

# DU412i ITH LONGHOLE DRILL

## TECHNICAL SPECIFICATION

Sandvik DU412i is a highly versatile and compact ITH longhole drill fitted with an onboard booster and designed for underground 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  $\text{Ø}3\frac{1}{2}$ " -  $8\frac{1}{2}$ " (90 - 216 mm) longholes, using 3" to 8" ITH hammers and  $\text{Ø}3$ " to  $\text{Ø}5$ " (76 - 127 mm) drill pipes. The DU412i can be fitted with a V-30 head for  $\text{Ø}30$ " (762 mm) reaming in service support, or reaming up to  $\text{Ø}17\frac{1}{2}$ " (445 mm) holes with 12" hammers in rapid raising.

The DU412i is mounted on a frame-steered and diesel-powered carrier. It is equipped with the CF706-F feed, PC194 pipe handler, RH6250 rotation head, ZR35 telescopic boom and operator's canopy or cabin for maximum productivity, safety and hole accuracy. The 360° drilling module rotation and wide boom swing and tilt angles make the unit suitable for mass mining and various service support applications. The iSOLO drilling control system with the user-friendly operating interface and various automation options allow maximum productivity and good drilling accuracy. The layout of the C400D carrier is designed for a good visibility and stability in tramming, and all service points are accessible from the ground level.

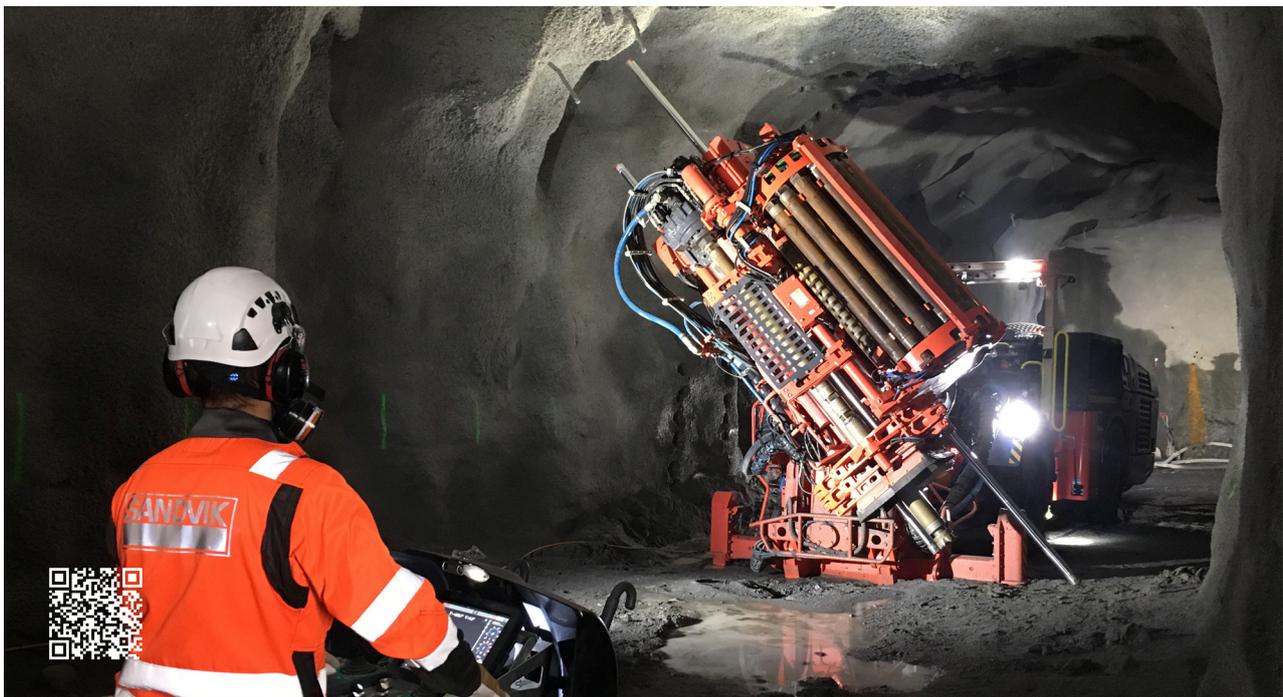
### KEY FEATURES

Top drive	RH6250 with splined piston
Feed	CF706-F with fixed centralizer
Pipe carousel	PC225 (22 pipes)
Pipe diameter	$\text{Ø}3$ "- $5$ " (76 - 127 mm)
Pipe length	4' - 6' (1 220 - 1 830 mm)
Telescopic boom	ZR35 (620 mm extension)
Drift width in T-section	3 800 mm (minimum)
Parallel vertical drilling coverage	3 000 mm
Pivot point height	2 100 mm
Transport height	3 050 mm
Transport width	2 345 mm
Transport length	10 495 mm
Transport weight	30 000 kg (without rock tools)

### ROCK TOOLS

ITH hammer	Pipe $\text{Ø}$ (mm)	Hole $\text{Ø}$ (mm)	Hole $\text{Ø}$ (in)
3"	76 - 79	90 - 115	$3\frac{1}{2}$ - $4\frac{1}{8}$
4"	79 - 89	115 - 127	$4\frac{1}{2}$ - 5
5"	102 - 115	140 - 152	$5\frac{1}{2}$ - 6
6"	115 - 127	165 - 178	$6\frac{1}{2}$ - 8
8"	127	203 - 254	$8\frac{1}{2}$ - 10
12"	127	445*	$17\frac{1}{2}$
V-30	127	762*	30

\*) by reaming



1. SANDVIK DU412i - ITH LONGHOLE DRILL

## TOP DRIVE

Type of rotation head	RH6250 with splined piston
Working pressure	Up to 210 bar (rotation)
Maximum torque	5 730 Nm
Rotation speed	0 - 60 rpm
Weight	336 kg
Length with saver sub	760 mm

## FEED AND CAROUSEL

Type of feed	CF706-F
Type of pipe handler	PC225
Pipe length (standard)	6' (1 830 mm)
Retaining centralizer	CF10 fixed centralizer
Drill table pass through	267 mm
Feed force	70 kN
Feed and return speed	Up to 0.3 m/s
Rear stinger extension	2 183 mm
Front stinger extension	1 386 mm
Cuttings diverter	DV10
Set-off from stope face	400 mm
Hole distance from the wall	850 / 1 470 mm (hose/carousel side)

## FEED DIMENSIONS

Type	CF706 (standard)	CF705 (option)	CF704 (option)
Pipe length	6' (1 830 mm)	5' (1 525 mm)	4' (1 220 mm)
Total length	3 560 mm	3 255 mm	2 950 mm

## CAROUSEL CAPACITIES

Type	PC194 (option)	PC225 (standard)	PC334 (option)
Storage capacity	19 pipes	22 pipes	33 pipes
Pipe diameter	3" - 4" (76 - 102 mm)	3" - 5" (76 - 127 mm)	3" - 4" (76 - 102 mm)
Max. hole length (6')	34.3 m	40.0 m	60.1 m
Max. hole length (5')	28.7 m	33.3 m	50.0 m
Max. hole length (4')	22.9 m	26.5 m	40.0 m

## LONGHOLE BOOM

Telescopic boom	ZR35
Boom swing	± 44°
Boom tilt (back / forward)	30° / 20°
Feed roll-over	360°
Boom extension	620 mm
Feed travel	1 300 mm (for 6' pipes)
Parallel vertical drilling coverage	3 000 mm
Pivot point height	2 100 mm
Laser offset from drill center	3 150 mm

## HYDRAULIC SYSTEM

Powerpack	HPP755 (55 kW)
Filtration size (pressure / return)	20 μ / 10 μ
Oil tank volume	270 liters
Cooler for hydraulic oil	OA40 oil-to-air (40 kW)
Low oil level indication	Low oil level switch

## DRILLING CONTROL SYSTEM

Control system and platform	iSOLO / SICA
Control screen	12" full colour touch screen
Control panel	Portable offboard control panel and stand
Diagnostics system	Comprehensive and interactive
Integrated interface	For pipe handler controls

## AUTOMATION PACKAGE (SILVER)

Drilling control selection	Torque drilling or manual
One-hole automation	Drill to predefined depth (and uncoupling of pipes)
Feed and hole parallelism	Assisted
Measurement of angles	Boom tilt and drilling module rotation
Stinger control	Full time monitoring and re-pressurizing

## ELECTRIC SYSTEM

Standard voltages	380 - 690 V (50 or 60 Hz)
Total installed power	130 - 220 kW (depends on booster size)
Main switch gear	MSE 10
Allowed voltage fluctuation	± 10%
Current reducer unit	Standard
Starting method	Star-Delta for booster and DOL for powerpack
Automatic cable reel	TCR4CD with spooling system
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
Portable working lights	2 x 50 W (24 V) LED
Carrier positioning lights	2 x Laser type
Braking lights and blinkers	LED (24V)
Stair case service lights	LED (24V)
Parking lights	LED (24V)
Sealed AGM batteries	2 x 12 V (100 Ah)
Current reducer unit	Power factor > 0.95
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 V DC with battery back-up and management
IP-classification	Mains switchgear IP66 / Nema4X, junction boxes ≥ IP68

## AIR AND WATER SYSTEM

Onboard booster	20 m <sup>3</sup> /min at 28 bar from 6 bar inlet (60 Hz)
Booster electric motor	90 kW
Booster inlet pressure	4 - 7 bar
Water booster pump	WBPU (30 l/min at 45 bar)
Hammer lubrication system	HLU50 with oil level sensor
Lubrication metering capacity	0...5 liters / h
Lubrication tank capacity	45 liters
Water outlet (low pressure)	Front of the carrier
Compressor air outlet	Quick coupling for hand tools

## OPERATOR'S SAFETY CANOPY

Canopy certification	FOPS / ROPS (ISO3447 / 3471)
Cabin inside height	2 020 mm
Unit height in tramming	3 050 mm
Sound pressure level	Operator station 69 dB(A) EN 16228 / ISO4872 / ISO1120
Vibration level	According to EN 16228/ISO2631-1
Operator's seat	For drilling and tramming
Air conditioning system	EU6/7 filtering capacity
Cabin heating	During drilling and tramming
Cabin safety grill	For front window
Audio system	CD / MP3-player, radio and loudspeakers
Electrical outlets (16 A)	12 / 24 V (DC) and 110 / 230 V (AC)
Cabin boot washer	At cabin entrance
Tramming cameras	Front, side and rear

## CARRIER

Type of carrier	C400D (frame-steered)
Carrier articulation	± 40°
Rear axle oscillation	± 8°
Ground clearance	330 mm
Diesel engine	Cummins QSB4.5 (119 kW Tier3)
Exhaust catalyzer	Standard
Transmission	Hydrostatic
Drop box	Dana Spicer 305D
Axles	Dana 113 (front and rear)
Tires	14.00-24 PR28
Brakes (parking and emergency)	SAHR fail safe wet disc brakes
Brakes (service)	Hydraulic applied disc brake
Steering	By joystick
Tramming speed	Horizontal (0%): 12 km/h 8°=1:7=14%: 5.5 km/h
Powerpack tramming	For short distance (1 km/h) only
Gradeability / sideways tilt	Max. 15° (27 %) / 5° (9 %)
Carrier stabilization	2 x TJ40 telescopic jacks (front) 2 x SJ600 jacks (rear)
Fuel tank	150 liters
Oil tank filling pump	Electric
Hand held fire extinguisher	7.7 or 9 kg (type ABC)
Centralized greasing points	Standard
Tramming alarm	Standard
Hill holder	Standard
Levelling indicators	Spirit level/monitor indication
Knowledge Box™	Connectivity solution (TS2-535)
Colour scheme	Sandvik standard
Documentation	1 x Operator's manual 1 x Maintenance manual 1 x Technical manual (English only) 1 x Parts manual (English only) 2 x Toolman USB key

## OPTIONAL FEATURES AND PACKAGES

### Drilling system

*CF1306-S heavy hoist feed	With split centralizer
*PC194 carousel	For 19 pipes, Ø 3-4" (76 - 102 mm)
*PC334 carousel	For 33 pipes, Ø3-4" (76-102 mm)
*PA15 single axis pipe arm	Remove carousel
CS15 retaining centralizer	Split open (for CF706-F feed)
Conversion kit (with carousel)	From one pipe size to another
Conversion kit (without carousel)	From one pipe size to another
DV20 cuttings diverter	For uphole drilling
DV30 cuttings diverter	For V-30 uphole blind boring
Petol chain wrench on feed	To open hammers
Thread lubrication system	For use with carousel

### Hydraulic system

Vacuum pump	For hydraulic oil
Bypass oil filter	2µ

### Automation package (Platinum)\*\*

Data transfer (USB/WLAN)	Excluding drill plan software
Boom automatic positioning	To the next hole
Drill plan management	In the user interface (create, copy and edit)
DrillConnect mobile application	Connectivity through Knowledge box™ for easy data transfer to and from the rig

### Instrumentation

Access detector, or protector	Mandatory in Europe (TS2-211)
Spirit level angle indicators	3 pcs (on boom and feed)
Tele-remote drilling	LAN or wireless WLAN
Radio remote control	For tramping, boom and carrier jacks
Offboard camera (for cabin units)	On tripod with working lights, video display in the cabin

### Cleaning system

High pressure system with reel	Up to 180 bar (TS2-343)
Low pressure system	Up to 15 bar (TS2-343)

### Greasing system

Automatic system (Lincoln)	Carrier, boom and pipe handler
Manual system	Pump, reel and nozzle (TS2-463)

## OPTIONAL FEATURES AND PACKAGES

### Electric system

*Supply voltage option	1000 V with DOL starter
*Supply frequency option	60 Hz
Multivoltage Basic	380 - 440 / 690 V
Multivoltage Pro	380 - 440 / 690 / 1000 V
Dewatering pump outlet	Site voltage 380 - 690 V (7.5 kW)
	Site voltage 1 000 V (8 kW)
	Transformer supply 400 V (7.5 kW)
	For power cable (1-wire pilot)
Earth continuity control	VYK
Ground fault and overcurrent unit	Front jacks up and down
Indicator lights	For boom movement prevention switch
	2 x 50 W (24 V) LED
Extra working light	LED (24 V)
Amber flashing light	110 V (15 A, single-phase, 1.6 kW)
Outlet on carrier	230 V (16 A, single phase, 2 kW)
	CAT
Battery jump start	

### Air and water system

*KS1127 booster upgrade	27 m <sup>3</sup> /min at 28 bar from 6 bar inlet (110 kW / 50 Hz)
*KS1634 booster upgrade	34 m <sup>3</sup> /min at 28 bar from 6 bar inlet (160 kW / 50 Hz)

### Operator's safety cabin / canopy

Safety canopy with safety grill	FOPS / ROPS (ISO3447 / 3471) Height 3 145 mm / 2 945 mm
Safety grill lifting mechanism	For cabin

### Fire suppression system

Additional fire extinguisher	7.7 kg (Europe) or 9 kg (type ABC)
Automatic system	Sandvik Eclipse™ (TS2-461)
Manual or automatic system	ANSUL, 8 nozzles (TS2-460)

### Carrier

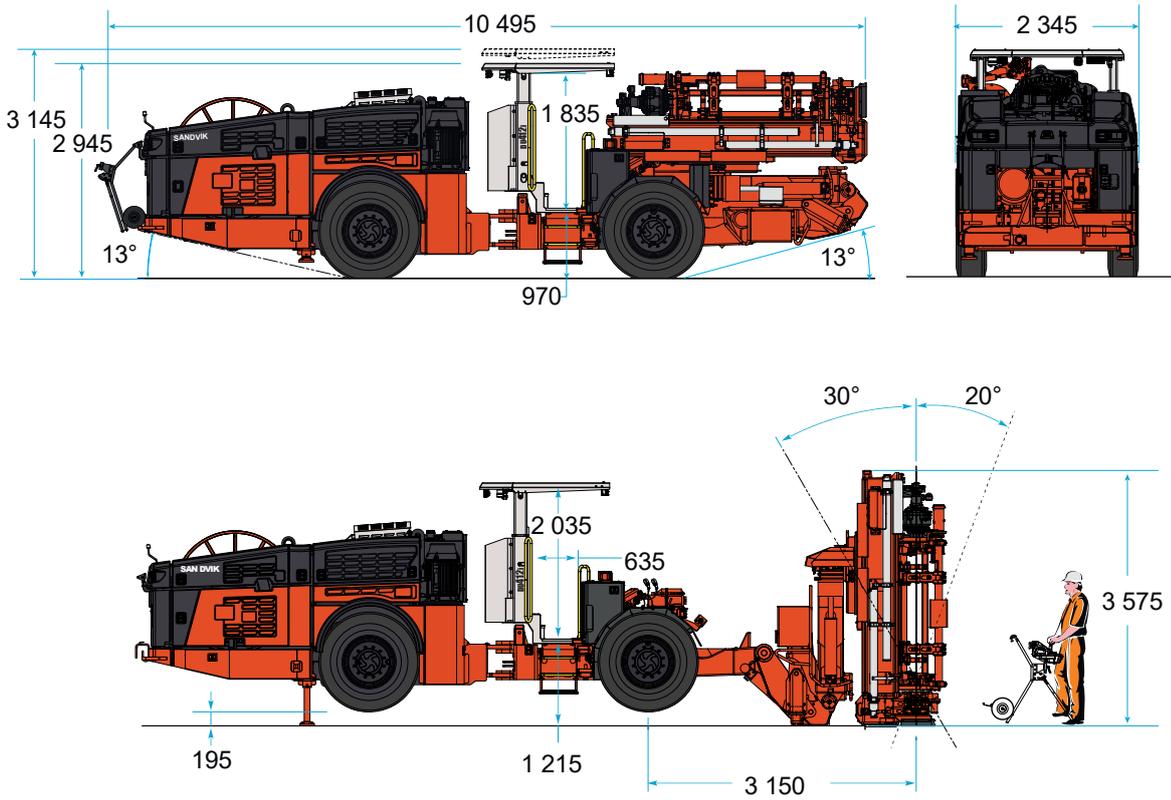
*Diesel engine	Cummins B4.5 (121 kW Stage V)
*Foam filled tires	4 pcs
Filling pump for hydraulic oil	Manual
Fast filling and evacuation system	Fuel, oil and coolants (Wiggins)
Wheel chocks and holders	One set on each side

### Extra items

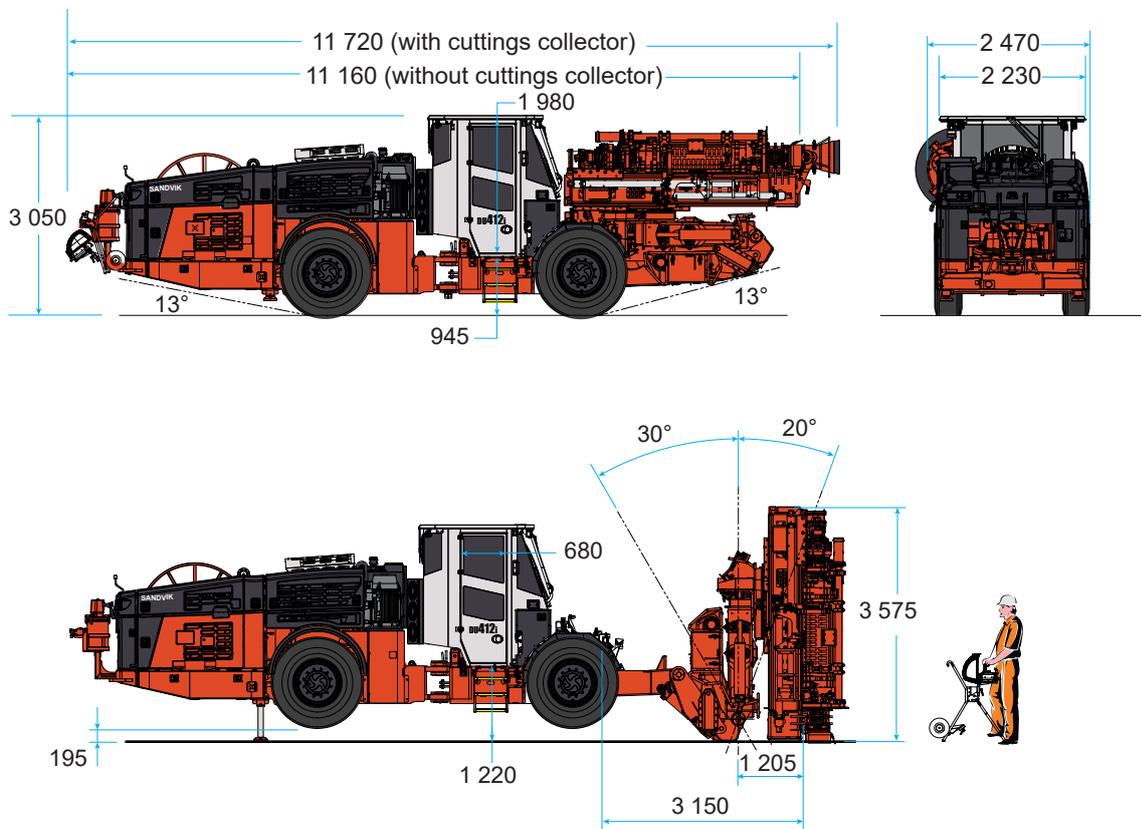
Spare offboard control panel	On trolley (including cable)
Spare wheel assembly	Standard or foam filled tires
Tools to specifications	For top drive, saver sub removal and the booster
Documentation	Extra manuals
*Packages: Environment	Temperature, environment, water and altitude specific
*Packages: Drilling	V-30 (pushing reaming up/down)

\*) replaces standard feature \*\*) features in addition to Silver

## MAIN DIMENSIONS FOR UNITS WITH CANOPY



## MAIN DIMENSIONS FOR UNITS WITH CABIN



All dimensions in mm  
Some drawings may show optional features

## PRODUCTION DRIFT DIMENSIONS

### MINIMUM PRODUCTION DRIFT SIZE\*

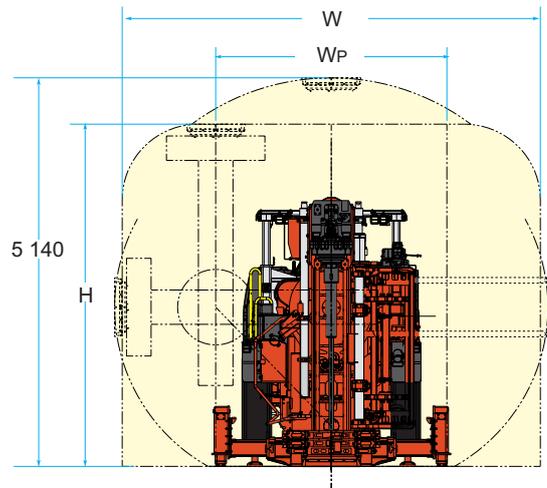
	H	W	WP
CF706-F (standard)	mm 3 760	3 760	2 020
CF705-F (option)	mm 3 455	3 455	1 720
CF704-F (option)	mm 3 150	3 150	1 420

\*) 100 mm clearance

### MAXIMUM PRODUCTION DRIFT SIZE\*\*

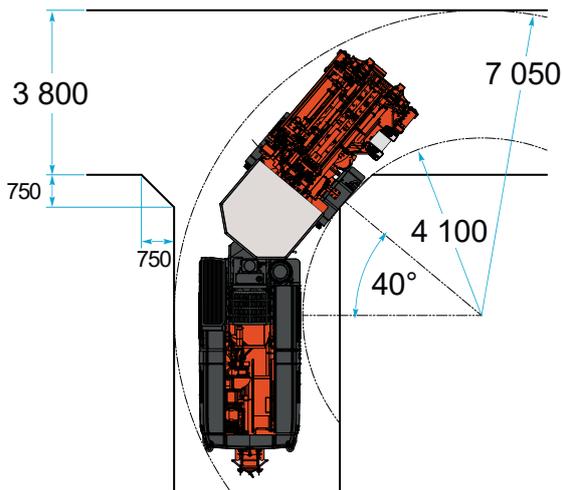
	H	W	WP
CF706-F (standard)	mm 4 525	5 490	3 000
CF705-F (option)	mm 4 225	5 190	3 000
CF704-F (option)	mm 3 925	4 890	3 000

\*\*) Rear stingers extended, front stingers retracted



All dimensions in mm

## DRIFT WIDTH IN T-SECTION



All dimensions in mm

Sandvik Mining and Rock Solutions reserves the right to make changes to the information on this data sheet without prior notification to users. Please contact a Sandvik representative for clarification on specifications and options.

ROCKTECHNOLOGY.SANDVIK

6. SANDVIK DU412i - ITH LONGHOLE DRILL