

**VONTRON INDUSTRIAL MEMBRANE ELEMENTS**

**FR SERIES FOULING RESISTANT MEMBRANE ELEMENTS**

**Brief Introduction**

FR (fouling resistant) series of aromatic polyamide RO membrane elements developed by Vontron Technology Co. are applicable to the desalination of brackish water. They are characterized by low-pressure operation, higher water productivity and excellent desalting performance. Moreover, special treatment has been made to the surface of the membrane with unique technology to change the electrical charge and smoothness, increasing the hydrophilicity of the membrane surface, thus decreasing the adhesion of contamination and microbes so as to lessen the fouling and extend the service life of elements.

The FR series is designed for desalting of such water with salt concentrations less than 10,000 ppm as surface water, underground water and municipal water, etc. Mainly used in the treatment of various industrial water applications, such as reuse of industrial reclaimed water and boiler water replenishment for power plants, etc. They are particularly applicable to the treatment of those waters containing slight organic pollutants such as industrial wastewater, municipal sewage and other slightly contaminated water.

**Specifications and Main Properties**

| Model     | Active Membrane Area<br>ft <sup>2</sup> (m <sup>2</sup> ) | Average Permeated Flow<br>GPD (m <sup>3</sup> /d) | Stable Rejection Rate (%) | Minimum Rejection Rate (%) |
|-----------|---|---|---------------------------|----------------------------|
| FR11-8040 | 365(33.9)   | 9600(36.3)  | 99.5                      | 99.3                       |
| FR11-4040 | 85(7.9)   | 2200(8.3)   | 99.5                      | 99.3                       |

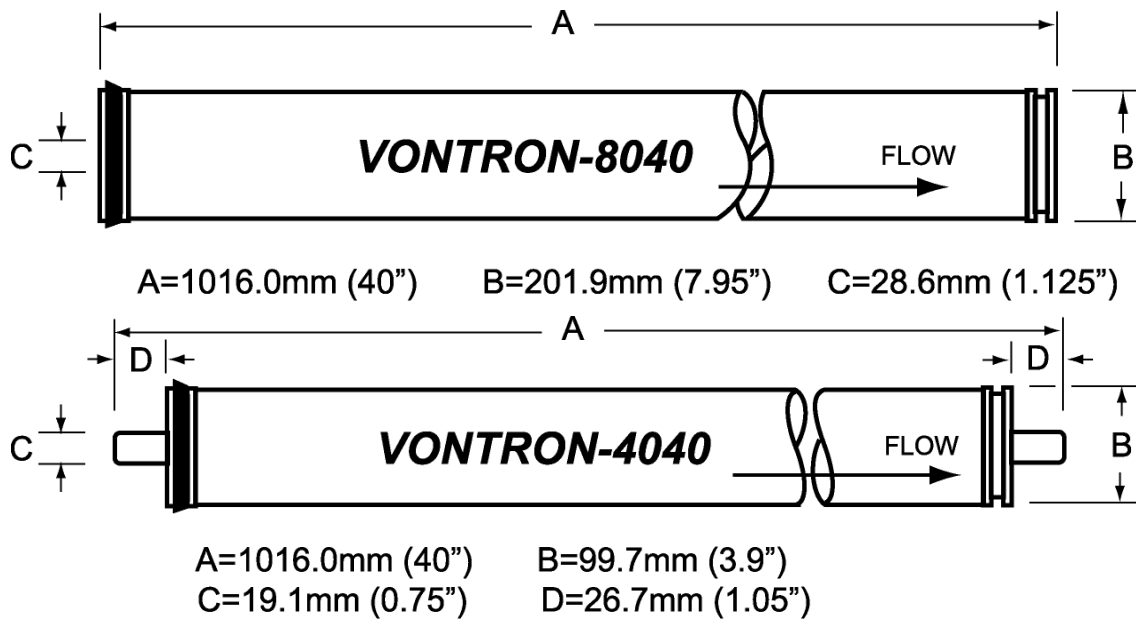
Testing Conditions: Testing Pressure.....225 psi (1.55Mpa)  
 Temperature of Testing Solution .....25 °C  
 Concentration of Testing Solution (NaCl)..... 2000ppm  
 pH Value of Testing Solution .....7.5  
 Recovery Rate of Single Membrane Element....15%

**Extreme Operating Conditions**

|   |   |
|---|---|
| Max. Working Pressure.....                            | 600psi (4.14Mpa)  |
| Max. Feed water Flow.....                             | 75gpm (17 m <sup>3</sup> /h) (8040-size)<br>16gpm (3.6 m <sup>3</sup> /h) (4040 and 4021) |
| Max. Feed water Temperature.....                      | 45°C  |
| Max. Feed water SDI.....                              | .5  |
| Residual chlorine Concentration of Feed water.....    | <0.1ppm   |
| pH Range of Feed water during Continuous Operation... | 3~10  |
| pH Range of Feed water during Chemical Cleaning.....  | 2~12  |
| Max. Pressure Drop of Single Membrane Element.....    | 15psi (0.1Mpa)  |

**Dimensions of Membrane Element**

All dimensions are shown in: millimeter (inch)



**Important Information**

- Any specific application must be limited within the extreme operating conditions. We strongly recommend you to refer to the latest edition of technology manual and design guide prepared by Vontron Technology Co., Ltd., or consult experts proficient in membrane technology. In case the customer fails to follow the operating conditions as specified in this

manual, Vontron technology Co., Ltd. will assume no liability for all results.

7. The permeate flow listed in the table is the average value. The permeate flow of a single membrane element is within a tolerance not exceeding  $\pm 15\%$  of the nominal value.
8. All wet-type membrane elements have been strictly tested before leaving the factory, and have been treated with the solution of 1.0% sodium hydrogen sulfite (an antifreeze solution of 10% propanediol required in winter) for storage purpose, then vacuum sealed in a plastic bag and further packed in carton boxes. In order to prevent the breeding of microbes during short-time storage, transportation and system standby, we recommend you to soak the membrane elements with protective solution (prepared with RO filtered water) containing 1.0% sodium hydrogen sulfite (food grade quality).
9. Discard the RO-filtered water produced during the first one hour after system start-up.
10. During storage time and run time, it is strictly prohibited to dose any chemical that may be harmful to the membrane elements. In case of any violation in using this kind of chemical, Vontron Technology Co. assumes no liability for any outcome incurred.

#### **Points of Attention**

1. All data and information provided has been obtained from long-term evaluation by Vontron Technology Co. This data and information is accurate and effective. Vontron Technology Co. assumes no liability for any consequences caused by user's failure in abiding by the conditions specified in this manual for the use or maintenance of membrane products. It is strongly recommended that the user shall strictly abide by the requirements for design, use and maintenance of products and keep relevant records.
2. Along with technical development and product review, the information contained herein will be subject to modification without prior notification. Please keep an eye on the website of Vontron Technology Co. for any product updates.