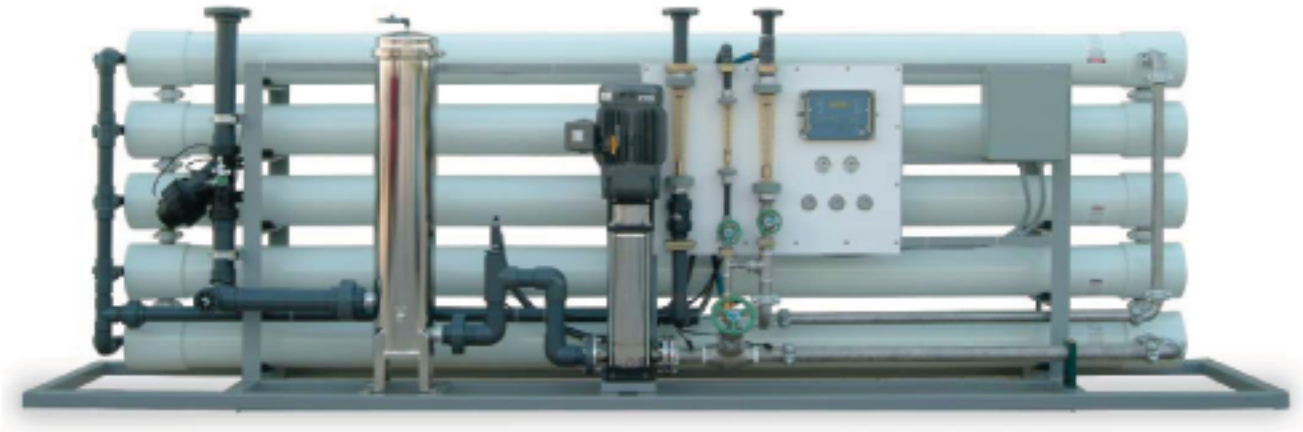
Enviro Solutions



R-48 standard features

- Powder coated steel frame
- FRP multi-port pressure vessels
- Stainless steel pre-filter and cartridges
- Webtrol® multi-stage centrifugal pump
- Automatic inlet valve
- Low-pressure shut-off with auto restart
- Tank level input
- Pretreatment interlock input
- Adjustable recycle line
- Pre-filter pressure gauges
- Pump discharge pressure gauge
- Flow meter for product water
- Flow meter for reject water
- Flow meter for recycle water
- Check valve for product water
- Sample valves for product water
- On / off switch

Specifications

Feed water connection	See below
Product water connection (40 & 60 GPM)	2" Flange
Product water connection (80 & 100 GPM)	2.5" Flange
Reject water connection	1.5" Flange
Feed water pressure requirement (min.)	20 PSIG
Drain requirement (maximum)	See below
Electrical requirement	460VAC/60hz
Phase	3
Amps (based on model)	25,30,35,40

Additional features included R48 systems

- CI-2000 electronic controller with feed and product water conductivity meter with percent rejection
- Programmable concentrate auto flush

Models

Model Number	Gallons Per Minute	Feed Water Connection	Pump (H.P.)	Recovery (Adj.)	Membrane Size	Membrane Array	Feed / Drain Required* (GPM)	Typical Rejection	Dimensions	Ship Wt. (Lbs.)
R48-08-3131100	40	2" Flange	15/TEFC	65%-75%	8" x 40"	1:1	62	98%	186"x26"x72"	2500
R48-12-3131100	60	2.5" Flange	20/TEFC	65%-75%	8" x 40"	2:1	93	98%	186"x26"x72"	2800
R48-16-3131100	80	3" Flange	25/TEFC	65%-75%	8" x 40"	2:2	123	98%	186"x26"x72"	3200
R48-20-1311100	100	3" Flange	30/TEFC	65%-75%	8" x 40"	3:2	154	98%	186"x26"x72"	3500

*At 65% recovery.

Notes: Performance specifications are based on 77°F feed water, 3 SDI or less, TDS below 1000 and pH of 8. Please see water temperature conversion charts to determine actual production rate for each installation. Chlorine reduction and other pretreatment may be required. Membrane rejection rates are based on membrane manufacturer's specifications. Pre-filter is Flow-Max® FM7x4 filter housing, constructed using 316 stainless steel and 2" MNPT pipe fittings and Flow-Pro® FPMB5-40 melt blown filter cartridges. Systems are designed for use with municipal and well water.

Introduction

Reverse Osmosis (R/O) Systems are designed to provide the commercial and industrial user with the most trouble free, cost effective and reliable form of water treatment available, by providing every option necessary for a successful installation.

Principles of Reverse Osmosis

R/O systems employ thin film composite spiral wound membrane elements for superior performance. To simply describe the process, pump pressure is used to supply source water to reverse osmosis membranes. These special membranes allow only high quality water to permeate them. In turn, they reject metals, salts, ionic and organic impurities that are processed to waste. Suspended solids are removed by pre-filters, which are standard components on all RO systems.

Water temperature

Product water quality and production of any RO system is dependent on pressure and temperature. Watts™ RO systems are rated at standard conditions of 77°F (25°C), 60 psi (4.2 bar) inlet pressure and 1,000 TDS feed water quality. Higher temperatures will result in more water passing through the membranes and increased water production. As a rule, at given pressures and TDS levels, for each one-degree change in water temperature the change in water production is approximately 2%.

Water temperature		Production Factor*
°F	°C	(Using thin film membranes)
40	4	0.48
50	10	0.60
60	16	0.73
70	21	0.88
77	25	1.00
80	27	1.06
90	32	1.26

*Percent of rated production.

Water pressure

Commercial RO systems require a minimum of 10 psi feed pressure to function properly. The maximum pressure is 90 psi, and a pressure regulator must be utilized over 90 psi to reduce feed water pressure.

Feed / source water inlet requirements

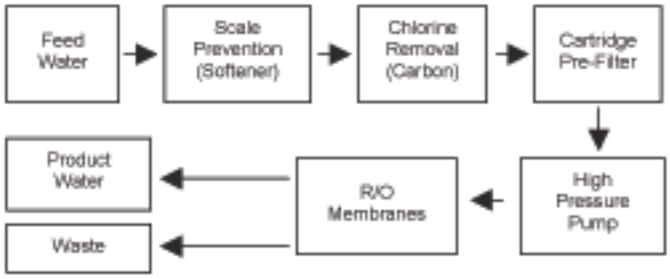
The source water requirements shown below are essential for proper operation:

Inlet feed water requirements	
Factor	Requirement
Hardness	<1 grain per gallon
Free chlorine	0 ppm
T.D.S.	<1,000 ppm
S.D.I.	<5
pH	3-11
Iron	<0.01 ppm
Silica	<25 ppm
Manganese	<0.05 ppm
Turbidity	<1 NTU
Temperature	40°F - 95°F (4°C - 32°C)
Pressure	10 - 90 psi (2.8 - 5.6 bar)

Note: Pretreatment may be required if the above parameters are not met. Failure to meet feed water requirements may foul membranes, void the warranty and possibly make it necessary to down-rate performance.

All specifications listed are based on an average of 1,000 TDS feed water, 77°F (25°C) temperature and 60 psi (4.2 bar) pressure. Typically, higher-pressure differentials and higher temperatures increase water production and water quality. Maximum pressure and temperature limits must be observed.

General RO Process Diagram



1. System location

The RO system should be located on a level surface in an area sheltered from sun, wind and rain. The temperature in this area should be maintained, and should not fall below 35°F, nor greater than 95°F. If these limits are exceeded, damage to components may result and the warranty may be considered void. It is important to allow sufficient space around the unit so maintenance can easily be performed.

2. Plumbing

The high-pressure pumps used require a continuous flow of water to the system. Minimum feed pressure is 10 psi. Please see table, below for minimum flow rates.

3. Feed water

Piping for feed water to the RO system should be either copper or plastic. Iron and carbon steel pipe will increase the iron content of the raw feed water and adversely affect the RO system's performance. Temperature of the feed water must not exceed 95°F.

4. Product water (permeate) line connection

Connect the product water (permeate) line to the manifold on the back side of the system. This line should not have valves and should run as directly as possible to the storage tank.

5. Concentrate (waste) line connection

Connect the waste line (concentrate) to the manifold on the back side of the system. The waste from the system should not have valves and should have an air break between it and the building drain system. The tubing or piping used for discharge of the concentrate should be run to an open drain in a free and unrestricted manner.

6. Electrical

The customer must provide a properly sized electrical service.

Level controls

In most installations it is necessary to use the level switch connector wire to install a level control or an electrical switch to turn the RO system on and off based on the water level in the storage tank.

Pumps

Never let pumps run dry. Operating pumps without sufficient feed water will cause damage. Feed pumps with filtered water only.

Pre-filtration

All RO systems come with particulate pre-filters to remove suspended particles down to five (5) micron in size. Change pre-filter cartridges at least every month or when there pressure differential of 10% or more that start-up pressure differential with clean cartridges.

Limited warranty

Commercial Reverse Osmosis systems are warranted to the original purchaser to be free of defects in material and workmanship for a period of one year from date of shipment. Should defects occur, Watts will repair or replace parts, which are defective. Shipping and labor costs are excluded for this limited warranty, and these costs are the customer's responsibility. Normal wear, accident, abuse, misuse, unauthorized alteration or repairs are also excluded.

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