ESPA4-LD-4040

Specified Performance*

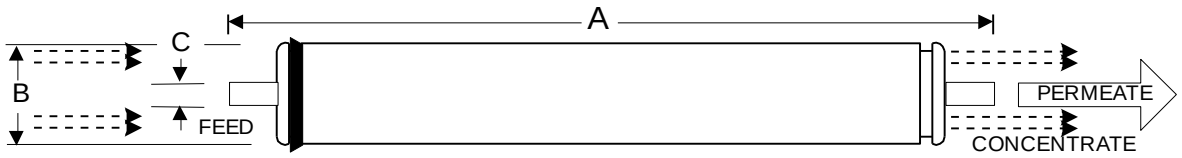
Permeate Flow:	2,350 gpd (8.90 m^3/d)
Salt Rejection:	99.2% (99.0% minimum)
Test Conditions:	500 ppm NaCl solution 100 psig (0.7 MPa) Applied Pressure 77 °F (25 °C) Operating Temperature 15% Permeate Recovery 6.5 - 7.0 pH Range

*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 + or -15 percent from the value specified.

General Product Description**

Configuration:	Low Fouling Spiral Wound
Membrane Polymer:	Composite Polyamide
Membrane Active Area**:	80 ft^2 (7.43 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)	3.95 (100.3)	0.75 (19.1)

Core tube extension = 1.05" (26.7 mm)

**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:	600 psig (8.27 MPa)
Maximum Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature:	113 °F (45 °C)
pH Range, Continuous (Cleaning):	2-10 (1-12)
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater SDI (15 mins):	5.0
Maximum Feed Flow:	16 gpm (3.6 m^3/h)
Minimum Brine Flow:	3 gpm (0.7 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.

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Membrane Element ESPA4 MAX

Performance:

Permeate Flow:	13,200 gpd (50 m^3/d)
Salt Rejection:	99.2% (99.0% minimum)

Type

Configuration:	Spiral Wound
Membrane Polymer:	Composite Polyamide
Membrane Active Area:	440 ft^2 (40.9m^2)

Application Data*

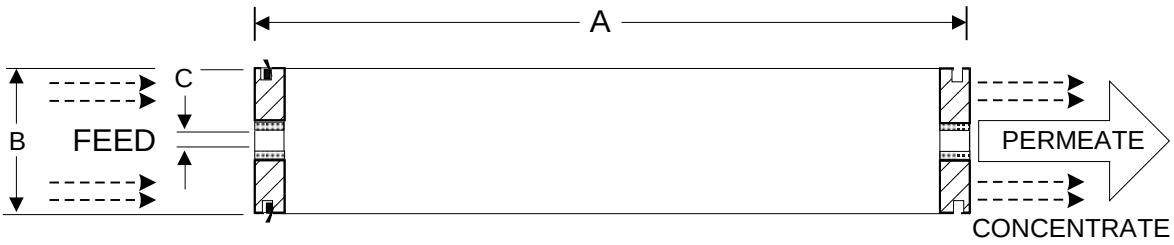
Maximum Applied Pressure:	600 psig (4.14 MPa)
Maximum Chlorine Concentration:	< 0.1 PPM
Maximum Operating Temperature:	113 °F (45 °C)
pH Range, Continuous (Cleaning):	2-10 (1-12)*
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater SDI (15 mins):	5.0
Maximum Feed Flow:	75 GPM (17.0 m^3/h)
Minimum Ratio of Concentrate to Permeate Flow for any Element:	5:1
Maximum Pressure Drop for Each Element:	15 psi

***** The limitations shown here are for general use. For specific projects, operating at more conservative values may ensure the best performance and longest life of the membrane. See Hydranautics Technical Bulletins for more detail on operation limits, cleaning pH, and cleaning temperatures.

Test Conditions

The stated performance is initial (data taken after 30 minutes of operation), based on the following conditions:

500 PPM NaCl solution
100 psi (0.7 MPa) Applied Pressure
77 °F (25 °C) Operating Temperature
15% Permeate Recovery
6.5 - 7.0 pH Range



A, inches (mm)	B, inches (mm)	C, inches (mm)	Weight, lbs. (kg)
40.0 (1016)	7.89 (200)	1.125 (28.6)	36 (16.4)

Notice: Permeate flow for individual elements may vary + or - 15 percent. Membrane active area may vary +/-4%. Element weight may vary. 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 10% propylene glycol, and then packaged in a cardboard box.

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HYDRACoRe10 and 50 LD Series

Hydranautics' HYDRACoRe products are chemical and oxidant-resistant, sulfonated polyethersulfone nanofiltration elements. Potential applications include removal of color and large molecular weight organics from industrial, food and beverage, and municipal feedwaters.

Specified Performance*

Model	Feed Spacer inch (cm)	Area, ft^2 (m^2)	Permeate Flow	NaCl Rejection			Test Pressure
			GPD (m^3/d)	Average	Min	Max	PSI (MPa)
HYDRACoRe10-LD	0.034 (0.086)	400 (37)	16,200 (61.3)	20%	5%	30%	50 (0.34)
HYDRACoRe50-LD	0.034 (0.086)	400 (37)	17,200 (65.1)	55%	40%	65%	140 (0.97)

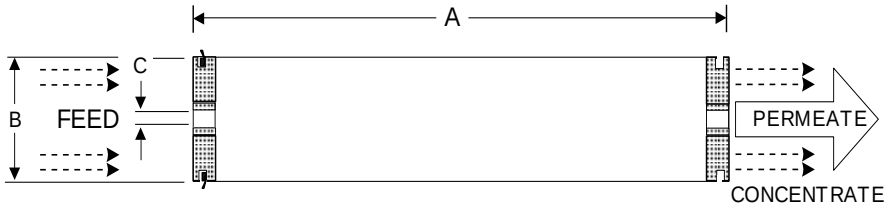
Test Conditions:
2000 ppm NaCl solution
77 °F (25 °C) Operating Temperature
20% Permeate Recovery
6.5 - 7.0 pH Range

*The Specified Performance is based on data taken after approximately 30 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 from the stated value with a range of -25% to "no upper limit".

General Product Description**

Configuration:	Spiral wound with FRP hard shell
Membrane Polymer:	Sulfonated Polyethersulfone
Molecular Weight Cut-off Hydracore10:	3000 Dalton
Molecular Weight Cut-off Hydracore50:	1000 Dalton

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)	Weight, lbs. (kg)
40.0 (1016)	7.89 (200)	1.125 (28.6)	29.8 ± 2 (13.5 ± 1)

**Values listed are indicative, not specified. For more detailed specifications, see our Technical Service Bulletin documents or contact Hydranautics Technical Department. Element weight values are as shipped from factory. Elements that are used and then gravity drained may still contain at least an additional 2 lbs (1 kg) of liquid.

Product Use and Restrictions^

Maximum Applied Pressure:	600 psig (4.14 MPa)
Maximum Continuous Chlorine Concentration[1]:	10 PPM
Maximum Chlorine Concentration for Cleaning[1]:	100 PPM
Maximum Operating Temperature:	113 °F (45°C)
Operating pH Range:	2-11
Cleaning pH Range:	1-12
(For cleaning temperatures <35°C)	
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater SDI (15 mins):	5.0
Maximum Pressure Drop per element:	15 psi (1.03 bar)

[1] Transition metals (Fe, Mn) should not be present in the water or on the membrane as these can accelerate detrimental reactions between the membrane and the oxidant.
^ The limitations shown here are for general use. For specific projects, operating at more conservative values may ensure the best performance and longest life of the membrane. See Hydranautics Technical Bulletins for more detail on operation limits, cleaning pH, and cleaning temperatures.

4/24/2018

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