

KOMATSU



14CM Series Continuous Miner Product Overview

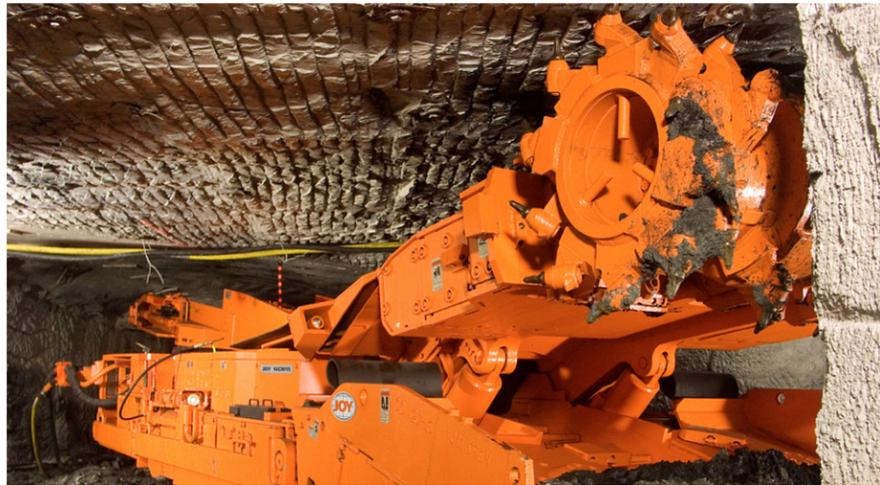


Who we are:

Since 1921, Komatsu has stood for unrivaled quality and reliability. Our enduring global success stems from the principles of our founder, Meitaro Takeuchi, who envisioned a sustainable future built through globalization, quality first, technology innovation and talent development. These defining principles, along with an emphasis on safety and compliance, remain part of our Komatsu DNA. With each brand and company added to the Komatsu family, we expand our capabilities, leveraging our global teams to push beyond what can be done and create what can be imagined. We believe partnering directly with our stakeholders and being in the workplace (gemba) is the best way to gain insight into their challenges, win their trust and develop cutting-edge solutions.

What we do:

Komatsu is an indispensable partner to the mining, forestry, industrial and construction industries that maximizes value for customers through innovative solutions. With a full line of products supported by our advanced IoT technologies and global service network, we help customers safely and sustainably optimize their operations. Our **Komatsu, P&H, Joy** and **Montabert** equipment and services are used to extract fundamental minerals and develop modern infrastructure.



14CM series

The Joy 14CM continuous miner product line has been developed to meet the high productivity requirements of today's underground mining industry and is the product of choice for the world's top producing mines. Joy continuous miners provide the ideal combination of cutting power, proven components and reliability for lower to mid-seam applications in a variety of materials. Built to withstand rigorous conditions, the 14CM offers optimum service life and return on investment.

Built to withstand rigorous conditions

The basic elements of each continuous miner are similar in design, following field proven philosophies perfected by Komatsu over the years. Each machine employs Komatsu'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 to be completed quickly and easily, thus reducing downtime and maintenance costs.

Wethead cutterhead systems

The Wethead continuous miner cutterhead from Komatsu 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 14CM is available in solid head or Ripperveyor models and in drum diameters ranging from 30 to 44 inches or 762 to 1117 mm. The cutting system can be sized to match seam conditions. Rated cutting power as high as 590 hp (440 kW) is available within this product line.



Smartconveyor

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, p. 83) SmartConveyor combines multiple technologies such as Komatsu'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 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 due to the machine's tram and conveyor swing functions. 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.

Total control

The latest in VFD technology...

Today's 14CM traction system builds on years of field-tested performance to offer even more durability and continuous miner maneuverability. Patented Optidrive AC electronics are coupled to a compact all-gear transmission that provides smooth and reliable performance. Cutter motor feedback control loops and an electronic traction motor differential optimize sump performance in even the most demanding of applications. Various track frame widths are available to reduce ground bearing pressure and better suit specific floor conditions and entry widths.



Komatsu history

Tradition in quality and pride...

With over 6,000 continuous miners shipped since 1948, Komatsu 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 Komatsu, the world leader in underground mining innovations.





14CM 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 Komatsu'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 Faceboss control platform enables operators to consistently operate their Komatsu underground machinery at the optimal balance of production rate and cost.

Product optimization

The 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
- Automated sequences**
 Consistent operation is now possible, even while changing operators or across multiple shifts. For example, one-touch-shear automatically controls the position of the cutter boom, which ensures the floor and roof levels are properly maintained while reducing operator fatigue
- 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
- Maximum flexibility**
 Different operating parameters for the typical cycle cutting requirements (e.g., full pass, half pass, cross cut, etc.) can be pre-defined, and are easily and quickly selected via the continuous miner remote station to prevent unnecessary delays

Reliability through design

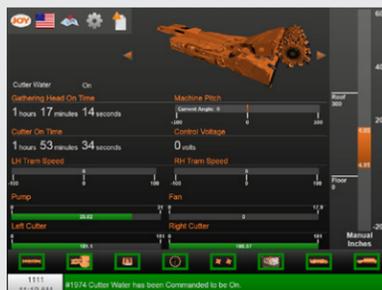
All Faceboss hardware has been designed and tested specifically for underground applications. Testing at extreme temperatures and vibration levels ensures that each component can stand up to harsh conditions. Further testing to destruction in a typical conditions allows Komatsu engineers to better understand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

Multilingual display

On a standard control platform...

The Faceboss control platform can be configured to display a variety of languages. In combination with local field personnel, this multilingual control platform helps Komatsu underground 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 Komatsu underground 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/Komatsu 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 Faceboss control platform includes an on-board graphical display which includes a log of events, messages and alarms. 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 14CM continuous miner General Specifications

	14CM10AA	14CM9A	14CM9CC	14CM15CC	14CM15C	14CM15B	14CM15D	14CM15E	14CM27
Cutter head design	Ripperveyor	Solid head							
Cutter head diameter	762 mm (30")	865 mm (34")	965 mm (38")				1120 mm (44")		
Maximum cutting height	2290 mm (7'6")	2270 mm (7'5")	2325 mm (7'7")	3075 mm (10')	3125 mm (10'3")	3260 mm (10'8")	3350 mm (11')	3400 mm (11'2")	
Minimum cutting height *height to clear drum and boom	760 mm (30")	865 mm (34")	965 mm (38")		1010 mm (40")	1090 mm (43")	1170 mm (46")	1250 mm (49")	1330 mm (52")
Recommended operating range	965 mm-1220 mm (38"-48")	1065 mm-1525 mm (42"-60")	1120 mm-1525 mm (46"-60")		1220 mm-1650 mm (48"-65")	1295 mm-1830 mm (51"-72")	1370 mm-2135 mm (54"-84")	1450 mm-2135 mm (57"-84")	1525 mm-2135 mm (60"-84")
Weight	45,360 kg (100,000 lb)	49,900 kg (110,000 lb)	54,450 kg (120,000 lb)	56,700 kg (125,000 lb)	59,000 kg (130,000 lb)	61,200 kg (135,000 lb)	63,500 kg (140,000 lb)	63,500 kg (140,000 lb)	72,500 kg (160,000 lb)
Ground pressure	160 kPa (23 psi)	170 kPa (25 psi)	195 kPa (28 psi)	200 kPa (29 psi)	210 kPa (30 psi)	215 kPa (31 psi)	220 kPa (32 psi)		225 kPa (33 psi)
Ground clearance	150 mm (6")		197 mm (7-3/4")			273 mm (10-3/4")		349 mm (13-3/4")	
Conveyor width	762 mm (30")			965 mm (38")					
Tram speed	5 m/min - 26 m/min (15 fpm - 85 fpm)								
Dust collector	13 kW (18 hp)		13 kW or 22 kW (18 hp OR 30 hp)		22 kW (30 hp)			22kW or 30 kW (30 hp or 40 hp)	
Cutter	123 kW (165 hp)	150 kW (201 hp)	175 kW (235 hp)					220 kW (295 hp)	
Pump	30 kW (40 hp)		40 kW (54 hp)						
Gathering head	50 kW (67 hp)								
Traction	60 kW (80 hp)								
Total power *does not include fan	496 kW (665 hp)	550 kW (738 hp)	600 kW (805 hp)					700 kW (938 hp)	

Smart Solutions

Integrated Smart Solutions help solve customers' toughest challenges using data-driven intelligence, collaboration through partnership and experience-based service execution. They are a way of partnering with customers to help reduce costs and increase productivity, in line with customers' operating and financial goals.

Komatsu service facilities have given world-class service a new home.

Smart Service Centers are strategically located around the world in order to conveniently serve our customers. With each new service center built, Komatsu products and people are becoming more connected, allowing for expanded benchmarking. Located strategically in zones of mining activity, each service center brings local support that is world-class. Services offered are structured to fulfill the lifecycle of mining equipment, optimizing equipment for productivity and safety.

Our commitment to world-class service is delivered through world-class processes and metrics. Our Joy OpEx processes bring operational excellence by prioritizing the elimination of waste, simplifying processes, automating and removing people from harm's way. We leverage those principles throughout our network, with the ability to rapidly customize locally, helping customers work smarter, worldwide.



Smart Solutions are integrations of smart connected Komatsu products and systems, advanced analytics and direct services customized to solve customers' toughest challenges.

Smart Solutions at work:

Costs

- Lower cost per unit produced by reducing overall parts and consumables expenditures
- Optimize costs for power/fuel, labor and rebuilds

Safety

- Automate processes and controls
- Increase awareness through training and standard setting

Productivity

- Improve system availability, performance, utilization and consistency
- Leverage extensive Komatsu engineering knowledge to solve problems



Smart Solutions

Komatsu Mining Corp. Group

mining.komatsu



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