Continuous Miners
JOY continuous miners have led the way by providing state-of-the-art technology to the coal industry for decades and the latest models are no exception. With the emphasis on increased productivity, some models are being offered with 2300 volt operation for maximum output.

Continuous Miners
Higher tonnage rates and more availability are expected from JOY continuous miners. Models are available to operate in a variety of seam heights in both coal and non-coal applications.

OPTIDRIVE is here
Joy’s new OPTIDRIVE is now available on all JOY continuous miners. The variable frequency AC drive system increases production by optimizing maneuverability and traction control.

The JOY continuous miner product line has been developed to meet the high productivity requirements of today’s underground mining industry. Machine designs are available to satisfy the full spectrum of seam conditions for today’s market.

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.

The continuous miner product range is segmented by mining height requirements into three machine classes for low, medium and high-seam applications. Although the features vary for each machine in order to maximize productivity and reliability in a given seam, these features have in common basic design principals that put JOY machines on the leading edge of underground mining technology and produce the lowest cost per ton to the customer.
The JOY 14CM provides the ideal combination of cutting power, proven components and reliability for lower to mid-seam applications in a variety of materials. Built to withstand the most rigorous conditions, the 14CM offers optimum service life and return on investment.

**Cutting System - 30” to 44” drum diameter**

The 14CM accommodates a wide variety of cutting options. Available in Ripperveyor™ or solid head models and in drum diameters ranging from 30 to 44 inches, the cutting system can be sized to match seam conditions. Rated cutting power as high as 500 hp (373 kW) is available within this product line.

**Traction System with OPTIDRIVE**

Today's 14CM traction system builds on years of field-tested performance to offer an even more durable, maneuverable package. Patented OPTIDRIVE AC electronics or its precursor, the DC microprocessor drive is 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.
**Proven Conveyor System**

Dual direct drive motors power the 14CM conveying system loading arms and chain via reliable, time-tested transmissions. The conveyor chain includes universal links to prolong chain life, and the cam style adjusting mechanism automatically compensates for chain slack as the conveyor swings. Recent enhancements to the system include increased abrasion resistant material use along the chain path and loading arms.

**Rugged Chassis**

The 14CM’s rugged framework is unmatched in this machine class. Heavy-duty covers, rub rails and ductwork afford protection to machine components. Modular hydraulic componentry simplifies hosing and improves maintenance. A number of available machine configurations and options give customers the needed flexibility in addressing varied mining environments.
Joy’s answer for mid to high-seam applications is the 12CM series continuous miners. This model line, available for both 950 and 2300 volt operation, can operate in seam heights up to 16 feet 4 inches or 5.0 meters.

**Traction System with OPTIDRIVE**

The 12CM traction drive system provides high reliability due in part to a substantial reduction of internal parts with simpler machine wiring. Patented OPTIDRIVE AC electronics or its precursor, the DC microprocessor drive is 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.

**Reliable Conveying System**

Dual direct drive motors power the 12CM conveying system loading arms and chain via reliable, time-tested transmissions. The conveyor chain includes universal links to prolong chain life, and the cam style adjusting mechanism automatically compensates for chain slack as the conveyor swings. Recent enhancements to the system include increased abrasion resistant material use along the chain path and loading arms.
**Cutting System - 44” to 53\(\frac{3}{4}\)” drum diameter**

The heart of any continuous miner is the cutting system and the 12CM's cutting system is unmatched in the market today. The 12CM model line is available with a variety of cutterheads, ranging from a 44 to 53\(\frac{3}{4}\) inch (1120 to 1367 mm) drum diameter.

**Deep Cut Capability**

The 12CM with remote control and flooded bed dust collector options provide deep cut capability. Deeper cuts mean fewer place changes, which in turn means increased production.
Joy’s answer to hard rock mining applications is the 12HM series continuous miners. These machines are successfully operating in trona, gypsum, potash and salt mines around the world.

**Cutting System - 47¼” to 58” drum diameter**

As the 12HM continuous miners are the largest manufactured by Joy, the cutting system has been designed to match the machine mass. The 12HM continuous miners are available with a chainless cutterhead, ranging from a 47 ¼ inch (1200 mm) drum diameter to a 53 ¾ inch (1367 mm) diameter, as well as a Ripperveyor™ cutterhead, with a drum diameter of 58 inches (1473 mm).

**Traction System with OPTIDRIVE**

The 12HM traction system features a heavy-duty crawler chain, along with a heavy-duty drive system, to effectively tram the machine. Patented OPTIDRIVE AC electronics or its precursor, the DC microprocessor drive is 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.
Closed Loop Cooling
For applications where machine-cooling water can not be discharged onto the cut material through water sprays, the 12HM continuous miner can incorporate an onboard closed loop cooling system. The coolant is pumped through the electrical enclosures and motors, through an onboard heat exchanger, and returned to an onboard coolant reservoir. Coolant flow and temperature are monitored through JNA to insure proper operation.

High Capacity Conveying System
The conveying system on the 12HM features a 38 inch (965 mm) conveyor for increased production capability. In addition to the dual drive gathering head system for loading, the 12HM is also equipped with single rear conveyor chain drive or optional dual rear conveyor chain drive. The cam style take-up automatically provides proper conveyor chain adjustment as the conveyor swings.
Miner & Satellite Bolters

Miner Bolters
Joy offers chassis-mounted roof drill units on both 12CM and 14CM continuous miner models. These wide-head, single pass machines offer a number of roof drill, cutterhead and conveyor configurations to suit a wide variety of entry development applications. The combination of JOY continuous miners and roof drills makes an unbeatable match for reliability, availability and low operating costs.

Satellite Bolters
Utilizing a separate independent drill frame unit, JOY satellite miners offer simultaneous cutting and bolting to provide maximum productivity and entry advance rates. The main frame has been specially designed to minimize chassis width and fit a variety of roof bolting patterns. Drum and gathering head extensions enhance clean-up operations and maneuverability when place changing.
To further build on Joy’s proven solidhead continuous miner technology, Joy Mining Machinery designers took on the task of designing a Wethead cutterhead system which was able to further reduce respirable dust levels and to decrease the possibility of frictional ignitions.

Currently available on 44” (1118 mm) 14CM and 12CM solidhead models, the JOY Wethead incorporates a fine spray behind each cutting bit on the cutter drums which potentially reduces frictional ignition occurrences and respirable dust levels. The water spray acts as both a cooling and a wetting agent in order to control both problems at the same time. The sprays also provide lubrication, thus improving bit life. It does all this while still consuming less water than standard miner dust sprays. The heart of the system is a back-to-back carbon face water seal designed to run dry for extended periods of time and last from rebuild to rebuild before refurbishment. It can even be replaced underground.

**Features**

- Back-to-back carbon-face water seal
- Water spray behind each cutting bit wets suspended dust at point of creation
- Water spray cools sparks at point of creation
- Water spray lubricates cutting bits
- 30 gpm (114 lpm) water flow required
- Dedicated in-line filtration

**Benefits**

- Long life and dry-running ability
- Further reduction in respirable dust levels and increased visibility
- Fewer face ignitions
- Lower bit consumption rate
- Less water consumption than standard dust sprays
- Fewer blocked spray nozzles
The JNA machine control system is based on Joy’s latest evolution of electronic hardware and software architecture. The key design intention is to provide the most powerful and flexible control system utilized by Joy. This mine-duty electronic platform is designed to perform effectively in harsh mining environments where Joy’s equipment operates. Key features of the system include: operator assist features, electronic motor overload protection, enhanced machine diagnostics and surface data logging/communication. These features are achieved through scalable control options.

**Automation**

JNA offers the capability to automate the continuous miner with features such as Boom Limit Control, and One-Touch Shear. The Boom Limit Control allows the operator to set the floor and roof cutting height of the machine, providing enhanced floor/roof control. The One-Touch Shear mode allows the operator to complete a shear cycle without maintaining the shear button on the remote.

**Scalability**

The modular design of the JNA product enables Joy to introduce the JNA Control System platform onto Joy’s continuous miners at an acceptable technology level and cost expenditure rate. The ability to add new technologies to the system as they become available further enhances customer investment.
JNA Surface Reports (JSRP)

This production and maintenance reporting system makes use of the extensive data gathered by Joy's up-scaled continuous miners and miner bolters to provide surface personnel with production, engineering and maintenance reports. Each report type can contain both textual and graphical data on a per shift, day, week or monthly basis. The exact content of each report is customizable to ensure users obtain the information that is most important to them. An automatic email feature allows designated personnel to be kept up-to-date even when they are not at the mine-site.

A full list of the extensive features of this product is available from your Joy representative.

Surface Data Communication Link

The Surface Data Communication Link provides real-time underground mining operational information that is transmitted to the surface. An electronic system on the surface displays and stores present mining information without affecting production. “Playback data and trending” of mining information are valuable assets to the link.

Equipment Diagnostics

JNA offers comprehensive machine diagnostics such as: JNA self diagnostics, power and control circuits, hydraulic system, radio remote control, traction system, motors and safety, and operational interlocks. The diagnostics system is a user-friendly, Windows®-based system that uses a high resolution color display and allows for advanced troubleshooting at the mine level. JOY electronic part books and technical manuals are available as an option on the display screen.
Throughout Joy Mining Machinery's company history, we have had an objective to provide equipment that is world class in safety, reliability and production capability. Considerable effort has been put forth to achieve this target. We contend that these attributes complement one another and result in preferred products.

To this end, Joy has been an industry leader in features such as:

- Use of remote control to allow proper positioning of the operator; to limit exposure to dust and noise.
- Installation of quiet, high efficiency scrubber fans.
- Schooling and training programs to promote proper maintenance such as replacing bent or misalign conveyor flights or sides and the use of a chain with proper tension or one having an automatic chain tension device.
- Manufacturing highly productive machines that limit the amount of time the conveyors run void of material.
- Developed the practical application of complex gear tooth geometry to aid in the reduction of noise inside cutterhead gear cases.

Joy has utilized non-metallic materials to deaden surfaces, where feasible and conducted extensive testing of new materials in an effort to further reduce the exposures of those utilizing our machinery.

Joy maintains a close working relationship with our customers, regulatory agencies and the academic community in an effort to stay on the cutting edge of technology that will lead to the reduced exposure to dust and noise in the work place.
All JOY products and services are sold subject to Joy’s standard terms and conditions of sale, including its limited warranty. These will be furnished upon request. The company reserves the right to alter or improve the design or construction of its machinery as described herein and to furnish it, when so altered, without reference to the illustration or descriptions in this bulletin.