

PF-3 Phase Flow Initiator Injection Pump

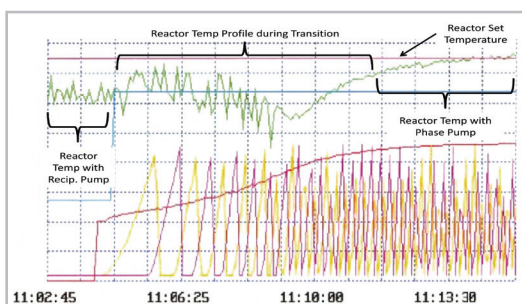
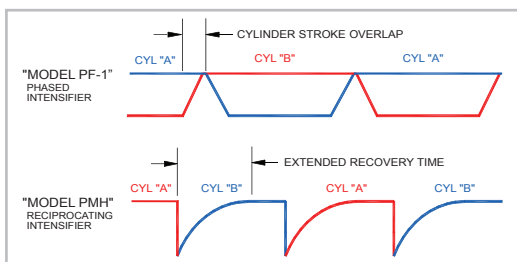


The McCartney PF-3 Phase Flow Intensifier represents a breakthrough in intensifier technology and another example of McCartney's commitment to the advancement of Polyethylene Initiator Injection Pump Technology.

The McCartney PF-3 Intensifier features three side by side piston/ plunger assemblies that operate with the same industry leading McCartney Phase Flow Control as the PF-1. However, the PF-3 offers an additional Service Mode feature for use when service of High Pressure components is required on any one of the three topworks. With this feature, the field operator can indefinitely idle and lock out the topworks needing service *without interrupting flow of initiator fluid from the pump skid!* **Service Mode** is enabled from the local control panel.

The design of the PF-3 results in a slower cycle rate than conventional reciprocating style intensifiers and normal PF-1's, resulting in fewer pressure cycles on the cylinder components and check valves. The slow, steady plunger movement will result in extended life of the patented, non-adjustable pressure seals. Overall reliability is very good, with seal life in excess of 9,000-27,000 hours and a 98% on-line time being achieved by users.

McCartney Phase Flow Control preloads the catalyst in the second cylinder while the first is on its power stroke, essentially eliminating the pressure drop associated with shifting the supply from one cylinder to the other. With this innovative technology the temperature profile within the reactor will get much smoother, allowing you to run closer to the optimum set-point. As improved rates can be achieved, the PF-3 can in most cases improve production without changing the process itself.



Transition from Reciprocating Pump to PF-1 Plus "Phase Flow" Initiator Injection

Modern electronics give the PF-3 a very fast response time. Simple interface connections to client DCS hardware is all that is required for the PF-3 to automatically control process temperatures with immediate and repeatable servo valve accuracy. The PF-3 is an advancement to the PF-1 design which is the industry standard for precision initiator fluid delivery systems.

Features:

- High-Performance Digital Motion Control System
- Discharge Pressure Rating up to 4100 bar (60,000 PSI)
- Easy Access Door and Panel Enclosure
- 3 Piece Elastomer Plunger Seal
- Stainless Steel Cylinder and Check Valve Body
- Pressure Compensated Axial Piston Hydraulic Pump
- HP Cylinder Cooling Jackets
- Stainless Steel Cylinder and Check Valve Body
- High Pressure Seal Lubricator
- Continuous Hydraulic Fluid Recirculation for Filtration and Cooling
- Epoxy Powder Coated 170L (45 Gal) Hydraulic Oil Reservoir
- Explosion Proof Electrical Enclosure
- Drip Pans

Control Features:

- Manual/Reset/Auto Mode Selection
- Emergency Stop
- 4-20 mA Input for Flow Control
- 4-20 mA Input for Phasing Control
- Over Temperature Contact and Fault Warning
- Plunger Position Feedback and Fault Warning

Advantages:

- Superior Discharge Pressure Signal
- HP Components Designed for up to 60,000 PSI (4138 Bar)
- Slow Stroking, Small Footprint and Safe DC Control
- External Control Cables are Hazardous Location Approved
- Longer Check Valve and Packing Life
- No Check Valve fouling because of seal design
- Seal Lubrication enhanced seal lifetime
- All Stainless Steel Hydraulic Tubing
- Environmentally Friendly

Typical Design & Operating Parameters for PF-1 Plus Peroxide Injection Pumps

Operating Specifications

Pump Type	Phased
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 100 L/hr (26.4 GPH)
Turndown Ratio	100:1
Suction Pressure	2.4 bar (35 PSI) Minimum
Discharge Pressure (Design)	4136 bar (60,000 PSI)
Discharge Pressure (Operating)	4 000 bar (58,000 PSI)

Electric Motors

Hydraulic Drive	30 – 37 KW (40-50 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/Stainless Steel Pipe
Fittings	Steel
Cooling Pipe	Stainless Steel

Nozzles

Process Inlet	1/2" Tube
Process Outlet	9/16" HP Connection
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
- High Performance Digital Motion Control System
- High Flow, Double Ball, Springless Check Valves
- HP Cylinder Cooling Jackets
- Floating Plunger Connection
- 15-5PH Monoblock HP Cylinder Body
- Pressure Compensated 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
- Explosion Proof Electrical Enclosure
- Stainless Steel Top Pan

Optional Features:

- Check Valve Cooling Jackets
- Composite Carbide Lined HP Cylinders
- Alternate Motor Brands, Voltages and Hazardous Location Ratings per Customer Requirements
- Hour Meter
- Stainless Steel Hydraulic Reservoir
- Stainless Steel Top Pan
- Discharge Pressure Transmitter
- Hydraulic Oil Heater
- Hydraulic Oil Temperature Transmitter
- Hydraulic Oil Level Transmitter
- Lubricator Box Oil Level Regulator
- Lubricator Box Low Level Switch
- Nitrogen Purge Plumbing for Hydraulic Reservoir

Available for Central Hydraulic Units

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.....	6,000 -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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