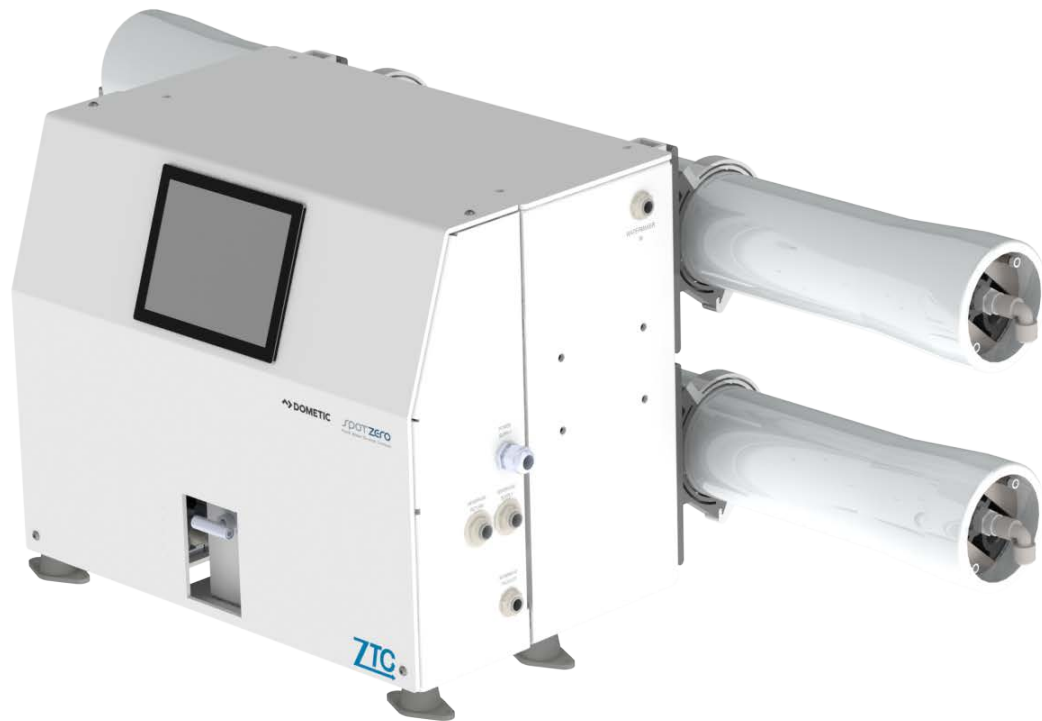




spotZERO®
Fresh Water Reverse Osmosis



ZTC

ZTC2000 ZTC3000

www.spotzerowater.com

TABLE OF CONTENTS

1. INTRODUCTION	4
Congratulations.....	5
System Requirements and Operation Guidelines.....	5
Acronyms and Definitions	7
Principles of Reverse Osmosis	8
Unit Specifications	9
2. INSTALLATION AND COMMISSIONING	10
Feed Water.....	11
Electrical Connections.....	14
Commissioning Report Form	18
3. SYSTEM OPERATION.....	20
Home Screen	21
Emergency Stop	22
Operation from Dock Feed	23
Water Maker Source	24
Menu Options	25
Summary	26
System Information.....	26
Alarms	27
Alarm History	28
Service Menu	29
Units of Measurement	29
Maintenance	30
Remote Support.....	30
Enable Remote Support	31
Remote Touch Screen Setup.....	37
4. SYSTEM MAINTENANCE	41

5. SYSTEM SCHEMATICS47

6. SYSTEM SPECS AND PARTS53

1. INTRODUCTION

CONGRATULATIONS

Your Spot Zero™ reverse osmosis system is a durable piece of equipment, which, with proper care, will last for many years. This User's Manual outlines installation, operation, maintenance and troubleshooting details vital to the sustained performance of your system.

Your system is designed to operate at a pressure of 80- 150 psi, unless otherwise stated. The recovery set for your system is between 50%-75%.

NOTE: Prior to operating or servicing the Spot Zero reverse osmosis system, this User's Manual must be read and fully understood. Keep it and other associated information for future reference and for new operators or qualified personnel near the system.

SYSTEM REQUIREMENTS AND OPERATION GUIDELINES

Plumbing

The membranes and high pressure pumps used on Spot Zero systems require a continuous and non-turbulent flow of water to the system with a minimum feed pressure of 20 psi during operation, which does not exceed 105°F.

The tubing or piping used for the inlet of the feed water is 3/4" ID. The tubing or piping used for the discharge of the concentrate is 3/8 O.D. and should be run to an open over board in a free and unrestricted manner.

The tubing or piping used for the product is 3/8 O.D. and can be transported to the holding tank or directly through a high quality nylon tubing or PVC pipe or other FDA accepted materials.

Material must not precipitate in the system. Be certain that all of the components of the feed water are soluble at the concentrations attained in the system

CAUTION: Any restrictions or blockage in the overboard discharge line can cause back pressure, which will increase the system's operating pressure. This can result in damage to the system's components and possible leaks of components or tubing.

Electrical

The motors used on Spot Zero™ systems are pump and motor combinations. They are available in single-phase 115 volt or 230 volt AC.

Please ensure that the electrical circuit supplying the system is compatible with the requirements of the specific Spot Zero™ model.



Pre-Filtration

Spot Zero™ systems are supplied with a 1 micron sediment pre-filter (part # 252404005) that filters out most particles over 1 microns, a GAC/KDF (part # 252404004) Cartridge that removes chlorine, chloramine, VOCs and heavy metals. CAUTION: a traditional carbon block filter must not be used as it will not remove chloramines and will cause permanent membrane damage. Pre Filters should be changed every 100 hours and/or whenever there is a pressure difference of 15 psi or more between the pressure readings before and after the filter. The pump must NEVER be run dry. Operating the pump without sufficient feed water will damage the pump. ALWAYS feed the pump with filtered water. The pump is susceptible to damage from sediment and debris.

NOTE: THE SZ10KDF2 CARTRIDGE MUST BE FLUSHED OUTSIDE OF SYSTEM BEFORE OPERATING TO REMOVE CARBON DUST. You can head to www.spotzero.com/support to see demo videos. Do not attempt to clean used filter cartridges. The SZ10KDF2 is rated to absorb chlorine, chloramine, heavy metals, etc. up to 18,000 gallons of feed water, which is the equivalent to approximately 100 hours of run time.



CAUTION: If the pre-filter becomes clogged and the water flow to the pump is reduced or interrupted, cavitation will occur. This will damage the pump.



Reverse Osmosis Systems

SZ-10KDF2
Dometic P/N#252404004

COCONUT SHELL GAC/2 LBS KDF
4.5" OD x 1.1" ID x 9.875"L

DIRECTIONS FOR USE: Flush with water hose for minimum of 60 seconds prior to use to remove carbon dust. Use only with microbiologically safe & adequately disinfected water. These filters must be replaced every 100 hours of use to prevent chlorine and/ or chloramine damage to membranes.

- Superior Chlorine Reduction
- Superior Chloramine Reduction
- Effective Bad Taste & Odor Reduction
- Greater VOC Reduction than Standard GAC Cartridges
- Post-Filter to Reduce Carbon Fines
- 15,000 US Gallon Capacity
- Water-washed Coconut Shell Activated Carbon
- Available in a Variety of Sizes and Flow Rates
- 2.0 lbs KDF-55 Media

Temperature Ratings: 40°F to 100°F

2000 N Andrews Ave. Ext.
Pompano Beach, FL 33069
954-973-2477 F 954-979-4414
marinesales@dometicUSA.com www.spotzerowater.com



Reverse Osmosis Systems

SZ-45-1001
Dometic P/N#252404005

SEDIMENT DEPTH FILTER: 4.5" ODx1" IDx9.785"L

- 1 µ Nominal Filtration
- 100% Polypropylene Sediment Filter Cartridge
- Four Separate Layers of Filtration
- Excellent Dirt Holding Capacity
- High Efficiency, Low Pressure Drop and a Long Life
- Tested for Performance & Verified by Independent Laboratory.

Temperature Ratings: 40°F to 100°F

2000 N Andrews Ave. Ext.
Pompano Beach, FL 33069
954-973-2477 F 954-979-4414
marinesales@dometicUSA.com www.spotzerowater.com

Do not use with microbiologically unsafe water and water of unknown quality without proper disinfection before or after the filter.

ACRONYMS AND DEFINITIONS

ACRONYM/SYMBOLS	DEFINITION
FWF	FRESH WATER FLUSH
RO	REVERSE OSMOSIS
PSI	POUNDS PER SQUARE INCH
GPM	GALLONS PER MINUTE
GPD	GALLONS PER DAY
TDS	TOTAL DISSOLVED SOLIDS
PPM	PARTS PER MILLION
TCF	TEMPERATURE CORRECTION FACTOR
LP SWITCH	LOW PRESSURE SWITCH
HP SWITCH	HIGH PRESSURE SWITCH
Φ	PHASE
SW	SEA WATER
FW	FRESH WATER

PRINCIPLES OF REVERSE OSMOSIS

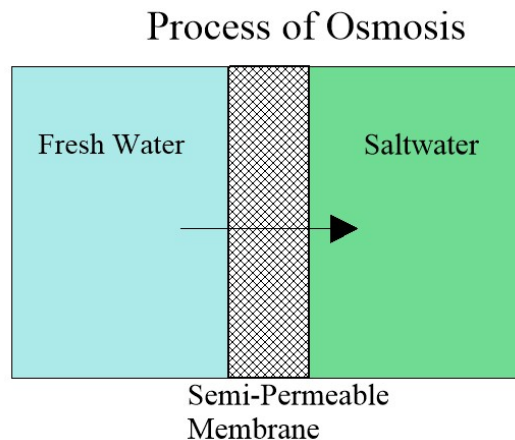
REVERSE OSMOSIS

How Fresh Water Is Produced

Reverse Osmosis or “RO” is a process where freshwater water is produced by pumping saltwater through a semi-permeable membrane.

Osmosis

Osmosis is a naturally occurring process where a weak solution will cross a semi-permeable membrane to mix with a highly concentrated solution. For example a freshwater solution will naturally want to mix with a saltwater solution.



Reverse Osmosis

To reverse this process work is put into the system using a pump. The pump causes pressure to build up on the saltwater side of the membrane. This pressure forces water across the semi-permeable membrane. The membrane is designed to allow the water molecules to pass while preventing the salt and other solids from doing so. Fresh water is collected on the other side of the membrane as a result.

UNIT SPECIFICATIONS

ZTC MODEL	2000	3000
FW Configuration (Spot Zero)	1 Vessel	2 Vessels
Feed Water Source	Fresh Water	Fresh Water
Rated Production Dock Water –gpd(ldp)	2000(7571)	3000(11356)
Rejection and Flow Rates		
FW Nominal TDSRejection % (Spot Zero)	95%	95%
FW Minimum Concen-trate Flow gpm (lpm)	1 (3.7)	1(3.7)
Connections		
FW Feed inch (Spot Zero)	1/2"	1/2"
Product inch	3/8" QC 9.5mm	3/8" QC 9.5mm
Concentrate inch	1/2" QC 12.7mm	1/2" QC 12.7mm
Membranes		
FW Membrane Per Vessel	1	1
FW Membrane Size	4039	4039

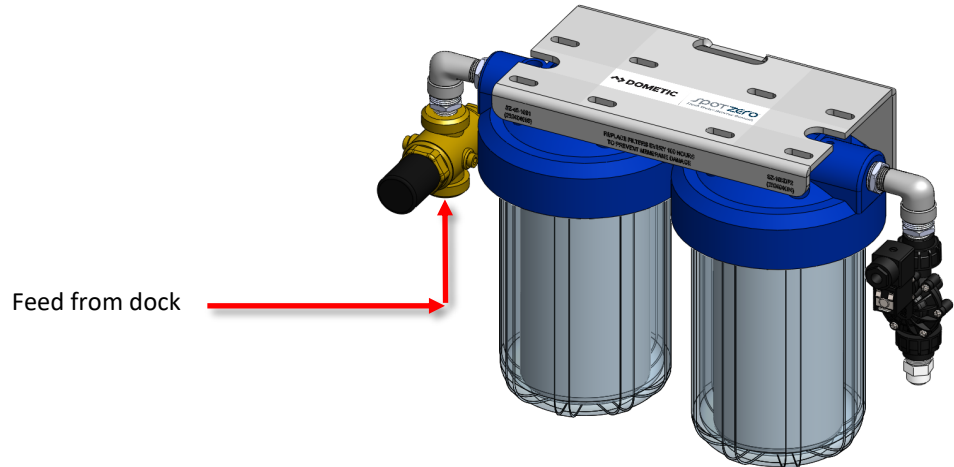
Pumps		
FW Pressure Pump Type	Vane	Vane
FW RO Motor amps	5.1	5.1
Electrical		
Voltage	230V 50/60Hz 1Φ	230V 50/60Hz 1Φ
Weight lb. (kg)	108(49)	108(49)

2. INSTALLATION AND COMMISSIONING

INSTALLATION PROCEDURE

FEED WATER

1. Plumb the feed water from the dock into the pre-filter inlet pressure regulator fitting. 3/4" FNPT or 1" MNPT custom connection from customer.



2. Tube cutting and installation procedure.

Cut the tube square



Cut the tube square and remove burrs and sharp edges. Ensure the outside diameter is free of score marks. For soft or thin walled tube we recommend the use of a tube insert.

Push up to tube stop



Push the tube into the fitting, to the tube stop.

Pull to check secure



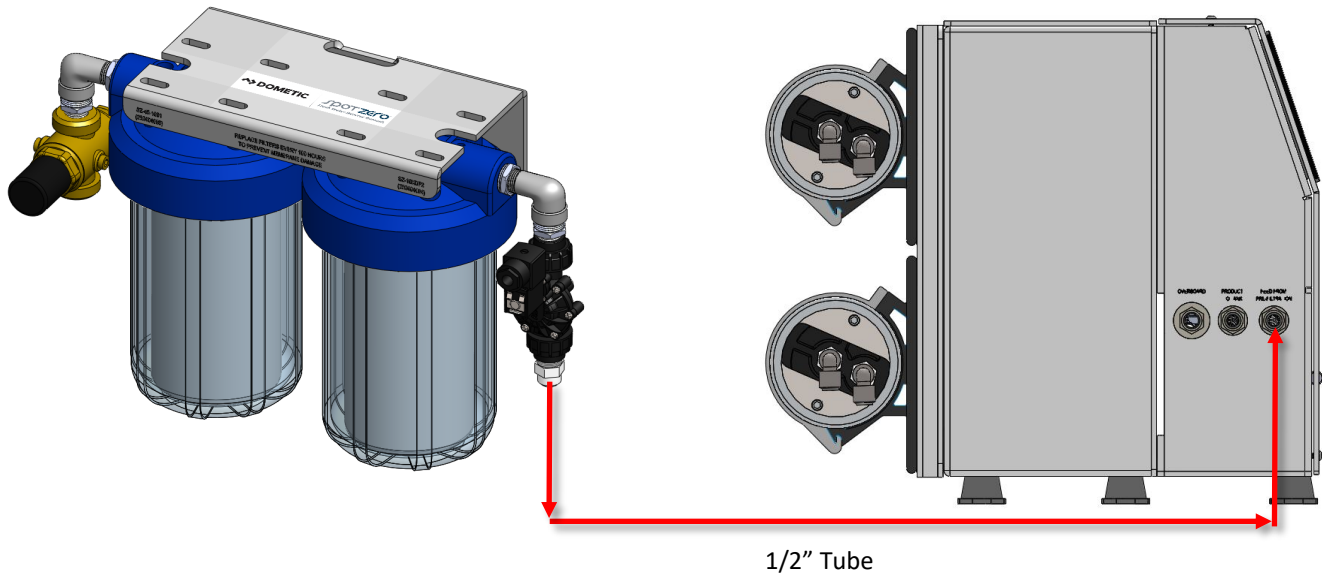
To disconnect

Push in collet and remove tube



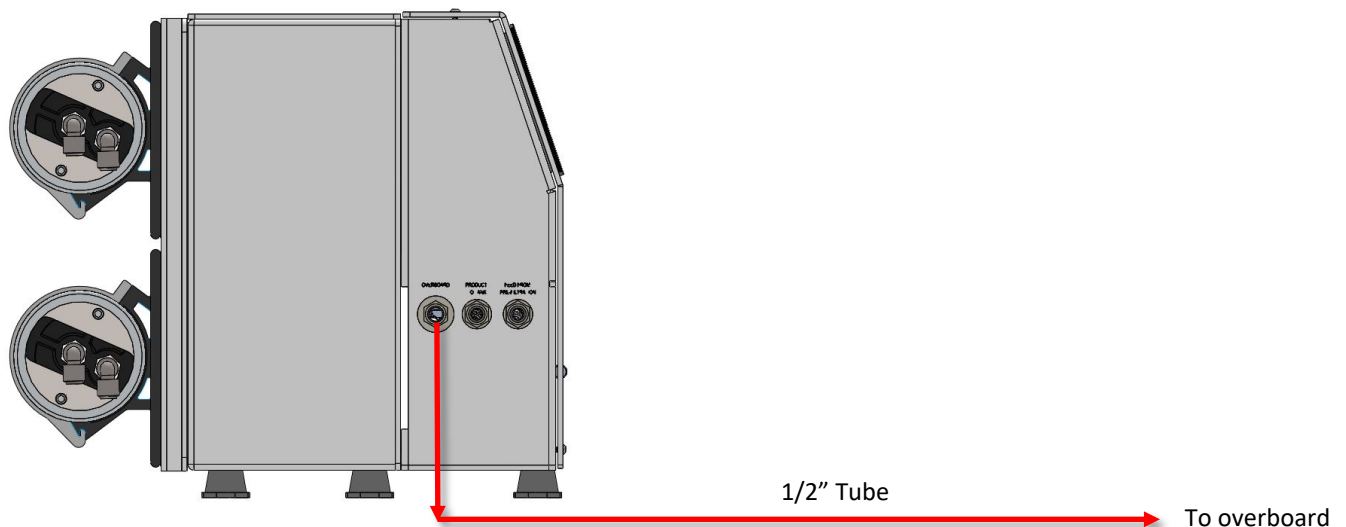
To disconnect, ensure the system is depressurized, push the collet square against the fitting. With the collet held in this position the tube can be removed.

3. From the pre-filter outlet fitting, run the white nylon 1/2" Spot Zero water tubing to the feed from pre-filtration fitting.

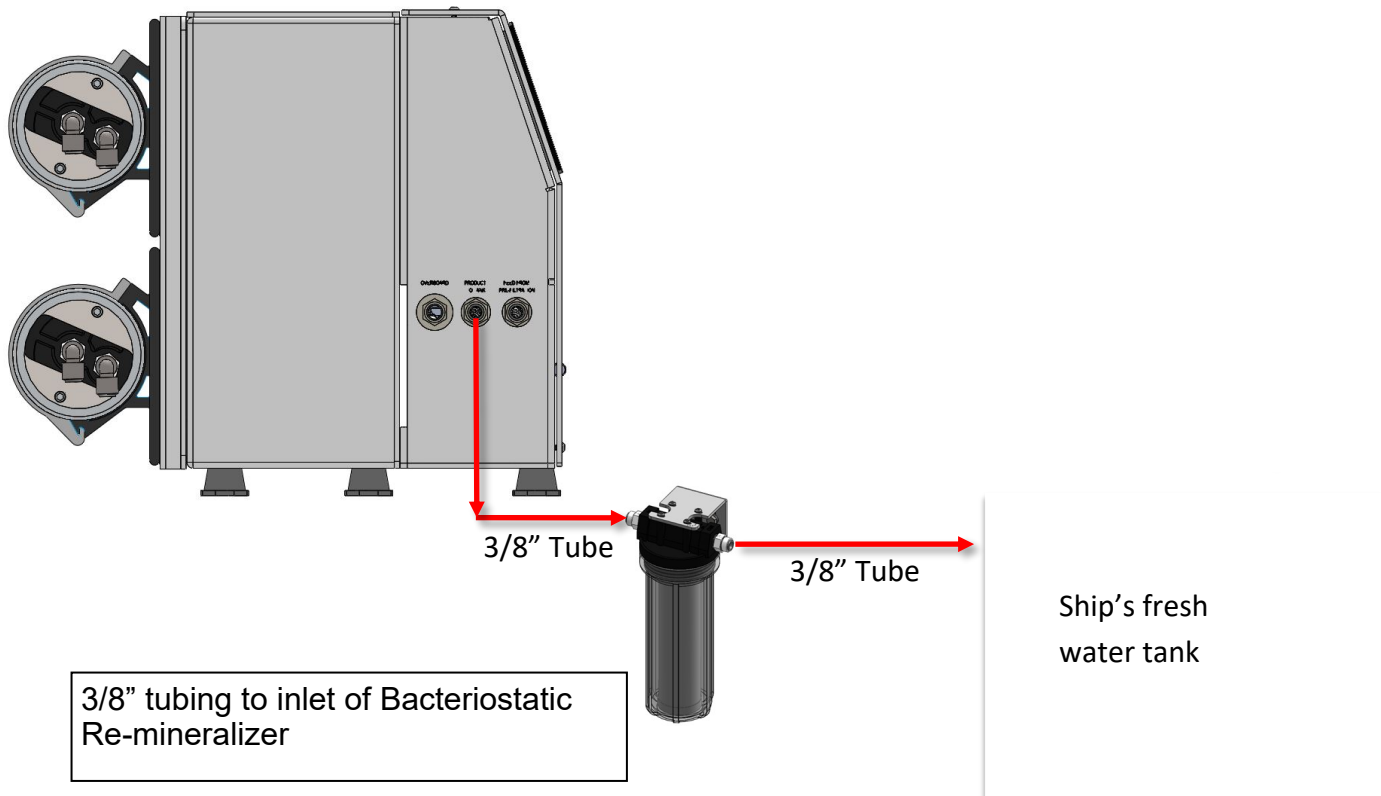


4. From the "Overboard" discharge fitting, run the white nylon 1/2" Spot Zero water tubing to a dedicated overboard fitting. Water must be allowed to run freely, without any restrictions or blockage in the brine discharge line. Be sure that no back pressure exists in the "Overboard" discharge line.

Note: There is an internal check valve in the brine discharge line in the system.

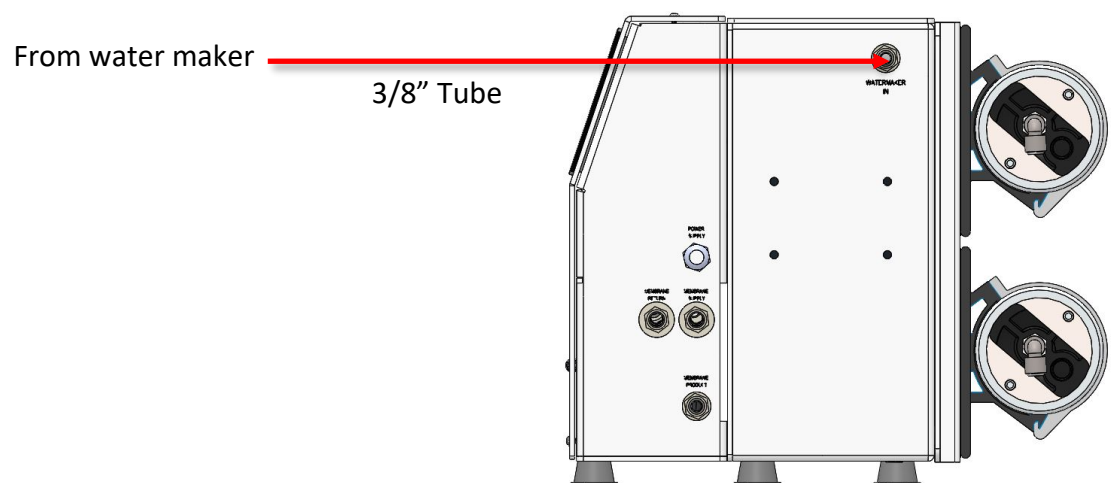


- From the product to tank fitting, run the white nylon 3/8" Spot Zero water tubing to the vessels fresh water tank.



FEED FROM WATERMAKER

- Connect the 3/8" product line from the water maker to the "WATER MAKER IN" fitting. Always install a three way valve in line with this, so the water can be diverted to the spot zero system, or to the vessels fresh water tank.



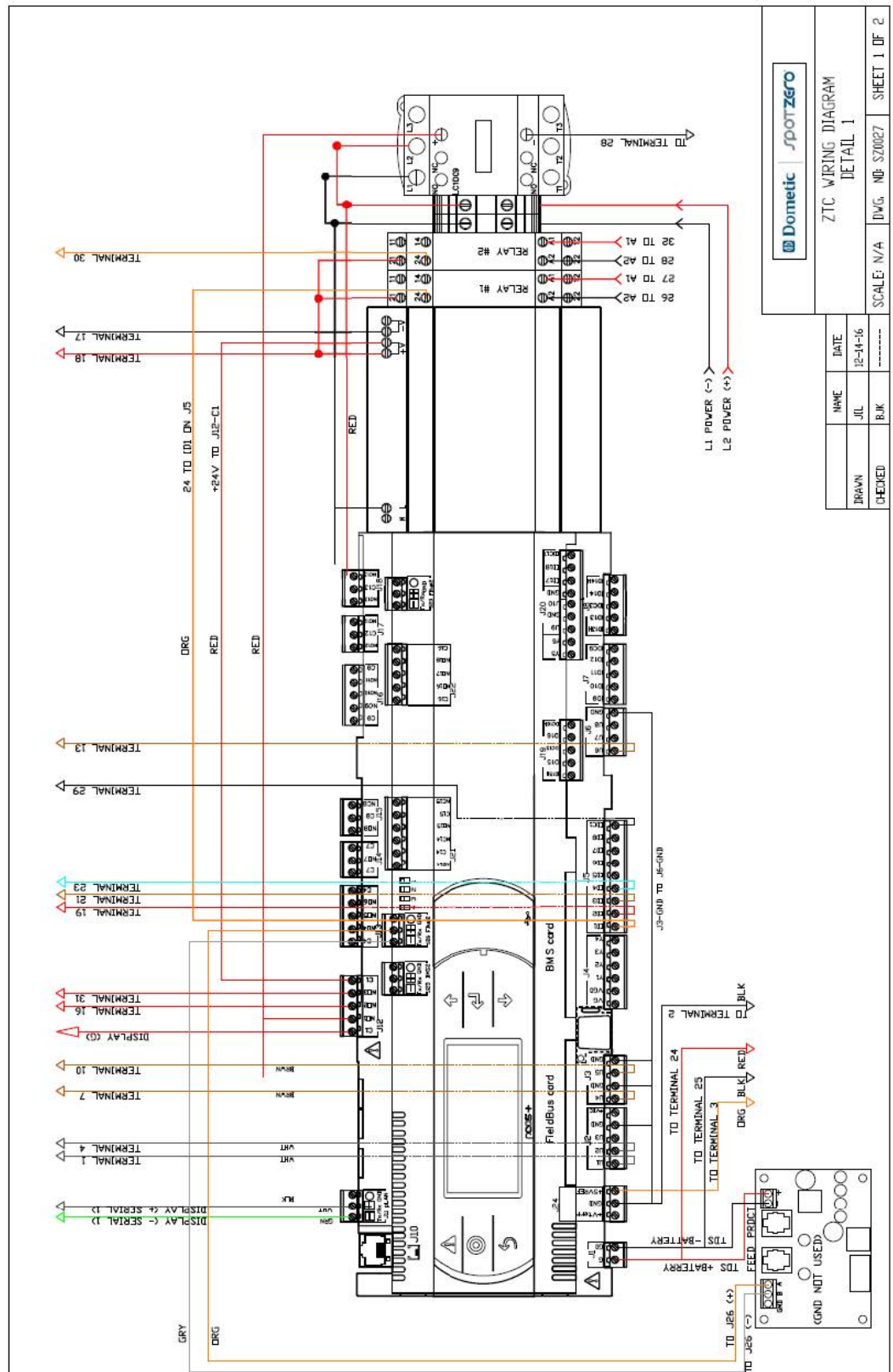
Electrical Connections







1. Supply and connect specified power (115v or 230v) from the vessels panel to the ZTC panel. Connect line 1 and line 2 to the terminals, and connect the ground wire to the ground bus bar. Be sure to confirm systems rated voltage before applying power. Reference DWG SZ0027.

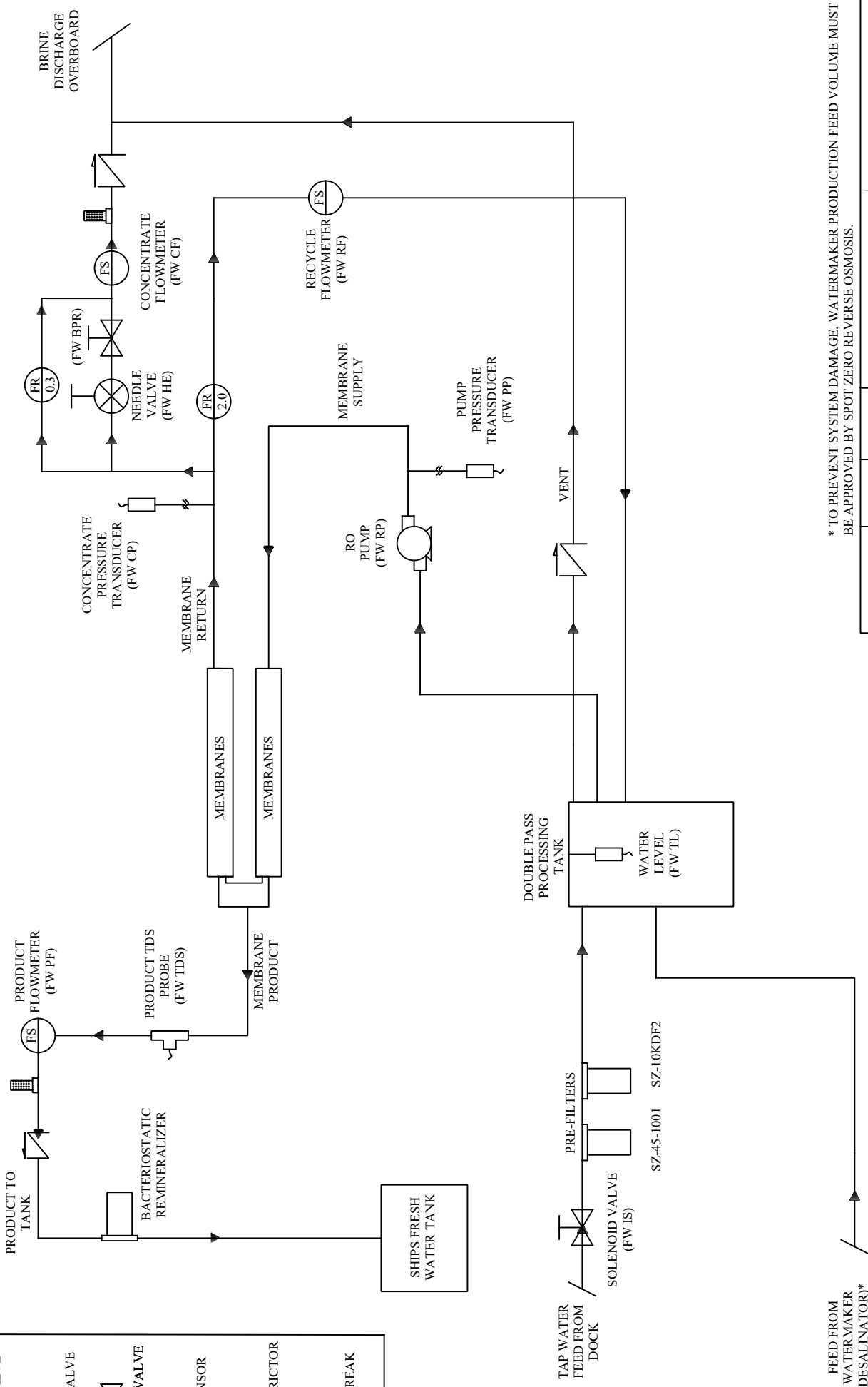
NOTE: IT'S RECOMMENDED THAT A QUALIFIED ELECTRICIAN WIRE YOUR SYSTEM IN ACCORDANCE WITH ABYC REQUIREMENTS.



WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, THE INCOMING POWER SUPPLY MUST INCLUDE A PROTECTIVE GROUND.



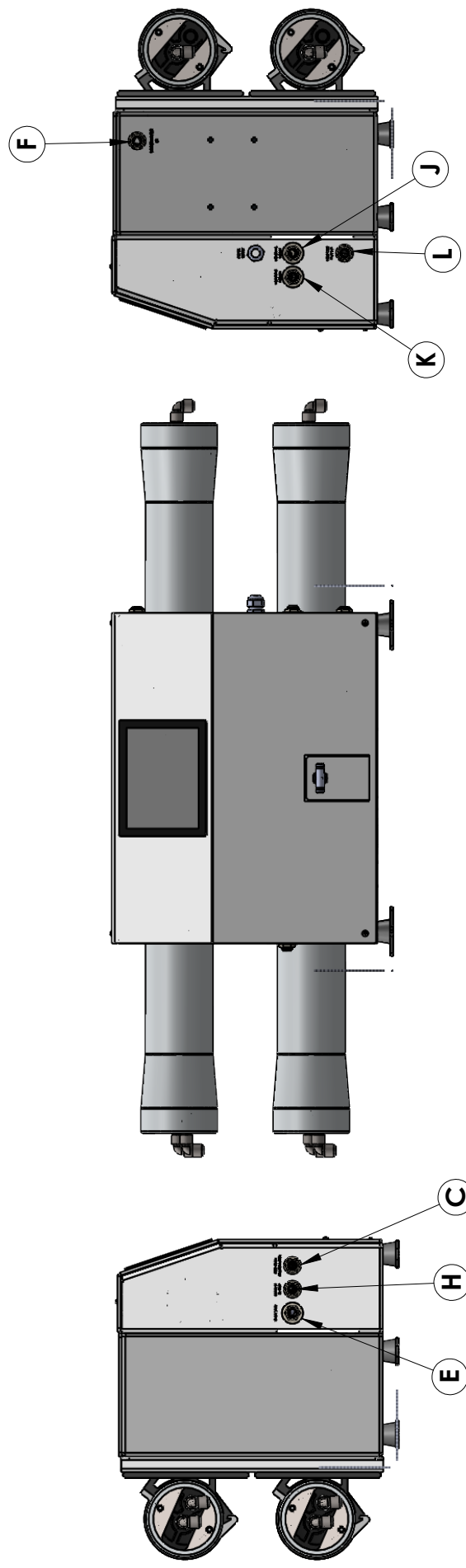
LEGEND

CHECK VALVE

NEEDLE VALVE

SOLENOID VALVE

FLOW SENSOR

FLOW RESTRICTOR

SYPHON BREAK



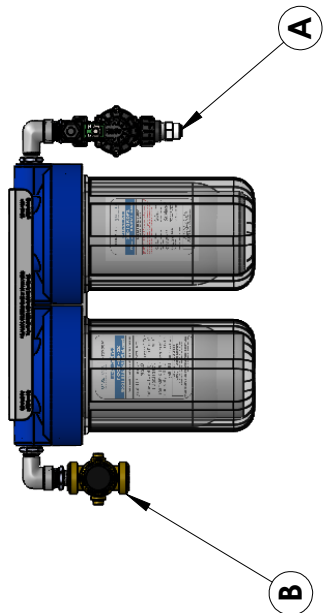
* TO PREVENT SYSTEM DAMAGE, WATERMAKER PRODUCTION FEED VOLUME MUST BE APPROVED BY SPOT ZERO REVERSE OSMOSIS.

DOMETIC		spotzero <i>Fresh Water Reverse Osmosis</i>	
DRAWN	NAME	DATE	
CHECKED	JIL	03-22-18	
ENG APPR.	BJK	09-08-14	
MFG APPR.			
Q.A.			
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES			
TOLERANCES: ±.015			
FRACTIONAL ±1/32			
ANGULAR: WACH ±1/2			
TWO PLACE DECIMAL ±.010			
THREE PLACE DECIMAL ±.005			
SPOT ZERO ZTC		PIPING & INSTRUMENTATION	
SCALE: N/A		DWG. # SZ0025	
		SHEET 1 OF 1	

NOTES:
1. SOME PARTS REMOVED IN ORDER
TO MAKE VISUALS MORE CLEAR.



PRE-FILTERS



INLETS & OUTLETS		
LOCATION	DESCRIPTION	TUBE SIZE
A	TO ZTC TANK	1/2"
B	FEED FROM DOCK	3/4" ID
C	FEED FROM PRE FILTER	1/2"
E	VENT/OUTBOARD	1/2"
F	WATERMAKER IN	1/2"
H	PRODUCT TO TANK	3/8"
J	MEMBRANE SUPPLY	1/2"
K	MEMBRANE RETURN	1/2"
L	MEMBRANE PRODUCT	3/8"

DRAWN	NAME	DATE
JIL	JIL	04-24-19
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: 1/32
ANGULAR: MACH: 1/2 BEND ±1
TWO PLACE DECIMAL ±.010
THREE PLACE DECIMAL ±.005

DOMETIC spotZERO

INLET & OUTLET LOCATIONS
ZTC

SCALE: 1:10 DWG. #: SZ0032 SHEET 1 OF 1

SPOT ZERO COMMISSIONING REPORT FORM

System Information:

Model number - _____

Serial number - _____

Date of Commission - _____

Commissioned by- _____

Installed by - _____

Vessel hull number- _____

First step to commissioning a new system is to look over the install to be sure everything is installed correct. This check-list must be gone through prior to powering up the system.

___ Have all plumbing connections have been made, and secured?

___ Have all plumbing lines been run to the correct locations?

___ Is the boost pump installed below the water line?

___ Has wire reinforce hose been used on the suction side of the boost pump?

___ Is raw water intake open?

___ Is the overboard open and free of obstructions?

___ Is the system _____ voltage, _____ hertz, and _____ phase correct?

___ Is the circuit breaker sized properly with sufficient wire gauge?

___ Is the power cable connected to the power inlet terminals of the system?

Now power up the system,

___ Are all displays on and functional?

At this time follow the start-up procedure in the manual and operate the system for an hour at its rated capacity, then record the following data.

System operating readings

Pre-filter inlet _____ psi

Pre-filter outlet _____ psi

Concentrate pressure _____ psi

Concentrate flow _____ gpm

Product flow _____ gpm

Product TDS _____ ppm

Feed water TDS _____ ppm

Feed water temperature _____ F or C

Hours on system _____ hrs

Amp draw _____ Voltage _____

Location system was tested _____

Problems or other notes:

Systems Standard Operating Parameters

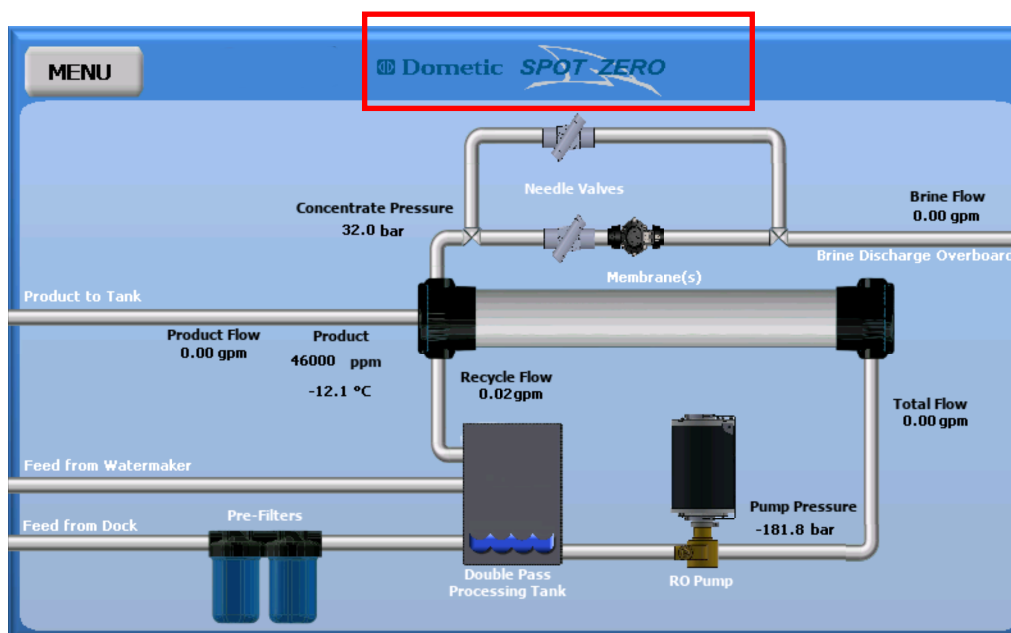
		Product Flow (gpm/lpm)	Concentrate Flow (gpm/lpm)	Recycle Flow (gpm/lpm) (+/-10%)	Total Flow (gpm/lpm)	Pump Pressure (psi/bar) MAX	Concentrate Pressure (psi/bar) MAX	Pre-filter Inlet Pressure Minimum (psi/bar)	Pre-filter Inlet Pressure Maximum (psi/bar)	Pre-filter Outlet Pressure Minimum (psi/bar)	Pre-filter Outlet Pressure Maximum (psi/bar)
<u>Fresh Water RO Systems</u>	Model/GPD										
	SZ/ZTC/XZ (FW-RO) SERIES										
	GPD 2000	1.4/5.3	1.0/3.8	2.0/7.6	4.4/16.7	150/10.3	150/10.3	15/1	85/4	15/1	85/4
	GPD 3000	2.0/7.5	1.0/3.8	2.0/7.6	5/18.9	150/10.3	150/10.3	15/1	85/4	15/1	85/4
SZ-HD/XZ-HD (FW-RO) SERIES											
	GPD 4000	2.7/10.2	1.5/5.7	2.0/7.6	6.2/23.5	150/10.3	150/10.3	15/1	85/4	15/1	85/4
	GPD 5000	3.47/13.1	1.5/5.7	2.0/7.6	7.0/26.5	150/10.3	150/10.3	15/1	85/4	15/1	85/4
	GPD 6000	4.16/15.7	2.0/7.6	2.0/7.6	8.2/31	150/10.3	150/10.3	15/1	85/4	15/1	85/4
<u>Salt Water RO Systems</u>											
SE SERIES											
	GPD 350	.24/.9	2.26/8.6	N/A	2.5/9.5	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 600	.41/1.5	2.09/7.9	N/A	2.5/9.5	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 800	.55/2.0	1.95/7.4	N/A	2.5/9.5	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 1200	.83/3.1	1.67/6.3	N/A	2.5/9.5	N/A	850/58.6	15/1	85/4	15/1	85/4
SX/XTC/XZ (SW-RO) SERIES											
	GPD 600	.41/1.5	3.79/14.3	N/A	4.2/15.9	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 1200	.83/3.1	3.37/12.8	N/A	4.2/15.9	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 1800	1.25/4.7	2.95/11.2	N/A	4.2/15.9	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 2200	1.52/5.75	2.68/10.1	N/A	4.2/15.9	N/A	850/58.6	15/1	85/4	15/1	85/4
SXII-HD/XZ-HD (SW-RO) SERIES											
	GPD 3600	2.5/9.46	5/18.9	N/A	7.5/28.4	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 4300	2.98/11.28	7.5/28.4	N/A	10.5/39.7	N/A	850/58.6	15/1	85/4	15/1	85/4
	GPD 5000	3.47/13.13	7.0/26.5	N/A	10.5/39.7	N/A	850/58.6	15/1	85/4	15/1	85/4
CX SERIES											
	GPD 20000	13.88/52.54	46/174	N/A	60/227	N/A	850/58.6	15/1	85/4	15/1	85/4
<u>Standard Parameters</u>											
Total Dissolved Solids For Fresh Water Systems (PPM)				90% less than feed water							
Total Dissolved Solids For Sea Water Systems (PPM)				Less than 500 PPM							
Temperature (F/C)				77/25							

3. SYSTEM OPERATION

SPOT ZERO ZTC TOUCHSCREEN NAVIGATION

Home Screen

From any screen the Spot Zero icon can be pressed to return to this home screen. There is also a lot of information on this home screen that is important to the operation of this system. Some of the images can be pressed to bring up different information and setting choices. Also the menu button can be pressed to access more information. This manual will go through these options.

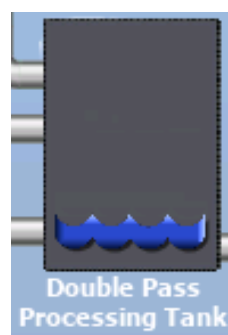


Operation Procedures

The Spot Zero ZTC is a fully automatic system. The capacity of the system is shown on the membrane in center of the screen. It will operate when water is present, and shut down when water is no longer fed to the system. On the home screen the double pass processing tank shows the water level present in the system. When the tank is full the unit will start to operate. When the tank is emptied, the system will shut down.



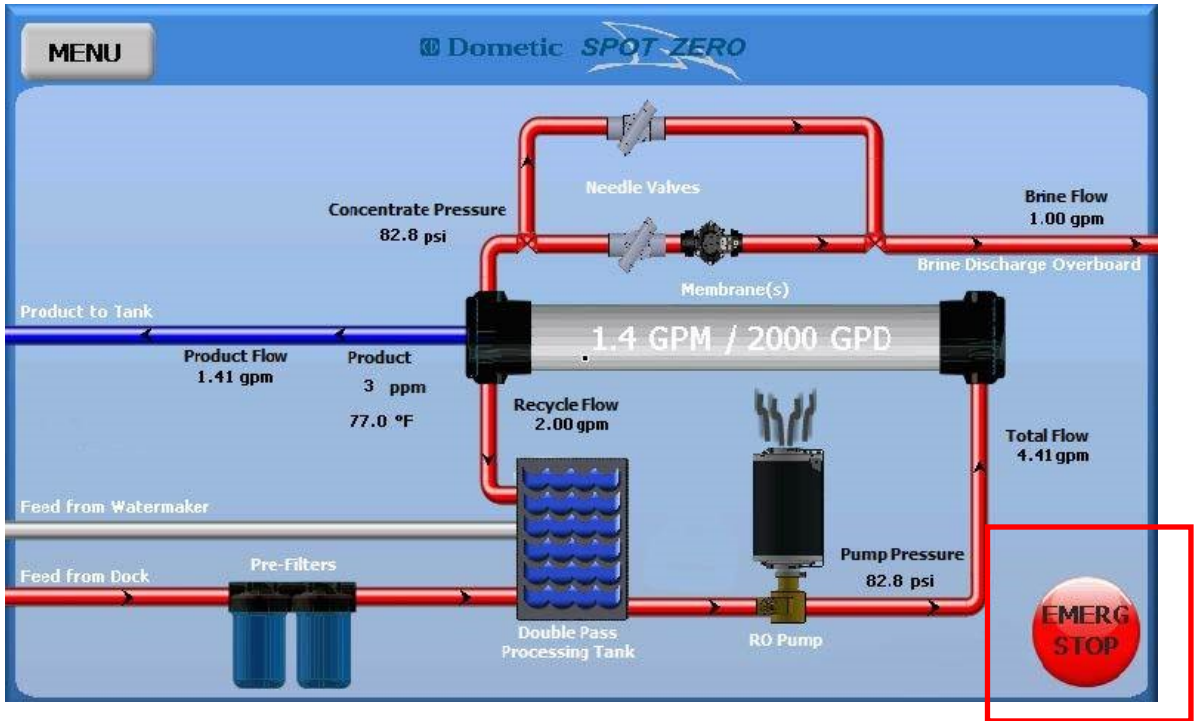
System will turn ON



System will turn OFF

Emergency Stop

While the system is operating the emergency stop button will appear. Pressing the emergency stop button will shut down the system.

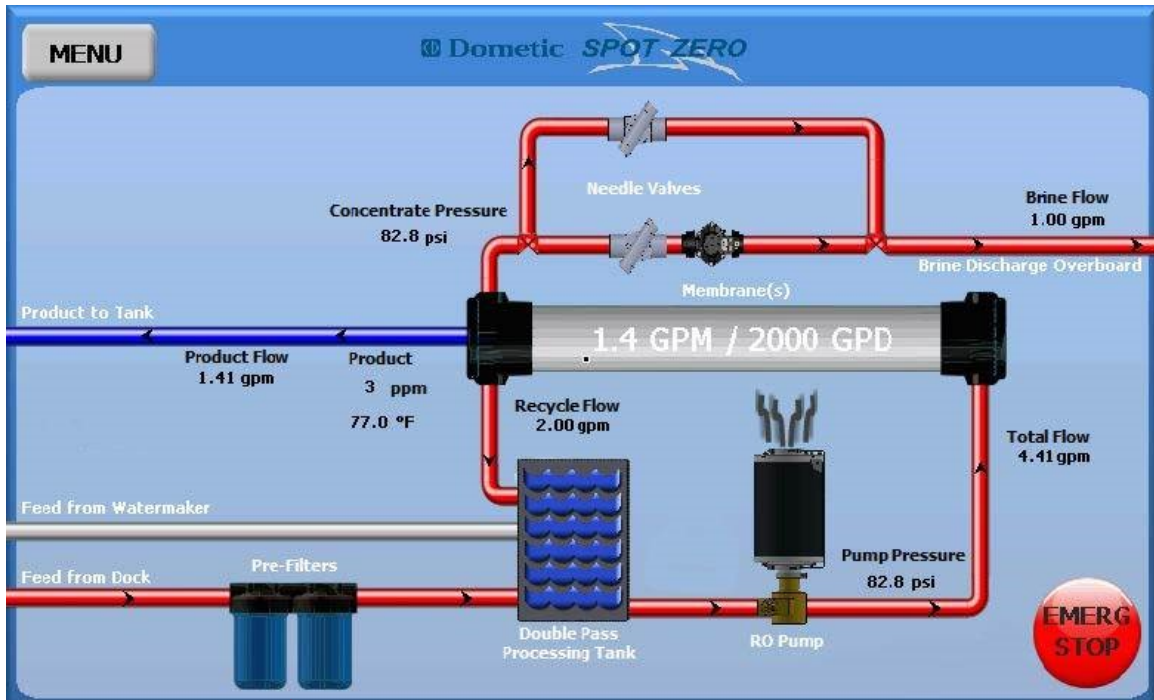


To restart the system, press the reset button



OPERATION FROM DOCK FEED

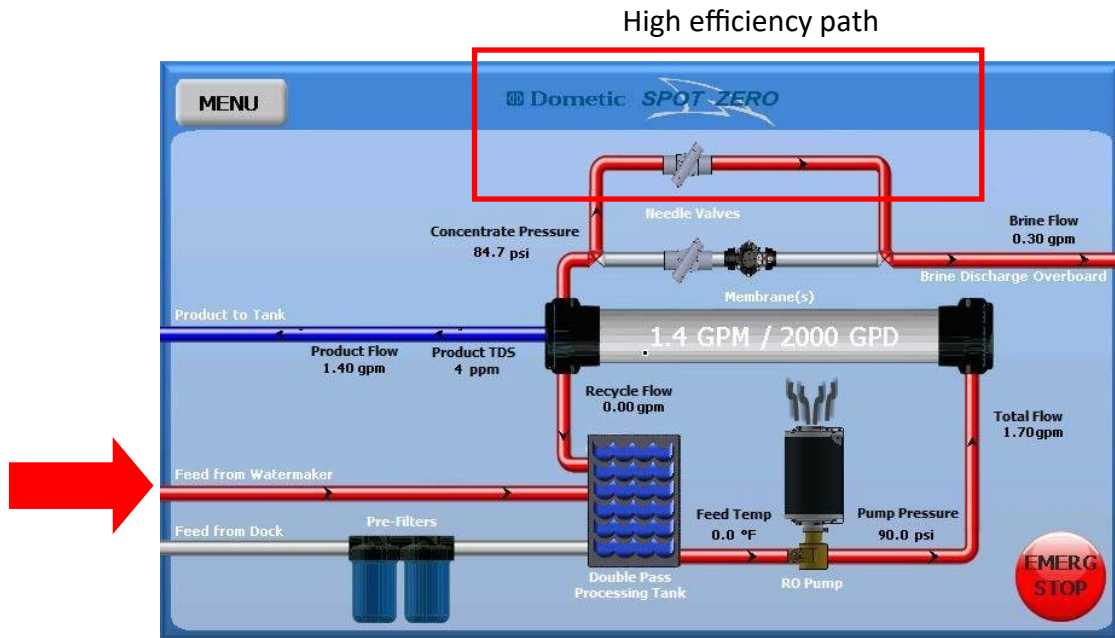
When operating from dock water, the system will show the water passing through the pre-filtration then into the double pass processing tank. The brine water will discharge overboard.



The dock water must flow through the pre-filtration to remove chemicals and contaminants that will harm the system and ruin the membranes.

Water maker Source

When operating from water maker product water, the flow will be shown going directly into double pass processing tank. The brine water from the water maker supply will be directed through the high efficiency valve then discharge overboard.

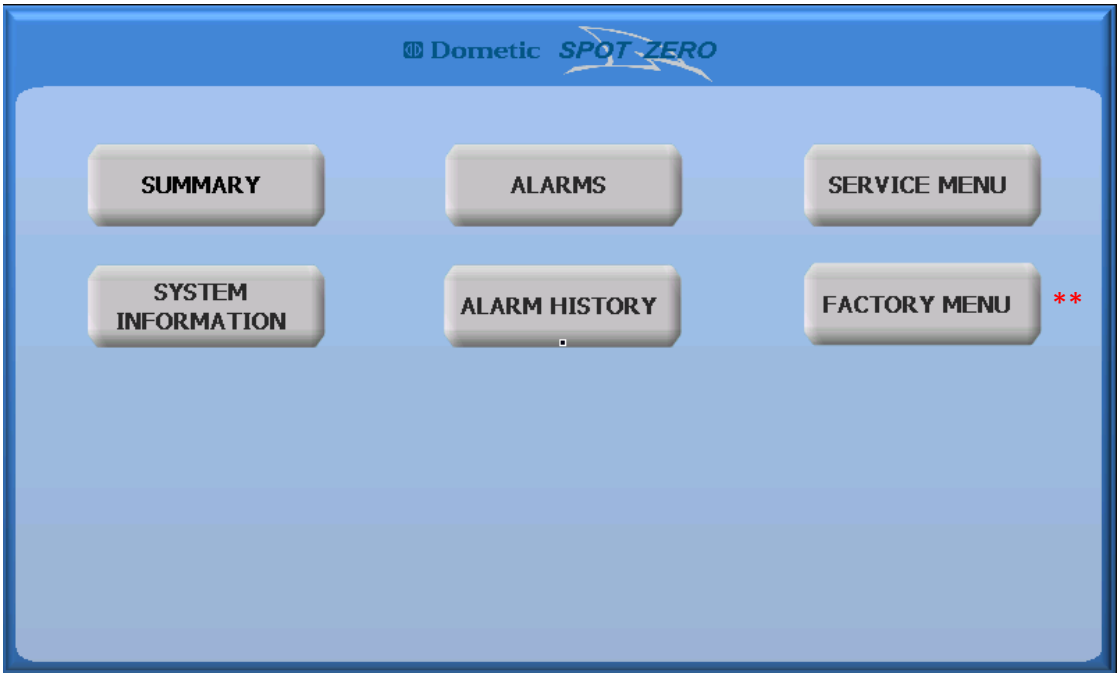
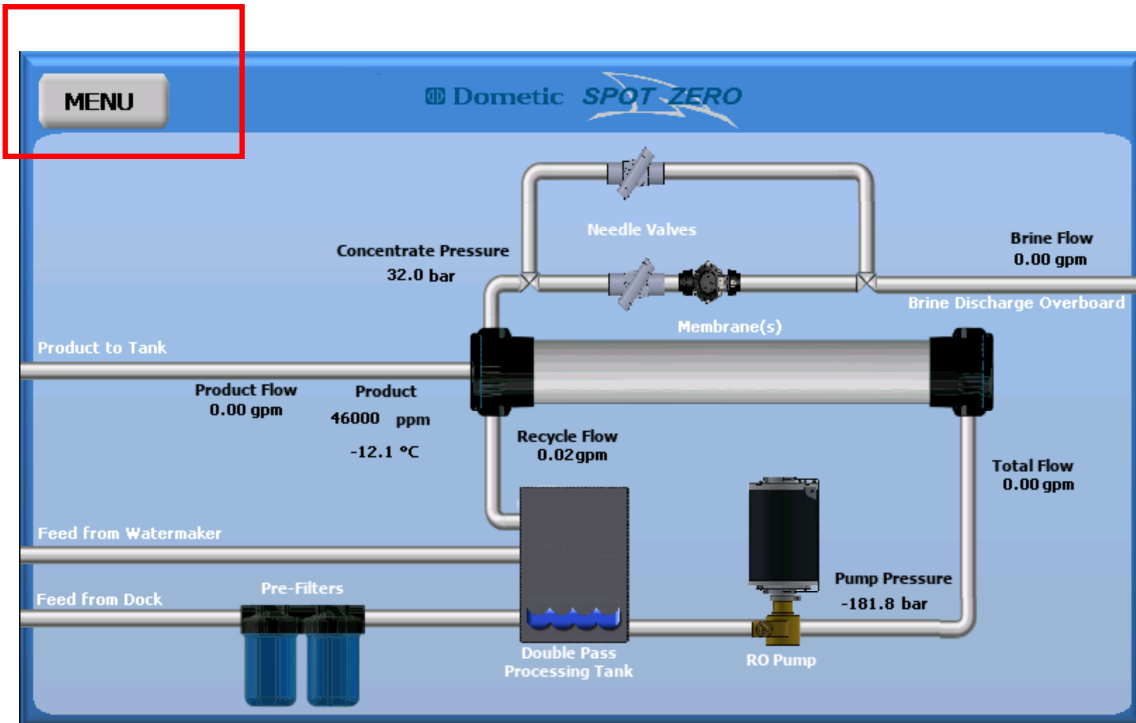


The product water from the water maker has already gone through a desalination system and does not contain the chemicals and contaminants that dock water has in it. Therefore this water flows directly to the double pass processing tank.

When the system is being run from a water maker the high efficiency valve will close and only allow a portion of the brine to discharge. Allowing the system to operate at a higher efficiency.

MENU OPTIONS

To access the menu, press the menu button in the upper left hand corner of the home screen.

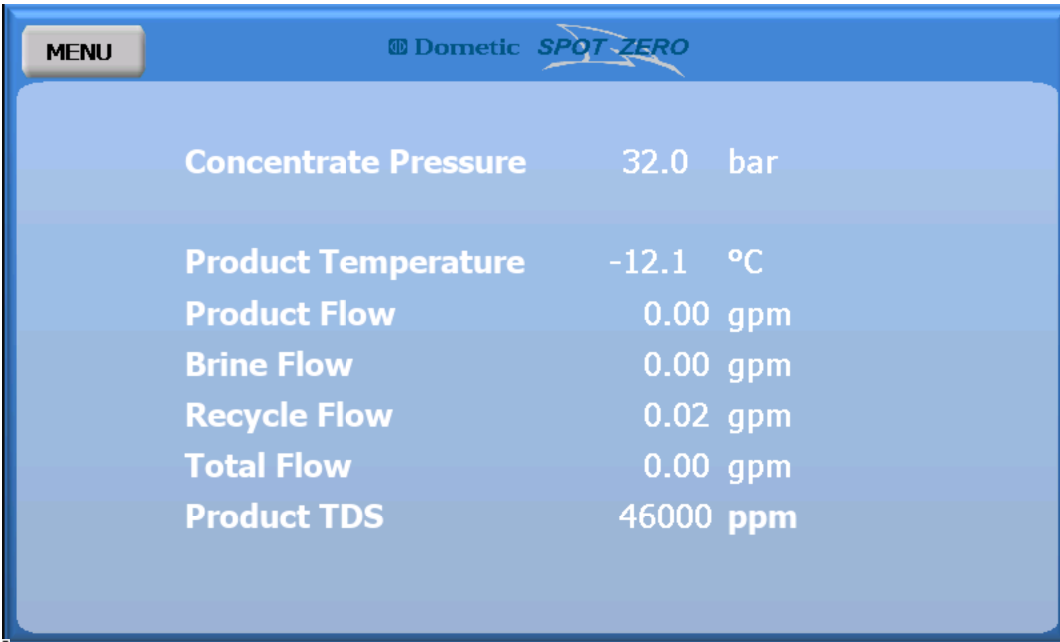


NOTE: The factory menu is password protected and for factory use only.**

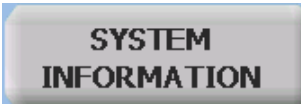
SUMMARY



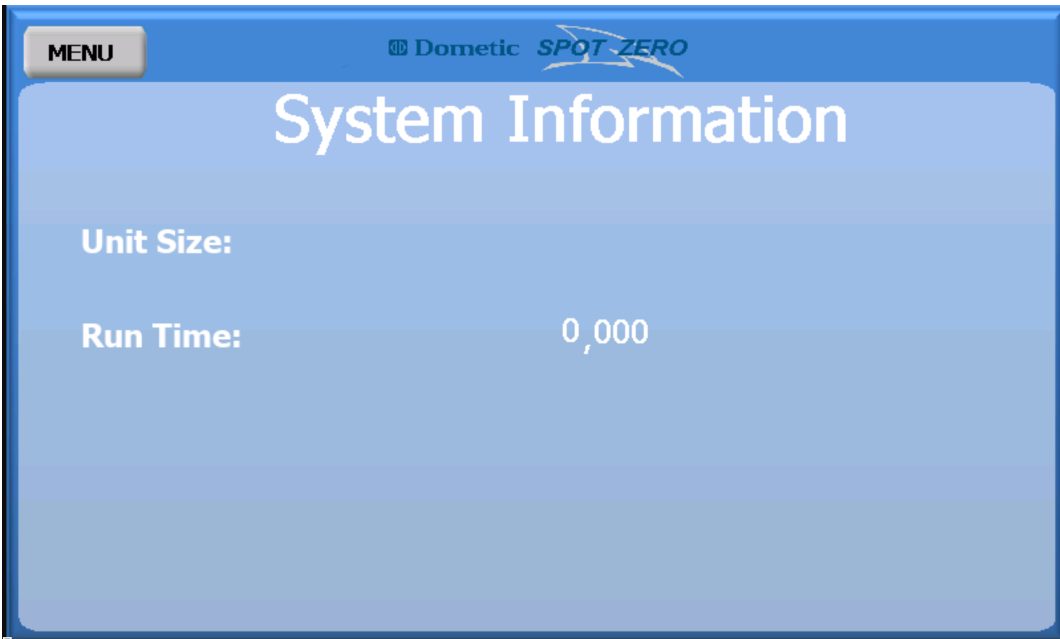
The summary screen shows the current values of the system



SYSTEM INFORMATION



The serial number of the system can be found here, also the system capacity, and the run time.



ALARMS



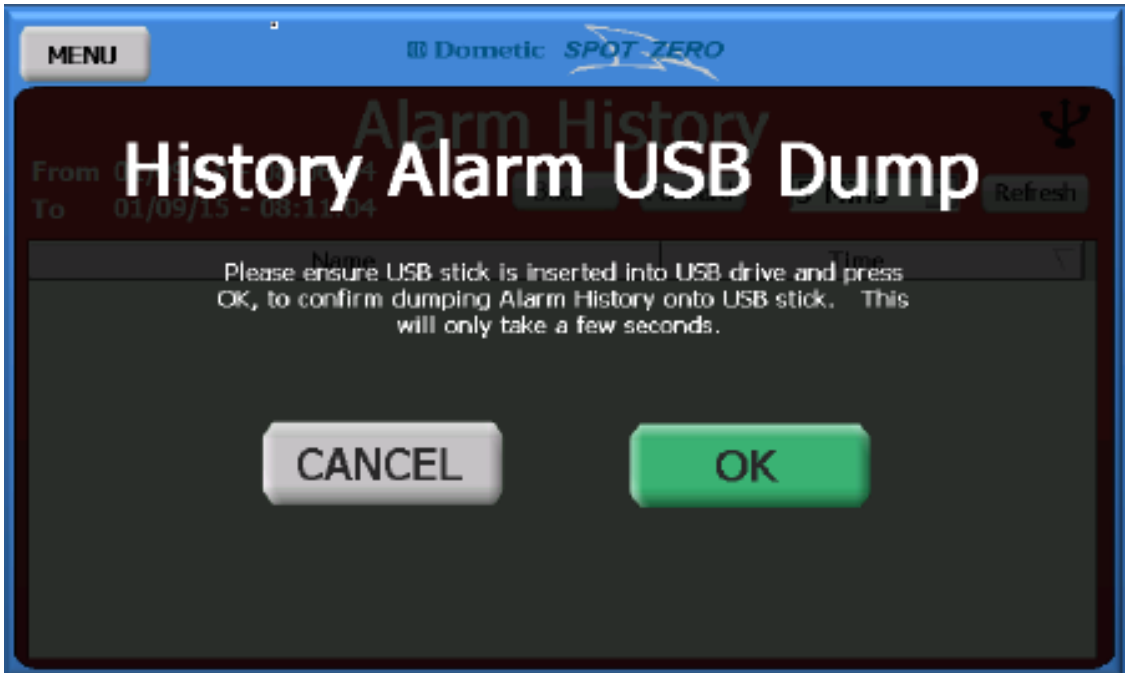
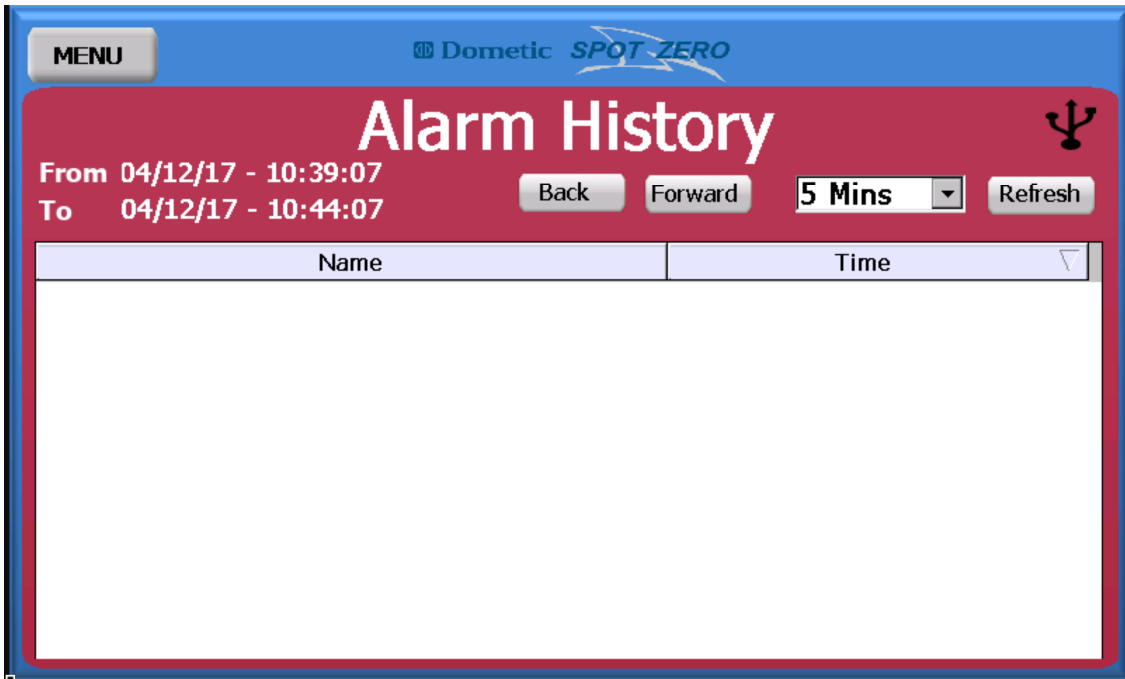
Any active alarms will be displayed here. When the system is in alarm a red alarm image will show at the top of the home screen. Pressing the alarm image will also open this screen.



Press the reset button after the issue has been fixed in order to clear the system

ALARM HISTORY

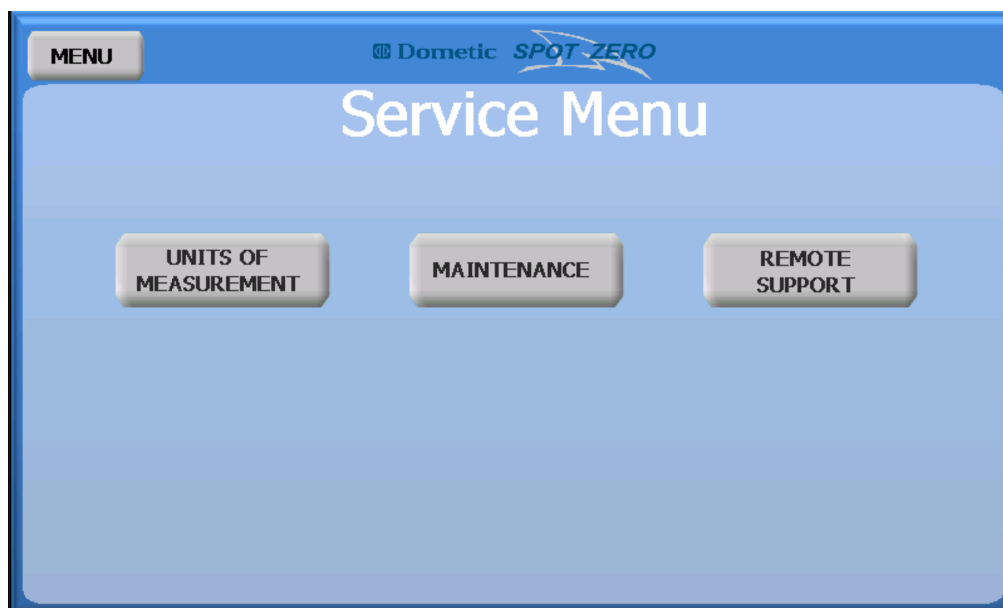
The alarm history can be scrolled through using the back and forward buttons. The amount of time that has passed can also be changed in the drop down menu. Pressing the USB icon will allow the history to be transferred to a USB.



SERVICE MENU

SERVICE MENU

The “SERVICE MENU” give you access to 3 system options as indicated on the screen below.



UNITS OF MEASUREMENT

UNITS OF
MEASUREMENT

Change the systems units of measurement. Choose between imperial units or metric system. Once you have selected what units you want to use, simply press the “SERVICE” button to go back or the main logo to return to the home screen.



MAINTENANCE



When maintenance is required it will be listed here. If no maintenance is due, then it will say no maintenance needed. If maintenance is needed then after it has been completed press reset.



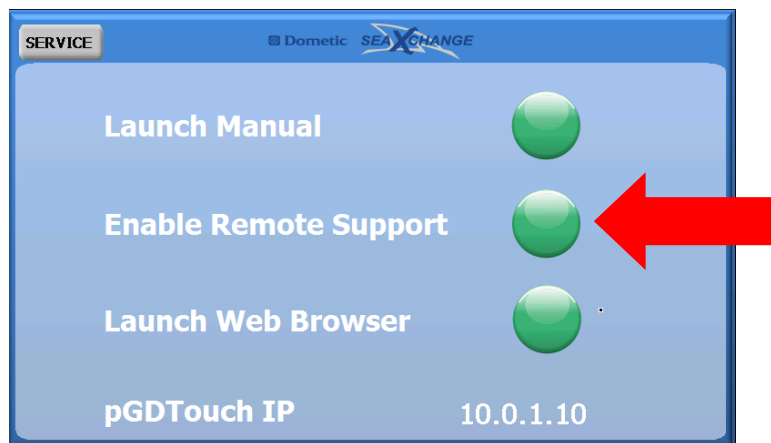
REMOTE SUPPORT



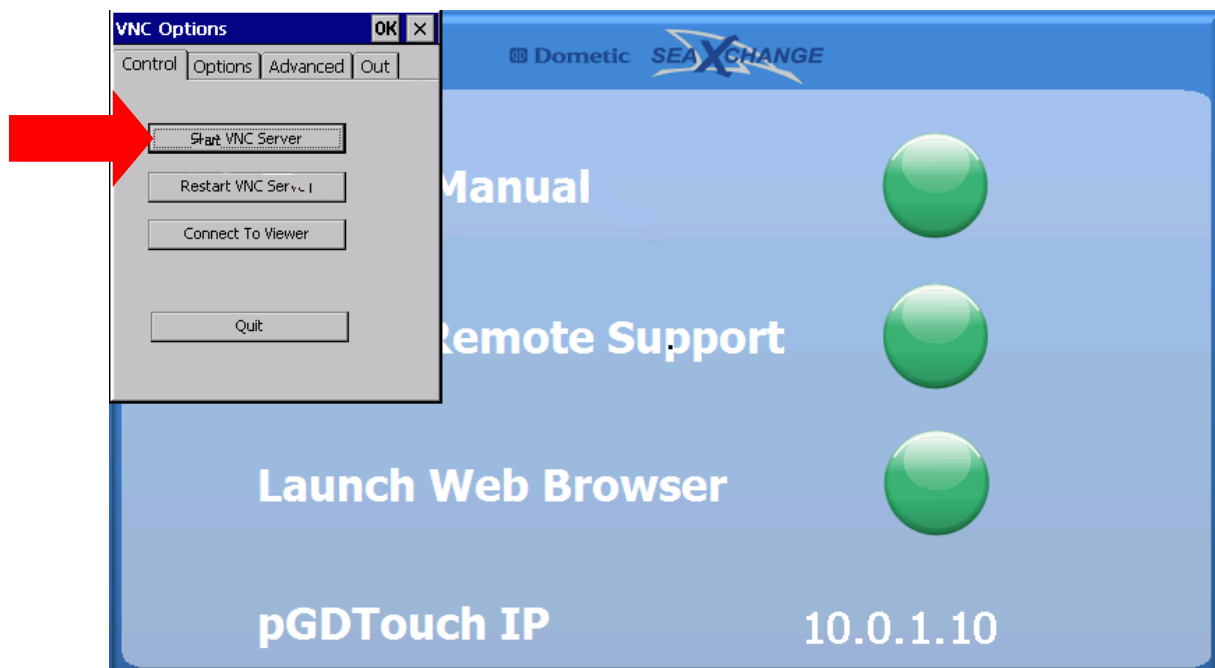
In this menu the pGD Touch IP address will be shown at the bottom of the screen if the system is wired to a router. This will be needed to connect to the VNC viewer app. This manual will be brought up if the launch manual button is pressed. The VNC viewer menu will pop up if the enable remote support is pressed. The web browser will pop up is the launch web browser is pressed. To enable remote support, see the VNC viewer procedure section of the manual.

Enable Remote Support

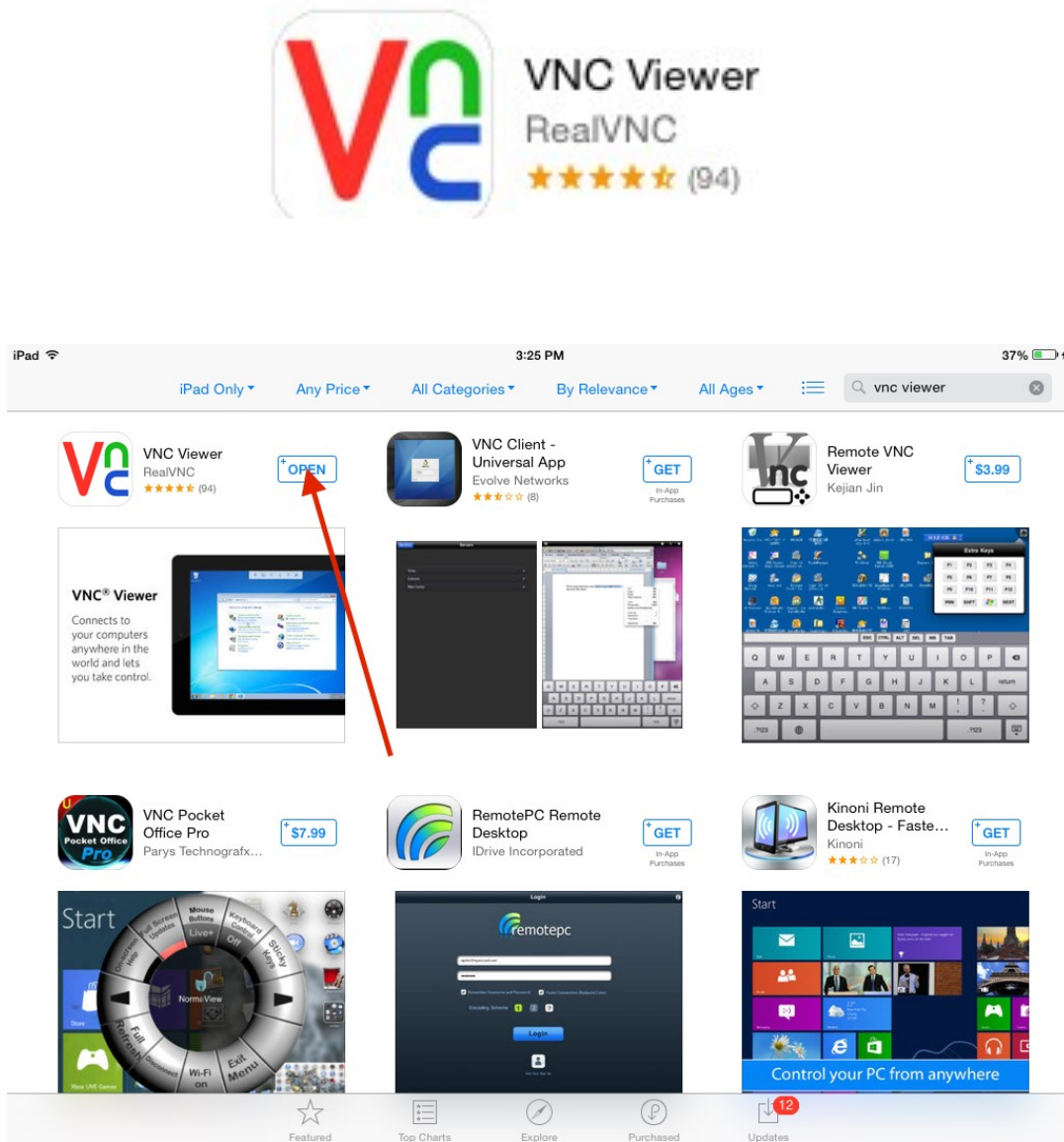
1. Press the green button next to Enable Remote Support



2. In the service menu, press the enable remote support button. Another menu will pop up. Press the start VNC server button, then press ok



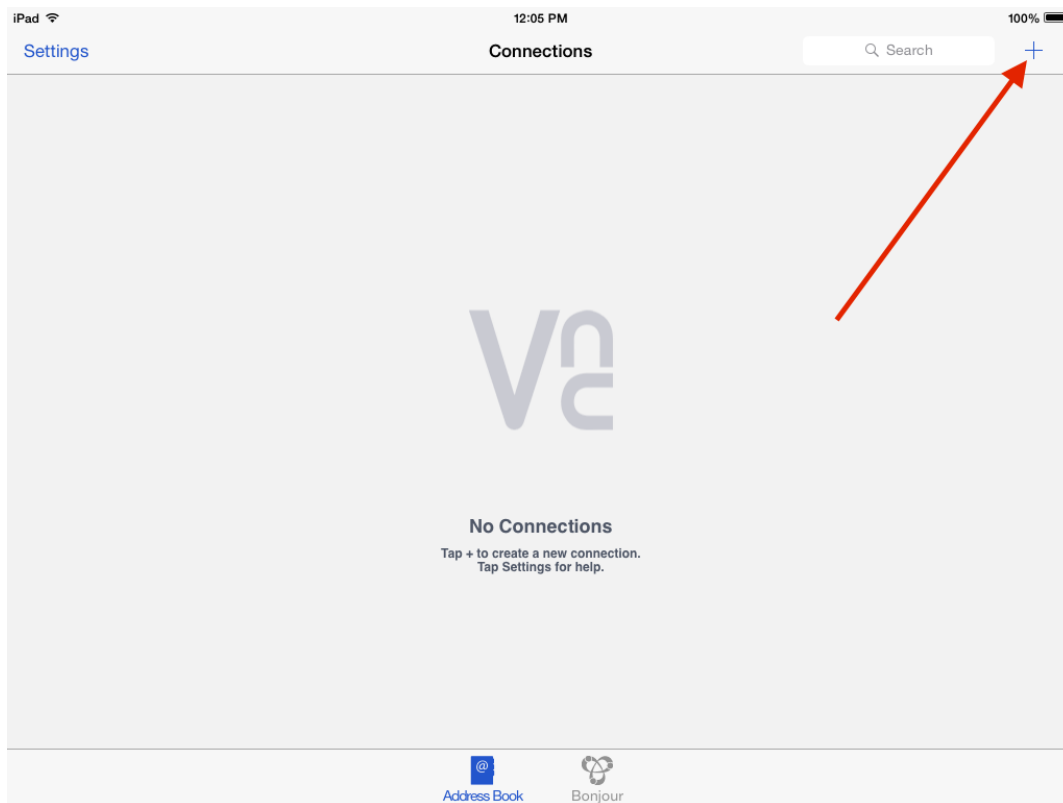
3. Download the Free VNC Viewer app from the app store.



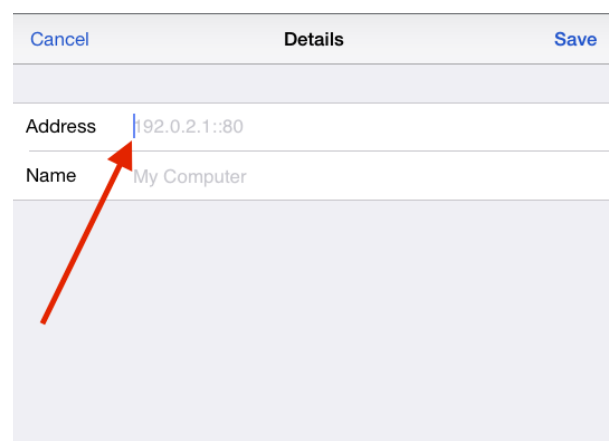
4. Search for the VNC Viewer Icon on you device and open it.



5. Press the plus sign in the upper right hand corner to set up new connection.



6. Type in the IP Address found in the unit's service menu, in the remote support menu at the bottom of the screen. Then give it a name.



EXAMPLE

Cancel

Details

Save

Address

10.0.1.10

Name

XTC


✕

7. Next, press the “Connect” button

Edit

XTC

Done



Connect

Address

10.0.1.10

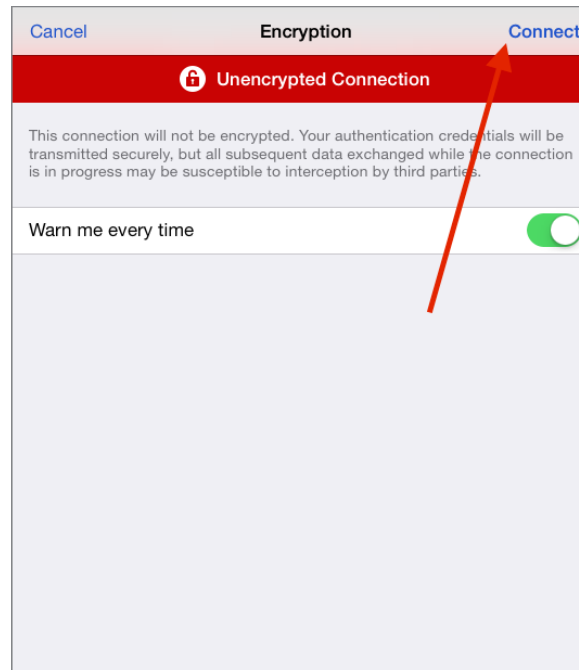
Name

XTC

Picture Quality

Automatic >

8. The following screen will pop up. Simply press the “Connect” option.

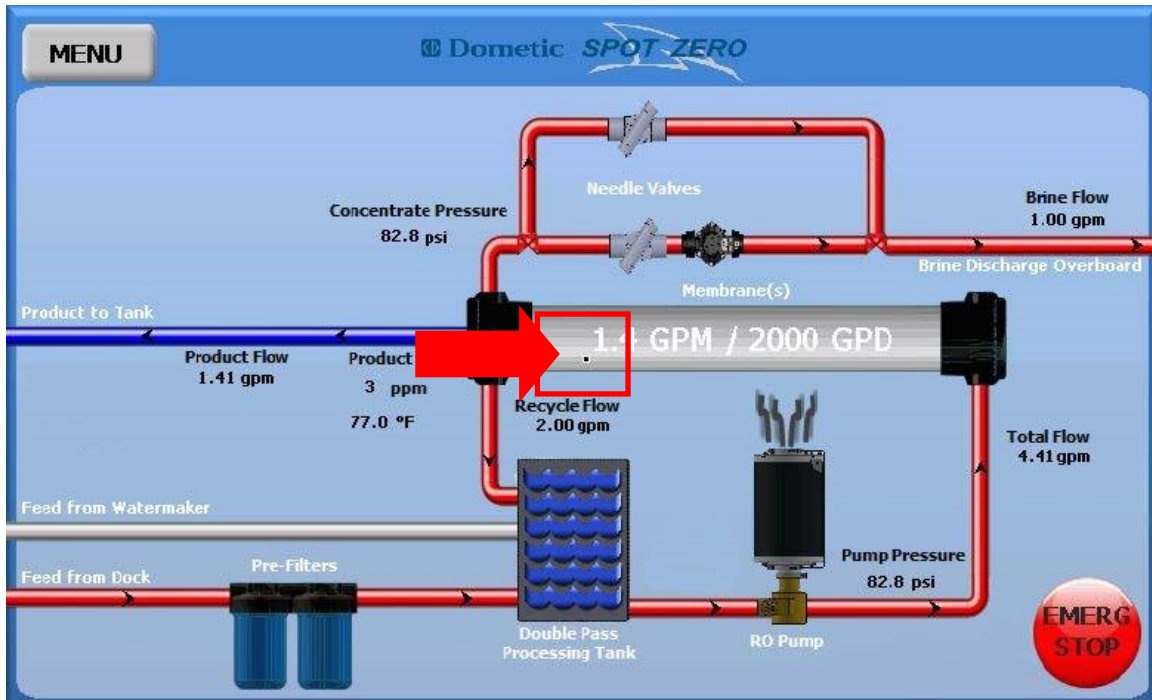


9. Finally it will show you the connecting screen. When it is done connecting you will see the same image on your display and your device

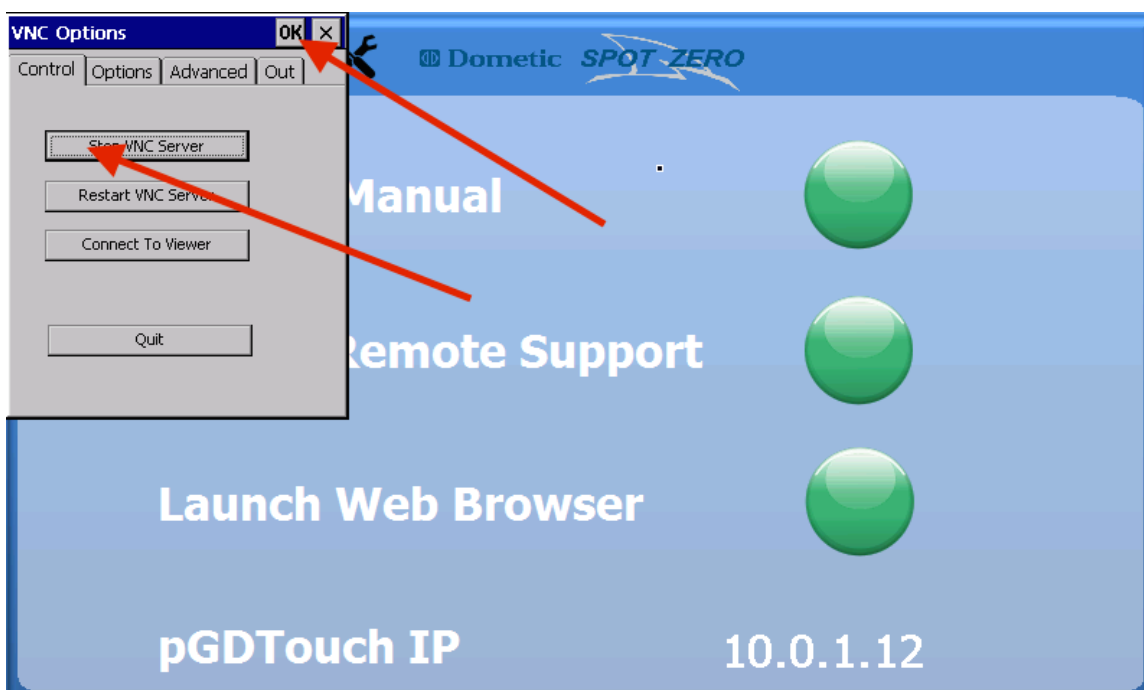


Cancel

10. In order to browse and navigate the screen on you phone, a small dot will appear. This is a cursor that allows you to select icons and menus. Move the cursor with your finger to an icon you want to press and tap the screen to select it.

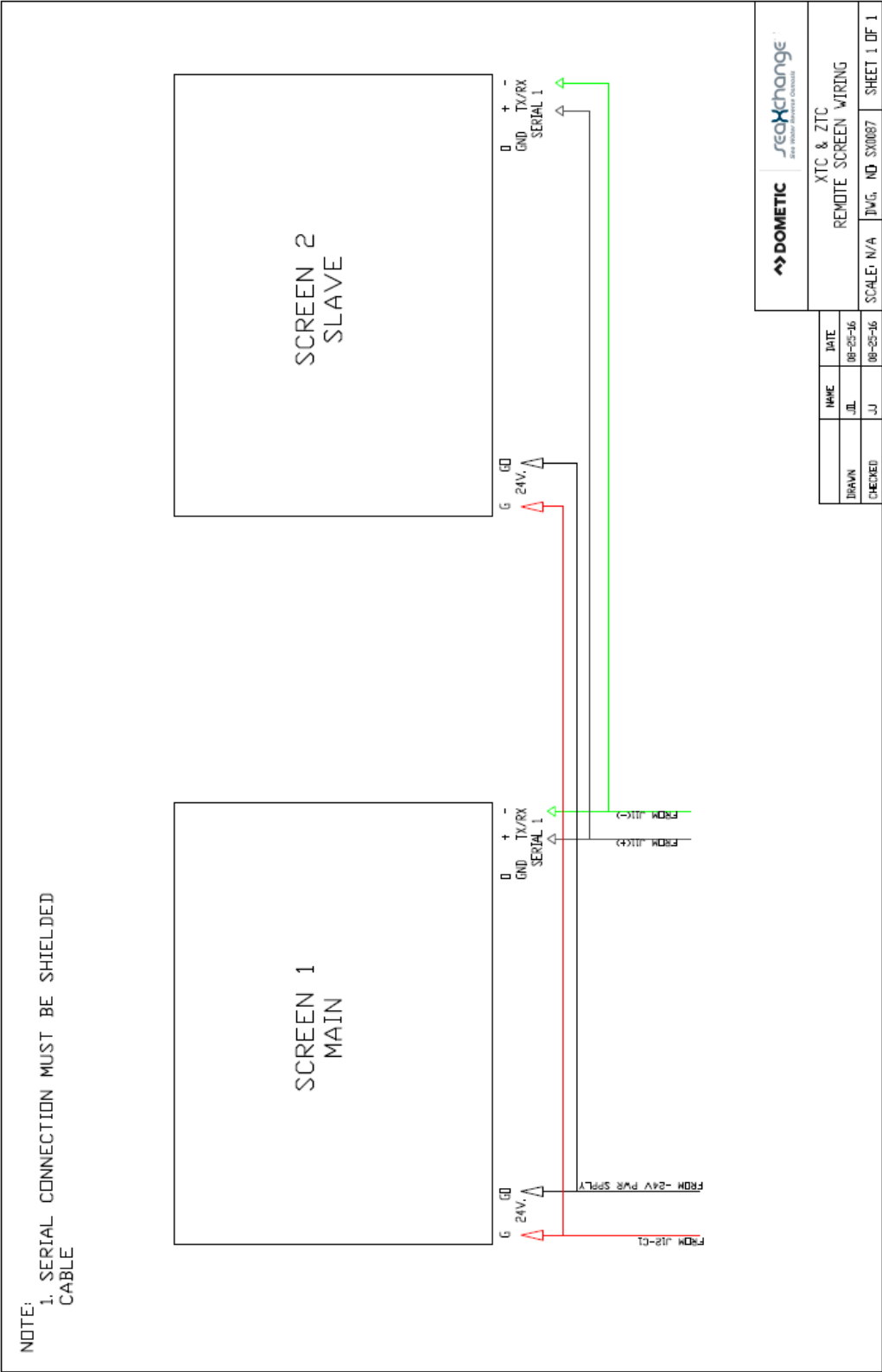


10. If there is a problem connecting, the enable remote support button can be pressed. Another menu will pop up. Select the start VNC server button, and press ok. Try to connect again.

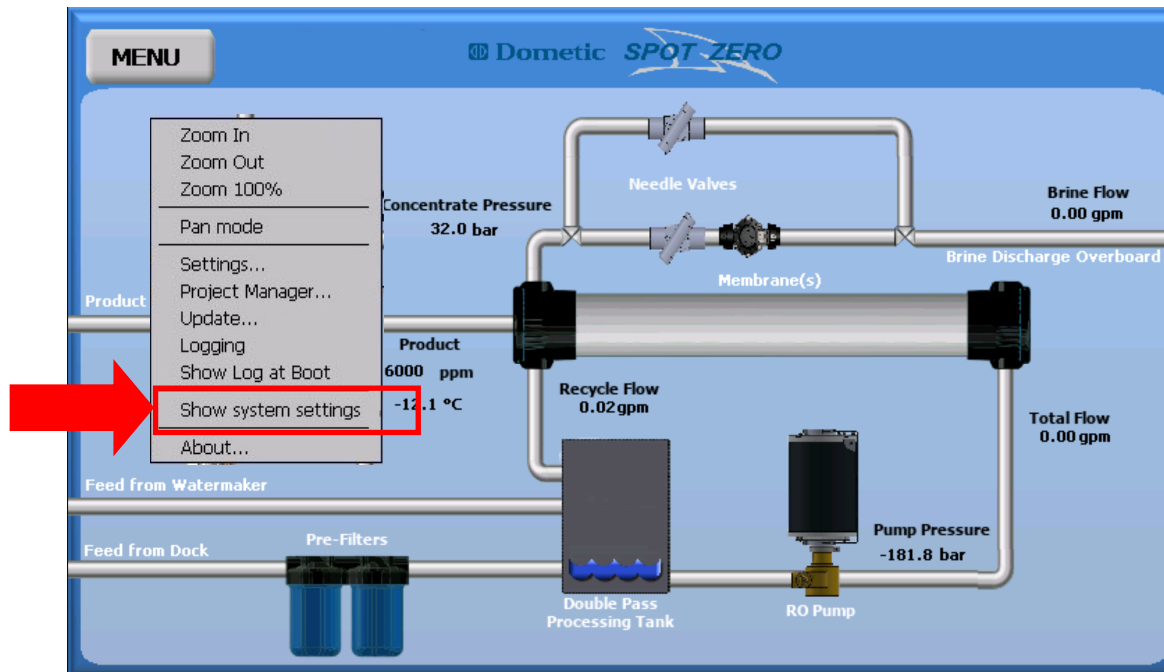


REMOTE TOUCH SCREEN SETUP

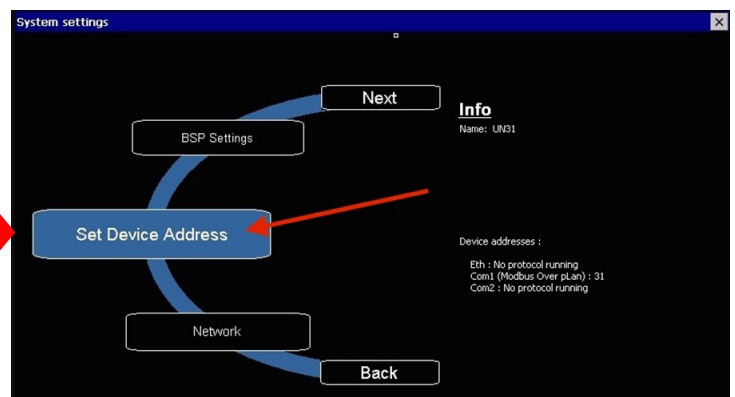
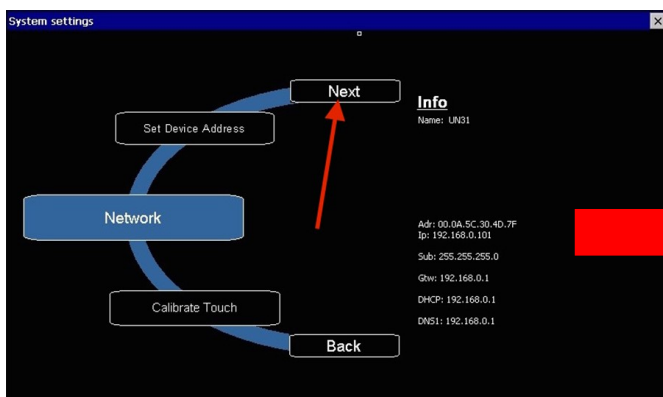
- 1. Run a 4 conductor cable piggy backed on the power terminal and communication terminal on the display on the unit to the same terminals on the remote display .



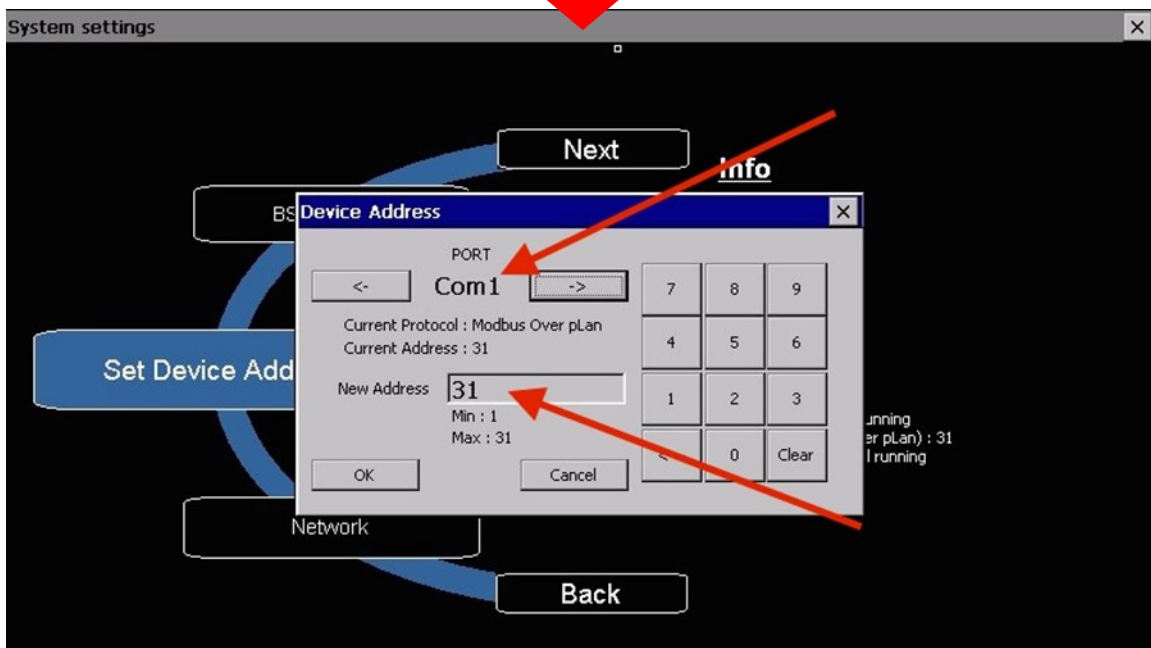
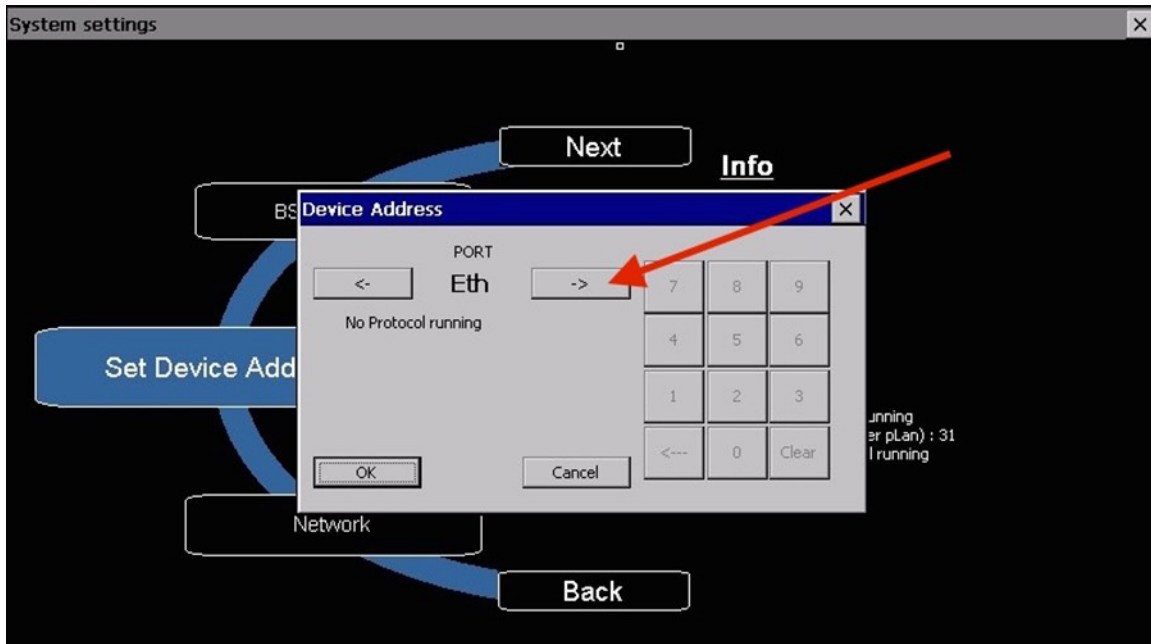
- Press and hold the screen in a spot that does not bring you to another screen. A hidden menu will pop up. Press the Show System Settings selection.



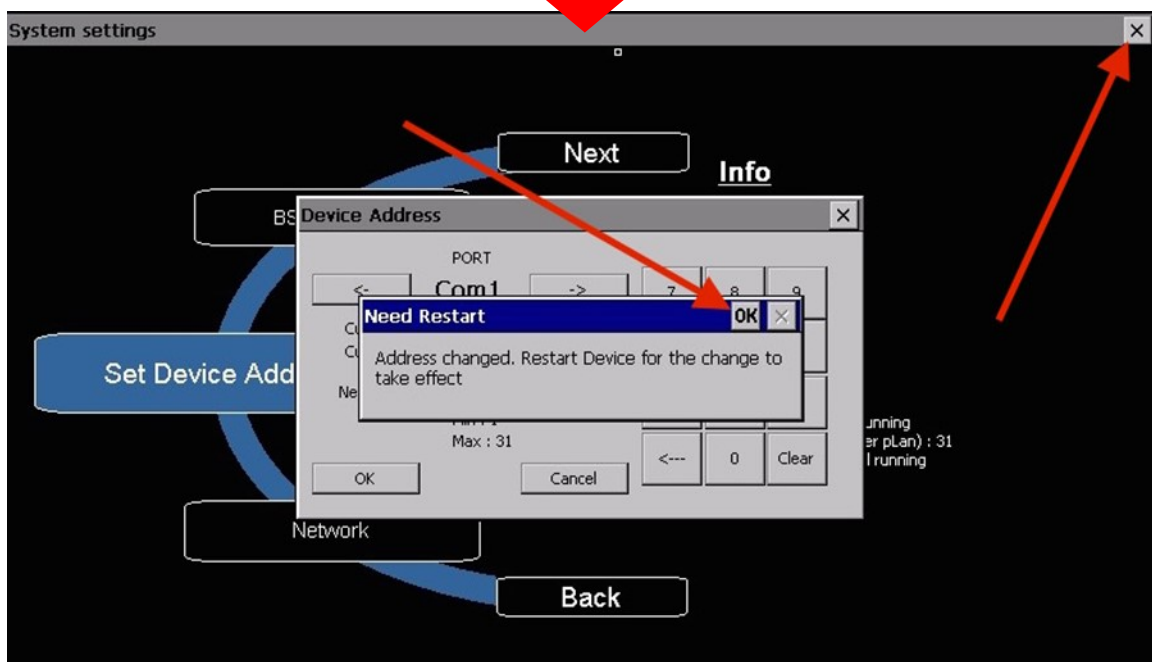
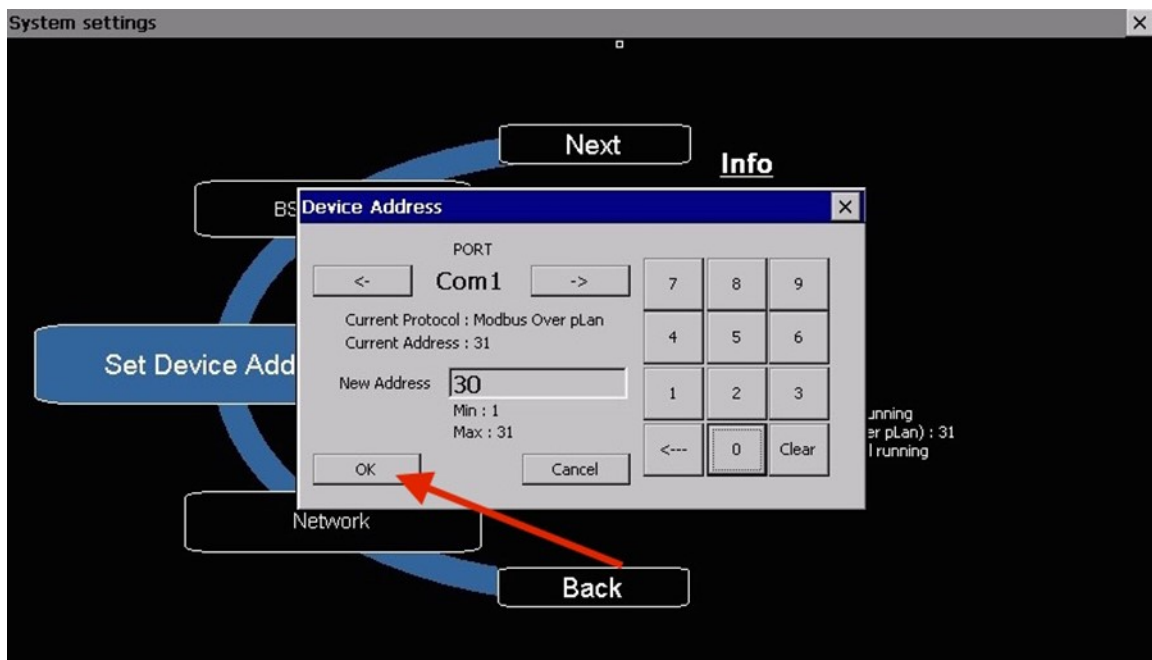
- Press the "Next" button until Set Device Address is highlighted. Then press "Set Device Address".



4. Press the Port selection button to select "COM 1". You will see it set for address 31. Press the box that has the 31 in it and change it to 30.



5. Press "ok". You will then be instructed to cycle the power of the unit for the changes to take effect. Press "ok", then "x" out of the screen and cycle the power to the machine. Now the display should be functioning correctly.



4. SYSTEM MAINTENANCE

Is my System Working Properly?

TDS Rejection

The Spot Zero ZTC reverse osmosis system is designed to reject 94% or more total dissolved solids (TDS). The rejection percentage is calculated by the following formula:

$$\% \text{ Rejection} = ((\text{Feed TDS} - \text{Product TDS}) / \text{Feed TDS}) * 100$$

$$\text{Example 1 : } ((117\text{ppm} - 4\text{ppm}) / 117\text{ppm}) * 100 = 96.58\%$$

$$\text{Example 2 : } ((900\text{ppm} - 45\text{ppm}) / 900\text{ppm}) * 100 = 95\%$$

Both examples represent membranes in perfectly operating condition. The quality of your product water will rely strictly on the feed quality going in.

Example 1 gives product water at 4 ppm

Example 2 gives product water at 45 ppm

In both examples both systems are operating at normal conditions.

Membrane Cleaning Procedure

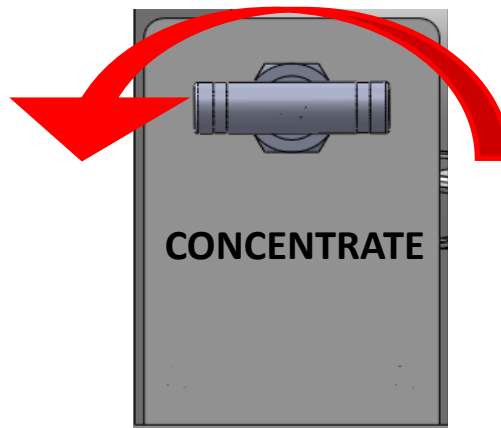
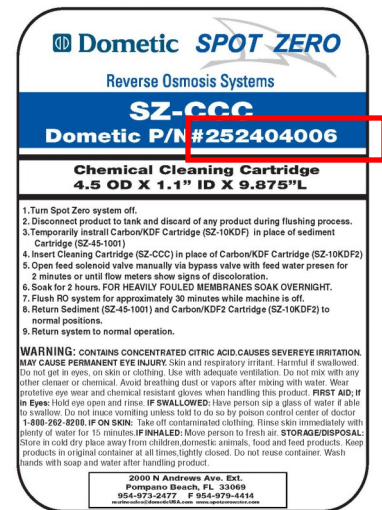
SZ-CCC part number 252404006

When membrane performance is reduced and is not due to temperature or feed water quality, a chemical cleaning may be required to remove scaling on the membrane film.



Note: Damage to membrane film caused by chlorine or chloramine is irreversible and cannot be corrected by chemical cleaning.

1. Procure part number 252404006 Spot Zero Chemical Cleaning Cartridge.
2. Turn System off.
3. Disconnect product to tank and discard any product during cleaning process.
4. Insert SZ-CCC (252404006) in second pre-filter housing.
5. Open concentrate valve counter clockwise until fully open.



6. Turn feed water supply on so the unit starts, when the product ppm reading spikes press emergency stop. Then turn feed water supply off. See Video at spotzerowater.com in the support section.
7. Allow membranes to soak for 2 hours. For heavily scaled membranes, soak for 24 hours.
8. After 2-24 hours soak time, turn feed water back on to allow system to flush for 30 minutes.
9. Discard SZ-CCC, and return a SZ-45-1001 filter to housing and return system to normal operation.

Restore System Settings

For Spot Zero 2000 (SZ 2000)

Set concentrate valve to produce specified flow rates of: 2 GPM of recycle, 1 GPM of concentrate flow, 1.4 GPM of product @ 77 Degrees F (25 Degrees C)

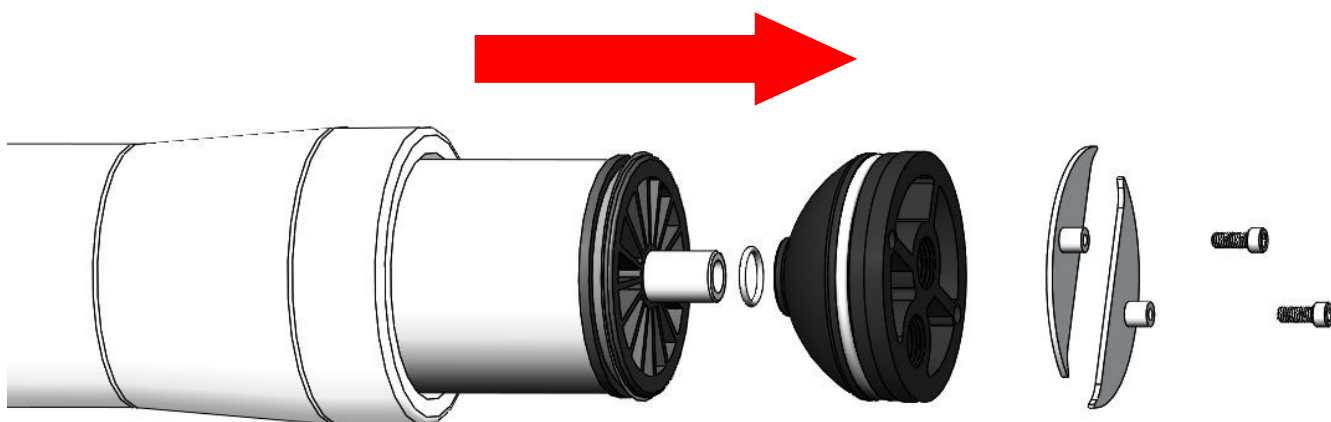
For Spot Zero 3000 (SZ 3000)

Set concentrate valve to produce specified flow rates of: 2 GPM of recycle, 1 GPM of concentrate flow, 2.0 GPM of product @ 77 Degrees F (25 Degrees C)

Membrane Change

NOTE: The system must be off.

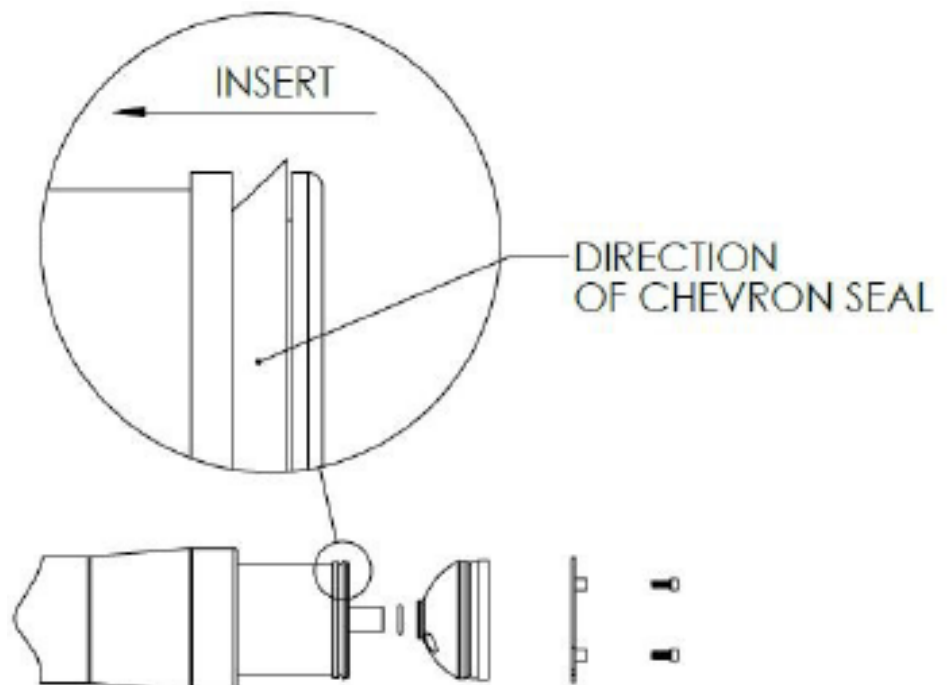
1. Locate the inlet end of the pressure vessel, that is opposite to the flow direction.
2. Remove the bolts that secure the retainer plates.
3. Remove both retainer plates.
4. Remove the end hub from the pressure vessel.



5. Slowly remove the membrane element from the pressure vessel being careful not to grasp it by the permeate tube. Needle nose pliers may be necessary to pull the old membrane element out of the pressure vessel.



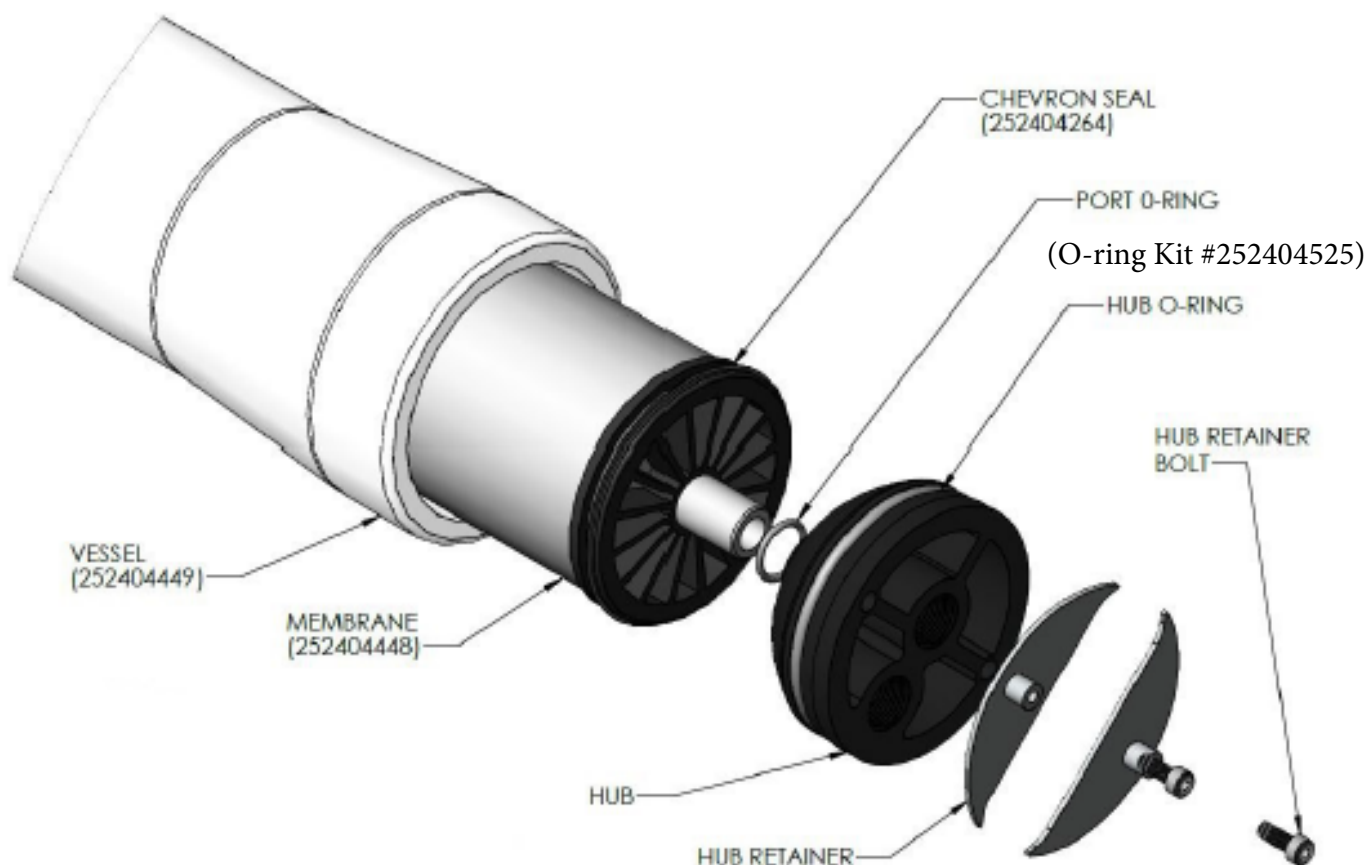
6. Remove new membrane element from container and inspect. Make sure that all parts are clean and free from dirt. Examine the brine seal, and permeate tube for nicks or cuts. Replace the O-rings or brine seal if damaged.
7. Lubricate the brine seal with a food grade lubricant
8. Install the membrane element so the brine seal will be located at the supply side of the vessel.
9. At a slight angle insert membrane while slightly rotating element being careful not to tear or flip the brine seal. Re-lube the brine seal if necessary.









10. With a smooth and constant motion, push the membrane element into the housing so that the brine seal enters the housing without coming out of the brine seal groove. A slow twisting motion should be used to insert the membrane element, to ensure that the brine seal stays in place.
11. Re-install the end hubs by gently twisting the end hub while pushing it onto the housing. Ensure that you do not pinch or fatigue any O-rings while pushing the end hub on (A rubber mallet may be necessary).
12. Re-install the hub retainers, and reconnect hoses and fittings.
13. These directions should be observed for installation of each element in each housing

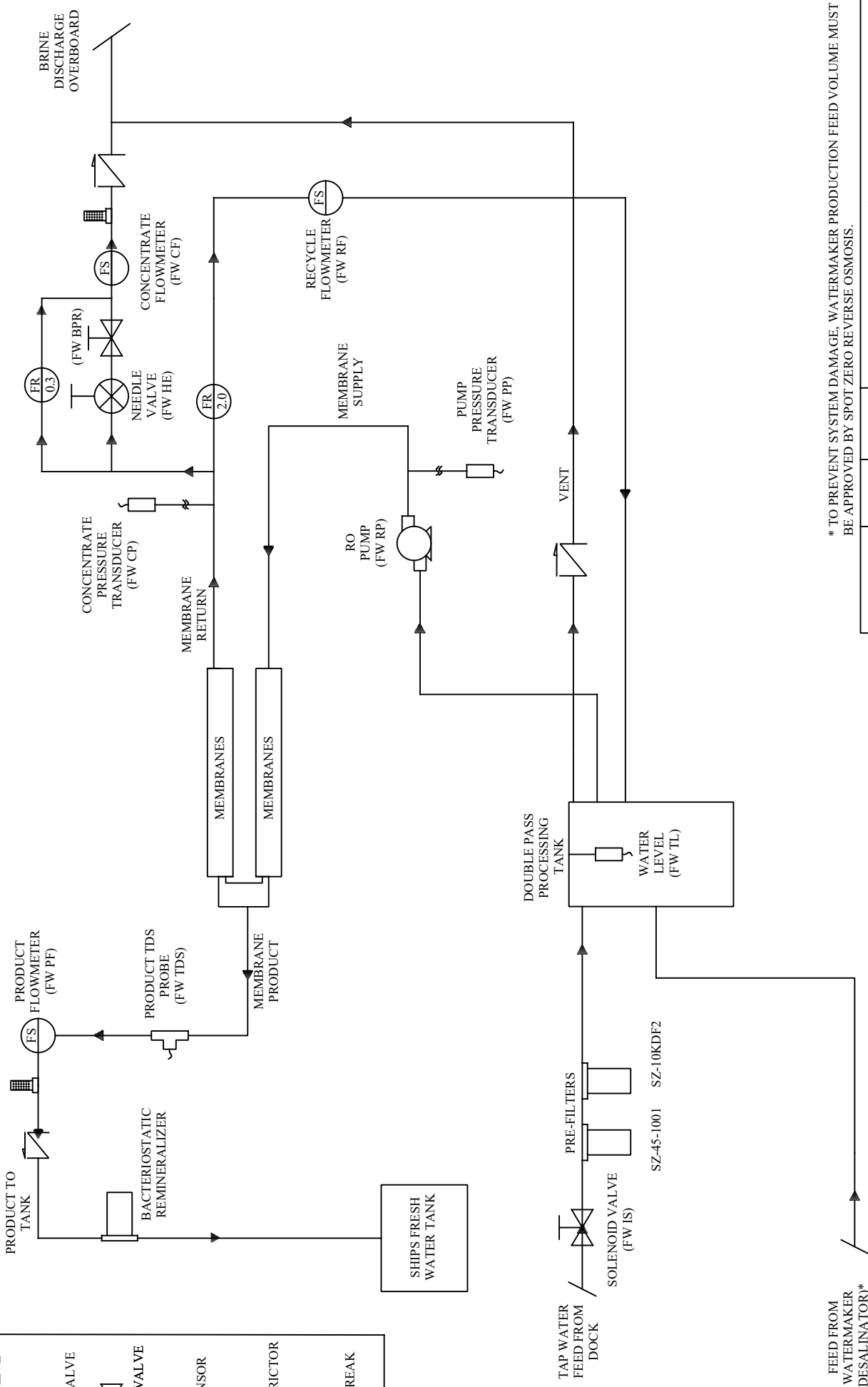
NOTE: As time progresses, the efficiency of the membrane will be reduced. The permeate flow rate will begin to decline slightly after one year of operation, but can be extended with diligent flushing and cleaning of the system. A high pH and/or precipitation of hardness can cause premature loss in rejection of membrane elements in the system.

NOTE: To get best results from the system change membranes every 1,000 hours.



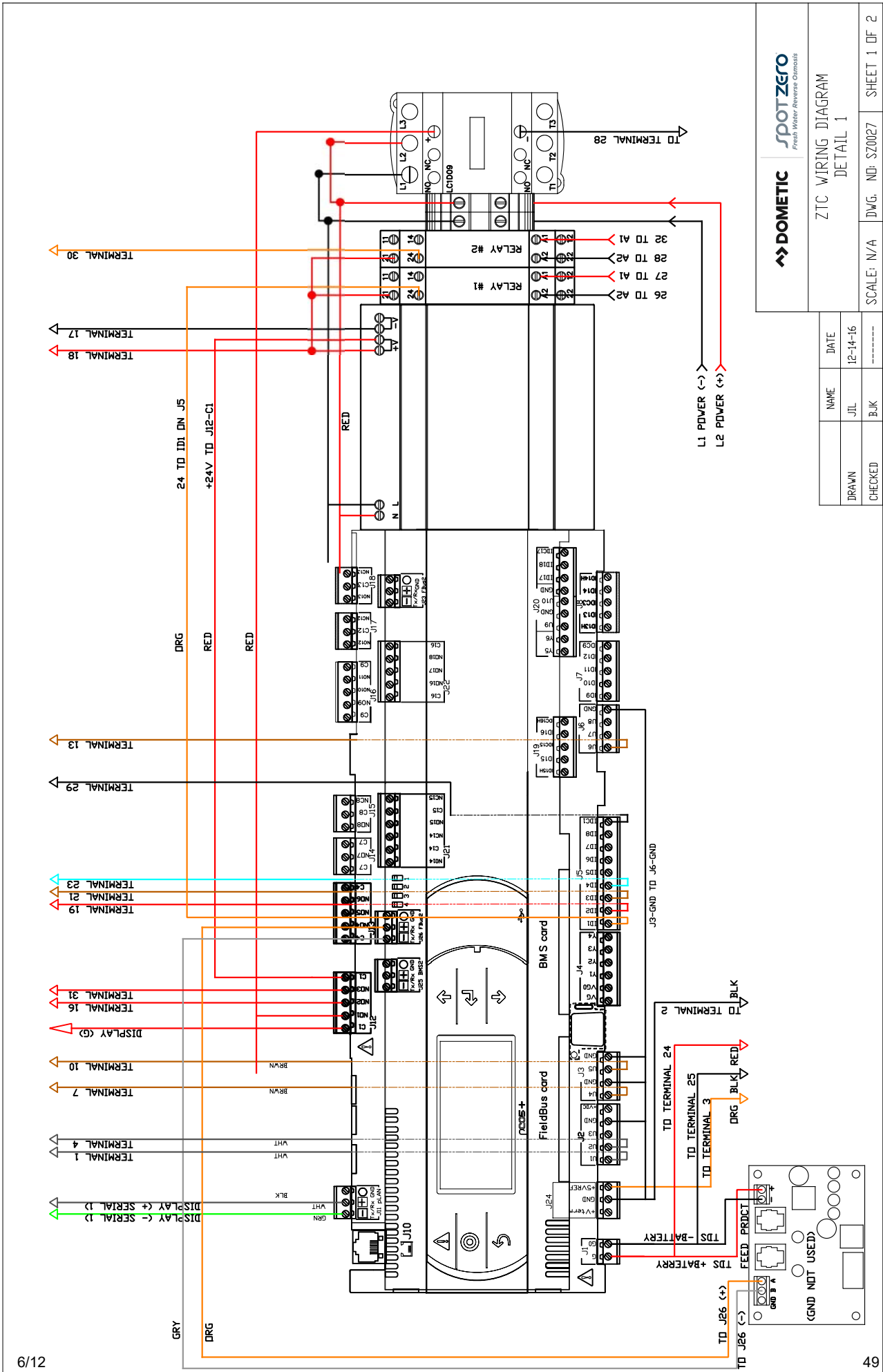
5. SYSTEM SCHEMATICS

LEGEND

CHECK VALVE

NEEDLE VALVE

SOLENOID VALVE

FLOW SENSOR

FLOW RESTRICTOR

SYPHON BREAK



* TO PREVENT SYSTEM DAMAGE, WATERMAKER PRODUCTION FEED VOLUME MUST BE APPROVED BY SPOT ZERO REVERSE OSMOSIS.

DOMETIC		spot zero <i>Fresh Water Reverse Osmosis</i>	
DRAWN	NAME	DATE	
CHECKED	JIL	03-22-18	
ENG APPR.	BJK	09-08-14	
MFG APPR.			
Q.A.			
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES			
TOLERANCES: ±.015			
FRACTIONAL ±1/32			
ANGULAR: WACH ±1/2			
TWO PLACE DECIMAL ±.010			
THREE PLACE DECIMAL ±.005			
SPOT ZERO ZTC		PIPING & INSTRUMENTATION	
SCALE: N/A		DWG. # SZ0025	
		SHEET 1 OF 1	

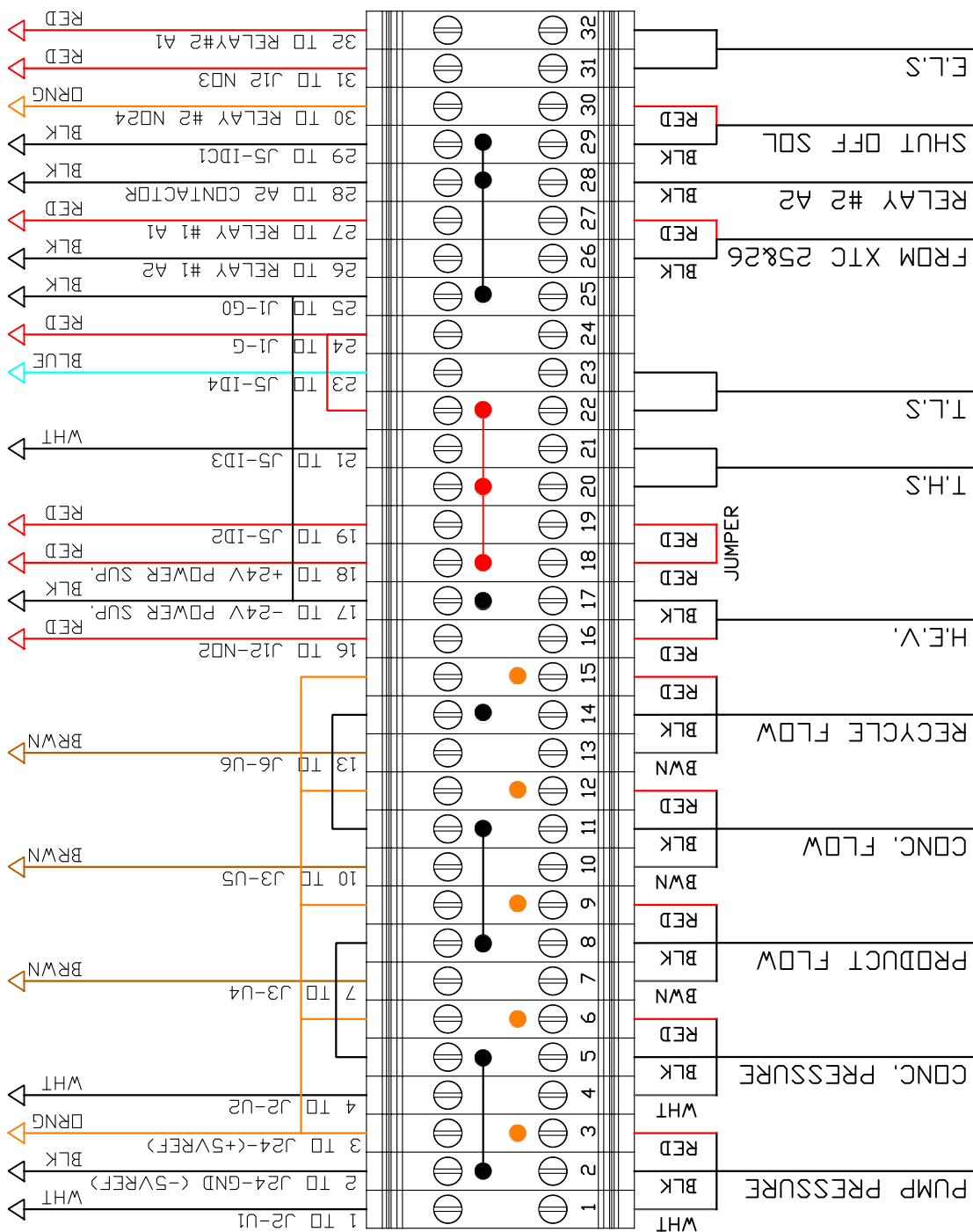


DOMETIC
spotzero
Fresh Water Reverse Osmosis

ZTC WIRING DIAGRAM
DETAIL 1

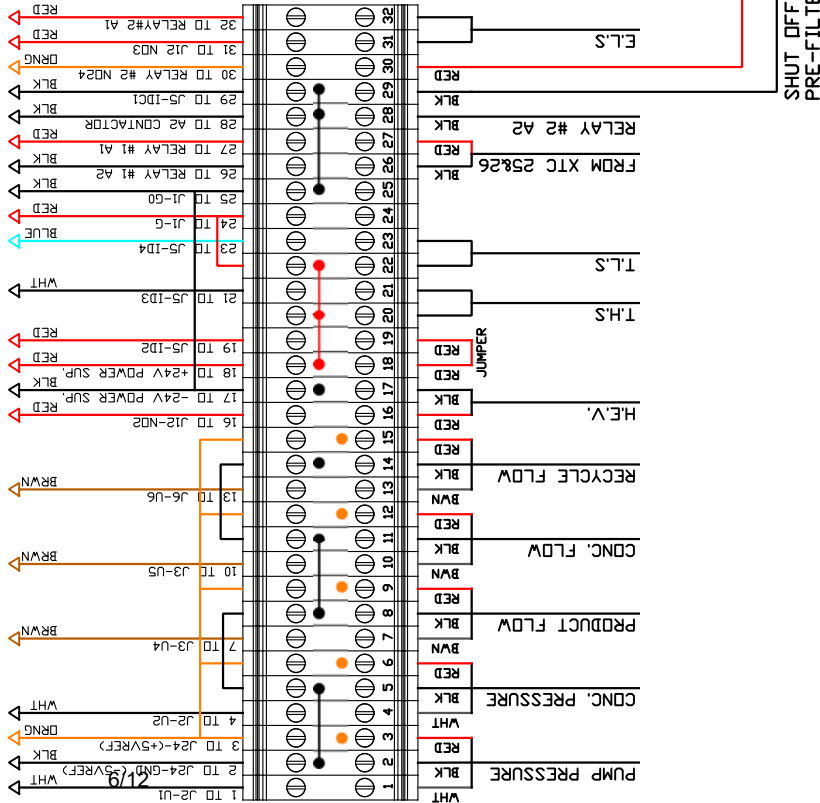
NAME	DATE
DRAWN	JIL 12-14-16
CHECKED	BJK

SCALE: N/A DWG. NO: SZ0027 SHEET 1 OF 2

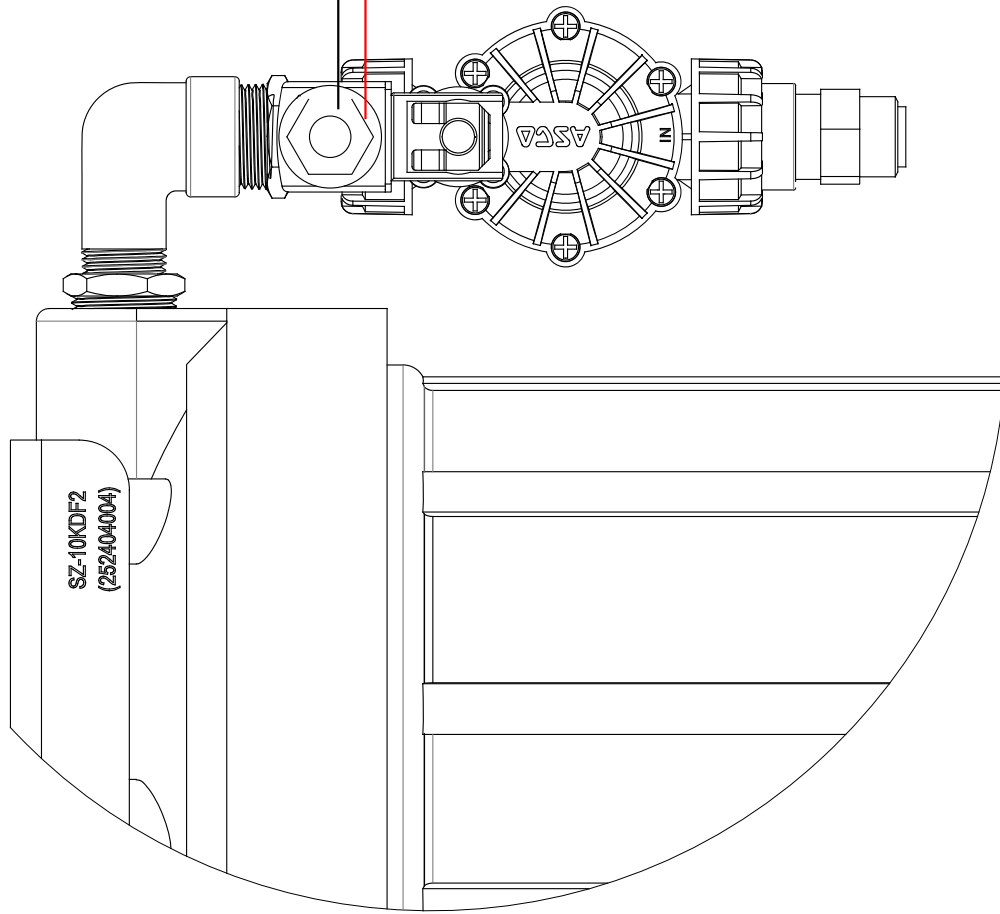


PROPRIETARY AND CONFIDENTIAL
THIS DRAWING IS THE SOLE PROPERTY OF SPOT ZERO. ANY REPRODUCTION IN
PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SPOT ZERO IS PROHIBITED.

	NAME	DATE	ZTC WIRING DIAGRAM DETAIL 2	
DRAWN	JTL	12-14-16		
CHECKED	JJ			
SCALE: N/A		DWG. NO: S20027	SHEET 2 OF 2	

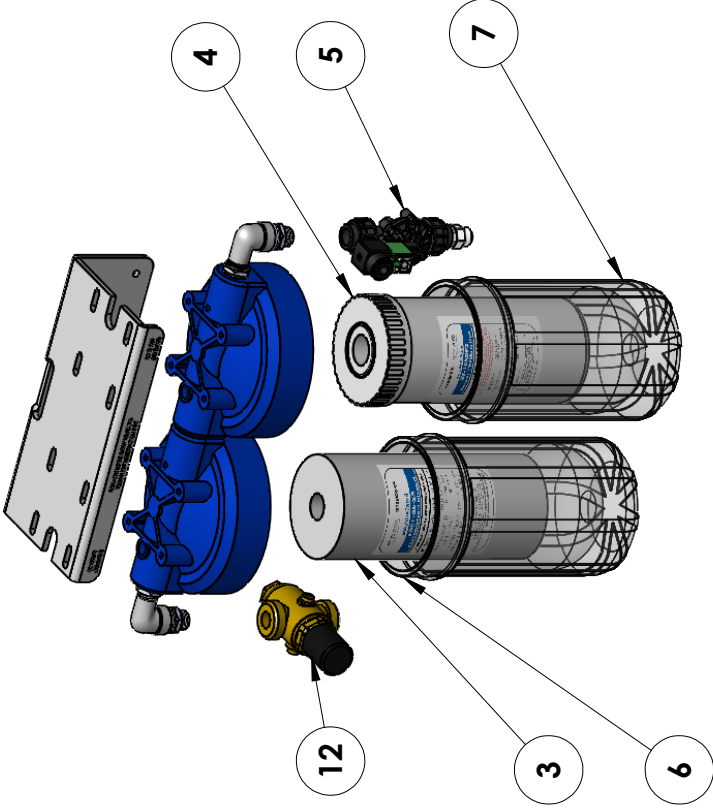
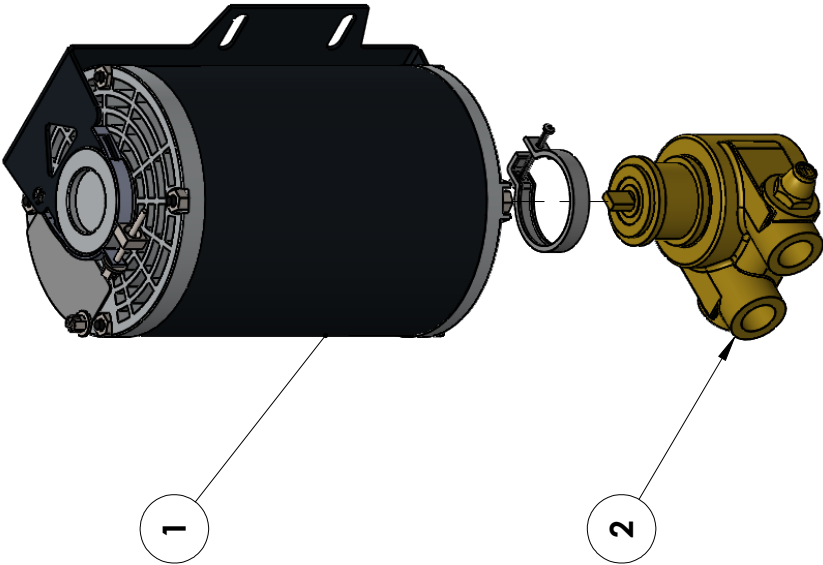


- INSTRUCTIONS:**
1. REMOVE FRONT COVER FROM ZTC.
 2. LOCATE THE TERMINAL BLOCK.
 3. INSERT WIRES FROM FWF SYSTEM INTO TERMINAL 29 AND 30 OF THE TERMINAL BLOCK.
 4. TIGHTEN THE BOLTS OF THE BLOCK TO SECURE THE WIRES IN PLACE.
 5. SYSTEM SHOULD NOW AUTOMATICALLY CLOSE AND OPEN THE SOLENOID FOR THE PRE-FILTERS.



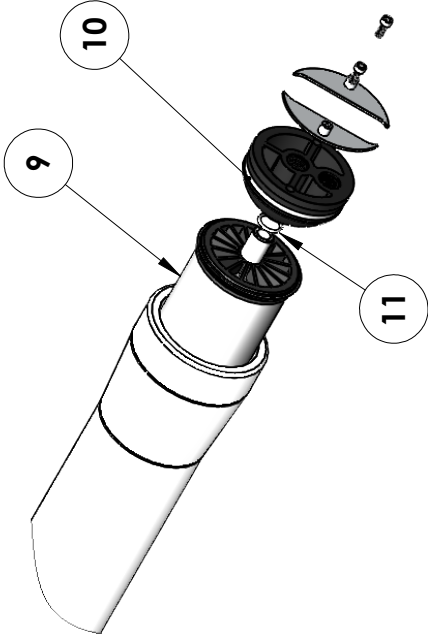
NAME	DATE	DOMETIC spotZERO	
JIL	02-20-17		
DRAWN	CHECKED		
ENG. APPR.			
MFG APPR.			
Q.A.			
SCALE: N/A	DWG. #: SZ0048	SHEET 1 OF 1	

ZTC SPECS AND PARTS



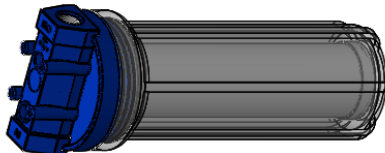

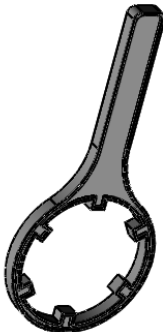

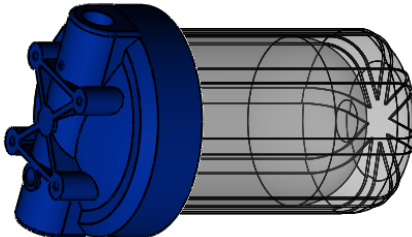

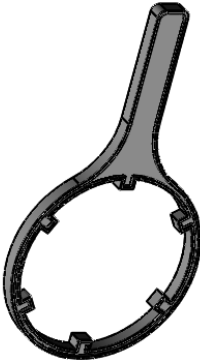
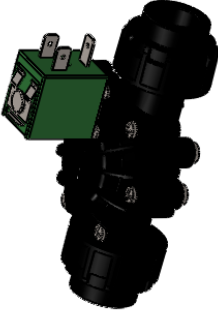
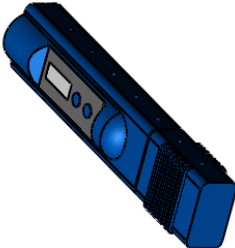



ITEM NUMBER	PART #	DESCRIPTION
1	252404026	3/4 HP SINGLE PH MOTOR
2	252404143	5.3 GPM VANE PUMP
3	252404004	SZ-45-1001 SPOT ZERO CARTRIDGE
4	252404005	SZ-10KDF2 SPOT ZERO CARTRIDGE
5	252404881	2-WAY/NC SOLENOID VALVE 24V
6	252404302	O-RING FOR 4.5X10 HOUSING
7	252404322	4.5X10 FILTER HOUSING
8	252404173	SPOT ZERO UPGRADE VESSEL

ITEM NUMBER	PART #	DESCRIPTION
9	252404000	SPOT ZERO 404T MEMBRANE
10	252404525	4" MEMBRANE O-RING (KIT)
11	252404525	1/2" MEMBRANE PRODUCT O-RING (KIT)
12	252404140	1/2" PRESSURE REGULATING VALVE



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SPOT ZERO. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SPOT ZERO IS PROHIBITED.

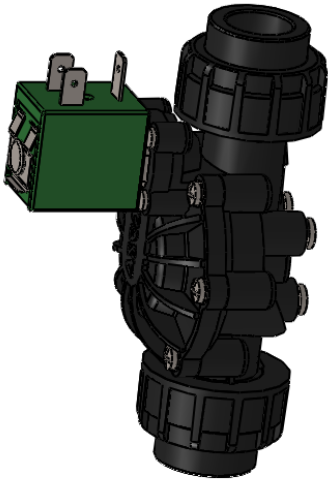
NAME	DATE
JIL	07-03-19
DRAWN	CHECKED
ENG APPR.	MFG APPR.
Q.A.	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: 1/32 ANGULAR: MACH: 1/2 BEND: 1 TWO PLACE DECIMAL: ±.010 THREE PLACE DECIMAL: ±.005	
DOMETIC spotZero	
ZCT PART LIST I	
SCALE: N/A	DWG. #: SZ0051
SHEET 1 OF 1	

<div>2.5 X 10 FILTER HOUSING</div> <div></div> <div>252404325</div>	<div>BACTERIOSTATIC REMINERALIZER CARTRIDGE</div> <div></div> <div>252404141</div>	<div>2.5 X 10 FILTER WRENCH</div> <div></div> <div>252404326</div>	<div>CHEMICAL CLEANING CARTRIDGE</div> <div></div> <div>252404006</div>																		
<div>4.5 X 10 FILTER HOUSING</div> <div></div> <div>252404322</div>	<div>4.5 X 10 FILTER HOUSING O-RING</div> <div></div> <div>252404302</div>	<div>4.5 X 10 FILTER WRENCH</div> <div></div> <div>252404327</div>	<div>INLET SOLENOID 2-WAY</div> <div></div> <div>252404881 FOR 24V (ZTC)</div>																		
<div>HAND HELD TDS</div> <div></div> <div>252404040</div>	<div>2.5 X10 FILTER HOUSING O-RING</div> <div></div> <div>252404304</div>	<table><tr><td></td><td>NAME</td><td>DATE</td></tr><tr><td>DRAWN</td><td>JIL</td><td>04-19-17</td></tr><tr><td>CHECKED</td><td></td><td></td></tr><tr><td>ENG APPR.</td><td></td><td></td></tr><tr><td>MFG APPR.</td><td></td><td></td></tr><tr><td>Q.A.</td><td></td><td></td></tr></table> <div><div>DOMETIC</div><div></div></div> <div><div>SPOT ZERO SPARE PARTS II</div><div>SCALE: N/A</div><div>DWG. #: SZ0038</div><div>SHEET 1 OF 1</div></div>			NAME	DATE	DRAWN	JIL	04-19-17	CHECKED			ENG APPR.			MFG APPR.			Q.A.		
	NAME	DATE																			
DRAWN	JIL	04-19-17																			
CHECKED																					
ENG APPR.																					
MFG APPR.																					
Q.A.																					

6/12

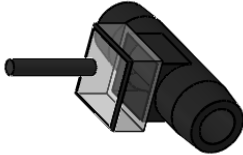
54

2-WAY SOLENOID VALVE



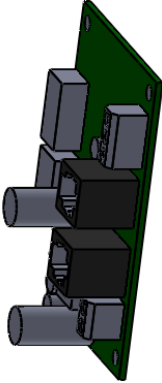
PART #: 252404881

FLOW TRANSMITTER



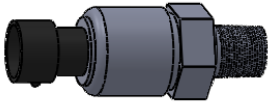
PART #: 252404349

TDS PC BOARD



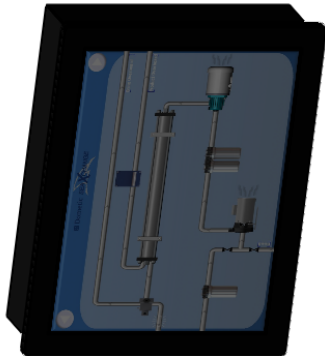
PART #: 252404350

PRESSURE TRANSDUCER



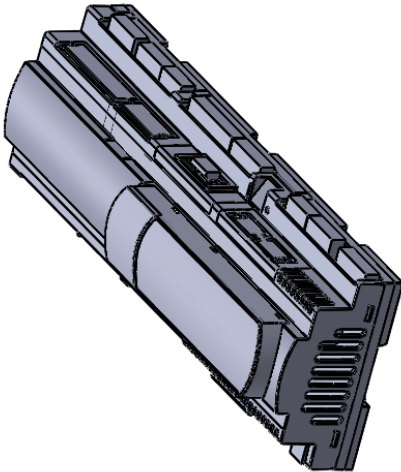
PART #: 252404347

TOUCH SCREEN



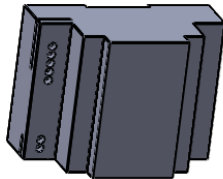
PART #: 252404181

PCO BOARD



PART #: 252404336

POWER SUPPLY

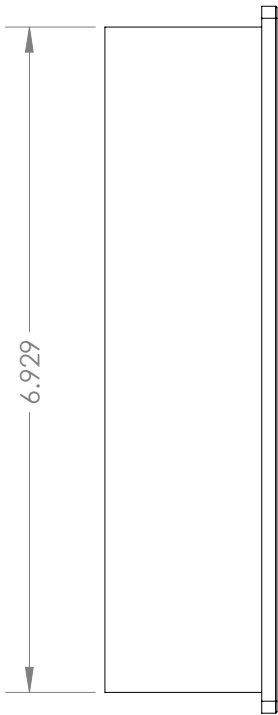


PART #: 252404351

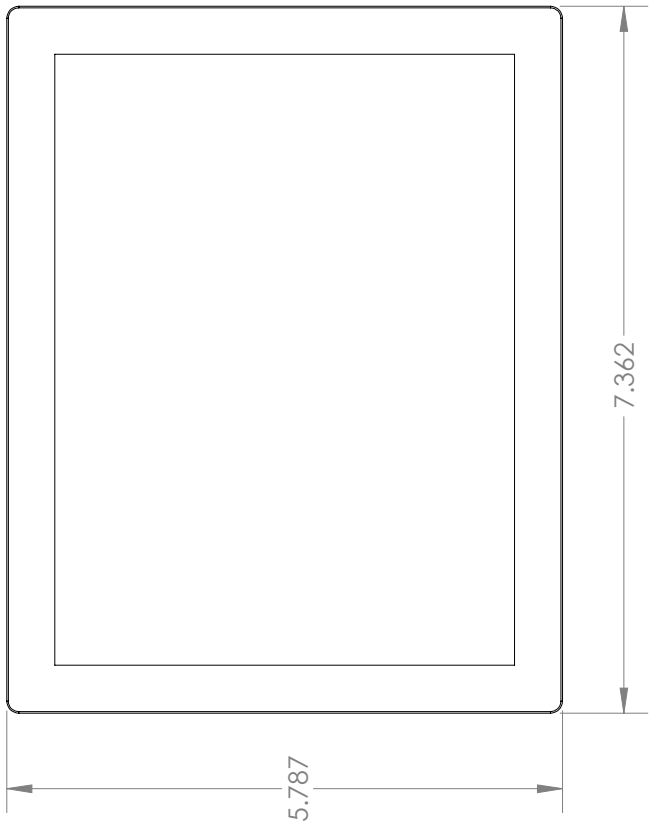
DOMETIC *spot zero*

ZTC
PARTS II

SCALE: N/A DWG.#: SZ0052. SHEET 1 OF 1

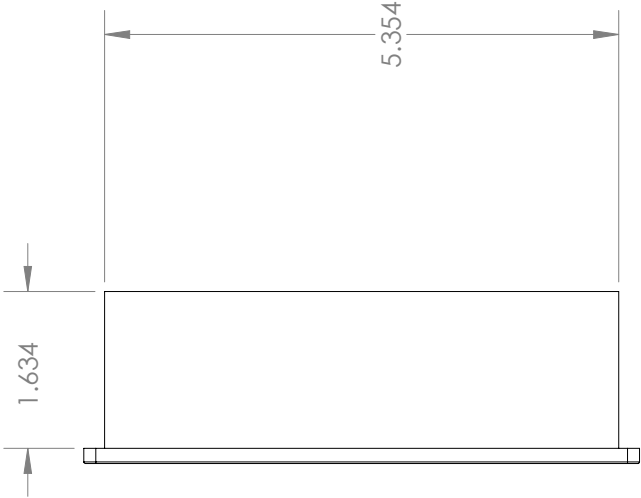


6/12



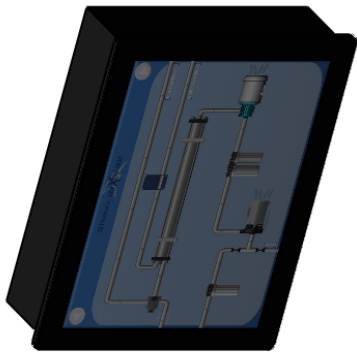
5.787

7.362



1.634

5.354



56

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONAL $\pm 1/32$ ANGULAR $\pm 1/2$ BEND ± 1 TWO PLACE DECIMAL $\pm .010$ THREE PLACE DECIMAL $\pm .005$	DRAWN	NAME JIL	DATE 12-14-15	 DOMETIC  SPOT ZERO Fresh Water Reverse Osmosis	SEA XCHANGE TOUCH SCREEN CONTROL
	CHECKED				
	ENG APPR.				
	MFG APPR.				
	Q.A.			SCALE: 1:2	DWG. #: SX0071
					SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SPOT ZERO. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SPOT ZERO IS PROHIBITED.

WARRANTY INFORMATION

OWNER'S LIMITED WARRANTY

Dometic Corporation (Dometic) warrants to the original purchaser/owner, and to subsequent owners during the applicable Limited Warranty Period, Dometic's Water Purification Products, Pumps, Related Accessories and Replacement Parts against failure from defects in material or workmanship arising in the periods specified in the Table of Limited Warranty Periods below. If a covered product or part fails during the applicable warranty period, Dometic will remedy same by repairing or replacing the defective warranted product or part as outlined below in the Table of Limited Warranty Periods. Defective parts shall be replaced free of charge and labor shall be paid for by Dometic only as set forth in the Table. Dometic reserves the right to refund the purchase price of the subject product or part as an alternative remedy to repair or replacement. The remedy allowed hereunder (repair, replacement or refund) shall be at Dometic's sole option.

SECTION I

WHAT'S COVERED

What does the Limited Warranty cover?

Water Purification Products, Pumps, Related Accessories and Replacement Parts manufactured and/or marketed by Dometic for the durations set forth in the Table of Limited Warranty Periods.

What is disclaimed, and are the warranties and remedies exclusive of all others?

Dometic does not disclaim the implied warranty of merchantability, but limits the duration of that implied warranty to the duration of the Limited Warranty offered herein.

This Limited Warranty, as well as the implied warranty of merchantability and the remedies offered by Dometic herein, are EXCLUSIVE and are made or provided in lieu of all other express or implied warranties, obligations, or liabilities. In no event shall Dometic be responsible or liable for any incidental or consequential damages alleged to have resulted from any defect in or failure of any warranted product or part. In those instances in which a cash refund is made, such refund shall effect the cancellation of the contract of sale and such refund shall constitute full and final satisfaction of all claims which the purchaser has or may have against Dometic due to any actual or alleged breach of warranty, either express or implied, including, without limitation, the implied warranty or merchantability or fitness for a particular purpose. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation may not apply to you. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The Dealer is not an agent for Dometic, except for the purpose of administering the above warranty to the extent herein provided. Dometic does not authorize the dealer or any other person to assume for Dometic any liability in connection with such warranty, or any liability or expense incurred in the replacement or repair of its products other than those expressly authorized herein. Dometic shall not be responsible for any liability or expense except as is specifically authorized and provided herein.

Dometic reserves the right to improve its products, through changes in design or material without being obligated to incorporate such changes in products of prior manufacture. Dometic can make changes at any time in design, materials, or part of units of any one, model year, without obligation or liability to owners of units of the same year's model of prior manufacture.

This warranty gives you, the purchaser/owner, specific legal rights, and you may also have other rights which vary from state to state.

OWNER'S LIMITED WARRANTY

SECTION II

WHAT'S NOT COVERED

What does this Limited Warranty not cover?

This Warranty Shall Not Apply to:

1. Failures resulting from improper installation or use contrary to instructions.
2. Failures resulting from abuse, misuse, accident, fire, or submergence.
3. Any part manufactured by Dometic, which shall have been altered so as to impair its original characteristics.
4. Any parts which fail as a result of misuse, improper application or improper installation.
5. Items not manufactured by Dometic, i.e., items, which are purchased from another manufacturer and supplied as received by Dometic without alteration or modification except as any part of a Dometic manufactured unit or component.
6. Components or parts used by or applied by the purchaser, as an integral part of products not manufactured by Dometic.
7. Labor resulting from difficult access to a Dometic product. The original installer or OEM is responsible for accessibility of unit.
8. Leaks due to improper installation of system, for example: hose clamps, fittings, flare nuts, quick disconnects.
9. Freight Damage.
10. Pumps that have been run dry, are water damaged or have blown freeze plugs.
11. Pumps with cracked heads.
12. Pump seals are not covered.
13. UV light bulbs are not covered.
14. Sea strainer elements are not covered.
15. Cartridge filter elements are not covered.
16. Sand & gravel in a multi-media filter are not covered.
17. Pump packing assemblies are not covered.
18. Pump valve assemblies are not covered.
19. Pump crankcase oil is not covered.
20. Gauge instrument calibration is not covered.
21. Fuses are not covered.
22. Valve seals and packings are not covered.
23. Exterior corrosion is not covered.
24. Membrane elements are not covered.
25. Logic boards with water damage.
26. Logic boards with blown MOV's (Power Surge)
27. Mis-programmed displays.
28. Displays or remotes with water damage.
29. Failures due to improper winterization.
30. Unit damage as a result of improper return packaging.
31. Travel costs are included in the hourly labor allowances and should not be billed as a separate item without preapproval from the factory.

Installation and application of Dometic components are not warranted by Dometic, because Dometic has no control or authority over the selection, location, application, or installation of these components.

OWNER'S LIMITED WARRANTY

SECTION III

COVERAGE PERIOD

What is the period of coverage?

SEE TABLE OF LIMITED WARRANTY PERIODS BELOW.

How does one determine when the Limited Warranty Period begins? All Dometic products bear a data plate on which there are model and serial numbers. The date of manufacture of the product can be determined by Dometic based on the serial number on the product. To determine whether or not any Dometic component is in warranty, proceed as follows:

1. Determine the model and serial number on the data plate located on the product. Write or call the Dometic Customer Service Department to obtain the manufacture date of the product. The hours of the Customer Service Department are 8:00 a.m. - 5:00 p.m. (USA, Eastern Standard Time Zone) Monday through Friday excluding holidays.
2. It is possible that a considerable time lag exists between the date a product or component is manufactured and the date it is put in service. In such instances, the date of manufacture could indicate that the item is out of warranty. However, based on the date the equipment is first put in service, the item may still be covered by the Dometic Limited Warranty. For proof of date put in service, Dometic will require a copy of the bill of sale of the Dometic equipment from the installer or new boat dealer to the original owner.

OWNER'S LIMITED WARRANTY

SECTION IV

GETTING COVERED WARRANTY SERVICE

How does the purchaser/owner get warranty service?

Please read the following Warranty Procedure: If the failure of a Dometic component is determined to be covered under the Dometic warranty and the time in service is determined to be within the warranty time limit, the owner has the following three options:

1. Preferred option: Have a Dometic authorized Servicing Dealer, perform the work needed. The customer needs to call Dometic Customer Service Department for a recommendation as to the closest dealer. If the customer already knows an authorized servicing dealer, the dealer should be contacted directly.
2. Second option: If the customer contacts Dometic Service Department for a Servicing Dealer and Dometic has no one in that particular area, Dometic will authorize the use of a local service company and Dometic will work with the local company to assist in any way possible.

The customer may contact the Dometic Service Department at 1(800) 542-2477, Monday through Friday, 8:00am - 5:00pm.

TABLE OF LIMITED WARRANTY PERIODS

Important Notes Regarding Product Start-up/ Commissioning:

1. Warranty periods begin from the date of possession of the boat/vessel by the first owner if OEM installed or date of installation if dealer installed, but not to exceed three (3) years from date of production of the product. However, if the product is started for any reason by the OEM or dealer, notwithstanding any provision to the contrary, the warranty period will be for a period of one (1) year commencing from the date that the product was started by the OEM or dealer. The warranty is transferable and will carry the remainder of the original owner's warranty based on the original date of purchase or date of installation.
2. Proof of purchase or installation may be required to verify warranty coverage.
3. Any unit or replacement part installed due to a warranty failure carries the remainder of the original warranty. Warranty coverage does not start over from the repair/replacement date.
4. Warranty coverage shall not exceed three (3) years from the date of production of the product.
5. These warranty periods are effective February 1, 2014.

WATER PURIFICATION PRODUCTS:

PRODUCT SALE TYPE WARRANTY COVERAGE

Spot Zero OEM 1-year warranty, parts and labor, from date of delivery of vessel. Not to exceed 3 years from date of production of product, and subject to **Important Notes above**. Pump warranty, see Pump section.

Dealer Installed 1-year warranty, parts and labor, from date of installation. Not to exceed 3 years from date of production of product, and subject to **Important Notes above**. Pump warranty, see Pump section.

Sea Xchange OEM 1-year warranty, parts and labor, Not to exceed 3 years from date of production of product, and subject to **Important Notes above**. Pump warranty, see Pump section.

Dealer Installed 1-year warranty, parts and labor, from date of installation. Not to exceed 3 years from date of production of product, and subject to **Important Notes above**. Pump warranty, see Pump section.

(SE SERIES, SX SERIES FROM DATE OF DELIVERY OF VESSEL. XTC SERIES, CX SERIES)

PUMPS, ACCESSORIES, REPLACEMENT PARTS:

PRODUCT SALE TYPE WARRANTY COVERAGE

Pumps OEM or Dealer Installed 1 year warranty, parts and labor. Wearable parts such as pump seals, brushes and plastic valves are not covered under warranty.

OWNER'S LIMITED WARRANTY

SECTION IV (CONTINUED)

Dealer Installed and 1 year warranty, parts only. Wearable parts such as pump seals, brushes and plastic valves are not covered under warranty.

Accessories OEM, Dealer Installed, 1 year warranty, parts only.

Replacement Parts Aftermarket sales. 90-Day warranty, parts only.