

# DS412i Intelligent rock bolter

## Technical Specification







# High automation levels

Sandvik DS412i is an advanced rock support bolter providing a high level of performance for underground mine and tunneling rock support .

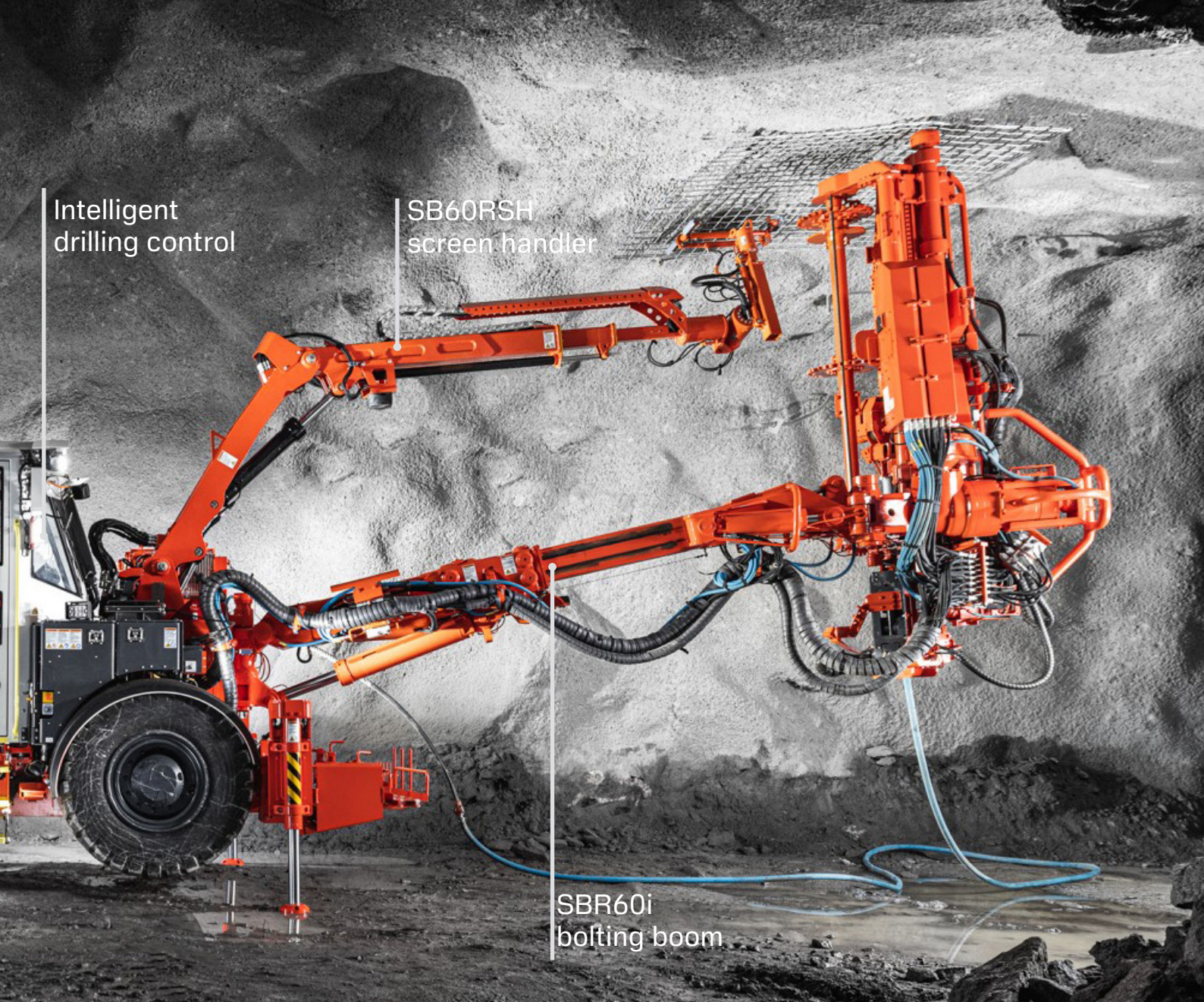
Upgraded bolting head with different bolt lengths enables wider bolt selection for all customers. Automatic resin shooting and cement mixing system ensure high quality rock reinforcement process.

Sandvik DS412i is available with high automation level as standard, like one hole automation, hole angle measurement, advanced boom manipulator mode and basic remote monitoring capabilities.

Higher level of automation can be achieved with the gold package (option) including full instrumentation, full fan bolt locations, iSURE® , total station navigation, full remote monitoring with reporting tools, MWD capability and new automated features.

Key features	
Optimum bolting coverage	4.5 m x 4.5 m
Bolt length	From 1.5 m to 3.0 m (5' to 10')
Turning width (T-section)	4 140 mm
Transport width	2 500 mm
Transport / drilling height	3 070 mm / 3 320 mm
Transport length	13 020 mm
Total weight	29 000 kg depending on options



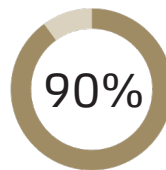


## Main benefits

### Fast and automated one bolt automation

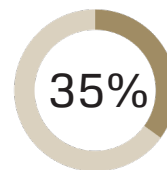
Sandvik DS412i is a bolter for 4 x 4 meters size headings combining a safe, ergonomic working environment with high levels of performance. The i-Class platform offers various levels of automation for rock support drilling.

The high level of data collection during bolting allows to better know how drifts and tunnels are supported with possibility to document it.



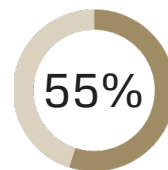
#### Better efficient

Up to 90%\* automatic bolt installation



#### Improved productivity

Up to 35%\* higher penetration rate



#### Improved Ergonomics

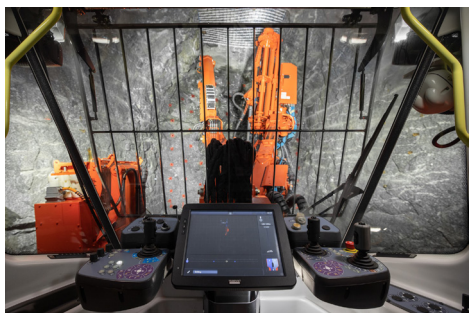
Up to 55%\* increase in operator's visibility tramming





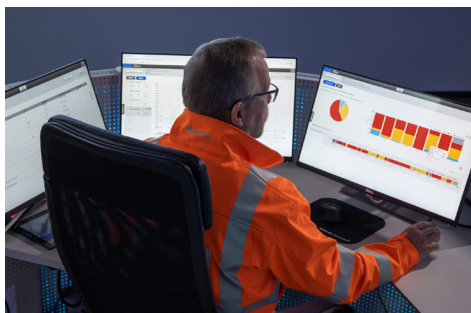
### Upgraded BHi bolting head

With different bolt lengths, it enables wider bolt selection for all customers. Automatic resin shooting and cement mixing system ensure high quality rock reinforcement process.



### Intelligent drill controls

The intelligent control system assists the operator during drilling, grouting and bolt tightening for optimized results.



### i-Class control system

Enables advanced mine automation and future tele-remote solutions reducing the need for manual tasks. It allows integration with our digital offering like iSURE®, MySandvik Remote Monitoring Service, OptiMine® and AutoMine®.



## Sandvik 365 Parts and Services

### Proudly keeping you on track!

Sandvik 365 Parts & Services offer a variety of possibilities to enhance your Sandvik DS412i drill's performance. As an OEM, we provide the best-suited choices to preserve your machine's high performance throughout its lifetime.

These consist of highly skilled service specialists supporting you 365 days a year, all using Sandvik Genuine parts and components complemented by a range of robust tools.

In addition, you get to enjoy the benefits of advanced digital services and a global infrastructure dedicated to keeping your Sandvik fleet on track.



Technical Specification

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 OMS100)
Rotation torque	340 Nm (with OMS100)
Hole size (bolting)	33 - 43 mm
Shank adapter	45 mm / R32 female
Weight	122 kg
Length	571 mm

Bolting head

Type of bolting head	BHi (TS2-277)
Bolting head feed	KS140
Bolt caroussel capacity	8 rock bolts with 200 x 200 mm maximum plate size
Bolt head length	Max. 4 342 mm (BH30)
Net weight	Max. 1 720 kg (BH30)

Bolting boom

Type of boom	SBR60i (TS2-478)
Boom extension	1 200 mm
Boom weight, net	2 200 kg
Roll-over angle	358°

Hydraulic system

Powerpack	HPP355 (1x55 kW)
Filtration size (pressure / return)	20 µ / 10 µ
Oil tank volume	270 liters
Oil tank filling pump	Electric
Cooler for hydraulic oil	OW30 oil-to-water (1x30 kW)

Drilling control system

Control system type	SICA
Drilling control modes	Intelligent Torque control / Feed percussion / manual

Upgradeable automation levels	
Comprehensive diagnostic system	
Electronic joystick controls	
15" full color touch screen	
Cable kit for spare part programming	
Safety lock for movement prevention	2 switches
MySandvik insight / OptiMine / WLAN	Data transfer readiness

Automation package, Silver level (Standard)

Drilling control system	Torque or manual drilling
One-bolt automation	Drills one hole automatically
Boom manipulator mode	Operator can lock XYZ-axis
Hole angle measurement	Boom tilt and bolting module rotation indication
Drill bit navigation	Drill bit can be used for bolter navigation
Basic remote data monitoring	Info about drilled meters installed bolts
Automatic cement mixer	Mixing one batch automatically

Electric system

Multivoltage	380 – 1 000 V (±10%)
Total installed power	70 - 80 kW
Main switch gear	MSE 10
IP-classification	Specification TS2-132
Starting method	Direct on line 380 V - 1 000 V
Automatic cable reel	TCR4CE with spooling system
Cable reel control	Operator station and remote control at rear machine
Front lights	6 x 50 W LED (24V) >125lx, 20 000 lm; 6 000 k
Rear lights	2 x 50 W LED (24V) and 2 x 17 W LED (24V) 8 000 lm; 6 000 k
Remote controlled spot lights	2 pcs
Outlets on carrier	1 x 110 V or 230 V (16A)
Parking rear brake / park lights	2 x Red LED
Stair and service lights	LED (24V)
Amber flashing light	LED (24 V)
Electric quality monitoring	Voltage, Amperage, Power, Pf Energy, Phase-sequence
Motor protection	Intelligent control with power maximization
Extra low voltage supply	Continuous 80 A (27 VDC) with battery back-up and management

Air and water flushing system

Flushing of holes	By Water
Water booster 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	SLU-1 (Air / oil mist)
Air compressor	CTN10 (1.0 m³/min at 7 bar)
Oil consumption	150 - 250 g/h
Air consumption	250 - 350 l/min
Compressed air outlet	Quick coupling

Operator's safety cabin

Cabin certification	FOPS / ROPS (ISO 3449)
Operation	Seated tramming Standing and seated drilling
Sound pressure level	According to EN 16228, ISO4872, ISO1120. Operator station: 69 db(A)
Vibration level	According to EN791/ISO2631-1
Operator's seat	Fully adjustable seat (tramming and drilling)
Optimized dust level control via air circulation	
Air conditioning system	EU6/7 filtering capacity
Cabin heating	During tramming and drilling
Electricity outlets	1 x 24 V, 1 x 12 V
Stairs and indoors lights	LED
Audio player	CD / MP3 player with radio
Boot washer	At each cabin entrance
Safety laminated acoustic windows	



## Technical Specification

### Carrier

Type of carrier	C400D (frame-steered)
Carrier articulation	± 35°
Rear axle oscillation	± 8°
Ground clearance	330 mm
Diesel engine	QSB4.5, 119 kW, Tier 3, Stage IIIA
Transmission	Hydrostatic
Axles	Dana Spicer
Tires	14.00–24 PR28
Brakes	SAHR type, fail-safe wet disc brakes
Tramming speed	12 km/h (limited)
Gradeability / sideways tilt	Max.15° / 5° (according to EN 16228-2)
Fuel tank	100 liters
Hydraulic jacks	2 x SJ500 (front) 2 x SJ600 (rear)
Brake release	Manual hand pump
Wheel chocks and holders	2 Sets
Centralized greasing points	Specification TS2-463
Hand held fire extinguisher	1 x 7.7 or 9 kg (type ABC)
Tramming cameras	Rear and side
Tramming alarm	Standard
Toolboxes and first aid kit	
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

### Automation package, Gold level (option) - TS2-539

Automation Silver package content
Bolt plan transfer
Bolting according to plan
Near hole automation
Total station navigation
MWD capability
Full remote data monitoring
DrillConnect mobile application : Connectivity through Knowledge box™ for easy data transfer to and from the rig

### Automation package, Platinum level (option) - TS2-539

Automation Gold package content
Position route drawing: Bolt plans adjusted to actual profile according to recorded position route
Full fan automation: Automatic boom movements from one bolt location to next one

### Optional features and packages

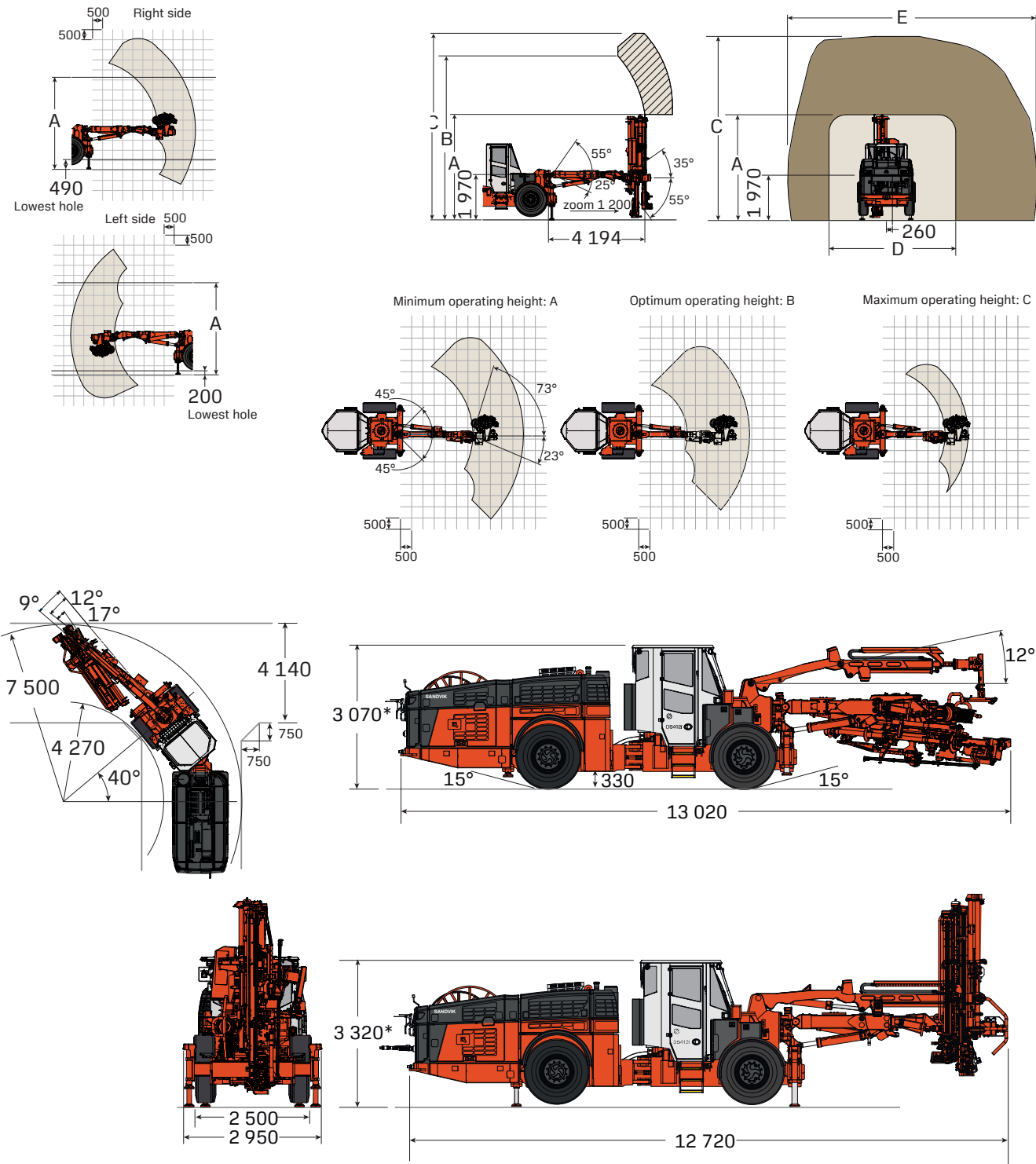
<b>Bolting head</b>	
*Bolt carousel capacity	10 rock bolts for square plate 200 mm 12 rock bolts for square plate 150 mm
<b>Bolting option</b>	
*Bolting alternatives	GCR with automatic resin system (ARI), BCS with automatic cement mixer, GBR Bulk resin system, WI water inflated, S Splitset bolts, M Mechanical bolts Specification TS2-290
"In the hole" resin cartridges injection system	
Screen handler	SB60RSH separate boom (TS2-324)
Bolt storage and bits rack	On right side, or front module
Bolting head oiler	Recommended with BCS-system
<b>Hydraulic system</b>	
Vacuum pump	For hydraulic system
By pass oil filter	
<b>Drilling control system</b>	
Boom movement prevention switches	Indicator lights
Access detector, or protector	Mandatory in Europe (TS2-211)
<b>Cleaning system</b>	
HP system with reel	Up to 180 bar (TS2-343)
Bolting module continuous washing system	Remote controlled
<b>Greasing systems</b>	
Automatic system	Lincoln (complete)
Manual system	Pump reel and nozzle (TS2-463)
<b>Electric system</b>	
Voltage option	1 000 V (50 / 60 Hz) with DOL
Multivoltage basic	380 – 440 V, 690 V 50 or 60 Hz
Multivoltage pro	380 – 1 000 V, 50 or 60 Hz
*Electric cables	Specification TS2-121
Dewatering pump outlet	8 kW, Site voltage 380 - 690 V 8 kW, Site voltage 1 000 V 400 V (16A) with transformer
Indicator lights for jacks	Up and down
Earth continuity control	1 wire pilot circuit with remote reset / disconnect
Battery jump start	Optional
Current draw reducer unit	
<b>Air and water system</b>	
*Air compressor	CT28 (2.8 m³/min, at 7 bar)
Compressed air outlet	Quick coupling
Water hose reel and hose	THR2.5E, with Ø38 mm (1 ½"), 100 m
<b>Operator's safety cabin</b>	
*Low height cabin	FOPS/ROPS (ISO 3449/3471) height 2 900 mm
Tiltable cabin	15° to improve operator's comfort
<b>Fire suppression system</b>	
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)
<b>Carrier</b>	
Reduced tramming speed	3 rd gear lockout
*Diesel engine	QSB4.5, 121 kW, Stage V
*Foam filled tires	4 pcs
Fast filling system	Complete
Rod rack	On carrier side (4 rods)
<b>Extra items</b>	
Spare rock drill	RD314
Spare wheel assembly	Standard or foam filled tire
Special tools for rock drill	Field kit, complete set
Documentation	Extra, Catbase, Link one manuals
Warranty extension	One year (excl. Kazakhstan)
Packages: Automation	Gold or platinum level (TS2-539)
Packages: Country	USA, CAN, AUS, EU, SAS
Package: Environmental	TS2-524

\*) Replaces standard feature



Technical drawings

Bolting head		Minimum operating height and width (A;D)	Optimum operating height (B)	Maximum operating height (C)	Maximum width (E)
BHi18	mm	3 150	6 600	7 585	9 970
BHi22	mm	3 650	6 600	7 585	9 970
BHi24	mm	3 900	7 060	8 045	10 890
BHi27	mm	4 110	7 060	8 045	10 890
BHi30	mm	4 450	7 060	8 045	10 890



\* Add 100 mm height with tilting option - \*\* 3 100 mm with bolts storage option  
All dimensions in mm



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