



## Commercial/Industrial Water Treatment Plant

### Seccua X-Spot Pro, Virex Pro and Phoenix Ultra Filtration Water Treatment Units

Ultra Filtration (UF) is a low pressure-driven, membrane-based separation process whose characteristics fall between those of Nano Filtration and Micro Filtration. Ultra Filtration membranes were first introduced during the late 1970s, for water filtration and purification. Research has increased rapidly, leading to the development of innovative materials, advanced properties, and an increased number of applications for Ultra Filtration.

The X-Spot Pro®, Virex Pro® and Phoenix® UF systems from Seccua are ideally suited to fully remove turbidity and pathogens from any source of water without leaving any residues downstream.

All Seccua UF systems use only membranes with certified and tested removal characteristics regarding pathogens and achieve removal rates for virus greater than 99.99% and bacteria or parasites/cysts greater than 99.9999%.

To ensure those removal rates long term, both the Virex as well as the Phoenix systems are equipped with a state-of-the-art membrane integrity test. This test has proven - under supervision of the California Department of Health Services – to find even the smallest defects in the membranes and to reliably deliver information about the membranes' integrity to the operator.

The filtration capacity of the Seccua Systems depends upon:

- a) the active membrane surface area selected
- b) the flux rate (flow-rate per surface area supplied).



The Phoenix UF unit with dual housings.

Unit type	Membrane Surface Area	Fluxrate long term	Fluxrate peak load, short term - max.
Virex Pro 1000	16 m <sup>2</sup>	80 – 160 l/(m <sup>2</sup> h) 1.6 m <sup>3</sup> /h ( 7 USgpm)	300 l/(m <sup>2</sup> h) up to 1.3 l/s (20.6 USgpm)
Phoenix 4	60 m <sup>2</sup>	9.2 m <sup>3</sup> /h ( 42 USgpm)	up to 5 l/s (79 USgpm)
Phoenix 7	120 m <sup>2</sup>	19.2 m <sup>3</sup> /h ( 84 USgpm)	up to 10 l/s (158USgpm)
Phoenix 10	240 m <sup>2</sup>	38.4 m <sup>3</sup> /h (168 USgpm)	up to 20 l/s (316 USgpm)

Available from: **BI Pure Water (Canada) Inc.**

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Phone: 604-882-6650 or 888-901-3111 Fax: 604-882-6659 or 888-882-6659



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### Typical flux rates

The following table shows applicable flux rates depending on the water source used to feed the UF system. The flux rates indicated are only to be used as guidelines and do not replace a thorough water chemistry analysis. In difficult cases, piloting at site may be required.

Water source	Characteristics	Treatment recommendation	Fluxrate, continuous
Well Water	Low turbidity No DOC	<300 µm pre-filtration Ultrafiltration	120 l/(m <sup>2</sup> h)
Well Water, influenced by Surface Water	Occasional, varying Turbidity No DOC	<300 µm pre-filtration Ultrafiltration	80 - 120 l/(m <sup>2</sup> h)
	Occasional, varying Turbidity and DOC	<300 µm pre-filtration Ultrafiltration with CIP*	80 – 100 l/(m <sup>2</sup> h)
Surface Water	Continuous turbidity and DOC	<300 µm pre-filtration Flocculation Ultrafiltration with CIP* (some cases may require sand filtration before Ultrafiltration)	60 – 80 l/(m <sup>2</sup> h)
	Occasional, varying turbidity and DOC	<300 µm pre-filtration Ultrafiltration with CIP*	80 – 100 l/(m <sup>2</sup> h)
Swimming Pool Water	Bacteria and DOC	Hair Removal Flocculation Active Carbon Filtration Ultrafiltration with CIP*	140 – 160 l/(m <sup>2</sup> h)

\* CIP: cleaning in place, cleaning chemicals are either caustic, various acids, chlorine or other chemicals.

### Connecting several units

Several Virex Pro or Phoenix units can be connected via CAN-Bus. In order to connect peripherals to the CAN Bus and to control them through the UF unit controllers, a separate UF CAN Connector is available. Each system then is set to a unique ID-number and can be accessed remotely, if the CAN-Bus is also connected to a modem, a PC or another control unit via CAN-Bus interpreter. The systems co-ordinates the following functions:

- during filtration, one unit can be set to stand-by mode and will turn on automatically upon an alert of another unit
- cleaning cycles of the units will not be carried out at the same time, but will be delayed until no cleaning cycle is reported on the CAN-Bus
- integrity tests will not be carried out at the same time

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- all units can be accessed by one GSM-Modem which is connected as a separate device to the CAN-Bus
- the CAN Bus can be connected to an existing Industrial-Bus-System via a hardware-interface (available for all common Bus-Systems)
- all units share one set of peripherals. Those peripherals are then coordinated by the UF-CAN device.

### Membrane integrity testing

Virex and Phoenix units are able to perform tests to verify even small damages to the membrane. The tests are carried out automatically and report failure to the operator via the alarm system. The control can be set so the system shuts down on membrane failure.

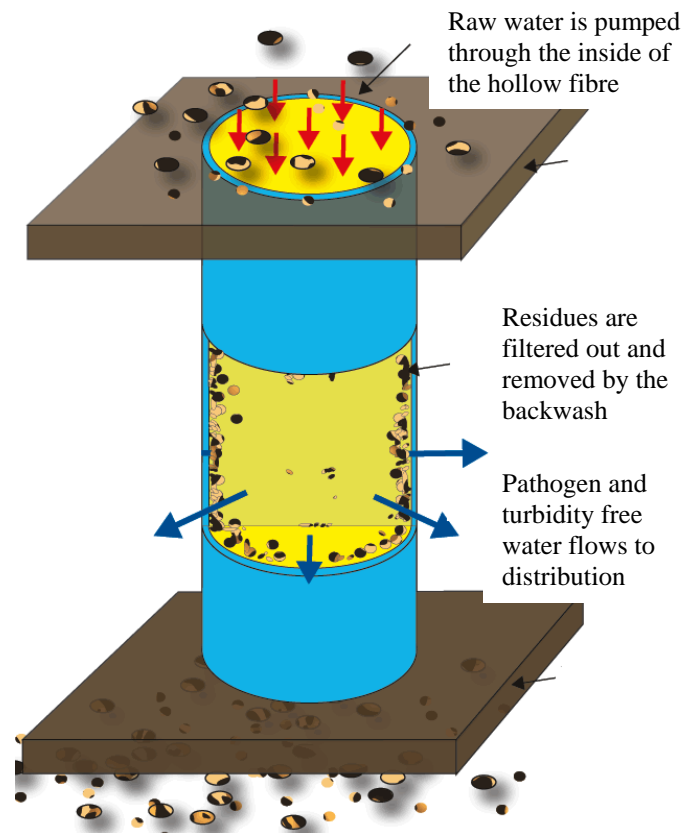
The efficiency of the tests have been verified by governmental authorities, such as the California Department of Health Service and the US EPA as well as leading certifying and researching institutes, like NSF (USA) or IWW (Germany).

The test is state-of-the-art and accepted by Health Authorities to deliver an accurate status about the actual membrane's pathogens removal capability. The resolution of the test ranges from detecting holes as small as  $0.5 \mu\text{m}$  to  $3 \mu\text{m}$  (standard-settings: ca.  $1.5 \mu\text{m}$ ). During the 5 to 10 minute membrane integrity test, the system does not deliver any filtrate.

### Programming

Virex and Phoenix units are equipped with fully programmable PLC controls. In order to set and modify all parameters of an optimized UF process comfortably, the systems can be programmed through a intuitive PC graphical interface.

The PC software shipped with the unit is installed on the computer (requires Windows 2000, XP or Vista), which is then connected to the unit either directly through a USB-connection, a CAN-Bus connection or via GSM/GPRS modem connection. The latter uses a Seccua Web-Communications system, which allows the user to comfortably connect to the unit via the Internet. It allows the operator to view and modify the settings required to optimize the system performance. A second pass-word protected-layer allows service and installation personnel to set up the basic process and the peripherals.



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### Data Logging

The unit's controller holds a data logger, which is able to log up to 90 days of operating data, including:

- date and time
- feed- and filtrate-pressure
- filtrate flow
- turbidity, if turbidity meter is connected
- alert occurred (if applicable)
- last system status before log

The systems logs data at each occurring alert or change of operating mode (before changing). It offers memory for 1024 sets of data. Add on turbidity analyzers register the turbidity of the raw water and of the UF filtrate.

### Remote control and alarm transmission

Alerts generated by the system or its peripherals can be transmitted either

- through the cold contact the system offers, which can be connected to a 12V surveillance potential – visually through alert messages shown on the display of the control unit.
- via SMS message if GSM modem is installed

There are two ways of remote controlling the units:

- Through an external GSM connection if the GSM modem is installed on the CAN-Bus (Connection is then established through the internet)
- Through an internal GPRS modem (only single unit operation)
- By connecting to the CAN-Bus

In each above case of remote controlling, the PC software shipped with the units can be used on the remote control client to access the unit. Alternatively, if required, the protocol of the data on the Bus is available for programming and integration into existing control systems.

Seccu Control Pro controls Membrane Filtration installations from small Point-of-Entry units up to Municipal Treatment Systems. It manages all required peripherals and operates the entire scheme fully automatically - filtration, chemically enhanced cleaning up to integrity testing of the system's membrane fibers.

### Flocculation

To handle fine material that may pack on the membrane, a flocculation agent (i.e. poly-aluminum chloride) can be injected and homogenously mixed using a static mixer. This will produce larger particles in the inlet water, which are easier to backwash off the UF membranes.

### Advantages of Seccu Ultra Filtration Systems:

- Superb filtrate quality with UF;
- Removal of suspended solids (turbidity) & micro-organisms
- Partial removal of TOC, COD & BOD
- Fully automated operation - operator friendly
- Save \$ and time wasted on cartridge filters
- Only Chlorine required for membrane cleaning

Contact BI Pure Water for more information or a quotation. Detailed information for Seccu products can be found on individual brochures at [www.bipurewater.com](http://www.bipurewater.com), [www.bipurewater.ca](http://www.bipurewater.ca) X-Spot Pro®, Virex Pro® and Phoenix® are registered trademarks of Seccu GmbH.

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