EnviQ® RF

Reinforced Fiber Ultrafiltration Membranes

HOW EnviQ RF WORKS

QUA's EnviQ Membranes have been specially designed to improve the ease of operation and maintenance of MBR facilities. EnviQ provides consistent ultrafiltration quality effluent using a strong and rugged PVDF hollow fiber membrane and unique airflow distribution system. EnviQ RF membranes are manufactured using QUA's innovative Non-solvent Induced Phase Separation (NIPS) process. EnviQ RF's reinforced PVDF membrane fibers offer high mechanical strength and high chemical and chlorine tolerance. This improves the modules' ability to handle high feed turbidity for a wide range of challenging wastewater applications.

ADVANTAGES

Reinforced, Robust Hollow Fiber Membrane

- High tensile and mechanical strength membrane can handle high MLSS feed water with ease

Backwashable Membrane

- Sustainable transmembrane pressure during operation

Compact and Adaptable Design

- High product flow in a small footprint, with a flexible design that withstands variable feed water

High Quality Product Water

- Provides ultrafiltration quality water with >99% TSS reduction

Unique Dual Airflow Distribution System

- Optimizes power consumption and reduces cleaning requirement

Complete Assembled Module

- Includes air header, product header, diffusers, frames, connectors and membrane.

THE TECHNOLOGY OF CHOICE

In addition to simpler operations, EnviQ lowers the total installed cost of biological wastewater treatment and recycle systems as compared to conventional activated sludge processes with tertiary filtration. EnviQ facilitates increased MBR adoption, resulting in more efficient biological treatment, smaller footprint and high quality effluent.

MBR combines conventional activated sludge technology with membrane filtration. MBR can be designed at a much higher mixed liquor suspended solids (MLSS) concentration compared to conventional processes, giving advantages of lower hydraulic retention time (HRT) and higher sludge retention time (SRT). In addition, MBR replaces clarifier/sedimentation tanks as well as media filtration. This reduces the footprint of the overall wastewater treatment.

The treated water is highly superior and can be used directly, or as feed to a reverse osmosis unit. EnviQ is available for a wide range of challenging wastewater applications in domestic, sewage, industrial and commercial installations.

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EnviQ® RF MODULE SPECIFICATIONS

		EnviQ ® RF MBR Model							
		RF-120	RF-150	RF-180	RF-210	RF-280	RF-350	RF-420	RF-490
Pore Size		0.04µ							
Membrane Type		Hydrophilic PVDF, Hollow Fiber Outside - In							
Membrane pH Tolerance		2-10							
Membrane Temperature Tolerance [#1]		5 - 40 °C / 41 - 104 °F							
Total membrane Area m^2		120	150	180	210	280	350	420	490
Single cartridge Area m^2		3.0				7.0			
Number of Membrane Cartridges		40	50	60	70	40	50	60	70
Flow m^3/hr (gpm)	Minimum	1.2(5.3)	1.5 (6.6)	1.8 (7.9)	2.1 (9.2)	2.8 (12.3)	3.5 (15.4)	4.2 (18.5)	4.9 (21.6)
	Maximum	3.6 (15.9)	4.5 (19.8)	5.4 (23.8)	6.3 (27.7)	8.4 (37)	10.5 (46.2)	12.6 (55.4)	14.7 (64.7)
Air Flow m^3/hr [#2] (CFM)		38- 72 (22- 42)	48- 90 (28- 53)	58-108 (34- 64)	67- 126 (39- 74)	45 – 84 (26 – 49)	56 –105 (33 – 62)	67.2 – 126 (39 – 74)	78.4 -147 (46 – 87)
Dimensions									
Dimensions	Length mm (inch)	893 (35.1)	1021 (40.2)	1132 (44.6)	1254 (49.4)	893 (35.2)	1021(40.2)	1132 (44.6)	1254 (49.4)
	Width mm (inch)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)
	Height mm (inch)	1915 (75.4)	1915 (75.4)	1915 (75.4)	1915 (75.4)	3065 (120.7)	3065 (120.7)	3065 (120.7)	3065 (120.7)
Module Weight (Dry) kgs (lbs)		322 (709.9)	380 (837.8)	440 (970.0)	495 (1091.3)	428 (943.6)	505 (1113.3)	584 (1287.5)	662 (1459.5)
Connection Flange									
Permeate		3" ASTM	3" ASTM	3" ASTM	3" ASTM	4" ASTM	4" ASTM	4" ASTM	4" ASTM
Air Diffuser		1" ASTM	1" ASTM	1" ASTM	1" ASTM	1" ASTM	1" ASTM	1" ASTM	1" ASTM
No. of Air Diffusers		8	10	12	14	8	10	12	14
Permeate Header Material		UPVC				SS 316			
Outer Frame Material		SS 316							
Air Diffuser Type & Material		Coarse Bubble, PVC							

[#1] The optimal temperature range for the biological active sludge is 20 – 37 °C.
[#2] Air requirement given is for membrane scrubbing only and does not include air for the biological process.Refere EnviQ® Software for actual air requirements

Technical Information

Operational Parameters	UOM	Value
MLSS	mg/L	3,000 – 15,000
Operating pH Range	-	5 to 9
Filtration		
Flux Range	Lmh/ gfd	10 - 30 / 6 - 17.6 [#3] (dependent on feed conditions)
Operating Transmembrane Pressure	mmHg / Psi	100 - 200 / 1.9 – 3.9
Maximum Transmembrane Pressure	mmHg / Psi	350 / 6.8
Filtration time	Min	5 - 30
Rest Time	Sec	20 - 120
Backwash		
Maximum Backwash Pressure	psi(bar)	8 (0.6)
Backwash Frequency	N/A	After every 15 to 60 min
Backwash Time	Sec	30 to 60
Product		
Typical Product TSS	mg/L	< 3
Typical Product Turbidity	NTU	<1
Cleaning Chemicals		
Maintenance Cleaning [#4]	N/A	NaOCl (250 ppm as Cl_2) and Citric Acid (1000 ppm)
Recovery Cleaning [#5]	N/A	NaOCl (1000 ppm as Cl_2) and Citric Acid (1000 ppm)

[#3] Actual flux would be dependent on the feed condition. Please consult QUA for guidance on modified air flow requirement for flux greater than 25 Lmh
[#4] Typically required once a week depending on feed condition
[#5] Typically required once every 3-4 months depending on feed condition