

SANDVIK

DR416i

BIGGER. SMARTER. STRONGER.

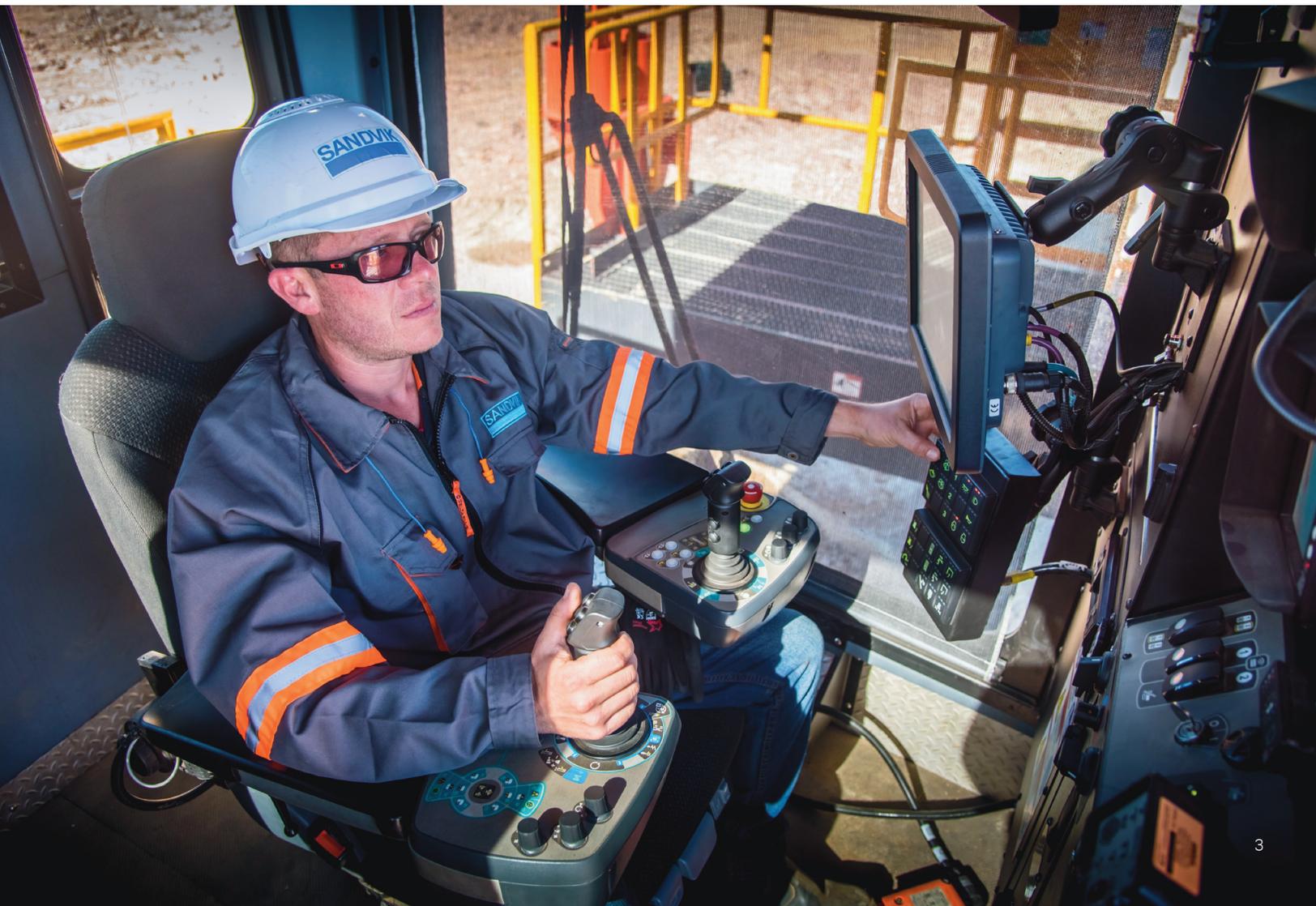




iSERIES FAMILY

The iSeries family of rotary blasthole drill rigs represents the next generation of surface drilling technology. Designed for the future, these automation capable drills are equipped to meet your needs today and in the future.

iSeries drill rigs simplify operation using automated functions while an intuitive user interface delivers a consistent operator experience across multiple drill models. The comprehensive Sandvik Intelligent Control System Architecture (SICA), a key component of our iSeries family, provides the operator with real-time feedback regarding the machine's performance and health, along with tools for drill planning, reporting and analysis ensuring quality and consistency hole-to-hole.



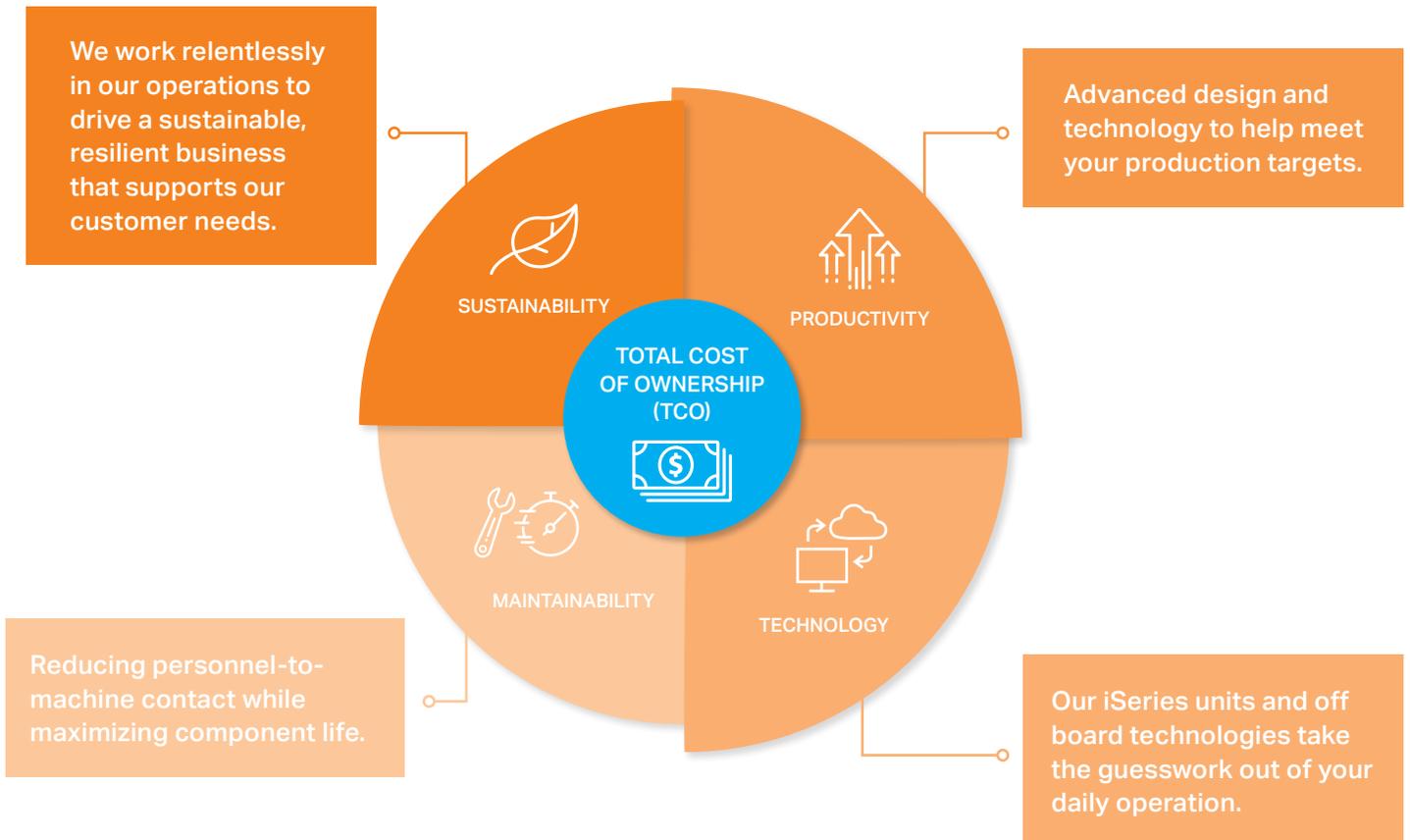
THE DR416i

BIGGER. SMARTER. STRONGER.

The DR416i blasthole drill delivers a single-pass capacity of 21m or 69ft, the longest single-pass mast in its class along with a maximum depth of 42.4 m/139 ft. across all recommended pipe diameters. Intended for large-diameter rotary drilling, (270–406 mm/10^{5/8} – 16 in) the DR416i combines power and intelligence, taking the guesswork out of daily operation and delivering a reliable high-yielding production environment.

The DR416i is AutoMine® ready providing functionality for both on-board and off-board automated needs. This scalable solution, from on-board automation that increases drilling efficiency to full autonomous operation, is designed to meet customer needs both now and in the future.

The four key principles that led to the innovative design efforts that brought the DR416i to life are:



MACHINE SPECIFICATIONS

DR416i

	METRIC	IMPERIAL
Hole diameter	270-406 mm	10 5/8 -16 in
Maximum hole depth	42.4 m	139 ft
First pass capability - single-pass	21 m	69 ft
FEED		
Maximum pulldown	534 kN	120,000 lbf
Weight on bit	600 kN	135,000 lbf
Feed rate up/down - single-pass	0 - 41 m/min	0 - 135 fpm
POWER GROUP		
Engine Options		
Cummins QSK50 (Non Tier 4)	1,118 kw	1,500 hp
COMPRESSOR OPTIONS		
Rotary Drilling	109 m ³ /min@5.5 bar	3,850 scfm @85psi
ROTATION		
Power	244 kW	327 hp
Speed		0 - 180 fpm

*Consult factory for options and alternate power group arrangements

KEY PRODUCT FEATURES

01

DRILLING CAPABILITY

Designed to perform to your specifications.

- 270 - 406mm (10 5/8 - 16in) Diameter Blasthole
- Single-Pass Capacity of 21m (69ft)
- Two-Pod Loader for Maximum Depth of 42.4m (139ft)

02

AUTOMATION

Increasing productivity through automated features.

- iDrill Performance package produces consistently clean, precision-drilled holes delivering improved fragmentation, downstream throughput, and asset utilization
- iDrill Navigation package accurately and safely positions the rig in the correct location to produce clean holes, improving blast accuracy, fragmentation and downstream throughput

03

OPERATOR ENVIRONMENT

Ensuring comfort and safety are top priority.

- FOPS Tested to meet ISO 3449 Level II
- Full Visibility of Drilling Operation
- Ergonomically-Designed Shock Mounted Cab
- Function Lockout Fail-Safe Programming
- Touchscreens for Ease of Operation

04

ACCESSIBILITY & MAINTENANCE

Improving serviceability through ease-of-access.

- Easy-Access 360° Walkways
- Hydraulic Actuated Main-Access Stairway*
- In-Cab Maintenance Features
- Open Design with Walkways for Safe, Easy Maintenance
- Filter Change Station with Collection Trough

05

COMPRESSOR MANAGEMENT

Our solution to the inherent inefficiencies of blasthole drilling.

- Reduces engine load and wear and tear on compressor and engine
- Reduces Fuel Consumption
- Extends Maintenance Intervals
- Reduces Greenhouse Gas Emissions

06

CUSTOMIZATION

Built with a wide range of needs in mind.

- Custom builds available for conditions ranging from extreme cold to intense heat.

**Denotes optional feature*

DR416i





iDRILL SCALABLE AUTOMATION PLATFORM

The scalable iDrill on-board automation platform provides automation options and digital services designed to speed up your production process and support your mine operations. You can use as much or as little technology as you need, knowing more is available when you need it.

AUTOMINE® (REMOTE OPERATION)

AUTONOMOUS

- Fully automated drilling cycle with hole-to-hole tramming



Fully autonomous drilling cycle and hole-to-hole tramming boosts productivity, lowers operating costs and enhances safety

CONTROL ROOM

- Operating from a central control center
- Fully automated drilling process for multiple drill rig operation via control room-based operating station



Single rig operator becomes a fleet supervisor, capable of controlling multiple highly-automated rigs from a control room ensuring high productivity with high level of safety

LINE-OF-SIGHT

- Operator in a movable drill station with line-of-sight view to drilling area
- A single operator able to control up to 3 rigs from the same station



Increased operator productivity
Keeps mine personnel out of the hazardous areas

iDRILL (ONBOARD OPERATION)

NAVIGATION

- High-precision drilling with TIM3D Navigation System
- Navigate based on drill plan with integrated drill to elevation capability
- Wireless plan transfer and basic reporting



Up to 23%* increased productivity compared to manual operation

Sandvik TIM3D drill navigation system guarantees precise drilling process from tramming and hole positioning to actual drilling

PERFORMANCE

- iSeries drill rig operated from cabin
- Automated drill functions (e.g. auto drill, auto level, etc) capable of being executed with the push of a button



Up to 15%* increased productivity compared to manual operation

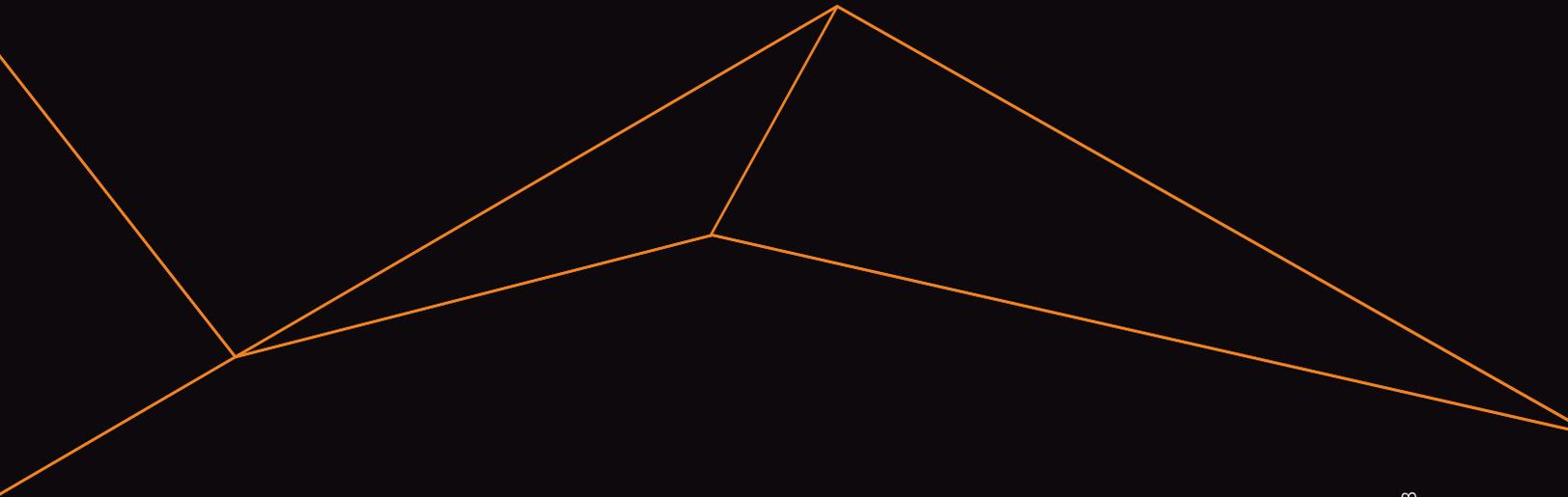
Improved drilling accuracy

Increased operational safety

*Result from field data. Results and calculations are to be considered as results reached under certain and controlled conditions. These results and calculations should not be treated as specifications and Sandvik does not guarantee, warrant or represent the outcome of results or calculations in any or all circumstances.

iDRILL PACKAGE FEATURES IN DETAIL

	FEATURE	DESCRIPTION	PERFORMANCE iDRILL	NAVIGATION iDRILL	LINE OF SIGHT AUTOMINE	CONTROL ROOM AUTOMINE	AUTONOMOUS AUTOMINE
ONBOARD AUTOMATION	Automated Mast Incline	Automate the rising/lowering of the mast in 5° increments to 20°.	✓	✓	✓	✓	✓
	Automated Levelling	Brings the drill rig to a stable, level position prior to drilling and unlevels after drilling completes.	✓	✓	✓	✓	✓
	Hole Collaring Automatics	Hole collaring algorithm reduces the chance of hole collapse during drilling.	✓	✓	✓	✓	✓
	Adaptive Auto Drill Functionality	Automatically adjusts drilling parameters during operation based on ground conditions.	✓	✓	✓	✓	✓
	Automated Pipe Add/Removal	Ability to automatically add and remove drill pipe until desired depth is reached.	✓	✓	✓	✓	✓
	Intelligent Hole Finishing Sequence	Automated functionality to clean the finished hole based on the depth and/or the final hole elevation.	✓	✓	✓	✓	✓
NAVIGATION	TIM3D High Precision Navigation	GPS based hole navigation system that assists the operator in positioning the drill bit to within 10 centimeters.		✓	✓	✓	✓
	Onboard/Wireless Pattern Creation	Capability to wirelessly transfer drill patterns, load drill patterns via USB, or create a pattern onboard using the current bit position.		✓	✓	✓	✓
	Delay Status Tracking*	Ability to track operator/equipment states/reasons throughout a shift based on an operations time utilization model.		✓	✓	✓	✓
	Driller's Notes Hole Logging*	Allows the operator to collect and store drilling information at specific depths while drilling.		✓	✓	✓	✓
	Measurement While Drilling*	Logging of drilling component measurements for future analysis while drilling.		✓	✓	✓	✓
	Onboard Diagnostics	Onboard diagnostics of alarms and system health parameters.		✓	✓	✓	✓
REMOTE AUTOMATION	AutoMine® Onboard Kit	Hardware components on the drill allow connectivity and access to the onboard controls and automation features.			✓	✓	✓
	AutoMine®: ACS Safety System	Safety system with physical safety key lock-out and remote E-stop.			✓	✓	✓
	AutoMine®: TeleControl	Control of all rig functions with same controls.			✓	✓	✓
	AutoMine®: InfoDrills	An overview of the key info from all rigs in the fleet and ability to switch control to a different drill (FleetView).			✓	✓	✓
	AutoMine®: InfoView	High-quality video and audio.			✓	✓	✓
	AutoMine®: InfoMap	Drill plan view to show location of all rigs and drill patterns with touch-screen move, zoom and rotate.			✓	✓	✓
	Obstacle Detection System (HW) Kit	Hardware components on the drill providing feedback of area around the drill to the control system for obstacle detection.				✓	✓
	AutoMine®: InfoGeoPhoto	Ability to load georeferenced photos as the background image for the drill map view with on/off toggling.				✓	✓
	AutoMine®: TeleGeofence	Predefined area where remote-operation allowed only inside the area. System prevents moving the rig outside of the area.				✓	✓
	AutoMine®: TeleDetect*	Sandvik Obstacle detection system provides improved awareness of obstacles for remote operator.				✓	✓
	AutoMine®: Autocycle	Autonomous drilling cycle where work proceeds through drilling cycle including hole-to-hole tramming without operator involvement.					✓
	AutoMine®: AutoPlanning	Plan the rig work sequence by selecting holes or adding waypoints. System defines the actual tramming path. Planning is enabled while rig is working.					✓
AutoMine®: AutoGeofence	Predefined area where autonomous tramming is allowed only inside the area. Proximity to area boundary stops a rig during auto tramming.					✓	
AutoMine®: AutoDetect*	Sandvik Obstacle detection system stops & interlocks tramming when there are obstacles in the STOP-zone.					✓	



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