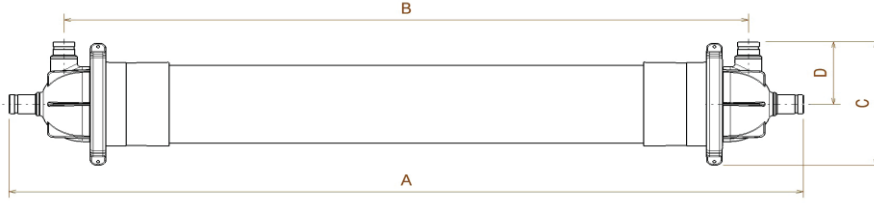


# AKUALYS ASM



## TECHNICAL DATA SHEET



MODEL	Surface Area (m <sup>2</sup> )	Dimensions (mm)				Weight (kg)
		A	B	C	D	
ASM	35	1455±1	1151±1	395±1	200±1	35

### A. SPECIFICATION

- Due to their high mechanical strength and chemical resistance, PVDF based hollow fiber membranes have long lifetime.
- Modified hollow fiber membranes have high permeability and 30nm nominal pore diameter.
- Hollow fiber membranes remove viruses, bacteria and particles including colloids.
- The produced water quality is <0,2 NTU.

### Module Specifications

PARAMETER	UNIT	SPECIFICATION
Model	-	ASM
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 <sup>2</sup>	35
Nominal MWCO, Dextrane	Dalton	≤ 150.000



Certified to NSF/ANSI 61



## • Feed Water Specifications

PARAMETER	UNIT	SPECIFICATION
Temperature	°C	25 (Max 40)
Particle 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 <sup>2</sup> h	45-180
Flow Capacity**	m <sup>3</sup> /h	1,75-6,30
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 feed water quality

## C. CLEANING, DISINFECTION & PRESERVATIVE SOLUTION

PARAMETER	UNIT	SPECIFICATION
<b>CLEANING</b>		
Backwash Pressure	bar	Max. 2,5
Air Flowrate	Nm <sup>3</sup> /h	Max. 20
<b>Chemically Enhanced Backwash (CEB)</b>		
Sodium Hypochlorite (NaOCl)	mg/l	1000
Sodium Hydroxide (NaOH)	mg/l	500
Hydrochloric Acid (HCl)	mg/l	1000
Citric Acid	%	1-2
<b>Clean-in-Place (CIP)</b>		
Frequency	Current Process TMP(bar) ≥ Initial TMP(bar) + 0,9bar	
Operation Duration	2 hours	
Chemical Cleaning Solutions (depend on pollutant)	1. % 0,1 NaOH + 0,2% NaOCl 2. % 0,2 HCl, 2% Citric Acid	
Cleaning Flowrate per Module	1-2 m <sup>3</sup> /h	

## GUIDELINES

- Follow the guidelines to avoid membrane deformation and to preserve membrane performance.
- At least the half capacity must be produced in the first production. If necessary, permeate water and preservative solution must be drained completely.
- Do not operate the module above the pressure limits to avoid membrane deformation.
- To obtain designed production capacity and designed water quality the operation parameters must be kept.
- Cleaning of preservative solution and cleaning-disinfection must be done according to below given instructions.
- The module must be filled with storage/ preservative solution during shut-down.

### Cleaning of Preservative Solution

- Preservative solution is composed of water / glycerol/ sodium metabisulfite.
- For the cleaning the module is drained slowly with feed water and the cleaning duration is minimum 4 hours.
- The feed water specifications must be kept and the used feed water volume must be at least 12m<sup>3</sup>.

### Cleaning - Disinfection

- The module should be chemically disinfected against biological contamination.
- 100 ppm sodium hypochlorite solution is circulated for 10 minutes.
- The solution should wait for 1 hour inside the module.
- After disinfection the module must be drained until the filtrate line is free from chlorine.

NOTE: Backwash procedure with treated/clean water at start-up process is advised.

## D. PROCESS STEPS

- Valve positions and specifications must be kept.
- CEB frequency must be defined according to feed water quality.
- Chemical solution is either filled in the module or is circulated by using a vessel and a pump up to 2 hours.

Valve Position:

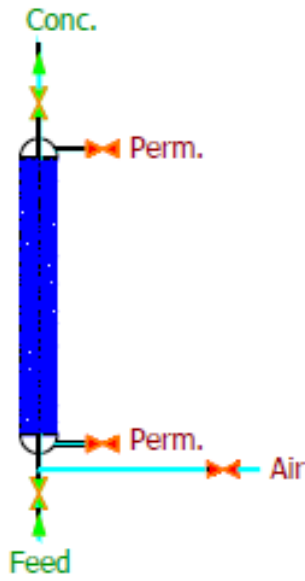
Open

Closed

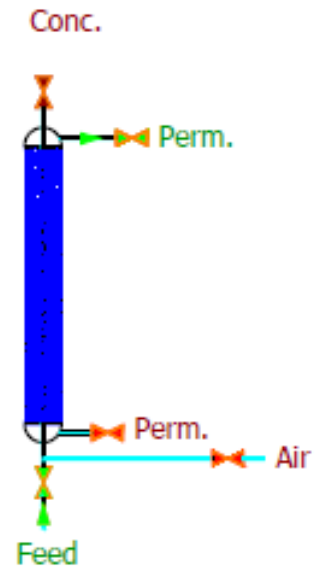
## 1. PRODUCTION

**1.1. Forward Flush:** The module is rinsed with feed water.

**1.2. Filtration:** The production is done.



1.1 Forward Flush



1.2 Filtration

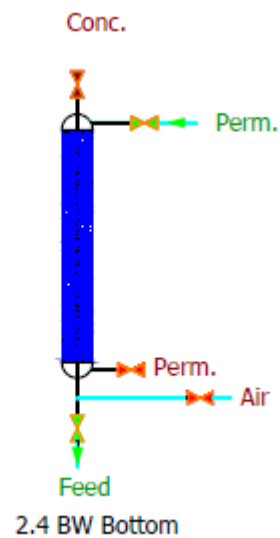
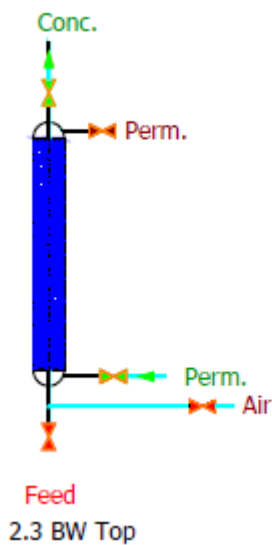
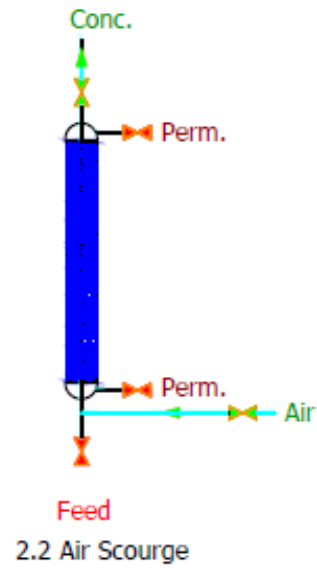
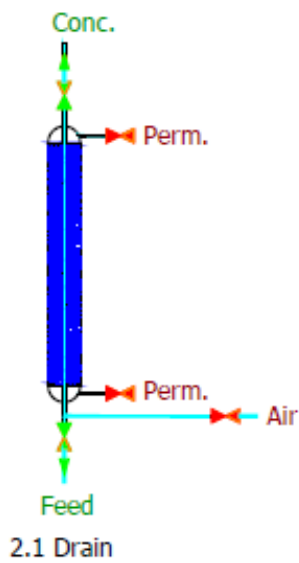
## 2.BACKWASH

**2.1.Drain:** The module is drained.

**2.2.Air Scourge:** The membranes are scoured by air.

**2.3.Backwash-Bottom:** The module is rinsed with permeate water. Flow direction is from top to bottom.

**2.4.Backwash-Top:** The module is rinsed with permeate water. Flow direction is from bottom to top.



### 3.CEB (CAUSTIC/CHLOR/ACID)

**3.1.Drain:** The module is drained.

**3.2.Air Scourge:** The membranes are scoured by air.

**3.3.Backwash-Bottom:** The module is rinsed with permeate water and chemical.

Flow direction is from top to bottom.

**3.4.Backwash-Top:** The module is rinsed with permeate water and chemical.

Flow direction is from bottom to top.

**3.5.Soak:** All valves are in closed position. The membranes are soaked.

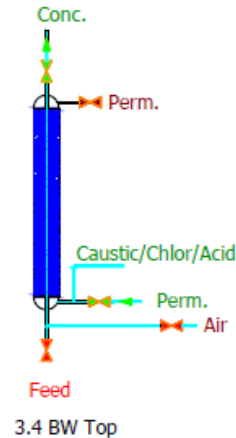
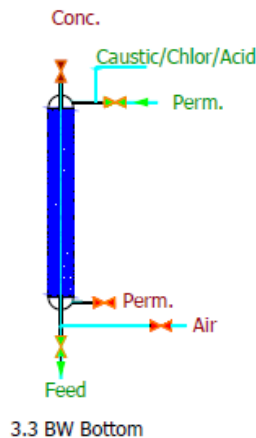
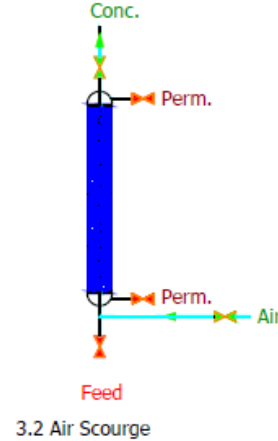
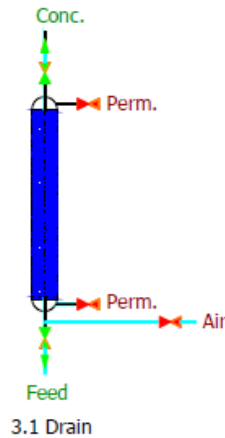
**3.6.Drain:** The module is drained.

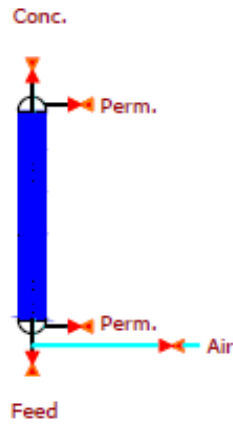
**3.7.Air Scourge:** The membranes are scoured by air.

**3.8.Backwash-Bottom:** The module is rinsed with permeate water. Flow direction is from top to bottom.

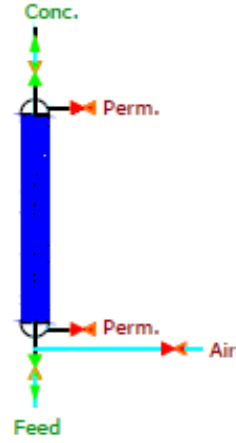
**3.9.Backwash-Top:** The module is rinsed with permeate water. Flow direction is from bottom to top.

**3.10.Forward Flush:** The module is rinsed with feed water.





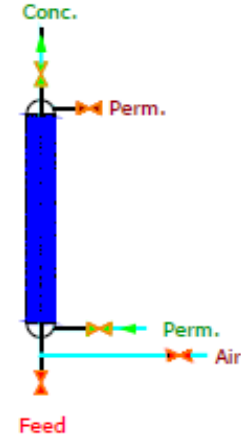
3.5 Soak



3.6 Drain



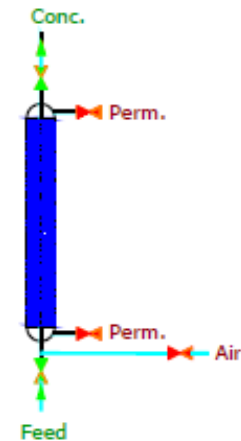
3.7 Air Scourge



3.8 BW Top



3.9 BW Bottom



3.10 Forward Flush

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