LEOPARD DI SERIES
BUILT TO PERFORM

SANDVIK

Ver 1.0

LEOPARD DI550 APPLICATIONS

- PRODUCTION DRILLING
- QUARRY AND MINE DEVELOPMENT
- PRE-SPLITTING & DE-WATERING

LEOPARD DI SERIES
PRODUCT MODELS

	Leopard DI450		Leopard DI550		Leopard DI560	
Recommended Hole-dia	90 - 130 mm 3½" – 5⅛"		90 - 165 mm 3½" – 6½"		90 - 165 mm 3½" – 6½"	
Tube diameters	76, 89, 102 (7 + 1) 3", 3 ½", 4" (7 + 1)		76, 89, 102 (7 + 1) and 114 mm (5 + 1) 3", 3 ½", 4" (7 + 1) and 4 ½" (5 + 1)		76, 89, 102 (7 + 1) and 114 mm (5 + 1) 3", 3 ½", 4" (7 + 1) and 4 ½" (5 + 1)	
DTH hammer and flushing air capacity **24 bar**	3", 4" RH510 DTH Hammer 4" RH460 DTH Hammer 18 m³/min at 24 bar 636 cfm at 348 psi		3", 4", 5", (6") RH510 DTH Hammer 4", 5", (6") RH460 DTH Hammer 24,4 m³ / min, 24 bar 862 cfm at 348 PSI		3", 4", 5" RH510 DTH Hammer 4", 5"" RH460 DTH Hammer 24,4 m³ / min, 24 bar 862 cfm at 348 PSI	
DTH hammer and flushing air capacity **30 bar**					4" DTH HP Hammer 21,6 m³ / min, 30 bar 762 cfm at 435 PSI	
Engine type	Tier 3 Caterpillar C9 261 kW / 1800 rpm 350 hp / 1800 rpm	Tier 4 Final Caterpillar C9.3 261 kW / 1800 rpm 350 hp / 1800 rpm	Tier 3 Caterpillar C13 328 kW / 1800 rpm 440 hp / 1800 rpm	Tier 4 Caterpillar C13 328 kW / 1800 rpm 440 hp / 1800 rpm	Tier 3 Caterpillar C13 328 kW / 1800 rpm 440 hp / 1800 rpm	Tier 4 Caterpillar C13 328 kW / 1800 rpm 440 hp / 1800 rpm

LEOPARD DI SERIES
MADE TO MATCH YOUR NEED

LEOPARD DI450

- PERFECT MATCH FOR 4” DTH HAMMER
- LOW FUEL CONSUMPTION

LEOPARD DI550

- PERFECT MATCH FOR 5” DTH HAMMER
- HIGH EFFICIENCY

LEOPARD DI560

- PERFECT MATCH FOR 4” HP DTH HAMMER
- HIGH PRODUCTIVITY
- VERSATILITY

SANDVIK

SEAMLESS
CO- OPERATION OF MAN AND MACHINE

LOW TOTAL OPERATION COSTS

UNSPARING IN PRODUCTION

RELIABILITY AND VERSATILITY

HOW HOLE NAVIGATION CAN HELP TO IMPROVE MY DRILLING PROCESS?

CUSTOMER REALITY:

HOW MUCH MONEY CAN BE SAVED, IF AVERAGE ALIGNMENT AND DEPTH ERROR IS MINIMIZED ?

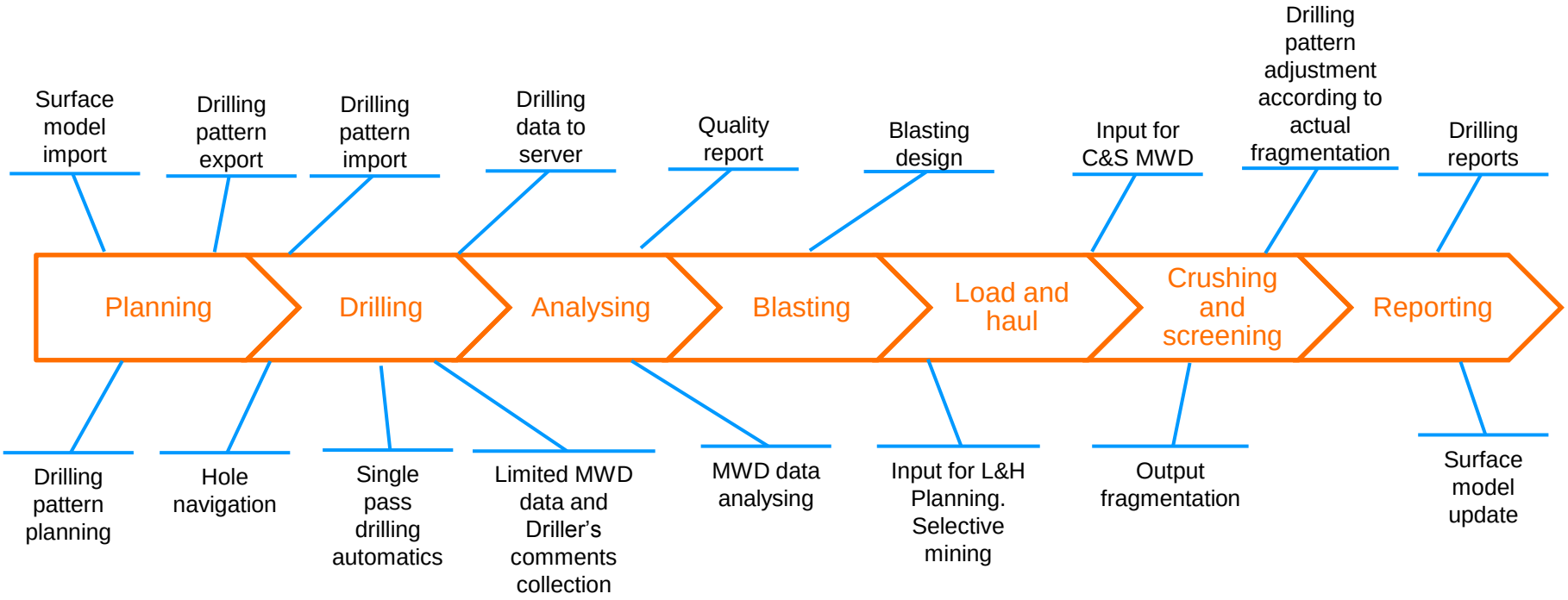
OUR SOLUTION:

SAVE UP TO

0,27 EUR

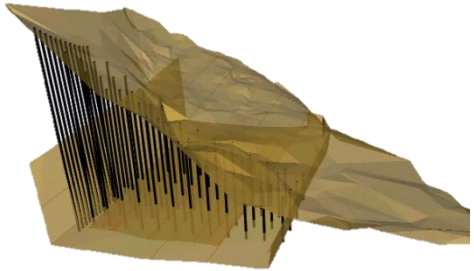
PER EVERY EXCAVATED CUBIC METER (m^3) USING TIM3D NAVIGATION.

DIGITALIZE YOUR EXCAVATION PROCESS



Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

- SURFACE MODEL OF JOB SITE CAN BE IMPORTED AS A FILE OR AS GPS COORDINATE POINTS TO DRILLER'S OFFICE –PLANNER DESIGNED BY SANDVIK.
- HOLES CAN BE DESIGNED AS A BIG GROUP OR INDIVIDUALLY. EDITING TOOLS MAKE IT POSSIBLE TO DESIGN EACH HOLE INDIVIDUALLY
- WHEN PATTERN IS READY IT CAN BE SENT TO DRILL RIG WIRELESLY BY USING SANREMO PREMIUM SERVICE.



Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

HIGH PRODUCTIVITY

- ROBUST AND STRONG DESIGN MEETS YOUR EXPECTATION EVEN IN THE MOST DIFFICULT DRILLING CONDITIONS.
- POWERFUL ENGINE AND COMPRESSOR ENSURES CONTINUOUS AND HIGH PRODUCTIVITY IN MINING AND QUARRY APPLICATIONS.
- ELECTRIC ANTI-JAMMING CONTROL SYSTEM INCLUDING FEED-EASE FUNCTION IS BASED ON ROTATION PRESSURE MONITORING TO MINIMIZE DRILLING DISTURBANCES.

HIGH PRODUCTIVITY

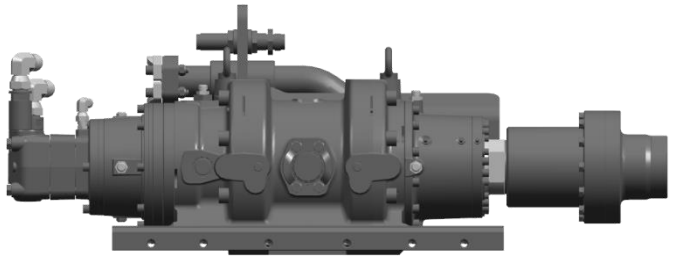
- LEOPARD DI560 HELDS EXTREMELY CLEVER MACHINE DESING PROVIDING OUTSTANDING VERSATILITY AND MULTI-FUNTIONALITY FOR ALL APPLICATIONS AND ENVIRONMENTS
  - WHEN USING 5” DTH HAMMER COMPRESSOR AIR VOLUME CAN BE SET TO LEVEL OF 24,5M³/MIN AND AIR PRESSURE TO 24 BAR.
  - *WHEN USING 4”HIGH PRESSURE DTH HAMMER COMPRESSOR AIR PRESSURE CAN BE INCREASED UP T0 30 BAR.
  - FOR PRODUCTION, PRE-SPLITTING, DE-WATERING, DEVELOPMENT

HIGH PRODUCTIVITY

- HEAVY DUTY ROTARY HEAD DOES NOT GET STUCK
  - ROTATION TORQUE EVEN UP TO 4300Nm
- FULLY AUTOMATIC ROCK SAMPLING DEVICE
  - SAMPLING DEVICE CAN BE OPERATED FROM CABIN
- IMPROVED ENTIRE MACHINE RELIABILITY
- EASE OF MAINTENANCE INCREASES PRODUCTION TIME AND MAXIMIZES MACHINE AVAILABILITY.

ROTARY HEAD HTRH6.0

- *HEAVY DUTY MODULAR DESIGN*
  - *SPHERICAL ROLLER THRUST BEARINGS*
  - *SEPARATE FLOATING MODULE*
  - *TORQUE, 4300Nm*



PERFECT MATCH
LEOPARD DI SERIES AND HAMMER

CUSTOMER REALITY:

Fuel cost is around 32 % of total ownership costs in Down The Hole drilling.

OUR SOLUTION:

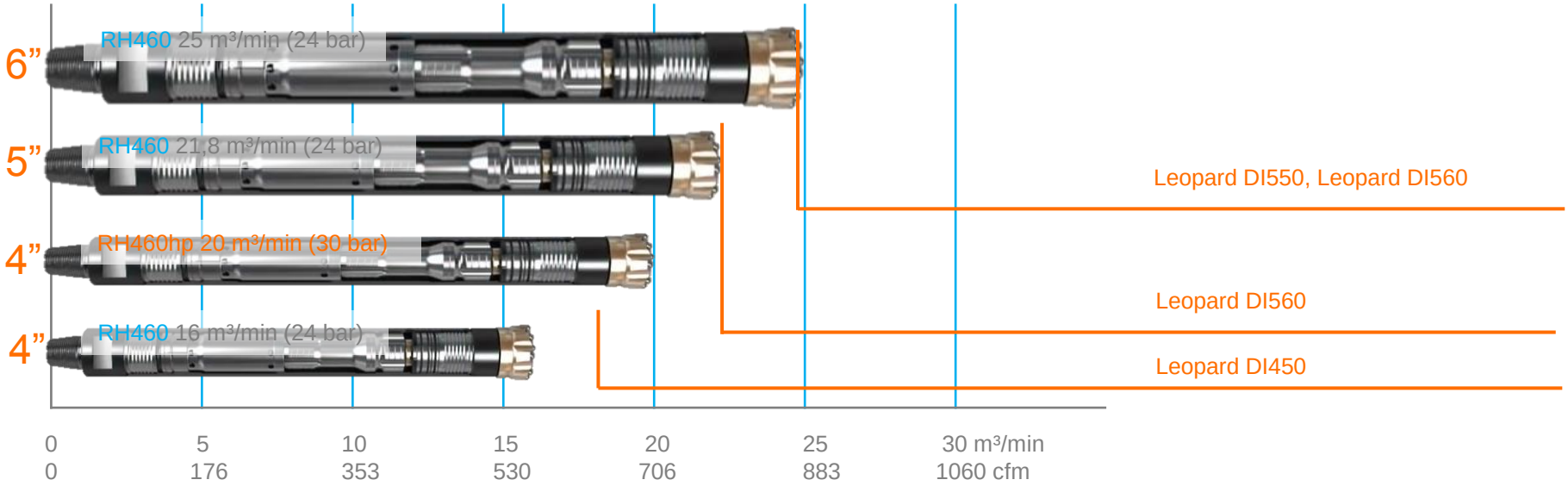
The perfect match of machine and hammer size makes outstanding combination of low consumption and high productivity.

LOW TOTAL OPERATION COSTS – FUEL EFFICIENCY

- PERFECTLY MATCHED COMPRESSOR CAPACITY WITH HIGH PRODUCTIVE DTH HAMMER ASSORTMENT DESIGNED BY SANDVIK OFFERS LOWEST POSSIBLE FUEL CONSUMPTION PER DRILLED METER.
- INTELLIGENT COMPRESSOR MANAGEMENT AND NEW HYDRAULIC CONTROLLED INTAKE VALVE.
  - PROVIDES FASTER CONTROL OVER COMPRESSOR
  - SYSTEM REDUCES TANK PRESSURE WHEN AIR PRESSURE IS NOT NEEDED .
- ADVANCED COOLING FAN SPEED CONTROL FOR IMPROVED FUEL EFFICIENCY.

” INTELLIGENT COMPRESSOR AIR PRESSURE CONTROL DURING IDLE SPEED FOR FUEL EFFICIENT OPERATIONS”

SANDVIK RH460 AND RH460HP DTH HAMMER



BAILING VELOCITY

	4" RH460	4" RH460hp	5" RH460	6" RH460
Pressure (bar)	24	30	24	24
Compressor air volume (m^3/min)	16,00	20,00	21,80	24,4
Hole diameter (mm)	127,00	127,00	152,00	165,00
Drill pipe diameter (mm)	87,00	76,00	102,00	114,00
Bailing velocity (m/sec)	39,66	40,9	36,43	36,39

BOOST YOUR BUSINESS

OUR SOLUTION:

SanRemo, remote monitoring system, collects non-stop performance data and drives improvement with accurate measures of machines and operator.

CUSTOMER REALITY:

How to improve utilization of my machine fleet ?

Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

SEAMLESS OPERATION

- AUTOMATION FOR SIMPLE AND SAFE FUNCTIONS
  - CLEVER CONTROL SYSTEM DRILLING PROVIDE AUTOMATIC DRILLING AID AND HELPS OPERATOR TO PERFORM ALWAYS
  - AUTOMATIC SINGLE PASS DRILLING
- SOPHISTICATED TRAMMING CONTROL TO ENSURE SMOOTH OPERATION IN ALL TYPE TERRAINS

Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

SEAMSLESS OPERATION

EXCELLENT VISIBILITY AND ERGONOMY

EFFICIENT AND PRODUCTIVE OPERATION, LOW NOISE LEVEL, VIBRATION FREE

ALIGINING SYSTEM (opt)

ACCURATE BOOM ALIGNING WITH INCLINED HOLES
ALIGNING SYTEM WITH GPS COMPASS SAVES TIME AND GUARANTEES PARALLEL DIRECTOIN

DRILLING AUTOMATICS

AUTO COLLARING, ROCK-DETECT, AUTO DRILL & STOP, TORQUE CONTROL

ELECTRIC OPERATED USER-INTERFACE

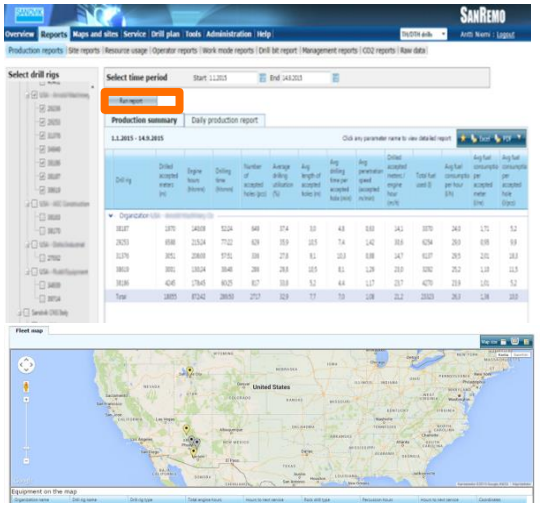
SIMPLE AND CLEAR GAUGES FOR VITAL PARAMETERS

AUTOMATIC REPORTING SYSTEM (opt)

FOLLOW PRODUCTION, MACHINCE AVAILABILITY, UTILIZATION, FUEL CONSUMPTION ON DAILY BASES.

SEAMSLESS OPERATION - SANREMO

- AUTOMATED DATA COLLECTION IN LIEU OF BY HAND
  - AVOIDS HUMAN ERROR (MORE ACCURATE DATA)
  - QUICKER, MORE EFFICIENT WAY OF MONITORING PROGRESS ALLOWING MORE TIME FOR DRILLING
- DRILL PERFORMANCE DATA WITH PRODUCTION AND UTILIZATION.
  - DATA TO DRIVE IMPROVEMENT WITH ACCURATE MEASURES ON MACHINES AND OPERATOR
- COMPARATIVE AND HISTORIC DATA TO IDENTIFY CHANGES IN DRILLING CONDITIONS
- IMPROVED MANAGEMENT OF OPERATORS

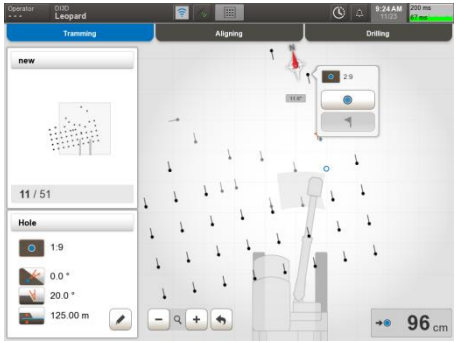


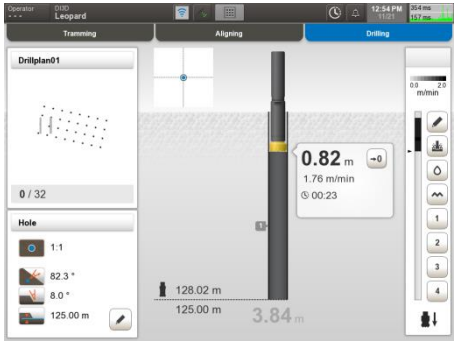
DRILLING ACCURACY

- FEED ALIGNMENT SYSTEM IS DESIGNED TO REDUCE SET-UP TIME BETWEEN HOLES AND ASSIST DRILLING IN DESIRED DIRECTION AND TO DEPTH TO AVOID HARMFUL, COSTLY AND UNSAFE DRILLING OPERATIONS.
- LEOPARD DI SERIES DRILL RIGS CAN BE EQUIPPED WITH LATEST TECHNILOGY ELECTRICAL ALIGNING SYSTEM WITH GPS COMPASS.
  - GPS COMPASS ALIGNING SYSTEM SAVES TIME AND GUARANTEES PARALLEL DIRECT OF HOLES WITH IMPROVED FRACTEMENTATION RESULT AND PROFITABILITY

TIM3D HOLE NAVIGATION

- OPERATOR SELECTS HOLE TO BE DRILLED FROM THE PATTERN. TIM3D HOLE NAVIGATION SYSTEM GUIDES OPERATOR TO CORRECT DRILLING SPOT
- EASY BOOM CONTROL ENSURE FAST FEED ALIGNING TO SET INCLINATION.
- DRILLER'S NOTES COLLECTS PENETRATION RATE DATA EACH HOLE DURING DRILLING. OPERATOR CAN REPORT OVERBURDEN, WATER, CAVITIES AND ADD OWN COMMENTS (i.e IN SAMPLING) THROUGH DRILLER'S NOTES.





PROVIDING VALUE OF YOUR DRILL WITHOUT COMPROMISING SAFETY OR PRODUCTIVITY

CUSTOMER REALITY:

PRODUTION CAN BE MORE THAN 8.500 TON PER DAY, IF SERVICE IS NOT AVAILABLE WHEN NEED COMES.

OUR SOLUTION:

SANDVIK PROVIDES SERVICES AND SERVICE AGREEMENTS FOR THROUGH OWN OR DEALER ORGANIZATIONS MORE THAN **80** IN COUNTRIES

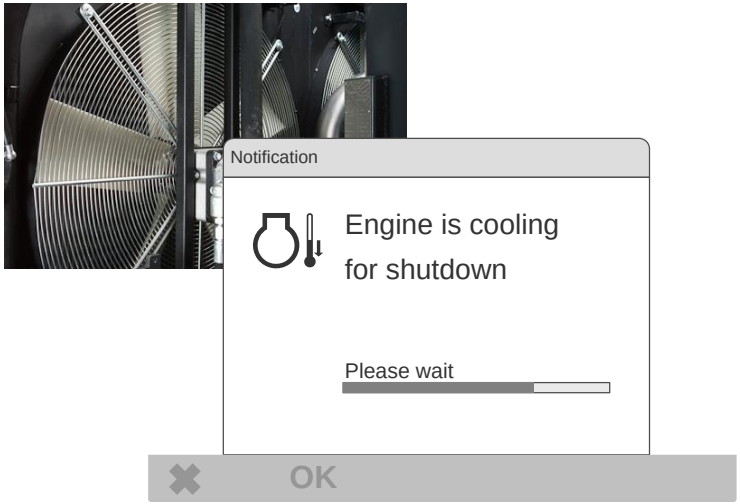
Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

LOW TOTAL OPERATION COSTS - MAINTENANCE

- THE SERVICE PORTFOLIO IS BASED ON TRADITIONAL LIFE-CYCLE, ENHANCED TECHNICAL AND BUSINESS SERVICES
  - TO IMPROVE THE OVERALL SAFETY SITUATION
  - SECURE COMPETENCE AND KNOWLEDGE FOR ALL OPERATIONS
  - INCREASE YOUR PRODUCTIVITY.
- SAVINGS WITH LONG SERVICE INTERVALS
  - EXTENDED ENGINE OIL CHANGE INTERVAL, 500 HOURS, FOR PANTERA DPI TIER 4 MODELS – REQUIRES CAT S.O.S OIL SAMPLING PROGRAM.
- EASE OF MAINTENANCE
  - SERVICE FRIENDLY LAYOUT AND CENTRALIZED OIL REMOVALS

LOW TOTAL OPERATION COSTS - RELIABILITY

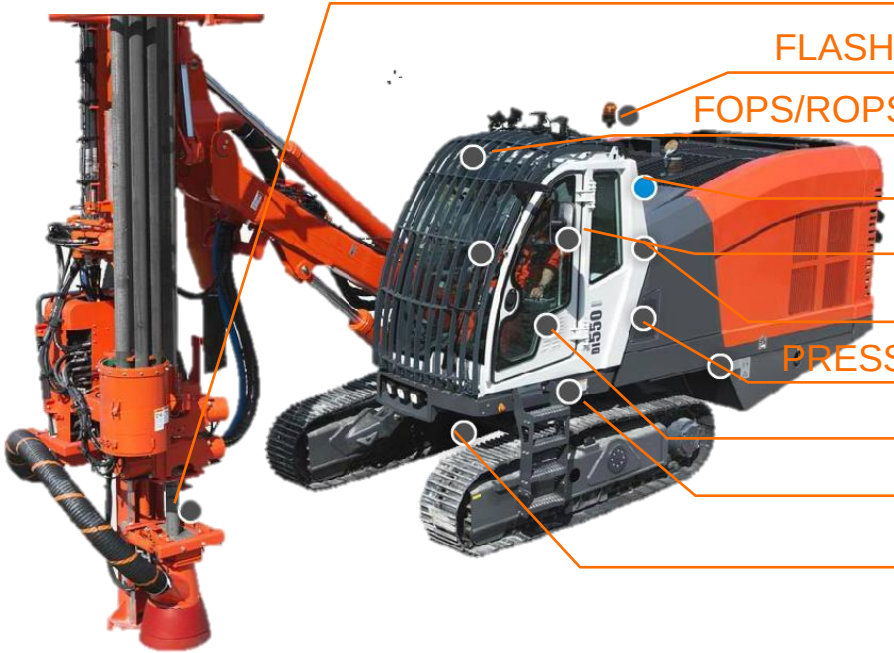
- AMBIENT TEMPERATURE CONTROLLED COMPRESSOR RUNNING TEMPERATURE – ALWAYS RIGHT TEMPERATURE LEVEL.
  - NO CONDENSATE WATER INTO COMPRESSOR OIL CIRCUIT
  - EXTENDED LIFETIME FOR SEALING AND LUBRICANT
  - INCREASED COMPRESSOR LIFETIME
- SECURE SHUT-DOWN FUNCTIONS PROTECTS ALL MAIN COMPONENTS AND INCREASES MACHINE LIFETIME.



SAFETY

- ALL SANDVIK DRILL RIGS HAVE BEEN DESIGNED TAKING INTO ACCOUNT HIGH SAFETY, HEALTH AND ENVIRONMENTAL ASPECTS FOR PERSONNEL, MACHINE AND ENTIRE DRILL AND BLAST PROCESS,

SAFETY



- SAFETY WIRE
- FLASHING BEACON AND 11 WORKING LIGHTS
- FOPS/ROPS CABIN, SAFETY DRILL, LOW dB LEVEL
- FIRE SUPPRESSION SYSTEM (opt)
- SAFETY LAMINATED WINDOWS
- CE CERTIFICATION
- PRESSURIZED CABIN WITH HIGH FILTRATION
- POWDER EXTINQUISHER
- CLIMBING LADDERS WITH LIGHT
- LOW CENTER OF GRAVITY

SANDVIK

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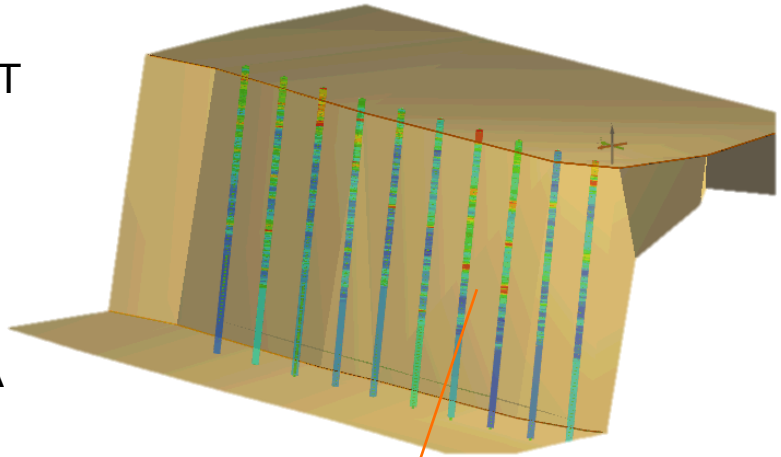
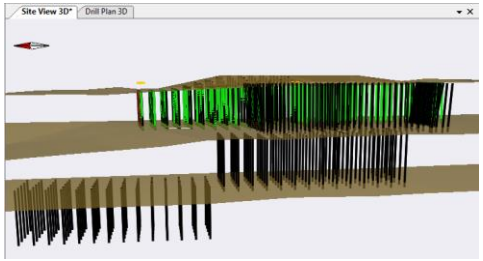
- PRODUCTION AND SERVICE DATA CAN BE SENT WIRELESSLY TO SANREMO SERVER.
- QUALITY REPORT PRESENTS THE DRILLING RESULT COMPARED TO THE PLAN
- PENETRATION RATE AND DRILLER'S COMMENTS (LIMITED MWD) CAN BE SEEN AS A GROUP OF HOLES OR HOLE BY HOLE.



" THE DRILLER'S NOTES OPTION HELPS TO INDENTIFY FRACTURES, VOIDS, SOFT AND HARD ZONES IN THE ROCK STRATA BY RECORDING PENETRATION RATE FOR FURTHER USE "

SANDVIK

- DRILLING GENERATES ACCURATE DATA FOR BLAST DESIGNING. DATA IS IN ELECTRONIC FORMAT AND CAN EASILY BE DISTRIBUTED TO EXTERNAL PARTIES. SYSTEMS LIKE TIM3D BENEFIT BLASTING BECAUSE HOLES ARE IN KNOWN LOCATION.
- COLLECTED DATA CAN BE USED AS INPUT TO PLAN LOADING AND HAULING ESPECIALLY WHEN SELECTIVE MINING IS USED.
- COLLECTED DRILLING DATA CAN PROVIDE INDICATIVE INFO FOR CRUSHING AND SCREENING. WHEN ROCK CONDITIONS ARE BETTER KNOWN BEFOREHAND ALSO FRAGMENTATION CAN BE MONITORED MORE DETAILED.



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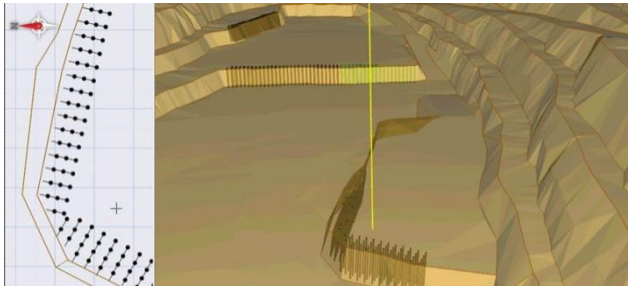
Planning | Drilling | Analysing | Blasting | Load and haul | Crushing and screening | Reporting

- EXTENSIVE AMOUNT OF EXCAVATION DATA CAN BE FILED FOR PLANNING NEXT BENCHES.
- BASED ON EXISTING DATA, SURFACE MODEL OF QUARRY / PIT CAN BE CORRECTED.



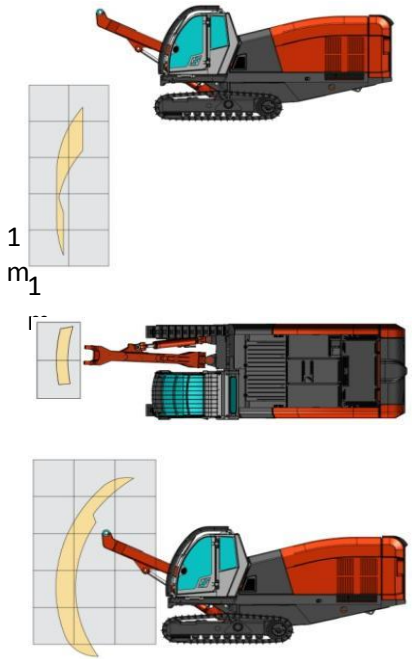
LEOPARD DI SERIES – OPTION LIST

SELECTION OF OPTIONS

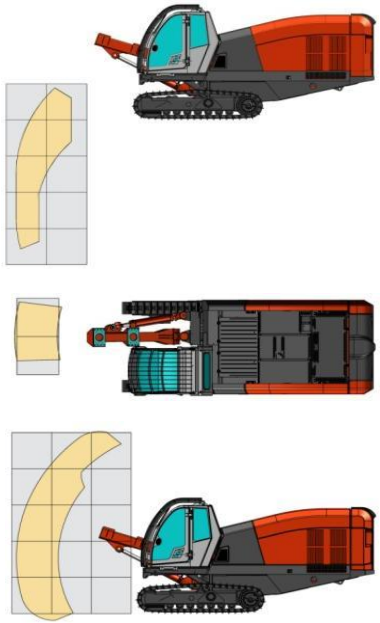
1. Additional tool box below cabin
2. Radio with CD-MP3 player
3. Reversing camera
4. Rock shield for lights and lower part of the window
5. Roller blinds for cabin windows
6. Vacuum cleaner for cabin
7. GPS aiming device for TIM and TIMi inclined holes
8. TIM 5200 for vertical holes
9. TIM 5300 for vertical holes and depth measuring
10. TIM 5600 for vertical and horizontal holes and depth measuring
11. TIM 6300 for inclined holes and depth measuring
12. TIM 6500 for inclined holes, depth measuring and laser level
13. TIM3D – hole navigation
14. DTH hammer service tool (requires radio remote control option)
15. Horizontal drilling kit
16. Kit for alternative pipes, each
17. Pipe winch (requires radio remote control option)
18. Thread greasing
19. Telescopic boom
20. Anti-freeze system for thread greasing
21. Central lubrication system Sandvik
22. Electric fuel filling pump
23. Electric hydraulic oil filling pump
24. Electric water filling pump
25. Fast fill connection for engine coolant, hydraulic and engine oil
26. Fire suppression system Sandvik, automatic
27. Guides for grousers
28. Hand-held led working light with accumulator
29. Hydraulic rear ground support
30. Hydraulic winch (requires radio remote control option)
31. Manual compressor oil filling pump
32. Pressure washer (with water injection option only)
33. Radio remote control (carrier, pipe winch and hammer service tool)
34. Single bar grouser plates
35. Towing hook
36. Xenon lights, 11 pcs
37. Disengagement clutch for compressor, manual
38. Ether starting aid for engine without ether bottle
39. Fuel powered engine heater, extra large
40. Fuel powered engine heater, large
41. Jump start device (high current el. socket)
42. Water injection system
43. Grinder Sandvik RG420H
44. Extra bit basket
45. Extra manuals, price will be added according to pricing sheet
46. First service kit for DI550

DRILLING COVERAGE
LEOPARD DI SERIES

Fixed boom, standard



Telescopic boom, *option*



“ Optional horizontal drilling feed support for extra stability for better holes”

“Lowest horizontal drilling height 0,6 m”

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