



TurboClean® High Purity Low Energy RO Elements

TurboClean® High Purity Low Energy RO elements are used in applications which demand ultrapure water such as dialysis, pharmaceutical and semiconductor rinse water. TurboClean elements feature unique, sanitary, patented hard-shell construction that offers better value than other sanitary elements. TurboClean elements feature about 60% less bypass flow than net-wrapped elements resulting in:

- Strongest Sanitary Element
- Most Effective Cleaning and Sanitizing
- Lower Effective Recovery
- Energy Savings
- Less Scaling
- Ease of Installation

MEMBRANE CHARACTERISTICS

Membrane	RO-LE
Membrane Type	Polyamide
Stabilized Salt Rejection (%)	98.5
Minimum Salt Rejection (%)	98.0

DESIGN INFORMATION

Model	Part Number	Permeate Flow m ³ /day (GPD) ^a	Membrane Area m ² (ft ²)	Feed Spacer Thickness (mil) ^b
TurboClean® HP 4040-RO-LE-M	164024441	9.1 (2,400)	7.4 (80)	31
TurboClean® HP 4040-RO-LE-F	164320442	9.1 (2,400)	7.4 (80)	31

^a Test conditions: 2,000 ppm NaCl, 10.3 bar (150 psi), 25°C (77°F), 15% recovery, pH 8.0, 30 minutes operation. Flow rates will be no more than 15% below the values shown. Product specifications may change without notice as design revisions occur.

^b All models on this sheet have TurboClean sanitary outer wrap and diamond shaped feed spacers. All models on this sheet include anti-telescoping devices (ATDs) attached to the ends of the element and one interconnector. A brine seal is not included and is not required.

OPERATING PARAMETERS

Maximum Operating Pressure	41 bar (600 psi)
Maximum Operating Temperature	50°C (122°F)
Cleaning pH Range¹	1.0 - 12.0
Chlorine Tolerance²	< 0.1 ppm
Maximum Pressure Drop	1.4 bar (20 psi) per element; 6 bar (80 psi) per housing
Maximum SDI₁₅	5.0
Maximum Turbidity	1 NTU

¹ Refer to temperature and pH limits in Membrane Cleaning Guide - Water Application Elements (TSG-C-001).

² Pretreatment is recommended for the removal of free chlorine and other oxidizing agents to prevent damage to membranes. Oxidizing agents, such as free chlorine, in contact with polyamide membranes may result in shortened operating life or membrane failure. Such oxidation damage is excluded from warranty. Refer to Membrane Operating Guide - Recommendations for Water Purification (TSG-O-012).

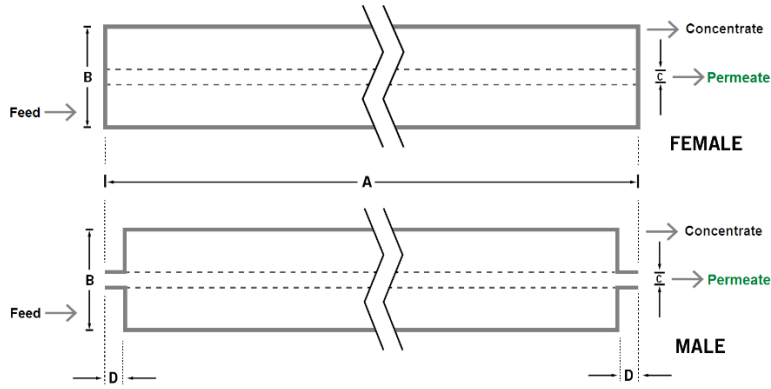
PHYSICAL DIMENSIONS

Model	Element Weight kg (lb) ^c	Dim. A mm (inches)	Dim. B mm (inches)	Dim. C ^d mm (inches)	Permeate Tube ^e
TurboClean® HP 4040-RO-LE-M	4 (9)	1,016 (40.0)	99 (3.9)	19.1 (0.75)	Male
TurboClean® HP 4040-RO-LE-F	4 (9)	1,016 (40.0)	99 (3.9)	15.9 (0.625)	Female

c Shipping weight is dependent on packaging material and quantity shipped.

d Diameters for Dimension "C" are as follows. For Female elements, "C" is the Inner Diameter. For Male elements, "C" is the Outer Diameter.

e Male elements have a protruding permeate tube, indicated as "D" in the diagram. Dimension "D" is 25.4 mm (1.0 in).



IMPORTANT INFORMATION

- Start-up:** MANN+HUMMEL Water & Fluid Solutions recommends flushing elements for 30 minutes at low pressure and discarding permeate during the flush prior to operation. For a more detailed start-up procedure, please see Element Start-Up Guide – System Start-Up (TSG-O-005).
- Cleaning:** TurboClean® membrane elements must be cleaned periodically to ensure proper operation and to prevent membrane damage. Please see Membrane Cleaning Guide – Water Application Elements (TSG-C-001).
- Storage:** TurboClean membrane elements must be stored appropriately to ensure proper operation and to prevent membrane damage. Please see Element Storage Guides (TSG-O-009 & TSG-O-010).
- Regulatory:** All models on this sheet use FDA (CFR Title 21) compliant materials.

CUSTOMIZABLE SPECIALTY ELEMENTS

MANN+HUMMEL Water & Fluid Solutions offers a full range of membranes and element designs for challenging water and process applications. Technologies include low-fouling RO, submerged UF, continuous high temperature, ultra-high pressure, unique sanitary designs and more. Contact us to customize a product that satisfies your specific requirements.

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