

# SpiraSep™ 960-PES

## Ultrafiltration Modules

SpiraSep™ 960 ultrafiltration (UF) modules feature a vacuum-driven, submerged, backwashable, spiral-wound membrane design with superior operating performance over conventional hollow fiber formats. The unique design characteristics of a spiral-wound membrane with open feed channels allow SpiraSep modules to handle the solids levels seen in high fouling water and wastewater streams. An advanced aeration process combined with periodic backwashing easily removes particulate matter from the membrane surface. The low net driving pressure of an immersed system minimizes energy costs and membrane fouling.

With a design built to handle high fouling water and wastewater streams, SpiraSep modules eliminate the need for extensive pre-treatment for UF systems, such as clarifiers, thus reducing cost, complexity, and footprint. Its ability to directly treat some of the most difficult water and wastewater streams allows SpiraSep to drastically reduce capital and operational costs while simplifying the overall treatment process.

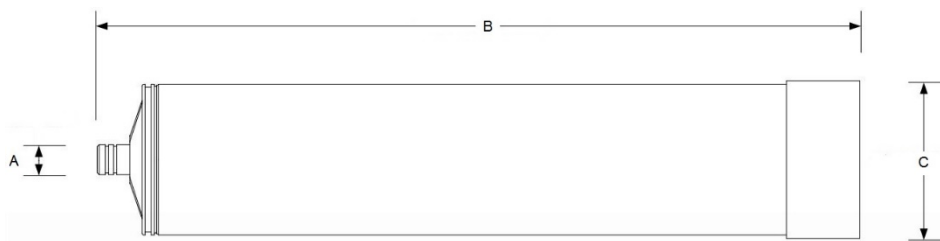
### MEMBRANE CHARACTERISTICS

<b>Membrane Chemistry</b>	Polyethersulfone (PES)
<b>Construction</b>	Submerged, Negative Pressure Ultrafiltration Module
<b>Pore Size</b>	0.03 micron

### MODULE SPECIFICATIONS

<b>Model</b>	SpiraSep™ 960-PES
<b>Feed Channel</b>	90 mil corrugated
<b>Membrane Area - m<sup>2</sup> (ft<sup>2</sup>)</b>	20.9 (225)

### PHYSICAL DIMENSIONS



<b>Dim. A - mm (inches)</b>	47 (1.87)
<b>Dim. B - mm (inches)</b>	1,187 (46.75)
<b>Dim. C - mm (inches)</b>	249 (9.80)
<b>Element Weight - kg (lb)</b>	23 (50)

## OPERATING PARAMETERS

<b>Transmembrane Pressure Range</b>	0.07 – 0.7 bar (1 – 10 psi)
<b>Temperature Range<sup>1</sup></b>	1 – 45°C (34 – 113°F)
<b>pH Range<sup>1</sup></b>	2.0 – 11.0
<b>Applicable Air Scour Rate</b>	5.6 Nm <sup>3</sup> /hr (3.5 scfm)
<b>Cleaning Chlorine Tolerance</b>	1,000 mg/L
<b>Maximum Feed TSS<sup>2</sup></b>	1,000 mg/L
<b>Maximum Feed Oil &amp; Grease<sup>2</sup></b>	300 mg/L

<sup>1</sup> Temperature, pH limits, and cleaning procedures are further detailed in the SpiraSep™ 960 Product Manual.

<sup>2</sup> Depending on feed water quality and operating conditions.

## IMPORTANT INFORMATION

**Start-up:** MANN+HUMMEL Water & Fluid Solutions recommends an operational sequence that incorporates permeate production, cleaning, and module draining steps. For a more detailed operational sequence, please see SpiraSep 960 Product Manual pages 10-11.

**Cleaning:** SpiraSep 960 ultrafiltration modules must be cleaned routinely via backwash, chemically enhanced backwash (CEB), and clean-in-place (CIP) to ensure proper operation and to prevent membrane damage. Please see SpiraSep 960 Product Manual pages 12-15.

**Storage:** SpiraSep 960 ultrafiltration modules must be stored appropriately to ensure proper operation and to prevent membrane damage. Please see SpiraSep 960 Product Manual pages 18-19.

## 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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