



2020 Hydraulic Control Product Catalogue

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Flameproof Hydraulic Manifold HBox 5

**Flameproof Hydraulic Manifold Hi Flow 5-Spools
Open Centre (Russian) HBox 5-150
Part Number: L0W00201**

**Flameproof Hydraulic Manifold Hi Flow 5-Spools
Open Centre (English) HBox 5-150
Part Number: L0W00202**

**Flameproof Hydraulic Manifold Hi Flow 5-Spools
Closed Centre Var. Comp. HBox 5-150
Part Number: L0W00301**

HBox 5 is a self-contained electronic-over-hydraulic control manifold integrated into a flameproof-certified (Ex d) protective enclosure.

The manifold is controlled and monitored from a host control system (PLC) via a single, industry-standard CAN field bus cable and 24-volt power source.

The manifold provides the following hydraulic control and monitoring features:

- Five (5) Spool Valves (150 litres/minute, 3-position, proportional, open-centre)
- Five (5) Fixed 14-bar compensator to regulate flow for each spool valve
- Three (3) Pilot Pressure Signal Output Valves
- One (1) Automatic spool flow safety isolation valve (internally managed)
- One (1) General Purpose Pressure Monitoring Port
- One (1) Internal hydraulic oil temperature sensor

The manifold also provides built-in spool position monitoring and stuck-spool safety protection

This version of the HBox 5 is configured for Russian language

Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Long Wall Shearers
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders
- Any industrial power supply application



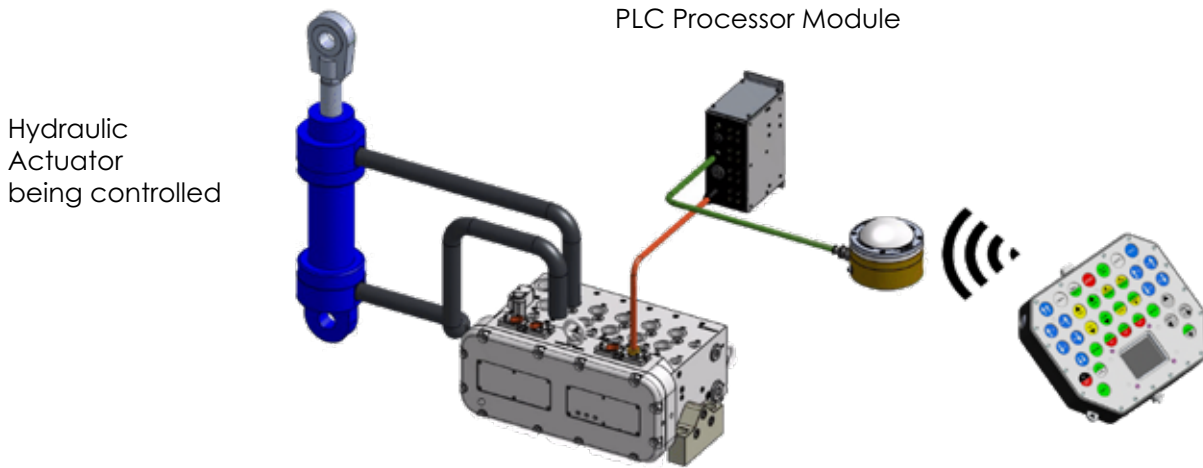
Refer to Pempek's Complete Flameproof Hydraulic Control System for more details

Features & Benefits

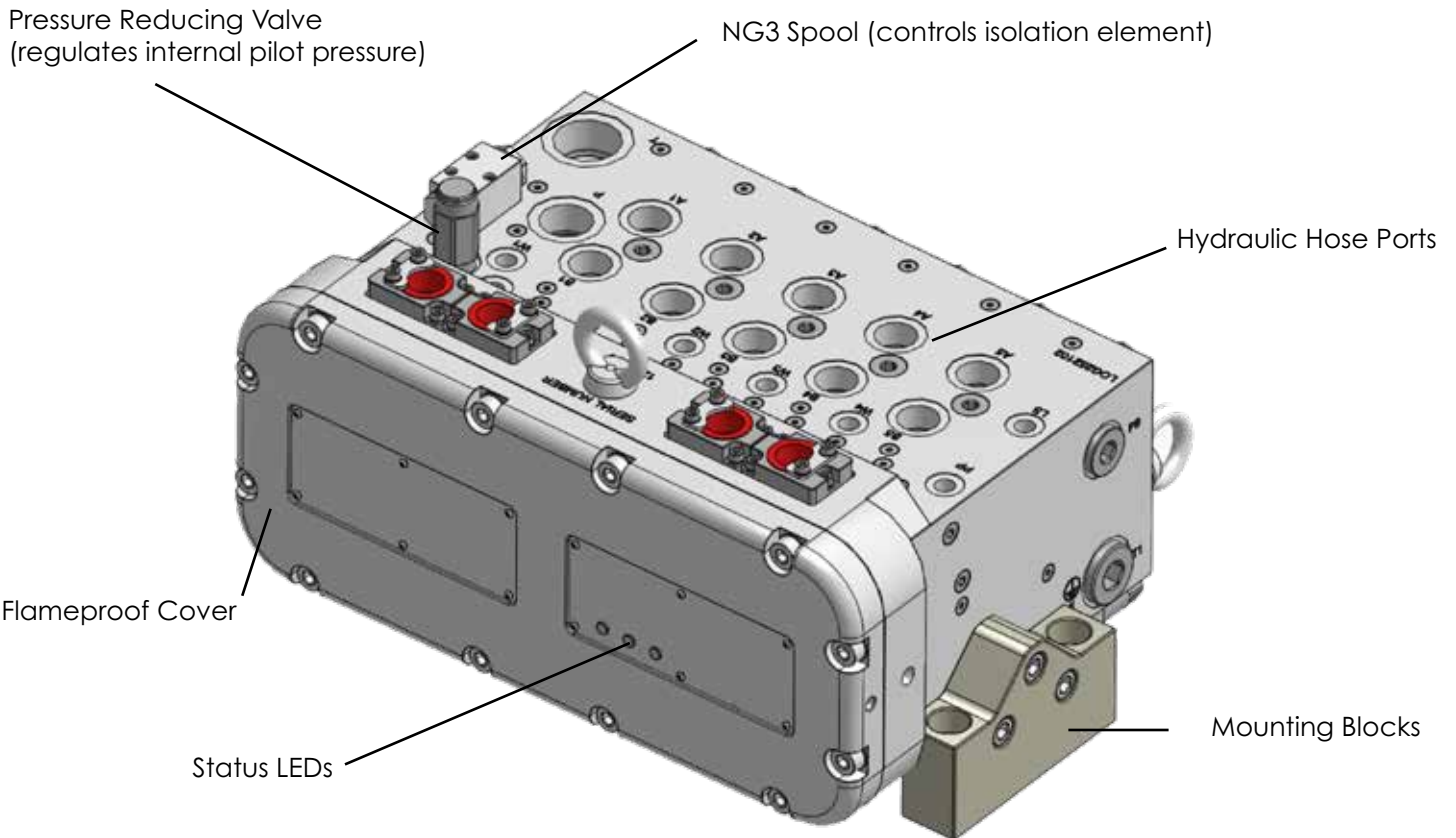
- Operating successfully for over a decade in Australian and South African mining industry with more than 120 units in operation as of Dec 2019
- Proven Record on 12CM & MB600 Series Continuous Miner & Bolter Miner
- Requires ONLY ONE Control Cable
- Pempek warrants and supports the complete package through its global partnerships
- Individual flow control and over pressure limit function for each spool
- Solenoids Don't Leak or Fill with Water (Rated to 315 Bar Continuous)
- Safety Isolation Valve - Built in and Automatically Controlled by Firmware to Maintain Safety
- Spool Safety - Built Into Product Firmware
- Pressure monitoring for internal and external functions (No I/O required)
- Temperature Monitoring - Internal Oil Temperature Sensor (No I/O required)
- Tell Tail LEDs on cover show: 1. Comms (green/red) 2. Status (blue/red/green) 3. Power (green)
- Replacing a Spool (eg After Swarf Ingestion) and Self Calibration take less than 3 Minutes
- Spool Self Diagnostic Built into Firmware Commanded from Remote Exercises all Circuits Without Oil Pressure
- HBox Diagnostic Road case Available that Exercises H-Box (See Diagnostic Screen)

Complete Hydraulic Control Solution in a Flameproof Box

5 Shooter Application Overview



5 Shooter Product Overview



Flameproof Hydraulic Manifold HBox 5

Specifications

		HBox 5-150
Work Spools [Qvmax] Lpm*	High Flow	150 x 5
	Medium Flow	X
External Pilot Functions	On/Off	X
	Proportional	3
Max Pump Flow	[qVmax]	240
Pump Pressure	[p BAR]	315
P&T Port	P	NB25 [OPT x 2]
	T	NB25 [OPT x 2]
Load Sensing Capable	Standard	✓
	Turbo	X
Pilot Filtration***	Full	X
	External	✓
Oil Temperature Monitoring	°C	✓
Internal Pressure Monitoring	P Bar	2
External Pressure Monitoring	P Bar	1
Spool Position Monitoring	Safety	✓
	Diagnostics	✓
Port Pressure Limiting	P Bar	✓
Reduced Mechanical Adjustment		✓
Fast Cartridge Replacement		✓
Self Cleaning Orifices	No Blockages	X
Options Configured By Pempek	Easy Commissioning	✓
Reduced Leak Points	No Slices	✓
Pempek Safety Integrated	Verified	✓
System Status Led	X 3	✓
Flame Path Openings	Single Opening	✓
	Single Inspect.	✓
Can Bus	Single Cable	✓
	Daisychain	✓

Flameproof Hydraulic Manifold HBox 7

**Flameproof Hydraulic Manifold 2x180 5x90 Litre
Spools Closed Centre Pilot Filter Port Plate HBox 7-180
Part Number: L0Z30104**

**Flameproof Hydraulic Manifold 2x180 5x90 Litre
Spools O/Centre Var. Comp No Port Plate HBox 7-180
Part Number: L0Z30105**

HBox 7 is a self-contained electronic-over-hydraulic control manifold integrated into a flameproof-certified (Ex d) protective enclosure.

The manifold is controlled and monitored from a host control system (PLC) via a single, industry-standard CAN field bus cable and 24-volt power source

The manifold provides the following hydraulic control and monitoring features:

- Hydraulic hose port adapter with built-in 10 micron pilot rail filter
- Two (2) Spool Valves (180 litres/minute, 3-position, proportional, closed centre)
- Five (5) Spool Valves (90 litres/minute, 3-position, proportional, closed centre)
- Five (7) Variable-adjustable compensator to maximize spool flow as needed
- Four (3) Pilot Pressure Signal Output Valves
- One (1) Automatic spool flow safety isolation valve (internally managed)
- Five (5) General Purpose Pressure Monitoring Ports
- One (1) Internal hydraulic oil temperature sensor

The manifold also provides built-in spool position monitoring and stuck-spool safety protection

Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Long Wall Shearers
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders
- Any industrial power supply application



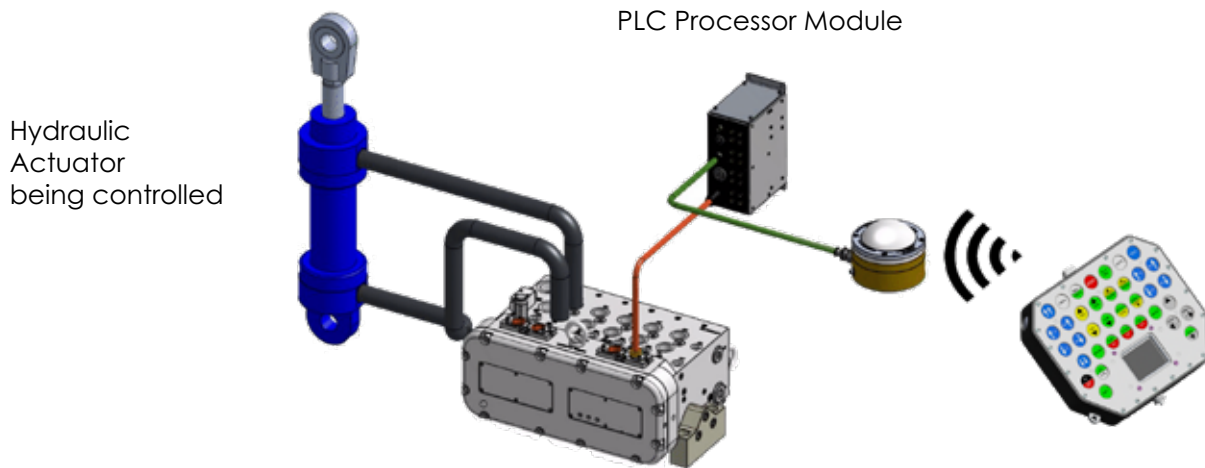
Refer to Pempek's Complete Flameproof Hydraulic Control System for more details

Features & Benefits

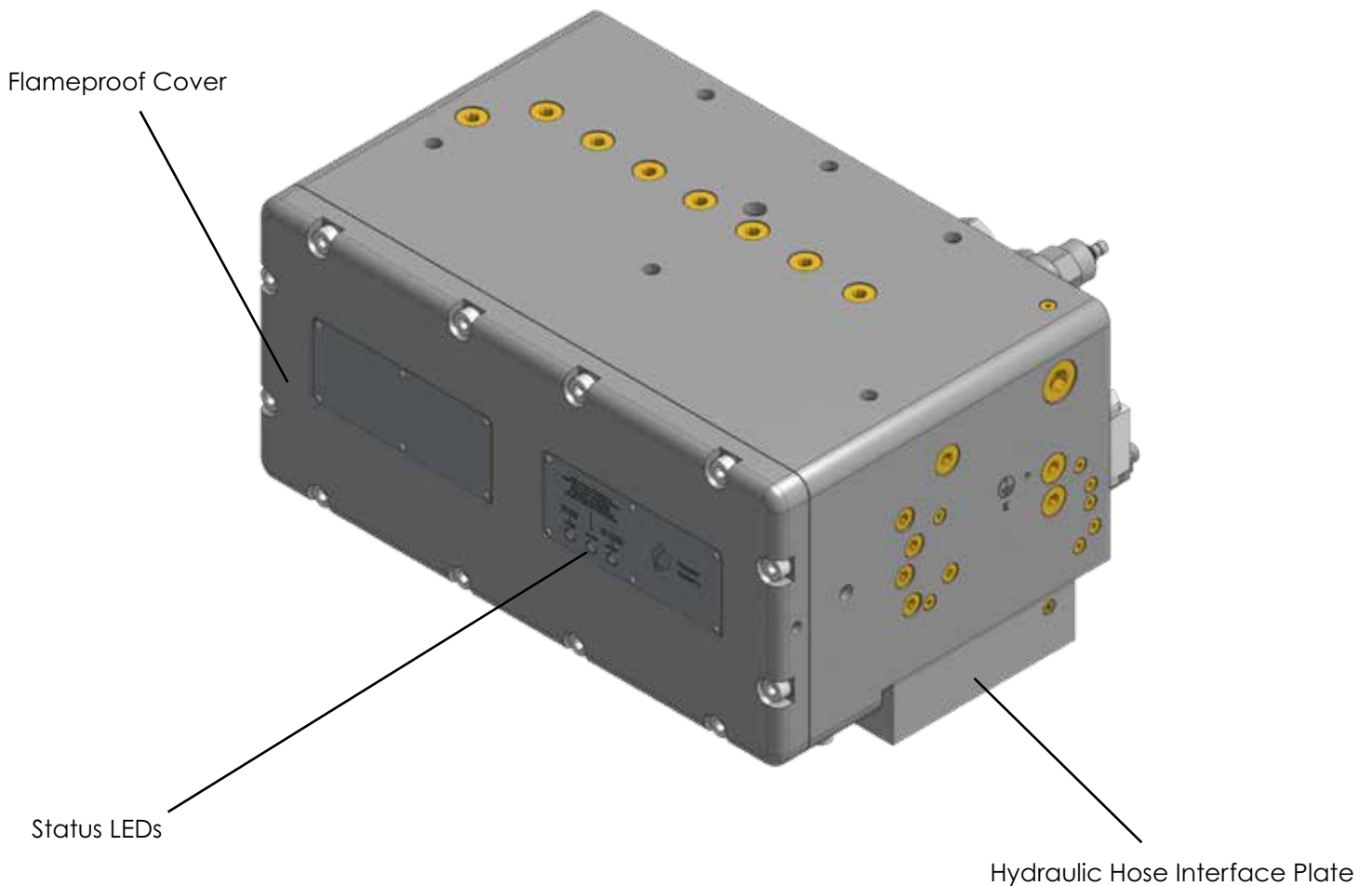
- Operating successfully for over a decade in Australian and South African mining industry with more than 120 units in operation as of Dec 2019
- Proven Record on 12CM & MB600 Series Continuous Miner & Bolter Miner
- Requires ONLY ONE Control Cable
- Pempek warrants and supports the complete package through its global partnerships
- Individual flow control and over pressure limit function for each spool
- Solenoids Don't Leak or Fill with Water (Rated to 315 Bar Continuous)
- Safety Isolation Valve - Built in and Automatically Controlled by Firmware to Maintain Safety
- Spool Safety - Built Into Product Firmware
- Pressure monitoring for internal and external functions (No I/O required)
- Temperature Monitoring - Internal Oil Temperature Sensor (No I/O required)
- Tell Tail LEDs on cover show: 1. Comms (green/red) 2. Status (blue/red/green) 3. Power (green)
- Replacing a Spool (eg After Swarf Ingestion) and Self Calibration take less than 3 Minutes
- Spool Self Diagnostic Built into Firmware Commanded from Remote Exercises all Circuits Without Oil Pressure
- HBox Diagnostic Road case Available that Exercises H-Box (See Diagnostic Screen)

Complete Hydraulic Control Solution in a Flameproof Box

7 Shooter Application Overview



7 Shooter Product Overview



Flameproof Hydraulic Manifold HBox 7

Specification

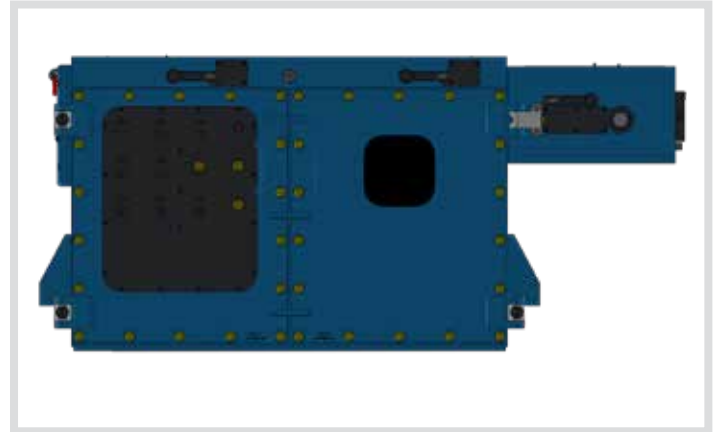
		HBox 7-180
Work Spools [Qvmax] Lpm*	High Flow	180 x 2
	Medium Flow	140 x 5
External Pilot Functions	On/Off	3
	Proportional	1
Max Pump Flow	[qVmax]	350
Pump Pressure	[p BAR]	315
P&T Port	P	NB25 x 2
	T	NB25 x 2
Load Sensing Capable	Standard	✓
	Turbo	✗
Pilot Filtration***	Full	✗
	External	✓
Oil Temperature Monitoring	°C	✓
Internal Pressure Monitoring	P Bar	4
External Pressure Monitoring	P Bar	5
Spool Position Monitoring	Safety	✓
	Diagnostics	✓
Port Pressure Limiting	P Bar	x4
Reduced Mechanical Adjustment		✓
Fast Cartridge Replacement		✓
Self Cleaning Orifices	No Blockages	✗
Options Configured By Pempek	Easy Commissioning	✓
Reduced Leak Points	No Slices	✓
Pempek Safety Integrated	Verified	✓
System Status Led	X 3	✓
Flame Path Openings	Single Opening	✓
	Single Inspect.	✓
Can Bus	Single Cable	✓
	Daisychain	✗**

Drill Rig Control Station

IEC Flameproof Enclosure - Ex d
Part Number: L0QX0301

Features & Benefits

- Reduces installation time and cost
- Consistent, predictable machine overhaul schedule
- Simplified supply chain
- Uniform documentation
- Standardised machine automation software
- Sub - Systems designed to work together from single supplier

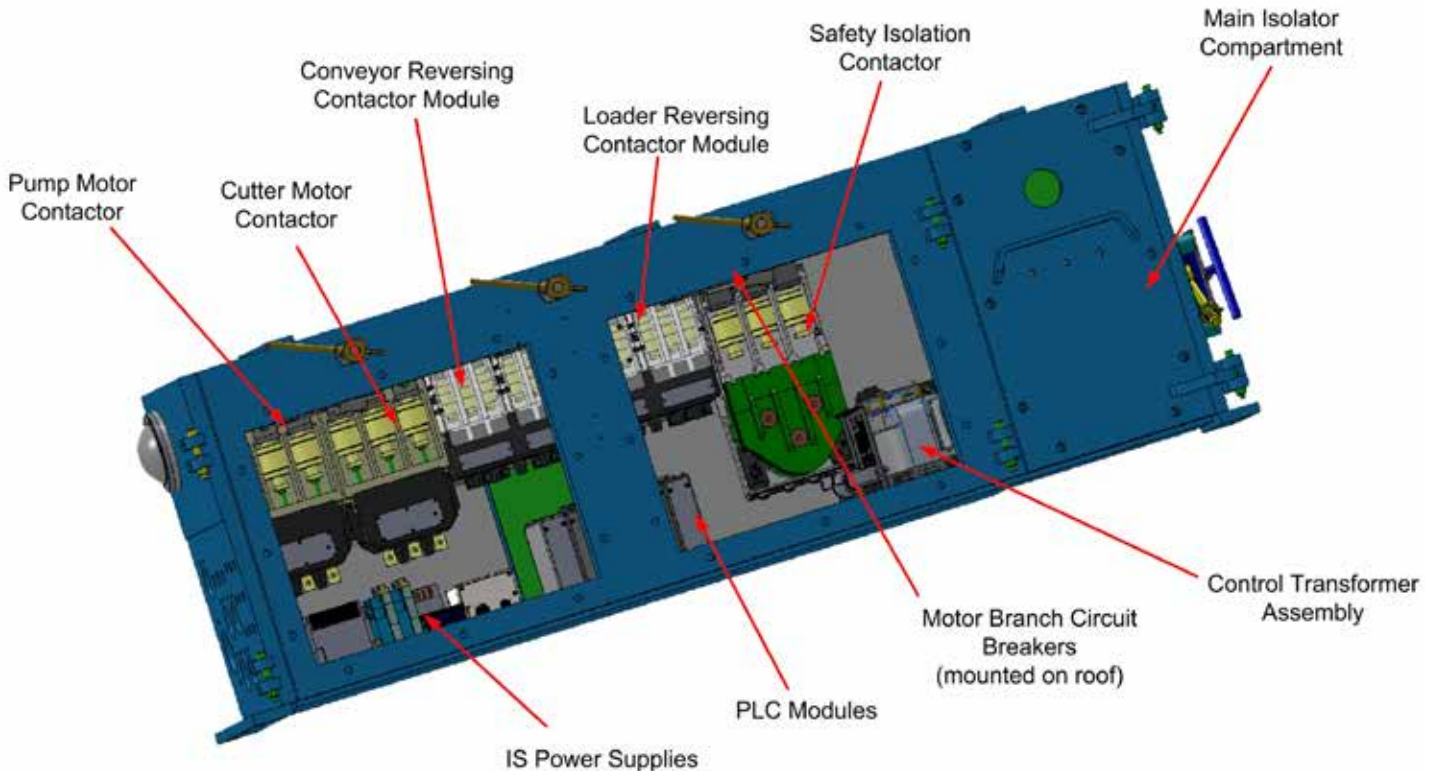


Typical Application

- Continuous Bolter/Miners
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- Remote Control Scoops
- Remote Control Loaders
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Refer to Pempek's Underground Mobile Plant Brochure for more details

Electrical Component Layout



HMI Drill Rig Control Station

HMI Flameproof Drill Rig Control Station Part Number: L0WD0102

The L0WD HMI (Human Machine Interface) Control Station is an integrated graphics display and push-button control unit that is built into a rugged, stand-alone flameproof enclosure.

The product is intended to provide a user-friendly, and robust, user interface control station for mobile mining equipment that must be operated in so-called hazardous areas; where there is a risk of fire and explosion due to methane gas and coal dust.

The complete assembly is built into a self-contained flameproof enclosure (EX d Explosion Protection Certification); making it suitable for use in hazardous environments such as underground coal mining.

Features & Benefits

- Compliant with IEC 60079.0 and IEC 60079.1 this flameproof HMI drill rig control module is designed for world-wide explosive atmosphere regulatory approval allowing it to be installed into any underground mining environment after certification assessment
- The L0WD module consists of a flameproof enclosure, graphic display, flameproof buttons allowing operation through the polycarbonate material and flameproof connectors allowing easy field replacement of the unit in case of failure
- The HMI drill rig control module is designed to be mounted on the machine in close vicinity of the drill rig itself.
- This Ex d apparatus can be operated in hazardous areas of Group I/IIB T6/T5/T4 environment.

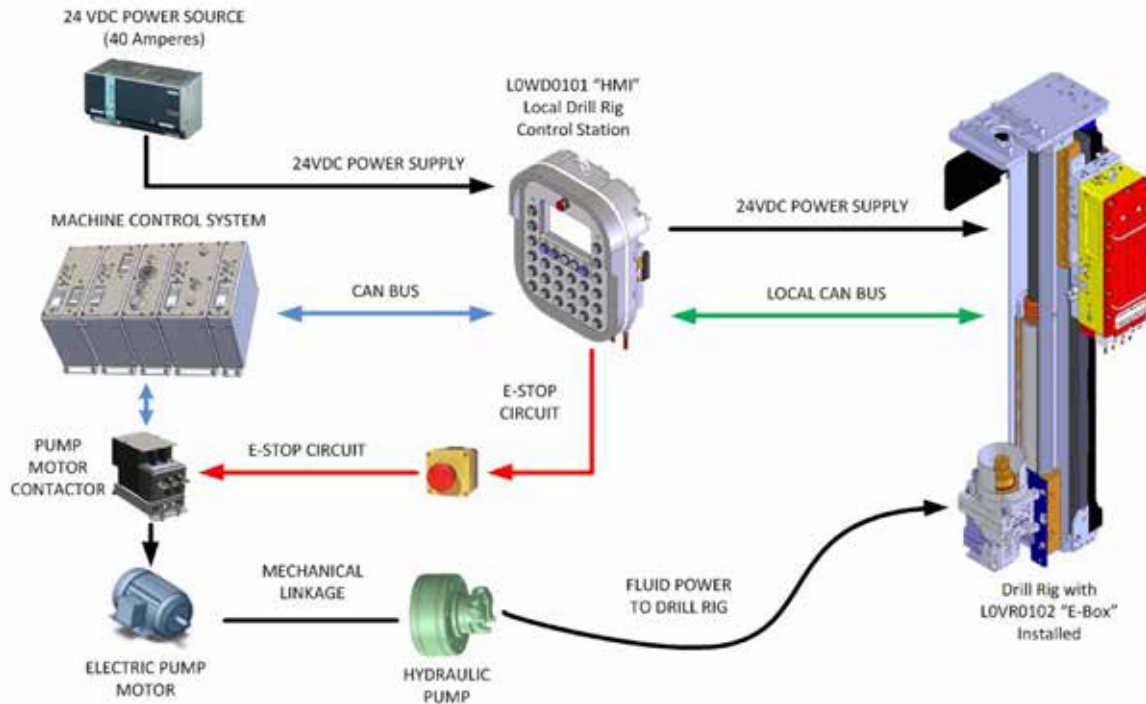


Typical Application

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- Mobile Bolters
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Drill Rig HMI Control Station

The following block diagram depicts a typical application of the L0WD0101 HMI platform. In this application, the HMI station is used to control and monitor an automated roof bolting drill rig.



In this application, the HMI includes automation, control and safety functions for control and monitoring of the "E-Box" installed on the drill rig. The HMI communicates with the drill rig via a dedicated, local CAN bus. This communication link allows the HMI to turn on and monitor solenoids in the E-Box that control hydraulic drill rig functions. The HMI also forms part of the machine stop circuit. It monitors the stop circuit and shuts down drill rig if the stop circuit is opened by the machine control system or any hard-wired stop device on the machine. The also HMI contains a set of redundant (wired in series) stop relay contacts. These are opened if the operator pressed the latching stop button on the front face of the HMI station. These are also opened if the HMI detects an unsafe condition in the E-Box; such as a stuck solenoid spool or an illegal pressure feedback.

The HMI station also communicates with the machine host control system via the machine-wide CAN bus. The host control system supervises and monitors the HMI and drill rig control via CAN bus communication. This allows the machine control system to implement machine wide automation and safety functions; which include one or more HMI-based drill rig control sub-systems.



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