FLUID SYSTEMS® TFC® - ULP 8” ELEMENT

Ultra Low Pressure, RO Elements

PRODUCT DESCRIPTION

Membrane Chemistry:	Proprietary TFC polyamide
Membrane Type:	TFC-ULP membrane
Construction:	Spiral wound with fiberglass outerwrap
Applications:	Ultra low pressure application for light industrial and potable water production
Options:	40” (1,016 mm) length with standard or high area construction, or 60” (1,524 mm) Magnum® length.

SPECIFICATIONS

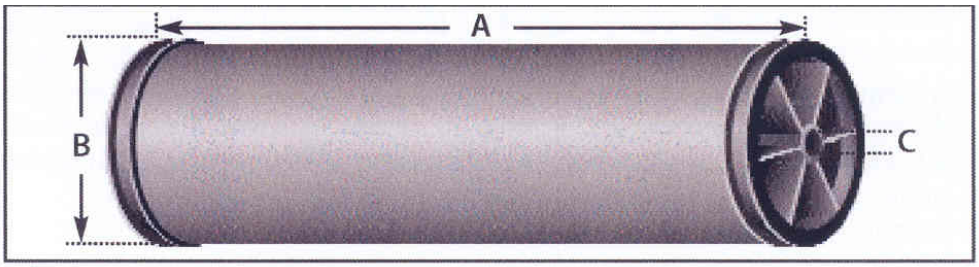
Part Numbers	Model	Permeate Flow gpd	Permeate Flow (m^3/d)	Chloride Rejection percent	Membrane Area ft^2	Membrane Area (m^2)
8882300	8823 ULP-400	8,500	(32.2)	98.5	400	(37.2)
8883300	8833 ULP-575 Magnum®	12,200	(46.2)	98.5	575	(53.4)

Test Conditions: 2,000 mg/l NaCl solution at 125 psi (860 kPa) applied pressure, 15% recovery (20% recovery for Magnum elements), 77°F (25°C) and pH 7.5.

OPERATING & DESIGN INFORMATION

Typical operating pressure:	50-175 psi (345 – 1,200 kPa)
Maximum operating pressure:	350 psi (2,400 kPa)
Maximum operating temperature:	113°F (45°C)
Maximum cleaning temperature:	113°F (45°C)
Maximum continuous free chlorine:	<0.1 mg/l
Allowable pH – continuous operation:	4 – 11
Allowable pH – short term cleaning:	2.5 – 11
Maximum differential pressure per element:	10/15 psi (69/104 kPa)
Maximum differential pressure per vessel:	60 psi (414 kPa)
Maximum feed turbidity:	1 NTU
Maximum feed SDI (15 minute):	5
Feed spacer thickness:	31/28 mil (0.8/0.7 mm)

PRODUCT DIMENSIONS AND WEIGHT



Model	A inches (mm)	B inches (mm)	C inches (mm)	Weight lbs (kg)	Part Numbers Interconnector	O-ring	Brine Seal
8823 ULP-400	40 (1,016)	8 (203.2)	1.50 (38.1)	44 (20)	0035270	0035478	0035705
8833 ULP-575 Magnum®	60 (1,524)	8 (203.2)	1.50 (38.1)	64 (29)	0035270	0035478	0035705

Performance:

Performance specifications shown on the front side of this document are nominal values. Individual element permeate flows may vary +20/-15% from the values shown. Minimum $MgSO_4$ rejection is 97.5% at the conditions shown.

System performance should be predicted using KMS' ROPRO® design software. Element performance is based on the nominal values shown.

System operating data should be normalized and key performance parameters tracked using KMS' NORMPRO® software.

Operating Limits:

- Operating Pressure: Maximum operating pressure is 350 psi (2,400 kPa). Typical operating pressure for TFC-ULP systems is in the range of 50 psi (345 kPa) to 175 psi (1,200 kPa). Actual operating pressure is dependent upon system flux rate (appropriate for feed source) as well as feed salinity, recovery and temperature conditions.
- Permeate Pressure: Permeate pressure should not exceed feed-concentrate pressure by more than 5 psi (34 kPa) at any time (on-line, off-line and during transition).
- Differential Pressure: Maximum differential pressure limits are 10 psi (69 kPa) for a 40" (1,016 mm) long element. Maximum differential pressure for any length pressure vessel is 60 psi (414 kPa).
- Temperature: Maximum operating temperature is 113°F (45°C). Maximum cleaning temperature is 113°F (45°C).
- pH: Allowable range for continuous operation is pH 4-11. Allowable range for short term cleaning is pH 2.5-11.
- Turbidity and SDI: Maximum feed turbidity is 1 NTU. Maximum feed Silt Density Index (SDI) is 5.0 (15 minute test). Experience has shown that feedwater with turbidity greater than 0.2 NTU generally results in frequent cleanings.
- Recovery: Maximum recovery is site and application specific. In general, single element recovery is approximately 15% for 40" (1,016 mm) long and 20% for 60" (1,524 mm) long elements. Recovery limits should be determined using KMS' ROPRO program.

Chemical Tolerance:

- Chlorine: Intentional exposure of TFC-ULP membrane to free chlorine or other oxidizing agents such as permanganate, ozone, bromine and iodine is not recommended. TFC-ULP membrane has a free chlorine tolerance of approximately 1,000 ppm-hours based on testing at 77°F (25°C), pH 8. This tolerance may be significantly reduced if catalyzing metals such as iron are present or if the pH and/or temperature are different. Sodium metabisulfite (without catalysts such as cobalt) is the preferred reducing agent. TFC-ULP membrane has a chloramine tolerance of approximately 60,000 ppm-hours in the absence of free chlorine based on testing at 77°F (25°C), pH 8.
- Cationic (Positively Charged) Polymers and Surfactants: TFC-ULP membrane may be irreversibly fouled if exposed to cationic (positively charged) polymers or surfactants. Exposure to these chemicals during operation or cleaning is not recommended.

Lubricants:

For element loading, use only approved silicone lubricant, water, or glycerin to lubricate O-rings and brine seals. The use of petroleum based lubricants or vegetable based oils may damage the element and void the warranty.

Service and Ongoing Technical Support:

KMS has an experienced staff of professionals available to assist endusers, and OEM's for optimization of existing systems and support with the development of new applications. Along with the availability of supplemental technical bulletins, KMS also offers a complete line of KOCHTREAT® and KOCHKLEEN® RO pretreatment and maintenance chemicals.

The information contained in this publication is believed to be accurate and reliable, but is not to be construed as implying any warranty or guarantee of performance. We assume no responsibility, obligation or liability for results obtained or damages incurred through the application of the information contained herein. Refer to Standard Terms and Conditions of Sale and Performance Warranty documentation for additional information.

FLUID SYSTEMS®, TFC®, Magnum®, ROPRO®, NORMPRO®, KOCHKLEEN®, KOCHTREAT® are registered trademarks of Koch Membrane Systems, Inc.
Koch Membrane Systems, Inc. is a member of Koch Chemical Technology Group, LLC.
© 2004 Koch Membrane Systems, Inc. All rights reserved worldwide. 05/04