



PART NO.  
40105-EN

**SPECIFICATIONS**

**SERVICE REQUIREMENTS:** Air Pressure: 80 PSI (5.5 bar) minimum, 120 PSI (8.2 bar) maximum, at 5 cfm (141.5 L/min).

**MATERIAL:** All welded, wetted materials are 316 Stainless Steel.

**CONNECTIONS:** Inlet & Outlet: 3" NPTE, Purge: 2" NPTI

**ELASTOMERS:** Viton® (VIT) or EPDM

**DESIGN PRESSURE:** Maximum working pressure: 150 PSI (10.3 bar), Minimum working pressure: 30 PSI (2.1 bar). Maximum differential pressure: 110 PSID (7.6 bar) for slotted and perforated elements, 50 PSID (3.4 bar) for defined pore elements.

**DESIGN TEMPERATURE:** Maximum working temperature: 180°F (82°C). Minimum working temperature (Orkot bearing): 28°F (-2.2°C). Minimum working temperature (Delrin bearing): 38°F (3.3°C).

**FILTER VOLUME:** Station volume: 11 gallons (41.6 L), Contaminant volume: 1.1 gallons (4 L).

**AIRBORNE NOISE EMISSIONS:** <70 dB(A) During normal operation.

**ACTUATOR VELOCITY LIMIT:** <50 cm/second; 30 cm/second recommended

**INSTALLATION INSTRUCTIONS**

- 1) Secure the filter unit frame legs to a foundation.
- 2) Attach the inlet and outlet connections to the interconnecting piping (customer supplied). To properly support the filter unit, mount the filter in the vertical position. Take care to avoid excessive nozzle loading at the filter connections. Consult your pump manufacturer's installation guide for the minimum pipe run length between the pump outlet and the inlet of the filter unit. NOTE: Isolation block valves (supplied by others) are required on all process connections of the filter unit so the filter can be isolated from the process liquid in the event that service is required. Pressure gauges (supplied by others) are also recommended before and after the filter.
- 3) Connect the purge line (customer supplied) to the filter unit's purge valve. To avoid restricting purge flow, the purge line should be: 1) the same or larger diameter as the purge valve size, 2) as short as possible, and 3) at or lower than the height of the purge valve.
- 4) Operate the filter actuator with air pressure within the service specifications; it is recommended that this is done at the maximum potential pressure supplied to the filter. Make adjustments to the solenoid flow controls (for units with Eaton supplied controls) or local air flow controls to ensure the actuator velocity is approximately 30 cm/second. The stroke length of this filter's actuator is 60 centimeters and a full stroke requires 2 seconds from start to finish

**INSTALLATION CHECKLIST**

Complete this checklist before operating the system:

- Verify that all process connections are secure and free of leaks.
- Element must be clean and free of damage. Top and bottom element seals must be properly installed. Proper element type must be used, as process requires. Confirm that the gasket sealing the lid to the filter housing is in good condition and properly installed.
- Verify that the cleaning disc can be activated manually and automatically if so equipped.
- Verify that the purge valve is operable and normally in the closed position for operation start-up.
- Check that the purge line is directed in a suitable fashion to accept waste when purged.

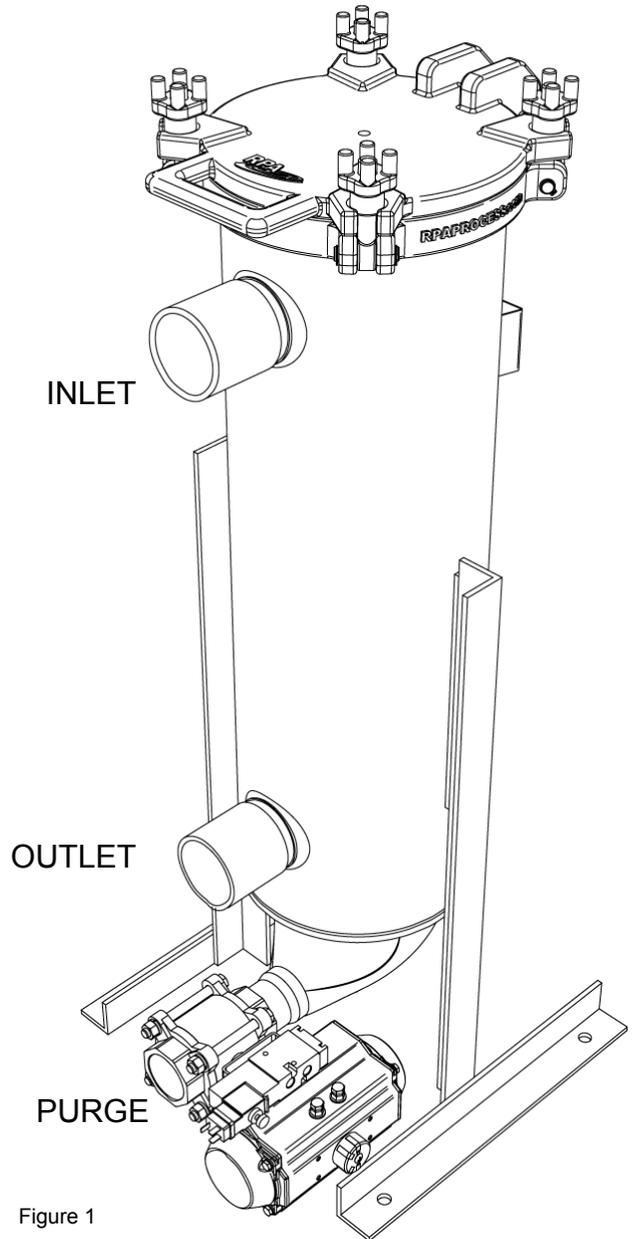


Figure 1

 <h2 style="margin: 0;">WARNING</h2> <p style="margin: 0;">Pressure vessel.</p>	
	<p><b>Maximum working pressure is:</b> <b>150 PSI (10.3 bar)</b></p>
	<p><b>Maximum differential pressure is:</b> <b>See design pressure above</b></p> <p>This unit is a pressure vessel. Extreme care must be taken when inspecting or servicing the equipment.</p>

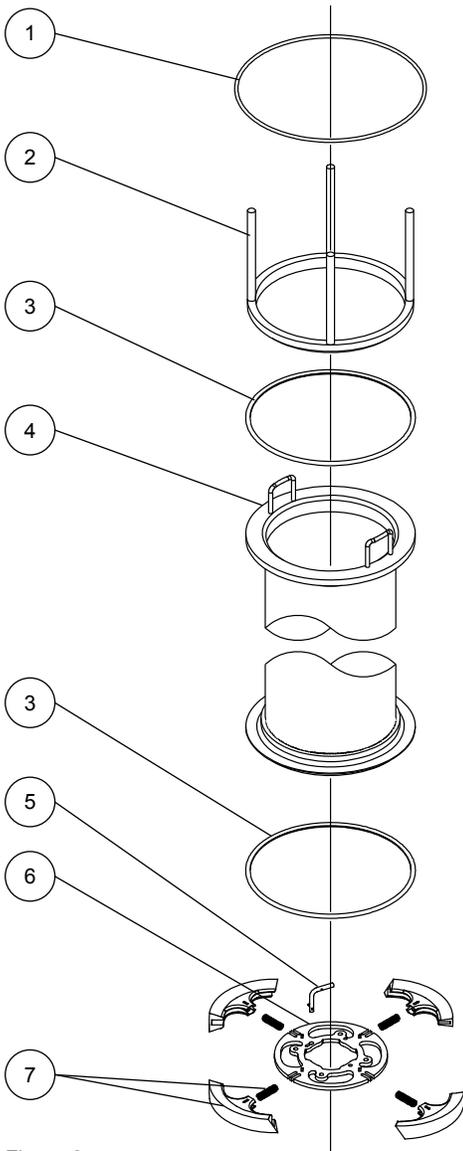


Figure 2

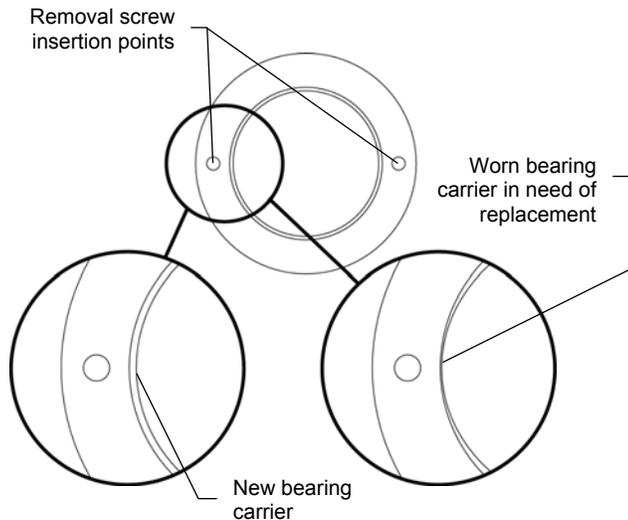


Figure 3

 <h2 style="margin: 0;">CAUTION</h2> <p style="margin: 0;">Magnetic Field.</p>		
	<p>Can be harmful to pacemaker wearers. Pacemaker wearers stay back 12 in. (30cm). Keep ferrous objects and materials that may be damaged by the magnetic field away from the filter. Take extra precautions when the filter is disassembled.</p>	
	<h2 style="margin: 0;">NOTICE</h2>	
	<p><b>Bearing life is severely reduced by operating the unit dry or without process fluid present.</b></p>	
	<h2 style="margin: 0;">NOTICE</h2>	
	<p><b>Do not exceed 180°F (82°C) normal operating temperature.</b></p>	
	<p><b>CAUTION: Do not backwash or operate the MCF-824 in any circumstance where flow can reverse between the inlet and outlet ports. Backwashing mechanically cleaned vessels may result in damage to the element and cleaning disc assemblies.</b></p>	

### OPERATION

- The MCF cleaning disc should stroke the element clean to keep the differential pressure between the inlet and outlet below 15 PSID (1.0 bar). **Stroking too frequently will shorten the life of all wear components.**
- The filter unit is supplied with a valve used to purge the contaminants from the housing. This valve should be opened before the collected contaminants exceed the purge volume and cause a differential pressure increase.
- If the filter element is removed from the unit for cleaning, avoid high-pressure washing from the inside of the element. This may force contaminants into the filter media and cause permanent blockage and/or element damage.
- Always pressurize the unit slowly on start-up and watch for any leakage. See COMMISSIONING PROCEDURE on page 3.

### OPERATION Continued

- The unit is equipped with a plug in the lid for the placement of overpressure vents, air connection/release or for filling the vessel with fluid.
- Monitoring of the differential pressure between the inlet and outlet pressures should be used to determine stroking and purging rates.
- Normal operation should exhibit low differential pressure that is maintained throughout.

### MAINTENANCE INSTRUCTIONS

See Table 1 for the filter unit maintenance schedule.

**Notice: The magnetic actuator must be handled carefully to avoid damaging or denting the cylinder tube.**

- 1) Isolate the unit from process fluids by closing the isolation valves to the unit.
- 2) Depressurize the unit by opening the purge valve.
- 3) Turn off unit and disconnect electrical power to the unit while the carrier is at the top of its stroke.
- 4) Open the lid by loosening the four castle nuts and swinging them out of the way. Clamp option: release the four clamps and swing them out of the way.
- 5) With the lid open, wash down the inside of the unit to remove all remaining process fluid.
- 6) Inspect the lid O-ring (item 1) and clean the O-ring groove of any debris.
- 7) Remove the element compression assembly (item 2) and upper element O-ring (item 3). Inspect O-ring for damage.
- 8) Blade removal instructions (item 7):
  - a. Inspect blades while in unit. Blade wear is indicated by pin location. See Figure 5. The cleaning blades should be replaced

- every six months to keep the filter in proper working order.
  - b. Removing retaining pin (item 5) from carrier.
  - c. Rotate cleaning assembly 45 degrees, corresponding to carrier.
  - d. Remove cleaning assembly (item 6).
  - e. Inspect blades (see Figure 5). If blades are in good condition, skip to step 10.
  - f. Remove blades by spreading and lifting past the retaining pin on the doctor plate.
  - g. Remove cleaning blade springs.
  - h. Clean doctor plate of any build up of process fluid.
- 9) Install new cleaning blades and springs (item 7).
    - a. Place a new spring over the post on the doctor plate.
    - b. Align blade with spring and slide blade onto plate until it slides over and catches the retaining pin.
    - c. After the four blades have been installed, compress each blade to ensure proper movement.
  - 10) Remove and inspect the filter element for damage.
  - 11) Clean the element from the outside. High pressure washing may damage the filter element.
  - 12) Remove and inspect the element O-ring. Clean and remove any debris from the bottom of the housing.
  - 13) Inspect the purge chamber to ensure it is clean and free of large debris.
  - 14) Inspect the actuator bearings (item 8) per Figure 3. Skip to step 16 if bearings are not worn. The bearings should be replaced every six months to keep the filter in proper working order.
  - 15) To replace the bearings, the actuator must be removed from the filter.
    - a. Shut off air supply to unit.
    - b. Label and mark the position of the air lines on the bottom of the actuator. Disconnect the air lines.
    - c. Pull the pin from the bottom of the actuator.
    - d. Pull the actuator out of the unit from the top.
      - If the actuator seems stuck, avoid excessive rocking when trying to remove it.
      - DO NOT place the actuator near ferrous materials.
    - e. Slide the carrier (item 9) to the top of the actuator (opposite the ported end).
      - DO NOT remove both bearings simultaneously. Severe damage to the actuator will occur.
    - f. Remove the snap ring retaining the upper bearing.
    - g. Thread the supplied screws into the two holes in the bearing and pull the bearing out of the carrier. The bearing holding block may remain inside the carrier. If this happens, inspect and replace if necessary. DO NOT stack holding blocks.
    - h. Insert the new bearing, and replace the snap ring.
    - i. Slide the carrier to the bottom (ported end) of the actuator.
    - j. Remove the snap ring retaining the lower bearing.
    - k. Thread the supplied screws into the two holes in the bearing and pull the bearing out of the carrier. The bearing holding block may remain inside the carrier. If this happens, inspect and replace if necessary. DO NOT stack holding blocks.
    - l. Insert the new bearing, and replace the snap ring.
    - m. Inspect the O-ring at the bottom of the actuator (item 10) and replace if necessary.
    - n. Re-install the actuator. Lower the actuator (ported end down) into the filter and through the opening in the bottom cone.
    - o. Insert the pin at the bottom of the actuator.
    - p. Re-attach the air lines to the actuator.
  - 16) Place the lower element O-ring (item 3) in the bottom of the housing, making sure it's laying flat.
  - 17) Lower the element into the filter until it is resting on the bottom O-ring. The element handles should be away from the filter inlet.
  - 18) Place the cleaning assembly onto the carrier by compressing the blades and sliding the cleaning assembly down into the element.
  - 19) Rotate the cleaning assembly 45 degrees and replace the retaining pin.
  - 20) Place the upper element O-ring (item 3) on top of the element, making sure it's laying flat.
  - 21) Place the compressor assembly (item 2) onto the element O-ring. Make sure the compressor assembly doesn't block the inlet.
  - 22) Place the lid O-ring into the groove, making sure it's laying flat.
  - 23) Close the lid and secure the four clamps. Rotate the swing bolts up and tighten the castle nuts down to the lid. Swing bolt option: Use the finger tab to hold the clamp arm in place while tightening. See QUICK CLAMP OPTION ADJUSTMENT below.
  - 24) Reconnect the electrical service and air to the unit. When the air supply is returned to the unit, the carrier assembly will return to the top of the unit. If it does not, the air lines must be reversed.

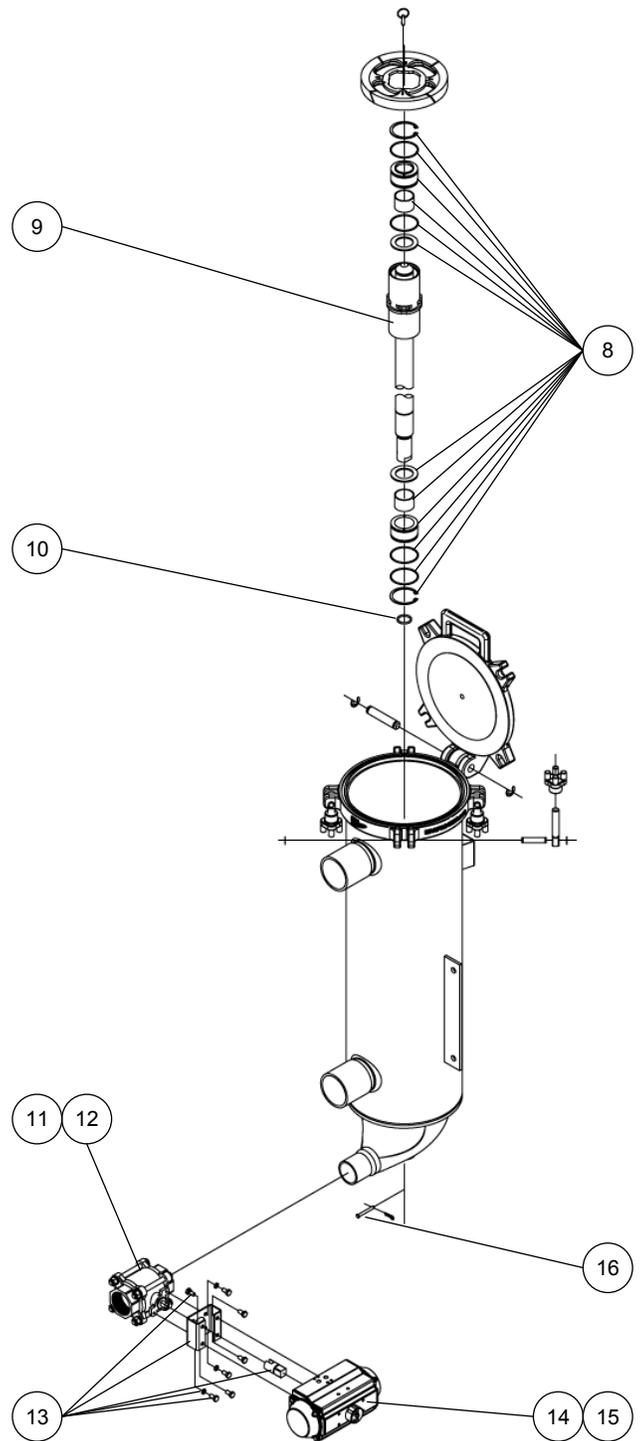


Figure 4

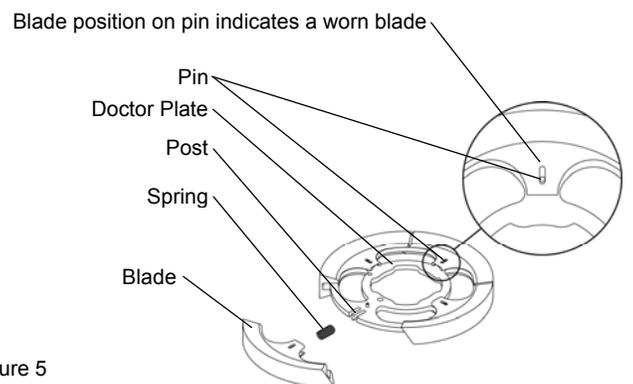


Figure 5

**TABLE 1 - MAINTENANCE**

description	daily	weekly	monthly	yearly
<p><b>Inspect for leakage around the actuator shaft seal (bottom of housing).</b> Replace the inner O-ring when leaking occurs.</p>		●		
<p><b>Inspect the cleaning disc for excessive wear.</b> Remove the cleaning assembly and inspect the blades (item 7).</p>		●		
<p><b>Inspect the inside of the filter element for excessive wear.</b> Remove the cleaning assembly and inspect the inside of the filter element. The lid seal (item 1) should be replaced to maintain a proper seal. If the element is removed from the housing, the seals (item 3) should be replaced to maintain a proper seal. Over time, gaskets will take on a permanent "set".</p>			●	
<p><b>Inspect the actuator assembly.</b> Confirm the actuator operating velocity is at the recommended value of 30 cm / second. When the actuator is beginning to fail, the differential pressure will rise. This occurs because the actuator cannot sufficiently move the cleaning assembly. To check carrier movement, grasp the bottom portion of the actuator. You can feel when the piston hits the top and bottom of its stroke. An early indicator of failure may be large bands at the top and bottom of the element where it's not being cleaned. If this occurs, the actuator has reached the end of its useful life and must be replaced (item 9).</p>			●	
<p>Frequency of inspection is at the discretion of the customer and may need to be increased or decreased accordingly. The wear of certain items depends on how often the filter is used and the abrasiveness of the product being filtered.</p>				

**COMMISSIONING PROCEDURE**

- 1) Inspect the piping connections to the filter. Verify that the inlet connection on the filter is connected to the inlet side on the process fluid. Repeat this procedure for the outlet and purge headers.
- 2) All isolation valves to the filter should be closed. If there is a bypass loop around the filter, that loop should be closed to prevent back flushing dirty process fluid into the filter.
- 3) Open the isolation valve for the outlet piping.
- 4) Turn the power to the filter system ON.
- 5) Ensure the actuator is operating at the recommended stroke velocity of 30 cm/second and adjust as necessary before introducing flow to the filter.
- 6) Open the inlet isolation valve to allow approximately 25% of the flow to reach the filter.  
**WARNING: Opening the inlet valve to the fully open position without proper ramping will cause the particles to become wedged into the filter media. If this happens, the filter media will have to be removed and cleaned manually.**
- 7) Over the next ½ hour, slowly introduce more of the flow until you reach 100%. You may want to manually initiate a purge during this time to ensure that piping debris is cleaned from the unit.

**QUICK CLAMP ADJUSTMENT**

The clamping force of the four lid clamps is adjustable. If you experience leaking related to the lid O-ring, the clamps will need to be adjusted. Tighten all clamp nuts evenly (¼ turn or ½ turn at a time).

**TROUBLESHOOTING**

Problem	Possible Solution
The actuator does not make the full stroke (contaminant remains at the top and bottom of the element).	Timers may need adjustment (if timer controlled).
	Actuator may have reached its service life (failed internals).
	Actuator bearing is completely worn and needs to be replaced.
	Confirm the actuator operating velocity is at the recommended value of 30 cm / second.
Leaking around the lid.	Temperature is too low: below 28 °F for Orkot or 38 °F Delrin.
	Lid O-ring is damaged or missing.
Leaking from the bottom of the unit.	Clamps or castle nuts need to be tightened.
	Actuator retaining O-ring is damaged or missing.
Element is being bypassed.	Damaged or missing O-rings.
	Improperly seated/compressed element O-rings.
Experiencing high differential pressure.	Worn cleaning disc blades.
	Cleaning cycle needs to be adjusted (not making a full stroke).
	Actuator may have reached its service life (failed internals).
The actuator is not at the top of the filter when switched off.	Switch (reverse) the air lines to the actuator.

**TABLE 2 – REPLACEMENT PARTS**

Ref	Part Number	Description
1	40140-EPT	O-RING, LID MCF EPDM
	40140-VIT	O-RING, LID MCF VITON
2	40626	COMPRESSOR ASSY DCF-1600 316SS
3	42627	O-RING, ELMT DCF-1600 EPT
	42626	O-RING, ELMT DCF-1600 VIT
4	*VARIES*	ELEMENT
5	40186	PIN, RETAINING FOR DISC MCF
6	40117	PLATE, 4 BLADE CLN DISC MCF
7	40116-DEL	KIT, DISC REPAIR MCF DELRIN
8	40148	KIT, BEARING REPAIR MCF VITON
	40149	KIT, BEARING REPAIR MCF EPT
	RPS0000012	BEARING KIT, MCF ACT RIFLED
9	40106	ACTUATOR, MAGNETIC ASSY VIT
	40170	ACTUATOR, MAGNETIC ASSY EPT
	40179	ACTUATOR, 180 MAG W/DELRIN
10	40126-EPD	O-RING, ACT RETAINING MCF EPDM
	40126-VIT	O-RING, ACT RETAINING MCF VIT
11	41009	VALVE, B 2" F/PT 3PC THD PARKER
12	41006	KIT, REPAIR 2.0" 2W BV PARKER
13	42756	KIT, 2" PURGE HARDWARE
14	45475	ACT. ROTARY, JAMESBURY DCF
15	60179	KIT, REPAIR FOR ACTUATOR
16	40144	PIN, CLEVIS AND HAIRPIN MCF
		An assembly of items 5, 7 and 8
	40172	KIT, MCF WEAR PARTS VIT ACT.
	40173	KIT, MCF WEAR PARTS EPT ACT.

**WARRANTY**

All products manufactured by Seller are warranted against defects in material and workmanship under normal use and service for which such products were designed for a period of eighteen (18) months after shipment from our factory or twelve (12) months after start up, whichever comes first. OUR SOLE OBLIGATION UNDER THIS WARRANTY IS TO REPAIR OR REPLACE, AT OUR OPTION, ANY PRODUCT OR ANY PARTS OR PARTS THEREOF FOUND TO BE DEFECTIVE. SELLER MAKES NO OTHER REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE SHALL NOT BE LIABLE FOR CARTAGE, LABOR, CONSEQUENTIAL DAMAGES OR CONTINGENT LIABILITIES. OUR MAXIMUM LIABILITY SHALL NOT IN ANY EVENT EXCEED THE CONTRACT PRICE FOR THE PRODUCT.

If you are interested in ordering spare parts or having service performed on your filter, please contact **Customer Service**.

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