

DU431 ITH LONGHOLE DRILL

TECHNICAL SPECIFICATION

Sandvik DU431 is a highly versatile and compact ITH longhole, and also an extremely versatile exploratory Reverse Circulation (RC) drill, fitted with an onboard booster and designed for underground mining in 4 x 4 m or larger production and/or exploratory drifts. Available drilling pressures are 400 psi or 500 psi.

It is capable of drilling vertical and inclined fans, and single or parallel $\varnothing 89 - 203$ mm ($3\frac{1}{2}'' - 8''$) longholes, in multi-directions (including forward), up to 150 m in depth, using 3" to 6" in-the-hole hammers and $\varnothing 79 - 127$ mm ($3\frac{1}{8}'' - 5''$) pipes.

The DU431 is mounted on a 4-wheel drive frame-steered and diesel-powered carrier. It is equipped with the RH6230 top drive, CF706-F feed with fixed centralizer, CB24 telescopic boom, ERIS drilling control panel and operator's safety canopy for maximum productivity, safety and hole accuracy. The 360° feed rotation, the 210° feed pivot swing, and the wide boom swing and tilt angles make the unit suitable for most mining methods and various service support applications. The CANbus based drilling control system with the user-friendly operating interface and various drilling instruments ensure good control of the drilling operation.

The layout of the Aries carrier is designed for good stability, ensuring fast and safe tramming in mine drifts. All service points are accessible from ground level.

KEY FEATURES

Top drive	RH6230 with splined piston
Feed	CF706-F with fixed centralizer
Pipe arm	PA15 single axis
Pipe length	4' - 6' (1 220 - 1 830 mm)
Telescopic boom	CB24, 610 mm (24") extension
Minimum production drift size (H and W)	3 788 mm (149 $\frac{1}{4}$ "), 6' feed
Minimum RC drift size (H and W)	4 192 mm (165 $\frac{1}{8}$ "), 6' feed
Drift width in T-section	4 000 mm (157 $\frac{1}{2}$ "), minimum
Parallel vertical drilling coverage	4 310 mm (169 $\frac{1}{16}$ ")
Forward drilling coverage (H x W)	4 550 mm (179 $\frac{1}{8}$ ") x 6 840mm (269 $\frac{5}{16}$ ")
Transport height	2 636 mm (103 $\frac{3}{4}$ ")
Transport width	2 337 mm (92")
Transport length	11 849 mm (466 $\frac{1}{2}$ ")
Total weight	26 535 kg (58 500 lbs)

ROCK TOOLS AND HOLE DIAMETERS

ITH hammer	Pipe \varnothing (mm)	Hole \varnothing (mm)	Hole \varnothing (in)
3"	79	89 - 102	3 $\frac{1}{2}$ - 4
4"	79	115 - 127	4 $\frac{1}{2}$ - 5
5"	89	140 - 152	5 $\frac{1}{2}$ - 6
6"	102	165 - 203	6 $\frac{1}{2}$ - 8



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TOP DRIVE

Type of rotation head	RH6230 with splined piston
Working pressure (rotation)	Up to 207 bar (3 000 psi)
Rotation motors	2 x ME12
Maximum torque	5 730 Nm (4 226 lb-ft)
Rotation speed	0 - 60 rpm
Weight	336 kg (739 lbs)
Length with spline piston	760 mm (30"), incl. saver sub

FEED AND PIPE ARM

Type of feed	CF706-F
Retaining centralizer	CF10 fixed centralizer
Type of pipe handler	PA15 single axis pipe arm
Pipe length (standard)	1 830 mm (6')
Drill table pass through	222 mm (8 ¾")
Set-off from stope face	520 mm (20½")
Feed force	70 kN (15 700 lbs)
Feed and return speed	Up to 0.3 m/s (1ft/s)
Hole distance from the wall	860 mm (33½") hose loop side 1 190 mm (46¾") pipe arm side

PRODUCTION FEED DIMENSIONS

Type	CF706 (standard)	CF705 (option)	CF704 (option)
Pipe length	6' (1 830 mm)	5' (1 525 mm)	4' (1 220 mm)
Stinger extension (rear)	1 664 mm (65½")	1 511 mm (59½")	1 359 mm (53½")
Stinger extension (front)	803 mm (31½")	650 mm (25½")	498 mm (19½")
Total length	3 665 mm (144¾")	3 360 mm (132¼")	3 055 mm (120¼")

RC FEED DIMENSIONS

Type	CF706 (option)	CF705 (option)	CF704 (option)
Pipe length	6' (1 830 mm)	5' (1 525 mm)	4' (1 220 mm)
Stinger extension (rear)	1 676 mm (66")	1 524 mm (60")	1 372 mm (54")
Stinger extension (front)	803 mm (31½")	650 mm (25½")	498 mm (19½")
Total length	4 071 mm (160¼")	3 766 mm (148¼")	3 461 mm (136¼")

LONGHOLE BOOM

Telescopic boom	CB24
Boom swing	± 30°
Boom lift (up / down)	30° / 15°
Feed pivot swing	± 110°
Feed roll-over	360°
Boom extension	610 mm (24")
Feed travel	CF706 = 1 372 mm (54") CF705 = 1 067 mm (42") CF704 = 762 mm (30")
Parallel vertical drilling coverage	4 310 mm (169¹¹⁄₁₆")
Reach vertically	6 074 mm (239¾")
Forward drilling coverage	Width 6 840 mm (269¾") Height 4 550 mm (179¾")
Laser offset from drill center	1 218 mm (47¹⁵⁄₁₆")

HYDRAULIC SYSTEM

Powerpack	HP45 (45 kW)
Hydraulic pumps	1 x 100 cm³, 1 x 74 cm³ (60 Hz) 1 x 130 cm³, 1 x 90 cm³ (50 Hz)
Type of pump	Variable displacement axial piston
Filtration (pressure / return)	5µ / 10µ
Oil tank volume	265 liters (70 gallons)
Cooler for hydraulic oil	Shell and tube type oil-to-water cooler

DRILLING CONTROL SYSTEM

Type of control system	CAN (control area network)
Control panel	ERIS portable control panel
Control screen	12" (16:10) color screen
Stand for control panel	Tripod type with 15 m (50') cable
Drilling controls	Rotation controlled feed (Accra Feed) Depth and RPM monitoring
Diagnostic system	Comprehensive and interactive
Pipe handler control interface	Standard
Hole alignment system	Digital angle indicator and 2 x alignment laser

ELECTRIC SYSTEM

Standard voltages	380 - 690 V (50 or 60 Hz)
Total installed power	145 - 201 kW (depends on booster size)
Main switch gear	MSE
Allowed voltage fluctuation	± 10%
Starting method	Delta-Wye
Automatic cable reel	CRH with limit stop
Cable reel remote control	At operator station
Front and rear lights (combined working and driving)	6 x 50 W (24 V) LED
Indicator lights	LED (24V)
Parking lights	LED (24V)
Amber flashing light	LED (24V)
Sealed AGM batteries	2 x 12 V
Safety shutdowns and alarms	Low compressor oil pressure High discharge air pressure Low hydraulic oil level High hydraulic oil temperature Low and high mine air pressure High booster discharge temperature
Electric quality monitoring	Phase loss or reversal protection Motor overload protection Voltage, Amperage Earth continuity control

AIR AND WATER SYSTEM

Onboard booster	KS921
Booster capacity (7 bar inlet)	24 m³/min (850 scfm) at 28 bar (400 psi) for 50 Hz 22 m³/min (770 scfm) at 28 bar (400 psi) for 60 Hz
Type of booster	Screw
Booster electric motor	92 kW (125 hp)
Booster inlet pressure	4 - 7 bar (60 - 100 psi)
Water booster pump	Triplex piston pump
Water pump capacity	27 l/min at 48 bar (7 gpm at 700 psi)
Hammer lubrication system	HLU unit with oil level sensor
Lubrication metering capacity	0 - 4 liters / h (0 -1 gallons/h)
Lubrication tank capacity	32 liters (8½ gallons)
Water outlet (low pressure)	Rear of the carrier

OPERATOR'S SAFETY CANOPY

Canopy certification	FOPS / ROPS (ISO 3449 / 3471)
Type of canopy	Tramming
Unit height in tramming	2 726 mm (107 5/16")
Operator's seat	Crosswise mounted
Tramming cameras	Front and rear

CARRIER

Type of carrier	Aries (frame-steered)
Carrier articulation	± 35°
Rear axle oscillation	± 10°
Ground clearance	305 mm (12")
Diesel engine	M-B OM904LA (110 kW Tier3)
Exhaust catalyzer	Standard
Transmission	Dana T14 (hydrodynamic)
Axles	Dana 113 (front and rear)
Tires	12.00-20 ITL solid rubber
Brakes	SAHR fail safe wet disc brakes
Tramming speed	Horizontal (0%): 8 km/h 8°=1:7=14%: 5 km/h
Powerpack tramming	For short distance (1 km/h) only Remote tramming capable
Gradeability	20° (35 %)
Carrier hydraulic jacks	2 x MJ16-T telescopic jacks (front) 2 x MJ16 jacks (rear)
Fuel tank	114 liters
Oil tank filling pump	Electric
Centralized greasing points	Standard
Tramming alarm	Standard
Wheel chocks and holders	One on each side
Automatic fire suppression system	Ansul (8 nozzles)
Knowledge Box™	Connectivity solution (TS2-535)
Colour scheme	Sandvik standard
Documentation	2 x Operator's manual 2 x Maintenance manual 2 x Parts manual (in English only) 2 x USB key

OPTIONAL ITEMS

Drilling system

Remote thread lubrication	For use with RC pipe
*CF706-S standard feed	With split centralizer
*CF1306-S heavy hoist feed	With split centralizer
Conversion kit (with pipe arm)	From one pipe size to another
Petol chain wrench on feed	To open hammers with hydraulic cylinder
RC slip plate	Without splined piston breakout

Instrumentation system

Dewatering pump outlet	Site voltage 380 - 1 000 V (8 kW) Site voltage 1 000 V, step down transformer available
**ERIS teleremote	Includes 2 x remote cameras, 1 x display and 1 x ERIS panel with stand
Office teleremote	Includes access protector, 2 x remote cameras and 1 x office control station (chair and 3 displays)
**Office and ERIS teleremote	Includes access protector, 2 x remote cameras, 1 x display, 1 x ERIS panel with stand and 1 x office control station (chair and 3 displays)
Portable angle indicator	With laser alignment
Access protector	Laser gate

Cleaning system

High pressure washer with reel	Up to 48 bar (700 psi)
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Greasing systems

Automatic system	For carrier and boom (Lincoln)
Manual greasing unit	Pump, reel and nozzle

Electric system

*Voltage option	1 000 V (50 or 60 Hz) system
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Air booster options

*Booster upgrade to KS921 at 34 bar (500 psi)	20m ³ /min (720 scfm) at 60 Hz and 7 bar (100 psi) inlet or 17m ³ /min (600 scfm) at 50 Hz and 7 bar (100 psi) inlet
*Booster upgrade to KS1121 at 28 bar (400 psi)	30m ³ /min (1050 scfm) at 50 or 60 Hz and 7 bar (100 psi) inlet
*Booster upgrade to KS1121 at 34 bar (500 psi)	22m ³ /min (760 scfm) at 60 Hz and 6 bar (80 psi) inlet or 22m ³ /min (790 scfm) at 50 Hz and 7 bar (100 psi) inlet
*Booster upgrade to KS1501 at 28 bar (400 psi)	37m ³ /min (1300 scfm) at 50 or 60 Hz and 7 bar (100 psi) inlet
*Booster upgrade to KS1501 at 34 bar (500 psi)	28m ³ /min (1000 scfm) at 50 or 60 Hz and 7 bar (100 psi) inlet
Pressure reducing safety valve	For inlet pressure greater than 7 bar (100 psi)

Carrier

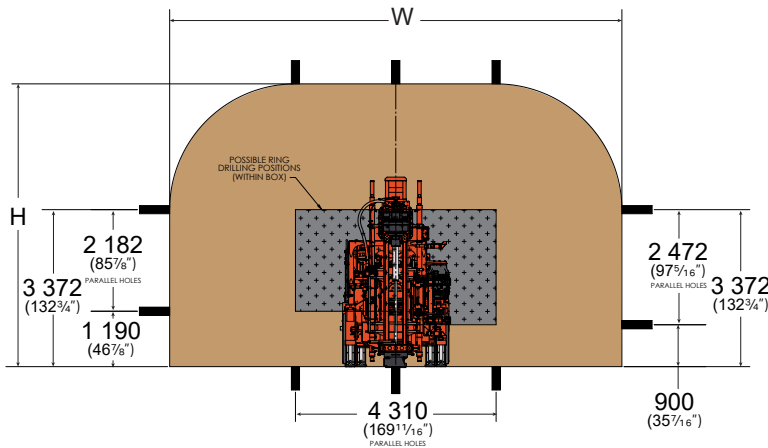
Fast filling and evacuation system	For fuel, hydraulic oil, engine oil, engine coolant, screw booster oil and transmission fluid (Wiggins)
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Extra items

Harsh water advanced	Upgraded cylinders and hydraulic oil cooler with enhanced corrosion protection
Drilling package: RC	Top drive upgrade (RC swivel) Hydraulic centralizers + RC slip plate Thread, forks and dual torque system Discharge diameter 76 mm Center tube ID 64 mm (maximum)
Spare ERIS control panel	With tripod stand and 15m (50ft) cable
Spare rotation head	RH6230 with splined piston
Spare wheel assembly	Rim and tire (for standard tires)
Tools to specifications	For top drive, saver sub removal
Documentation	Extra manuals (printed and USB key)

*) Replaces standard feature

**) Incl. one ERIS panel with stand in addition to the standard ERIS panel with stand


MINIMUM RC DRIFT SIZE (MM)**

	H	W
CF706-F (6') (option)	4 192 (165 1/8")	4 192 (165 1/8")
CF705-F (5') (option)	3 889 (153 1/8")	3 889 (153 1/8")
CF704-F (4') (option)	3 586 (141 3/8")	3 586 (141 3/8")

**) 100 mm (3 1/8") clearance

MAXIMUM DRIFT SIZE (MM)

	H	W
CF706-F (6') (standard)	6 074 (239 1/8")	9 714 (382 7/8")
CF705-F (5') (option)	5 770 (227 3/4")	9 106 (358 1/2")
CF704-F (4') (option)	5 465 (215 3/8")	8 496 (334 1/2")

MINIMUM PRODUCTION DRIFT SIZE (MM)**

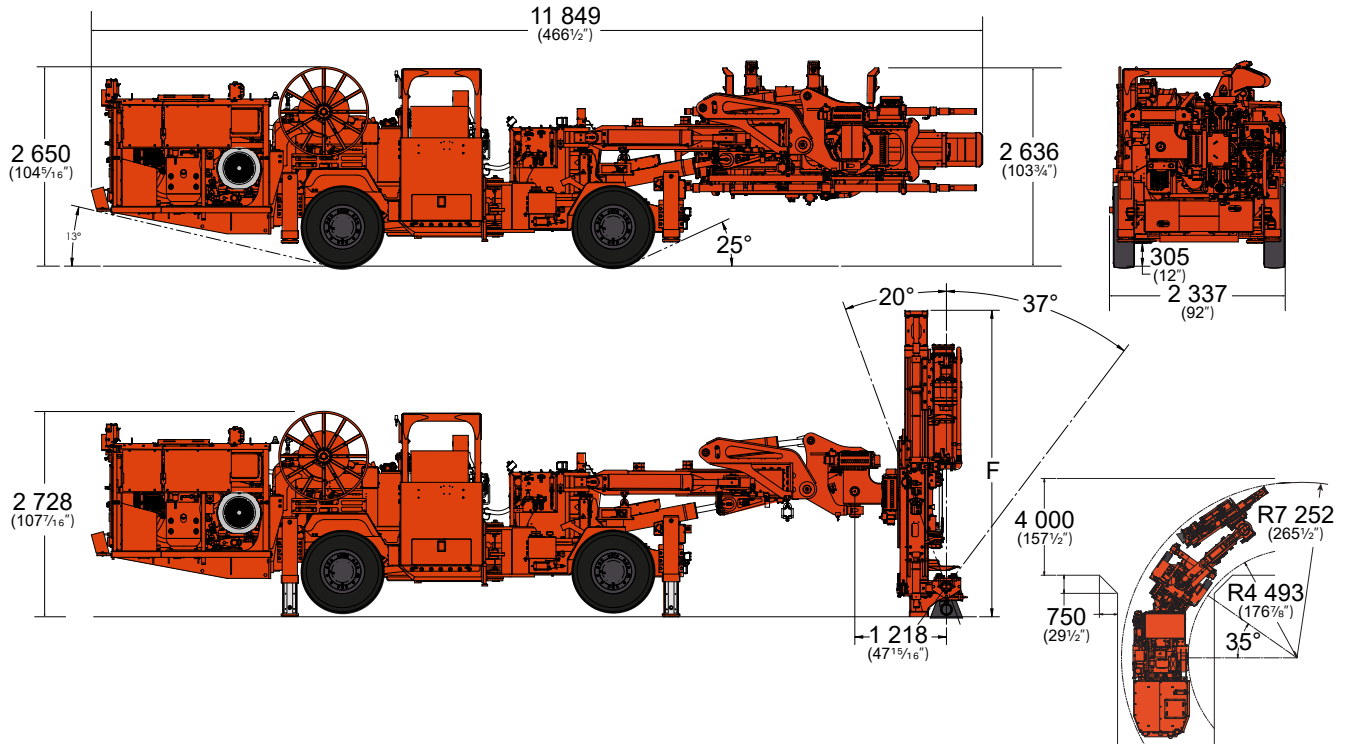
	H	W
CF706-F (6') (standard)	3 788 (149 1/4")	3 788 (149 1/4")
CF705-F (5') (option)	3 485 (137 3/8")	3 485 (137 3/8")
CF704-F (4') (option)	3 183 (125 5/8")	3 183 (125 5/8")

**) 100 mm (3 1/8") clearance

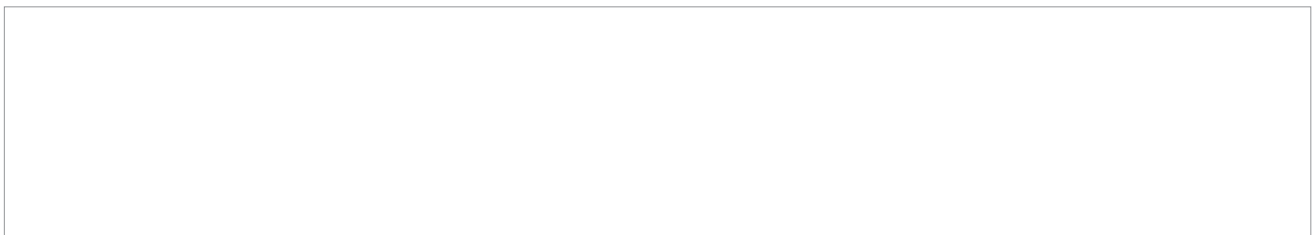
DRILLING MODULE HEIGHT (MM)**

	F
CF706-F (6') (standard)	4 071 (160 1/4")
CF705-F (5') (option)	3 766 (148 1/4")
CF704-F (4') (option)	3 461 (136 1/4")

*) Reduced height by 406 mm (16") for DTH drilling module



All dimensions in mm (in inches)



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4. SANDVIK DU431 - ITH LONGHOLE DRILL