

Secure support program presented by a blast hole drill pioneer



Blast Hole Drill Operation Support System

What is F-MICAS ?

F-MICAS stands for "FRD Machine Information Control & Analysis System," a blast hole drill operation support system developed by Furukawa Rock Drill.

The system collects operation data and alert information from blast hole drills, to support customers in their machine operation and maintenance.

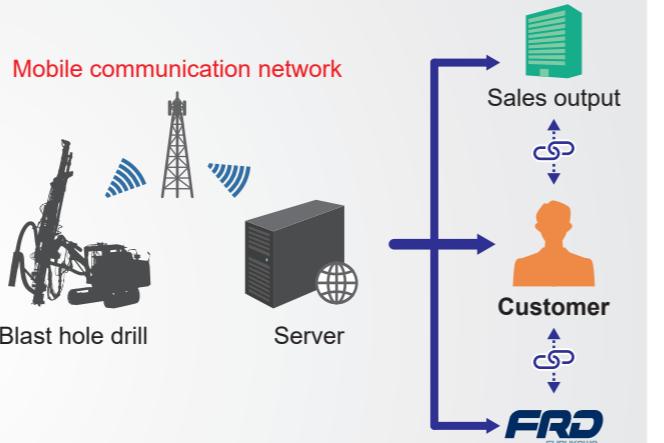
The customers can check their machine information by logging in to the special member site "F-MICAS Web Site."

Structure of F-MICAS

The communication device equipped inside the operator cabin collects data from the machine, sending the data to the server via a mobile communication network.

For sites without such a network, the collected data can be stored in the device and exported to a USB drive, etc.

The sent data will be provided to the customer and FRD personnel over the internet. Sharing real-time data in this way can realize optimal machine support.



F-MICAS's 4 benefits

1 Repair cost reduction

Early detection of problems prevents breakdowns and reduces repair costs.

2 Efficient operation management

Daily and monthly reports are automatically generated from operational data, reducing operational management work costs.

3 Securing stable operation

Immediate alert notification and visualization of parts replacement guidelines contribute to decrease downtime and stable operation.

4 Improving drilling efficiency

Improve drilling efficiency by quantified hole depth, operating hours, and operation.

Swift and appropriate advice and consultation

FRD or its sales output will analyze and assess the customer's machine status from F-MICAS data, realizing preventive maintenance before occurrence of failure. We also propose ideal tool selection and work operation utilizing the data as necessary.

Customers can also receive professional work consultation (paid service) based on analysis reports.

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FRD
FURUKAWA

HCR L100-E3
HCR L100-I3

Tier 3 / Stage III



FRD FURUKAWA ROCK DRILL



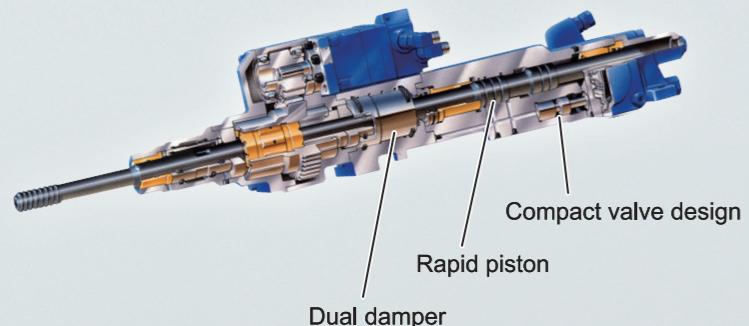
HCR L100 Series-E2403-F1

THE ULTIMATE COMBINATION OF PERFORMANCE AND ECONOMY

To achieve more powerful and speedy drilling

Evolutional High-Beat Drifter (HBD) HD715

FRD has developed the industry's first Dual-Damper System. For maximum energy transfer, active DDS minimizes return of shock waves by keeping the bit firmly against the rock at all times during drilling. Active DDS minimizes percussion energy loss and by optimizing the overall feed force. An additional benefit is greatly improved life of drilling accessories.



Compact valve design

The HD715 drifter maximizes energy transmission and drills effectively in a variety of rock types.

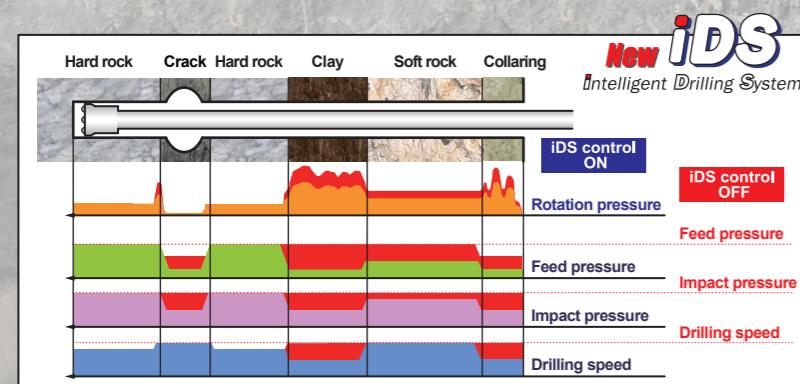


Reverse Percussion (RP)

The RP facilitates recovery of a lodged bit and steel by applying repetitive impacting force. (Optional equipment)

New iDS (Intelligent Drilling System)

iDS is equipped as standard. It helps with drilling in various kinds of rock formations. In addition to conventional function which is auto-stop and auto-back at abnormal rotation pressure due to a bit jamming, iDS controls drilling automatically by balancing the 3-key elements, such as feed, rotation and percussion. The New iDS is an evolution of the current iDS that monitors and controls rotation pressure to automatically perform the same careful drilling that is performed by skilled workers.



New iDS

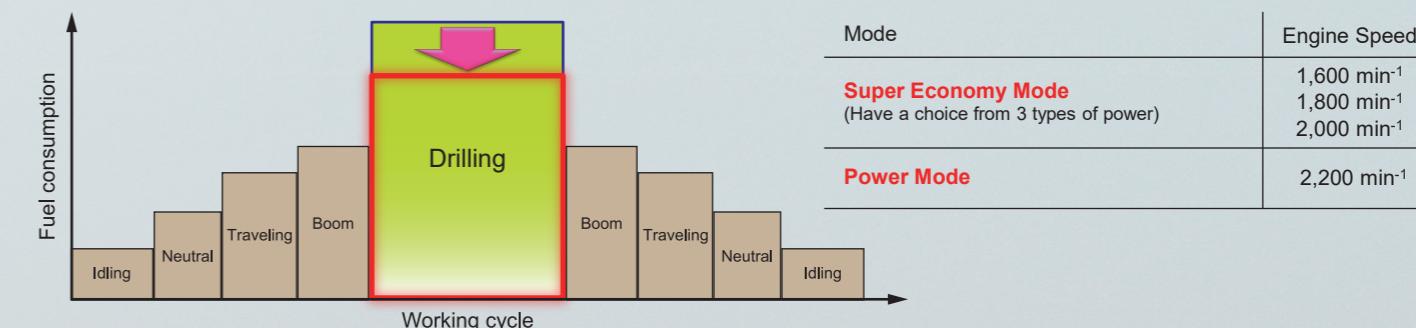
Rotation pressure rises:
to 6.5MPa ⇒ Drifter feed stop
to 8.0MPa ⇒ Drifter reverses
+ Collaring pressure is applied

Super economy mode PLUS (SEP)

HCR L100 enabled reduction of fuel consumption with integration of the fuel saving functions.

1. Super Economy Mode

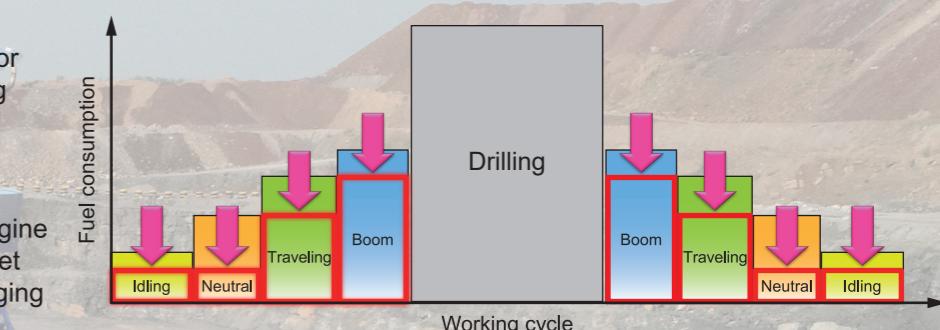
Super Economy Mode has four drilling engine speeds. Super Economy Mode helps reduce fuel consumption while maintaining performance by selecting the optimum engine speed according to the rock properties or production volume.



Minimize fuel consumption by engine throttle control, auto idling & compressor low-pressure standby other than drilling work.

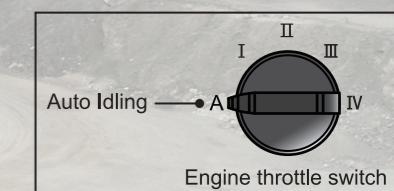
2. Automatic Throttle Control

Automatic Throttle Control switches engine speed automatically between the pre-set drilling engine speed and the rod changing engine speed.



3. Auto Idling

Auto idling automatically switches to 1600min during feed operation, drifter rotation operation, and rod changer operation.



4. Compressor Low-pressure Standby

Compressor Low-pressure Standby function minimizes compressor standby power at all times other than flushing. This reduces both fuel consumption and engine load.





Comfortable operator seat

Suspension seat is available as an standard.

Adjustable items

- Weight
- Fore and aft position
- Seat height
- Bottom cushion angle
- Backrest angle
- Headrest height
- Armrest height



Dual action travel control lever

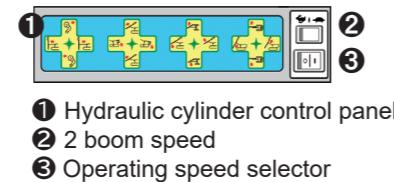
To prevent running due to incorrect operation, this model is equipped with a safety device that prevents running even if the travel control levers (pedals) are operated once.

Safety lock lever

Stops the traveling function and the function of the rod changer operation.

Touch panel boom control box

The boom can be easily operated with the panel boom control box. It can be removed from the console and operated at hand.



Right control panel

The drill and the boom control is located on this panel.

Left control panel

Operation switches for rod changer control are located on this panel.

Pillar mounted gauges

Pressure gauge installed to center pillar. Easily checkable from sitting position.



Digital engine indicator



- Engine rpm
- Engine hour meter
- Engine coolant temp
- Engine oil pressure etc

Comfort and convenience to keep operator productive

A 1,100 mm wide cab has ROPS/FOPS as standard. The cab comes with an automotive air conditioning system as standard, with air ducts on the left side and right to provide temperature-controlled air. The traditional FRD forward-cab roof design provides greater head space, and large doorways allow the operator to get in and out even while wearing a thickly insulated jacket. The roof-mounted skylight allows the operator to see screw connection and disconnection during rod changing.

Improvement of work efficiency

Multi function drilling lever

A low effort drilling lever controls feed forward or reverse. And rotation switch on top of the drilling lever controls rod rotation direction. ch on top of the control lever controls rod rotation direction.



- ① Impact (collaring) and feed forward position
- ② Impact (regular drilling) and feed forward position
- ③ Feed forward position (fast)
- ④ Feed backward position
- ⑤ Feed backward position (fast)

* In case of push drill specification.

Anti-jamming switch

The anti-jamming switch has a function to preventing "jamming" from occurring when the bit or rod cannot be pulled out during drilling work, and a RP(reverse percussion) function for pulling out the rod using the percussion force of the drifter when the rod gets jammed during drilling.

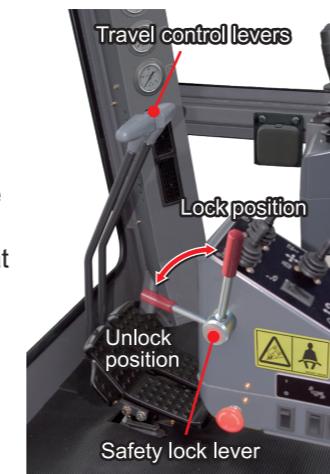
If the switch is set to position "I", "II" or "III", the drifter automatically reverses when a problem is detected in the main drilling to prevent "jamming".

* The RP (reverse percussion) is fitted to the drifter as an option when shipped from the factory.

Mode selector switch

The operator can change the drilling mode based on the rock conditions.

N mode is for standard drilling. When the impact pressure in standard drilling is too strong, such as in fracture zones or a clay layer, H mode is used to lower the impact pressure, increase the shank rod speed and maintain the drilling speed.



Other equipment

Emergency stop button



Stop the engine in the event of an emergency situation.

Evacuation hammer



Clinometer (level meter)



Cup holder



FM/AM radio



Fire extinguisher



Luggage box



Semi-automatic rod changer

With the semi-automatic rod changer, the operator can simply move the operation lever in a certain direction to perform a series of complex operations, from "adding" to "withdrawing" rods.



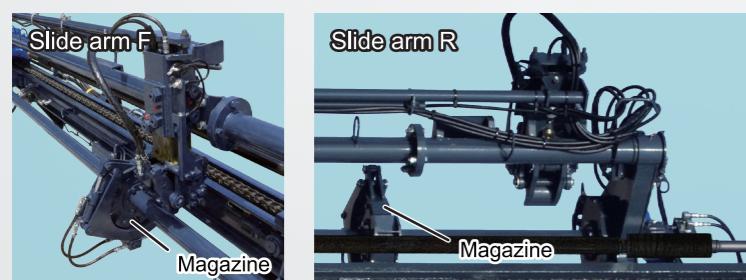
- One action by control lever at left console box in cabin
- Auto-detect drifter for adding/connecting or collecting rods
- Less time of adding/connecting rods
- Easy and proper loosening thread by rotator device (HCR L100-L3)

Rod changer individual control panel

There are individual control switches to adjust the rod changer located on the side of the left console box. These switches can be used to adjust the alignment or check the operation of the rod changer.

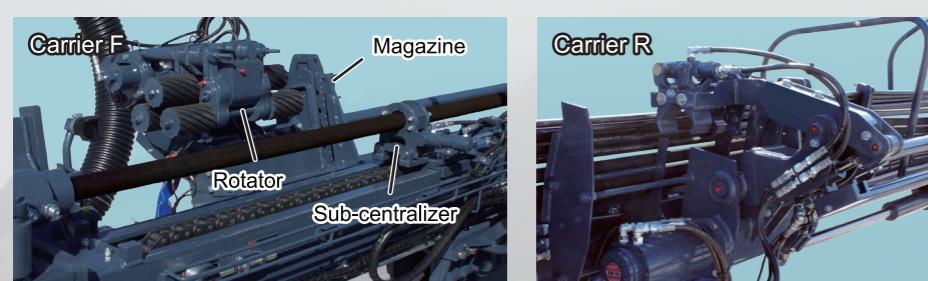
GR802 rod changer equipped with L100-E3

The rod is grabbed by the slide arms at the front and rear, and then the slide arms slide and swing the rods in and out to add or withdraw them. This simple and quick operation ensures a short cycle time on the rod changer. The rotary type magazine can store 6 rods.



GR801 rod changer equipped with L100-L3

Grabbing only one rod and swings in 2-steps. Magazine should be synchronized with swing. High reliability of rod collecting. Easy and proper loosening thread by rotator device. Easy drilling with unstable condition such as fragmented and clay area.



Robust guide shell for 20ft rods (HCR L100-L3)

The L100-L3 has a robust long guide shell designed to handle up to 20ft rods.

- Drilling by 20 ft rod reduces cycle time
- Reduce rod changing time by less numbers of rod

Drifter feed by chain feed system

Feed traction force 31 kN by chain feed system. When rod cannot be pulled out due to jamming etc., the largest feed traction force in same class is highly useful for collecting rods and bits etc.

- * Reverse percussion system (option) can support traction when jamming without leaving rod and bit.

Double hose reels (HCR L100-L3)

Extends hose life, ensures longer service life and reduces service load.



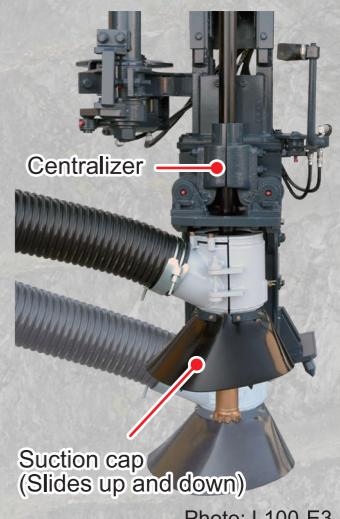
High-capacity compressor and dust collector

A 13.5 m³ free air delivery air compressor and a 40 m³ capacity dust collector is mounted inside the right side cover. High out-put compressor increases flushing air, provides faster drilling and decreases bit wear. This leaves flushing with more than enough capacity to significantly reduce residual cuttings and help shorten the cycle time. With the pre-cleaner capturing the large cuttings, the lifespan of the dust collector filter can be extended.



FEATURES

- ✓ High performance suction capacity
- ✓ Waterproof type element
- ✓ Pre-cleaner
- ✓ Slidable suction cap
- * Build-in dust collector makes excellent external view.



Mouth treatment

The suction cap adopts the guide rod mechanism. Durability and visibility of the drilled hole mouth are improved. Drilled hole mouth can be treated securely. The hydraulic centralizer holds the rod securely.

Tough under carriage with hydraulic oscillation

Heavy-duty track flames provide strength and durability. Standard full track guards protect undercarriage, Track tension can be adjusted easily with a grease gun.

The left and right track frame is equipped with an oscillating system that oscillates on each side to match the contours of the road surface. The entire machine oscillates up-down 7.5 degrees total 15 degree to maintain machine level.





All daily maintenance can be performed at ground level. Gas spring cylinders allow the hinged service doors to be opened easily for access to all required maintenance requirements. Maintenance costs have also been reduced, because the structure includes waterproof couplers and weather-proof, water-resistant and oil-resistant cables to help prevent electrical problems.

Water separator

Remove coarse debris and water from the fuel.



Fuel filter

Highly efficient filtration fuel filter. The inspection and replacement can be checked easily remotely.



Air filter

The air filter separates and removes the moisture in the air circuit.



More comfortable with more features!

More comfortable and safe

Head guards

Overhead window is steel gauge protected.



Oil supply pump

The oil supply pump is used to fill the oil and helps prevent contamination of hydraulic oil.

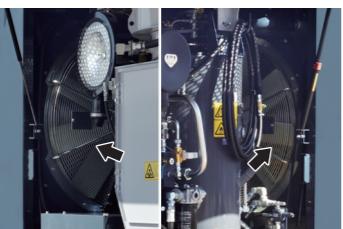


Long catwalk and large handrails

The crawler is equipped with large handrails and a long catwalk.



360° protective fan guard



Hoses and piping clearly accessible for Maintenance



Low-noise design for quieter environment

Cab undercover

Improves cab airtightness and quietness.



Cleaning fan positioned at rear

Minimize the impact of fan noise.



Heavy duty undercover

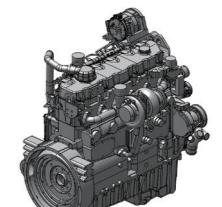


More features to cover important details

Thanks to advanced hydraulic and pneumatic technology, output energy can be transferred to each component with minimum power loss. These systems support high productivity.

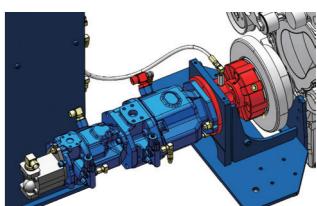
Powerful CAT engine

The C9.3B engine is EPA Tire3 equivalent emission standards. It gives full control for easy drilling.



Advanced hydraulic system

Employed Variable displacement pump with load sensing system for main pump.



Specifications

■ Standard & Optional equipments

Unit	
Drifter	
Dual damper system	Standard
Reveres percusion	Optional
Guide shell	
Hydraulic centralizer	Standard
Sliding suction hood	Standard
Open-Close + Sliding suction cap	Optional
Synthetic wear plate for carriage	Optional
Pendulum type guide tilt angle meter	Standard
Pendulum type guide swing angle meter	Optional
Rod changer	
Rod length	12ft (L100-E3) 20ft (L100-L3)
Rod size	51R (T51)
MM/MF rod	Select
Boom	
Extension boom (L100-E3)	Standard
Fix boom (L100-L3)	Standard
Guide rotary	Standard
Undercarriage	
Triple shoe	Standard
Single shoe	Optional
Lifting eyes for transportation	Optional
Dust collector	
Pre-cleaner	Standard
Exhaust shutter	Standard
Sinter-Lamellar filter	Optional
Cab	
ROPS/FOPS cab	Standard
Suspension seat	Standard
Seat belt	Standard
Air conditioner	Standard
FM/AM radio	Standard
iMS (Intelligent Monitoring System)	Optional
Clinometer (Level)	Standard
Side mirror (left side of cab)	Standard
Rotating light (Yellow)	Optional
Rear view monitoring camera	Optional
Additional lights (70Wx2)	Optional
Interior light	Standard
Evacuation hammer	Standard
Catwalk	Standard
Folding catwalk	Optional
Control	
Push switch for boom control	Standard
Joystick control for impact, feed and rotation	Standard
iDS (Intelligent Drilling System)	Standard
Anti-jamming device	Standard
2 boom speed	Standard
2 travelling speed	Standard
Back-up alarm	Standard
Auto throttle control for impact and air flow	Standard
Others	
2 dimensional electric angle indicator	Optional
3 dimensional electric angle indicator	Optional
Water tank for water injection system	Optional
Emergency shut down system	Optional
Pre-cleaner for engine	Standard
Pre-cleaner for compressor	Standard
Hour meter for engine	Standard
Hour meter for drifter	Optional
Large tool box	Optional
Ladder for access rear engine cover	Optional
Bumper base	Optional
Heavy duty under cover	Optional
Water separator for engine	Standard
Winter package for anti-freeze	Optional
High capacity battery	Optional
Battery cut switch	Optional

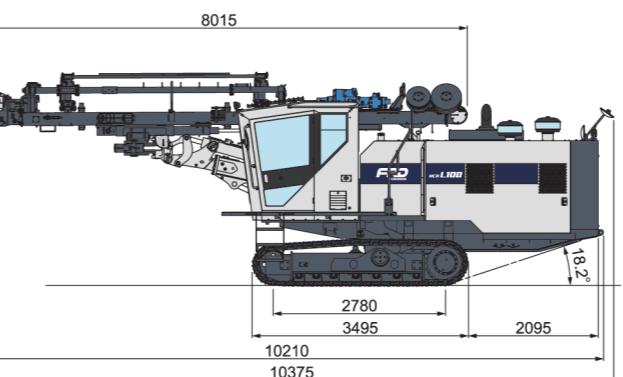
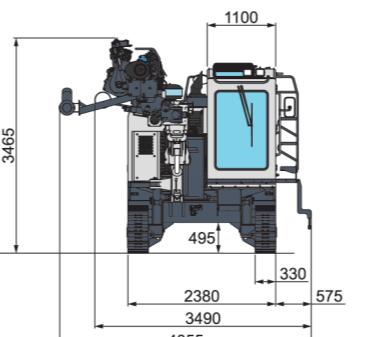
■ Specifications

Model	HCR L100-E3	HCR L100-L3
Dimensions & Weight		
Operating Weight*	17,370 kg	18,100 kg
ROPS/FOPS Cab (1100mm Wide)		
Operating Weight*	17,470 kg	—
ROPS/FOPS Cab (1300mm Wide)		
Overall Length (Shipping)	10,210 mm (10,345 mm)	10,215 mm (10,580 mm)
Overall Width with Pre-cleaner	4,055 mm	4,175 mm
without Pre-cleaner (Shipping)	3,490 mm (2,670 mm)	3,525 mm (3,055 mm)
Overall Height (Shipping)	3,465 mm (3,310 mm)	3,630 (3,410) mm
Drifter		
Model	HD715	
Weight (with Reverse Percussion)	269 kg (304 kg)	
Impact Rate	2,250 - 2,500 min ⁻¹	
Rotating Speed	0 ~ 150 min ⁻¹	
Undercarriage		
Track Length	3,495 mm	3,570 mm
Track Length on Ground	2,780 mm	2,865 mm
Track Width	330 mm	330 mm
Ground Pressure	92.8 kPa (1100mm Wide) 93.3 kPa (1300mm Wide)	93.8 kPa
Ground Clearance	495 mm	495 mm
Frame Oscillation Angle	±7.5°	±7.5°
Tramming Speed	0 ~ 3.7 km/h	0 ~ 4.0 km/h
Gradeability	57.7 % (30°)	57.7 % (30°)
Maximum Traction Force	99 kN	98 kN
Engine		
Model	C9.3B	
Type	Diesel, Water-cooled, 6 Cylinders	
Make	CATERPILLAR	
Power Output	280 kW / 2,200 min ⁻¹	
Fuel Capacity	640 L	
Hydraulic Equipment		
Variable Displacement PV Pump	PV Pump x 2	
Fixed Displacement Pump	Gear Pump x 3	
Hydraulic Oil Reservoir Capacity	240 L	
Boom		
Model	JE326	JF325
Type	Extension Boom	Fix Boom
Boom Lift Angle	Up 41°, Down 19°	Up 40°, Down 25°
Boom Swing Angle	Right 38°, Left 7° (1100mm Wide) Right 38°, Left 6° (1300mm Wide)	Right 35°, Left 1°
Boom Slide Length	900 mm	—
Guide Rotary Angle	90°	90°
Guide Shell		
Model	GH832	GH830
Length	8,015 mm	10,215 mm
Feed Length (with Reverse Percussion)	12 Feet 4,700 mm (4,520 mm)	20 Feet 6,884 mm (6,694 mm)
Feed Type	Hydraulic Motor Driven Chain	Hydraulic Motor Driven Chain
Guide Slide Length	1,500 mm	1,500 mm
Guide Swing Angle	Right 30°, Left 45°	Right 25°, Left 90°
Guide Tilt Angle	170°	170°
Maximum Rod Pull-Out Force	31 kN	31 kN
Compressor		
Model	PDSF290-S16	
Type	1 Stage Screw Compressor	
Free Air Delivery	13.5 m ³ /min	
Discharge Pressure	1.03 MPa	
Dust Collector		
Model	A885	
Suction Capacity	40 m ³ /min	
Number of Filter Element	6	
Type of Dust Ejection	Automatic Air Pulse Jet	
Rod Changer		
Model	GR802	GR801
Rod Diameter	T51	T51
Number of Rod Storage	6	4
Rod Length	3,660 mm	6,100 mm
Bit and Rod		
Bit Range	90 ~ 127 mm	90 ~ 127 mm
Rod Diameter	T51	T51
Rod Length	3,660 mm (12 Feet)	6,100 mm (20 Feet)
Maximum Starter Rod Length	4,270 mm (14 Feet)	6,100 mm (20 Feet)
Electrics		
Battery	12V; 160 Ah / 5 h x 2	
Light	24V; 70 W x 4	
Voltage	DC 24 V	
Operating Environment		
Ambient Temperature Range	-15°C ~ +45 °C	
Maximum Altitude	Max. 2,500 m	

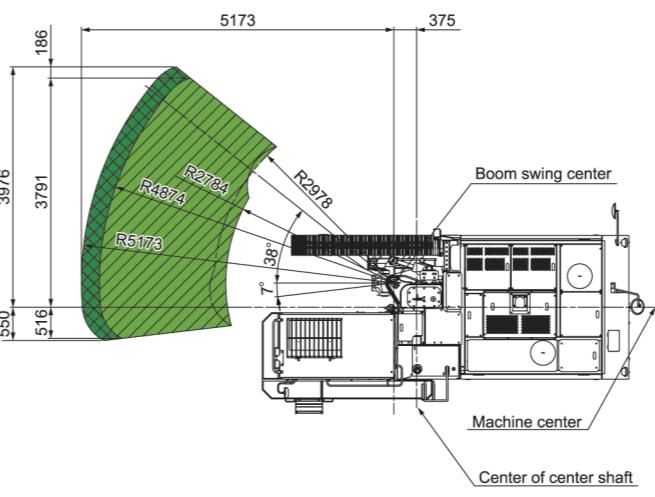
* "Overall Weight" includes weights of fuel and oils (full).

HCR L100-E3

■ Dimensions (mm)

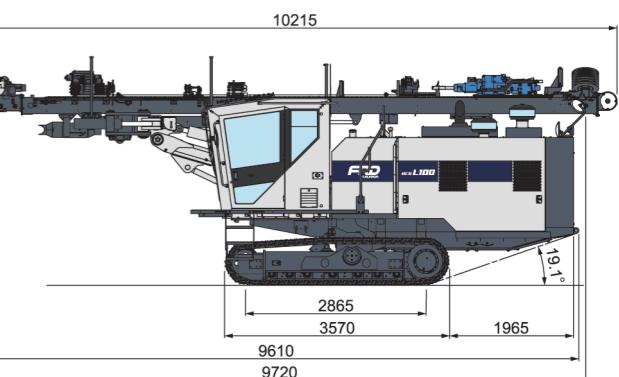
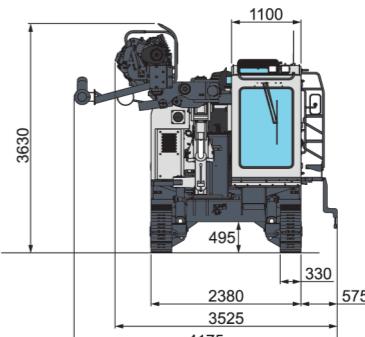


■ Drilling Coverage (mm)



HCR L100-L3

■ Dimensions (mm)



■ Drilling Coverage (mm)

