VEOLIA

SERIE GF

SOLUCIONES PARA AGUA POTABLE & AGUA DE PROCESO

Aplicaciones:

- Agroindustria
- Alimentos y bebidas
- Construcción
- Farmacéuticas
- Industria química
- Inmobiliarias, hoteles y hospitales
- Minería
- Sanitarias

APLICACIONES

PRODUCCIÓN DE AGUA POTABLE PARA:

- Sanitarias
- Industria de la construcción
- Campamentos mineros
- Inmobiliarias, hoteles y hospitales

PRODUCCIÓN DE AGUA DE PROCESO PARA:

- Producción de alimentos y bebidas
- Lavado de frutas en la agroindustria
- Formulaciones de productos químicos
- Producción de fármacos

ABATIMIENTO DE TURBIDEZ
Filtros de profundidad **GFAA Y GFZE**

PRINCIPALES APLICACIONES

- Clarificación para **producción de agua potable.**
- Clarificación para **procesos industriales.**
- Pretratamiento de **Ósmosis inversa.**
- Clarificación de **agua torres de enfriamiento.**

Especificaciones técnicas

	GFAA arena antracita	GFZE zeolita
Capacidad	1 m^3/h hasta 120 m^3/h	1 m^3/h hasta 217 m^3/h
Temperatura máxima de trabajo	50 ºC	50 ºC
Turbiedad máxima de alimentación	50 NTU	50 NTU
Turbiedad en el agua de servicio	<2,0 NTU	<2,0 NTU
Presión máxima de prueba	7,5 bar	7,5 bar
Presión máxima de alimentación	5,0 bar	5,0 bar
Presión mínima de alimentación	1,5 bar	1,5 bar

DECLORADOR
Filtros mediante carbón activado **GFCDC**

PRINCIPALES APLICACIONES

- Producción de **alimentos y bebidas.**
- Pretratamiento de **Ósmosis inversa.**

Especificaciones técnicas

	GFCDC
Capacidad	2 m^3/h hasta 137 m^3/h
Temperatura máxima de trabajo	50 °C
Turbiedad máxima de alimentación	<2,0 NTU
Concentración de Cloro libre en agua producto	0,0 ppm de cloro libre
Presión máxima de prueba	7,5 bar
Presión máxima de alimentación	5,0 bar
Presión mínima de alimentación	1,5 bar

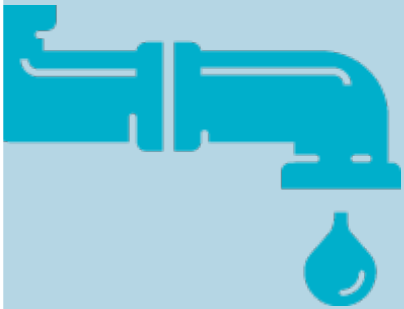
ABATIMIENTO DE Fe-Mn y As
Filtros **GFFM y GFAS**

PRINCIPALES APLICACIONES

- Producción de **agua potable.**
- Producción de **alimentos y bebidas.**
- Pretratamiento de **Ósmosis inversa (GFFM).**

Especificaciones técnicas

	GFFM Hierro-Manganeso	GFAS arsénico
Capacidad	1 m^3/h a 84 m^3/h	1 m^3/h hasta 84 m^3/h
Temperatura máxima de trabajo	50 °C	50 °C
Turbiedad máxima de alimentación	50 NTU	2 NTU
Calidad agua producto de acuerdo con NCH 409-1 Of 2005	Fe < 0,3 ppm Mn < 0,05 ppm	As < lt; 0,01
Presión máxima de prueba	5,0 bar	5,0 bar
Presión máxima de alimentación	5,0 bar	5,0 bar
Presión mínima de alimentación	1,5 bar	1,5 bar



ESPECIFICACIONES GENERALES

Todos nuestros filtros pueden ser de operación manual o automática y se entregan con una carpeta de calidad con la siguiente información:

- Cálculo de espesor de paredes estanque en función de presión de operación interior de acuerdo con ASME Div VIII.
- Control dimensional.
- Trazabilidad y certificado de origen de materiales.
- Control radiográfico y ensayos no destructivos de acuerdo con ASME Div V.
- Tratamiento y preparación de superficies metálicas de acuerdo con normas SSPC-SP5/ NACE -1.
- Control de espesor de pintura y ensayos no destructivos de acuerdo con ASME Div V.
- Prueba hidrostática de acuerdo con ASME Div VIII UG-99.

CONTACTO

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PRO*flex**

FACT SHEET

60 Hz reverse osmosis machines from 35 to 550 gpm (8 - 125 m^3/hr)

Flexible Design

- PRO*flex* has 15 base configurations using 12 to 108 elements that allows user to choose various pumps and membrane element types to work for their specific situation and capex budget.
- 2-stage and 3-stage designs available
- Footprint is same for all models
- New design allows for wired devices, motor starters, disconnects, monitors, to be configured and easily customized on the instrument panel and assembly
- Pump is in front of skid for easy access and maintenance.
- Piping is clean and simple – allowing for easy modifications, as needed.

Standard Features

All PRO*flex* RO/NF systems come standard with the following features:

- UL/cUL electrical panel
- Primary and final pressure transmitters
- RO permeate flush on shutdown
- pH Meter on RO feed
- Allen Bradley CompactLogix PLC control package
- Signet control/monitoring package

Instrumentation

Flow meters .....Permeate, concentrate
Conductivity ..... Permeate, feed
Pressure gauge .....Pre and post cartridge filter, pump outlet, inter-stage, concentrate, permeate
Pressure transmitter ..... Pre and post elements, pre and post cartridge filter
Pressure switch .....Feed, permeate, concentrate
pH ..... Feed

Configurable Options Available

For more details, go to the Veolia website at https://engg.watertechnologies.com/products/configurator

- Multiple pump options – use the flexConfigurator tool to help select the right pump for your application.
- Membrane options:
  - High rejection elements
  - Low energy elements
  - Nanofiltration elements
- Motor starters/variable frequency drive: mounted or shipped loose.
- Stainless steel upgrade options:
  - Housings
  - Low pressure piping
  - Cartridge filter housing
- Recycle
- Stage by stage cleaning on two stage (2S) systems
- 575V motors
- NEMA 4X control panel
- Instrument packages
  - Rosemount
  - E&H
  - No Instruments

PRO NA accessories

- PRO Multi-Media filters
- PRO Activated Carbon and Softeners
- PRO Clean-in-Place Units
- PRO Chemical Feed Systems
- Transfer pumps and storage tanks

Operating Parameters

Use Winflows as the guide for specific rates and ranges with your machine.

- Design recovery[1]..... 77.5-80%
- Design temperature 60ºF (16ºC)
- Operating temperature range .. 35-85ºF (2-29ºC)
- Nominal rejection 97-99%
- System inlet pressure .....30-60 PSI

[1]Recovery rate can vary +/- 5%

Materials of Construction (default)

High-pressure piping .... 316 Stainless Steel, Sch. 10
Low-pressure piping .....PVC, Sch. 80
Frame .....Painted blue carbon steel
Enclosure ..... NEMA 4
Clamps/fittings.....Zinc-plated

Membrane Elements and Housings (default)

Membrane model AG8040F-400
Style.....Spiral-wound elements
Membrane type ..... TFC(Polyamide)
Average membrane flux 15-17 gfd2
Membrane rejection..... 99.0 to 99.5%
Membrane element manufacturer .....Veolia
Housing material ..... FRP
Housing pressure rating .....450 psi
Housing manufacturer .....Codeline or Equal

[2]Use the *flex*Configurator to choose the PRO*flex* configuration needed to meet your desired flux.

Cartridge Filtration

Housing model .....ROPV or Equal
Housing material ..... FRP
Cartridge filter.....1-micron nominal, HF.RO.Zs 01-40-FSE

PRO*flex* – true *flexibility* to design a system you want

PRO*flex* offers the flexibility to choose a system that allows you to choose an aggressive or conservative design to meet the capital and flux requirements of your specific application. PRO*flex* allows complete choice on arrays, number of elements, and pump sizes within each array. Figure 1 shows the PRO*flex* product line and the flow ranges. The flow ranges are the hydraulic limits with each model. Users should choose their system by determining:

1. Desired permeate flow range
2. Temperature of the water
3. Square footage of the membranes needed (or flux limits), per element
4. Desired recovery.
5. Recycle, if any.

NOTE: The Pre-Configured Starting points in Figure 1 give you a place to start, and are designs that we may have in stock. They show flow location using the base assumptions of:

1. 60°F feedwater temperature
2. 400 sq. ft, elements AG elements
3. 77.5-80% recovery
4. Tonkaflo* Pump shown in the charts below

Use the *flex*Configurator tool and Winflows to determine other designs that move you to different points in the bars above, for example: different elements, pumps, and recovery. These different points will allow you to see changes to the capital investment one makes and weighs with design considerations. Further, move left or right in above chart to further affect flux and capex spen

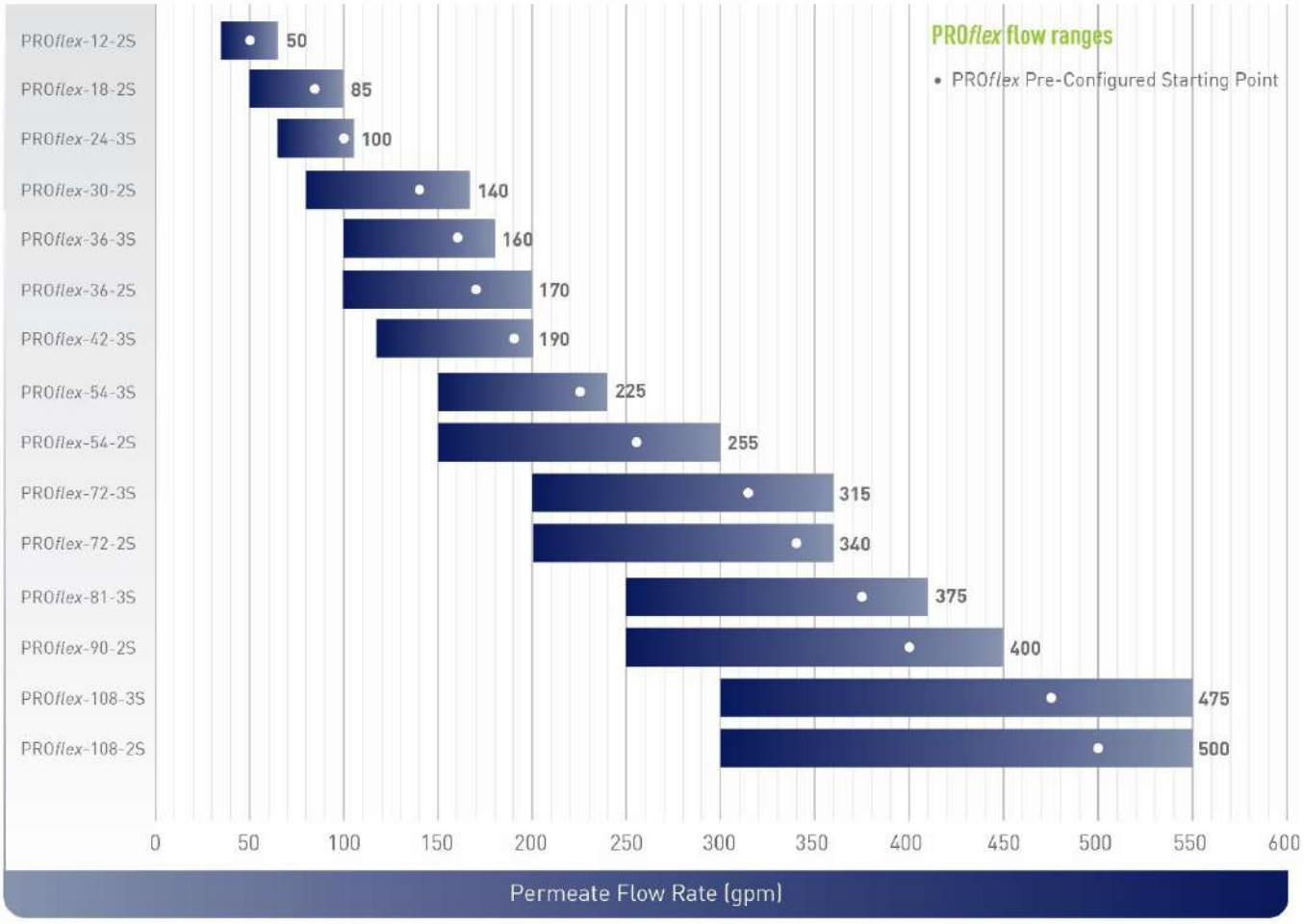

Figure 1: PRO*flex* flow ranges

PRO*flex* 2 stage (2S) NA models

MODEL	PRO*flex*-12-2S	PRO*flex*-18-2S	PRO*flex*-30-2S	PRO*flex*-36-2S	PRO*flex*-54-2S	PRO*flex*-72-2S	PRO*flex*-90-2S	PRO*flex*-108-2S
Permeate Rate[2]:	50 gpm (11 m^3/hr)	85 gpm (20 m^3/hr)	140 gpm (32 m^3/hr)	170 gpm (38 m^3/hr)	255 gpm (59 m^3/hr)	340 gpm (78 m^3/hr)	400 gpm (91 m^3/hr)	500 gpm (114 m^3/hr)
Concentrate Rate:	15 gpm (4 m^3/hr)	25 gpm (6 m^3/hr)	40 gpm (9 m^3/hr)	50 gpm (11 m^3/hr)	75 gpm (17 m^3/hr)	100 gpm (23 m^3/hr)	116 gpm (26 m^3/hr)	145 gpm (33 m^3/hr)
Concentrate Recycle:	~10 gpm (2 m^3/hr)	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]
Feed Rate:	65 gpm (15 m^3/hr)	110 gpm (25 m^3/hr)	180 gpm (41 m^3/hr)	220 gpm (50 m^3/hr)	330 gpm (75 m^3/hr)	440 gpm (100 m^3/hr)	516 gpm (117 m^3/hr)	645 gpm (147 m^3/hr)
Model:	SS8512	SS12512	SS24009	SS24009	AS40409	AS40409	AS62505	AS62506
Manufacturer:	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo
Quantity:	1	1	1	1	1	1	1	1
Motor Power and type:	20 Hp (30 KW) TEFC	40 Hp (30 KW) TEFC	60 Hp (45 KW) TEFC	60 Hp (45 KW) TEFC	75 Hp (56 KW) TEFC	75 Hp (56 KW) TEFC	100 Hp (75 KW) TEFC	125 Hp (93 KW) TEFC
Installed Power:	15 KW	30 KW	45 KW	45 KW	56 KW	56 KW	75 KW	93 KW
Design Flow Rate:	75 gpm (17 m^3/hr)	110 gpm (25 m^3/hr)	180 gpm (41 m^3/hr)	220 gpm (50 m^3/hr)	330 gpm (75 m^3/hr)	440 gpm (100 m^3/hr)	516 gpm (175 m^3/hr)	645 gpm (147 m^3/hr)
Design boost pressure:	240 psig (16 Bar)	240 psig (16 Bar)	235 psig (16 Bar)	240 psig (16 Bar)	240 psig (16 Bar)	235 psig (16 Bar)	235 psig (16 Bar)	235 psig (16 Bar)
Membranes Quantity:	12	18	30	36	54	72	90	108
Memb. Housing Style:	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port
Banking Arrangement:	1→1	2→1	3→2	4→2	6→3	8→4	10→5	12→6
Housing Model:	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40
Housing Quantity:	1	1	2	2	3	3	4	5
Cartridge Filter Model:	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE
Cartridge Filter Length:	40-inch (120 cm)	40-inch (120 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)
Cartridge Filter Qty:	1 per housing, 1/change out	1 per housing, 1/change out	1 per housing, 2/change out	1 per housing, 2/change out	1 per housing, 3/change out	1 per housing, 3/change out	1 per housing, 4/change out	1 per housing, 5/change out
Inlet:	3.0” flange	3.0” flange	4.0” flange	4.0” flange	4.0” flange	4.0” flange	6.0” flange	6.0” flange
Permeate:	2.0” flange	2.0” flange	3.0” flange	3.0” flange	4.0” flange	4.0” flange	4.0” flange	6.0” flange
Concentrate:	1.5” flange	1.5” flange	1.5” flange	1.5” flange	2.0” flange	2.0” flange	3.0” flange	3.0” flange
Inlet Water Pressure:	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig
Air Pressure:	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free
Drain to be Sized for:	106 gpm (24 m^3/hr)	106 gpm (24 m^3/hr)	175 gpm (40 m^3/hr)	213 gpm (49 m^3/hr)	319 gpm (73 m^3/hr)	425 gpm (98 m^3/hr)	425 gpm (98 m^3/hr)	425 gpm (98 m^3/hr)
Power:	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz
Control Circuit:	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz

MODEL	PRO*flex*-12-2S	PRO*flex*-18-2S	PRO*flex*-30-2S	PRO*flex*-36-2S	PRO*flex*-54-2S	PRO*flex*-72-2S	PRO*flex*-90-2S	PRO*flex*-108-2S
Height:	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)
Width:	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)
Depth:	50” (127 cm)	50” (127 cm)	50” (127 cm)	50” (127 cm)	50” (127 cm)	50” (127 cm)	67” (170 cm)	67” (170 cm)
Skid Shipping Weight Estimate Without Membranes:	4835 lb (2193 kg)	4995 lb (2270 kg)	5155 lb (2340 kg)	5235 lb (2380 kg)	5475 lb (2490 kg)	5715 lb (2600 kg)	5955 lb (2700 kg)	6195 lb (2810 kg)
Membranes Shipping Weight Estimate:	210 lb (95 kg)	315 lb (142 kg)	525 lb (240 kg)	630 lb (290 kg)	945 lb (430 kg)	1260 lb (580 kg)	1575 lb (715 kg)	1890 lb (857 kg)
Operating Weight Estimate:	6440 lb (2921 kg)	6810 lb (3090 kg)	7180 lb (3260 kg)	7370 lb (3350 kg)	7920 lb (3600 kg)	8550 lb (3880 kg)	9180 lb (4164 kg)	10440 lb (4736 kg)

[2]*Permeate ranges are stated at the following design conditions: 500 ppm TDS, 80% recovery, 60F, pump listed, and using 400 ft AG elements. Your flow rate will vary greatly as you change temperature, elements and pump sizes and TDS levels. Consult Veolia or Winflows for flows expected with your feed water conditions.*

[3]*Recycle Rate will vary with flux and feedwater conditions. When to use recycle will depend on the tradeoff user wants to make between permeate quality and membrane element life/frequency of cleaning. The base 3S models do not come with recycle but there is an option to add recycle in the configurator. 12-2S may vary, and if you provide us with additional flow and feed water characteristics, we can optimize design for you.*

PRO*flex* 3 stage (3S) NA models

MODEL	PRO*flex*-24-3S	PRO*flex*-36-3S	PRO*flex*-42-3S	PRO*flex*-54-3S	PRO*flex*-72-3S	PRO*flex*-81-3S**	PRO*flex*-108-3S
Permeate Rate[2]:	100 gpm (23 m^3/hr)	160 gpm (37 m^3/hr)	190 gpm (44 m^3/hr)	225 gpm (52 m^3/hr)	315 gpm (72 m^3/hr)	375 gpm (85 m^3/hr)	475 gpm (108 m^3/hr)
Concentrate Rate:	25 gpm (6 m^3/hr)	40 gpm (9 m^3/hr)	48 gpm (11 m^3/hr)	56 gpm (13 m^3/hr)	79 gpm (18 m^3/hr)	109 gpm (25 m^3/hr)	119 gpm (27 m^3/hr)
Concentrate Recycle:	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]	Not in stnd design[3]
Feed Rate:	125 gpm (29 m^3/hr)	200 gpm (46 m^3/hr)	238 gpm (55 m^3/hr)	281 gpm (65 m^3/hr)	394 gpm (91 m^3/hr)	484 gpm (110 m^3/hr)	594 gpm (135 m^3/hr)
Model:	SS12512	SS24009	AS30012	AS30012	AS40409	AS62505	AS62506
Manufacturer:	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo	Tonkaflo
Quantity:	1	1	1	1	1	1	1
Motor Power and type:	40 Hp (30 KW) TEFC	60 Hp (45 KW) TEFC	60 Hp (45 KW) TEFC	60 Hp (45 KW) TEFC	75 Hp (56 KW) TEFC	100 Hp (75 KW) TEFC	125 Hp (93 KW) TEFC
Installed Power:	30 KW	45 KW	45 KW	45 KW	56 KW	75 KW	93 KW
Design Flow Rate:	125 gpm (29 m^3/hr)	200 gpm (46 m^3/hr)	238 gpm (55 m^3/hr)	281 gpm (65 m^3/hr)	394 gpm (91 m^3/hr)	484 gpm (110 m^3/hr)	594 gpm (135 m^3/hr)
Design boost pressure:	240 psig (16 Bar)	250 psig (17 Bar)	260 psig (18 Bar)	240 psig (16 Bar)	250 psig (17 Bar)	235 psig (16 Bar)	235 psig (16 Bar)
Membranes Quantity:	24	36	42	54	72	81	108
Memb. Housing Style:	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port	6 element long, 4 port
Banking Arrangement:	2→1→1	3→2→1	4→2→1	4→3→2	6→4→2	9→4→2	9→6→3
Housing Model:	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40	HFRP1-40
Housing Quantity:	2	2	2	3	3	4	5
Cartridge Filter Model:	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE	HF.RO.Zs 01-40-FSE
Cartridge Filter Length:	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)	40-inch (102 cm)
Cartridge Filter Qty:	2 per housing, 2/change out	2 per housing, 2/change out	2 per housing, 2/change out	3 per housing, 3/change out	3 per housing, 3/change out	1 per housing, 4/change out	1 per housing, 5/change out
Inlet:	3.0” flange	4.0” flange	4.0” flange	4.0” flange	4.0” flange	6.0” flange	6.0” flange
Permeate:	3.0” flange	3.0” flange	3.0” flange	4.0” flange	4.0” flange	4.0” flange	6.0” flange
Concentrate:	1.5” flange	1.5” flange	1.5” flange	2.0” flange	2.0” flange	3.0” flange	3.0” flange
Inlet Water Pressure:	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig	30-60 psig
Air Pressure:	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free	80 psi, oil-free
Drain to be Sized for:	125 gpm (29 m^3/hr)	200 gpm (46 m^3/hr)	238 gpm (55 m^3/hr)	281 gpm (65 m^3/hr)	394 gpm (91 m^3/hr)	394 gpm (91 m^3/hr)	394 gpm (91 m^3/hr)
Power:	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz	460-480 VAC, 3-phase, 60Hz
Control Circuit:	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz	120 VAC, 1-phase, 60Hz

MODEL	PRO*flex*-24-3S	PRO*flex*-36-3S	PRO*flex*-42-3S	PRO*flex*-54-3S	PRO*flex*-72-3S	PRO*flex*-81-3S**	PRO*flex*-108-3S
Height:	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)	94” (234 cm)
Width:	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)	274” (696 cm)
Depth:	50” (127 cm)	50” (127 cm)	50” (127 cm)	50” (127 cm)	50” (127 cm)	67” (170 cm)	67” (170 cm)
Skid Shipping Weight Estimate Without Membranes:	4995 lb (2270 kg)	5155 lb (2340 kg)	5235 lb (2380 kg)	5475 lb (2490 kg)	5715 lb (2600 kg)	5955 lb (2700 kg)	6195 lb (2810 kg)
Membranes Shipping Weight Estimate:	315 lb (280 kg)	525 lb (240 kg)	630 lb (290 kg)	945 lb (430 kg)	1260 lb (580 kg)	1420 lb (644 kg)	1890 lb (857 kg)
Operating Weight Estimate:	6810 lb (3090 kg)	7180 lb (3260 kg)	7370 lb (3350 kg)	7920 lb (3600 kg)	8550 lb (3880 kg)	9180 lb (4164 kg)	10440 lb (4736 kg)

[2]Permeate ranges are stated at the following design conditions: 500 ppm TDS, 80% recovery, 60F, pump listed, and using 400 ft AG elements. Your flow rate will vary greatly as you change temperature, elements and pump sizes and TDS levels. Consult Veolia or Winflows for flows expected with your feed water conditions.

[3]Recycle Rate will vary with flux and feedwater conditions. When to use recycle will depend on the tradeoff user wants to make between permeate quality and membrane element life/frequency of cleaning. The base 3S models do not come with recycle but there is an option to add recycle in the configurator.

***This model is not found on the configurator, but please call us for more details. Model is banked 9-4-2 with the first array of 9 housings short loaded with 5 elements, versus 6 elements in the rest of the arrays.*

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Veolia Water Technologies
Please contact us via:
www.veoliawatertechnologies.com

VEOLIA

E-Cell* Electrodeionization (EDI) Stack

WATER TECHNOLOGIES

Evolution Of Demineralization

Electrodeionization (EDI) For Industrial Use

For many years, operators of pure water production systems were trying to find a technology to replace mixed bed ion exchange for final demineralization. The operating cost as well as the complexity and risks associated with acid and caustic regeneration were frustrations to these operators. EDI became established as the innovative alternative solution by reducing operating costs, improving site environmental, health, and safety risk profiles, and producing a continuous and steady supply of pure and ultrapure water.

Production of pure water has evolved from conventional pretreatment with multiple stages of ion exchange in initial and final demineralization to the following membrane based operations, including EDI, that are now considered to be best practice by many customers around the world:

Pre-treatment – (MF)/ (UF) → Reverse osmosis → EDI

EDI utilizes both traditional ion exchange resin and ion exchange membrane to remove contaminants, including those that are uncharged or lightly charged in the feed water such as silica and boron. The biggest advantage lies in the fact that EDI technology employs direct current to drive contaminants out of the feed water and through the ion exchange membranes into the concentrate channels. The direct current also splits water into hydrogen and hydroxyl ions which act as continuous regenerating agents so that contaminants do not accumulate on the ion exchange resin. Therefore, EDI can continuously and predictably produce high-purity and ultrapure water with equal or better quality than mixed bed ion exchange.

Advantages Of EDI Compared To Mixed Bed

- More advanced technology
- No regeneration chemicals or neutralization systems needed
- Much lower operating cost
- Continuous and simplified operation
- A smaller footprint and reduced building height requirement

Typical EDI Applications

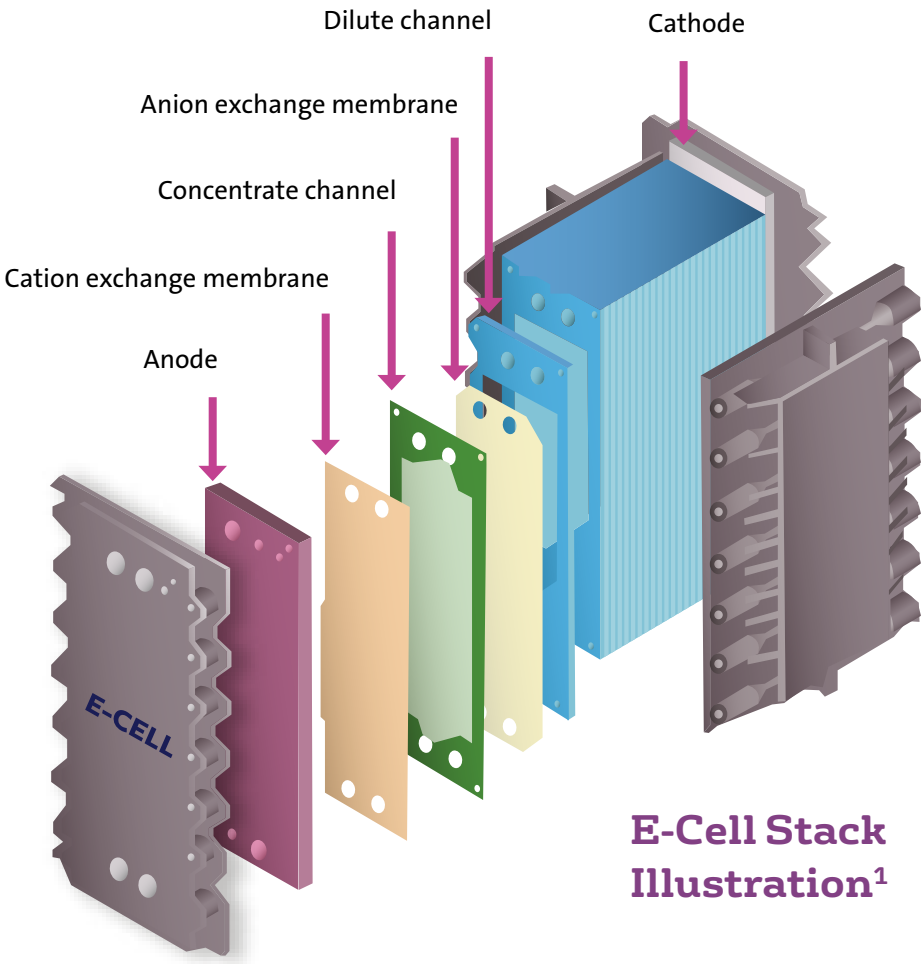
- Semiconductor, microelectronic and solar panel production rinse water
- Boiler feed water for power generation or the chemical, steel, and metallurgical industries
- Various pharmaceutical industry waters
- Laboratory water

EDI System

E-Cell EDI Stack

E-Cell EDI technology provides industry leading product water quality, energy consumption, and reliability from time-tested manufacturing practices. Veolia reputation for performance has enabled a leading market share and deep experience in EDI applications globally.

E-Cell EDI technology employs a modular stack-and-rack design that can adapt to project requirements with varying capacity. Veolia is also willing to offer performance guarantees when extra confidence in the quality of the pure and ultrapure water is desired.



E-Cell Stack Illustration[1]

[1] **Details modified for simplicity**

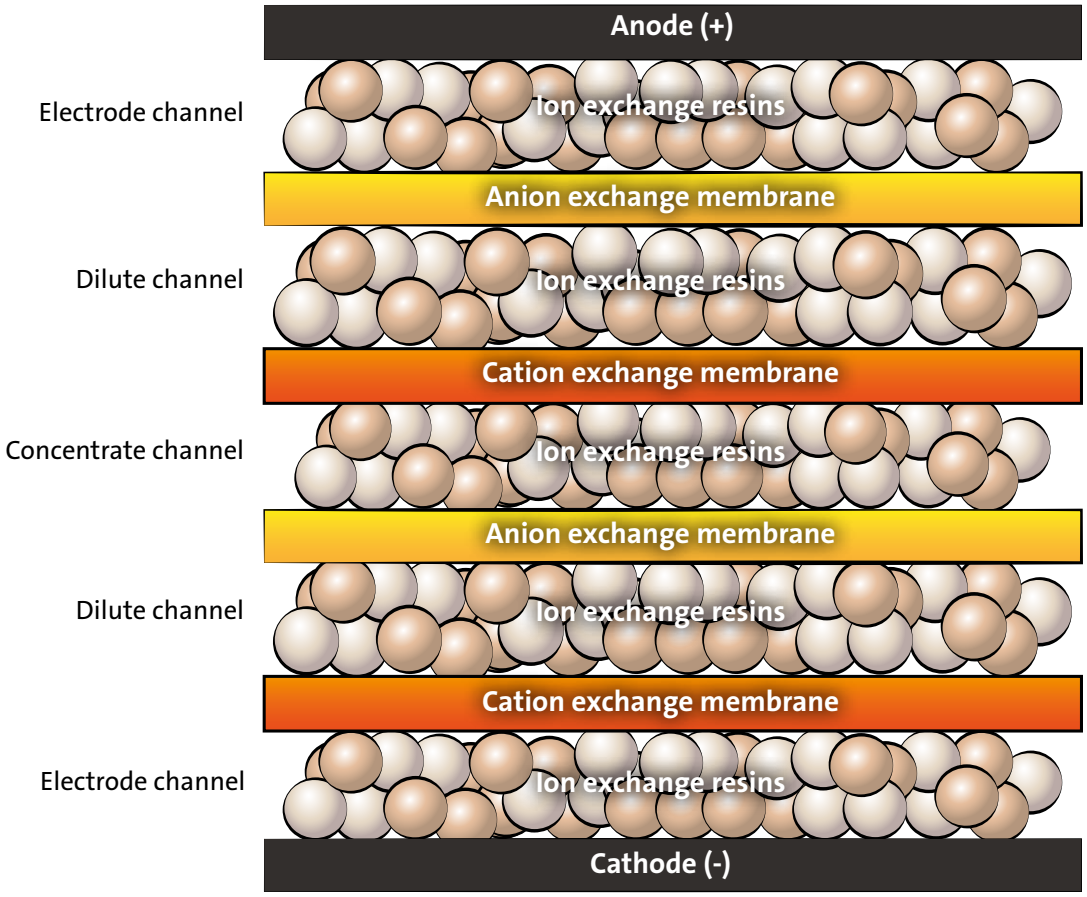
E-Cell EDI Stack Features And Benefits

- Low energy consumption
- Leading product water quality, in part due to ion exchange resin filled concentrate and dilute channels as well as a patented ion exchange resin arrangement
- Counter-current operation reduces the possibility of scale formation
- Strong reputation for reliable operation
- Simplified system design does not require degassing the concentrate, a concentrate recirculation loop, or added salts

Quality Assurance

- CE, RoHS, and CSA marked
- FDA compliant (pharmaceutical modules)
- Manufactured in an ISO 9001 and ISO 14001 certified facility
- Halal certified. E-Cell stacks are manufactured in accordance with the Islamic Food and Nutrition Council of America (IFANCA) standards

Simplified E-Cell Stack Design



General Industrial Stacks†

	Stack Name	MK-7	E-Cell-3X	MK-3
Weight	Shipping weight (kg)	136	135	92
Dimensions	Dimensions (cm as width x height x depth)	30 x 61 x 74	30 x 61 x 72	30 x 61 x 54
Feed Water Quality Specifications	Total exchangeable anions (ppm as $CaCO_3$)	< 14	< 25	< 25
	Conductivity (µS/cm)	< 24	< 43	< 43
	pH	4-11	4-11	4-11
	Temperature (°C)	4.4-40	4.4-40	4.4-40
	Hardness (ppm as $CaCO_3$)	< 1.0	< 1.0	< 1.0
	Silica (ppm as SiO_2)	< 1.0	< 1.0	< 1.0
	TOC (ppm)	< 0.5	< 0.5	< 0.5
	Turbidity (NTU)	< 1.0	< 1.0	< 1.0
	Color (APHA)	< 5	< 5	< 5
	Chlorine (ppm)	< 0.05	< 0.05	< 0.05
	Fe, Mn, H_2S (ppm)	< 0.01	< 0.01	< 0.01
	Oxidant	Not detected	Not detected	Not detected
	Oil and grease	Not detected	Not detected	Not detected
	SDI_{15}	< 1.0	< 1.0	< 1.0
Product Water Quality	Resistivity (MOhm-cm)	> 10	> 16	> 16
	Silica (SiO_2) removal	Up to 99%	Up to 99% / < 5 ppb	Up to 99% / < 5 ppb
Operating Parameters	Maximum water production (m^3/hr)	7.8	6.4	4.5
	Minimum water production (m^3/hr)	4.2	2.3	1.7
	Typical designed water production (m^3/hr)	6.0-7.8	4.0-6.4	2.0-4.5
	Recovery	Up to 97%	Up to 97%	Up to 96%
	Voltage (VDC)	0-400	0-400	0-300
	Amperage (ADC)	0-5.2	0-5.2	0-5.2
	Inlet pressure (bar)	Counter-current: 4.1-6.9 Co-current: 3.1-6.9	Counter-current: 4.1-6.9 Co-current: 3.1-6.9	Counter-current: 4.1-6.9 Co-current: 3.1-6.9
	Dilute inlet/outlet standard pressure drop (bar)	1.0-3.1	1.4-2.8	1.4-2.8
	Minimum pressure difference between dilute outlet and concentrate inlet (bar)	0.34	0.34	0.34

†Actual feed water quality specifications and performance may vary depending on flow rate through each stack and site conditions. Entries here based on nominal flow. Reference fact sheets and Winflows projection software to verify actual performance.

Hot Water Sanitizable Stacks‡

	Stack Name	MK-3PharmHT	MK-3MiniHT
Weight	Shipping weight (kg)	92	52
Dimensions	Dimensions (cm as width x height x depth)	30 x 61 x 54	30 x 61 x 29
Feed Water Quality Specifications	Total exchangeable anions (ppm as $CaCO_3$)	< 25	< 25
	Conductivity (µS/cm)	< 43	< 43
	pH	4-11	4-11
	Temperature (°C)	4.4-40	4.4-40
	Hardness (ppm as $CaCO_3$)	< 1.0	< 1.0
	Silica (ppm as SiO_2)	< 1.0	< 1.0
	TOC (ppm)	< 0.5	< 0.5
	Turbidity (NTU)	< 1.0	< 1.0
	Color (APHA)	< 5	< 5
	Chlorine (ppm)	< 0.05	< 0.05
	Fe, Mn, H_2S (ppm)	< 0.01	< 0.01
	Oxidant	Not detected	Not detected
	Oil and grease	Not detected	Not detected
	SDI_{15}	< 1.0	< 1.0
Product Water Quality	Resistivity (MOhm-cm)	> 10	> 10
	TOC (ppb)	< 500	< 500
Operating Parameters	Maximum water production (m^3/hr)	4.5	1.5
	Minimum water production (m^3/hr)	1.6	0.5
	Typical designed water production (m^3/hr)	2.0-4.5	0.5-1.5
	Recovery	Up to 96%	Up to 93%
	Voltage (VDC)	0-300	0-150
	Amperage (ADC)	0-5.2	0-5.2
	Inlet pressure (bar)	Counter-current: 4.1-6.9 Co-current: 3.1-6.9	Counter-current: 4.1-6.9 Co-current: 3.1-6.9
	Dilute inlet/outlet standard pressure drop (bar)	1.4-2.8	1.4-2.8
	Minimum pressure difference between dilute outlet and concentrate inlet (bar)	0.34	0.34
	Number of 1 hour sanitization cycles	160	160
	Maximum sanitization temperature (°C)	85	85

‡Actual feed water quality specifications and performance may vary depending on flow rate through each stack and site conditions. Entries here based on nominal flow. Reference fact sheets and Winflows projection software to verify actual performance.

E-Cell EDI Technology Performance Examples

E-Cell EDI technology has been successfully applied in various industries such as power, petroleum, chemical, steel, pharmaceutical, and electronics.

Location: Singapore

Industry: Semiconductor

Capacity: 1000 m^3/h

Application: Ultrapure water

Location: China

Industry: Power

Capacity: 360 m^3/h

Application: Boiler feed water

Location: Australia

Industry: LNG

Capacity: 84 m^3/h

Application: Boiler feed water

Location: China

Industry: Coal chemical

Capacity: 480 m^3/h

Application: Boiler feed water

Location: USA

Industry: Pharmaceutical

Capacity: 6.8 m^3/h

Application: USP purified water

Location: China

Industry: Solar energy

Capacity: 300 m^3/h

Application: Ultrapure water

Location: Canada

Industry: Steel

Capacity: 100 m^3/h

Application: Boiler feed water

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Veolia Water Technologies
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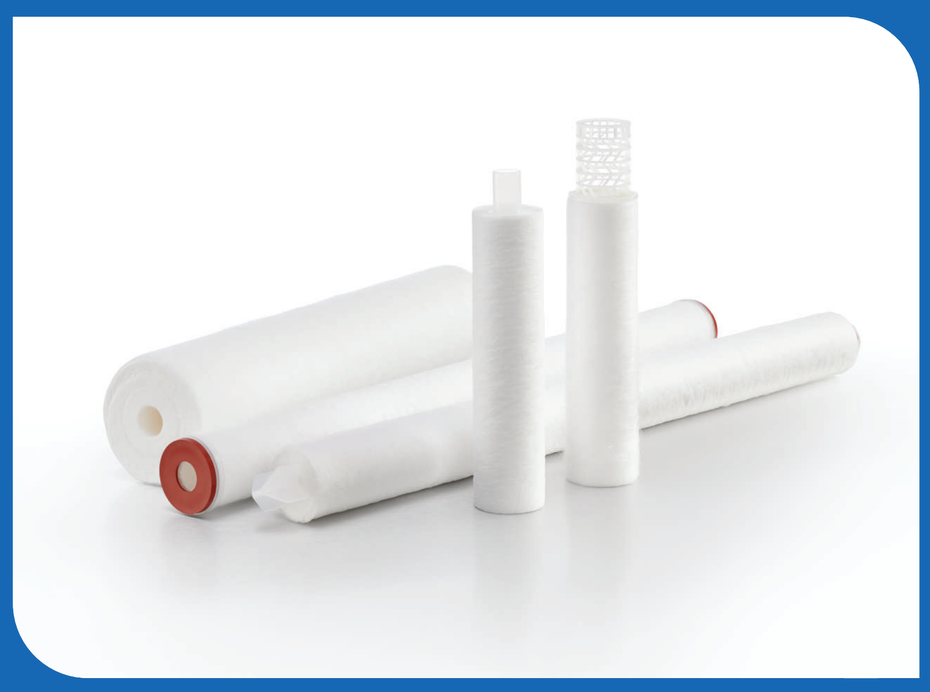
Veolia Cartridge Filter Endcap Adapters

Geometries adaptable to fit your need

Depth Filters

	Description	Individual Cap	On Filter	Schematic
A	Open end w/gasket (Absolute.Za only)			
E	222 O-Ring			
F	226 O-Ring			
H	Fin			
K	Self Seal Spring			
L	Extended Core			
S	Solid End or Closed End Cap			
X	Standard Plain End (no gasket)			
Y	Thermally Bonded Gasket or Flat Gasket			



Pleated Filters

	Description	Individual Cap	On Filter	Schematic
A	Open End Gasket			
B	120 O-Ring			
C	213 O-Ring			
E	222 O-Ring			
F	226 O-Ring			
G	Closed End			
H	Fin Adapter			
J	020 Adapter			
Q	222 O-Ring Stainless Steel Insert			
Z	226 O-Ring Stainless Steel Insert			

Purify, Reuse, and Recover While Reducing Costs

Spiral wound membranes for water, wastewater and process applications

Purifying water from any source

- Desalination & sulfate removal from seawater with AC/AD/AE & SWSR products
- Potable water & beverage make-up water production from brackish waters with AG, AK, AL, AP, & HL products

Reusing wastewater from industrial & municipal effluents

- Hot condensate with Duratherm* products
- High TDS/COD/TS with Industrial RO & NF products

Recovering components & ingredients from process streams

- Extreme pH & acid recovery with Duracid products
- Milk & protein separation or concentration with Dairy NF & RO products
- Sugar fractionation & juice concentration with Duracon NF products
- Alcoholic beverage adjustment with Vinocon* & Vinopro products

Desalination | Water Reuse | ZLD/MLD | Drinking Water | Dairy

Food & Bev | Oil & Gas | Mining | Chemical & Pharma | Power

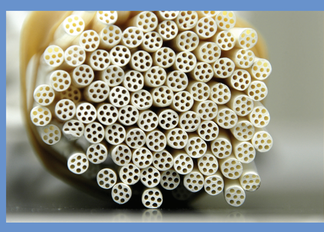
*A trademark of Veolia, may be registered in one or more countries

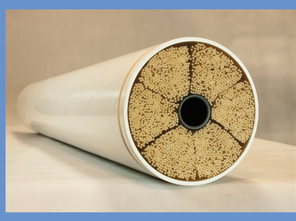
Protecting our community with advanced technology from Veolia

The ZeeWeed* 700B membrane system at the heart of this plant is an effective, reliable way to provide cleaner water for our community. ZeeWeed membranes provide high quality water that meets or exceeds government water quality regulations.

What is a Membrane?

SevenBore® fiber membranes are long, narrow tubes with billions of microscopic pores on the surface that are thousands of times smaller in diameter than a human hair. The tiny pores filter water, allowing clean water to pass through, while preventing virtually all particles from being discharged to the environment.





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ZeeWeed* 1500 RMS

Veolia's next generation of advanced pressurized ultrafiltration membrane technology

Lower Cost

- Up to 75% lower than a typical rack

Reduced Footprint

- 50% reduction in rack footprint

Increased Simplicity

- Reduced installation costs and site assembly

Extended Reliability

- Uses proven ZW1500 membrane module

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