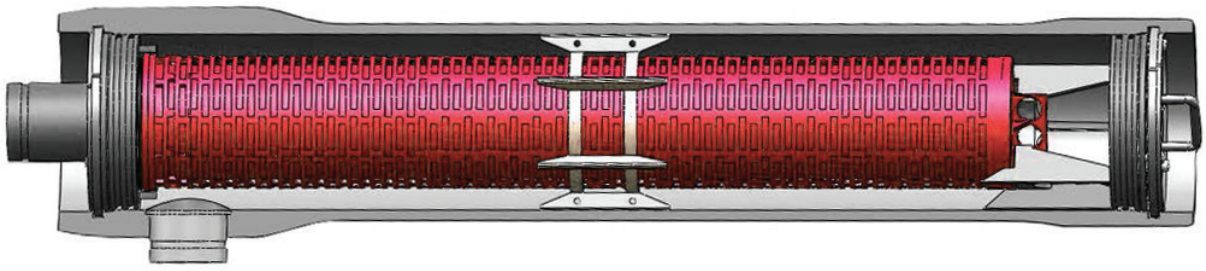
Piedmont



USER GUIDE

CARTRIDGE PURIFICATION SYSTEM

CONTENTS

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GENERAL WARNING

Piedmont FRP Cartridge housings (housing) are designed to provide safe operation over a long service life when properly installed, operated, and maintained. However, the housing may cause loss of life, severe bodily harm, or property damage if it is NOT correctly installed, operated, or maintained. Please make sure you read and understand all the guidelines in this User Manual. Observe all warnings and precautions contained herein. Failure to do so may result in malfunction, damage and potential catastrophic failure. It is recommended that only qualified technicians experienced in servicing hydraulic systems work with this housing.

USE AND PRECAUTIONS

Prior to installation of housings, ensue that damaged or corroded components are not used. Misuse, incorrect assembly, or use of damaged/corroded components may result in catastrophic failure, and may cause to void the warranty.

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- Positive pressure is based on the design pressure (PSI) of the specific model being used
- Accommodates Piedmont High flow Cartridge Filters
- The housing expands under pressure and careful consideration must be taken when installing straps/saddles and system piping connection
- Installation with the provided straps/saddles is strongly recommended
- The housing should not support any other system components, connections should be NON-LOAD BEARING
- Periodic inspection of the housing end cap is recommended to ensure all parts are dry and free of corrosion, usually performed during cartridge replacement
- Failure to understand and follow all precautions may void the warranty and/or result in catastrophic failure of the housing
- These guidelines are subject to change without prior notice. Please check with Piedmont to ensure that the User Manual is the latest version for the housing model being used.
- Mount the housing(s) using the straps/saddles hardware provided and based on the span positioning recommended in the engineering drawing
- Do not over tighten the straps - the housing(s) must be allowed to expand under operation
- Maximize the connection flexibility to allow for vessel growth while under pressure
- Align the side ports with the system manifold, correcting any misalignment before final installation
- Provide overpressure protection in the system safety devices
- Inspect the end caps regularly for signs of damage or corrosion. Immediate corrective action and/or replacement are recommended in case of damage or corrosion
- Always relieve the system pressure before working on the housing
- Never operate the housing in excess of its specified ratings. This may void the warranty and cause bodily or property damage.
- Flush the housing with permeate before system shutdown to reduce the chance of corrosion
- Do not install the housing under direct sunlight
- Operate the housing within the recommended pH range

o Operating pH Range: 3 - 11

o Cleaning pH Range: 2 - 12 (less than 30 minutes)

MODEL EXPLANATION

Cartridge Housing

MODEL	CONNECTION	MAX. PRESSURE	FILTER LENGTH
ET80-150S-20	SIDE	150 PSI	20”
ET80-150S-40	SIDE	150 PSI	40”
ET80-150S-60	SIDE	150 PSI	60”

Cartridge Housing

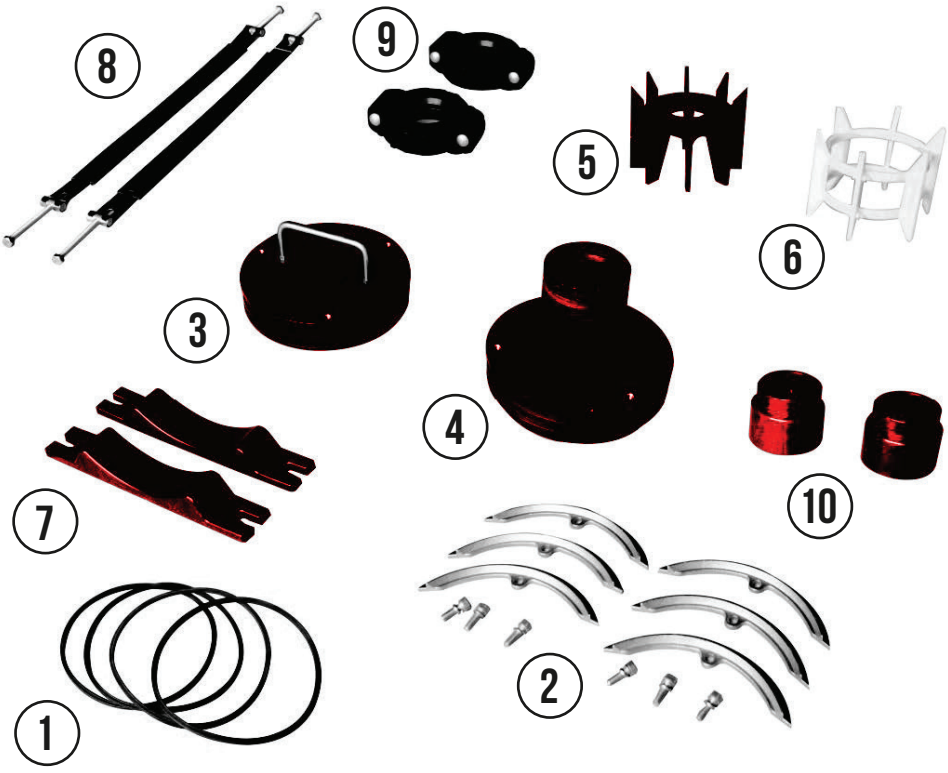
CARTRIDGE FILTER	LENGTH	MEDIA TYPE	REMOVED RATING	O-RING
ETHF - EURO TEC HIGH FLOW	20 - 20” 40 - 40” 60 - 60”	PP - Pleated GF - Pleated PM - Melt Blown	01 - 1 µm 05 - 5 µm 10 - 10 µm 20 - 20 µm 50 - 50 µm 100 - 100 µm	E - EPDM N - NBR

Example: Model ETHF-40-PP-20-E

OVERVIEW

The Piedmont system is designed for filtration system technologies for critical applications, cartridge filter care and protection. The Piedmont innovative proprietary design allows for easy and fast maintenance for minimum downtime that ensure your systems run continuously.

Cartridge housing Accessories



1: O-ring
2: Locking kit segments
3: End Cap (Handle Side)
4: End Cap (Inlet Side)
5: Thrust Ring
6: Guiding frame
7: Saddle
8: Strap
9: Couplings
10: Short Tube

INSTALLING THE CARTRIDGE FILTERS

STEP 1 - Installing the End Cap (inlet Side)

Check and clean the End Cap (Inlet side) groove prior to installation. Assemble the O-ring on the End Cap (Inlet side) groove using a mild dishwashing liquid (highly recommended).

Insert the End Cap with Inlet side facing the housing. Push the End Cap firmly until it is correctly positioned and the retaining groove is visible. It may be necessary to use a rubber mallet to secure the head into its engaged position.

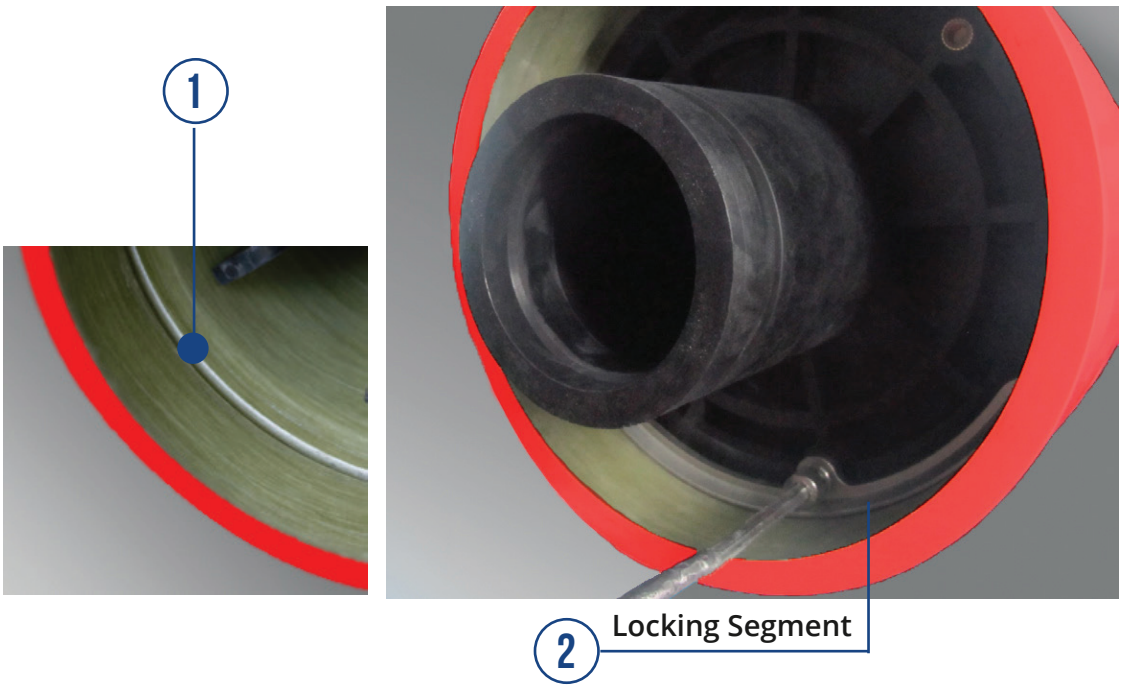
DO NOT tap the mallet directly into the End Cap, use a piece of wood to disperse the impact. Using the mallet directly on the End Cap may cause damage.

STEP 2 - Installing the Locking Kit Segments

(1) Clean and dry the retaining groove.

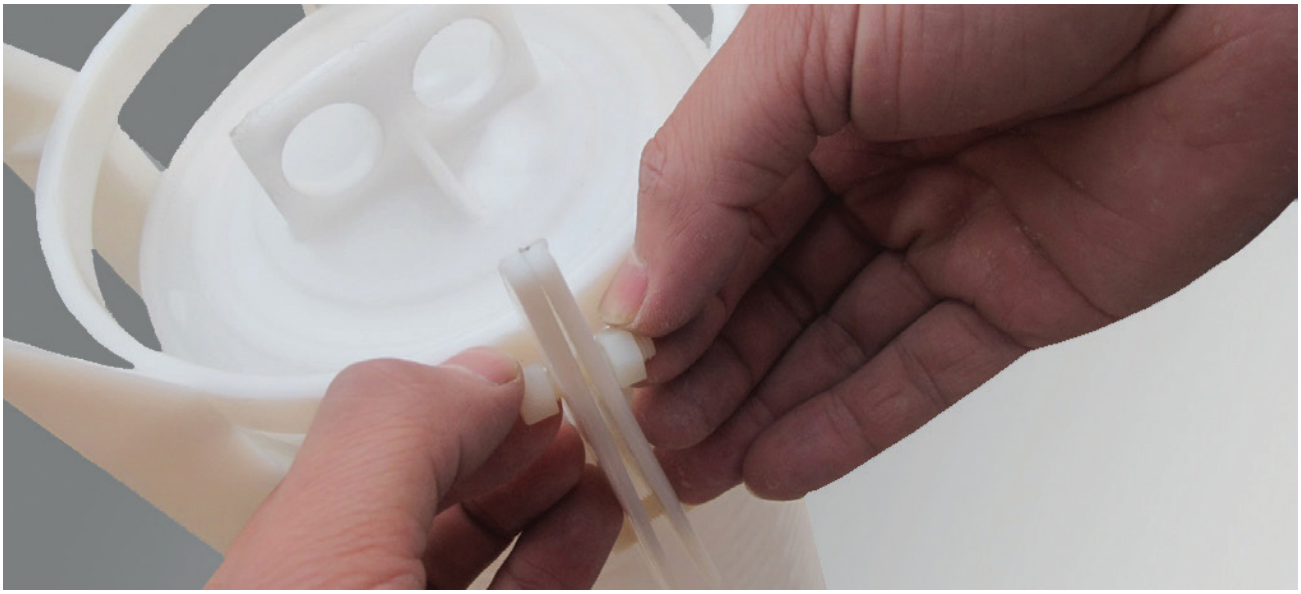
(2) Position the first locking segment so that the end section sits in the retaining groove and the screw aligns with the threaded openings in the end cap.

Use an M6 sized hex wrench to tighten the screw until tight.

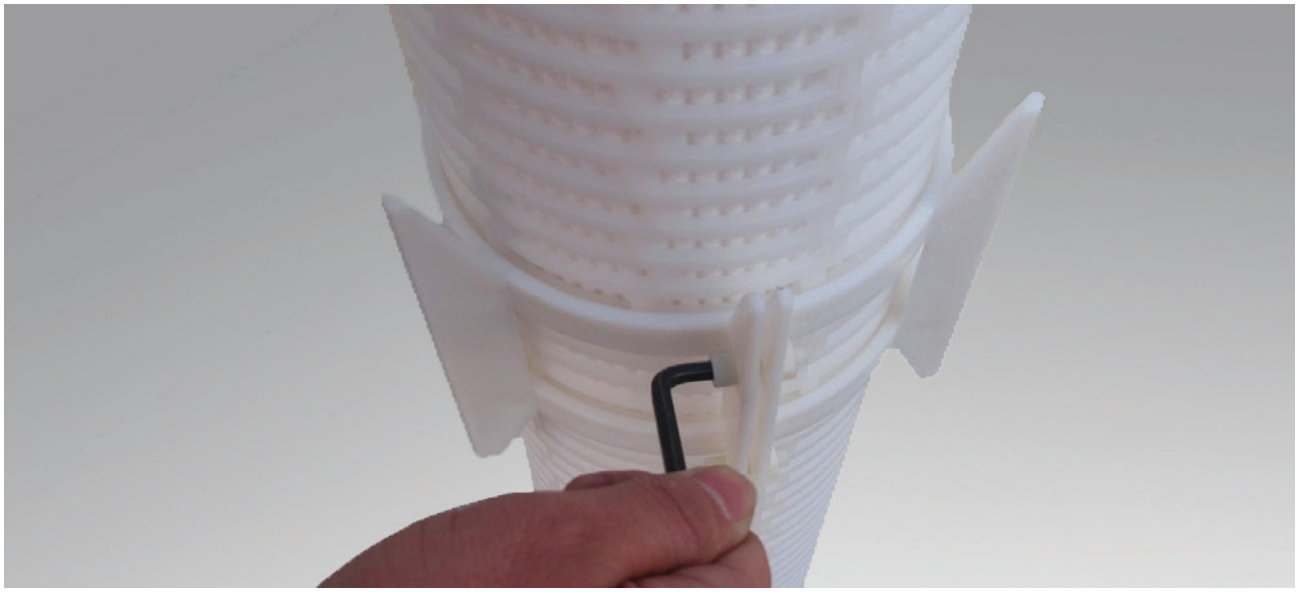


DO NOT overtighten - the maximum torque guideline is 10 Nm. Install the two other segments in the same manner. Conduct a final tightness check for each screw after all three segments are installed.

STEP 3 - Installing the Guiding Frame into the Cartridge Filters



Loosen the plastic screw of the Guiding Frame and slide it through the cartridge filter to the location indicated on the location guide.



Once the Guiding Frame is securely in place, tighten the plastic screws using a an M5 size hex key wrench.

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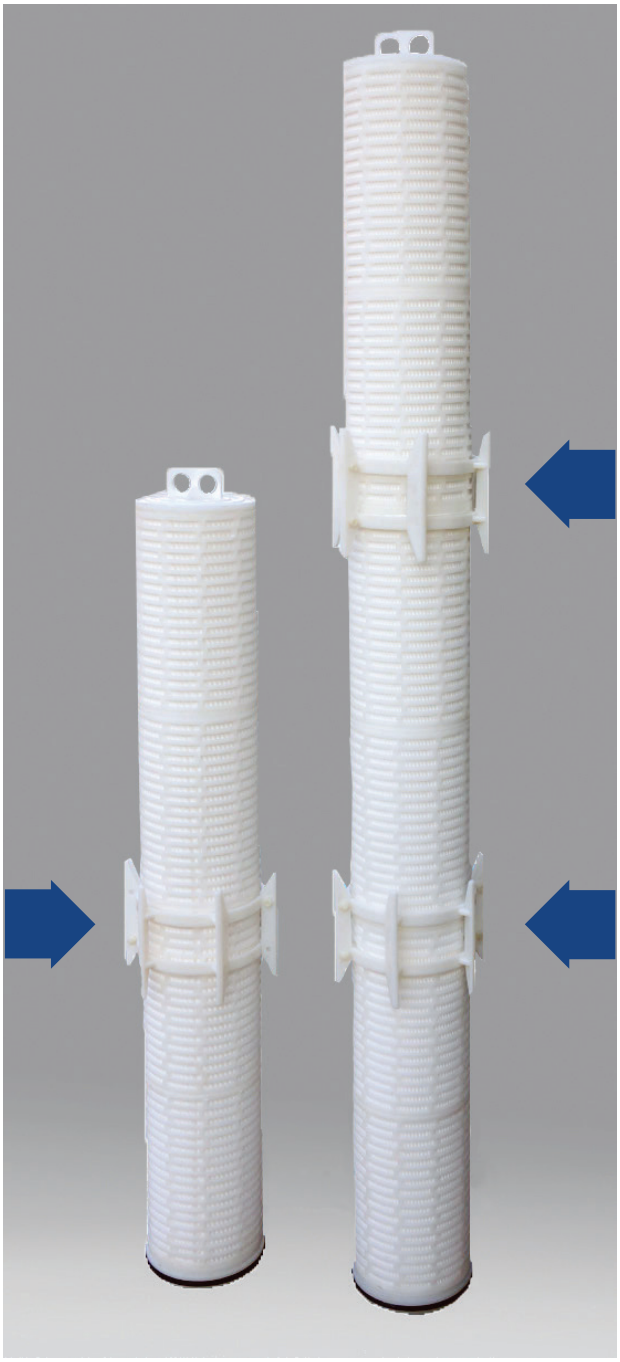
Guiding Frame Requirements & Location Guide



20" Cartridge filter

Does not require
the Guiding Frame

40" Cartridge filter

Requires one Guiding Frame
at the middle of the cartridge filter

60" Cartridge filter

Requires two Guiding frames
to be installed; at every third
of the length of the cartridge filter.

40'' 60'' Cartridge Length

STEP 4 - Installing the Cartridge Filters

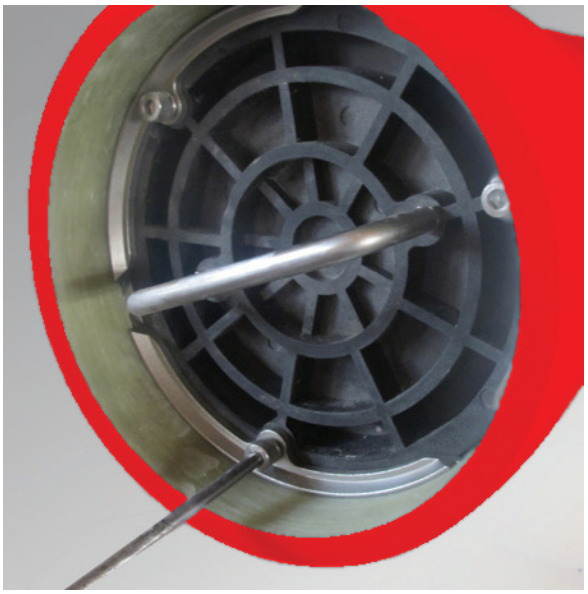
Place a small amount of the dishwashing liquid on the O-ring of the Cartridge filters.

Install the thrust ring on the finger insertion handle side of the cartridge filter and insert the assembled cartridge filter into the cartridge housing.

STEP 5 - Installing the End Cap

Use a rubber mallet and a block of wood (for even force dispersion) and gently tap the end cap into its engaged position. Be careful not to use the hamer directly on the end cap as this might cause damage to the end cap.

STEP 6 - Installing the Locking Kit Segments



Clean and dry the retaining groove. Position the first locking segment so that the end section sits in the retaining groove and the screw aligns with one of the threaded openings in the end cap.

Use an M6 hex wrench to tighten the screw until snug. Do not over-tighten — maximum torque guideline: 10Nm.

Install the two other segments in the same manner. Conduct a final tightness check of each screw after all three segments are installed.

STEP 7 - Connect the System Piping to the Inlet Side End Cap

STEP 8 - Conduct Pre-Pressurization Visual Inspection

A thorough pre-pressurization visual inspection should be conducted, to verify that the End caps are properly installed, system piping connections are in place, elements and adapters are installed, and the thrust ring is installed at Handle Cap side of the Housing.

STEP 9 - Pressurize System

STEP 10 - Inspect for Leaks

All connections should be free from leaks. Do not operate the system with a leaking cartridge housing.

REPLACING CARTRIDGE FILTER

STEP 1 - Shut Down the RO System and then Relieve the System Pressure

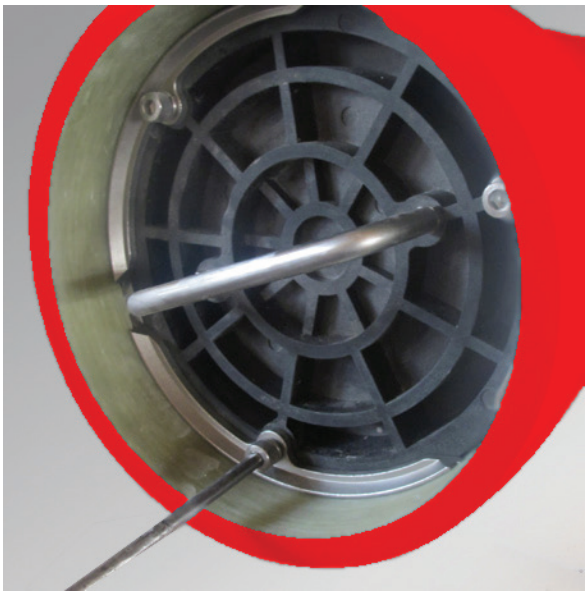
The RO system should be totally shut down and all pressure relieved before conducting any maintenance or repair on the housings.

STEP 2 - Disconnect the Locking Screws

Each of the three locking kit segments is held in place with a single locking screw. The locking screws can be unthreaded using an M6 hex wrench.

STEP 3 - Remove the Locking Kit Segment / Screw Assemblies

The locking kit segment/screw assemblies should be easily removed from the retaining groove. Should the assemblies be difficult to remove, it may be necessary



to rock the End Cap slightly or tap the End Cap inward ly using a rubber mallet. Be careful when using metal tools, avoid leveraging against the sidewall of the vessel or scratching the inside surface of the bell area.

STEP 4 - Remove the Cartridge Filter

Pull the cartridge filter using the finger handles at the end of the cartridge filter using your fingers. Continue to slide it out until it is free and clear of the cartridge housing.

TECHNICAL INFORMATION

Cartridge Filter Type

Inside to Outside Liquid Flow Direction that allows contamination to be captured inside the element

Cartridge Filter Recommended Operating Temperatures and Pressures

MAXIMUM WORKING TEMPERATURE	120 ° F (49 ° C)
MAXIMUM WORKING PRESSURE	50 psi

Actual operational parameters may vary depending on the fluid and filter compatibility, and may result in lower than recommended operational parameters, please contact a Piedmont technical service engineer for support.

Fluid discharge

All fluid in the cartridge housing must be drained before attempting to replace the cartridge filter.

Pressure Monitoring System

Differential pressure is a key factor that impacts the performance and operational life of cartridge filters. Pressure monitoring systems play an essential role in ensuring that cartridge filters operate within specified and safe operating pressures. These systems also of offers

additional advantages by maximizing efficiency and offering extended cartridge filter life. Monitoring set-ups may vary depending on industry applications. A typical monitoring set-up includes a pressure gauge at the pipeline on the INLET SIDE of the cartridge housing, additional monitoring systems include installation of pressure alarm devices and pressure limiting valves.

Temporary Reflux Device

Countercurrents (negative water flow) affects cartridge filter performance and may cause mechanical damage as they were designed to handle inside to outside liquid flow and not the other way around. As a preventive measure it is important to install temporary reflux devices such as valves at both the inlet and outlet side of the cartridge housing pipelines. This measure also allows easy access to individual filter cartridges, as it isolates them while allowing the entire RO system to remain operational during the maintenance process.

Extending Cartridge Filter Life

When operated properly, filter life may be extended, and dirt holding capacity will be higher.

- Ensure smooth flow rates while maintaining lower pressure
- During system operation avoid opening or closing the valve at high flow rates
- Use the configuration flow control to maintain a range of process parameters including monitoring inlet pressure fluctuation that causes flow instability.

O-ring information

O-ring inner seal material: EPDM, NBR, PTFE, Silicone Rubber, Nitrile Butadiene Rubber,

Cartridge Filter Replacement

Average filter life ranges from two to three months and dependent on different variables. Typically cartridge filters are affected by pressure or flow. It is highly recommended that actual must be lower than the recommended maximum pressure during the system process on-site, generally use a 35 PSI range when maximum pressure is 50 PSI.

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