

Operation & Maintenance Manual

Pump & Treat Water Treatment System

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



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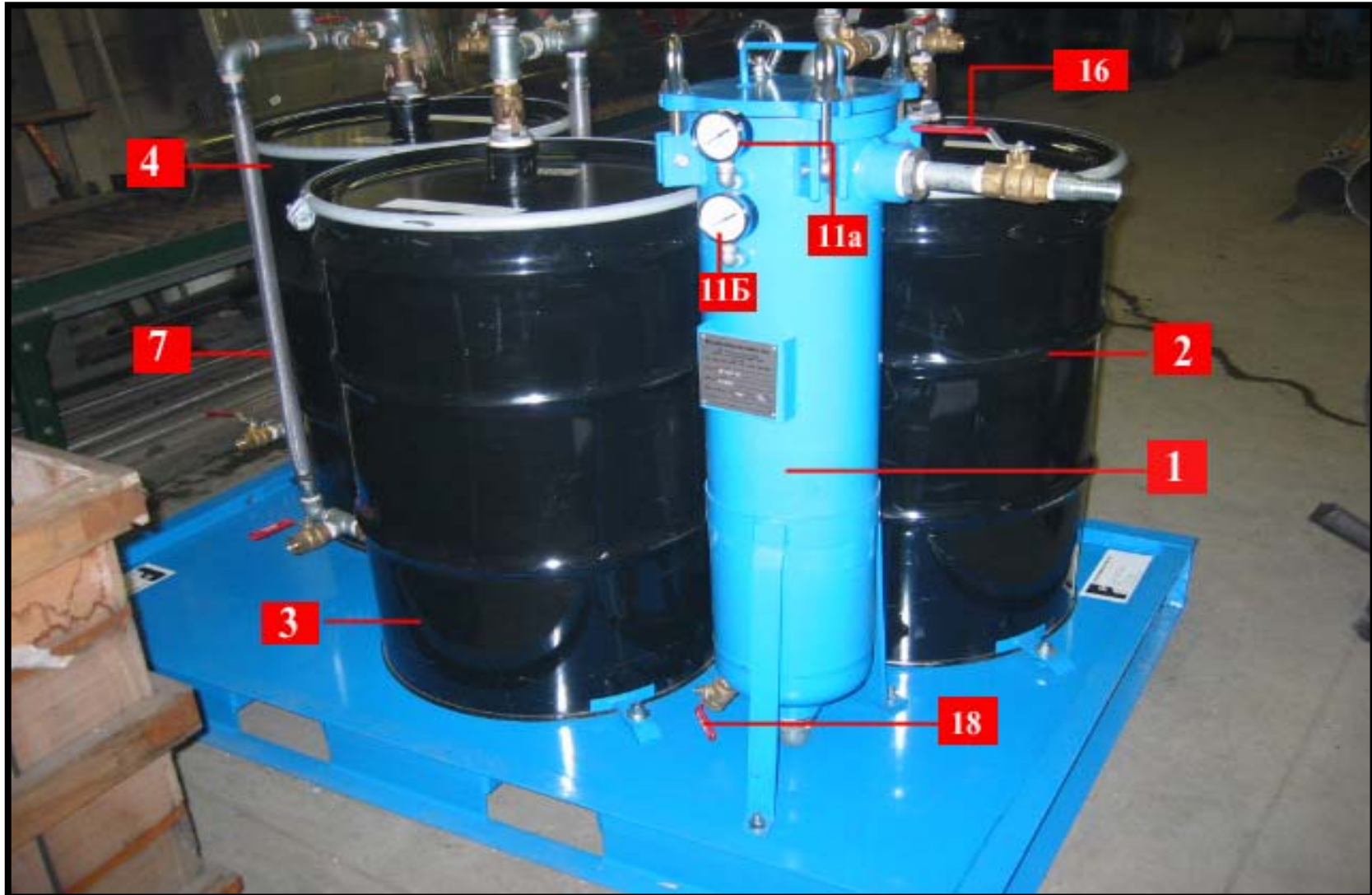
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1.0 Product Photographs

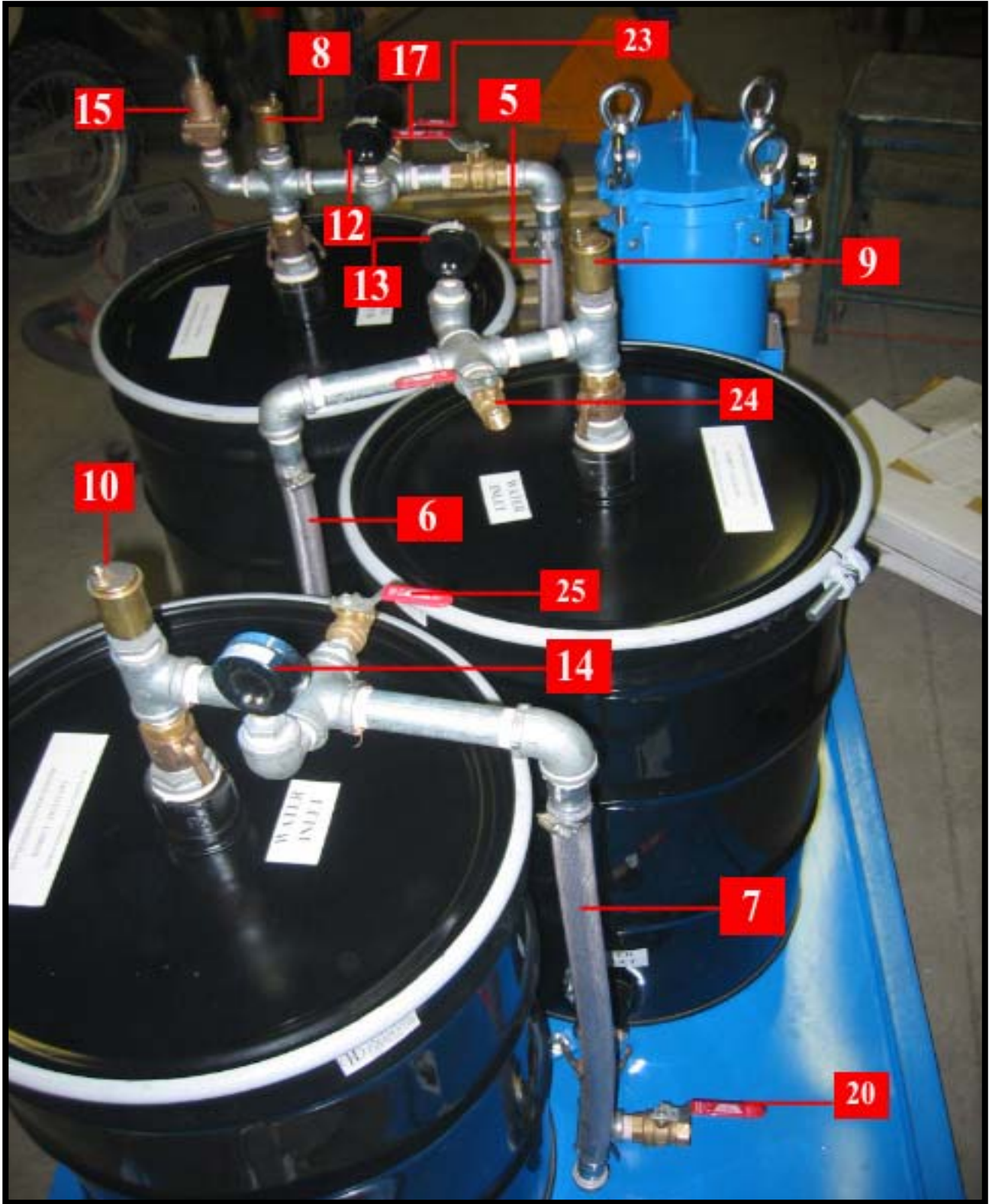
1.1 Photograph Legend

#	Part Name
1	Bag Filter
2	TM Drum
3	Primary Activated Carbon
4	Secondary Activated Carbon
5	Hose (Inlet from Bag Filter)
6	Hose (Inlet from TM Drum)
7	Hose (Inlet from Activated Carbon Drum)
8	Air Eliminator (TM Drum)
9	Air Eliminator (Primary Activated Carbon)
10	Air Eliminator (Secondary Activated Carbon)
11	[11a & 11b] Pressure Gauge (Bag Filter)
12	Pressure Gauge (TM Drum)
13	Pressure Gauge (Primary Activated Carbon)
14	Pressure Gauge (Secondary Activated Carbon)
15	Pressure Relief Valve
16	Isolation Valve (Bag Filter)
17	Flow Control Valve (TM Drum)
18	Sample Port / Drain Valve (Bag Filter)
19	Sample Port / Drain Valve (TM Drum)
20	Sample Port / Drain Valve (Primary Activated Carbon)
21	Sample Port / Drain Valve (Secondary Activated Carbon)
22	Sample Port / Drain Valve / Discharge
23	Sample Port Valve (TM Drum)
24	Sample Port Valve (Primary Activated Carbon)
25	Sample Port Valve (Secondary Activated Carbon)

1.2 Product Photographs



Photograph 1 – 5 GPM Pump & Treat System (First View)



Photograph 2 – 5 GPM Pump & Treat System (Second View)



Photograph 3 – 5 GPM Pump & Treat System (Third View)

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 waste water streams. Contaminant levels below those set out in the Municipal Sewer-Use Bylaws can be readily achieved.

Filter Innovations Pump & Treat Oil Absorption Equipment (Model FII-5-P&T-1-P) consists of three 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 Oil Absorbing Media

The Oil Absorbing TM Media (TM 100) is contained in removable drums. The steel drums are epoxy-coated, making them both chemical- and abrasion-resistant. The TM media absorbs oil and grease through a partitioning phenomenon. The unique characteristics of the media result in a slight swelling of the bed as it removes the hydrocarbon from the contaminated liquid. At the maximum pressure allowance of 8 PSI, pumping action through the system will be stopped due to saturation of the media. The flow of unfiltered liquid through and out of the system will be automatically prohibited until the TM Media is replaced.

2.1.3 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 **should not be used for the separation of chemical oil emulsions.**

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 by referring to the drawings.
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. Ensure that the drain piping is led well away from the unit. The water drain lines can be connected into a common drain system.
7. 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 all drain valves [18,19,20,21] and open the discharge valve [22].
2. Open the flow control valve [17] slightly.
3. Check the flow. If it is greater than 5 GPM, immediately adjust it with the control valve [17].

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) are allowed, damage to the drums or leakage will occur.

4. Allow water to completely fill the system. This will purge any air trapped in the filters.
5. Check the flow and ensure that it is still less than 5 GPM.
6. 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.

7. Observe the pressure gauges and record differential pressure readings for future reference.
8. Samples of incoming water may be taken from sampling drain valves [18-21] and samples of discharge water after filtration may be taken from sample drains [21] or [22].
9. The system is now ready to treat your waste water.

4.1 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.

1. When the differential pressure across the bag filter vessel [1] reaches 15 psi, as shown by the gauge [12], the pump should be shut off. The bag filter is plugged and needs to be changed.
2. When the differential pressure across the oil-absorbing drum [2] reaches 8 psi, as shown by the inlet and outlet pressure gauges [11a & 11b], the pump should be shut off. The oil absorbing drum is saturated and needs to be replaced.

When a filter bag or drum is plugged, it must be cleaned before pumping can resume. When the primary carbon drum [3] 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

Note: Figure numbers refer to Photograph 1 (Section 1.2)

1. Check pressure gauges [11a, 11b] to confirm that either the filter bag is plugged or the replacement is mandated by daily change-out requirements.
2. Shut the system off.
3. Shut the bag filter isolation valve inlet into the bag filter [16]. This will prevent wastewater from continuing into the bag filter.
4. Shut the flow control valve [17]. This will prevent any backflush water from entering the bag filter.
5. Open the sampling valve [18] at the discharge of the filter. The product drained from the filter may contain contaminated wastewater and should be piped or collected accordingly. This 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 sampling valve [18] at the discharge of the filter.

6. Loosen bar knobs on the lid so that they are free and the eye bolt assembly can be swung away.
7. Remove 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 [18].
12. Re-open flow control valve [17] slightly and open bag filter isolation valve [16].
13. The unit is ready to operate. Restart the system. On restart, ensure that the flow is less than 5 GPM. If the flow is greater than 5 GPM, adjust the flow control valve [17].
14. Record in the log book the time, date and gallons processed for the bag filter change.

5.2 Changing the Oil-Absorbing Drum

Note: Figure numbers refer to Photograph 1 (Section 1.2)

1. Check pressure gauge [12] to confirm that the oil-absorbing drum is plugged and requires a change-out.
2. Shut down the system. Close the isolation valve [16] prior to inlet connection on bag filter.

3. Open the drain valves [18] and [19] to relieve internal pressure and remove any water which may remain in the drum. Wait 10 minutes to allow all drain-water to escape.

Note: The most important step when changing the oil-absorbing drum is to ensure that the pressure in the system is relieved prior to removing the drum. This is accomplished by opening the drain valve [19] at the bottom of the drum.

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

Note: The saturated weight of the drums and media is approximately 500 pounds. The drums must be handled with proper equipment when removing them from the skid.

5. Remove spent drum.
6. Replace with new drum. Replace and retighten inlet and outlet of drum.
7. Close drain sample valves [18] and [19] and open isolation valve [16].
8. Unit is ready to operate. Restart the system. On restart, ensure that the flow is less than 5 GPM. If the flow is greater than 5 GPM, adjust the flow control valve [17].
9. Record in the log book the time, date and gallons processed for the TM-100 change.

5.3 Changing Activated Carbon Drums

Note: Figure numbers refer to Photograph 2 (Section 1.2)

1. Check water samples from valves [20] and [21]. If water quality is the same, then the carbon drum is saturated and must be replaced.
2. Shut the system off.
3. Close the isolation valve [16] prior to inlet connection on bag filter.
4. Open drain valve [18], drain valve [19] at the bottom of the TM-100 drum and drain valve [20] at the bottom of the carbon drum to relieve internal pressure and remove any water which may remain in the drums. Wait 10 minutes to allow all drain-water to escape.

Note: The most important step when changing the activated carbon drum is to ensure that the pressure in the system is relieved prior to removing the drum. This is accomplished by opening the drain valve [19] at the inlet to the activated carbon drum.

5. Undo the inlet and 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.

6. Remove the activated carbon drum.
7. Replace and retighten the inlet and outlet of the carbon drum.
8. Close drain valves [18], [19] and [20] and open the isolation valve [16].

9. Unit is ready to operate. Restart the system. On restart, ensure that the flow is less than 5 GPM. If the flow is greater than 5 GPM, adjust the flow control valve [17].
10. Record in the log book the time, date and gallons processed for the activated carbon change.