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AG HR Series

High Rejection Brackish Water RO Elements

The A-Series family of proprietary thin-film reverse osmosis membrane is characterized by high flux and high sodium chloride rejection. AG HR brackish water elements are selected when high rejection and operating pressures as low as 200 psi (1,379 kPa) are desired. These elements are recommended for brackish water with salt concentration (TDS) levels between 1,000 and 10,000mg/l or when very high salt rejection of monovalent ions is required.

Table 1: Element Specification

Membrane	Thin-film membrane (TFM*)

Model	Average permeate flow gpd (m3/day)[1,2]	Average NaCl rejection[1,2]	Minimum NaCl rejection[1,2]
AG-90	2200 (8.3)	99.8%	99.3%
AG-365	9600 (36.3)	99.8%	99.3%
AG-400	10500 (39.7)	99.8%	99.3%
AG-400, 34	10500 (39.7)	99.8%	99.3%
AG-440	11500 (43.5)	99.8%	99.3%
AG-1600	42000 (159.0)	99.8%	99.3%

[1]Average salt rejection after 24 hours operation. Individual flow rate may vary +25%/-15%.
[2] Testing conditions: 2,000ppm NaCl solution at 225psi (1,550kPa) operating pressure, 77°F (25°C), pH7 and 15% recovery.

Model	Active area ft² (m²)	Outer wrap	Part number
AG-90	90 (8.4)	Fiberglass	3056665
AG-365	365 (33.9)	Fiberglass	3056666
AG-400	400 (37.2)	Fiberglass	3056667
AG-400, 34	400 (37.2)	Fiberglass	3056668
AG-440	440 (40.9)	Fiberglass	3056669
AG-1600	1600 (148.6)	Fiberglass	3056670

Table 2: Operating and CIP parameters

Typical Operating Pressure	200 psi (1,380 kPa)
Typical Operating Flux	10-20GFD (15-35LMH)
Maximum Operating Pressure	600 psi (4,137 kPa)
Maximum Temperature	Continuous operation: 122°F (50°C) Clean-In-Place (CIP): 122°F (50°C)
pH range	Optimum rejection: 7.0-7.5, Continuous operation 4.0-11.0, Clean-In-Place (CIP): 2.0-11.5
Maximum Pressure Drop	Over an element: 12 psi (83 kPa) Per housing: 50 psi (345 kPa)
Chlorine Tolerance	1,000+ ppm-hours, dechlorination recommended
Feedwater[3]	NTU < 1 SDI < 5

[3]SDI is measured on a non-linear scale using a 0.45 micron filter paper. Additionally, finer colloids, particulates and microorganisms that pass through the filter paper and not measured in the SDI test, will potentially foul the RO element. For performance consistency and project warranty, please use Winflows projection software and consult your Filters with Membranes representative.

Figure 1a: Element Dimensions Diagram – Male

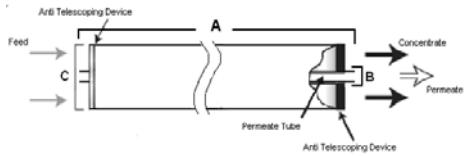

Figure 1b: Element Dimensions Diagram – Female

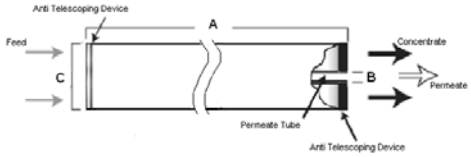

Table 3: Dimensions and Weights

Model[1]	Type	Dimensions, inches (cm)			Boxed
		A	B[2]	C	Weight lbs (kg)
AG-90	Male	40.0 (101.6)	0.75 (1.90)	3.9 (9.9)	9 (4)
AG-365	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AG-400	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AG-400, 34	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AG-440	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AG-1600	Female	40.0 (101.6)	3.000 (7.620)	16.0 (40.6)	120 (54)

AK HR Series

High Rejection Low Energy Brackish Water RO Elements

The A-Series proprietary thin-film reverse osmosis membrane elements are characterized by high flux and high sodium chloride rejection. AK HR low pressure brackish elements are selected when high rejection and low operating pressures are desired. These elements allow significant energy savings since good rejection is achieved at operating pressures as low as 100 psig (689 kPa).

These elements are recommended for low brackish water with salt concentration (TDS) levels up to 5,000mg/l. In turn, AK HR elements produce a permeate quality close to a standard brackish membrane element at a much lower pressure.

Table 1: Element Specification

Membrane	Thin-film membrane (TFM*)

Model	Average permeate flow gpd (m3/day)[1,2]	Average NaCl rejection[1,2]	Minimum NaCl rejection[1,2]
AK-90	2200 (8.3)	99.5%	99.0%
AK-365	9600 (36.3)	99.5%	99.0%
AK-400	10500 (39.7)	99.5%	99.0%
AK-440	11500 (43.5)	99.5%	99.0%
AK-1600	42000 (159.0)	99.5%	99.0%

[1]Average salt rejection after 24 hours operation. Individual flow rate may vary +25%/-15%.
[2]Testing conditions: 500ppm NaCl solution at 115psi (862kPa) operating pressure, 77°F (25°C), pH7.5 and 15% recovery.

Model	Active area ft² (m²)	Outer wrap	Part number
AK-90	90 (8.4)	Fiberglass	3056678
AK-365	365 (33.9)	Fiberglass	3056679
AK-400	400 (37.2)	Fiberglass	3056680
AK-440	440 (40.9)	Fiberglass	3056681
AK-1600	1600 (148.6)	Fiberglass	3056682

Table 2: Operating and CIP parameters

Typical Operating Pressure	120 psi (830 kPa)
Typical Operating Flux	10-20GFD (15-35LMH)
Maximum Operating Pressure	400 psi (2,758 kPa)
Maximum Temperature	Continuous operation: 122°F (50°C) Clean-In-Place (CIP): 122°F (50°C)
pH range	Optimum rejection pH: 7.0-7.5, Continuous operation: 4.0-11.0, Clean-In-Place (CIP): 2.0-11.5
Maximum Pressure Drop	Over an element: 12 psi (83 kPa) Per housing: 50 psi (345 kPa)
Chlorine Tolerance	1,000+ ppm-hours, dechlorination recommended
Feedwater[3]	NTU < 1 SDI < 5

[3]SDI is measured on a non-linear scale using a 0.45 micron filter paper. Additionally, finer colloids, particulates and microorganisms that pass through the filter paper and not measured in the SDI test, will potentially foul the RO element. For performance consistency and project warranty, please use Winflows projection software and consult your Filters with Membranes representative.

Figure 1a: Element Dimensions Diagram – Male

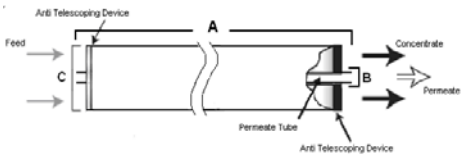

Figure 1b: Element Dimensions Diagram – Female

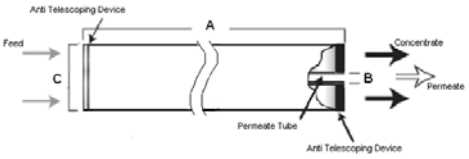

Table 3: Dimensions and Weights

Model[1]	Type	Dimensions, inches (cm)			Boxed
		A	B[2]	C	Weight lbs (kg)
AK-90	Male	40.0 (101.6)	0.75 (1.90)	3.9 (9.9)	9 (4)
AK-365	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AK-400	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AK-440	Female	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)
AK-1600	Female	40.0 (101.6)	3.000 (7.620)	16.0 (40.6)	120 (54)

AK Series

Low Energy Brackish Water RO Elements

The A-Series, family of proprietary thin-film reverse osmosis membrane elements are characterized by high flux and high sodium chloride rejection. AK Low Pressure Brackish Water Elements are selected when high rejection and low operating pressures are desired. These elements allow significant energy savings since good rejection is achieved at operating pressures as low as 100 psi (689 kPa).

Table 1: Element Specification

Membrane	A-series, thin-film membrane (TFM*)

Model	Average permeate flow gpd (m3/day)[1,2]	Average NaCl rejection[1,2]	Minimum NaCl rejection[1,2]
AK2540FM	710 (2.7)	99.0%	98.0%
AK2540TM	710 (2.7)	99.0%	98.0%
AK4040C	2,500 (9.5)	99.0%	98.0%
AK4040CM	2,400 (9.1)	99.0%	98.0%
AK4040FM	2,200 (8.3)	99.0%	98.0%
AK4040FM, WET	2,200 (8.3)	99.0%	98.0%
AK4040NM	2,200 (8.3)	98.5%	98.0%
AK4040TM	2,200 (8.3)	99.0%	98.0%
AK8040C	9,900 (37.5)	99.0%	98.0%
AK8040F	9,600 (36.3)	99.0%	98.0%
AK8040F, WET	9,600 (36.3)	99.0%	98.0%
AK8040F 400	10,500 (37.9)	99.0%	98.0%
AK8040F 400 WET	10,500 (39.7)	99.0%	98.0%
AK8040N	9,600 (36.3)	98.5%	98.0%
AK8040N 400	10,500 (39.7)	98.5%	98.0%

[1] Average salt rejection after 24 hours operation. Individual flow rate may vary +25%/-15%.
[2] Testing conditions: 500ppm NaCl solution at 115psi (793kPa) operating pressure, 77°F (25°C), pH7.5 and 15% recovery.

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Model	Membrane area ft² (m²)	Outer wrap	Part number US[1]	Part number Other plants[2]
AK2540FM	29 (2.7)	Fiberglass	1206800	N/A
AK2540TM	27 (2.5)	Tape	1206802	N/A
AK4040C	95 (8.8)	Cage*	1223696	N/A
AK4040CM	90 (8.4)	Cage*	1227885	N/A
AK4040FM	85 (7.9)	Fiberglass	1206813	3039082
AK4040FM, WET	85 (7.9)	Fiberglass	3052307	3044157
AK4040NM	85 (7.9)	Net*	1231787	N/A
AK4040TM	85 (7.9)	Tape	1206816	N/A
AK8040C	380 (35.3)	Cage*	1206819	N/A
AK8040F	365 (33.9)	Fiberglass	1206820	3039160
AK8040F, WET	365 (33.9)	Fiberglass	N/A	3044153
AK8040F 400	400 (37.2)	Fiberglass	1206821	3039161
AK8040F 400 WET	400 (37.2)	Fiberglass	1239766	3039162
AK8040N	365 (33.9)	Net*	1231788	N/A
AK8040N 400	400 (37.2)	Net*	1231789	N/A

[1]These elements are rolled in US.
[2]These elements are rolled in China and Hungary.

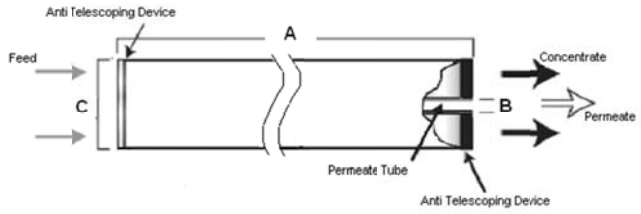

Figure 1: Element Dimensions Diagram - Female

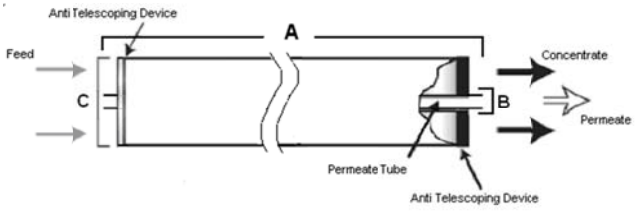

Figure 2: Element Dimensions Diagram - Male

Table 2: Dimensions and Weight

Model[2]	Dimensions, inches (cm)			Boxed
	A	B[1]	C[3]	Weight lbs (kg)
AK2540*M	40.0 (101.6)	0.75 (1.9) OD	2.4 (6.1)	5 (2.3)
AK4040C	40.0 (101.6)	0.625 (1.59)	3.9 (9.9)	8 (3.5)
AK4040*M	40.0 (101.6)	0.75 (1.9) OD	3.9 (9.9)	8 (3.5)
AK4040*M WET	40.0 (101.6)	0.75 (1.9) OD	3.9 (9.9)	8 (3.5)
AK8040*, AK8040* 400	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	32 (14.5)
AK8040*, AK8040* 400 WET	40.0 (101.6)	1.125 (2.86)	7.9 (20.1)	35 (16)

[1] Internal diameter unless specified OD (outside diameter).
[2] These elements are bagged dried, unless specified WET, before shipping.
[3] The element diameter (dimension C) is designed for optimum performance in GE pressure vessels. Others pressure vessel dimension and tolerance may result in excessive bypass and loss of capacity.

Table 3: Operating and CIP parameters

Typical Operating Pressure	100 psi (689 kPa)
Typical Operating Flux	10-20 GFD (15-35LMH)
Maximum Operating Pressure	400 psi (2,756 kPa)
Maximum Temperature	Continuous operation: 122°F (50°C), Clean In Place (CIP): 122°F (50°C)
pH Range	Optimum rejection: 7.0-7.5, Continuous operation: 4.0-11.0, Clean In Place (CIP): 2.0-11.5
Maximum Pressure Drop	Over an element: 12 psi (83 kPa) Per housing: 50 psi (345 kPa)
Chlorine Tolerance	1,000+ ppm-hours, dechlorination recommended
Feedwater	NTU < 1 SDI < 5