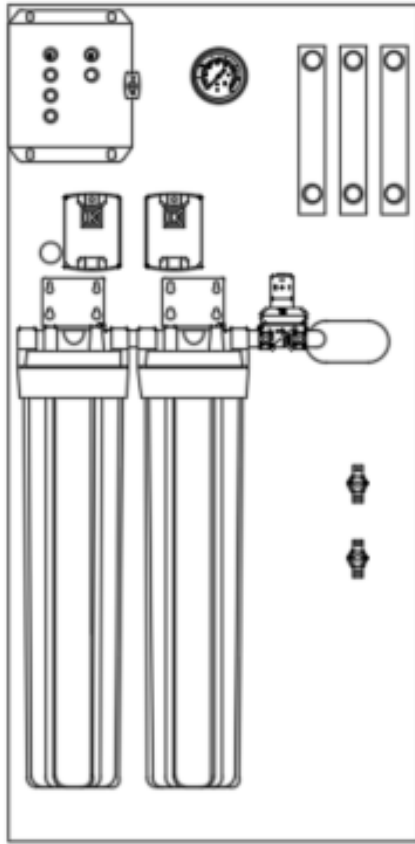




Commercial/Industrial Engineering Division



WGR 600 to 1800

Installation, Operation & Service Instructions

- ◆ Please read carefully all instructions before proceeding with the installation. Systems must be properly installed, operated and maintained. Failure to do so voids the warranty.
- ◆ Pre-treatment equipment must be properly installed and must always be operating as intended. The pre-treatment equipment must not pass untreated water to the RO when regenerating. A RO lock out switch can be used to shut down the RO during these regeneration periods. Failure to do so will void the warranty.
- ◆ The systems must be protected from freezing temperatures and avoid installing in direct sunlight.
- ◆ Do not use the system with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- ◆ Test the water periodically to verify that the system is operating satisfactorily. A regular preventative maintenance inspection by a water professional is recommended.
- ◆ Handle all components with care. Do not drop, drag or turn components upside down.
- ◆ Check all local plumbing and electrical codes. The installation must conform to them.
- ◆ It is recommended to wait until the entire system is fully pressurized, confirmed to be operating properly, and recheck for leaks before leaving the site.

WARNING

This Reverse Osmosis System contains a preservative solution to prevent microbiological growth and freezing which if ingested, may cause Irritation of the gastrointestinal tract, colic, diarrhea or other similar symptoms. Therefore the unit should be flushed for 2 hours prior to use. The water should be disposed of immediately.

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Read this Manual First

Items to Note

Before you operate the Canature WaterGroup WGR series reverse osmosis systems, the manual must be fully read and understood. This manual will familiarize you with the system and its capabilities.

The reverse osmosis system is designed to meet the needs of applications for high quality water. This manual contains important information about the unit, including information needed for installation, operating, and maintenance procedures.

In order for the water treatment system to continue to provide high quality water, you must develop a thorough understanding of the system and its operation. Review this manual before making any attempt to install, operate, or service the system. Installation or maintenance done on this system by an untrained service person can cause major damage to equipment or property damage.

In order to maintain the manufactures warranty, the operator must maintain accurate records of the operation of the unit. Copies will need to be sent to your supplier for review on a regular basis. This will serve to protect his/her interests and greatly expedite replacement should it be required.

Before starting the installation, **verify** that the feed water meets the limits shown in the table below.

The RO must is have the correct pretreatment installed before the RO and to be confirmed to be operating as intended. The pretreatment system must ensure the RO feed water always meets the requirements as indicated below. The RO must not be operated contrary to the operating limits listed below. To do so will void your warranty.

Operating Limits

Maximum Operating Pressure	190 PSI	13.1 bar
Feed Line Pressure Min/Max	30 to 85 PSI	2 to 5.9 bar
Feed Water Temperature Maximum	100 F	37 C
Total Dissolved Solids Max	2000 mg/l	2000 mg/l
Turbidity	< 1 NTU	< 1 NTU
pH Range	5 to 10	5 to 10
Silt Density Index	Well Water	<3
	Surface Water	<5
Chlorine/Chloramines Max	0 mg/l	0 mg/l
Iron Maximum	< 0.1 mg/l	< 0.1 mg/l
Manganese Maximum	<0.05 mg/l	< 0.05 mg/l
Hydrogen Sulfide	0 ppm	0 ppm
Water Hardness*	< 1 grain	< 17 mg/l
Oil tolerance	0 ppm	0 ppm
Organic Tolerance	0 ppm	0 ppm

Note: in some applications a water softener may not be required, (Up to 10 grains in some applications) (for example using anti-scalent). Consult your representative on these special applications. If anti-scalent is used, it is critical that the correct anti-scalent is used as well as the proper concentration and feed rate. Any changes in the feed water may require adjustments as well. The anti-scalent must be continually monitored and confirmed that the chemical feed system is operating correctly.

1.0 Introduction

Users Guide

This manual describes the procedures necessary to install, operate, and maintain your Canature Watergroup water treatment system. To avoid warranty nullification, please adhere to the operating instructions as outline in this manual.

The purpose of this manual is to provide the user with the necessary information to operate this equipment. Failure to follow the instructions laid forth in this manual may put the operators at risk of injury and possible

Icon Key



NOTE



Caution



WARNING

Warnings, Cautions, and Notes are used to attract attention to essential or critical information in a manual. Notes are used to add information, state exceptions, and point out areas that may be of greater interest or importance. Warnings indicate condition, practices, or procedures which must be observed to avoid personal injury or fatalities. Cautions indicate a situation that may cause damage or destruction of equipment or may pose a long term health hazard.

The CAUTION and WARNING paragraphs are not meant to cover all possible conditions and situations that may occur. It must be understood that common sense, caution, and careful attention are conditions which cannot be built into the equipment. These MUST be supplied by the personnel installing, operating, or maintaining the system.

Disclaimer

It is recommended that this manual be read thoroughly before any operation of the unit is performed. The purchaser must keep accurate records of the operation of the unit. This will serve to protect his/her interests and greatly expedite replacement should it be required.

All illustrations, diagrams and photos are used solely to illustrate specific points. Do not refer to any of these as actual representations of your unit unless otherwise stated.

To avoid unnecessary damage to the membrane elements in the RO unit the operator should follow the instructions that they receive from Canature Watergroup technicians. Any damage caused by negligence on part of the operator will not be covered under warranty. In all cases, if the operator is unsure of the solution to any RO problems he/she should contact Canature Watergroup for technical support.

This manual is to provide general assistance for installation, operation, cleaning or troubleshooting, Canature Watergroup will not be held liable for any damage to the RO unit if the operator causes damage by their misunderstanding of this manual. Though Canature Watergroup has made every effort to make sure this booklet contains correct information, if it is found that this manual is in error

Canature Watergroup will not be held liable. Operators should contact Canature Watergroup for any technical assistance, especially if this manual contains conflicting information.

Support

Canature strives to provide safe, efficient & trouble-free equipment. For service, sales, parts, or additional manual copies call your area representative. To avoid damage to the unit please follow the safety precautions outlined below. If there is any uncertainty about any procedures regarding installation and operation of the unit, contact Canature for technical support.

Safety Precautions



This equipment operates at high voltage and high pressure, has moving parts and possibly hazardous chemicals that may cause serious injury or fatality. Exercise caution and common sense when faced with potential hazards.

1. It is the responsibility of the owner to ensure that this equipment is used properly and safely.
2. Do not attempt to operate this equipment if you are drowsy or impaired in any other way.
3. Always wear safety equipment (safety glasses, earplugs, gloves) while working on the equipment.
4. Refer to Material Safety Data Sheets (MSDS) when handling hazardous materials.
5. Always operate the equipment at the parameters specified.
6. Never connect the system to piping that has not been approved by Canature Watergroup. If there are any doubts, please call your Canature Watergroup dealer.
7. Never remove any components from the unit while under pressure.
8. No one under the age of 18 years of age should operate or be allowed near this equipment.
9. Do not remove any warning labels that may be on the unit.
10. Proper maintenance assures the equipment will run properly and can reduce the risk of injury.
11. Correcting problems as they occur will help prolong the life of the system. Continuously inspect the system for leaks and damage.
12. Use Lock-Out and Tag-Out devices when servicing the unit.
13. Please use common sense when operating or installing this equipment, keep in mind that this manual is to be used as a guidance tool. If you are unsure about a procedure, ask your supervisor. Canature Watergroup welcomes any questions you may have.

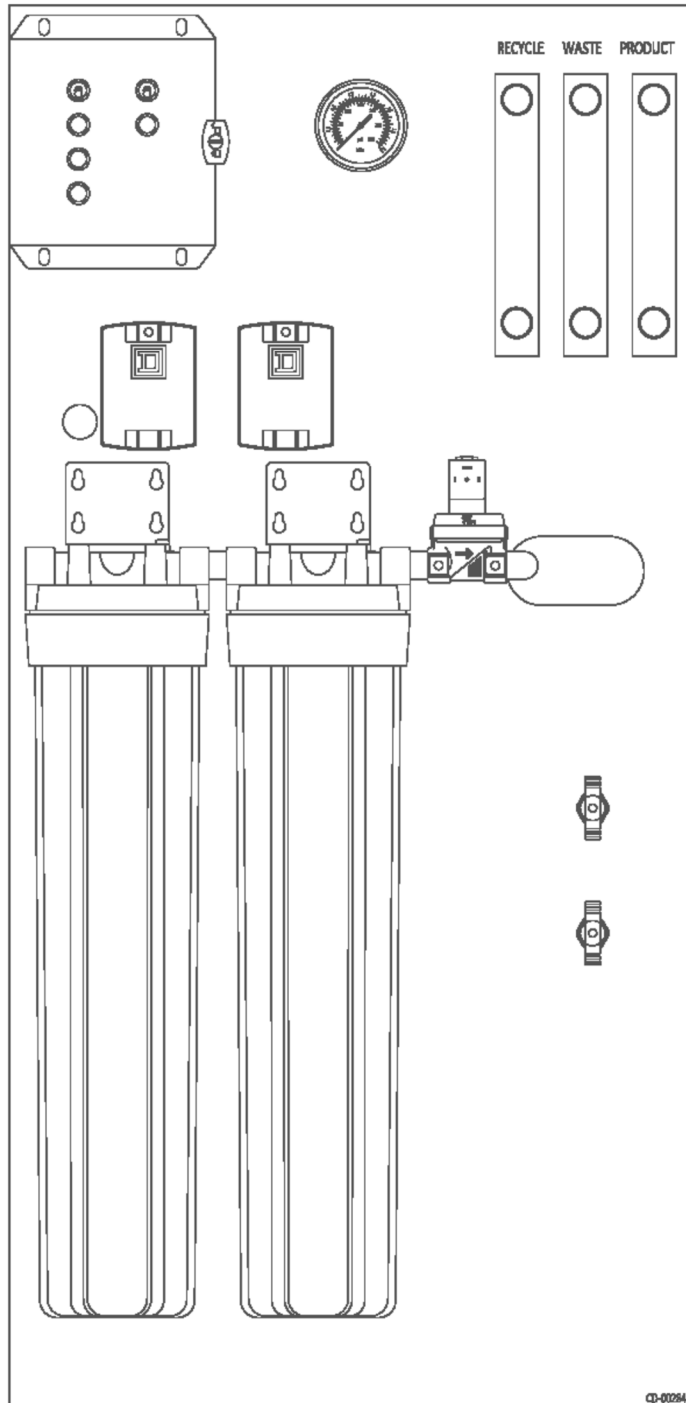
Below is a list of equipment and materials that should be kept nearby the equipment. The equipment is the bare minimum required to maintain a safe working environment.

- Lock-out and Tag-out devices for servicing and shutdowns.
- Eyewash/safety shower for any chemical accidents.
- Safety glasses are to be worn at all times.
- Earplugs should be worn when encountering high levels of noise.
- Gloves that offer protection from the chemicals used herein.
- Steel toe work boots for protection against heavy equipment and components.

Receiving And Inspection

Be sure to check the entire shipment for any shipping damage or lost parts. Note any damage to shipping cartons. All skids are fully shrink wrapped at the factory. Note if any skids are missing shrink wrap. If damage is present, notify the transport company immediately. The manufacturer is not responsible for damage or loss in transit.

Note: Do not discard any small parts. To avoid loss of small parts, keep them in the parts bag until you are ready to use them. Thoroughly check all boxes & cartons to ensure there are no small parts tucked inside.



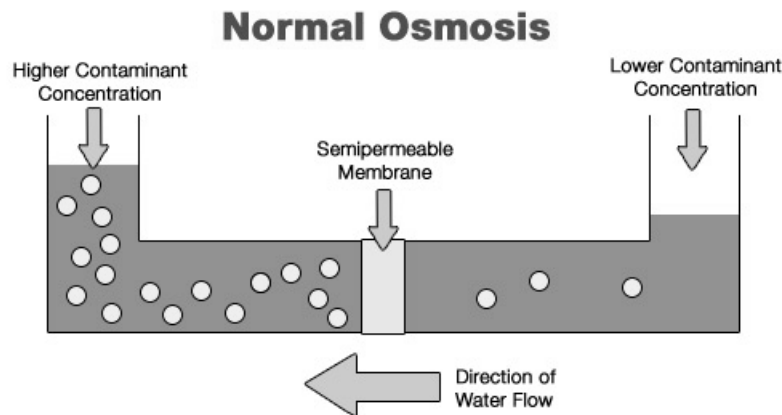
2.0 Equipment Description

Reverse Osmosis Overview

Reverse osmosis (RO) is a pressure driven membrane separation process that separates dissolved and suspended substances from water. The membrane acts as a selective barrier, removing unwanted substances such as salt, producing water safe for drinking.

Principles of Osmosis

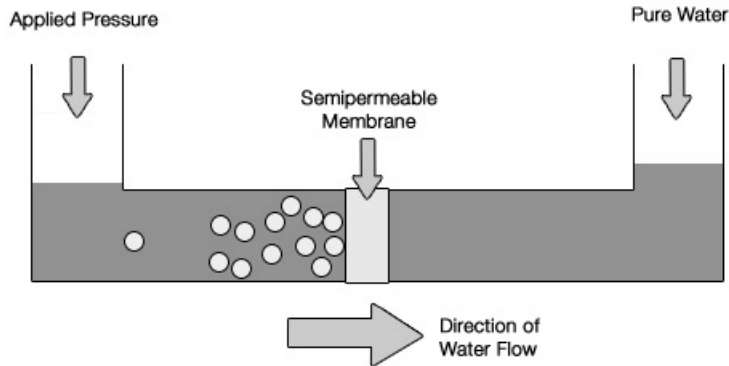
If you place a semi-permeable membrane between two compartments as in the container shown below, and then place salt water in one half of the container and pure water in the other half, a fundamental scientific principle comes into play. That is, two different concentrations of liquids within the same system will try to reach equilibrium (i.e. the same concentration of contaminants) on both sides of the membrane. Of course the only way for this to happen is for pure water to pass through the membrane to the salt water side in an attempt to dilute the salt solution. This attempt to reach equilibrium is called osmosis.



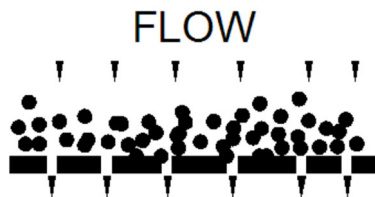
The Pressure Difference

Reverse osmosis is the reversal of the natural flow of osmosis. In a water purification system, the goal is not to dilute the salt solution, but to separate the pure water from the salt and other contaminants. When the natural osmotic flow is reversed, water from the salt solution is forced through the membrane in the opposite direction by application of pressure - thus the term reverse osmosis. Through this process, we are able to produce pure water by screening out the salts and other contaminants.

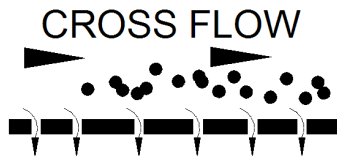
Reverse Osmosis



The reverse osmosis process cannot go on indefinitely without removing the contaminants. Ultimately the membrane will become clogged by salt and other impurities, requiring increasingly greater pressure to force water through the membrane.

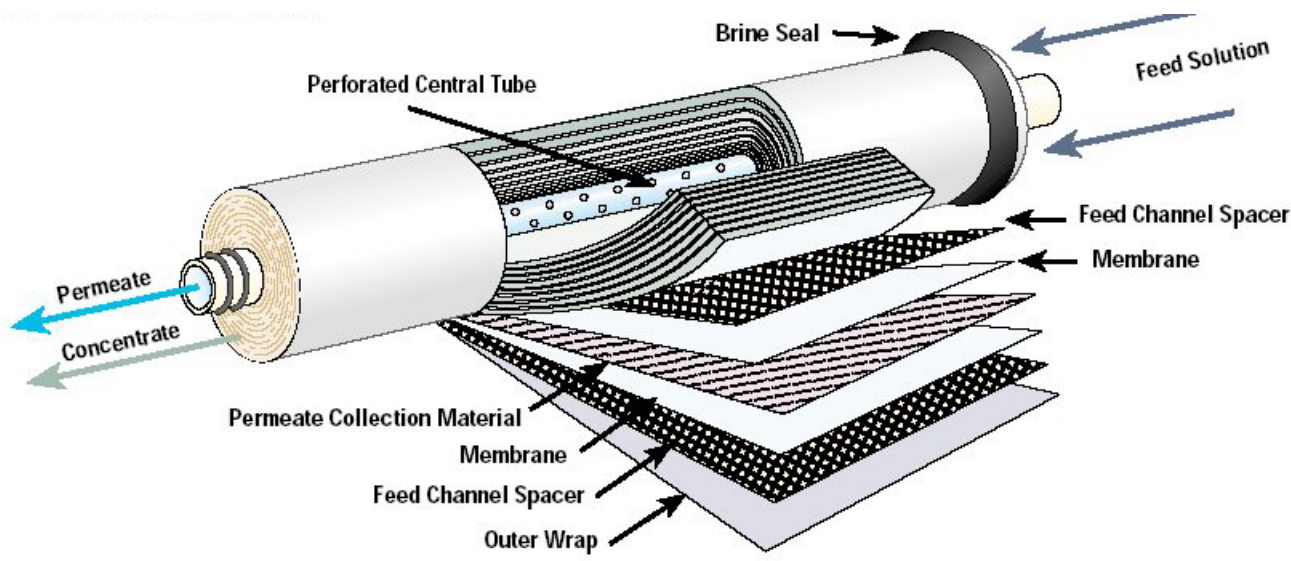


To minimize this problem, the membranes are configured to split the feed water into two streams - one part to be purified and the other part to wash away the particles rejected by the membrane. There is a recommended minimum “cross flow” concentrate flow rate to keep the membrane surface clear.




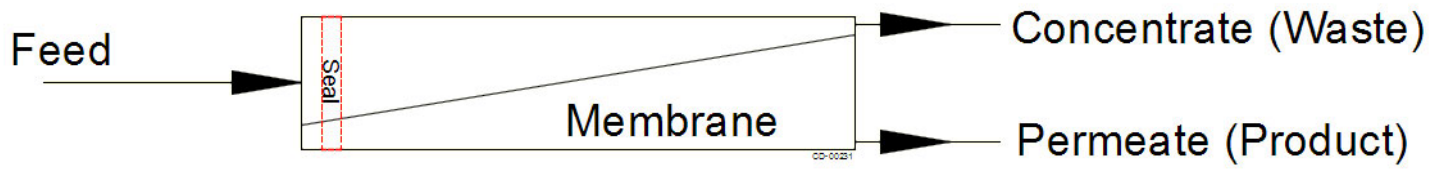
This minimum concentrate flow rate will vary depending upon the diameter of the membrane (see table below). If this minimum flow rate is not always maintained, the membranes can prematurely foul and fail.

Membrane Diameter	Minimum Cross Flow Flowrate
2.5"	1 usgpm
4"	4 usgpm
8"	16 usgpm



The reverse osmosis membrane is constructed of several membrane envelopes wound around a perforated central tube. The permeate (product) water passes through the membrane into the envelope and spirals inward to the center tube of collection. The envelopes are thin layers or sheets of film that are bonded together around the edge and rolled in a spiral configuration around a plastic tube. This is also known as a thin film composite or TFC membrane.

 An understanding of rejection/recovery percentages and temperature compensation is essential for monitoring and evaluating the performance or condition of the reverse osmosis system. **DO NOT** operate the system before becoming familiar with these concepts.



During the process of reverse osmosis, the permeate (product), water has its dissolved solids content reduced. The actual percentage depends upon a number of factors which include membrane type, operating pressure and temperature, and chemical makeup of the feed water. Different ions are also rejected at different levels.

The rest of the feed water contains the dissolved solids removed from permeate (product) water, in addition to the dissolved solids already present in the feed water. This concentrate (waste) water is sent to drain.

The amount of total dissolved solids rejected by the system is expressed as a percentage. A 95% rejection means that 95% of the dissolved solids have been removed from the feed water by the system. To calculate the percent rejection, use the following equation:

$$\frac{\text{Feed TDS} - \text{Permeate (Product) TDS}}{\text{Feed TDS}} \times 100 = \% \text{ Rejection}$$

The amount of high quality water recovered for use as a percentage of the water fed into the reverse osmosis system is called percent recovery. Use the following equation to calculate percent recovery:

$$\frac{\text{Permeate (Product) Flow Rate}}{\text{Feed Water Flowrate}} \times 100 = \% \text{ Recovery}$$

Permeate Production Temperature Compensation Factor

As the feed water temperature decreases, so will permeate (product) water production. The standard rated permeate (product) production is based upon the feed water temperature equal to 77° F (25° C).

As the feed water temperature drops, permeate (product) water production will also decrease at the rate of approximately 1.5% per 1° F. To calculate the temperature compensation factor, use the following formula. Note: the feed water temperature is in degrees Fahrenheit.

$$1 - ((77 - \text{Feed water temperature (in } F^{\circ})) \times 0.015) = \text{Temperature Compensation Factor}$$

For example, if the feed water temperature is 45° F, the temperature compensation factor is:

$$1 - ((77 - 45) \times .015) = \text{Temperature Compensation Factor}$$

$$1 - (32 \times 0.015) = \text{Temperature Compensation Factor}$$

$$1 - (0.48) = 0.52 \text{ is the Temperature Compensation Factor}$$

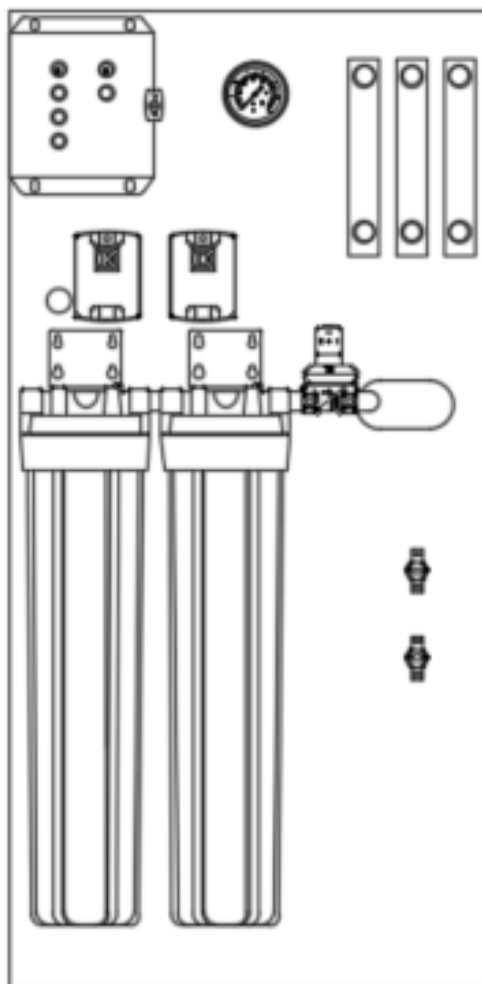
If the RO unit was rated at 100 usgpm @ 77° F, with the temperature compensation factor for 45° F, the RO would produce approximately 100 x 0.52 = 52 usgpm. See table below

Temp F ⁰	Multiplier	Temp F ⁰	Multiplier	Temp F ⁰	Multiplier	Temp F ⁰	Multiplier
77	1.00	66	0.84	55	0.67	44	0.51
76	0.99	65	0.82	54	0.66	43	0.49
75	0.97	64	0.81	53	0.64	42	0.48
74	0.96	63	0.79	52	0.63	41	0.46
73	0.94	62	0.78	51	0.61	40	0.45
72	0.93	61	0.76	50	0.60	39	0.43
71	0.91	60	0.75	49	0.58	38	0.42
70	0.90	59	0.73	48	0.57	37	0.40
69	0.88	58	0.72	47	0.55	36	0.39
68	0.87	57	0.70	46	0.54	35	0.37
67	0.85	56	0.69	45	0.52		

D-00333

RO Unit Specifications

Performance Specifications			
Item Number	2613B	2614B	2615B
Capacity GPD ⁽¹⁾ (lpd)	600(2270)	1200(4540)	1800(6810)
Maximum Operating Pressure PSI(bar)	190 (13.1)		
Typical TDS Rejection	< 97%		
Typical Recovery	Up to 50%		
Membranes	1	2	3
Inlet connection	1/2"	1/2"	1/2"
Motor (HP)	1/2	3/4	3/4
Electrical (Standard)	115V/1Ph/60Hz		
Dimensions in(cm)	53(135)H x 22(56)W x 24(61)D		
Shipping Weight -lbs (kg)	155(71)	163(74)	170(78)



Main Components

Frame

Powder coated steel.

Prefilters

This is a 20" carbon cartridge filter followed by 20" five micron cartridge filter. The carbon filter is for removal of chlorine from the feed water. Chlorine will attack and destroy the membranes. If chloramines are present, additional pretreatment is recommended. The five micron filter helps reduce suspended particles such as dirt. Depending upon feedwater conditions, prefilter cartridges are changed at least every 6 months.

System Pressure Gauges

The inlet pressure gauge reads the feed water pressure. The second pressure gauge, after the prefilters reads the water pressure entering the process pump. As the filters become clogged, a pressure drop will develop across the filters. A pressure drop of 7 psi or more will indicate the need to check or replace filters.

A third gauge indicates the water pressure that is being discharged by the pump and applied to the first R.O. membrane. The maximum recommended system operating pressure is 190 psi. This should not be exceeded.

Inlet / Flush (optional) Valves

The inlet valve and optional fast flush valves are electrically operated solenoids.

Low Pressure Switch

Inadequate feed pressure can seriously damage a booster pump. For this reason the RO unit has been equipped with a low pressure switch. The pressure switch is factory set for off at 20 psi, on at 30 psi. Operating the pump at 20 psi or less can damage the pump. Low pressure is indicated by a light on the controller. The low pressure switch has two black springs.

Tank Full Pressure Switch

The tank full pressure switch is set for off at 50 psi, on at 30 psi. The system can be used in conjunction with an atmospheric tank as well. A float switch installed in the tank will measure tank level and turn the RO system on when levels are low and off when tank is full. Tank full is indicated by the red light on the controller. The tank full pressure switch has a black and a green spring.

Booster Pump

The pump is a rotary vane positive displacement pump coupled to a thermally protected, 120v 1ph 60 hz motor with a v clamp. The pump has a built in bypass valve and is factory set for 250 PSI. Any replacement pump must also be set on the unit for 250 psi or the pump will fail. To adjust the pump, the pressure increases by turning the slotted blade screw clockwise.



Operating the pump at a feed pressure of 20 psi or less can damage the pump.

Concentrate (Waste) Flow Control

A concentrate valve restricts the rate of water flowing to drain. This maintains a constant operating pressure, as well, allows for constant flushing of the elements. To allow for a range of recoveries the waste flow is adjustable. For the WGR series, the waste flow rate should as a minimum match the product (permeate) flow rate.



DO NOT decrease the waste flow below the minimum specified flow and the waste valve should NEVER be closed; the membranes will be permanently damaged.

Recycle Flow Control

In order to achieve 50% recovery, part of the waste stream is recycled back into the feedwater of the R.O. system. In order to ensure that membranes do not burn out prematurely, use the following.



The Concentrate (waste)flowrate PLUS the recycle flowrate must equal to OR HIGHER than 1.5 gpm (to keep the membranes flushed)

Flowmeters

There are three flow meters, permeate (product water) concentrate (waste water) and recycle.

The permeate (product) meter measures the flowrate going to the storage tank. The concentrate (waste) meter measures the flowrate going to the drain. The recycle flowmeter measures the flowrate of the concentrate (waste) water being redirected to the pump inlet.

On/Off Control

This switch turns the RO system on or off. Moving the switch to on will start the system and activate the green light. The system will not start if the storage tank is full or there is insufficient feed water pressure. When the system is turned on, there is a 60 sec delay before the process pump cuts in. Once the system is running, it will continue until the storage tank is full (red light lit) or a low pressure feed water situation occurs (amber light lit).

Auto Flush Control (optional)

During the flush operation, the waste is diverted around the concentrate (waste) valve to drain. The auto flush switch has three positions. The auto position has the unit flush on start up and every two hours of continuous use. The flush green light will be on during this time. The manual position holds the flush solenoid open, and continuously diverts water to drain. The center position is off which disables the flush solenoid. If the unit does not have the optional auto flush, the unit will have a manual flush valve. This manual flush valve is closed during normal operation

3.0 Installation



The installation of the RO must comply with all applicable plumbing, sanitation and electrical codes. Obtaining permits and meeting codes is the responsibility of the installer.



This Reverse Osmosis System contains a preservative solution to prevent microbiological growth and freezing which if ingested, may cause Irritation of the gastrointestinal tract, colic, diarrhea or other similar symptoms. Therefore the unit should be flushed for 2 hours prior to use. The water should be disposed of immediately.

Location

The WGR system should be positioned in a suitable location near inlet water, open drains, and electrical outlet. The unit should be located indoors on a solid level base which can support the weight of the unit. Allow enough space for servicing of the unit and removal of the membranes.

Install the unit away from direct sunlight in a well ventilated location. Ensure that the system is protected from weather or excessive dust.

Water Connections

RO Feedwater Connection

RO feed water supply line connection is 1/2" FNPT. Install a isolation valve (not included) which is required when changing the prefilters. It is also recommended to install a sample point.



Use only non ferrous materials for the RO feed water supply line. Iron is detrimental to the membrane and will cause fouling and premature failure of the membrane.

Product (Permeate) Water Connection

The WGR system comes with 10 ft of 3/8" tubing. This tubing is used to connect from the product water flow meter tubing connection to the storage tank. The storage tank (not included) can be of the pressure tank or open storage variety. An additional float must be used when using the open storage tank. A sample point is recommended.

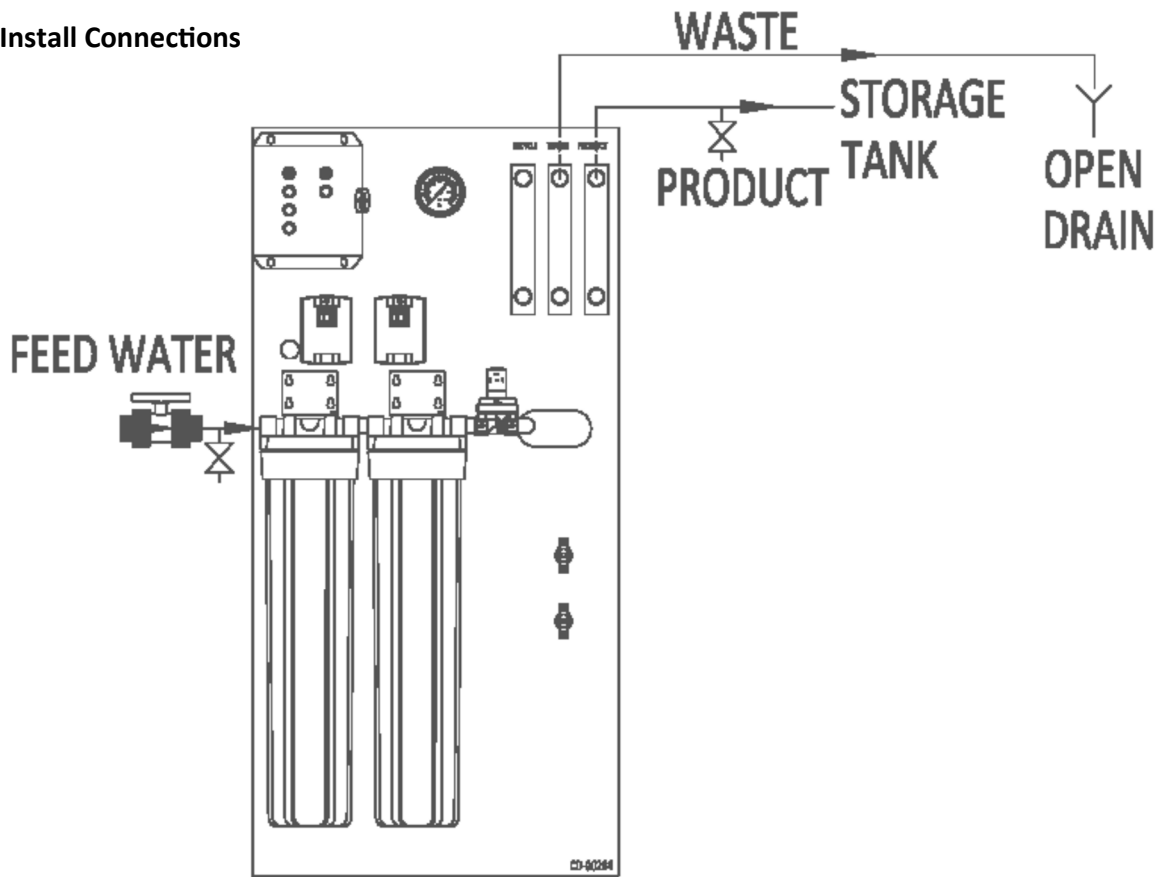


Use only plastic or stainless steel fittings on the product water storage lines as the unit produces high quality RO water and is aggressive and will corrode other materials such as copper.

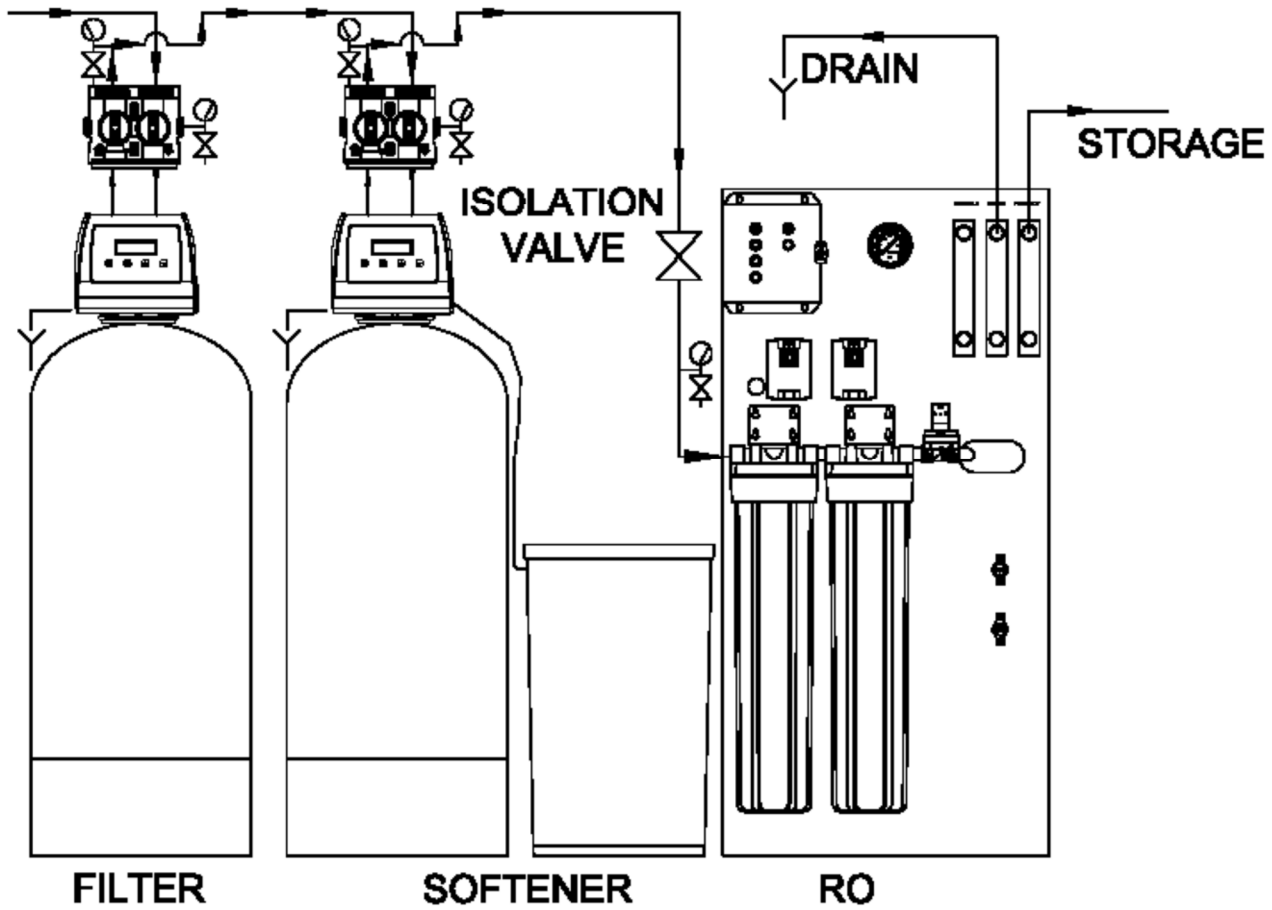
Waste (Concentrate) Water Connection

The WGR system comes with 10 ft of 3/8" tubing. This tubing is used to connect from the waste (concentrate) meter tubing connection to an open drain. This connection must include a proper air gap to prevent back flow into the unit (check local plumbing codes). Ensure the drain tubing is securely fastened as when the system enters fast flush mode considerable pressure is applied and the tubing may come loose.

RO Install Connections

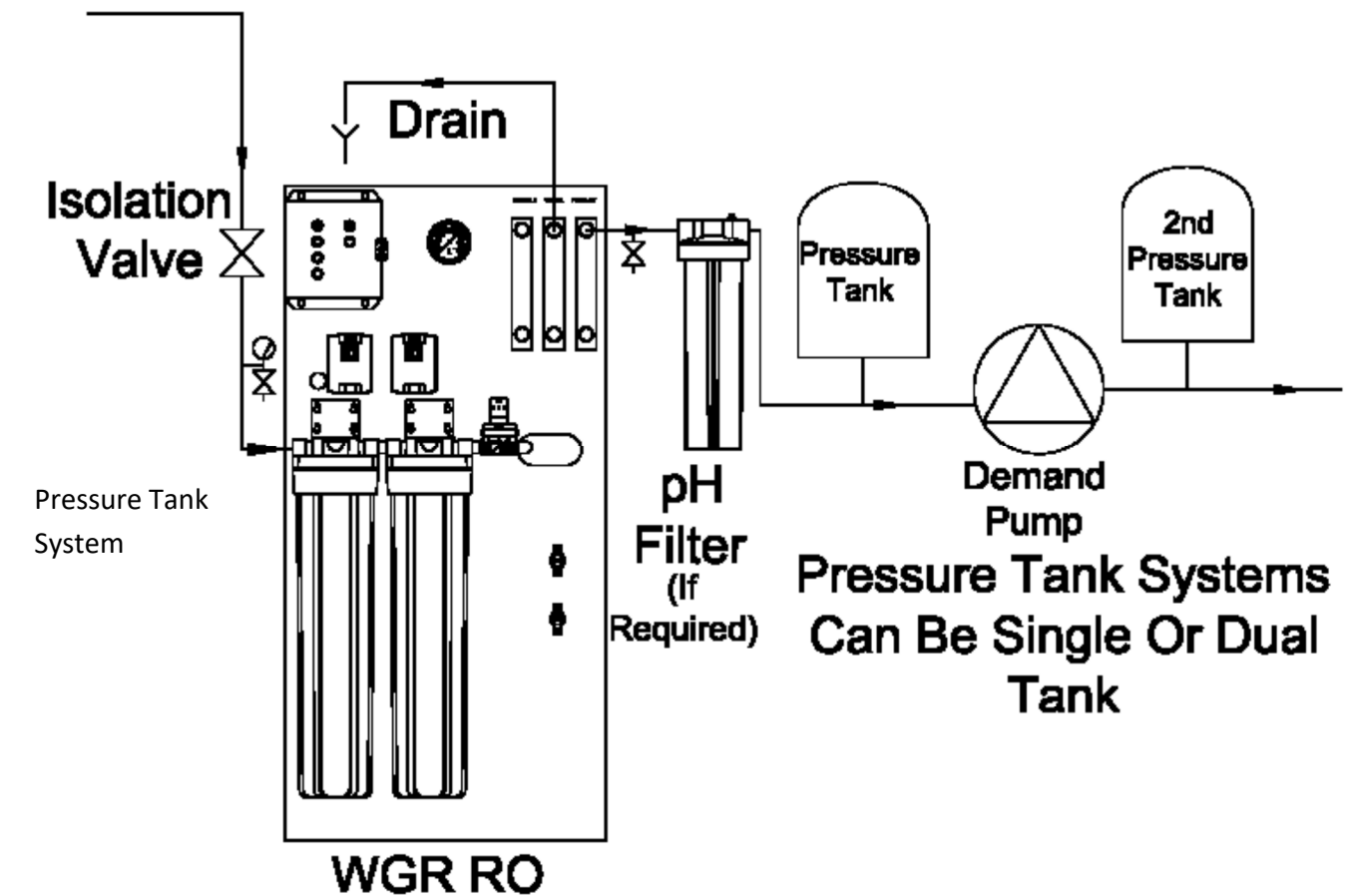
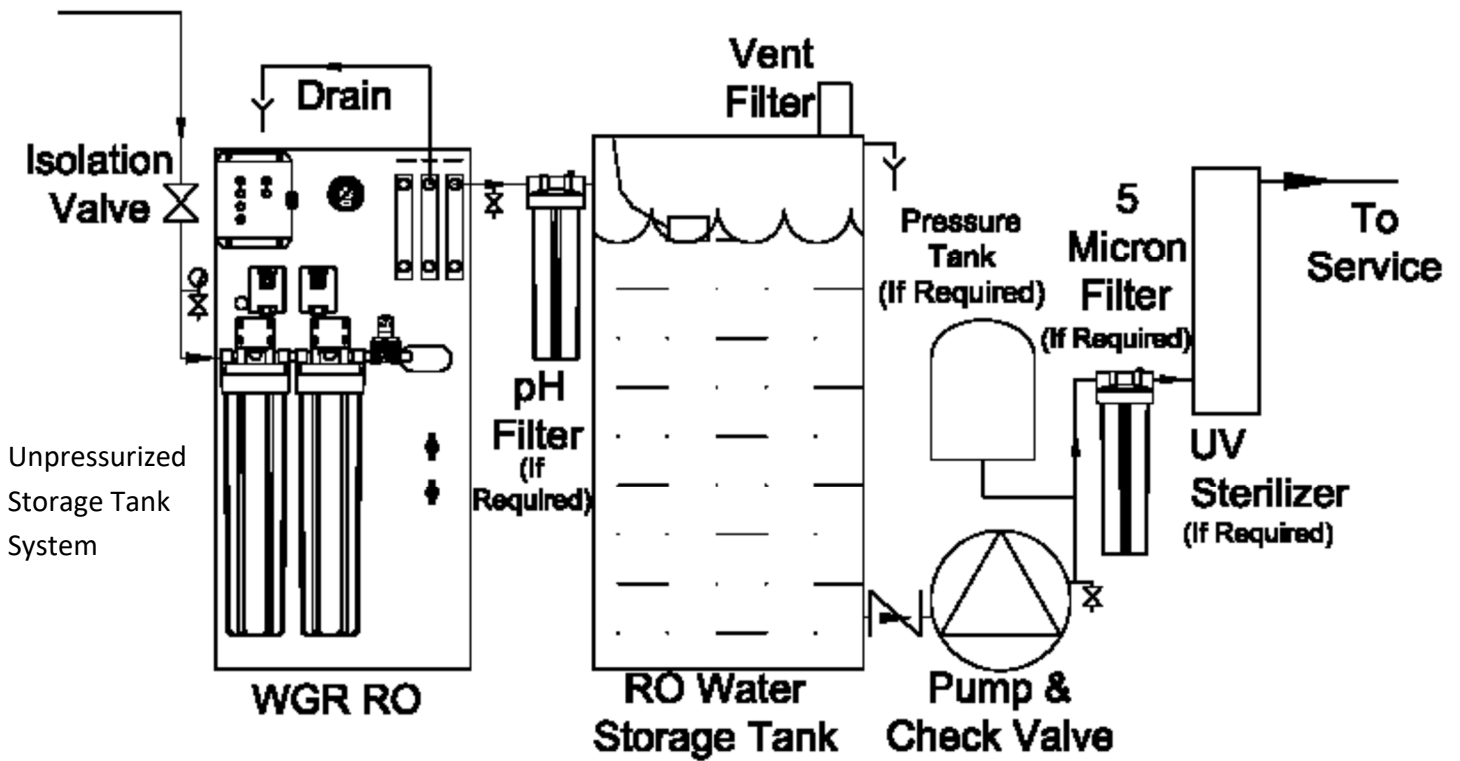


Pre-treatment Installation



RO Storage Tank Installation

There are two main RO storage tanks systems used. The most common has the RO feed an atmospheric pressure tank. The other is a single or dual pressure tank system.



Unpressurized Storage Tank System

The unpressurized storage tank is the most common type of storage when larger amounts of storage are required. Typical storage tanks are 150 gallon, 300 gallon and larger. Typical components include

-pH filter cartridge or tank (to raise the pH of the RO water to make it less aggressive).

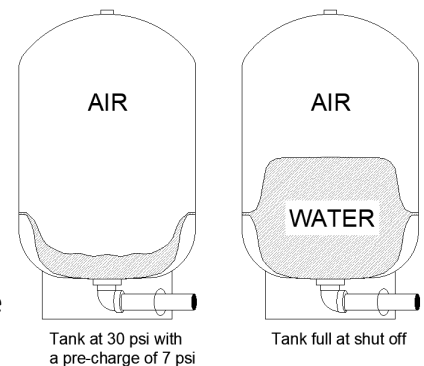
-Unpressurized storage tank which is also typically equipped with an overflow piped to open drain, and a vent filter. The storage tank will also require a electric float to be wired into the WGR RO to shut the RO down when the tank is full.

- Re-pressurization pump system which will have a separate or built in check valve. Some systems may require a pressure tank. Also the pump should have an additional control to prevent the pump from running dry.

- A five micron prefilter and a uv sterilizer.

Pressure Tank Storage Systems

Pressure tank systems are normally used when smaller volumes of water storage are required. They can be single or dual tank configuration. The WGR RO has a built in pressure switch with check valve that is set to turn on at 30 psi and shut off at 50 psi. The first pressure tank (or if there is only one in the system) has the air pre-charge set at 7 to 10 psi. With this pre-charge, the pressure tank will still have a little water left in the pressure tank when the RO turns back on at 30 psi. The demand pump between the two pressure tanks will keep the second pressure tank at 60 psi or higher so the pre-charge for the second pressure tank is usually 50 psi.



Electrical Connections

Verify that the available power exactly matches voltage, hertz and phase specified on the system's nameplate before connecting power to the unit.



Connecting the unit to a power source that does not match may cause damage and void the warranty.

Float Switch Connections

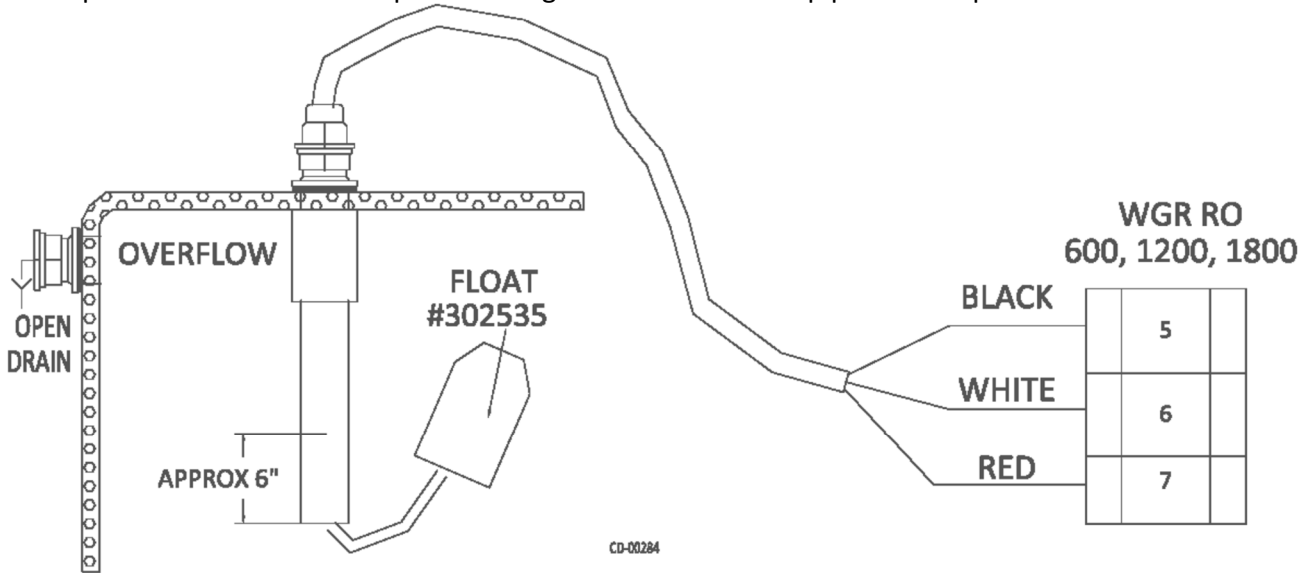
A float switch may be connected to this system for use with an atmospheric tank. The control box has a jumper between terminal blocks 5 & 6 that is removed and the float wiring installed. There is a liquid tight already installed on the control box that the float wiring can be installed through.

RO Pretreatment Interlock Connections

An electrical connection can be made to the RO pretreatment equipment to allow the shutdown of the RO system during regeneration. The jumper between terminals 4 & 5 is removed and then interlock wiring is installed onto terminals 4 & 5. The circuit between 4 & 5 must be closed when the pretreat equipment is in service and open when in regeneration.

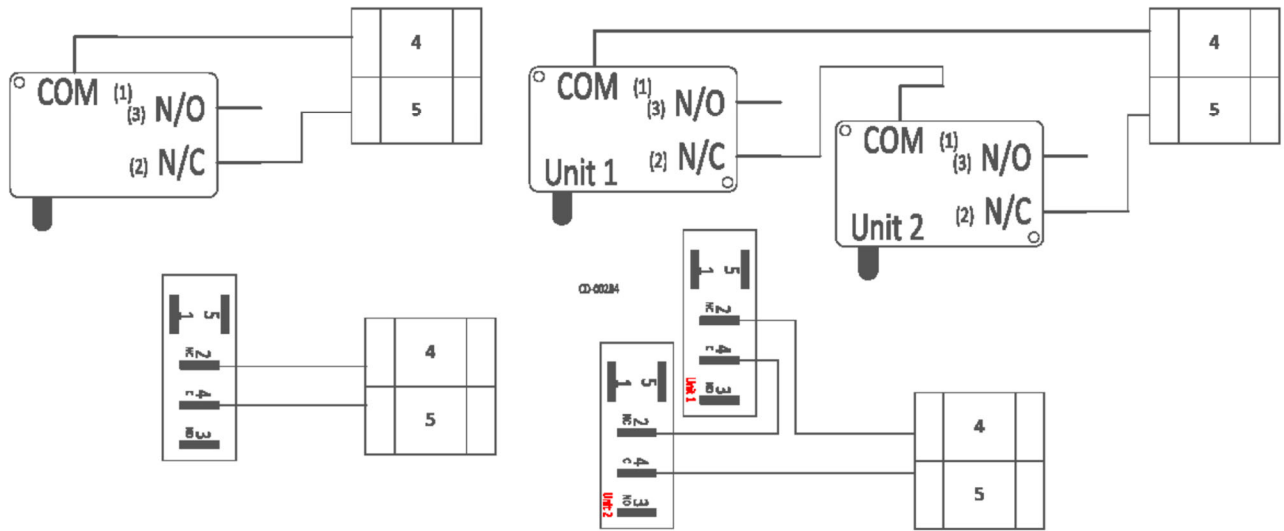
External Tank Float Wiring

A three wire float must be used (302535). On this float the black wire is common. The black and white wire is open on tank full. The black and red wire is closed on tank full. On the WGR the existing jumper between terminals 5 and 6 must be removed. Note: The float must be properly tethered to ensure proper float operation. Also on atmospheric storage tanks an overflow piped to an open drain is recommended.

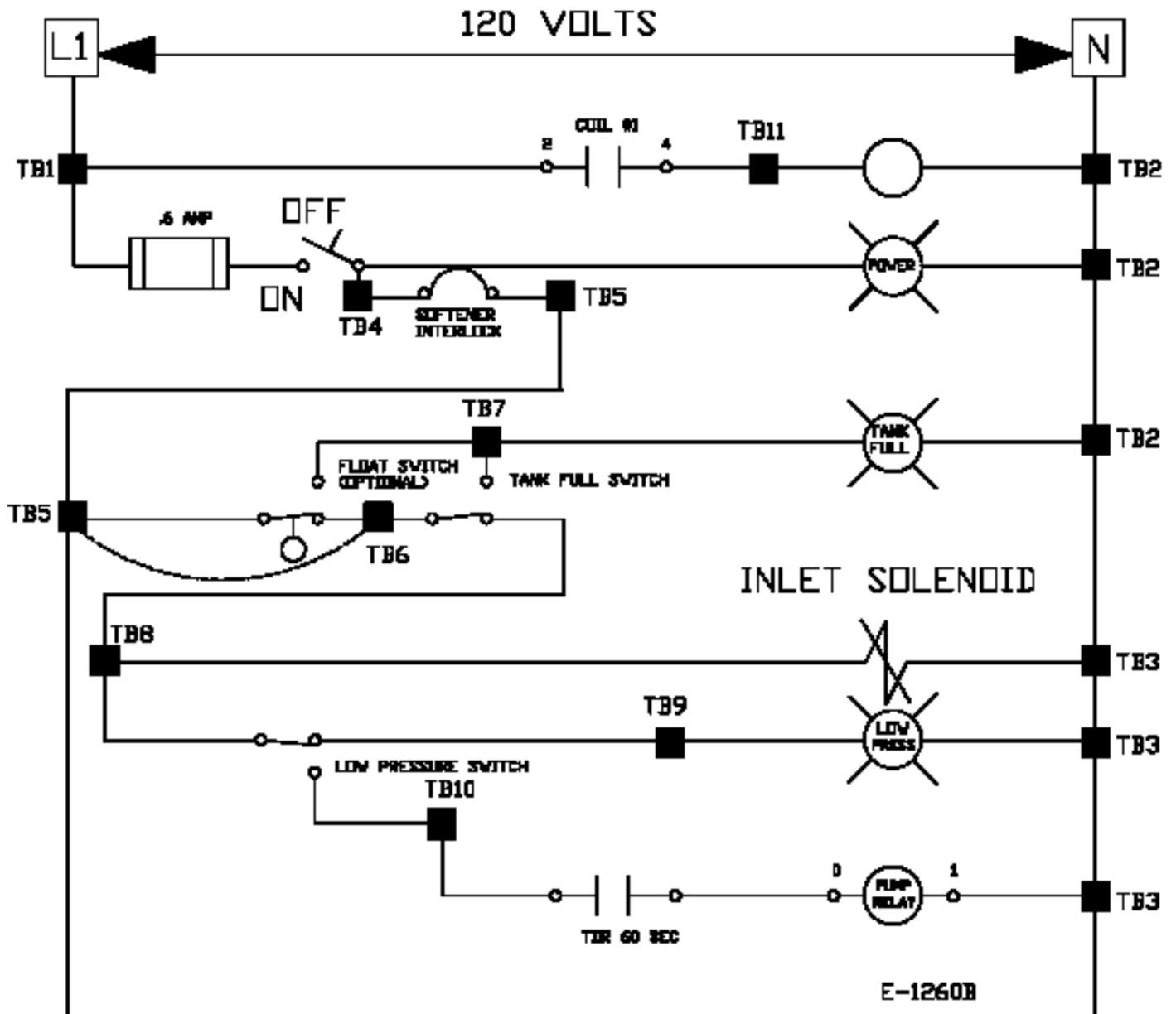


Pretreatment Interlock Wiring

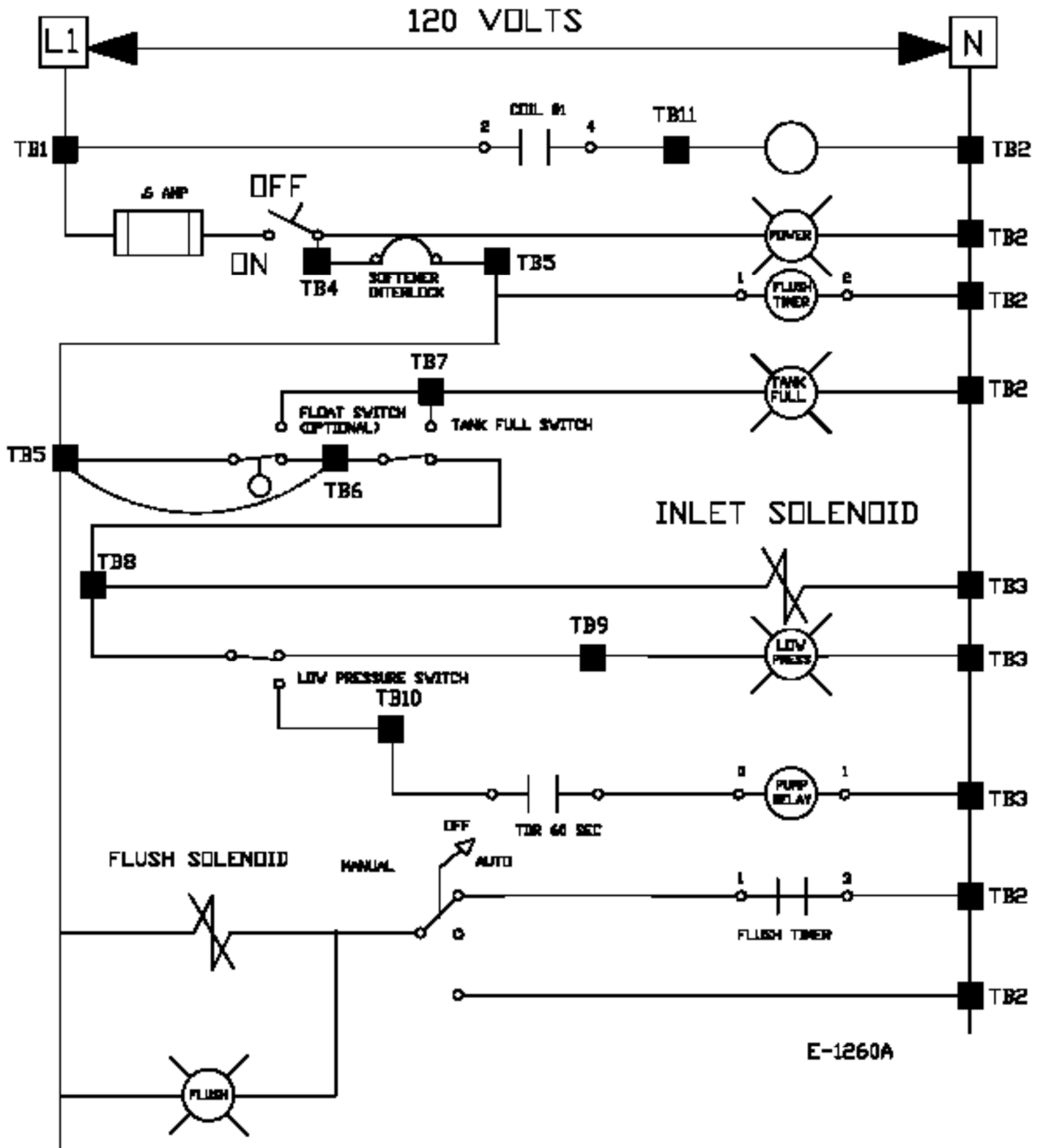
The pretreatment interlock wiring connects to terminals 4 and 5. The jumper between these two terminals must be first removed. When the pretreatment is in service, the circuit must be closed. When any of the pretreatment equipment is in regeneration, the circuit is open. Some examples using microswitches and single pole relays are shown below.



Standard WGR Electrical Diagram



Auto Flush WGR Electrical Diagram



4.0 Start Up

- Bring the raw water analysis for the start-up.
- Ensure the proper test equipment will be on site to confirm the pre-treatment is functioning properly. (Typically, to test for iron, manganese hardness, pH & free chlorine etc).
- The RO must have the correct pretreatment installed and operating correctly before beginning to start the RO up. The pretreatment system must ensure the RO feed water always meets the requirements as indicated below. The RO must not be operated contrary to the operating limits listed below.



- All pre-treatment equipment must be fully operational and confirmed to be operating properly. If any of the equipment is a single unit, the system must be set up so no untreated water can be fed to the RO. In this case, an interlock switch must be used to shut the RO down when the unit goes into regeneration.

Operating Limits

Maximum Operating Pressure	190 PSI	13.1 bar
Feed Line Pressure Min/Max	30 to 85 PSI	2 to 5.9 bar
Feed Water Temperature Maximum	100 F	37 C
Total Dissolved Solids Max	2000 mg/l	2000 mg/l
Turbidity	< 1 NTU	< 1 NTU
pH Range	5 to 10	5 to 10
Silt Density Index		
Well Water	<3	<3
Surface Water	<5	<5
Chlorine/Chloramines Max	0 mg/l	0 mg/l
Iron Maximum	< 0.1 mg/l	< 0.1 mg/l
Manganese Maximum	<0.05 mg/l	< 0.05 mg/l
Hydrogen Sulfide	0 ppm	0 ppm
Water Hardness*	< 1 grain	< 17 mg/l
Oil tolerance	0 ppm	0 ppm
Organic Tolerance	0 ppm	0 ppm

* In some cases, up to 10 grains may be tolerated. but less than 1 grain is recommended . Confirm with your water dealer.

Confirm the pre-treatment is operating as intended. For example

- If a softener is part of the pre-treatment system, confirm the water is fully softened.



- If a carbon filter is being used to remove chlorine or chloramines, confirm they have been removed. **NOTE:** *If a carbon filter is used, ensure the filter has been regenerated & rinsed thoroughly. Confirm the pH on the outlet is the same as the incoming water.*

If the pH is higher on the outlet, continue to rinse the carbon until the pH matches the incoming pH. Quite often, the pH initially coming out of a carbon filter can be much higher than the raw water. The high pH will affect the water chemistry and can scale the membranes up very quickly.

- Once all the pre-treatment equipment has been confirmed to be functioning properly, the start-up of the RO can begin. Check the system to make sure it is installed correctly.
- The RO feed water supply pipe is large enough to supply the RO unit adequately with both the flowrate and pressure required.
- The concentrate (waste) must flow to an OPEN drain) and to be of a size to properly handle the flow rate.
- The RO storage tank (if open storage) must have an tank overflow line piped to an OPEN drain.
- **If the unit has been shipped during cold weather, the RO must be fully thawed out before proceeding with the startup.**
- **Also note the initial RO product water should be dumped to drain for at least the first two hours as there is also preservative in the RO.**
- Install the pre filter cartridge(s). Use some silicone grease on the housing o-ring before attaching the sump to the housing. If silicon grease is not used, the oring may be stretched and could possibly leak. Ensure the plastic wrap has been removed before inserting the cartridge(s). If there is a carbon filter cartridge, it is installed before the sediment cartridge. The sediment cartridge (usually a 5 micron) is always the last cartridge before the RO. The carbon cartridge filter must be flushed before running the RO system. To accomplish this, with the carbon cartridge in the first sump, remove the second sump and place a bucket below. Open the inlet isolation valve and allow the carbon filter to flush for two minutes. Place the 5 micron cartridge into the second housing and install the sump.
- **With the power off, check all the wiring connections and make sure they are complete. The RO supplies its own power for all the inputs (float & pre-treat lockout).**
- There may be a float wired in to the RO. The RO units supply power to the float switch so the float itself must be unpowered. The float circuit contact must be closed to allow the unit to run.
- Any pre treatment lockout wiring to shut down the RO should be installed. The RO supplies power so the lockout switch must be unpowered.
- Next inspect the plumbing connections. There are three or four RO piping connections, depending upon the unit options.
- On all units there will be a inlet, concentrate (waste to drain) and permeate (product water to storage tank. **For start-up temporarily move the product water to drain. The RO should flush the initial product water to drain to remove any preservatives etc.**
- Plug in the RO unit to power supply and turn the water pressure on.
- Fully open the concentrate (waste valve).
- The RO unit is full of air so we want to cycle the unit off and on to help purge the air. We want to turn the RO back off just before the pump starts (a minute or two). Keep cycling it on and off until very little air is seen escaping out the concentrate (waste meter). Note that depending upon which RO controller being used, the RO will go into a flush.

- Once the air is purged, the RO can be allowed to run. With the RO concentrate valve wide open, most water will flow to drain. After doing so for about 5 minutes, the concentrate (waste) valve can slowly be PARTIALLY closed (**THE CONCENTRATE VALVE MUST NEVER BE COMPLETELY CLOSED**). The membrane pressure will start to rise.
- By adjusting the concentrate and recycle valves and by observing the pressure gauges the RO is adjusted in the following manner:
 - For WGR 600 –1200 & 1800 units (2.5” membranes).
 - The concentrate (waste flowrate) should be equal to or slightly higher than the permeate (product) flowrate.
 - The Concentrate (waste)flowrate PLUS the recycle flowrate must equal to OR HIGHER than 1.5 gpm (to keep the membranes flushed).
 - The membrane pressure is between 150 psi & 180 psi. If the pressure is too high, open the recycle valve more.
 - Record operating parameters on the log sheet.
 - Confirm that the tank float turns the RO on and off properly. Note that depending upon which RO controller being used, the RO will go into a flush mode which delays the pump from starting.
 - Confirm the pre-treatment lockout switches are operating properly. The RO should shut down if a pre-treatment unit goes into regeneration.
 - Confirm the RO low pressure is operating as intended. The RO should shut down once the feed water pressure has dropped to 20 psi. The system should restart once the pressure rises to 30 psi.
 - It will take a few hours for the membranes to fully wet out and the RO may have to be slightly adjusted.
 - Check the complete system for any drips or leaks and repair as required.
- It is recommended to wait until the entire system is fully pressurized, confirmed to be operating properly and rechecked for any leaks before leaving the site.**

RO Data Sheet

In order to maintain the manufactures warranty, the operator must maintain accurate records of the operation of the unit. Copies may need to be sent to your supplier for review on a regular basis.

OPERATING LOG

D-00336

Model	Serial #	Date Of Last Cleaning
		Start Up
Company Name	Location	Date
Week of		Membrane Type

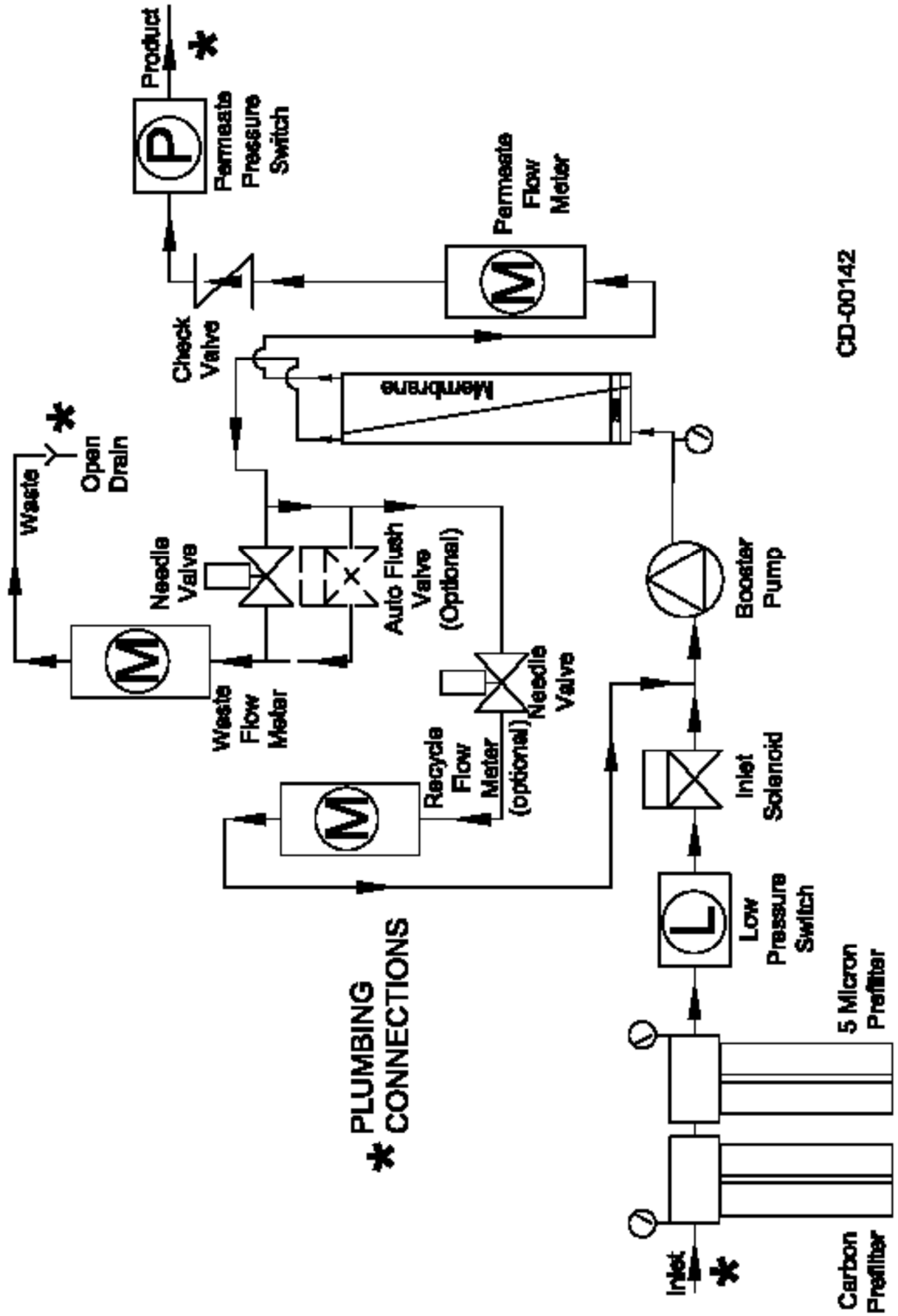
Info Recorded By							
Date							
Time Of Day							
Unit- Hours Of Operation							
Pressure							
Feed Water (psi)							
Post Filter (psi)							
Membrane Feed (psi)							
Concentrate(Waste)(psi)							
Flow Rates (gpm)							
Permeate (Product)(gpm)							
Concentrate(Waste)(gpm)							
Recycle (gpm)							
Recovery %							
Feed Water							
Water Temp °F							
Feed TDS							
Feed pH							
Free Chlorine (mg/l)							
Hardness Grains(CaCO ₃)							
Iron (mg/l)							
Antiscalant Feed (ppm)							
Permeate (product)							
Permeate TDS							
pH (before correction)							
pH (after correction)							
Notes							

5.0 Operation

This switch turns the RO system on or off. Moving the main power switch to on will start the system and activate the green light. The system will not start if the storage tank is full, there is pretreatment equipment in regeneration, or there is insufficient feed water pressure. When the system is turned on, there is a 60 sec delay before the process pump cuts in. Once the system is running, it will continue until the storage tank is full (red light lit), pre-treatment in generation, or a low pressure feed water situation occurs (amber light lit).

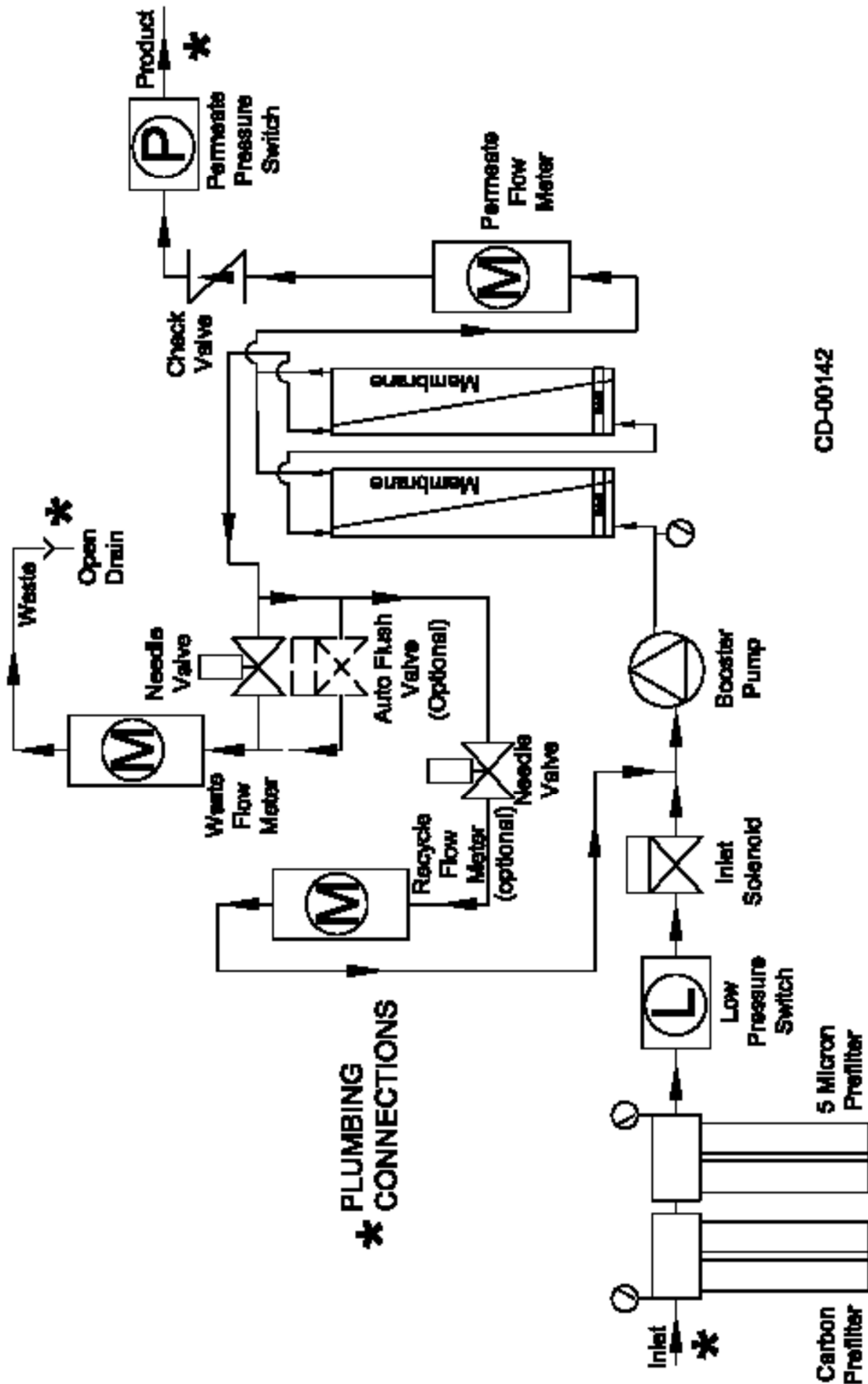
System settings

- When the RO starts, there is a 1 minute delay before the booster pump turns on.
- Low pressure switch is factory set for off at 20 psi, on at 30 psi. Operating the pump at 20 psi or less can damage the pump.
- The tank full pressure switch is set for off at 50 psi, on at 30 psi. The system can be used in conjunction with an atmospheric tank as well. A float switch installed in the tank will measure tank level and turn the RO system on when levels are low and off when tank is full. Tank full is indicated by the red light on the controller.
- The optional auto flush switch has three positions. The auto position has the unit flush on start up and every two hours of continuous use. The flush green light will be on during this time. The manual position holds the flush solenoid open, and continuously diverts water to drain. The center position is off which disables the flush solenoid. If the unit does not have the optional auto flush, the unit will have a manual flush valve. This manual flush valve is closed during normal operation
- The maximum operating pressure is 190 psi.



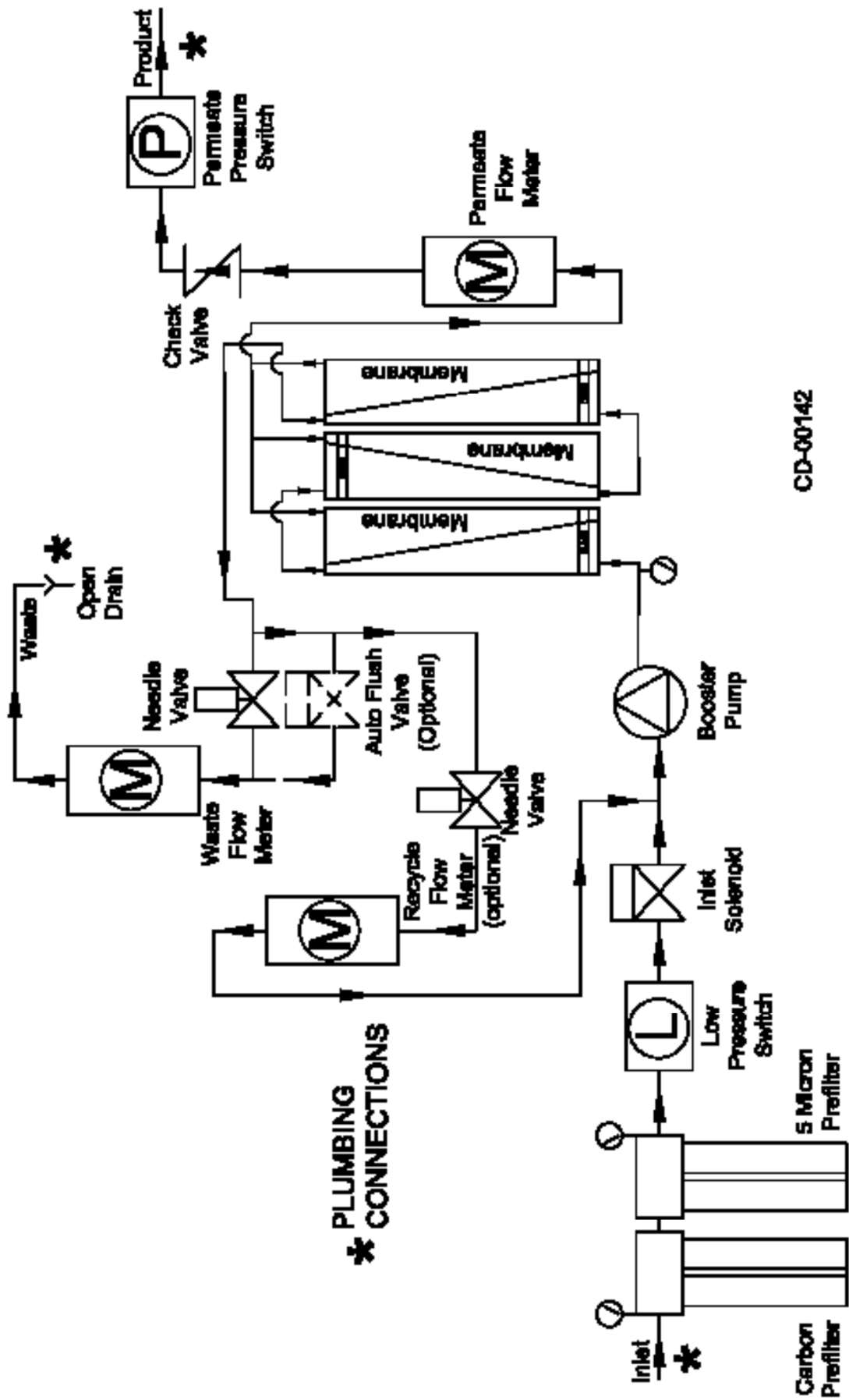
PLUMBING CONNECTIONS
* * *

CD-00142



*** PLUMBING CONNECTIONS**

CD-00142



CD-00142

6.0 Maintenance

Pump

- The process pump requires no regular maintenance. When the pump becomes noisy or 190 psi system operating pressure cannot be maintained, the pump should be replaced.

Reverse Osmosis Membranes

- The condition of the membranes is indicated by comparing the current permeate water quality (TDS) and production to the baseline permeate quality and production values that were established upon initial installation.
- Cleaning is recommended whenever the maximum flow is less than 80% of the normal flow, after temperature correction, or when the % rejection drops below 95%.

Flushing Membrane

- Organic and or mineral sludge tends to build up on the surface of the membrane that can reduce its performance. For units with the manual flush valve, open this valve slowly and let the unit fast flush for five minutes. Units with auto fast flush will be automatically activated on start-up, and every 2 hours thereafter. For the manual units, once a week flushing is helpful. In some cases, once a day flushing may be desired to control odor from organic build up. Replacement is recommended whenever the recovery rates are unacceptable.

TDS Reading

- After initial installation, check and note the TDS of the product water using a portable hand held TDS meter.
- Subsequent readings should be compared to this reading to determine whether any potential problems are developing. Over a period of time, a gradual increase in product water TDS can be expected. Rapid increases require further attention.

Product water TDS can increase by one or more of the following factors;

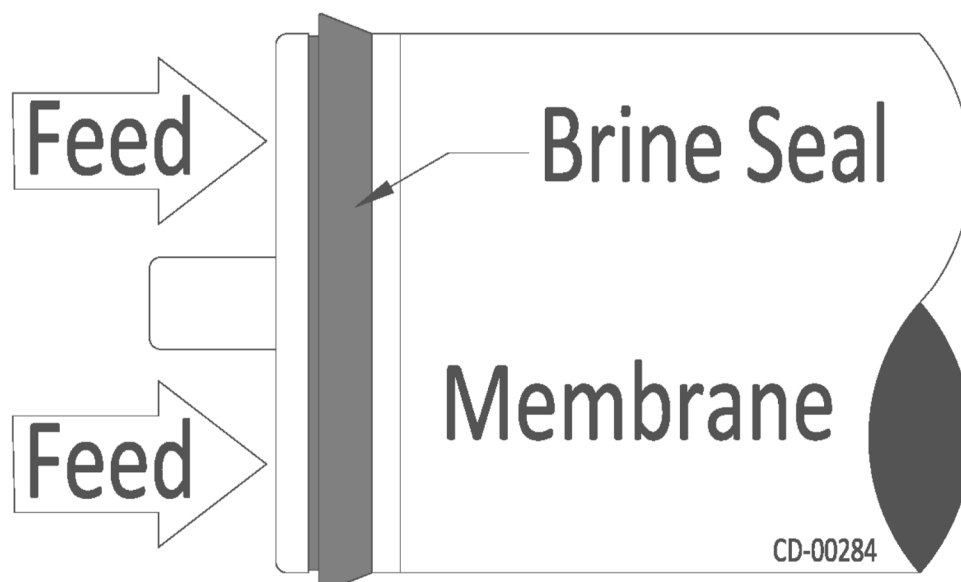
- Increase in feed water TDS
- Membrane is fouled with mineral salts due to a recovery rate that is too high.
- Carbon filter is exhausted and no longer removing chlorine. Chlorine will permanently damage the membrane.
- Membrane is fouled with biological contamination such as algae or bacteria.

Filters

- When a large pressure differential (7 psi or more) develops across the 5 micron sediment filter and the granular activated carbon filter, they should be replaced.
- The activated carbon filter reduces volatile organic compounds and removes chlorine. When the permeate water shows the first sign of objectionable taste or odor, the carbon filter is nearly expended. It should be changed every 3-6 months or sooner if chlorine is detected after the cartridge filter.

Membrane Loading Instructions

- Turn off the power and unplug the unit.
- Close the RO feed water inlet isolation valve and allow the unit to completely depressurize.
- Remove endcaps from all vessels, leaving the tubing in place. Note placement of caps to assure re-installation in the same orientation.
- Remove the membranes from housing noting orientation of the brine seals on the membranes. Check the o-rings on the end cap (both the permeate inner O-rings and outer end cap O-rings) and membrane brine seals for damage and replace as require.
- Lightly lubricate the O-rings and brine seal using silicone grease or glycerin. **Materials other than glycerin and silicone lubricant must not be used, because they may damage the membrane or components of the element.**
- Make sure the brine seal is located in the direction of the incoming membrane housing feed water as shown below.



- Re-install the end plugs into the vessels same as the original orientation.
- If the replacement membranes were not "dry" membranes, the preservative will need to be thoroughly flushed out of the RO before putting the unit back into to service.
- After the unit has been flushed, re-adjust the unit as follows:
 - The concentrate (waste flowrate) should be equal to or slightly higher than the permeate (product) flowrate
 - The concentrate (waste)flowrate PLUS the recycle flowrate must equal to OR HIGHER than 1.5 gpm (to keep the membranes flushed).
 - The membrane pressure is between 150 psi & 180 psi. If the pressure is too high, open the recycle valve more. The maximum operating pressure is 190 psi.
- Record operating parameters on the log sheet.

Solenoid Maintenance

Solenoids typically have a small pilot hole on the diaphragm that if plugged, the solenoid will not shut off.

To disassemble, use the following procedure.

Turn off the power and unplug the unit.

Close the RO feed water inlet isolation valve and allow the unit to depressurize.

Unplug the solenoid power connection.

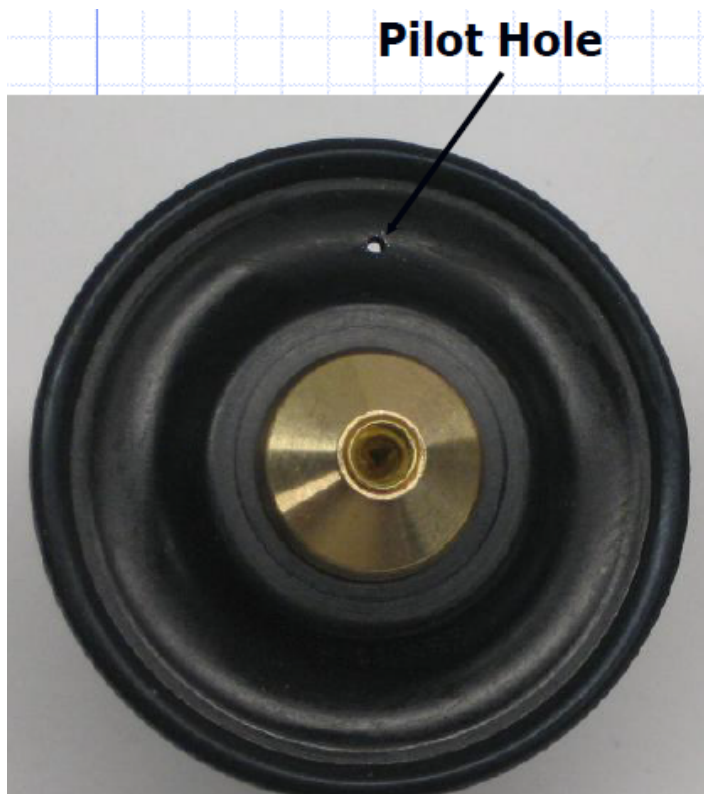
Remove the solenoid coil top nut and remove the solenoid coil



Remove the four bolts to expose the diaphragm. NOTE: there will be some spring(s) so note where they are located.



Remove the diaphragm and clean the small pilot hole. After cleaning, reassemble.



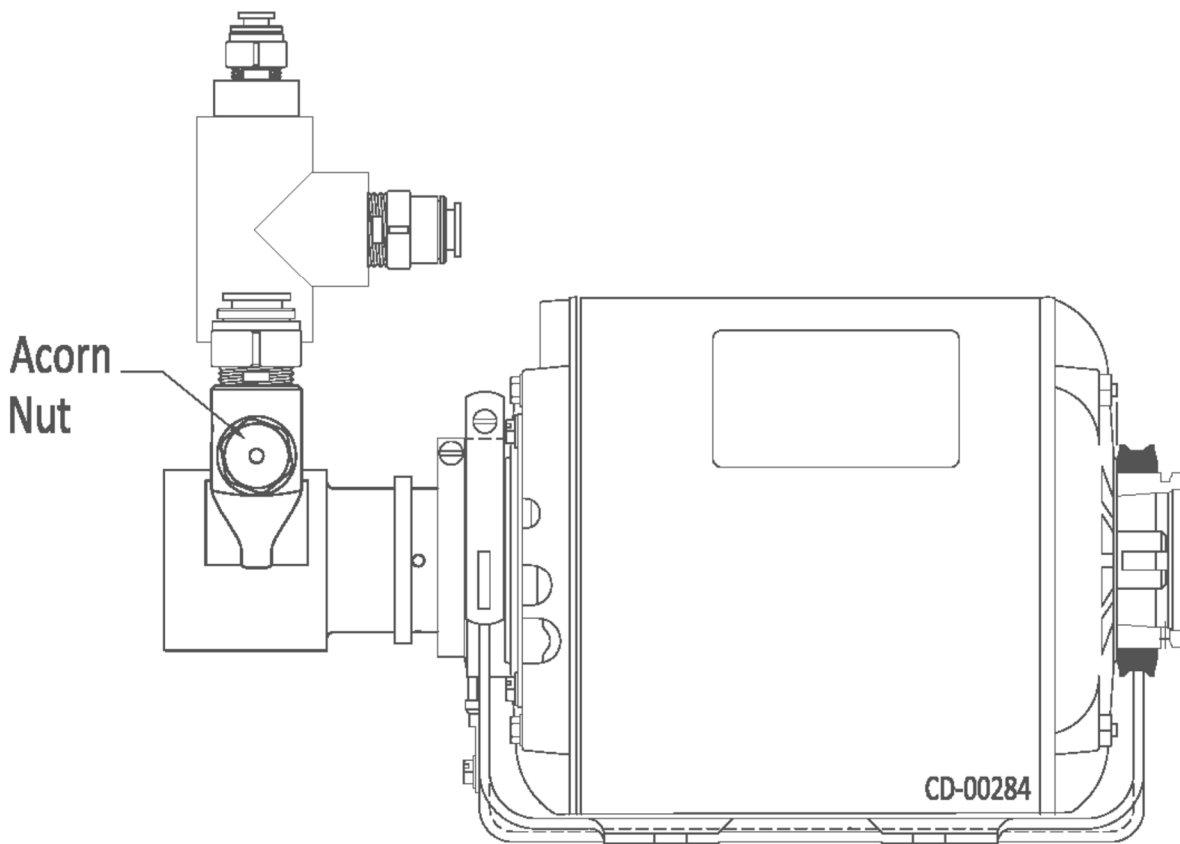
Pump Replacement

When replacing the pump, the internal pressure relief valve must be properly adjusted. If it is not adjusted, the pump can fail prematurely. To properly adjust the pump on a 600(Pump #74908 and #74908SS), 1200 (Pump #74909 and #74909SS), or 1800(Pump #74912 and #74912SS) Reverse Osmosis Units:

To adjust the pump internal pressure relief valve, use the following procedure.

With the unit off, close the concentrate (waste) and recycle needle valves. If the unit has auto flush, set the auto flush switch to OFF. If the unit is a standard unit close the manual flush ball valve.

Remove the acorn nut from the pump which exposes the slotted adjustment screw.



Temporarily turn the unit on and adjust the screw until the membrane pressure is 250 psi. Once set replace the acorn nut and immediately open the concentrate (waste) and recycle needle valves.

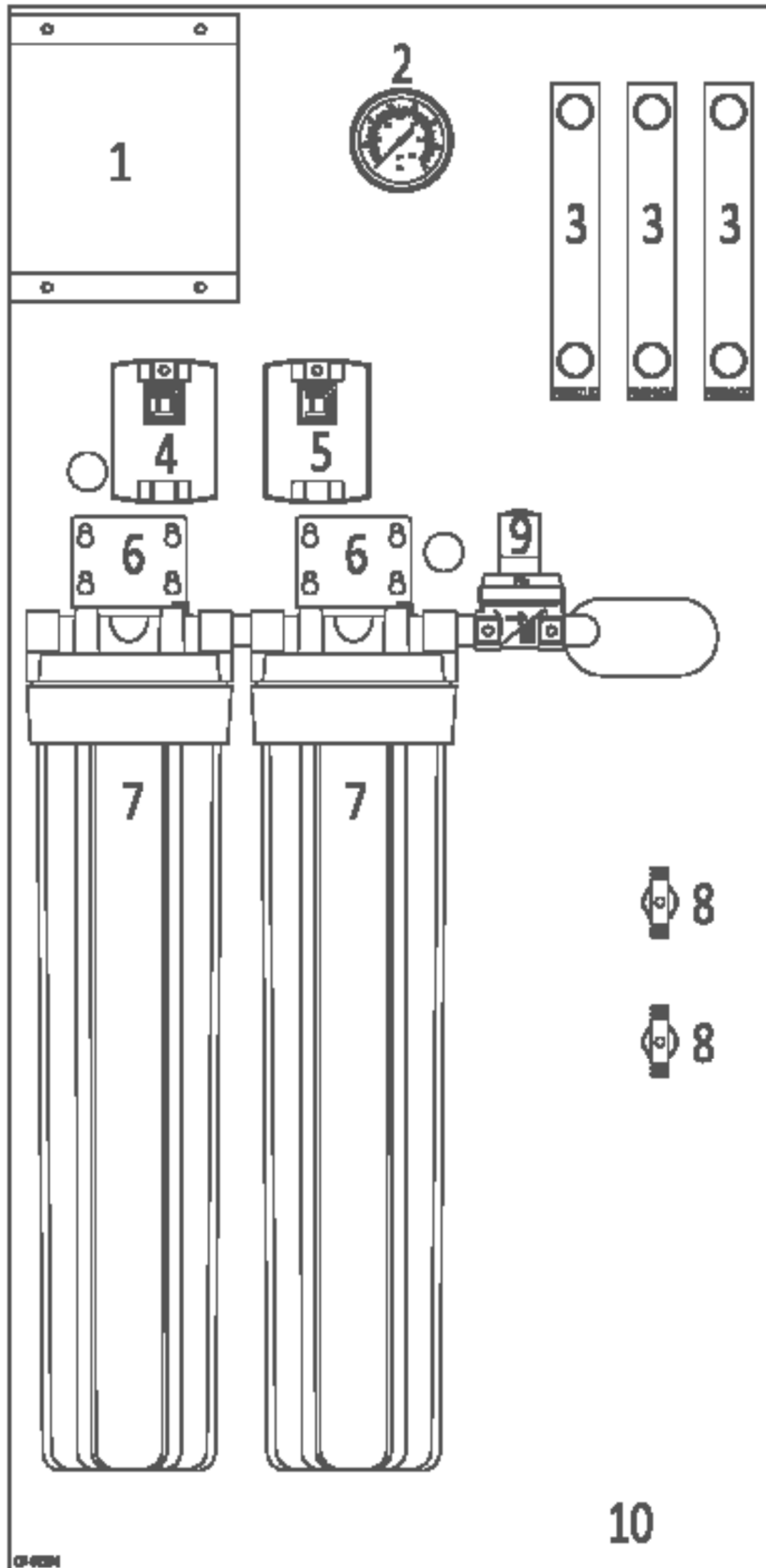
Adjust the needle valves to the following

- The concentrate (waste flowrate) should be equal to or slightly higher than the permeate (product) flowrate
- The concentrate (waste)flowrate PLUS the recycle flowrate must equal to OR HIGHER than 1.5 gpm (to keep the membranes flushed)
- The membrane pressure is between 150 psi & 180 psi. If the pressure is too high, open the recycle valve more. The maximum operating pressure is 190 psi.
- Record operating parameters on the log sheet.

Troubleshooting

Problem	Probable Cause	Solution
RO UNIT WILL NOT START	No electrical power to control circuit	Check power supply, circuit breakers, fuses, etc.
	Storage tank full	Drain a portion of water from storage tank
	Low feed pressure	Check feed water supply
	Pre-treatment in regeneration	Wait until regeneration is complete
	Pressure of float switch defective	Check or replace
	Pump motor	Check or replace
LOW FEED PRESSURE	Feed water valve closed	Check and open
	Feed water solenoid plugged or defective	Check or replace
	Obstructed feed line	Check
	Upstream pre-treatment	Check
	Inlet feed pressure	Check and remedy
NO HIGH SYSTEM PRESSURE	System pressure gauge defective	Check or replace
	Auto or manual flush valve open	Check and close
	Pump internal bypass not set when pump replaced.	Check or replace
	Pump impellers worn	Check and replace
	Low water volume to pump	Check and replace
	Malfunctioning pump	Check and replace
NO WASTE (CONCENTRATE) WATER	Concentrate valve closed	Open
	Plugged drain line	Check and clean
NO OR LOW PRODUCT (PERMEATE) WATER	Low system pressure	Check and adjust
	Membrane fouled	Check, clean or replace
	Low feed water temperature	Check
	Product water check valve plugged	Check or replace
HIGH PRODUCT (PERMEATE) WATER TDS	Membrane housing permeate tube o-rings not sealing	Check and replace
	Increase in feed water TDS	Check
	Membrane oxidized	Replace
	Insufficient brine flow	Check membrane brine seal
	Insufficient brine flow	Check or replace concentrate valve
BAD TASTING WATER	Filter cartridges exhausted	Replace
	Tank and system contaminated	Replace filters and sanitize the tank
	Tank diaphragm ruptured	Replace tank
CLOUDY WATER	Dissolved air in feed water is concentrated in the product water	Usually clears up as condition of feed water changes. Letting water stand for a few minutes will allow the air to dissipate

WGR Parts
Front Frame

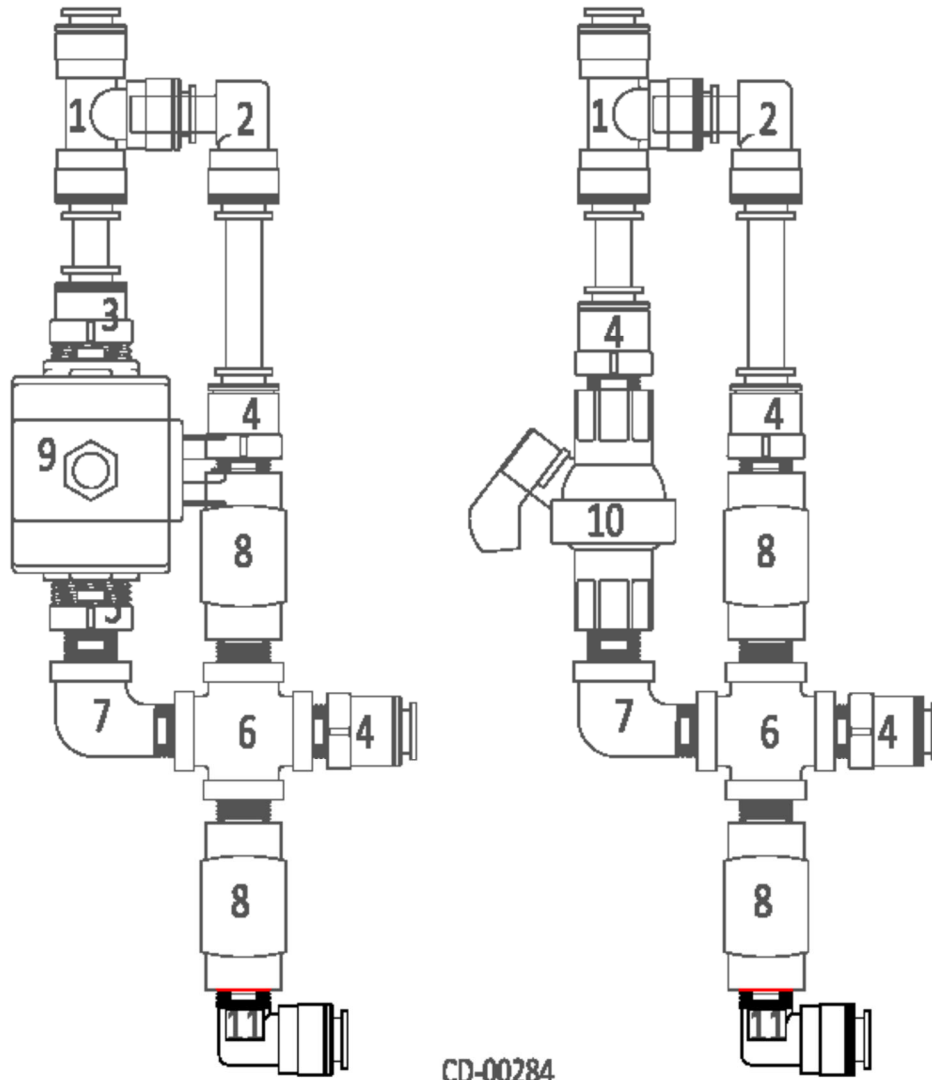


WGR Parts

Front Frame			
Item	Description	Part #	
1	Controller Standard	P70040280	
	Controller Autoflush	P70040281	
2	Pressure Gauge 0-300 psi	70050195	
	Adapter 1/2x 1/4NPTF	pi450822s	
3	Flow Meter 2 gpm	70050132	
4	Low Pressure Switch	101031	
	Connector 1/4"MNPT x 1/4QC	pi010822s	
	Screw #8-32 x 3/4"	110416	
	Nut #8-32	110420	
	Fitting, Elbow 1/4stem x 1/4QC	pp220808w	
	5	Tank Pressure Switch	101032
	Connector 1/4"MNPT x 1/4QC	pi010822s	
	Screw #8-32 x 3/4"	110416	
	Nut #8-32	110420	
	Fitting, Elbow 1/4stem x 1/4QC	pp220808w	
6	Filter Housing Bracket	150073	
	Screws Housing	29713	
	Bolt 1/4-20x1/2	110415	
	Lock Washers 1/4" SS	a1354016	
	Nuts 1/4" NC SS	80127090	
7	Filter Housing 1/2"	92023	
	Label Pre Carbon	51572	
	Label 5 Micron	51573	
8	SS Needle Valve 1/4"	70050160	
9	Solenoid 1/2" 120V	80307	
10	Frame	92271-1	
	Frame Side Brackets	92271-B	
	Bolts 1/2"-20x3/4" SS	110414	
	Lock Washers 1/4" SS	a1354016	
	Nuts 1/4" NC SS	80127090	
	Frame Feet Stand 1/4x3/4	110413	
	Cap Screw 1/4-20-3/4"	110414	
	Items Not Shown		
	Pressure Gauge 0-100 psi	101047	
	Nipple, Brass 1/4x0	80031091	
Connector 1/4x 1/4QC	pi010822s		
Tee, Brass 1/4"	80031112		
Nipple, PVC 1/2" x 2"	92441		
Nipple, PVC 1/2" x 4"	92442		
Elbow, PVC S40 1/2MT-FT	92446		
Clip, Lock 1/4" Red	PIC1808R		
Label, RO	51605		

WGR Parts

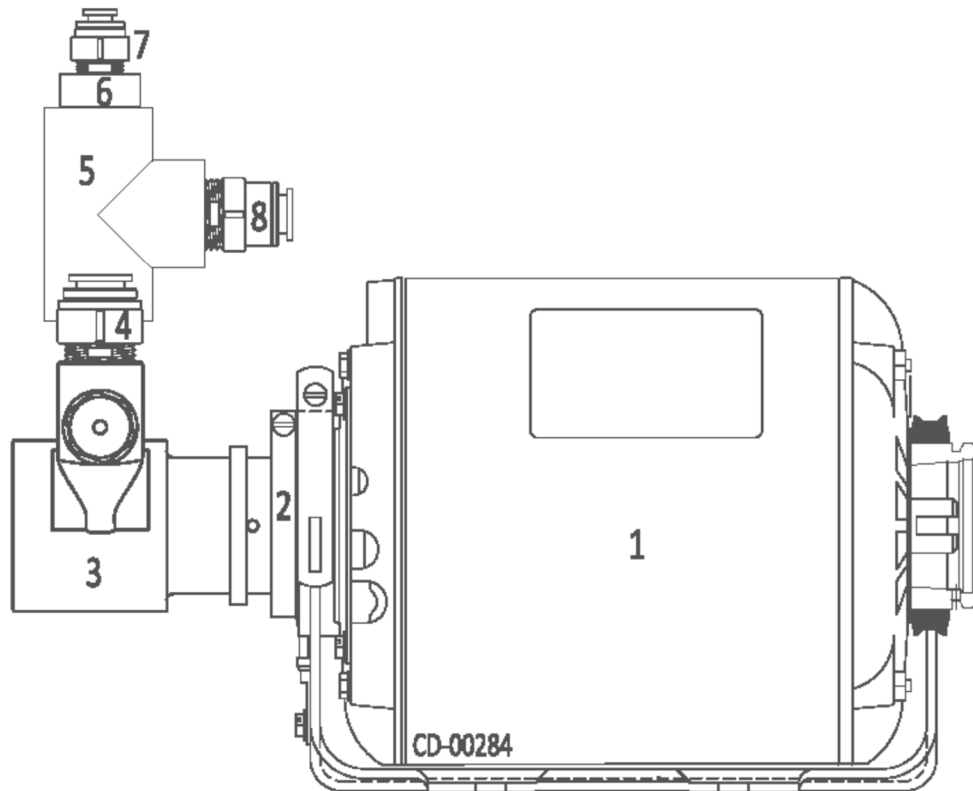
Needle Valve Assembly



Needle Valve Assembly		
Item	Description	Part #
1	Tee,Union 3/8	pi0212s
2	Elbow,3/8Stem x 3/8 QC	ci221212w
3	Connector1/2"x3/8QC	pp011224w
4	Connector 1/4" x 3/8"QC	pi011222s
5	Bushing, Brass,1/2x1/4	80127720
6	Cross,Brass 1/4"	80031049
7	Elbow,Street Brass 1/4"	80031301
8	SS Needle Valve 1/4"	70050160
9	Solenoid 1/2" 120V	80307
10	Valve,Ball 1/4" RO	80702
11	Elbow 1/4"mnpt x 3/8QC	pi481222s
	Not Shown	
	Nipple,Brass 1/4x0	80031091
	Elbow,Union 3/8 QC	PI0312S
	Clip, Lock 3/8" Red	PIC1812R
	Tubing, 3/8 OD Black	115212

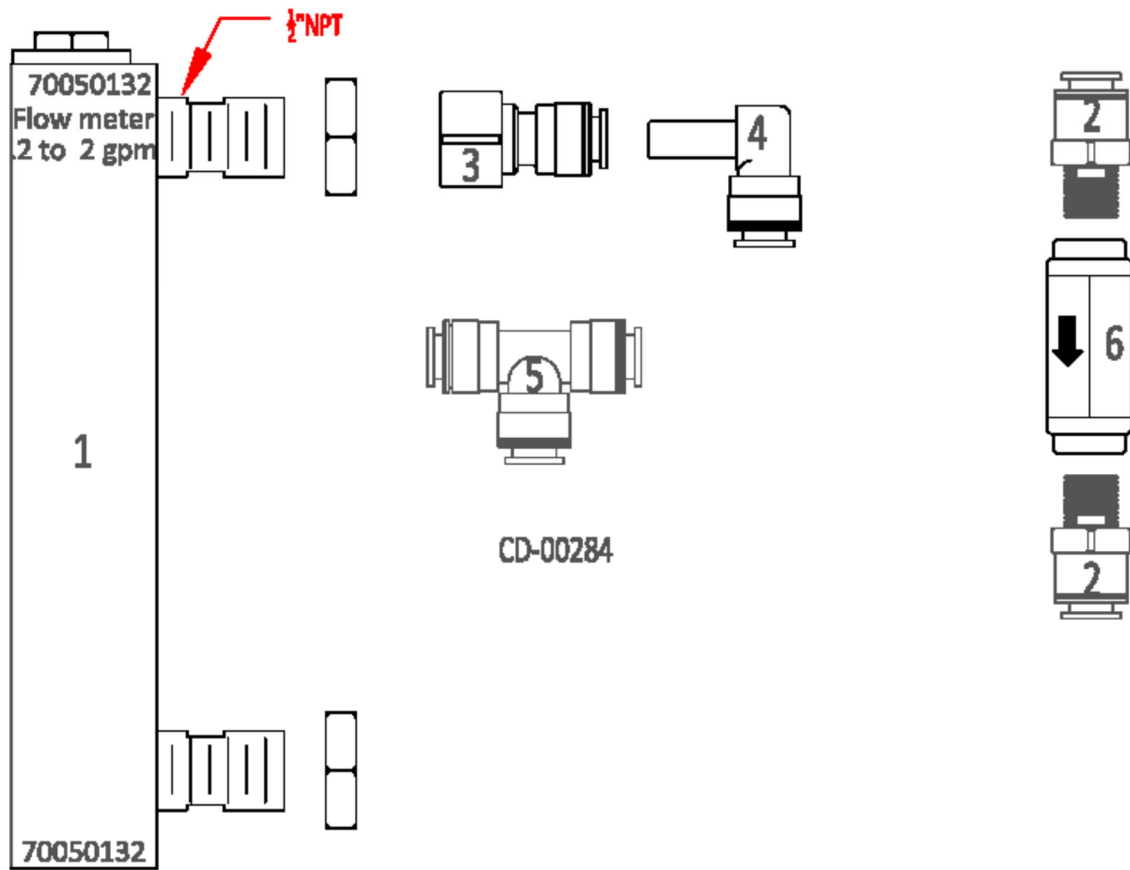
WGR Parts

Pump/Motor Assembly



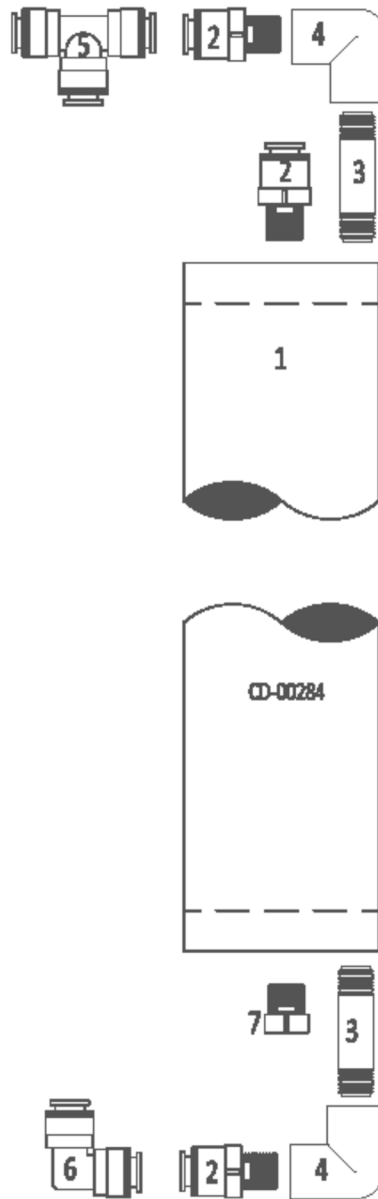
Pump Assemblies		
Item	Description	Part #
	Washer Flat 5/16 SS	00442565
	Washer, Lock 1/4	a1354016
	Screw Cap 1/4-20x3/4 SS	110414
	Nut 1/4" NC SS	80127090
2	Clamp, V-Band Rotary Vane	74914
	Bushing,S40 pvc 1/2Tx1/4T	80030252
5	Tee,PVC S80 1/2T	92443
	Nipple S80 1/2x2"WGR 1200-1800	92441
	Nipple,S80 3/8"x 1.5" WGR 600	92447
6	Bushing,S401/2Tx3/8T WGR 600	92448
7	Connector 1/4"x 1/4"QC	pi010822s
8	Connector 1/2" x 3/8"QC	pi011224s
4	Connector 1/2" x 1/2"QC	pi011624s
1	Motor 1/2hp,120V WGR 600	100787
1	Motor 3/4hp,120V WGR 1200-1800	100788
3	Pump,140G 112A140F11 WGR 600	74908
3	Pump,130G WGR 600SS	74908SS
3	Pump 160G 114B165F11 WGR 1200	74909
3	Pump 160G WGR 1200 SS	74909SS
3	Pump 210G 114B215F11 WGR 1800	74912
3	Pump 210G WGR 1800SS	74912SS
	Clip,Lock 1/4" Tube Red	PIC1808R
	Clip,Lock 3/8" Tube Red	PIC1812R

Flow Meter—Check Valve



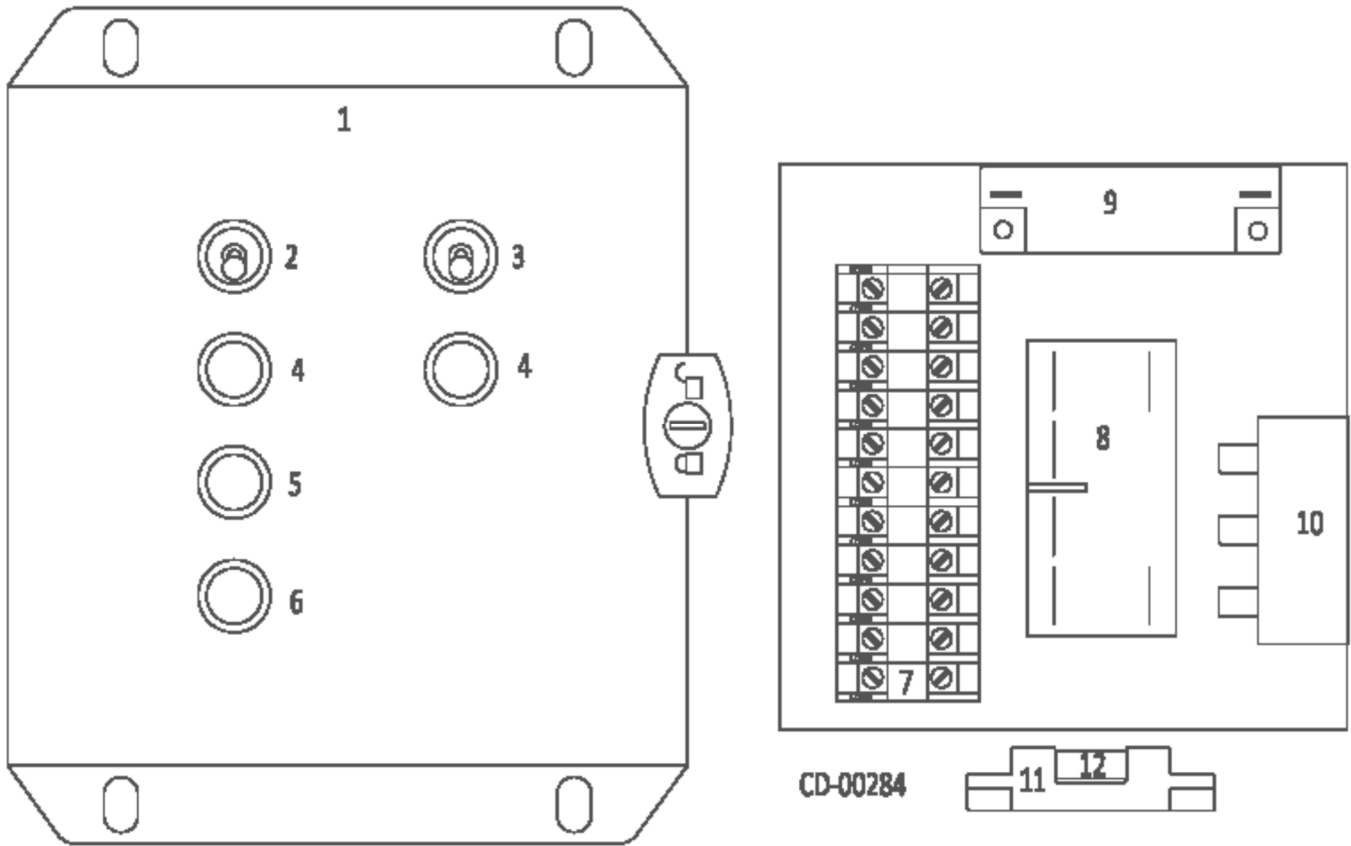
Item	Description	Part #
1	Flow Meter 2 gpm	70050132
3	Connector Straight 1/2x3/8QC	60010217
4	Elbow, StemxTube 3/8x3/8QC	CI221212W
5	Tee, Branch reducing 3/8-3/8-1/4	PI301208S
2	Connector 1/4"x3/8QC	PI011222S
6	Valve, Check 1/4fnpt	121794
	items Not Shown	
	Clip, Strut, 3/4" Caddy	92034
	ClipLock 1/4" Tube Red	PIC1808R
	ClipLock 3/8" Tube Red	PIC1812R

Membrane Assembly



<u>Membrane Housings</u>		
Item	Description	Part #
1	Membrane Housing	01022825
	Clamp,Membrane Housing	92031
	Screw Cap 1/4-20 x 2.25 SS	00x18121
7	Plug,S80 1/4 MNPT	80127792
3	Nipple,S80 1/4" x 2	92451
4	Elbow,S80,1/4-TxT	92452
2	Connector 1/4"x3/8QC	pi011222s
6	Elbow,Union 3/8	pi0312s
5	Tee,Union 3/8	pi0212s
	ClipLock 3/8" Tube Red	PIC1812R
	Membranes	
	Standard Membrane AQ-U-2540	92021AQ
	Low Energy Membrane AQ-X2540	92038AQ

WGR Controller



Controller Item	Description		Part #
	SCREW CAP 1/4-20x3/4 SS	HEX HEAD	110414
	SCREW MACH #6-32x3/8	ZINC PHILLIPS PAN	110417
	SCREW MACH #6-32x1-1/4	ZINC PHILLIPS PAN	110418
	NUT #6-32 HEX		110421
	WASHER 1/4" EXT. TOOTH	LOCK	110423
	Screw,#8-12 x 1/2",ZINC	Phillips Pan Head	110425
	WASHER #8 SPLIT LOCK		110426
8	RELAY,POWER,25AMP,1HP		16808
9	TIME DELAY,60SEC		16809
10	TIMER,REPEAT CYCLE		16810
2	SWITCH,TOGGLE,SINGLEPOLE	SINGLETHROW,C/WSPADE	16811
3	SWITCH,TOGGLE,DOUBLEPOLE	DBLETHROW,/SCR.TERM CONN	16812
6	LIGHT, PILOT, RED,110V	C/W SPADE	16813
5	LIGHT, PILOT, AMBER,110V	C/W SPADE	16814
4	LIGHT, PILOT, GREEN,110V	C/W SPADE	16815
	CABLE,WIRE,3-14GAUGE,	SJOW ***	16817
11	FUSE,HOLDER,INLINE		16820
	RAIL,DIN,ALLEN BRADLEY		16821
7	TERMINAL,BLOCK,SINGLE,ALLEN	BRADLEY ***	16822
	CLIP,END,ALLEN BRADLEY		16823

WGR Controller

Controller			
Item	Description		Part #
12	FUSE,.6AMP/250V		16829
	CONNECTOR,SPADE,14GAUGE,	.25",BLUE,1855C	16830
	CONNECTOR,SPADE,18GAUGE	1/4", RED, 1755	16831
	CONNECTOR,18GAUGE,RED,	1700C ***	16833
	CONNECTOR,FORK,14GAUGE,	,#8,BLUE,1834 ***	16834
	CONNECTOR,FORK,18GAUGE,	#8,RED,1724 ***	16835
	CONNECTOR,ROUND,18GAUGE,	,.25",***	16836
	CORD,POWER,10',14/3 SJTW		16838
	CONNECTOR,SPADE,18GAUGE,	.187",RED,1751	16840
	CONNECTOR,SPADE,14GAUGE,	.187",BLUE,1851 ***	16841
1	JUNCTION BOX,/GASKET	6X6X4,NEMA 4-12**	302035
	CAP,TUBING,1/4 ,PLASTIC		34504
	LABEL,COM RO,KIT		51605
	PAD, WIRE MOUNTING,4-WAY		60017
	LIQUID TIGHT HEYCO 3/8"	#3213	60020130
	NUT HEX 1/4"NC STAINLESS	NH18.8C14	80127090
	WIRE, BELDON 3 WIRE 18	GAUGE Red, Black & White	80130004
	WASHER 1/4" LOCK SPRING	STAINLESS STEEL	a1354016

7.0 Warranty

Commercial RO Unit Warranty

D-00322

80151810

Subject to the conditions and limitations described below, Commercial RO units manufactured by Canature WaterGroup are warranted to be free from defects in materials and workmanship for a period of 1 year from date of purchase. Any components not manufactured by Canature Watergroup are limited to the warranty given by the manufacturer of the component.

As a manufacturer, we do not know the characteristics of your water supply. The quality of water supplies may vary seasonably or over a period of time. Your water usage may vary as well. Water characteristics can also change if the RO is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligation for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product with a non-potable water source or a water source which does not meet the conditions for use.

The RO must have the correct pretreatment installed before the RO operating as intended. The pretreatment system must ensure the RO feed water always meets the requirements as indicated below. The RO must not be operated contrary to the operating limits listed below.

Operating Limits

Maximum Operating Pressure	200 PSI	13.7 bar
Feed Line Pressure Min/Max	45 to 80 PSI	3.1 to 5.5 bar
Feed Water Temperature Maximum	100 F	37 C
Total Dissolved Solids Max	2500 mg/l	2500 mg/l
Turbidity	< 1 NTU	< 1 NTU
pH Range	5 to 10	5 to 10
Silt Density	<3	<3
Chlorine/Chloramines Max	0 mg/l	0 mg/l
Iron Maximum	< 0.1 mg/l	< 0.1 mg/l
Manganese Maximum	<0.05 mg/l	< 0.05 mg/l
Hydrogen Sulfide	0 ppm	0 ppm
Water Hardness	< 0.3 grain	< 5 mg/l
Oil tolerance	0 ppm	0 ppm
Organic Tolerance	0 ppm	0 ppm

Other than the membrane and cartridge filters, any part found defective within the terms of this warranty will be repaired or replaced by Canature WaterGroup™.

The booster pump warranty is subject to the conditions by the warranty of the pump manufacture,

This warranty shall not apply to any part damaged by accident, fire, flood, freezing, Act of God, bacterial attack, chlorine / chloramines, iron, manganese, sediment and or silt, membrane fouling and/or scaling, sediment, misuse, misapplication, neglect, alteration, installation, or under conditions contrary to the operating limits, or by the use of accessories or components which do not meet Canature WaterGroup™ specifications. If the RO system is altered by anyone other than Canature WaterGroup™ the warranty shall be void.

RETURN OF GOODS: An authorization number must be obtained before returning any merchandise. NOTE: All material returned to Canature Watergroup must be returned freight prepaid.