



# DATA SHEET

AUTOMATED MEMBRANE SOLUTION  
FOR SMALL SCALE WATER TREATMENT





The UF-PRO Series of ultrafiltration units provide stand alone capability requiring no additional operating equipment other than water pump, plumbing and tanks. Connections are “plug-in” requiring no hard-wiring of mains power. UF-PRO Series provide pathogen-free water at low cost with minimal operator attendance.

## MULTI-MODULE AUTOMATED ULTRA FILTRATION UNITS

### UFP100MONO (20-25 kl/day)

Single (1) module automated

### UFP200DUAL (40-50 kl/day)

Dual (2) module automated

### UFP300TRI (60-70 kl/day)

Tri (3) module automated

### UFP400QUAD (80-100 kl/day)

Quad (4) module automated

The UF-PRO affords practical, small-scale potable water treatment using proven ultrafiltration (UF) membrane technology. The system controller provides continuous, automatic water production via a ECO-FLUSH™ CLEAN CYCLE, with minimal operator input.

The low-pressure hollow fibre (UF) membrane filtration module is mounted inside moulded food grade polyethylene pressure housing. It is compact, tough, 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, or MIOX can be utilised if desired.

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



## TYPICAL APPLICATIONS

- Decentralised water treatment systems
- Community and rural small scale systems
- Remote mining and resource communities
- Point-of-entry filtration
- Emergency and temporary water supplies
- Hotels / restaurants / resorts
- Bottled water production
- RO (reverse osmosis) pre-treatment

## UF-PRO OPERATING DESCRIPTION

Raw water flows into the auto ultrafiltration unit under minimal pressure. There is an option to utilise existing system pressure supply or an external feed pump. Feedwater passes through the porous walls of the hollow fibre membranes (outside to inside) and contaminants are retained on the membrane surface.

The auto ultrafiltration unit is suitable for use in either pumped feed or gravity feed applications. Flow is regulated at a constant rate by a flexible orifice flow control valve supplied with the system.

### ECO-FLUSH™ Clean Cycle

The key feature for successful operation of the auto ultrafiltration unit is the effectiveness of its patented backwash process, which uses low pressure aeration to maintain a clean membrane surface.

The patented shell-scour protocol does not rely on conventional inside-outside reverse flush backwash operation. Neither air or water reverse flow is engaged during the backwash cycle. The low energy linear air pump provides the energy source for the intermittent purge of contaminants.

The controller initiates the backwash automatically, typically every 15, 30 to 60 minutes during filtration (as preset by operator).

The system controller fully automates operation of the filtration and backwash cycles. Provision is made for a level switch input from a feed supply tank and a level switch input from a filtrate storage tank. These inputs may be used to pause the filtration operation as the liquid levels in the feed or filtrate storage systems change. This feature can be used to minimise operator attendance requirements during normal filtration service.

The unit periodically requires a chemical clean or CIP (Clean In Place) cycle. This removes residual fouling that cannot be removed by the backwash process alone and helps to limit biological growth in the system. Sodium hypochlorite solution (household bleach or chlorine) is typically the chemical used for cleaning. Citric Acid is also used periodically (when iron is present in supply water). The system controller

## SIMPLIFIED CLEANING PROCESS

A simple automated low pressure aerated backwash sequence (patent pending) together with periodic chemical cleaning ensure high capacity and stable performance at low differential pressure, even with highly turbid feedwaters.

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## LONG-TERM, HIGH PERFORMANCE FILTERS

The membrane filtration modules use MEMCOR® high permeability, low fouling PVDF hollow fibre membranes for optimum performance and long life. Our modules are simple in design and easy to install and maintain. Thousands of membrane plants globally rely on MEMCOR® membrane modules for their water filtration requirements.



UFPRO200DUAL - 2 Module Unit



## TECHNICAL DATA

### SPECIFICATIONS

**Typical Application** Filtration of potable surface water, groundwater or seawater. Note: Not suitable for use with water sources containing chemical or mineral contaminants such as heavy metals.

**Typical auto ultrafiltration unit production capacity treating clean surface water (per module housing)<sup>1</sup>**

Model Number		Litres/min (nominal)	Net kL/day (nominal)	Litres/day (nominal)	US Gallons/day (nominal)
UFPRO-100-MONO	Single Module Unit	18	20	20,000	5,200
UFPRO-200-DUAL	Dual Module Unit	36	40	40,000	10,400
UFPRO-300-TRI	Triple Module Unit	54	60	60,000	15,654
UFPRO-400-QUAD	Quad Module Unit	72	80	80,000	20,872

**Membrane Module Details** MEMCOR® S10V membrane filtration module polyvinylidene fluoride (PVDF) hollow fibre ultrafiltration membrane with nominal pore size 0.04 µm

**Materials of Construction:**

Module Housing Assmly  
Valves  
Seals and Gaskets  
Pipe and Fittings

Food grade polyethylene (PE)  
Various including PVC and PP  
EPDM typical  
Various including PE, ABS, Nylon and PVC

**“Filter” Mode Operation**

Pressurised outside to inside filtration. Automatic standby on feed and filtrate storage levels via level switch inputs (where fitted). Automatic backwash at preset filtration intervals.

**Standard Flow Control Device**

Fixed flow rate flexible orifice flow control valve (FCV) (nominal instantaneous flow rate approx 18 litres per minute)

### OPERATING CRITERIA

**Typical Feed Inlet Pressure Range for Pumped Feed or High Head Gravity Feed (FCV fitted)**

10 m to 15 m (100 - 150 kPa) to 18 litres per minute per module housing.  
20 m (200 kPa) maximum shut-off head

**Typical Feed Inlet Pressure Range for Low Head Gravity Feed (FCV not fitted)**

2 m (minimum) to 10 m (maximum) at 18 litres per minute (flow control manually adjusted).

**Maximum Housing Operating Pressure**

200 kPa

**Feed Pre-screen Mesh Size Requirement<sup>2</sup>**

500 µm or finer

**Maximum Recommended Feed Turbidity<sup>3</sup>**

50 NTU (typically)

**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)

**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.

**Backwash**

Automatically initiated and controlled, using low pressure air scour and feed flush.

**Aeration Air Blower**

Compact linear air pump: ALITA AL-150 standard series high capacity air pump, single-phase AC power supply with rated performance 170 – 180 L/minute at 20 kPa (0.2 bar, 2.9 psig), approximately 140-Watts power consumption.

<sup>1</sup> Capacity based on standard size flow control valve (FCV), standard configuration settings and no cleaning cycle. Feed water quality will affect production capacity.

<sup>2</sup> Unscreened or coarsely screened raw water may reduce membrane-operating life.

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

**Waste Water Volume per Backwash**

Nominal 30 litres (maximum 36 litres) every backwash cycle per module housing. Gravity drain waste outlet to be provided adjacent to unit.

**CHEMICAL CLEANING CYCLE**

- Concentrate and volume required
- Typical target chlorine concentration

Typically household liquid bleach is used. For sodium hypochlorite 5 % (or 5.0 g/L) concentration, approximately 100 – 150 mL will be used. Note: Cleaning solution waste may require further treatment, such as neutralisation, prior to disposal.  
300 to 500 mg/L / 300 to 500 ppm

**CITRIC ACID CLEANING CYCLE**

- Concentrate and volume required
- Typical target acid concentration

Typically about 300 grams of citric acid powder will be used.  
2.0 to 2.2 pH (not less than 2.0 pH)

**Electricity Supply Required**

220 – 260 VAC, 50 or 60 Hz single phase and earth (full sine wave only from DC to AC inverters – other inverter wave forms not suitable)  
110 – 130 VAC, 60 Hz option also available

## INSTALLATION CRITERIA

**Piping Terminations**

25 BSP - NS (typical)

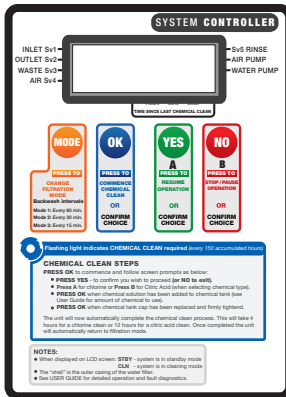
**Recommended minimum clearances (for operation and Maintenance Access)**

Front and both sides 1,000mm

**Recommended Installation Location**

Installed under cover with protection from direct sunlight and rainfall.

**System Controller**



Microprocessor controlled by memory functions with LCD graphic display.

Push button function keys for operator input by menu selection. Sealed polycarbonate enclosure with sealed external terminal and electrical connections.

Built in switched power supply powers electronics, LCD, discrete inputs and 24 VDC solenoid valve and relay outputs. Advanced controller protection for electronics provided plus replaceable fuse. 24 VDC powered discrete inputs provided for feed level switch and filtrate level switch.

24 VDC powered discrete outputs for auto ultrafiltration unit mounted solenoid valves.

Outputs provided for feed pump call to run and aeration blower call to run at same voltage and frequency as power incomer.

## WEIGHT & DIMENSIONS

UNIT Dimensions & Mass (Approximate)

Model Number	Height (cm)	Depth (cm)	Width (cm)	Mass (kg-dry)	Mass (kg-wet)
UFPRO <b>100</b> MONO - Single Module	161	34	51	50	75
UFPRO <b>200</b> DUAL - Dual Module	161	34	71	70	100
UFPRO <b>300</b> TRI - Triple Module	161	34	91	90	135
UFPRO <b>400</b> QUAD - Quad Module	161	34	111	110	170

SHIPPING Dimensions & Mass (Approximate – Shrink Wrapped Carton)

Model Number	Height (cm)	Depth (cm)	Width (cm)	Weight(kg)
UFPRO <b>100</b> MONO - Single Module	63	38	165	57
UFPRO <b>200</b> DUAL - Dual Module	83	38	165	78
UFPRO <b>300</b> TRI - Triple Module	110	38	165	100
UFPRO <b>400</b> QUAD - Quad Module	124	38	165	145



## TYPICAL REQUIREMENTS FOR AUTO ULTRAFILTRATION UNIT OPERATION

The auto ultrafiltration unit forms the core component of a membrane filtration system. Ancillary equipment external to the unit is required to complete connections to the system.

Requirements vary from site to site but typically the client or end user must supply the following:

### 1) A suitable operating location

Plus assembly and set up of the auto ultrafiltration unit.

### 2) Raw water feed delivery system

This typically includes:

- Gravity feed or feed pump system within the specified flow and pressure range (including any external power supply requirements plus call to run signal connection via the system controller, if necessary);
- Feed tank (where required) and feed storage level switch (where fitted, plus connection to system controller);
- Feed supply pipe or hose connections and valves;
- Feed strainers/pre screens;
- Any other feed pre treatment requirements (such as pH correction).

### 3) The filtrate storage or distribution system

This typically includes:

- A filtrate storage tank and filtrate storage level switch (where fitted, plus connection to system controller);
- Filtrate outlet pipe or hose connections and valves;
- Filtrate disinfection system (for potable water);
- Any other filtrate post treatment requirements.

### 4) The waste disposal system

This typically includes:

- Free venting of air out of the waste outlet/vent termination point, allowing free discharge of aeration air from the top of the module housing;
- A freely draining pipe, pit or channel that removes liquid waste, without returning it to the feed water source;
- Pipe or hose connections from waste outlets on the unit to the waste disposal system;
- A means of neutralising cleaning solution waste liquid.

### 5) Electrical installation

This typically includes:

- Power connection to the system controller from a protected (with external circuit breaker or fuse) single-phase power supply and earth. This also supplies the aeration blower output and the feed pump output (where used);
- Protected single phase (typically) power connection through the designated system controller relay contact to operate the feed pump (where used);
- Protected single phase (typically) power connection through the designated system controller relay contact to operate the aeration blower;
- Installation and connection of the feed level switch (where used) to the system controller;
- Installation and connection of the filtrate level switch (where used) to the system controller.

### 6) An operator to monitor unit operation and to perform cleaning cycles when necessary

Please refer to the standard auto ultrafiltration unit process and instrumentation diagram and the typical system controller process and instrumentation diagram for operating process requirements.



## U L T R A F I L T R A T I O N   S Y S T E M S

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