4100C
Electric Mining Shovel – DC Drive
Product Overview
P&H 4100C DC 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 DC electric mining shovel. The P&H shovel line is combining its solid reputation of reliability with the proven Centurion electrical control system, time-tested DC 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 DC-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 DC 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 adjustable 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 20 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 DC 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 by achieving the lowest total cost of ownership for our customers:
- Quality components
- Focus on machine availability and productivity
- Heavy-duty structures
- Komatsu Mining field support

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P&H 4100C DC Drive Electric Mining Shovel

General Specifications

**Working ranges**
- Height of cut: 15.9 m (51 ft. 10 in.)
- Radius of cut: 24.7 m (78 ft. 8 in.)
- Outrigger height (door open): 9.1 m (30 ft. 0 in.)
- Floor level radius: 16.4 m (53 ft. 6 in.)
- Tail swing radius: 10.2 m (33 ft. 3 in.)
- Operator eye level: 9.8 m (33 ft. 1 in.)

**Capacity**
- Nominal payload*: 816 mt (90 st)
- Nominal dipper capacity:
  - SAE 2-1: 45.9 m³ (60.0 yd³)
  - SAE 2: 50.8 m³ (66.4 yd³)
- Rated suspended load: 154.2 m (170 st)
- Optimum track size:
  - 450 st: 172.383 m (400 st: 190.400 st)

**Electrical control**
- P&H digital DC static DC power conversion and reactive power compensation
- Hoist**:Propel Swing Crowd/Propel
  - Continuous armature converter kW rating (400 V DC)**
    - 2x1860 kW
    - 3700 amp.
  - 15 Sec. armature converter current rating*:
    - 60 Hz (7 step)
    - 50 Hz (8 step)
  - Continuous field converter rating*:
    - 150 amp.
    - 150 amp.
  - P&H digital DC automatic reactive power compensation*
    - 60 Hz (7 step)
    - 50 Hz (8 step)
- Switched steps: +4725 kVAR total
- * Nominal rating at rated capacitor voltage (600 VAC)
- ** Cascaded hoist converters.

**Power requirements**
- Supply voltage*:
  - 3 phase, 50 Hz: 547 kW/733 hp
  - 3 phase, 60 Hz: 600 kvA/803 hp
- Supply transformer (minimum): 3000 kVA
- Minimum short circuit VA available at shovel: 16 MVA

**Transformer**
- Main transformer: 2500 kVA
- Auxiliaries transformer: 450 kVA
- Control/lighting supply/winding: 10 kVA

**Dimensions**
- **Height of cut**: 15.8 m (51 ft. 10 in.)
- **Radius of cut**: 24.7 m (78 ft. 8 in.)
- **Tail swing radius**: 10.2 m (32 ft. 3 in.)
- **Floor level radius**: 16.4 m (52 ft. 6 in.)
- **Working ranges**: 4.0 - 66.6 meters

**Electrical control systems**
- P&H Delta drive low tension sprocket drive system with heavy duty cast crawler shoes.
- Swing set air release disc brake – one per motor.
- Splash lubrication system – optional.

**Propel**
- Two modular P&H planetary gearcases of proven design and a single piece forged swing gear transmit torque for fast cycle times.
- Spring set air release disc brake – 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.

**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 L&T 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.
- Swing set air release disc brake – one per motor.

**Dimensions**
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*Height shown with bail-type dipper. Actual dumping height can be greater than door clearance height.

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

- A Width: 13.1 m (43 ft. 0 in.)
- B Length: 15.8 m (51 ft. 8 in.)
- C Height over gantry: 12.6 m (41 ft. 5 in.)
- D Width of crawler shoes: 1930 mm (6' 1")
- E Width of crawlers: 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: 2.8 m (9 ft. 1 in.)

Machinery deck plan

- Air compressor
- Hoist motor
- Reactive power compensation cabinet
- Swing motor and transmission
- Transfer cabinet
- Converter cabinet
- Accessory panel
- Ground fault suppression cabinet
- Secondary breaker cabinet
- Auxiliary transformer
- Main transformer
- High voltage cabinet with isolators

Loading control center

- Ante room (shown with optional toilet)
- Space for appliances
- Trainer’s station
- Lockers
- Storage cabinet
- 6-way power adaptable air suspension seat with heat and vibratory massage
- Touchscreen GUI and optional remote camera system
- Space for mine communications equipment
- Amort supported, anti-slip walkplates

Ground pressure and weight

- Bearing area — ground pressure
  - Standard: Crawler bearing area, 76" shoes / 1930 mm
    - 34.69 m² (53767 in²)
    - 351 kPa (50.98 psi)
  - Optional: Crawler bearing area, 87" shoes / 2210 mm
    - 39.71 m² (61549 in²)
    - 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 (punchings)**: 195,500 kg (431,000 lbs)

* All weights subject to 5% variation.
** To be furnished by customer.

Features and customization

The P&H 4100C 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 DC 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

Contact a Komatsu Mining service representative for more information on the P&H 4100C DC drive electric mining shovel or visit https://mining.komatsu