CM235
Continuous Miner

Power		
Total Power	701 kW	940 hp
Cutter Head Power	410 kW	550 hp
Loading Unit		
Loading Capacity	14-29 tonnes/min	15-32 tons/min

Cutting		
0 to Maximum Cut [2.8 m^3/sec (6,500 ft^3/min) scrubber]	914-3251 mm	36-128 in
Machine Weight		
Weight	61.2 tonnes	135,000 lb

Features

Maneuverability
Compact design with independent tramming

Maximized Safety and Productivity
Integrated machine control unit

Superior Weight/Power Ratio
Robust frame and pivot points ensure extended service life and high remanufacturing capability

Like all Cat® continuous miners, the CM235 offers:

- *Heavy main frame for rigidity and stability*
- *Wide conveyor for maximum loading rates*
- *Wide crawlers for maximum penetration and low ground pressure*
- *Radio remote with self diagnostics available*
- *Easy access and low maintenance*

Contents

Weighing in at 61.2 tonnes (135,000 lb) and with a compact design specifically for low- to mid-seam operations, the Cat CM235 continuous miner incorporates all the robust features of the CM200 Series plus new features and enhancements. With 2 × 205 kW (2 × 275 hp) cutter-head motors, it is the most powerful continuous miner in its class.

Mainframe

Heavy Duty Mainframe

To ensure maximum rigidity and stability, the high-strength one-piece mainframe is constructed from steel plate ranging in thickness from 1.9 mm to 7.6 mm (0.75 in to 3 in). The main support rails are 50.8 mm (2 in) thick, and the large 114.3 mm (4.5 in) diameter pivots have replaceable 12.7 mm (0.5 in) wall bushings. The mainframe has been shortened by 762 mm (2 ft 6 in) to improve maneuverability. The mainframe allows crossover bidirectional scrubber discharge (integral to main frame).

Traction

Continuous miner in its class

Traction

Like all Cat continuous miners, the CM235 features independent tramming for greater maneuverability and wide crawlers for maximum penetration and low ground pressure.

Maximum Torque

The traction system is controlled by Variable Frequency Drives (VFDs), which give smooth zero-to-full speed transition. The drives can develop 100% torque at zero RPM.

Crawlers

Forged, heat-treated alloy steel pads with a minimum hardness of 340 BHN with a width of 558.8 mm (22 in) ensure high strength and wear resistance, and low ground pressure.

Enhanced Productivity

Variable Frequency Drive (VFD) traction control means more tonnes (tons) produced per shift due to improved sumping and relocation times and a faster tram speed of up to 26 m/min (85 ft/min) (governed).

Cutter Head

Motor Protection

Massive 152 mm (6 in) boom legs on the cutter support the frame and ensure minimal deflection and fatigue. The cutter drums are 50.8 mm (2 in) thick, allowing maximum bit-tip standoff. The cutting head is powered by two 205 kW (275 hp) motors. Each is attached to a gear case via a torque-limiting clutch with a response time of 0.1 seconds.

Split Gear Case

The cutter gear case is split. Each side is independent and only connected by the center cutting drum. This allows one gear case – with half the number of components – to be replaced, as opposed to standard designs which require replacement of the entire assembly. The gear case has three independent oil compartments, allowing convenient viewing of oil levels through site gauges.

Gathering Head and Conveyor

Gathering Head

The CM235 offers a variety of 3-finger centrifugal loading arms (CLAs) to meet customer requirements as well as a choice of three chain and CLA speeds. 6-finger CLAs – found to be 40% more effective in low seams – are also available. The gathering head assembly has a chromium-carbide overlay (CCO) wear protection package.

Conveyor

CM235 has a new conveyor boom design with inboard conveyor lift cylinders and a conveyor width of 965 mm (38 in) for faster loading. The conveyor is driven by a double-sprocket drive with universal swivel-joint operation. The conveyor chain transitions around an 8-tooth sprocket on the foot shaft which ensures smooth and quiet operations, while the 31.75 mm (1.25 in) diameter chain provides greater strength. The interface between the cutter boom, gather pan and conveyor provide maximum throat clearance ensuring optimum load rates

Wear Protection

The top decking of the conveyor is CCO-plated (chromium-carbide overlay) and the return deck is plated with 450 BHN wear plate for greater wear protection. The conveyor has a 45-degree swing capability each way.

Control Systems

Ease of Operation

The Cat Machine Control Unit (MCU) is designed to operate the entire Cat CM235. Based on a mine-duty PLC, this drive and control system combines maximized coal production and operator safety with minimum downtime. Traction motors are controlled by a microprocessor-based system, minimizing the connection points that are the major cause of downtime. The MCU provides data logging, fast diagnostics and enhanced troubleshooting capability.

Machine Management

A comprehensive machine management and diagnostics system is used to manage the continuous miner's health and aid in the quick diagnosis and repair of the problem.

Remote Control

A Super Simpson radio remote with self-diagnostics is available. Features include:

- Graphic display shows the condition of all motors, VFD components, and the condition and position of all hydraulic control valves and solenoids.
- Tito remote control console or new compact remote control console
- Motor Mate AC current sensor

VFD Technology

Enhanced Performance with VFD

Variable Frequency Drive (VFD) traction control means greater tonnage produced per shift due to improved sumping and relocation times and a faster tram speed of up to 26 m/min (85 ft/min) (governed).

VFD also means

- Greater system efficiency
- Reduced cost of motors
- Ease of troubleshooting

More Torque

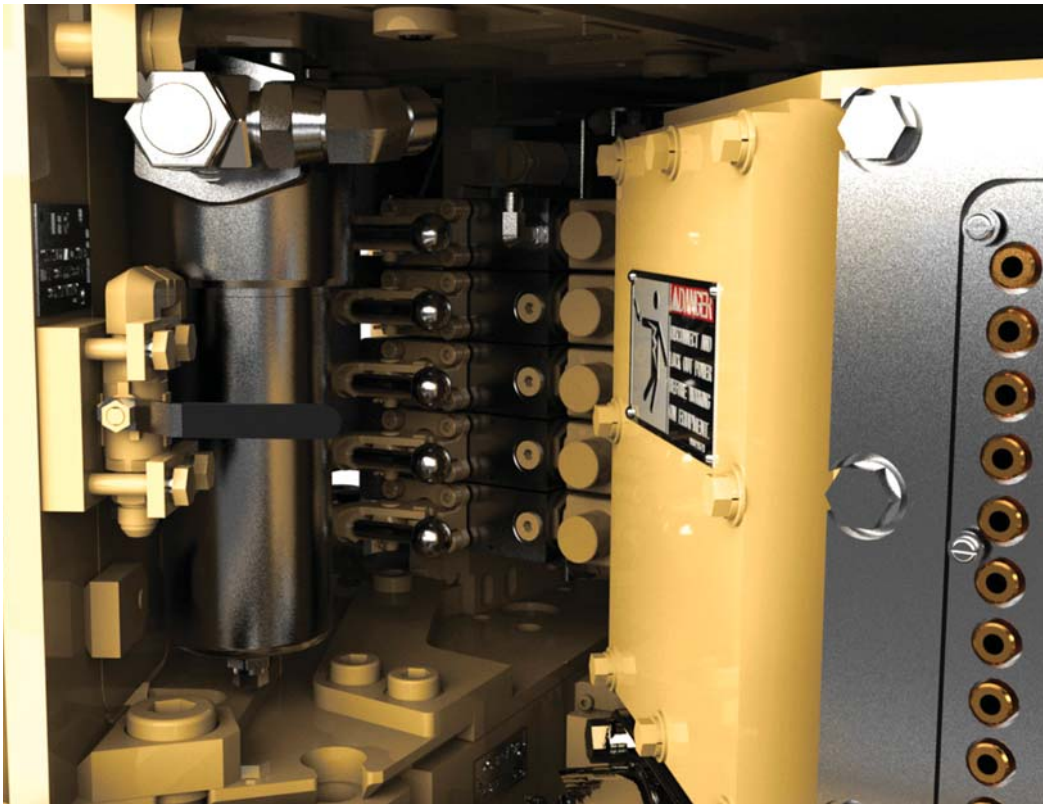
VFD provides more motor torque across the entire traction speed range.

Brushless Motor Design

This translates into less maintenance and longer motor service life.

Return on Investment

VFD pays for itself through higher extraction and lower maintenance costs over its 1.79 million tonne (2 million ton) service life.



Health and Safety

Safety

Cat mining machines and systems are designed with safety as their first priority.

The control system is proximity detection ready (details below). The intuitive human machine interface gives the operator and maintenance supervisor an unprecedented level of understanding of their machine.

The dual-sprocket conveyor chain drive results in lower ambient noise.

Proximity Detection

Caterpillar has developed a Personnel Proximity Detection System with the aim of clearly identifying the presence or absence of personnel reliably and with high repetition accuracy, and of transmitting this information in real time to the local control system to allow appropriate action to be taken to prevent injury.

The machine controls can be configured to give different responses to encroachment into the various zones, such as warning, reduced speed and shutdown. A silent zone can overlay the red zone, allowing the operator to see the cutter while staying out of the turning radius of CM. The fields can be customized to provide different-shaped fields.

Other Safety Features

These include a dust collector, scrubber, dust ignition protection, water solenoid valve to minimize water use and spillage, methane monitoring and noise reduction.

Serviceability

Service-Friendly

In addition to long overhaul intervals and wear-resistance features, the CM235 has a number of features to simplify maintenance and repair:

Preventive Maintenance

Caterpillar's thorough preventive maintenance program ensures that the integrity of the machine is not compromised. When properly maintained, Cat continuous miners perform for years at lower maintenance costs, thus lowering the total cost of ownership.

Easy Access

- Centralized locations of grease points and fill ports for ease of maintenance.
- Ease of access to cutter head gear oil checks and replacement
- Cutter head motor mounting location allows easier access for replacement

Resistant to Wear

- Astralloy-V crawler frame wear liners
- Chromium-carbide overlay (CCO) wear protection package for cutting head gear case struts
- 3- or 6-finger centrifugal loading arms (CLA) with replaceable bolt-on wear tips
- Chromium-carbide overlay (CCO) wear protection package for gathering head assembly
- The top decking of the conveyor is CCO plated and the return deck is plated with 450 BHN wear plate
- Heat treated alloy steel crawler pads for wear resistance and 100% increase in pivot wear area material

Split Gear Case

The cutter gear case is split. Each side is independent and only connected by the center cutting drum. This allows one gear case – with half the number of components – to be replaced, as opposed to standard designs that require replacement of the entire assembly. The gear case has three independent oil compartments, allowing convenient viewing of oil levels through site gauges.

Component Accessibility

The traction units are complete assemblies that slide in from the side. VFD motors are brushless motor design, requiring less maintenance and ensuring longer motor life.

CM235 Continuous Miner Specifications

Operating Dimensions

Mining Range (recommended)	1067-2946 mm	42-116 in
Minimum Height	914 mm	36 in
Maximum Reach	3251 mm	10 ft 8 in
Ground Clearance	229 mm	9 in
Length Rear Bumper to Face	8160 mm	26 ft 9 in

Transport Dimensions

Frame Width (over rub rails)	3277 mm	10 ft 9 in
Overall Length	11 049 mm	36 ft 3 in
Height (over scrubber duct)	914 mm	36 in

Machine Weight

Weight (total)	61.2 tonnes	135,000 lb

Cutting Unit

Cutting Drum Diameter	914 mm	36 in
Cutting Drum Width	3581 mm	11 ft 9 in
Cutting Power – Motors (one-hour rating)	2 × 205 kW	2 × 275 hp

Loading Unit

Loading Method	6-finger CLA	
Conveyor Width	965 mm	38 in
Conveyor Depth	152 mm	6 in
Loading Capacity	14-29 tonnes/ min	15-32 tons/ min
Conveyor Power – Motors (one-hour rating)	2 × 45 kW	2 × 60 hp

Traction Unit

Crawler Chain Width	508 mm	20 in
Crawler Assembly Length	2896 mm	9 ft 6 in
Ground Pressure	204 kPa	29.6 psi
Crawler Speed	0-26 m/min	0-85 fpm
Traction Power – AC/VFD (one-hour rating)	2 × 82 kW	2 × 110 hp

Pump Unit

Pump Power – Motor (one-hour rating)	1 × 37 kW	1 × 50 hp

Optional Dust Suppression

Scrubber Assembly	Top mounted, dual intake (bidirectional discharge)	
Scrubber Type	Wet bed	
Scrubber Capacity	2.8 m^3/sec	6,000 ft^3/min
Fan Power – Motor	1 × 22 kW	1 × 30 hp

Electrical System

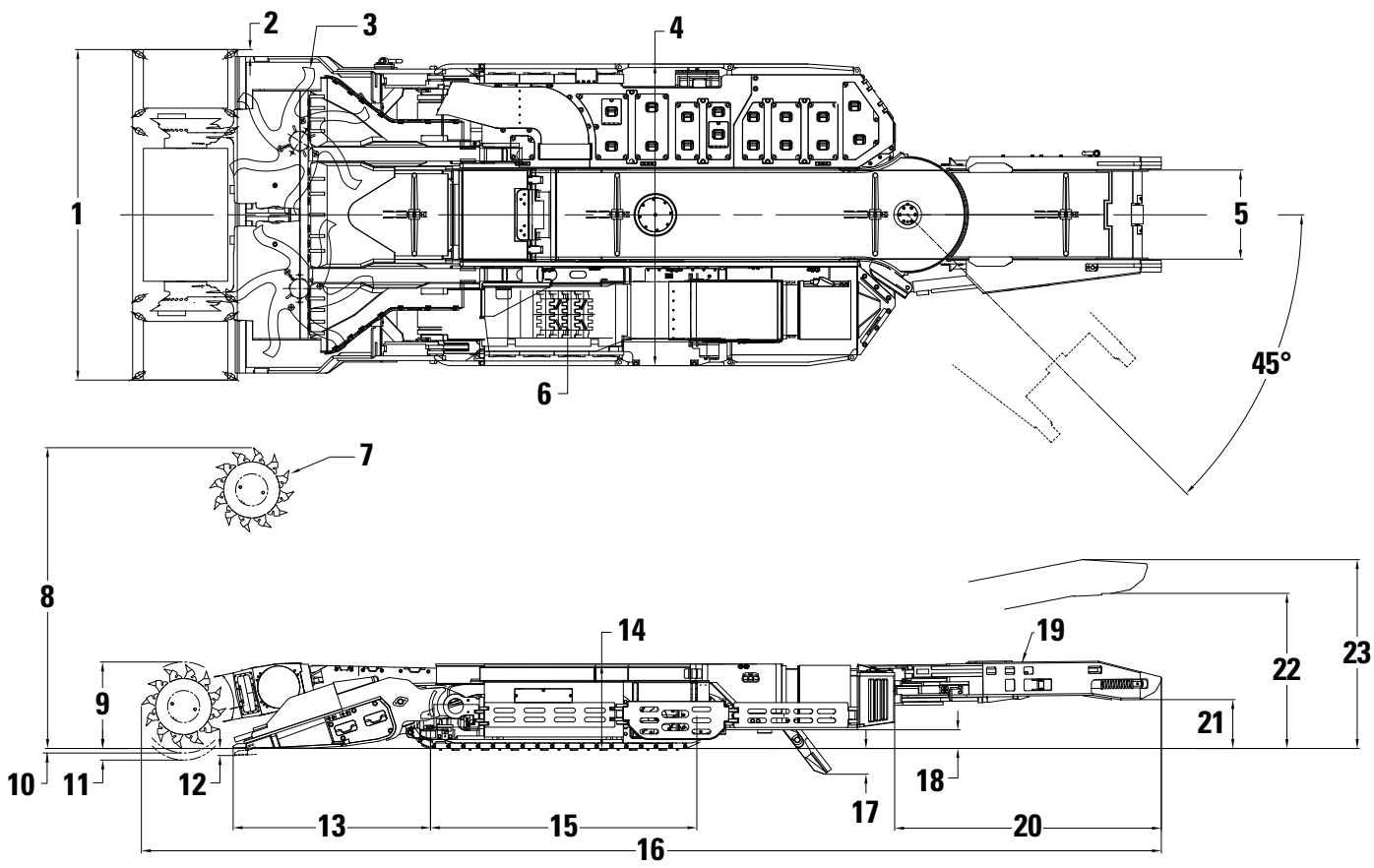
Machine Voltage (International voltages available)	950V AC 60 Hz	
Control System	Processor based/ radio remote control	

Total Installed Power

One-hour Rating without Scrubber	701 kW	940 hp

Dimensions

All dimensions are approximate.



1	3581 mm	11 ft 9 in
2	76 mm	3 in
3	1600 mm	63 in
4	3277 mm	10 ft 9 in
5	965 mm	38 in
6	508 mm	20 in
7	914 mm	36 in
8	3251 mm	10 ft 8 in
9	914 mm	36 in
10	51 mm	2 in
11	127 mm	5 in
12	76 mm	3 in

13	2134 mm	7 ft 0 in
14	914 mm	36 in
15	2896 mm	9 ft 6 in
16	11 049 mm	36 ft 3 in
17	279 mm	11 in
18	229 mm	9 in
19	152 mm	6 in
20	2889 mm	9 ft 5.75 in
21	527 mm	1 ft 8.75 in
22	1683 mm	5 ft 6.25 in
23	2045 in	6 ft 8.5 in

Notes

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at **www.cat.com**

AEHQ6841-01 (12-2012)
Replaces AEHQ6841

Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat dealer for available options.