



# DS411 ROCK SUPPORT BOLTER

## TECHNICAL SPECIFICATION

Sandvik DS411 is a rock reinforcement drill rig that installs all most common rock bolt types in combination with steel wire meshes when required. Provided with a strong and reliable boom TBR60, it can install from one carrier setup, several rows of rock bolts, from 1.5 m to 3 meters long.

The extremely short but powerful Sandvik RD314 rock drill delivers the best ratio between the rock bolt length and drift height. The rock bolting process is completely mechanized and controlled by a single operator from under a ROPS/FOPS safety cabin or FOPS safety canopy.

As all the Sandvik drill rigs based on the NC7 carrier family, the Sandvik DS411 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	RD314, 14 kW
Bolting head	BH (BH15 to BH30)
Bolting boom	TBR60
Bolt length	From 1.5 m to 3 m (5' to 10')
Turning width (T-section)	3 900 mm
Tramming / bolting width	2 740 mm / 3 975 mm
Tramming height (cabin / canopy)	2 940 mm / 2 940 mm
Transport / bolting length	11 370 mm / 10 950 mm
Total weight	23 000 kg depending on options



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## HYDRAULIC ROCK DRILL

Type of rock drill	RD314 (TS2-137)
Percussion power	14 kW
Percussion pressure	Max. 160 bar
Percussion rate	110 Hz
Rotation speed	Max. 520 rpm (with OMS 100)
Rotation torque	340 Nm (with OMS 100)
Hole size (bolting)	33 - 43 mm
Shank adapter	45 mm / R32 female
Weight	122 kg
Length	571 mm

## BOLTING HEAD

Type of bolting head	BH (TS2-277)
Bolting head feed	KS140
Bolt carousel capacity	8 rock bolts with 200 x 200 mm maximum plate size
Bolt head length	Max. 4 142 mm (BH30)
Net weight	1 720 kg (with RD314)

## 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	HPP355 (1 x 55 kW)
Percussion pump	100 cc (variable)
Rotation pump	33 cc (gear)
Filtration size (pressure / return)	20 µ / 12 µ
Oil tank volume	200 liters
Oil tank filling pump	Electric
Cooler for hydraulic oil	OW30 oil-to-water (1 x 30 kW)

## CONTROL SYSTEM

Type of control system	TPC301 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
Returns automatics	Rock drill
OptiMine™ / FDM / WLAN	Data transfer readiness

## ELECTRIC SYSTEM

Standard voltages	380 - 690 V (± 10%), 50 or 60 Hz
Total installed power	70 kW
Main switch	MSE 10
IP classification	Specification TS2-132
Starting method	Star delta 380 V - 690 V Soft starter 575 V
Automatic cable reel	TCR3E with spooling system
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
Battery jump start	Standard
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)
Manual search light	1 x 40 W LED
Rear parking / brake lights	2 x Red LED (24V)
Stair and service lights	LED (24 V)

## AIR AND WATER SYSTEM

Flushing	By water
Water booster pump	WBP1
Water pump capacity	50 l/min
Water pump inlet pressure	2 bar (Min.)
Flushing water pressure	10 - 15 bar
Shank lubrication device	SLU1 (air / oil mist)
Air compressor	CTN10, 1 m³/min (7 bar)
Air cleaner for external air supply	IP5
Rock drill oil consumption	100 - 200 g/h
Rock drill air consumption	150 - 250 l/min

## OPERATOR'S SAFETY CABIN

Safety cabin	FOPS / ROPS (ISO 3449 / 3471)
Operation	Seated drilling and tramping
Sound pressure level according to EN 16228	Operator station: 76 dB(A)
Seat	Ergonomic, adjustable for tramping and drilling including seat belt
Air conditioning system	For drilling and tramping
Audio system	CD / MP3-player, radio and loudspeakers and 12 V outlet
Boot washer	At cabin entrance
Cabin safety grill	Standard

## CARRIER

Type of carrier	NC7N (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	14.00-20
Service brakes	Hydraulic wet disc brakes
Parking and emergency brakes	SAHR type, fail safewet disc brakes
Tramming speed	16 km/h (Horizontal) 5 km/h (14%=1:7=8°)
Gradeability / sideways tilt	Max. 15° / 5°
Fuel tank	140 liters
Carrier stabilization	2 x TJ40 Vertical (front) 2 x TJ60 Vertical (rear)
Hand throttle	Standard
Centralized greasing points	Specification TS2-463
Hand held fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Tramming alarm	Standard
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 FEATURES AND PACKAGES

### Bolting head

*Bolt carousel capacity	10 rock bolts for square plate 200 mm 12 rock bolts for square plate 150 mm
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### Bolting option

*Bolting alternatives	GCC, GCR, WI, S, BC, M, K
Automatic resin shooting	ARI system (TS2-282)
"In the hole" resin cartridges injection system	Specification TS2-290
Screen handler	SB60RSH (TS2-324)
Cement dust collector	Above the mixer
Bolting head oiler	For BC and BCS system (TS2-291)
Dry cement silo	500 kg, above right mud guard
SDA bolt type and bulk resin	
Roll-mesh manipulator	

### Hydraulic system

By pass	Oil filter
Vacuum pump	For hydraulic oil

### Instrumentation

Bolting instrumentation	SBI (Sandvik bolting instrumentation) Navigate with fan laser or tachymeter
Access detector	Mandatory in Europe (TS2-211)

## 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 Ø32 mm (1 ¼"), 100 m
Compressed air outlet	Quick coupling for pneumatic tools

### Cleaning system

Low pressure system with reel	Up to 15 bar (TS2-343)
High pressure system with reel	Up to 180 bar (TS2-343)
Bolting module continuous washing system	Remote controlled

### Greasing systems

Manual system	Specification TS2-463
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
Dewatering pump outlet	380 - 690 V (Max. 8 kW)
Battery jump start	Optional
Extra working lights	2x 50 W LED
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
Canopy boot washer	At each access

### Fire suppression system

Spare hand held fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Manual or automatic system	Ansul, 6 nozzles (TS2-460)
Automatic system	Sandvik Eclipse™ (TS2-461)

### Carrier

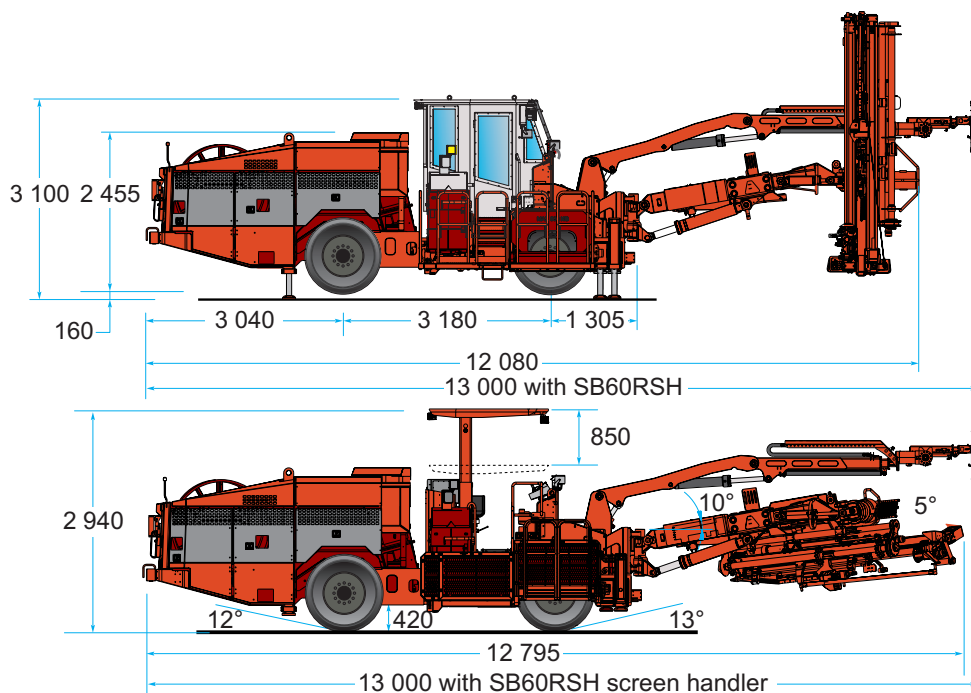
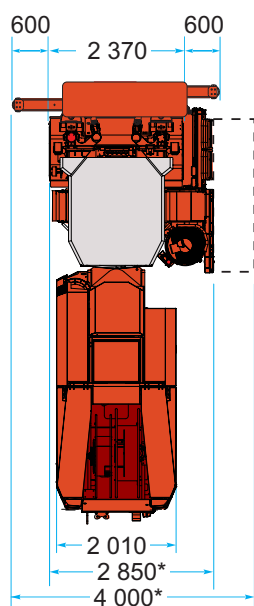
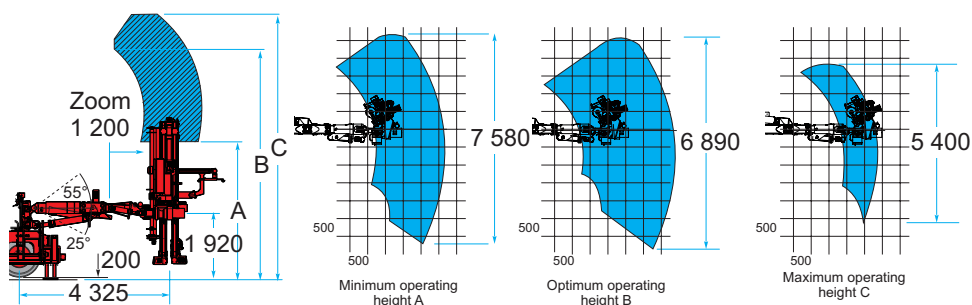
Reduced tramming speed	3rd gear lockout
Tramming camera	Rear and side
*Diesel engine	Cummins QSB4.5, 119 kW, Tier 4i Cummins B4.5, 129 kW, Stage V
*Foam filled tires	4 pcs
Fast filling systems	Complete
Wheel chocks and holders	2 Sets
Bolt storage	Right side
Bolt storage with a drill bit rack	Max. 3 meters length (front)
Rod rack	For 4 rods (N/A with bolt storage)

### Extra Item

Spare rock drill	RD314
Spare wheel assembly	Air or foam-filled
Special tools for rock drill	Field tool set (TS2-119) Complete tool set (TS2-118)
Warranty extension	One year (excl. Kazakhstan)
Documentation	Extra, Catbase, Link one manuals
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*

Bolting head	Bolt length (m)	A - Minimum (mm)	B - Optimum (mm)	C - Maximum (mm)
BH15	1.2 - 1.5	2 700	6 600	7 900
BH18	1.2 - 1.8	3 100	6 600	7 900
BH22	1.5 - 2.2	3 600	6 600	7 900
BH24	1.5 - 2.4	3 800	7 100	8 400
BH27	1.5 - 2.7	4 000	7 100	8 400
BH30	1.5 - 3.0	4 300	7 100	8 400

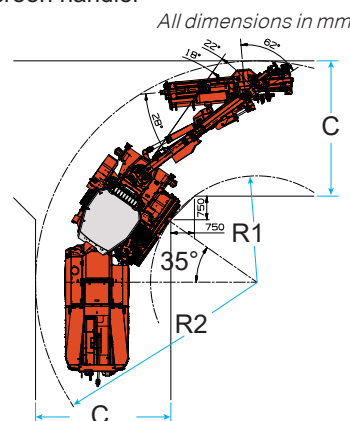
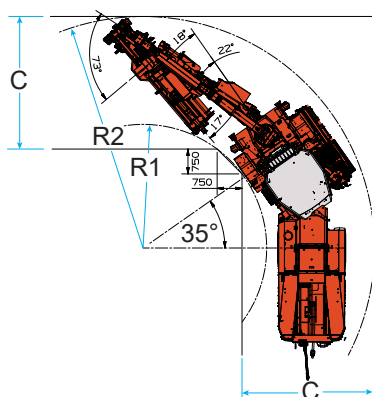


#### CORNERING (LEFT)

	Angle (A)	Internal radius (R1)	External radius (R2)	T-cross (C)
DS411	mm 35°	3 800	6 850	3 900
DS411 (SB60RSH)	mm 35°	3 730	6 985	4 000

#### CORNERING (RIGHT)

	Angle (A)	Internal radius (R1)	External radius (R2)	T-cross (C)
DS411	mm 35°	3 350	6 600	4 000
DS411 (SB60RSH)	mm 35°	3 380	7 035	4 300



All dimensions in mm

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#### 4. SANDVIK DS411 - ROCK SUPPORT BOLTER