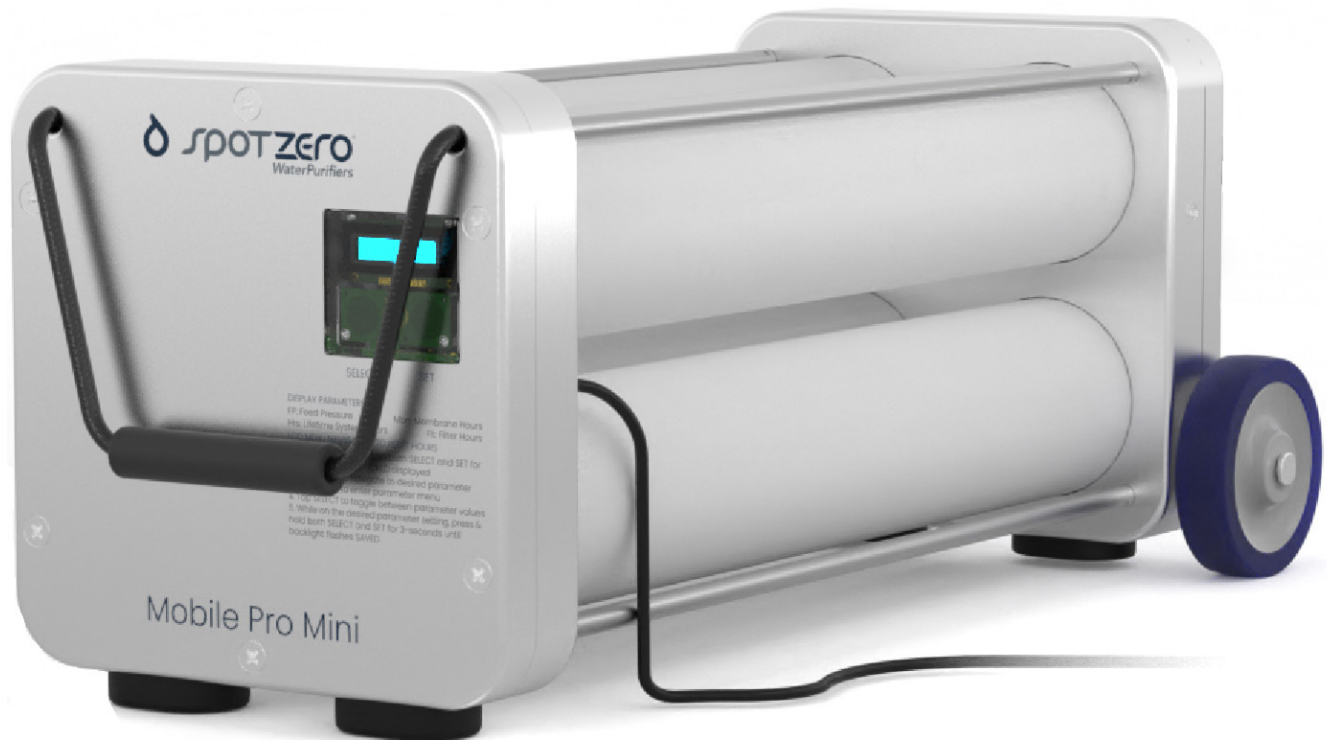




OPERATION MANUAL



Mobile Pro Mini

100 SW 16th St Fort Lauderdale, FL 33315

Phone: 954-533-5640

www.spotzerowater.com



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Manufacturer's Statements

Disclaimer

The following manual was written by Spot Zero Reverse Osmosis specifically for the Spot Zero Mobile Pro Mini reverse osmosis system. The information prepared within this manual has been compiled by Spot Zero with the best attempts to make it both comprehensive and accurate but Spot Zero makes no definitive claim or guarantee of the completeness and accuracy of the presented information. Spot Zero disclaims all liability for inaccuracies, omissions and outdated information.

Furthermore, any direction, recommendation, or instruction provided directly by Spot Zero Reverse Osmosis will take precedence over the information provided within this manual.

Status at Time of Printing

Spot Zero Reverse Osmosis has always pursued continued innovation to ensure superior customer service and produce industry leading technology. In this effort, it is possible that some of the features and functionality discussed in this document may differ from those found within your Spot Zero system. Therefore, it is the responsibility of the customer to take the information provided as a reference only and to conduct due diligence to ensure proper system performance, maintenance, and general ownership

Limitations of the Manual

To ensure proper system performance, you must use common sense and diligence when operating your Spot Zero unit. A variety of marinas, geographical locations, and residential complexes, have specific regulations in regards to water purification, discharge of contaminants, electrical consumption, water consumption, and other various processes involved in reverse osmosis. It is the responsibility of the operator to follow the ecological, biological, municipal, and other regulations involved with the operation of the Spot Zero system. Compliance with these regulations is beyond the scope of this manual and Spot Zero is not responsible for proper instruction in these areas.

Spot Zero Reverse Osmosis
100 SW 16th St
Fort Lauderdale, FL, 33315
Telephone: 954-533-5640
www.spotzerowater.com



Introduction



The Spot Zero Mobile Pro Mini is a self-contained water purification system used to remove up to 99% of all waterborne contaminants such as heavy metals, bacteria, chlorine and many others. Product water from the Spot Zero Mobile Pro Mini can be used to wash-down a boat, car, RV or airplane as well as fill your vessel's tank or fill up a glass of the purest water on Earth.

Safety

The safety section of this User Manual outlines the various safety headings used through this manual's text which are enhanced and defined below.

Before 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 personnel involved with the system.

DO NOT UNDER ANY CIRCUMSTANCES REMOVE ANY CAUTION, WARNING, OR OTHER DESCRIPTIVE LABELS FROM THIS SYSTEM.

NOTE	INDICATES STATEMENT THAT PROVIDE FURTHER INFORMATION OR CLARIFICATION
 CAUTION	INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN EQUIPMENT OR OTHER DAMAGE.
 WARNING	INDICATES STATEMENTS THAT ARE USED TO IDENTIFY CONDITIONS OR PRACTICES THAT COULD RESULT IN INJURY OR LOSS OF LIFE. FAILURE TO FOLLOW WARNINGS COULD RESULT IN SERIOUS INJURY OR EVEN DEATH.

Common Acronyms and Abbreviations

ACRONYM	DEFINITION
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
PC Board	Printed Circuit Board
MGH	Male Garden Hose
NPT	National Pipe Thread
LED	Light Emitting Diode
LCD	Liquid Crystal Display
SDI	Salt Density Index

Operating Specifications

Your system is designed to operate with a product pressure between 10–150 psi. Ensure you use a good quality hose capable of handling 150 psi.

Pre-Filtration

Spot Zero™ Mobile Pro Mini systems are supplied with a pre-filter (Part #: FI-FW0021) that is used to filter out most particles over 1-micron as well as remove chlorine, chloramine, VOCs and other heavy metals. The filter removes these waterborne contaminants through an absorption process that consumes the life of the carbon and other activated materials within the filter. Therefore, the pre-filter should be changed every 100 hours of use and you should NEVER attempt to clean used filter cartridges as this may result in permanent system damage. The pump and membranes are susceptible to damage from sediment and debris that results from a dirty or clogged filter.

Pump and Motor

The high pressure pump used on the Spot Zero Mobile Pro Mini require a continuous and non-turbulent flow of water to the system with a minimum feed pressure of 10-psi during operation and not exceeding a temperature of 100°F.

CAUTION

IF THE PRE-FILTER BECOMES CLOGGED OR DAMAGED AND THE WATER FLOW TO THE PUMP IS REDUCED OR INTERRUPTED, CAVITATION WILL OCCUR. THIS CAN LEAD TO PERMANENT PUMP DAMAGE.

Feed Water

Nothing has a greater effect on the life and performance of a reverse osmosis system than the feed water quality. Specifications for the feed water are found in the table below:

Max. Feed Temperature °F (°C)	100 (45)	Min. SDI Rating	< 3
Min. Feed Temperature °F (°C)	40 (4.4)	Max. Free Chlorine ppm	0
Max. Ambient Temperature °F (°C)	100 (37.7)	Max. TDS ppm	1,000
Min. Ambient Temperature °F (°C)	40 (4.4)	Max. Hardness gpg	3
Max. Feed Pressure psi (bar)	85 (5.9)	Max. pH (Continuous)	9
Min. Feed Pressure psi (bar)	10 (3.1)	Min. pH (Continuous)	6
Max. Operating Pressure psi (bar)	150 (10.34)	Max. Turbidity NTU	1

NOTE

IT IS VERY IMPORTANT TO MEET THE MINIMUM FEED WATER REQUIREMENTS. FAILURE TO DO SO WILL CAUSE THE MEMBRANES TO FOUL AND VOID THE MANUFACTURER'S WARRANTY.

Electrical Requirements

The motor used on the Spot Zero Mobile Pro Mini requires single-phase, 115-Volt, 60-Hz AC power. Please ensure that the electrical circuit supplying the system is compatible with the requirements of the Spot Zero Mobile Pro Mini model. A good quality extension cord, with 12-gauge wiring or better, is required providing power to the system along with a 15-Amp breaker.

VOLTAGE	AMP DRAW	FREQUENCY	PHASE	BREAKER
115-V	10 A	60-Hertz	Single	15 A

NOTE IT IS RECOMMENDED THAT A QUALIFIED ELECTRICIAN WIRES YOUR SYSTEM IN ACCORDANCE WITH ALL APPLICABLE CODES, RULES, LAWS, AND REGULATIONS.

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

CAUTION FAILURE TO USE A PROPERLY RATED EXTENSION CORD AND/OR CIRCUIT BREAKER CAN RESULT IN INEFFICIENT SYSTEM OPERATION OR USER INJURY OR DEATH.

Plumbing Connections

The Spot Zero Mobile Pro Mini has 3 unique plumbing connections that must be made to ensure proper system performance. Please see the specifications and accompanying Figure below for the external plumbing fittings sizes and locations.

1 - FEED WATER	2 - PRODUCT OUTLET	3 - DISCHARGE OUTLET
3/4" Male Garden Hose	3/4" Male Garden Hose	3/4" Hose Barb

FIGURE 1: PLUMBING FITTING LOCATIONS



CAUTION ANY RESTRICTIONS OR BLOCKAGE IN THE DISCHARGE LINE CAN CAUSE MEMBRANE SCALING AND BACK PRESSURE, WHICH WILL INCREASE THE SYSTEM'S OPERATING PRESSURE. THIS MAY RESULT IN PERMANENT DAMAGE TO THE SYSTEM.



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Normal Operation

Set Up

1. Attach a feed water hose to the connection port labeled TAP WATER FEED INPUT (Fig. 2, #1). Ensure the hose used is rated with a minimum pressure rating of 150-psi to avoid bursting.

NOTE	FOR BEST SYSTEM PERFORMANCE, UTILIZE AS SHORT OF A 3/4" HOSE AS POSSIBLE WITH A MAXIMUM REQUIRED HOSE LENGTH OF 25-FEET.
-------------	--

2. Attached a hose to the connection port labeled SPOT ZERO OUTPUT (Fig. 2, #2). Ensure the hose used is rated with a minimum pressure rating of 150-psi to avoid bursting.
3. Ensure the discharge hose connected to the concentrate outlet hose barb (Fig. 3, #3) is attached and free of any restriction, debris, and allows for easy water escape to an open area.
4. Plug the attached power cord to a GFCI protected AC power receptacle.
5. Ensure the feed water conditions fall within the Feed Water Quality Specifications, Pg. 5.



FIGURE 2: GARDEN HOSE PLUMBING CONNECTIONS

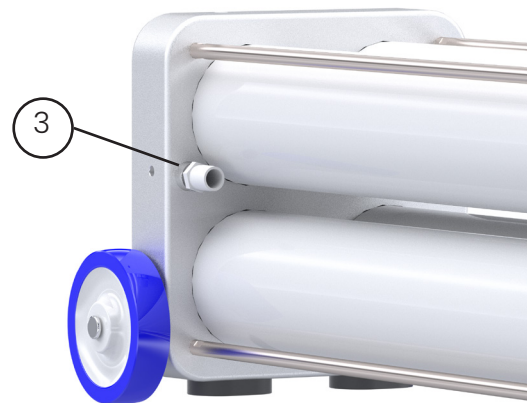


FIGURE 3: HOSE BARB PLUMBING CONNECTION

⚠ WARNING	A GFCI PROTECTED OUTLET SHOULD BE USED TO SUPPLY POWER TO THIS SYSTEM. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH!
------------------	--

⚠ CAUTION	FAILURE TO OPERATE SPOT ZERO EQUIPMENT WITHIN SPECIFIED PARAMETERS MAY RESULT IN PERMANENT DAMAGE TO SYSTEM.
------------------	--



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General Use

1. Once the LCD display is powered on, the system will be in Standby mode as indicated by the word STANDBY intermittently displaying on the screen.
2. Once you are ready for operation, turn on the pressurized tap water feed to the system.
3. The system will begin purging air for a brief period of time.
4. Once the air is purged from the system and there is adequate feed flow, the system will begin priming as indicated by the LCD showing PRIMING.
5. Once the system is primed and ready for performance, it will enter Ready mode as indicated by READY displaying on the LCD.
6. The pump will turn on and the LCD will show RUNNING. The system is now ready for use.

NOTE	THERE IS A STANDBY TIMER SET FOR 10 MINUTES OF INACTIVITY. MEANING, IF THE PRODUCT VALVE IS CLOSED FOR A PERIOD OF TIME LONGER THAN 10 MINUTES, THE SYSTEM WILL RETURN TO STANDBY MODE INDICATED BY STEP 1 IN THE GENERAL USE SECTION ABOVE.
-------------	--

System Performance

As with any fluid flow application, there is a linear relationship between fluid pressure and flow rate. The same principle is applicable to the Spot Zero Mobile Pro Mini. Please see the brief description below for best system performance based on specific application.

Filling A Vessel's Tank

When filling a vessel's tank, you want to achieve the greatest possible flow rate to reduce fill time and system use. As stated in the principle above, with the greatest available flow, the system will produce the least amount of pressure.

To achieve this type of flow, remove any nozzles or valves on the Spot Zero Output of the Mobile Pro Mini so the flow is free from obstruction.

***The tables below shows feed conditions and results for a Spot Zero Mobile Pro Mini operating with no restrictions or nozzle on the product output. Results may vary for each customer.**

FEED SOURCE CONDITIONS	GPM	Pressure	Temperature	PPM	Hose Length
	3.25	60 PSI	77° F	165 PPM	10 Feet

PRODUCT WATER RESULTS	GPM	PPM	Hose Length
	2.25 GPM	19	10 Feet

Vessel Washing

When spraying down a vessel with Spot Zero water, you want to achieve the greatest pressure and flow rate to quickly and efficiently wash down the vessel. As stated in the principle above, achieving sufficient product pressure while also maintaining an ample flow rate is a balance in the restriction of the product output from the machine.

To achieve this type of flow, most users incorporate a spray nozzle on the product output of the system. In most applications, some restriction of the product is required to generate the most velocity of the product water and therefore the most distance. An example of the above application is shown on the next page.

Sample System Performance

System performance has been thoroughly tested and measured for the Spot Zero Mobile Pro Mini. Performance metrics for the Mobile Pro Mini are shown below in the tables and graphics for a washdown application where the customer is using a proportional nozzle on the product water outlet of the system.

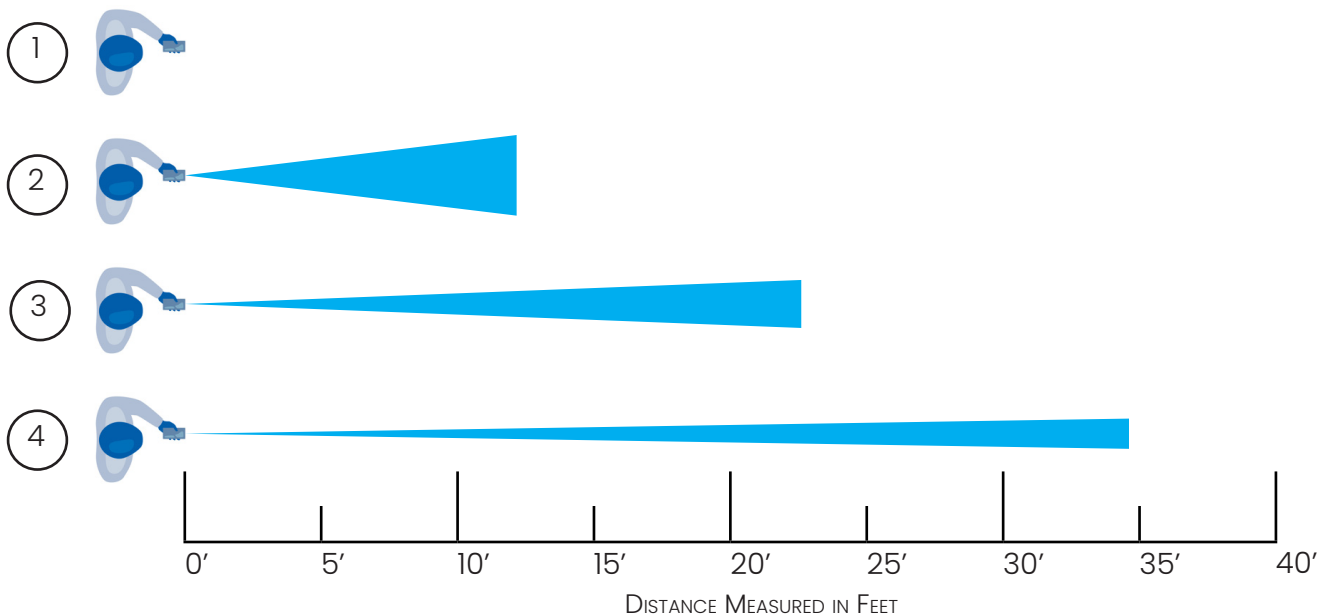
NOTE: The specified values for nozzle position, product flow rate, product pressure, distance, and overall system performance were measured using new prefilters, membranes and the following feed water parameters. Results may vary for each customer based on feed conditions, temperature, filter and membrane life, pump condition and overall system condition.

Feed Source GPM	Feed Source Temp.	Feed Source PPM	Feed Hose Length
3.25	75° F	80 PPM	10 Feet

Figure Number	Nozzle Position	Product Flow Rate
1	CLOSED - 0%	0 GPM
2	FULLY OPEN - 100%	2.25 GPM
3	PARTIAL OPEN - ~60%	2.10 GPM
4	PARTIAL OPEN - ~40%	2.0 GPM



Approximate Distance vs Nozzle Position



Shutdown Procedure

Please follow the steps below for proper shutdown of the Spot Zero Mobile Pro Mini. The system is equipped with a built-in flushing cycle and does not require the use of a ball valve.

1. While the system is running (displaying RUNNING on the LCD), stop the flow from the SPOT ZERO OUTPUT using an in-line valve or spray nozzle.
2. Once the product water is turned off, the system will begin auto-flushing. Allow the system to flush uninterrupted for 3-minutes. **To promote the longest membrane life, fill the vessel with Spot Zero product water and utilize the product water and your on-board vessel pump to feed the Mobile Pro Mini with the Spot Zero water.**
3. After the flushing cycle, turn off the TAP WATER FEED INPUT. The system will shutdown automatically.
4. Disconnect input power supply, and the TAP WATER FEED INPUT and SPOT ZERO OUTPUT hoses.
5. Reinstall storage caps (Part Number: PF-PY0047) to SPOT ZERO OUTPUT and TAP WATER FEED INPUT.

NOTE

SYSTEM MUST BE USED OR FLUSHED EACH MONTH FOR 5-MINUTES TO PREVENT FOULING.

NOTE

IT IS NORMAL FOR THE LCD DISPLAY TO SHOW !LOW FP! FOR A SHORT PERIOD OF TIME DURING THE SHUTDOWN CYCLE AFTER THE TAP WATER FEED SUPPLY HAS BEEN SHUT OFF FROM THE SYSTEM.

NOTE

TO PROMOTE THE LONGEST MEMBRANE LIFE, FILL THE VESSEL WITH SPOT ZERO PRODUCT WATER AND UTILIZE THE PRODUCT WATER AND YOUR ON-BOARD VESSEL PUMP TO FEED THE MOBILE PRO MINI WITH THE SPOT ZERO WATER.

CAUTION

SPOT ZERO MOBILE PRO MINI MUST BE USED/STORED IN AN ENVIRONMENT WITH TEMPERATURES ABOVE FREEZING (32° F/0° C). DAMAGE CAUSED FROM A FAILURE TO DO SO WILL NOT BE COVERED UNDER WARRANTY BY SPOT ZERO.



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LCD Display Cycles

The LCD will display a sequence of parameters for 1.5-seconds at a time. The display follows the same continuous sequence unless the operating mode is changed, a fault occurs, flow is interrupted, or the power is disengaged.

The sequence for each operating mode is shown below.

STANDBY

LCD DISPLAY	DESCRIPTION
SpotZero	Manufacturer Label
Standby	Indicates Operation Sequence
FP_XXX	Feed Pressure
Flt_XXX	Filter Hours
Mbn_XXX	Membrane Hours
Hrs_XXX	Total System Hours



PRIMING

LCD DISPLAY	DESCRIPTION
Priming	Indicates Operation Sequence
FP_XXX	Feed Pressure



READY

LCD DISPLAY	DESCRIPTION
Ready	Indicates Operation Sequence
FP_XXX	Feed Pressure



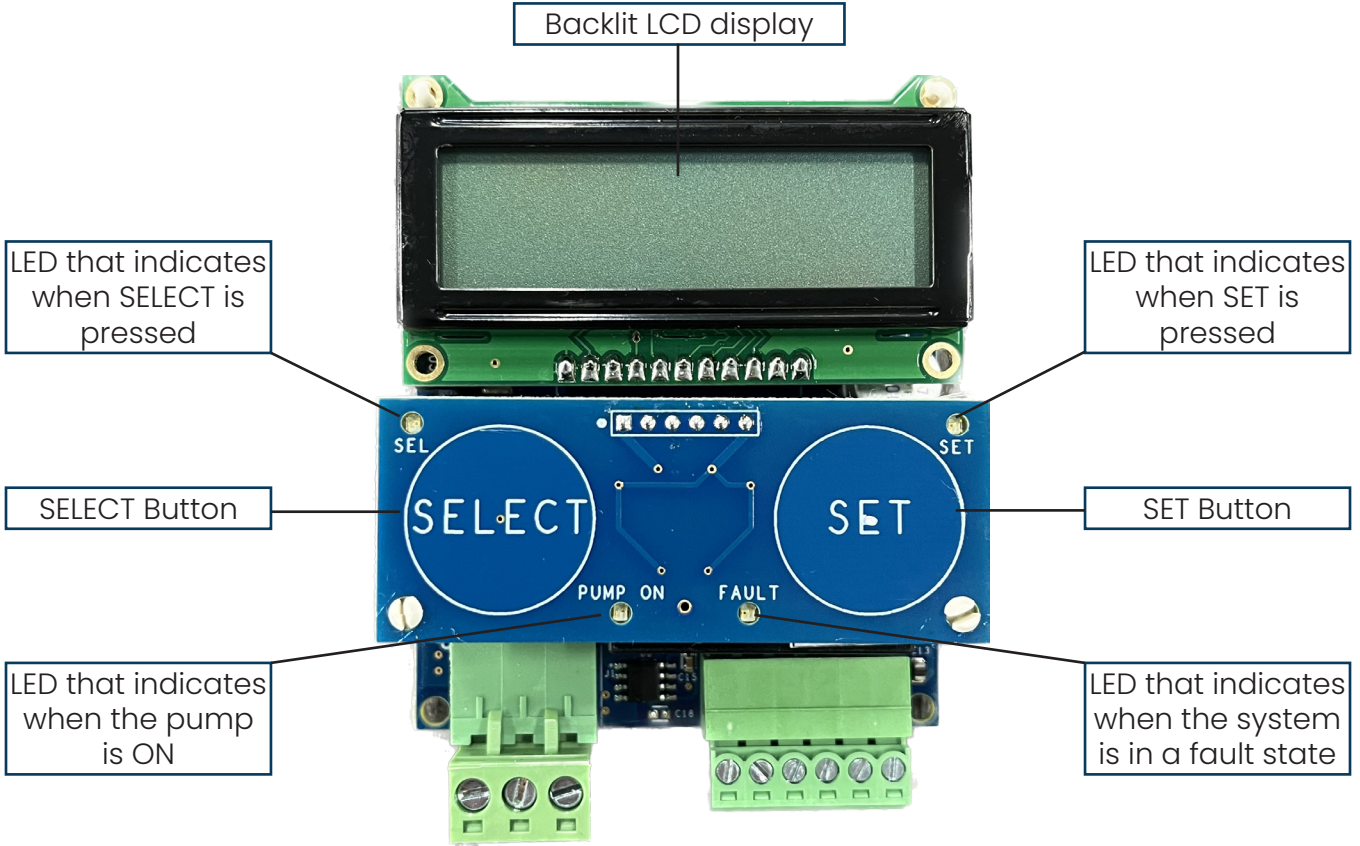
RUNNING

LCD DISPLAY	DESCRIPTION
SpotZero	Manufacturer Label
Running	Indicates Operation Sequence
FP_XXX	Feed Pressure
Flt_XXX	Filter Hours
Mbn_XXX	Membrane Hours
Hrs_XXX	Total System Hours

PC Board and LCD Components

The driving component behind the operation of the Spot Zero Mobile Pro Mini is the internal PC Board and accompanying LCD Display. Indication and description of important LCD components can be found below in Figure 4.

Figure 4: Mobile Pro Mini PC Board Reference



LCD Maintenance Indicators

The Mobile Pro Mini is equipped with smart maintenance tracking capabilities align with programmed reminders for system maintenance. Please see the below table for reference on LCD maintenance indicators and corresponding required action.

LCD Display	LED Indicator	Action Required	Reference
ORDER FILTER	NONE	Order filter	Part #: FI-FW0021
CHANGE FILTER	FAULT LED slow RED flash	Change filter	Pg. 15
FILTER PAST DUE	FAULT LED rapid RED flash	Change filter	Pg. 15
ORDER MEMBRANE	NONE	Order membrane	Part Number: MM-FW0014
CHANGE MEMBRANE	FAULT LED slow RED flash	Change membrane	Pg. 17
MEMBRANE PAST DUE	FAULT LED rapid RED flash	Change membrane	Pg. 17

LCD Programming and Navigation

The Spot Zero Mobile Pro Mini is preprogrammed with set recommended maintenance cycles along with programming sequences that a customer can use to monitor system performance more closely. Please see the below information for LCD navigation.

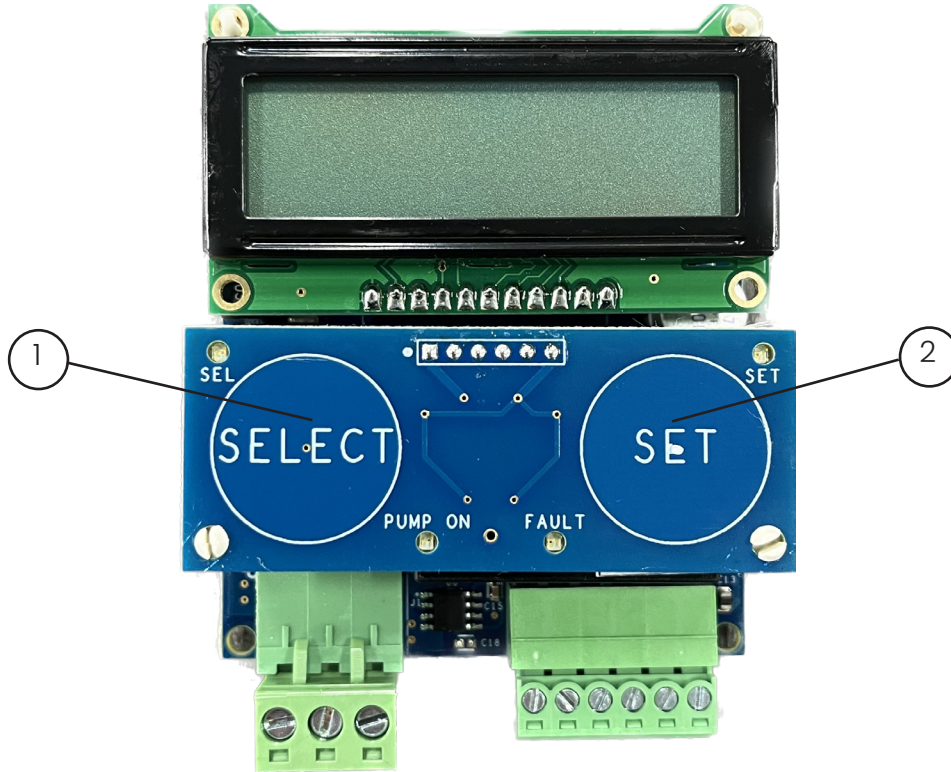
At any time during operation, if either the SET or SELECT buttons are pressed, the LCD will display LOCKED for 0.5-seconds to prevent from any accidental programming or variable change. Therefore, to reset parameters such as filter and membrane hour counters, the keypad must be unlocked first.

Unlocking the Keypad

Press and hold BOTH the SET (Fig. 5, #1) and SELECT (Fig. 5, #2) buttons for 3-seconds until you see UNLOCKED display on the LCD for 0.5-seconds.

NOTE	FEEDBACK TO DETERMINE IF EITHER SET OR SELECT ARE BEING PRESSED IS GIVEN BY THE BLUE LED'S ABOVE EACH BUTTON AS SHOWN IN FIGURE 4 ON PG. 12.
-------------	--

Figure 5: Mobile Pro Mini PC Board Reference



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Maintenance

Filter Replacement

Each Spot Zero Mobile Pro Mini contains one prefilter that is responsible for removing suspended solids, heavy metals, and other contaminants before the membranes. The filter (Part #: FI-FW0021) must be replaced every 100 hours of operation or as needed.

The LCD display is programmed with the following indicators to show recommended filter change intervals:

For a Complete Collection of Maintenance Videos Scan the QR Code Below or

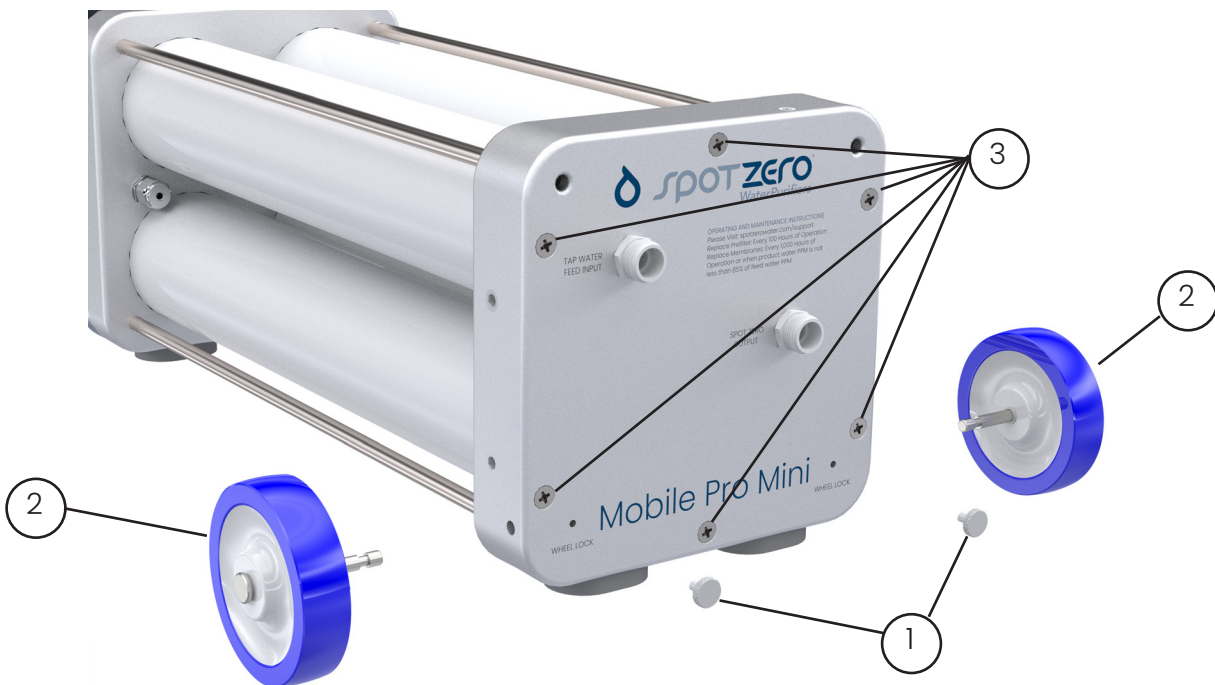
[Click HERE](#)



TIME	LCD DISPLAY	LED SEQUENCE
90 Hours	ORDER FILTER	None
100 Hours	CHANGE FILTER	Slow consistent red flash
110 Hours	FILTER PAST DUE	Rapid red flash

1. Ensure the water supply is turned off and hoses are disconnected from the system.
2. Ensure power is disconnected from the power supply.
3. If wheels are installed, follow the brief instructions below to remove them before continuing.
 - a. Unthread the Wheel Lock set screw (Part #: HW-SC0016) half-way from the plate on the backside of the system as shown Figure 6, Item 1.
 - b. Slide wheel axle assembly (Part Number: MA-MP0000) out of the retaining channel and set aside for re-installation later (Fig. 6, Item 2)
 - c. Repeat on opposite side.

FIGURE 6: WHEEL ASSEMBLY/REMOVAL



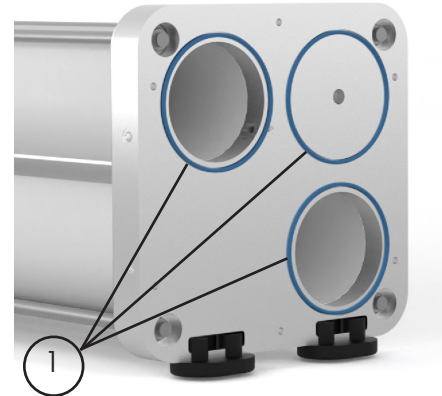
4. Once the wheels and plumbing have been removed, unscrew the 6 end plate retaining screws shown in Figure 6, Item 3, one at a time.
5. Hold end plate firmly with two hands and pull away from the unit to release the end plate.

6. As shown in Figure 7, the filter is located in the top left hole through the inner end plate (#1).
7. Using either pliers or your hand, reach into the housing and firmly grasp the filter.
8. Remove the filter from the housing by pulling away from the system.
9. Install the new filter in the direction of the arrow label as shown in Figure 7, #2. NOTE: the white seal should be the **last** side of the filter to enter the vessel.
10. Push the filter inside the housing until it stops.

FIGURE 7: FILTER CHANGE



FIGURE 8: O-RING EMPHASIS

**NOTE**

BEFORE RETURNING END PLATE TO SYSTEM FACE, ENSURE ALL O-RINGS ARE PROPERLY INSTALLED AND HAVE NOT COME LOOSE IN THE REMOVAL PROCESS AS SHOWN IN FIGURE 8, #1. IF NEEDED, RELUBRICATE WITH MOLYKOTE.

NOTE

THE NEW FILTER HAS A MEMBRANE CLEANER IN IT THAT WILL ASSIST IN CLEANING THE MEMBRANE FILM. REMOVAL OF THESE IMPURITIES WILL ASSIST IN THE OVERALL EFFICIENCY AND PERFORMANCE OF THE SYSTEM. DO NOT USE ANY PRODUCT WATER UNTIL THE FOLLOWING STEPS ARE COMPLETED.

11. Retrieve the end plate and return to the system top side up as shown in Fig. 9.
12. Align the end plate and push inward toward the system until the external edges of the plate are flush with those of the internal end plate.
13. Return all screws to the system, properly fastening each one by hand to a torque of 50 in-lb
14. Reconnect all hoses to the system and turn on water for approximately 30-seconds to bleed air out of the unit.

FIGURE 9: END PLATE RE-INSTALLATION



FIGURE 10: SCREW RE-INSTALLATION



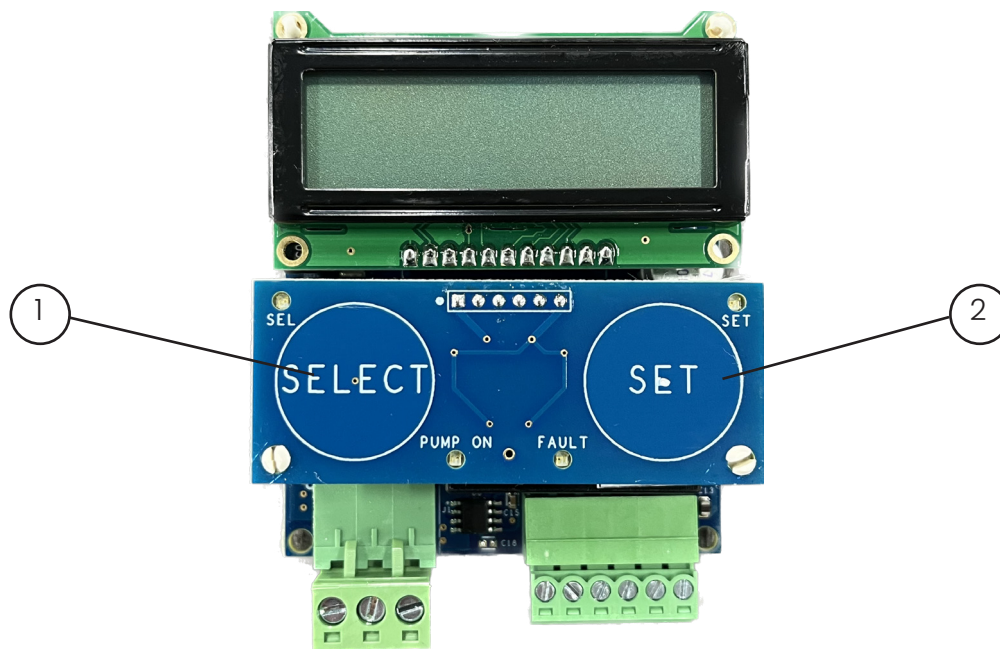
15. Allow the membrane cleaner solution to soak for a minimum of 30-minutes by turning off the water supply. Longer soak times will promote greater performance. Do not let the cleaner soak for more than 24-hours.
16. Turn the water supply on to allow the system to flush with the Spot Zero product outlet shut for 10-minutes to remove residual cleaner. DO NOT plug in the system to power yet.
17. Reset Filter Maintenance Hours as shown on Pg. 16. Return to Normal Operation

Resetting the Maintenance Hours

1. Unlock the keypad as explained on the previous page.
2. Press the SELECT button to see the first programmable parameter. Continuing to press SELECT will toggle through all parameters and will wrap around back to the beginning.
3. To begin editing a parameter, navigate to the desired parameter and press the SET button.
4. Once the parameter value is displayed, press the SET button again to change the value to the alternate value. Each subsequent press of SET will change the value by a step.
5. To save the parameter value, press and hold both SET and SELECT buttons for 3-seconds until the LCD displays SAVED for 1.5-seconds. Parameter setting mode will be exited and you will be returned to the normal display sequence.
6. To exit parameter setting mode WITHOUT saving, press the SELECT button at any time, this will return you to the parameter menu.

***The programmable parameters are shown below with all available options.**

Parameter	Value 1	Explanation if Saved
Flt Hrs	KEEP	Filter hours will remain unchanged
	RESET	Filter hours will reset back to 0
Memb Hrs	KEEP	Membrane hours will remain unchanged
	RESET	Membrane hours will reset back to 0



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Membrane Replacement

Each Spot Zero Mobile Pro Mini contains two RO membranes that are responsible for the ultra-filtration of incoming water supply. The membranes (Part #: MM-FW0014) must be replaced every 500 hours of operation or as needed.

The LCD display is programmed with the following indicators to show recommended membrane change intervals:

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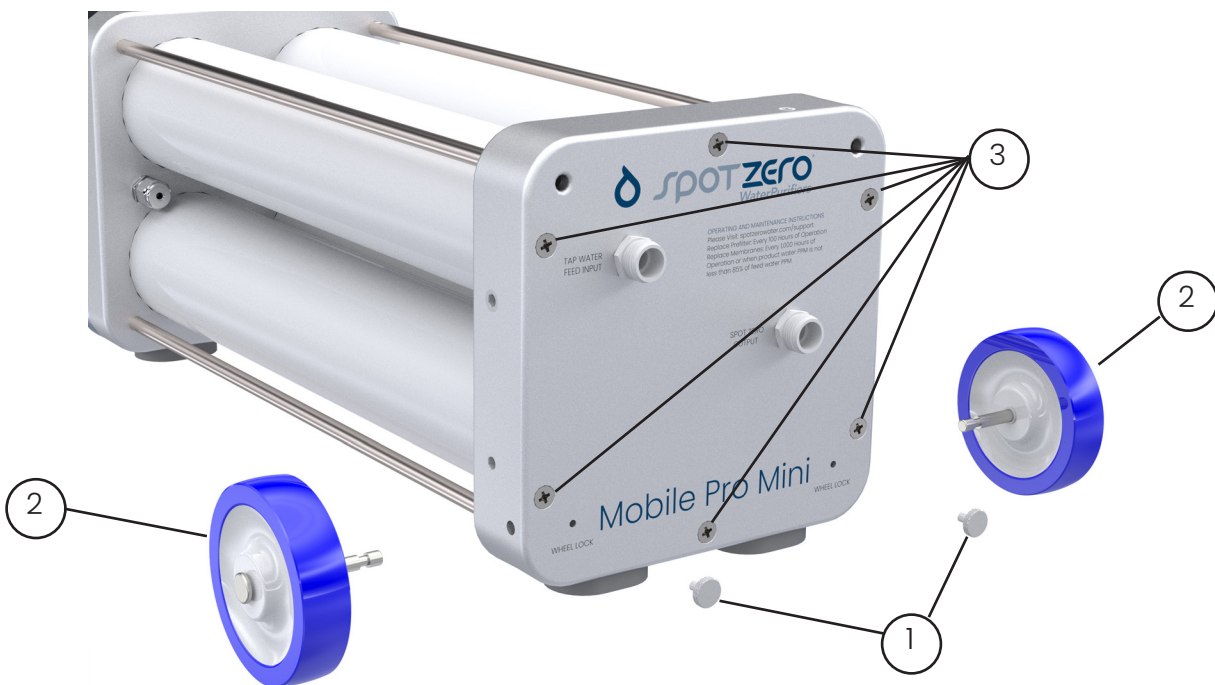
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TIME	LCD DISPLAY	LED SEQUENCE
490 Hours	ORDER MEMBRANE	Slow consistent red flash
500 Hours	CHANGE MEMBRANE	Slow consistent red flash
510 Hours	MEMBRANE PAST DUE	Solid red

1. Ensure the water supply is turned off and hoses are disconnected from the system.
2. Ensure power is disconnected from the power supply.
3. If wheels are installed, follow the brief instructions below to remove them before continuing.
 - a. Unthread the Wheel Lock set screw from the plate on the backside of the system as shown in the image below.
 - b. Slide wheel axle assembly out of the retaining channel and set aside for re-installation later.
 - c. Repeat on opposite side.

FIGURE 11: WHEEL ASSEMBLY/REMOVAL

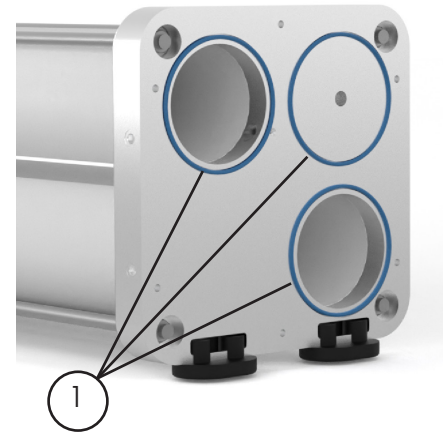
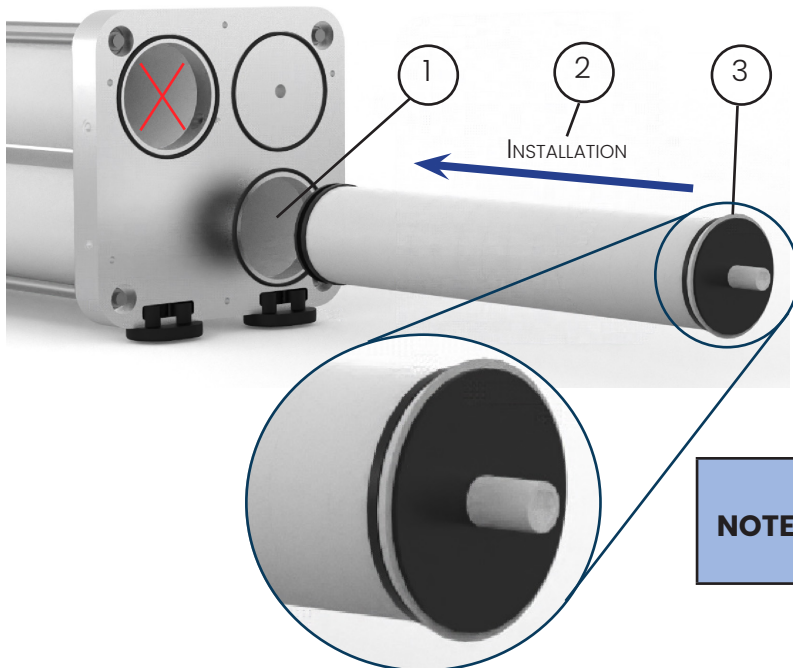


4. Once the wheels and plumbing have been removed, unscrew the 6 end plate retaining screws shown in Figure 11 one at a time.
5. Hold end plate firmly with two hands and pull away from the unit to release the end plate.

6. As shown in Figure 12, the first membrane is located in the bottom right hole through the inner end plate (Fig. 12, #1). Using either needle nose pliers or your hand, reach into the housing and firmly grasp the membrane by one of the black fins, ensuring not to grasp the product tube in case inspection or reuse is required (Fig. 12).
7. Remove the membrane from the housing by pulling away from the system (Fig. 12, #2).
8. Remove the new membrane from the packaging and inspect for any nicks, cuts, or deformities. If the white brine seal (Fig. 12, #3) is damaged, replace with a new one.
9. Lubricate the white brine seal (Fig. 12, #3) with a food grade lubricant such as Molykote.
10. Install the membrane element so the brine seal is on the side that is last to enter the housing (Fig. 12, #3). Push the membrane into the housing until it stops, using a slight twisting motion to ensure the brine seal stays properly seated.
11. Continue to firmly push on the membrane until it feels like it set in place.

FIGURE 12: MEMBRANE REPLACEMENT WHEEL SIDE

FIGURE 13: MEMBRANE O-RING EMPHASIS WHEEL SIDE



NOTE	THE SIDE WITH THE WHITE SEAL MUST BE THE LAST SIDE TO ENTER THE HOUSING
-------------	--

FIGURE 14: CORRECT PLIER USE ON MEMBRANE

FIGURE 15: INCORRECT PLIER USE ON MEMBRANE

CORRECT



INCORRECT



NOTE	BEFORE RETURNING END PLATE TO SYSTEM FACE, ENSURE ALL O-RINGS ARE PROPERLY INSTALLED AND HAVE NOT COME LOOSE IN THE REMOVAL PROCESS AS SHOWN IN FIGURE 13, #1. IF NEEDED, RELUBRICATE WITH MOLYKOTE.
-------------	--

- 12. Retrieve the end plate and return to the system top side up as shown in Fig. 16.
- 13. Align the end plate and push inward toward the system until the external edges of the plate are flush with those of the internal end plate.
- 14. Return all screws to the system, properly fastening each one by hand to a torque of 50 in-lb

FIGURE 16: END PLATE RE-INSTALLATION



FIGURE 17: SCREW RE-INSTALLATION



- 15. Move to the opposite side of the unit and repeat Steps 5-14 to replace the second RO membrane using Figures 18 and 19 instead of 12 and 13. The membrane is contained in the only open hole that is visible when the second outer end plate is removed, Figure 18.
- 16. Reset Membrane Maintenance Hours as shown on Pg. 16. Return to Normal Operation

FIGURE 18: MEMBRANE REPLACEMENT LCD SIDE

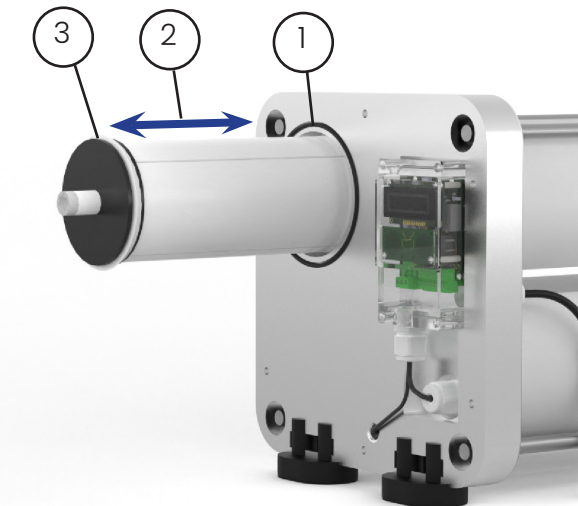


FIGURE 19: MEMBRANE O-RING EMPHASIS LCD SIDE

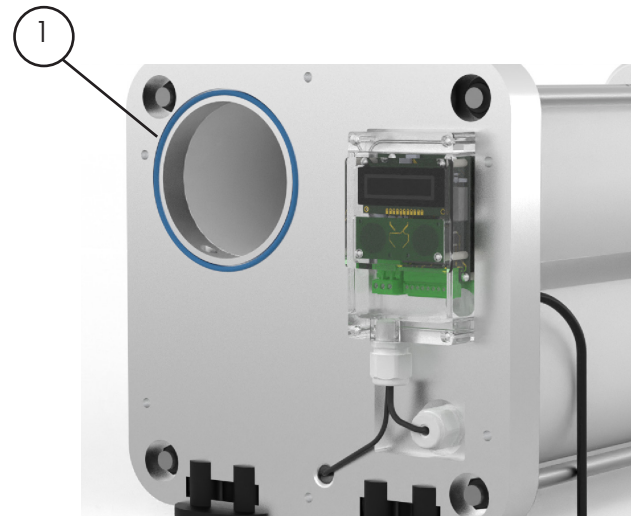


FIGURE 20: END PLATE RE-INSTALLATION LCD SIDE



FIGURE 21: END PLATE SCREW RE-INSTALLATION LCD SIDE



Preparing System for Storage or Shipment

If the unit will be sitting idle for a significant amount of time (i.e. anything longer than 1 month), the membrane vessels must have static water replaced with membrane storage chemical solution. The CH-03 Membrane Storage Chemical is **Part #:252404263** and can be purchased through any dealer of Spot Zero. To prepare for storage, please follow the steps below.

1. Turn the system on and fill a 5-gallon bucket with the Spot Zero product water that comes out of the Mobile Pro Mini.

CAUTION

PRODUCT WATER FROM THE MOBILE UNIT MUST BE USED FOR THE BELOW STEPS, FAILURE TO DO SO MAY RESULT IN PERMANENT MEMBRANE DAMAGE.

2. Disconnect the inlet hose from the TAP WATER FEED INPUT fitting.
3. Remove the filter from the system using Steps 1-8 shown on Pgs. 14-15.
4. Return end plate to the system and secure properly as shown in Steps 11-13 shown on Pg. 16.
5. Thoroughly mix contents on the Membrane Storage Chemical with the 5-gallons of Spot Zero water produced in Step 1 above.
6. Run a hose from the bucket with the solution to an auxiliary pump to circulate the solution into the unit. This pump should be hooked up into the TAP WATER FEED INPUT.

CAUTION

ENSURE THE PUMP DOES NOT EXCEED 30-PSI INTO THE SYSTEM AND THE WATER IS BELOW 110°F (44°C).

7. Connect a hose to the SPOT ZERO OUTPUT and run the open end to the 5-gallon bucket from Step 1 above.
8. Connect a hose to the Overboard Discharge and run the open end to the 5-gallon bucket from Step 1 above.
9. Turn the auxiliary pump on and circulate the solution throughout the system for a minimum of 15-minutes. Do not drain the solution from the system.
10. Be sure to remove the hoses from the system and plug the inlets and outlets of the system to ensure that the storage solution does not leak out of the system.

CAUTION

THE SYSTEM SHOULD NEVER BE PLUGGED IN FOR ANY OF THE ABOVE STEPS. ONLY AN AUXILIARY PUMP SHOULD BE USED TO CIRCULATE THE SOLUTION. PLUGGING IN THE SYSTEM AND ALLOWING THE PUMP TO RUN CAN PERMANENTLY DAMAGE THE MEMBRANES IF ALL THE STORAGE CHEMICAL HAS NOT BEEN REMOVED FIRST.

Recommissioning System After Storage

1. Install a new pre-filter (Part #: FI-FW0021) into the system following Steps 1-17 on Pgs. 14-15. Reconnect the TAP WATER FEED INPUT to a hose feed, as well as connect the Overboard Discharge and SPOT ZERO OUTPUT to their respective hoses.
2. Turn on the water supply to the unit. DO NOT PLUG IN THE UNIT TO POWER YET.
3. Allow the system to flush without the pump running for approximately 30-minutes.
4. After the 30-minute flush, provide power to the unit and commence normal operation.

WARNING

ENSURE ALL OF THE PRODUCT WATER DURING THE 30-MINUTE FLUSH IS DISCARDED OVERBOARD. THIS IS NON-POTABLE, HIGH PPM WATER AND COULD FOUL PLUMBING FIXTURES AND/OR DISCOLOR OR STAIN MATERIALS IT CONTACTS.

Winterization of the Spot Zero Mobile Pro Mini

There are two options for winterizing your Spot Zero Mobile Pro Mini. It is the responsibility of the user to determine the best method for their application and use due diligence for following all required steps.

Option 1: Storage in a Stable Above Freezing Environment (32°F/0°C)

The best practice for winterization is to store the Spot Zero Mobile Pro Mini in a heated, controlled storage climate. During this storage, the system still needs to be ran and flushed once a month for five minutes to prevent the membranes from fouling. If the system cannot be run for five minutes once a month, you must prepare the unit for storage following the Preparing System for Storage or Shipment guide on Pg. 20.

Option 2: Storage in an Uncontrolled Environment

If the system is stored in freezing or near freezing temperatures and will not be stored in a heated climate, the following should must done to avoid permanent damage. If the system will also sit without flushing for more than a month at a time, the membrane vessels must have static water replaced with membrane storage chemical solution. The CH-03 Membrane Storage Chemical is **Part #:252404263** and can be purchased through any dealer of Spot Zero. To prepare for storage, please follow the steps below.

1. Turn the system on and fill a 5-gallon bucket approximately half-way with the Spot Zero product water that comes out of the Mobile Pro Mini.

CAUTION

PRODUCT WATER FROM THE MOBILE UNIT MUST BE USED FOR THE BELOW STEPS, FAILURE TO DO SO MAY RESULT IN PERMANENT MEMBRANE DAMAGE.

2. Disconnect the inlet hose from the TAP WATER FEED INPUT fitting.
3. Remove the filter from the system using Steps 1-8 shown on Pgs. 14-15.
4. Return end plate to the system and secure properly as shown in Steps 11-13 shown on Pg. 16.
5. Using the bucket of product water from Step 1 above, create a 50/50 mix of the Spot Zero product water or distilled water and Propylene Glycol (available at most hardware and automotive stores).
6. Thoroughly mix contents on the Membrane Storage Chemical with the 5-gallons of Spot Zero water / Propylene Glycol mix produced in Step 5.

WARNING

DO NOT USE ETHYLENE GLYCOL, ONLY NON-TOXIC PROPYLENE GLYCOL SHOULD BE USED.


7. Run a hose from the bucket with the solution to an auxiliary pump to circulate the solution into the unit. This pump should be hooked up into the TAP WATER FEED INPUT.

CAUTION

ENSURE THE PUMP DOES NOT EXCEED 30-PSI INTO THE SYSTEM AND THE WATER IS BELOW 110°F (44°C).

8. Connect a hose to the SPOT ZERO OUTPUT and run the open end to the 5-gallon bucket from Step 1 above.
9. Connect a hose to the Overboard Discharge and run the open end to the 5-gallon bucket from Step 1 above.
10. Turn the auxiliary pump on and circulate the solution throughout the system for a minimum of 15-minutes. Do not drain the solution from the system.

11. Be sure to remove the hoses from the system and plug the inlets and outlets of the system to ensure that the storage solution does not leak out of the system.

 CAUTION	<p>THE SYSTEM SHOULD NEVER BE PLUGGED IN FOR ANY OF THE ABOVE STEPS. ONLY AN AUXILIARY PUMP SHOULD BE USED TO CIRCULATE THE SOLUTION. PLUGGING IN THE SYSTEM AND ALLOWING THE PUMP TO RUN CAN PERMANENTLY DAMAGE THE MEMBRANES IS ALL THE STORAGE CHEMICAL HAS NOT BEEN REMOVED FIRST.</p>
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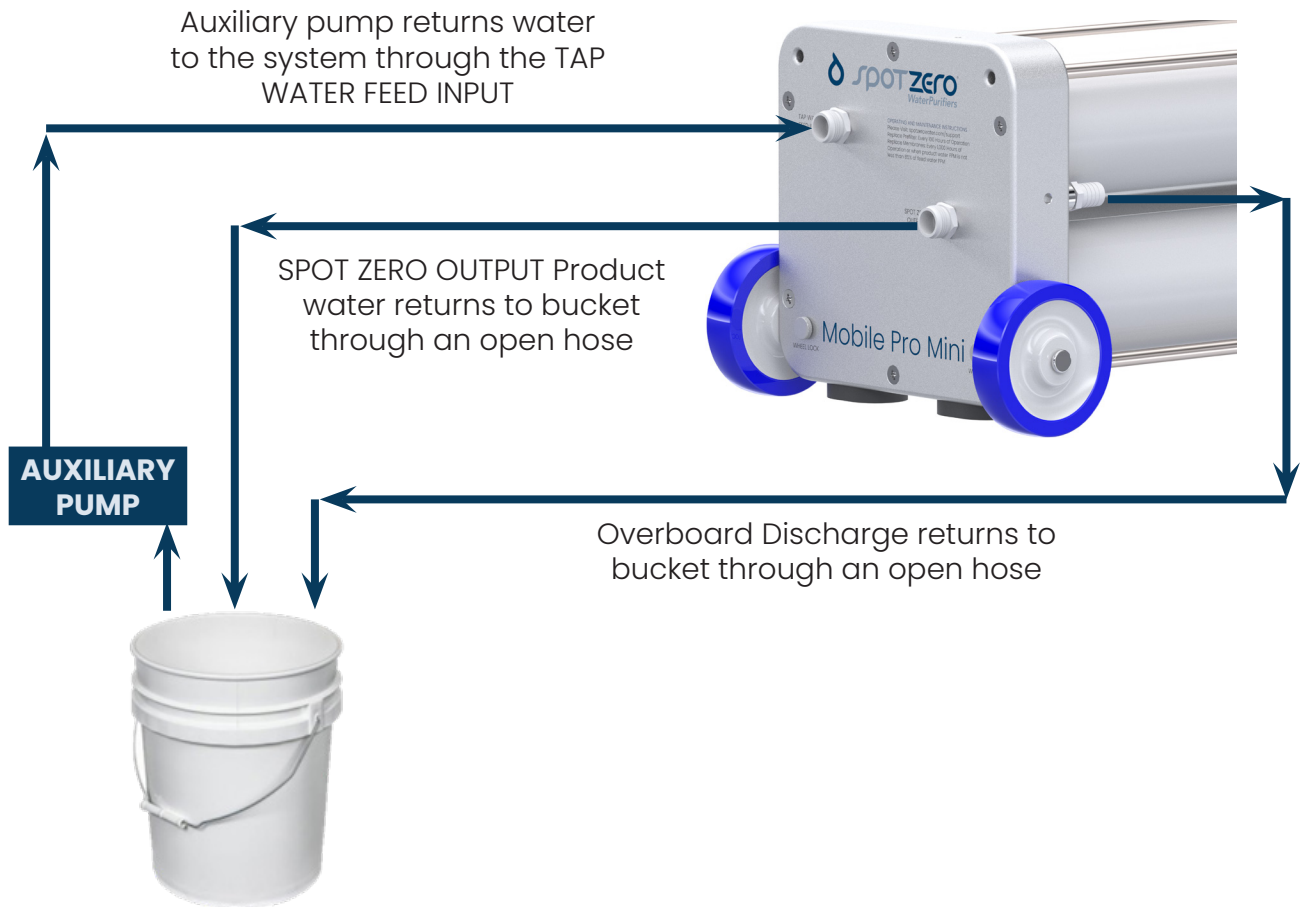
Recommissioning System After Storage

1. Install a new pre-filter (Part #: FI-FW0021) into the system following Steps 1-17 on Pgs. 14-15.
2. Reconnect the TAP WATER FEED INPUT to a hose feed, as well as connect the Overboard Discharge and SPOT ZERO OUTPUT to their respective hoses.
3. Turn on the water supply to the unit. DO NOT PLUG IN THE UNIT TO POWER YET.
4. Allow the system to flush without the pump running for approximately 30-minutes.
5. After the 30-minute flush, provide power to the unit and commence normal operation.

 WARNING	<p>ENSURE ALL OF THE PRODUCT WATER DURING THE 30-MINUTE FLUSH IS DISCARDED OVERBOARD. THIS IS NON-POTABLE, HIGH PPM WATER AND COULD FOUL PLUMBING FIXTURES AND/OR DISCOLOR OR STAIN MATERIALS IT CONTACTS.</p>
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Figure 22:

Example of Closed Loop Created During Winterization and Storage Process



Troubleshooting

The following table is meant to show any of the circumstances you may experience with your Spot Zero Mobile Pro Mini where the system may not be performing as expected. Please refer to the table below, follow any necessary steps and call Spot Zero if you have any further questions at 954-533-5640.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION	REFERENCE
Low Product Flow	Cold feed water	See Temperature Correction Sheet	Pg. 24
	Dirty / clogged filter	Replace pre-filter	Pg. 14-15
	Insufficient operating pressure	Check supply water pressure and flow rate	
	Fouled or scaled membrane	Perform membrane chemical cleaning	
Low Product Flow and High Concentrate Discharge	Failed flow restricter	Contact Spot Zero for technical support	
	Rolled / damaged product tube O-ring	Inspect and/or replace O-ring	
High Product Flow and High PPM	Membranes installed backward	Remove membranes and check direction of flow	Pg. 17-19
	Rolled / damaged product tube O-ring	Inspect and/or replace O-ring	
	Exceeding max feed water temperature	See Temperature Correction Sheet	Pg. 24
	Damaged or oxidize membranes	Replace membranes	Pg. 17-19
High Pump Pressure	Cold feed water	See Temperature Correction Sheet	Pg. 24
	Fouled or scaled membrane	Perform membrane chemical cleaning	
High PPM Product Water	Rolled / damaged product tube O-ring	Inspect and/or replace O-ring	
	Fouled or scaled membrane	Perform membrane chemical cleaning	

Temperature Correction Factors for Membrane

The reverse osmosis process is also heavily dependent on the input water temperature. This is because higher temperature water has a reduced viscosity which makes it easier for the water to permeate the RO membrane. Because of this, at different temperatures the unit will either produce more or less product than its rated production at 77°F. To find the temperature correction factor (TCF) the table below may be used. Simply divide the listed standard system flow rate at 77°F by the temperature correction factor. The result is the permeate flow at the desired temperature. (See example below)

Reference: °F = (°C x 9/5) + 32

Corrected Flow Rate: (Measured Flow Rate) x (TCF @ Feed Water Temperature)

Rated Flow	Feed Water Temp.	TCF (From Chart Below)	Equation	Resultant Product Flow
1.25 GPM	59° F	1.422	1.25 ÷ 1.422 = 0.88 GPM	0.88 GPM
1.25 GPM	77° F	1.000	1.25 ÷ 1.000 = 1.25 GPM	1.25 GPM
1.25 GPM	84° F	0.892	1.25 ÷ 0.892 = 1.40 GPM	1.40 GPM

Temperature °F (°C)	Temperature Correction Factor	Temperature °F (°C)	Temperature Correction Factor	Temperature °F (°C)	Temperature Correction Factor	Temperature °F (°C)	Temperature Correction Factor	Temperature °F (°C)	Temperature Correction Factor
50.0 (10.0)	1.711	57.2 (14.0)	1.475	64.4 (18.0)	1.276	71.6 (22.0)	1.109	78.8 (26.0)	0.971
50.2 (10.1)	1.705	57.4 (14.1)	1.469	64.6 (18.1)	1.272	71.8 (22.1)	1.105	79.0 (26.1)	0.968
50.4 (10.2)	1.698	57.6 (14.2)	1.464	64.8 (18.2)	1.267	72.0 (22.2)	1.101	79.2 (26.2)	0.965
50.5 (10.3)	1.692	57.7 (14.3)	1.459	64.9 (18.3)	1.262	72.1 (22.3)	1.097	79.3 (26.3)	0.962
50.7 (10.4)	1.686	57.9 (14.4)	1.453	65.1 (18.4)	1.258	72.3 (22.4)	1.093	79.5 (26.4)	0.959
50.9 (10.5)	1.679	58.1 (14.5)	1.448	65.3 (18.5)	1.254	72.5 (22.5)	1.090	79.7 (26.5)	0.957
51.1 (10.6)	1.673	58.3 (14.6)	1.443	65.5 (18.6)	1.249	72.7 (22.6)	1.086	79.9 (26.6)	0.954
51.3 (10.7)	1.667	58.5 (14.7)	1.437	65.7 (18.7)	1.245	72.9 (22.7)	1.082	80.1 (26.7)	0.951
51.4 (10.8)	1.660	58.6 (14.8)	1.432	65.8 (18.8)	1.240	73.0 (22.8)	1.078	80.2 (26.8)	0.948
51.6 (10.9)	1.654	58.8 (14.9)	1.427	66.0 (18.9)	1.236	73.2 (22.9)	1.075	80.4 (26.9)	0.945
51.8 (11.0)	1.648	59.0 (15.0)	1.422	66.2 (19.0)	1.232	73.4 (23.0)	1.071	80.6 (27.0)	0.943
52.0 (11.1)	1.642	59.2 (15.1)	1.417	66.4 (19.1)	1.227	73.6 (23.1)	1.067	80.8 (27.1)	0.940
52.2 (11.2)	1.636	59.4 (15.2)	1.411	66.6 (19.2)	1.223	73.8 (23.2)	1.064	81.0 (27.2)	0.937
52.3 (11.3)	1.630	59.5 (15.3)	1.406	66.7 (19.3)	1.219	73.9 (23.3)	1.060	81.1 (27.3)	0.934
52.5 (11.4)	1.624	59.7 (15.4)	1.401	66.9 (19.4)	1.214	74.1 (23.4)	1.056	81.3 (27.4)	0.932
52.7 (11.5)	1.618	59.9 (15.5)	1.396	67.1 (19.5)	1.210	74.3 (23.5)	1.053	81.5 (27.5)	0.929
52.9 (11.6)	1.611	60.1 (15.6)	1.391	67.3 (19.6)	1.206	74.5 (23.6)	1.049	81.7 (27.6)	0.926
53.1 (11.7)	1.605	60.3 (15.7)	1.386	67.5 (19.7)	1.201	74.7 (23.7)	1.045	81.9 (27.7)	0.924
53.2 (11.8)	1.600	60.4 (15.8)	1.381	67.6 (19.8)	1.197	74.8 (23.8)	1.042	82.0 (27.8)	0.921
53.4 (11.9)	1.594	60.6 (15.9)	1.376	67.8 (19.9)	1.193	75.0 (23.9)	1.038	82.2 (27.9)	0.918
53.6 (12.0)	1.588	60.8 (16.0)	1.371	68.0 (20.0)	1.189	75.2 (24.0)	1.035	82.4 (28.0)	0.915
53.8 (12.1)	1.582	61.0 (16.1)	1.366	68.2 (20.1)	1.185	75.4 (24.1)	1.031	82.6 (28.1)	0.913
54.0 (12.2)	1.576	61.2 (16.2)	1.361	68.4 (20.2)	1.180	75.6 (24.2)	1.028	82.8 (28.2)	0.910
54.1 (12.3)	1.570	61.3 (16.3)	1.356	68.5 (20.3)	1.176	75.7 (24.3)	1.024	82.9 (28.3)	0.908
54.3 (12.4)	1.564	61.5 (16.4)	1.351	68.7 (20.4)	1.172	75.9 (24.4)	1.021	83.1 (28.4)	0.905
54.5 (12.5)	1.558	61.7 (16.5)	1.347	68.9 (20.5)	1.168	76.1 (24.5)	1.017	83.3 (28.5)	0.902
54.7 (12.6)	1.553	61.9 (16.6)	1.342	69.1 (20.6)	1.164	76.3 (24.6)	1.014	83.5 (28.6)	0.900
54.9 (12.7)	1.547	62.1 (16.7)	1.337	69.3 (20.7)	1.160	76.5 (24.7)	1.010	83.7 (28.7)	0.897
55.0 (12.8)	1.541	62.2 (16.8)	1.332	69.4 (20.8)	1.156	76.6 (24.8)	1.007	83.8 (28.8)	0.894
55.2 (12.9)	1.536	62.4 (16.9)	1.327	69.6 (20.9)	1.152	76.8 (24.9)	1.003	84.0 (28.9)	0.892
55.4 (13.0)	1.530	62.6 (17.0)	1.323	69.8 (21.0)	1.148	77.0 (25.0)	1.000	84.2 (29.0)	0.889
55.6 (13.1)	1.524	62.8 (17.1)	1.318	70.0 (21.1)	1.144	77.2 (25.1)	0.997	84.4 (29.1)	0.887
55.8 (13.2)	1.519	63.0 (17.2)	1.313	70.2 (21.2)	1.140	77.4 (25.2)	0.994	84.6 (29.2)	0.884
55.9 (13.3)	1.513	63.1 (17.3)	1.308	70.3 (21.3)	1.136	77.5 (25.3)	0.991	84.7 (29.3)	0.882
56.1 (13.4)	1.508	63.3 (17.4)	1.304	70.5 (21.4)	1.132	77.7 (25.4)	0.988	84.9 (29.4)	0.879
56.3 (13.5)	1.502	63.5 (17.5)	1.299	70.7 (21.5)	1.128	77.9 (25.5)	0.985	85.1 (29.5)	0.877
56.5 (13.6)	1.496	63.7 (17.6)	1.294	70.9 (21.6)	1.124	78.1 (25.6)	0.982	85.3 (29.6)	0.874
56.7 (13.7)	1.491	63.9 (17.7)	1.290	71.1 (21.7)	1.120	78.3 (25.7)	0.979	85.5 (29.7)	0.871
56.8 (13.8)	1.486	64.0 (17.8)	1.285	71.2 (21.8)	1.116	78.4 (25.8)	0.977	85.6 (29.8)	0.869
57.0 (13.9)	1.480	64.2 (17.9)	1.281	71.4 (21.9)	1.112	78.6 (25.9)	0.974	85.8 (29.9)	0.866

LCD Fault Indicators

The Mobile Pro Mini is equipped with several safety parameters, performance indicators, and data logging tools. Please see the LCD indications and fault states below along with the corresponding signal to determine how to address the fault.

LCD Display	LED Indicator	Action Required	Reference
BAD FP SENSOR	FAULT LED rapid RED flash	Power OFF, replace sensor	Pg. 26
OVER CURRENT	FAULT LED flashes RED 3 times	System will reboot after 10-seconds	Pg. 27
OVER TEMP	FAULT LED flashes RED 3 times	System will reboot after 10-seconds	Pg. 28
OVER PRESSURE	FAULT LED flashes RED 3 times	System will reboot after 10-seconds	Pg. 29
OVER CURRENT SEE MANUAL	FAULT LED solid RED	Inspect motor, user intervention button sequence	Pg. 27
OVER TEMP SEE MANUAL	FAULT LED solid RED	Inspect motor, user intervention button sequence	Pg. 28
OVER PRESSURE SEE MANUAL	FAULT LED solid RED	Inspect plumbing, user intervention button sequence	Pg. 29
!LOW FP!	FAULT LED flashes RED	Check supply feed	Pg. 30

LCD Fault Indicators Explained

Bad Feed Pressure Sensor

Bad FP Sensor - Rapid LCD Flashing, Flashing RED LED

The BAD FP SENSOR fault indicates that the feed pressure transducer has either failed or the connection is loose and/or needs to be replaced. The feed pressure transducer is located on the underside of the Mobile Pro Mini, in between the two bottom PVC housings on the wheel side of the system (Fig. X #1). The transducer is threaded into the inner aluminum end plate. Please see below for troubleshooting and replacement options.

FIGURE 23: PRESSURE TRANSDUCER LOCATION

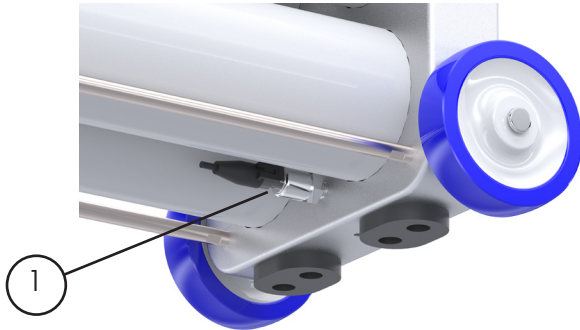


FIGURE 24: PRESSURE TRANSDUCER CAP CONNECTION



Option 1: Reconnect the Transducer Cable

The most likely scenario is the transducer cable plug has become disconnected or removed.

1. To reconnect the plug, first disconnect power to the unit.
2. Locate the transducer on the bottom of the unit (Fig. 23 #1).
3. The plug can only fit into the transducer in a single orientation. Once this orientation is found, push the plug into the transducer until you hear a “click” produced by the retaining clip latching on the set point.

Option 2: Faulty Transducer or Transducer Cap

1. Check that the transducer cap is sending proper voltage to the transducer.
 - a. Disconnect the transducer cap from the transducer as shown in Fig. 24.
 - b. Using a voltmeter, measure the voltage across the terminals labeled L1 and L2 in Figure 25.

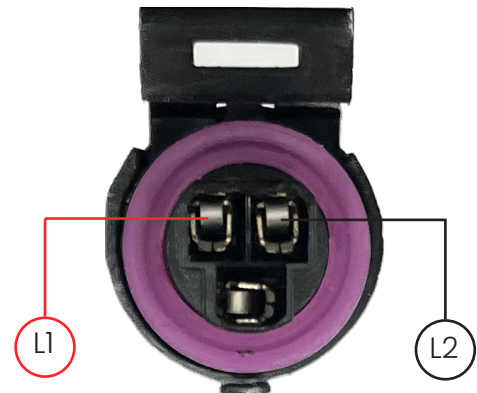


FIGURE 25: TRANSDUCER CAP VOLTAGE TEST

Option 2a: Voltage Shown is Approximately 5-Volts DC

1. Reconnect the transducer cap firmly following Option 1 above.
2. If still encountering the issue, it is likely a faulty pressure transducer, Part #: MI-PT0002.
3. Contact Spot Zero or a local dealer and discuss installation of the pressure transducer

Option 2b: Voltage Shown is 0-Volts or Significantly Less than 5-Volts

4. Check the wire for kinks, nicks, or damage.
5. Transducer cap likely needs to be replaced, please contact Spot Zero.
6. Contact Spot Zero or a local dealer and discuss installation of the pressure transducer cap

Over Current Fault

Fault 1 & 2: OVER CURRENT - Cycles message across LCD 3-times, LED flashes RED 3 times

Fault 3: OVER CURRENT SEE MANUAL - STAGE 3 FAULT

The Over Current fault is a preventative safety fault programmed by Spot Zero. This fault will engage when the motor draws significantly more amperage than when under typical load. This action could be caused by a locked rotor on the motor, seized pump, or electrical issues.

Fault Cycle - Up to 3 Sequential Faults

1. First Fault and Second Fault
 - a. Motor power disabled
 - b. LCD flashes 'Over Current' 3 times with flashing RED LED
 - c. System returns to READY mode, motor will reengage if feed conditions are adequate.
2. Third Fault - OVER CURRENT INSPECT MOTOR
 - a. Motor power disabled
 - b. LCD flashes 'Over Current Inspect Motor' continuously, solid RED LED
 - c. System requires user intervention via power cycle

Troubleshooting

1. Examine electrical connections external to the unit.
2. Confirm amperage and voltage from shore power connection.
3. If motor is making an abnormal noise or minimal flow production is present, call Spot Zero or your local dealer and discuss.

Over Temperature Fault

Fault 1 & 2: OVER TEMP – Cycles message across LCD 3-times, LED flashes RED 3 times

Fault 3: OVER TEMP SEE MANUAL – STAGE 3 FAULT

The Over Temp fault is a preventative safety fault programmed by Spot Zero. This fault will engage when the PC board is experiencing performance temperatures beyond those under typical load. This action could be caused by a locked rotor on the motor, seized pump, or electrical issues.

Fault Cycle – Up to 3 Sequential Faults

1. First and Second Fault
 - a. Motor power disabled
 - b. LCD flashes 'Over Temp' 3 times with flashing RED LED
 - c. System returns to READY mode and motor will reengage if feed conditions are adequate.
2. Third Fault – OVER TEMP SEE MANUAL
 - a. Motor power disabled
 - b. LCD flashes 'Over Temp Inspect Motor' continuously, solid RED LED
 - c. System requires user intervention via power cycle

Troubleshooting

1. Examine electrical connections external to the unit.
2. Confirm amperage and voltage from shore power connection.
3. Remove from direct sunlight and allow system to cool before plugging back in.
4. If motor is making an abnormal noise or minimal flow production is present, call Spot Zero or your local dealer and discuss.

Over Pressure Fault

OVER PRESSURE- Cycles message across LCD 3-times, LED flashes RED 3 times

OVER PRESSURE SEE MANUAL - STAGE 3 FAULT

The Over Pressure fault is a preventative safety fault programmed by Spot Zero. This fault will engage when the system experiences pressures beyond standard operating conditions. Over pressurization can be caused by obstructed plumbing and improper feed conditions.

Fault Cycle - Up to 3 Sequential Faults

1. First Fault and Second Fault
 - a. Motor power disabled
 - b. LCD flashes 'Over Pressure' 3 times with flashing RED LED
 - c. System returns to READY mode, motor will reengage if feed conditions are adequate.
2. Third Fault
 - a. Motor power disabled
 - b. LCD flashes 'Over Pressure See Manual' continuously, solid RED LED
 - c. System requires user intervention via power cycle

Troubleshooting

1. Examine all hoses connected to the system, specifically the Spot Zero Output and Overboard Discharge.
2. Measure dock feed flow rate and pressure and ensure it falls within the Operating Specifications shown on Pg. 5.
3. Inspect Feed Pressure Sensor as discussed on Pg. 26.

Low Feed Pressure Fault

!LOW FP!- Cycles message across LCD 3-times, LED flashes RED 3 times

The !LOW FP! fault stands for Low Feed Pressure and is a preventative safety fault programmed by Spot Zero. This fault will engage when the system experiences pressures below standard operating conditions. Low feed pressure can be caused by obstructed plumbing and improper feed conditions.

Fault Signal

1. !LOW FP! Flashes on LCD screen until either of the following occur
 - a. Feed pressure returns above Adequate Feed Pressure range as shown in the System Specification on Pg. 5. System resumes normal operation.
 - b. Feed pressure falls below Adequate Feed Pressure range as shown in the System Specification on Pg. 5. Motor shuts down and system returns to READY mode.

Troubleshooting

1. Examine all hoses connected to the system, specifically the TAP WATER FEED INPUT.
2. Measure dock feed flow rate and pressure and ensure it falls within the Operating Specifications shown on Pg. 5.
3. Inspect Feed Pressure Sensor as discussed on Pg. 26.

NOTE

IT IS NORMAL FOR THE LCD DISPLAY TO SHOW !LOW FP! FOR A SHORT PERIOD OF TIME DURING THE SHUTDOWN CYCLE AFTER THE TAP WATER FEED SUPPLY HAS BEEN SHUT OFF FROM THE SYSTEM.

Consumable Items

Part Number	Description	Maintenance Frequency
MM-FW0014	Spot Zero Freshwater Membrane Replacement 4022	Every 1,000 Hours of Operation or when product water PPM is not less than 85% of feed water PPM
FI-FW0021	SZ Mobile Filter with Chemical Cleaner and Antiscalant	Every 100 Hours of Operation

Optional Spare Components

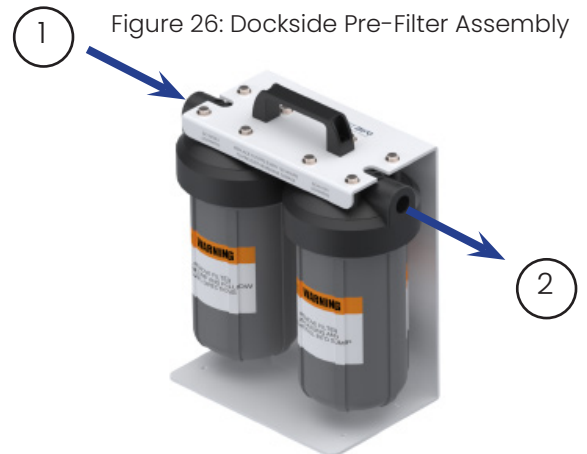
Part Number	Description
MI-PT0002	Feed Pressure Transducer
HW-MS0063	Mobile Pro Mini Wheel
MA-MP0000	Mobile Pro Mini Wheel Assembly
MA-MP0001	Mobile Pro Mini O-Ring Kit
HW-SC0016	Mobile Pro Mini Wheel Set Screw
HW-MS0061	Mobile Pro Series Rope Handle
HW-MS0060	Mobile Pro Series Rubber Nonskid Feet
HW-BL0027	Mobile Pro Mini Plate Retaining Screws

Optional Dockside Pre-Filter

The dockside pre-filter assembly is recommended for the Mobile Pro Mini if it will be used with increased chlorine or suspended solids (refer to the Feed Water Parameters Table on Pg. 5) as this will extend the life of your Mobile Pro Mini’s internal prefilter and membranes. Plumbing of the Dockside Pre-Filter can be seen in Figure 26 below.

Part Number	Description
FA-FW0005	Portable Dockside Prefilter Assy.
Dockside Prefilter Consumable Items	
FI-FW0009	Spot Zero KDF Filter 4.5"x10"
FI-FW0016	Spot Zero Sediment Prefilter 4.5"x10"

Item #	Reference	Fitting Size
1	Tap Water Feed In	3/4" NPT
2	To Mobile Pro Mini	3/4" NPT



Owner's Limited Warranty

Spot Zero Reverse Osmosis warrants to the original purchaser/owner, and to subsequent owners during the applicable Limited Warranty Period, Spot Zero'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, Spot Zero 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 Spot Zero only as set forth in the Table. Spot Zero 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 Spot Zero's sole option.

Section 1

WHAT'S COVERED

What does the Limited Warranty cover?

Water Purification Products, Pumps, Related Accessories and Replacement Parts manufactured and/or marketed by Spot Zero 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?

Spot Zero 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 Spot Zero herein, are EXCLUSIVE and are made or provided in lieu of all other express or implied warranties, obligations, or liabilities. In no event shall Spot Zero 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 Spot Zero 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 Spot Zero, except for the purpose of administering the above warranty to the extent herein provided. Spot Zero does not authorize the dealer or any other person to assume for Spot Zero 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. Spot Zero shall not be responsible for any liability or expense except as is specifically authorized and provided herein.

Spot Zero 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. Spot Zero 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.

Section 2**WHAT'S NOT COVERED****What does this Limited Warranty not cover?****This Warranty Shall Not Apply to:**

Failures resulting from improper installation or use contrary to instructions.

Failures resulting from abuse, misuse, accident, fire, or submergence.

Any part manufactured by Spot Zero, which shall have been altered so as to impair its original characteristics.

Any parts which fail as a result of misuse, improper application or improper installation.

Items not manufactured by Spot Zero, i.e., items, which are purchased from another manufacturer and supplied as received by Spot Zero without alteration or modification except as any part of a Spot Zero manufactured unit or component.

Components or parts used by or applied by the purchaser, as an integral part of products not manufactured by Spot Zero.

Labor resulting from difficult access to a Spot Zero product. The original installer or OEM is responsible for accessibility of unit.

Leaks due to improper installation of system, for example: hose clamps, fittings, flare nuts, quick disconnects.

Freight Damage.

Pumps that have been run dry, are water damaged or have blown freeze plugs.

Pumps with cracked heads.

Pump seals are not covered.

UV light bulbs are not covered.

Sea strainer elements are not covered.

Cartridge filter elements are not covered.

Sand & gravel in a multi-media filter are not covered.

Pump packing assemblies are not covered.

Pump valve assemblies are not covered.

Pump crankcase oil is not covered.

Gauge instrument calibration is not covered.

Pre-filtration

Fuses are not covered.

Valve seals and packings are not covered.

Exterior corrosion is not covered.

Membrane elements are not covered. 25 Logic boards with water damage.

Logic boards with blown MOV's (Power Surge)

Mis-programmed displays.

Displays or remotes with water damage.

Failures due to improper winterization.

Unit damage as a result of improper return packaging.

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

Section 3**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 Spot Zero products bear a data plate on which there are model and serial numbers. The date of manufacture of the product can be determined by Spot Zero based on the serial number on the product. To determine whether or not any Spot Zero component is in warranty, proceed as follows: Determine the model and serial number on the data plate located on the product. Write or call the Spot Zero 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.

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 Spot Zero Limited Warranty. For proof of date put in service, Spot Zero will require a copy of the bill of sale of the Spot Zero equipment from the installer or new boat dealer to the original owner.

Go to www.spotzerowater.com and under the support section, fill out the warranty claim form.

Section 4**GETTING COVERED WARRANTY SERVICE****How does the purchaser/owner get warranty service?**

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

Preferred option: Have a Spot Zero authorized Servicing Dealer, perform the work needed. The customer needs to call Spot Zero 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.

Second option: If the customer contacts Spot Zero Service Department for a Servicing Dealer and Spot Zero has no one in that particular area, Spot Zero will authorize the use of a local service company and Spot Zero will work with the local company to assist in any way possible.

The customer may contact the Spot Zero Service Department at 954-533-5640, Monday through Friday, 8:00am - 5:00pm.

TABLE OF LIMITED WARRANTY PERIODS

Important Notes Regarding Product Start-up/ Commissioning:

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.

Proof of purchase or installation may be required to verify warranty coverage.

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.

Warranty coverage shall not exceed three (3) years from the date of production of the product.

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.

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- NO labor.

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