

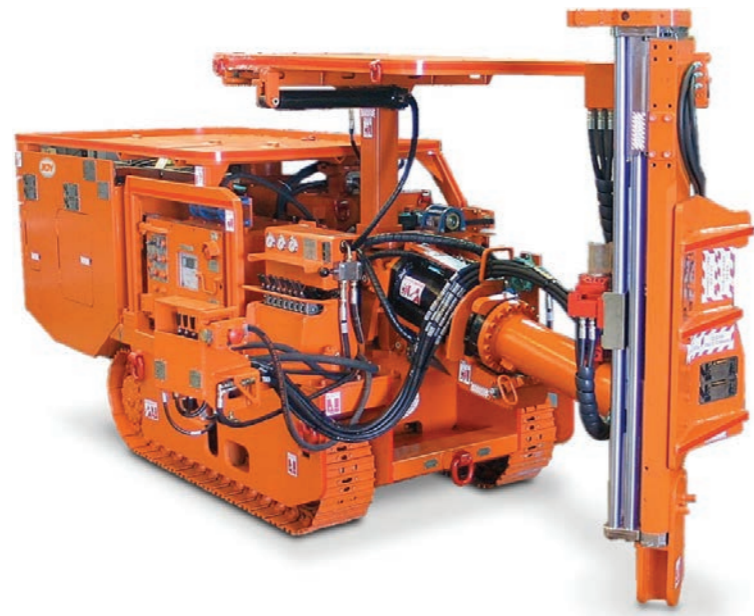
# KOMATSU

## Mobile Bolters

Product Overview







### RamTrak 2300

The Joy RamTrak 2300 series of mobile roof bolters from Komatsu offers a highly versatile, narrow width, single boom bolting machine complete with extensive boom movement and rotary movement allowing a complete range of roof, rib and floor bolting. The RamTrak mobile roof bolter is capable of roof and rib-bolting in working heights of 1.85 metres and above. The compactness of this machine gives it excellent maneuverability.

RamTrak 2300 machines from Komatsu are electro-hydraulic and feature onboard condition monitoring and semi-automatic drill operations, with an optional temporary roof support. The RamTrak roof bolter can be fitted with rotary or percussive drills to suit conditions and is available in either standard or long-reach articulating arm versions as well as gas drainage versions. The RamTrak 2300 roof bolter can also be configured for use by a single operator in “place change” operations, for installation of secondary cable bolting, or for gas drainage drilling.

#### 2300 Specifications

Typical operating range	1850 – 5000 mm
Length (typical)	5700 mm
Width (typical)	1660 mm
Height (typical)	1820 mm
Machine weight	10,000 kg (depending on options)
Ground pressure at max. rated load	95 kPa (depending on options)
Hydraulic motor	60 kW (1140V or 1050V or 550V 50 Hz)
Hydraulic traction	0-28 m / min
Rotary actuator	Wide range of drilling positions
Boom swing	Sideways +/- 28°, Raise/lower +32°/-23°, Twist +10° to -15°
Dual controls	Rear of machine and pendant control
Canopy	Optional

RamTrak 2300 allows a complete range of roof, rib and floor bolting.



### RamTrak 2300 — wide reach

The RamTrak 2300 wide reach bolter has been specially adapted to provide a wide range of drilling and bolting solutions for secondary bolting in difficult conditions. This highly versatile, single-mast bolter can achieve numerous roof and rib bolt positions from one location.

### Bolting in awkward locations

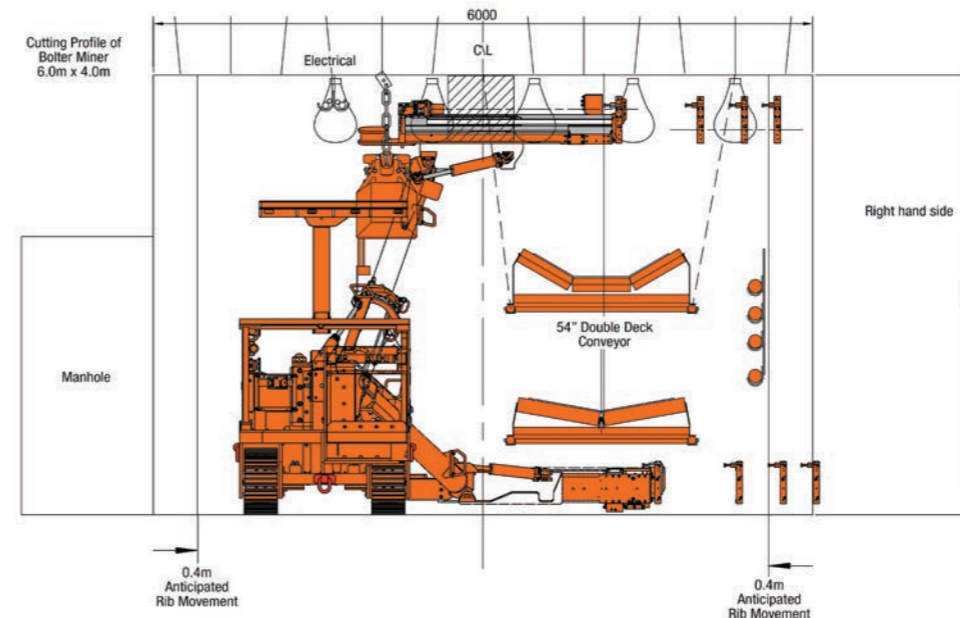
The extended arm can swing from side to side, raise and lower as well as lift and twist. This range of motion allows secondary bolting in awkward locations such as above and below the conveyor belt structure and behind obstacles.

### Maximum versatility 360 degree rotation...

The 360 degree rotary actuator allows the RamTrak 2300 roof bolter to easily adapt to place bolts at a variety of different positions in roof, rib or floor. The arm is also extendable and moves from side to side allowing accurate indexing and positioning of bolts.



### RamTrak gas drainage Longhole drilling...



Mobile machines are available for forward drilling of long holes in de-gassing and for wet or dry (vacuum) roofbolting with either percussive or rotary drilling units. The single and multi-head bolters are proven for speed and reliability and offer cost-effective solutions for roof and rib-bolting and gas drainage drilling. All machines can be adapted for cable-bolting with semi-automatic operation to install bolts up to 15 metres long.



The Joy Quadbolter combines innovative design and proven Joy technologies.



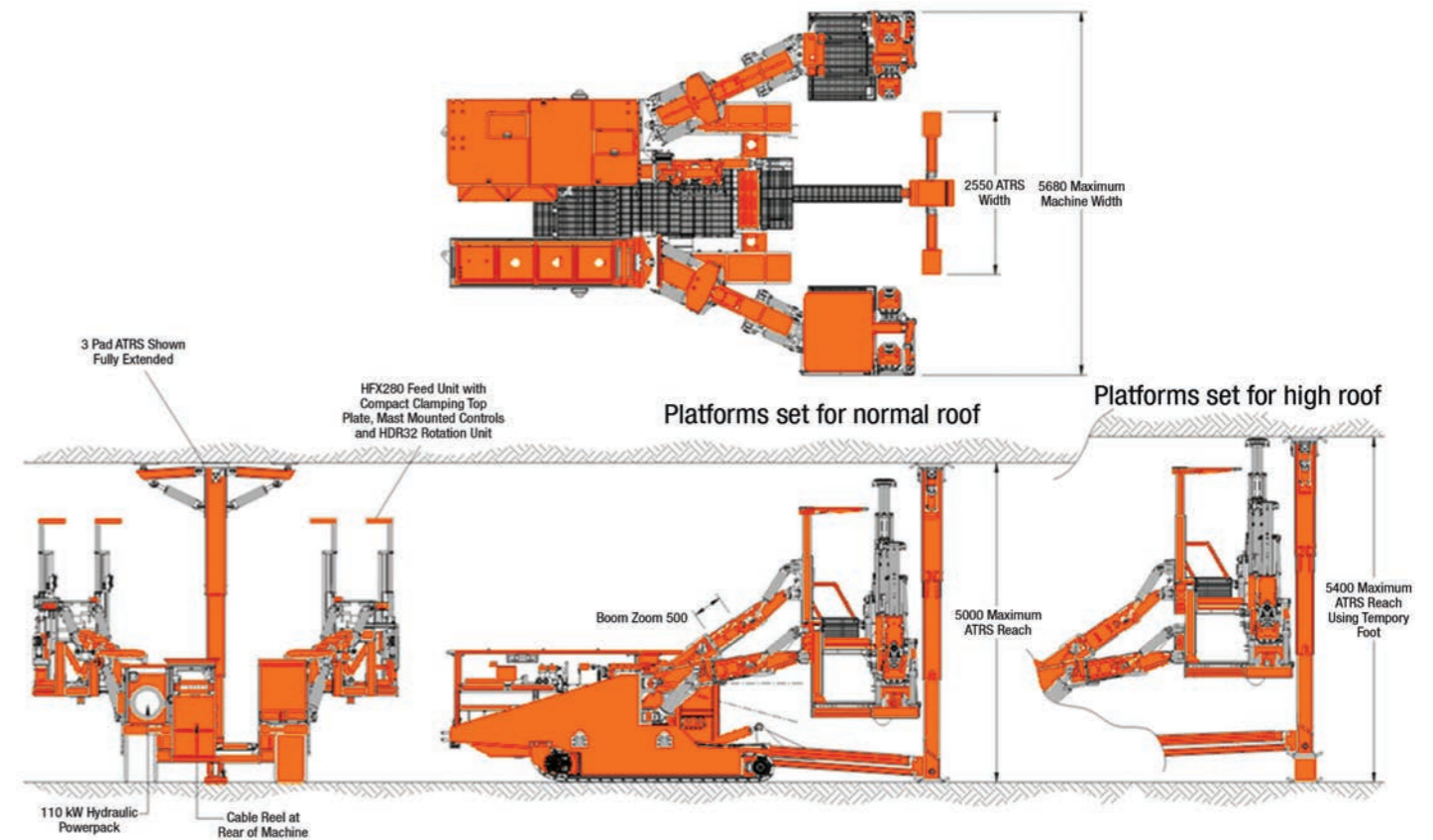
### Quadbolter

The latest generation Joy Quadbolter is a twin boom, four mast, mobile bolting machine with a wide range of boom movement and highly versatile bolting positions. It combines innovative design and proven Joy technologies. The inherent advantages of a twin boom, four mast, semi-automatic bolter are more bolts installed in less time with less effort.

The quadbolter is capable of installing four bolts simultaneously using two operators. The outer roof bolters can be rotated over to provide rib-bolting. Drilling is accomplished by Joy patented hydraulic roofbolters and direct mast-mounted hydraulic controls, reducing the number of hoses. The mast-mount controls are directly ported into the feed carrier eliminating most hosing and down-time associated with conventional drilling equipment. The semi-automated control system allows the operator to smoothly install two bolts in a parallel operation that significantly reduces cycle times.

A wide range of drill options is available for rotary or percussive drilling. The rotary drills can be used in wet or dry drilling applications. The functionality of the operator's platform is of paramount importance. The quadbolter has the largest deck area available of any boom-style bolter. Well-lit and spacious, the layout provides operators the opportunity to perform their duties with greater ease and safety. The platform has a large canopy providing excellent protection for the operator. The canopy is rated to withstand a vertical load of 100kN and has adjustable height settings. The boom arrangement, with a unique parallel holding design, provides full range ability for medium and high seam applications. The operator has the ability to adjust the level of the platform for varying localized seam conditions. The standard quadbolter has the option to raise the operator's platform and TRS an additional 600 mm for high seam operation.

A large capacity, on-board materials pod provides storage for all bolting consumables. Operators have a material storage tray mounted directly behind them for easy access. The tramming and TRS station provides excellent all around vision and is spacious and well lit with a large walkway that provides safe access through the center of the machine.



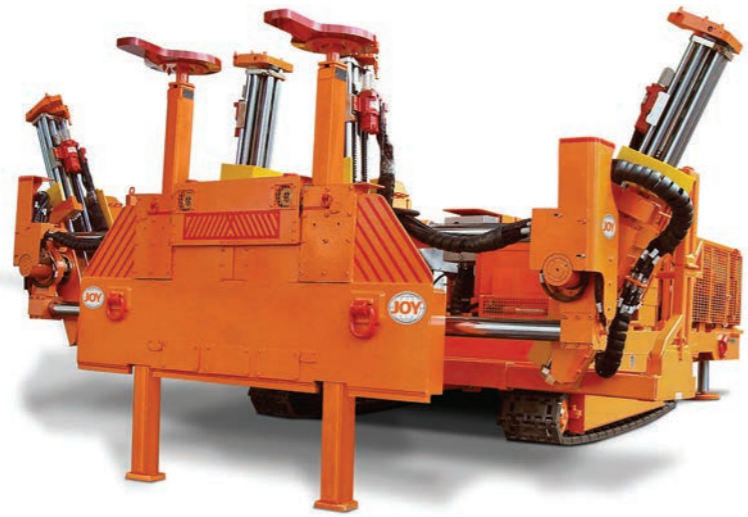
**Maximum versatility**  
Four bolts,  
multiple positions...



Four roof, or two roof and two rib bolts can be placed from many different set up positions simultaneously. The extendable booms and three dimensional positioning in space allow a full range of bolting positions.

General specifications	Mid-to-high seam
Number of roof drills Number of rib drills	Nominally 4 Roof drills roll over to bolt rib
Machine weight Ground pressure	Approx 29,800 kg depending on options 170 kPa
ATRS	3-point advanced temporary roof support (in front of machine)
Machine length Machine width	8008 mm 3160 mm retracted, 5680 mm with platforms extended
Operating width Operating range	Up to 6000 mm 2400 mm to 5000 mm
Min tramming height	2060 mm
Ground clearance	360 mm
Traction speed	0 – 20 m/min hydraulic drive, proportional control
Hydraulic tank	450 litres main tank + 350 litres in chassis
Motors	Hydraulic pump motor 1 x 125kW air-cooled 50 Hz
Pump	Fixed gear pump, 4 sections, each section 97 litre/min
Voltage	1140V, 1050V or 950V





## Multibolter

The Joy multibolter is one of the most innovative additions to Komatsu's bolting product range. It is a multiple drill-head, platform-based, mobile bolter designed primarily for "place change" continuous miner applications. The functional and ergonomic design, based around a large operating platform that can be raised and lowered, reduces cost and increases the working space, enhancing safety and productivity. The elimination of swinging booms and other moving parts reduces repair costs, enhances operator safety and extends the unit's operating life.

The Joy multibolters can be designed to meet a wide range of operating conditions with four models to cover various seam heights. The number of platform-mounted drill units can be matched to suit the bolting pattern and mine conditions with up to six semi-automatic roofbolters. Either wet-drill or dry-drill versions (with vacuum dust collection system) are available and, with additional equipment, the multibolter can be used for rockdusting and installation of ventilation ducting.



Side frames extended



Multibolter 2036



## Maximum bolting range Full range of roof and rib drilling...

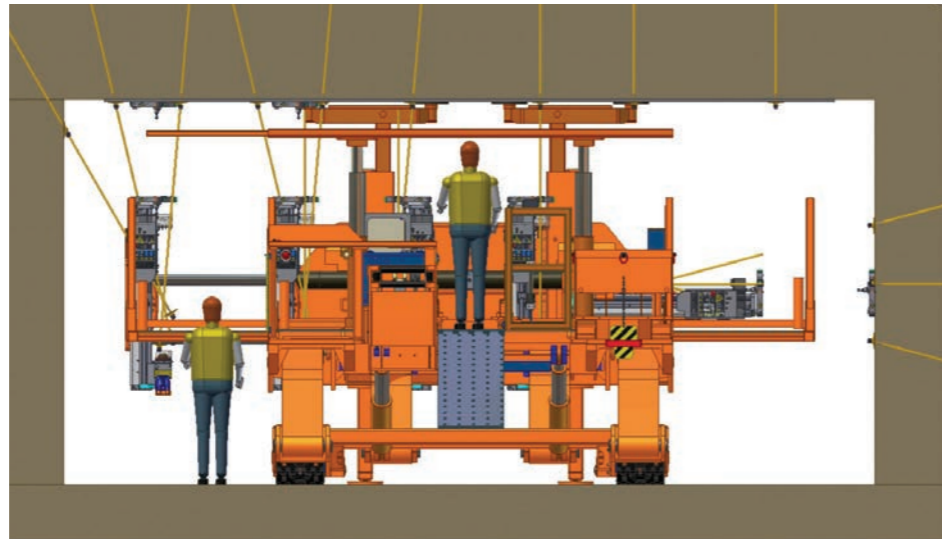
All bolters can be indexed and tilted for multiple bolting positions. The outer bolters can be extended and rolled over to bolt the ribs.



### General specifications

	Model	2036	2337	3045	3554
Nominal operating range		2.0 – 3.6 m	2.3 – 3.7 m	3.0 – 4.5 m	3.5 – 5.4 m
Length (typical)		7510 mm	6680 mm	5982 mm	6400 mm
Width (typical)					
Retracted		3200 mm	3400 mm	4000 mm	4000 mm
Extended		4550 mm	4900 mm	6800 mm	6800 mm
Closed height (typical)		2100 mm	2400 mm	2550 mm	3050 mm
Machine weight		28,000 kg	34,000 kg	35,000 kg	46,500 kg
Ground pressure (typical)		140 kPa	150 kPa	170 kPa	200 kPa
Hydraulic motor		112 kW	112 kW	112 kW	125 kW
Voltage 50Hz		1140V / 1050V	1140V / 1050V	1140V / 1050V	1140V / 1050V
Traction		Hydraulic	Hydraulic	Hydraulic	Hydraulic
Traction speed		0-20 m / min	0-20 m / min	0-25 m / min	0-20 m / min
Auto Temporary Roof Support (ATRS )		2 point 6 to 170 kN	2 point 6 to 170 kN	2 point 6 to 170 kN	2 point 6 to 170 kN





## Multibolter 3045

### Operational features

- Side platforms extend to allow full-width bolting.
- Outer bolters can roll over to allow a range of rib bolting options.
- Platform lifts using cylinder and scissor mechanism.

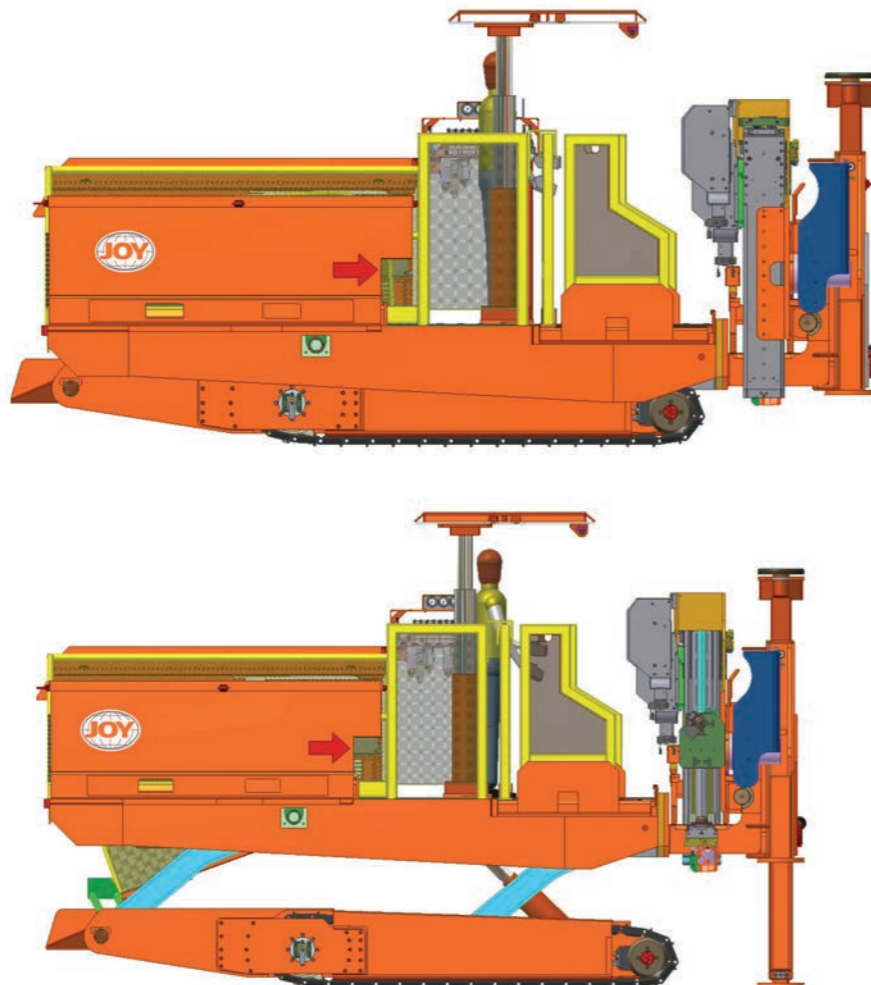


Extendable bolting platform

### Maximum versatility Extendable side frame...



The main platform can be raised and lowered.  
The outer bolters are mounted on extending cylinders with a tilt mechanism to fully cover roadway widths and rib bolting positions.



### Zero harm mentality Increased safety

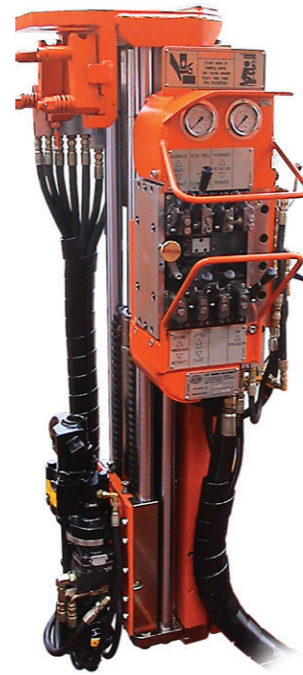
The walk-through machine concept, together with the use of extendable platforms and semi-automatic two-speed, two-handed drilling operations are designed to place all operators in a safety-assessed environment, removed from interaction with rotating or moving machinery and other safety hazards. Komatsu can also assist end users in the risk assessment process for operators and operations and for all machine and drilling functions.

With its unique scissor lift arrangement, the Multibolter 3045 can achieve a wide range of bolting heights. The platform extensions allow for a wide range of operating widths and also enable rib bolting.

The operator height range of the new Multibolter 3045 is greatly extended by the new scissor lift mechanism. Also the entire operator platform and guard rails extend sideways to fully reach the roadway edges.







## Hydraulic roofbolter

### HFX, HDR and ICM2

The HFX drill feed is designed to be a key component in automated roofbolting systems. Mounted on continuous miners, roadheaders or other mobile equipment, it provides fast, reliable roofbolting.

The HFX drill feed is a patented, semi-automatic, wear-resistant and telescopic roofbolter that minimizes maintenance and downtime. The highly reliable, semi-automatic drilling and bolt insertion machine provides for either single lever auto-drilling or manual operation. The Joy HFX drill feed from Komatsu also provides auto-water on-off and mast extend-retract during a drilling cycle. A very important safety feature is the ability to disable the auto-drill function by simply pressing a button. The HFX drill feed features a completely sealed carrier unit that virtually eliminates wear to the hardened chrome slide bars. Integration of the carrier and the slide bars provides outstanding structural stiffness. This roofbolter is available in two and three stage versions as well as rib-bolter models.

The HFX drill feed comes in a range of sizes with a choice of top plates and rotation units. The unit's advanced features include rapid penetration rate, easy use, quick set-up and long-life, low-wear design. Combined with reliability and a reduction in life cycle costs, these features provide optimum roofbolter performance.

#### HFX drill feeds - technical specifications

	Model	170	190	210	240	280	310	340
Retracted length		1250	1400	1507	1675	1885	2035	2185
Extended length		2075	2275	3464	2770	3170	3470	3770
Chain travel		925	1075	1156	1350	1560	1680	1790
Total travel		1750	1950	2113	2445	2845	3145	3440
Approximate mass kg		360	405	445	505	590	650	710



ICM2 – Mast-mounted control module (auto drill and return cycle)

### HDR Hydraulic Rotation Unit



- Compact drill motor
- Improved bearings
- Self lubrication, internal porting
- Better offset (side) loads
- Improved water sealing
- Robust, reliable



### AFX, TSRU and ICM3

The AFX drill feed from Komatsu is a heavy-duty, low-maintenance drill feed with a 50% increase in feed thrust over the HFX drill feed and is suitable for wet or dry drilling. It offers high reliability and durability. The patented HFX and AFX roofbolters feature a hardened, corrosion-resistant slide tube rod structure and sealed, automatically lubricated slide blocks which virtually eliminate wear to the hardened chrome slide bars, reduce maintenance and increase productivity.

#### AFX drill feeds - technical specifications

HFX and AFX models ranging from 1.9m to 3.4m single pass capabilities. Typical model and travel lengths for the AFX models are shown below:

	Model	190	210	280	310
Retracted length		1533	1645	1900	2145
Extended length		2425	2445	3338	3645
Chain travel		1042	1152	1500	1650
Total travel		1934	2152	2848	3150
Approximate mass kg		585	655	720	790

### ICM3 Integrated Control Module

- Auto-cycle, two-speed control.
- Auto-feed options.
- Increased safety with two-handed operation during bolting operations.
- Two-speed control.
- Water monitoring.



### TSRU Two-Speed Rotation Unit

- Two-speed motor requiring less oil.
- Compatible with existing HFX drill feed masts.
- Wet and dry drilling options.
- Slow speed for safe operator interface.
- High speed drill rig.
- 240 - 750 rpm speed range.
- 71 Lt/min oil supply.
- 400 Nm peak output torque.





### Electro-hydraulic roofbolter

The Joy Electro-Hydraulic bolting rig or 'E-Bolter' takes roofbolting equipment to the next level of automation, control, monitoring and safety. The E-Bolter offers a number of additional features. Based on the proven AFX feed, the E-bolter utilises solenoid-controlled proportional valves mounted directly on the drill feed mast. The solenoids are controlled by an electronic controller which, in turn, links back to a display screen. Every function can be individually controlled from a push button console and, if preferred, programmed to perform controlled automatic cycles. Once the rig has been positioned, an automatic drilling cycle can be initiated. When the automatic drilling cycle is complete and the chemical has been inserted, the automatic bolting cycle can be initiated to spin in the bolt and torque up the nut to pre-defined limits. The automatic bolting cycle inserts the bolt, mixes the chemical, waits for the set time and then tightens the nut.

### E-bolter control

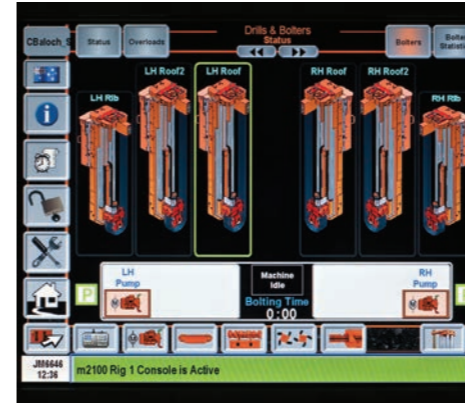
As all drilling parameters are continuously monitored, several advanced functions are available including adaptive drilling (where the drill feed speed is adapted to the roof conditions), anti-stall (if the drill speed slows, the feed thrust will reduce), prevention of drill steel bending (the feed pressure is monitored depending on the type of drill steel and depth of collaring into the drill hole) and prevention of water blockage (the water flow is monitored and the feed rate is slowed if the water flow slows). A full event log of every drill cycle is also available.



### Push button control auto operation...



The simple push button control station allows two-handed control for all fully automated operations including drilling and bolt insertions. Two-handed control ensures the operator cannot interact with rotating parts when initiating a drill cycle.



The electronic control of the E-Bolter has a number of other advantages. Various parameters can be set interactively on the display screen, e.g., the chemical set time. There are also many diagnostic features such as the 'fault and transactions' log and adaptive drilling features to regulate the drill speed if either hard or soft material is encountered. Also the feed travel can be monitored to enable various checks including that the drill and bolt have reached full stroke.

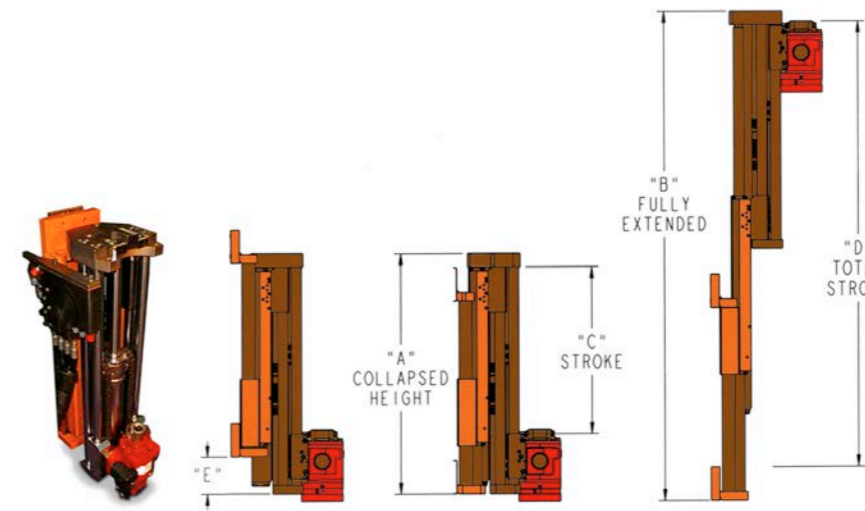
The E-Bolter enhances operator safety as locating the drill steel or bolt in the chuck avoids the need for the operator to interact with the rig and the controls at the same time. In addition, the control console can be easily mounted in an ergonomic position to suit the operator. The rig is available on the 190, 210, 240, 280, 310 and 340 AFX models with single pass drill feed ranges from 1.9 to 3.4 metres.

### HGX – low height feed

The Joy HGX drill feed is a low height, three stage drill feed designed for use in restricted height operations. With a collapsed height of only 1082 mm, this feed is ideal for seam heights of 1.3 to 2.0 metres.

### HGX feed series 2 (triple stage) - dimensions

Model	Overall length (mm)			Total stroke (mm)	Mass (kg)	
	A	B	C	D	E	F
210	1082	2212	745	2041	168	350



### Technical specifications

Feed thrust	
140 k	0 - 28.4 kN
210 bar	0 - 42.6 kN
Feed speed - drilling	0 - 6 m/min
Feed speed - bolt insertion	25 m/min
Feed speed - retraction	25 m/min
Feed oil	
Consumption drilling	0 - 9 Lt/min
Feed oil	37 Lt/min





## Facebolter 3040

The Joy longwall Facebolter is an AFC-mounted, hydraulically-propelled roofbolting machine specifically designed for longwall face bolting during salvage or installation or in the presence of severe adverse geologic conditions. This bolter mounts directly onto the AFC and is powered by hydraulic energy from the longwall roof supports supplied through a sprocket meshed into the AFC rack bars. It incorporates maximum roofbolting flexibility allowing a wide coverage of roofbolter positions by permitting the two roofbolting rigs to move on sliding mechanisms both forward and backward (toward and away from the face) and also to raise and lower. A rotary actuator also allows the roofbolt rig to roll over to install bolts into the longwall face.



### Facebolting versatility Faceside roofbolts and facebolts...



Roofbolts can be placed on the faceside or angled into the longwall face in a variety of different positions and different bolt centres.

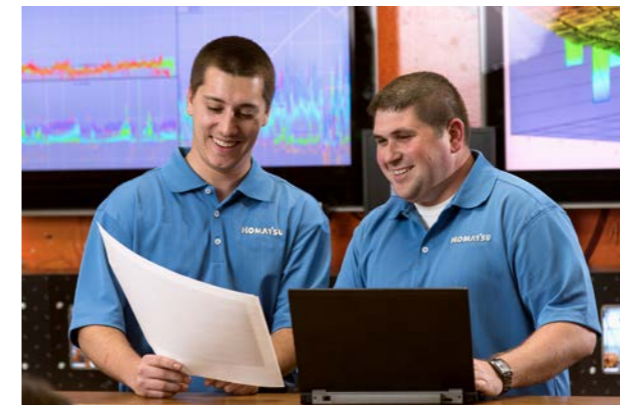
General specifications	
Number of roofbolting rigs	Two (2), one on either end
Facility to load on and off AFC	By LHD
Hydraulic Power	Hydraulic PTO or from longwall roof supports
Operating height range (std platform)	2.1 m – 3.2 m
Bolt centres (extendable platform)	3.0 m – 4.0 m
Machine length (adjustable range)	4.3 m – 5.3 m
Machine width	2000 mm
Operator's platform width	970 mm
Machine height during tram	1900 mm
Bolter slide in line with face	500 mm
Bolter slide toward face	400 mm
Drive	Hydraulic motor and sprocket on longwall rack bars
3 Speed tram	1st 10 m/min, 2nd 15 m/min, 3rd 20 m/min
Tractive effort	7 – 12 tonne
TRS (Temporary Roof Support)	Operator canopy
Roof drill rig type	Joy HFX190
Drill rig controls	Cabinet-mounted

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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 increased availability and performance.

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



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

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- 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.

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