Poly-UF™



Operation & Maintenance Manual

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Important Dealer/Homeowner Information

Your Nelsen Poly UF™ filter system is a precision built, high quality product. This unit will deliver safe filtered water for many years to come, when installed and operated properly. Please study this manual carefully and understand the cautions and notes before installing. This manual should be kept for future reference. If you have any questions regarding your system, contact your installing dealer, or the manufacturer at the following: 3250 Barber Rd. Norton, OH 44203.

Poly UF™ Limited Warranty

Nelsen Corporation & ENPRESS LLC warrants its line of Poly-UF™ products to be free of defects in material and workmanship for a period of three years from the date of purchase.

This warranty does not cover any equipment purchased for use in applications in which the product is not suited. It is the responsibility of the buyer to determine if a product is suitable for a particular application.

Our obligations under this warranty are limited to the repair or replacement (at ENPRESS's sole discretion) of the failed parts of the water treatment unit manufactured by ENPRESS, and we assume no liability whatsoever for direct, indirect, incidental, consequential, special, general or other damages.

We assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us.

We assume no liability and extend no warranties, expressed or implied, for the use of this product with a non-potable water source or a water source which does not meet the conditions for use described in the owner's guide or performance data sheet for the product.

The warranty provided herein applies, only when used within the product specifications and service life, from the date of installation, beyond which ENPRESS LLC is absolved of any and all liability for any use of the product. There are no other warranties, either of merchantability or fitness, either expressed or implied.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state

This warranty is not in effect until installer performs (product specific) ENPRESS LLC Product Protocol, when required, for testing, record-keeping and certification of the ONE product prior to installation.

THIS WARRANTY EXCLUDES THE FOLLOWING:

- Damage caused by improper installation, operation or care.
- Damage caused by chemical attack, environment, accident, fire, flood, freezing, Act of God, misuse, mis-application, neglect, oxidizing agents (such as chlorine, ozone, chloramines and other related components), alteration, installation or operation contrary to the printed instructions, or by the use of accessories or components which do not meet ENPRESS's specifications, including the use of a replacement element not manufactured or supplied by ENPRESS LLC. Refer to the specifications section in the Installation and Operating manual for approved application parameters.
- Modification or alteration by other than ENPRESS LLC employees.
- Rubber type parts and normal wear items i.e. "O" rings, etc…
- Any costs of labor or expenses expended in the removal and/or installation of unit, or any surrounding device.
- Altering or removing the ENPRESS LLC information label.
- Use of non ENPRESS LLC approved cartridges, filters, or replacement parts with the appropriate systems or vessels.
- Non-use of supported piping for plumbing connections to In/Out connections.

Service under this warranty is to be provided by the distributor/installer who sold the unit to the user. If the distributor is unable to provide warranty service, contact:

Nelsen Corporation
3250 Barber Rd.
Norton, Ohio 44203
Phone: 330-745-6000

ENPRESS LLC
34495 Melinz Parkway
Eastlake, Ohio 44095
Phone: 866-859-9274

A Returned Goods Authorization (RGA) number must be received from the above office and placed on all shipments to and correspondence with ENPRESS LLC.

Please be prepared with the following information:

- Model number and serial number.
- Date of installation.
- Name of installer
- Nature of problem.
- Your address and contact information.

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Dealer/Installer Field Integrity Testing

1 Integrity testing measures the ability of the lumen pores (capillaries) to hold fluid against air pressure. If the lumens are undamaged (no cracks and no breaks between the lumens and the potting), then the fluid will resist the air pressure, and the measured challenge pressure will remain unchanged. If the lumens are damaged, then the challenge air pressure will be lost. Care must be exercised to not exceed the challenge air pressure. If the challenge pressure is too high, the capillaries will loose their fluid, and the test will fail even if the lumens are undamaged.

2 The INTEGRITEST is the only warranty test for the Poly-UF.

3 The INTEGRITEST must be performed and recorded by all OEMs upon receipt of the manufactured Poly-UF from ENPRESS.

4 The INTEGRITEST certifies the integrity of the lumens only. The test certifies that the lumens and their connections to the potting are intact. There is no demonstration of filtration capability.

5 The INTEGRITEST will normally be performed on "Dry" membranes.

6 The Field PDT is intended for confirmation that the UF has survived the shipment from the OEM to the Dealer, and from the Dealer to the installation site.

7 The Field PDT will normally be performed on wetted (installed and flushed) membranes.

8 The Field PDT may be used by Dealers periodically for confirmation that the lumens have not been damaged. (Not for filtration capability.)

9 The danger with Field PDT is that the Poly-UF be over-pressurized. This may cause the lumen capillaries to lose their water. If this is so, then the Field PDT will fail.

10 If a Poly-UF fails a Field PDT, the membrane should be re-wetted and the test should be repeated.

11 At no time will a Field PDT be accepted for any type of warranty claim.

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Integrity Test With Compressor

Depressurize

1 Isolate Valve. Close Valve 1, Valve 3 and Inlet Bypass.

2 Depressurize. Put valve in backwash.

3 Drain membrane. Open Valve 3.

Stabilize Membrane Pressure

1 Put valve in the service position.

2 Close Valve 1, Valve 3 and Inlet Bypass.

3 Pressurize. Open Valve 2 and activate compressor until 15 psi.
Do not over-pressurize. Then close Valve 3 and turn air pump off.

4 Check integrity. Wait 5 minutes.
Pressure will decrease somewhat.

Test Membrane

1 Close Valve 1, Valve 3 and Inlet Bypass.

2 Pressurize. Open V2 and activate compressor until 14 psi.
Do not over-pressurize. Then close Valve 3 and turn air pump off.

3 Check integrity. Wait 3 minutes.
Pressure should be greater than 10.5 psi.

Re-Pressurize

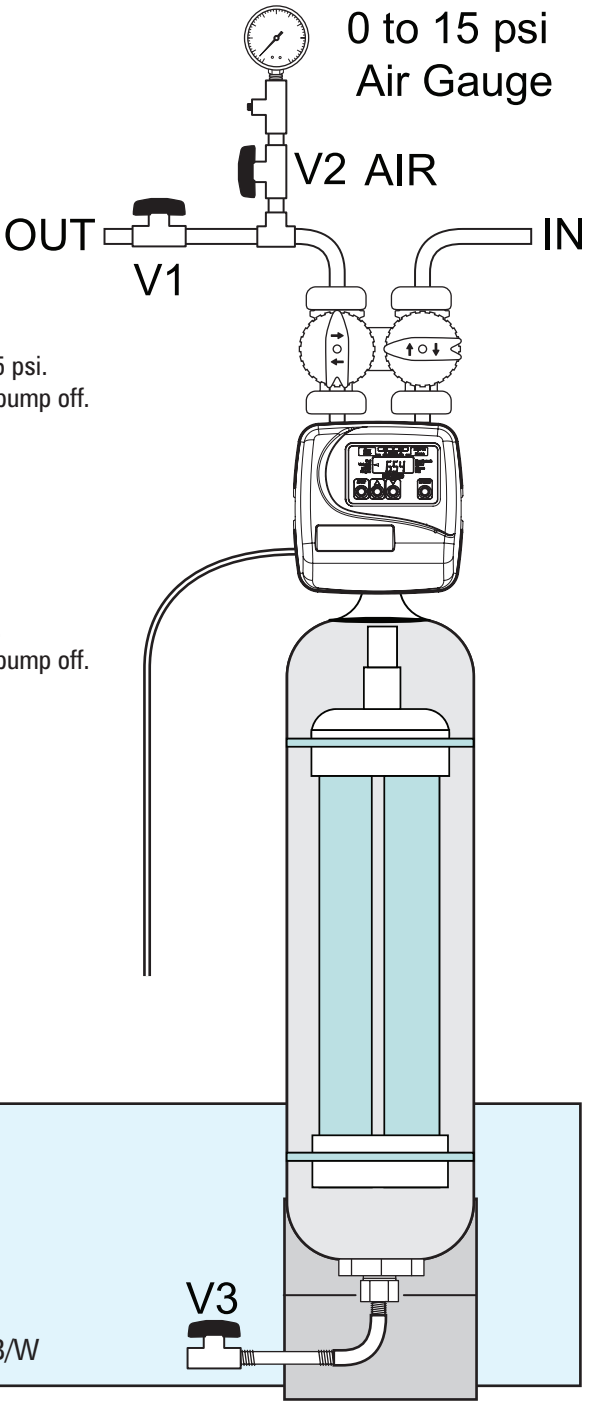
1 Open Valve 2 to release pressure.

2 Open Valve 1 to outlet.

3 Put valve in service.

4 Slowly open Inlet Bypass valve to refill tank.
(Let air release through Valve 2)

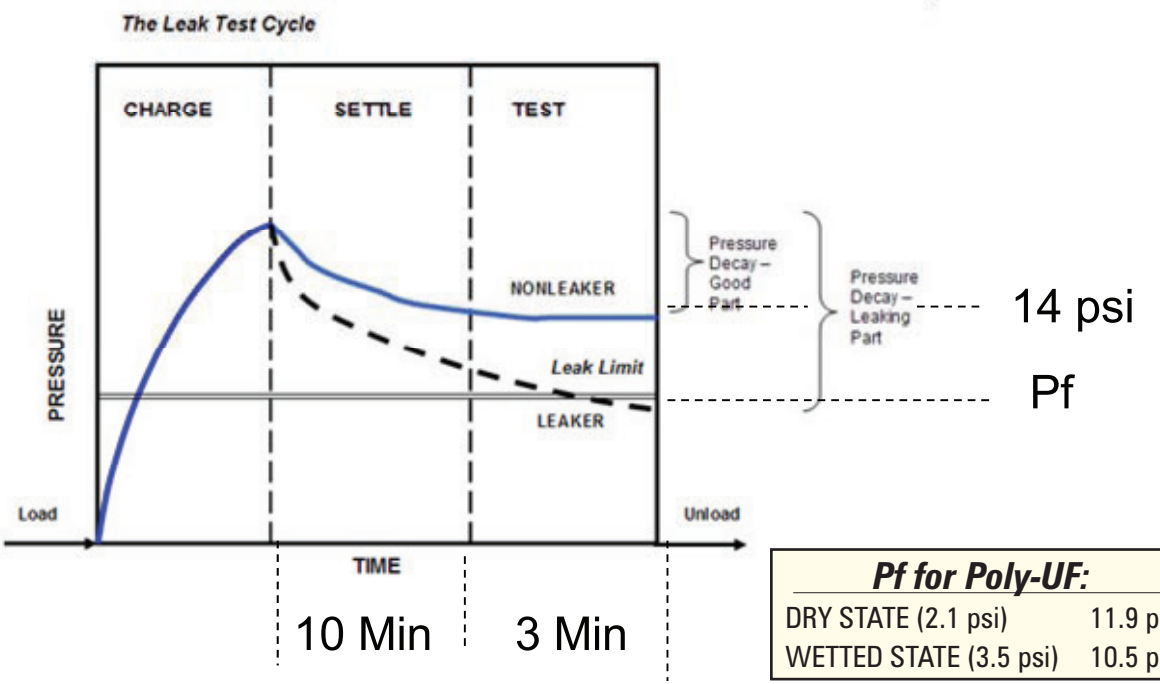
5 Once air has vented to drain, close Valve 2.



1. Drain (V1C, V2C, V3O, Inlet Bypass Closed) B/W
2. Membrane Pressure (V1C, V2O, V3C) Service
3. Membrane Stabilize 15 psi for 5 minutes
4. Membrane Pressure (14 psi for 3 minutes)
5. Record end pressure at least 10.5psi
6. Re-Pressurize (V1O, V2C, V3C, Inlet Bypass Open) B/W

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Pressure Decay Test Cycle



Pf for Poly-UF:	
DRY STATE (2.1 psi)	11.9 psi
WETTED STATE (3.5 psi)	10.5 psi

Air Pump w/accessories

A small air compressor with a pressure regulator that has the ability to set to 15 PSI. The Airman® Cordless, Multi-Purpose Air Pump is available online at a number of outlets features a 9.6-Volt Rechargeable NiCd Battery and Automatic Pressure Control making operation safe and prevents over-inflation.



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Backwash Cleaning Cycles

1. Installation Intent. The prescribed membrane cleaning cycle is a function of the quality of the feed water and the intended purpose of the ENPRESS Poly-UF. In most cases, the feed water will have some pretreatment stage, including at least a 5 micron cartridge filter. The intended purpose of the ultrafiltration will be one of the three:
    a. Microbiological barrier
    b. Sediment/turbidity/tannin filter
    c. Combination
2. Cleaning Routines: The cleaning routine for membranes may be any or a combination of these stages:
    a. Raw backwash. Reverse flow of feed water to drain.
    b. Treated backwash. Reverse flow of a separate treated source to drain.
    c. Disinfection backwash. Reverse flow with a disinfectant to drain. Disinfectant may be introduced through an injector using an up-flow brine water softening valve.
    d. Raw flush. Service flow of feed water, with exit at the bottom drain.
3. Cycle Selection. The following are examples of cleaning cycles.

a.	*Standard Cycle:*	Raw backwash (2 GPM for 5 minutes each day) Raw flush (5 GPM for 1 minutes each week)
b.	*Microbiology:*	Raw backwash (2 GPM for 5 minutes each day) Disinfection backwash (2 GPM for 2 minutes each week) Delay of 2 minutes Treated backwash (2 GPM for 5 minutes) Raw flush (5 GPM for 1 minute each week.)
c.	*Sediment:*	Treated backwash (2 GPM for 5 minutes each day*) Raw flush (5 GPM for 2 minutes every 3 days*)

4. Disinfectant Use. Chlorine at 500 mg/l.
Make up: 1 ounce of 5.25% bleach in 1 gallons water.

**** May be decreased based upon clarity of effluents.***



For detailed information on how to program the control valve, please refer to the manufacturers control valve manual.

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Membrane Wetting Process

1. General. The wetting solution is intended to bubble testing of the membrane, for long-range (i.e., over 5 months) storage, and for treating the membrane for shipment during freezing conditions.
2. Solution Components. The wetting solution is an aqueous (water) solution of 50% (by weight) of Glycerin and 1% (by weight) of Sodium Metabisulfite. The Glycerin is heavier than water, and provides pore protection from freezing and from drying out; the Sodium Metabisulfite provides protection from bacteriological damage to the membrane.
3. Solution Make-Up. The wetting solution is made up as follows:
   a. Water and Glycerin: Mix 4 gallons (volume) of Glycerin with 5 gallons of water.
   b. Water/Glycerin and Sodium Metabisulfite: Mix 1 ounce (by weight) of Sodium Metabisulfite with each gallon of Water/Glycerin solution. Mix the solid Metabisulfite in warm water; then add to the Glycerin/water solution.
4. Wetting Treatment Process. Ultrafiltration membranes should be wetted as follows:
   a. Attach closure fitting to the bottom tank opening.
   b. Add wetting solution until the level is above the lumens of the membrane.
   c. Top off the wetting solution after 10 minutes to allow for the absorption of the wetting solution in the lumen fibers.
   d. Afterwards, the membrane may be bubble tested or stored for later use.
5. Removal of Wetting Solution. To remove wetting solution, use a gravity drain. There will be a residual in the membranes which will continue to drain afterwards.
6. Wetting Solution Reuse. The wetting solution may be reused provided that it is filtered at 130 microns.

EXAMPLE Add 5 gallons of Glycerin to the make-up tank. Add 6 gallons of (cold) water. Then dissolve 11 ounces (weight) of Sodium Metabisulfite in one quart of warm water. Add the Metabisulfite solution to the Glycerin/Water solution and mix thoroughly.

Poly-UF™ Specifications

Membrane
Polysulfone, 0.02 micron
194 sqft , Outside-In

Configuration Permeate (top)
Drain (top & btm)
Feed (top or btm)

Operation
Any multiport valve

Advertising
7-log Bacteria
4-log Virus and Cyst
100,000 MWC
WQA and BioVir

Feed Water Chemistry
< 0.3 ppm Fe,
< 0.05 Mn, SDI < 6.0,
pH 3-10

Feed Water Physics
10-100 psi, 35° to 100°

Pretreatment
5 micron or less

Service Flow
12 GPM @ 25° C, 10 GPM @ 56° F

Flush Frequency
Once per day standard, per application testing

Flush Duration
5 minutes standard, per application testing

Backwash Frequency
Once per day (standard)

Backwash Duration
5 minutes

Sanitizing
Chlorine: 1ppm maximum for continuous flow (up to 2000ppm for cleaning only)

DLFC
1.7 GPM

Accessories
Stick tester, PDT tester

Winterize Fluid
50% Glycerine

Uninstalled Membranes
Semi-dry until install

Integrity Testing
Kit for warranty
14 psi for 10 min

Pressure Decay
PDT tester
Field expedient

Normalized Conditions
Compensation chart

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FAQ's

How often do you advise a cleaning procedure (CIP) of the membranes?

A cleaning procedure regiment will be dependent on the application. As you are aware, small community systems require maintenance and monitoring so creating a proper frequency of membrane cleaning is easy. As like most applications, there are unique idiosyncrasies inherent to the small system so a professional operator can easily be educated to properly maintain the system.

Can we clean endotoxins less than 10 eu/ml?

Yes. Endotoxins are the skeletons of dead bacteria, and have a size range that is larger than 0.05 microns. An "Endotoxin Filter" used in dialysis has an absolute rating of 0.05 micron. Since our UF has an absolute rating of 0.02 micron, our UF is a better (smaller pore size) filter than the standard Endotoxin Filter. If the UF is used for this purpose, it is absolutely essential that the Poly-UF™ use a separate treated source of water for backwash. Otherwise, the backwash cycle will put Endotoxin inside the lumens.

What is the Cleaning Protocol for the System?

The standard cleaning protocol includes periodic backwash pulses by reversing the flow from outside-in to inside-out. If the untreated water contains tannins, then this pulsing should be done with ***UF-treated*** water. The "dirtier" the water the more frequent the backwash. The frequency of the backwash cycle can be controlled by adjusting the "Hardness" setting. The valve is set at a "capacity" of 5000 grains. The initial "hardness" setting is 20 GPG. This means that the UF will backwash every 250 gallons. If we want it to backwash every 100 gallons, set the "hardness" to 50. The highest "hardness" setting is 150, and this will cause the UF to backwash every 33 gallons.

What is the lowest practical pressure for the Poly-UF

It is 30 psi. With that said, you can pass water through the membrane at 10 psi but the output is minimal; that reference is best suited for the UF Pilot Stick. Since most ground water systems provide 30-50 or 40-60 pressure switches the minimum pressure shouldn't be an issue.

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