



TYPICAL APPLICATIONS

- Decentralised water treatment systems
- Community small-scale systems
- Remote and rural
- Communities
- Point-of-entry filtration
- Emergency and temporary water supplies
- RO (reverse osmosis) pre-treatment

DATA SHEET

Requiring no power to operate and needing no replacement filters this lightweight portable ultrafiltration unit is ideal for supplying drinking water in most remote locations. Non-technical persons can set up and operate the unit and it can be used for both surface and ground water supplies.

Capable of producing up to 10,000 litres of clean drinking water per day the ultrafiltration unit weighs only 12kg. The unit can operate as a single standalone system or as multi-configured bank of units set up as a water production plant where high water volumes are required.

The ultrafiltration unit will significantly remove pathogens from feed water including bacteria, viruses, protozoa, cysts and parasites to a level as classified by the World Health Organisation (WHO) as suitable for drinking water.

Turbidity will also be removed however higher levels of turbidity in the feed water will require more frequent cleaning cycles. A pre-filter to 200 microns is recommended to remove solid material from fouling the filter module.

The cleaning cycle is easy to undertake and requires no tools or the need to access internal components of the filter. For cleaning purposed, an "O" ring seal on top of the unit is released and the cleaning handles are moved back and forth for about a minute after which a flush valve is opened to release contaminates. Once completed the unit is returned to service again.

Background

Small communities require robust, reliable water treatment solutions often from difficult water sources. The treatment systems must provide pathogen free water economically and with minimal operator attendance.

The Solution

The ultrafiltration unit is a patented low cost, low maintenance water filtration solution.

It affords practical, small-scale potable water treatment using proven ultrafiltration (UF) membrane technology.

The hollow fibre membrane filtration module is mounted inside a potable rated moulded plastic pressure housing which is compact, robust, easy to transport and simple to install.

The UF barrier filtration process provides primary disinfection by removing pathogens and particulates to supply safe drinking water from the majority of non-saline surface and ground waters.

Additional post filtration treatment including ultra violet (UV) or chlorine disinfection can be utilised if desired.

Operating Description

Raw water flows into the ultrafiltration unit module housing under low pressure. As it passes through the porous walls of the hollow fibre membranes, solids are retained on the membrane surface. The ultrafiltration unit is suitable for use in either pumped feed or gravity feed applications.

The secret to the successful operation of the ultrafiltration unit is the effectiveness of its backwash process, which uses a mechanical agitation process to clean membrane surface.

Backwashing is initiated manually by an operator, on a frequency as determined by site conditions and at least once a day.

The unit also periodically requires a chemical clean cycle.

This removes residual fouling that cannot be removed by the backwash process alone and helps to limit biological growth in the system. A chlorine solution is typically the chemical used for cleaning. The process involves an operator to manual input is required during the cycle. Cleaning frequency is application specific but is generally between weekly and monthly.

MEMCOR® Membrane Modules

The membrane filtration modules use high permeability, low-fouling PVDF hollow fibre membranes for optimum performance and long life. The modules are simple in design and easy to install and maintain.

Membrane Cleaning

A simple low pressure patented mechanically agitated backwash sequence together with periodic chemical cleaning for quality performance at low differential pressure, even with turbid feedwaters.

Note: Design, data and dimensions are subject to modification without notice.

TECHNICAL DATA

Typical application	Filtration of potable non-saline surface water or groundwater for small communities. Not suitable for use with sea water or brackish water or other water sources containing contaminants such as heavy metals.
Typical filtrate production capacity treating clear surface water ¹	Up to 10,000 litres per day based upon low turbidity feed water. From 400 Lph approximately to Maximum 1,000 Lph
Typical feed inlet pressure range for gravity feed	3 to 4 metres head pressure
Maximum housing operating pressure	100 kPa
Membrane module details	MEMCOR® S10V membrane filtration module polyvinylidene fluoride (PVDF) hollow fibre ultrafiltration membrane with nominal pore size 0.04 µm. Filter direction outside to inside.
Materials of construction:	
Module housing assembly	Food grade polyethylene (PE)
Valves	Various including PVC and PP
Seals and gaskets	EPDM typical
Pipe and fittings	Various including PE, ABS, Nylon and PVC
“Filter” mode operation	Pressurised outside to inside filtration.
Feed pre-screen mesh size recommended ¹	500 µm or finer
Maximum recommended feed turbidity ¹	50 NTU
Filtered water turbidity	< 0.1 NTU
Typical log reduction value	> 4 LRV (for particles 2 – 5 µm)
Operating feed temperature range	> 0 to 35 °C (> 32 to 95 °F)
Temperature range for transportation and storage	> 0 to 35 °C (> 32 to 95 °F) Note: The unit must not be allowed to freeze.
Feed pH range	6.0 to 9.0 pH Note: Exposure to chlorine or chloramines is not recommended in feeds below 6.5 pH.
Allowable pH range for cleaning	2 – 10 pH typical Note: Occasional brief exposure during chlorine cleans to 10.5 pH is acceptable.
Waste water volume per backwash	Approximately 15 litres. Gravity drain waste outlet to be provided adjacent to unit.
Backwash	Mechanical Agitation
Typical target chlorine concentration during a chlorine clean	300 to 500 mg/L / 300 to 500 ppm

¹ Feed water quality will affect production capacity.

² Unscreened or coarsely screened raw water may reduce membrane operating life.

³ Capacity and backwashing/cleaning frequency will typically vary with feed turbidity.

TECHNICAL DATA (continued)

Cleaning concentrate and volume required for an acid cleaning cycle	Typically about 300 grams of citric acid powder will be used.
Typical target acid concentration during an acid clean	2.0 to 2.2 pH (not less than 2.0 pH)
Electricity supply	Not Required
Recommended installation location	Installed under cover with protection from direct sunlight and rainfall.

PRODUCT WEIGHT & DIMENSIONS

Approximately Weight (kg)	Dry	12
	Operating	27
	Packaged	16
Product Dimensions (cm) H x W x D		143cm x 18cm x 25cm
Packaged Dimensions (shrink wrap carton) H x W x D		145cm x 19cm x 27cm
Packaged Weight		16 kg (packaged including all kits & contents)

FILTRATE QUALITY

Parameter	Log Reduction Value
Bacteria	>6 99.9999%
Virus	>3 99.9%
Coliform	>6 99.9999%
Cryptosporidium	>6 99.9999%
Giardia	>6 99.9999%
Algae	>6 99.9999%
Turbidity	<0.02

TERMINOLOGY

Ppm = Parts Per Million	Lph = Litres per Hour
NTU = Nephelometric Turbidity Units (a measurement of turbidity)	Lpm = Litres per Minute
Um = Micron	M = Metre

IMPORTANT OPERATING INFORMATION

- The filter Sub-modules located inside the ultrafiltration unit is to remain in a wet environment to avoid the membrane drying which would result in total and permanent loss of performance. If long-term storage is necessary after operation, the unit is to be rinsed with a solution of sodium hypochlorite (100ppm) and stored at a temperature not above 40°C, out of direct sunlight.
- When new units are being used for the first time it is recommended that one standard backwash is carried out before the filtrate is used.
- The filter sub-module is resistant to oxidising agents such as chlorine, chloramines, bromine, bromamine, and potassium permanganate. Maximum exposure of sub-modules to bromine, bromamine, potassium permanganate, and other oxidants should be checked prior to starting operation.
- The unit comprises a single MEMCOR® membrane sub-module located inside in a low-pressure housing. The unit is suitable for operation under low positive or negative head pressure. Raw water flows along the length of the hollow fibres before being forced through the walls of the fibre to produce a filtrate virtually free of suspended solids. The unit removes virtually all solids and bacteria and significantly reduces virus levels. Filtrate flow rate is controlled manually.