LEGIONELLA & PATHOGEN CONTROL MADE SIMPLE

Water Control offers several High-Capacity Ultrafiltration (HUF™) tools in the fight to control Legionella and pathogen levels in building water systems. Our HUF™ systems filter out nearly ALL bacteria, parasites, viruses, and nutrient particulates, with minimal pressure loss. This keeps systems clean, reducing biofilms, fouling, corrosion, and risk of disease outbreak.

HOW IT WORKS: High-Capacity Ultrafiltration (HUF™) utilizes hollow-fiber membrane technology to catch and remove virtually ANY non-dissolved particulates from flowing water, including (but not limited to) bacteria, protozoans, viruses, and biological nutrients. The filters are comprised of hundreds of tiny ‘straw-like’ membranes. Raw water enters via the ‘straw’ end. Each membrane has millions of microscopic pores along its surface. The pores are so tiny that water and disinfectants flow through freely, yet microorganisms and other suspended solids remain trapped inside. System controls continuously monitor flow rate vs pressure loss. When the membranes begin to foul (and lose their permeability), a drain valve is opened at the opposite ‘straw’ end. Water flows out to drain at high-velocity, carrying away the particulates. The membranes are clean and the system goes back into service.

Features:
- >99.999% bacterial, protozoan, and sediment reduction. >99.99% viral reduction (third party verified)
- <0.02μ absolute filtration
- Flow-through filter design (no constant waste stream) with minimal pressure loss
- Dissolved substances remain in water (disinfectants, minerals, etc.)
- Long membrane life (10+ year typical) with EPA-compliant integrity verification system (included)

System and accessory characteristics (including dimensions) are subject to change without notification.
**Standard System Dimensions:**

**Phoenix GT-Systems**

- **Virex Pro**
  - Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
  - Membrane potting material: Polyurethane
  - Membrane housings: UPVC
  - System piping: Sch. 80 PVC (std), 304 SS (optional)
  - Skid base: 304 stainless steel

- **Phoenix GT-1**
  - Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
  - Membrane potting material: Polyurethane
  - Membrane housings: UPVC
  - System piping: Sch. 80 PVC (std), 304 SS (optional)
  - Skid base: 304 stainless steel

- **Phoenix GT-2**
  - Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
  - Membrane potting material: Polyurethane
  - Membrane housings: UPVC
  - System piping: Sch. 80 PVC (std), 304 SS (optional)
  - Skid base: 304 stainless steel

- **Phoenix GT-3**
  - Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
  - Membrane potting material: Polyurethane
  - Membrane housings: UPVC
  - System piping: Sch. 80 PVC (std), 304 SS (optional)
  - Skid base: 304 stainless steel

- **Phoenix GT-4**
  - Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
  - Membrane potting material: Polyurethane
  - Membrane housings: UPVC
  - System piping: Sch. 80 PVC (std), 304 SS (optional)
  - Skid base: 304 stainless steel

**Operating Parameters**

- **Min/Max Water Temp**: 39°F / 104°F
- **Min/Max Room Temp**: 34°F / 104°F
- **Max Inlet Pressure**: 73 PSI
- **Max ∆P Across Membrane**: 36 PSID
- **Chlorine Tolerance**: 200,000 PPM hours
- **Max Chlorine Concentration**: 200 PPM
- **Required Pre-Filtration**: 100μ
- **Electrical Requirements**: 120V, 60 Hz, 7FLA

**Materials of Construction:**

- Membranes: Modified polyethersulfone (PES) (hydrophilic, no plasticisers)
- Membrane potting material: Polyurethane
- Membrane housings: UPVC
- System piping: Sch. 80 PVC (std), 304 SS (optional)
- Skid base: 304 stainless steel

**ALL WETTED COMPONENTS ARE NSF/ANSI 61 COMPLIANT**
**POINT-OF-ENTRY SYSTEMS: Additional Components**

**100 Micron Pre-Filter Assemblies (Included):**
All Point-of-Entry HUF™ systems include a required 100 micron pre-filter assembly (field installed) for membrane protection. 2 housings are provided for redundancy. Contractor to install in parallel, with isolation valves on each housing. Inlet/outlet pressure gauges recommended.

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<th>Pre-Filter Assembly Dimensions &amp; Weights</th>
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In challenging water applications, additional pre-treatment may be required. Automatic backwashing filters also available (please inquire).

**Hydropneumatic Tanks (Quoted Separately):**
Water Control recommends Wessels TXA Series™ (or comparable) full-acceptance expansion tanks with flow-through connections for prevention of stagnant water. Multiple tanks to be piped in reverse-return. Recommended dry-tank air charge: street pressure less 20 PSI.

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Optional Filtered Bypass Assemblies:
Bypass kits (field installed) include 24V motorized (NO) valve, controller, inline check valves (x2), inline isolation ball valves (x2), filter housings, and double-pleated electropositive cartridge filters (99.99% bacterial removal, 6-month intermittent/up to 10-day continuous use). Contractor to install in series for redundancy.

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<td>HUF-BP-196</td>
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POINT-OF-ENTRY SYSTEMS: Additional Features

Automatic Membrane Integrity Test:
A key feature of Water Control’s Point-of-Entry HUF™ systems is the ability to automatically verify membrane integrity. Using a small, integral compressor, air pressure is applied to the filtrate (outlet) side of the hollow-fiber membranes. Air pressure loss is monitored for 25 minutes. We use a complex algorithm, per the USEPA Membrane Filtration Guidance Manual, to verify that membranes are intact – and high-log removal of microorganisms and nutrients is occurring. This process is compliant with the strict requirements of the USEPA’s LT2 “Enhanced Surface Water Treatment Rules”. If membranes are compromised (normally after 10+ years with ‘typical-quality’ city water), an alarm actuates, and flow can be stopped. Membrane Integrity Testing is normally initiated automatically, during off-peak hours (typically monthly in commercial building applications). NOTE: Membrane Integrity testing lasts 25 minutes. During this period, filtrate valves are closed – and water flow is stopped. Options for providing water to the facility during these periods include hydropneumatic tank storage, redundant Point-of-Entry systems, or one of Water Control’s Temporary Electropositive Bypass Assemblies, which provide up to 10 days of purified water between filter changes (dependent on incoming water quality).

Programmable Logic Controller (PLC):
Every Point-of-Entry HUF™ system includes a standard PLC with lighted LCD display screen and LED light bar, indicating current membrane permeability status. From the control panel, users can access the following:
- View current mode, GPM flow rate, and PSID
- Initiate a membrane flush or Integrity Test
- Manually cycle individual valves, air compressor, and powered accessories
- View and reset system alarms
- Cycle system into Standby Mode (system OFF, but flushes to maintain clean membranes)

A laptop computer with USB connection to the PLC provides advanced setup, control, and monitoring options, including a 3-month datalog of operating parameters (PC laptop, pre-loaded with software drivers, is included with system).

Connectivity Kit:
Systems come standard with an I/O panel for analog and digital inputs/outputs, as well as power to external accessories such as chemical dosing pumps and turbidity monitors. Available inputs/outputs include:
- Turbidity sensor signal in (4-20 mA)
- Powered (12 VDC) general alarm output
- GPM flow rate signal out (4-20mA)
- Dry contact general alarm output
- Chemical feed pump power (120VAC, 16 amp max)
- Inlet booster pump run signal (120VAC to external relay)
- Remote “alert” 12VDC input (used to enable/disable filtration)

External Communication:
Optional gateway hardware is available for BUS integration into Building Automation Systems (Modbus/ BACnet). System may also be accessed over the internet, with the addition of an active SIM card into the integral GPRS modem. Contact Water Control for more details on these features.
**POINT-OF-ENTRY SYSTEMS: Required Maintenance**

Water Control’s Point-of-Entry HUF™ systems require significantly less maintenance than other pathogen control methods. Recommended schedules for ensuring optimal performance are:

- **Flush/disinfect membranes**: Upon installation/replacement
  - New building: Every 36 months
  - Existing building: Every 6-12 months
- **Membrane Integrity Test (automated)**: Every month
- **Replacement of pre-filters**: 2-6 months (dependent on water quality)
- **Replacement of optional Bypass Assembly filters**: 6 months (or post-event)
- **Calibration of pressure sensors**: Annually
- **Replacement of membranes**: Upon failure of Integrity Test (typically 10+ years)

**OTHER AVAILABLE HUF™ SYSTEMS:**

- **Point-of-Use**
  Clean water to fixtures, cooling tower feed, humidification, misters, decorative fountains, etc.
- **Hot Water Recirculation Treatment**
  Use your recirc system for 24-7 Legionella filtration!

**THE WATER CONTROL DIFFERENCE**

- Easy-to-use system design questionnaires
- 3D (Revit®) renditions for every system
- Custom AIA® format specifications
- Detailed project submittals
- Project-specific installation diagrams
- Intuitive, adaptable controls
- Large network of local representatives and service agents

**TO GET STARTED** with your High-Capacity Ultrafiltration application, download a system design questionnaire at www.watercontrolinc.com.