Filtration Systems

Operating and Safety Manual

for Portable Liquid Pump and Filter Systems

Over-The-Top® Design

OPERATING AND SAFETY MANUAL FOR PORTABLE LIQUID PUMP AND FILTER SYSTEMS

TABLE OF CONTENTS

PLEASE READ THESE INSTRUCTIONS CAREFULLY, PRIOR TO OPERATION OF THIS EQUIPMENT. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

IN ADDITION, PLEASE REVIEW THE SUPPLEMENTARY INFORMATION INCLUDED WITH THE SYSTEM:

- Filtration Systems *Installation, Operating and Safety Manual for Liquid Filter Bags and Housings*
- *Technical Bulletin C* (provides complete product specifications)
- *Operator's Manual for Diaphram Pump*

IF YOU HAVE ANY QUESTIONS, OR NEED OUR ASSISTANCE, PLEASE DO NOT HESITATE TO CALL US AT (954) 572-2700.

INTRODUCTION

Thank you for selecting *Filtration Systems* equipment for your liquid filtration requirements. This Operating & Safety Manual for Portable Liquid Pump & Filter Systems was prepared by professionals at *Filtration Systems* who are concerned with your safety and satisfaction. By familiarizing yourself with this booklet, most of your questions about our products will be answered.

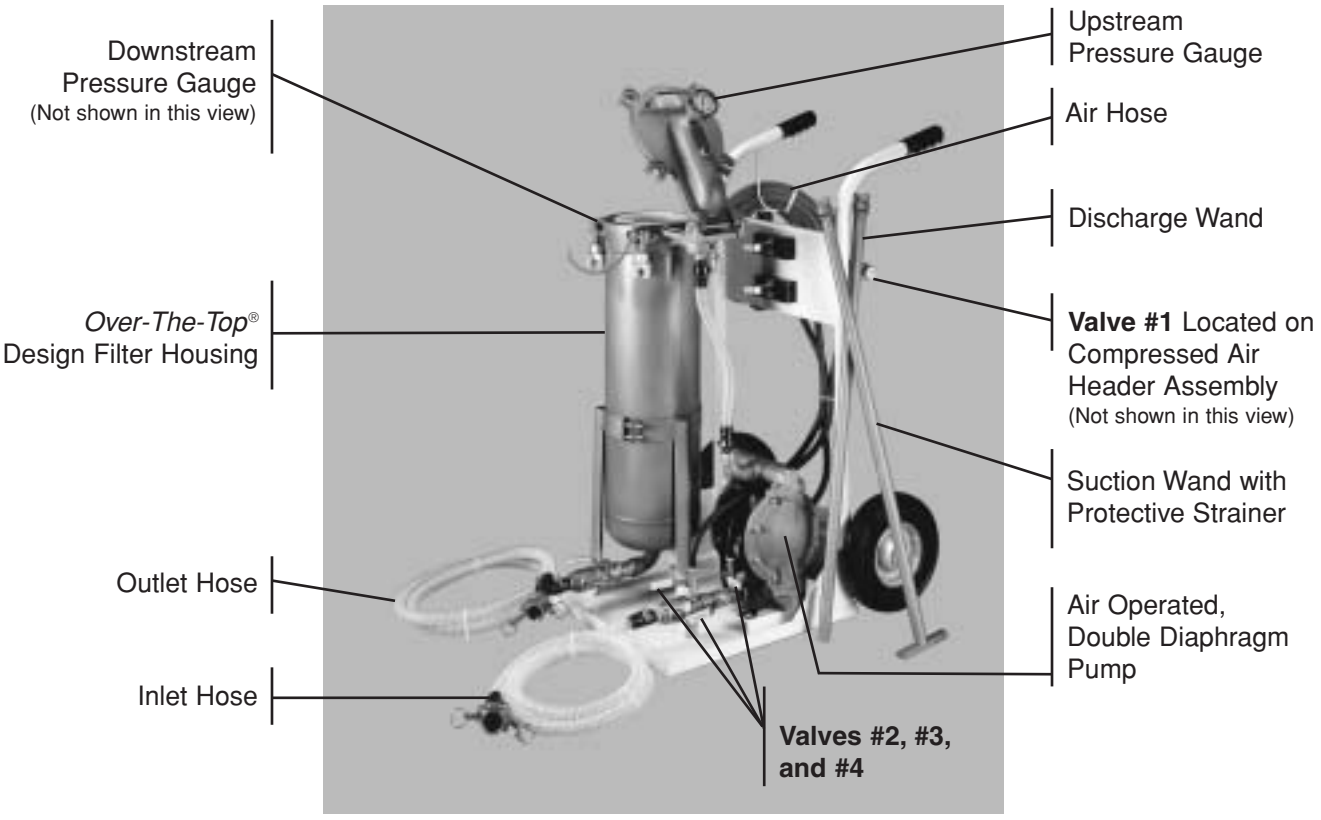
DESCRIPTION

Filtration Systems Portable Liquid Pump and Filter Systems are designed to pump, transfer, and filter liquids from tanks, drums or other reservoirs. Essential equipment for any industrial facility where liquids are present, they are ideal for multiple-site batch filtering, recycling of expensive process fluids, or cleanup of accidental spills. Portable Liquid Pump and Filter Systems are designed for use with high-performance Filter Bags, Strainer Baskets, or Cartridge Filters.

STANDARD FEATURES

- Double Diaphragm Pumps, powered by compressed air, eliminate potential hazards typically associated with electric pumps.
- Clear Hoses (PVC or PTFE) allow observation of flow and color variance of Pre- and Post-Filtered Liquids.
- Heavy-duty, Magnetic Clamps (provided) attach to tanks, and hold the Suction and Discharge Wands in the liquid reservoir, permitting unattended use.
- Pressure Gauges (two included) allow monitoring of differential pressure, indicating when media change-out is required.

IDENTIFICATION OF COMPONENT FEATURES



SET UP PROCEDURE

(Refer to Identification of Component Features on Page 2)

1. **Be certain all Valves are closed.** Connect the Air Hose Coupling to a compressed air source. Note: The Air Filter/Regulator is pre-adjusted to approximately 80psi. **The pressure setting should not exceed 125psi.**
2. Connect each Liquid Hose to a Wand. The Suction Wand has a "T" shaped strainer at the end. The Discharge Wand has a plain end.
3. Connect the Suction Hose, with the "T" shaped Suction Wand affixed, to the Pump Inlet. Always use the Wand with the Protective Strainer as the Suction Wand, to prevent damage to the Pump.
4. Connect the Discharge Hose, with the Discharge Wand affixed, to the Outlet of the Vessel.

FILTER BAG INSTALLATION

Prior to using this equipment, Filter Media must be installed in the Filter Housing.
Refer to the following sections of the *Installation, Operating and Safety Manual for Liquid Filter Bags and Housings:*

INSTALLING FILTER MEDIA

OPERATING PROCEDURES
- Lid Sealing Procedure
- Start up and Shut Down Procedures

FILTER MEDIA REMOVAL
- Filter Bag Removal

1. **Take the housing "off-line"** (follow the SHUT DOWN PROCEDURES). After draining and venting the Housing (DOWNSTREAM PURGE), loosen the four Bar Knob Assemblies from the Lid, and lay them back through the slots provided. Open the Vessel Lid and tilt it back completely. Remove the used Filter Bag (follow procedures for FILTER BAG REMOVAL).
2. **Be certain that a Perforated Support Basket is in place.** The use of a Support Basket is mandatory with Filter Bags.
3. **Select the appropriate *Accufit*® or *Ultrafit*® Welded brand Liquid Filter Bag.** Check chemical and thermal compatibility of the Filter Media to be used in the application.
4. **Remove the Filter Bag from the plastic package.** Removing Filter Media from packaging may produce static electrical sparks. To avoid risk of combustion or explosion, never open static packaging in or around areas containing potentially flammable or explosive materials, liquids or gases.
5. **Insert the Filter Bag into the Support Basket.** The round bottom of the Filter Bag is designed to conform to the shape of the Support Basket. Be certain that the Filter Bag is fully extended and supported by the Basket, completely and evenly. Push down on the Bag Collar so it sits flush with the top of the flanged lip of the Support Basket.

   Note: Our Filter Bags, by design, are longer than the Support Basket. The additional length ensures that the Bag remains fully supported by the Basket during use. Improper Filter Bag installation can result in Filter Bag breakage.

6. Confirm that the O-Rings have been installed properly, and that they are chemically & thermally compatible.
7. Close the Lid of the Vessel, being careful not to drop it.
8. Bring the four Bar Knob Assemblies up into position. Hand-tighten bolts in a diagonal pattern, then torque to specification in the same manner. **To ensure a secure seal, we recommend 30-50 ft./lbs. of torque on the hold-down bolts.**

OPERATING MODES

Filtration Systems Portable Systems have three basic operating functions:

1) **Pumping and Filtering:** [Operational Function]
   In this mode, liquids are Pumped and Filtered. Portable Liquid Pump and Filter Systems may be used in two ways…

   A) Liquid can be Re-circulated within the same tank

   B) Liquids may be Transferred to a separate tank, when the volume is so large that transfer is more practical

2) **Downstream Purge:** [Cleaning Function]
   This mode purges liquid from the Pump, Vessel, Discharge Hose and Wand. Upon completion of the filtering task or for Filter Bag change-out, the downstream purge will void the Filter Bag of liquid, allowing easier Filter Bag replacement.

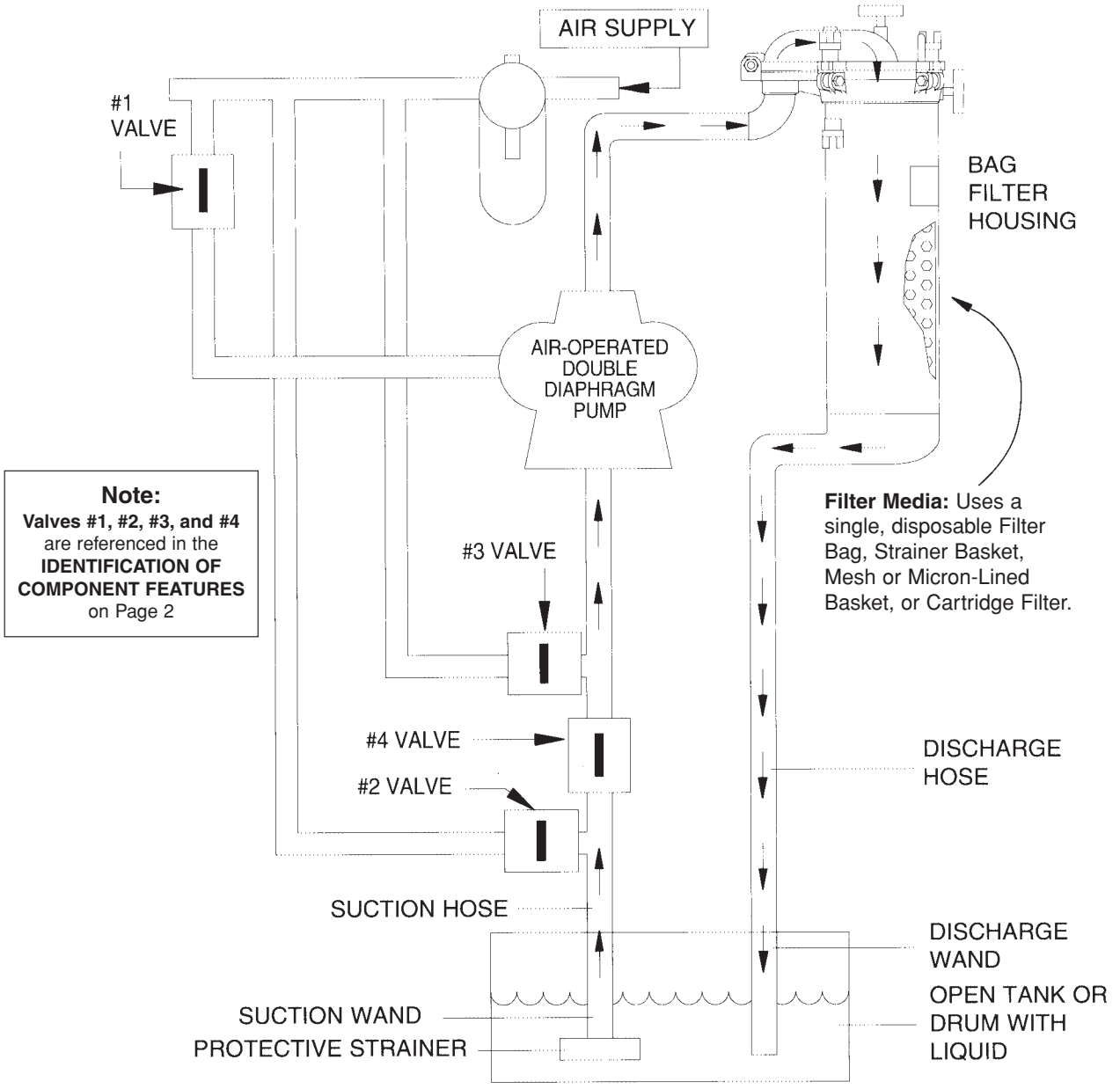
3) **Upstream Purge:** [Cleaning Function]
   In this mode, a burst of air purges the Suction Hose and Wand of any blockage.

PUMPING AND FILTERING – OPERATIONAL MODE

(Refer to Typical Flow Diagram on Page 5 for valve identification)

1. **Be certain all Valves are closed.**
2. Insert the Suction Wand into the tank of fluid to be filtered. The Suction Wand may either be hand-held, or secured with the Magnetic Wand Clamps.
3. For Re-circulation, place the Discharge Wand at the farthest point from the Suction Wand within the same tank, using it to agitate and circulate the liquid.
4. The Suction Wand can be used to filter sediment on the bottom of the reservoir, or to skim the surface of the liquid to remove floating contaminants.
5. **Open Valve #4.**
6. **Open Valve #1 slowly.** The Pump will begin to operate. The liquid flow rate can be controlled by adjusting Valve #1.
7. When the flow through the Discharge Hose has been substantially reduced, or the Pressure Gauges show an increase over the initial starting pressure, the Filter Bag has reached its solids loading capacity, and it is time to replace it. Initial operating pressure with a clean Filter Bag installed in the Vessel will remain constant until the Filter Bag is approximately **80%** "blinded". When the pressure differential increases by approximately **15-25psi**, the Filter Bag should be changed. This figure may vary with the Filter Bag manufacturer. *Actual pressure differential, pressure drop, and the frequency of Filter Bag changes can only be determined by experience in each individual application*. (Refer to Filter Bag Removal, page 6.)
8. **To stop Pumping and Filtering (Operational Mode), first close Valve #1, then close Valve #4.**

TYPICAL FLOW DIAGRAM
(Re-circulation)



OPERATING MODES	VALVES OPEN	VALVES CLOSED
Pumping and Filtering (Operational Function)	1 and 4	2 and 3
Downstream Purge (Cleaning Function)	3	1, 2 and 4
Upstream Purge (Cleaning Function)	2	1, 3 and 4

DOWNSTREAM PURGE – CLEANING MODE & FILTER BAG REMOVAL

(Refer to Typical Flow Diagram on Page 5 for valve identification)

For complete instructions refer to the following sections of the *Installation, Operating and Safety Manual for Liquid Filter Bags and Housings:*

OPERATING PROCEDURES
Shut Down Procedure

FILTER MEDIA REMOVAL

1. When the Filter Bag has reached its solids loading capacity and requires change-out, the Filter Bag and Vessel should be voided of as much liquid as possible, in order to simplify the removal of the Bag.
2. **Be certain all Valves are closed.**
3. **Slowly open Valve #3.** This will force the liquid out of the Filter Vessel, if the Filter Bag is not blinded. Be prepared for "spurts of air" to come through the Hoses as the liquid is voided from the Vessel.
4. **Close Valve #3** when no further liquid is discharged from the Discharge Hose.
5. **Disconnect the system from the air source, prior to opening the housing.**
6. Open the Housing.
7. Grasp the Filter Bag Handles and pull the Collar inward to loosen the upper section of the Bag. Twist the Collar in a circular motion to release the filter material that may be embedded in the perforations of the Support Basket.
8. Anchor the Support Basket Flange while pulling the Filter Bag out of the Basket. If the Bag does not come loose easily, twist the Collar in a circular motion when pulling up.
9. If a Filter Bag is not changed on a timely basis, it will not drain; if this happens, remove the Filter Bag and pour its contents into the new Filter Bag (installed in the Vessel), and filter it.
10. Refer to the Pumping and Filtering section (Operational Mode) of this manual to continue filtering.

Disposal of Filter Media

A Filter Bag or Cartridge that has been used with a hazardous liquid may contain residual amounts of this material and should be handled with the same safeguards that would be used in handling any hazardous and/or toxic material. It is the user's responsibility to dispose of all Filter Media in accordance with Federal, State, and/or Local laws or requirements.

UPSTREAM PURGE – CLEANING MODE FOR BLOCKAGE REMOVAL OF SUCTION HOSE AND/OR WAND

(Refer to Typical Flow Diagram on Page 5 for valve identification)

1. **Be certain all Valves are closed.**
2. When unclogging the Suction Hose or Wand, be careful to point it in a safe direction, away from yourself and others, or equipment.
3. **Slowly open Valve #2.** Air forces partial blockage out of the Suction Hose & Wand.
4. When the Suction Wand has been purged, close Valve #2.
5. Refer to the **Pumping and Filtering** section (Operational Mode) of this manual to continue Filtering.

GENERAL SAFETY AND PRECAUTIONARY INFORMATION FOR PORTABLE LIQUID PUMP AND FILTER SYSTEMS

- Do not operate the Pump above **125psi**.
- The Air Filter/Regulator is pre-adjusted to approximately 80psi. **The pressure setting should not exceed 125psi.**
- To avoid unintentional Start-Up, be certain all Valves are **OFF** before making connections to the Air Hose.
- Always disconnect the system from the air source, prior to opening the Housing.
- Always point the Suction and Discharge Wands in a safe direction, away from people & property.
- If more than one liquid is to be filtered with this system, it may be necessary to change Filter Media and clean the system between batches, to avoid potential cross-contamination.
- Be certain that the Pump is large enough to handle the solids in the liquid to be filtered. Long, thin solids could conceivably enter and block a Valve. If this happens, purge the system (Upstream Purge).
- Air-powered, Double Diaphragm Pumps are available in a variety of materials. Be certain that the body of the Pump, its Diaphragms and Seals are chemically and thermally compatible with the liquid to be filtered.
- Be certain that the O-Ring material in the Housing is both chemically and thermally compatible with the fluid being Filtered. Fluid compatibility includes all materials in contact with the liquid under elevated pressures and temperatures.
- O-Rings are subject to wear and should be checked for dirt, cuts, or swelling each time the Filter Vessel is opened. Replacement of O-Rings should be done prior to pressurization of the Filter Vessel.

SAFETY INFORMATION FOR LIQUID FILTER HOUSINGS

Filtration Systems **Filter Vessels are designed to filter liquids under pressure, in accordance with the temperature and pressure restrictions stamped on the nameplate. The following procedures are mandatory for all users operating our Filter Vessels. Retain this manual, and any product related literature, for review by all personnel operating or supervising the operation of this equipment.**

- Follow the Installation, Operating, and Safety Instructions in this Manual.
- Wear protective garments, splash protection, eye protection and respirators, as required.
- Always check chemical and thermal compatibility of Housing Material, O-Rings, Gaskets, and Media with the fluid being filtered. Consult a liquid compatibility guide or ask your local dealer. Fluid compatibility includes all materials in contact with the liquid under elevated pressures and temperatures.
- Before pressurizing a Filter Vessel, always make sure you have fastened the Lid Hardware.
- O-Rings are subject to wear and should be checked each time the Filter Vessel is opened. Replace O-Rings prior to pressurization of the Filter Vessel. Be certain that the O-Ring material is both chemically and thermally compatible with the fluid being filtered.
- Always relieve pressure to the system before loosening the Lid Hardware or opening the Vessel Lid.
- In certain operating environments, static electrical charges or sparks may cause combustion or explosion of volatile materials. Properly ground equipment, as required.
- Removing Filter Media from packaging may produce static electrical sparks. To avoid risk of combustion or explosion, never open static packaging in or around areas containing potentially flammable or explosive materials, liquids or gases.
- Disposal of Filter Media: A Filter Bag that has been used with a hazardous liquid may contain residual amounts of this material and should be handled with the same safeguards that would be used in handling hazardous and/or toxic material. Dispose of Media in accordance with Federal, State, and/or Local laws or requirements.

Improper use of Filter Vessels may result in injury or property damage. Any misuse or modification to our products will void both the manufacturer's warranty as well as the ASME certification of ASME Code Vessels. Safety Information does not by itself eliminate any danger. Information or warnings are not a substitute for proper accident prevention measures.

Lethal Service

Filtration Systems Vessels are not designed for Lethal Service. "Lethal Service" refers to Vessels containing lethal substances, poisonous gases, or liquids of such a nature that a very small amount of the gas or vapor of the liquid (mixed or unmixed) is dangerous to life when inhaled. In addition, substances of this nature that are stored under pressure, or may generate pressure if stored in a closed Vessel, are considered lethal.

WARRANTY

Filtration Systems warrants its products to be free from defects in workmanship for a period of one year from the date of purchase, when used in accordance with our specific guidelines. Our only obligation and a customer's remedy, subject to our inspection and evaluation, shall be to replace the product or refund the purchase price.

LIMITATION OF LIABILITY

Filtration Systems shall not be held responsible or liable for any loss resulting from the resale, direct or indirect misuse, incidental or consequential damages, arising out of the use of this product. Not all questions or issues may have been addressed in this manual. If you require any additional assistance or technical information, please contact our Customer Service Department at (954) 572-2700.

Filtration Systems

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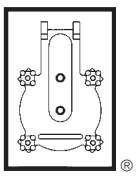

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