INSTALLATION, OPERATION, & MAINTENANCE MANUAL

UL Series

Pump Serial Number: _____

Date: 9/3/2021

Revision: 01

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UL SERIES INSTALLATION, OPERATION, MAINTENANCE MANUAL		
DOCUMENT PART #: B UL OPERATOR		
REV.	**DESCRIPTION**	**DATE ISSUED**
00	Original	08/26/2016
01	▪ UL FP 3HP. ▪ Signal harness information. ▪ Minor cosmetic changes.	12/20/2016

Safety Precautions/Hazards

1. Certain coolants are flammable and should not be used without a fire control system.
2. Dangerous voltage is present inside the UL Series and must be serviced by qualified personnel.
3. Dangerous voltage present inside the UL Series. Must be disconnected before servicing.
4. All UL Series must be disabled before servicing.
5. Sharp chips present in used filter bag. Handle with care.
6. Return line must not be blocked.
7. UL Series must stop if the fire control system is tripped.

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1. Intended Uses

Section: 1

MP Systems UL Series is built for the harsh environments of the CNC machining industry. The UL series is designed for machining applications where the stock coolant pump does not provide adequate pressure for the application.

The UL Series is designed to operate as a pressure booster for the stock low pressure coolant pump. The stock low pressure pump supplies coolant to the inlet of the UL filter, is filtered down to 5mc nominal, and then sent to the Turret at pressures up to 250PSI.

1.1. Features & Benefits

- Provides increased pressure for general applications.
- Filters stock low pressure coolant leading to turret on lathes.
- Standard 5MC filter bag.
- HMI Display showing pump status.
- Compact, enclosed design taking up minimal floor space.
- Low maintenance, less downtime.

2. Specifications

Section: 2

*All specifications are subject to change.

All MP Systems equipment ships with identification label. The label is located by main disconnect on front of the system.

The label contains

- **Serial Number**
- **Build Date**
- **Series/ Model**
- **Operating voltage** (*208-230VAC*)
- **FLA/ Largest Load for determining power service requirements**

2.1. Electrical Specifications

All power for motors and hydraulics is derived from UL Series power input source.

Main Power: 3 Phase @ 60Hz

Model	208-230 VAC	460 VAC	kVA
UL 3HP	10 FLA	5 FLA	4
UL FP 3HP	14 FLA	7 FLA	5.5

Moto	HP	RPM	208-230 VAC	460 VAC
Turbo Regen Pump	3	3450	10-9	5
Feed Pump	3/4	3450	4	2

Control Power UL	Control Signal	Alarm Circuit
208-230 VAC/460 VAC	24vdc	NC (Normally Closed) NO (Normally Open)

2.2. Mechanical Specifications

Model	UL 3HP	UL FP 3HP
Length	27”	
Width	21”	
Height	34”	
Weight	300 lbs	350 lbs

Filter	Area	Dimensions	Rating
HB BAG ST RING #2 5MC 7X32	4.4 ft²	7” x 32”	5 Micron N

2.3. Options & Accessories

Abbreviation	Description
FP	Feed Pump

3. Installation

Section: 3

All MP Systems UL Series are shipped on custom wooden pallets designed for UL Series, to ensure safe shipment. A large MP Systems box covers the UL Series to avoid any unnecessary damage.

Inspect container for any damage. If any damage has occurred IMMEDIATELY NOTIFY THE CARRIER & MP SYSTEMS @ 877-689-1860

3.1. Unpacking

1. Remove MP System box covering UL Series.
2. Remove any stretch wrap on UL Series.
3. Remove any and all parts, boxes, and hoses on or underneath UL Series.
4. Remove shipping straps.
5. Using a fork truck remove UL Series off pallet.

*NOTE: Position fork truck forks under the UL Series avoiding mounting bolts on the base of the UL Series. This will allow for a stable lift with fork truck.

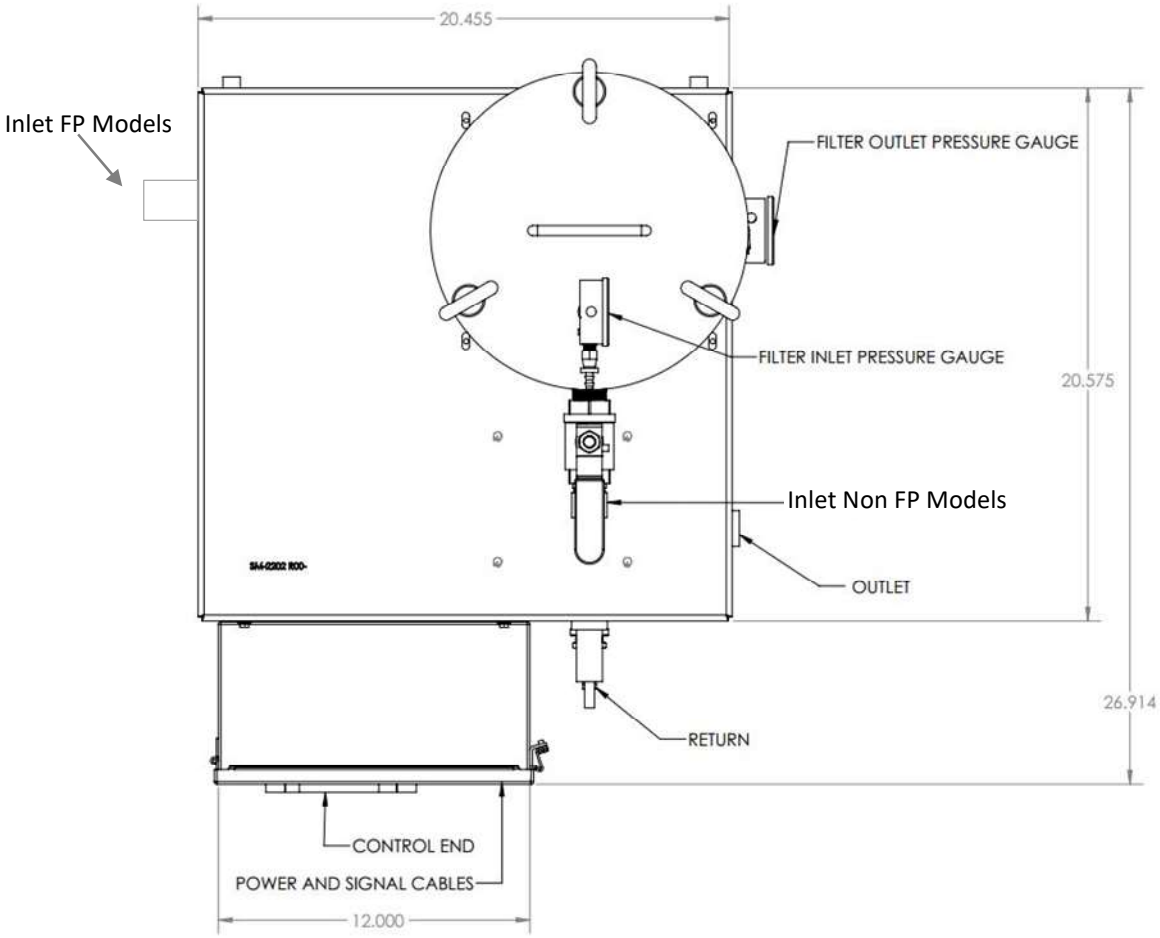
3.2. Parts Included in Kit

Parts	UL 3HP (Lathe)	UL FP 3HP (Mill) (Built in Feed/Supply Pump)
Control/Signal Harness & Accessories	1	1
3 Phase Power Connector	1	1
Operator/Install Manual	1	1
Inlet Dip Tube Assembly	0	1
Return Dip Tube Assembly	1	1
High Pressure Hose	0	10’
Assorted Installation Fittings	1 Set	1 Set
1 1/4" Inlet Hose	0	14’
3/4" PushLoc Hose	15’	0
1/2" Relief Hose	15’	15’
1/4" Vent Hose	15’	15’

3.3. Tools Required

- Phillips Head Screwdriver
- Flat Blade Screwdriver
- Drill & 7/8” Step Drill or Hole Saw
- 3/8” Socket, Wrench, or Nut Driver
- Multiple Size Adjustable Wrenches
- 12” Pipe Wrench (Minimum)
- Metric Hex Keys
- Teflon Pipe Tape / Liquid Pipe Sealant
- Knockout or Hole saws (optional)
    - 1.75”, 2.00”, 2.50”

3.4. Floor Plan



3.5. Electrical Installation

One Twist-Lock power plug and one 19Pin Signal Harness will need to be installed.
***Lock Out / Tag Out any and all disconnect switches before performing any maintenance / work on any equipment.**

- Verify on the service tag of machine that the 3 phase power is adequate for the FLA of UL Series. UL Series FLA is located on identification label. & **Section: 2.1 Electrical Specifications.**
- Confirm correct voltage from supply power with voltage on UL Series identification label.
- If available power is too great, a circuit breaker will need to be installed.
- Ensure all State and Federal electrical codes are followed.

3 Phase Power Installation

1. Mount supplied power/signal cable with hardware provided in UL Series installation kit * If 1/2" conduit plug is not available, knock out hole and install cord grip. Make sure UL Series power cable reaches desired mounting point.
2. Run supplied power/signal cable through supplied 1/2" cord grip.
3. Run supplied cables inside cabinet, wire cable into appropriate 3 phase power and ground (Leave enough slack to reach grounding point).

Control Signal Installation

- All UL Series are 24vdc. Relays may need to be installed for 110VAC signals.
- Wire #1 must be (+) (24v) to Turn Pump On.
- Wire #9 (COM) to be used across dry contact when using UL Series voltage.
- Wire #5 must be (-) (Ov) COM from machine, when using machine tool voltage.
- Wires #7 & #8 for Alarm Com and NC Alarm Out from UL Series pump.
- Wires #7 & #10 for Alarm COM and NO Alarm Out from UL Series pump.
- NC alarms are typically wired in series with machine coolant pump.
- Refer to UL Series signal explanation attached to signal harness.

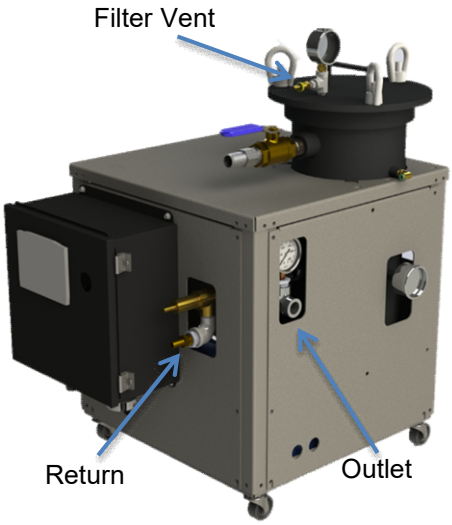
Please refer to supplied **UL GEN SGNL** attached to signal harness.

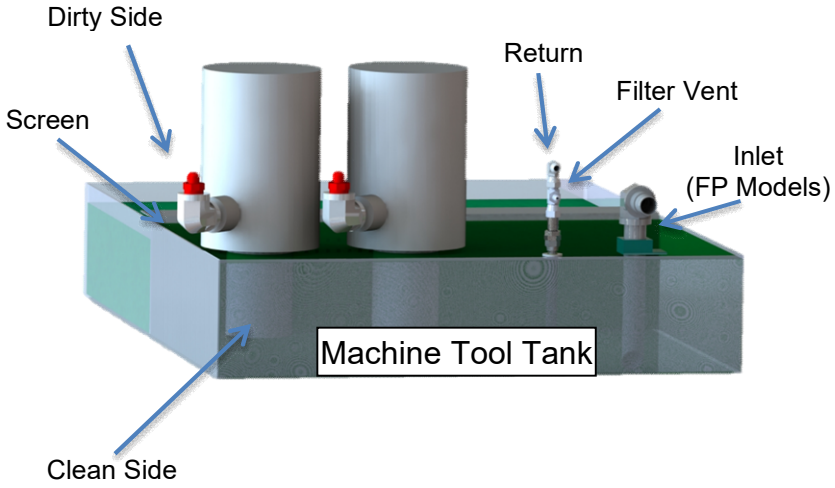
***PLEASE CALL MP SYSTEMS WITH ANY QUESTIONS OR CONCERNS BEFORE WIRING 877-689-1860.**

MP Systems recommends Normally Closed Alarm circuit. This will allow the machine tool to alarm out if UL Series ever becomes disconnected.

3.6. Low Pressure Installation

- Pump Relief Return Hose Installation (All Models);
  - Drill approx. 7/8” hole on top of machine tank in appropriate location for pump return flow dip tube.
  - Install the supplied dip tube assembly, making sure the hose is submersed below the coolant level so it will not cause foaming.
  - Measure and cut supplied ½” Black Pushlock Hose to desired length.
  - Lubricate Pushlock fittings before pressing into hose. Be sure hose is pressed onto fitting completely before pressurizing with fluid.
  - Install one end of hose on -8 flared fitting of pump faced marked “Return”.
  - Install other end of hose onto the -8 flared fitting on the dip tube.
- Filter Vent Hose Installation (All Models);
  - Measure and cut supplied ¼” Black Pushlock hose to desired length.
  - Lubricate Pushlock fittings before pressing into hose. Be sure hose is pressed onto fitting completely before pressurizing with fluid.
  - Install one end of hose on -4 fitting located near the filter inlet gauge.
  - Install other end of hose onto the -4 flared fitting on the dip tube.



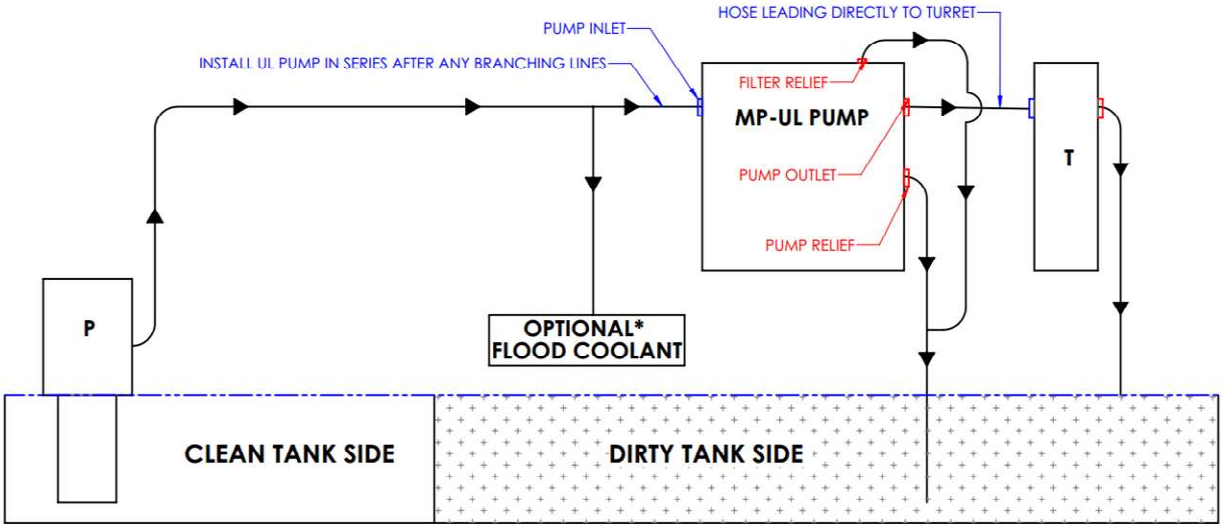


FP Models Only

- Mount supplied weld clamp on clean side of reservoir tank, after the screens, usually near the low pressure pumps already on reservoir tank ;
  - Use an already open area on the tank. If no opening, use 1 ¼” Conduit Punch or equivalent size drills for 1 ¼” dip tube.
  - Make sure hole for inlet dip tube is away from low pressure pumps and always touching bottom of the tank to ensure proper suction of coolant.

3.7. High Pressure Installation Lathe (Non FP Models)

The UL Series pump's intended purpose is to increase the stock low pressure coolant pump leading to the turret in the machine tool. Because of this, the UL series pump will be connected in series with the machine's low pressure pump. The UL pump must be connected AFTER any branching coolant lines coming off the low pressure pump, which may lead to a bed wash or other flushing system. The UL pump should only be supplying coolant to the machine turret. Not all machines are configured the same, some may be able to be connected directly to the stock pump's outlet. Refer to photo below for example of where to connect in series with the stock low pressure pump.



1. Using the fittings provided, assemble the ¾" pushlock fittings and hose by lightly lubricating ends of pushlock hose. Be sure to press the hose fully onto each fitting to ensure proper seal.
2. Connect one end of pushlock hose to the stock low pressure coolant pump. Connect the other end of pushlock hose to the UL series pump inlet located on top of the filter vessel. There is a ball valve located on the inlet of the UL pump to allow valving off the inlet when changing the filter bag.
3. Check to see if stock pump hose/fittings are rated for 250PSI. 1Mpa = 145PSI. Using the stock coolant hose and fitting, connect the fitting and hose to the outlet of the UL series pump.**
   **Not all machines are configured the same way. Some additional hoses/fittings may be required for installation. Contact MP for a quote or refer to local hose/fitting store for additional parts.

When setting MAX pressure on UL series Pump, DO NOT EXCEED 250PSI. Adjustment relief valve is located on front of pump above relief hose. Pressure must be set to a dead-head to ensure pressure will not exceed 250PSI with small tools.

3.8. High Pressure Installation Mills (FP Models Only)

1. Disconnect hose from machine tool through spindle pump;
    - Through spindle pump, typically mounted to plate that covers machine tool tank.
2. Use supplied JIC to JIS adapter(s) to connect supplied high pressure hose to machine tool high pressure hose;
    - Installation kit ships with all necessary adapters for installation.
3. Attach supplied high pressure hose to UL Series unit;
    - Hose ships with -6JIC & -8JIC fittings.
    - If needed, use supplied adapters.

	Warning: Ensure high pressure hose(s) **DO NOT** rub on any hard edge of machine tool. Rubbing hose(s) can cause unnecessary wear which can lead to hose rupture.

4. Operation

Section: 4

UL Series is designed to increase the pressure of the stock coolant pump system on machine tools. Typical low pressure coolant systems may not provide sufficient pressure to break the vapor barrier or help with chip breakage. The UL Series will take the low pressure flow, and increase the pressure up to 250PSI. It is best used in turning applications or situations that may benefit from increased pressure. It is not intended as a substitute for High Pressure Coolant Systems (1000PSI+).

4.1. Filling & Priming (Non FP Models)

Once all hoses and fittings are connected and tight, simply run the low pressure pump supplying the UL pump for several minutes. Be sure that the inlet ball valve is open before doing so. This will allow the UL pump's filter vessel and all other areas to fill with fluid before running the UL pump. When first turning on the UL pump, be sure the outlet is not dead headed so it will allow any air in the system to be purged before attempting to build pressure.

4.1.1. Filling & Priming (FP Models Only)

Once all hoses and fittings are connected and tight, the following steps will need to be taken to ensure feed/supply pump is properly primed;

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<tr>
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1. Loosen 3 eye bolts on filter vessel lid.
2. Remove filter lid.
3. Pour fluid into filter vessel.

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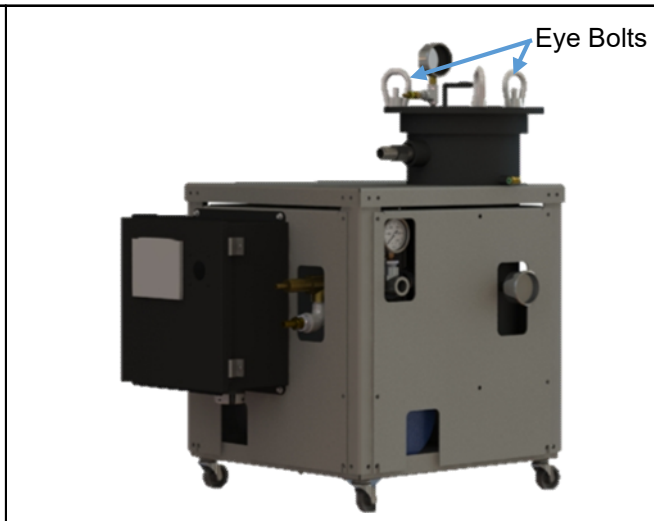

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4. Fluid should begin flow from inlet of filter vessel, into feed/supply pump.
5. Keep filling filter vessel until feed/supply pump inlet hose has become approximately 3/4 of the way full.
6. Replace filter lid.

*It may be necessary to manually jog feed/supply pump to ensure complete prime.

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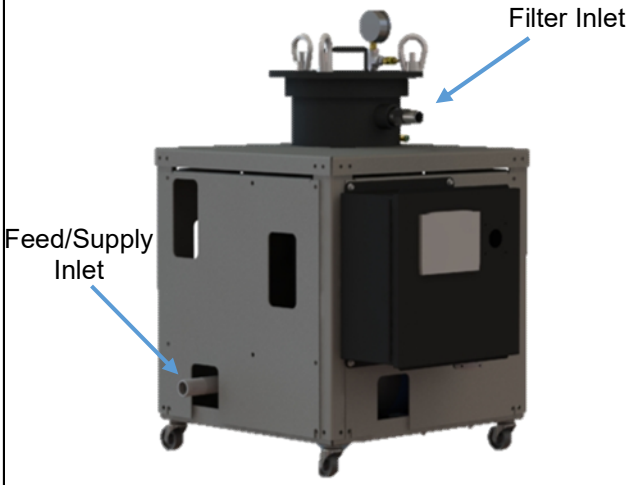

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4.2. Testing

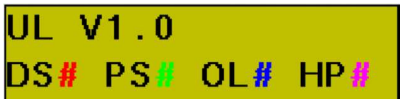
After priming the UL there are a few things to inspect before running the machine.

1. Motor Rotation – The pump In the UL Series must run clockwise from back side. Backwards rotation will not only be noisy but will have very poor performance and the system will not function correctly. Remove side panel from pump and, using a flashlight, inspect the motor shaft connecting to the pump head. Make a mark with a permanent marker if necessary to identify rotation.

2. MCode – Confirm that the "MCode" from the machine will drop out whenever an Emergency Stop is active or an A-Level alarm status is active. Once they are reset, the "MCode" should be true and "1" will be displayed by "HP" on the UL Series PLC display.

3. Alarm Circuit – After confirming that the pump is running properly, test the alarm circuit by turning off the UL disconnect. You should see an alarm status on the machine panel. Turn UL Series disconnect back on and reset alarm on machine.
The UL Series is now tested and ready for continuous operation.

4.3. PLC & Alarm Displays

<table>
<tr><td colspan="2"><u>MAIN SCREEN</u>
UL – Software Version
DS – Differential switch active. 1=YES : 0=NO
PS – Pressure Switch. 1=HP ON : 0=HP OFF
OL – Motor Overload, 1=GOOD : 0=TRIPPED
HP – High Pressure, 1=ON : 0=OFF</td><td>  </td></tr>
<tr><td colspan="3"><u>ALARM DISPLAYS</u></td></tr>
<tr><td>DISCONNECT OFF/
OVERLOAD TRIP</td><td>▪ Disconnect OFF or 3 phase power has been removed.
▪ Motor circuit protector overload.</td><td> </td></tr>
<tr><td>CHANGE FILTER
ENTER TO RESET</td><td>▪ Replace filter bag.
▪ Check inlet conditions of UL unit.</td><td> </td></tr>
<tr><td>LOW TANK/FLOW
ENTER TO RESET</td><td>▪ Check inlet pressure gauge. Should display steady reading.
▪ Check machine tool tank level while pumps are running.
○ Ensure clean side of tank is not low.</td><td> </td></tr>
</table>

5. Maintenance

Section: 5

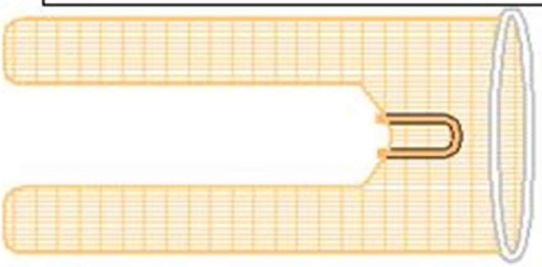
General maintenance for UL Series consists of standard coolant filter bag replacement. Filter bag service intervals will vary widely, depending upon application. Filter bags must be changed when the UL Series goes into a “Dirty Filter” alarm. Heavier coolants that pump hard and hold chips will shorten filter life. Applications that create small fines will tend to coat filter bags faster. If filter bag life seems to be to short please contact MP systems to discuss other options.

To change a filter bag:

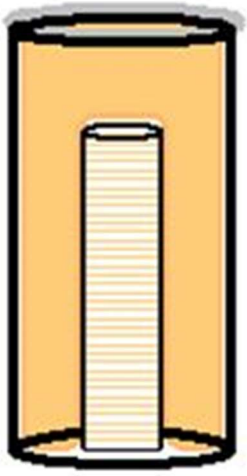
1. Let filter vessel pressure equalize for 30 seconds.
2. Press [1] & [9] on the PLC (5 Seconds) to drain some fluid from vessel.
3. Loosen 3 eye bolts on filter lid.
4. Lift away filter lid to side.
5. Lift out bag by handles on bag seal (Coolant should drop as bag is lifted. DO NOT CUT BAG TO DRAIN).
6. Pull on tab on bottom inside of new filter and pull bag halfway inside itself.
7. Install new filter bag making sure the seal seats properly in filter vessel.
8. Reinstall filter lid, making sure O ring seats properly and tighten eye bolts.
9. If “Dirty Filter” alarm remains on display, hold enter button to reset.

Grab tab, inside filter bag, pull towards embedded O-ring (Inside Out). Try to keep filter bag even all the way around, this will make installing new filter bag much easier.

Filter bag should look similar to the image below. Failure to follow instructions can lead to poor filter performance & potentialy damage high pressure unit.



Be sure filter bag slides over filter cone, center of filter basket.



DO NOT TRY TO FORCE FILTER BAG TO ONE SIDE OF FILTER CONE. THIS CAN CAUSE FILTER BASKET TO FAIL & MAY VOID WARRANTY.

6. Spare Parts

Filter bags should be kept in stock. Filter bag life is unpredictable and the UL Series cannot be run without them. Running the UL Series without the correct filter bag will void warranty. Filter bags can be purchased directly from MP Systems and are in stock at all times.

Section: 6

Part	Part Number #
Filter Bag	HB BAG ST RING #2 5MC 7x32
O Ring	M ORING MPA

Warranty Information

CDR Series equipment comes standard with a 2 year parts warranty. Warranty is void if proper installation, specification, and operational procedures are not followed. Contact MP Systems directly for warranty claims.

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