

JOYGLOBAL



12CM Series

Continuous Miner

Product Overview





12CM Series

Joy's answer for the mid to high-seam applications is the 12CM series continuous miners. Utilizing proven technology from years of service life, this product line is designed to provide

Designed to provide high productivity and reliability

high productivity and reliability in the most rigorous of conditions.

The basic elements of each continuous miner are similar in design, following field proven philosophies perfected by

Joy over the years. Each machine employs Joy's multi-motor concept with outboard access to motors, gearcases, controllers and other major components. The philosophy calls for the isolation of major components for easier troubleshooting and maintenance. The continuous miners use individual motors with direct drive transmissions to power the cutter, traction, gathering and hydraulic systems. This permits service or repair quickly and easily, thus reducing downtime and maintenance costs.

WETHEAD Cutterhead Systems

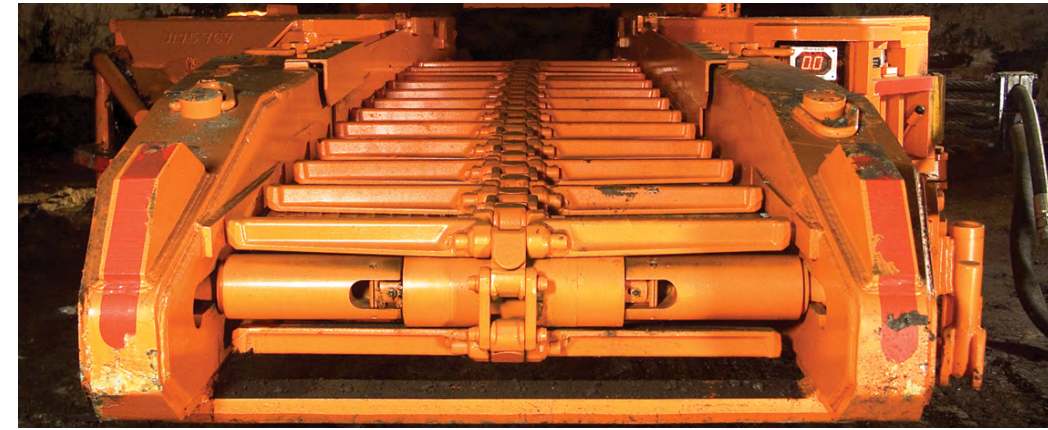
The JOY WETHEAD continuous miner cutterhead incorporates a fine water spray behind each cutting bit on the cutter drums. Acting as both a cooling and wetting agent, the water reduces the potential for frictional ignitions and also reduces respirable dust levels. The water spray acts as both a cooling and wetting agent in order to address both issues at the same time. The sprays also provide lubrication that substantially improves bit life. The WETHEAD does all this while potentially consuming less water than the standard miner dust sprays.

Application Specific Cutting

A wide variety of cutting options...



The 12CM is available in solid head models ranging in drum diameter from 44 to 53 ¾ in (1120 to 1380 mm). Combined with cutting power up to 698 hp (520 kW), the cutting system can be sized to match most seam conditions.



SMARTConveyor

JOY's SMARTConveyor incorporates the latest sound abatement technologies to reduce sound output while improving maintainability. "Underground results show a 45% and 65% noise exposure reduction for the operator" when compared to a standard machine. (Mining Engineering, 2011, Vol. 63, No. 7, pp.83) SMARTConveyor combines multiple technologies such as JOY's patented Dual Sprocket Conveyor Chain and auto-tensioning features to improve the operating environment. SMARTConveyor is currently available as an option on all continuous miner models.

SMARTZONE PROXIMITY SYSTEM

The JOY SMARTZONE PROXIMITY SYSTEM is an integrated training device that helps teach personnel to operate a continuous miner from safe working zones, and to otherwise stay clear of danger zones. Its unique ability to track, recognize and log operator movement around the machine provides an additional layer of analysis for in depth training initiatives. The SMARTZONE PROXIMITY SYSTEM option is currently available on all continuous miner models.

High Voltage Capability

The 12CM27 is a high-voltage machine that is operated at 2300 Volt 60 Hz (3300 Volt 50 Hz) to provide a significant increase in horsepower to the cutting system. Reduced thermal losses in the cutter motors and trailing cable increase the available continuous cutting time almost indefinitely, leading to improved production levels. With a high-voltage cutting system, the 12CM27 is typically operated well within its maximum operating limits. This leads to longer motor and electrical component lives, reduced maintenance and lower repair costs.

Total Control

The latest in VFD technology...

Today's 12CM traction system builds on years of field-tested performance to offer an even more durable, maneuverable package. Patented OPTIDRIVE AC electronics are coupled to a compact all-gear transmission to provide smooth, reliable service. Cutter motor feedback and traction differential features optimize sump performance in even the most demanding applications. Optional track frame widths are offered to suit specific floor and entry conditions. Brushless AC traction motors are highly reliable and require minimal maintenance.



Joy History

Tradition in Quality & Pride...

With over 6,000 continuous miners shipped since 1948, Joy leads the mining industry with innovations that increase productivity and improve operator safety. Innovations such as air scrubbers, Wethead cutterhead drums, AC traction motors, noise reducing conveyor systems, and hydraulics manifolds are just a few examples. All are industry firsts from Joy Mining Machinery, the world leader in underground mining innovations.





12CM Automation

The **FACEBOSS** control platform enables operators to consistently operate at the optimal balance of production rate and cost.

Competitive and market pressures require that Joy's customers produce product at an ever increasing rate and at an ever decreasing cost per ton. These objectives are made all the more challenging by the worsening attributes of available reserves and the ever deteriorating operating conditions in which machinery must operate.

Using a combination of operator assistance tools, automated sequences, advanced diagnostics, machine performance monitoring and analysis tools, the JOY FACEBOSS control platform enables operators to consistently operate their JOY machinery at the optimal balance of production rate and cost.

Product Optimization

The JOY FACEBOSS control platform can maximize continuous miner productivity in a variety of ways:

- **Optimized Cutting** Rate of cutting is automatically maximized during sump and shear cycles by ensuring optimal cutter loading through the control of the traction motor speed and hydraulic shear rate respectively.
- **High Availability Feedback** Control loops protect all electric motors on the continuous miner from jam and thermal overloads, ultimately extending motor life and minimizing machine downtime.

Reliability Through Design

All FACEBOSS hardware has been designed and tested specifically for underground applications. Testing at extreme temperatures and vibration levels ensures that each component can stand up to harsh conditions. Further testing to destruction in atypical conditions allows Joy engineers to better understand the failure modes of each component in order to improve the overall design and reliability.

Multilingual Display

On a Standard Control Platform...

The JOY FACEBOSS control platform can be configured to display a variety of languages. In combination with local field personnel, this multilingual control platform helps JOY equipment to achieve the goal of operating at the lowest cost per ton, regardless of where the equipment is located.

This platform is standard across all JOY equipment, reducing inventory to support a typical fleet. Common practices reduce training burdens and overall knowledge required for electrical maintenance personnel. This enables maintenance and trouble-shooting performance to rise to a more productive level.



Outby Communications

With the JOY continuous miner connected to a surface computer, the FACEBOSS control platform enables the real-time monitoring of the machine from remote locations (Remote Machine Monitoring - RMM).

In addition to RMM, the FACEBOSS control platform continuously buffers and streams operating data to the surface computer. The surface computer, installed with JOY Surface Reporting Software (JSRP), interprets this data and generates value-added production reports directly following each shift and emails the report to the appropriate mine/Joy individuals. This feedback mechanism allows management to intervene where required to make positive change. Similarly, monthly production and engineering reports are generated and communicated to provide a higher-level interpretation of the operation.

Advanced Diagnostics

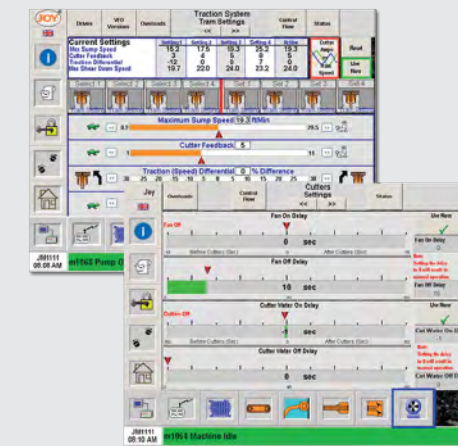
The JOY FACEBOSS control platform includes an on-board graphical display which includes a log of events, messages and alarms. All key machine operating parameters are continuously monitored and recorded during machine operation. By using the on-board trending and graphing capability on this stored information, the root cause of machine failure can be quickly and easily determined.

For quick and easy reference, on-board service manuals are accessible through the on-board display. Supplementary to the service manual are step-by-step instructions for regular maintenance operations and help text for systematic trouble shooting.

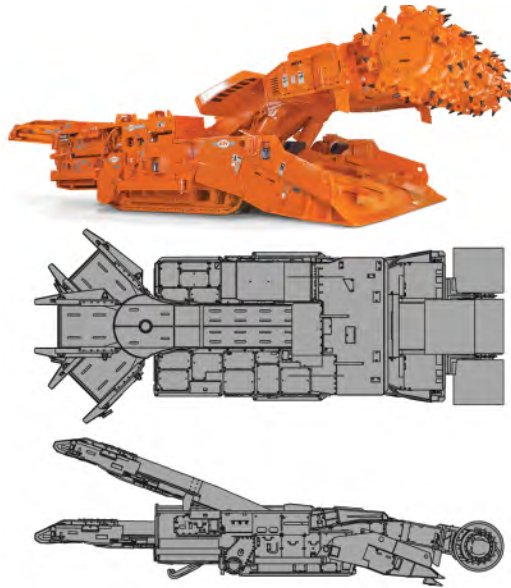
User Friendly Interface

Machine Setup/Configuration...

Graphical on-board interface with intuitive screens simplifies initial machine setup. These same screens make it easy to adapt to changing mining conditions without the need to open an XP enclosure. In addition, preset tram functions can be selected from the remote to allow the operator to make on the fly cutter feedback adjustments as conditions dictate. The roof and floor cutting limits used with automation sequences are conveniently adjusted via the remote.

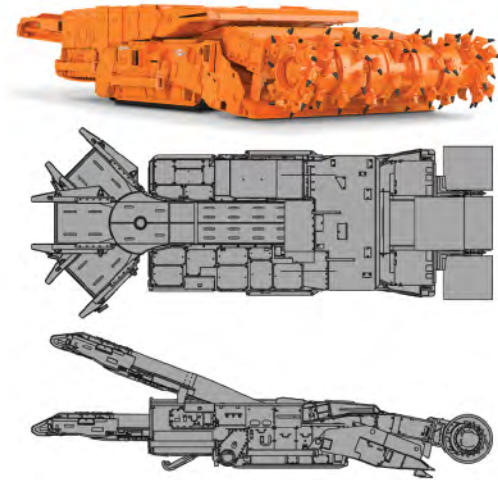


JOY 12CM12 Continuous Miner



		12CM12B		12CM12D	
Loading Rate		17-32 ton/min	15-29 tonne/min	17-32 ton/min	15-29 tonne/min
Cutter Head Diameter		44 in	1120 mm	44 in	1120 mm
Conveyor	Width	38 in	965 mm	38 in	965 mm
	Chassis Depth	12 in	305 mm	12 in	305 mm
	Chain Pitch	3 ¼ in	82 mm	3 ¼ in	82 mm
	Speed Options	402 fpm 475 fpm	123 m/min 145 m/min	402 fpm 475 fpm	123 m/min 145 m/min
Crawler Chain	Width	18 ½ in	470 mm	18 ½ in	470 mm
	Pitch	7 in	178 mm	7 in	178 mm
Cutter Drums	JOY Bit Blocks, Spacing	2 ¼ in	57 mm	2 ¼ in	57 mm
Cutting Width		10 ft 10 in	3302 mm	10 ft 10 in	3302 mm
Ground Pressure		32 psi	221 kPa	32 psi	221 kPa
Weight		130,000 lbs	59 kg	130,000 lbs	59 kg
Maximum Cutting Height		145 in	3685 mm	181 in	4600 mm
Minimum Cutting Height		50 in	1270 mm	85 in	2160 mm
Basic Chassis Height		39 ½ in	1005 mm	39 ½ in	1005 mm
Ground Clearance		12 in	305 mm	12 in	305 mm
Sump Range		0-25 fpm	0-7.6 m/min	0-25 fpm	0-7.6 m/min
Tram Speed	Slow	15 fpm	4.6 m/min	15 fpm	4.6 m/min
	Intermediate	30 fpm	9.1 m/min	30 fpm	9.1 m/min
	High	65 fpm	19.8 m/min	65 fpm	19.8 m/min
	Turbo	85 fpm	25.9 m/min	85 fpm	25.9 m/min
Gathering Arm Speed		45 or 54 rpm	45 or 54 rpm	45 or 54 rpm	45 or 54 rpm
Cutter Speed		60 fpm	60 m/min	60 fpm	60 m/min
Bit Tip Speed		691 fpm	210 m/min	691 fpm	210 m/min
Motors (Water Cooled)					
950 Volt, 60 Hz					
Cutter - 2		235 hp	175 kW	235 hp	175 kW
Pump - 1		54 hp	40 kW	54 hp	40 kW
Gathering Head - 2		67 hp	50 kW	67 hp	50 kW
Traction - 2		80 hp	60 kW	80 hp	60 kW
Total Power		818 hp	610 kW	818 hp	610 kW
950/1050 Volt, 50 Hz					
Cutter - 2		228 hp	170 kW	228 hp	170 kW
Pump - 1		54 hp	40 kW	54 hp	40 kW
Gathering Head - 2		60 hp	45 kW	60 hp	45 kW
Traction - 2		80 hp	60 kW	80 hp	60 kW
Total Power		730 hp	545 kW	730 hp	545 kW

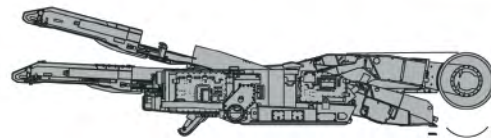
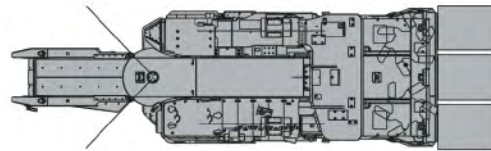
JOY 12CM15 Continuous Miner



		12CM15B		12CM15D	
Loading Rate		17-30 ton/min	15-27 tonne/min	17-30 ton/min	15-27 tonne/min
Cutter Head Diameter (Optional)		44 in	1120 mm	44 in	1120 mm
Conveyor	Width	30 in	762 mm	30 in	762 mm
	Chassis Depth	12 in	305 mm	12 in	305 mm
	Chain Pitch	3 ¼ in	82 mm	3 ¼ in	82 mm
	Speed Options	402 fpm 475 fpm	123 m/min 145 m/min	402 fpm 475 fpm	123 m/min 145 m/min
Crawler Chain	Width	18 ½ in	470 mm	18 ½ in	470 mm
	Pitch	7 in	178 mm	7 in	178 mm
Cutter Drums	JOY Bit Blocks, Spacing	2 ¼ in	57 mm	2 ¼ in	57 mm
Cutting Width		10 ft 10 in	3302 mm	10 ft 10 in	3302 mm
Ground Pressure		32 psi	221 kPa	32 psi	221 kPa
Weight		130,000 lbs	59 kg	130,000 lbs	59 kg
Maximum Cutting Height		145 in	3685 mm	181 in	4600 mm
Minimum Cutting Height		50 in	1270 mm	85 in	2160 mm
Basic Chassis Height		39 ½ in	1005 mm	39 ½ in	1005 mm
Ground Clearance		12 in	305 mm	12 in	305 mm
Sump Range		0-25 fpm	0-7.6 m/min	0-25 fpm	0-7.6 m/min
Tram Speed	Slow	15 fpm	4.6 m/min	15 fpm	4.6 m/min
	Intermediate	30 fpm	9.1 m/min	30 fpm	9.1 m/min
	High	65 fpm	19.8 m/min	65 fpm	19.8 m/min
	Turbo	85 fpm	25.9 m/min	85 fpm	25.9 m/min
Gathering Arm Speed		45 or 54 rpm	45 or 54 rpm	45 or 54 rpm	45 or 54 rpm
Cutter Speed		60 fpm	60 m/min	60 fpm	60 m/min
Bit Tip Speed		691 fpm	210 m/min	691 fpm	210 m/min
Motors (Water Cooled)					
950 Volt, 60 Hz					
Cutter - 2		235 hp	175 kW	235 hp	175 kW
Pump - 1		54 hp	40 kW	54 hp	40 kW
Gathering Head - 2		67 hp	50 kW	67 hp	50 kW
Traction - 2		80 hp	60 kW	80 hp	60 kW
Total Power		818 hp	610 kW	818 hp	610 kW
950/1050 Volt, 50 Hz					
Cutter - 2		228 hp	170 kW	228 hp	170 kW
Pump - 1		54 hp	40 kW	54 hp	40 kW
Gathering Head - 2		60 hp	45 kW	60 hp	45 kW
Traction - 2		80 hp	60 kW	80 hp	60 kW
Total Power		730 hp	545 kW	730 hp	545 kW

JOY 12CM27 Continuous Miner

12CM27D & E



Loading Rate		15-29 ton/min	9-19 tonne/min
Cutter Head Diameter		51 ½ in	1310 mm
Conveyor	Width	38 in	965 mm
	Chassis Depth	12 in	305 mm
	Chain Pitch	3 ¼ in	82 mm
	Speed Options	402 fpm 475 fpm	123 m/min 145 m/min
Crawler Chain	Width	22 in	560 mm
	Pitch	7 ¼ in	184 mm
Cutter Drums Cutting Width	JOY Bit Blocks, Spacing	4 ½ in	115 mm
		11 ft 6 in	3505 mm
Ground Pressure Weight		34 psi	234 kPa
		165,000 lbs	74.7 kg
Maximum Cutting Height	12CM27D	197 in	5000 mm
	12CM27E	147 in	3765 mm
Minimum Cutting Height	12CM27D	95 in	2410 mm
	12CM27E	61 ½ in	1560 mm
Basic Chassis Height	12CM27D	64 in	1625 mm
	12CM27E	54 in	1371 mm
Ground Clearance		12 in	305 mm
Sump Range		0-25 fpm	0-7.6 m/min
Tram Speed	Slow	15 fpm	4.6 m/min
	Intermediate	30 fpm	9.1 m/min
	High	60 fpm	18.3 m/min
	Turbo	85 fpm	25.9 m/min
Gathering Arm Speed		45 or 54 rpm	45 or 54 rpm
Cutter Speed		50.5 fpm	50.5 m/min
Bit Tip Speed		679 fpm	207 m/min
Motors (Water Cooled)			
950 Volt, 60 Hz			
	Cutter - 2	328 hp	245 kW
	Pump - 1	54 hp	40 kW
	Gathering Head - 2	67 hp	50 kW
	Traction - 2	80 hp	60 kW
	Total Power	1004 hp	750 kW
950/1050 Volt, 50 Hz			
	Cutter - 2	349 hp	260 kW
	Pump - 1	54 hp	40 kW
	Gathering Head - 2	60 hp	45 kW
	Traction - 2	80 hp	60 kW
	Total Power	1032 hp	770 kW

Smart Services

JOY Smart Services combines all of Joy's value-added offerings into one package, under one roof as an integrated solution to our customers. The facilities and services feature technological advancements in

processes/system optimization with 24-hour support.*

Our service strategies are delivering responsive and competitive service solutions,

Smart Services vision is our Performance Life Cycle Management (PLCM) strategy, which brings together all of the innovative people, services and products that Joy has to offer.*

Joy Global service facilities have given world class service a new home.

prognostics, remote health monitoring, reliability and asset management, advanced training and integration of mining

meeting the needs of our customers and driving unprecedented value in our customers' operations. At the core of Joy's

Performance Life Cycle Management focuses these services, to align with our customers' needs, cultivating a zero harm mentality and delivering the highest productivity at the lowest cost per ton, from the time you receive your new equipment for the entire life cycle of the equipment.



Health Management - State of the art predictive software analyzes the data streamed from your machines. The software predicts malfunctions, failures or process gaps at the earliest instance.

- Application Optimization
- 24/7 Product Support
- Health Management
- Performance Life Cycle Management
- Advanced Technical Training
- Technology Products
- Genuine Service Products
- Reliability
- Asset Revitalization & Rebuilds
- 24/7 Parts & Logistics
- Interactive Information Delivery

*All services are not yet available in all regions of the world.



JOYGLOBAL



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