



**OSMO ASIA PACIFIC LTD.**

## Ultrafiltration Hollow Fiber Systems

### Applications:

- Pre-treatment
- Primary Treatment
- Final Polishing



Above "UF-2-HF" fabricated with 6" (15 cm) elements, is with (2) elements (right) and the backwash storage tank (left)

Self-contained Systems Modular  
Process Units

### System Capacities:

- Standard 2 to 10 M<sup>3</sup>/H
- Custom designs for higher flows

### Product Water Quality:

- Removes virtually all particulates above 0.05 micron

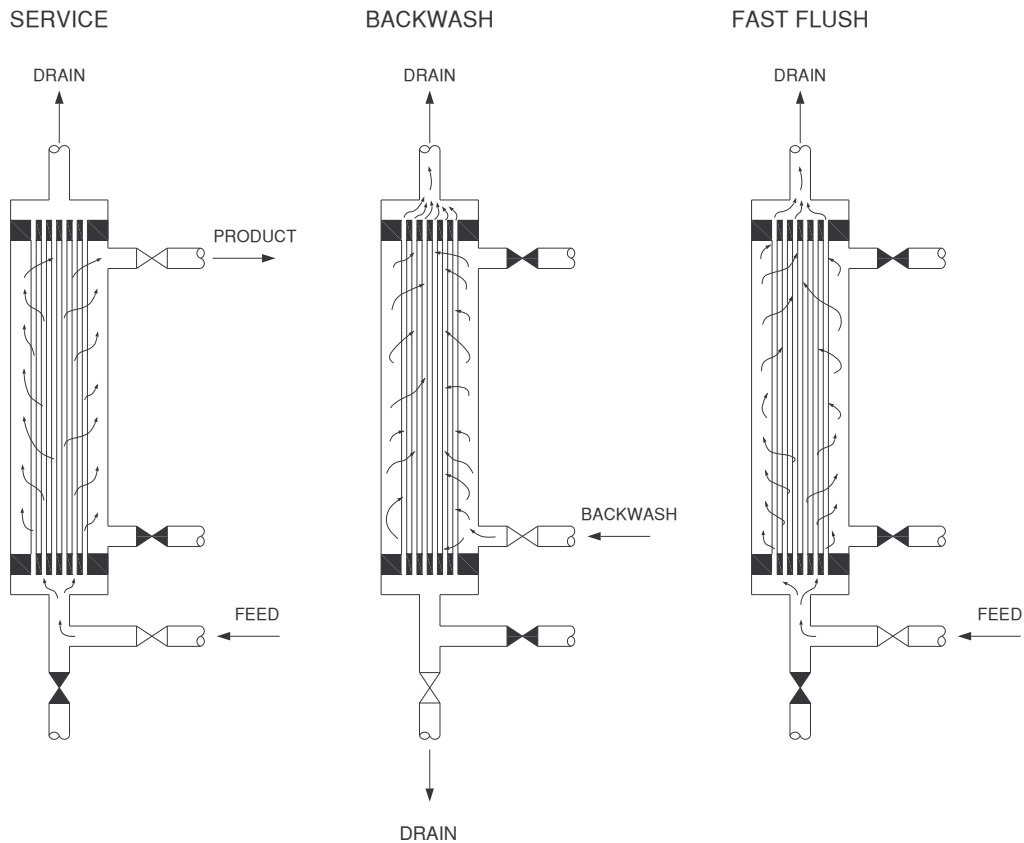
### Process Design Features:

- Single-pass at 100% recovery
- Fast flush
- Backwash

### Osmo Asia Pacific (OAP) Ultrafiltration Technology

OAP Hollow Fiber Ultrafiltration Systems incorporate our Purotec hollow fiber permeable membrane filter modules with either 6 in. (15 cm) or 9 in. (23 cm) diameters. In designing total custom made systems, we are able to consult with managers, engineers and operating personnel for proper assessment of ultrafiltration requirement.

Before designing custom made system, OAP engineers consider the water analysis of each facility supply and the desired water quality to be produced. Organic molecular weight and colloid content must be considered because they significantly affect ultrafiltration membranes, ultimately determining system efficiency.



Modules operate in three modes: 1) single-pass ultrafiltration 2) backwash 3) fast-flush

### Module Design

The ultrafilter module is a PVC cylinder with clamped noryl end pieces providing inlet and outlet ports on the shell for both process fluid and permeate. This shell is resistant to impact, temperature, chemicals and protects the inner core of PVC fibers. An epoxy potting compound secures the membrane bundle at each end of the module and separates collected permeate from process fluid.

### Single-pass

For single-pass processing, water is fed into the lower inlet port of the module and enters the lumen\* of each fiber in the bundle. As water flows through the bundle and exits through the upper outlet port, permeate is forced through the membrane fiber walls into the module shell while impurities collect along the membrane surface. Pore size of the hollow fiber material is approximately 0.05 micron, and the nominal molecular weight cutoff is 100,000. Therefore, the permeate is free of all colloidal, particulate and higher molecular weight matter.

### Backwash

Following service, backwashing will be necessary to clean the membrane surface of debris which may build up. To clean the membrane, permeate is forced back through the fiber under pressure. The motive being an air pressure adjusted at 1 bar. Permeate port is closed, both drain ports as well as port pressurizing the water in the backwash storage tank are open, creating a flushing action which carries solids away to waste.

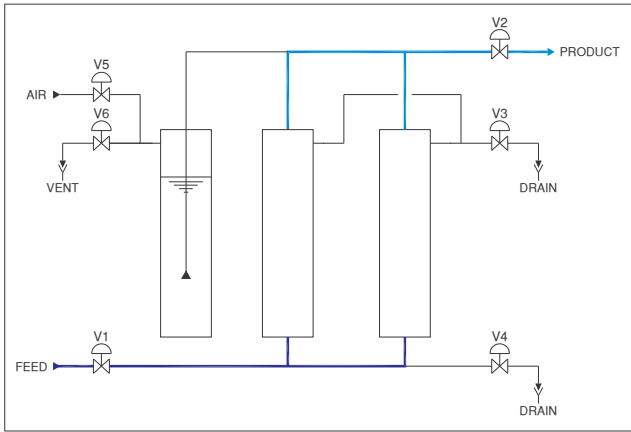
### Fast-flush

Typically, 100% of the feed water will be recovered as permeate in a single pass. As a result, the upper half (or low pressure end) of a fiber is more susceptible to fouling and needs to be cleaned more thoroughly than the lower (or high pressure) end. Fast-flush is used with backwash to clean the membrane surface. Permeate outlet is closed to build up pressure within the fiber shell, and permeate throughout the cartridge reaches a pressure equal to the average feed pressure. Inside the fiber, a certain pressure drop is created by operating at maximum flow. The pressure differential at the upper half of the cartridge causes permeate to flow in through the fiber, cleaning that end of the module.

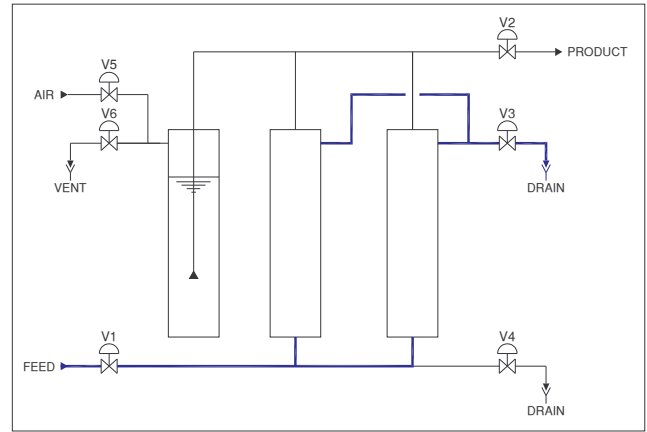
Both backwash and fast-flush cleaning procedures maintain membrane flux at high production rates by reversing solids buildup on membrane surfaces. Though this phenomenon does not normally occur in water systems, there is always the risk of membrane fouling not readily reversed by these flushing techniques. If it does happen, chemical cleaning agents may be flushed through the modules without degrading the inert fiber matrix of the membranes. The backwash is conducted with a pressure of one and a half bar.

\*lumen – open space in a fiber or tube

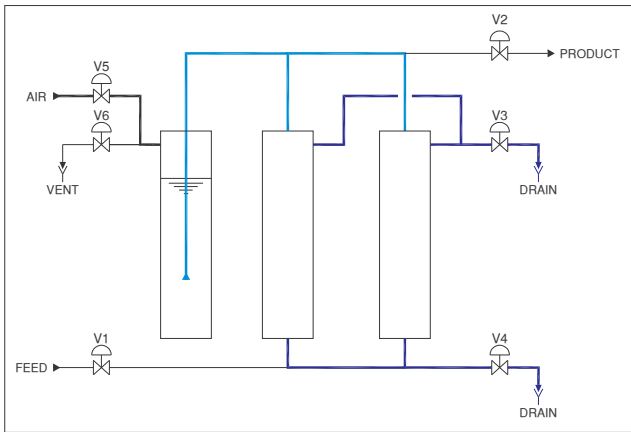
## UF BACKWASH SEQUENCE



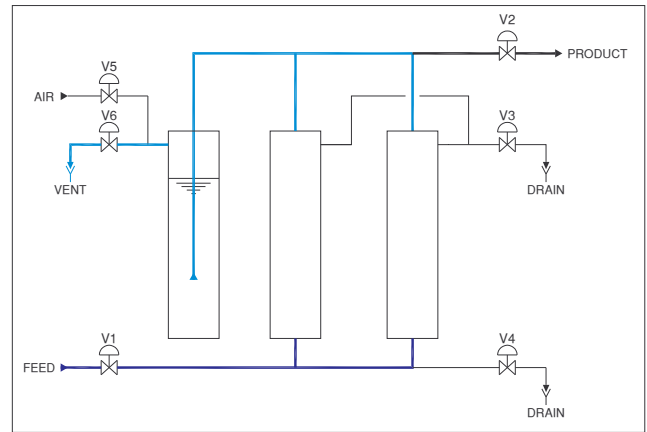
Service



Fast Flush



Backwash



Filling

Typically, UF backwashing involve (4) steps: Pre fast flush – Backwash – Post fast flush  
Various steps are with a fixed timing. The backwash frequency is adjustable.

### Feed Water

It is not unusual to incorporate a pre-treating component as part of a complete Ultrafiltration system. Disc filter installed ahead of our unit inhibits solid build up on membrane surfaces.

### Pressure

Lower pressure is best for economical backwash pump sizing (whenever backwash pump is necessary for UF with higher capacities) and minimum operating costs. The trans-membrane pressure in service is below one bar and in backwash one bar.

## Specification: Standard OAP Units

### Low Capacity Machines

Designed for pilot application, production of clean water out of surface water, ideal for small Reverse Osmosis or Demineralizers pretreatment.

Model	Flow M <sup>3</sup> /H	No. of Modules	Dia. of Module (in)	Dimensions			Shipping Weight (kg)
				W (cm)	D (cm)	H (cm)	
UF-2-HF	2	2	6	90	65	160	160
UF-4-HF	4	4	6	100	91	160	300
UF-10-HF	10	2	10	140	100	200	600

**Note:** Above nominal capacities are base on a feed water turbidity  $\leq 5$  NTU.  
At higher turbidity, up to 15 NTU, the flux will be decreased accordingly.

### Instrumentation:

- Our unit include: Pressure indicators and product flow indicators (Rotameters)

### Controls:

- Automatic sequencer (PLC) governing the unit function and the backwash sequence (field adjustable)
- Automatic air operated diaphragm valves
- Air pressure regulator adjusted at 1 bar, as a motive during backwash sequence

### Included:

- Backwashable disc filter of 100 micron installed on the feed water

### Options:

- Backwash chlorination system
- Flow monitoring c/w 4-20 mA output signal, instead of flow indicator

### Power supply:

- Available at 220V 50Hz & 110V 60Hz

Larger sizes are available in custom designs. Please consult us for details.



**OSMO ASIA PACIFIC LTD.**

1044/8 Soi 44/2 Sukhumvit Road, Prakanong, Bangkok 10110, THAILAND.

Tel : 66 (0) 2-381-4213 to 7 Fax : 66 (0) 2-391-8183 Mobile : 66 (0) 81-833-1271

E-mail : [claudio@osmoasia.com](mailto:claudio@osmoasia.com) Website: [www.osmoasia.com](http://www.osmoasia.com)

PN 01-11 05 REV 3