PMH (Single & Dual) Reciprocating Peroxide Injection

McCARTNEY™ LDPE A KMT BRAND

The McCartney PMH Hydraulic Driven Reciprocating Metering Pump has long been the *Industry Workhorse* for Initiator Injection.

The McCartney PMH Pump, now available with Single or Dual Intensifiers, is the latest generation of reciprocating peroxide injection LDPE pumps.

The PMH pump includes the newest proven designs for the intensifier top works as well as the hydraulic drive unit. The new PMH hydraulic drive units are equipped with state of the art Closed Loop Electronic Flow Control. The fully calibrateable PID controller responds directly to a 4-20 mA input and provides precision control of initiator flow and high turndown ratios not achievable with traditional pneumatic positioners utilizing instrument air control.

Pump units are available in single configuration or in a dual configuration when space is a consideration. Single and dual pump units are supplied with manifolded process suction and discharge piping with single point connections. Cooling jackets are an option when initiator flashing is a concern.

Features:

- PMH Topworks Upgrade Available for Older Pumps
- Hydraulic Driven Reciprocating Metering Pump with Electronic Control
- Initiator Injection: 1380 – 4100 bar
- Modifier Injection: 345 – 600 bar
- Proven Reliability for More than 45 Years
- Extended Check Valve and Packing Lifetime
- Easy Access Door and Panel Enclosure
- 3-Piece Elastomer Plunger Seal
- Stainless Steel Cylinder and Check Valve Body
- Magnetic Proximity Reversing Devices
- High Pressure Seal Lubricator
- Continuous Hydraulic Fluid Recirculation for Filtration and Cooling
- Epoxy Powder Coated 170L (45 Gal) Hydraulic Oil Reservoir, Stainless Steel is Optional
- Axial Piston Hydraulic Pump
- HP Cylinder Cooling Jackets
- Environmentally Friendly

PMH Equipment Description

The Model PMH Pump is a reciprocating positive displacement pump unit comprised of reciprocating intensifiers, each with two opposed pumping heads, mounted above one electric motor driven hydraulic power unit. The epoxy powder coated 170-liter hydraulic fluid reservoir is complete with low level and temperature monitoring ports. The reservoir is located along side the power unit, providing a flooded suction at all times. The entire package is assembled on a rigid steel frame, complete with covers and doors. With doors and covers in place, the pump unit operates within the industry standard of 85 dba.

Each reciprocating intensifier consists of one, double acting hydraulic cylinder that provides power to two H.P. Cylinders, mounted on opposite ends of the hydraulic cylinder. The extremely close concentricity tolerances incorporated into the hydraulic piston, hydraulic cylinder heads, and cylinder housing designs provide superior alignment between the hydraulic piston and high pressure cylinder plunger. The connection design of the unique plunger/piston easily compensates for any minor misalignment that may be present. These important design considerations result in longer high pressure seal life.

Hydraulic piston sealing is accomplished by four brass piston rings. The piston ram operates on two brass bushings, one in each cylinder head. Hydraulic piston ram sealing is provided with easily maintainable, screw in glands.

The high pressure cylinder body is fabricated with 15-5PH stainless steel. We offer the most advanced high pressure cylinder sealing arrangement available today. Our patented 3-piece High Pressure Seal is lubricated and non-adjustable, eliminating the human error typical with the traditional chevron packing designs.

The lubricator is a Premier brand with dedicated pumps for each H. P. Cylinder. The lubricator operates with a non-pressurized lubrication gland on the high pressure cylinder. The common fowling of the downstream check valve due to packing debris is eliminated with this advanced design. A seal life of 4,000-18,000 hours can be expected routinely with no intermittent maintenance required.

Integral to the high pressure cylinder assembly is the McCartney Double Ball Check Valve. This highly reliable check valve is a simple design with few moving parts, and therefore few maintenance concerns. The unique design offers the lowest possible Cv across the valve, keeping the NPSH requirement to a minimum.

The HP Plunger speed is directly proportional to the discharge flow rate of the electronically controlled hydraulic drive unit. The 4-20 mA signal from the DCS is processed by the electronic pump controller yielding a precise flow rate from the intensifier topworks. As the intensifier top works nears the end of the stroke in either direction, the hydraulic ram piston triggers a magnetic proximity device to send a pneumatic signal to the 4-way directional control valve, which in turn, reverses its direction pressurizing the opposing high pressure cylinder.

Typical Design and Operating Parameters for PMH Peroxide Injection Pumps

Operating Specifications	
Pump Type	Reciprocating
Materials Handled	Solution of Peroxide in hydrocarbon
Specific Gravity	0.6 – 1.0 (kg/L @ 25°C)
Viscosity,	0.8 - 1.2 (cp @ 25 °C)
Discharge Capacity	Up to 150 L/hr (39.6 GPH)
Turndown Ratio	50:1
Suction Pressure	2.4 bar (35 PSI) Minimum
Discharge Pressure (Design)	4136 bar (60,000 PSI)
Discharge Pressure (Operating)	4000 bar (58,000 PSI)
Electric Motors	
Hydraulic Drive	11 – 37 KW (15-50 HP) 1500/1800 RPM
	C-Face Horizontal Foot Mounted
	Totally Enclosed Fan Cooled, Explosion Proof
	Voltage & Phase to Meet Customer Requirements
	Explosion Proof Rating to Meet Customer Requirements
	Direct Coupling
Lubricator Drive	.25 KW (1/3 HP) 1500/1800 RPM
	NEMA 56 Frame
	Totally Enclosed, Explosion Proof
	Voltage & Phase to Meet Customer Requirements
	Explosion Proof Rating to Meet Customer Requirements
	Direct Coupling
Hydraulic Power Unit Piping	
Hydraulic Line	Hydraulic Hose
Fittings	Steel
Cooling Pipe	Stainless Steel
Nozzles	
Process Inlet	1/4" NPT
Process Outlet	9/16" HP Connection
Plant Air Inlet	1/4" NPT
Cooling Water Inlet	1/2" NPT
Cooling Water Outlet	1/2" NPT

Standard Features:

- High Pressure Pump Heads with 3-Piece Patented High Pressure Plunger Seal
- Closed Loop Electronic Flow Control
- High Flow, Double Ball, Springless Check Valves
- HP Cylinder Cooling Jackets
- Floating Plunger Connection
- 15-5PH Monoblock HP Cylinder Body
- Axial Piston Hydraulic Pump
- Cooling/Filtering Circuit for Hydraulic Oil System Powered by Auxillary Gear Pump
- Lube Oil System for HP Plunger Seal
- Cabinet Doors
- Special Tools
- Epoxy Powder Coated 170 L (45 Gal)Hydraulic Oil Reservoir

Optional Features:

- Uniflow System to Reduce the Pressure Drop While Changing Stroke Direction
- Check Valve Cooling Jackets
- Composite Carbide Lined HP Cylinders
- Alternate Motor Brands, Voltages and Hazardous Location Ratings per Customer Requirements
- Magnetic Proximity Switches for Stroke Registration
- Explosion Proof Electrical Enclosure
- Hour Meter
- Larger Capacity Hydraulic Reservoir
- Stainless Steel Hydraulic Reservoir
- Stainless Steel Top Pan
- Discharge Pressure Transmitter
- Hydraulic Oil Heater
- Hydraulic Oil Temperature Transmitter
- Nitrogen Purge Plumbing for Hydraulic Reservoir

Estimated Service Life

The estimated service life for the following components is based on customer supplied historical data, and cannot be guaranteed.

Plunger..... 3 - 4 years

High Pressure Seal ..... 4,000 -18,000 hrs.

Check Valve..... 7,500 hrs.

High Pressure Cylinder..... 2-5 years

Hydraulic Cylinder Seals..... 2-4 years

Hydraulic Piston Rings..... 7-10 years

Hydraulic Pump..... 7-10 years

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