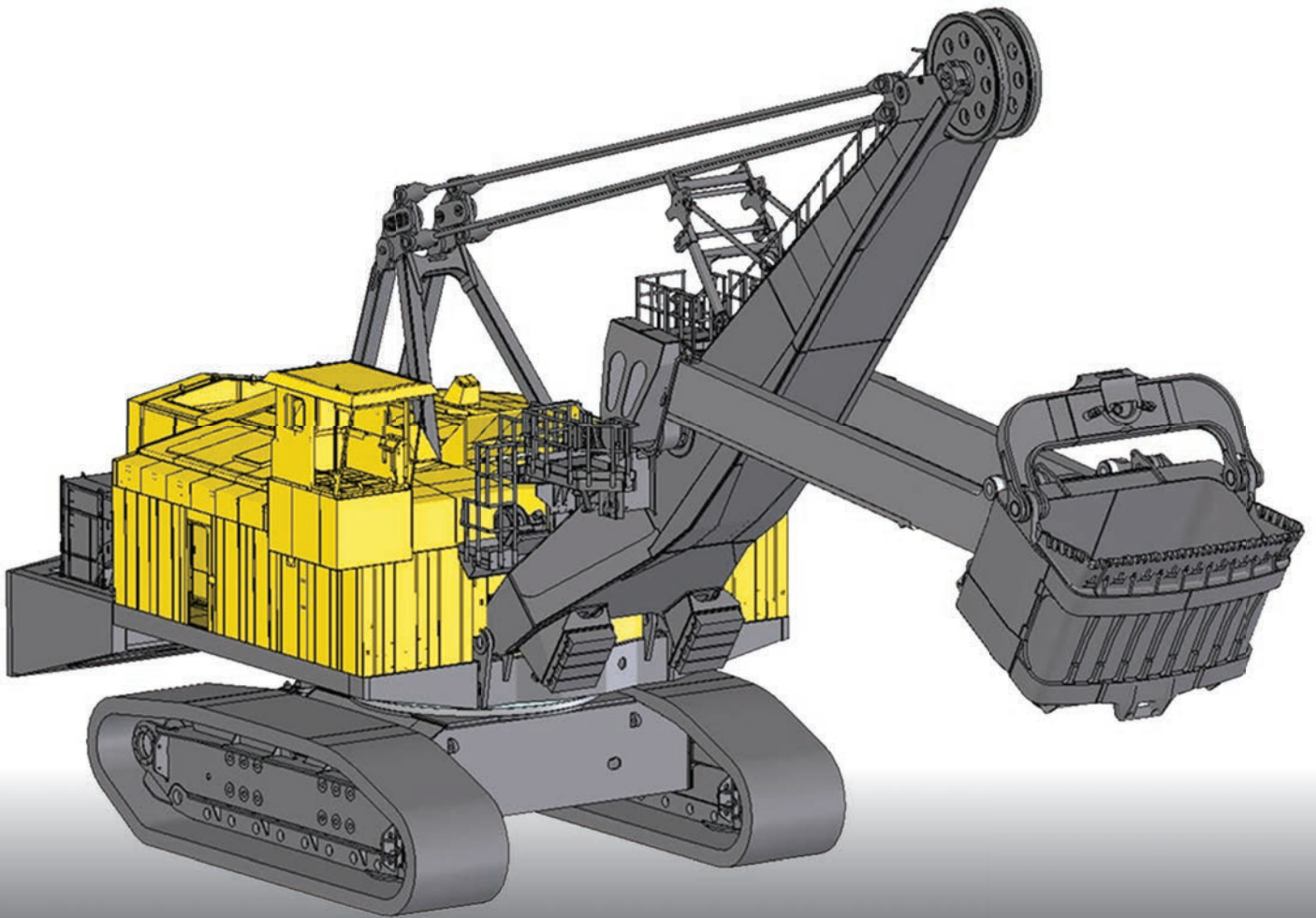


KOMATSU

4100C AC

Electric Mining Shovel - AC Drive



P&H



P&H 4100C AC Shovel building on proven success

Mine operations and maintenance managers demand the best from their loading tools. For this reason, Komatsu Mining has been the electric mining shovel market share leader and preferred equipment supplier to the world's toughest mining environments for over **100 years**.

Komatsu is proud to offer the **P&H 4100C AC** electric mining shovel. The P&H shovel line is combining its solid reputation of reliability with the proven Centurion electrical control system, time-tested AC systems, rugged structures and the industry's only direct field service and support network to set the industry standard for electric mining shovels.

Proven availability and productivity ultimately lead to the lowest cost per ton and the most efficient ultra-class loading tool available in the industry today. P&H shovels dig deeper into the realms of productivity, safety and reliability with greater control, comfort and consistency.



Proven performance

P&H AC-drive shovels have been exceeding customer requirements and expectations since 1920.

- Lowest total cost of ownership
- Highest productivity
- Superior machine reliability and durability

We set the industry standard for electric mining shovels.

A closer look

The P&H 4100C AC *utilizes proven components.*

- Structures developed with advanced design software and field data collection
- Motors designed and manufactured by Komatsu specifically for electric mining shovels

The P&H performance edge

Attachment of choice for the world's toughest applications

- Twin-leg dipper handle – Stable dipper trajectory, **faster cycle times, higher productivity**
- Rack and pinion crowd – Less maintenance, all weather performer
- Optima dippers – Mine-matched dippers with pitch braces for precise rake angles



Rugged components

- Dual hoist motors – Balanced and evenly distributed load
- Delta drive – Improved shoe-to-tumbler engagement
- Planetary transmissions – Proven long life on swing and propel with over 99 million hours logged

Technology

- Centurion electrical control system – Superior performance, monitoring and data integration capabilities
- Universal shovel interface – Send and receive data with any mine management system
- PreVail remote health management – Real time machine health and performance management

World-class cab/loading control center

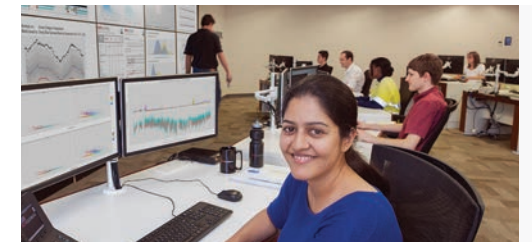
Performance and comfort have been optimized with:

- Smart ergonomics
- Clear sight lines
- Easy access to command and control functions
- Access to key data on machine health and performance provided by Centurion electrical control system

Smart Solutions

Our smart connected products and systems, advanced analytics and direct services are integrated together and customized to solve our customers' toughest challenges:

- Service products and consumables
- Machine assembly and rebuild
- Component exchange programs
- Life cycle management
- Genuine OEM parts
- Prognostics and remote health management



Komatsu Mining is the worldwide leader in electric mining shovels. The P&H 4100C AC sets the standard in performance and productivity.

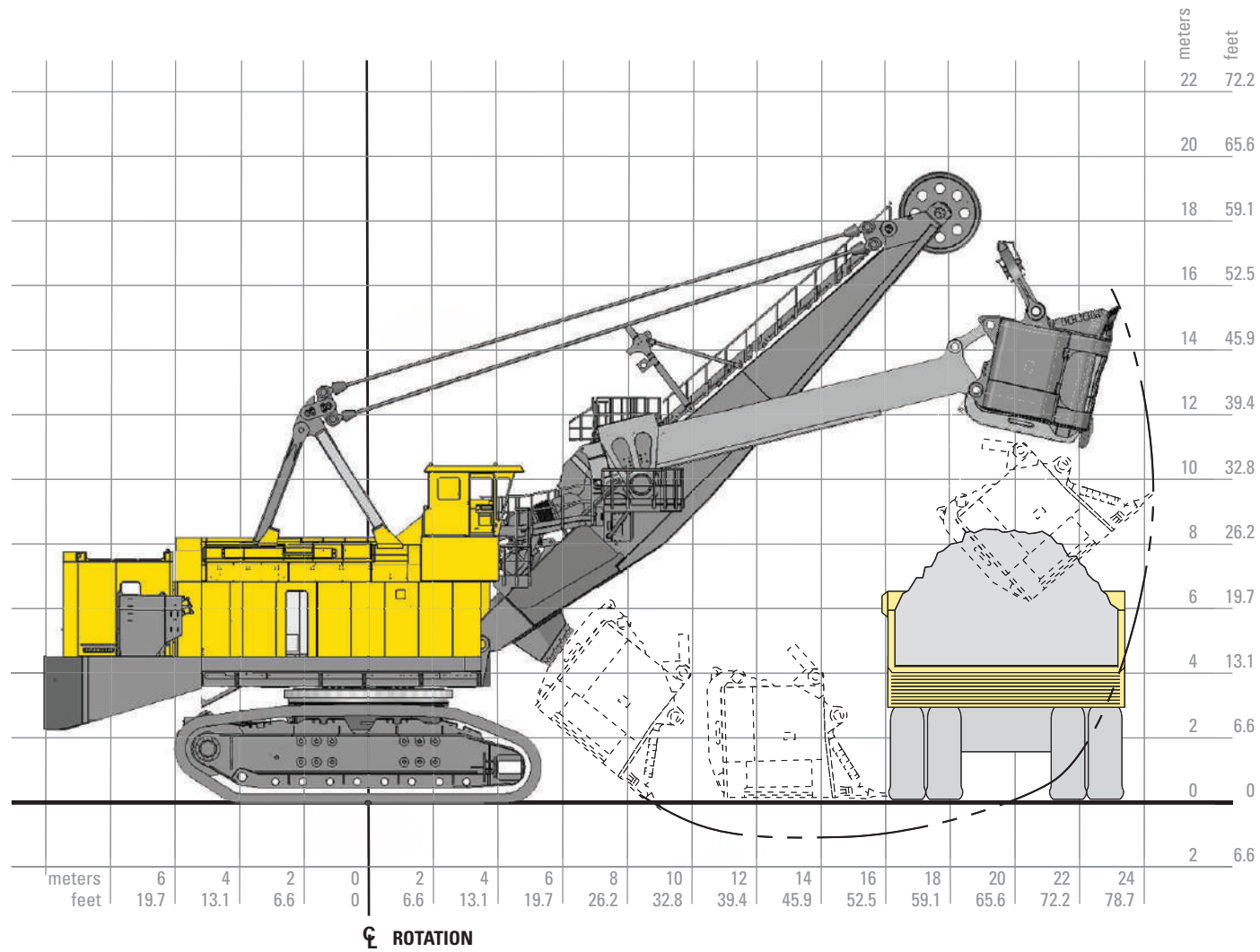
- Designed for severe-duty digging and loading
- Years of experience in building rugged, reliable equipment
- Extensive collaboration with customers and our partner ABB during development

We are driven to help achieve the lowest total cost of ownership for our customers:

- Quality components
- Focus on machine availability and productivity
- Heavy-duty structures
- Komatsu Mining field support

P&H 4100C AC Drive Electric Mining Shovel

General Specifications



Working ranges		
Height of cut	15.8 m	51 ft. 10 in.
Radius of cut	24.7 m	78 ft. 8 in.
Dumping height* (door open)	9.1 m	31 ft. 0 in.
Floor level radius	16.4 m	52 ft. 6 in.
Tail swing radius	10.2 m	32 ft. 3 in.
Operator eye level	9.5 m	31 ft. 3 in.

*Height shown with bail-type dipper. Heights will be greater with bail-less or compact-bail dippers. Actual dumping height can be greater than door clearance height.

Capacity		
Nominal payload*	81.6 mt	90 st
Nominal dipper capacity SAE struck	45.9 m ³	60.0 yd ³
SAE 2:1	50.8 m ³	66.4 yd ³
Rated suspended load	154.2 mt	170 st
Optimum truck size (400 st truck shown)	172-363 mt	190-400 st

*Payload and dipper capacity are dependent on many factors. Contact Komatsu Mining for an analysis of your specific application.

Electrical control

Centurion supervisory controller provides direct integrated communication with motor drives giving precise motor control and fast cycle times. Real-time multi-tasking capability allows for optimal machine logic sequencing, monitoring and control.

Centurion I/O system uses 'Profibus' communication protocol for seamless integration of all shovel subsystems and future expandability. Low-voltage 24V DC I/O drop points feature open and short circuit detection for improved diagnostics and troubleshooting.

Centurion information system's enhanced Graphical User Interface (GUI) features intuitive, icon-based screens to display vital information such as shovel status, troubleshooting information, and optional production monitoring data and operator feedback.

Electrical control systems

Electrical drive ratings (50°C, 2000m)	Nominal Drive Power
IGBT supply unit (ISU)	3679 kVA
Crowd motion	1000 kW
Hoist motion	4000 kW
Propel motion	2200 kW
Swing motion	2000 kW

The electrical drive system is comprised of a multi drive platform, sharing a common DC bus between the IGBT Supply Unit (ISU) and the motor drive Inverter Units (INU). The fully regenerative ISU controls the power flow to and from the shovel, maintaining a near unity power factor with extremely low harmonic content. The fully regenerative INU controls the power flow to and from the individual AC motors.

P&H AC fast response main machinery motors		
Hoist motor (two used)	Continuous rating @ 690 volts peak developed power	Total 2388kW/3200hp 2834kW/3800hp
Swing motor (two used)	Continuous rating @ 690 volts peak developed power	Total 1090kW/1460hp 1370kW/1838hp
Crowd motor (one used)	Continuous rating @ 690 volts peak developed power	Total 545kW/730hp 800kW/1071hp
Propel motor (two used)	Continuous rating @ 690 volts peak developed power	Total 1090kW/1460hp 1264kW/1695hp

Power requirements

Supply voltage*	7200V 3 phase, 60 Hz	5000, 6000 or 6600 3 phase, 50 Hz
Supply transformer	(minimum) 3000 kVA	
Minimum short circuit VA available at shovel	25 MVA	

*Voltage per customer requirements

Transformer

Main transformer	2130 kVA
Auxiliaries transformer	310 kVA
Control/lighting supply winding	50 kVA

Dipper and dipper trip

Optima dippers combine consistent productivity with high durability and maintainability. Dippers are configured to mine specific conditions and capacity requirements from a variety of combinations of body and lip designs, as well as other unique Komatsu technologies. Specific wear packages and GET styles can be cooperatively specified.

TripRite system utilizes a brushless DC electric motor with sealed planetary drive unit for reliable trip and slack take up operation.

Swing

Two modular P&H planetary gear cases of proven design and a single piece forged swing gear transmit torque for fast cycle times.

Spring-set air release disc brakes – one per motor
Optional Swing Filtration system available

Propel

Two rugged P&H planetary gear cases of proven design independently transmit torque to the drive sprockets, producing the tractive effort required for fast, efficient propel and positioning operations.

P&H Delta drive low tension sprocket drive system with heavy duty cast crawler shoes.

Spring-set air release disc brakes – one per motor.

Crowd

Powerband V-belt drive between motor and gear case absorbs shock loads.

First and second reduction gearing in enclosed gear case for reliable splash lubrication, ease of maintenance, and extended component life.

Twin-leg dipper handle with torsion box and rack and pinion drive has inherent stability in the bank for optimal digging.

Spring-set air release disc brake.
Optional crowd filtration system available

Hoist

All gearing housed in single enclosed gear case with filtered oil circulation for reliable splash lubrication and ease of maintenance.

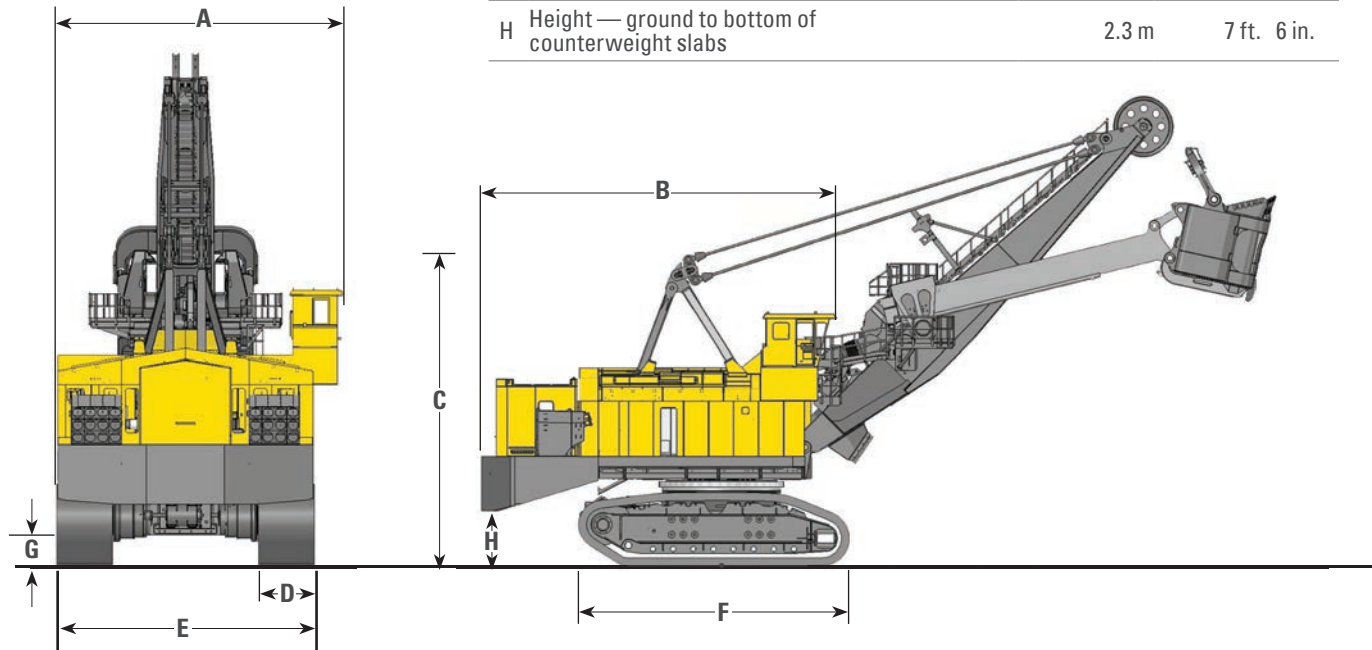
Large 65" diameter hoist drum for extended rope bending life. Ferrule becket system and dual electric tuggers are standard for efficient rope change.

Spring-set air release disc brakes – one per motor.

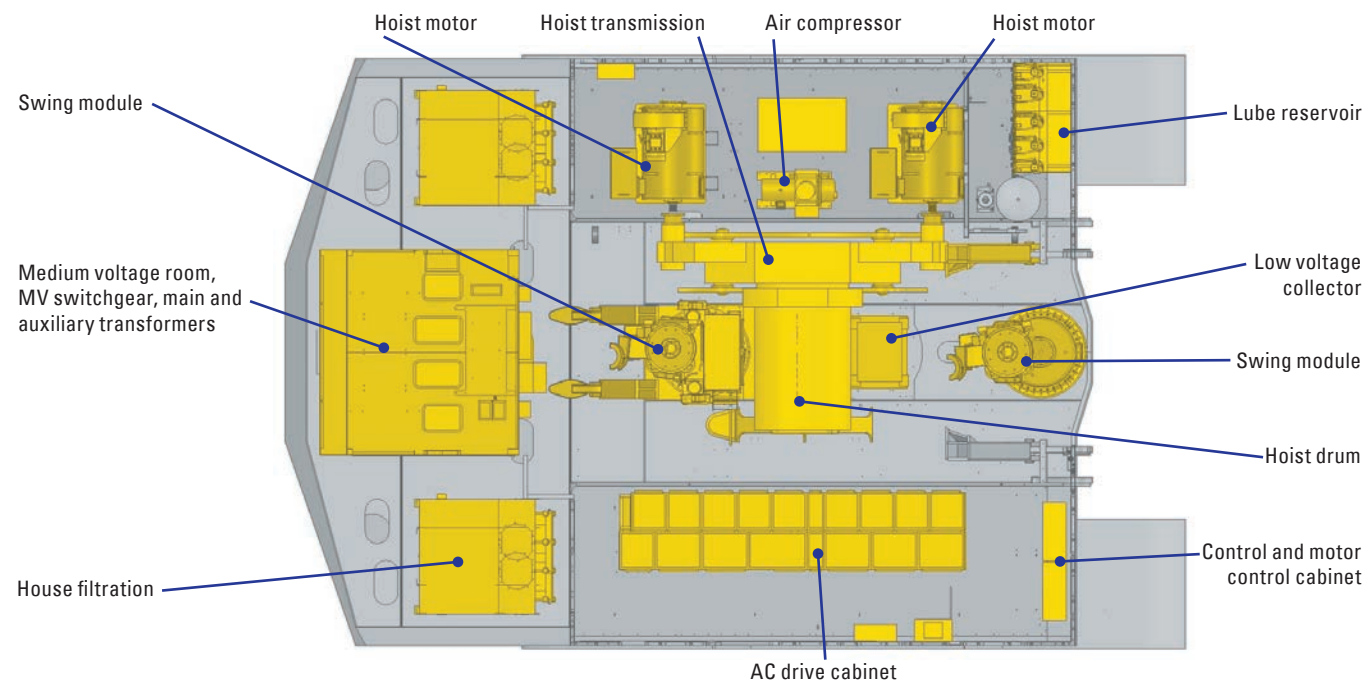
Cable data

Hoist (wire rope)	67 mm 70 mm	2.62 in. dia. 2.75 in. dia.
Suspension (bridge strand)	102 mm	4.00 in. dia.
Dipper trip (wire rope)	19 mm	0.75 in. dia.

Overall dimensions		
A Width	13.1 m	43 ft. 0 in.
B Length	14.9 m	48 ft. 9 in.
C Height over gantry	12.6 m	41 ft. 5 in.
D Width of crawler shoes	1930 mm 2210 mm	76 in. 87 in.
E Width of crawlers (76")	9.9 m	34 ft. 4 in.
F Length of crawlers	11.6 m	38 ft. 0 in.
G Ground clearance	1.1 m	3 ft. 6 in.
H Height — ground to bottom of counterweight slabs	2.3 m	7 ft. 6 in.



Machinery deck plan



Ground pressure and weight

Bearing area – ground pressure

Standard:		
Crawler bearing area 76" shoes / 1930 mm	34.69 m ²	53,767 in ²
Crawler ground pressure 76" shoes / 1930 mm	351 kPa	50.98 psi
Optional:		
Crawler bearing area 87" shoes / 2210 mm	39.71 m ²	61,549 in ²
Crawler ground pressure 87" shoes / 2210 mm	308 kPa	44.70 psi

Weights – approximate*

Working weight (with dipper, approx. wt.)		
76" shoes / 1930 mm	1,243,300 kg	2,741,000 lbs
87" shoes / 2210 mm	1,247,800 kg	2,751,000 lbs
Counterweight (ballast)**	304,000 kg	670,000 lbs

*All weights subject to 10% variation.
** To be furnished by customer.

Features and customization

The P&H 4100C AC is built with several features to enhance safety, reliability, and productivity over the lifecycle of the operation.

- Automatic lubrication and compressed air systems with advanced diagnostic and control
- Temperature monitoring system for all AC motors, drum shaft bearings and shipper shaft bearings
- Automatic Boom Soft Setdown system (ABSS) and boom profile protection envelope to help prevent excessive loading to the attachment during operation
- Anti-swing-in-bank system to reduce excessive side loading on handle and attachment
- Remote hoist control pendant and hoist rope winch to assist in safe and efficient rope changeouts
- House pressurization system to provide filtered air for cooling and dust repression

The shovel has multiple options for local and minesite specific conditions in the following areas:

- Operator cab
- Climate control
- Cold weather equipment
- Technology and software
- Electrical and mechanical systems
- Maintenance systems

Lower your TCO

Contact your Komatsu Mining service rep or visit mining.komatsu for more information on the P&H 4100C AC electric mining shovel.

Komatsu: Revolutionizing the mining industry for a sustainable future

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