### **RO MEMBRANES VRO-400-28**

High Rejection, good Productivity - Brackish Water Element

	Nominal Area	Permeate Flow Rate m³/d (usgpd)		/ Rate	Salt Rejection (%)	
Part Number				d)	Minimum	Nominal
MBROYR301661	37.2		40 (10500	)	99.0	99.5
Part Number	Part Number Maximum Feed Flow m³/hr (usgpm)		sions inch	es (mm)	Weight kg (lbs)	Permeate tube length inches (mm)
			В	С	weight. kg (ibs)	
MBROYR301661	17.0 (75)	40 (1016)	7.89 (200)	1.5 (38,1)	16,4 (36)	-
Туре						
Configuration:	Spiral W	Vound				
Membrane Polymer:	Compos	site Polya	amide			
Brine Spacer Material	Polypro	pylene				
			*	<u> </u>	A	(P) Permeate
Test Conditions						······PCn (F) Feed
2000 ppm NaCl solution, Permeate Recovery 15%.	15.5 bar, 25°C, pH 8.0,		€····⊳ C B		프 프 	···▷(P) (m) Concentrate

#### **Operating Limits\***

Maximum Applied Pressure:	41.4 bar (600 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)

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Hydrex<sup>™</sup> inhibitors are employed during routine operation for :

· Inhibition of mineral scales and metal deposits

• Prevention of biofouling

• Prevention of membrane oxidation

**Hydrex™ cleaners** are employed during periodical cleaning of the RO units (CIP) to recover the performances of the membranes. The complete **Hydrex™ program** will be determined by our engineers depending on water quality and system design.

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Notice: Minimum permeate flow for individual elements 15 % below listed flow. All membrane elements are supplied with a brine seal and o-rings. Elements are vacuum sealed in a polyethylene bag containing less than 1.0% sodium metabisulphite and 10% propylene glycol solution and then packaged in a cardboard box.

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# **RO MEMBRANES VRO-2540**

High Productivity - Brackish Water Element

Part Number Nominal Area Permeate Flow Rate m <sup>2</sup> m <sup>3</sup> /d (usgpd)	Nominal Area	Permeate Flow Rate	Salt Rejection (%)		
	Minimum	Nominal			
MBROYL307131	2.6	3.8 (1000)	99.0	99.5	

Part Number	Maximum Feed Flow m³/hr (usgpm)	Dimensions inches (mm)			Weight kg (lbs)	Core Tube Extension
		А	В	С		inches (mm)
MBROYL307131	1.4 (6)	40 (1016)	2.4 (61)	0.75 (19.1)	1.8 (4)	1.2 (30.5)

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

2000 ppm NaCl solution, 15.5 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 15%.



#### **Operating Limits\***

Maximum Applied Pressure:	20.7 bar (300 psig)		
Maximum Free Chlorine Concentration:	< 0.1 ppm		
Maximum Operating Temperature: 45°C			
Feedwater pH Range:	2.0 - 11.0		
Cleaning pH Range:	1.0 - 13.0		
Maximum Feedwater Turbidity:	1.0 NTU		
Maximum Feedwater Fouling Index (SDI):	5.0		
Maximum Element Recovery:	19%		
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)		



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Prevention of biofouling

Prevention of membrane oxidation

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### **RO MEMBRANES VRO-HR4040**

Low Energy, Excellent Productivity - Brackish Water Element

Part Number	Nominal Area	Permeate Flow Rate	Salt Rejection (%)			
rait Nullibel		m³/d (usgpd)	Minimum	Nominal		
MBROYN307128	8.7	10.2 (2900)	99.3	99.5		

Part Number	Maximum Feed Flow m³/hr (usgpm)	Dimensions inches (mm)			Weight kg (lbs)	Core Tube Extension
		А	В	С		inches (mm)
MBROYN307128	3.6 (16)	40 (1016)	3.95 (100.3)	0.75 (19.1)	3.6 (8)	1.05 (26.7)

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

2000 ppm NaCl solution, 15 bar, 25°C, pH 8.0, Permeate Recovery 15%.



#### **Operating Limits\***

Maximum Applied Pressure:	20.7 bar (300 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)

**Hydrex™ cleaners** are employed during periodical cleaning of the RO units (CIP) to recover the performances of the membranes. The complete **Hydrex™ program** will be determined by our

engineers depending on water quality and system design.

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• Prevention of biofouling

• Prevention of membrane oxidation

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### **RO MEMBRANES VRO-HRSE440-28**

Low Energy, Very High Rejection - Brackish Water Element

Part Number	Nominal Area	Permeate Flow Rate	Salt Rejection (%)			
		m³/d (usgpd)	Minimum	Nominal		
MBROYR307123	40.9	47.9 (12650)	99.0	99.3		

Part Number	Maximum Feed Flow m³/hr (usgpm)	Dimensions inches (mm)			Weight kg (lbs)	Permeate tube length
		А	В	С		inches (mm)
MBROYR307123	17.0 (75)	40 (1016)	7.89 (200)	1.125 (28,6)	16,4 (36)	-

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

2000 ppm NaCl solution, 10.3 bar, 25°C, pH 8.0, Permeate Recovery 15%.



#### **Operating Limits\*** Maximum Applied Pressure: 41.4 bar (600 psig) Maximum Free Chlorine Concentration: < 0.1 ppm Maximum Operating Temperature: 45°C Feedwater pH Range: 2.0 - 11.0 Cleaning pH Range: 1.0 - 13.0 1.0 NTU Maximum Feedwater Turbidity: Maximum Feedwater Fouling Index (SDI): 5.0 Maximum Element Recovery: 19% Maximum Pressure Drop Per Element: 1.0 bar (15 psi)



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Inhibition of mineral scales and metal deposits

Prevention of biofouling

• Prevention of membrane oxidation

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# **RO MEMBRANES VRO-HWS390FF**

Heat Sanitizable Full-Fit Elements

Part Number	Nominal Area	Permeate Flow Rate	Salt Rejection (%)		
		m³/d (usgpd)	Minimum	Nominal	
MBROYN307125	36	34 (9000)	99.0	99.5	

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lbs)	Permeate tube length
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYN307125	-	40 (1016)	7.9 (200)	1.125 (28,6)	15 (33)	-

Туре

Configuration: Membrane Polymer: ATD & Core Tube Material: Sanitizable Spiral Wound Full-Fit (Mesh wrap) Composite Polyamide Polysulphone

41.4 bar (600 psig)

#### **Test Conditions**

2000 ppm NaCl solution, 10.3 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 15%.



### Operating Limits\* Maximum Applied Pressure:

Maximum Free Chlorine Concentration:	< 0.1 ppm	
Maximum Operating Temperature: 45°C		
Feedwater pH Range:	2.0 - 11.0	
Cleaning pH Range:	1.0 - 12.0	Real -
Maximum Feedwater Turbidity:	1.0 NTU	A
Maximum Feedwater Fouling Index (SDI):	5.0	
Maximum Sanitizing Temperature: 85°C		and and
Maximum Sanitizing Pressure:	1.7 bar (25 psi)	
Temperature pH 10:	35°C	



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• Prevention of biofouling

• Prevention of membrane oxidation

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# **RO MEMBRANES VRO-HWS4040FF**

Heat Sanitizable Full-Fit Elements

Davt Number	Nominal Area	Permeate Flow Rate	Salt Rejection (%)			
Part Number		m³/d (usgpd)	Minimum	Nominal		
MBROYN307124	8.4	7.2 (1900)	-	99.5		

Part Number	Maximum Feed Flow	Dimensions inches (mm) Weight kg (lbs)				Core Tube Extension
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYN307124	-	40 (1016)	3.98 (101)	0.75 (19.1)	3.2 (7)	1.05 (26.7)

#### Туре

Configuration: Membrane Polymer: ATD & Core Tube Material:

#### Sanitizable Spiral Wound Full-Fit (Mesh wrap) Composite Polyamide Polysulphone

#### Test Conditions

2000 ppm NaCl solution, 10.3 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 15%.



### **Operating Limits\***

Maximum Applied Pressure:	41.4 bar (600 ps
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 12.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Sanitizing Temperature: 85°C	
Maximum Sanitizing Pressure:	1.7 bar (25 psi)
Temperature pH 10:	35°C



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Inhibition of mineral scales and metal deposits

• Prevention of biofouling

membranes.

• Prevention of membrane oxidation

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### **RO MEMBRANES VRO-SE4040**

Extra Low Energy, Excellent Productivity - Brackish Water Element

Part Number	Nominal Area	Permeate Flow Rate	te Salt Rejection (%)			
Fait Number	m² m³/d (usgpd)	Minimum	Nominal			
MBROYN307130	8.7	10.2 (2700)	-	99.0		

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lhs)	Core Tube Extension
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYN307130	3.6 (16)	40 (1016)	3.95 (100.3)	0.75 (19.1)	3.6 (8)	1.05 (26.7)

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### Test Conditions

2000 ppm NaCl solution, 8.6 bar, 25°C, pH 8.0, Permeate Recovery 15%.



#### **Operating Limits\***

Maximum Applied Pressure:	20.7 bar (300 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)



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### **RO MEMBRANES VRO-XSE400-28**

High Rejection, High Productivity - Sea Water Element

Part Number	Nominal Area	Permeate Flow Rate	Salt Reje	ection (%)	Boron Rejection (%)
	m²	m³/d (usgpd)	Minimum	Nominal	Stabilized
MBROYR307133	37.1	34 (9000)	99.6	99.8	91.5

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lbs)	Permeate tube length
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYR307133	17.0 (75)	40 (1016)	7.89 (200)	1.125 (28,6)	16,4 (36)	-

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### Test Conditions

32000 ppm NaCl solution, Boron Concentration 5 ppm, 56 bar, 25°C, pH 8.0, Permeate Recovery 8%.



#### **Operating Limits\***

Maximum Applied Pressure:	82.7 bar (1200 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)



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### **RO MEMBRANES VRO-XSE2521**

Extra Low Energy, Excellent Productivity - Brackish Water Element

Part Number	Nominal Area m²	Permeate Flow Rate m³/d (usgpd)	Stabilized Salt Rejection (%)
MBROYL307126	1.1	1.4 (365)	99.0

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lbs)	Core Tube Extension
	m³/hr (usgpm)	Α	В	С		inches (mm)
MBROYL307126	1.4 (6)	21.0 (533.4)	2.4 (61)	0.75 (19.1)	0.9 (2)	1.2 (30.5)

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

500 ppm NaCl solution, 6.9 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 8%.



#### **Operating Limits\***

Maximum Applied Pressure:	20.7 bar (300 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	0.9 bar (13 psi)



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Prevention of biofouling

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### **RO MEMBRANES VRO-XSE2540**

Extra Low Energy, Excellent Productivity - Brackish Water Element

Part Number	Nominal Area Permeate Flow Rate m <sup>2</sup> M <sup>3</sup> /d (usgpd) Stabilized St		Permeate Flow Rate m³/d (usgpd)		t Rejection (%)	
MBROYL307127	2.6	3.2 (850)			99	9.0
Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lhs)	Core Tube Extension
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYL307127	1.4 (6)	40.0 (1016)	2.4 (61)	0.75 (19.1)	1.8 (4)	1.2 (30.5)

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

500 ppm NaCl solution, 6.9 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 15%.



### Operating Limits\*

Maximum Applied Pressure:	20.7 bar (300 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	0.9 bar (13 psi)



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Inhibition of mineral scales and metal deposits

• Prevention of biofouling

• Prevention of membrane oxidation

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### **RO MEMBRANES VRO-XSE4021**

Extra Low Energy, Excellent Productivity - Brackish Water Element

Part Number	Nominal Area m²	Permeate Flow Rate m³/d (usgpd)	Stabilized Salt Rejection (%)
MBROYN307129	3.29	3.88 (1025)	99.0

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Waight kg (lbc)	Core Tube Extension
	m³/hr (usgpm)	А	В	С		inches (mm)
MBROYN307129	3.2 (14)	21.0 (533.4)	3.95 (100.3)	0.75 (19.1)	1.8 (4)	1.2 (30.5)

#### Туре

Configuration: Membrane Polymer: **Brine Spacer Material**  Spiral Wound **Composite Polyamide** Polypropylene

#### **Test Conditions**

500 ppm NaCl solution, 6.9 bar, 25°C, pH 6.5 - 7.0, Permeate Recovery 8%.



## (Cn) Concentrate

Operating Limits*	
Maximum Applied Pressure:	20.7 bar (300 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	0.9 bar (13 psi)



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Prevention of biofouling

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## **RO MEMBRANES VRO-XSE440-28**

Extra Low Energy, High Rejection - Brackish Water Element

Part Number	Nominal Area	Permeate Flow Rate	Salt Rejection (%)		
rait Number	m² m³/d (usgpd)	Minimum	Nominal		
MBROYR307122	40.9	53 (14000)	97.0	99.0	

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lhs)	Permeate tube length
	m³/hr (usgpm)	Α	В	С		inches (mm)
MBROYR307122	17.0 (75)	40 (1016)	7.89 (200)	1.5 (38,1)	16,4 (36)	-

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material: Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

2000 ppm NaCl solution, 8.6 bar, 25°C, pH 8.0, Permeate Recovery 15%.



### **Operating Limits**\*

41.4 bar (600 psig)
< 0.1 ppm
2.0 - 11.0
1.0 - 13.0
1.0 NTU
5.0
19%
1.0 bar (15 psi)



Veolia RO membranes are designed to be operated with Hydrex™ additives to get optimum performance and extended life of the membranes.

Hydrex<sup>™</sup> inhibitors are employed during routine operation for :

Inhibition of mineral scales and metal deposits

• Prevention of biofouling

Prevention of membrane oxidation

**Hydrex™ cleaners** are employed during periodical cleaning of the RO units (CIP) to recover the performances of the membranes. The complete **Hydrex™ program** will be determined by our engineers depending on water quality and system design.

\* Operating limits are for information only, actual operating conditions should be optimised to ensure best performance and membrane life.

Notice: Minimum permeate flow for individual elements 15 % below listed flow. All membrane elements are supplied with a brine seal and o-rings. Elements are vacuum sealed in a polyethylene bag containing less than 1.0% sodium metabisulphite and 10% propylene glycol solution and then packaged in a cardboard box.

Veolia Water Technologies accept no responsibility for results obtained by the application of this information or the safety or suitability of our products, either alone or in combination with other products.

#### Visit our website: www.veoliawatertechnologies.com/vwsro\_membranes/en/

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### **RO MEMBRANES VRO-HRSE400-28**

Low Energy, Very High Rejection - Brackish Water Element

Part Number	Nominal Area	Permeate Flow Rate	w Rate Salt Rejection (%)			
Part Number		m³/d (usgpd)	Minimum	Nominal		
MBROYR307862	37	44 (11500)	99.0	99.3		

Part Number	Maximum Feed Flow	Dimensions inches (mm)			Weight kg (lhs)	Permeate tube length
	m³/hr (usgpm)	Α	В	С		inches (mm)
MBROYR307862	17.0 (75)	40 (1016)	7.89 (200)	1.125 (28,6)	16,4 (36)	-

#### Туре

Configuration: Membrane Polymer: Brine Spacer Material: Spiral Wound Composite Polyamide Polypropylene

#### **Test Conditions**

2000 ppm NaCl solution, 10.3 bar, 25°C, pH 8.0, Permeate Recovery 15%.



Maximum Applied Pressure:	41.4 bar (600 psig)
Maximum Free Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature: 45°C	
Feedwater pH Range:	2.0 - 11.0
Cleaning pH Range:	1.0 - 13.0
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater Fouling Index (SDI):	5.0
Maximum Element Recovery:	19%
Maximum Pressure Drop Per Element:	1.0 bar (15 psi)





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Prevention of membrane oxidation

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