill	With 55 kW or 75 kW power pack
*Drilling module sideways swing	ZR32P boom (TS2-289)
Drilling module wear parts kit	For alternative tools
*Power extractor	For HL820ST and HL710S

### Instrumentation

Access detector or protector	Mandatory in Europe (TS2-211)
Drilling instrument TMS	For DL300-series (TS2-122)
Spirit level angle indicators	2 pcs (on feed and boom)
Teleremote drilling operation	Including data transfer (USB/WLAN)
Proximity detection	Interface to external system (TS2-381)

### Automation

Rod handler sequence control	Specification TS2-197
One-hole automation	Including TMS (TS2-198)
Fan automation	Including TMS (TS2-199)
Data transfer USB/WLAN (incl. DrillConnect mobile app)	Connectivity through Knowledge box™ for easy data transfer to and from the rig

### Cleaning system

Low pressure system with reel	Up to 15 bar (TS2-343)
High pressure system with reel	Up to 220 bar (TS2-343)

### Greasing systems

Automatic system	Lincoln (for carrier, boom and rod handler)
Carrier centralized greasing points	Specification TS2-463
Manual system	Specification TS2-463

## OPTIONAL ITEMS

### Electric system

*Voltage option	1 000 V (50 or 60 Hz) with 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 (excluding USA/CAN)
Outlet on carrier 110 V	16 A, single phase, 1.6 kW
Outlet on carrier 230 V	16 A, single phase, 2 kW
Amber flashing light	LED (24 V)
Battery jump start	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
2 x 60 liters air receivers	For end-of-hole flushing (requires CT28)
Hooks and water hose	Ø38 mm hose (lg: 30 m)
Water hose reel and hose	THR and Ø38 mm hose (lg: 60 m)

### Fire suppression system

Spare hand held fire extinguisher	1 x 7.7 kg or 9 kg (type ABC)
Automatic fire suppression system	Sandvik Eclipse™
Manual or automatic system	Ansul (6 nozzles)

### Carrier

*Foam filled tires	4 pcs
Fast filling and evacuation system	Wiggins (complete)
Wheel chocks and holders	2 pcs

### Extra items

Spare rock drill	HL820ST or HL710S
Spare wheel assembly	Standard or foam filled tires
Special tools for rock drill	Field kit or complete set
Warranty extension	One year (excl. Kazakhstan)
Documentation	Extra manuals
Package: Country specific options	LAM, CAN, USC, AUS, EUR
Package: Harsh water	Basic or Advanced (TS2-049)
Package: Onboard air and water supply	Specification TS2-328

*\*) Replaces standard feature*

#### MINIMUM PRODUCTION DRIFT SIZE (mm)\*

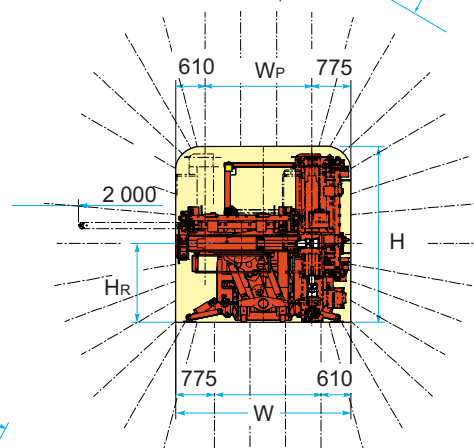
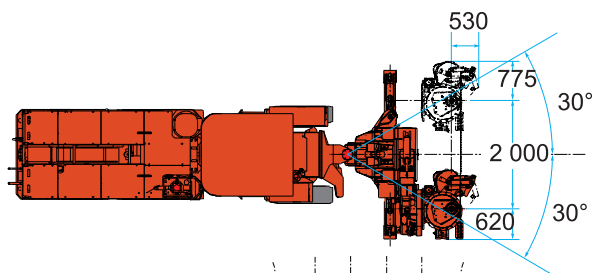
Module	H	W	W <sub>p</sub>	H <sub>R</sub>
LFRC704	3 150	3 150	1 460	1 615
LFRC705	3 450	3 450	1 760	1 615
LFRC706	3 750	3 750	2 000	1 615

\*) 100 mm clearance, add 400 mm (total) for fan automation

#### MAXIMUM PRODUCTION DRIFT SIZE (mm)\*\*

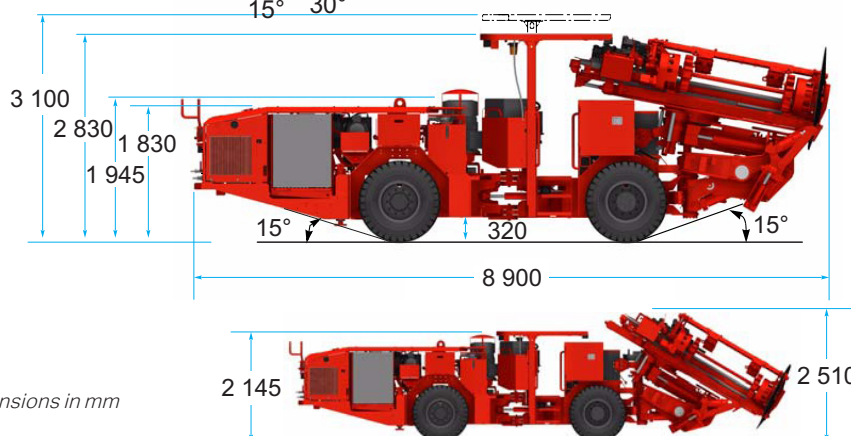
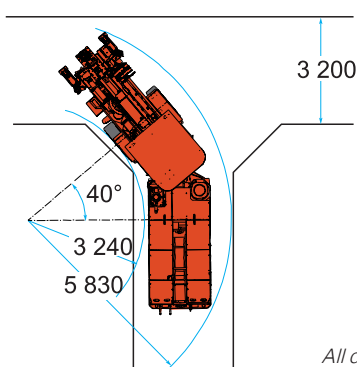
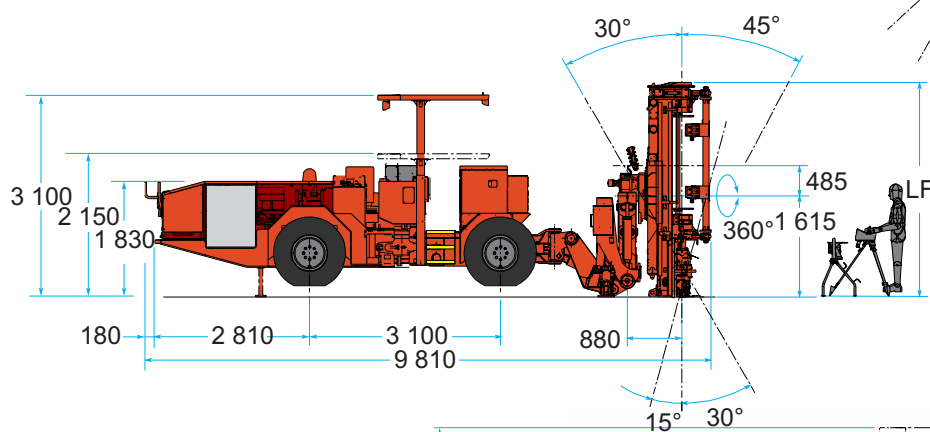
Module	H	W	W <sub>p</sub>	H <sub>R</sub>
LFRC704	3 700	4 800	2 000	1 750
LFRC705	4 000	5 100	2 000	1 750
LFRC706	4 150	5 250	2 000	1 750

\*\*) Rear stinger extended; the use of drilling module mounted front stinger extends the coverage further



#### DRILLING MODULE LENGTH (LF)

LFRC704	2 940
LFRC705	3 240
LFRC706	3 550



All dimensions in mm

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#### 4. DL311 TOP HAMMER - LONGHOLE DRILL