WIRTGEN GROUP

Wirtgen

Technical specification

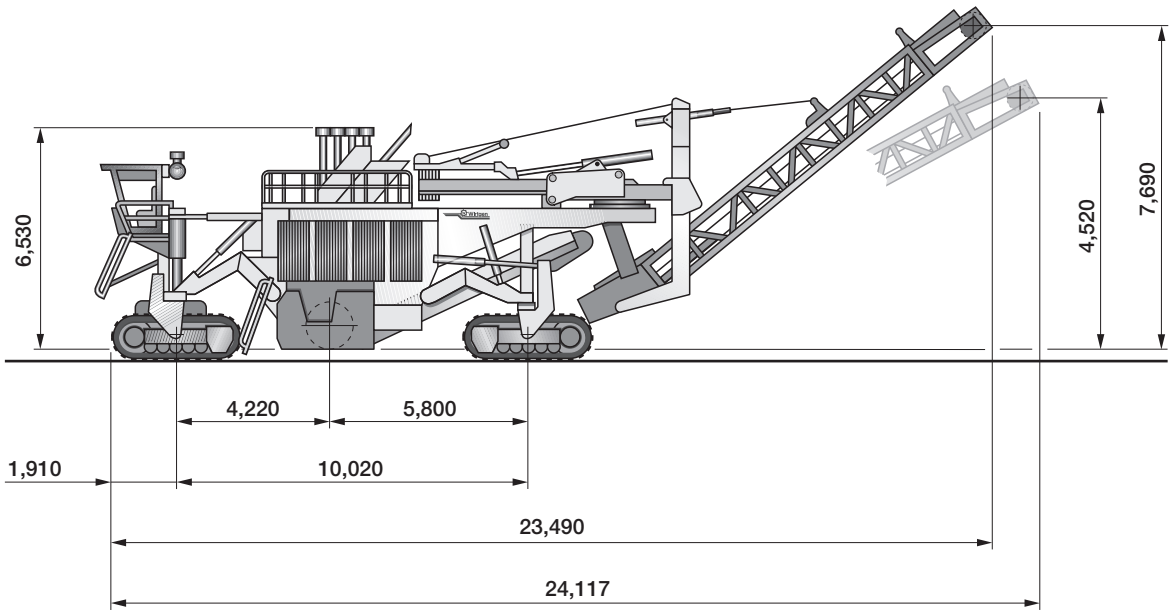
Surface Miner 4200 SM

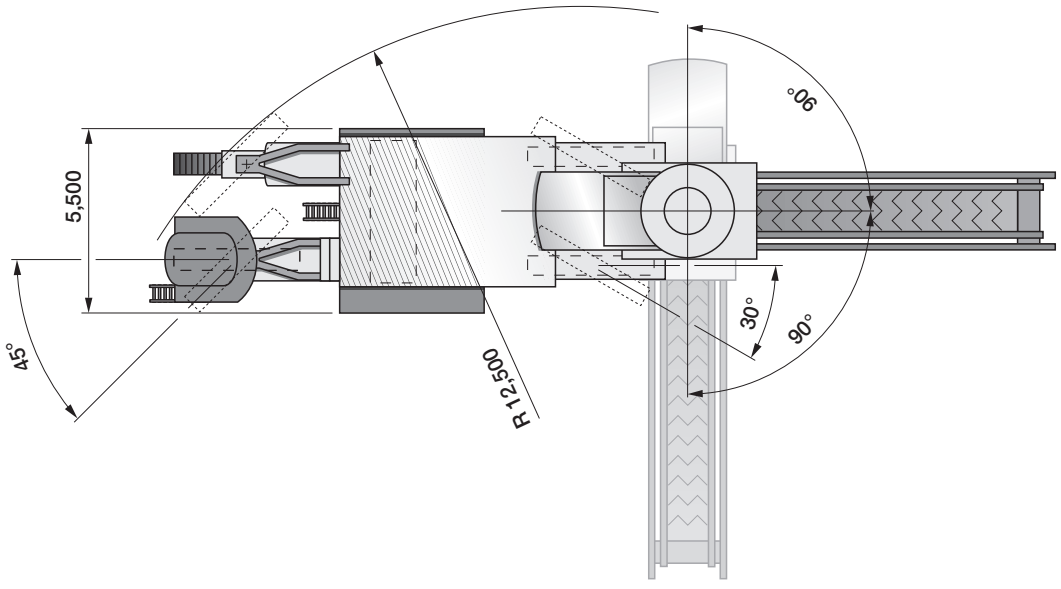
	Surface Miner 4200 SM Basic machine for medium-hard rock	Surface Miner 4200 SM Basic machine for soft rock
Cutting drum		
Cutting width max.	4,200 mm	4,200 mm
Cutting depth *1	0 to 650 mm	0 to 830 mm
Drum diameter with tools	1,500 mm	1,860 mm
Number of cutting tools	Depending on operating conditions	Depending on operating conditions
Engine		
Engine manufacturer	Cummins	Cummins
Displacement	50,000 cm^3	50,000 cm^3
Cooling	Water	Water
Number of cylinders	16	16
Rated power	1,194 KW/1,600 HP/1,623 PS	1,194 KW/1,600 HP/1,623 PS
Fuel consumption, full load	284 l/h	284 l/h
Fuel consumption, $^2/_3$ load	189 l/h	189 l/h
Driving characteristics		
Operating gear	0–20 m/min	0–20 m/min
Travel gear	0–2.5 km/h	0–2.5 km/h
Gradeability	20%	20%
Max. lateral inclination	8%	8%
Weights with 16,000 mm discharge conveyor *2		
Front axle load	80,000 daN (kg)	82,000 daN (kg)
Rear axle load	115,000 daN (kg)	116,000 daN (kg)
Own weight	195,000 daN (kg)	198,000 daN (kg)
Operating weight, full tanks (fuel, water)	208,300 daN (kg)	211,300 daN (kg)
Weights with 12,000 mm discharge conveyor *2		
Front axle load	81,000 daN (kg)	83,000 daN (kg)
Rear axle load	108,000 daN (kg)	109,000 daN (kg)
Own weight	189,000 daN (kg)	192,000 daN (kg)
Operating weight, full tanks (fuel, water)	202,300 daN (kg)	205,300 daN (kg)
Crawler tracks		
Crawler tracks, front	approx. 3,912 x 600 x 1,271 mm	approx. 3,912 x 600 x 1,271 mm
Crawler tracks, rear	approx. 3,912 x 600 x 1,271 mm	approx. 3,912 x 600 x 1,271 mm
Filling capacities		
Fuel tank	2,900 l	2,900 l
Hydraulic fluid tank	800 l	800 l
Water tank	approx. 10,000 l	approx. 10,000 l
Electrical system		
Control system	24 V	24 V
Conveyor system		
Belt width of primary conveyor	1,800 mm	1,800 mm
Length of primary conveyor	7,000 mm	7,000 mm
Belt width of discharge conveyor	1,800 mm	1,800 mm
Length of discharge conveyor	16,000 mm / 12,000 mm	16,000 mm / 12,000 mm
Theoretical capacity of discharge conveyor	2,400 m^2/h	2,400 m^2/h

*1 = The maximum cutting depth may deviate from the value indicated due to tolerances and wear.
*2 = All weights refer to basic machine without any additional equipment.

Surface miner 4200 SM, length of conveyor 12 m

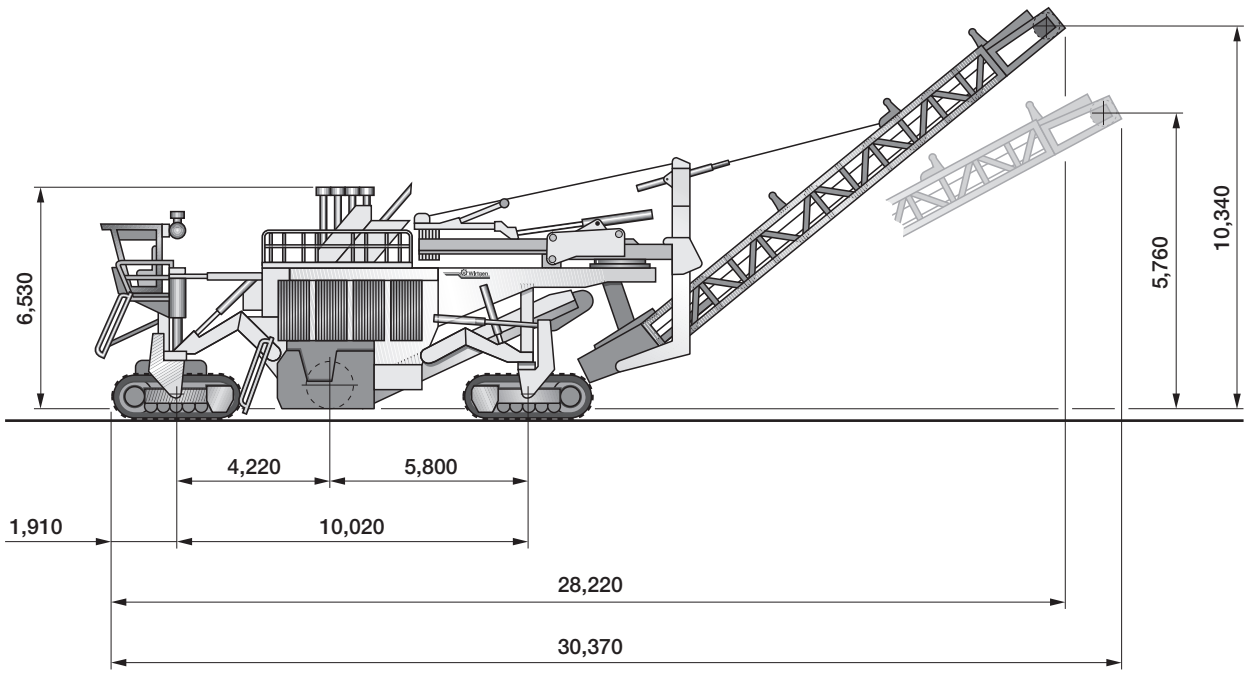
Dimensions in mm

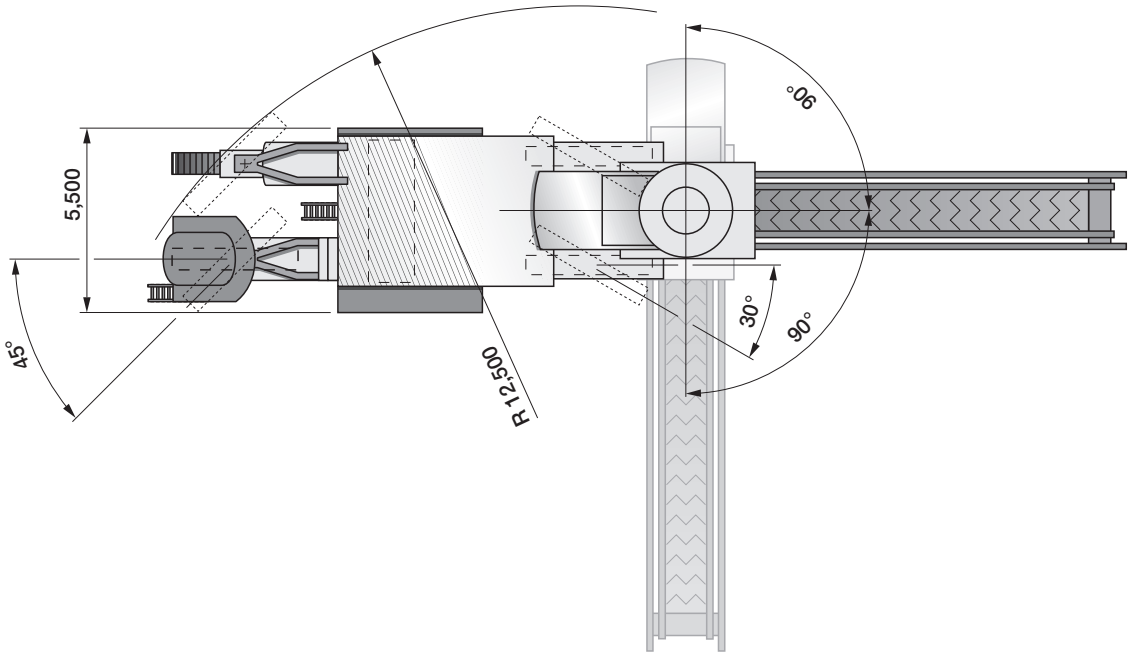




Surface miner 4200 SM, length of conveyor 16 m

Dimensions in mm





Basic design

The 4200 SM is a surface miner for cutting soft to medium-hard rock equipped with mechanically driven cutting drum and two-stage loading conveyor.
The discharge conveyor is adjustable in height and can be slewed to either side. The machine is equipped with crawler track units.

Machine frame

Heavy-duty welded structure with mounts for the individual function modules and attachments. The tanks for diesel fuel and water are integrated in the machine frame.
Hydraulically operated access ladders and service panels on both sides of the machine guarantee safe and ready accessibility for maintenance and service.

Operator's cabin

The cabin is located above the front, left-hand crawler track unit. This position prevents the vibrations and noise emissions caused by the engine and cutting drum from entering the cabin. Safe and convenient access is guaranteed by a hydraulically operated ladder with independent battery-operated pump. A second emergency exit complies with the safety regulations of the mining industry.
The cabin's distance (FOPS approved) from the right side of the machine provides additional safety when working close to a steep sidewall.
The entire cabin can be swivelled about 45° to either side, thus ensuring an optimum view for loading the heavy-duty dump trucks and for steering the crawler track units.
The cabin is mounted on shock absorbers, and is equipped with air-conditioning and heating systems to ensure a pleasant working environment. The driver's seat can be turned about 135° to either side.
All controls are integrated into the armrests, and include a joystick on either side. They comprise all functions of the entire operating process.
The automatic "Level Pro" cutting depth control system is located in the left-hand armrest.
A display of the Wirtgen information and diagnostic system is integrated in the right-hand armrest.
Three digital displays indicate the hydraulic working pressures of crawler track drive, primary conveyor and discharge conveyor.

Wirtgen Information and Diagnostic System

The Wirtgen Information and Diagnostic System keeps the machine operator informed of the current status of important machine components, such as the engine, hydraulic system and cutting drum drive, generating visual and audible alarms as and when required. The parameters indicated are saved in order to permit fast troubleshooting and diagnosis of faults. Air filters and hydraulic filters are connected to the system, which also ensures monitoring of the water and diesel filling levels. The system supplies additional parameters, such as the position of the rear crawler tracks, travel speed, operating hours, battery charge, engine speed, etc.

Engine

The machine is driven by a powerful Cummins engine.
The Wirtgen Information and Diagnostic System keeps monitoring the engine status all the time, shutting the engine down if and when required.
The cooler consists of separately replaceable finned tubes. The finned tubes are rubber-mounted, thus ensuring an extended lifespan. An extremely large cooling surface ensures effective cooling of the engine even at very high outside temperatures. The fan speed decreases at low ambient temperatures and reduced load.
Fan speed control thus contributes to lower noise emission levels and reduced fuel consumption rates.
The cooling flow is conducted into the machine in vertical direction, and is blown out on both sides.
This prevents dust from being drawn in from the ground, while simultaneously ensuring the intake of cold and clean combustion air.
The four air filters located above the engine are equipped with safety elements and preliminary filters, offering an extended lifespan due to the preliminary filters.

Cutting drum drive

The cutting drum drive is located on the left side of the machine. The maintenance-free and wear-free turbo clutch is fed by a separate oil circuit.
The oil circuit has an independent oil cooler.
The generously dimensioned belt drive consists of 9 multiple V-belts with 4 ribs each. A tensioning roller is automatically adjusted by means of a hydraulic cylinder. The powerful

drum gearbox is located inside the cutting drum. The belt pulley is arranged above the cutting drum centre, enabling the cutting drum to be lowered even deeper into the rock to be cut. The larger cutting depth means fewer machine passes and thus higher production rates.
The gearbox includes a lubrication pump with filter and cooler.

Cutting drum
The cutting drum works against the direction of travel.
Toolholders accommodating the point-attack cutting tools are welded onto the drum body in a helical pattern.
While the drum keeps rotating, the pattern of the cutting tool arrangement on the drum keeps moving the cut material towards the drum centre where ejectors reliably transfer it onto the primary conveyor.
The seatings accommodating the toolholders have been processed to maximum precision in order to ensure smooth replacement on site.
A scraper located behind the cutting drum ensures clean levelling of the cut surface. The cutting drum can be turned into the desired position quickly and safely – with the engine switched off – by means of a battery-operated drum turning device to facilitate the replacement of cutting tools.
For reasons of safety, the functions in the operator's control panel are deactivated during cutting tool replacement.
The large stroke range of the front height adjustment and large ground clearance enable the cutting tools to be replaced in a comfortable working posture.

Travel drive units / Height adjustment
The travel drive units are suspended to the machine frame by way of two heavy-duty swingarms each.
Each suspension has two hydraulic cylinders for height adjustment.
The rear units are adjusted separately via the electronic automatic levelling system. The front travel drive units act as full-floating axle and are controlled manually by the machine operator.

Travel drive
The surface miner is equipped with large crawler track units (D 9) fitted with dual grouser track pads. The crawler track units are driven separately via one hydraulic motor each.
Two hydraulic variable displacement pumps feed the front and rear travel drive motors respectively.
The machine's travel speed can be adjusted continuously from zero to maximum speed. Two switchable hydraulic flow dividers act as differential locks and ensure uniform traction even in difficult working conditions.
A previously driven speed can be saved in a cruise control system ("Tempomat") and then re-set, for instance, once trucks have changed.

Automatic power control
The machine is equipped with an automatic power control system. It governs the machine's advance speed in accordance with the load of the diesel engine but can also be switched off.

Steering
The machine has all-track steering which is operated by means of a joystick and permits pre-selection of the steering mode.

Positioning: The rear and front crawler track units are steered in opposite directions in order to achieve a small turning radius.

Front-wheel steering: Only the front crawler track units are steered. The rear crawler tracks are held in a straight position in order to enable long, straight cuts.

Crab steering: The rear and front crawler track units are steered in the same direction in order to allow fast positioning of the machine in lateral direction, for instance, close to steep walls.

When positioning, the rear crawler track units are kept in the centre of the cut automatically during the cutting operation.

When the miner is raised out of the cut, the rear crawler track units can be fully turned, thus enabling a small turning radius.
The steering cylinder is directly connected to the crawler track suspension from the machine frame.
This heavy-duty design is ideally suited to the tough mining operation.

The front crawler track units are steered via one cylinder per track, while the rear crawler track units are steered via two cylinders per track.

Brake system
Braking in operation is effected by the machine's hydrostatic transmission.
In addition, the surface miner is equipped with automatic multiple-disk parking brakes at all four crawler track units.

Conveyor system
An 1,800 mm wide conveyor system, comprising primary conveyor and discharge conveyor, loads the mined material into the heavy-duty dump truck.
The crusher bar installed in front of the drum largely prevents the material to be mined from breaking into large slabs, and protects the conveyors from premature wear and tear.
The discharge conveyor is height-adjustable and can be slewed about 90° to either side.
A counterweight is slewed in opposite direction to the conveyor in order to ensure stability and traction.
The counterweight can be retracted to enable the machine to be driven up close to a wall or to permit operation along steep sidewalls. For reasons of safety, the conveyor can be slewed about 45° only with the counterweight retracted.
The loading system has been designed so as to enable easy replacement of the conveyor belts.

Cutting depth adjustment and automatic levelling
The surface miner is equipped with an electronic automatic levelling system for controlling the cutting depth.
The system is operated by means of proportional control, meaning that level differences in the reference plane are levelled quickly and without overshooting of the machine.
Scanning of the reference planes can be effected by various methods, for instance, at the side plates via wire-rope sensors, on the existing surface via an ultrasonic sensor, via a stringline combined with rotary transducing sensors, or via a plane formed by lasers.
A slope sensor is also part of the machine's standard equipment. Upon request, a multiplex system for levelling irregularities in longitudinal direction can also be integrated into the automatic levelling system.

Hydraulic system
All functions are driven hydraulically, the only exception being the cutting drum drive.
The actual working pressure is significantly lower than the maximum permissible pressure to ensure an extended service life of the different components.
The pumps are driven via a transfer case installed in front of the engine on the right side of the surface miner.
The hydraulic fluid tank is located close to the pumps in order to ensure short suction distances.
An elastic coupling between the crankshaft and gearbox prevents torsional vibrations.
Pumps and motors are high-performance units from manufacturers of good reputation.

Each of the following components is fed by an independent, closed circuit:
- Front crawler track units
- Rear crawler track units
- Primary conveyor
- Discharge conveyor

Two zero-stroke pumps serve the cylinder functions.
All fans are driven hydraulically.
The entire system is filtered via return line suction filters.
The oil for the setting functions (cylinders) is additionally passed through a pressure filter.

Electrical system
24 V electrical system with dual starters, 3-phase alternator and four 12 V batteries, as well as lamp sockets.

Water spray system
The formation of dust clouds during the cutting operation is largely prevented by a water spray system which also cools the point-attack cutting tools, thus considerably extending their lifespan.
The spray nozzles are easily removed for cleaning.
A generously dimensioned water tank permits extended uptimes between fillings.

Safety features
- Numerous lifting and lashing lugs permit secure loading and transport.

- Fireproof walls separate the engine unit from the hydraulic unit and drum drive clutch.
- Ladders, access steps and platforms are produced from anti-skid grating.
- Working lights with magnetic bases can be mounted in any position on the machine.
- Access steps and walkways are illuminated.
- Lights at the crawler track units, cutting drum and conveyor permit safe operation of the surface miner in darkness.
- Several emergency stop switches can be actuated from the ground and are additionally located in the engine compartment, at the electrical cabinet and in the operator's cabin.
- The ladders leading to the cabin and engine compartment can be lowered in battery mode when the engine is switched off.

Equipment features	Surface Miner 4200 SM
Working width 4,200 mm, working depth up to 830 mm in one machine pass, drum diameter 1,860 mm(for soft rock/coal), tool spacing and tooling varying in accordance with machine application and the material to be mined	●
Working width 4,200 mm, working depth up to 650 mm in one machine pass, drum diameter 1,500 mm (for hard rock), tool spacing and tooling varying in accordance with machine application and the material to be mined	●
Drum tooling in welded design with cylindrical toolholders	○
Mechanical cutting drum drive via multiple V-belts	○
Two cutting speed options through changing the belt pulleys	○
Continuously adjustable, hydraulic four-track drive with two speed ranges	○
Crawler tracks with dual grouser track pads	○
Hydraulically relieved scraper blade behind the drum	○
All-track steering	○
Two-stage conveyor system; primary conveyor: 1,800 mm wide belt; discharge conveyor: 1,800 mm wide and 16,000 mm long, with a slewing range of 180°, adjustable in height and with continuously adjustable belt speed	●
Two-stage conveyor system; primary conveyor: 1,800 mm wide belt; discharge conveyor: 1,800 mm wide and 12,000 mm long, with a slewing range of 180°, adjustable in height and with continuously adjustable belt speed	●
Four height adjustment options for the entire machine, consisting of two hydraulic cylinders each at the front and rear, indication of cutting depth, control of cutting depth, lateral inclination and longitudinal inclination	○
Fully glazed operator's platform, soundproof and mounted on anti-vibration buffers, equipped with rotating seat with all major controls installed in the armrests, as well as with air-conditioning system for cooling and heating system	○
Complete lighting system (9 Xenon spotlights)	○
Comprehensive safety package with 5 emergency stop switches	○
Water spray system at the cutting drum	○
Water spray system at the conveyors and material transfer points	○
Central lubrication system	●
Comprehensive toolkit for servicing and maintenance	○
Painting: white with orange stripe	○
Machine commissioning by qualified personnel	○

○ Standard ● Option

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