

Veritas Capsule Water System with Remote Monitoring



For 800 GPD and 2400 GPD models

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1 USER INFORMATION

1.1 Introduction

The purpose of this manual is to provide a general overview of system installation, validation, monitoring, and general diagnostics. We want to help ensure your system maintains the system health required to meet the critical quality requirements outlined in ANSI/AAMI: 2023 ST108.

This system package is designed to pretreat and purify water for use in health care applications. The system is shipped with required water treatment components. This System Manual was written specifically for the Sterile Processing Department Systems. Your system was thoroughly tested and in excellent condition when it was shipped to you. However, because damage during shipment is possible, please unpack and carefully inspect the system as soon as you receive it. Please notify AmeriWater if any problems are encountered.

Please read the Operations Manual before using the system. Contact AmeriWater with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. Eastern Time. For after-hours emergencies call 1-800-535-5585 and follow the instructions on the recorded message. Our on-call technician will return your call as soon as possible.

This System manual will guide you through installation and start-up of your system as well as advise on system monitoring and disinfection. The Operation Manuals should be read before operating or servicing any component in this system. This System Manual should then be kept near the system and used as a reference.

For information on individual components and details on their operation, maintenance, and troubleshooting use the necessary Operation Manual listed below.

Item	Assembly Number	Manual Number
Carbon Tank	0095029	98-0107
PH Adjust	0084-0003	98-0101
RO	SRB800-115-FT	98-2040
	AWRO2400	98-2042
Anti-Scalant	0184-0010	98-0092
Deionizer	00MW1000 (800)	98-0160
	00HC-2003 (2400)	98-0108
Storage Tanks	00CT055UV-10 (800)	098-0001
	00HC-0091 (2400)	
Remote Monitoring	00RM-0009	98-2048

2 SYSTEM SPECIFICATIONS

00SPDVER800

Component	Electrical	Connection	Connection Type
Reverse Osmosis (SRB800-115-FT)	N/A	RO Inlet	1/2" PTC ⁶ OR 1/2" FPT ⁵ (removal of PTC fitting)
		Product Outlet	3/8" FPT ⁵
		Drain	1/4" PTC ⁶
Deionizer (00MW1000)	(1) 115V, 1 \emptyset , <1A	RO Water In	1/2" FPT ⁵
		DI Out	1/2" PTC ⁶
Storage Tank (00CT055UV-10)	(1) 208-230V, 1 \emptyset , 7A	Ozone	CPC coupling
		Tank Inlet	3/4" MGHT ¹
		Loop Feed	3/4" MHB ³
UV Lamp (001-014-0015)	(1) 115V, 1 \emptyset , 1.5A	Water Inlet	3/4" MHB ³
		Water Outlet	3/4" MHB ³
Remote Monitoring Panel (00RM-0009)	(1) 115V, 1 \emptyset , 5A	N/A	N/A

00SPDVER2400

Component	Electrical	Connection	Connection Type
RO-Reverse Osmosis (AWRO2400)	AWRO2400 Pump: (1) 115 / 230VAC, 60Hz, 1 \emptyset RO Controller: (1) 115V, 1 \emptyset , 13A	RO Inlet	1" MHB ³
		Product Outlet	3/4" MHB ³
		Drain	3/4" MHB ³
Dual Column Silex Deionizer (00HC-2003)	(1) 115V, 1 \emptyset , <1A	Silex in	3/4" FGHT ²
		Silex out	3/4" FGHT ²
Storage Tank (00HC-0091)	(1) 208-230V, 1 \emptyset , 7A	Ozone	CPC coupling
		Tank Inlet	3/4" MGHT ¹
		Loop Feed	1 1/2" Socket PVC
UV Lamp (001-014-0014)	(1) 115V, 1 \emptyset , 2.5A	Water Inlet	1" MHB ³ OR 1" socket PVC
		Water Outlet	1" MHB ³ OR 1" socket PVC
Endotoxin Filter (001-021-0013)	N/A	Water Inlet	1" MHB ³ OR 1" socket PVC

		Water Outlet	1" MHB ³ OR 1" socket PVC
Remote Monitoring Panel (00RM-0009)	(1) 115V, 1Ø, 5A	N/A	N/A

2.1 Optional Pre-Treatment Add-Ons

Component	Electrical	Connection	Connection Type
Carbon Tank / Header (0095029 / 009591)	(1) 115V, 1Ø, 15A	Inlet	1" Socket PVC
		Outlet	1" Socket PVC
PH Adjust Anti-Scalant (0184-0010)	Used in onboard Anti-Scalant injection	Injection Port	1/2" MPT ⁷
Sediment Filter	N/A	Inlet	1" FPT ⁵ OR 1" socket PVC
		Outlet	1" FPT ⁵ OR 1" socket PVC
Blend valve	N/A	Inlet(s)	1" FPT ⁵
		Outlet	1" FPT ⁵

NOTE: For specifications on system components related to electrical requirements, system pressures and voltage draws, please refer to component manuals listed in Section 1.1.

¹MGHT=Male Garden Hose Thread

²FGHT=Female Garden Hose Thread

³MHB=Male Hose Barb

⁴Q-Con=Quick Connect

⁵FPT=Female Thread

⁶PTC= Push to Connect (tube OD)

⁷MPT=Male Thread

2.2 Required Feed Water Specifications

Feed Water Specification	Value
Feedwater Pressure	20 PSI to 80 PSI dynamic
Minimum Feedwater Flow Rate	2 GPM (800) 6 GPM (2400)
Maximum Water Temperature Adjust blend valve to 75°F to 80°F (24°C to 27°C)	90°F (32°C)
Design Temperature	77°F (25°C)
Silica	40 ppm
Silt Density Index	< 5
Turbidity	< 1 NTU
pH Range	6.0 to 8.5
Iron	0.1 ppm

2.2.1 Add-On Pre-Treatment Components

In some installations, standard water treatment may not be sufficient to address unique or more demanding feed water conditions. To ensure reliable system performance and protect downstream equipment, additional pre-treatment components can be applied. The chart below outlines common feed water challenges, such as temperature, high levels of chlorine/chloramines, high PH, high sediment content, along with recommended pre-treatment solutions that can be added to the system. This guidance helps match the right equipment to specific water issues, ensuring both optimal water quality and long-term system protection.

Addressable Water Issue	Solution	Description
Cold water affecting desired output of the RO	Blend Valve (00HC-5001)	A blend valve mixes incoming cold water with warmer supply water to maintain optimal feedwater temperature, ensuring the RO system delivers expected flow and performance.
High sediment content causing too frequent of desired carbon cartridge exchange	Sediment Filter Assembly (0021008/20-1055)	A sediment prefilter removes suspended particles such as sand, silt, and rust, preventing premature clogging of downstream carbon filters and protecting RO membranes.
High chlorine/chloramine content causing too frequent of desired carbon cartridge exchange	Carbon Tank / Header (0095029 / 009591)	Carbon filtration removes chlorine, and chloramines from the feed water supply to protect downstream water purification equipment (RO membranes).

High PH (>9) affecting performance of RO rejection and long term life (PH 6.5-7.5 desired for peak performance)	HpH Anti-Scalant PH Adjust 4 Gal Refill (95810126)	An anti-scalant with PH adjustment solution lowers feedwater alkalinity, bringing the pH into the optimal range for RO performance and extending membrane life.
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2.3 ENVIROMENTAL SPECIFICATIONS

Environmental Specification	Value
Ambient Temperature	41 to 104 °F (5 to 40 °C)
Ambient Pressure	Atmospheric from 0 to 6500 ft (2000 m)
Relative Humidity	10 to 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40 °C
Voltage Fluctuations - Main Supply	Not to exceed $\pm 10\%$ of nominal voltage
Overvoltage Category	II
Pollution Degree	2

2.4 System Component Diagram

2.4.1 00SPDVER800 System Component Diagram

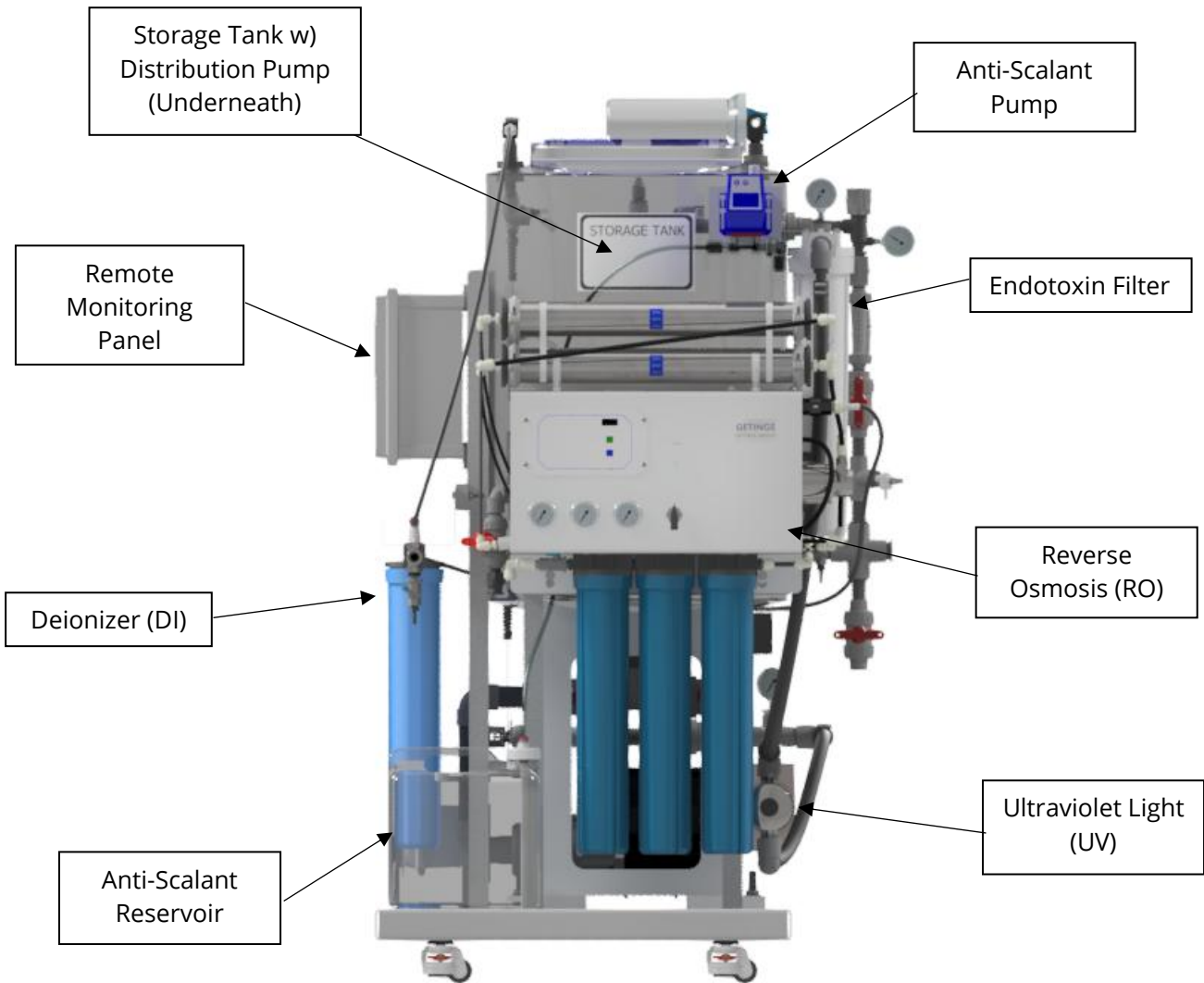


Figure 1: 00SPDVER800 COMPONENT DIAGRAM

2.4.2 00SPDVER2400 System Component Diagram

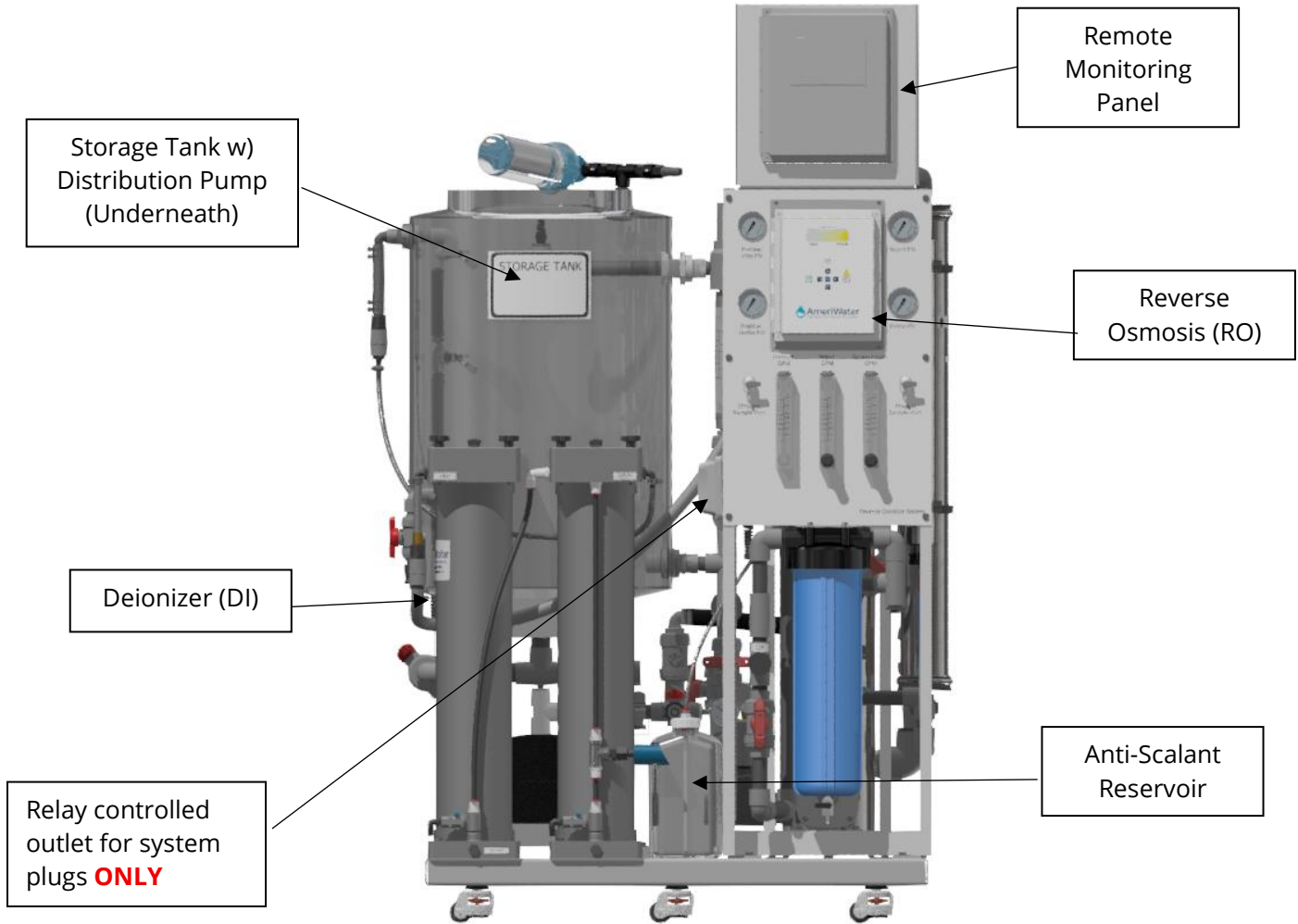


Figure 2: 00SPDVER2400 COMPONENT DIAGRAM (FRONT)

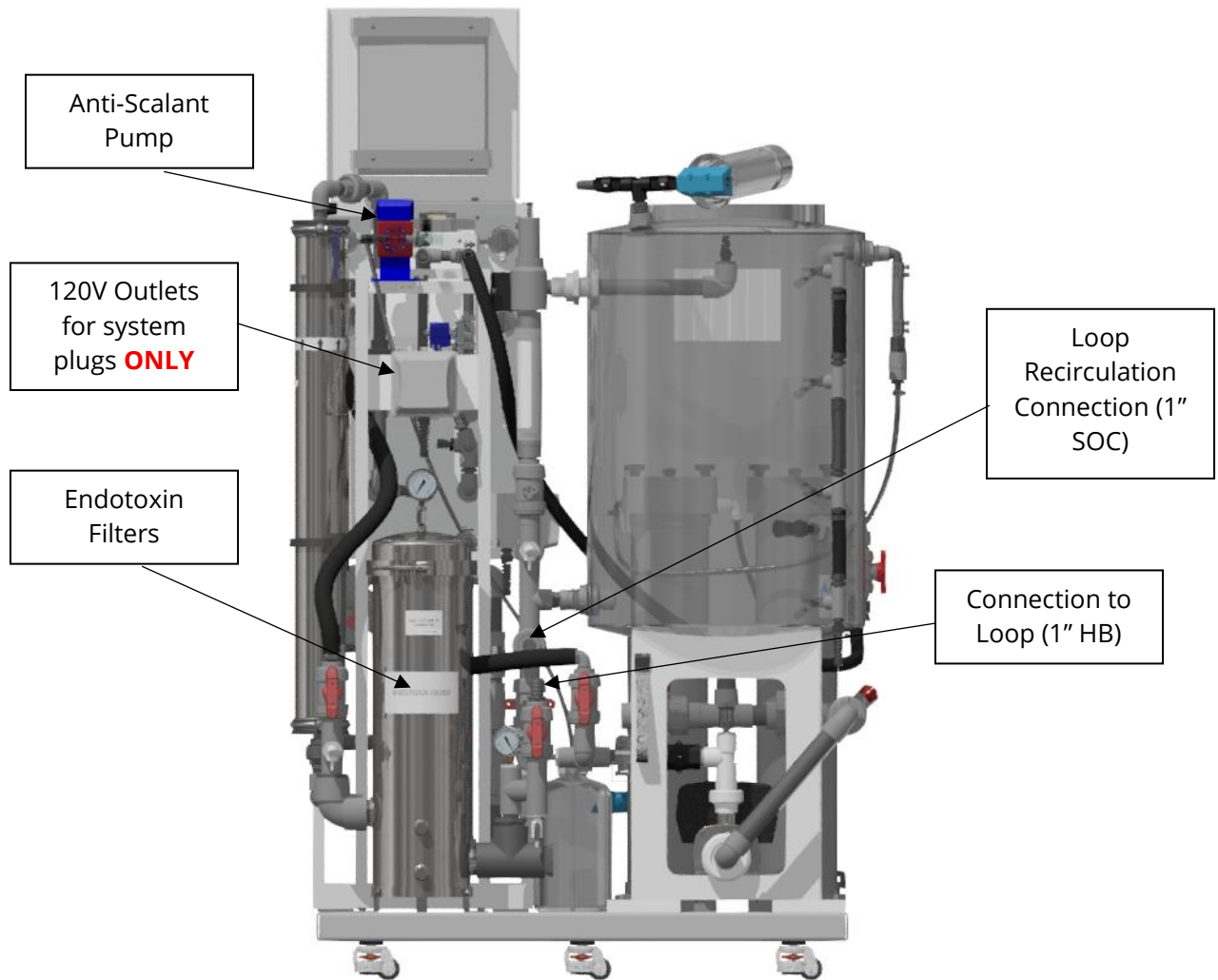


Figure 3: 00SPDVER2400 REAR VIEW

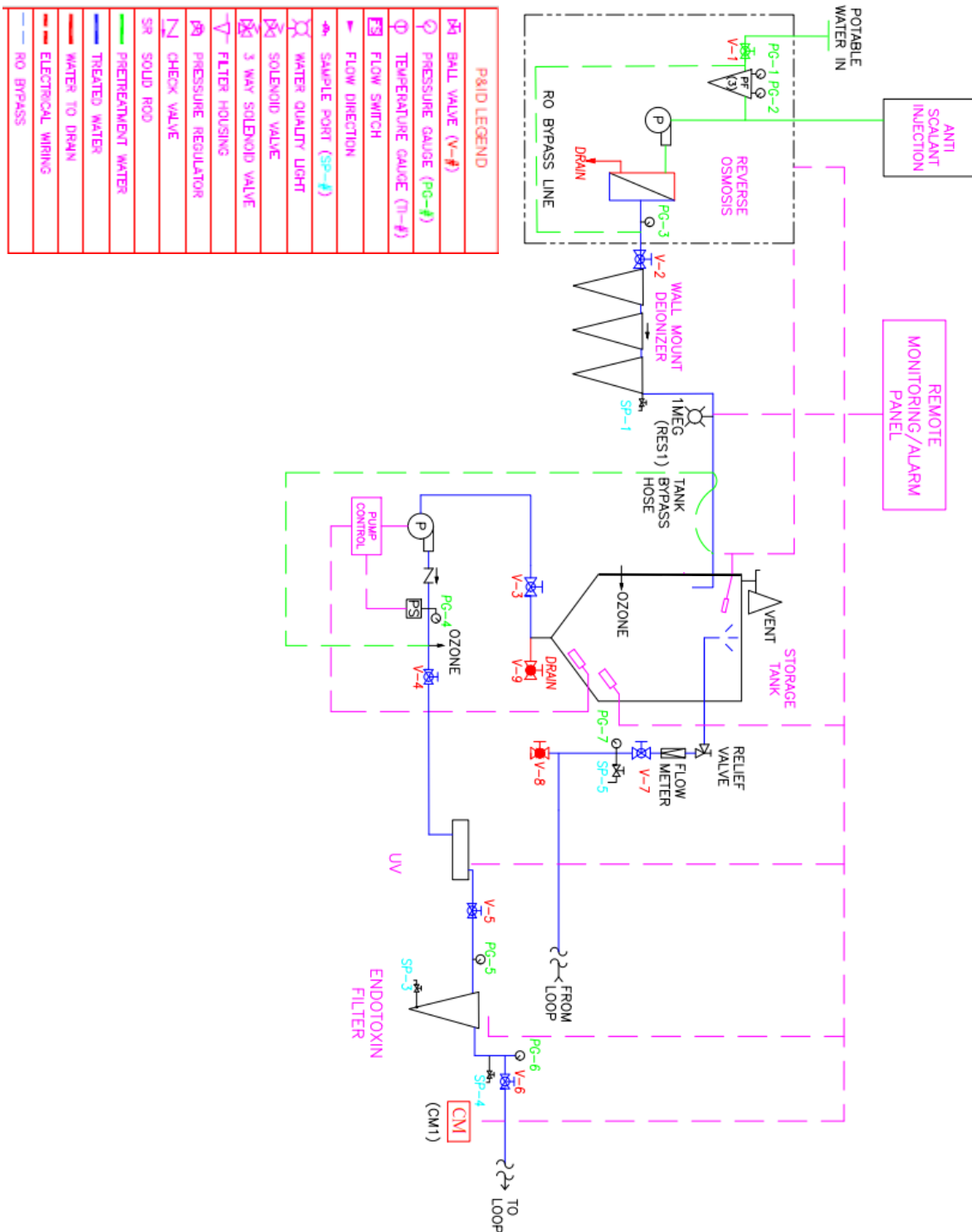
3 SYSTEM INSTALLATION

This section outlines the requirements and steps for installing the system safely and correctly. It includes pre-installation considerations, plumbing and electrical connections, and final checks to ensure the system is ready for operation.

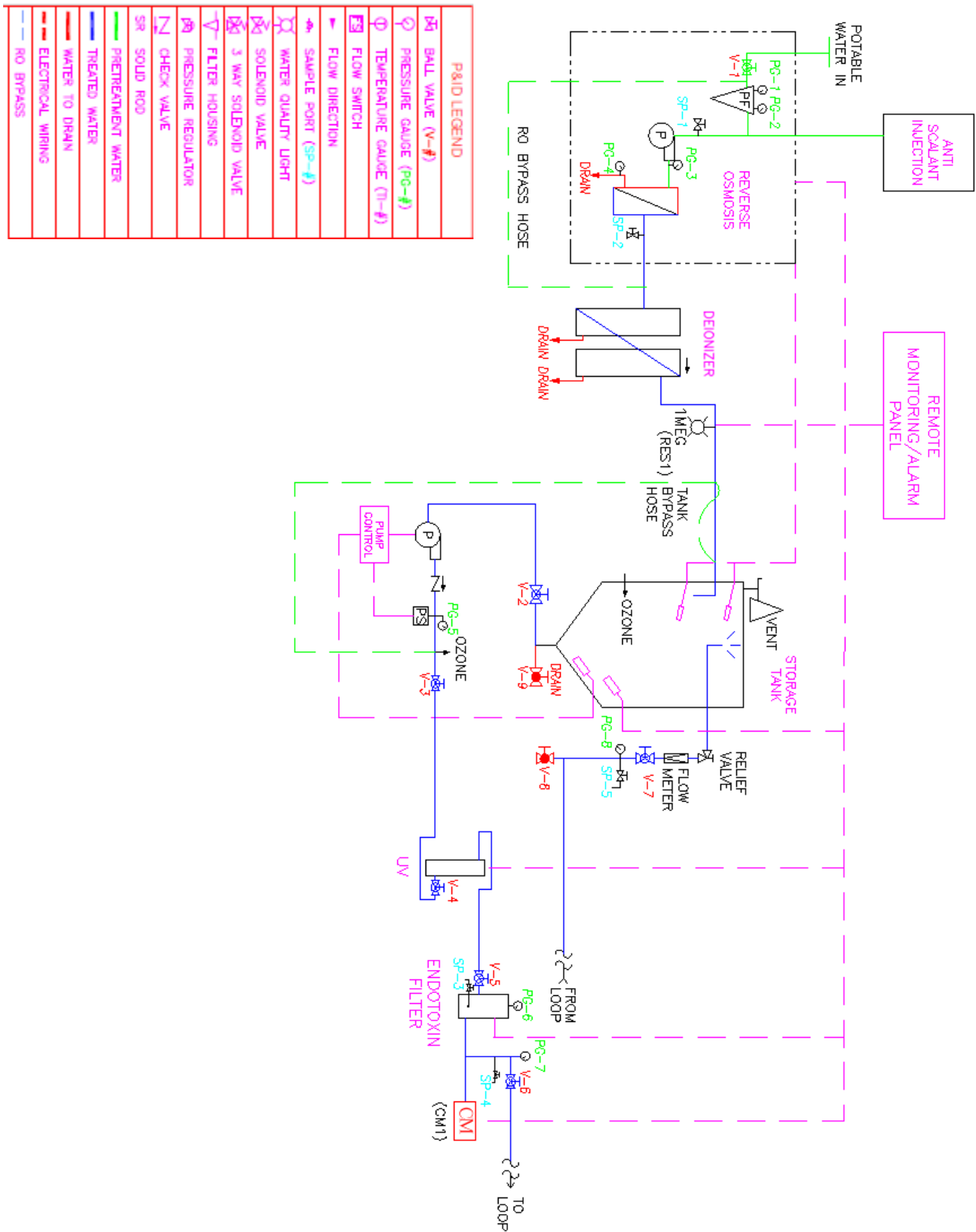
Note that a standard installation drawing package should have been provided. This package contains a typical room layout as well as plumbing and electrical requirements to further aid with installation.

3.1 System Flow Schematic

3.1.1 800 System Flow Schematic



3.1.2 2400 System Flow Schematic



3.2 Pre-Installation Requirements

1. Utility requirements;
 - a. Plumbing (800): 1/2" ball valve with NPT threads on tap water supply and dynamic pressure of at least 20 PSI at 2GPM. This should be installed after blended water to approximately 77F. A bushing from 1" to 1/2" (blend valve to NPT ball valve) thread will be provided in Ameriwater install kits.
 - b. Plumbing (2400): 1" ball valve with NPT threads on tap water supply and dynamic pressure of at least 20 PSI at 6GPM.
 - c. Electrical: see section 2.
2. Tap water supply line flushed and free of debris before equipment installation.
3. Floor drain within 4 feet of the system and Storage Tank drain/Loop Return drain capable of handling up to 10 GPM flow each.
4. Supply piping to the washer/disinfector/sterilizer system(s) within 5 feet of the systems Loop Supply with a shut off valve (3/4" for 800 model / 1" for 2400 model) . Loop Out and Loop Return should each have their own shut off valve. This ensures provided hosing is an adequate length to the start of the distribution loop.
5. Access space of 1 foot on each side and behind the water treatment equipment with a 3 foot aisle in front of the equipment or required to meet local codes.

3.3 General Installation

1. Two (2) hose clamps are to be used per hose connection.
2. A visual inspection is to be performed upon finishing installation and start-up of each system to ensure each component will function as intended. This includes, but is not limited to: lids and respective O-rings are not damaged or loose, damaged or loose hoses, leakage, secured power outlets, etc.

3.4 Optional Add-On Pre-Treatment Installation

For more specific directions on device installation reference the operation manual for the device. Not all system packages include all components listed.

1. The first device to be installed should be the blend valve. Locate the blend valve prior to the RO as close to the water source as possible. Plumb the cold-water piping with an insulation valve within accessible distance into the cold-water side of the blend valve and plumb the hot water piping with an insulation valve within accessible distance into the hot water side of the blend valve as shown on system installation drawing.

NOTE: Blend valve installation should be performed by the plumbing contractor.

NOTE: Backflow preventers may be applicable depending on local plumbing codes.

CAUTION: Local plumbing & electrical codes must be observed.

2. The system pre-filter should be installed after the blend valve. Install plumbing from water source or blend valve outlet to the pre-filter inlet. Locate the system pre-filter within 8 feet of the blend valve.

3. Locate the carbon tank close to clean working drain within 8 feet of both the system pre-filter and the RO with wall space to install the header. Verify that the tank is level and on a firm base, and that the tank label and control face are visible. Here are some additional things to consider when choosing an installation location.
 - a. Is there sufficient space available to mount the Bypass Header?
 - b. Will the hoses reach from the Bypass Header to the control valve connections?
 - c. Will the control valve power cord reach the 120-Volt GFI receptacle?
 - d. Will the control valve drain hose reach the drain?
 - e. Is there sufficient space available to set the brine tank?
 - f. Will the brine line tubing reach from the control head to the brine tank?
 - g. Are there any obstructions that interfere with reading the labels, reading the controller screen, programming the controller, or performing maintenance?

4. After the carbon tank is loaded with media it may be too difficult to reposition. Perform the following steps to establish the final location of the control valve in relation to the tank body.
 - a. Install the control valve and sealing o-ring into the tank.
 - b. Tighten to the same torque you expect to use after the media is loaded.
 - c. Mark the junction of the control valve to the tank body with a small ink pen mark or mark from a marker pen or a piece of tape.
 - d. Remove the control valve and sealing o-ring from the tank, being careful not to disturb the alignment marks just made.
 - e. Reposition the tank now if needed to keep the control valve in the desired position.

5. The carbon tank should be connected to the carbon tank header, which connects to the pre-filter outlet and RO inlet.

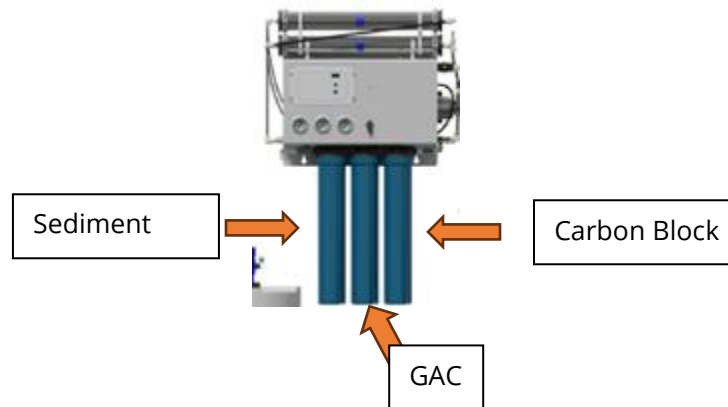
3.5 System Installation

For more specific directions on device start up reference the operation manual for the device.

Refer to section 2.1 for water connection sizes needed for installation

3.5.1 800 System Installation

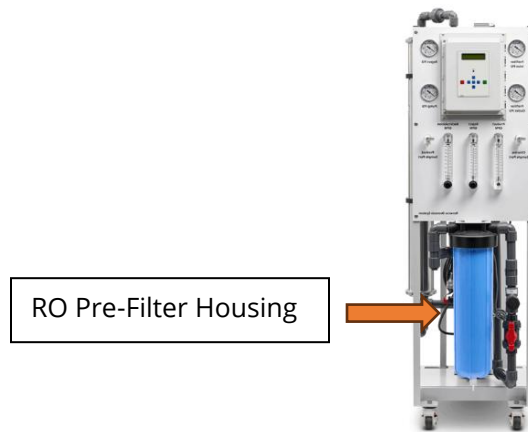
1. Connect the feed water hose from the water supply to the Inlet on the RO (1/2"). Install the pre-filter cartridges and secure the blue housings to the RO:
 - Sediment cartridge at the inlet.
 - GAC (activated carbon) cartridge in the middle.
 - Carbon block cartridge at the outlet.



2. Run the RO reject water hose to the drain, maintaining a 2 inch air gap.
3. Plumb the drain valve under the tank and the return drain valve beneath the loop return connection separately to a drain. Maintain a 2-inch air gap for each connection.
4. Install the endotoxin filter and DI resin packs after system start-up disinfection. Endotoxin can be installed if disinfecting with PAA.
5. Plumb the provided 0.75" hose from the endotoxin outlet to the ball valves at the beginning of the distribution loop (provided by the customer; see Section 2.2).
6. Plumb the provided 0.75" hose from the storage tank loop return to the ball valves at the end of the distribution loop (provided by the customer; see Section 2.2).
7. Adjust the leveling casters by turning the adjustment dial until the frame rests securely on the pads, ensuring the wheels are lifted off the ground.

3.5.2 2400 System Installation

1. Install the carbon block pre-filter cartridge and secure the blue housing to the RO.
2. **If using carbon exchange or backwashing carbon tanks:** Install provided sediment cartridge instead of the carbon block cartridge.



3. Run the RO reject water hose to the drain, maintaining a 2 inch air gap.
4. Plumb the drain valve under the tank and the return drain valve beneath the loop return connection separately to a drain. Maintain a 2-inch air gap for each connection.
5. Install the endotoxin filter and DI resin packs after system start-up disinfection. Endotoxin can be installed if disinfecting with PAA.
6. Plumb the provided 1" hose from the endotoxin outlet to the ball valves at the beginning of the distribution loop (provided by the customer; see Section 2.2).
7. Plumb the provided 1" hose from the storage tank loop return to the ball valves at the end of the distribution loop (provided by the customer; see Section 2.2).
8. Adjust the leveling casters by turning the adjustment dial until the frame rests securely on the pads, ensuring the wheels are lifted off the ground.

3.5.3 Installation Kits – Provided

Ameriwater installation kit is meant to facilitate typical installations. Site to site variation may warrant. The below table will explain the application of the components within the install kit.

0188-0121 (00SPDVER800)

Ameriwater Part Number (QTY)	Description	Application
00AAMI-VAL (2)	AAMI ST108 Validation Water Testing (ONLY AVAILABLE WITH SPD SYSTEMS - NOT SOLD SEPARATELY)	Test kit used to ensure system is working properly before use
010-0124 (1)	LEGRIS MALE CON, 0.5T X 0.5MPT	Threads into 041520207 bushing on the blend valve outlet
041520207 (1)	BUSH,1x.5,MNPTxFNPT,PVC80	Threads into the outlet of the 00HC-5001 blend valve to convert 1" FPT to ½" FPT to accommodate 010-0124
08760141 (10ft)	TUBING,.25OD,358 PSI,BLACK POLYETHELENE	RO drain tubing
08760164 (10ft)	TUBE,.5,33-150F,230PSI,LDPE,BLACK	Inlet tubing that connects to blend valve outlet to the inlet of the RO via ½" push to connect.
12677130 (30ft)	HOSE,MEDICAL,.75,STYLE 5000	Hosing for loop out (10ft), loop return (10ft), and Loop Return Drain (10ft)
12677135 (5ft)	HOSE,MEDICAL,1",STYLE 5000	Tank Drain hosing
14560326 (2)	ADPT,1,MPTxHB,PVC80	Tank Drain adaption
14730014 (4)	ADPT,.75MPTx.75HB,PVC80	Fitting for Loop Out (1) and Loop Return (1) customer supplied isolation valves. Loop return drain (2)
15650075 (6)	CLAMP,HOSE,.75,SS#10	Clamps for ¾ hose connections
15650100 (2)	CLAMP,HOSE,1,SS#16	Clamps for 1" hose connections
95-0020 (1)	PERACIDIN DISINFECTANT, 1 GALLON CASE (UN3149)	Disinfectant for disinfecting the system
95810125 (1)	PT401M,ANTISCALANT,(4) 1GAL. JUGS	Antiscalant liquid that goes in 2.5 Gal. bottle
97WT3000 (1)	TEST KIT FOR CENTRAL SYSTEMS	Test strips for chlorine checks, incoming hardness, disinfectant, PH
ST108DOCS (1)	ST108 DOCUMENTATION	ST108 proof of compliance

0188-0122 (00SPDVER2400)

Ameriwater Part Number (QTY)	Description	Application
00AAMI-VAL (2)	AAMI ST108 Validation Water Testing (ONLY AVAILABLE WITH SPD SYSTEMS - NOT SOLD SEPARATELY)	Test kit used to ensure system is working properly before use

041720169 (1)	VAL,BALL,1,TU,PVC80	Inlet line valve for customer supplied tap to the beginning of kit supplied parts.
12677130 (10ft)	HOSE,MEDICAL,.75,STYLE 5000	RO drain hosing
12677135 (45ft)	HOSE,MEDICAL,1",STYLE 5000	RO Inlet hosing (10ft)
		Storage Tank Drain hosing (5ft)
		Endotoxin Filter -> Loop Out (10ft)
		Loop Return (10ft)
		Loop Return drain (10ft)
14560326 (2)	ADPT,1,MPTxHB,PVC80	Inlet line hose adaption (1) & Loop return drain (1)
15650075 (4)	CLAMP,HOSE,.75,SS#10	Clamps for ¾ hose connections
15650100 (8)	CLAMP,HOSE,1,SS#16	Clamps for 1" hose connections
95-0020 (1)	PERACIDIN DISINFECTANT, 1 GALLON CASE (UN3149)	Disinfectant for disinfecting the system
95810125 (1)	PT401M,ANTISCALANT,(4) 1GAL. JUGS	Antiscalant liquid that goes in 2.5 Gal. bottle
97WT3000 (1)	TEST KIT FOR CENTRAL SYSTEMS	Test strips for chlorine checks, incoming hardness, disinfectant, PH dilution, and residual rinse out disinfectant strips
ST108DOCS (1)	ST108 DOCUMENTATION	ST108 proof of compliance

3.6 Electrical Connections

Most wiring is pre-installed and no additional internal electrical work is required. Customer must provide electrical connections below:

Requirement	Specification	Notes / Warnings
Storage Tank Pump Plug	230 V, 1-phase outlet	Connect using supplied plug only
Auxiliary power	115 V, 20 A outlet	Connect using supplied plug only
Junction box usage (on-board)	N/A	Do not move, swap, or plug any other devices into the system outlets

WARNING: Disconnect ALL power supplies to the equipment, prior to wiring or electrical shock could result.

WARNING: Be sure jumpers on the auxiliary board on the RO's controller are jumpered between J3 & J4 ONLY. If not, damage to the alarm panel or RO controller will result.

3.7 Final Install Steps

Mount the provided Piping & Instrumentation Diagram (P&ID) on the wall near the system so that it is easily visible. Ensure it remains accessible for operators during system operation and for future reference.

The P&ID refers to the valve, gauge, and sample port tags pre-labeled on the systems.

3.8 Installation Qualification (IQ) Checklist

Step No.	Task Description	Verification Check	Installer Initials	Date
1	Install carbon block pre-filter cartridge and secure blue housing to RO.	Housing tight, O-ring seated, no cross-threading.		
2	If using carbon exchange or backwashing tanks, install sediment cartridge instead of carbon block.	Correct cartridge selected and seated.		
3	Connect feed water hose (½") and install pre-filter cartridges: Sediment (inlet), GAC (middle), Carbon block (outlet). Anti-scalant liquid is added to the reservoir.	Hoses secure, clamps tight, housings leak-free.		
4	Route RO reject water hose to drain with 2-inch air gap.	Hose secure, air gap unobstructed.		
5	Plumb drain valve under tank and loop return drain valve separately to drain with 2-inch air gaps.	Connections secure, air gaps maintained.		
6	Stage endotoxin filter & DI resin packs (to be installed after system initial disinfect).	Items labeled and ready for later installation.		
7	Plumb hose (1" for 2400 / 0.75" for 800) from endotoxin outlet to loop supply ball valves.	Hose routing correct, fittings tight.		
8	Plumb hose (1" for 2400 / 0.75" for 800) from storage tank loop return to loop return ball valves.	Hose routing correct, connections secure.		
9	Adjust leveling casters so frame rests on pads, wheels lifted off floor.	Frame stable, unit level, wheels clear.		
10	Bypass hoses are neatly stored in visible sight for future use	Neatly visible storage of hoses for future operators		

4 SYSTEM START-UP PROCEDURES

This section provides step-by-step instructions for properly starting the system after installation or service. It ensures the system is brought online safely, without risk to components, water quality, or users.

WARNING: Ensure the endotoxin filters and resin bags for the Silex are not installed prior to the disinfection of the system.

4.1 800 System Start-Up

4.1.1 Flushing the RO Pre-Filters (SRB)

1. Turn Bypass valve located on RO face to bypass mode.
2. Turn on water to the pre-filters.
3. Flush the pre-filter for 5 minutes.
4. Let the filters settle for 45 minutes.
5. Flush the pre-filters until the drain water is clear.
6. Reconnect the hose to the inlet solenoid valve.

4.1.2 Starting the RO System

CAUTION: Do not start the RO pump until it has been filled with liquid.

1. Check that the pre-filter inlet gauge is 30 to 80 psi.
2. Plug the system 120V power cord into the receptacle.
3. Press the POWER button on the controller if the water is not flowing to the drain.
4. Turn ON the hot and cold water supplies and adjust the blend valve to 77°F (25°C).

NOTE: Running the product water to drain removes the preservative from the membrane.

5. Disconnect the hose to the DI and run it to drain.
6. Allow the RO water system to run the product water to drain for 2 hours (even if the WATER QUALITY light is green).
7. Press the POWER button to turn OFF the system.
8. Ensure the product water to the product water connection.
9. Press the POWER button to turn ON the system.

10. Allow the storage tank to fill until the tank float switch turns OFF the RO water system (displays FUL). If system does not operate when tank is low, check that float device is installed correctly.
11. Drain the storage tank below the low level start point. Ensure the unit starts up again and makes water.
12. Verify the product water quality at your intended point of use.

WARNING: Do not use the RO water system until all specifications are met.

12. Refer to the Monitoring Log (Section 6). Complete the log, making sure that the system is operating within all the required ranges.

4.1.3 Anti-Scalant Set-Up (PT401)

The following procedure should be followed during the initial startup of the system, and whenever the chemical injection pump loses its prime:

1. Verify that the RO system is on and running.
2. Verify that the chemical injection pump's suction line is immersed in solution in the chemical tank.
3. Press the ON key on the chemical injection pump to turn on the pump (see figure 3.1).
4. Press the "UP" key to increase the STROKE RATE up to approximately 150 to 200, or the "DOWN" key if already greater than 200 (see figure 3.1).

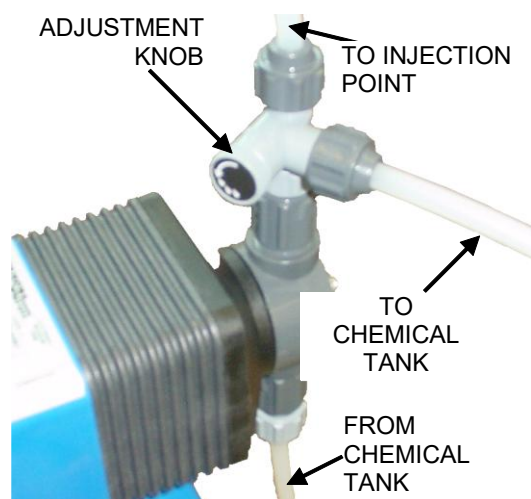
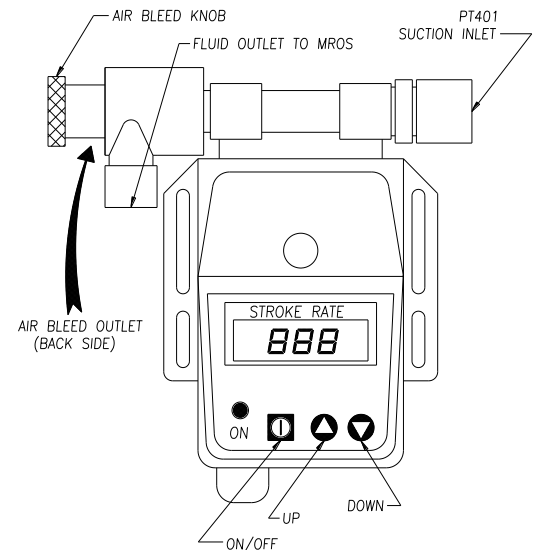


FIGURE 3.2



5. Run the chemical injection pump until a stream of chemical without air bubbles flows out of the air bleed tube.
6. Close the adjustment knob completely by turning clockwise until the knob stops, and make sure there is no liquid flowing out of the air bleed tubing (see figure 3.2).
7. If the chemical injection pump does not prime, repeat the steps 1 through 6.
8. When the chemical injection pump has been primed and is pumping the chemical into the water stream, adjust the stroke rate to the desired setting.

Repeat these steps as necessary when the system is started after sitting for extended periods of time or the chemical tank is empty and air has drawn into the chemical injection pump. The priming may not take as long as the initial time.

SETTING THE CHEMICAL FEED PUMP (FOR PT401 ANTISCALANT)

WARNING: Overdosing PT401 will adversely affect (blind) the membrane causing a decrease and/or loss of permeate flow.

WARNING: DO NOT use PT401 with softened water. Turn off the pump and empty the PT401 container.

There is one control that needs to be set on the feed pump.

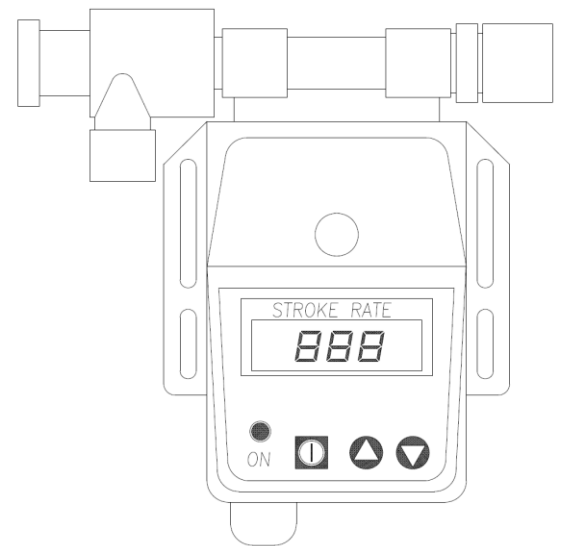
STROKE RATE = the number of strokes per minute (Set at 5 during use).

Your PT401 Antiscalant/Scale Inhibitor feed pump has been set at the factory default setting of 5 for the stroke rate. The factory default setting supplies the appropriate amount of antiscalant to the system for most water conditions.

If you have very hard water and/or iron water condition, AmeriWater will work with you set the pump injection rate for your particular water hardness condition. The recommended pump rate is for "average" water hardness. Higher injection rates may be necessary to control hardness and prevent damage to the MRO membrane.

If a reduction of PRODUCT flow or an increase in conductivity is observed over a few months, the PT-401 pump may not be adjusted high enough to control the hardness at your particular hardness condition.

Figure 4.1

**PT401 ANTISCALANT SETTINGS**

The digital readout on the PT401 injection pump can be adjusted from 0 to 360 strokes per minute. Based on the hardness of the feed water, the following stroke settings are recommended:

<u>HARDNESS (Grains Per Gallon)</u>	<u>STROKE SETTINGS</u>
1-6 GPG	2
7-20 GPG	3
21-40 GPG	4

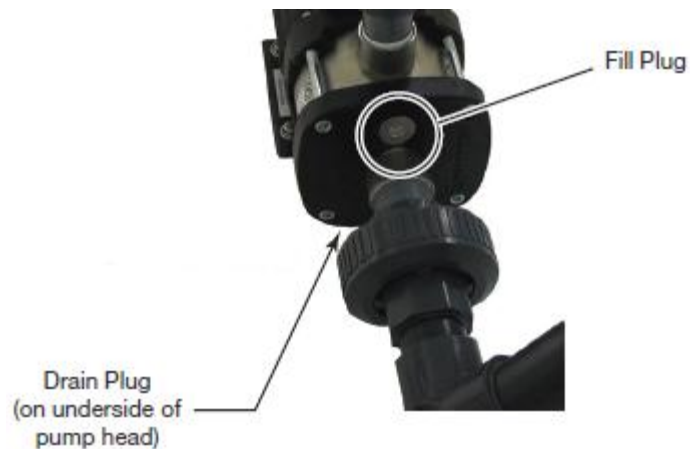
For water with hardness greater than 40 GPG, contact AmeriWater for consultation
1-800-535-5585

4.1.4 *Wetting the Storage Tank*

CAUTION: Do not start the delivery pump until it has been filled with liquid.

NOTE: After filling the delivery pump, check the pump rotation.

1. Fill the pump with liquid:
 - a. Close the isolating valve (V-4) on the discharge side of the pump.
 - b. Open the isolating valve (V-3) in the suction pipe completely before starting the pump.



- c. Remove the filling plug.
 - d. Fill the pump housing and the suction pipe completely with liquid until a steady stream of liquid runs out the filling hole.
 - e. Fit and tighten the filling plug.
 - f. Slowly open the discharge isolating valve while the pump is running. This ensures venting and pressure build-up during start-up.

CAUTION: The discharge valve must be opened immediately after start-up of the pump. Otherwise, the temperature of the pumped liquid may become too high and cause material damage.

4.1.5 *Disinfecting the System*

Now that everything has been rinsed, perform a system disinfection. Make sure all plumbing connections between the systems are made and properly tightened. Also verify that there are no valves open in the loop and the loop is not open to any devices. Ensure that the endotoxin filters and resin cartridges for the DI are not installed. Reference Section 8.1 for steps on disinfecting the system.

4.2 2400 System Start-Up

4.2.1 Flushing the RO Pre-Filters (AWRO)

1. Ensure RO is in standby.
2. Run ¼ hosing from the chlorine sample port to a bucket or nearby drain.
3. Open the chlorine sample port valve.
4. Flush the pre-filter for 5 minutes or until the water is very clear.
5. Let the filters settle for 45 minutes.
6. Flush the pre-filters again until the drain water is clear.
7. Reconnect the hose to the inlet solenoid valve.

4.2.2 Starting the AWRO System

CAUTION: Do not start the RO pump until it has been filled with liquid.

1. Open the REJECT FLOWMETER valve at least three (3) full turns counter-clockwise or till fully open.
2. Check that the pre-filter inlet gauge is 30 to 80 psi.
3. Plug the system 120V power cord into the receptacle.
4. Disconnect the product water hose from the Silex or DI and run hose to drain.
5. Press the POWER button on the controller if the water is not flowing to the drain.

NOTE: Running the product water to drain removes the preservative from the membrane.

6. Allow the RO water system to run the product water to drain for 2 hours minimum.
7. Press the POWER button to turn OFF the system.
8. Connect the product water to the Silex or DI tanks.
9. Press the POWER button to turn ON the system.
10. Adjust the REJECT FLOW and RECIRC FLOW meter to achieve the approximate product flow (at 50% recovery), REJECT FLOW should be 66% of PRODUCT FLOW and RECIRC FLOW should be 33% of PRODUCT FLOW.

NOTE: The REJECT flow meter setting is calculated by dividing the equipment capacity in gallons per day by 1,440 minutes. For example, the setting for the AWRO 14400 is 14400/1440 which equals 10 gpm. The PRODUCT FLOW and RECIRC FLOW + REJECT FLOW meters should be equal (50% rejection).

11. Allow the storage tank to fill until the float device turns OFF the RO water system (displays TANK FULL).
12. Drain the storage tank until the level drops below the level switch (opening the switch). Wait for the two minute time out and ensure the unit starts up again and makes water.
13. Verify the product water quality at your intended point of use.

WARNING: Do not use the RO water system until all specifications are met.

14. Refer to the Monitoring Log (Section 6). Complete the log, making sure that the system is operating within all the required ranges.

4.2.3 Anti-Scalant Set-Up (PT401)

The following procedure should be followed during the initial startup of the system, and whenever the chemical injection pump loses its prime:

9. Verify that the RO system is on and running.
10. Verify that the chemical injection pump's suction line is immersed in solution in the chemical tank.
11. Press the ON key on the chemical injection pump to turn on the pump (see figure 3.1).
12. Press the "UP" key to increase the STROKE RATE up to approximately 150 to 200, or the "DOWN" key if already greater than 200 (see figure 3.1).

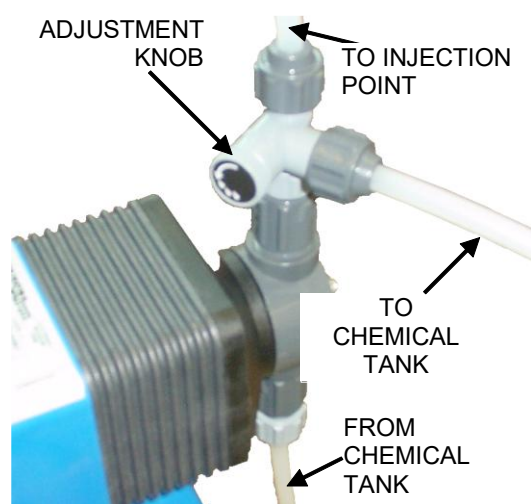
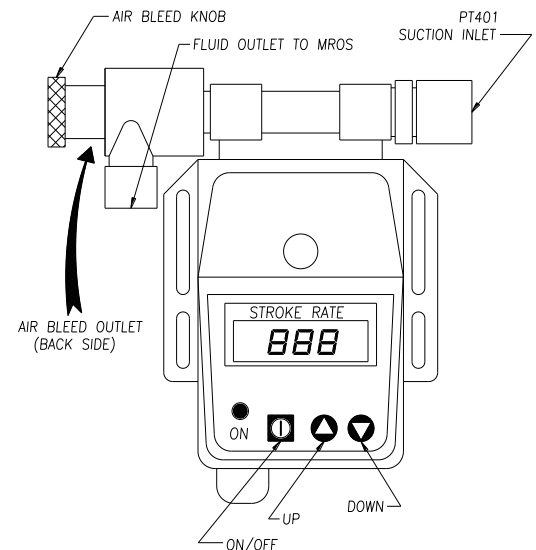


FIGURE 3.2

13. Run the chemical injection pump until a stream of chemical without air bubbles flows out of the air bleed tube.
14. Close the adjustment knob completely by turning clockwise until the knob stops, and make sure there is no liquid flowing out of the air bleed tubing (see figure 3.2).
15. If the chemical injection pump does not prime, repeat the steps 1 through 6.
16. When the chemical injection pump has been primed and is pumping the chemical into the water stream, adjust the stroke rate to the desired setting.



SETTING THE CHEMICAL FEED PUMP (FOR PT401 ANTISCALANT)

WARNING: Overdosing PT401 will adversely affect (blind) the membrane causing a decrease and/or loss of permeate flow.

WARNING: DO NOT use PT401 with softened water. Turn off the pump and empty the PT401 container.

There is one control that needs to be set on the feed pump.

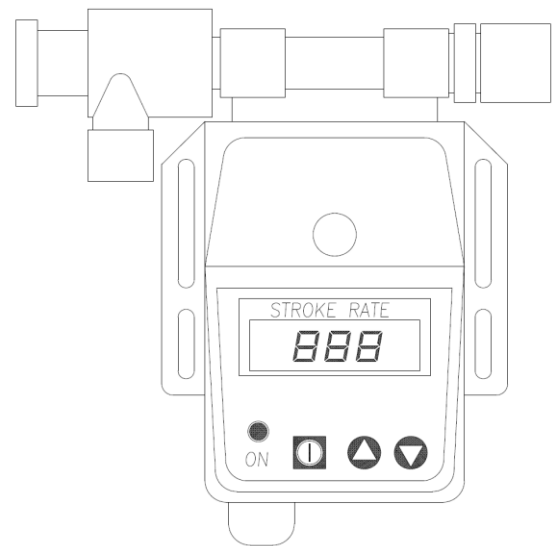
STROKE RATE = the number of strokes per minute (Set at 5 during use).

Your PT401 Antiscalant/Scale Inhibitor feed pump has been set at the factory default setting of 5 for the stroke rate. The factory default setting supplies the appropriate amount of antiscalant to the system for most water conditions.

If you have very hard water and/or iron water condition, AmeriWater will work with you set the pump injection rate for your particular water hardness condition. The recommended pump rate is for “average” water hardness. Higher injection rates may be necessary to control hardness and prevent damage to the MRO membrane.

If a reduction of PRODUCT flow or an increase in conductivity is observed over a few months, the PT-401 pump may not be adjusted high enough to control the hardness at your particular hardness condition.

Figure 4.1



PT401 ANTISCALANT SETTINGS

The digital readout on the PT401 injection pump can be adjusted from 0 to 360 strokes per minute. Based on the hardness of the feed water, the following stroke settings are recommended:

<u>HARDNESS (Grains Per Gallon)</u>	<u>STROKE SETTINGS</u>
1-6 GPG	2
7-20 GPG	3
21-40 GPG	4

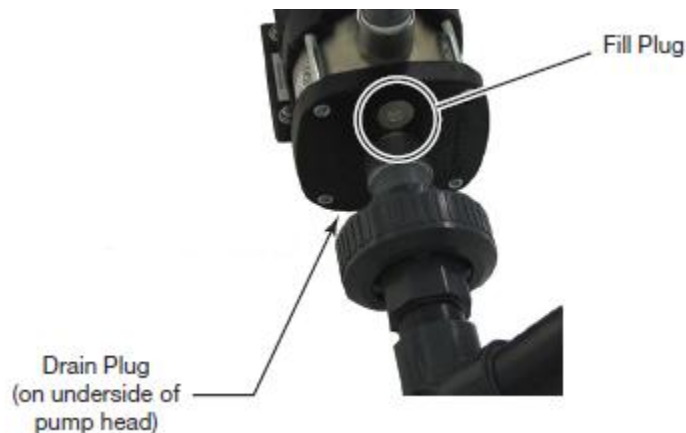
For water with hardness greater than 40 GPG, contact AmeriWater for consultation
1-800-535-5585

4.2.4 *Wetting the Storage Tank*

CAUTION: Do not start the delivery pump until it has been filled with liquid.

NOTE: After filling the delivery pump, check the pump rotation.

2. Fill the pump with liquid:
 - a. Close the isolating valve (V-3) on the discharge side of the pump.
 - b. Open the isolating valve (V-2) in the suction pipe completely before starting the pump.



- c. Remove the filling plug.
- d. Fill the pump housing and the suction pipe completely with liquid until a steady stream of liquid runs out the filling hole.
- e. Fit and tighten the filling plug.
- f. Slowly open the discharge isolating valve while the pump is running. This ensures venting and pressure build-up during start-up.

CAUTION: The discharge valve must be opened immediately after start-up of the pump. Otherwise, the temperature of the pumped liquid may become too high and cause material

4.2.5 *Adjusting Set-Points on the Storage Tank Pump*

1. Press the "OK" button on the controller to wake the screen. The home screen will be displayed on the pump.
7. Use the arrow keys to scroll up until the "Set-Point" setting is displayed. Press the "OK" key to enter the set-point menu.
8. Press the "OK" key to modify the set-point. Use the arrow keys to set the set-point to the desired value. The percentage displayed directly controls the operating speed of the pump (i.e. set-point of 71% will operate the pump at 71% of the maximum speed).

4. Monitor return flow rate on the storage tank flow meter. Ensure desired changes are properly performing. (Do not exceed 15 GPM on 800 model for proper post-treatment efficacy)

NOTE: Pump should still be running while changes are being made real-time to ensure efficacy of desired changes.

4.2.6 Disinfecting the System

Now that everything has been rinsed, perform a system disinfection. Make sure all plumbing connections between the systems are made and properly tightened. Also verify that there are no valves open in the loop and the loop is not open to any devices. Ensure that the endotoxin filters and resin bags for the Silex are not installed. Reference Section 8.1 for steps on disinfecting the system.

4.3 Final Startup Checklist-Operational Qualification (OQ)

Step No.	Task Description	Verification Check	Installer Initials	Date
1	Flush pre-filters until water runs clear	Flow OK, water clarity confirmed		
2	Fill RO pump with liquid before starting	Pump primed, no air pockets		
3	Power ON system and verify pre-filter pressure 30–80 PSI	Pressure within range		
4	Run RO product water to drain for 2 hours. Anti-Scalant pump turns on when RO is on.	Preservative flushed, flow continuous		
5	Connect product water to storage / DI	Hose connected securely		
6	Fill storage tank to float switch OFF	Tank fills, system shuts off		
7	Drain tank below low level to verify RO restart	System restarts as expected		
8	Set REJECT and RECIRC flow for 50% recovery (2400 only)	REJECT = 66%, RECIRC = 33% of PRODUCT FLOW		
9	Fill delivery pump & suction pipe, open discharge valve slowly (2400 only)	Pump filled, venting confirmed		
10	Verify plumbing connections and valves, perform disinfection per Section 6.1	All connections tight, system disinfected		
11	Verify product water quality and complete Monitoring Log (Section 5)	Water meets specifications		

5 OPERATION

This section explains how to operate the system under normal conditions. It covers standard functions, manual bypass procedures, and user interactions necessary to maintain reliable performance.

Once the system has been started, the RO will continue to make water until the high-level float switch is tripped on the storage tank. At this point, the RO will be placed into standby (tank full) until the high-level float switch is no longer tripped. Once the high-level float is not tripped, the RO will re-initialize and begin to produce water again.

In the event that the conductivity or PPM is above the pre-determined set-point, an alarm will sound from the alarm panel. The storage tank will still operate as normal while there is water in the tank; however, there will be no water flow from the RO through the DI Polisher until the alarm condition is corrected.

5.1 Manual Bypass Procedures

In the event of equipment failure or maintenance, the system can be manually bypassed to maintain temporary water flow. Because bypassed water may not meet quality standards, it should only be used in emergencies or with verified testing, and the system should be restored to normal operation as soon as possible. The distribution loop will become non-recirculating and distribute DI water using city water pressure.

NOTE: Before using any hoses for bypass, spot disinfect them to ensure that they are clean and free of any contaminants that could impact the quality of the water.

Refer to P&ID in Section 2.1 for nomenclature used in the instructions below.

5.1.1 800 Manual Bypass Procedures

1. Begin by turning off the power to the RO and Storage Tank Pump (wall plug). This will ensure that there is no electricity running through the system.
2. Shut off the water supply, V-1 valve on the inlet to the RO.
3. Ensure system is depressurized before disconnecting hoses.
4. Turn the valve on the front of the RO to "Bypass"
5. Disconnect DI Outlet->Storage Tank Inlet hose from the Storage Tank. Run water to the drain until RES1 light turns green.
6. Connect DI outlet hose to Tank Bypass hose provided.
7. Connect the Tank Bypass hose to the quick connect on the storage tank pump discharge line. Make sure that the hose is securely connected and that there are no leaks.
8. Close V-7 loop return ball valve on the storage tank.
9. Verify loop conductivity is below the alarm setpoint.

10. Finally, turn on the water supply to begin the bypass operation. This will enable using the DI manual bypass to supply critical water as needed.

5.1.2 2400 Manual Bypass Procedures

1. Begin by turning off the power to the RO and Storage Tank Pump (wall plug). This will ensure that there is no electricity running through the system.
2. Shut off the water supply, V-1 valve on the inlet to the RO.
3. Ensure system is depressurized before disconnecting hoses.
4. Attach the labeled RO Bypass hose directly to the CIP connection on the front of the RO. Attach the other end of the RO Bypass hose to the DI inlet.
5. Disconnect DI Outlet->Storage Tank Inlet hose from the Storage Tank. Run water to the drain until RES1 light turns green.
6. Connect DI outlet hose to Tank Bypass hose provided.
7. Connect the Tank Bypass hose to the quick connect on the storage tank pump discharge line. Make sure that the hose is securely connected and that there are no leaks.
8. Close V-7 loop return ball valve on the storage tank.
9. Verify loop conductivity is below the alarm setpoint.
10. Finally, turn on the water supply to begin the bypass operation. This will enable using the DI manual bypass to supply critical water as needed.

6 AAMI ST108:2023 COMPLIANCE FOR THIS DEVICE

AAMI ST108:2023 — Water for the Processing of Medical Devices
At-a-Glance Summary for Healthcare & Equipment Teams

6.1 ST108 Main Focus Areas

Purpose

Defines the minimum requirements for water used to clean, rinse, disinfect, and sterilize reusable medical devices. Focuses on consistent quality, validated systems, and ongoing monitoring.

ST108 Main Focus Area	Description
Risk Management	Assess contamination risks, system failure impacts, and establish mitigation actions.
System Design	Systems must support continuous flow, minimal stagnation, and validated treatment steps (e.g., softening, RO, DI, UV).
Validation	Requires IQ/OQ/PQ to confirm the system consistently meets water quality specifications.
Water Quality	Sets limits for microbial, chemical, and physical parameters for Utility, Critical, and Steam water.
Monitoring & Maintenance	Define alert/action limits, test frequencies, and sanitization schedules to control biofilm and contamination.
Documentation & Quality Management	Procedures, change control, maintenance logs, validation reports, and training records must be maintained.

6.1.1 Risk Management

To systematically identify, evaluate, and mitigate risks associated with the Critical Water System to ensure water quality, patient safety, and regulatory compliance. This should be addressed by the facilities cross functional team.

6.1.2 System Design

This system was designed by Ameriwater to meet AAMI ST108:2023 water quality standards. This system was engineered to meet water quality requirements before installation. All records provided from Ameriwater should be stored in the end user's quality management system.

6.1.3 System Validation (IQ/OQ/PQ)

Demonstrates the system is installed correctly, operates as intended, and produces water meeting ST108 limits.

The required validation documentation and testing should be completed and once validation is completed through a lab it should be kept on file for the facility per ST108. Follow validation protocol established by the facilities cross functional water management team.

Validation(s)/Evidence of Compliance	Where to find:
IQ (Installation Qualification): Verify installation matches design and manufacturer specifications.	Section 3.8 of this manual. This template should be duplicated and maintained in your Documentation & Quality management.
OQ (Operational Qualification): Confirm operational parameters, alarms, and instrumentation function correctly.	Section 4.3 of this manual. This template should be duplicated and maintained in your Documentation & Quality management.
PQ (Performance Qualification): Demonstrate system produces water within Critical Water limits under normal operating conditions.	See below “Ongoing Performance Qualification(s)” This template should be duplicated and maintained in your Documentation & Quality management and maintained on an established interval within your processes. Recommended occurrences are in Section 6.2

Ongoing Performance Qualification(s) (PQ)

When a performance qualification be conducted:

- Initial Start-Up
- Changes in source water quality
- After major system component replacement (RO membranes, UV lamps, pumps, etc)
- Extended shutdown or idle period
- Process or equipment modification
- Loop modification (loop reroute, added point of use, etc)

How to conduct:

- Order Ameriwater test kits listed in Section 6.5

Ensure test results are maintained in your Documentation & Quality System.

6.1.4 Monitoring & Maintenance

Monitoring

Ensure ongoing compliance with Critical Water requirements through systematic monitoring and preventive maintenance.

Monitoring should occur at the water treatment system as well as each point of use.

Table 3: Routine Monitoring Testing at Water Treatment System				
Water Quality Measurement	Type of Testing	Routine Monitoring Sample Site	Frequency for Each Type	
			Utility Water	Critical Water
pH @ 77°F (25°C)	pH meter or Colorimetric dipsticks	After the last treatment step	Quarterly	Monthly
Conductivity	Conductivity meter	After the last treatment step	Quarterly	Daily
Total Alkalinity	Colorimetric dipsticks	After the last treatment step	Quarterly	Monthly
Total Hardness	Determination of ppm CaCO ₃ or Colorimetric dipsticks	After the last treatment step	Quarterly	Monthly
Bacteria	Heterotrophic plate count	Loop Out & Loop Return	N/A	Monthly
Endotoxin	LAL test	Loop Out & Loop Return	N/A	Monthly

Table 3 and 4 are the recommended types of testing, sampling location and frequency for water treatment system and reprocessing equipment point of use within the department. For additional information, refer to Annex G in AAMI ST108.

The frequencies listed must be taken as a recommended minimum. If a problem is found or levels exceed recommendations, more frequent monitoring may be necessary.

Table 4: Routine Monitoring Testing at Point of Use					
Water Quality Measurement	Type of Testing	Routine Monitoring Sample Site	Frequency for Each Type		
			Utility Water	Water for Steam	Critical Water
pH @ 77°F (25°C)	pH meter or Colorimetric dipsticks	First Point of Use on the Distribution Loop	Quarterly	Quarterly	Monthly
Conductivity	Conductivity meter	First Point of Use on the Distribution Loop	Quarterly	Quarterly	Monthly
Total Alkalinity	Colorimetric dipsticks	First Point of Use on the Distribution Loop	Quarterly	Quarterly	Monthly
Total Hardness	Determination of ppm CaCO ₃ or Colorimetric dipsticks	First Point of Use on the Distribution Loop	Quarterly	Quarterly	Monthly
Bacteria	Heterotrophic plate count	Each Location of Point of Use in Department	Quarterly	N/A	Monthly
Endotoxin	LAL test	Each Location of Point of Use in Department	N/A	N/A	Monthly
Visual Inspection	Visual Inspection of inside of equipment - Look for residue, staining, scaling and discoloration (Annex I)	Spray Arms/Inside Chamber Walls/Inside Interior of Machine	Daily	Daily	Daily

Sampling Points

Sampling points are established locations in the water system used to collect representative water samples for chemical, microbial, and endotoxin testing. Their purpose is to confirm that water quality is maintained throughout the entire system — from generation to points of use (POUs).

Sampling Point Design Requirements

According to AAMI ST108:

- Sampling ports must be representative of the flowing water, not dead legs.
- Ports should be easily accessible and sanitizable.
- Sampling valves should be zero-dead-leg or minimal-volume designs.
- Valves and fittings should be made of stainless steel or plastic compatible with disinfection methods.
- Each port should be uniquely identified and documented on the P&ID and in the sampling plan.
- The system must support aseptic sampling, especially for microbial and endotoxin testing.

Maintenance

Maintain schedule laid out in Section 7.2 and keep maintenance records in your quality management system.

6.1.5 Documentation & Quality Management

To maintain a centralized, controlled repository of all Critical Water System documentation that provides traceability, audit readiness, and evidence of compliance with AAMI ST108:2023.

Deliverables/Evidence of Compliance

- All deliverables generated from **Sections 6.1** are consolidated into a central repository.
 - This includes test results, IQ/OQ/PQ checklists, SOPs developed for validations, monitoring, and maintenance.
- Provides a single reference point to demonstrate that the system consistently meets Critical Water requirements

6.2 AAMI ST108:2023 Water Testing Kits

Note : Bacteria and Endotoxin samples should be pulled within 24 hours prior to disinfection.

Testing Kit (Ameriwater Part Number)	Purpose
AAMI Contaminant Test for Critical Water (00AAMI-CS-CWV)	Measures overall water quality, including ionic and chemical contaminants, to verify compliance with ST108 chemical limits (conductivity, hardness, pH, chloride, alkalinity).
Bacteria Count Test (00AAMI-MICRO)	Quantifies total heterotrophic bacteria (HPC/CFU) to monitor microbial contamination and ensure levels remain below ST108 limits (<10 CFU/mL).
LAL for Endotoxin (00AAMI-LAL)	Detects and quantifies endotoxin levels in water, confirming compliance with ST108 critical water endotoxin limits (<10 EU/mL).
Total Organic Carbons (00AAMI-TOC)	Measures dissolved organic carbon to monitor organic contamination and prevent biofilm growth, verifying TOC ≤ 1.0 mg/L per ST108.

7 SYSTEM MONITORING & MAINTENANCE

7.1 System Monitoring

This section details routine monitoring requirements and maintenance activities necessary to sustain long-term system reliability of this device. It provides guidance on AAMI ST108 compliance, inspection points, and maintenance schedules.

In addition to the ST108 requirements in Section 6, the following is recommended to maintain equipment health of this device.

Fill out the daily monitoring log tailored to this device. Having this information available will help to quickly diagnose issues related to performance. Failure to carry out the monitoring and maintenance at the indicated intervals will result in reduced performance of the RO system and may void the warranty. The following page shows a sample daily monitoring log.

FEED WATER QUALITY	Parameters	Results (Write Value)	Date	Initials
Conductivity (uS)	Record			
Hardness (GPG)	Record			
Chlorine (ppm)	Record			
pH	Record			
PRE-FILTRATION	Parameters	Results (Write Value)	Date	Initials
Carbon Filter Inlet Pressure				
Carbon Filter Outlet Pressure				
RO OPERATION	Parameters	Results (Write Value)	Date	Initials
Chlorine (ppm)	< 0.1 PPM			
Pre-filter Inlet Pressure	> 25PSI			
Pre-filter Outlet Pressure	> 25PSI			
**Pre-filter Delta Pressure (Subtract Inlet by Outlet)	≤ 15PSI			
Pump Pressure	90 – 140 PSI			
Product Flowrate (GPM)	See Table			
Reject Flowrate (GPM)	See Table			
Recirculation Flowrate (GPM)	See Table			
TDS or PPM Display (800)	< 25 PPM			
Conductivity (2400)	< 50 uS			
*Percent Rejection (2400)	> 90%			
Amount of Hours in Operation	Record			
POST RO	Parameters	Results (Write Value)	Date	Initials

Distribution Pump Outlet	> 50PSI			
Storage Tank Loop Return Pressure	> 25PSI			
Storage Tank Loop Return Flowrate	> 8 GPM			
DI Packs / Tank Providing Adequate Resistivity	Green Light \geq 1 Meg			
UV Intensity	> 50%			
**Endotoxin Filter Delta Pressure	< 10PSI			
Verify System Normal Display on Main Alarm Panel	Record			
Verify Conductivity Display on Main Alarm Panel	< 10 uS			

*The RO system can operate below percent rejection parameter due to post deionization treatment.

** From established new filter DP

7.2 System Routine Maintenance

It is recommended to keep track of the system maintenance and stay on a regular schedule to maintain quality water results.

Frequency	Maintenance
Weekly	Check anti-scalant levels
Monthly	Chemical or Ozone Disinfection
Monthly	Water Sampling (Tests laid out in Section 6.2)
Quarterly or >15psi dp	Replace System Pre-filter
Quarterly or >15psi dp	Exchange Carbon Tank
Quarterly or >15psi dp	Replace RO Pre-Filter
Quarterly or >15psi dp	Replace Carbon Block Filter
Quarterly or >15psi dp	Replace GAC Filter (800 only)
Annually or as needed	Replace the Membranes
As needed per quality light	DI Polisher Resin Change
Annually	Replace Endotoxin Filters
Annually	UV Lamp/Quartz Sleeve Replacement
Annually or if it gets wet	Storage Tank Vent Filter

Example log for maintenance.

EXCHANGE	Frequency	Date	Initials
Anti-scalant levels	Weekly		
Chemical or Ozone Disinfection	Monthly		
System Pre-filter	Quarterly or >15psi dp		
Carbon Tank Exchange	Quarterly or >15psi dp		
RO Pre-Filter	Quarterly or >15psi dp		
Carbon Block Filter	Quarterly or >15psi dp		
GAC Filter (SRB Only)	Quarterly or >15psi dp		
Replace the Membrane	Quarterly or as needed		
DI Polisher Resin Change	As needed		

Endotoxin Replaced	Annually or >15psi dp		
UV Lamp/Quartz Sleeve Replacement	Annually		
Storage Tank Vent Filter	Annually		

7.3 Remote Monitoring Option

The system can be equipped with an optional remote monitoring package to provide real-time visibility of operating parameters, alarms, and water quality performance. Remote monitoring allows operators and service personnel to view system status without being physically present, which helps identify issues earlier, reduce downtime, and support compliance with AAMI ST108 monitoring requirements.

The following parameters can be monitored by the system controller. When operating values fall outside the set thresholds, the controller will generate an alarm and send an alert to the user(s).

For setup of the remote monitoring device refer to manual 98-2048 Remote Monitoring

Parameter	Normal Range / Limit	Alarm Trigger	Description
RO Filter Differential Pressure	≤ 15 PSI	> 15 PSI	Identifies fouling or scaling of the RO filter; elevated DP impacts RO efficiency.
RO Alarm	Normal operation	Any active RO alarm	Signals directly from RO controller; user must check controller for alarm details.
RO Product Conductivity	< 50 μS	≥ 50 μS for 10 sec	Monitors RO water quality to ensure compliance with system requirements.
Primary DI Water Resistivity	≥ 1 Meg-Ohm	< 1 Meg-Ohm for 10 sec	Confirms DI polisher performance; alerts when cartridge or silex is exhausted.
Storage Tank Low Float Switch	Tank filling	Low-level signal	Alerts if storage tank is not filling and water supply is limited.
Endotoxin Filter Differential Pressure	< 10 PSI	> 10 PSI	Confirms filter health; rising DP indicates filter replacement required.
Final Water Quality (POU)	< 10 μS	≥ 10 μS for 10 sec	Ensures point-of-use water meets final quality specifications.

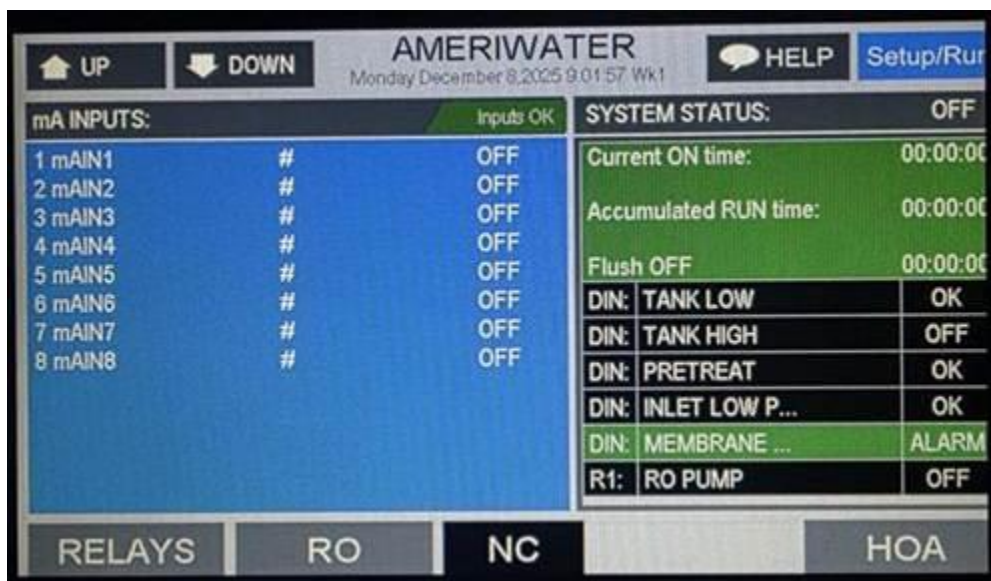
While remote monitoring improves system oversight, it does not replace the need for routine manual inspections and logging as described in Sections 5.1 and 5.2.

7.3.1 Enabling Additional Pre-Treatment Differential Pressure Sensors

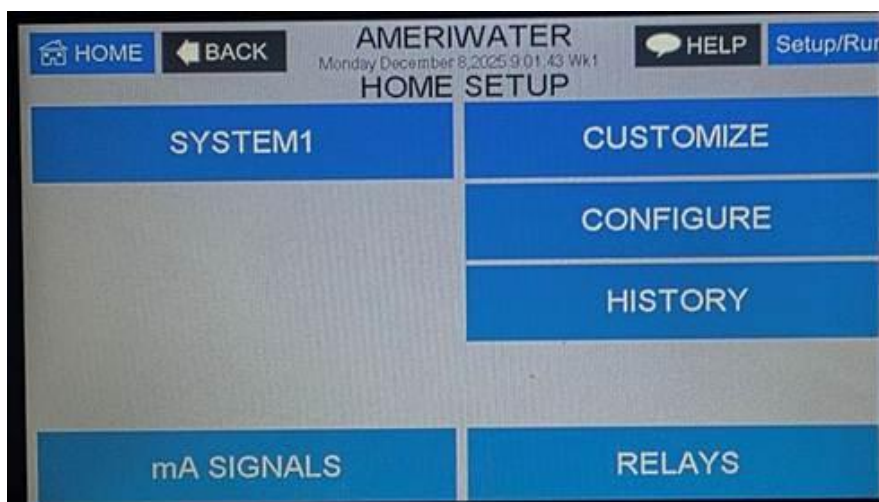
In installations where additional pre-treatment is installed before the skid, an extra pressure transducer is included pre-wired. ## indicators on the screen are normal for operation and indicate that this extra sensor is not being used. This sensor can be plumbed on the **inlet** port of a differential pressure monitoring filter i.e. sediment filter.

Follow the steps below to enable the additional pressure sensor:

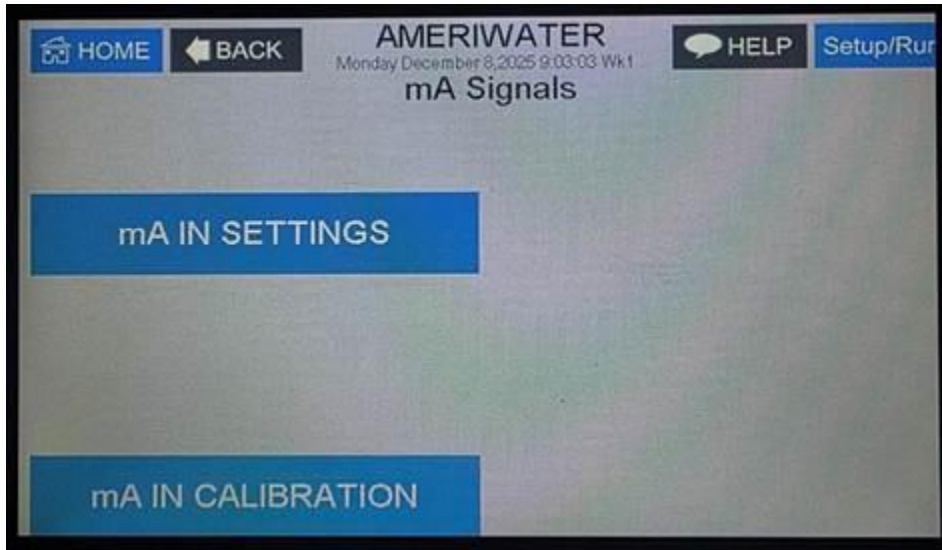
1. Press "Setup/Run"



2. Press "mA SIGNALS"



3. Press "mA IN SETTINGS"



4. Press "INPUT 1"



5. Press "HIGH ALARM"



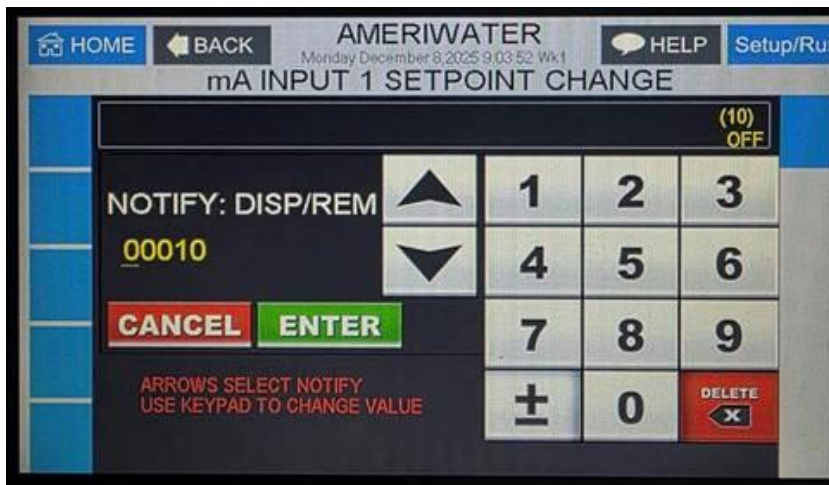
- Press up arrow till the "Notify" is changed to "OFF" to **disable** the alarm or "DISP/REM" to **enable** the alarm.



- Press "LOW ALARM"

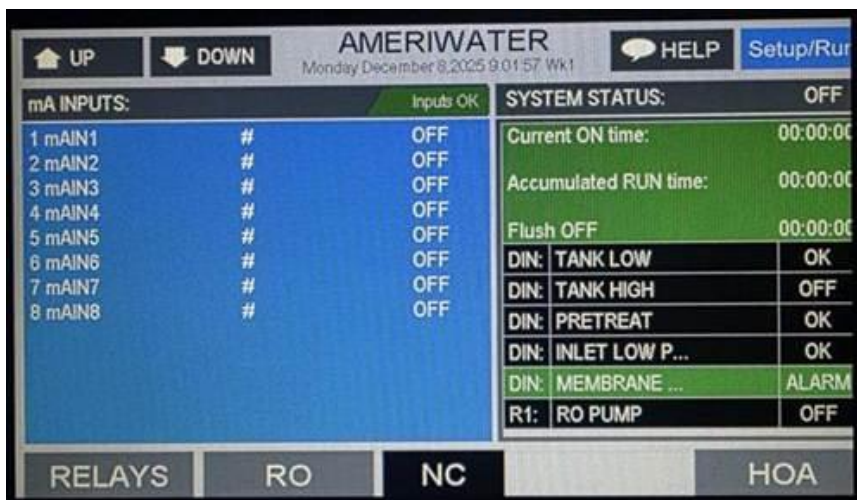


- Press up arrow till the "Notify" is changed to "OFF" to disable the alarm or "DISP/REM" to enable the alarm.

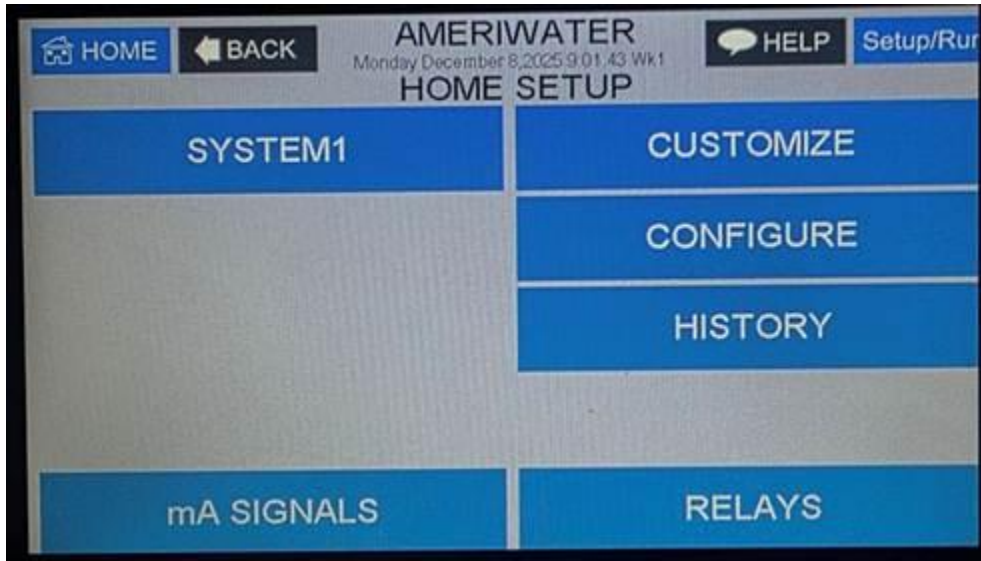


Changing Notepad for Pretreatment DP:

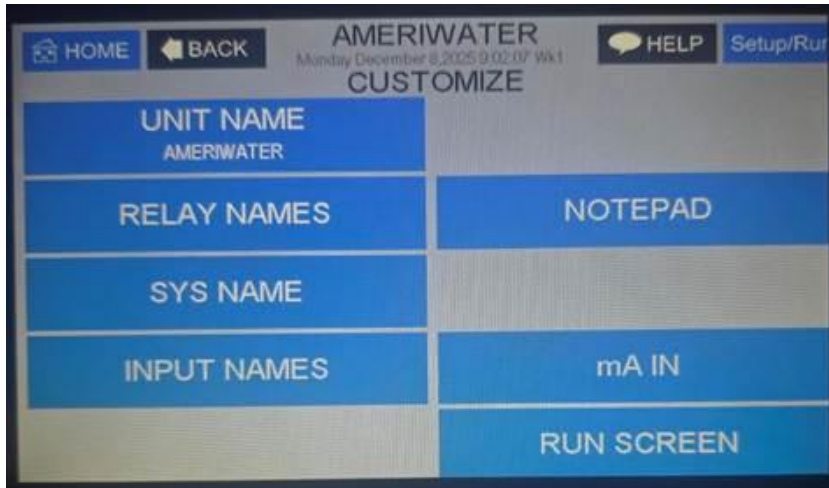
- Press "Setup/Run"



2. Press "CUSTOMIZE"



3. Press "NOTEPAD"



4. Press "NOTEPAD 1"



5. Press "ALARMS"



6. Press "HI NOTIFY"



7. Press up/down arrow till the "Notify" is changed to "OFF" to **disable** the alarm or "DISP/REM" to **enable** the alarm



8 DISINFECTION

This section describes procedures for disinfecting system components, including RO, storage tanks, distribution loops, and ultraviolet systems. Regular disinfection is critical to maintaining water quality and preventing microbial growth.

AmeriWater recommends that all systems should be disinfected monthly. The following sections will outline the disinfection steps for various systems. Refer to Section for AAMI standards for disinfection. Disinfection is the procedure of destroying greater than 95% of bacteria and removal of endotoxin. Improper disinfection of an RO can be worse than no disinfection at all because endotoxin are created if the dwell time is not long enough, or the disinfectant is not strong enough. The following procedures are designed to kill bacteria and flush out endotoxin in your storage tank and loop.

The RO/DI and loop disinfections are separate processes. The AWRO can be disinfected using the CIP skid (reference CIP manual) or via the pre-filter housing (reference AWRO manual). The loop disinfection can be done following the next section for Chlorine or PAA disinfection or following the ozone manual if applicable.

8.1 Reverse Osmosis / Deionizer Disinfection

8.1.1 800 RO / DI Disinfection

8.1.1.1 800 Pre-Filter Method

1. Before work, review Peracidin SDS and conform to all safety requirements including PPE when handling this chemical and operating this disinfection process.
2. Close the feed water shutoff valve (V-1) and open the sample port (SP-1) after the deionizer .
3. Remove pre-filter cartridges from the housings. Place cartridge in a sanitary location. Close the sample port (SP-1).
4. Remove DI cartridges and set aside. Reinstall cartridge housings.
5. Disconnect the DI->Storage Tank Inlet hose from the point of use and put to drain. Ensure REJECT hose is also to drain if not already, and that both hoses are oriented to reduce splashing or spray.
6. Add PAA specified by the model per **the table below** to the first filter housing.
7. Reopen the feed water shutoff valve and ensure pressure at prefilter inlet is at least 20 PSI. Failure to have sufficient pump inlet pressure can result in unit damage.
8. Press the power button on the front of the controller and let operate for the time on the table below. After the duration, check that the dilution from the DI sample port (SP-1) is at least 1% (500 ppm). Verify using peracetic acid potency test strip (P/N: 97HP20401) Close SP-1. Add additional PAA to the filter housing if not @ 500 ppm. Record the final volume used for future disinfections of your device.
9. Allow the unit to dwell with PAA in the system for 60 minutes, then run the unit in supply

with hoses run to drain to rinse for 60 minutes. After rinse, confirm that the Product Hose water is measuring 0 ppm with Peracidin test strips. Verify rinse using residual test strip (P/N: **97PX20501**). Once 0 ppm is achieved, turn off the RO and let rest for 10 minutes, then repeat rinse until 0 ppm is achieved again.

10. Bleed pressure and drain the pre-filter housing and remove from system. Thoroughly rinse the housing and dipose fluid to drain. Replace pre-filter cartridges and reinstall.
11. Install new DI cartridges.
12. Reconnect the DI->Storage Tank Inlet hose to its previous position.

Model	PAA amount	Time to Run Disinfectant
SRB800	60ml	30 seconds

8.1.2 2400 RO / DI Disinfection

The two chemical disinfection methods available on the RO are adding chemicals via a Clean-in-Place (CIP) device or via the RO pre-filter housing.

WARNING: Remove DI Resin packs from the Silex Deionizer prior to disinfection.

8.1.2.1 2400 Clean-In-Place (CIP)

1. Before work, review Peracidin SDS and conform to all safety requirements including PPE when handling this chemical and operating this disinfection process.
2. Close the feed water shutoff valve.
3. Make sure the system is depressurized. Remove pre-filter cartridge from the housing and reinstall the empty housing. Remove the two DI resin packs from the Silex Deionizer.
4. Connect the sanitization equipment to the CIP inlet connection on RO.
5. Disconnect the DI->Storage Tank Inlet hose and RO REJECT hoses from their current end connections.
6. Connect the two hoses to the end connections on the Sanitation or CIP Equipment to create a closed loop.
7. Sanitize the RO per the sanitization protocol referred to in the CIP manual, 98-0008. Confirm minimum 1% dilution at product sample port (500 ppm).
8. Disconnect the sanitization equipment when finished.
9. Ensure proper rinse out of disinfectant
10. Reinstall the pre-filter cartridge. Install two new DI resin packs in the Silex Deionizer.
11. Reconnect the hoses to their previous positions.

8.1.2.2 2400 RO Pre-Filter Housing Method

1. Before work, review Peracidin SDS and conform to all safety requirements including PPE when handling this chemical and operating this disinfection process.
2. Set unit to 'DISINFECT MODE' by quickly holding the left arrow then, at the same time, hold the right arrow key and simultaneously release both buttons, the screen will say "DISINFECT ENABLED". Additionally, flip the CIP switch located on the back of the controller. The alarm light will illuminate.
3. Close the feed water shutoff valve and open the sample port under the RO pre-filter housing to reduce pressure in the housing.
4. Remove pre-filter cartridge from the housing. Place cartridge in a sanitary location. Close the sample port under the RO pre-filter housing.
5. Disconnect the DI->Storage Tank Inlet hose from the point of use and put to drain. Ensure REJECT hose is also to drain if not already, and that both hoses are oriented to reduce splashing or spray.
6. Add PAA specified by the model per **the table below** to the filter housing and mix with RO water. Lightly agitate for 10 seconds then reinstall the housing.
7. Reopen the feed water shutoff valve and ensure pressure at prefilter inlet is at least 20 PSI. Failure to have sufficient pump inlet pressure can result in unit damage.
8. Hold the Enter button on the front of the controller for the duration listed on the table below. After the duration, check that the dilution from the Product Sample Port is at least 1% (500 ppm). Verify using peracetic acid potency test strip (P/N: 97HP20401) Close sample port. Add additional PAA to the filter housing if not @ 500 ppm. Record the final volume used for future disinfections of your device.
9. Allow the unit to dwell with PAA in the system for 60 minutes, then run the unit in supply with hoses run to drain to rinse for 60 minutes. After rinse, confirm that the DI->Storage tank hose is measuring 0 ppm with Peracidin test strips. Perform this check at the product sample port also. Verify rinse using residual test strip (P/N: **97PX20501**). Once 0 ppm is achieved, turn off the RO and let rest for 10 minutes, then repeat rinse until 0 ppm is achieved again.
10. Bleed pressure from pre-filter housing and remove from system. Thoroughly rinse the housing and dispose fluid to drain. Replace pre-filter cartridge and reinstall.
11. Reconnect the PRODUCT hose to its previous position. Return the unit to standard operation by flipping the disinfect switch on the rear of the controller.

Model	PAA amount	Time to Run Disinfectant
AWRO2400	200ml / 1.5 Gallon RO Water	30 seconds

8.2 Storage Tank / Loop Disinfection

NOTE: It is necessary to have new resin bags for the Silex during the disinfection process.

Since the storage tank contains a spray device installed in the top of the tank, it washes down the top and sides of the tank. This enables the water level in the tank to be lowered during disinfection, which reduces the chemicals required and reduces the rinse out time.

- Determine the volume of water in the tank and loop. The length of the loop can be estimated by measuring the general path of the loop in the facility, then adding 50% more length for safety. Below is a chart showing the number gallons in various sizes of pipe. Example: 450 feet of 1" pipe; $450 / 24 = 18.75$ gallons. Add the loop volume (gallons) to the volume in the storage tank. If you have a 185-gallon tank without a spray device, use the full 185 gallons. With a spray device, use less of the volume ($185 / 4 = 46.25$ for a tank that is $\frac{1}{4}$ full or the lowest level for that allows the tank to function). Example: 46.25 gallons + 18.75 gallons from the loop = 65 gallons.

PIPE SIZE	FEET OF PIPE TO CONTAIN 1 GAL OF WATER
$\frac{1}{2}$ "	98
$\frac{3}{4}$ "	43
1"	24
1 $\frac{1}{4}$ "	15
1 $\frac{1}{2}$ "	10

- Prior to disinfecting system loop, ensure disinfection is necessary by taking bacteria and endotoxin samples at various system sample ports. If bacteria and endotoxin levels do not meet the requirements listed in the table below, or it is a period of time in which the loop has not been frequently used (such as initial installation), it is required to disinfect the loop.

Type of Water		Utility Water	Critical Water
Water Use		All	All
Bacteria	cfu/mL	<500	<10
Endotoxin	EU/mL	N/A	<10

- Determine the dilution and amount of chemical to use. The following are the recommended dosages of chlorine and PAA (Peracidin, Minncare) for disinfection. Choose a disinfectant compatible with the loop material of construction.

Chemical	Instructions
Chlorine	500 PPM. Dilute one (1) gallon of chlorine bleach in 100 gallons of water in the system. Based on the example on the previous page: 65 gallons / $100 = 0.65$ gallons of bleach. Add to the system by removing the tank lid and pouring in the chlorine bleach solution. Endotoxin filter must be removed.
PAA	500 PPM. Dilute one (1) gallon PAA in 100 gallons of water in the system. Based on the example on the previous page: 65 gallons / $100 = 0.65$ gallons of PAA. Add to the system by removing the tank lid and pouring in the PAA solution. Not to be used as disinfectant on systems with UV.

Ozone	0.5-1 PPM. Add to the system by running the ozone disinfection system until the desired level is reached. Hold at this level for at least 30 minutes. Reference Ozone manual, 98-0121, for disinfection steps. UV must be unplugged.
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WARNING: DO NOT use PAA with UV bulb & sleeve installed in UV lamp.

WARNING: DO NOT use chlorine (bleach) or ozone with endotoxin filters installed in housing; filters are not approved to be used with bleach. Endotoxin filters should be removed and stored in a sterile bag.

4. Verify that the disinfectant is present at the connections to the loop (each point of use).
5. Disconnect inlet connections from storage tank.
6. Recirculate the disinfectant in the loop via distribution pump until it is verified at each point of use that the above requirements have been met. Use appropriate test strip to verify.
7. Turn off the distribution pump and allow the disinfectant to soak inside the loop for one hour for PAA & Bleach. Ozone will be continuous flow during disinfection. Replace connection to storage tank after adequate time has passed.
8. Turn the distribution pump back on, ensuring the dump valve on the loop return is opened and the spray bar isolation valve is closed. Drain remaining disinfectant from the tank when the pump is off. Empty the tank entirely via tank dump valve.
9. Fill the storage tank enough to recirculate and rinse the loop via the spray bar fixed to the storage tank (loop return dump valve closed and spray bar isolation valve opened).
10. Continue rinsing and dumping the system until all disinfectant is rinsed out by verifying at each usage point. Use a chlorine test strip to verify the residual chlorine level or a PAA test strip to verify the residual PAA level. Repeat this step until the test strip indicates a residual level at or below 1.0 ppm chlorine and PAA. If using ozone dump the tank once and refill with RO.

8.3 A Word about Hydrogen Peroxide/Peroxyacetic Acid

Do not use hydrogen peroxide/ peroxyacetic acid concentrate (PAA) after the expiration date. Using outdated PAA may cause incomplete disinfection. PAA loses effectiveness if not kept out of direct sunlight and/or the cap is not tightly sealed. Using ineffective disinfecting solution will cause incomplete disinfection. Using less than the required volume of PAA concentrate will result in incomplete disinfection.

Disposal of Outdated Hydrogen Peroxide/Peroxyacetic Acid:

1. Put on rubber gloves, apron, and goggles.

CAUTION: Exposure to PAA concentrate or solution may cause severe chemical burns to skin or eyes.

2. Start a flow of cold tap water to dilute the PAA as it flows down the sink drain.
3. Slowly and carefully pour the disinfecting solution down the drain, taking care to avoid spills, splashes, or breathing the vapors.

CAUTION: Splashing PAA concentrate may cause severe chemical burns.

4. Rinse the emptied PAA container with tap water to remove all traces of the chemical.
Rinsing emptied containers is needed to protect waste handlers from accidental exposure to the chemical.
5. Rinse the drain with tap water to remove residual disinfecting solution from the surfaces and flush the chemical from the drains.
6. Discard the emptied and rinsed container in a waste receptacle or set aside for recycling.
7. Inspect the area for spilled or dripped disinfecting solution. Wipe up small spills with a damp paper towel. Larger spills should be either flushed to drain with water or removed with a water bucket and floor mop.

WARNING: Verify that there is no chlorine (bleach) in the water bucket or floor mop. Chlorine (bleach) will cause a severe chemical reaction when it encounters PAA concentrate!

8. Rinse rubber gloves with tap water to remove any residues due to handling.
9. Return rubber gloves, apron, and goggle to their storage area

8.4 2400 MEMBRANE FLUSH FEATURE (Auto Flush)

The 2400 AWRO is connected to a storage tank only having 1-2 days of non-use when dialysis procedures are not being carried out. The MEMBRANE FLUSH FEATURE is the preferred means for minimizing bacterial growth during periods when the RO is not being used. The AWRO can be set up to discourage microbiological growth by “flushing” periodically.

The Membrane Flush feature is disabled as a default from the factory for AWRO models. If these default settings do not meet your particular need, then they can be changed. See Section 9.4 on how to change from the default settings.

FLUSH MODE	RO PUMP	INLET VALVE	DIVERT VALVE
3 (FOR STORAGE TANK APPLICATIONS)	ON	OPEN	ENABLED
4 (FOR DIRECT FEED APPLICATIONS)	ON	OPEN	DISABLED

FLUSH MODE #3 assumes that the **AWRO is connected to a storage tank** and, therefore, will divert the PRODUCT WATER to the drain. This minimizes bacterial growth and directs all the water to

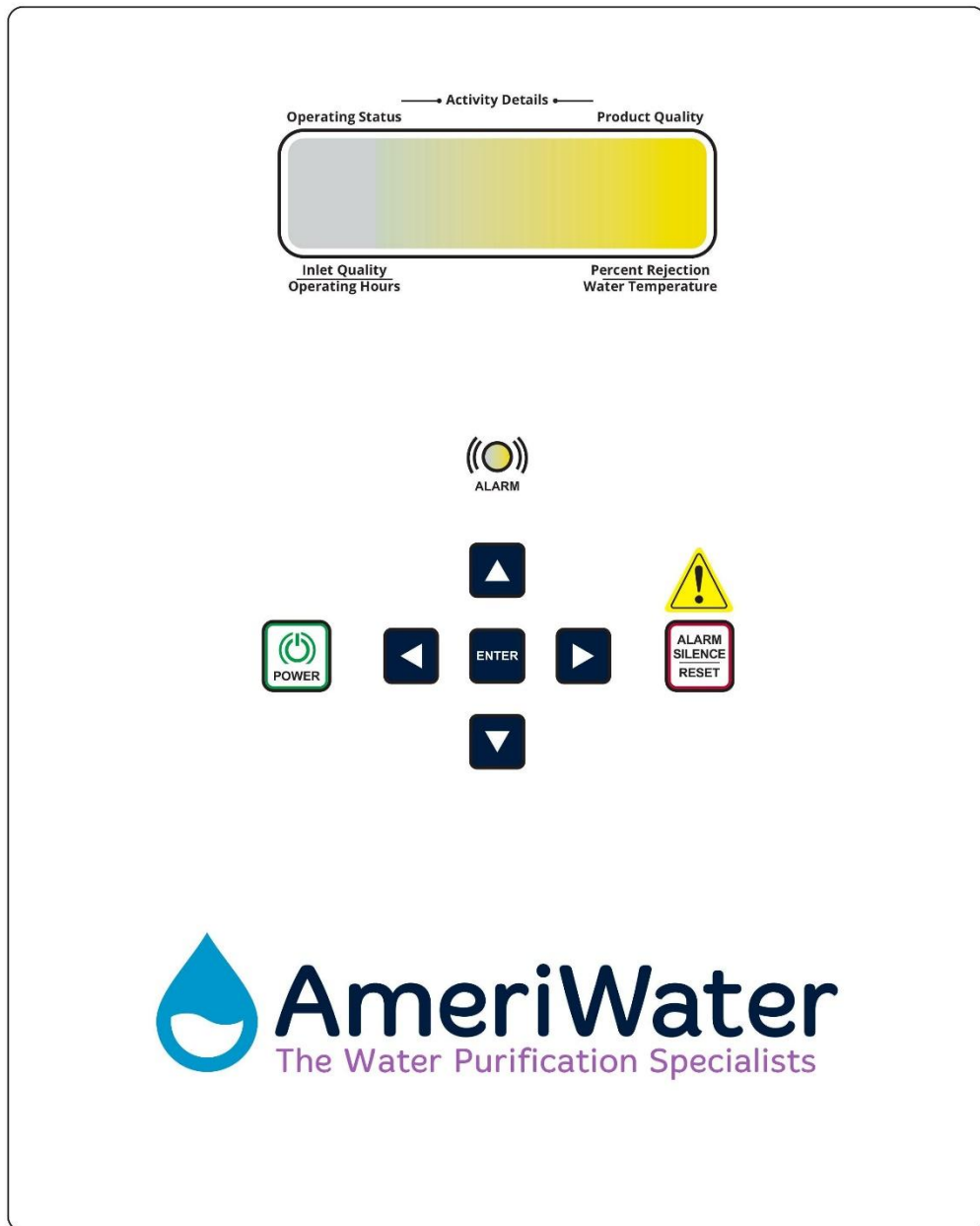
the drain, rather than refill the storage tank. **FLUSH MODE #3** will cause all the water to be diverted to drain for each MEMBRANE AUTO FLUSH cycle.

On the other hand, when an **AWRO is connected to a Direct Feed Loop**, the PRODUCT water should be directed into the loop during the MEMBRANE AUTO FLUSH cycle to keep the water in the loop "fresh". Setting the **FLUSH MODE for #4** will disable the DIVERT TO DRAIN feature, and the PRODUCT WATER will be circulated through the loop during each MEMBRANE AUTO FLUSH cycle. The MEMBRANE AUTO FLUSH will operate while the AWRO is in the STANDBY mode, while connected to the loop even though no water is being used.

The AWRO must be connected to the electric power source, incoming water supply, and drain at all times for this feature to be operable.

9 CONTROLLER

9.1 RO Front Panel Controls and Indicators (2400)



Control or Indicator	Function
DISPLAY	Shows status of system.
ALARM LAMP	Flashes when fault causes an RO system shut down. On steady when a setpoint is exceeded that does not cause an RO system shut down.
POWER KEY	Places controller in operating or standby mode.

LEFT ARROW KEY	Scrolls through setpoints starting with the first setpoint in Section 9.4.
RIGHT ARROW KEY	Scrolls through setpoints starting with the last setpoint in Section 9.4.
UP ARROW KEY	Increases value of setpoint.
DOWN ARROW KEY	Decreases value of setpoint.
ENTER KEY	Confirms entry of new setpoint value.
ALARM SILENCE / RESET KEY	Push once for alarm silence and twice to reset system after a shutdown has occurred.
ACCESSING DISINFECT MODE	Push and hold the left arrow key, and then push the right arrow key.
NOTE: The J2 jumper must already be installed to make this an active mode (Refer to figure in Section 9.5).	
DISINFECT DRAW	Push the ENTER key and hold until all of the solution is drawn into the RO.

NOTE: Setpoints can only be changed when WRITE PROTECT is OFF. See section **Error! Reference source not found.** for instructions on changing setpoints.

The operating status of the unit is shown on the top line of the display. The following list describes the items shown for the operating status.

Status Message	Indication
STATUS	The unit is in standby mode.
DELAY [##]	The unit is in the RO start delay. The number is the seconds remaining before the RO pump starts.
OPERATING	The RO unit is operating.
TANK FULL	The unit is shut down due to a tank full condition.
TANK FULL [##]	The unit is shut down due to a tank full condition. <ul style="list-style-type: none"> • If the number is blinking, the tank full high switch has cleared, but the tank full low switch is still active. • If the number is on steady, both tank level switches have cleared and the delay is counting down.
PRESS FAULT	The unit is shut down due to pressure fault condition.
HIGH CONDUCTIVITY	The unit will divert water to drain until water reaches acceptable quality.
MEMB FLUSH [##]	Membrane flush is active. The number is the minutes remaining in the flush cycle.

OPERATING HOURS

The current operating hours are shown on the bottom line.

TEMPERATURE

The current water temperature is shown on the bottom line after the operating hours. When the unit is offline because of a shutdown condition, the reading is replaced with '---'.

WARNING MESSAGES

Warning messages are also shown on the second line. If any warnings are active, the active warnings will alternate with the normal displays for the bottom line. The following lists the warning messages.

ALARM LAMP

The ALARM lamp flashes when a fault causes an RO system shutdown. The lamp is ON steady when a setpoint is exceeded that does not cause an RO system shutdown.

To silence an alarm, press ALARM SILENCE/RESET once. To reset the system after a shutdown, press ALARM SILENCE/RESET twice.

ALARM LOG

Pressing the Alarm Silence and Power keys (hold for 1 second) at the same time allows access to an Alarm Log. Pushing the up arrow key allows the user to cycle through the five most recent alarms. Pressing the Enter Key will clear this log. This log is not time stamped and cannot be exported.

9.2 Controller Operation

TANK FULL OPERATION

The RO can be operated with 1 or 2 level switches. With 1 level switch, the switch is connected to the tank full high input. When this switch has been active for 5 seconds, the unit will shut down on tank full. TANK FULL will show on the display. When the tank full condition clears, the display will show TANK FULL ##. The number is the tank full restart time, and the unit will restart when this delay times out.

For 2 level switch operation, the upper switch is connected to the tank full high input, and the lower switch is connected to the tank full low input. When both switches are "open", the RO unit will start. The RO unit will continue to run when the water level rises, and while the lower switch becomes active (closed). When the upper switch becomes active (closes), after the 5 second delay, the RO unit will shut down. TANK FULL will show on the display. When the tank level drops and the upper-level switch clears, the display will show TANK FULL ## and the RO unit will remain off. The number is the tank full restart time, and the number will blink until the lower-level switch clears (opens). When the lower-level switch clears (opens), the number will remain steady, and the RO will restart when the delay times out.

NOTE: The Direct Feed setting must be set to "0" for the RO to run off the float switches.

TANK FULL RESTART

The tank full restart is the delay before the RO unit starts when a tank full condition clears. This delay can be in minutes or in seconds. The **TF Restart** setpoint selects seconds or minutes.

PRESSURE FAULT

If the pressure fault input becomes active and stays active for the delay programmed in the **Press Fault Delay** setpoint, the unit will shut down for a pressure fault. The display shows PRESS FAULT, the ALARM lamp flashes and the audible alarm sounds. The pressure fault can be cleared by pressing the ALARM SILENCE/RESET key twice.

Inlet pressure switch is set to 10PSI at the factory.

AUTO RESET

If a pressure fault shut down occurs and the Auto Reset set-point is programmed to 0, the unit will remain shut down until manually reset. If the Auto Reset set-point is programmed to a value greater than 0, the unit will automatically clear the pressure fault and attempt to restart after this delay times out.

TANK FULL OVERRIDE

A timed tank full override can be initiated when the RO unit is shut down due to a tank full condition. Pressing the Alarm Silence/Reset key for 3 seconds during a tank full condition will enable the tank full override. The RO will start and TF OVERRIDE # will show on the display. The number is the minutes remaining in the override timer. When the override times out, the unit will return to the tank full shut down condition. The TANK FULL OVERRIDE will divert all water to the drain, whether the water quality is good or bad coming into the RO.

PRETREAT

If the pretreat input becomes active (closes) and stays active for 2 seconds, the unit will shut down in a pretreat lockout condition. PRETREAT will show on the display and the unit will remain shut down as long as the pretreat input is active.

ALARM OUTPUT

The Expansion I/O relay 2 has been programmed to operate as an alarm relay. The relay will energize whenever a warning or alarm condition occurs. The relay will remain energized as long as the warning/alarm condition is active.

MEMBRANE FLUSH

The membrane flush function is configured by the **Flush Type, Flush Time, Flush Interval, and Flush Mode** setpoints.

HIGH TDS/CONDUCTIVITY WARNING/ALARM

If the TDS/conductivity reading exceeds the limit programmed, the **TDS/COND Limit** setpoint for the delay programmed in the **TDS/COND Delay** setpoint, the ALARM lamp lights and the HI TDS/Cond warning message is displayed. The warning clears when the TDS/conductivity drops below the setpoint.

9.3 Controller ALARMS

Warning Message	Description
TANK FULL	The unit is shut down due to a tank full condition.

PRESS FAULT	The unit is shut down for a pressure fault. To clear the pressure fault, press the ALARM SILENCE / RESET key twice.
HI TDS/COND	The TDS/Conductivity reading has exceeded the programmed limit.
TANK LOW	The tank low input is active.

9.4 Standard Setpoints

SET-POINT	DESCRIPTION	RANGE	FACTORY SETTING
TDS/COND Limit	When this value is met or exceeded, the alarm lamp will light and high TDS/Cond will show on the display. To disable, set to 0.	0-999 μ S or PPM*	50 μ S
TDS/COND Delay	When the limit set-point is exceeded, no alarm will be given until this time has expired.	0-999 seconds	10
RO Start Delay	The amount of time between the inlet valve opening and the RO pump start.	0-99 seconds	10
Press Fault Delay	The time a pressure fault must be active before a pressure fault shut down occurs.	0-99 seconds	10
Auto Reset	When a pressure fault shut down is active, the system will attempt to restart after this delay. If set to 0, system must be manually reset.	0-99 minutes	0
Alarm Silence	If the audible alarm is silenced, after this delay, the alarm will resound. If set to 0, the alarm will remain silenced.	0-99 minutes	3
TF Restart Delay	When a tank full condition clears, the system will restart after this delay.	0-99 sec/min	5
TF Restart	Selects whether the tank full restart delay is in seconds or minutes. 0=seconds, 1=minutes.	0-1	0
TFO Time	The amount of time that a tank full override lasts.	0-99 minutes	3
Tank Lo Restart	Not Used.	N/A	0
Flush Type	Selects the type of flush. Set to 0 to disable or 6 to flush during off hours.	0-8	0
Flush Time	The length of time a membrane flush cycle will last when flush is active.	0-99 minutes	0
Flush Interval	The interval between flush cycles. Only valid with operation hour, elapsed time or off flush types.	0-99 hours	0

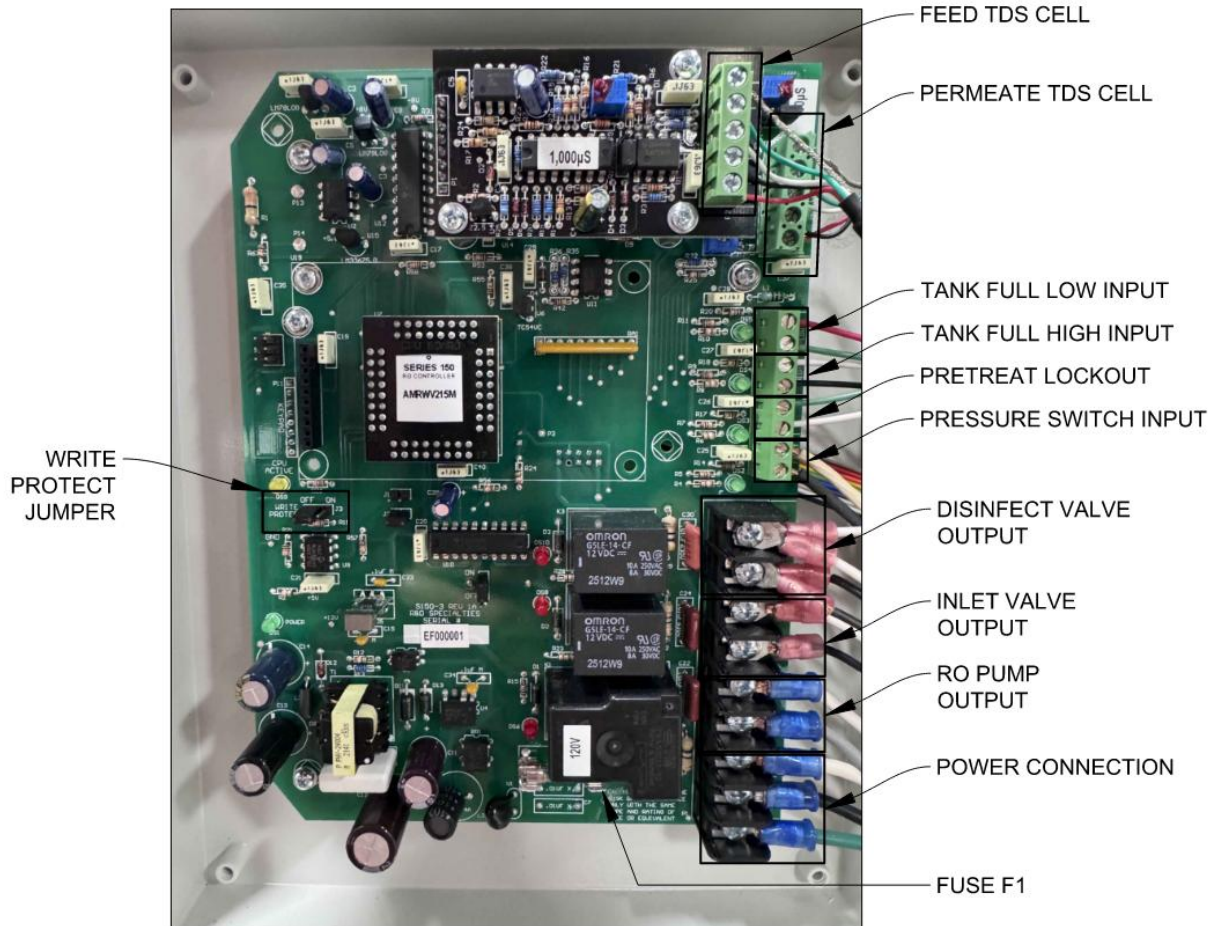
SET-POINT	DESCRIPTION	RANGE	FACTORY SETTING
Flush Mode	Selects if the inlet and RO pump relays operate during flush. Set to 0 to disable. See section 8.3	0-4	0
Maximum Hours	If the current operating hours exceed this limit, the operating hours warning will occur. Set to 0 to disable.	0-65000 hours	0
Current Hours	Current number of hours of RO system operation.	0-65000 hours	0
Temp Offset	Allows adjustment of temperature reading by ± 5 degrees.	± 5	0
Temp UOM	Selects display of temperature in °F or °C. 0 = °F, 1 = °C.	0-1	0
Switch Select	Selects if switch inputs are normally open or normally closed. Should always be set to 0.	0-31	0
TDS/COND UOM ¹	Selects display of water quality in μS or PPM.	0-1	0
TDS/COND Range ¹	Selects range of TDS/Conductivity monitor 0 = 50, 1 = 100, 2 = 250, 3 = 500, 4 = 1000, 5 = 2500, 6 = 5000.	0-6	1
C2 Range (Feed Water Conductivity) ¹	Selects range of TDS/Conductivity monitor 0 = 50, 1 = 100, 2 = 250, 3 = 500, 4 = 1000, 5 = 2500, 6 = 5000.	0-6	4
C2 Limit	When this value is met or exceeded, the alarm lamp will light and high TDS/Cond will show on the display. To disable, set to 0.	0-999 μS or PPM*	0
%Rej	The 2 nd TDS/Conductivity is used to monitor 0-1 feed water, programming this set-point to 1 allows the % rejection to be displayed.	0-1	1

¹ If this set-point is changed, the unit must be recalibrated. Some setting ranges may require a different resistor to be installed. Reference AWRO Operation Manual

* μS = microsiemens; PPM = Parts Per Million

9.5 To Change Setpoints

To change the setpoint, the WRITE PROTECT jumper, J3, must be moved to the OFF position (center and left pins).



1. Use the left and right arrows to display the setpoints. Each press of an arrow key will advance the display to the next setpoint. The left arrow key starts with the beginning setpoint (**TDS/Cond Limit**) and the right arrow key starts with the last setpoint (**% REJ**).
2. The up and down arrow keys are used to increment or decrement the setpoint value. The value will change by 1 count each time a key is pressed. If the key is pressed and held for about 1 second, the setpoint value will change at a fast rate. When the key is released, the fast rate will be reset. Pressing both the up and down arrow keys together will reset the setpoint value to 0.

NOTE: Pressing the ALARM SILENCE/RESET key at any time will cancel the operation and return the display to the main screen. If the WRITE PROTECT jumper is ON, the unit will show WRITE PROTECTED on the display and one long beep will sound.

3. To accept the new setpoint value, press the ENTER key. The unit will beep twice if the change is accepted.

CAUTION: Incorrect settings may cause the system to malfunction. Setpoints should only be changed by personnel who understand the operation of the system. Write protecting the setpoints is recommended.

- When finished changing setpoints, place the WRITE PROTECT jumper in the ON position (center and right pins).

10 TROUBLESHOOTING

This section provides a guide to diagnosing and resolving common system issues. It lists symptoms, probable causes, and corrective actions to minimize downtime and service interruptions.

The table below covers common troubleshooting tips and diagnostics. For more information on troubleshooting, please reference the operation manual for the impacted device.

Problem / Symptom	Possible Cause	Corrective Action
RO Unit – PRESS FAULT condition Alarm on HMI, RO shuts down	Pre-treatment device malfunction (softener, carbon, sediment filter)	Check pretreatment equipment if applicable; replace media/cartridges
	Feed water source issue	Confirm stable feed pressure and flow via pressure gauges on RO Inlet
	Inlet pressure switch not set properly (~10 psi)	Adjust inlet pressure switch.
	Inlet pressure switch corroded or defective	Inspect, clean, or replace switch.
	Feed water supply interruption	Confirm water supply; open isolation valves.
RO Unit – Low product flow rate System runs, but product output is below spec	Inadequate feed pressure (<20 psi at pre-filter inlet)	Open supply valve; confirm pressure ≥ 20 psi while RO is operating.
	Clogged pre-filters	Replace cartridge filters.
	Fouled or scaled RO membrane	Clean membranes per procedure in RO manual or replace.
DI Unit – Resistivity drops Product resistivity below setpoint	Exhausted DI resin	Replace or regenerate DI cartridges/tanks. Red light displaying on sensor.
	Channeling in resin bed	Repack resin or bags/cartridges

	Bacterial contamination in DI bed	Sanitize system and replace resin.
Storage Tank – Water not filling	Level sensor or float malfunction	Inspect and replace sensors/floats triggers proper RO function
	Tank vent filter clogged/wet	Replace vent filter.
	Tank overflowing	Standby flush not set at mode 3
		Defective float
RO/DI unit not producing	Refer to RO/DI troubleshooting section.	
Distribution Pump – Will not start No flow to loop or points of use	No water in suction line	Check tank level and suction piping.
	Pump overheated (water too hot)	Ensure water is within spec range.
	Pump seized or blocked	Disconnect piping; clear obstructions.
	Supply voltage too low/high	Verify and correct supply voltage.
	No electrical supply	Restore power.
	Pump in alarm condition	Reset pump via panel or pushbutton. Refer to storage tank manual for alarm diagnostics.
	No demand / downstream closed	Open downstream valves or outlets.
Distribution Pump – Low pressure/flow	Partially closed discharge valve	Fully open discharge valve.
	Blockage in distribution piping	Inspect loop, filters, valves; clear blockages.
	Pump impeller worn	Service or replace impeller/pump.
Endotoxin Filter – Low flow downstream	Filter fouled or clogged	Replace filter cartridge when DP is >10 psi
	Bacterial fouling upstream	Sanitize distribution loop.
	Incorrect installation	Verify orientation and O-Ring seals; reinstall properly.
UV Disinfection – Alarm / Low intensity	UV lamp aged or failed	Replace lamp on schedule.

	Quartz sleeve fouled/scaled	Clean or replace sleeve.
	Ballast/power supply failure	Inspect, repair, or replace ballast.
	Flow rate exceeds design	Reduce flow or upgrade UV unit.

11 SPARE PARTS & CONSUMABLES

This section contains a list of recommended spare parts for maintaining system functionality. It helps users quickly identify and order replacement components as needed.

For spare parts on systems other than the UV and system pre-filter, reference the system operation manual as found in Section 1.1.

11.1 800 Consumables

RO Yearly PM Kits available with necessary components to meet maintenance recommendations:

- 5-micron cartridge filter (Qty 4) and replacement o-ring (Qty 4)
- GAC cartridge filter (Qty 4) and replacement o-ring (Qty 4)
- Carbon block cartridge filter (Qty 4) and replacement o-ring (Qty 4)
- Vent filter on Storage Tank (Qty 1) (FT model only)
- RO Check Valve (Qty 1) and Delivery Check Valve on storage tank (Qty 1) (FT model only)
- Flow Restrictor (Qty 1)
- Membrane (Qty 1-2, based on model) and replacement o-ring (Qty 1-2)
 - There are kits available with no membranes

Model	Part Number	
	Membrane Kits	Kits Without Membranes
SRB800-FT	R188-0028	R188-0027

800 Components	Description	P/N
Anti-Scalant	PT401M,ANTISCALANT,(4) 1GAL. JUGS	95810125
PAA Disinfectant	PERACIDIN DISINFECTANT, 4 GALLON CASE	95-0013
RO	RO Pre-Filter - Sediment	20-2505
	RO Pre-Filter - Carbon Pre-Treatment	20-5102
	RO Pre-Filter - Granular Activated Carbon	20-5106
	RO Membrane	R22-2522
	O-Ring kit, membrane housing	24-0031
	O-ring, RO Pre-Filter Housing	21-0040
DI Resin Cartridges (QTY 3)	Mixed Bed DI Cartridges	20-6001

Storage Tank	Vent Filter	20-3021
Endotoxin Filters	Endotoxin Filters (QTY 4)	20-3046-CS
UV	UV Disinfection Bulb	76-0016
	UV Quarts Sleeve	76-0019
	UV Sensor	76-0017
Test Strips	Test Strips Water Soft, Water Hardness (6 bottles of 100 strips each)	97WS20301
	Test Strips pH (6 Bottles of 100 Strips each) For Measuring pH/Water/Acid, Base/Bicarbonate	97PH20901
	WaterCheck RC (6 Bottles of 100 Strips each) For Measuring Residual Chlorine	97RC22101
	WaterCheck 2 (6 Bottles of 100 Strips each) For Measuring Low Level Chlorine/Chloramine	97CM20201
	Assortment kit, chlorine, bleach, hardness, disinfectant residual (peroxide), disinfectant ppm (peroxide)	97WT3000

11.2 800 Spare Parts

11.2.1 800 Spare Parts - RO / DI

Part Number	Description
R080-0235	Pump Assembly, 115V, 1.25 GPM
0153-0227	RO Controller Replacement Kit
59-0047	Inlet Solenoid Valve, .38" FPT, NC, DIN inlet
65-0020	Inlet Pressure Switch, NO, Adj. 7.3 to 17.4 PSI
65-0021	Differential Pressure Switch, NO, Adj. 28.1 to 58 PSI
430002	Pressure Gauge, 0-100, U-Clamp
55-0018	Check Valve, .5" FPT

11.2.2 800 Spare Parts - Storage Tank

AmeriWater P/N	Description
911-0002	PUMP, REPLACEMENT, GRUNDFOS, CME5-3, 208-230V
R167-0017	FLOAT SWITCH, REPLACEMENT, ASSEMBLY, 10' CABLE
13-1075	O-RING, 10.75"x.139", EPDM , LID
85-0063	LID, TANK, 12" GAMMA SEAL, BLUE
21530234	O-RING,FLTR,HSG,#10 & #20 "SLIMLINE",.50 I/O,NO PR, 222 20 & 10"

11.3 2400 Consumables

2400 Components	Description	P/N
Anti-Scalant	PT401M,ANTISCALANT,(4) 1GAL. JUGS	95810125

PAA Disinfectant	PERACIDIN DISINFECTANT, 4 GALLON CASE	95-0013
RO	RO Pre-Filter (No Carbon Pre-Treatment)	20-5105
	RO Pre-Filter (Carbon Pre-Treatment)	20-1016
	RO Membrane	22-4046
	O-Ring, RO Pre-Filter Housing	21530239
	O-Ring Kit, RO Membrane Housing	24-0028
DI Resin Packs (QTY 2)	STARTUP PACK ULTRA PURE .48CUFT	DI-45101S
Storage Tank	Vent Filter	20-3021
Endotoxin Filters	Endotoxin Filters (QTY 4)	20-3046-CS
30 GPM Packages (00SPDVER2400)	UV Disinfection Bulb	76-0020
	UV Quarts Sleeve	76-0021
	UV Sensor	76-0017
Test Strips	Test Strips Water Soft, Water Hardness (6 bottles of 100 strips each)	97WS20301
	Test Strips pH (6 Bottles of 100 Strips each) For Measuring pH/Water/Acid, Base/Bicarbonate	97PH20901
	WaterCheck RC (6 Bottles of 100 Strips each) For Measuring Residual Chlorine	97RC22101
	WaterCheck 2 (6 Bottles of 100 Strips each) For Measuring Low Level Chlorine/Chloramine	97CM20201
	Assortment kit, chlorine, bleach, hardness, disinfectant residual (peroxide), disinfectant ppm (peroxide)	97WT3000

11.4 2400 Spare Parts

11.4.1 2400 Spare Parts – RO / DI

Part Number	Description
80-0313	Pump Replacement for AWRO1200 & AWRO2400
R69446021	S150 Controller Door Replacement
69-0096	Conductivity Sensor for S150 controller
63-0046	Fuse, 5A Time Delay, for AWRO Controller
R65-0014	Inlet Pressure Switch, Adjust 3-40 PSI, ¼" NPT
59-0027	Inlet/Flush Solenoid Valve, 1", NC, 120V, DIN
41-0054	Recirc Flowmeter with valve, 0.2-2 GPM, AWRO1200-2400
41530611	Reject Flowmeter with valve, 0.5-5 GPM, AWRO2400
41530608	Product Flowmeter, 0.5-5 GPM, AWRO2400
43530714	Pump/Reject Pressure Gauge, 0-300, CBM, U-Clamp
43-0023	Pre-filter Pressure Gauge, 0-160, BM
12677135	Hose, Medical, 1", Style 5000 (sold by foot)
21675190	Filter Housing, 4.5" X 20", 1.5" I/O, DOE
R0153-0229	Replacement Controller for AWRO1200-2400

60-0076	Motor Controls Replacement for AWRO1200-2400 and 12000-19200
69-0228	I/O Expander Board Replacement for AWRO Controller
69-0096	Conductivity Sensor Replacement AWRO with 10' cable

11.4.2 2400 Spare Parts – Storage Tank

AmeriWater P/N	Description
911-0002	PUMP, REPLACEMENT, GRUNDFOS, CME5-3, 208-230V
R167-0017	FLOAT SWITCH, REPLACEMENT, ASSEMBLY, 10' CABLE
13-1075	O-RING, 10.75"x.139", EPDM , LID
85-0063	LID, TANK, 12" GAMMA SEAL, BLUE
21530234	O-RING,FLTR,HSG,#10 & #20 "SLIMLINE",.50 I/O,NO PR, 222 20 & 10"

CALIFORNIA PROPOSITION 65

WARNING

This product can expose you to chemicals such as vinyl chloride (used in the production of PVC) or Nickel (used in the production of stainless steel), that are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Dear Valued Customer,

California Proposition 65 (Prop 65) is the Safe Water and Toxic Enforcement Act of 1986. The State of California began enforcing amendments to California Prop 65 at the end of August 2018. Prop 65 requires manufacturers to provide a clear and reasonable warning to residents of California about chemicals used in products that they purchase that are included on the Prop 65 Chemical List. The chemicals included on the list are chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. One such chemical is Vinyl Chloride, a compound used to produce Polyvinyl Chloride (PVC). The AmeriWater system you have purchased may contain PVC or stainless steel parts.

While warnings are only required in the State of California, AmeriWater has initiated the use of Prop 65 labeling for all products to ensure compliance with California regulations. Please note that the above warning does not necessarily mean that the product that you have purchased is unsafe. Products that have been cleared for market by FDA have been determined to be safe and effective by the United States Food and Drug Administration. The warning is simply a requirement by the State of California. If you wish to obtain additional information, please visit: p65warnings.ca.gov. You may also contact your AmeriWater representative if you have any questions.

Thank you for your understanding and we look forward to continuing to serve you.