



Spraymec MF 050 VC SD





Robust carrier for small and medium-sized tunnel profiles

Spraymec is a self-propelled, mobile concrete sprayer for modern mines with small and medium-sized tunnel profiles. The robust mining carrier is equipped with a proven and very agile spray manipulator and a concrete spraying pump with a capacity of up to 27 m³/h in mains operation.



Latest battery-electric drive system for zero local emissions

With the use of a long-life industrial-grade Li-lon battery (LTO) and a sophisticated battery management system that disconnects the batteries in case of exceeding limit values, Normet delivers the safest and most robust battery technology on the market.

The machine's batteries are charged from the AC grid or fast-charged using CCS compliant charging station.

Two independent electric motors flanged to the standard axles ensure an extremely reliable driveline and allow energy recovery when tramming downhill to charge the batteries and minimize brake wear. Operating costs are much lower than a diesel-driven machine due to lower maintenance costs of the electric drive, reduced ventilation requirements due to the absence of exhaust fumes, and very low heat emissions.

Unmatched dosing system and concrete spraying pump

The integrated closed-loop control system monitors the dosage of the liquid accelerators as well as the concrete pump. This provides a very precise dosage of the accelerator as well as the automatic synchronization of the output of the dosing and concrete pump.

As an alternative to the positive cavity pump, the dosing system can be equipped with a low-pulsation peristaltic pump and an additional display in the driver's cab.

A special hydraulic system is available as an option, in which the concrete delivery cylinders can be controlled independently of each other, thus reducing the pulsation of the concrete delivery to an absolute minimum.



Spraying boom

The proven spray manipulator with selectable vertical tracking of the upper boom telescope to keep the spraying distance constant is easy to operate. The good protection against rebound, nozzle rotation for better distribution of the spray material, and a high degree of freedom of the manipulator result in a highly effective set-up of a concrete sprayer.

High volume compressor and concrete delivery system

A reliable and high-volume onboard compressor delivers the air volumes required for a high-quality sprayed concrete application.

The conveying and nozzle system with big diameter steel pipes and hoses minimizes the risk of blockages. An optionally available automatic washing system for the nozzle and conveying line reduces personnel to clean the machine.

Reliable control system and electrics

The spray manipulator is controlled by radio remote control. All exposed control components are IP65 rated and the industrial-grade CAN bus system allows effortless troubleshooting.

Well-dimensioned lights on the carrier vehicle and the spray boom provide a good view both while driving and during the spraying operation.

Drivers cabin

The ergonomically located controls in the driver's cabin allow comfortable spraying from the cabin as well as good driving comfort. An LCD multi-information display on the dashboard provides centralized information on the most important operating parameters.



Focus on easy maintenance

A special focus has been given to easy access to the maintenance elements and the arrangement of the individual components. The central arrangement of the lubrication points for the carrier vehicle reduces daily maintenance work and ensures that no lubrication point is forgotten, thus avoiding costly repairs.



SPRAY BOOM

SPRAY BOOM SB 500 C

Selectable vertical tracking of the upper boom telescope to keep the spraying distance constant.

Nozzle rotation for better distribution of the spray material and surface quality

Boom working range:

Lateral	8.0 m
Vertical max.	9.5 m
Vertical with upper boom horizontal	5.3 m
Nozzle rotation	420°
Nozzle tilting	105°

Spraying nozzle:

- Fixed nozzle head
- Rotating nozzle head (Nozzle oscillation 5°)

CONCRETE PUMP AND DOSING SYSTEM

CONCRETE PUMP NSP 30

Low-wear and low-maintenance double piston pump specially designed for low-pulsation concrete pumping.

Reversing function for concrete pressure relief in case of overpressure and automatic switching off of the nozzle air supply.

Pump capacity (mains operation)	3 - 27 m³/h
Pumping volume (from drive batteries, external air supply, depending on concrete rheology)	up to 10.5 m ³
Pumping cylinder diameter and stroke	200/600 mm
Pumping pressure, max.	51 bar
Feeding hopper 300 l at height	1250 mm

The high pumping pressure enables the conveying of stiff concrete.

PI control loop for constant concrete delivery even when the rheology of the concrete is changing.

Emptying and flushing the concrete pump from the battery pack.

The pump is capable of conveying concrete with an aggregate size of 16 mm (including crushed material) and all types of structural fibres up to a length of 60 mm.

Hydraulically driven agitator in hopper:

Advanced control system (hydraulic and electrical) ensure low-pulsation concrete flow.

- Nordoser XEM, Hydraulic pilot control system for the concrete pump with screw pump
- Nordoser XEP, Hydraulic pilot control system for the concrete pump with peristaltic pump
- Nordoser XIM, Electrical control system for the concrete pump with low pulsation pumping feature and screw pump
- Nordoser XIP, Electrical control system for the concrete pump with low pulsation pumping feature, linear sensor & peristaltic pump

Vibrator with electric drive 24 VDC

The performance of the pump, including the maximum pumping capacity, are based on a theoretical filling rate of 100%.

DOSING SYSTEM FOR ACCELERATOR NORDOSER

Hydraulically driven dosing pump with electric control Max. pumping pressure

12 bar

Dosing rate

0.6...16 l/min (36 - 960 l/h)

The accelerator dosage and concrete delivery rate are fully synchronized and can be adjusted from the remote control and from the driver's compartment.

Accelerator tank

- 600 I
- o 800 l

Accelerator filling point on the side of the machine

COMPRESSOR

Electrically operated screw compressor (only in mains operation)

- 10 m³/min 55 kW
- 12 m³/min 75 kW

Compressor	Mains voltage at 50 Hz	Mains voltage at 60 Hz
10 m³/min	380/400/415/525/690/1000 V	440/480/600/1000 V
12 m³/min	525/690/1000 V	480/600/1000 V

Rated operating pressure Soft start system for 12 m³/min compressor (standard up to 600 V) 7 bar

Normet reserves the right to change this specification without further notice.

• = Default

 \circ = Option



CONCRETE LINE

Concrete line assembly side

- Left hand side
- o Right hand side

Concrete output pipes

- Reduction from 5" to 3" including HD couplings
- Victaulic output flange, pipes not included, must be sourced and installed locally

Concrete hose diameter

- 65 mm (2½")
 - Standard couplings
 - HD couplings
- 50 mm (2") with HD couplings

Concrete hoses

- Included
- o Not included, must be sourced and installed locally

ELECTRICAL SYSTEM

Mains supply voltage:

- 50 Hz
 - 380 V (IEC)
 - 400 V (IEC)
 - 415 V (IEC)
 - o 525 V (IEC)
 - o 690 V (IEC)
 - o 1000 V (IEC)
 - 1000 V (AN/NZS)
- o 60 Hz
 - 440 V (UL/CSA)
 - o 440 V (IEC)
 - 480 V, (460 V) (UL/CSA)
 - o 600 V, (575 V) (UL/CSA)
 - o 1000 V (UL/CSA)

Robust and abrasion-resistant mains voltage supply cable with PUR outer sheath:

- With supply cable (excluding plug)
- Without supply cable (must be sourced and installed locally)

Hydraulically driven cable reel:

- Slipring with pilot contact
- Slipring without pilot contact

Hydraulic power pack 75 kW

Power supply of the truck mixer depending on the supply voltage and compressor output:

Voltage	Frequency	Compressor	Cable size	Power supply to truck mixer
380 V	50 Hz	10 m³/min	3 x 95 mm²	n/a
400 V	50 Hz	10 m³/min	3 x 95 mm²	n/a
415 V	50 Hz	10 m³/min	3 x 95 mm²	n/a
440 V	50 Hz	10 m³/min	3 x 95 mm²	n/a
525 V	50 Hz	10 m³/min	3 x 70 mm²	ok
690 V	50 Hz	10 m³/min	3 x 50 mm ²	ok
1000 V	50 Hz	10 m³/min	3 x 25 mm²	ok
440 V	60 Hz	10 m³/min	3 x 95 mm²	n/a
460 V	60 Hz	10 m³/min	3 x 95 mm²	n/a
480 V	60 Hz	10 m³/min	3 x 95 mm²	ok
575 V	60 Hz	10 m³/min	3 x 70 mm²	ok
600 V	60 Hz	10 m³/min	3 x 50 mm ²	ok
1000 V	60 Hz	10 m³/min	3 x 25 mm²	ok

Voltage	Frequency	Compressor	Cable size	Power supply to truck mixer
380 V	50 Hz	12 m³/min	3 x 95 mm²	n/a
400 V	50 Hz	12 m³/min	3 x 95 mm²	n/a
415 V	50 Hz	12 m³/min	3 x 95 mm²	n/a
440 V	50 Hz	12 m³/min	3 x 95 mm²	n/a
525 V	50 Hz	12 m³/min	3 x 70 mm²	ok
690 V	50 Hz	12 m³/min	3 x 50 mm ²	ok
1000 V	50 Hz	12 m³/min	3 x 25 mm²	ok
440 V	60 Hz	12 m³/min	3 x 95 mm²	n/a
460 V	60 Hz	12 m³/min	3 x 95 mm²	n/a
480 V	60 Hz	12 m³/min	3 x 95 mm²	n/a
575 V	60 Hz	12 m³/min	3 x 70 mm²	ok
600 V	60 Hz	12 m³/min	3 x 50 mm²	ok
1000 V	60 Hz	12 m³/min	3 x 25 mm²	ok

Cable reel capacity:

Cable size	Outer diameter	Max. length on the cable reel
3x35+3G6+2x1x1.5	28,0	150 m
3x50+3G10+2x1x1.5	32,0	130 m
3x70+3G16+2x1x1.5	37,0	100 m
3x95+3G16+2x1x1.5	42,0	100 m

Socket's (2 pcs) supply voltage:

- 220 / 230 / 240 V (no UL/CSA or AN/NZS approval)
- o 110 / 120 V

Since not all socket types, voltage levels, pilot wire and high voltage lightning are available in every country, they must be checked on a case-by-case basis.

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ELECTRIC MOTORS

Two direct drive permanent magnet electric motors

4-wheel drive, no separate transmission

Combined power rating 200 kW

PERFORMANCE

99 kN 0 km/h
4°

Lateral gradient for tramming (continuous) 4°
Longitudinal gradient for tramming (continuous) 9°
Lateral gradient for operation 4°

Depending of machine configuration, lateral and longitudinal tramming gradient can temporarily be higher.

BATTERY

Li-ion battery technology

Nominal voltage 663 V Energy content 90 kWh

Liquid cooled

Fast charging capability

BATTERY CHARGING

25-30 kW on-board 3-phase AC charging system for up to 2.5 hours of charging time (from 0 to 80%)

CCS type 2 fast-charging socket

to charge batteries from 0-80% in up to 40 min depending on charger

NOTE: compatible CCS charging station required with type 2 plug

CONTROL SYSTEM

Latest NorSmart 3 control and diagnostic system to control:

Spray boom

Concrete pump

Accelerator dosing system

Carrier functions

Safety elements

Fault diagnostics

Data logging

AXLES AND BRAKES

Dana planetary type axles

Fixed load end axle

Suspended engine end axle

Electronic braking: energy recuperation via electric motor braking

Service brake: hydraulically powered dual-circuit oil immersed multidisc brakes in both axles

Safety/Parking brake: spring applied hydraulically released fail-safe -type brake

Brake testing possible from cabin

TYRES AND RIMS

Tyres:

- Nokian Tyres 12.00–20"
- o Bridgestone 12.00-20"

Rims:

- Standard rims
- NDT inspected rims

STEERING

Orbitrol type hydraulic frame steering

Frame articulation +/- 42°

HYDRAULIC SYSTEM

Electric power pack 75 kW, 50/60 Hz with hydraulic pumps

Variable displacement pump for carrier and sprayboom

Variable displacement pump for concrete pump

Fixed displacement gear pump for agitator and dosing system

Oil tank capacity 350 I

Return oil filtration 10 µm

Oil level and return filter contamination indicator Oil cooler for concrete and spray boom circuit

Mineral hydraulic oil

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REMOTE CONTROL SYSTEM

Wireless remote control with 2 joysticks and cable support

- o 419 MHz
- 434 MHz
- 458 MHz and tilt switch 22.5°

The following machine components can be controlled by radio remote control:

Accelerator dosing rate

Accelerator pump ON/OFF

Concrete pump output

Concrete pump ON/OFF/REVERSE

Compressed air supply to spray nozzle ON/OFF

Nozzle guick wash ON/OFF

Wall washing ON/OFF

Vertical levelling of the upper boom telescope ON/OFF

Automatic second telescope IN/OUT and ON/OFF

Nozzle nutation ON/OFF

MACHINE WASHING

Hydraulically driven pressure washer with hose reel:

Water pressure, max. 180 bar

Water flow, max. 30 l/min

Hose length 20 m

WATER HOSE REEL

- Manually operated reel
 - Hose diameter 1", length on the reel 40 m, effective length about 35 m *
- o Hydraulically operated reel
 - Hose diameter 1", length on the reel 60 m, effective length about 55 m*
 - Hose diameter 1 ¼", length on the reel 80 m, effective length about 75 m*
 - Hose diameter 1 1/4", length on the reel 120 m, effective length about 115 m* (NOTE! Requires manual guiding during winding so that the entire cable fits on the reel)

24 VDC ELECTRICAL SYSTEM

2 x 12 V deep cycle batteries

24 V battery charger (DC/DC converter)

LED driving and indicator lights

LED work lights on cabin roof (4 pcs)

LED work and reversing lights (6 pcs)

LED work light on hopper (1 pcs)

LED side lights

Warning LED light:

Color

- Amber
- Blue
- Red
- Green (n/a with rotating light pattern)
- White (n/a with rotating light pattern)

Light pattern

- Strobe
- Rotating

DRIVER'S COMPARTMENT

Cabin type:

Enclosed cabin with ROPS/FOPS approval and ergonomically placed controls for spray operation on the driver's seat armrests

Air conditioning and heating

Driver's seat with heavy duty seat with head- and armrests:

- Mechanically suspended seat
- Air suspended seat

Seat belt with safety switch:

- 3" retractable lap seat belt
- o 2" fixed lap seat belt
- 3-point seat belt

Front facing throttle and brake pedals

Water jet for boot washing

Puddle lights under door steps, on the side of the cabin

^{*}The effective length vary depending on machine model



DATA TRANSFER

Machine connectivity hardware

- WLAN
- o 3G
- o LTE

TECHNICAL DOCUMENTATION

Standard documents:

Instruction manuals, hard copy 2 pcs:

- English
- Russian
- One of destination EU languages

Spare parts manuals, hard copy 2 pcs:

- English
- Russian

PDF manuals on USB-stick 2 pcs, includes instruction and spare parts manuals

Additional documentation:

- Extra hard copies of manuals
- o Extra PDF manuals
- LinkOne WebView electronic manuals
- o Other than standard language manuals

OTHER

Dry chemical fire extinguisher system:

Ansul A-101:

- Checkfire 110
- Checkfire 210

Powder extinguisher:

- 12 kg
- Ansul Sentry

Number of extinguishers:

- •
- 0 2

Painting and taping:

- Standard painting and taping
- Painting and taping according to customer specification

Reversing camera:

- 3 cameras, 3 displays
- o 3 cameras, 3 displays and reversing radar
- 6 cameras, 3 displays. OACR/VCR system recording device with 72 h memory (4 recorded cameras)

Hydraulic front support legs

Front and rear grounding straps:

- Flat cable
- o Chain

Towing kit

Text labels in:

- En/Ru/One of destination EU languages
- Other language

Measurements:

- Noise
- Vibration

Standard tool set:

Cleaning plug

Washing ball

Hitting tool for nozzle

Claw coupling

Hose clamp

Rubber hose 3/4", 4 m

Carabiner

Wrench for spraying nozzles

Hammer 800 g

Nozzle tip d45 mm plastic

Cone and special bolt for concrete piston assembly



PROCESS PRODUCTIVITY

- Concrete thickness measurement system Normet SmartScan
- Hose reel for external air tools including air gun
- o Extra display for the dosing system (Nordoser) in cabin
- Spraying condition monitoring system (ambient, concrete, accelerator temperature and air pressure)
- Hot climate kit (extra water/oil-heat exchanger for internal oil system of compressor, required for ambient temperatures above 30°C)
- Hydraulically controlled cleaning gate under the concrete hopper
- Automatic lubrication system for concrete pump
- Automatic lubrication system for carrier and spray boom (n/a for nozzle head)
- Automatic concrete line washing system including protective cover on hopper
- Electric heating element with mixer wheel for accelerator tank, 230 VAC (no UL approval, for 800 I tank only)
- o Additional separator in suction line of accelerator
- Accelerator filling pump
 Hydraulic driven filling pump 80 110 l/min, impeller type
- Soft start system for compressor with supply voltage 690 V
- Bypass filter kit for oil circuit
 - Filter between pressure line and oil tank
 - Filter unit with electric pump (independent of oil pressure)
 - 110 V
 - 230 V
- Hydraulic oil diagnostic sensor
- o Form oil system 24 VDC with hose reel:

Tank capacity 30 I Hose length 20 m

Working pressure 10 bar

- Wireless remote control with 2 joysticks and cable support
 - o 419 MHz
 - 434 MHz
 - 458 MHz and tilt switch 22.5°

Number of wireless remote controls:

- 1
- 0 2
- 3 x 100 W LED working lights on cabin roof (no UL -approval)

Surface preparation

High-pressure water system for cleaning and pre-wetting of the spray area with water nozzle installed on the spray head:

- 180 bar, 90 l/min, hydraulic motor drive for water pump (Speck), nozzle holder with 3 nozzles
- 180 bar, 90 l/min, piston to piston type hydraulic water pump (Dynaset), nozzle holder with 3 nozzles
- 460 bar, 50 l/min, piston to piston type hydraulic water pump (Dynaset), nozzle holder with 1 nozzle
- o Electric winch (24 VDC) to lift the hopper grill
- o Feeding hopper chute extension 80 l at height 1400 mm
- Hydraulically operated cable guide for the main electric cable
- Additional inlet water filter

CARRIER PRODUCTIVITY

- Accessories for enclosed cabin:
 - Audio system
 - Heated mirrors
- 12 V, 20 A power supply in cabin with socket and connector
- Deutch connector for 24 V, 10 A for external power supply
- Drive battery coolant heater with interior heater and 24 VDC battery charger (230 V)
- Feedthrough for charging of concrete truck
- Remote Driving System (RDS) to move the machine from the remote control
- o Fluid evacuation panel with sampling points
- o Pump for filling of hydraulic tank
 - Hand pump
 - Electric pump
 - Spare rim and tyre
- Toolbox and maintenance tools
- Interior cooling fan

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Wax tape for electric connectors

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• = Default

○ = Option



SAFETY

- Cabin door safety brake interlock switches
- o Extra warning LED light

Color

- Amber
- o Blue
- o Red
- o Green (n/a with rotating light pattern)
- White (n/a with rotating light pattern)

Light pattern

- Strobe
- Rotating
- Direction lights (left/right)
 - Green / Red
 - o Red / Green
- Extra warning LED light with battery backup Color
 - Amber
 - o Blue
 - o Red
 - o Green (n/a with rotating light pattern)
 - White (n/a with rotating light pattern)

Light pattern

- Strobe
- Rotating
- Seat belt interlock switch applies safety brake
- o Redundant brake monitoring system
- o Methane monitoring system
- o Protection guards for tunnel curtains
- o Tyre pressure indicators
- Warning triangles
- o Flashlight with charger
- Hearing protectors
- Wheel chocks with brackets



NORMET SERVICES

Our services cover the whole life cycle of your equipment. They include start-up and commissioning, genuine spare parts, upgrades & modifications, and remanufacturing, as well as rental and leasing offerings, and field services. We also offer improvement services such as operator training and process audits.

SPARE PARTS

Genuine parts from Normet Services ensure that you always have the highest quality parts available to keep your equipment up and running. Depending on your needs, we can offer everything from individual parts to complete parts contracts, and our professionals around the world have the experience to ensure that you have the parts you need when you need them.

Initial spare parts package: Available for 1000 h of use*. Includes periodical service, most common wearing parts and most critical safety parts.

Spare parts packages made for customer needs: Available based on hours of use*. Includes periodical service, most common wearing parts and most critical safety parts.

* Recommendations are based on average hours - can vary a lot depending on work site conditions.

UPGRADES AND MODIFICATIONS

Our Upgrades and Modifications services are designed to ensure the economical, efficient and purposeful performance of your equipment over its entire life cycle. A service provided by a reliable OEM like Normet ensures the safety and performance of your equipment. Normet Upgrades and Modifications save you both time and money, while delivering the high quality you expect from us.

SERVICE CONTRACTS

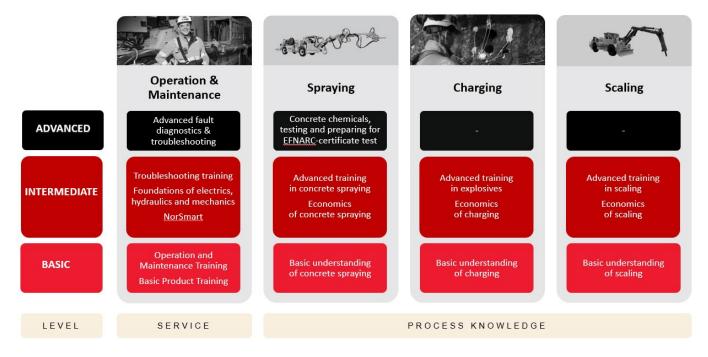
With a service agreement, Normet manages your fleet with guaranteed availability and agreed costs, giving you transparency for your life cycle costs, annual operational budget and fleet uptime. This lets you focus on your core operations. Each service agreement is built and customized to meet the individual customer's needs from our portfolio of services. Depending on the level of service agreement you need, you can choose anything from basic technical support for an individual machine all the way up to services for your entire fleet, as well as process performance. The service levels we offer are:

- Parts Availability
- Fleet Support
- Fleet Availability
- Process Performance

The content of a service level can be tailored to meet your particular requirements.

TRAINING SERVICES

Our Training Services are available for you and your operators throughout the equipment lifecycle and they include:



Start-up and commissioning



1. OPERATOR TRAINING

	Start-up training	Commissioning
1.1 Classroom training		
General introduction and operation of machine	Basic	No classroom
Safety instructions	Basic	
Use of manuals	Basic	training included in
Technical introduction of equipment	Basic	
Hands-on service and pre-operation checks	Basic	commissioning
Controls and driving (starting, driving, stopping, parking)	Basic	
1.2 Practical training		
Pre-operation checks	Basic	Introduction
Driving, starting, stopping, parking	Basic	Introduction
Preparing the machine for specific operation conditions	Basic	Not covered
Operation	Basic	Introduction
Washing the machine	Basic	Introduction
Troubleshooting	Basic	Basic

2. MAINTENANCE AND REPAIR TRAINING

General operation of machines	Basic	Introduction
Symbols of drawings and codes	Basic	Not covered
Understanding hydraulic and electric schematics	Basic	Introduction
Control systems	Basic	Introduction
Function of main components (depending on equipment)	Basic	Introduction
Locations of components in the machine	Basic	Not covered
Locations of components in the machine Periodical maintenance	Basic Basic	Not covered Introduction
·		
Periodical maintenance	Basic	Introduction
Periodical maintenance Troubleshooting	Basic Basic	Introduction Not covered



DIMENSIONS

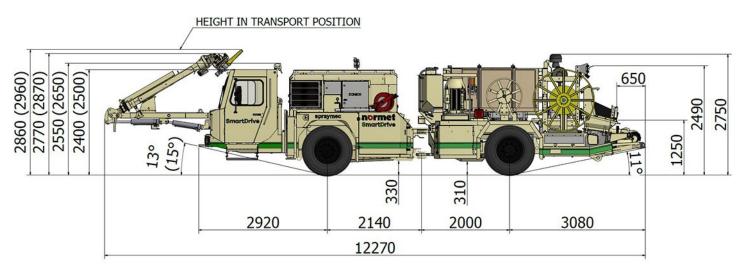
Length	12270 mm
Width	2000 mm
Height	2860 mm
Height of cabin	2550 mm
Wheel base	4140 mm
Track	1670 mm
Ground clearance as shown	310 mm

TURNING RADIUS

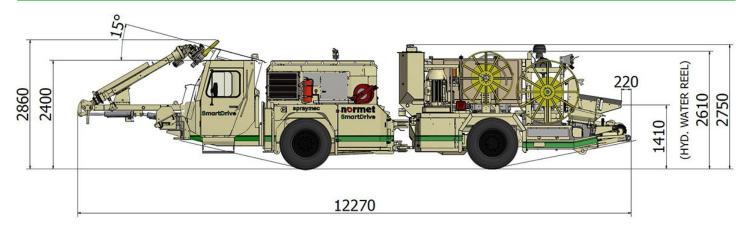
Outer 8030 mm Inner 4340 mm

SIDE VIEW - BASIC MACHINE

Dimensions in () apply when the cabin is installed in the upper position

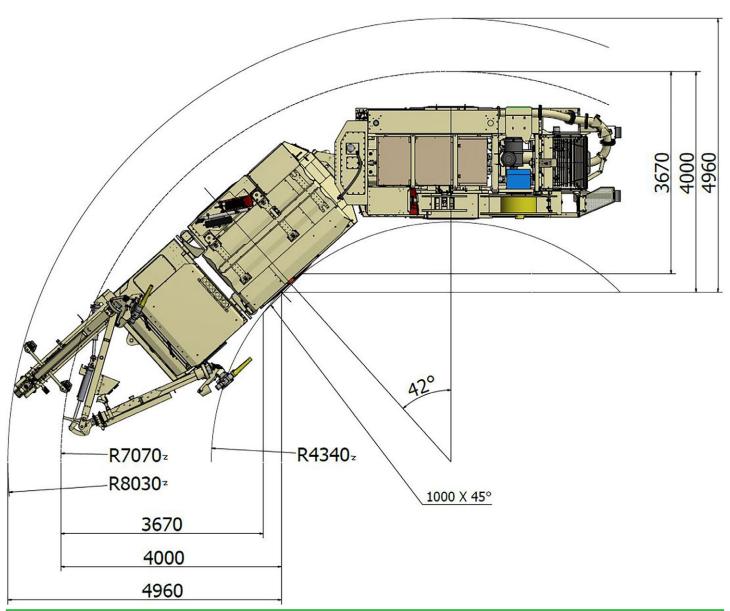


SIDE VIEW - MACHINE WITH OPTIONS

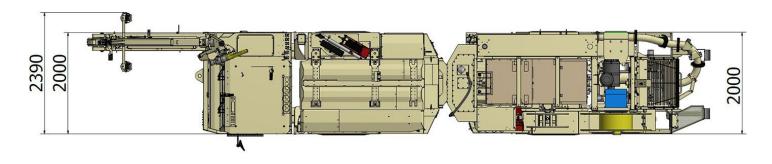




TURNING RADIUS

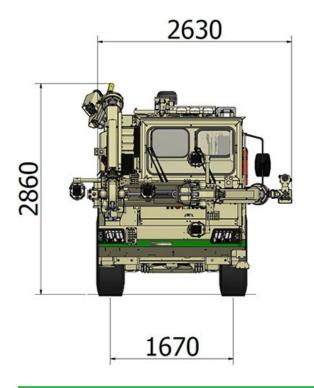


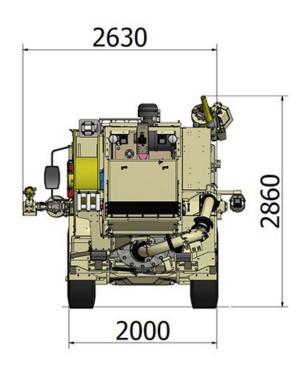
TOP VIEW



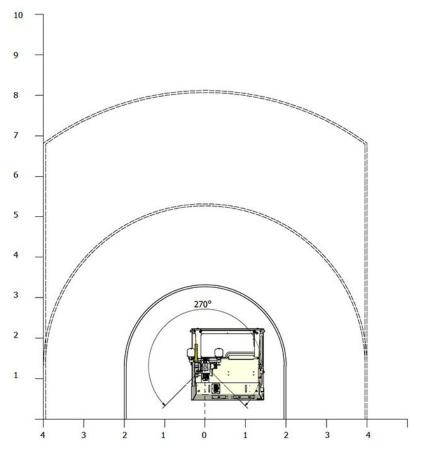


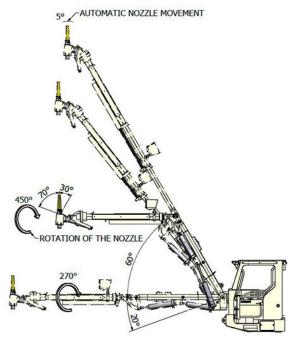
FRONT AND BACK VIEWS





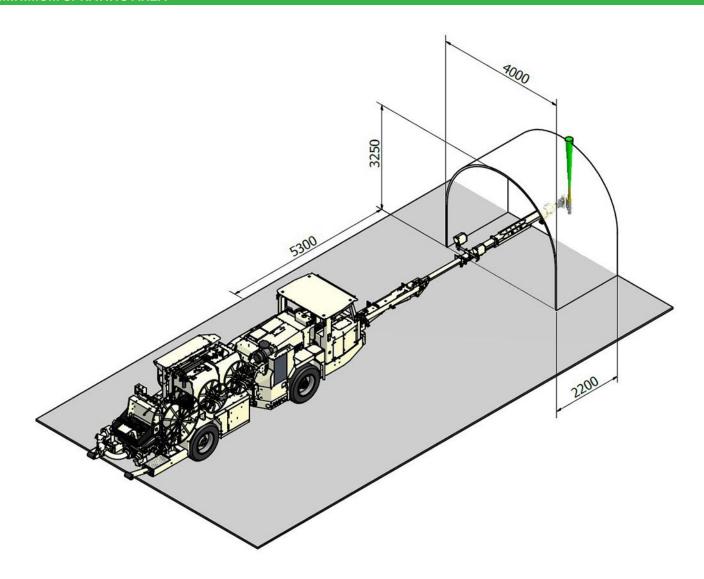
REACH AREA AND BOOM MOVEMENTS





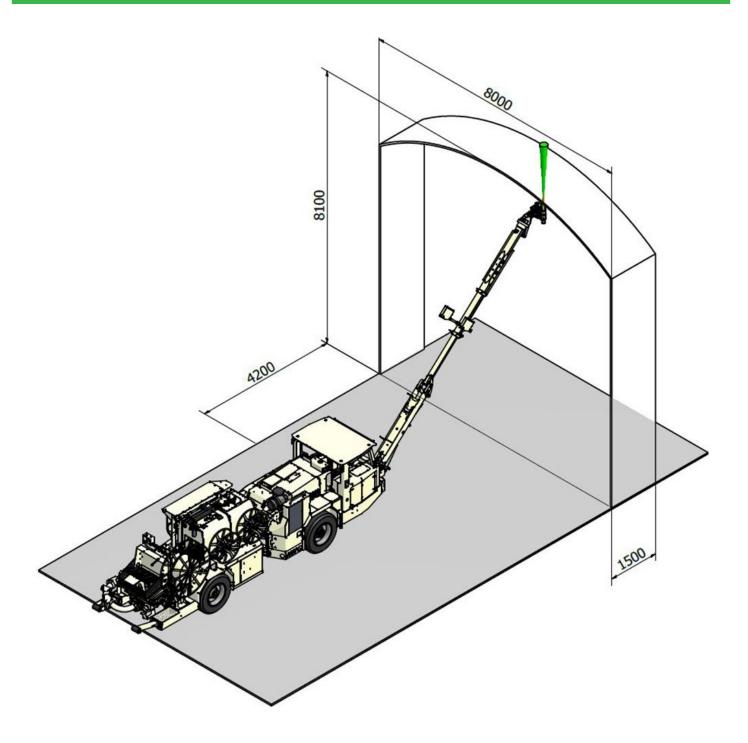


MINIMUM SPRAYING AREA



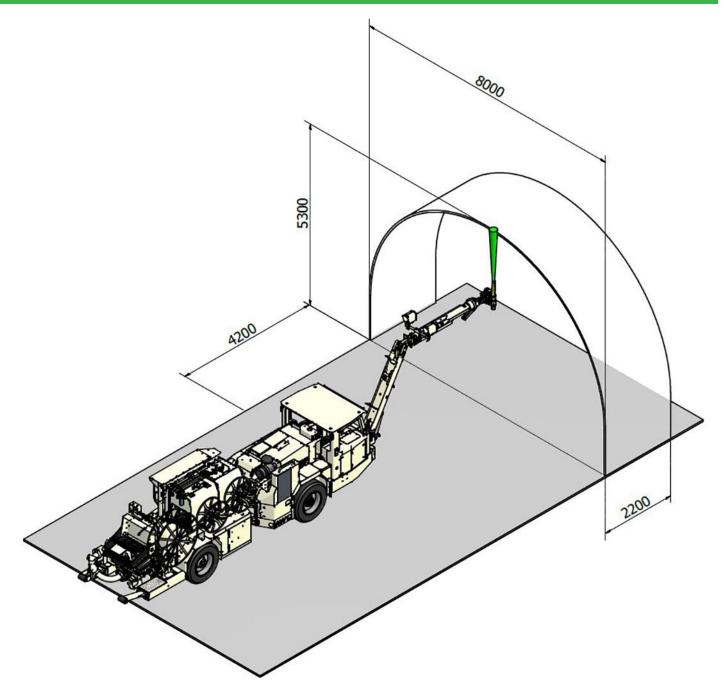


MAXIMUM SPRAYING AREA



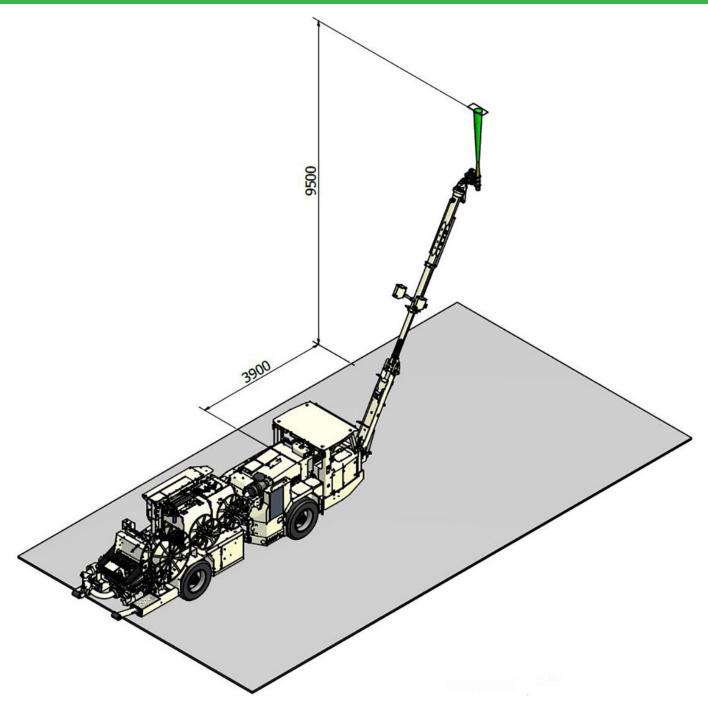


OPTIMAL SPRAYING AREA





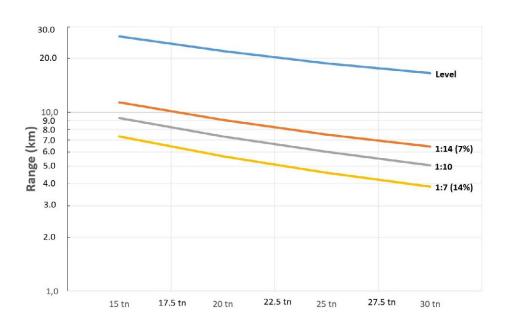
SPOT SPRAYING REACH





DRIVING RANGE

Driving range curve: DOC060017

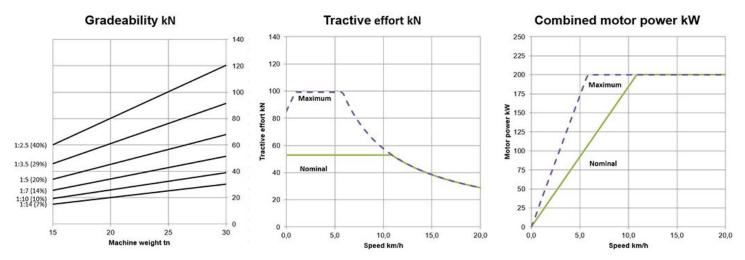


OPERATING WEIGHT

Basic machine 21 200 kg

TRACTIVE EFFORT

Performance curve: DOC059935



SmartDrive





Spraymec MF 050 VC SD

