

# Operation & Maintenance Manual

## Pump & Treat Water Treatment System

Model FII-5-P&T-1-P



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# Contents

<b>1.0 Product Photographs .....</b>	<b>3</b>
Photograph 1.0 – Pump and treat system.....	3
Photograph 4.0 – External piping.....	5
Photograph 5.0 – External piping.....	5
Photograph 6.0 – External piping.....	5
<b>2.0 General Information .....</b>	<b>6</b>
2.1 Product Overview.....	6
2.1.1 The Particulate Filter.....	6
2.1.2 The Activated Carbon .....	6
2.2 Warnings.....	7
<b>3.0 Pump &amp; Treat System Installation .....</b>	<b>8</b>
<b>4.0 Pump &amp; Treat System Operation .....</b>	<b>9</b>
4.1 System Start-Up.....	9
4.2 Monitoring System Pressure.....	9
<b>5.0 Pump &amp; Treat System Maintenance .....</b>	<b>11</b>
5.1 Changing Filter Bags .....	11
5.2 Changing Activated Carbon Drums.....	11

# 1.0 Product Photographs

Photograph 1.0 – Pump and treat system





Photograph 2.0 – Carbon Drum



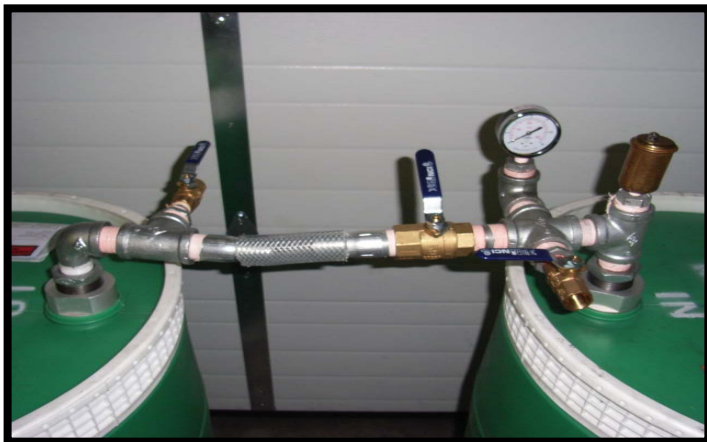
Photograph 3.0 – Bag filter and carbon drum



**Photograph 4.0 – External piping**



**Photograph 5.0 – External piping**



**Photograph 6.0 – External piping**

## 2.0 General Information

### 2.1 Product Overview

The *Filter Innovations* Pump & Treat Water Treatment System is the simplest, most efficient and most versatile method for removing organics, oil and grease from wastewater streams. Contaminant levels below those set out in the Municipal Sewer-Use Bylaws can be readily achieved.

The *Filter Innovations* Pump & Treat System (Model FII-5-P&T-1-P) consists of two basic components:

#### 2.1.1 The Particulate Filter

The Particulate Filter is a pre-filter designed to effectively remove any dirt and dust particles that might prematurely plug the oil-absorbing media. It is a bag filter system consisting of a pressure vessel, a micron-rated disposable filter bag and a restrainer basket to support the filter bag.

The disposable filter bag is a triple-layered bag with a filter rating of approximately 1 micron. It can hold between 1 and 5 pounds of dry solids before becoming plugged. Contaminants which have been filtered out are contained within the bag, and rapid access to the filter bag ensures the quick and easy clean-up of the vessel. "Spaghetti" media is added to the clean filter bag to enhance its particulate-holding capacity by up to 5 times.

#### 2.1.2 The Activated Carbon

The *Primary* carbon absorption drum removes all low molecular weight organics. This unit can hold 160 pounds of granular, activated carbon and comes complete with inlet and outlet headers.

The *Secondary* carbon absorption drum polishes any contaminants that may flow from the primary carbon drum. When the primary drum becomes saturated, it should be replaced with secondary drum. A new drum should be placed in the secondary position.

Both carbon absorption drums contain GC 12x40, a virgin activated carbon that is granular in form. Made from the finest grades of bituminous coal, it is ideal for many liquid phase applications including the removal of organics from water stream and the purification of potable water.

## 2.2 Warnings

The Pump & Treat System is designed with disposable *FII* filter products of the type and model specified in the operation instruction manual and drawings. Safe operation and performance is guaranteed with the specific *FII* filters. We will not guarantee the performance and function of the system with other makes, models or types of components. **Any accidents or damages caused by using incorrect, non-specified filters or media are the full responsibility of the operator or user.**

## 3.0 Pump & Treat System Installation

Setting up the Pump & Treat System for the first time:

1. Remove the unit from the skid, being careful not to damage any of the system components.
2. **Note:** Be sure to correctly identify the inlet and outlet connections of the unit to avoid piping the unit backwards. The filter will not perform if the connections are reversed.
3. Proceed with the required piping as per pictures.
4. Tighten all bolts evenly and securely. **Note:** Check to make sure that the bag filter has been installed in the filter vessel before tightening the end cover bolts.
5. Install all pressure gauges, air eliminators and pressure relief valves.
6. After all connections have been made and all bolts have been tightened securely, the unit is ready.

## 4.0 Pump & Treat System Operation

### 4.1 System Start-Up

To place the unit in operation, the following procedures must be observed:

1. Close bag filter drain valves and sample effluent valves on the water treatment system.
2. Open the flow control valve slightly
3. Open the isolation valve.
4. Check the flow. If it is greater than 5 GPM, immediately adjust it with the control valve.

**Warning:** If the flow is greater than 5 GPM, the quality of the treated water will be severely compromised due to reduced contact time between the water and the media. If excessive flow or pressure (greater than 15 psi) is allowed, damage to the drums or leakage will occur.

5. Allow water to completely fill the system. This will purge any air trapped in the filters.
6. Check the flow and ensure that it is still less than 5 GPM.
7. All water to flow approximately 5-10 minutes to ensure all trapped air, TM-fines and carbons fines are removed from the system.

**Warning:** The unit should only be drained when changing filter elements or when it is no longer in service. The oil-absorbing media must remain immersed in water to eliminate air pockets that can compromise its oil-absorbing capabilities.

8. Observe the pressure gauges and record differential pressure readings for future reference.
9. Samples of influent and effluent water from the carbon vessels may be taken using the sampling valves, if present.
10. The system is now ready to treat your wastewater.

### 4.2 Monitoring System Pressure

The filter system requires minimal attention after the initial installation. However, regular attention should be paid the differential pressure readings within the system.

Ensure that the water flow is registering a maximum of 5 gallons per minute. If the flow is higher than 5 GPM, the flow control valve should be adjusted until it reads below 5 GPM.

When the differential pressure across the bag vessel reaches 15 psi, as shown by the gauge, the pump should be shut off. The bag filter is plugged and needs to be changed.

When a filter bag or drum is plugged, it must be cleaned before pumping can resume. When the primary carbon drum becomes saturated, it should be disposed of and replaced with the secondary carbon drum. A new carbon drum should be put in the secondary position.

## 5.0 Pump & Treat System Maintenance

### 5.1 Changing Filter Bags

1. Check the pressure gauges to confirm that the filter bag is plugged. If the differential pressure between the two inlets and outlet pressure gauges is 15 psi, then the bags should be changed.
2. Close the bag filter isolation valve on the inlet of the bag filter. This will prevent wastewater from continuing into the bag filter.
3. Close the flow control valve on the inlet of the primary carbon drum or the outlet of the bag filter. This will prevent any backflush water from entering the bag filter.
4. Open the bag filter air vent valve to relieve internal pressure.
5. Open the bag filter drain valve. The product drained from the filter may contain contaminated wastewater and should be collected for additional filtration before being discharged. Opening the drain valve will also relieve any internal pressure.

**Note:** The most important step when replacing filter bags is to ensure that the pressure in the filter vessel is relieved prior to opening the unit; this is accomplished by opening the air valve to relieve the air and opening the drain valve on the filter to discharge the water in the unit.

6. Loosen bar knobs on the lid so that they are free and the eyebolt assembly can be swung away.
7. Lift the hold-down device, remove the bag using its handle and discard the filter bag.
8. Insert the clean filter bag into the restrainer basket (already installed) and form the bag to the contours of the basket by pressing against the restrainer basket.
9. Check positioning of the O-ring, which should be properly seated in the filter. The ring of the filter bag must be seated in the edge provided by the restrainer basket.
10. Close cover carefully. Do not drop. Tighten bar knobs evenly and securely.
11. Close the drain valve.
12. Re-open the inlet flow control valve slightly and open the bag filter isolation valve.
13. The unit is ready to operate. Ensure that the flow is at 5GPM. If the flow is greater than 5GPM, adjust the flow control valve.
14. In the logbook, record the time, date and gallons processed for the bag filter change.

### 5.2 Changing Activated Carbon Drums

1. Check water samples from the influent and effluent sample valves. If the water quality is the same, then the carbon drum is saturated and must be replaced.

2. Shut the pump off.
3. Close the flow control valve prior to the inlet connection of the primary drum.

**Note:** The most important step when changing the activated carbon drum is to ensure that the air pressure in the system is relieved prior to removing the drum. This is accomplished by opening the air valve on the carbon drum to relieve the air.

4. Undo the inlet and the outlet of the activated carbon drum.

**Note:** The saturated weight of the drums and media is approximately 250 pounds. The drums must be handled with proper equipment when removing them from the skid.

5. For easy removal of the drums, it is recommended that as much water as possible be removed from the spent drums. A shop vacuum or a pump can be used to accomplish this. Insert a hose down into the discharge (outlet) connection of the drum and vacuum or pump the water out of the drum.
6. Remove the primary activated carbon drum and dispose of it.
7. Replace the primary carbon drum with the secondary carbon drum and retighten the inlet and outlet of the carbon drum.
8. Follow step 5 to remove the water from the secondary carbon drum.
9. Place a new carbon drum in the secondary position.
10. Redo inlet and outlet external piping of the drums
11. Open the isolation valve of the second drum.
12. Ensure that the flow is 5GPM. If it is greater than 5GPM, adjust the flow control valve accordingly.
13. Record in the logbook the time, date and gallons processed for the activated carbon change.