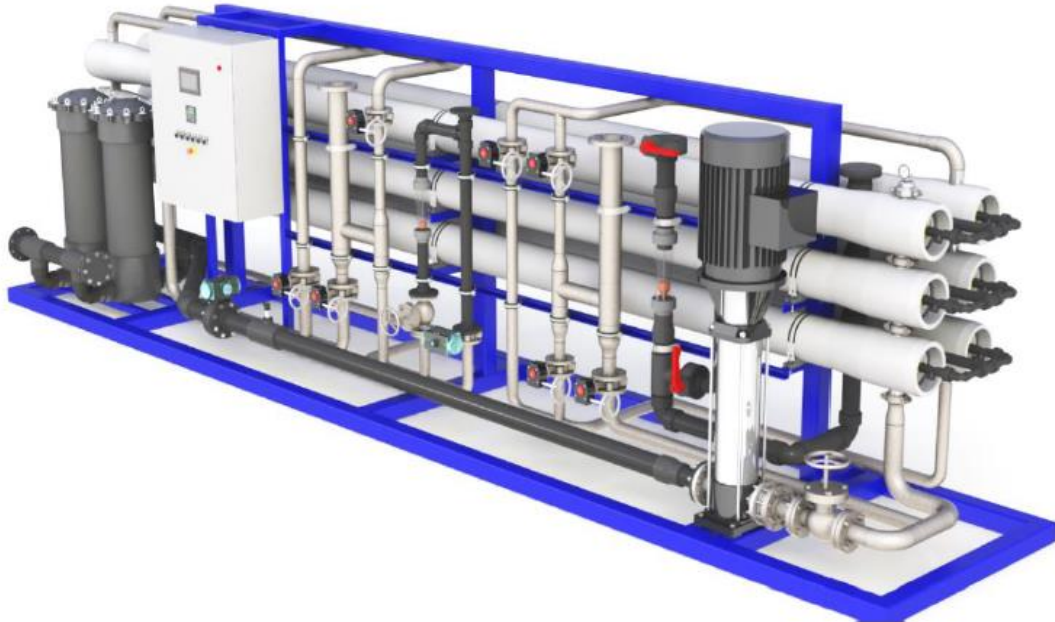


# AGWT STANDARD SKID MOUNTED BRACKISH WATER RO (BWRO) SYSTEMS

## PTROL Series 50HZ

Reverse Osmosis Systems from 15m<sup>3</sup>/h to 100m<sup>3</sup>/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				
<b>Nominal Capacity</b>				
16	[16 m <sup>3</sup> /h];	20	[20 m <sup>3</sup> /h]	
24	[24 m <sup>3</sup> /h];	30	[30 m <sup>3</sup> /h]	
36	[36 m <sup>3</sup> /h];	48	[48 m <sup>3</sup> /h]	
60	[60 m <sup>3</sup> /h];	72	[72 m <sup>3</sup> /h]	
90	[90 m <sup>3</sup> /h];	108	[108 m <sup>3</sup> /h]	
<b>Connection (code)</b>				
TB	[Thread, BSPT]			
TN	[Thread, NPT]			
FA	[Flange, ANSI]			
FD	[Flange, DIN]			
SA	[Socket, ANSI]			
SD	[Socket, DIN]			
<b>Power supply (code)</b>				
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

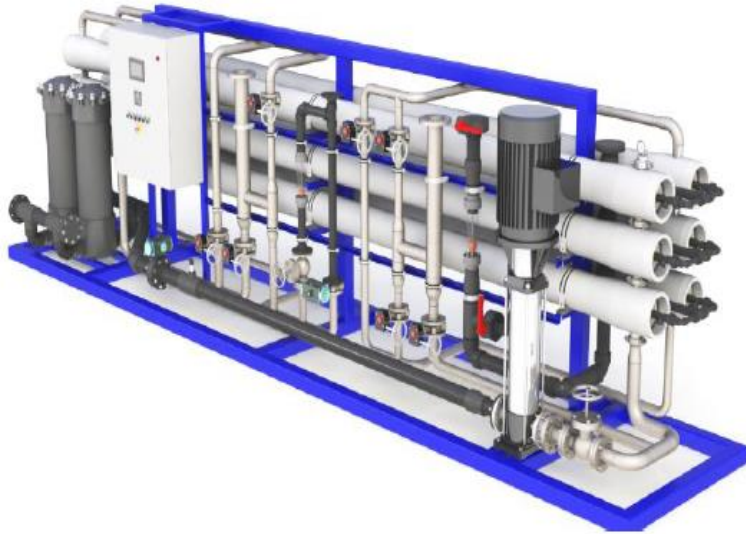
- Fully equipped and customizable
- Individually tested and preserved
- Expandable and skid mounted
- Low operation and maintenance costs
- Components easily accessible
- Easy maintenance and servicing
- Pre-plumbed, wired and assembled
- 1-year limited warranty

### 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  $\leq 1000$ ppm)  
FRP, 450psi, side port (for  $\leq 2500$ ppm)
- 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 <sup>1</sup>	16m <sup>3</sup> /hr	19.7m <sup>3</sup> /hr	24m <sup>3</sup> /hr	29.9m <sup>3</sup> /hr	32.5m <sup>3</sup> /hr
Approx. conc. rate	5.3m <sup>3</sup> /hr	6.6m <sup>3</sup> /hr	8m <sup>3</sup> /hr	10m <sup>3</sup> /hr	11m <sup>3</sup> /hr
Approx. feed rate	21.3m <sup>3</sup> /hr	26.3m <sup>3</sup> /hr	32m <sup>3</sup> /hr	40m <sup>3</sup> /hr	43.5m <sup>3</sup> /hr
Design recovery	75%	75%	75%	75%	75%
<b>Pump and Motor - Up to 1000mg/L Feed TDS design</b>					
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 <sup>2</sup>	22m <sup>3</sup> /hr	28m <sup>3</sup> /hr	32m <sup>3</sup> /hr	40m <sup>3</sup> /hr	44m <sup>3</sup> /hr
Design boost pressure	13.3bar	13.6bar	13.8bar	13.8bar	13.7bar
<b>Pump and Motor - Up to 2500mg/L Feed TDS design</b>					
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 <sup>2</sup>	22m <sup>3</sup> /hr	28m <sup>3</sup> /hr	32m <sup>3</sup> /hr	40m <sup>3</sup> /hr	44m <sup>3</sup> /hr
Design boost pressure	18.0bar	18.4bar	18.1bar	18.0bar	18.7bar
<b>Membrane Element and Housing</b>					
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
<b>Cartridge Filtration</b>					
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
<b>Installation</b>					
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
<b>Package Dimension</b>					
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
<b>Options</b>					
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: 32m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2	CIP tank: 1000L CIP pump: 40m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2	CIP tank: 1500L CIP pump: 48m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2	CIP tank: 1500L CIP pump: 40m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2	CIP tank: 2000L CIP pump: 48m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2
Pretreatment: PTMC series	PTMC-135	PTMC-150	PTMC-150	PTMC-180	PTMC-135 ×2

<sup>1</sup> Maximum permeate rate listed at temperature 25 °C, Permeate rate will decrease with decreasing temperature.

<sup>2</sup> Design flow rate of the pump is the sum of Feed rate and Concentrate recycle rate

MODEL	PIROL-48	PIROL-60	PIROL-72	PIROL-90	PIROL-108
Max. permeate rate <sup>1</sup>	48m <sup>3</sup> /hr	57.8m <sup>3</sup> /hr	65m <sup>3</sup> /hr	86m <sup>3</sup> /hr	96.8m <sup>3</sup> /hr
Approx. conc. rate	16m <sup>3</sup> /hr	19.2m <sup>3</sup> /hr	22m <sup>3</sup> /hr	29m <sup>3</sup> /hr	32.2m <sup>3</sup> /hr
Approx. Feed rate	64m <sup>3</sup> /hr	77m <sup>3</sup> /hr	87m <sup>3</sup> /hr	115m <sup>3</sup> /hr	129m <sup>3</sup> /hr
Design Recovery	75%	75%	75%	75%	75%
<b>Pump and Motor - Up to 1000mg/L Feed TDS design</b>					
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 <sup>2</sup>	64m <sup>3</sup> /hr	77m <sup>3</sup> /hr	87m <sup>3</sup> /hr	115m <sup>3</sup> /hr	129m <sup>3</sup> /hr
Design boost pressure	13.3bar	13.0bar	13.2bar	13.2bar	13.7bar
<b>Pump and Motor - Up to 2500mg/L Feed TDS design</b>					
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 <sup>2</sup>	64m <sup>3</sup> /hr	77m <sup>3</sup> /hr	87m <sup>3</sup> /hr	115m <sup>3</sup> /hr	131m <sup>3</sup> /hr
Design boost pressure	18.9bar	18.3bar	18.8bar	17.5bar	16.2bar
<b>Membranes Elements and Housings</b>					
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
<b>Cartridge Filtration</b>					
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
<b>Installation</b>					
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
<b>Package Dimension</b>					
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
<b>Options</b>					
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: 96m <sup>3</sup> /h@3.5bar CIP filter:BF-1-2×2	CIP tank: 3000L CIP pump: 96m <sup>3</sup> /h@3.5bar CIP filter:BF-1-2×2	CIP tank: 4000L CIP pump: 96m <sup>3</sup> /h@3.5bar CIP filter:BF-1-2×2	CIP tank: 5000L CIP pump: 144m <sup>3</sup> /h@3.5bar CIP filter: BF-1-2×3	CIP tank: 6000L CIP pump: 144m <sup>3</sup> /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

**HIGHER CAPACITIES CAN BE CONFIGURED WITH MULTIPLE PARALLEL SKIDS OR CAN BE CUSTOMIZED TO LOWER CAPITAL COST. PLEASE EMAIL FOR SIZING AND PRICING TO: [SALES@AGWTPHILINC.COM](mailto:SALES@AGWTPHILINC.COM)**

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