

PRO ATHENA Series 50 Hz

Reverse Osmosis Machines from 11 to 102 m³/hr



Basic Features

- 1000 mg/L feed TDS and 20C water temperature design
- AS3000 compliant electrical panel
- GE Micro VersaMax PLC with 6-inch Quick Panel touchscreen
- 4-20 mA instrument display on instrument center
- Non return valve on inlet and 3-way valves or pressure relief valves on outlets
- Optional 2500 mg/L feed TDS and 16C water temperature design.
- Optional pH and Chlorine sensors
- Optional skid mounted Wye-Delta motor starter

Materials of Construction

High-pressure piping.....316 SS, Sch. 10
 Low-pressure piping.....PVC, Sch. 80
 Frame Painted blue carbon steel
 EnclosureIP54 (painted carbon steel)

Instrumentation

Flow Meters Permeate, concentrate
 Conductivity..... Permeate
 Pressure Pre-filter, post-filter, primary, final, permeate, concentrate, pump discharge
 Pressure Switch Feed, permeate, concentrate
 pH (Optional with Basic Electrical) Feed
 Chlorine (Optional with Basic Electrical) Feed
 Instrument Center Signet 8900

Premium Features

- 1000 mg/L feed TDS and 20C water temperature design
- AS3000 compliant electrical panel with Allen Bradley CompactLogix PLC and PanelView 700 color touchscreen
- pH and ORP Sensors included
- Skid mounted and wired variable speed drive
- Non return valve on inlet and 3-way valves or pressure relief valves on outlets
- Automatic concentrate flow control valve
- Optional 2500 mg/L feed TDS and 16C water temperature design.

Documentation Included

- Operation and maintenance manual
- Drawings: piping and instrumentation, electrical and general dimension

Operating Parameters

Design Recovery¹ 75%
 Design temp.² 20°C
 Operating range 2 to 30°C
 Nominal rejection 97-99%
 Design inlet pressure 2-4 bar

¹ Recovery Rate can vary +/- 5%

² Option available for 16°C water temperature

Membrane Elements and Housings

Membrane model.....AG8040F
 Style.....Spiral-wound elements
 Membrane manufacturer.....GE
 Membrane type.....TFC (Polyamide)
 Average membrane flux¹.....28 lmh (16.4 gfd)
 Membrane rejection.....99.0-99.6%
 Housing manufacturer.....Code Line or Equal
 Housing material and rating.....FRP, 300psi ASME²

Cartridge Filtration

Housing model.....7 Rounds, 102cm (40")
 Housing material.....316 SS
 Cartridge filter.....1-micron nominal, ROsave.Z*s

¹ Flux can be reduced to 25.5 lmh (15 gfd) by using 400sqft elements. Rated flow can be further reduced by up to 20%.
² 300psi housings used for 1000 TDS, 20C design. 450psi housings used for 2500 TDS 16C

GE PRO-ATHENA Models

MODEL	PRO-11-ANZ-50	PRO-23-ANZ-50	PRO-34-ANZ-50	PRO-45-ANZ-50	PRO-68-ANZ-50	PRO-102-ANZ-50
Permeate rate: ²	11.4 m ³ /hr	22.7 m ³ /hr	34.1 m ³ /hr	45.4 m ³ /hr	68.1 m ³ /hr	102.2m ³ /hr
Concentrate Rate:	3.8 m ³ /hr	7.5 m ³ /hr	11.4 m ³ /hr	14.9 m ³ /hr	22.7 m ³ /hr	34.1 m ³ /hr
Feed Rate:	15.1 m ³ /hr	30.2 m ³ /hr	45.4 m ³ /hr	60.4 m ³ /hr	90.8 m ³ /hr	136.3m ³ /hr
Pumps and Motors – Up to 1000 mg/L Feed TDS and 20C water temperature design						
Manufacturer:	Grundfos	Grundfos	Grundfos	Grundfos	Grundfos	Grundfos
Model	CRN 15-14 A-FGJ-G-E-HQQE	CRN 32-9-2 A-G-G-E-HQQE	CRN 45-7-2 A-G-G-E-HQQE	CRN 64-6-2 A-G-G-E-HQQE	CRN 45-7-2 A-G-G-E-HQQE	CRN 64-6 A-G-G-E-HQQE
Quantity:	1	1	1	1	2	2
Motor HP:	11 kW	18.5 kW	30 kW	30 kW	2 x 30 kW	2 x 37 kW
Design Flow Rate:	18.2 m ³ /hr	32.4 m ³ /hr	45.4 m ³ /hr	64.9 m ³ /hr	90.8 m ³ /hr	136.3m ³ /hr
Design boost pressure:	15.0 bar	12.3 bar	13.5 bar	12.3 bar	13.5 bar	13.4 bar
Pumps and Motors – Up to 2500 mg/L Feed TDS and 16C water temperature design						
Manufacturer:	Grundfos	Grundfos	Grundfos	Grundfos	Grundfos	Grundfos
Model	CRN 15-17 A-FGJ-G-E-HQQE	CRN 32-13-2 A-G-G-E-HQQE	CRN 45-9 A-G-G-E-HQQE	CRN 64-8-1 A-G-G-E-HQQE	CRN 45-9 A-G-G-E-HQQE	CRN 64-8-1 A-G-G-E-HQQE
Quantity:	1	1	1	1	2	2
Motor HP:	15 kW TEFC	30 kW TEFC	37 kW TEFC	45 kW TEFC	2 x 37 kW TEFC	45 kW TEFC
Design Flow Rate:	18.6 m ³ /hr	33.2 m ³ /hr	46.5 m ³ /hr	64.6 m ³ /hr	91.0 m ³ /hr	136.0m ³ /hr
Design boost pressure:	18.0 bar	18.0 bar	18.0 bar	18.0 bar	18.0 bar	18.0 bar
Membrane Elements and Housings						
Membranes quantity:	12	24	36	48	72	108
Memb. housing style:	4 element long, 4 port	4 element long, 4 port	6 element long, 4 port	4 element long, 4 port	6 element long, 4 port	6 element long, 4 port
Banking Arrangement:	1→1→1	3→2→1	3→2→1	6→4→2	6→4→2	9→6→3
Cartridge Filtration						
Cartridge Filter:	ROZs01-40	ROZs01-40	ROZs01-40	ROZs01-40	ROZs01-40	ROZs01-40
Filter Length:	102 cm (40")	102 cm (40")	102 cm (40")	102 cm (40")	102 cm (40")	102 cm (40")
Filter Quantity:	7 per housing 7/change out	7 per housing 7/change out	7 per housing 14/change out	7 per housing 14/change out	7 per housing 21/change out	7 per housing 28/change out
Installation and Utility Requirements						
Inlet:	ANSI 2" flange	ANSI 3" flange	ANSI 3" flange	ANSI 4" flange	ANSI 4" flange	ANSI 6" flange
Permeate:	ANSI 2" flange	ANSI 3" flange	ANSI 3" flange	ANSI 3" flange	ANSI 4" flange	ANSI 4" flange
Concentrate:	ANSI 1.5" flange	ANSI 1.5" flange	ANSI 1.5" flange	ANSI 2" flange	ANSI 2" flange	ANSI 3" flange
Inlet Water Pressure:	2 bar min.	2 bar min.	2 bar min.	2 bar min.	2 bar min.	2 bar min.
Air Pressure:	6.9 bar, oil-free	6.9 bar, oil-free	6.2 bar, oil-free	6.2 bar, oil-free	6.9 bar, oil-free	6.9 bar, oil-free
Drain to be Sized for:	15.1 m ³ /hr	30.2 m ³ /hr	45.4 m ³ /hr	60.4 m ³ /hr	90.8 m ³ /hr	136.3m ³ /hr
Power:	380 VAC, 3-phase, 50Hz	380 VAC, 3-phase, 50Hz	380 VAC, 3-phase, 50Hz	380 VAC, 3-phase, 50Hz	380 VAC, 3-phase, 50Hz	380 VAC, 3-phase, 50Hz
Control Circuit:	220 VAC, 1-phase, 50Hz	220 VAC, 1-phase, 50Hz	220 VAC, 1-phase, 50Hz	220 VAC, 1-phase, 50Hz	220 VAC, 1-phase, 50Hz	220 VAC, 1-phase, 50Hz
Skid						
Approx.Height:	2000 mm	2200 mm	2240 mm	2240 mm	2420 mm	2475 mm
Approx. Width:	800 mm	900 mm	950 mm	1250 mm	1400 mm	1850 mm
Approx.Depth:	4900 mm	5050 mm	6850 mm	5200 mm	6950 mm	7080 mm
Approx. Shipping Weight :	1543 kg	2132 kg	2722 kg	3085 kg	4490 kg	6124 kg

² Maximum permeate rate listed at design temperature. Permeate rate can be reduced by up to 20%