

HydraGuard™ 10” UltraFilter - Flush, Instructions for Use

INTRODUCTION

Information on this sheet must be read before the use of this device to ensure safe and effective operation.

Recommended Storage: Between 5 and 35°C (41 and 95°F).

INDICATIONS

Description: The HydraGuard 10” UltraFilter - Flush is a hollow fiber ultrafilter that retains bacteria, viruses, and endotoxin from water.

Indications for Use: The HydraGuard 10” UltraFilter - Flush is intended to be used to filter EPA quality drinking water. The filter retains bacteria, viruses and endotoxin. By providing ultrapure water for patient washing and drinking, the filter aids in infection control. The filter produces water that is suitable for patient wound cleansing, cleaning of equipment used in medical procedures and washing of surgeon’s hands. The filter is not intended to provide water that can be used as a substitute for USP sterile water.

Use Life: The device is intended for long term continuous use. Once it completes its useful life, the filter should be replaced and discarded. Do not attempt to sterilize or reuse it.

CONTRAINDICATIONS

Chemical: The HydraGuard 10” UltraFilter - Flush retains biological contaminants. To obtain chemically pure water it is necessary to use the filter in conjunction with other devices such as DI beds or RO systems.

WARNINGS & PRECAUTIONS

Pressure & Temperature: The HydraGuard 10” UltraFilter - Flush is intended for a maximum incoming water pressure of 60 psi (4 bar) and a maximum incoming temperature of 27°C (80°F).

Cyclic Use: The HydraGuard 10” UltraFilter - Flush is designed to achieve a maximum of 6,000 on/off cycles.

Replacement: The filter should be replaced when the flow rate begins to noticeably decrease. It is recommended to establish a maintenance schedule of replacing the filter at least every 12 months dependent on water quality.

Water Monitoring: After installation of the HydraGuard 10” UltraFilter - Flush, periodic monitoring of the water is recommended. Water quality is dictated by the intended use and should be established and monitored by the facilities engineer. Nephros is available to assist with establishing guidelines and acceptance criteria as needed.

FILTER INSTALLATION & REMOVAL

New Install: If this is the first time any reusable cartridge type filter is being installed in a location (i.e. there are no cartridge housings in place), please refer to the second page of these instructions for installation guidance before proceeding with the instructions below.

Note: Prior to handling a new filter, wash hands and wear disposable gloves.

- Turn off the water source upstream of the filter and vent any excess pressure from the housing via its bleed valve or flush port valve.
- Remove both the housing bowl/cover and the old filter. Open a new filter blister pack and aseptically remove the filter.
- Insert one end of the filter into the head of the housing cap. It may be necessary to use a twisting motion to ensure that the filter is firmly in place and the O-rings seat properly. Re-attach the housing bowl/cover, to the housing cap.
- Open the flush port valve and the upstream water source to prime the new filter.
- Close the flush port valve after 20-30 seconds, and continue to prime the filter for 5 minutes to purge it of trapped air (if the

housing has a bleed valve, open it at the same time to assist purging).

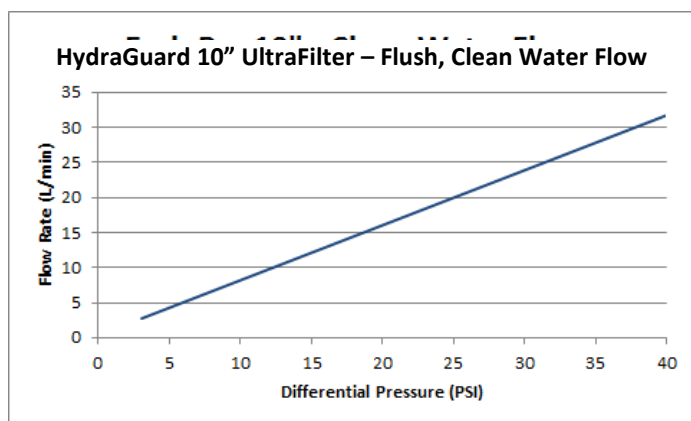
- Close the outlet test valve (and bleed valves if present) and verify there are no leaks.

OPERATION

After a new HydraGuard 10” UltraFilter - Flush is installed, water should be run through the filter for approximately 5 minutes to purge it of trapped air. The pressure drop across the HydraGuard 10” UltraFilter - Flush generally reduces the flow rate by about 10-20% of the rate without a filter. The HydraGuard 10” UltraFilter - Flush is designed with a flush capability for periodic filter flushing. The filter should operate for up to 12 months of normal use with minimal degradation in flow (dependent on water quality and flush frequency). If the flow rate degrades significantly, the filter should be replaced.

INTEGRITY TESTING

- The filter integrity can be verified with a pressure holding test after the filter has been properly primed and there are no connection leaks.
- Turn off the water source and open the inlet test valve to bleed off any residual pressure.
- Connect an air source (compressed air or air pump) to the inlet test port as shown in *Housing and Filter Installation Example*. Note that a pressure gauge must be installed to monitor the inlet filter pressure to carry out this test.
- Open both test valves, and pressurize the filter inlet; ensure the outlet test port is venting. Raise the air pressure to 15 psi at the filter inlet and allow water to exit from the outlet test port. Do not exceed 30 psi to prevent damage to the filter membrane.
- When water stops coming out from the outlet test port close the outlet test valve and check for external leaks (via pressure gauge).
- Open the outlet test valve and re-pressurize as necessary to reach 15 psi at the filter inlet.
- With the outlet test valve open, close the inlet test valve and allow the pressure to stabilize for 5 to 10 seconds.
- Monitor the pressure gauge and determine the pressure drop for a period of 1 minute.
- If the pressure drops by more than 1 psi over a minute, check for leaks and repeat the test to confirm. If the filter fails, it must be replaced.
- Close the outlet test valve and remove air source. Open water source valve and re-prime filter to return to operation.



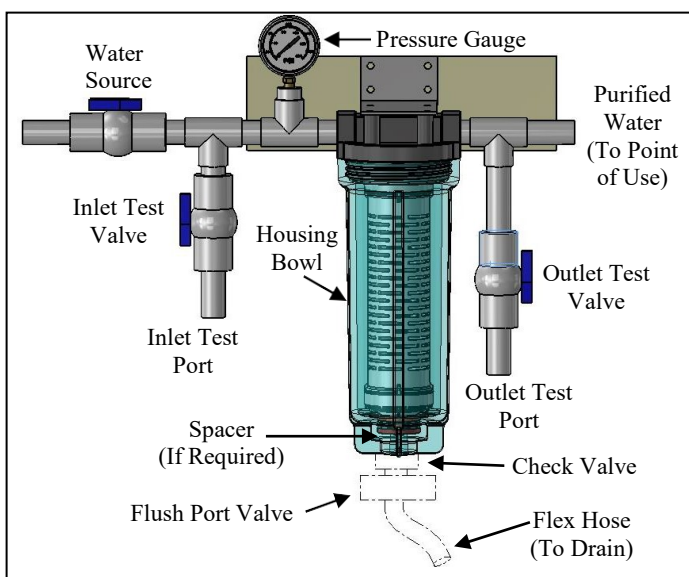
HydraGuard™ 10" UltraFilter - Flush, Instructions for Use

Specifications	HydraGuard 10" UltraFilter - Flush
Max Inlet Pressure	60 psi (4 bar)
Max Inlet Temperature	27°C (80°F)
Max # On/Off Cycles	6,000
<u>Filter Membrane¹</u>	Medisulfone®
Material	Polysulfone
MW cut-off	15 kDa
Bacterial Retention	> 10 ¹¹ (B. diminuta)
Virus Retention	>10 ⁸ (PhiX-174)
Endotoxin Retention	> 10 ⁵ EU/ml
Expected Life ²	Up to 12 months

¹Medisulfone® is a registered trademark of Medica S.p.A.

²Expected life based on daily flush frequency (dependent on water quality).

Housing and Filter Installation Diagram



HOUSING INSTALLATION

If no cartridge filter housing is currently installed, the initial installation of the HydraGuard-F 10" UltraFilter requires tapping into an existing section of the distribution line between the water source and the equipment and plumbing a siphon resistant drain line, which includes a flush valve, between the flush port of the filter housing and an existing drain. This can be accomplished with a back-flow prevention device (eg. check valve) or maintaining a suitable air gap between the outlet of this line and drain.

It is recommended to incorporate a segment of flexible hose downstream of the flush valve to enable easy removal of the housing bowl for replacing the filter cartridge. Contact Nephros for additional support with housings and install components.

A typical installation of a HydraGuard-F 10" UltraFilter with cartridge housing is shown in the *Housing and Filter Installation Diagram*.

Note: HydraGuard 10" UltraFilter - Flush is only to be installed in reusable flushable cartridge filter housing that are rated to at least 100 psi working pressure and comply with NSF/ANSI Standard 42/61 for material (or made from pure polypropylene with no fillers, colorants, plasticizers or lubricants) and accept 10" 222 O-ring head cartridge filters.

Note: Ensure that the top cap of the housing is oriented such that the inlet flow is delivered to the center (ring section) of the cap and the outlet flow comes from the bowl space as some commercial housings may have reversed inlet/outlet labeling on housing cap). A spacer may be required for longer housings to properly seat the O-rings (contact Nephros for acceptable spacers).

HOUSING AND PLUMBING DISINFECTION

In cases where a HydraGuard 10" UltraFilter - Flush housing is being installed for the first time or the filter is being replaced, it is recommended to disinfect the cartridge housing and downstream plumbing (faucet, equipment, etc.). This applies whether it is a new housing recently installed or an existing housing that may have contained another cartridge type filter.

Note: Disinfection should be performed with a diluted 1:100 bleach/water solution. Use personal protective equipment (gloves, lab coat, glasses, etc.) when handling the disinfectant, filter and housing to decrease any chances of contaminating the water system.

Note: Prior to handling a new filter, wash hands and wear disposable gloves.

- Turn off water source upstream of the housing and vent any excess pressure from the housing via its bleed valve (if present) or outlet test valve.
- Remove the housing bowl & used filter cartridge and empty water.
- Aseptically remove a new filter from its packaging and install the O-ring end into the top cap of the filter housing.
- Ensure that the flush port valve is closed.
- Fill the housing bowl with 0.5 Liters of a fresh bleach solution prepared as a 1:100 dilution of standard bleach (8.25%) per the manufacturer's instructions.
- Carefully re-assemble the housing bowl containing the bleach solution to the top cap and tighten. Be careful to avoid spillage of the bleach solution.
- Open the upstream water source.
- Slowly open the downstream valve on the equipment or faucet to purge air out of the housing and until disinfectant is observed to be flowing through the system using a chlorine test strip. Close the downstream valve.
- Slowly open the outlet test port valve and confirm the presence of bleach with a chlorine test strip. Close the outlet test valve.
- Allow the disinfectant to dwell for a minimum of 10 minutes, but no more than 30 minutes. Any longer could damage internal components of the equipment or faucet.
- Open the downstream valve and allow water to flush the disinfectant out of the filter housing and the downstream plumbing. To effectively rinse bleach from the filter housing, the flow rate should be at least 10 L/min (2.6 GPM) for 5 minutes.
- Open the flush port valve for approximately 30 seconds to flush disinfectant from the flush port.
- Open the outlet test valve for approximately 30 seconds to flush disinfectant from the outlet test port.
- Test the downstream water to ensure low residual disinfectant levels relative to the inlet water chlorine levels. **If residual level is too high, repeat rinsing steps above until acceptable results are obtained.**

Note: To determine that the chlorine residuals have been effectively removed from the rinse water, Nephros recommends using Serim® Guardian Residual Chlorine Test Strips, 5100A. Follow all instructions from the manufacturer to obtain proper results.

Manufacturer:

Nephros Inc., 380 Lackawanna Place, South Orange, NJ 07079 USA · 833-NEPHROS