

AUTOMATIC FUEL OIL FILTRATION SET

Model PF

- **Standard Flows from 180 to 1200 GPH**
- **Cleans and dewateres fuel with:**
 - Nearly 100% water removal
 - 99% particulate removal (to 2 microns)
- **Automatic cycling based on the time of day and the day of the week ensures continuous fuel maintenance**
- **Alarm and Safety Shutdown for filter water level “High”, filter “Saturated”, system base “Leak” detected**
- **Microprocessor-based**
- **Factory mounted and wired control cabinet**

The Automatic Fuel Oil Filtration Set Model PF are the most complete, efficient and reliable engine protection systems you can install. These self-contained, fully automatic systems remove water, suspended rust, dirt and other contaminants in order to maintain the quality and purity of stored diesel fuel.

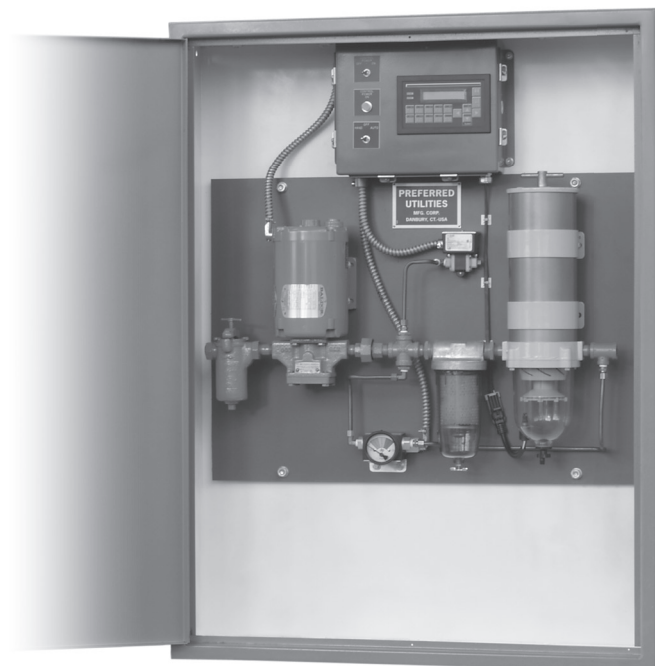
Water enters fuel systems through vents, leaks, and sometimes with the delivered fuel. Microorganisms can grow in fuel, especially in the presence of moisture. The resulting sludge left in the system can cause tank, fuel line, strainer, pump and engine injectors to clog. Water induced corrosion (rusting) can reduce tank life expectancy and reliability of the emergency diesel generator or boiler.

The Model PF Fuel Oil Filtration Set combine microprocessor-based control and monitoring with a “five stage” fuel oil de-watering and cleaning process:

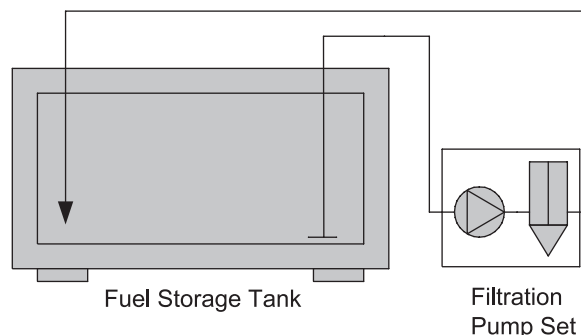
1. **Fuel Straining:** Large contaminants are removed
2. **Primary Filtration:** Initial fuel filtration
3. **Centrifuge:** Separates solids and water through centrifugal action. Although the centrifuge has no moving parts, over 30% of the contaminants are removed here
4. **Coalescing:** Smaller water droplets and solids coalesce on the specially designed conical baffle and fall to the collection bowl
5. **Secondary Filtration:** 2 micron fuel filtration

The separated contaminants and water are monitored by an integral filter water level detector. Depending on the size of the system, this waste water is piped to an optional Waste Water Holding & Removal System or connected directly to the customer's waste tank (by others). A differential pressure switch/indicator is installed around the filter units to provide a visual indication of filter element condition. An alarm notifies when the filter elements require replacement.

Systems are available in standard sizes ranging from 180 to 1200 gallons per hour, to custom units for processing 50 gallon per minute or more.



Automatic Fuel Oil Filtration Set



Automatic Fuel Oil Filtration Set Application Example

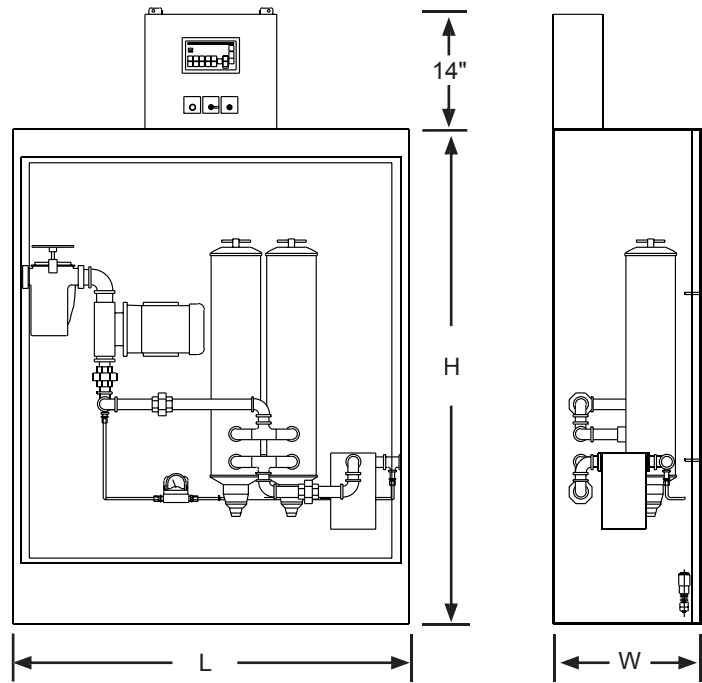
Standard Equipment

- Microprocessor-based control with message display/keypad
- Pump “Hand-Off-Auto” switch
- Control power “On-Off” switch
- Leak detector switch
- Oil over pressure switch
- Pump & motor assembly
- Simplex strainer
- Primary filter
- Secondary filter
- Primary/secondary filter DP switch/gauge

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Specifications

- Power: 120 Vac (external)
- Fluid: No. 2 Fuel Oil (diesel fuel) is standard. Consult factory for other fuel types.
- Pump: Positive displacement type with cast iron housings:
Model PF-301, 302 & 303 are Lobe Gear; **Model PF-304 & 305** are internal gear
- Motors: Base mounted, Totally Enclosed Fan Cooled (TEFC) construction.
- Strainer: Simplex ½", or 1" (according to inlet line size) complete with 100 mesh perforated basket
- Automatic Controls: - Adjustable run-time period (4, 8, 12, or 24 hour operation)
 - Indications/Alarms:
 Control Power On
 Pump run
 Excess water in fuel
 (Model PF-303, 304, & 305 only)
 Filter Saturated
 Filter Water Level High
 System Basin Leak Detected



Tank Turnover Time In Hours (Rounded to Nearest Hour)

	Storage Tank Size (Gallons)					
	1,000	2,000	4,000	8,000	16,000	20,000
PF-301	6	11	22	44	89	111
PF-302	2	4	8	17	33	42
PF-303	2	3	7	13	27	33
PF-304	1	2	4	9	18	22
PF-305	1	2	3	7	13	16

Notes:

1. Shaded hours are not recommended.
2. Due to the mixing of filtered fuel with unfiltered fuel, a minimum of three tank turnovers are recommended to ensure fuel quality.

Ordering Information

Select Catalog Number from the table below.

Catalog Number	G.P.H. Oil #2	P.S.I.	Motor		Dimension			Connection Size
			R.P.M.	H.P.	L.	W.	H.	Inlet & Outlet
PF-301	180	15	1725	1/3"	30"	8"	36"	1/2"
PF-302	480	15	1725	1/3"	42"	8"	42"	1/2"
PF-303	600	15	1725	1/3"	36"	12"	48"	1"
PF-304	900	15	1725	3/4"	48"	18"	60"	1 1/2" & 1"
PF-305	1200	15	1725	3/4"	48"	18"	60"	1 1/2" & 1"

Note: All pumps are 115V 60Hz 1 phase

Optional Accessories

Specify the following as required:

1. Waste Water Holding & Removal System (PF-303, 304, & 305 only):

A gear pump automatically pumps water from the secondary filter housing to the holding tank based on an integral filter water detector signal. Automatic isolating valves prevent water leakage into the fuel or fuel into the water holding tank when the system is idle. The holding tank is equipped with a high level switch to alarm and shutdown the fuel maintenance system until the tank is emptied. A hand pump is provided for periodic removal of waste water from the holding tank. Specify P/N-WR-01.

2. Chemical Additive Holding Tank & Injection System:

Chemical treatment helps to prevent fuel degradation and improve cetane rating. Higher cetane rating improves cold starting, reduces white smoke, and maximizes engine efficiency. A gear metering pump injects additives into the oil while the oil is circulating in order to ensure complete mixing. The additive feed pump operating cycle runs biannually, or it can be activated when new fuel is delivered. A welded steel chemical additive holding tank is provided. Specify P/N-CA-01.

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Suggested Specifications

1. Enclosure, Piping And Mounting

Provide a Fuel Oil Filtration System that is factory assembled with components piped and mounted inside a continuously welded steel enclosure. The enclosure shall be constructed of 14 gauge steel as minimum, continuously welded and constructed to NEMA 12/13 standards and have an integral 2" steel containment basin with plugged drain connection. The basin shall be sized to contain (capture) potential leaks from all factory installed piping and components. Doors shall be fully gasketed with a turned edge, piano hinges, and a three point lockable latching mechanism. The enclosure interior shall be primed and finished in a white gloss, chemical resistant enamel. The enclosure exterior shall be primed and finished in a durable, chemical resistant, textured gray enamel, suitable for industrial environments. Pipe shall be schedule 40 ASTM A-53 Grade "A" with ANSI B16.3 Class 150 malleable iron threaded fittings. The Fuel Oil Filtration System shall be Preferred Utilities Mfg. Corp. Danbury, CT Model PF-____ rated at ____ GPH of No. 2 fuel oil.

2. Containment Basin Leak Detection Switch

Provide, mount and wire a float operated Containment Basin Leak detection Switch to shut off the pumps and energize an audible and visual alarm should a leak be detected. The level sensor shall be a plasma welded stainless steel construction. Electrical connections shall be contained in a weatherproof junction box.

3. Strainer

Oil strainer shall have cast iron body, threaded connection, size shall be suitable for the required flow and suitable for working pressures to 150 psi. Clamped cover and handle shall permit easy removal of the basket. Basket shall be constructed of 100 mesh stainless steel.

4. Pump and Motor Assembly

A base mounted, TEFC motor and positive displacement pump with cast iron housing shall be provided. Pumps that have aluminum, brass, or bronze housing or rotors or centrifugal pumps are not acceptable. The pump shall be an industrial type intended for continuous heavy-duty service.

5. Primary Filtration Stage

The primary filter stage shall be used for the initial fuel filtration.

6. Secondary Filtration, Centrifuge Stage

The filtration system shall separate solids and water through centrifugal action. The centrifuge shall remove 30% of the contaminants.

7. Secondary Filtration, Coalescing Stage

Fuel oil shall pass through a specially designed conical baffle system to coalesce the smaller water droplets and solids. The unit shall include a collection bowl for waste removal.

8. Secondary Filtration, Final Stage

The secondary filtration stage shall provide 2 microns fuel filtration. The unit shall include a water sensing probe to alert the operator when water removal has reached capacity.

9. Filter Monitoring

Both filter stages shall have a differential pressure switch piped across them to indicate when the filters need to be changed. The switch shall provide indication on the main filtration control cabinet to alert operators and sound a horn. The differential pres-

sure switch shall provide clear indication of strainer basket status with the use of a Tri-Colored Scale Plate with GREEN denoting Clean, YELLOW denoting Change and RED denoting dirty strainer. This shall have one piece cast-iron body and shall be suitable for pressure to 200 psi.

10. Pressure monitoring

Located on the inlet side of the filtration stages and outlet side of the filtration pump shall be a pressure switch to monitor the inlet pressure to the filters. If the inlet pressure exceeds the preset pressure, the pump shall be shut down. The switch shall provide indication on the main filtration control cabinet to alert operators and sound a horn.

11. Control Hardware

The control strategy shall be microprocessor-based. RELAY LOGIC SHALL NOT BE ACCEPTABLE. The control strategy shall be factory configured and stored on a EEPROM, and shall be safeguarded against re-configuration by un-authorized / un-qualified personnel. Control hardware shall include combination magnetic motor starter with overload protection and circuit breaker. The control system shall provide common alarm dry contacts to be interfaced with the Building Maintenance System as required.

12. Automatic Operation

In order to ensure automatic fuel maintenance the filtration system shall have an adjustable automatic start and run time. The operator shall be able to set the system to run at a certain time every day or week.

13. Safety Interlocks

Provide safety interlocks to shutdown pump when a "leak" is detected.

14. Operator Interface

All operator interface shall be cabinet front door mounted. As a minimum, the following indications, alarms, control switches and pushbuttons shall be provided:

1. Alarm Silence, Manual Reset, Lamp/Alarm Test Pushbuttons
2. Pump "Hand-off-Auto" control switch
3. "Pump On", indicator
4. "Filter Saturated", "Filter Water Level High" and "System Basin Leak Detected" Alarms

15. Quality Assurance Inspection, Labeling and Testing

The Control Cabinet shall be manufactured in accordance with UL508A. Simply supplying UL recognized individual components are not sufficient. The assembled control cabinet as a whole must be inspected for proper wiring methods, fusing, etc., and must be labeled as conforming to UL508A (CSA C22.2 #14 for use in Canada). Inspection and labeling shall be supervised by UL or other OSHA approved Nationally Recognized Test Lab (NRTL). The system must be manufactured by a nationally recognized Trade Union (I.B.E.W. or similar trade union). Lack of an NRTL certified UL508A wiring methods inspection and label or lack of a Trade Union label will be grounds for rejection.