

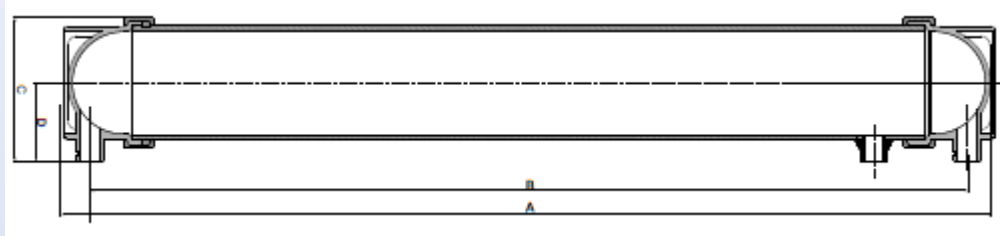


E-PORE 80



e-pore.co.uk

TECHNICAL DATA SHEET



MODEL	Surface Area (m ²)	Dimensions (mm)			
		A	B	C	D
APM	80	2042±1	1923±1	314±1	172±1

A. SPECIFICATION

- PVDF based hollow fiber membranes have long lifetime due to their high mechanical strength and chemical resistance.
- The capacity of clean water production is higher due to modification of membranes which enhances the hydrophilicity of membrane.
- Membrane which pore size of has 30 nm separates virus and bacteria.
- The product water quality is <0,2 NTU.

• Module Specifications

PARAMETER	UNIT	SPECIFICATION
Name of model	-	e-pore 80
Diameter	mm	250
Body and cap material	-	U-PVC
Nozzles	mm	DN50 - Victaulic
Potting material	-	Polyurethane

• Membrane Specifications

PARAMETER	UNIT	SPECIFICATION
Material	-	Modified PVDF
Membrane type	-	Hollow Fiber UF
Flow direction	-	Outside to inside
Fiber outside/inside diameter	mm	1,4 / 0,8
Active surface area	m ²	80
Nominal MWCO, Dextrane	Dalton	≤ 150.000



• Feed Water Specifications

PARAMETRE	UNIT	SPECIFICATION
Temperature	°C	25 (Max 40)
Particule dimension	μ	< 300
Turbidity	NTU	50 (Max 250)
Oil and grease	%	0 (Max 1)
pH	-	6-9
TOC	mg/l	< 10 (Max 30)
Total Suspended Solid (TSS)	mg/l	50 (Max 80)
Chlorine	mg/l	0,4 (Instant Max. 150)

B. OPERATION

PARAMETER	UNIT	SPECIFICATION
Operation modes	-	Dead End / Crossflow
Temperature	°C	5-40
pH	-	2 - 11
Filtrate flux @25°C *	L/m ² h	45-180
Flow capacity**	m ³ /h	3,60-14,40
Feed water inlet pressure @ 25°C	bar	2-3 (Instant Max. 5)
TMP	bar	0,4 - 2
Filtrate water SDI	-	≤ 2,5
Filtrate Water Turbidity*	NTU	≤ 0,2

(*), (**): Depend on quality of feed water

C. CLEANING, DISINFECTION & PRESERVATIVE SOLUTION

PARAMETRE	UNIT	SPECIFICATION
CLEANING		
Backwash pressure	bar	Max. 2,5
Air flowrate	Nm ³ /h	Max. 20
Chemically Enhanced Backwash (CEB)		
Sodium hypochlorite (NaOCl)	mg/l	1000
Sodium hydroxide (NaOH)	mg/l	500
Hydrochloric acid (HCl)	mg/l	1000
Citric acid	%	1-2
Cleaning in Place (CIP)		
Frequency	When the current TMP pressure is 0.9 bar higher than the first TMP Pressure.	
Operation duration	Circulation or Filling method, 2 hours	
Chemical cleaning solutions (up to pollutant)	1. % 0,1 NaOH + 0,2% NaOCl 2. % 0,2 HCl, 2% Citric acid	
Cleaning flowrate per module	1-2 m ³ /h	

Important Warnings & Informations

- In order to prevent membrane deformation and to maintain membrane performance, please follow the instructions during start-up,
- During any operation mode, do not operate the module outside of the specified pressure values and special care should be taken to prevent to damage membranes,
- To obtain designed production capacity and designed water quality, operation parameters should be compatible with specifications,
- Please follow the instructions about draining of the preservative solution and flushing of the module.
- During shut-down, fill the module with preservative solution in order to avoid biological contamination.

Cleaning of Preservative Solution

To prevent drying of membranes and avoid biological contamination, a preservative solution which is composed of water / glycerol / sodium metabisulfite is used. Flushing of preservative solution is done by following steps:

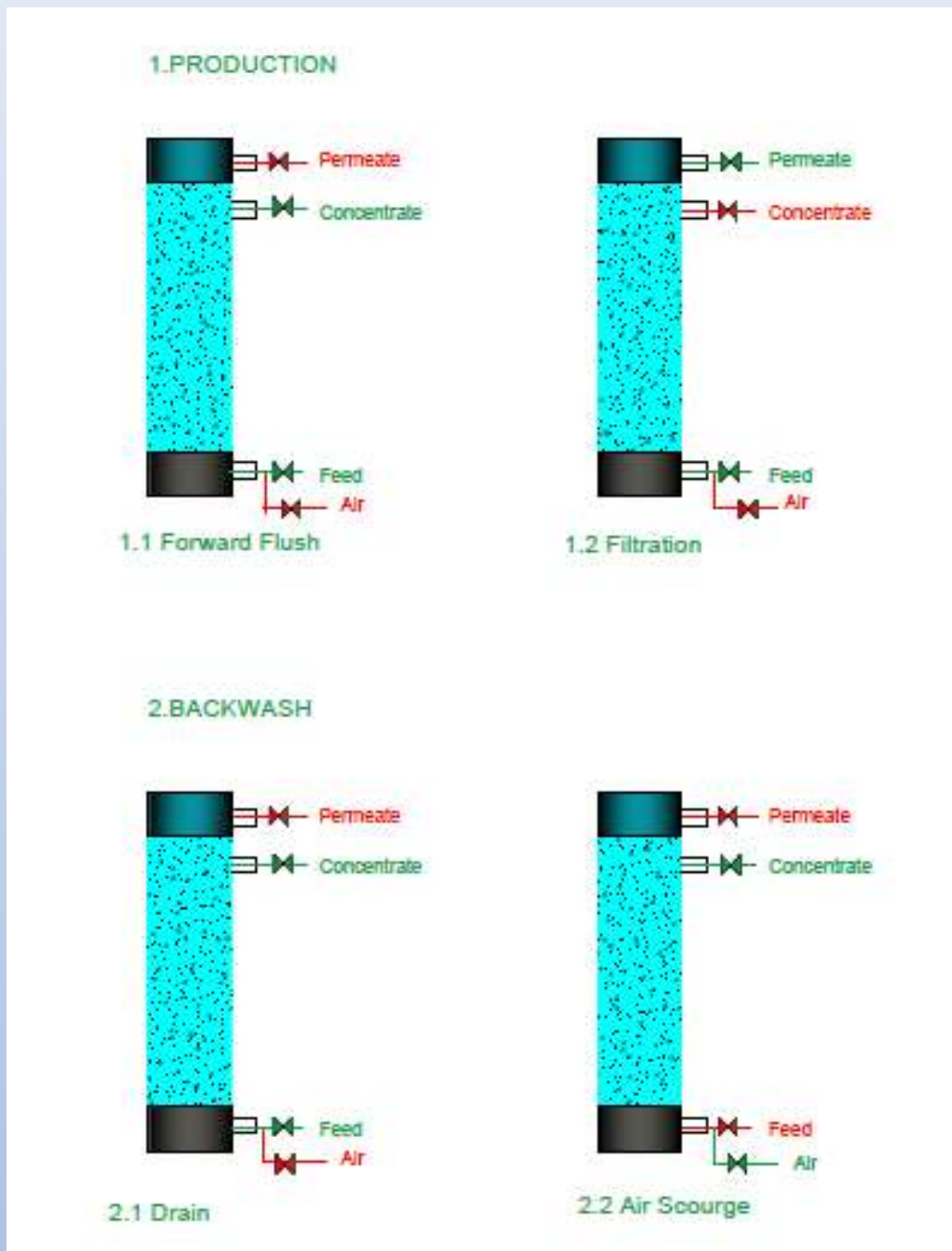
Filtration Module or Modules are filled slowly with raw water and the washing process is initiated as shown in figure (6). The duration of this process is minimum 4 hours and the washing water coming out of the module or modules are sent to drainage. The volume of water to be fed to the filter during this process should not be less than 12 cubic meters. The characterization of the water to be fed is mentioned in technical specifications. At the end of this process, the module or modules are free of the storage/protection solution in them and they are ready for filtration.

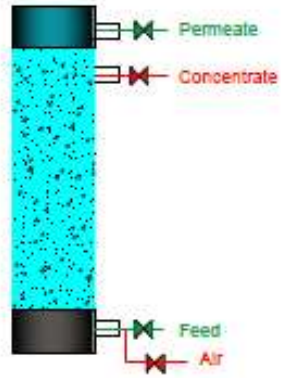
Cleaning - Disinfection

Before first start-up or in case of biological contamination, the module is chemically disinfected by operation (Describe under page 3 / Module Operation Modes). 100 ppm sodium hypochlorite solution is prepared in chemical solution vessel. The solution is circulated through the module approximately 10 minutes. The solutions should wait for 1 hour inside the module. After disinfection, filtration can start and drained until the filtrate line is discharged from chlorine.

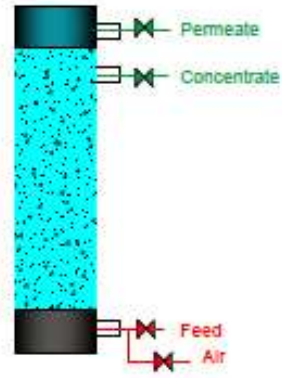
D. MODULE OPERATION MODES

NOTE: Backwash procedure with treated/clean water at start-up proses must be advised.



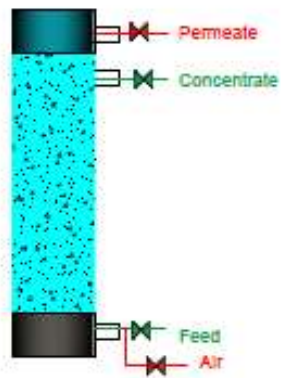


2.3 BW Bottom

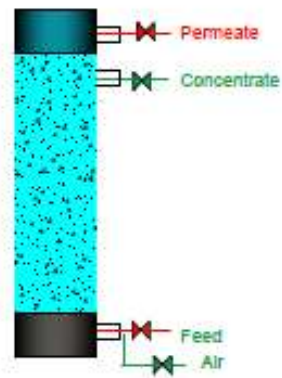


2.4 BW Top

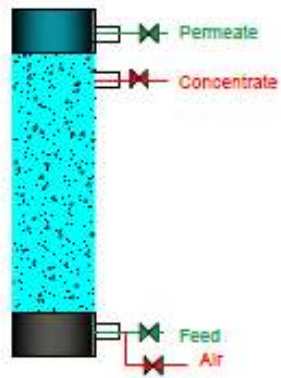
3.CEB(CAUSTIC/CHLOR/ACID)



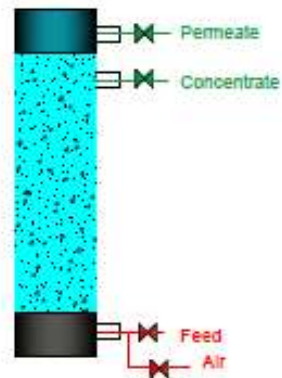
3.1 Drain



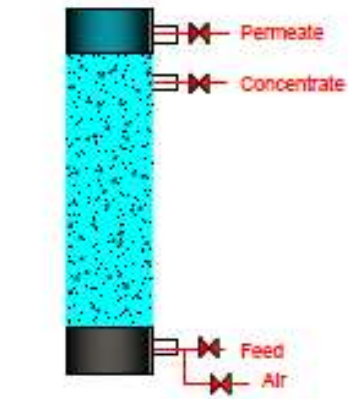
3.2 Air Scourge



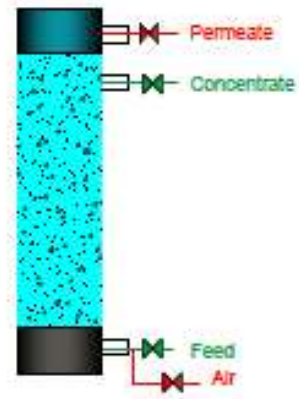
3.3 BW Bottom



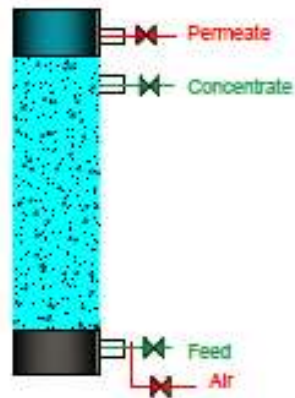
3.4 BW Top



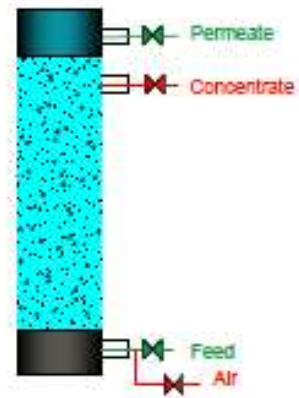
3.5 Soak



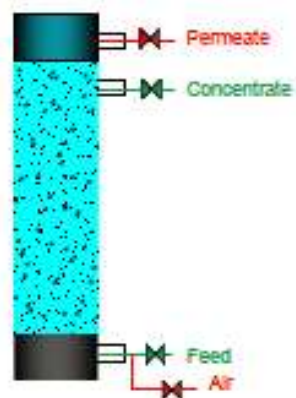
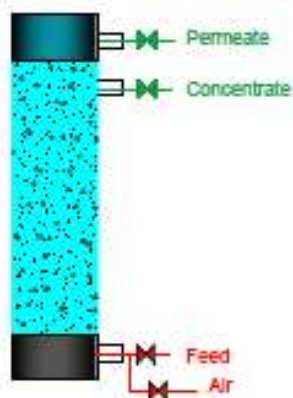
3.6 Drain



3.7 Air Scourge



3.8 BW Bottom



PRODUCTION

- 1) Forward Flush is done and position of the valves is figured in production mode 1.1 Forward Flush Module is fed from bottom and flux line is down to up side
- 2) As seen in the 1.2 Filtration mode module starts filtration from bottom to up

BACKWASH

- 3) Backwash starts with Drain process Module is drained from both top and bottom
- 4) Air scouring is done and air and concentration valves are opened When module is fouled, air is fed from the feed water line. And, the particles on membrane surface are shake out
- 5) For effective backwash and for discharge air and suspended particles in the module , 2.3 Backwash Bottom and 2.4 Backwash Top steps are completed and position of valves are like the figures.

CEB(CAUSTIC, CHLOR and ACID)

CEB process is applied with caustic, chlorine and acid , separately and respectively.

- 6) Drain process is repeated and module is drained from top and bottom and 1/3 of the module is emptied out
- 7) Air scouring is done and open and concentration valves are opened When module is fouled, air is fed from the feed water line. And, the particles on membrane surface are shake out.
- 8) For effective backwash and for discharge air and suspended particles in the module, 3.3 Backwash Bottom and 3.4 Backwash Top steps are completed and position of valves are like the figures . In these steps , chemically enhanced cleaning solutions are used for backwash and caustic chlorine acid is fed, respectively.
- 9) 3.5 Soak mode is started . All valves are closed and waited to complete the chemical cleaning .
- 10) Drain process is repeated . Both valves at the top and bottom are opened and the module is drained from top and bottom and 1/3 of the module is emptied out
- 11) Air scouring is done and open and concentration valves are opened When module is fouled, air is fed from the feed water line. And, the particles on membrane surface are shake out.
- 12) At 3.8 and 3.9 modes , instead of chemical solution Caustic chlorine acid filtrated water is used to complete chemical cleaning
- 13) Filtrate continues to forward flush

Depending on fouling level of feed water, modules are subjected to CEB process monthly or once every three months. Chemical solution is either filled to the module and kept in module or is circulated through module by using a vessel and a pump up to 2 hours