PRO-XP1

Ultra High-Pressure Reverse Osmosis

The Hydranautics® PRO-XP series is a set of ultra high-pressure spiral wound membranes customized specifically for challenging industrial process applications such as brine dewatering. These membranes are based on existing Hydranautics high performance membrane products which have been specially designed to treat a variety of industrial feed streams including high fouling, high TDS, or chemically aggressive feeds.

Specified Performance*

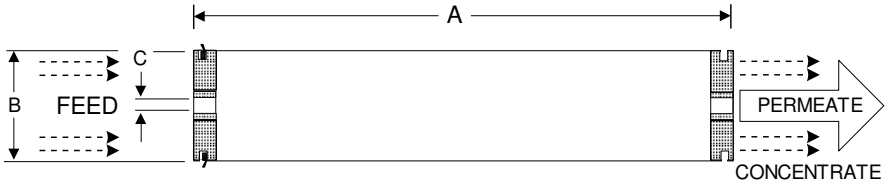
Permeate Flow:	8,000 gpd (30.3 m^3/d)
Salt Rejection:	99.8% (99.7% minimum)
Test Conditions:	32,000 ppm NaCl solution 800 psig (5.5 MPa) Applied Pressure 77°F (25°C) Operating Temperature 10% Permeate Recovery 6.5 - 7.0 pH Range

*The Specified Performance is based on data taken after a minimum of 10 minutes of operation. Actual testing of elements may be done at conditions which vary from these exact values; in which case, the performance is normalized back to these standard conditions. Permeate flow for individual elements may vary -15% to +25% from the value specified. Expect as much as 25-45% flux loss after operating near high pressure limits.

General Product Description**

Configuration:	Spiral Wound
Membrane Polymer:	Composite Polyamide
Membrane Active Area**:	365 ft^2 (33.9 m^2)
Feed Spacer:	34 mil (0.86 mm)

Packaging: All membrane elements are supplied with a brine seal, interconnector, and O-rings. Elements are enclosed in a sealed polyethylene bag containing less than 1.0% sodium meta-bisulfite solution, and then packaged in a cardboard box.



Element Details**

A, inches (mm)	B, inches (mm)	C, inches (mm)
40.0 (1016)	7.89 (200)	1.125 (28.6)

**Values listed are indicative, not specified. For more detailed specifications, see our Technical Service Bulletin documents or contact Hydranautics Technical Department.

Product Use and Restrictions^

Maximum Applied Pressure§ :	1,800 psig (12.4 MPa) up to 30°C (see Chart 1 for detail)
Maximum Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature:	Pressure dependent (see Chart 1 for detail)
pH Range, Continuous (Cleaning):	
	2-11 (1-13) at T <25˚C
	2-11 (1-12) at T= 25 to <35˚C
	3-10.5 (2-11) at T= 35 to 45˚C
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater SDI (15 mins):	5.0
Maximum Feed Flow:	85 gpm (19.3 m^3/h)

Minimum Brine Flow: 12 gpm (2.7 m^3/h)
Maximum Pressure Drop for Each Element: 15 psi (0.10 MPa)

^ The limitations shown here are for general use. For specified projects, operation at more conservative values may ensure the best performance and longest life of the membrane. See Hydranautics Technical Bulletins for more details on operation limits, cleaning pH, and cleaning temperatures.
§ The recommended maximum applied pressure is specific to feed water temperature. See maximum feed pressure and temperature curve on page 2 for pressure limit.

Chart 1: Temperature vs. Maximum Membrane Feed Pressure

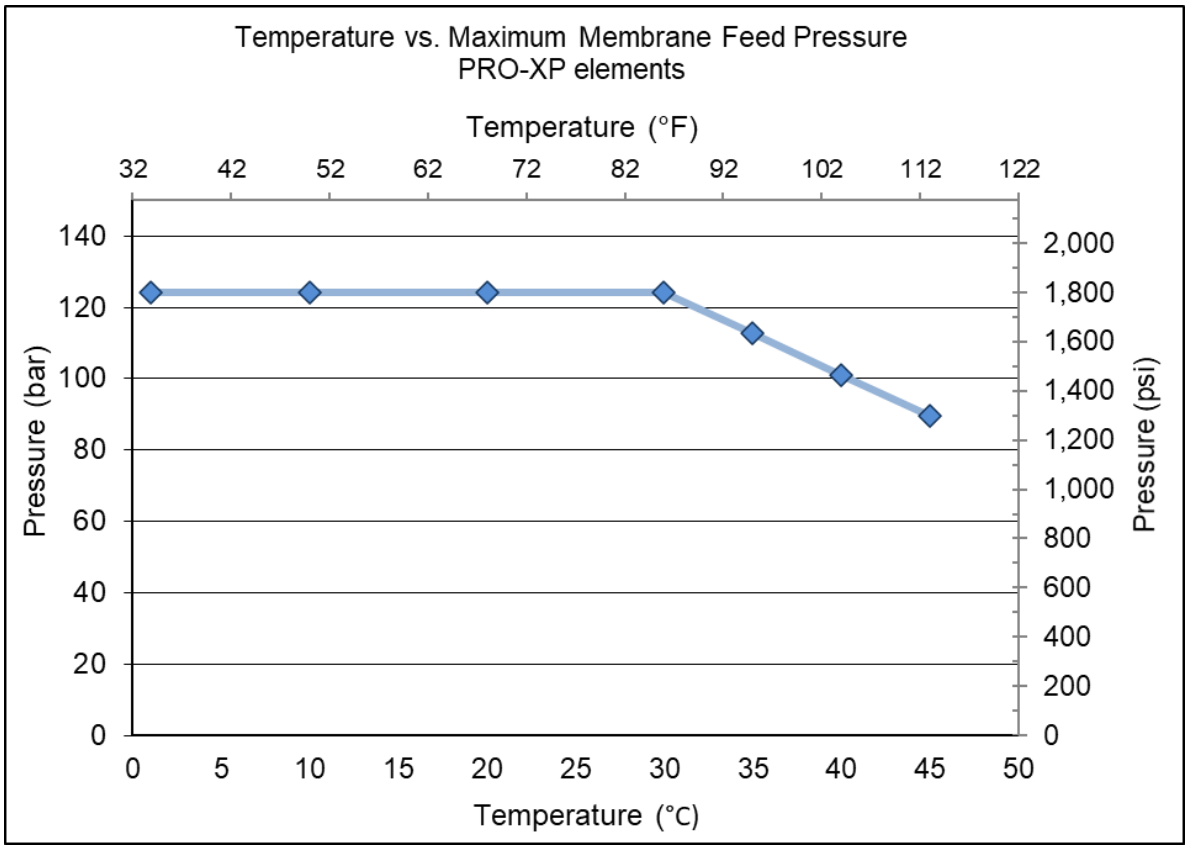


Table 1: Temperature vs. Maximum Feed Pressure limits for PRO-XP elements

°F	°C	psi	bar
33.8	1	1,800	124.1
50	10	1,800	124.1
68	20	1,800	124.1
86	30	1,800	124.1
95	35	1,635	112.7
104	40	1,465	101.0
113	45	1,300	89.6

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