

# AG P FR Series

## High Performance and Fouling Resistant Brackish Water RO Elements (Replaces B085 FR 4040, B400 FR, and B400 FR ASD)

The AG P FR-Series thin-film reverse osmosis (RO) membrane is characterized by very high ionic rejection and fouling resistance that makes it ideal for challenging brackish waters such as those with high organics or a highly scaling water source. The AG P FR family of brackish water elements all utilize SUEZ's highly cross-linked polyamide thin film layer with low surface zeta potential that can also withstand multiple cleanings and maintain differentiated performance for the life of the element.

The ASD (alternating strand design) feed spacer technology offers an improvement in RO lifetime cost performance by lower pressure drop and reduced fouling tendency.

AG P FR series is certified to NSF 61.

**Table 1a: Element Specification**

Membrane	AG P FR-series, thin-film membrane (TFM*)
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Model	Average permeate flow gpd (m <sup>3</sup> /day) (1)(2)	Average NaCl rejection (1)(2)	Minimum NaCl rejection (1)(2)
AG-85 P FR	2,400 (8.9)	99.5%	99.0%
AG-400 P FR	10,500 (39.9)	99.5%	99.2%
AG-400 P FR, 34 (ASD)	11,000 (41.5)	99.7%	99.5%

(1) Average salt rejection after 24 hours of operation. Individual flow rate may vary with a minimum of 1,900 gpd (7.1 m<sup>3</sup>/d) for the AG-85 P FR, 8,400 gpd (31.9 m<sup>3</sup>/d) for the AG-400 P FR, and 8,700 gpd (33.2 m<sup>3</sup>/d) for the AG-400 P FR (ASD).

(2) Testing conditions: 2,000ppm NaCl solution at 225psi (1,550kPa) operating pressure, 77°F (25°C), pH7 and 15% recovery.

Model	Active area ft <sup>2</sup> (m <sup>2</sup> )	Outer wrap	Feed spacer mil	Part number
AG-85 P FR	85 (7.9)	Fiberglass	34	3185603
AG-400 P FR	400 (37.2)	Fiberglass	34	3185600
AG-400 P FR, 34 (ASD)	400 (37.2)	Fiberglass	34 (ASD)	3185612

**Table 1b: Typical rejection of other species**

Nitrate, NO <sub>3</sub> <sup>-</sup> (1)(3)	Silica, SiO <sub>2</sub> (1)(3)	Isopropyl Alcohol (IPA) (2)(3)	Boron, B (1)(3)
98.5%	99.7%	95.0%	80.0%

(1) Typical rejection performance for specific ions based on the above test condition plus 100 mg/L NO<sub>3</sub><sup>-</sup>, 50 mg/L SiO<sub>2</sub>, or 5 mg/L B respectively.

(2) Isopropyl alcohol testing is at 100 mg/L IPA without NaCl.

(3) These items are provided as general information only. They are approximate values and are not considered part of the product specifications.

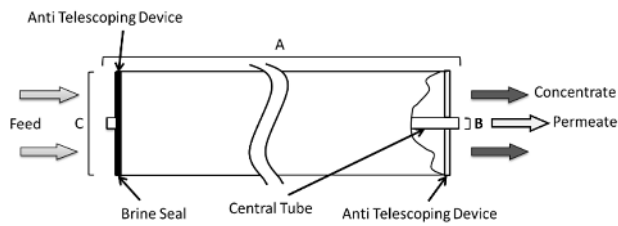
**Table 2: Dimensions and Weights**

Model	Type	Dimensions, inches (cm)			Boxed Weight lbs (kg)
		A	B	C	
AG-85 P FR	Male	40.0 (101.6)	0.75 (1.90)	3.9 (10.0)	12 (5.5)
AG-400 P FR	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	40 (18)
AG-400 P FR, 34 (ASD)	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	40 (18)

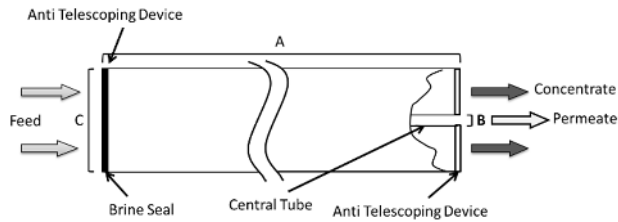
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**Figure 1a: Element Dimensions Diagram – Male**



**Figure 1b: Element Dimensions Diagram - Female**

**Table 3: Operating and CIP parameters**

<b>Typical Operating Pressure</b>	200 psi (1,380 kPa)
<b>Typical Operating Flux</b>	10-20GFD (15-35LMH)
<b>Maximum Operating Pressure</b>	600 psi (4,137 kPa)
<b>Maximum Temperature</b>	Operation: 113°F (45°C)
<b>pH range</b>	Continuous operation 2.0 – 11.0 Clean-In-Place (CIP): 1.0-12.0
<b>Maximum Pressure Drop</b>	Over an element: 15 psi (103 kPa) Per housing: 50 psi (345 kPa)
<b>Chlorine Tolerance</b>	0.1 ppm maximum
<b>Feedwater</b>	NTU < 1 SDI <sub>15</sub> < 5

## Additional Information

- As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.
- Treat RO elements with care; do not drop the element.
- Each RO element is wet tested, preserved in a 1% weight sodium bisulfite solution, and vacuum packed in oxygen barrier bags.
- During storage, avoid freezing and direct sunlight. The temperature should be below 35°C (95°F).

## After Installation

- Keep the RO elements wet and use a compatible preservative for storage duration longer than 7 days.
- During the initial start-up, discharge the first permeate to drain for 30 minutes.
- Permeate back pressure should not exceed feed pressure at any time.
- The RO elements shall be maintained in a clean condition, unfouled by particulate matter or precipitates or biological growth.
- Consider cleaning, if the pressure drop increases by 20% or water permeability decreases by 10%. Use only chemicals which are compatible with the membrane.