Brackish Water Reverse Osmosis Systems - Skid Mounted SM Series

Brackish Water Reverse Osmosis Systems

Advanced Technologies for a Thirsty World ...

AGWT BWRO SM Series Reverse Osmosis Systems are designed and built for rigorous industrial duty operations which demand reliable equipment.

Completely packaged and assembled in corrosion proof powder coated steel skids, BWRO-SM Series systems are factory tested prior to shipment and incorporate the latest technology. Feed, Power and concentrate are the only required hook -ups and the unit is ready for operation. AGWT BWRO SM Series can also be designed for installation inside ISO Containers for quick site installation.

AGWT engineers provide full-service technical support to insure each system is designed and built to the exacting requirements of each application.

www:agwtphilinc.com

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AGWT

Advanced Global Water Technologies

AGWT Brackish Water RO Systems

Standard Features

- 5 Micron Filters
- Powder Coated Frames
- Recycle Flow Meter
- Concentrate Pressure Gauges
- TFC Brackish Membranes, 99% Minimum Salt Rejections
- Product Flow Meter
- Permeate Conductivity Meter
- Concentrate Flow Meter
- PVC Pressure Vessels
- PLC Controls
- Fiberglass Pressure Vessels, 450 PSI

Typical BWRO Installation

Dosing System

Optional Features

- Recycle Valve
- Stainless Steel Pump
- Conductivity on Concentrate & Feed Monitor
- 50Hz Motor
- Media Pre Filters
- Carbon Pre Filters
- Integral Cleaning System with Heater
- Auto Stop/Start w/Storage Tank Level
- HMI Operator Interface
- Timer/Relay Logic Controls for installation in Remote areas

Cleaning System

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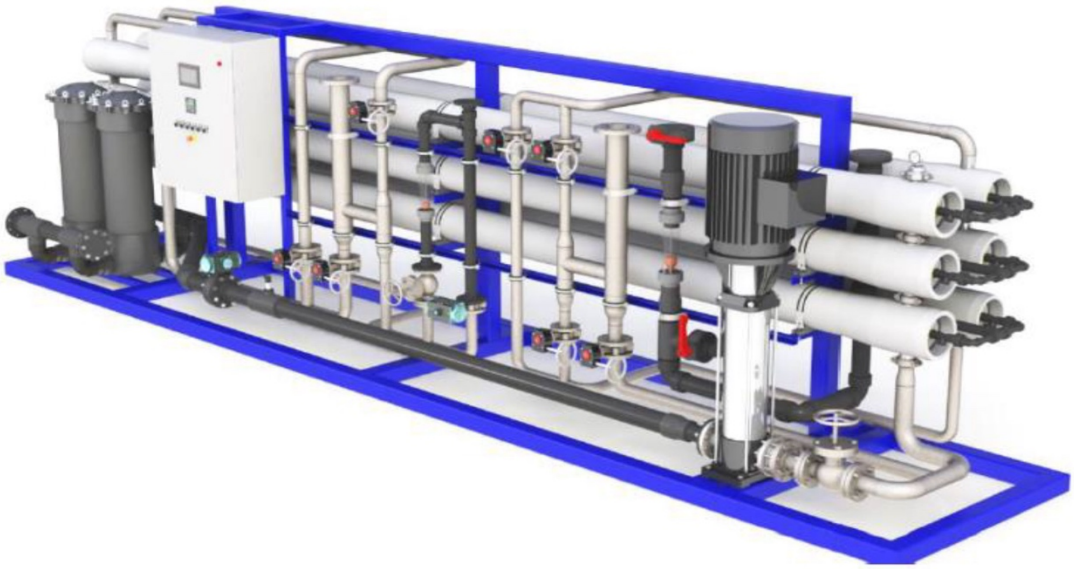
Sample Panel

Advanced Global Water Technologies

Safe, Clean and Affordable Water for Everyone

PTROL Series 50HZ

Reverse Osmosis Systems from 15m³/h to 100m³/h (Feed TDS < 2500 ppm).



PTROL Series

The smart, clean utilitarian industrial design of the PTROL Series allows for convenient installation, user-friendly operation, and ease of maintenance. These skid-mounted, packaged systems are pre-plumbed and pre-wired complete on a steel frame with panel-mounted pressure and flow instrumentation allowing for straight forward system monitoring and control. EWP offers an assortment of both basic and premium designs of pure water systems that can be private labeled or customized.

Ordering Guide				
Order Example	PTROL	36	TB/FD	380T50
RO series				
PTROL				
Nominal Capacity				
16 [16 m3/h]; 20 [20 m3/h]				
24 [24 m3/h]; 30 [30 m3/h]				
36 [36 m3/h]; 48 [48 m3/h]				
60 [60 m3/h]; 72 [72 m3/h]				
90 [90 m3/h]; 108 [108 m3/h]				
Connection (code)				
TB [Thread, BSPT]				
TN [Thread, NPT]				
FA [Flange, ANSI]				
FD [Flange, DIN]				
SA [Socket, ANSI]				
SD [Socket, DIN]				
Power supply (code)				
220S60 [220VAC/ single phase/60hz]				
380T50 [380VAC/ three phase /50hz]				
230S50	120S60	240S60	440T50	240T60
240S50	127S60	380T60	200T60	440T60
100S60	200S60	400T50	208T60	460T60
110S60	220S50	415T50	220T60	480T60

Benefits

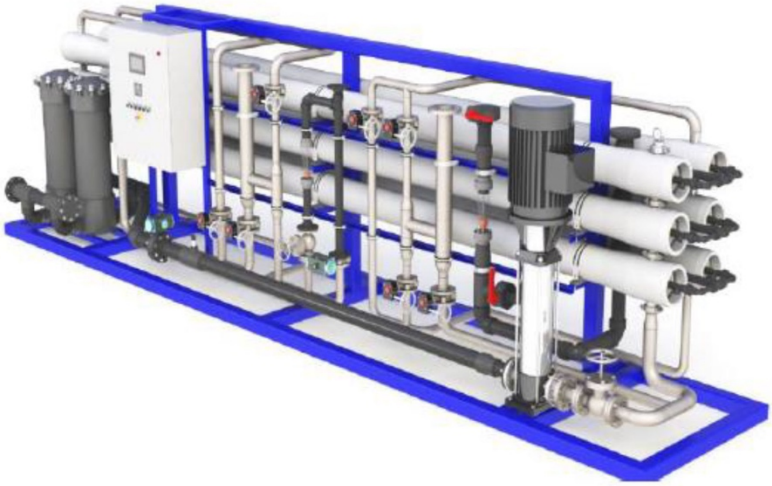
Fully equipped and customizable
Individually tested and preserved
Expandable and skid mounted
Low operation and maintenance costs
Components easily accessible
Easy maintenance and servicing
Pre-plumbed, wired and assembled
1-year limited warranty

Applications

Municipal, Wastewater, Hotel, Military, Hospital,
Food and beverage, Pharmaceutical, Mining,
Power and energy, Refinery, Restaurants,
Agriculture, Boiler feed, Disaster relief

PTROL Series Reverse Osmosis System

Standard Feature



Membrane and housing

- Membrane model --- LP22-8040
- Membrane manufacturer --- Vontron
- Nominal rejection --- 97-99%
- Housing --- FRP, 300psi, side port (for ⩽ 1000ppm)
  FRP, 450psi, side port (for ⩽ 2500ppm)
- Housing manufacturer --- First Line or equal

Boost pump

- Type --- vertical multi-stage centrifugal
- Pump material --- SS316L
- Connection --- DIN Flange
- Pump brand --- CNP

Electrical valve

- Feed valve --- UPVC
- Flush valve --- SS316

Instrumentation

- Flow meters --- permeate, concentrate, concentrate recycle
- Conductivity --- permeate
- Pressure gauge --- pre-filter, post - filter, pump discharge, concentrate
- Pressure switch --- feed, RO membrane inlet

Material of construction

- High-pressure piping --- SS316
- Low-pressure piping --- UPVC
- Frame --- SS304 or Q235 steel with painting
- Control box --- IP54

Connection port

- Feed inlet port
- Permeate port
- Drain port
- Clean-in-place (CIP) ports

Documentation included

- Operation and maintenance manual
- Drawings: P&ID, electrical diagram

Control system

- Siemens PLC
- Weinview HMI
- ABB VFD
- Parameter setting panel
- High pressure pump soft start
- Tank level control
- Low pressure/High pressure protection
- Auto flush
- Pretreatment interconnection backup

Options and Upgrades

- ✧ **pH and ORP meter**
- ✧ **Feed water conductivity meter**
- ✧ **Grundfos/Danfoss pump**
- ✧ **Dow/Hydranautics/Toray membrane**
- ✧ **SS304/316 seamless housing**
- ✧ **VPN internet**
- ✧ **Communication: Modbus RTU**
- ✧ **Flow transmitter with pulse signal output**
- ✧ **Pressure transducer with analog signal output**
- ✧ **Antiscalant dosing system**
- ✧ **Clean-in-place (CIP) system**
- ✧ **Pretreatment system**

PTROL Series Specifications

MODEL	PTROL-16	PTROL-20	PTROL-24	PTROL-30	PTROL-36
Max. permeate rate [1]	16m³/hr	19.7m³/hr	24m³/hr	29.9m³/hr	32.5m³/hr
Approx. conc. rate	5.3m³/hr	6.6m³/hr	8m³/hr	10m³/hr	11m³/hr
Approx. feed rate	21.3m³/hr	26.3m³/hr	32m³/hr	40m³/hr	43.5m³/hr
Design recovery	75%	75%	75%	75%	75%
Pump and Motor - Up to 1000mg/L Feed TDS design					
Manufacturer	CNP	CNP	CNP	CNP	CNP
Model	CDLF20-12 (50hz)	CDLF32-90 (50hz)	CDLF32-100 (50hz)	CDLF42-70-2 (50hz)	CDLF42-70 (50hz)
Quantity	1	1	1	1	1
Motor HP	15kw	18.5kw	18.5kw	30kw	30kw
Pump material	SS316	SS316	SS316	SS316	SS316
Design flow rate [2]	22m³/hr	28m³/hr	32m³/hr	40m³/hr	44m³/hr
Design boost pressure	13.3bar	13.6bar	13.8bar	13.8bar	13.7bar
Pump and Motor - Up to 2500mg/L Feed TDS design					
Manufacturer	CNP	CNP	CNP	CNP	CNP
Model	CDLF20-16 (50hz)	CDLF32-120 (50hz)	CDLF32-130 (50hz)	CDLF42-90-2 (50hz)	CDLF42-100-2 (50hz)
Quantity	1	1	1	1	1
Motor HP	18.5kw	22kw	30kw	30kw	37kw
Pump material	SS316	SS316	SS316	SS316	SS316
Design flow rate [2]	22m³/hr	28m³/hr	32m³/hr	40m³/hr	44m³/hr
Design boost pressure	18.0bar	18.4bar	18.1bar	18.0bar	18.7bar
Membrane Element and Housing					
Membrane quantity	16	20	24	30	36
Memb. housing style	4element long	4element long	4element long	6element long	6element long
Membrane housing array	2→1→1	2→2→1	3→2→1	3→2	3→2→1
Cartridge Filtration					
Filter housing	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4
PP cartridge length	40"	40"	40"	40"	40"
Filter housing qty.	1	1	1	2	2
	9 per housing	9 per housing	9 per housing	9 per housing	9 per housing
Installation					
Inlet	3“ Flange	3“ Flange	3“ Flange	3“ Flange	3“ Flange
Permeate	2" Flange	3" Flange	3" Flange	3" Flange	3" Flange
Drain	1.5" Flange	1.5" Flange	1.5" Flange	1.5" Flange	1.5" Flange
CIP inlet	2" BSPT or NPT	2" BSPT or NPT	2.5" BSPT or NPT	2.5" BSPT or NPT	2.5" BSPT or NPT
CIP conc. outlet	1.5" BSPT or NPT	1.5" BSPT or NPT	2" BSPT or NPT	2" BSPT or NPT	2" BSPT or NPT
CIP perm. outlet	1"DIN or Sch80	1.5"DIN or Sch80	1.5"DIN or Sch80	1.5"DIN or Sch80	1.5"DIN or Sch80
Package Dimension					
Approx. height	1800mm	1900mm	1900mm	1900mm	1900mm
Approx. width	5000mm	5000mm	5000mm	6700mm	6700mm
Approx. depth	1000mm	1000mm	1300mm	1000mm	1300mm
Approx. shipping weight	825kg	880kg	950kg	980kg	980kg
Options					
Antiscalant dosing system	Metering pump: 3L/h Chemical tank: 200-300L	Metering pump: 3L/h Chemical tank: 200-300L	Metering pump: 3L/h Chemical tank: 300-500L	Metering pump: 3L/h Chemical tank: 300-500L	Metering pump: 7L/h Chemical tank: 300-500L
CIP system	CIP tank: 1000L CIP pump: 32m³/h@3.5bar CIP filter: BF-1-2	CIP tank: 1000L CIP pump: 40m³/h@3.5bar CIP filter: BF-1-2	CIP tank: 1500L CIPpump: 48m³/h@3.5bar CIP filter: BF-1-2	CIP tank: 1500L CIP pump: 40m³/h@3.5bar CIP filter: BF-1-2	CIP tank: 2000L CIP pump: 48m³/h@3.5bar CIP filter: BF-1-2
Pretreatment: PTMC series	PTMC-135	PTMC-150	PTMC-150	PTMC-180	PTMC-135 ×2

[1] Maximum permeate rate listed at temperature 25℃, Permeate rate will decreases with decreasing temperature.

[2] Design flow rate of the pump is the sum of Feed rate and Concentrate recycle rate

MODEL	PTROL-48	PTROL-60	PTROL-72	PTROL-90	PTROL-108
Max. permeate rate [1]	48m³/hr	57.8m³/hr	65m³/hr	86m³/hr	96.8m³/hr
Approx. conc. rate	16m³/hr	19.2m³/hr	22m³/hr	29m³/hr	32.2m³/hr
Approx. Feed rate	64m³/hr	77m³/hr	87m³/hr	115m³/hr	129m³/hr
Design Recovery	75%	75%	75%	75%	75%
Pump and Motor - Up to 1000mg/L Feed TDS design					
Manufacturer	CNP	CNP	CNP	CNP	CNP
Model	CDLF65-70-2 (50hz)	CDLF85-60-2 (50hz)	CDLF85-60 (50hz)	CDLF120-70-2 (50hz)	CDLF120-70 (50hz)
Quantity	1	1	1	1	1
Motor HP	37kw	45kw	45kw	75kw	75kw
Pump Material	SS316	SS316	SS316	SS316	SS316
Design flow rate [2]	64m³/hr	77m³/hr	87m³/hr	115m³/hr	129m³/hr
Design boost pressure	13.3bar	13.0bar	13.2bar	13.2bar	13.7bar
Pump and Motor - Up to 2500mg/L Feed TDS design					
Manufacturer	CNP	CNP	CNP	CNP	CNP
Model	CDLF32-140-2 (50hz)	CDLF42-90-2 (50hz)	CDLF42-100-2 (50hz)	CDLF65-80-1 (50hz)	CDLF65-80-1 (50hz)
Quantity	2	2	2	2	2
Motor HP	2×30kw	2×30kw	2×37kw	2×45kw	2×45kw
Pump Material	SS316	SS316	SS316	SS316	SS316
Design flow rate [2]	64m³/hr	77m³/hr	87m³/hr	115m³/hr	131m³/hr
Design boost pressure	18.9bar	18.3bar	18.8bar	17.5bar	16.2bar
Membranes Elements and Housings					
Membrane quantity	48	60	72	90	108
Memb. housing style	4element long	5element long	6element long	5element long	6element long
Membrane housing array	6→4→2	6→4→2	6→4→2	9→6→3	9→6→3
Cartridge Filtration					
Filter housing	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4	HPCF-9DC4
PP Cartridge Length	40"	40"	40"	40"	40"
Filter housing Qty.	2	3	3	4	4
	9 per housing	9 per housing	9 per housing	9 per housing	9 per housing
Installation					
Inlet	4“ Flange	4“ Flange	4“ Flange	6“ Flange	6“ Flange
Permeate	3" Flange	4" Flange	4" Flange	5" Flange	5" Flange
Drain	2" Flange	2" Flange	3" Flange	3" Flange	3" Flange
CIP inlet	3" Flange	3" Flange	3" Flange	4" Flange	4" Flange
CIP conc. outlet	3" Flange	3" Flange	3" Flange	3" Flange	3" Flange
CIP perm. outlet	1.5"DIN or Sch80	2"DIN or Sch80	2"DIN or Sch80	2"DIN or Sch80	2"DIN or Sch80
Package Dimension					
Approx. Height	2000mm	2000mm	2000mm	2000mm	2000mm
Approx. Width	5000mm	6000mm	6700mm	6000mm	6700mm
Approx. Depth	1300mm	1300mm	1300mm	1700mm	1700mm
Approx. Shipping Weight	1400kg	1500kg	1560kg	1800kg	2000kg
Options					
Antiscalant Dosing System	Metering pump: 7L/h Chemical tank: 300-500L	Metering pump: 7L/h Chemical tank: 300-500L	Metering pump: 7L/h Chemical tank: 500-1000L	Metering pump: 15L/h Chemical tank: 500-1000L	Metering pump: 15L/h Chemical tank: 500-1000L
CIP system	CIP tank: 2500L CIP pump: 96m³/h@3.5bar CIP filter:BF-1-2×2	CIP tank: 3000L CIP pump: 96m³/h@3.5bar CIP filter:BF-1-2×2	CIP tank: 4000L CIP pump: 96m³/h@3.5bar CIP filter:BF-1-2×2	CIP tank: 5000L CIP pump: 144m³/h@3.5bar CIP filter: BF-1-2×3	CIP tank: 6000L CIP pump: 144m³/h@3.5bar CIP filter: BF-1-2×3
Pretreatment: PTMC series	PTMC-150 ×2	PTMC-150 ×2	PTMC-180 ×2	PTMC-180 ×3	PTMC-180 ×3

Operating Limits

Maximum Feed Temperature	°C (°F)	35 (95)	pH (Continuous)		4 ~ 9
Minimum Feed Temperature	°C (°F)	5 (41)	Minimum pH (Continuous)		4
Maximum Feed Pressure	bar (psi)	5 (72)	Free Chlorine		undetectable
Minimum Feed Pressure	bar (psi)	2 (29)	Iron	ppm	<0.1
Maximum TDS	ppm	1500	Manganese	ppm	<0.05
SDI		<5	Organic matter	ppm	<1

Advanced Wastewater Treatment Systems

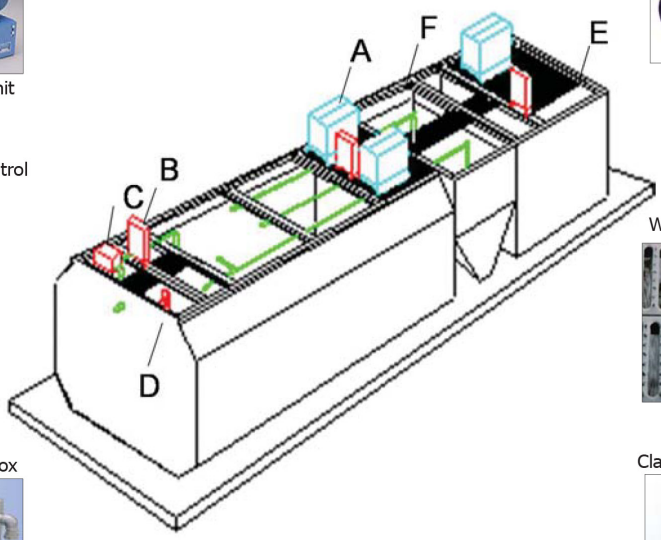
Typical applications with hydraulic flow rates from 1,000 gallons to 300,000 gallons per day are:

- Industrial Facilities
- Apartment Complexes
- Condominiums
- Resort Areas
- Motels/Hotels
- Recreational Facilities
- Mobile Home Parks
- Highway Rest Areas
- Power Stations
- Prisons/Military Facilities
- Any Remote Facility

A. Air Blower Unit

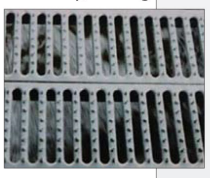
B. Electrical Control Console

C. Flow Proportioning Box



D. Coarse Air Bubble Diffuser

E. Service Walkway/Grating



F. Mechanical Clarifier Drive Unit

AGWT's STP Systems are a type of biological treatment designed specifically for the treatment of domestic waste utilizing the extended aeration concept (a modified activated sludge process). The basic design incorporates an extended aeration period (approximately 24 hours) coupled with a defined settling period (approximately four hours.) The extended aeration period destroys the organic compounds using air to mix and oxidize the volatile material into gas, water and sludge and greatly improves the biological efficiency of the process.

The result is a clear and odor-free effluent. A similar thing happens naturally in streams and rivers. Basically, we are doing the same thing as Mother Nature does. We provide sufficient air for the microbes to live with an ideal volume of food base. This provides an environment for bacterial growth to produce and consume organic materials. The only difference is that we do it faster than Mother Nature.

Tertiary treatment systems are available to further treat the effluent. With this addition, the effluent is further clarified, and routed through carbon filters to remove any trace organics and any residual chlorine. The tertiary treated effluent can then be used for irrigation or other non-potable purposes.

AGWT Service engineers are always available for technical support to insure that your system is always operating and producing water as designed and built. Units are covered by AGWT Warranty.

Models, Capacities, Dimensions & Weight

Model	Design Flow GPD	Population Equivalent	Length	Width	Height	Shipping Weight
AT-50	5,000	75	17' 4"	8' 0"	9' 6"	10,600 lb
AT-100	10,000	150	24' 3"	10' 0"	11' 0"	15,200 lb
AT-150	15,000	227	33' 10"	10' 0"	11' 0"	20,200 lb
AT-200	20,000	300	35' 11"	11' 11"	11' 0"	22,900 lb
AT-250	25,000	379	37' 10"	11' 11"	11' 0"	27,300 lb
AT-300	30,000	454	49' 7"	11' 11"	11' 0"	36,000 lb
AT-350	35,000	530	54' 9"	11' 11"	11' 0"	41,600 lb
AT-400	40,000	606	60' 9"	11' 11"	11' 0"	44,200 lb
AT-450	45,000	682	66' 9"	11' 11"	11' 0"	47,200 lb
AT-500	50,000	757	72' 8"	11' 11"	11' 0"	50,600 lb

Typical Installation of Packaged System

Truck delivers System to project site where a Crane of adequate size offloads tankage

System is positioned on Foundation Slab

Sections are re-assembled and made watertight. Additional sections set into position

System anchored to Foundation Slab. Ancillary equipment, blowers & controls are placed

Tertiary Filter System is set into position

Systems connected to utilities and are ready for operation