



# SANDVIK TH665B BATTERY ELECTRIC TRUCK





# RETHINK THE FUTURE OF MINING

## HALF A CENTURY OF EXPERIENCE COMBINED WITH INNOVATIVE EXPERTISE

TH665B battery electric truck from Sandvik is the largest battery powered dump truck made for underground mining conditions. It combines 50 years of experience developing underground mining equipment by Sandvik and the innovative Artisan™ battery pack and electric driveline. This combination of experience and proven solutions create our 3rd generation BEV technology. This dump truck is a game changer for any site in pursuit of a more sustainable and highly productive fleet.

## REPLACE OR REDESIGN? RETHINK

When designing the battery electric loaders and trucks, it was not enough to replace the diesel engine with a battery. This technology compelled us to rethink the whole machine. To best utilize the possibilities that the technology brings, this battery electric truck has been designed entirely around the Artisan™ battery pack and electric driveline. TH665B battery electric truck builds on its predecessor truck, TH550 battery electric truck, but now includes improved battery life along with a larger payload capacity.

## LESS HEAT, ZERO DIESEL EMISSIONS

TH665B battery electric truck utilizes today's cutting edge battery technology, the Lithium-Iron Phosphate chemistry (LiFePO4 or LFP). The fully battery powered truck produces no underground exhaust emissions and significantly less heat than traditional engines, supporting a mine operation in reaching sustainability targets, such as reduced CO<sub>2</sub> emissions. Battery-powered equipment also helps to reduce ventilation requirements, therefore reducing costs.

## HIGH-POWER ELECTRIC DRIVELINE

Since battery equipment power is not constrained by mine ventilation limitations, Sandvik 3rd generation BEVs use the most powerful electric motors available for underground use. The electric driveline delivers 630 kW (858 hp) of continuous power, allowing for high acceleration and fast ramp speeds for shorter cycle times.





# RETHINK THE EQUIPMENT, KEEP THE SAME MINE

## MINIMAL INFRASTRUCTURE

We completely redesigned the machine so it can work seamlessly in any mine with only a few changes. Thanks to AutoSwap, a patented self-swapping system for the Artisan™ battery pack, TH665B battery electric truck does not require any significant mine infrastructure such as overhead cranes or forklifts, which pose an increased safety hazard. The swapping system and mobile charging station can easily be set up in an unused passing bay or old re-mucking bay. When using AutoSwap to change the battery, the operator can remain in the cabin during the process.

## SHORT CYCLE TIMES

TH665B by Sandvik offers high speeds, thanks to the high-performance driveline. As there is no transmission or need to change gears, instant torque provides quick acceleration. Battery swaps that are required during long hauls uphill are done in about five minutes, the fastest battery swapping process on the market.



## REGENERATIVE BRAKING

Sandvik BEVs are designed with regenerative braking, which allows the battery to recharge during the braking process by converting mechanical energy into usable electric energy. TH665B battery electric truck uses the traction motor to decelerate and control speed going downhill. This energy is typically lost as heat through traditional friction brakes. With regenerative braking, the brakes are rarely used, contributing to a longer brake life.

## LFP CHEMISTRY

For safety and reliability in tough underground mining environments, TH665B battery electric truck utilizes the lithium-iron phosphate chemistry (LiFePO<sub>4</sub> or LFP). LFP has the most stable battery chemistry on the market and the lowest rate of heat production. It is designed to be reliable, corrosion resistant and to withstand overcharge, vibration, punctures and heavy impacts.



# FEATURES

## AUTOSWAP

TH665B battery electric truck is equipped with AutoSwap, a patented self-swapping system for the Artisan™ battery pack. Battery swapping is fast and easy. The process takes about five minutes and allows the operator to stay in the cabin during the process. With the purpose-designed battery, it will improve safety and productivity. AutoSwap also does not require any heavy mine infrastructure such as overhead cranes or forklifts and the charging bay is easy to relocate as operations advance for added flexibility.

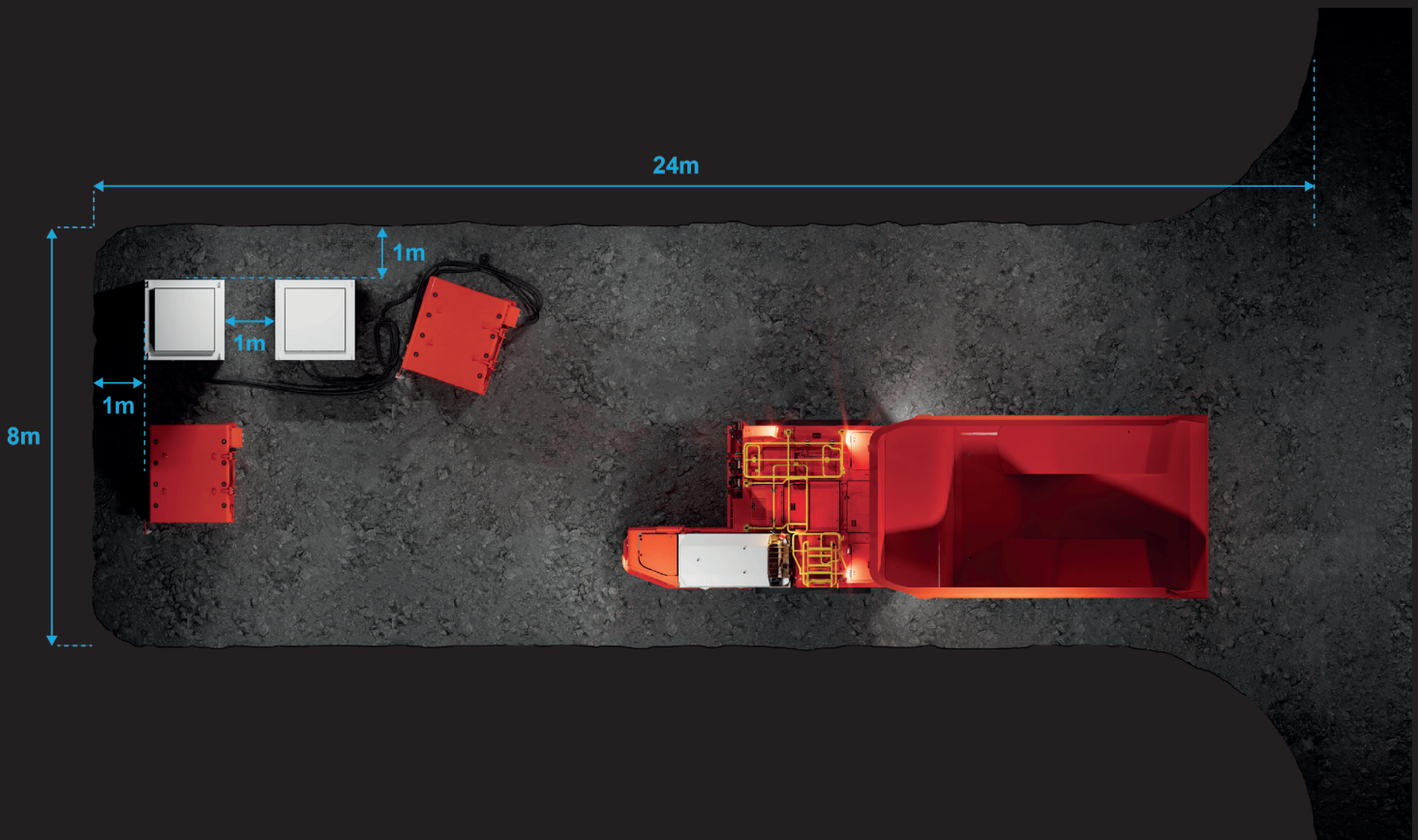
## 12" TOUCH SCREEN COLOR DISPLAY

The 12" color display with advanced touch screen functionality has all the needed information and alarms on one large display, giving the operator more time to keep eyes on the road. A dark background and graphics with clear symbols are designed for the underground environment to reduce eye fatigue. The Sandvik Intelligent Control system monitors and warns the operator before failures occur, preventing severe damage and potential loss of production.

## ROPS AND FOPS CERTIFIED

TH665B battery electric truck has a noise resistant cabin that is sealed and pressurized and uses dust resistant materials, has three-layer laminated safety glass windows, emergency exits, an illuminated cabin entrance with three-point contact handles and anti-slip steps. In addition, the cabin is mounted on oil dampened bushings to reduce whole body vibration. The cabin door includes a door lock and latch mechanism and a magnetic interlock switch which automatically applies brakes and inactivates box and steering when the door is opened.

**IMPROVED VISIBILITY** Adjustable high-power LED lights are standard configuration in every TH665B battery electric truck. All-around operator visibility can be further improved by selecting optional right-hand side and rear facing monitoring cameras. The air conditioning system is equipped with a heater as a standard, helping to keep windows free of mist and ice in cold conditions.





## SUPERIOR OPERATOR ENVIRONMENT

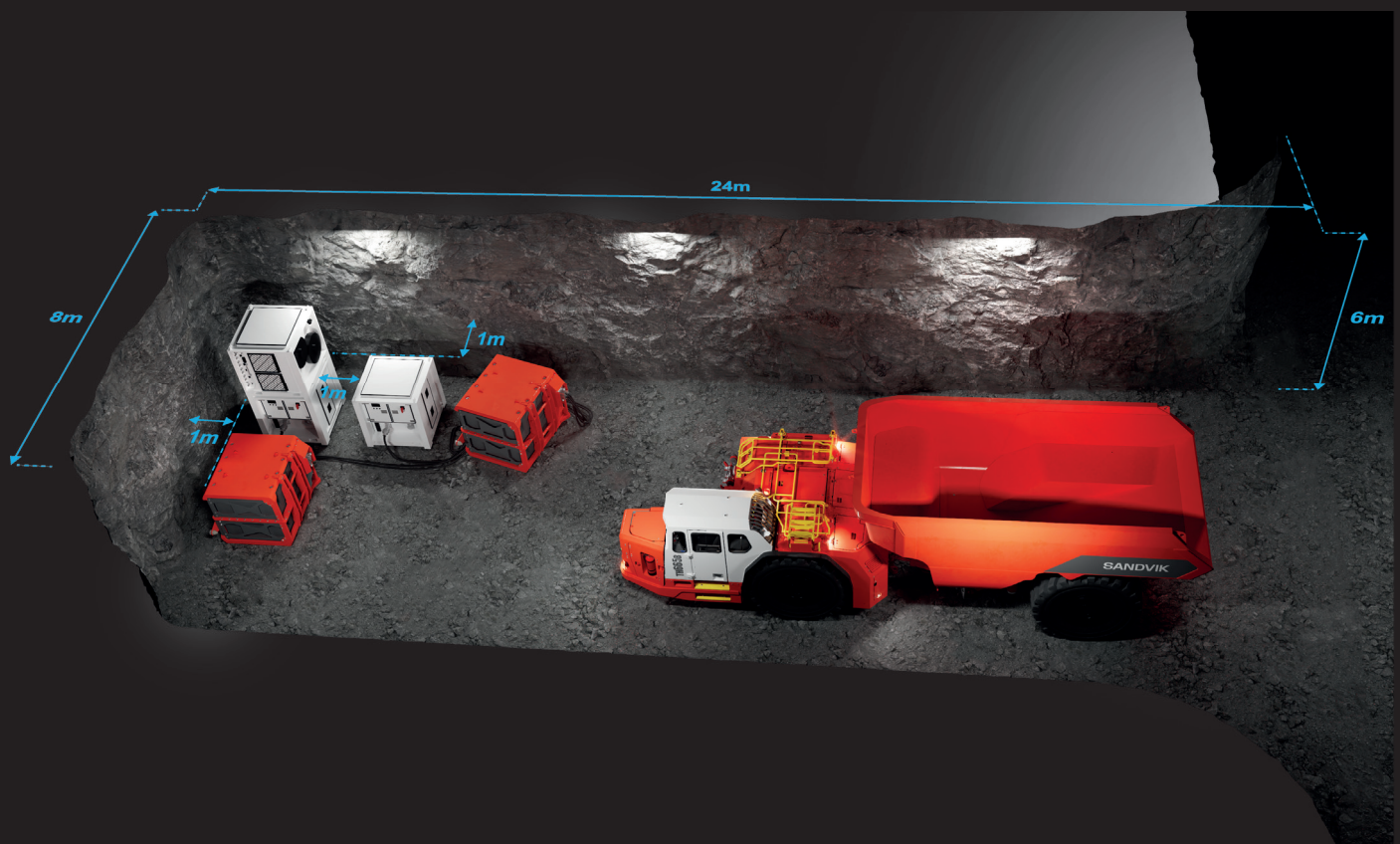
**PREMIUM ERGONOMICS** The modern cabin of TH665B battery electric truck offers premium operator ergonomics. It features increased legroom, a comfortable seat with low frequency pneumatic suspension to perfectly match the operator weight, adjustable steering wheel/joystick (tilt and telescopic) and arm rests as well as an air conditioning system supplying fresh air, all of which help to reduce operator fatigue.

**OPERATOR SAFETY** TH665B battery electric truck has a noise resistant cabin that is sealed, air-conditioned and pressurized. It uses dust resistant upholstery materials, has three-way laminated safety glass windows, emergency exits, an illuminated cabin entrance with three-point contact handles and anti-slip steps. In addition, the cabin is mounted on oil dampened bushings to reduce whole body vibration. The cabin is sealed for noise reduction. The cabin door includes a magnetic interlock switch which automatically applies brakes and steering when the cabin door is opened.

## ADJUSTABLE JOYSTICK ARMRESTS AND LOW FREQUENCY SUSPENSION SEAT

This truck is fitted with an adjustable low frequency pneumatic seat with two-point seat belt. Padded arm rests can be configured to suit the operator. The electro-hydraulic joystick controls for steering to eliminate hydraulic hoses inside the cabin and reduce potential hydraulic hazards. ment top speed. When the operator takes their foot off the pedal, the equipment stops.

**VIRTUAL GEARS** TH665B battery electric truck has no conventional gears, therefore its virtual gears can be set to a speed range which allows the operator to use the speed control pedal within that range. On a pre-set range, the operator can use the full movement of the throttle pedal. Naturally, the virtual gear function can be used to limit the equipment top speed. When the operator takes their foot off the pedal, the equipment stops.





## BEV MEANS 50% LESS MAINTENANCE

### FIELD SERVICEABLE BATTERY CHEMISTRY

The battery is designed to be serviced in the field to avoid expensive downtime and logistics. Full refurbishment with new cells can be done underground in one day. Special attention was paid to arc-flash risk reduction in the system design to protect technicians from the hazards of high voltage. For easy and fast maintenance, it is possible to take one module out from the battery pack to maintain only one part of the pack.

### SANDVIK INTELLIGENT CONTROL SYSTEM

To minimize the need to move around the machine or use special tools, the 12" touch screen color display in the operator's compartment provides service information, easy system diagnostics and alarm log files. An automatic brake test with diagnostics and logging can also be performed from the display.

**BATTERY HEALTH MONITORING** For general battery health and status monitoring, the battery temperature, voltage and current information is available from the control system diagnostics. The battery maintenance indicator light turns on when the battery needs to be taken for cell balancing and when state of charge (SOC) calibration is needed.

**GROUND LEVEL DAILY SERVICE** Because TH665B battery electric truck has no diesel engine, fuel tank, transmission, torque converter, air intake and exhaust, or axles, it has on average, fifty percent fewer maintenance events per year. As this truck has been designed with a field serviceable battery and smart placement of key service areas and safer service access, and all daily checks can be done on ground level. Standard onboard wheel chocks can be used to ensure the machine remains stationary. Also standard are a lockable main switch, energy isolation, articulation lock and box support. An electric filling pump for hydraulic oil quickly fills the hydraulic tank through a filter to ensure clean oil to protect the hydraulic system components.





# SANDVIK 365 PARTS & SERVICES

## PROUDLY KEEPING YOU ON TRACK!

Sandvik 365 Parts & Services offer a variety of possibilities to enhance your Sandvik TH550B truck's performance. As an OEM, we provide the best-suited choices to preserve your machine's high performance throughout its lifetime. These consist of highly skilled service specialists supporting you 365 days a year, all using Sandvik Genuine parts and components complemented by a range of robust tools. In addition, you get to enjoy the benefits of advanced digital services and a global infrastructure dedicated to keeping your Sandvik fleet on track.

## BENEFIT FROM OUR 365 SOLUTIONS

Our Sandvik 365 Parts & Service solutions will enable your equipment to function safely at peak condition and allow you to achieve the most demanding production targets. Our aftermarket portfolio attends all possible needs throughout your equipment's lifecycle, ranging from the most basic and traditional offerings to the most sophisticated ones.

## YOUR EQUIPMENT UPTIME IS OUR FOCUS – SANDVIK 365 COMPONENT SOLUTIONS

We have all your key components available to you under our various commercial offerings to suit your needs. Whether you have an ad-hoc failure or you are planning your maintenance in advance – we can assist, manage your components to maximize your uptime.

## GAIN PRODUCTIVITY THROUGH CONNECTIVITY

365 My Sandvik Digital Service solutions will provide you with visualization of fleet utilization, productivity, safety and health on 24/7 basis. The digital service dashboards can be accessed through the My Sandvik customer portal, where you can subscribe to My Sandvik Insight or Productivity. This way, My Sandvik Digital Service Solutions enable you to minimize unplanned downtime and set exact targets for improvement.

## CHOOSE FROM OUR RANGE OF SERVICE AGREEMENTS

With Sandvik Service Agreements, you can improve productivity and minimize unplanned downtime by making use of our expertise, systems and processes. They can be adapted to the specific level of support you require – helping you proactively manage your fleet and avoid any unexpected surprises.





# TECHNICAL SPECIFICATION

## SANDVIK TH665B

### CAPACITIES \*SAE heaped 2:1

|                   |          |
|-------------------|----------|
| Maximum Payload   | 65 000kg |
| Standard Dump Box | 36 m³    |
| Dump box range    | 32-40 m³ |

### MAIN DIMENSIONS

|                |           |
|----------------|-----------|
| Overall Length | 11,600 mm |
| Overall Width  | 3500 mm   |
| Overall Height | 3600 mm   |

### OPERATING WEIGHTS - UNLOADED \*Unit weight dependent on selected options

|                        |           |
|------------------------|-----------|
| Total operating weight | 56,400 kg |
| Front axle             | 41,300 kg |
| Rear axle              | 15,100 kg |

### OPERATING WEIGHTS - LOADED \*Unit weight dependent on selected options

|                     |            |
|---------------------|------------|
| Total loaded weight | 116,300 kg |
| Front axle          | 53,800 kg  |
| Rear axle           | 62,500 kg  |

### SPEED

|                     |          |
|---------------------|----------|
| Level/Loaded        | 33 km/h  |
| 1:7 (ramp - loaded) | 9.5 km/h |

### OTHER SPECIFICATIONS \*Speeds over 20 km/h subject to application approval

|               |           |
|---------------|-----------|
| Maximum Speed | 36.5 km/h |
|---------------|-----------|

### DUMP BOX MOTION TIMES

|                   |         |
|-------------------|---------|
| Discharging Times | 10 sec. |
| Dumping Angle     | 70°     |

### FRAME

#### REAR AND FRONT FRAME

|  |                                     |
|--|-------------------------------------|
| Material   | High-Strength Alloy (HSLA) steel    |
| Central Hinge  | Tapered Roller Bearing Articulation |
| Central Frame Oscillation for Improved Stability   | +/- 8°                              |
| Automatic Central Lubrication  |                                     |
| High strength structure with optimized material thicknesses. Reduced machine weight for higher overall hauling capacity and long structural lifetime. Welded steel construction. |                                     |
| Tanks are stand alone structures bolted onto main frame  |                                     |

### OPERATIONAL CONDITIONS AND LIMITS

|                             |  |
|-----------------------------|--|
| Environmental Temperature   | From 0 to +45°C                              |
| Standard Operating Altitude | Altitude capability from -1500 m to + 3000 m |

### REQUIREMENTS AND COMPLIANCE

Compliance with 2006/95/EC Low voltage directive

Compliance with 2004/108/EC Electromagnetic compatibility directive

Compliance with 2006/42/EC Machinery directive (Equipment for EU area, achieved with relevant options)

Design based on ISO 19296:2018 Mining - Mobile machines working underground - Machine safety

Design based on MDG 15. Guideline for mobile and transportable equipment for use in mines. (Equipment for Australia, achieved with relevant options)

### POWER TRAIN

#### ELECTRIC/TRACTION MOTOR(S) X4

|                           |                      |
|---------------------------|----------------------|
| Locations                 | Wheel hubs           |
| Motor Type                | Permanent Magnet, AC |
| Continuous Power Output   | 180 kW each          |
| Regenerative Braking      | Equipped             |
| ATF cooling system volume | 100 l                |
| Cooling system volume     | 35 l                 |
| Power (continuous)        | 630 kW               |

#### AUXILIARY MOTOR

|                    |         |
|--------------------|---------|
| Torque, Continuous | 1200 Nm |
| Power              | 200 kW  |

#### PRIMARY BATTERY

(Skid consisting of 2 battery packs)

|                    |                       |
|--------------------|-----------------------|
| Nominal Energy     | 354 kWh               |
| Nominal Capacity   | 576 Ah                |
| Continuous Power   | 600 kW                |
| Dimensions (LxWxH) | 1800 x 2130 x 1680 mm |
| Approx. Weight     | 8260 kg               |

#### TRAMMING BATTERY

|                    |                     |
|--------------------|---------------------|
| Nominal Energy     | 25 kWh              |
| Nominal Capacity   | 72 Ah               |
| Dimensions (LxWxH) | 270 x 640 x 1250 cm |
| Approx. Weight     | 280 kg              |



## TIRES

Tire size (Tires are application approved. Brand and type subject to availability.) 35/65R33

## HYDRAULICS

### MAIN COMPONENTS

Door interlock for brakes

Filling pump for hydraulic oil

Hydraulic oil tank capacity 156 l

Oil cooler for hydraulic and transmission oil with capability up to 45°C ambient temperature

ORFS fittings

Sight glass for oil level, 2 pcs

### STEERING HYDRAULICS

Center articulated, power steering with two double acting cylinders

Hydraulic Cylinders - 140mm, 2 pcs  
140mm, 2 pcs

Pilot operated steering main valve

Variable displacement steering piston pump

### DUMP BOX HYDRAULICS

Fully hydraulic system, equipped with variable displacement piston pump. Oil flows to box hydraulic system from the steering hydraulics. Oil flow from the brake circuit pump is divided to the brake system and oil cooler motor.

Fully hydraulic system, equipped with variable displacement piston pump. Oil flows to box hydraulic system from the steering hydraulics.

Control valve Solenoid operated

Cylinders 170 mm, 2 pc

Hydraulic pump Variable displacement piston

Main valve Solenoid operated

### BRAKE HYDRAULICS

Automatic brake application, ABA

Electrically driven emergency brake release pump

Foot Operated Brake Pedal valve

Neutral brake

Service brakes are spring applied, hydraulically operated multi-disc wet brakes on all wheels. Two independent circuits: one for the front and one for the rear axle. Service brakes also function as an emergency and parking brake. Brake system performance complies with requirements of EN ISO 3450, AS2958.1 and SABS 1589.

### ENERGY ISOLATION

Automatic discharge for pressure accumulators (brake system and pilot circuit)

Emergency stop push buttons according to EN ISO 13850: 1 pc in the cabin  
2 pc in front frame  
2 pcs in the mid-ship

Frame articulation locking device

Lockable main switch, ground level access

Mechanical dump box locking device

Wheel chocks and brackets

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

24 V Low voltage Batteries 2 x12V, 180Ah

24V Solid-state Power Distribution System for improved reliability and diagnostic capabilities

Camera system 7 Point Camera System

Control System 12" colour display with Sandvik integrated control system hardware modules

Driving lights LED lights:  
4 pcs in front  
2 pcs in rear

Flashing Beacon

Marker lights

Parking, brake and indicator (blinkers) lights LED lights:  
2 pcs in front  
2 pcs in rear

Reverse alarm (CEN)

Reverse camera

Working lights

### AXLES

Front axle Proprietary direct drive

Rear axle Proprietary direct drive

## INCLUDED SAFETY FEATURES

### FIRE SAFETY

ANSUL Fire Suppression

## OPERATOR'S COMPARTMENT

### CABIN

12 V and 24V outputs

Air conditioning unit located outside the cabin to reduce noise inside the cabin

Cabin mounted on rubber mounts to the frame to reduce vibrations

Cyclone pre-filter for A/C device

Drive by wire ergonomic joystick

Dump box up alarm buzzer in the cabin

Emergency Exit

Floor washable with water to reduce dust

Inclinometers to indicate operating angle

Remote circuit breaker switch

ROPS certification according to EN ISO 3471

FOPS certification according to EN ISO 3449

Sealed, air conditioned, over pressurized, noise suppressed closed cabin

Sound absorbent material to reduce noise

Safety glass windows

Three-point contact access system with replaceable and colour coded handles and steps



## OPERATOR'S SEAT

|   |
|---|
| Adjustable lumbar support                     |
| Adjustment according to the operator's weight |
| Fore-aft isolation                            |
| Height adjustment                             |
| Low frequency suspension                      |
| Padded and adjustable arm rests               |
| Selectable damping                            |
| Three-point seat belt                         |

## CONTROL SYSTEM, DASHBOARD AND DISPLAYS

|  |
|--|
| 12" display with adjustable contrast and brightness          |
| Illuminated switches   |
| Instrument panel with illuminated switches                   |
| My Sandvik Digital Services Knowledge Box™ on-board hardware |

## OPTIONS

|   |
|---|
| ANSUL 210 fire suppression system w. CHECKFIRE                    |
| Blue flashing beacon  |
| Clear flashing beacon   |
| Cold Climate package  |
| Connection for external 24V power supply                          |
| Cover grills for lamps  |
| Driving direction lights (red/green)                              |
| Emergency steering (CE)   |
| Integrated weighing system (IWS) for trucks (not w. ejector)      |
| Monitoring camera system  |
| Proximity Detection System Interface (not operable in automation) |
| Safety rails  |
| Spare rim   |
| Tyre Pressure Monitoring System                                   |
| Wiggins quick filling set for oils                                |

## DOCUMENTATION

### STANDARD MANUALS

|                           |   |
|---------------------------|---|
| Operator's Manual         | English and other EU languages                    |
| Maintenance Manual        | English and other EU languages                    |
| Parts Manual              | English   |
| Service and Repair Manual | English   |
| ToolMan                   | 2 x USB stick in pdf format, includes all manuals |
| Decals                    | English and other EU languages                    |

## AVAILABLE BOXES (OPTIONAL)\*

|                                  |      |      |      |    |
|----------------------------------|------|------|------|----|
| Box capacity SAE heaped 2:1 (m³) | 20   | 24   | 26   | 31 |
| Total height (mm)                | 3050 | 3150 | 3150 |    |
| * According to SAE 1363/ISO 6483 |      |      |      |    |

## GRADE PERFORMANCE - UPHILL (KPH)\*

Assumed 3% rolling resistance

|               |      |      |     |      |     |      |      |      |      |      |
|---------------|------|------|-----|------|-----|------|------|------|------|------|
| Percent grade | 0.0  | 2.0  | 4.0 | 6.0  | 8.0 | 10.0 | 12.5 | 14.3 | 17.0 | 20.0 |
| Unloaded      | 36.5 | 35.5 | 33  | 30.5 | 28  | 25.5 | 22.5 | 20.5 | 17.5 | 15.5 |
| Loaded        | 33   | 28   | 23  | 18   | 15  | 12.5 | 10.5 | 9.5  | 8    | 7    |

\*Speeds over 20 km/h subject to application approval

## GRADE PERFORMANCE - DOWNHILL (KPH)\*

Assumed 3% rolling resistance

|               |      |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Percent grade | 0.0  | 2.0  | 4.0  | 6.0  | 8.0  | 10.0 | 12.5 | 14.3 | 17.0 | 20.0 |
| Unloaded      | 36.5 | 36.5 | 36.5 | 36.5 | 36.5 | 36.5 | 30.5 | 25   | 20   | 16.5 |
| Loaded        | 33   | 36.5 | 36.5 | 36.5 | 26   | 18.5 | 13.5 | 11.5 | 9    | 7.5  |

\*Speeds over 20 km/h subject to application approval



DIMENSIONS WITH 28 M³ BOX

The dimensions are indicative only

