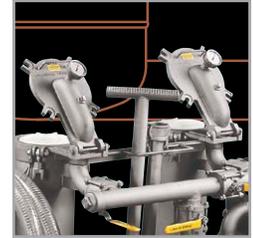


# Portable Liquid Pump and Filter Systems

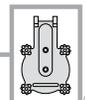
Compressed Air-Powered  
Pump and Filter System



Technical Bulletin C

**Filtration Systems**

Division of Mechanical Mfg. Corporation



# PORTABLE LIQUID PUMP AND FILTER SYSTEMS



## Description

*Filtration Systems* Portable Liquid Pump & Filter Systems are designed to pump, transfer, and filter liquids from tanks, drums, or other reservoirs. It is an essential piece of equipment for any industrial facility where liquids are present; ideal for multiple-site batch filtering, recycling of expensive process fluids, or cleanup of accidental spills. Portable Liquid Pump & Filter Systems are designed for use with high performance filter bags, strainer baskets, or cartridge filters.

Completely packaged systems include *Over-The-Top*® filter housing(s) and a pneumatically actuated diaphragm pump, mounted to a portable cart or stand.

## Standard Features

- *Over-The-Top*® design Liquid Filter Housing
- Air-Powered Double Diaphragm Pump
- Portable Cart or Stand
- Hoses, Wands, Gauges, and Valves included
- Easily operated by single user
- Non-Electric System
- Requires No Special Tools
- Systems can be used with Filter Bags, Cartridges, Strainers, or Mesh/Micron Lined Baskets

## Housing Features

*Filtration Systems* vessels feature *Over-The-Top*® design. Compression of our *Zero-Bypass*® bag collar between the housing lid and the top of the support basket provides a positive 360-degree seal, preventing bypass of unfiltered liquid. Solids are trapped and collected in the bag, eliminating clean-up of the vessel interior during bag change-out.

## Pump Features

- Compressed Air-Powered Double Diaphragm Pump
- Self-Priming from a dry start
- Can run dry without damage
- Stops automatically if discharge is closed; resumes running when line is open
- Low internal velocity allows trouble-free pumping of abrasives or viscous materials
- Pumps are available in Stainless Steel, Polypropylene, or Aluminum

## Filter Media

Systems use a variety of disposable filter media, making them highly versatile for industrial, pharmaceutical, water, beverage, and other process applications. Housings accommodate #2 size (7" dia. x 32" long), #4 size (4" dia. x 14" long), or #5 (4" dia. x 24" long) filter bags, Mesh or Micron Lined Strainer Baskets, or APX® Cartridge Elements.



**Our vessels and filter media are specifically designed to work together as a system, maximizing efficiency and results.**



**Model  
PNS-122-35**



**Model  
PNS-122-75**



**Model  
PNS-141-10**

# STANDARD SPECIFICATIONS AND FEATURES

| <b>SYSTEM BASICS</b>                               | <b>PNS-141-10</b> | <b>PNS-122-35</b> | <b>PNC-122-35</b> | <b>PNF-122-35<br/>"Non-Ferrous"</b> | <b>PNS-122-75</b> | <b>PNS-222-V-135</b> | <b>PNS-151/122-35</b> | <b>PNDF-4</b>      |
|--|-------------------|-------------------|-------------------|-------------------------------------|-------------------|----------------------|-----------------------|--------------------|
| <b>System Operating Capacity (gpm)</b>             | 10 gpm            | 35 gpm            | 35 gpm            | 35 gpm                              | 75 gpm            | 135 gpm              | 35 gpm                | .5 gpm             |
| <b>Filter Housing Construction</b>                 | T-316 SS          | T-304 SS          | Carbon Steel      | T-304 SS                            | T-304 SS          | T-304 SS             | T-316 & T-304         | T-304 SS           |
| <b>Pump Construction</b>                           | Polypropylene     | Stainless         | Aluminum          | Aluminum                            | Stainless         | Stainless            | Stainless             | Polypropylene      |
| <b>FILTER HOUSING</b>                              |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Filter Housing Model Number</b>                 | NS-141            | NS-122            | NC-122            | NS-122                              | NS-122            | NS-222-V-PS          | NS-151 & NS-122       | Disc Filter        |
| <b>Material of Construction</b>                    | T-316 SS          | T-304 SS          | Carbon Steel      | T-304 SS                            | T-304 SS          | T-304 SS             | T-316 & T-304 SS      | T-304 SS           |
| <b>Standard O-Ring Material</b>                    | Buna              | Buna              | Buna              | Buna                                | Buna              | Buna                 | Buna                  | Buna               |
| <b>Standard Housing Finish</b>                     | Blasted           | Blasted           | White Primer      | Blasted                             | Blasted           | Blasted              | Blasted               | 2-B Mill Finish    |
| <b>Micron Size to be Filtered</b>                  | .5-800            | .5-800            | .5-800            | .5-800                              | .5-800            | .5-800               | .5-800                | .5-800             |
| <b>Bag Support Basket Included</b>                 | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | N/A                |
| <b>Vent Port and Gauge Ports (NPT)</b>             | 1/4"              | 1/4"              | 1/4"              | 1/4"                                | 1/4"              | 1/4"                 | 1/4"                  | N/A                |
| <b>Lid Safety Detents &amp; Lid Stop</b>           | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | N/A                |
| <b>Hinged Closure w/ Lid Handle</b>                | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | N/A                |
| <b>Hardware-Bar Knobs (Plated)</b>                 | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | N/A                |
| <b>PUMP</b>  |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Pump Size</b>                                   | 1/2"              | 1"                | 1"                | 1"                                  | 1-1/2"            | 2"                   | 1"                    | 1/4"               |
| <b>Pump Body Construction</b>                      | Polypropylene     | Stainless         | Aluminum          | Aluminum                            | Stainless         | Stainless            | Stainless             | Polypropylene      |
| <b>Internal Diaphragm &amp; Seals</b>              | Buna              | PTFE              | Buna              | Buna                                | PTFE              | PTFE                 | PTFE                  | Buna               |
| <b>Maximum Solids Size</b>                         | 1/32"             | 1/8"              | 1/8"              | 1/8"                                | 1/8"              | 5/16"                | 1/8"                  | .10"               |
| <b>HOSES</b>                                       |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Hose Diameter</b>                               | 1/2"              | 1"                | 1"                | 1"                                  | 1-1/2"            | 2"                   | 1"                    | 1/4"               |
| <b>Material of Construction</b>                    | Clear PVC         | Teflon            | Clear PVC         | Clear PVC                           | Clear PVC         | Clear PVC            | Teflon                | Polypropylene      |
| <b>Spiral Reinforced</b>                           | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>Cam and Groove Ends for Quick Disconnect</b>    | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | Push-On Connection |
| <b>SUCTION &amp; DISCHARGE WANDS</b>               |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Wands Included with System</b>                  | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>Wand Diameter</b>                               | N/A               | 3/4" SS           | 3/4" SS           | 3/4" SS                             | 1-1/2" SS         | 1-1/2" SS            | 3/4" SS               | N/A                |
| <b>Suction Screen Material &amp; Size</b>          | T-316 SS 3/32"    | T-316 SS 1/8"     | T-316 SS 1/8"     | T-316 SS 1/8"                       | T-316 SS 1/4"     | T-316 SS 1/4"        | T-316 SS 1/8"         | N/A                |
| <b>Cam and Groove End for Quick Disconnect</b>     | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | N/A                |
| <b>Magnetic Wand Clamps for Unattended Use</b>     | No                | Yes               | Yes               | Yes                                 | Yes               | No                   | Yes                   | N/A                |
| <b>COMPRESSED AIR COMPONENTS</b>                   |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Air Filter/Regulator Included</b>               | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | Yes                |
| <b>Air Pressure Gauge Included</b>                 | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | Yes                |
| <b>Air Filter Micron Rating</b>                    | 50                | 50                | 50                | 50                                  | 50                | 50                   | 50                    | 50                 |
| <b>Air Shutoff/Control Valves Included - Brass</b> | Yes               | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | Yes                |
| <b>Length of Airhose Included (ft)</b>             | 5                 | 25                | 25                | 25                                  | 25                | 25                   | 25                    | N/A                |
| <b>Air Connection Size</b>                         | 1/4" Adapter      | 3/8" Adapter      | 3/8" Adapter      | 3/8" Adapter                        | 1/2" Adapter      | 3/4" Adapter         | 3/8" Adapter          | 1/4" Adapter       |
| <b>Clean Out Air Purge</b>                         | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>VALVING SPECIFICATIONS</b>                      |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Pump Suction Valve Included</b>                 | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>Vessel Effluent Valve Included</b>              | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>Valving for Series Operation Included</b>       | No                | No                | No                | No                                  | No                | Yes                  | No                    | No                 |
| <b>Valving for Parallel Operation Included</b>     | No                | No                | No                | No                                  | No                | Yes                  | No                    | No                 |
| <b>Valve Materials of Construction</b>             | T-316 SS/PTFE     | T-316 SS/PTFE     | Brass             | Brass                               | T-316 SS/PTFE     | T-316 SS/PTFE        | T-316 SS/PTFE         | T-316 SS/PTFE      |
| <b>Valve Type</b>                                  | Ball Valve        | Ball Valve        | Ball Valve        | Ball Valve                          | Ball Valve        | Ball Valve           | Ball Valve            | Ball Valve         |
| <b>HAND TRUCK/STAND</b>                            |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>2 Wheel – 4 Wheel Type</b>                      | Stand             | 2-Wheel           | 2-Wheel           | 2-Wheel                             | 2-Wheel           | 4-Wheel              | 2-Wheel               | Stand              |
| <b>Material of Construction</b>                    | Stainless Steel   | Coated Steel      | Coated Steel      | Coated Steel                        | Coated Steel      | Stainless Steel      | Coated Steel          | Stainless Steel    |
| <b>Wheel Diameter and Type</b>                     | N/A               | 10" Pneum.        | 10" Pneum.        | 10" Pneum.                          | 10" Pneum.        | 5" Swivel/Brake      | 10" Pneum.            | N/A                |
| <b>Drip Containment</b>                            | No                | Yes               | Yes               | Yes                                 | Yes               | Yes                  | Yes                   | No                 |
| <b>Wheels Off Ground at Rest</b>                   | N/A               | Yes               | Yes               | Yes                                 | Yes               | No                   | Yes                   | N/A                |
| <b>DIMENSIONS AND WEIGHT</b>                       |                   |                   |                   |                                     |                   |                      |                       |                    |
| <b>Dimensions (Inches)</b>                         | 18 x 9 x 20       | 44 x 29 x 26      | 44 x 29 x 26      | 44 x 29 x 26                        | 44 x 29 x 44      | 44 x 30 x 72         | 44 x 29 x 44          | 7 x 11 x 30        |
| <b>Shipping Weight (Pounds)</b>                    | 110               | 260               | 245               | 225                                 | 335               | 680                  | 300                   | 17                 |



Filtration Systems *Over-the-Top*® Filter Housings accommodate a variety of filter media including High Performance Filter Bags, Mesh or Micron Lined Baskets, Strainer Baskets, or APX Large Diameter Cartridge Elements.



# VALVED DUPLEX, PARALLEL AND/OR SERIES SYSTEM



**Model  
PNS-222-V-135**

Individually valved modules may operate independently, providing continuous service during bag filter changes. Concurrent operation of both housings doubles the flow rate capacity of a single vessel. Each vessel accommodates a #2 size filter bag (7" dia. x 32" long). This system may be used with any combination of Strainers, Micron-Rated Baskets, or Cartridge Contaminant Chambers.

This system allows for Two-Stage (series) filtration; the first vessel feeds the second vessel. When used as a two-stage unit, the liquid is filtered in two separate passes which can, at a minimum, filter more effectively when there are any of the following conditions:

| CONDITION  |                            | OUTCOME  |
|--|----------------------------|--|
| Redundancy for Greater Quality Control and Performance | <b>Parallel Filtration</b> | Improved performance with two filters (same micron) back-to-back for greater efficiency and capture rates  |
| Unequal Particle Size Distribution                     | <b>Series Filtration</b>   | First stage can handle larger particles, Second stage can filter finer levels of particulate   |
| Cost Reduction Requirements using Disposable Filters   | <b>Series Filtration</b>   | Less Expensive Pre-filters (Disposable or Reusable) may be used for the First stage, whereas Absolute Rated media can filter in the Second stage |

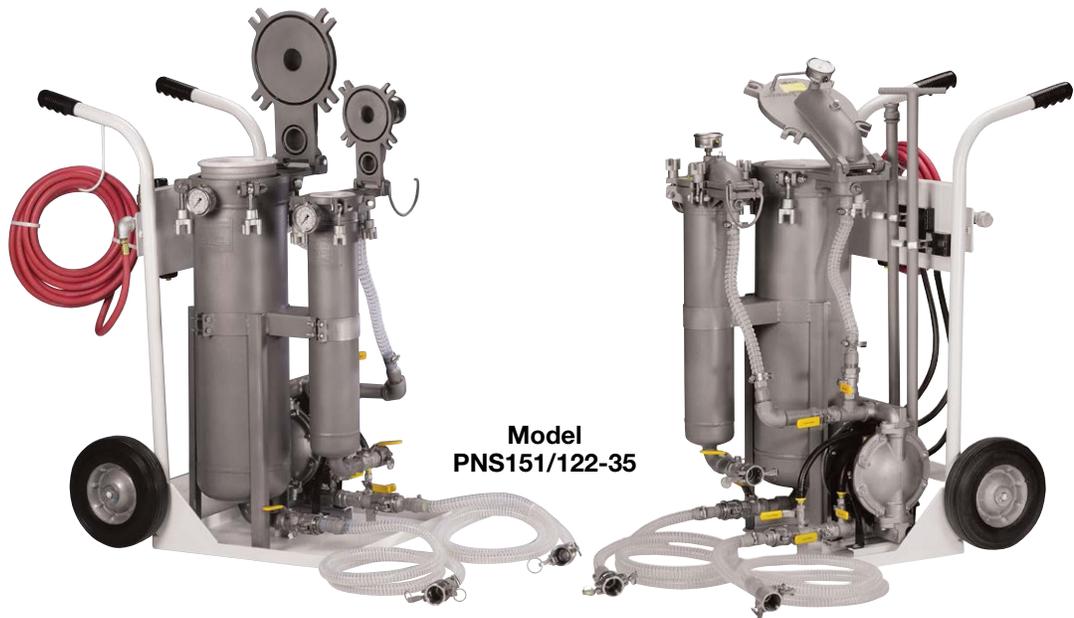
## Applications

**Portable Systems are extremely effective for batch processing and/or clean-up of accidental spills.**

**Some liquids that are compatible with these systems include:**

- Acids
- Adhesives
- Beverages
- Bulk Chemicals
- Cooling Oils
- Cosmetics
- Cutting Fluids
- Detergents
- Food
- Fuel Oil
- Hydraulic Oil
- Inks
- Paints & Varnishes
- Petrochemicals
- Pharmaceuticals
- Process Water
- Resins
- Sludges
- Slurries
- Solvents
- Vegetable Oil
- Water

## PORTABLE TEST/PROCESS SYSTEM



The Portable Test/Process System consists of two filter housings and a double-diaphragm pump, mounted on a mobile cart. This self-contained system runs on factory compressed air. A valve, located next to each vessel, allows liquid flow to be directed through either filter housing for testing or batch processing. Small quantities of liquid may be run through the smaller housing (NS-151) for sample testing, allowing validation of the filtered liquid (effluent) based upon observation or evaluation. The larger housing (NS-122) may be used with an *Accufit*® or *Ultrafit*® Welded filter bag, or APX® cartridge to determine solids loading characteristics, which can be

“scaled-up” (extrapolated) to provide general sizing information for full-size production applications. Additionally, filtering with an *Ultrafit* Calibrated Test Bag in the NS-122 allows the user to determine the micron rating of *Ultrafit* Welded High Performance filter bag for their process. By observing visible performance characteristics of specific filter media, users benefit by participating in their own Quality Control Testing Process.

In addition to its test function capabilities, the Portable Test/Process System is a very desirable piece of equipment for any factory, due to its versatility as a “go-anywhere” portable filtering system.

## PORTABLE DISC FILTER HOUSING SYSTEM

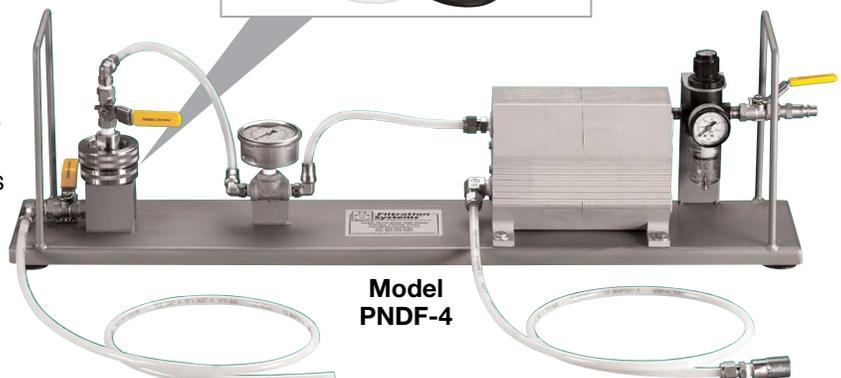
### Disc Filter Housing for use with 47mm Filter Discs

The Portable Disc Filter Housing System consists of a Variable Compression Disc Filter and an adjustable flow, diaphragm pump. This system is designed for sample testing, validation and optimum media selection. Disc Filter Housing and Filter Discs also sold separately.

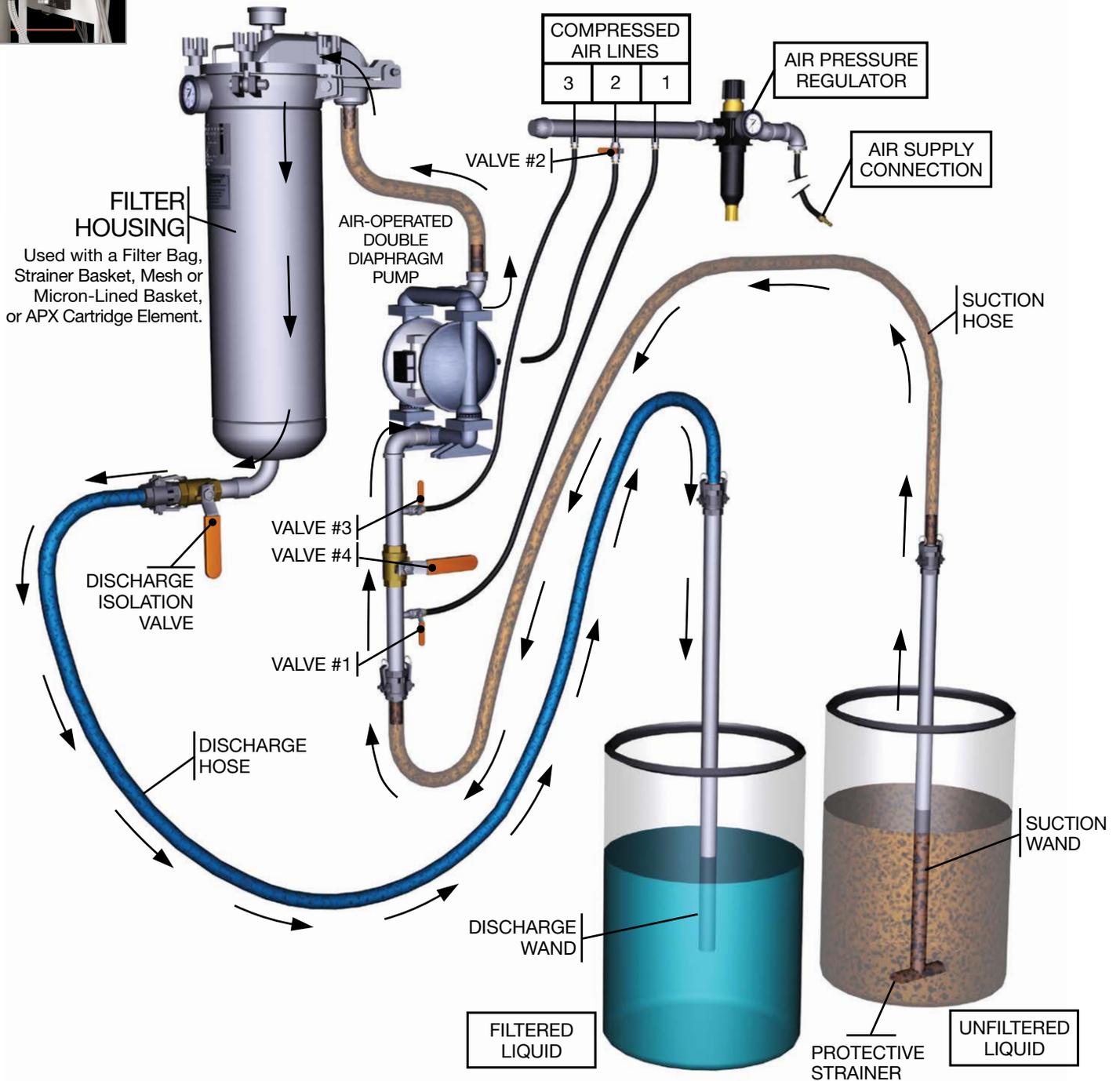
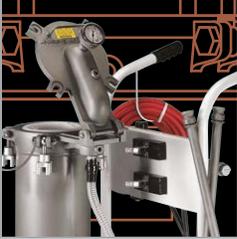
### Applications

- Collect data to determine the optimum grade of filter media for your specific requirements
- Test filter media on a small scale basis for all General Filtration and Microfiltration applications
- Sample small amounts of liquid for process scale-up or pilot studies, or from production runs
- Verify incoming bulk liquid deliveries
- Evaluate the performance characteristics of *Accufit*® and *Ultrafit*® Welded Filter Bag products

### Component parts of the Variable Compression Disc Filter Housing



# PORTABLE LIQUID FILTER SYSTEM FLOW DIAGRAM



**Product Identification:** All *Filtration Systems* filter vessels have a unique serial number that can be identified by our factory. Nameplates, specifying both the serial number and maximum allowable pressure and temperature ratings, are permanently affixed to all housings.

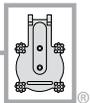
**Product Specifications:** With over 50 years of industry expertise and proven performance, *Filtration Systems* offers quality products at responsible prices. We continually strive to improve our products through ongoing research and development; therefore, we reserve the right to change specifications without notice.

**Warranty:** *Filtration Systems* warrants our 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.

## Filtration Systems

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