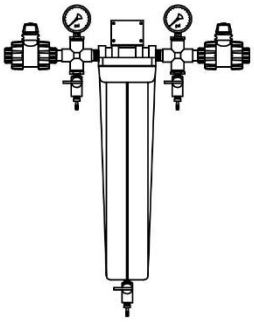
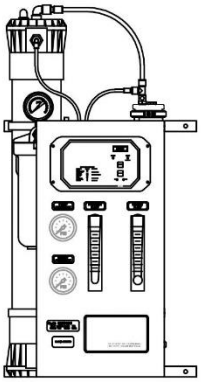
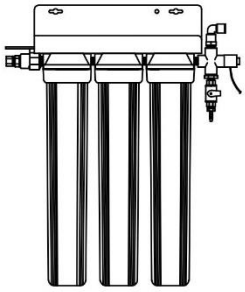
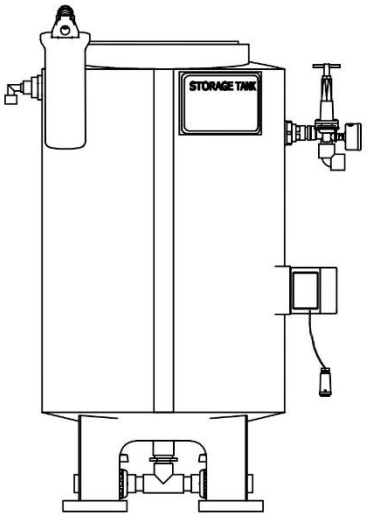
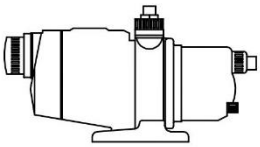
AmeriWater
The Water Purification Specialists

MOBILE SPD FOR STERIS
OPERATION & MAINTENANCE MANUAL



Manufactured With Pride
In The USA

www.ameriwater.com • 800-535-5585

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098-0003 Rev. B

TABLE OF CONTENTS

1.0 THEORY OF OPERATION

This system is designed to pretreat and purify water for use in health care applications. Below is the sequence of the water progression as it goes thru the components of the MOBILE SPD SYSTEM. Each component's theory of operation is listed in order of water progression thru the system.

RO:

The process of osmosis can be reversed by placing pressure upon the feed water side (concentrated solution side) of the membrane. Water will be forced through the membrane barrier to yield water that is purer on the lower pressure side of the membrane than on the more concentrated solution side (higher pressure side) of the membrane. The feed water will become more "concentrated," and will be discharged through the reject port known as "reject water" or "concentrate". Liberation of purer water from its solutions is caused by the reversal of the osmotic pressure; (the operation termed as "Reverse Osmosis"). Reverse Osmosis is commonly referred to as "RO".

DI:

Mixed Bed De-ionizer contains both the cation and anion resins in a single vessel. The purpose of mixing the resins is to achieve a very high quality deionized water. As water passes through the mixed bed, it has millions of chances to contact a cation resin bead, then an anion, then another cation, another anion, and so on. An exchange takes place, of course, only when a positive ion contacts a negative exchange site, and vice versa. With each exchange, purity of the water improves because more ions are removed and held by resin beads. Mixed bed deionizer is utilized as a polishing unit downstream of the RO.

STORAGE TANK:

The reverse osmosis unit makes a limited amount of water at a time. It is therefore necessary to store it in a storage tank. The storage tank is equipped with float switches, which will turn the reverse osmosis unit off and on when the water reaches a predetermined point in the storage tank.

This tank is also equipped with a spray nozzle on the return loop side of the tank. This allows disinfectant to reach all parts of the tank when it is applied to the tank, for faster disinfections.

The vent filter on the tank is designed to filter the air when water moves in and out of the storage tank. Tanks are equipped with a "rupture disk", which will break if the flow of air/water becomes too much for the filter or tank to handle.

The storage tank is equipped with 2 float switches, which will turn the reverse osmosis unit off when the water reaches the predetermined cutoff point and turn the RO on when the tank is drained to the appropriate level float. The distribution pump on the storage tank will cycle whenever there is a pressure drop detected.

ENDOTOXIN FILTER:

The Endotoxin-Retentive Filters are the final purification process prior to distribution of the product water. They are sub-micron filters with the ability to remove bacteria and endotoxin. The filters are enclosed in an opaque housing to inhibit the proliferation of algae. Water flows through the filter, which traps bacteria and endotoxin.

The MOBILE SPD SYSTEM is shipped completely assembled with required water treatment components. This Operation Manual was written specifically for the MOBILE SPD SYSTEM. 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 Customer Service with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. eastern standard 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 entire Operations Manual should be read before operating or servicing the system. This Operations Manual should then be kept near the system and used as a reference and troubleshooting guide.

1.1 SPECIFICATIONS

Connections	SRO Feed = 1/2" O.D. Tube SRO Product = 1/2" O.D. Tube SRO Reject to Drain = 1/2" O.D. Tube Wall Mount DI Feed = 1/2” O.D. Tube Wall Mount DI Product = 1/2” MPT to 3/4” FGHT Storage Tank Feed = 3/4” Male GHT Storage Tank Product = 1” FPT Storage Tank Return = 3/4” FPT Pump Suction = 1” FPT Pump Discharge = 1” FPT Endotoxin Filter Feed = 3/4”FPT Endotoxin Product = 3/4”FPT
Electrical Requirements	3X 120V 1PH Dedicated 20Amp GFI service
Shipping Weight Operating Weight	353 LBS 796 LBS

Note: Water with a silt density index (SDI) above 5 SDI will foul the membrane.

Note: For specifications on system components related to electrical requirements, system pressures and voltage draws, please refer to listed component manuals as listed below.

For 00SRO1095 RO, refer to Manual 98-0150

For 00MW200 Silex Wall Mount Deionizer, refer to Manual 98-0160

For 0185-8000 Healthcare Storage Tank, refer to Manual 098-0001

For 0021003 Loop Endotoxin Filter, refer to Manual 98-0033

1.2 SYSTEM FLOW DIAGRAM

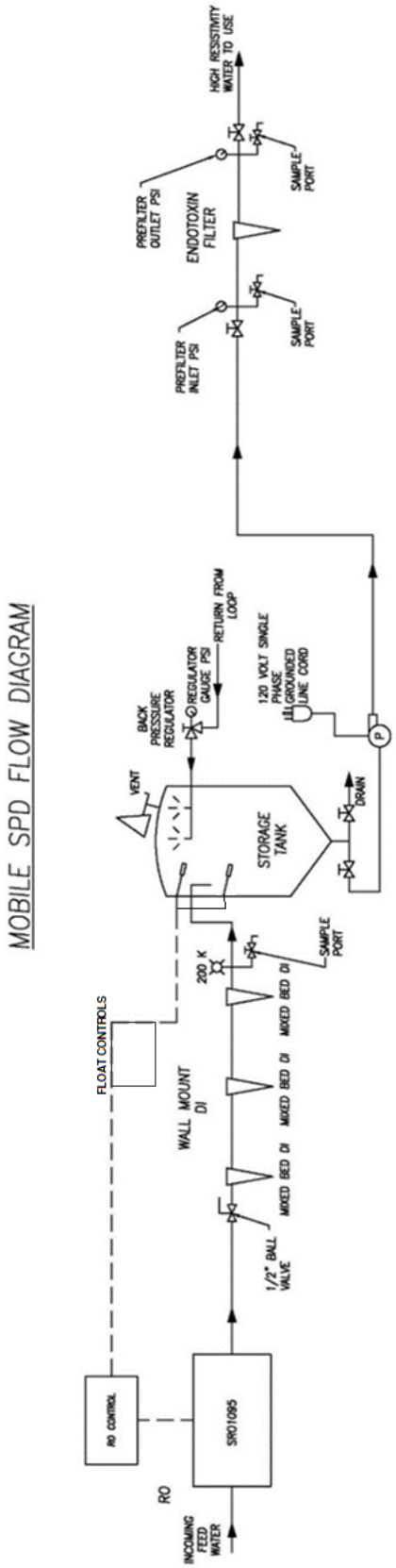

Figure 1.1

2.0 SYSTEM INSTALLATION

CAUTION: **Local plumbing and electrical codes must be observed.**

2.1 SRO

1. The electrical source for the S100 controller must be a single phase, 3-conductor receptacle with a ground fault interrupter (GFI) at 120V, 20amp, and 60Hz. The proper polarity and ground integrity must be initially checked and thereafter maintained. Failure to do so may result in electrical shock to the operator. The SRO must only be plugged directly into a GFI receptacle. It must not be plugged into an extension cord or power strip that could cause low amperage.

To avoid electrical shock, always unplug and disconnect the SRO system power source before opening the back of the electrical controller.

2. Mount the SRO (level) on a wall near a drain that can handle the reject water flow. (It is recommended to secure the frame to the wall with anchoring bolts.)

3. SRO is equipped with sediment and chlorine removal.

4. Connect the feed water supply to the inlet 1/2” fitting on the SRO prefilter.

5. The feed water supply requires a minimum dynamic pressure of 20 psi and maximum of 50 psi (at the pre filter gauge). Feed water supply tubing should be large enough to provide the required feed flow rate for the SRO. Connect the water supply from your isolation valve to the INLET of the pre filter.

6. Connect the REJECT WATER to an open drain, maintaining a 2” air gap.

7. Connect a product line to the fitting marked PRODUCT WATER.

8. Remove and discard the 5 micron sediment filter (part number 20-1051) that has been factory installed and Install the supplied 10 micron Carbon Block filter cartridge (part number 20-5101).

9. Always maintain water flow and pressure to avoid damage to the RO pump.

CAUTION: **To ensure proper assembly, all tubing extensions MUST be fully inserted into fitting bodies, to the tube stops.**

10. Plug the power cord into a dedicated 120-volt, 20-amp GFI receptacle.

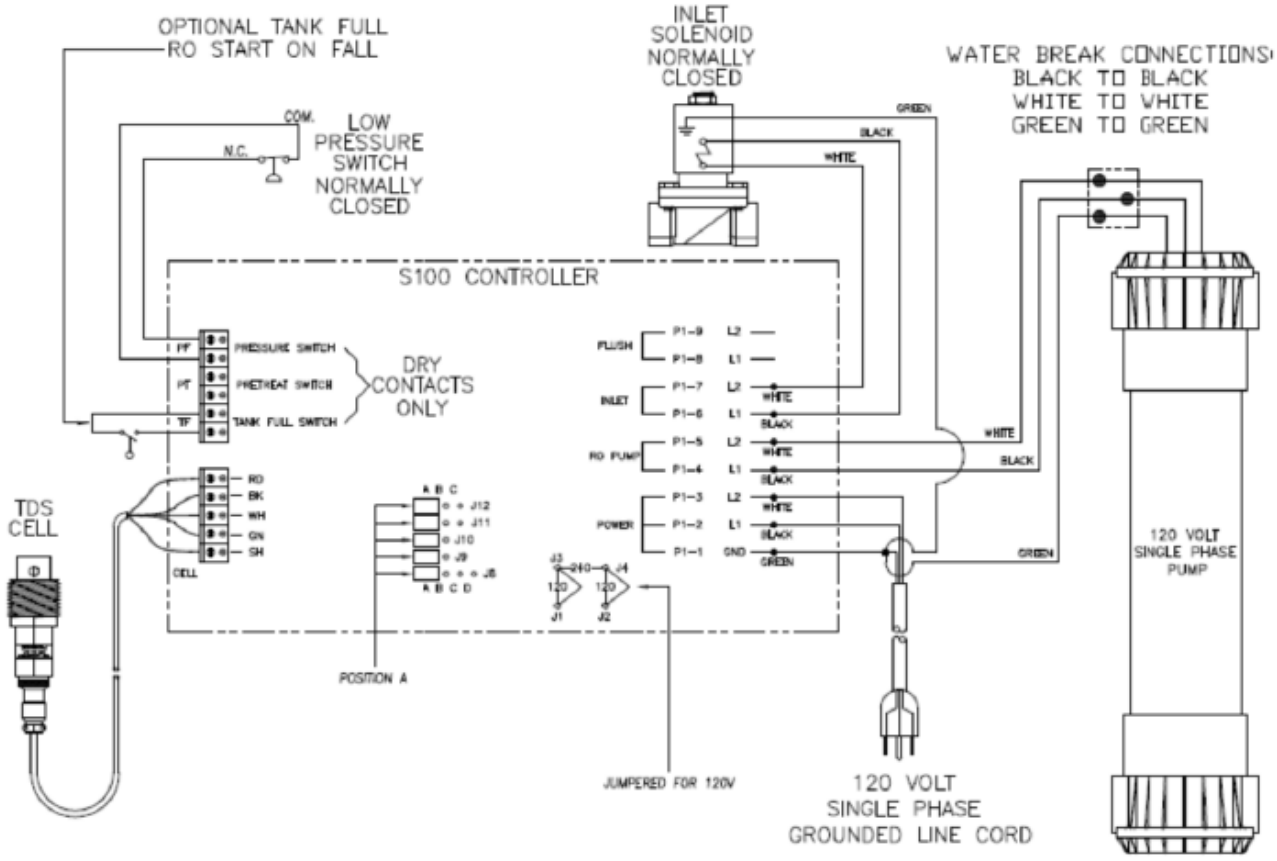

Figure 1.2 SRO Controller Diagram

2.2 WALL MOUNT DI

The Ameriwater Wall Mount Deionizer should be installed on a wall capable of supporting 50 pounds.

1. Locate the DI Polisher to the right of the SRO, just before the storage tank and within 6 feet from a 120 volt 60 hertz receptacle

2. Assembly should be level when mounted to the wall.

3. Connect tubing from the SRO product flow meter outlet to the Wall Mount DI inlet 1/2" tube connector on the ball valve. (Figure 2.1)

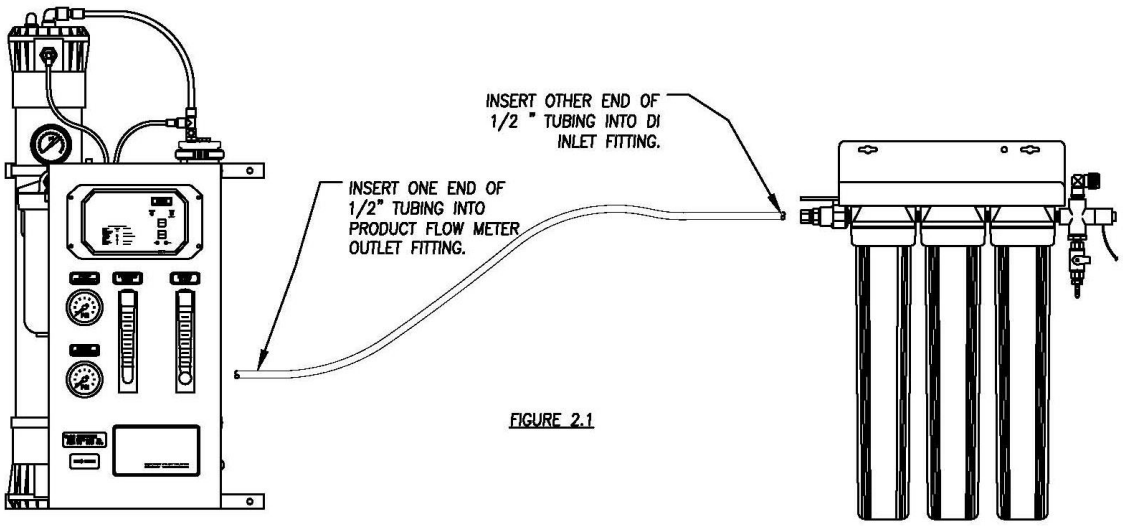

FIGURE 2.1

4. Connect DI to storage tank hose to the 1/2” MPT x 3/4” GHT outlet fitting. (Figure 2.2)

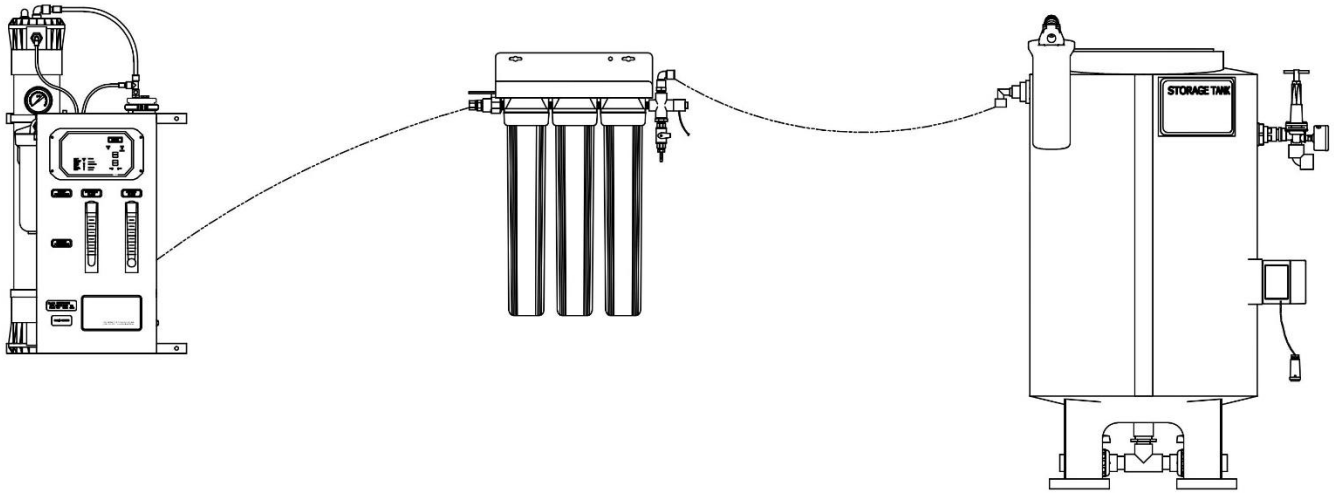

FIGURE 2.2

5. Make sure that the deionizing cartridges are installed in the filter housing and that the bowls are hand tightened only.

6. Plug transformer into the receptacle and open the inlet and sample port valves.

2.3 STORAGE TANK

1. Locate the storage tank on a firm, level foundation and anchor securely.

2. Connect the Wall Mount DI product outlet hose to the storage tank's inlet. (Figure 2.2 above)

3. Connect the tank outlet to the distribution pump. (Figure 2.3)

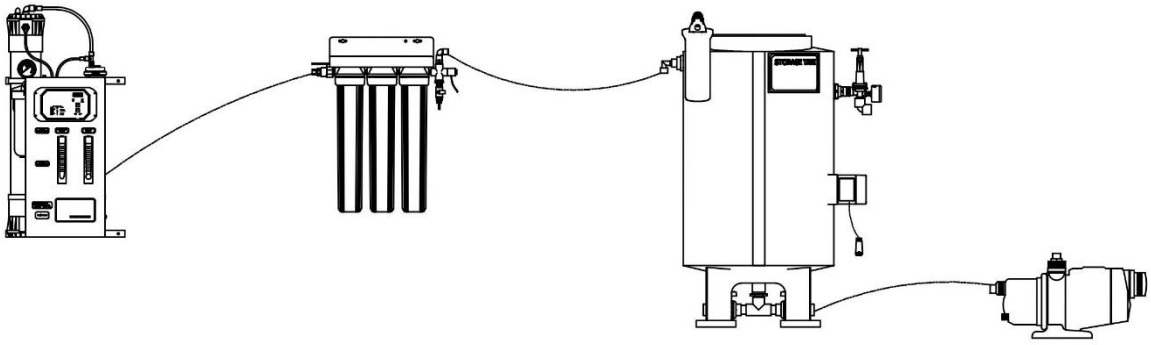

FIGURE 2.3

4. Run the float switch quick disconnect from storage tank to the SRO controller and lock in place. Length of cord approximately 10 ft. (Figure 2.4)

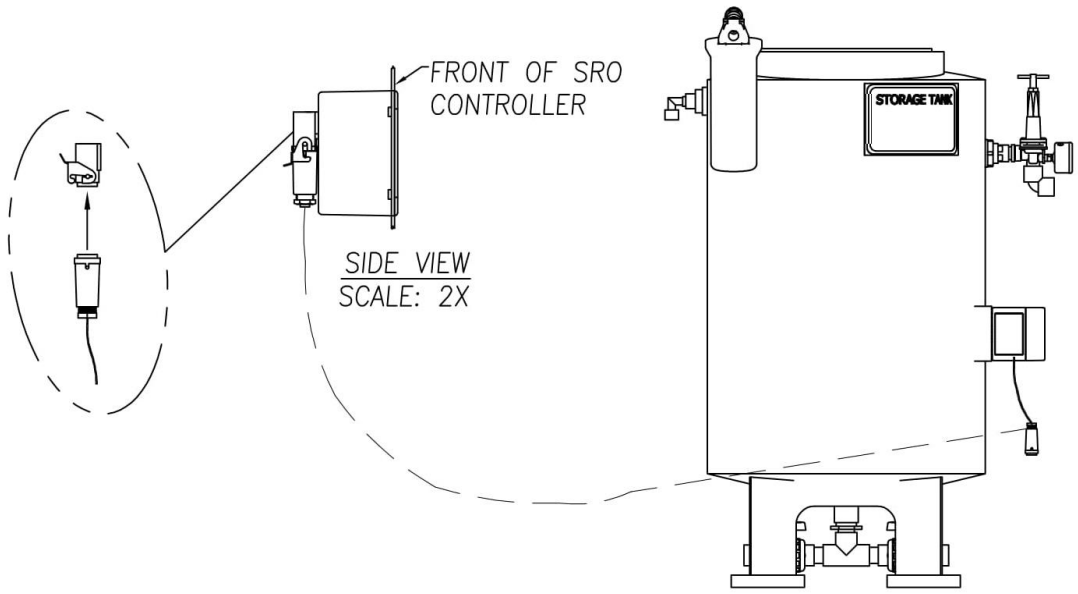

FIGURE 2.4

2.4 ENDOTOXIN FILTER

1. Locate and install the Endotoxin-Retentive Filter assembly on or near the wall.
2. Connect the 1” pump discharge hose to inlet valve on the endotoxin filter assembly. (Figure 2.5)

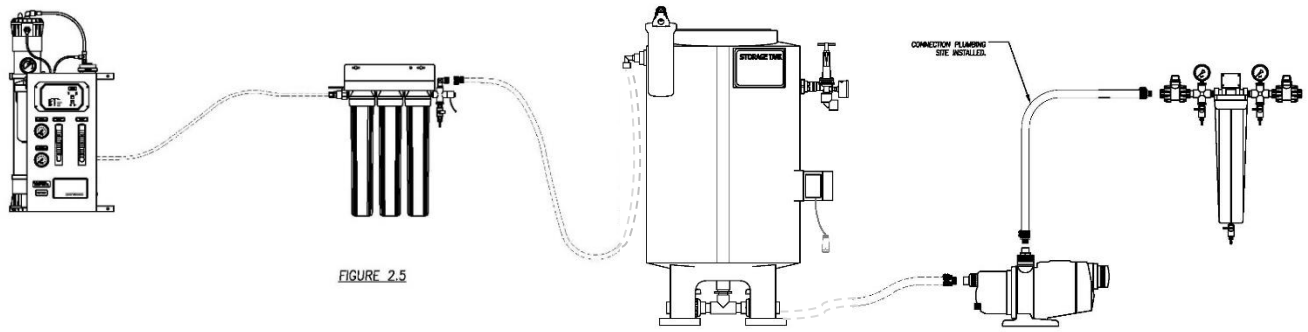

FIGURE 2.5

3.0 SYSTEM START-UP

WARNING: This Reverse Osmosis System (RO) contains a preservative solution to prevent microbiological growth and freezing. Discard all product water for at least two hours of operation before placing the RO in service.

NOTE: As each component is started and flushed of any debris, make sure to divert loop water to the drain to flush loop of any debris as well.

For 00SRO1095 RO, refer to Manual 98-0150

For 00MW200 Silex Wall Mount Deionizer, refer to Manual 98-0160

For 0185-8000 Healthcare Storage Tank, refer to Manual 098-0001

For 0021003 Loop Endotoxin Filter, refer to Manual 98-0033

3.1 OPERATION

Once the system has been started, the SRO will continue to make water until the float switch is tripped upon high water level in the storage tank. At this point, the SRO will be placed into standby (tank full) until the water in the storage tank reaches a low-level to open the float switch. Once the float switch opens, the SRO will re-initialize and begin to produce water again. In the event that the TDS is above the pre-determined set-point, the alarm lamp will light and the HI TDS warning message will show on the display. This warning will clear when the TDS drops below the Setpoint.

The DI polishes the water from the RO. The DI continues to polish the water until the resistivity light senses that the incoming water is above the threshold value of 200,000 ohm. At which point, the resistivity light will turn red showing a warning of the water quality being above the pre-determined set-point of 200,000 ohms.

The Endotoxin filter will remove endotoxins from the feed water, sending the filtered water to the loop.

4.0 MONITORING

Under AAMI TIR34 requirements, the below listed items need to be monitored on varying intervals.

1. Ultra filters are to be monitored daily for a pressure drop. The pressure drop across the filter that indicates the need for replacement is 15 PSI.

2. Reverse osmosis systems should be monitored in accordance with the facility's quality management system, using continuous-reading monitors that measure product water quality (total dissolved solids). These measurements can provide a measure of equipment performance.

3. Cartridge filters are to be monitored daily for a pressure drop. The pressure drop across the filter that indicates the need for replacement is 15 PSI.

4. Water storage tanks are to be monitored monthly for the three listed specifications:
   a. Bacterial count – Utility and critical of <10 cfu/mL
   b. Tap, softened, deionized water of <200 cfu/mL [2]
   c. Endotoxin- Critical Water of <10 EU/mL[2]

Fill out the monitoring log daily. Having this information available will help to quickly diagnose issues related to performance. Failure to carry out the daily monitoring and maintenance at the indicated intervals will result in reduced performance of the SRO system and may void the warranty.

(SHOULD BE COMPLETED DAILY WHEN THE SYSTEM IS USED)

DATE			
SRO PERFORMANCE	**PARAMETERS**	**RECORDED PARAMETERS**	**INITIALS**
Feed Water Temperature	**50ºF - 80ºF**		
Feed Water Pressure	**>20PSI**		
Pump PSI	**100 - 200PSI**		
Product Flow - GPM	**0.55 - 0.76**		
Reject Flow - GPM	**ADJUSTED EQUAL TO PRODUCT**		
Product Quality - TDS	**< 25ppm**		
Total Chlorine	**< 0.1ppm**		
Reject PSI	**< 135PSI**		
WALL MOUNT DEIONIZER			
Product Quality >100,000OHM when operating	**GREEN LIGHT**		
STORAGE TANK			
Loop Return PSI	**>30 PSI**		
Vent Filter Dry	**YES/NO**		
DISTRIBUTION PUMP			
Pump PSI	**>65psi**		
ULTRA FILTER			
Filter ΔP	**<15PSI**		
EXCHANGE			
10 Micron Carbon Block Pre-Filter	**AS NEEDED**		
Membrane	**AS NEEDED**		
Deionizer Cartridges	**RED LIGHT**		
Storage Tank Vent Filter	**YEARLY / WET**		
Endotoxin Filter Cartridges	**>15 ΔP**		

5.0 PREVENTATIVE MAINTENANCE SCHEDULE FREQUENCY

For 00SRO1095 RO,

Pre-filter, part number 20-5101, must be replaced in the event of listed instances below:

1. High chlorine levels of greater than 0.1ppm
2. Pressure drop across the filter of greater than 15PSI.

Membrane, part number R22-2521, must be replaced in the event of listed instances below:

1. Fouled - reading of poor quality product water with a TDS of greater than 25ppm.
2. Low product flow rate of less than 0.55gpm.
3. Winterization – Winter Storage

For 00MW200 DI,

DI Cartridge, part number 20-6001, must be replaced in the event of listed instances below:

1. Red light - the red light warns that the water conductivity is above the threshold value of 200,000 ohm

For 0185-8000 Storage Tank,

Vent Filter Cartridge, part number 20-3021, must be replaced in the event of listed instances below:

1. Yearly – Cartridge must be changed on a yearly basis
2. Filter cartridge is wet

For 0021003 Loop Endotoxin Filter,

Endotoxin Filter Cartridge, part number 20-3046, must be replaced in the event of listed instances below:

1. >ΔP of 15 psi – A differential pressure loss of greater than 15psi.
2. Levels for Bacteria of Endotoxins are exceeded.
3. Yearly

All nine above instances can be identified by following a daily regiment of monitoring as listed in section 4.0 table.

5.1 WINTERIZATION

Step 1 –

Disconnect all Power sources.

Filter housings- Open the sample ports to all filter housings in the system (i.e. RO prefilter, Wall Mount DI, Endotoxin filters) to relieve water pressure. Open filter housings, remove filters cartridges and discard cartridges. Undo any plumbing connections to the filter housing that will not allow water to freely drain from the fitting.

Step 2 –

Drain water from system. Open all plugs. Disconnect all joints. Save all plugs and O-rings / gaskets. (Fig. 5.1)

Step 3 –

Gages – Because gages are liquid filled. Remove from RO, Storage Tank and from Endotoxin Filter. Store in an area above 34 degrees F. Gages are located on face plate of the RO and top of the Pre filter housing, Return on the Storage Tank and the inlet and outlet of Endotoxin filter. (Fig. 5.1)

Step 4 –

Membranes – Remove membranes from housings and discard. Disconnect joints to membrane. Remove all water pooling in any joints. Remove any connection that will not allow water to free flow out of it. Uncouple the product line and drain all water. Remove any fitting that will not allow water to flow freely out of it. (Fig. 5.1)

Step 5 –

RO Pump Assembly – Disconnect all fitting to the pump assembly. Allow pump housing to completely drain.

Step 6 –

Demand pump – MQ pump. Remove drain cock on the MQ pump and allow to drain.

Step 7 –

Wall Mount DI – Open DI housings, remove DI cartridges and discard cartridges. Completely drain housings. Once housings are drained, put housing O-rings in housing bowl.

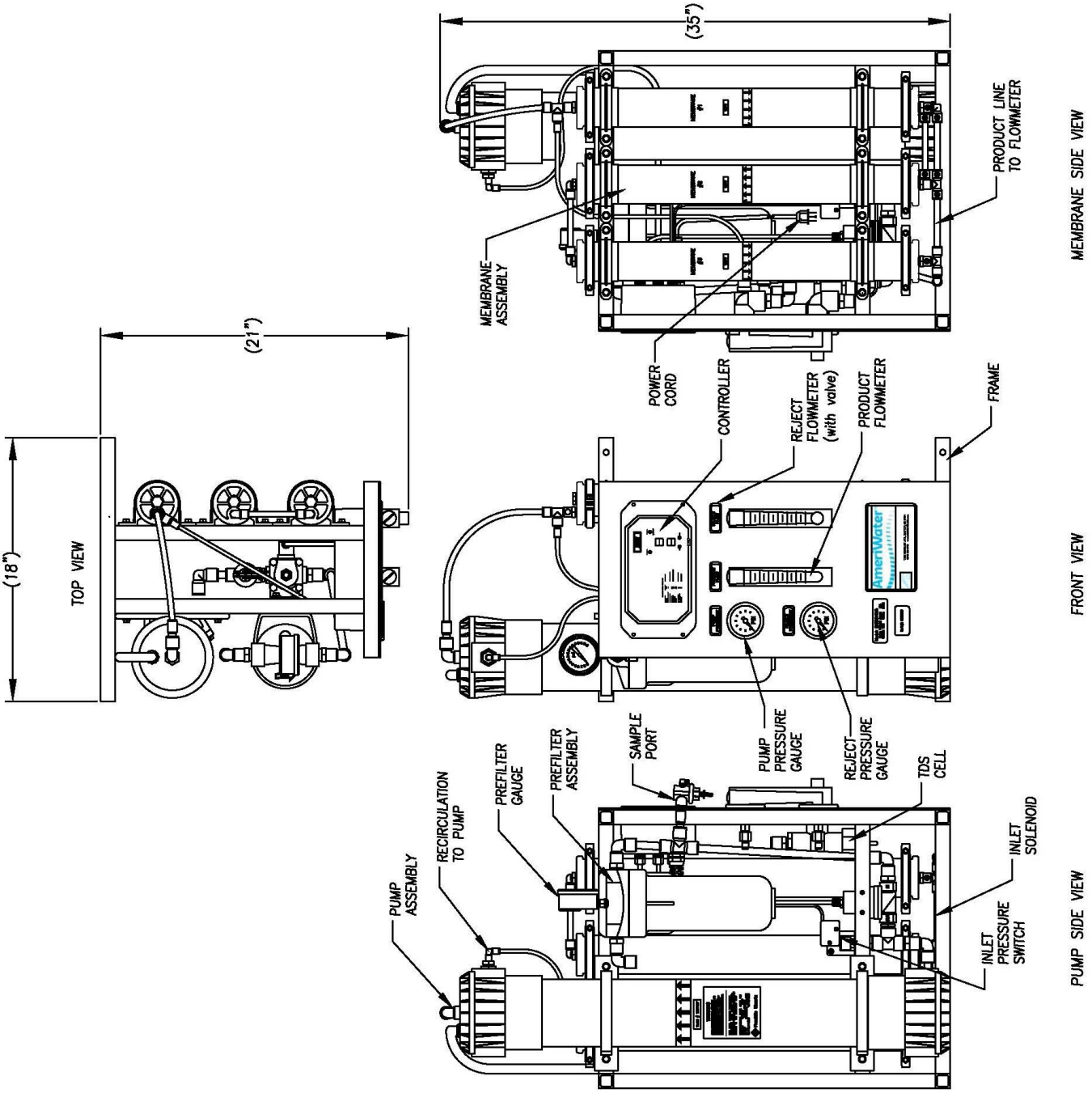
(21")
(18")
TOP VIEW
(35")
MEMBRANE ASSEMBLY
PRODUCT LINE TO FLOWMETER
MEMBRANE SIDE VIEW
POWER CORD
CONTROLLER
REJECT FLOWMETER (with valve)
PRODUCT FLOWMETER
FRAME
FRONT VIEW
PUMP PRESSURE GAUGE
REJECT PRESSURE GAUGE
SAMPLE PORT
TDS CELL
PREFILTER ASSEMBLY
PREFILTER GAUGE
RECIRCULATION TO PUMP
PUMP ASSEMBLY
INLET SOLENOID
INLET PRESSURE SWITCH
PUMP SIDE VIEW

Figure 5.1

6.0 UNIQUE COMPONENT PART NUMBERS

UNIQUE COMPONENT PARTS (NON-DURABLE COMPONENTS)

PART #	DESCRIPTION
20-6001	FILTER CARTRIDGE,MIXED BED DI,20"x2.5",11000 mg/L
20-3046	FILTER CARTRIDGE ABSOLUTE ENDOTOXIN PALL,0.2 MICRON, 2.5" x 20", 222
20-5101	FILTER CARTRIDGE CARBON BLOCK, 10 MICRON, 2.5" X 10", DOE
0185-0070	TANK,VENT,FILTER,ASSY,.5",2.5x10,.75
20-3021	VENT,FILTER CARTRIDGE SUBMICRON, 0.2 MICRON, 2.5" X 10", DOE
R22-2521	MEMBRANE, 2.5 X 21 (System requires quantity of 3)
24-0031	O-RING,LARGE FOR 24-0024 2.5" SST HOUSING (RO Membrane)
24-0035	O-RING, 4x26, 24-0024 END CAP 2.25, and 40' SS HSG, SMALL BLUE O-RING (RO Membrane)
21-0035	O-RING,FLTR,HOUS,#10 “SLIMLINE”, BLUE/BLK, .50I/O,NO PR (Prefilter, Vent Filter and DI)
21530233	O-RING,FLTR HSG,10IN BB,SQ THD (Loop Endotoxin Filter Assembly)

*Call AmeriWater or your AmeriWater distributor for pricing.

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7.0 TROUBLESHOOTING GUIDE

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⚠ 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.