

# R4X40 Series Whole House RO

Three models for flow rates up to 6,600 GPD



Model: R4X40-1

## Standard Features

- Powder coated steel frame
- Inlet solenoid valve
- 20" prefilter
- Prefilter pressure gauge
- Multistage centrifugal pump
- Low-pressure protection with microprocessor auto reset
- 2 1/2" liquid filled pump pressure gauge
- Stainless steel pressure vessel(s)
- Product flow meter
- Reject flow meter
- Concentrate needle valve
- Non metallic recycle needle valve
- Feed water and product water TDS monitor

## Applications

- Whole house
- Boiler feed water
- Humidifiers
- Greenhouses
- Process Water
- Electronics

## Specifications

Membrane Size	4" x 40"
Average membrane rejection	98%
Feed Water Connection	3/4" NPTF
Prefilter	2.5" x 20"
Product Water Connection	5/8" tubing OD
Reject Water Connection	5/8" tubing OD
Feed Water Pressure (minimum)	10 psi
Electrical Requirement *	120 VAC 60 Hz

## Options

PART NUMBER	DESCRIPTION
R2353-SD	Product float switch
R2288-165	165 gal tank whole house option*
R2288	300 gal tank whole house option*
R2288-500	500 gal tank whole house option*

\*Includes atmospheric storage tank, product float switch, and repressure pump with built in controls.

**Note: For indoor installation only.**

## Models

	R4X40-1	R4X40-2	R4X40-3-230
Maximum Productivity (gallons per day)	2200	4400	6600
Recovery (user adjustable)	15 - 75 %	25 - 75%	32 - 75 %
Number Of Membranes	1	2	3
Feed Water Required (maximum)	10gpm	12 gpm	14 gpm
Drain Required (maximum)	10gpm	12 gpm	14 gpm
Motor Horse Power	4-Mar	1	1 1/2
Electrical Requirement*	15 amps	20 amps	12 amps
Dimensions W x D x H	20 x 20 x 50	20 x 20 x 50	20 x 26 x 50
Shipping Weight (estimated lbs)	120	150	180

Notes: Maximum production based on a feed water of 77°F, SDI < 1, 1000 ppm TDS, and pH 7. Individual membrane productivity may vary (± 15%). May be operated on other feed waters with reduced capacity. Percent Rejection is based on membrane manufactures specifications; overall system percent rejection may be less. \*R4X40-3 is available only in 230-volt single phase.

# R4X40 Deluxe Series Whole House RO

Three models for flow rates up to 6,600 GPD



Model: R4X40-Deluxe

## Added Capabilities

- Input for auto shut-off when storage tank is full.
- input for auto shut-off when pretreatment is in regeneration.

## Standard Features

- Powder coated steel frame
- Inlet solenoid valve
- 20" prefilter
- Prefilter pressure gauge
- Multistage centrifugal pump
- Low-pressure protection with microprocessor auto reset
- Tank level input (dry contact)
- Pretreatment interlock input (dry contact)
- 2 1/2" liquid filled pump pressure gauge
- Stainless steel pressure vessel(s)
- Product flow meter
- Reject flow meter
- Concentrate needle valve
- Non metallic recycle needle valve
- Feed water and product water TDS monitor

## Applications

- Whole house
- Boiler feed water
- Humidifiers
- Greenhouses
- Process Water
- Electronics
- Car wash spot-free

## Specifications

Membrane Size	4" x 40"
Average membrane rejection	98%
Feed Water Connection	3/4" NPTF
Prefilter	2.5" x 20"
Product Water Connection	5/8" tubing OD
Reject Water Connection	5/8" tubing OD
Feed Water Pressure (minimum)	10 psi
Electrical Requirement	230 VAC 60 Hz, 1 PH

## Models

	R4X40-1-220-DLX	R4X40-2-220-DLX	R4X40-3-220-DLX
Maximum Productivity (gallons per day)	2200	4400	6600
Recovery (user adjustable)	15 - 75 %	25 - 75%	32 - 75 %
Number Of Membranes	1	2	3
Feed Water Required (maximum)	10gpm	12 gpm	14 gpm
Drain Required (maximum)	10gpm	12 gpm	14 gpm
Motor Horse Power	3/4	1	1 1/2
Electrical Requirement	8 amps	10 amps	12 amps
Dimensions W x D x H	20 x 20 x 50	20 x 20 x 50	20 x 26 x 50
Shipping Weight (estimated lbs)	120	150	180

Notes: Maximum production based on a feed water of 77°F, SDI < 1, 1000 ppm TDS, and pH 7. Individual membrane productivity may vary (± 15%). May be operated on other feed waters with reduced capacity. Percent Rejection is based on membrane manufactures specifications; overall system percent rejection may be less.

## Options

PART NUMBER	DESCRIPTION
R2350-SD	Product float switch
R2288-165	165 gal tank whole house option*
R2288	300 gal tank whole house option*
R2288-500	500 gal tank whole house option*

\*Includes atmospheric storage tank, product float switch, and repressure pump with built in controls.

**Note: For indoor installation only.**

# R12 Series Wall-Mounted RO Systems



R12-1200-2 system with optional legs

## Compact, Wall-Mounted Systems

Four models for flow rates to 1200 GPD.

## Standard Features (Package #1)

- Stainless steel frame
- Automatic inlet valve
- Pre-filter housing and cartridge, 10"
- Procon pump (brass)
- 1/2 HP motor
- Liquid filled pump pressure gauge (2-1/2")
- Stainless steel pressure vessels
- Needle valve for concentrate line
- Needle valve for recycle line
- Check valve for product water (stainless steel)
- Product pressure switch with Auto/Off
- Low-pressure shut-off with automatic restart

## Additional Features Included In Package #2

- Pre-filter pressure gauges
- Product water flow meter
- Reject water flow meter

## Additional Features Included In Package #3

- Automatic fast flush for concentrate

## Specifications

Product water & reject water connection (tubing)	3/8"
Feed water requirement (maximum)	2.4 GPM
Feed water pressure requirement (minimum)	10 PSIG
Drain requirement (maximum)	2.4 GPM
Electrical requirement	120v/60hz
Amps	8
Pump	1/2 HP

## Options

Part Number	Description
R2864	Stainless steel leg kit
R2353-SD	Product water float switch
R2288	Whole house option*

\*Includes 300 gallon tank, product water float switch and repressurization pump with built-in controls.

## Models

Model Number	Package	GPD	Recovery (Adjustable)	Membrane Size	Number Of Membranes	Feed Water Connection	Typical Rejection	Dimensions	Ship Wt. (lbs.)
R12-0150-1	1	150	15%-75%	2-1/2"x14"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0150-2	2	150	15%-75%	2-1/2"x14"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0150-3	3	150	15%-75%	2-1/2"x14"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0250-1	1	250	15%-75%	2-1/2"x21"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0250-2	2	250	15%-75%	2-1/2"x21"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0250-3	3	250	15%-75%	2-1/2"x21"	1	1/2" NPT	98%	22"x32"x12"	50
R12-0600-1	1	600	15%-75%	2-1/2"x40"	1	1/2" NPT	98%	22"x52"x12"	60
R12-0600-2	2	600	15%-75%	2-1/2"x40"	1	1/2" NPT	98%	22"x52"x12"	60
R12-0600-3	3	600	15%-75%	2-1/2"x40"	1	1/2" NPT	98%	22"x52"x12"	60
R12-1200-1	1	1200	25%-75%	2-1/2"x40"	2	1/2" NPT	98%	22"x52"x12"	70
R12-1200-2	2	1200	25%-75%	2-1/2"x40"	2	1/2" NPT	98%	22"x52"x12"	70
R12-1200-3	3	1200	25%-75%	2-1/2"x40"	2	1/2" NPT	98%	22"x52"x12"	70

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-Pro® FPMB5-978 melt blown cartridge. Systems are designed for use with municipal and well water.

# R13 Compact Wall Mount RO



R-13 with optional stand

## R-13 Compact Wall Mount RO

Three models for flow rates to 1200 GPD

### Standard features

- Powder coated steel frames
- Inlet solenoid valve
- Pre-filter
- 1/2 HP motor
- Brass pump
- Liquid filled pre-filter pressure gauge
- 2 1/2" liquid filled pump pressure gauge
- Product water & reject water flow meters
- High pressure, non-metallic membrane housings
- SS needle valves for concentrate and recycle lines
- Stainless steel product water check valve
- On / Off toggle switch
- Low-pressure shut-off with auto restart
- Feed water and product water TDS monitor

### Specifications

Feed water connection	3/4" NPTF
Product water connection	3/8" Tubing OD
Reject water connection	3/8" Tubing OD
Feed water required (max.)	2.4 GPM
Feed water pressure (min.)	10 PSI
Drain required (max.)	2.4 GPM
Electrical requirements	120 VAC 60 Hz
Amps	8
Pump (H.P.)	1/2



Proprietary Membranes  
(for R-13 systems)

### Options

Part Number	Description
R2868	Leg Kit
R2353-SD	Product float switch
R2288	Whole house option*

\*Includes 300 gal tank, product float switch and repressurization pump with built in controls.

### Applications

- Whole house
- Ice makers
- Labs
- Beverages
- Coffee shops
- Restaurants

**Note:** For indoor installation only.

### Models

	R13-0250	R13-0600	R13-1200
Maximum production (gallons per day)	250	600	1200
Average membrane rejection rate	98 %	98 %	98 %
Recovery (adjustable)	8 - 75 %	17 -75%	34 - 75 %
Membrane size	3" x 10"	3" x 20"	3" x 20"
Number of membranes	1 (P/N R96310)	1 (P/N R96320)	2 (P/N R96320)
Pre-filter (system ships with one 5 micron cartridge)	10"	20"	20"
Dimensions, approximate (W x H x D)	26" x 26" x 9"	26" x 36" x 9"	26" x 36" x 9"
Shipping Weight, estimated (lbs.)	50	60	75

**Note:** Performance specifications are based on 77°F feed water, SDI < 3, TDS below 1000 ppm and pH of 8. Individual membrane productivity and rejection rates are based on manufactures specifications. Please see water temperature conversion charts for production factor. Chlorine reduction and other pretreatment may be required. Systems are designed for use with municipal and well water.

# R14 Series Floor Model RO Systems

## Top Quality, Attractively Priced, Fully Assembled RO systems

Five models for flow rates to 10,800 GPD. Select the features you want to meet your requirements!



R14-06-1131100 System

## Standard Features (Package #1)

- Powder coated steel frame
- Stainless steel pressure vessels
- Pre-filter housing and cartridge (20" Full-Flow)
- Webtrol® heavy-duty multi-stage centrifugal pump
- Automatic inlet valve
- Low-pressure shut-off with automatic restart
- Tank level input
- Pretreatment interlock input
- Adjustable recycle line
- Pre-filter pressure gauges
- Pump discharge pressure gauge (liquid filled)
- Flow meter for product water
- Flow meter for reject water
- Flow meter for recycle water
- Check valve for product water
- On / off switch

## Additional Features Included With Package #2

- CI-1000 electronic controller with product water conductivity meter and alarm output
- Programmable concentrate auto flush

## Specifications

Feed water connection	1" FNPT
Product water connection	3/4" FNPT
Reject water connection	3/4" FNPT
Feed water pressure requirement (min.)	10 PSIG
Drain requirement (maximum)	15 GPM
Electrical requirement	230VAC/60hz
Phase	3
Amps	15

## Models

Model Number	PACK-AGE	GPD	Pump (H.P.)	Recovery (Adj.)	Membrane Size	Membranes	Feed Water Required* (GPM)	Typical Rejection	Dimensions	Ship Wt. (Lbs.)
R14-02-1111000	1	3600	5	25%-75%	4" x 40"	2	5	98%	60"x18"x56"	400
R14-02-1131100	2	3600	5	25%-75%	4" x 40"	2	5	98%	60"x18"x56"	400
R14-03-1111000	1	5400	5	36%-75%	4" x 40"	3	7.50	98%	60"x18"x56"	500
R14-03-1131100	2	5400	5	36%-75%	4" x 40"	3	7.5	98%	60"x18"x56"	500
R14-04-1111000	1	7200	5	42%-75%	4" x 40"	4	10	98%	60"x18"x56"	600
R14-04-1131100	2	7200	5	42%-75%	4" x 40"	4	10	98%	60"x18"x56"	600
R14-05-1111000	1	9000	5	46%-75%	4" x 40"	5	12.5	98%	60"x18"x56"	700
R14-05-1131100	2	9000	5	46%-75%	4" x 40"	5	12.5	98%	60"x18"x56"	700
R14-06-1111000	1	10800	5	50%-75%	4" x 40"	6	15	98%	60"x18"x56"	800
R14-06-1131100	2	10800	5	50%-75%	4" x 40"	6	15	98%	60"x18"x56"	800

\*At 50% 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-Pro® FPMB-BB5-20 melt blown cartridge. Systems are designed for use with municipal and well water.

# R24 Series Commercial RO Systems

Three models and two design options for flow rates up to 15 GPM.



## Standard Features (Package #1)

- Powder coated steel frame
- FRP multi-port pressure vessels
- Pre-filter housing and cartridge (20" B-B)
- 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	1" FNPT
Product water connection	1" FNPT
Reject water connection	3/4" FNPT
Feed water pressure requirement (min.)	10 PSIG
Drain requirement (maximum)	17, 21, 25 GPM
Electrical requirement	230VAC/60hz
Phase	3
Amps	20

## Additional Features Included With Package #2

- CI-1000 electronic controller with product water conductivity meter and alarm output.
- Programmable concentrate auto flush.

## Models

Model Number	PACK-AGE	Gallons Per Minute	Pump (H.P.)	Recovery (Adj.)	Membrane Size	Membrane Array	Feed Water Required* (GPM)	Typical Rejection	Dimensions	Ship Wt. (Lbs.)
R24-08-1111000	1	10	7.5/TEFC	60%-75%	4" x 40"	2:1:1	17	98%	96"x24"x72"	800
R24-08-1131100	2	10	7.5/TEFC	60%-75%	4" x 40"	2:1:1	17	98%	96"x24"x72"	800
R24-10-1111000	1	12.5	7.5/TEFC	60%-75%	4" x 40"	2:2:1	21	98%	96"x24"x72"	900
R24-10-1131100	2	12.5	7.5/TEFC	60%-75%	4" x 40"	2:2:1	21	98%	96"x24"x72"	900
R24-12-1111000	1	15	7.5/TEFC	60%-75%	4" x 40"	3:2:1	25	98%	96"x24"x72"	1000
R24-12-1131100	2	15	7.5/TEFC	60%-75%	4" x 40"	3:2:1	25	98%	96"x24"x72"	1000

\*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 20" Full-Flow plastic housing and Flow-Pro® FPMB-BB5-20 melt blown filter cartridge. Systems are designed for use with municipal and well water

## Introduction

Watts 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

Watts 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 Watts 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* (Using thin film membranes)
°F	°C	
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

Watts® 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

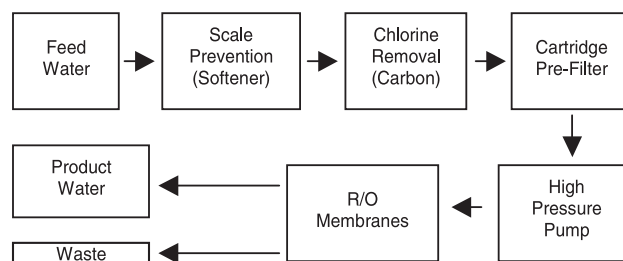
The source water requirements shown below are essential for proper operation:

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

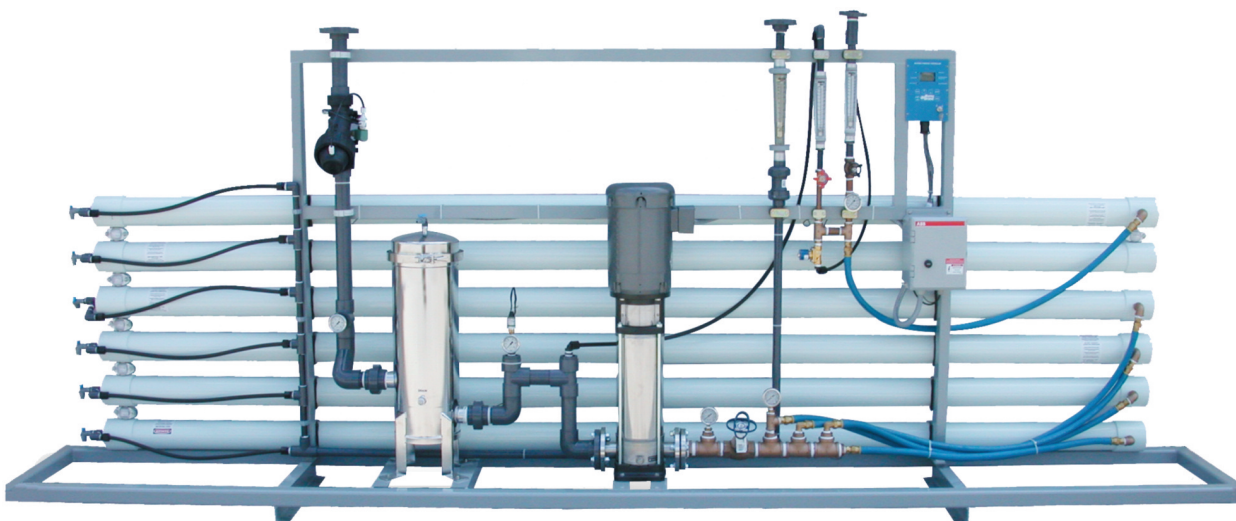
All Watts® RO systems come with particulate pre-filters to remove suspended particles down to five (5) micron in size. Change pre-filter cartridges at least every month or when there pressure differential of 10% or more that start-up pressure differential with clean cartridges.

### Limited warranty

Watts® 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. Watts will not be responsible for any incidental or consequential damages, losses or expenses arising from the installation or use of a Watts system. For warranty issues please call your dealer or Watts Water Quality & Conditioning Products at 800-659-8400.

# R44 Series Commercial RO Systems

Three models and two design options for flow rates up to 30 GPM.



## Standard Features (Package #1)

- 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	2" Flange
Product water connection	1.5" Flange
Reject water connection	1" Flange
Feed water pressure requirement (min.)	10 PSIG
Drain requirement (maximum)	31, 39, 46 GPM
Electrical requirement	230VAC/60hz
Phase	3
Amps	30

## Additional Features Included With Package #2

- CI-1000 electronic controller with product water conductivity meter and alarm output
- Programmable concentrate auto flush

## Models

Model Number	PACK-AGE	Gallons Per Minute	Pump (H.P.)	Recovery (Adj.)	Membrane Size	Membrane Array	Feed Water Required* (GPM)	Typical Rejection	Dimensions	Ship Wt. (Lbs.)
R44-16-1111000	1	20	10/TEFC	65%-75%	4" x 40"	2:2	31	98%	192"x26"x72"	1400
R44-16-1131100	2	20	10/TEFC	65%-75%	4" x 40"	2:2	31	98%	192"x26"x72"	1400
R44-20-1111000	1	25	10/TEFC	65%-75%	4" x 40"	3:2	39	98%	192"x26"x72"	1600
R44-20-1131100	2	25	10/TEFC	65%-75%	4" x 40"	3:2	39	98%	192"x26"x72"	1600
R44-24-1111000	1	30	10/TEFC	65%-75%	4" x 40"	4:2	46	98%	192"x26"x72"	1800
R44-24-1131100	2	30	10/TEFC	65%-75%	4" x 40"	4:2	46	98%	192"x26"x72"	1800

\*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® FM4X3 filter housing, constructed using 316 stainless steel and 2" MNPT pipe fittings and Flow-Pro® FPMB5-30 melt blown filter cartridges. Systems are designed for use with municipal and well water.

## Introduction

Watts 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

Watts 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 Watts 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* (Using thin film membranes)
°F	°C	
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

Watts® 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

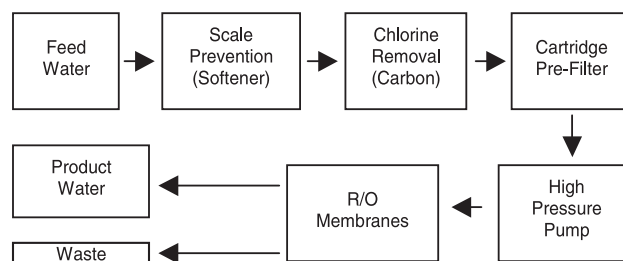
The source water requirements shown below are essential for proper operation:

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

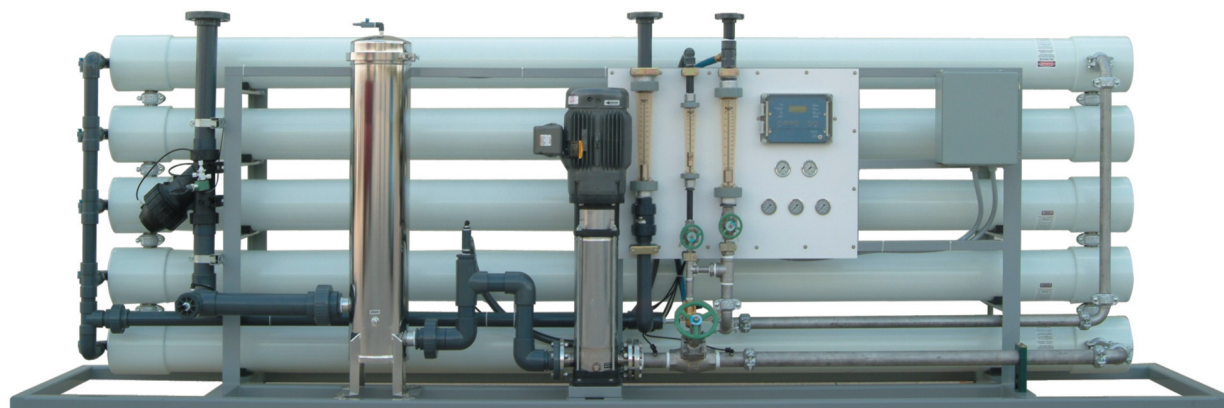
All Watts® RO systems come with particulate pre-filters to remove suspended particles down to five (5) micron in size. Change pre-filter cartridges at least every month or when there pressure differential of 10% or more that start-up pressure differential with clean cartridges.

### Limited warranty

Watts® 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. Watts will not be responsible for any incidental or consequential damages, losses or expenses arising from the installation or use of a Watts system. For warranty issues please call your dealer or Watts Water Quality & Conditioning Products at 800-659-8400.

# R48 Series Commercial RO Systems

*Four models for flow rates up to 100 GPM.*



## 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%	198"x42"x72"	2500
R48-12-3131100	60	2.5" Flange	20/TEFC	65%-75%	8" x 40"	2:1	93	98%	198"x42"x72"	2800
R48-20-3131100	80	3" Flange	25/TEFC	65%-75%	8" x 40"	2:2	123	98%	198"x42"x72"	3200
R48-20-1311100	100	3" Flange	30/TEFC	65%-75%	8" x 40"	3:2	154	98%	198"x42"x72"	3500

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

Watts 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

Watts 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 Watts 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* (Using thin film membranes)
°F	°C	
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

Watts® 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

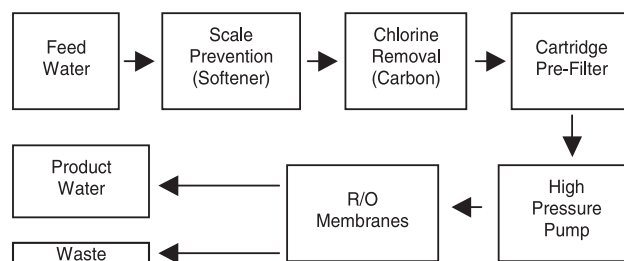
The source water requirements shown below are essential for proper operation:

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 Watts® 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

Watts® 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. Watts will not be responsible for any incidental or consequential damages, losses or expenses arising from the installation or use of a Watts system. For warranty issues please call your dealer or Watts Water Quality & Conditioning Products at 800-659-8400.

# Commercial RO Membranes

*Top quality membranes for commercial reverse osmosis systems.*



## Watts® Commercial Membranes

Part Number	Application	O.D.	Length	Capacity (GPD)	No. Per Case
W-2521-TW	Tap water	2-1/2"	21"	300	1
W-2540-TW	Tap water	2-1/2"	40"	800	1
W-4021-TW	Tap water	4"	21"	1,050	1
W-4040-TW	Tap water	4"	40"	2,200	1
W-4040-BW	Brackish water	4"	40"	2,200	1

Note: Watts commercial membranes are packaged in preservatives. Keep in cool environment if stored for prolonged periods of time.

## Watts Membrane Specifications

Data	W-2521-TW	W-2540-TW	W-4021-TW	W-4040-TW	W-4040-BW
Membrane type	TFC	TFC	TFC	TFC	TFC
Material	Polyamide	Polyamide	Polyamide	Polyamide	Polyamide
Charge	Negative	Negative	Negative	Negative	Negative
Configuration	Spiral-wound	Spiral-wound	Spiral-wound	Spiral-wound	Spiral-wound
Salt rejection	99.5%	99.5%	99.5%	99.5%	99.5%
Max. operating temp.	113°F / 45°C	113°F / 45°C	113°F / 45°C	113°F / 45°C	113°F / 45°C
Max. operating pressure	400 psi	400 psi	400 psi	400 psi	600 psi
Maximum turbidity (NTU)	<1	<1	<1	<1	<1
Max. SDI	<5	<5	<5	<5	<5
pH range (cleaning)	2-11	2-11	2-11	2-11	2-11
Flux (GPD)	300	800	1,050	2,200	2,200

Note: Tap water membrane specifications are based on 225 psi pressure and 77°F temperature.

## Filmtec® By Dow® Commercial Membranes For Tap Water

Part Number	Application	O.D.	Length	Capacity (GPD)	No. Per Case
TW30-2514	Tap water	2-1/2"	14"	170	1
TW30-2521	Tap water	2-1/2"	21"	300	1
TW30-2540	Tap water	2-1/2"	40"	660	1
TW30-4014	Tap water	4"	14"	480	1
TW30-4021	Tap water	4"	21"	900	1
TW30-4040	Tap water	4"	40"	2,200	1

Note: Specifications are based on 225 psi pressure and 77°F temperature.

## Commercial Membranes For Brackish Water

Part Number	Application	O.D.	Length	Capacity (GPD)	No. Per Case
BW30-2540	Brackish water	2-1/2"	40"	660	1
BW30-4040	Brackish water	4"	40"	2,200	1
BW30-400	Brackish water	8"	40"	10,500	1

Note: Brackish water membrane specifications are based on 225 psi pressure and 77°F temperature.

## Filmtec® By Dow® Commercial Membranes For Sea Water

Part Number	Application	O.D.	Length	Capacity (GPD)	No. Per Case
SW30-2514	Sea water	2-1/2"	14"	100	1
SW30-2521	Sea water	2-1/2"	21"	200	1
SW30-2540	Sea water	2-1/2"	40"	540	1
SW30-4021	Sea water	4"	21"	600	1
SW30-4040	Sea water	4"	40"	1,500	1
SW30-8040	Sea water	8"	40"	6,000	1

# Atmospheric Tank & Pump Packages

*Ideal for whole house and light commercial installations.*



Polyethylene atmospheric storage tanks with float switch and bulkhead fittings installed.



Pre Installed Float Switch.



Junction box connects the float switch to RO system.

## Grundfos® MQ3 Pump

This unique pump is included in the package for re-pressurization. It's a totally stand alone component, operating independently.

Simply plug it in directly to a 110 volt outlet and the pump turns itself on and off and adjusts speed based on flow.

*MQ3 pumps are stocked as components.*  
**Part Number: R6316-MQ3-45-1.**



*Reduce installation labor with these complete tank and pump packages with components pre-installed to save time and money!*

## Model Numbers

Part Number	Tank Size	Float Switch And Junction Box	Bulkhead Fittings	Overflow	Pump
R-2288-165	165 gals.	Installed	Installed	Installed	Grundfos® MQ3
R2288	300 gals.	Installed	Installed	Installed	Grundfos® MQ3
R2288-500	500 gals.	Installed	Installed	Installed	Grundfos® MQ3

***Custom sizes are available – please call for quotation.***

# Atmospheric Storage Tanks

*Non-pressure polypropylene.*



Part Number	Dia. x Hgt.	Gallons	Thickness	Opening	Points	Weight
C8005	23X38	65	1/4"	7" Lid / 2" Drain	TCIP	26
C8006	23x64	100	1/4"	7" Lid / 2" Drain	TCIP	33
C8009	31x58	165	1/4"	8" Lid / 2" Drain	TnTCIP	50
C8013	35x81	300	1/4"	16" Lid / 2" Drain	TCIP	80
C8017	48x72	500	5/16"	16" Lid / 2" Drain	TnTCIP	100
C8029	64x81	1000	3/8"	16" Lid / 2" Drain	TnTCIP	365
C8035	86x52	1200	3/8"	16" Lid / 2" Drain	TnTCIP	375
C8045	86x74	1700	13/32"	16" Lid / 2" Drain	TCIP	340
C8049	87x87	2100	7/16"	16" Lid / 2" Drain	TCIP	340

Tanks designed for 12# liquids or 1.5 specific gravity. Manufactured using FDA approved materials.

# Blue-White® Flowmeters



**F-400 Series**



**F-440 Series**



**F-410N Series**



**F-410N Series**



**F-452 Series**

## Standard Flowmeters For Liquid With 316 SS Guide Rods

Part Number	BW Part No.	Series	GPM	Connection	Adapter Material	Float Material
R5126	F-40375LN-6	F-400N	0.1 to 1.0	3/8"	Polypropylene	PVC
R5129	F-40376LN-8	F-400N	0.2 to 2.0	1/2"	Polypropylene	316 SS
R5138	F-40500LN-8	F-400N	0.5 to 5.0	1/2"	Polypropylene	316 SS
R5397	F-451003LHN	F-451	3.0 to 30	1"	Polysulfone	316 SS
R5398	F-451004LHN	F-451	4.0 to 40	1"	Polysulfone	316 SS
R5408	F-452060LHN	F-452N	6 to 60	2" FNPT	Polysulfone	316 SS
R5409	F-452080LHN	F-452N	8 to 80	2" FNPT	Polysulfone	316 SS

# Accessories for Commercial RO Systems

*Liquid level controls, pressure switches & metal pressure tanks.*



## Liquid Level Controls

Float switch used with atmospheric storage tanks to shut-off system when tank is full.

Part Number	Description
L75222	Control with single stage suction and 1/2" NPT PP fittings.

Important:

Install level control so the float will hinge upward (as shown). Not downward.

## Pressure Switch

Used with bladder pressure tanks to shut-off system with tank is full.

Part Number	Description
U217-2E	Switch pre-set 30-60 psi with 1/4" NPT fittings.



## Watts® Pressure Regulators

Part Number	Description
P50-0/25	1/4" Pressure reg 0-25 PSI 4 port
P60	2 port pressure regulator valve
P60-4	Pressure regulator 1/4" 0-125 PSI 4 port