



LEOPARD™ D1650i
TIME FOR A NEW LEADER



RELIABLE AND ROBUST MAIN COMPONENTS

For over 50 years, we have claimed widespread expertise in developing drill rigs to meet your expectations. With that expertise, we have engineered an entirely new high-pressure down-the-hole (DTH) drill rig to complete the offering in the upper hole size range: Leopard DI650i.

Built on proven Sandvik engineering solutions and components, Leopard DI650i offers solid productivity and advanced automation options for challenging rock conditions. We strive to maximize your success. The new Leopard DI650i helps in turning that success into a tangible reality.

“Leopard DI650i offers solid productivity and advanced automation options for challenging rock conditions.”

SAFETY

Safety is a fundamental value for us and an intrinsic characteristic of all our drill rigs. On top of the proactive work to improve operational safety, we turn requirements into technical solutions - as a result, the Leopard DI650i complies fully with the drill rig safety standard EN16228.





LEOPARD DI650i

TIME FOR A NEW LEADER

Leopard DI650i offers long-term productivity and superior stability; trustworthy and robust main components integrated with the latest technical solutions. The new Leopard has been designed for scalable automation, easy maintenance and efficient

operation. Our new iCab offers the most silent and ergonomic cabin in DTH drill rig. The cabin is spacious, silent and safe. Also, iCab is designed to provide clear and improved visibility to the drilling area.

TECHNICAL DATA

Recommended hole diameter	115 - 203 mm (4½" – 8")
Pipe diameter	89, 102, 114, 127 and 140 mm* (3½", 3 7/8", 4½", 5" and 5 ½"*)
DTH-hammer size	4", 5", 6"
Rotary head type	HTRH6, MRH6 (heavy duty option)
Maximum hole depth	53,6 m with up to 114 mm pipes
Engine type	Caterpillar C15 (Tier 3)
Engine output power	403 kW / 1800 rpm
Flushing air capacity	28.3 m ³ /min (1000 cfm), working pressure up to 30 bar (435 psi)
Operator cabin	iCab
Certificate	ROPS and FOPS
Transport Length	12.4 m (40.7 ft)
Transport Width	3.00 m (9.8 ft)
Transport Height	3.50 m (11.5 ft)
Weight approx.	25100 kg (55336 lb) **

* Available only with MRH6 rotary head.

** Dry weight

SCALABLE AUTOMATION ADAPTING TO YOUR NEEDS

LEOPARD DI650i INTELLIGENT AND SCALABLE

The scalable automation concept offers an intelligent drill rig platform where automation options and digital services can be selected to speed up your production process and support your mine operations. All the options can be also easily added and expanded afterwards according to future automation demands.



HIGH LEVEL AUTOMATION OPTIONS:

- AutoMine® Surface Drilling
 - Lite
 - Fleet

Off-board high-level automation systems.

INFORMATION MANAGEMENT:

- My Sandvik digital services
- Driller's Office
- Measuring while drilling (MWD)
- Wireless data transfer
- OptiMine® for surface drilling
- 3rd party system interfaces

Off-board automation options and digital services, which are communicating with the Leopard DI650i drill rig wirelessly.

ON-BOARD AUTOMATION OPTIONS:

- TIM3D drill navigation system
- Driller's Notes
- Full cycle one hole drilling automatics
- Feed auto-aligning and positioning
- Feed to tramming support assist
- iFlow Control system

Automation options that can be integrated on the intelligent drill rig platform.

INTELLIGENT LEOPARD DI650i DRILL RIG PLATFORM:

Sandvik SICA control system including advanced iTorque drilling control, compressor management and flushing control system. It also contains sophisticated fuel saving features and easy trouble-shooting.

High technology level drill rig, which can be extended with additional advanced automation options.

DATA IS THE KEY TO A PERFECT HOLE

In addition to its intelligent drilling control system, Leopard DI650i offers solutions with GPS based navigation and data collecting from basic to advanced systems.

TIMi INCLINATION SYSTEM

TIMi angle-measurement system for vertical holes and depth measurement is a standard for DI650i. The system can be expanded with additional options for inclined holes, GPS-aligned holes, feed auto-aligning and TIM3D readiness. All different options are operated with modern touch-screen display, including automation and troubleshooting features. You can choose the system that matches your current needs and easily upgrade it, if necessary.

TIM3D DRILL NAVIGATION SYSTEM

The highly advanced TIM3D drill navigation system will guide the operator in all stages of precision drilling process from tramming, hole positioning and feed alignment to actual drilling and reporting. The system enables a two-way wireless connection: transferring drill plans and surface models to the drill rig and hole-quality reports back for analyzing purposes.

The TIM3D drill navigation system is tailor-made for Sandvik and it has been successfully utilized by mines and quarries worldwide over the last decade. The high-resolution navigation system with accuracy within 10 centimeters is based on GNSS positioning signals and a correction signal – either through a base station or a mobile network (VRS).

TIM3D is using components tested and approved by Sandvik which ensures seamless functionality with the Leopard DI650i drill rig. The system is also fully integrated into the Sandvik SICA control system, meaning that there is no need for any extra displays. All measurements are done using robust integrated sensors built into the hydraulic cylinders. Satellite antennas are mounted only on the carrier, making them less exposed to vibration and dust.

TIM3D offers a solid base for many operator-assisting and fully autonomous machine automation options, such as feed auto-positioning and Automine® Surface Drilling remote operating systems.

Sandvik TIM3D drill navigation system

- | | |
|--|---|
| ✓ TIM3D drill navigation system (option) | Fast and accurate drilling navigation for improved drilling results. Accuracy within 10 centimeters/4 inches. Surface model and drilling plan can be used concurrently. |
| ✓ Driller's Notes (option) | Logging of measurement while drilling (MWD) data including operator's markings and comments. |
| ✓ SanRemo Premium (option) | Wireless transfer of drill plans, quality reports and MWD data. |
| ✓ Driller's Office (option) | Office software for fast and easy drill plan creation and MWD data analyzing. |

DRILLING APPLICATIONS

Excellent boom reach, collaring height, feed drilling angles combined with tramping power of 168 kN and excellent stability ensure the best possible drilling coverage area in difficult terrain. These features make the Leopard DI650i an essential choice for different production and pre-split DTH drilling applications.

Outstanding tramping force-weight ratio and stability.

Pre-splitting
Production drilling



Boom reach:
4188 mm



Collaring height:
714 mm



FEED SWING DRILLING ANGLES



FEED TILT DRILLING ANGLES



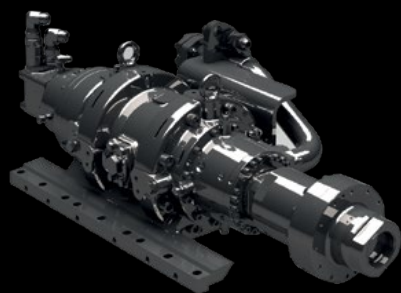
ROTATION HEAD OPTIONS

Rotation head is one of the key components in DTH drill rig that ensures the high availability and reliability of the drill rig. For Leopard DI650i there are two rotation head models available to fit your needs: a standard HTRH6 and a heavy-duty version MRH6 as an option. The HTRH6 is designed for 115–178 mm hole sizes and MRH6 for 127–203 mm hole sizes. Both are robust, extremely reliable and easy to maintain.

HTRH6

HTRH6 is designed for 4", 5" and 6" DTH hammers and 115-178 mm hole sizes. It is both modular and easy to maintain.

HTRH6 is divided into four main modules all designed to perform optimally. The drive module generates high torque required by 6" DTH drilling. The bearing module is optimized to carry high loads. The separate air inlet module makes the sealing maintenance easy and the separated floating spindle provides good serviceability. The modular design of HTRH6 makes it easy to maintain as all service points are easy to access.



TECHNICAL DATA	
Rotation head type	Sandvik HTRH6
Hole diameter	115-178 mm
Hammer size	4", 5" and 6"
Rotation torque (max.)	4300 Nm
Operating pressure	30 bar (Air inlet) 180 bar (rotation max.)
Drill tubes	89, 102, 114, 127 mm

MRH6

The MRH6 rotation head is optimized for 6" & 6.5" DTH hammers and 127-203 mm hole sizes. It is heavy in weight for extra power and extremely durable.

The rotation head is designed for heavy duty work and has especially robust design. The gearbox is designed to carry high loads and enhance reliability in heavy duty mining applications. Patented bearing pretention mechanism eases bearing service and enhances durability. A separate floating spindle provides good serviceability. The carriage is also separated for quick replacement and maintenance.



TECHNICAL DATA	
Rotation head type	Sandvik MRH6
Hole diameter	127 - 203 mm
Hammer size	5", 6" and 6,5"
Rotation torque (max.)	5 800 Nm
Operating pressure	30 bar (Air inlet) 200 bar (rotation max.)
Drill tubes	102, 114, 127, 140 mm



DRILL FASTER AND SUCCEED HARDER

Built on our proven i-series intelligent drill rig platform and our scalable automation design the Leopard DI650i is the perfect match for our RH560 6" DTH hammer, making it uniquely productive while keeping fuel consumption and operating costs to a minimum.

The all-new RH560 hammer helps you to drill faster because of its improved air cycle. Less air is required, making the penetration rate higher. RH560 is your reliable and powerful drilling companion with proven Sandvik technology.

ROTATION UNIT ADAPTER

D: 89 mm (3 1/2") L: 300 mm
Male thread: M80*3
Female thread: API 2 3/8"
52-089-11516555



DRILL PIPE

D: 89 mm (3 1/2") L: 6000 mm
Thread type: API 2 3/8"
6,3 mm thick: 52-089-10505952
8,8 mm thick: 52-089-10671706



RH560g 4"

Top Sub thread: API 2 3/8"
32-5645-GTA-16S



560-4 SHANK BITS

42-4HFA115-S48. 115 mm FF XT48
42-4HFB127-S48. 127 mm FF XT48

ROTATION UNIT ADAPTER

D: 114 mm (4 1/2") L: 300 mm
Male thread: M80*3
Female thread: API 3 1/2"
52-114-11505151



DRILL PIPE

D: 114 mm (4 1/2") L: 6000 mm
Thread type: API 3 1/2"
6,3 mm thick: 52-114-10505147
8,8 mm thick: 52-114-102072



RH460g 5"

Top Sub thread: API 3 1/2"
32-4655-GQA-04C



QL50 SHANK BITS

42-5019146-S48. 146 mm CC XT48
42-502D152-S48. 152 mm FF XT48

RH560g 6"

Top Sub thread: API 3 1/2"
32-5665-GQA-04C



560-6 SHANK BITS

42-632E165-S48. 165mm FF XT48
42-63DE172-S48. 172mm CC XT48

ROTATION UNIT ADAPTER

D: 127 mm (5") L: 300 mm
Male thread: M80*3
Female thread: API 3 1/2"
52-127-11516261



DRILL PIPE

D: 127 mm (5") L: 6000 mm
Thread type: API 3 1/2"
6,3 mm thick: 52-127-10505190



RH560g 6"

Top Sub thread: API 3 1/2"
32-5665-GQA-04C



560-6 SHANK BITS

42-632E165-S48. 165 mm FF XT48
42-63DE172-S48. 172 mm CC XT48

ALL LENGTHS ARE SHOULDER TO SHOULDER MEASURE



ENJOY THE SILENCE IN NEW iCAB CABIN

New iCab cabin offers the best driller experience with excellent visibility to the drilling area. iCab is FOPS & ROPS certified with HEPA and optional HEPA H13 filter. It is also the most silent and ergonomic cabin in DTH drill rigs. All machine information is seamlessly integrated on one touch display. There is also room for the trainer or service technician behind the operator seat.

Significantly low
noise level – **78 dB**
during drilling

Control system

- | | | |
|-------------------------------------|--|--|
| <input checked="" type="checkbox"/> | User interface | Touchscreen, all parameters can be adjusted from cabin. |
| <input checked="" type="checkbox"/> | Sandvik iTorque | Drilling control system, different drilling recipes for different rock conditions. |
| <input checked="" type="checkbox"/> | Troubleshooting functions | Easy to use flow chart type of troubleshooting features for all system functions. |
| <input checked="" type="checkbox"/> | Full cycle one hole drilling automatics (option) | Automatic drilling to preset depth, coupling and uncoupling automatics. |
| <input checked="" type="checkbox"/> | Sandvik iFlow (option) | Flow control ensures maximum drilling performance in difficult rock conditions. |
| <input checked="" type="checkbox"/> | Automatic aligning and positioning (option) | Faster and more accurate hole to hole setup. |

SERVICEABILITY TAKEN TO THE NEXT LEVEL

The new Leopard DI650i offers easy ground level access to every daily maintenance and service points. This feature maximizes uptime and provides safer working environment for the service personnel.

DAILY CHECKS FROM THE GROUND LEVEL



