



**INTERNATIONAL LTD  
THERMAL RESEARCH**

# **OASIS SERVICE & TROUBLESHOOTING MANUAL (WITH DM10 OR DM12)**

Revision 1.0

Page 1 of 50

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# **Oasis Service & Troubleshooting Manual**

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## TABLE OF CONTENTS

<b>LIST OF FIGURES.....</b>	<b>4</b>
<b>0.0 GENERAL INFORMATION .....</b>	<b>5</b>
<b>1.0 OPERATION OF THE OASIS HEATING MODULE .....</b>	<b>6</b>
1.1 BURNER .....	6
1.2 ELECTRIC HEATING ELEMENTS.....	9
<b>2.0 OPERATION OF THE OASIS DISTRIBUTION MODULE.....</b>	<b>10</b>
2.1 DOMESTIC HOT WATER .....	11
2.2 CABIN HEAT.....	11
2.2.1 DM10 .....	12
2.2.2 DM12 .....	12
2.3 JUMPERS.....	12
<b>3.0 TROUBLESHOOTING.....</b>	<b>14</b>
3.1 SYSTEM.....	14
3.2 OASIS HEATING MODULE .....	18
3.2.1 Compressor .....	18
3.2.2 Fuel Pump.....	19
3.2.3 Combustion Fan.....	21
3.2.4 Ignitor.....	22
3.2.5 Flame Out .....	23
3.2.6 Voltage .....	27
3.2.7 Low Water.....	28
3.3 OASIS DISTRIBUTION MODULE .....	30
<b>4.0 SERVICING THE OASIS HEATING MODULE .....</b>	<b>32</b>
4.1 INDICATIONS SERVICE IS REQUIRED .....	32
4.2 CLEANING THE COMBUSTION CHAMBER.....	33
4.3 PART REPLACEMENTS .....	34
4.3.1 Compressor .....	34
4.3.2 Fuel Pump.....	35
4.3.3 Fuel Solenoid .....	36
4.3.4 Combustion Fan.....	37
4.3.5 Hour Meter.....	38
4.3.6 Aquastat .....	38
4.3.7 Igniter.....	39
4.3.8 Fuel Filter .....	40
4.3.9 Fuel Nozzle.....	41
4.3.10 Flame Sensor.....	42
4.3.11 Level Switch .....	43
4.3.12 Primary Electric Heating Element .....	44
4.3.13 Secondary Electric Heating Element .....	45
4.3.14 Air Filter .....	46
<b>5.0 SERVICING THE OASIS DISTRIBUTION MODULE.....</b>	<b>47</b>
5.1 FILLING THE COOLANT SYSTEM.....	47
5.2 PART REPLACEMENTS .....	48
5.2.1 Summer pump.....	48
5.2.2 Loop 1 and Loop 2 pumps .....	49

### **List of Figures**

Figure 1: Oasis Heating Module .....	6
Figure 2: Burner schematic .....	7
Figure 3: Front of Oasis Heating Module .....	8
Figure 4: Oasis Remote Operating Panel.....	9
Figure 5: Electric heating components schematic .....	10
Figure 6: Oasis Distribution Module .....	10
Figure 7: distribution module zone board .....	11
Figure 8: Distribution Module Zone Board Jumpers .....	12
Figure 9: ITR Cabin Fan (Aquastat Wiring).....	14
Figure 10: Oasis Heating Module Components.....	18
Figure 11: Burner box components.....	33
Figure 12: Compressor components .....	34
Figure 13: Fuel pump assembly .....	35
Figure 14: Fuel solenoid components .....	36
Figure 15: Combustion fan mounting .....	37
Figure 16: Aquastat mount.....	38
Figure 17: Igniter assembly .....	39
Figure 18: Fuel filter assembly .....	40
Figure 19: Fuel nozzle assembly.....	41
Figure 20: Flame sensor attachment .....	42
Figure 21: Level switch assembly.....	43
Figure 22: Primary element location.....	44
Figure 23: Air filter assembly .....	46
Figure 24: Initial fill up Oasis system.....	47
Figure 25: Summer Pump replacement.....	48
Figure 26: Loop 1&2 pump replacement.....	49

# **Oasis Service & Troubleshooting Manual**

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## **0.0 General Information**

### **TOOLS**

The tools in this list should be considered the minimum required for performance of routine maintenance, servicing and minor repair work.

- Wrench Sizes 11/32 , 9/16 , 5/8 , 7/8 , 15/16 , 13/8
- Socket Wrench Sizes 1/4 , 5/16 , 7/16 , 11/32
- Adjustable Crescent Wrench
- Phillips Head Screw Driver No. 2
- Flat Head Screw Driver
- Combination pliers
- Pliers – vise grip
- Pliers – needle nose
- Multi meter

### **MAXIMUM TORQUE VALUES**

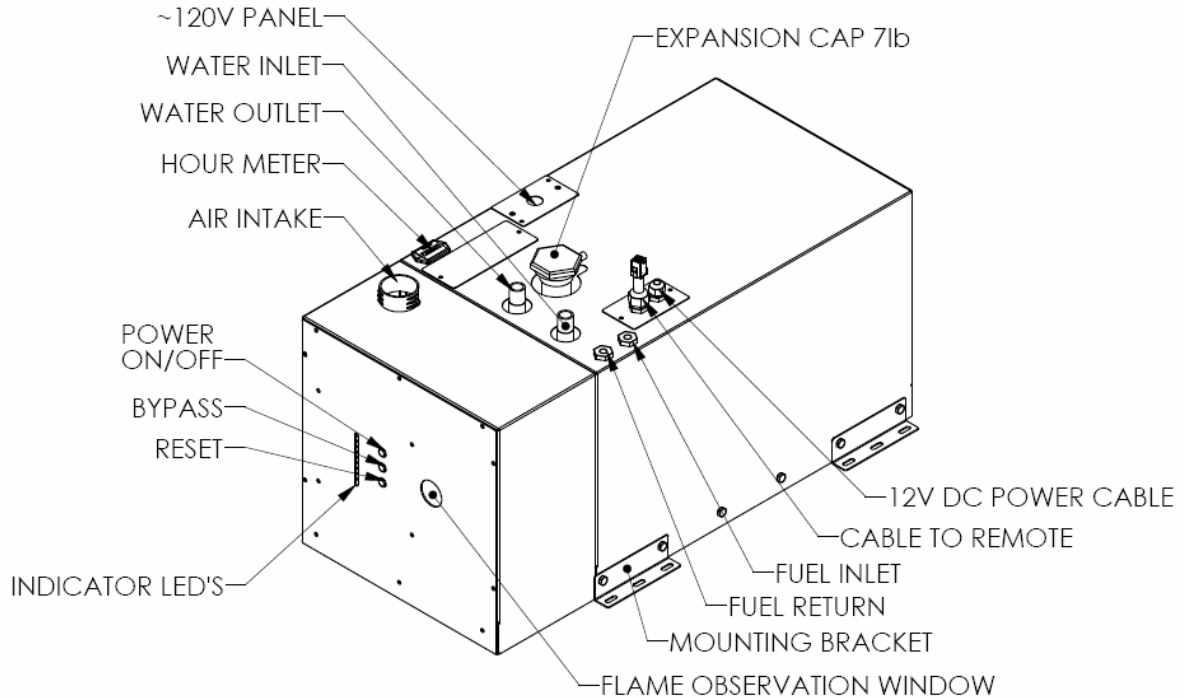
The fasteners used to assemble this heater are all US thread size. Most threaded fasteners should be tightened to a specific torque value. Over tightening the fastener can weaken it and cause it to break, while under tightening can cause it to eventually come loose. Below is a table with the specific torque values for each type of bolt/screw used in this heater. Be sure to follow the recommendations closely.

**Table 1: Fastener Torque values**

U.S. THREAD SIZE	Ft-lbs	In-lbs	Nm
#8	2	24	3
#10	3	36	4.5
1/4-20	6 to 9	72 to 108	9 to 12
3/8-16	22 to 32	264 to 384	30 to 43

## **1.0 Operation of the Oasis Heating Module**

The Oasis Heating Module has two sources of heat; a 50,000 BTU burner and two 1500 Watt immersion electric heating elements. The burner is the primary heat source and the electric heating elements are used as a secondary heat source.

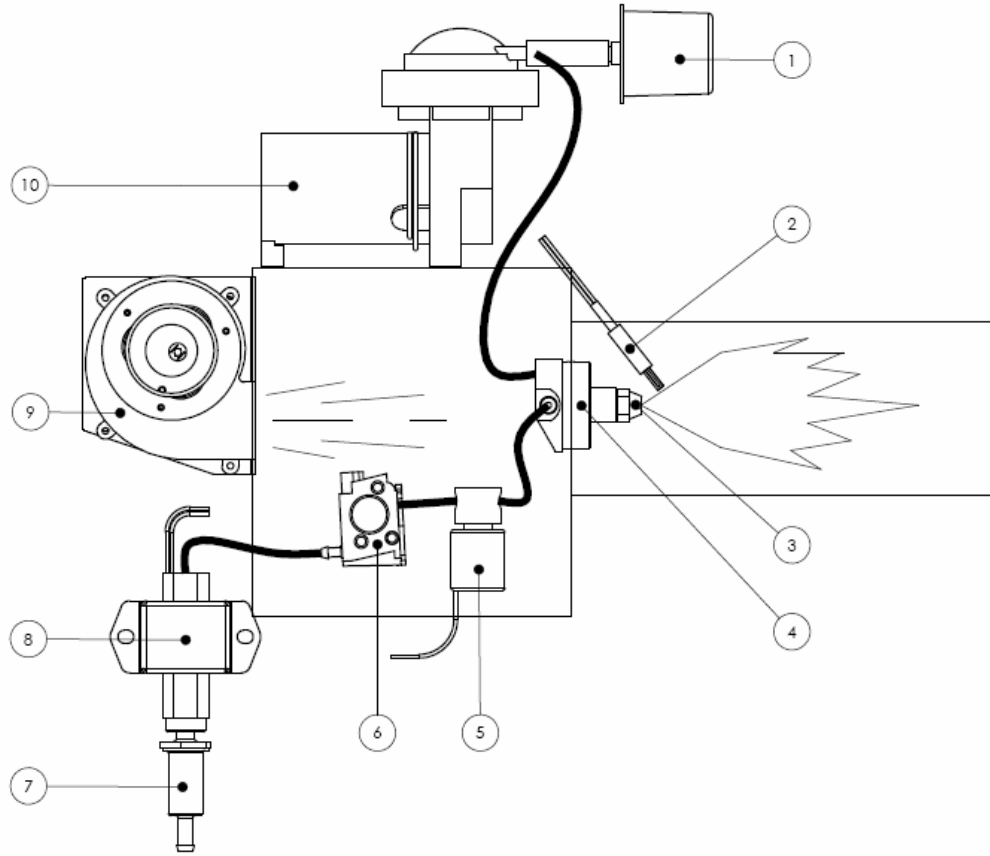


**Figure 1: Oasis Heating Module**

### **1.1 Burner**

The burner consists of the following 12VDC components:

- Air compressor (10)
- Fuel pump (8)
- Fuel solenoid (5)
- Combustion fan (9)
- Igniter (2)



**Figure 2: Burner schematic**

When the burner is activated (burner switch on Oasis Remote Operating Panel, must be turned ON), it will go through the following ignition sequence:

1. The igniter will turn ON and the combustion fan will turn OFF.
2. The igniter will glow for 10 seconds to allow it to reach ignition temperature.
3. After the igniter has been glowing for 10 seconds, the air compressor, fuel pump, fuel solenoid, and combustion fan will turn ON.
4. The air compressor provides a constant air supply to the nozzle under a specific pressure and flow rate. This air is filtered before it enters the compressor. In the nozzle the compressed air is guided over the tip of the nozzle where it creates a negative pressure in the center tube. This negative pressure is used to draw fuel from the fuel regulator. All fuel lines from the regulator to the nozzle must be air tight. Any leaks will have an adverse effect on the flame. The nozzle produces a solid cone pattern spray with extremely fine particles of fuel. This spray is then ignited when it makes contact with the igniter.
5. The fuel pump pumps fuel from the fuel tank up to the fuel regulator. Before the fuel enters the fuel pump, it passes an internal fuel filter. Fuel is only allowed to pass the regulator when there is a negative pressure between the regulator and the nozzle. In between the regulator and the nozzle is a fuel solenoid. This fuel solenoid prevents the fuel from being drawn back from the nozzle when the burner is off. This allows for a clean ignition.
6. The combustion fan draws outside air which is used to create a forced air flow through the combustion chamber for optimal combustion and to exhaust the combustion gasses through an exhaust pipe system into the atmosphere.
7. After ignition takes place, the igniter will remain ON for an additional 5 seconds. This is so if there are any air bubbles in the system, the atomized fuel will continue to be ignited.
8. After 5 seconds, the igniter will turn OFF and the air compressor, fuel pump, fuel solenoid, and Combustion fan will remain ON. At this point the flame sensor will also look for a flame.

## Oasis Service & Troubleshooting Manual

9. The burner will continue to run until one of the following occurs:
- The coolant inside of the Oasis Heating Module reaches the set operating temperature range
  - The burner switch is turned off
  - The power button is pressed
  - The reset button is pressed
  - One of the components fault
  - A flame out occurs
  - A low water level fault occurs
  - A voltage fault occurs

Note: After any of the above situations, the combustion fan will run for 2 minutes to purge exhaust gases from the system. The only time the combustion fan will not run after the system cycles/faults/resets is when the combustion fan has faulted. In this case all of the burner components will shut down immediately.

This ignition sequence can be followed by observing the diagnostic LED's on the front of the Oasis Heating Module (Figure 3). If any of the burner components happen to fault during the ignition sequence or during the operation of the burner, the burner components will shut down and the diagnostic LED's associated with those components will flash.

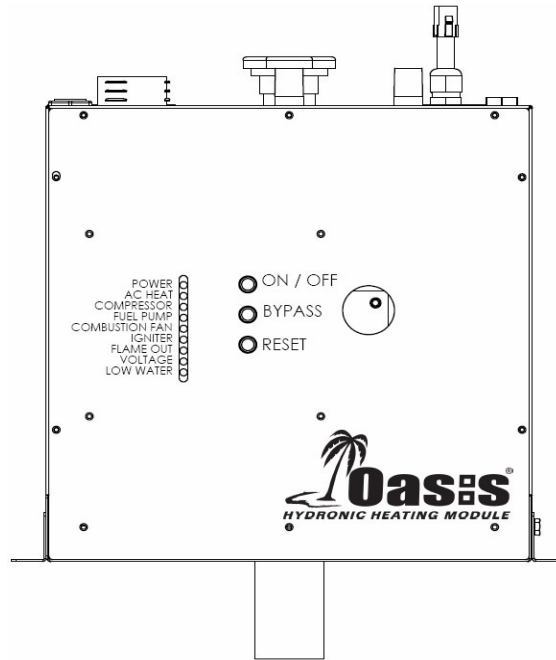


Figure 3: Front of Oasis Heating Module

Table 2: Diagnostic Information

Diagnostic LED's	Normal Operation	FAULT
Power LED	ON	-
AC Heat	ON	-
Compressor	ON	FLASHING
Fuel Pump	ON	FLASHING
Combustion Fan	ON	FLASHING
Igniter	ON	FLASHING
Flame Out	OFF	ON
Voltage	OFF	ON
Low Water	OFF	ON



## Oasis Service & Troubleshooting Manual

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If the diagnostic LED's are indicating a fault, refer to the troubleshooting section (3.2) for the appropriate fault to troubleshoot the problem.

### Notes on flame out:

If the flame goes out while the burner is running, the flame sensor will detect a flame-fault after 2 seconds. If the flame goes out during the ignition period (5 seconds), the flame sensor will detect a flame fault 2 seconds after the ignition period (i.e. 7 seconds from the start of the ignition period).

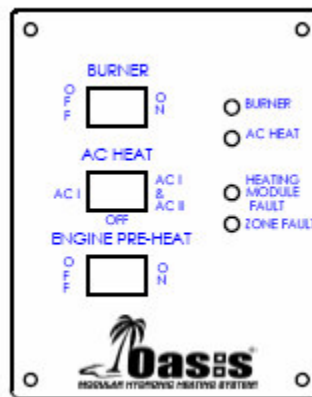
After the first flame-fault, the burner will attempt the ignition sequence one more time. If the flame goes out a second time within a 2 minute period of the initial flame out, then the Oasis Heating Module will shut down and the combustion fan will purge for 2 minutes and turn OFF. The Oasis Heating Module will remain in this state until the reset button on the Oasis Heating Module is pressed or until the burner switch on the Oasis remote operating panel is turned OFF (delay 1 second) and turned ON again.

### Notes on voltage fault:

When the voltage goes below 10.5 volts for a period of more than 10 seconds, the Oasis Heating Module will shut down. If the voltage goes above 10.5 volts, the heater will restart. If the voltage drops below 10.5 volts a second time within a 2 minute period of the initial low voltage fault, then the Oasis Heating Module will shut down and the combustion fan will purge for 2 minutes and turn OFF. The Oasis Heating Module will remain in this state until the reset button on the Oasis Heating Module is pressed or until the burner switch on the Oasis remote operating panel is turned OFF (delay 1 second) and turned ON again.

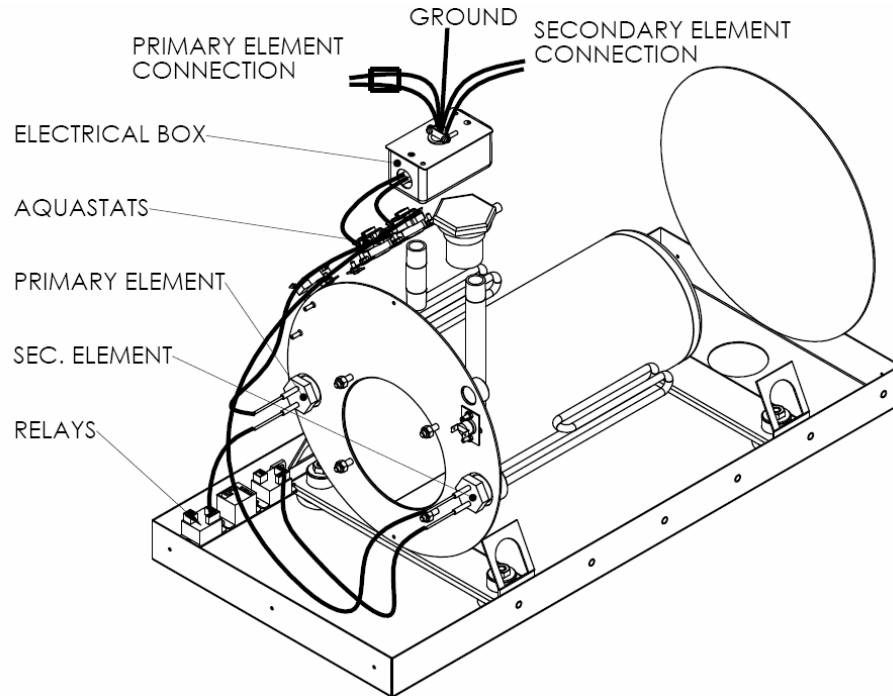
### **1.2 Electric Heating Elements**

When AC power is available, the AC heat LED on the Oasis Heating Module (Figure 3) will turn ON. This only indicates that AC power is available and does not indicate that the electric heating elements have been activated. The user has the option of using the electric heating elements by placing the AC switch on the Oasis remote operating panel in the ACI or ACI & ACII position (see Figure 4).



**Figure 4: Oasis Remote Operating Panel**

The ACI position will turn on the primary electric heating element. The ACI & ACII position will turn on the primary and secondary electric heating elements. The OFF position will turn both electric heating elements OFF. When either of the electric heating elements has been activated, the AC heat LED on the Oasis remote operating panel will turn ON. See Figure 5 for the location of the primary and secondary electric heating elements.

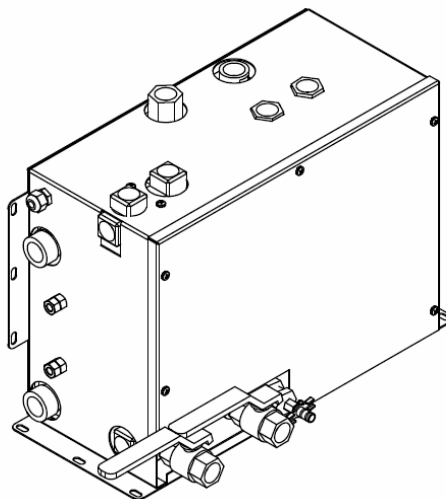


**Figure 5: Electric heating components schematic**

**Note:** If AC power is not available at the primary AC connection to the Oasis Heating Module, the AC elements will not operate. The primary AC connections (HOT and NEUTRAL) are tied together with BLACK heat shrink inside of the AC box on the top left side of the Oasis Heating Module (see Figure 5).

### 2.0 Operation of the Oasis Distribution Module

The purpose of the Oasis Distribution Module (see Figure 6) is to circulate hot coolant (generated by the Oasis Heating Module and/or the Engine) through the system, whether it is for domestic hot water, engine heat/pre-heat, or cabin heat.



**Figure 6: Oasis Distribution Module**

# Oasis Service & Troubleshooting Manual

The Oasis Distribution Module consists of the following 12VDC components:

- Summer Pump
- Loop 1 Pump
- Loop 2 Pump

The Oasis Distribution Module activates only when the coolant inside of the Oasis Heating Module has reached a pre-set temperature range and there is a call for cabin heat or domestic hot water. It detects the coolant temperature by using a temperature sensor (see Figure 17) that is mounted inside of the Oasis Heating Module, on the coolant tank.

The distribution module zone board (see Figure 7) will indicate what components are activated by lighting the green LED next to the component name. If a component has blown a fuse, the Red LED next to the component name will be lit.

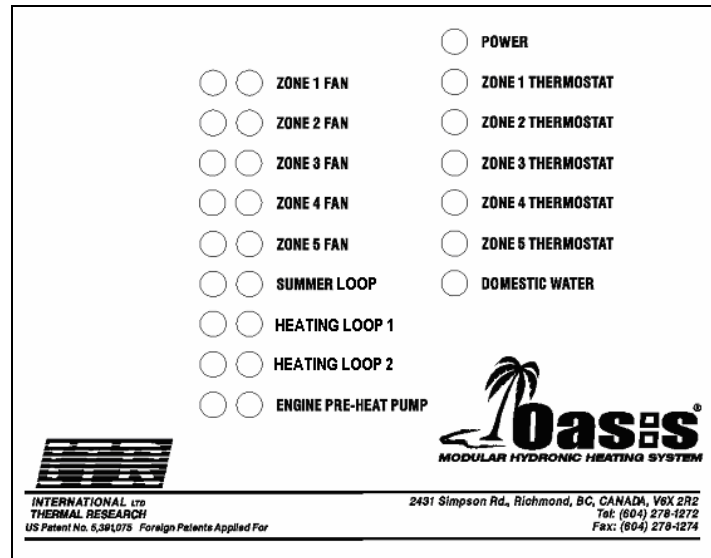


Figure 7: distribution module zone board

## 2.1 Domestic Hot Water

The call for domestic Hot water is automatic. There is a temperature sensor mounted on the domestic water inlet pipe to the heat exchanger. Once the hot water tap is opened, the domestic water will begin circulating through this heat exchanger. Once the inlet pipe cools below a pre determined temperature range, the distribution module zone board will respond to a call for domestic hot water, as long as it detects that heat is available inside of the Oasis Heating Module. In this situation, the distribution module zone board will turn on the summer pump and will circulate hot coolant through a small loop (summer loop) that goes through the heat exchanger and back to the Oasis. This will allow a constant supply of hot water, whenever the domestic hot water is used.

## 2.2 Cabin Heat

The distribution module is available in 2 versions. One is the DM10 which has all of the cabin fans on a single loop. The other is the DM12 which has the cabin fans on two separate loops. Depending on the installation, the user can have one thermostat to control multiple zones, or multiple thermostats to control multiple zones. When the thermostat(s) call for heat in one or more zones, the distribution module zone board will indicate what zones are calling for heat by lighting the Green LED next to the zones.

### 2.2.1 DM10

Once a thermostat in any zone calls for heat, the distribution module zone board will activate the Loop 1 pump and cabin fans associated with the zones calling for heat. When this happens, the Loop 1 pump forces the coolant to flow through the large cabin fan loop. When using hot water, less heat is available for the cabin fan loop. Domestic hot water supply has priority over space heating. Note that the summer pump will not run when the Loop 1 pump is running. The Loop 1 pump moves the coolant through the domestic water heat exchanger as well.

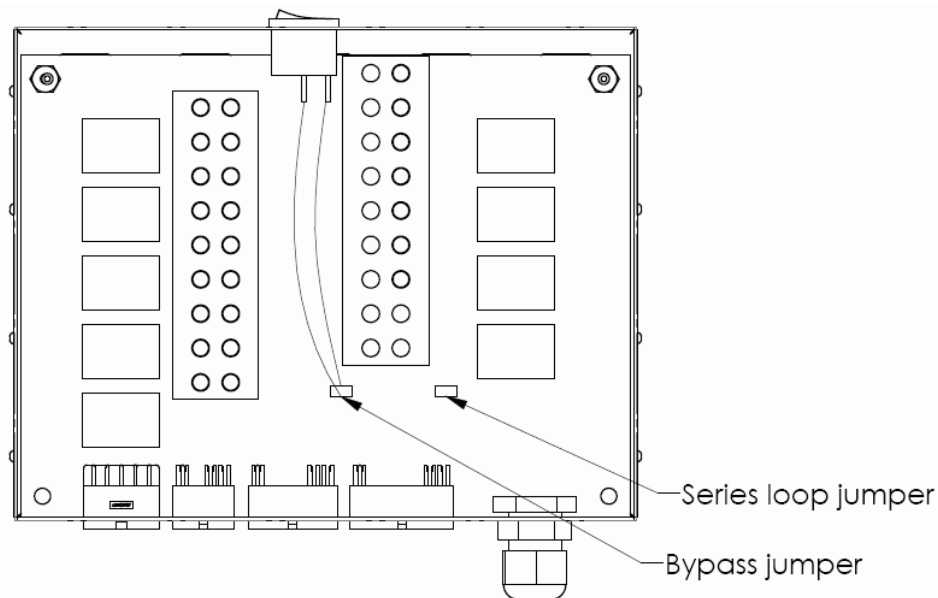
### 2.2.2 DM12

Once a thermostat in zone 1 or 2 calls for heat, the distribution module zone board will activate the Loop 1 pump and cabin fans associated with the zones calling for heat. When this happens, the Loop 1 pump forces the coolant to flow through the first cabin fan loop. Once a thermostat in zone 3, 4, or 5 calls for heat, the distribution module zone board will activate the Loop 2 pump and cabin fans associated with the zones calling for heat. When this happens, the Loop 2 pump forces the coolant to flow through the second cabin fan loop. Note that both cabin fan loops can be activated at the same time. When using hot water, less heat is available for the cabin fan loops. Domestic hot water supply has priority over space heating. Note that the summer pump will not run when the Loop 1 pump or Loop 2 pump is running. The Loop 1 and Loop 2 pumps move the coolant through the domestic water heat exchanger as well.

## 2.3 Jumpers

The bypass jumper (activated via a switch mounted on the top of the distribution module zone board) can be used in conjunction with a purge pump to initially fill the system with coolant. When this jumper is activated, the Loop 1 and Loop 2 pumps turn on and push coolant through the entire system. Once the system is filled and purged of air, the bypass switch must be turned OFF.

The series jumper is in place for distribution module zone boards used with the DM10. The jumper is removed for distribution module zone boards that are used with the DM12.



**Figure 8: Distribution Module Zone Board Jumpers**

## Oasis Service & Troubleshooting Manual

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**Table 3: Distribution module zone board jumpers**

<b>Jumper Name</b>	<b>Jumper Function</b>
Series Loop Jumper	This jumper is in place when the distribution module zone board is used with a DM10 (series plumbed system). When this jumper is in place, all zones will activate the Loop 1 pump.
Bypass Jumper	This jumper is used to fill/purge the system. This jumper activates the Loop 1 and Loop 2 pumps. A switch that is mounted on top of the distribution module zone board is connected to this jumper. To activate this jumper, the switch should be turned to the ON position.

**IMPORTANT:** Make sure the bypass switch is NOT in the ON position during normal operation. The switch should only be used when the system is initially hooked up to prime the pumps in the Oasis Distribution Module. **The pumps should not be run dry.**

# Oasis Service & Troubleshooting Manual

## 3.0 Troubleshooting

### 3.1 System

The Burner switch is in the ON position, and the thermostats are calling for heat, but there is no cabin fan heat or domestic hot water available.

Ensure that the Oasis Heating Module is powered ON (Power LED on the front cover must be ON – see Figure 3). Check the burner LED on the Oasis remote operating panel (Figure 4). Proceed to Q1.

Q1: Is the burner LED on the Oasis remote operating panel ON?

IF YES:

Check the service LED on the Oasis remote operating panel. Proceed to Q2.

IF NO:

Check the connections from the Oasis remote operating panel to the distribution module zone board and from the distribution module zone board to the Oasis Heating Module. Proceed to Q6.

Q2: Is the service LED on the Oasis remote operating panel ON?

IF YES:

There is a problem with the Oasis Heating Module. Look at the front panel of the Oasis Heating Module and refer to the diagnostic section (section 3.2) for additional information.

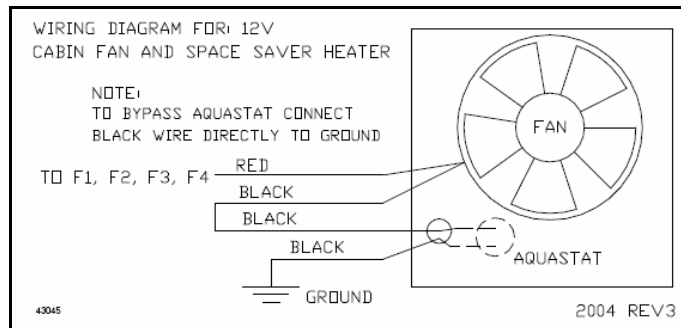
IF NO:

Check to see if the burner portion of the Oasis Heating Module is firing. Proceed to Q3.

Q3: Is the burner portion of the Oasis Heating Module firing?

IF YES:

If the temperature sensors on the cabin fans (If using ITR fans) have not been wired into the circuit (see Figure 9), and if the system is cold, the cabin fans will blow cold air (until the heated coolant reaches the fans) when the thermostats are calling for heat.



**Figure 9: ITR Cabin Fan (Aquastat Wiring)**

If the system is cold, it will take approximately 15 minutes for the diesel portion of the Oasis Heating Module to heat the coolant loop. Proceed to Q4.

IF NO:

Check to see if the Oasis Heating Module is heating the coolant. Feel the pressure relief cap on top of the Oasis Heating Module. Be careful as the cap can be very HOT. Proceed to Q5.

Q4: Are the cabin fans blowing cold air after 15 minutes?

IF NO:

There is no problem. The system is operating as expected.

IF YES:

The Oasis Distribution Module is not circulating the coolant properly. See the Servicing the Oasis Distribution Module (section 5.0) for troubleshooting.

## Oasis Service & Troubleshooting Manual

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Q5: Is the pressure relief cap in the Oasis Heating Module hot?

IF YES:

The Oasis Heating Module is cycling. The Oasis Distribution Module is not circulating the coolant properly. See the Servicing the Oasis Distribution Module (section 5.0) for troubleshooting.

IF NO:

The Operating temperature sensor may be damaged. Contact ITR for further assistance.

Q6: Are the connections from the Oasis remote operating panel to the distribution module zone board and from the distribution module zone board to the Oasis Heating Module secure?

IF NO:

Secure the connections at the Oasis remote operating panel, distribution module zone board, and Oasis Heating Module.

IF YES:

Contact ITR for further assistance.

AC switch is in AC I position or AC I & AC II position, but the AC Heat LED is not lit.

Ensure that the Oasis Heating Module is powered ON (Power LED on the front cover must be ON – see Figure 3).

If the thermostats are calling for heat, check if the fans are blowing warm air. If the thermostats are not calling for heat, turn on the hot water tap and check for hot water.

Q1: Are the fans blowing warm air or is the domestic water hot?

IF YES:

The heater is cycling. This is part of the normal operation. Once the coolant inside the heater reaches a pre-set temperature range, it will turn off the burner as well as the AC elements until the temperature drops below the pre-set temperature range.

IF NO:

Locate the breaker panel where the AC elements are connected. Note that each AC element must be connected to a separate 15 amp breaker. Place each breaker (individually) in the ON position, starting with the breaker labeled “primary”, or “ACI”. Check to see if the breaker trips. If the breaker does not trip, observe the AC heat LED on Oasis remote operating panel. After the “primary” AC breaker is turned on, turn on the breaker labeled “secondary”, or “ACII”. Check to see if the breaker trips. Proceed to Q2.

Q2: Does the AC heat LED turn on once the primary AC breaker is put into the ON position?

IF YES:

Problem solved.

IF NO:

Proceed to Q3

Q3: Do the “primary” or “secondary” AC element breakers trip once they are placed in the ON position?

IF YES:

**IMPORTANT:** Ensure both AC element breakers are in the OFF position and that all incoming AC power is turned OFF before proceeding with the next step. Failure to do so can result in **SERIOUS INJURY** or **DEATH**. Remove the AC access cover (Figure 1) on the Oasis Heating Module and check the AC wiring.

The hot and neutral wires for the primary AC element are bound together with BLACK heat shrink. The hot and neutral wires from the primary AC element breaker should be connected to these wires (BLACK – hot, WHITE – neutral). The hot and neutral wires from the secondary AC element breaker should be connected to the remaining BLACK and WHITE wires. If there is no secondary AC element breaker, these wires should be left unconnected.

## Oasis Service & Troubleshooting Manual

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The ground (GREEN) wire on the Oasis Heating Module should be connected to the ground wire of the breaker panel. Proceed to Q7.

IF NO:

Check that the AC supply is available and that the main AC breaker is ON. Proceed to Q4.

Q4: Is AC supply available and is the main AC breaker ON?

IF NO:

Ensure that AC power is available and that the main AC breaker is ON. Note that each AC heating element is a 1500 Watt element (12.5 amps @ 120VAC). Ensure that the combined load of the AC heating elements and the rest of the electrical equipment does not exceed the available AC supply, otherwise the main breaker will trip.

IF YES:

Remove the access panel to the AC high limit temperature sensors (Figure 1). The two high limit temperature sensors on the top of the tank should be accessible. Attempt to reset the high limit temperature sensors by pressing the square red button on the top of the sensors. If the buttons on either of the high limit temperature sensors click or are able to be pushed down, then this indicates that the high limit temperature sensor has tripped. Proceed to Q5.

Q5: Have one or both of the high limit temperature sensors tripped?

IF YES:

Contact a service representative before attempting to run the heater again.

IF NO:

Check to see if the Oasis Heating Module is heating the coolant. Feel the pressure relief cap on top of the Oasis Heating Module. Be careful as the cap can be very HOT. Proceed to Q6.

Q6: Is the pressure relief cap of the Oasis Heating Module tank hot?

IF YES:

The Oasis Heating Module is cycling. The Oasis Distribution Module is not circulating the coolant properly. See the Servicing the Oasis Distribution Module (section 5.0) for troubleshooting.

IF NO:

There could be a problem with the AC detector relay. Contact ITR for further assistance.

Q7: Are the AC elements wired correctly?

IF NO:

Correct the wiring and put the wires back into the AC box on the Oasis Heating Module. Turn ON the breakers for the AC elements and turn ON the incoming AC power.

IF YES:

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

Disconnect the yellow connectors with the matching BLACK and YELLOW heat shrink (left side of the burner box). Wrap the connectors in electrical tape. Fold up the front panel of the Oasis Heating Module and turn ON the power button. Go back to the AC breaker panel and place the primary and secondary AC element breakers in the ON position and turn on the incoming AC power. Check to see if the breakers trip. Proceed to Q8.

Q8: Did the primary or secondary AC element breakers trip once the yellow connectors were disconnected?

IF YES:

There is a problem with the wiring from the AC breaker panel to the AC element. Check the wiring at the breaker panel. Also check that no AC wires are bare and touching the chassis of the heater. Once the wiring has been corrected, re-connect the yellow connectors with the matching BLACK and YELLOW heat shrink.



## **Oasis Service & Troubleshooting Manual**

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IF NO:

The primary and/or secondary AC element (depending on which breaker tripped) need to be replaced. Turn off the primary and secondary AC element breakers.

To replace the primary AC element, refer to Servicing the Oasis Heating Module (section 4.3.12).

To replace the secondary AC element, refer to Servicing the Oasis Heating Module (section 4.3.13).

AC switch is in AC I position or AC I & AC II position, the AC Heat LED is lit, but there is no heat in the system.

The AC heating elements are 1500 Watt elements. If they are used by themselves, it will take approximately 1 hour for the coolant inside the Oasis Heating Module to reach operating temperature (when the coolant is not circulating). If the Oasis Distribution Module is circulating the coolant, then it will take much longer to heat up the coolant.

Locate the AC breaker panel and ensure that the secondary AC heating element breaker is in the ON position. Ensure that that coolant in the system is cool (close to ambient temperature). Disconnect the power to the Oasis Distribution Module (to stop the flow of coolant).

To determine if the primary AC heating element is working properly, put the AC switch on the Oasis remote operating panel (see Figure 4) to the ACI position and allow the heating element to heat the coolant in the Oasis Heating Module for approximately 2 hours. After approximately 2 hours, observe the AC heat LED on the Oasis Heating Module or on the Oasis remote operating panel. Proceed to Q1.

To determine if the primary AND secondary AC elements are working properly, put the AC switch on the Oasis remote operating panel to the ACI & ACII position and allow the elements to heat the coolant in the Oasis Heating Module for approximately 1 hour. After approximately 1 hour, observe the AC heat LED on the Oasis Heating Module or on the Oasis remote operating panel. Proceed to Q1.

Q1: After approximately 1 hour of running the AC heating elements, does the AC heat LED on the front plate of the Oasis Heating Module or on the Oasis remote operating panel turn OFF?

IF YES:

The Oasis Heating Module is operating as expected. If no heat is being distributed to the rest of the system (taking into account that it will take a long time for the AC heating elements to heat the entire system by themselves), then the Oasis Distribution Module may not be circulating the coolant properly. See Servicing the Oasis Distribution Module (section 5.0) for troubleshooting.

IF NO:

There could be a problem with the AC relays or with the AC heating elements. Contact ITR for further assistance.

### 3.2 Oasis Heating Module

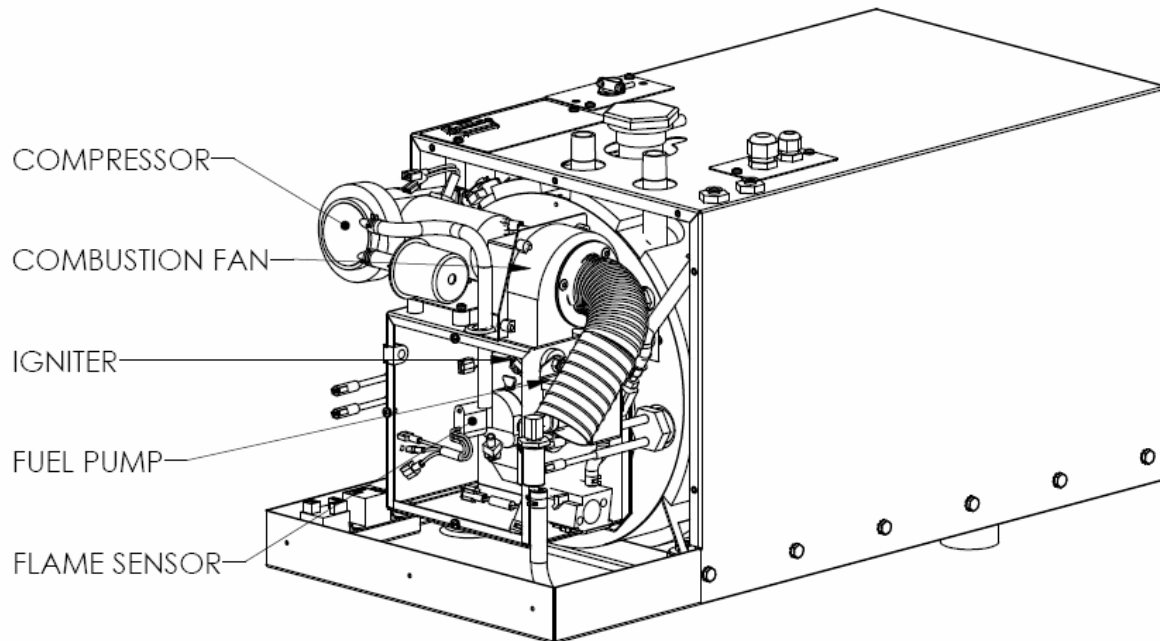


Figure 10: Oasis Heating Module Components

#### 3.2.1 Compressor

##### Air compressor LED flashing

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.

The two high limit temperature sensors on the top left side of the tank (see Figure 17) should be accessible. Note that the ground wire for the air compressor goes through these two temperature sensors before returning to the ground bar. If one or both of these temperature sensors have tripped, the air compressor will stop working. Attempt to reset the high limit temperature sensors by pressing the square red button on the top of the sensors. If the buttons on either of the high limit temperature sensors click or are able to be pushed down, then this indicates that the high limit temperature sensor has tripped. Proceed to Q1.

Q1: Have one or both of the high limit temperature sensors tripped?

A: If YES:

Feel the pressure relief cap on top of the Oasis Heating Module. Be careful as the cap can be very HOT. **WARNING:** removing the pressure relief cap when the system is hot can expel HOT coolant which can cause SEVERE BURNS. If the pressure relief cap is hot, allow the system to cool for at least 30 minutes. Once the system has cooled, remove the cap. Check coolant level from the filler neck. Proceed to Q4.

IF NO:

Check that the connections to the RED and BLACK wires on the air compressor (see Figure 10) are secure. This connection will have RED heat shrink on both sides of the matching

## Oasis Service & Troubleshooting Manual

---

connectors. If the heat shrink colors on both sides of the connectors do not match, then the component has been misconnected. Also, the wire connected to the BLACK wire on the air compressor must be securely connected to the ground bar on the left side of the burner box. Proceed to Q2.

Q2: Are all air compressor connections secure and correct?

IF NO:

Correct the connections. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

Without removing the air compressor, disconnect the connectors from the Red and Black air compressor wires. Take a new air compressor and connect its wires to the wires that were connected to the old air compressor. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Note that the air compressor is not connected to the system, so if the heater attempts to run, it will detect a flame fault after 7 seconds. Proceed to Q3.

Q3: Does the heater attempt to run for the first 7 seconds without flashing the air compressor LED?

IF YES:

Problem solved. The new air compressor needs to be installed. To install the air compressor refer to Servicing the Oasis Heating Module (section 4.3.1).

IF NO:

Contact ITR for further assistance.

Q4: Is the coolant level up to the filler neck?

IF YES:

Contact ITR before attempting to run the heater again.

IF NO:

1. Fill up the tank (using filler neck) with a 50/50 mixture of propylene glycol and water
2. Ensure that the tank is filled up to the filler neck
3. Place the pressure relief cap back on the filler neck
4. Turn ON the power button (front panel of Oasis Heating Module) and allow the heater to fire.
5. Observe that the heater cycles OFF (once it comes up to temperature) and then ON again (once the coolant temperature drops). Proceed to Q5.

Q5: Does the heater cycle OFF and ON again?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.

### **3.2.2 Fuel Pump**

#### Fuel pump LED flashing

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

Check that the connections to the RED and BLACK wires on the fuel pump (see Figure 10) are secure. This connection will have BLUE heat shrink on both sides of the matching connectors. If the heat shrink colors on both sides of the connectors do not match, then the component has been misconnected. Also, the wire connected

## Oasis Service & Troubleshooting Manual

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to the BLACK wire on the fuel pump must be securely connected to the ground bar on the left side of the burner box. Proceed to Q2.

Q2: Are all fuel pump connections secure and correct?

IF NO:

Correct the connections. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

Without removing the fuel pump, disconnect the connectors from the RED and BLACK fuel pump wires. Take a new fuel pump and connect its wires to the wires that were connected to the old fuel pump. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Note that the fuel line is not connected to the new fuel pump, so if the heater attempts to run, it will detect a flame fault after 7 seconds. Proceed to Q3.

Q3: Does the heater attempt to run for the first 7 seconds without flashing the fuel pump LED?

IF YES:

Problem solved. The new fuel pump needs to be installed. To install the fuel pump refer to Servicing the Oasis Heating Module (section 4.3.2).

IF NO:

Re-connect the wires of the original fuel pump and ensure that the wires have BLUE heat shrink on both sides of the matching connectors.

**IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.

Remove the screws on the burner box cover and remove the cover. Check that the connections to the BLACK wires on the fuel solenoid (see Figure 10) are secure. This connection will have BLUE heat shrink on both sides of the matching connectors. If the heat shrink on both sides of the connectors do not match, then the component has been misconnected. Also, the BLACK/BLUE wire connected to one of the BLACK fuel solenoid wires must be securely connected to the ground bar on the left side of the burner box. Proceed to Q4.

Q4: Are all fuel solenoid connections secure and correct?

IF NO:

Correct the connections. Screw the burner box cover back in place. **IMPORTANT: DO NOT** attempt to run the heater with the burner box cover off as it will project open flame towards the user. Connect the main 12VDC power to the Oasis Heating Module. Turn ON the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

Without removing the fuel solenoid, disconnect the connectors from the BLACK fuel solenoid wires. Take a new fuel solenoid and connect its wires to the wires that were connected to the old fuel solenoid. Screw the burner box cover back in place. **IMPORTANT: DO NOT** attempt to run the heater with the burner box cover off as it will project open flame towards the user. Connect the main 12VDC power to the Oasis Heating Module. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Note that the fuel line is not connected to the new fuel solenoid, so if the heater attempts to run, it will detect a flame fault after 7 seconds. Proceed to Q5.

Q5: Does the heater attempt to run for the first 7 seconds without flashing the fuel pump LED?

IF YES:

Problem solved. The new fuel solenoid needs to be installed. To install the fuel solenoid, refer to Servicing the Oasis Heating Module (section 4.3.3).

IF NO:

Contact ITR for further assistance.

### **3.2.3 Combustion Fan**

#### Combustion Fan LED flashing

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (if the combustion fan has faulted, this should happen immediately; otherwise the combustion fan will run for 2 minutes before powering down). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

Check that the connections to the RED and BLUE wires on the combustion fan (see Figure 10) are secure. This connection will have WHITE heat shrink on both sides of the matching connectors. If the heat shrink on both sides of the connectors do not match, then the component has been misconnected. Also, the wire connected to the BLUE wire on the combustion fan must be securely connected to the ground bar on the left side of the burner box. Proceed to Q2.

Q2: Are all combustion fan connections secure and correct?

IF NO:

Correct the connections. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

**IMPORTANT:** Disconnect the air compressor wires (RED heat shrink) from the main harness. Disconnecting these wires ensures that the heater will not attempt to fire. If the heater were allowed to start with the combustion fan not blowing into the burner box, flame would come back into the burner box and cause damage to the components and wiring. Without removing the combustion fan, disconnect the connectors from the RED and BLUE combustion fan wires. Take a new combustion fan and connect its wires to the wires that were connected to the old combustion fan. Turn on the power button (front panel of Oasis Heating Module) and observe the combustion fan. Proceed to Q3.

Q3: Does the combustion fan run for 2 minutes without flashing the combustion fan LED?

IF YES:

Problem solved. The new combustion fan needs to be installed. To install the combustion fan, refer to Servicing the Oasis Heating Module (section 4.3.4).

IF NO:

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (if the combustion fan has faulted, this should happen immediately). Re-connect the wires of the original combustion fan and ensure that the wires have WHITE heat shrink on both sides of the matching connectors. Check that the connections to the hour meter are secure. The wires going to the hour meter will have CLEAR heat shrink on them. Also, the WHITE/BLACK wire connected the hour meter must be securely connected to the ground bar on the left side of the burner box. Proceed to Q4

Q4: Are all hour meter connections secure and correct?

IF NO:

Correct the connections. Connect the air compressor wires to the main harness ensuring both sides of the connectors have matching RED heat shrink. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

Without removing the hour meter, disconnect the connectors from the terminals of the hour meter. Take a new hour meter and connect it to the wires that were connected to the old hour meter. Turn on the power button (front panel) and observe the combustion fan. Proceed to Q5.

Q5: Does the combustion fan run for 2 minutes without flashing the combustion fan LED?

IF YES:

Problem solved. The new hour meter needs to be installed. To install the hour meter, refer to Servicing the Oasis Heating Module (section 4.3.5).

IF NO:

Contact ITR for further assistance.

### 3.2.4 Ignitor

#### Ignitor LED flashing

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (if the combustion fan has faulted, this should happen immediately; otherwise the combustion fan will run for 2 minutes before powering down). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

**IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.

Remove the screws on the burner box cover and remove the cover. Check that the connections to the WHITE wires on the ignitor (see Figure 10) are secure. This connection will have BLACK heat shrink on both sides of the matching connectors. If the heat shrink on both sides of the connectors do not match, then the component has been misconnected. Also, the BLACK/PINK wire connected to one of the BLACK wires on the ignitor must be securely connected to the ground bar on the left side of the burner box. Proceed to Q2.

Q2: Are all ignitor connections secure and correct?

IF NO:

Correct the connections. Screw the burner box cover back in place.

**IMPORTANT: DO NOT** attempt to run the heater with the burner box cover off as it will project open flame towards the user. Connect the main 12VDC power to the Oasis Heating Module. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q3.

IF YES:

1. Install a new ignitor. To install a new ignitor, refer to Servicing the Oasis Heating Module (section 4.3.7).
2. Once the ignitor is installed, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q3.

Q3: Does the ignitor turn on without flashing the ignitor LED?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.

### 3.2.5 Flame Out

#### Flame Out LED ON

##### Notes:

1	For troubleshooting a flame out, leave the burner switch on the Oasis Remote Operating Panel in the ON Position.
2	There are two methods to reset the Oasis Heating Module after a flame out has been detected: <ol style="list-style-type: none"><li>1. Turn the burner switch OFF, wait 1 second and turn it ON again.</li><li>2. Press the reset button on the front panel of the Oasis Heating Module (this method will be used in this troubleshooting section).</li></ol>

Check the following before continuing with the troubleshooting:

- The fuel supply from the fuel storage tank to the fuel inlet of the Oasis Heating Module must be from a dedicated fuel pickup on the top of the tank.
- The fuel level in the fuel storage tank must be above the level of the bottom of the fuel pickup tube.
- The total rise from the bottom of the fuel pickup tube to the fuel inlet on the Oasis Heating Module should not exceed 60”.
- The fuel return from the Oasis Heating Module must go back to the diesel fuel storage tank.
- The fuel line from the diesel fuel tank to the inlet of the Oasis Heating Module must not have any kinks or leaks.
- All fittings must be leak tight.
- External fuel filter must be clear of any contaminants obstructing the flow of fuel.
- The first time that the fuel line is connected to the Oasis Heating Module, there will be air in the line. It may be necessary to reset the Oasis Heating Module a couple of times to bleed the air from the fuel line.

If any of the above issues were found to be a problem, correct the situation and press the reset button on the front panel of the Oasis Heating Module to allow the burner to fire again.

Keeping the power button ON, remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

Refer to the following underlined statements that best describe the problem that is being encountered:

When the heater attempts to light, there is no flame and a flame-out occurs after 7 seconds.

Press the reset button on the Oasis Heating Module and look through the flame observation window (see Figure 1) and check for a glow when the ignitor LED on the Oasis Heating Module is ON. Proceed to Q1.

Q1: Is there a glow in the burner chamber when the ignitor LED on the Oasis Heating Module is ON (10 seconds before the other components turn ON)?

IF NO:

1. Install a new ignitor. To install the ignitor, refer to Servicing the Oasis Heating Module (section 4.3.7).
2. Once the ignitor is installed, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF YES:

During the first 7 seconds when the fuel pump is running (fuel pump LED is ON), ensure the fuel return line is open and check the fuel coming out of the fuel return line. Proceed to Q2.

## Oasis Service & Troubleshooting Manual

---

Q2: When the fuel pump is running, is there fuel coming out of the fuel return line?

IF YES:

Place your finger on the air compressor's air filter (see Figure 10). Once the air compressor turns on, there should be enough suction to keep your finger in place. Proceed to Q3.

IF NO:

1. Replace the fuel filter because it may be clogged. To replace the fuel filter, refer to Servicing the Oasis Heating Module (section 4.3.8).
2. Once the fuel filter has been replaced, press the reset button (front panel of Oasis Heating Module) and attempt to fire the heater. During the first 7 seconds when the fuel pump is running (fuel pump LED is ON), ensure the fuel return line is open and check the fuel coming out of the fuel return line. Proceed to Q4.

Q3: Once the air compressor turns on, is there enough suction at the inlet of the air filter to hold your finger in place?

IF NO:

Change the air compressor. To change the air compressor, refer to Servicing the Oasis Heating Module (section 4.3.1).

IF YES:

Check the glow of the ignitor. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). To check the glow of the ignitor, do the following:

1. **IMPORTANT:** Disconnect the air compressor wires (RED heat shrink) from the main harness. Disconnecting these wires ensures that the heater will not attempt to fire if the power button is accidentally turned ON. This will make it safe to view the ignitor with an open burner box.
2. Remove the screws on the burner box cover and remove the cover.
3. Loosen the tab on top of the fuel block and pull the fuel block out from its mounting position.
4. Ensure that the ignitor tip is horizontal (see Figure 18).
5. With the fuel block out of the way, turn on the power button (front panel) and observe the ignitor during the first 10 seconds. Note: the heater will stop and show a compressor fault after 10 seconds. Proceed to Q6.

Q4: Once the fuel filter has been changed and the fuel pump is running (fuel pump LED is ON), is there fuel coming out of the fuel return line?

IF YES:

Problem solved.

IF NO:

1. Change the fuel pump. To change the fuel pump, refer to Servicing the Oasis Heating Module (section 4.3.2).
2. Once the fuel pump has been replaced, press the reset button and attempt to fire the heater. During the first 7 seconds when the fuel pump is running (fuel pump LED is ON), ensure the fuel return line is open and check the fuel coming out of the fuel return line. Proceed to Q5.

Q5: Once the fuel pump has been changed and the fuel pump is running (fuel pump LED is ON), is there fuel coming out of the fuel return line?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.



## **Oasis Service & Troubleshooting Manual**

---

Q6: Is the ignitor glowing bright yellow?

IF YES:

1. Clean the fuel nozzle. To clean the fuel nozzle, refer to Servicing the Oasis Heating Module (section 4.3.9).
2. Once the fuel nozzle has been cleaned, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q7.

IF NO:

Replace Ignitor. To replace the ignitor, refer to Servicing the Oasis Heating Module (section 4.3.7).

Q7: Does the heater fire once the fuel nozzle has been cleaned?

IF YES:

Problem solved.

IF NO:

Check the fuel solenoid. Turn off the power button (front panel) and allow the heater to completely power down (this will take 2 minutes). **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user. To check the fuel solenoid, do the following:

1. Remove the screws on the burner box cover and remove the cover.
2. Disconnect the wires to the fuel solenoid.
3. Being careful the O-ring stays in place on the brass head, unscrew the fuel solenoid from the brass head and remove the plunger (inside of fuel solenoid).
4. Screw the solenoid body back in place (note this is temporary to test if the fuel solenoid is a problem).
5. Screw the burner box cover back in place.
6. Connect the main 12VDC power to the Oasis Heating Module.

Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q8.

Q8: Does the heater fire once the plunger from the fuel solenoid is removed?

IF YES:

Problem solved. Replace the fuel solenoid. To replace the fuel solenoid, refer to Servicing the Oasis Heating Module (section 4.3.3).

IF NO:

Contact ITR for further assistance.

When the Oasis Heating Module attempts to fire, a stable flame comes on for 7 seconds. After 7 seconds the Oasis Heating Module detects a flame out.

**IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.

Remove the screws on the burner box cover and remove the cover. Check that the connections to the RED, BLACK, and YELLOW wires on the flame sensor (see Figure 10) are secure. This connection will have YELLOW heat shrink on both sides of the matching connectors. Proceed to Q1.

Q1: Are all flame sensor connections secure and correct?

IF YES:

1. Disconnect the flame sensor wires and unscrew (counter-clockwise) the flame sensor from the fuel block.
2. Check for soot build up on the flame sensor eye.
3. Check for soot buildup in the flame sensor hole in the fuel block (using a flashlight). This hole should have a clear line of sight into the burner chamber. Proceed to Q2.

## Oasis Service & Troubleshooting Manual

---

IF NO:

1. Correct the connections.
2. Screw the burner box cover back in place.
3. Connect the main 12VDC power to the Oasis Heating Module.
4. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

Q2: Does the flame sensor eye have soot on it, or is soot blocking the flame sensor hole in the fuel block?

IF YES:

1. Clean the soot off the flame sensor eye
2. Clean the flame sensor hole using high pressure air
3. Screw the flame sensor (clockwise) into the fuel block.
4. Connect the flame sensor wires to the connectors with matching YELLOW heat shrink.
5. Screw the burner box cover back in place.
6. Connect the main 12VDC power to the Oasis Heating Module.
7. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.

IF NO:

1. Replace the flame sensor. To replace the flame sensor, refer to Servicing the Oasis Heating Module (section 4.3.10).
2. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q3.

Q3: Did the new flame sensor allow the heater to continue running after 7 seconds?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.

### The heater sputters intermittently and eventually flames out.

The sputtering effect is due to air in the fuel system. When the burner chamber is hot, this sputtering effect can cause the heater to backfire. Intermittent sputtering is commonly caused by leaks in the fuel line. To check the fuel line, do the following:

1. Turn off the fuel supply to the Oasis Heating Module before proceeding with the next step.
2. Remove the fuel line from the fuel inlet of the Oasis Heating Module and replace it with a short piece of fuel line. Secure this line with a hose clamp.
3. Put a fuel filter on the other end of the fuel line and place the end in a jerry can filled with diesel fuel.
4. Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater.
5. There will be air in this new fuel line. It may be necessary to reset the Oasis Heating Module to bleed the air from the fuel line.
6. Proceed to Q1.

Q1: Does the heater continue to sputter after the jerry can is put in place?

IF YES:

If the fuel block was taken out or the fuel solenoid replaced, then the fuel line from the outlet of the fuel regulator to the inlet of the fuel solenoid could have been damaged. To check this fuel line for leaks, do the following:

Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

1. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the

power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.

2. Remove the screws on the burner box cover and remove the cover.
3. Inspect the fuel line from the regulator to the fuel solenoid for leaks. The hose clamps must be secured on the outlet of the fuel regulator and on the inlet of the fuel solenoid. Also, if the fuel solenoid was replaced, check to for proper sealant on the threads. Proceed to Q2.

IF NO:

The problem is not with the Oasis Heating Module. There may be a cut in the fuel line running from the fuel tank to the fuel inlet of the Oasis Heating Module, or the hose clamps may not be secured in place.

Q2: Is the fuel line leaking or does the fuel solenoid not have proper sealant on the threads?

IF YES:

- If the fuel line is leaking, replace the fuel line with 3/16" I.D. diesel approved fuel line (SAE 30R7).
- If the fuel solenoid does not have sealant on the threads, refer to Servicing the Oasis Heating Module (section 4.3.3) to put on the appropriate sealant.

IF NO:

Refer to the next section (continuous sputtering). If this section does not solve the problem, contact ITR for further assistance.

The heater sputters continuously and eventually flames out.

The sputtering effect is due to air in the fuel system. When the burner chamber is hot, this sputtering effect can cause the heater to backfire. Continuous sputtering is commonly caused by a damaged O-ring in the fuel nozzle. To check the nozzle, refer to Servicing the Oasis Heating Module (section 4.3.9). Proceed to Q1.

Q1: Is the O-ring in the fuel nozzle damaged?

IF YES:

Replace the fuel nozzle. To replace the fuel nozzle, refer to Servicing the Oasis Heating Module (section 4.3.9).

IF NO:

Refer to the previous section (intermittent sputtering). If this section does not solve the problem, contact ITR for further assistance.

### **3.2.6 Voltage**

#### **Voltage LED ON**

Check the DC voltage (see Figure 1) to the Oasis Heating Module using a multi-meter. Note that the voltage at the battery is not necessarily the voltage supplied to the Oasis Heating Module. Depending on the gauge and length of the power wires, there will be a voltage drop between the battery and the Oasis Heating Module. To ensure the correct voltage is being measured, measure the voltage as close to the Oasis Heating Module as possible. Proceed to Q1.

Q1: Is the voltage range between 10.5V and 16 Volts?

IF NO:

If the voltage is below 10.5V, correct the situation by charging the battery. If the voltage is above 16V, then there is a problem with the charger. Once the situation is corrected, press the reset button (front panel of Oasis Heating Module) to restart the heater.

If YES:

Check the voltage to the Oasis Heating Module using a multi-meter, and at the same time, press the reset button (front panel of Oasis Heating Module). At this point the heater will begin its ignition sequence. Monitor the voltage during the ignition sequence. If at any time the voltage drops below 10.5V and stays below 10.5V for longer than 10 seconds, the Oasis Heating Module will indicate a voltage fault (RED Voltage LED on front panel will light) and shut down. The Oasis Heating Module will attempt to re-start one more time, and if the same thing happens, it will shut down and indicate a voltage fault. The Oasis Heating Module will remain off until the reset button (front panel of Oasis Heating Module) is pressed. Proceed to Q3.

Q3: Once the burner fires, does the voltage drop below 10.5V?

IF YES:

The battery is discharged and showing a voltage that it is not capable of supporting under load. Once a load is put onto the battery (i.e. when the burner attempts to fire), the battery voltage will drop. This situation indicates that the battery needs to be charged or possibly replaced. Once the battery is charged press the reset button to restart the Oasis Heating Module.

IF NO:

Contact ITR for further assistance.

### **3.2.7 Low Water**

#### Low Water LED ON

Remove the radiator cap from the filler neck on the Oasis Heating Module and fill up the tank with a 50/50 mixture of propylene glycol and water. Ensure that the tank is filled up to the filler neck. Place the expansion cap back on the filler neck. Observe the Low Water LED on the Oasis Heating Module as the tank is being filled up. Proceed to Q1.

Q1: Does the low water level LED turn off when the tank is filled?

IF YES:

Problem solved. Fill up the overflow bottle half way with a 50/50 mixture of propylene glycol and water.

IF NO:

Turn off the power button (front panel) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.

Check that the connections to the YELLOW wires on the level switch (see Figure 10) are secure. This connection will have GREEN heat shrink on both sides of the matching connectors. If the heat shrink on both sides of the connectors do not match, then the component has been misconnected. Proceed to Q2.

Q2: Are all level switch connections secure and correct?

IF NO:

Correct the connections. Move the front panel of the Oasis Heating Module to a position where it can be observed. Turn on the power button and observe the Low Water LED.

IF YES:

Unplug the level switch from the main harness (GREEN heat shrink on both ends). Move the front panel of the Oasis Heating Module to a position where it can be observed. Turn on the power button and observe that the Low Water LED turns on. Plug a new level switch into the wires that were connected to the old level switch. Hold the level switch so the "NO" engraved

## **Oasis Service & Troubleshooting Manual**

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on the switch is flat and visible when looking at the level switch from the top. Lift the arm of the level switch to the up position and at the same time monitor the Low Water LED on the front panel. Proceed to Q3.

Q3: Does the Low Water LED turn OFF when the arm of the new level switch is moved to the UP position?

IF YES:

Problem solved. The new level switch must be installed. To install the level switch, refer to Servicing the Oasis Heating Module (section 4.3.11).

IF NO:

Contact ITR for further assistance.

### ***3.3 Oasis Distribution Module***

**IMPORTANT:** If at any time the pump inside the Oasis Distribution Module starts making loud noises, disconnect the Oasis Distribution Module harness immediately and refer to Servicing the Oasis Distribution Module (section 5.1). Running the pumps dry will permanently damage the pumps.

If the Oasis Heating Module fires and comes up to temperature, but heat is not available at the cabin fans or domestic hot water, then coolant is not being circulated adequately.

The distribution module zone board controls the Oasis Distribution Module which circulates hot coolant to the cabin fans and the domestic water/engine heat exchanger. If the coolant inside the Oasis Heating Module is hot, but heat is not available at the cabin fans or the domestic hot water, do the following:

Ensure that the thermostats for all of the zones are calling for heat. Check the power LED on the distribution module zone board. Proceed to Q1.

Q1: Is the power LED on the distribution module zone board ON?

IF YES:

Check the zone thermostat LED's on the distribution module zone board. Proceed to Q2.

IF NO:

Check the fuse (from battery to distribution module zone board) and make sure that 12V is available to the distribution module zone board.

Q2: Are the zone thermostat LED's on the distribution module zone board ON for the zones that are calling for heat?

IF YES:

Check the Green LED's for the summer pump, Loop 1 pump, Loop 2 pump, and Zone fans on the distribution module zone board. Proceed to Q3.

IF NO:

Check the connections to the thermostat wires on the input to the zone board. The wires connected from the thermostat to these inputs must be 12V and must be connected to the same battery that is feeding power to the distribution module zone board.

Q3: Are the Green LED's for the summer pump, Loop 1 pump, Loop 2 pump, and zone fans ON?

IF YES:

Check the connection from the zone board to the Oasis Distribution Module. Proceed to Q4.

IF NO:

Check the RED LED's for the summer pump, Loop 1 pump, Loop 2 pump, and Zone fans on the distribution module zone board. Proceed to Q5.

Q4: Are the connections from the distribution module zone board to the Oasis Distribution Module secure?

IF YES:

Check to see if the pumps are running. Check the "heating loop supply" and "to heater inlet" connections on the Oasis Distribution Module for vibration. Proceed to Q8.

IF NO:

Secure the connections at the distribution module zone board and at the Oasis Distribution Module.

Q5: Are any of the RED LED's for the summer pump, Loop 1 pump, Loop 2 pump, and zone fans ON?

IF YES:

The fuse is blown for the component that has the RED LED ON. Remove the front cover on the distribution module zone board and replace the fuse. Note the following are the fuse values:

## Oasis Service & Troubleshooting Manual

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Fuse Name	Amperage
Cabin Fan 1	10 A
Cabin Fan 2	5 A
Cabin Fan 3	5 A
Cabin Fan 4	5 A
Cabin Fan 5	5 A
Summer Pump	5 A
Heating Loop 1 Pump	5 A
Heating Loop 2 Pump	5 A
Engine Pre-heat Pump	5 A

If the fuse blows again, the component with the RED LED has shorted. If the component that has shorted is a cabin fan, replace the fan. If the component that has shorted is one of the pumps in the Oasis Distribution Module, replace the pump. To replace the pumps, refer to Servicing the Oasis Distribution Module (sections 5.2.1 and 5.2.2).

IF NO:

Turn ON the bypass switch on top of the distribution module zone board. Proceed to Q6.

Q6: Once the bypass switch is ON, do the Green LED's for the Loop 1 and Loop 2 pumps, and zone fans turn ON?

IF YES:

Check the connections from the distribution module zone board to the Oasis Heating Module. Proceed to Q7.

IF NO:

distribution module zone board could be damaged. Turn the bypass switch OFF and contact ITR for further assistance.

Q7: Are the connections from the distribution module zone board to the Oasis Heating module secure?

IF YES:

The problem could be with the heat detection sensor. Contact ITR for further assistance.

IF NO:

Secure the connections at the distribution module zone board and at the Oasis Heating Module.

Q8: Is there vibration present at the "heating loop supply" and "to heater inlet" connections on the Oasis Distribution Module?

IF YES:

There is most likely an air lock in the system, or the pumps in the distribution module have not been primed. To prime the pumps and bleed the air out of the system, refer to Servicing the Oasis Distribution Module (section 5.1).

IF NO:

The pumps may need to be replaced. To replace the pumps, refer to Servicing the Oasis Distribution Module (section 5.2.1 and 5.2.2).

### **4.0 Servicing the Oasis Heating Module**

#### ***4.1 Indications Service Is Required***

The flame is a dirty orange color.

Press the reset button on the front panel of the Oasis Heating Module and place your finger on the air compressor's air filter. Once the air compressor turns on, there should be enough suction to keep your finger in place. Proceed to Q1.

Q1: Once the air compressor turns on, is there enough suction at the inlet of the air filter to hold your finger in place?

IF NO:

Replace the air compressor. To replace the air compressor refer to Servicing the Oasis Heating Module (section 4.3.1). Once the air compressor has been replaced, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q2.

IF YES:

Clean the fuel nozzle. To clean the fuel nozzle, refer to Servicing the Oasis Heating Module (section 4.3.9). Once the fuel nozzle has been cleaned, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q2.

Q2: Is the flame a bright yellow color after replacing the air compressor or cleaning the fuel nozzle?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.

The flame is small and has a blue color

Clean the fuel nozzle. To clean the fuel nozzle, refer to Servicing the Oasis Heating Module (section 4.3.9). Once the fuel nozzle has been cleaned, turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q1.

Q1: Is the flame a bright yellow color after cleaning the fuel nozzle?

IF YES:

Problem solved.

IF NO:

Replace the fuel filter attached to the inlet of the fuel pump. To replace the fuel filter, refer to Servicing the Oasis Heating Module (section 4.3.8). Turn on the power button (front panel of Oasis Heating Module) and attempt to run the heater. Proceed to Q2.

Q2: Is the flame a bright yellow color after replacing the fuel filter?

IF YES:

Problem solved.

IF NO:

Contact ITR for further assistance.

1000 hours has passed since the last service

The following service needs to be done after 1000 hours of operation:

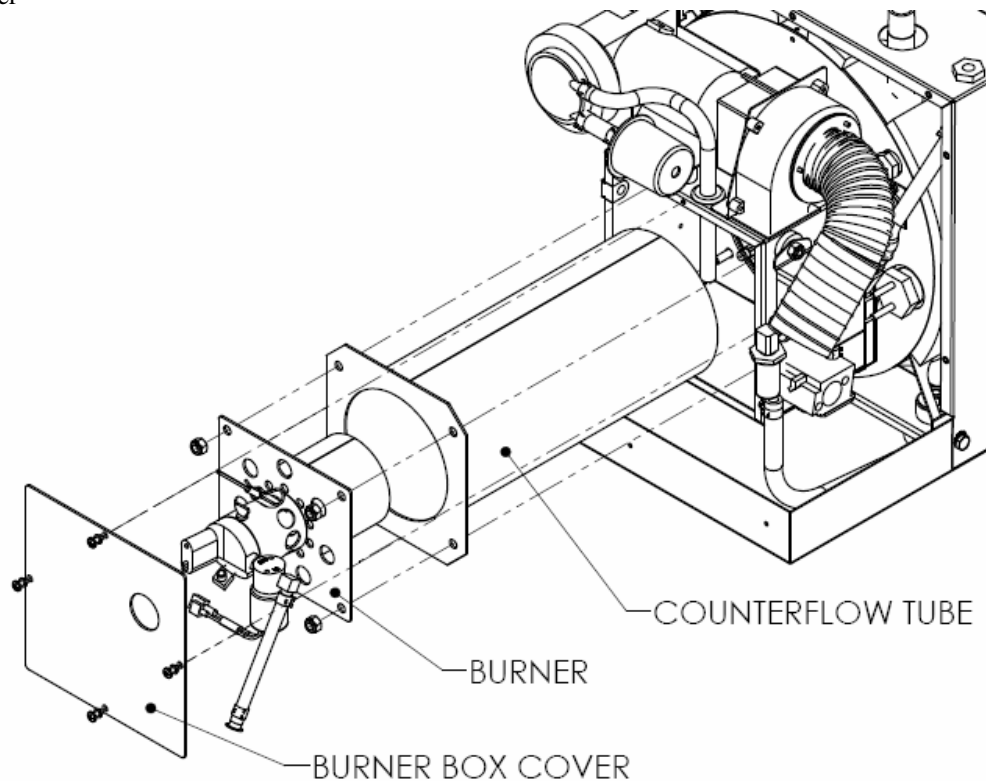
- Replace the fuel filter; refer to Servicing the Oasis Heating Module (section 4.3.8).
- Clean or replace the fuel nozzle; refer to Servicing the Oasis Heating Module (section 4.3.9).
- Replace the air filter on the air compressor; refer to Servicing the Oasis Heating Module (section 4.3.14).
- Clean the combustion chamber; refer to Servicing the Oasis Heating Module (section 4.2).



### 4.2 Cleaning the Combustion Chamber

To clean out the combustion chamber, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover



**Figure 11: Burner box components**

4. Remove the fuel line from the elbow connected to the inlet of the fuel solenoid (using a pair of pliers on the hose clamp).
5. Remove the air compressor hose from the fuel block (using a pair of pliers on the hose clamp).
6. Remove the 4 locknuts (using 7/16" socket) that are holding the burner box in position.
7. Pull out the burner and the counter-flow tube (see Figure 12) and clean them with carb cleaner.
8. Clean out the ash from inside the burner chamber (using a vacuum or pressurized air).
9. Place the counter-flow tube back in position followed by the burner and secure them in place using the 4 locknuts (recommendation: use new brass locknuts).
10. Connect the fuel line to the brass elbow connected to the inlet of the fuel solenoid and secure it in place using the hose clamp.
11. Attach the air compressor hose to the fuel block and secure it in place using the hose clamp.
12. Screw the burner box cover back in place.
13. Connect the main 12VDC power to the Oasis Heating Module.

### 4.3 Part Replacements

#### 4.3.1 Compressor

To install the air compressor do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.
2. **IMPORTANT:** Disconnect the air compressor wires (RED heat shrink) from the main harness. Disconnecting these wires ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Cut the tie wrap on the top left corner of the air compressor that is holding the 4 air compressor and combustion fan wires in place.

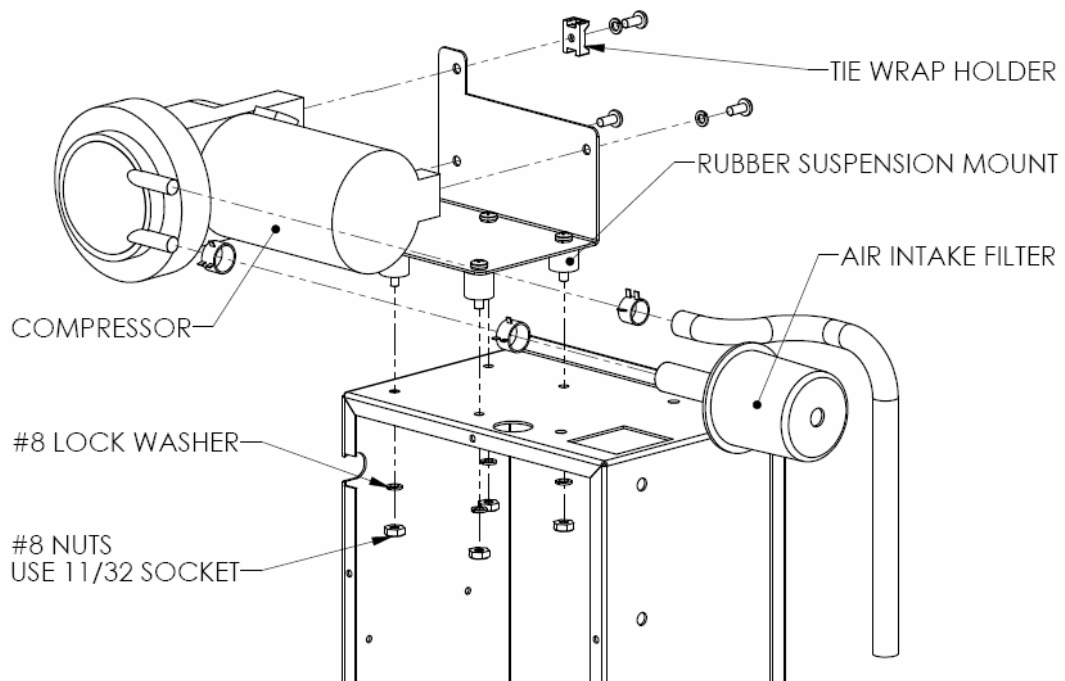


Figure 12: Compressor components

4. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover
5. Use an 11/32" socket to remove the 4 nuts from the upper left hand corner of the burner box (see Figure 13).
6. Remove the air compressor and unscrew the attached bracket (using a Philips head screwdriver).
7. Screw this bracket to the new air compressor and place it in the same position as the old air compressor
8. Attach the 4 nuts to the upper left hand corner of the burner box
9. Screw the burner box cover back in place.

10. Attach the two combustion fan wires and two air compressor wires to the top left corner of the air compressor using a tie wrap.
11. Connect the air compressor wires to the main harness ensuring both sides of the connectors have matching RED heat shrink.
12. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.2 Fuel Pump

To install the fuel pump do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.
2. Cut the tie wrap that attaches the combustion fan air intake hose to the fuel pump.
3. Before proceeding with the next step, ensure that the fuel supply to the heater is shut off.

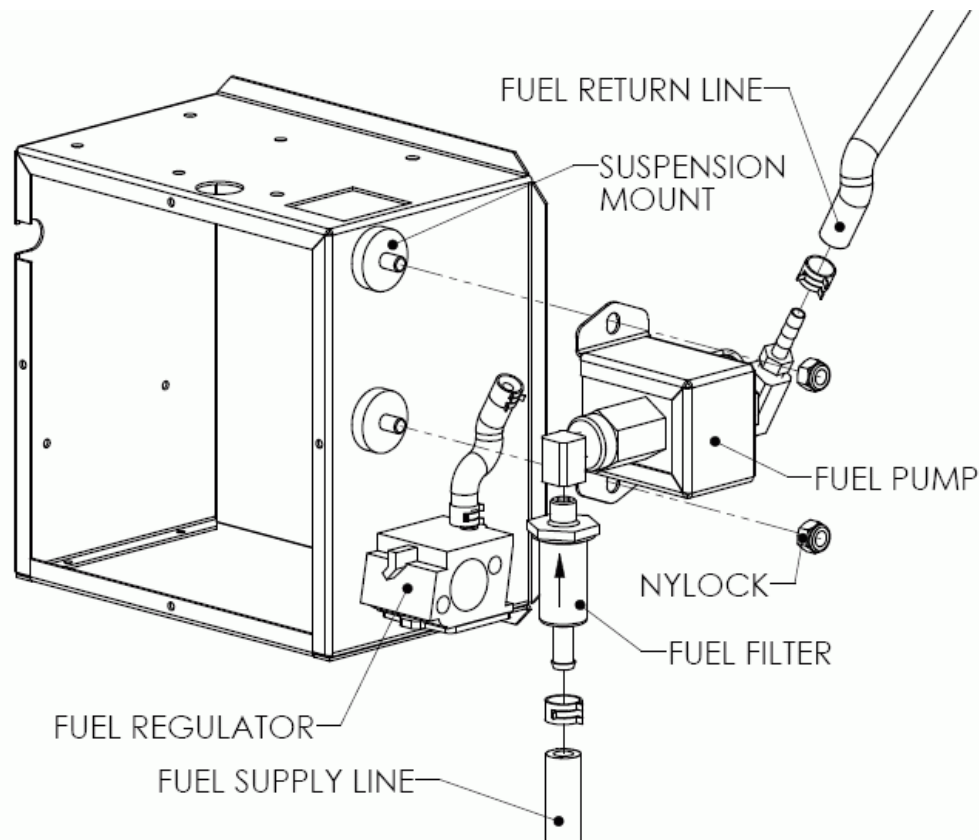


Figure 13: Fuel pump assembly

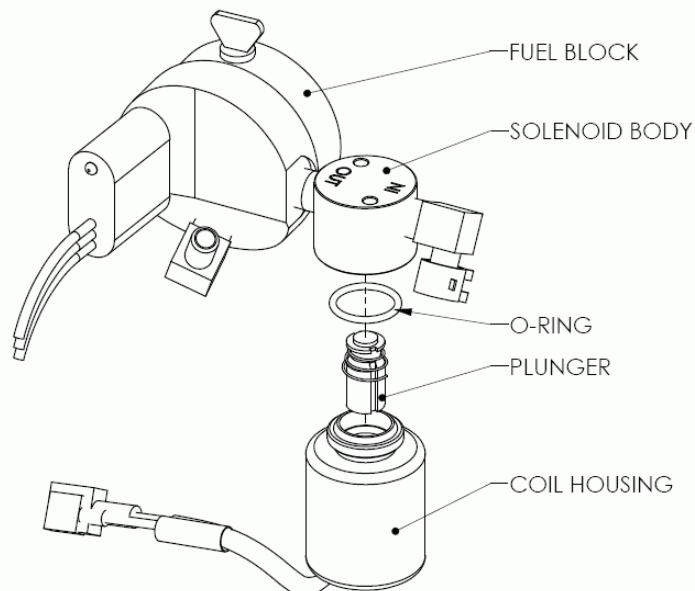
4. Remove the fuel lines (using a pair of pliers on the hose clamps) from the inlet of the fuel filter and outlet of the fuel pump. There are two hose clamps on the outlet of the fuel pump (one to the regulator and one to the fuel return).
5. Remove the 2 nylocks (see Figure 14) from the fuel pump (using a 7/16" socket) and remove it from the burner box.

6. Place the new fuel pump in the position of the old one and attach it to the burner box using the two nylocks.
7. Connect the fuel line coming from the regulator to the fuel outlet (bottom connection) of the fuel pump and connect the fuel line going to the fuel return to the outlet (top connection) of the fuel pump. Ensure both connections are secured with hose clamps.
8. Connect the fuel line coming from the input of the heater to the inlet of the fuel filter and make sure the connection is secured with a hose clamp. If any of the fuel lines are cracked or damaged, replace them with diesel approved hose of appropriate size and length (5/16", 1/4", 3/16").
9. Clean up any diesel fuel that was spilt.
10. Connect the fuel pump wires to the main harness ensuring both sides of the connectors have matching BLUE heat shrink.
11. Secure the air intake hose from the combustion fan to the fuel pump using a tie wrap.
12. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.3 Fuel Solenoid

To install the fuel solenoid, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover
4. Disconnect the wires to the fuel solenoid.
5. Unscrew the fuel solenoid coil housing from the solenoid body (counter-clockwise).



**Figure 14: Fuel solenoid components**

6. Make sure the old O-ring and plunger are removed as well.

7. Unscrew the coil housing from the new solenoid including the new O-ring.
8. Carefully screw back the new solenoid coil housing into the body without damaging the O-ring.
9. Connect the fuel solenoid wires to the main harness ensuring the connectors and the fuel solenoid wires have matching BLUE heat shrink on both sides of the connectors.
10. Screw the burner box cover back in place.
11. Connect the main 12VDC power to the Oasis Heating Module.
12. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.4 Combustion Fan

To install the combustion fan, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Cut the tie wrap that attaches the combustion fan air intake hose to the fuel pump.
4. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover

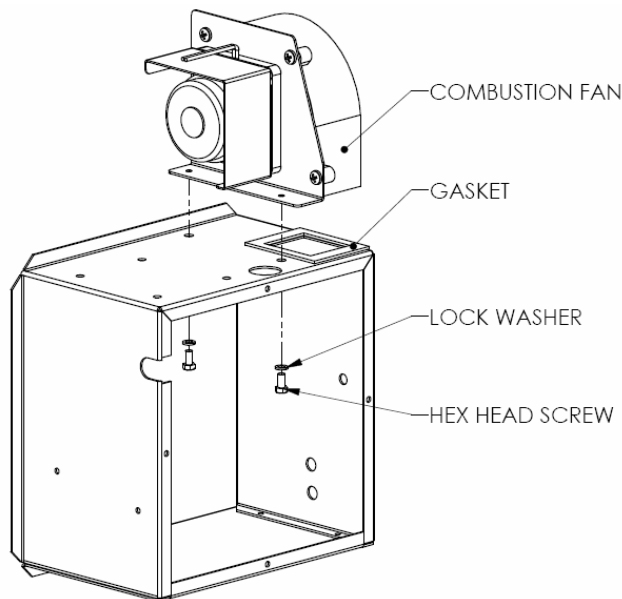


Figure 15: Combustion fan mounting

5. Use a 1/4" socket to remove the 2 machine screws (see Figure 16) from the upper right hand corner of the burner box.
6. Remove the combustion fan and place the new combustion fan in the same position as the one that was removed.
7. Attach the 2 nuts to the upper right hand corner of the burner box
8. Screw the burner box cover back in place.
9. Connect the combustion fan wires to the main harness ensuring both sides of the connectors have matching WHITE heat shrink.

10. Secure the air intake hose from the combustion fan to the fuel pump using a tie wrap.
11. Connect the main 12VDC power to the Oasis Heating Module.
12. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.5 Hour Meter

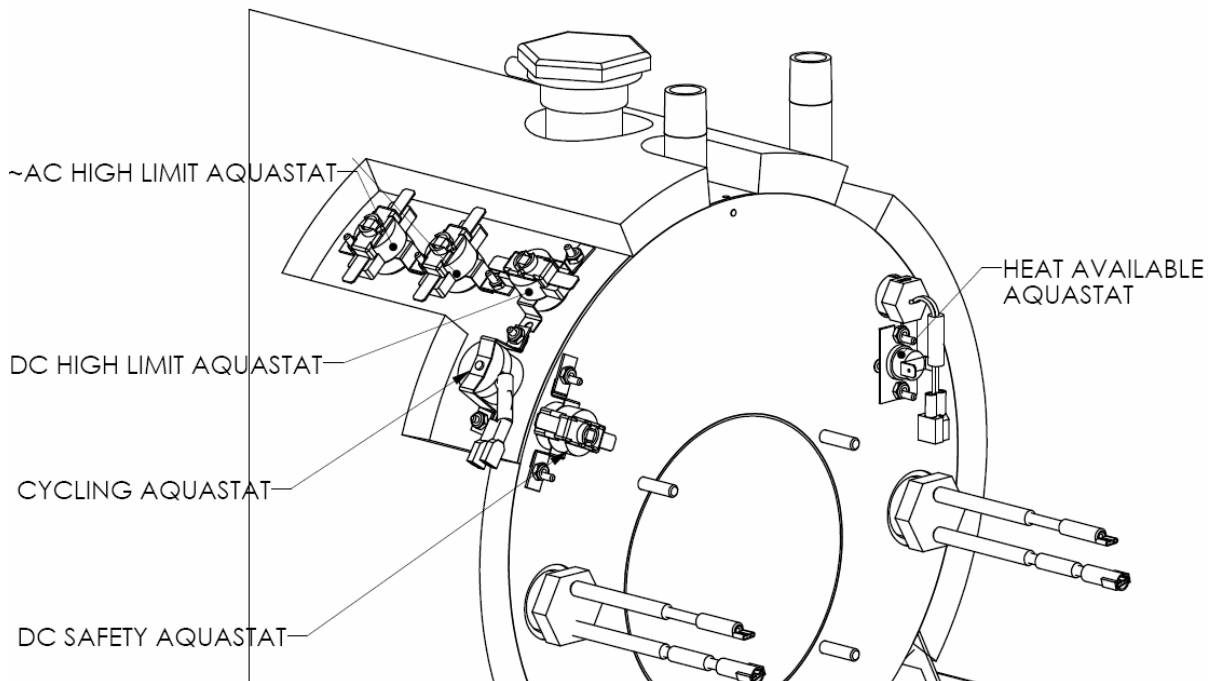
To install the hour meter, do the following:

1. Remove the two screws (using a Philips head screw driver) from the top of the hour meter (see Figure 10) and lift up the hour meter.
2. Remove the wires from the hour meter (being careful not to drop them into the heater).
3. Connect the wires to the new hour meter (polarity does not matter).
4. Position the new hour meter in place of the old one and screw it in place.

### 4.3.6 Aquastat

To replace the aquastat, do the following:

1. Use an 11/32 socket to remove the aquastat from the tank.
2. Unplug the wires from the spade connector on the aquastat.
3. Insert a new aquastat, assure that the square washer is on top and tighten nut.
4. Plug in the wires to the spade connector of the new aquastat.

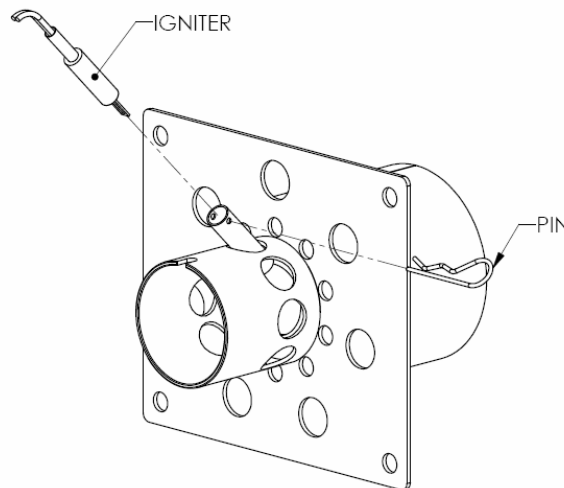


**Figure 16: Aquastat mount**

### 4.3.7 Igniter

To install the igniter, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover.
4. Disconnect the igniter wires.



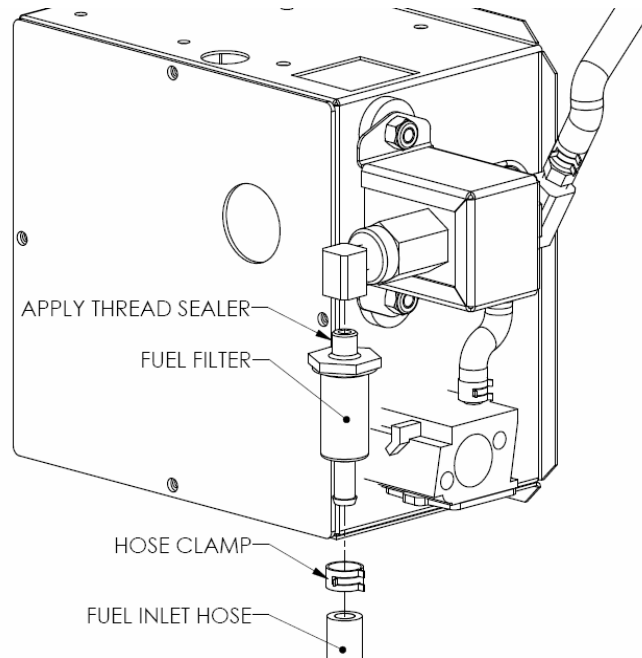
**Figure 17: Igniter assembly**

5. Remove the pin that holds the igniter in the igniter tube and remove the igniter (see Figure 18).
6. Place the new igniter in the igniter tube, being careful the igniter tip does not hit the sides of the igniter tube.
7. Once the igniter is fully inserted into the igniter tube, secure the pin that holds the igniter in place, being careful not to pierce the heat shrink on the igniter. Note that the pin can go in only if the igniter tip is in the horizontal position (see Figure 18).
8. Connect the igniter wires to the main harness ensuring both sides of the connectors have matching BLACK heat shrink.
9. Screw the burner box cover back in place.
10. Connect the main 12VDC power to the Oasis Heating Module.
11. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.8 Fuel Filter

To install the fuel filter, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. Cut the tie wrap that attaches the combustion fan air intake hose to the fuel pump.
3. Before proceeding with the next step, ensure that the fuel supply to the heater is shut off.



**Figure 18: Fuel filter assembly**

4. Remove the fuel line (using a pair of pliers on the hose clamps) from the inlet of the fuel filter.
5. Unscrew the fuel filter (counter-clockwise) from the brass elbow on the inlet of the fuel pump (see Figure 19) using a 15/16" wrench (stabilize the fuel pump by holding the brass elbow using a 9/16" wrench).
6. Place a small amount of thread sealer (compatible with diesel fuel) on the threads of the new fuel filter.
7. Screw in a new fuel filter (clockwise) to the brass elbow on the inlet of the fuel pump and attach the fuel line to the inlet of the fuel filter, ensuring it has been secured with the hose clamp.
8. Secure the air intake hose from the combustion fan to the fuel pump using a tie wrap.
9. Clean up any diesel fuel that was spilt
10. Put the outer cover back in place (tighten screws) and screw in the front cover.



### 4.3.9 Fuel Nozzle

To install the fuel nozzle, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover.
4. Loosen the thumb screw on top of the fuel block and remove it from its mounting position.

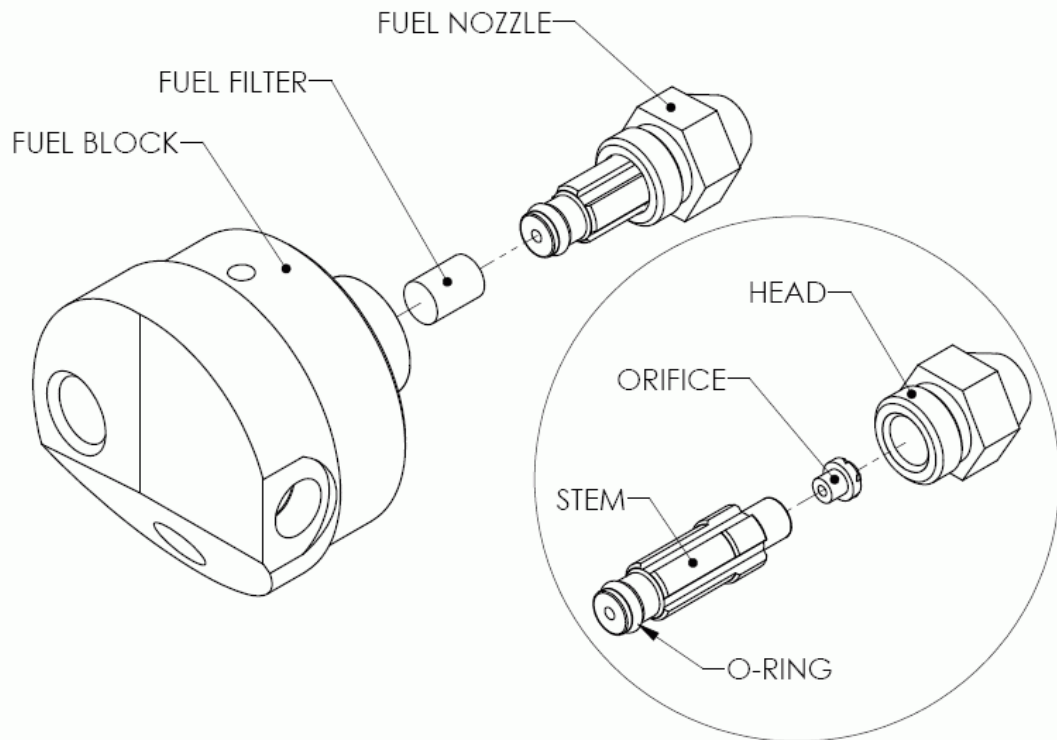


Figure 19: Fuel nozzle assembly

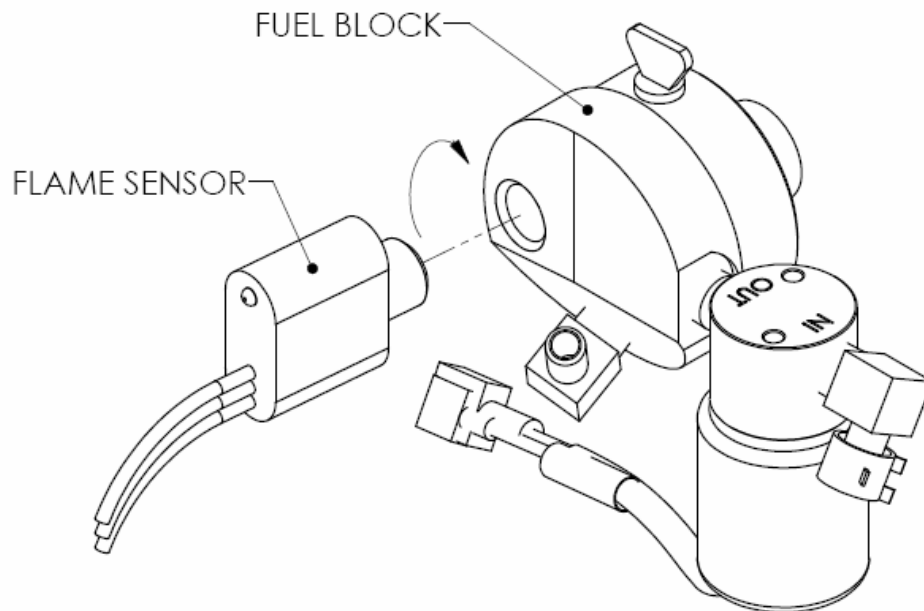
5. Unscrew the fuel nozzle (counter-clockwise) using a 5/8" wrench (see Figure 20).
6. When the fuel nozzle is removed, a fuel filter is visible inside the fuel block. Remove this filter and clean it using solvent and high pressure air.
7. For the following procedure, keep the nozzle vertical so the distributor does not fall out when the nozzle is taken apart.
8. Hold the fuel nozzle using a 5/8" wrench and turn the stem counter-clockwise using a crescent wrench.
9. Clean the distributor orifice and air slots of any debris using solvent and high pressure air. Check O-rings for nicks and replace if in doubt.
10. When putting the nozzle head and stem back together, ensure the distributor is fitted properly in position. Also, keep the nozzle vertical when putting the nozzle head and stem back together. If this is not done, the nozzle will get damaged.

11. Place the filter in the fuel block and screw the cleaned fuel nozzle (clockwise) back in place. When doing this, position the fuel block so the fuel nozzle is vertical when being screwed into the fuel block. If this is not done, the fuel filter can fall out.
12. Place the fuel block back in its mounting position and tighten the tab on top of the fuel block to secure it in place.
13. Clean up any diesel fuel that was spilt
14. Screw the burner box cover in place.
15. Connect the main 12VDC power to the Oasis Heating Module.
16. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.10 Flame Sensor

To install the flame sensor, do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON. If the heater were to attempt to fire with the burner box cover off, it will project open flame towards the user.
3. Remove the screws from the burner box cover (using a Philips head screw driver) and remove the cover.



**Figure 20: Flame sensor attachment**

4. Disconnect the flame sensor wires and unscrew (counter-clockwise) the flame sensor from the fuel block (see Figure 21).
5. Screw (clockwise) a new flame sensor into the fuel block.
6. Connect the flame sensor wires to the main harness ensuring both sides of the connectors have matching YELLOW heat shrink.

7. Screw the burner box cover in place.
8. Connect the main 12VDC power to the Oasis Heating Module.
9. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.11 Level Switch

The tank must be partially drained before the new level switch is installed. To drain the tank and install the level switch do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.
2. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON.
3. Clamp the inlet and outlet hose so no fluid can flow through them.
4. Open the radiator cap on the filler neck of the Oasis Heating Module.
5. Disconnect the inlet hose and connect a pump to the inlet tube on the Oasis Heating Module.
6. Use the pump to drain the coolant. Drain approximately 2 gallons out of the tank (the tank does not need to be fully drained).
7. Once the tank has been drained, use a 7/8" wrench to remove the level switch (counter-clockwise) from the tank (see Figure 22).

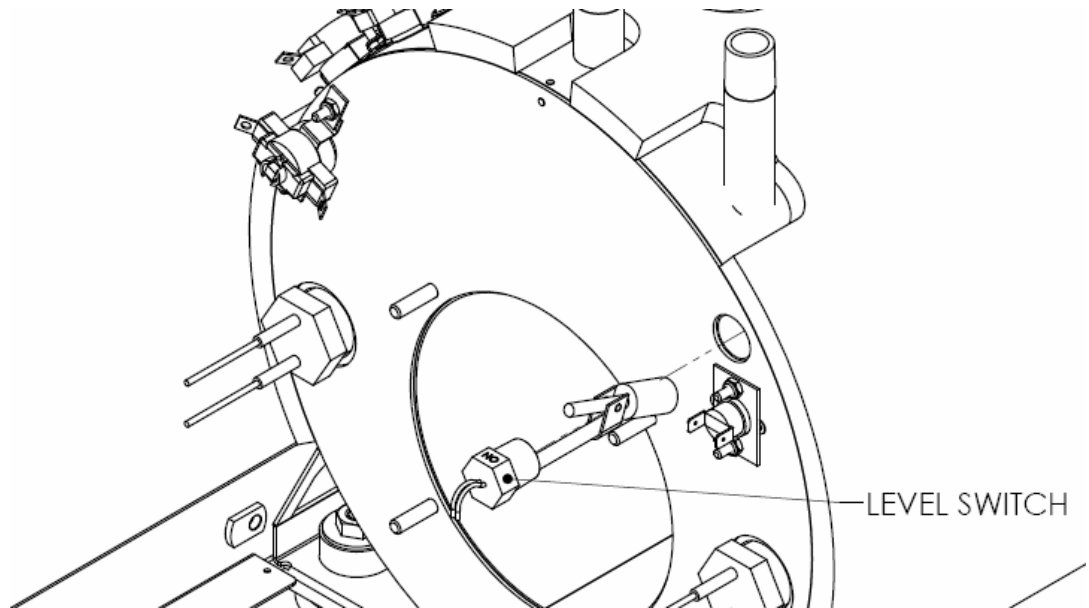


Figure 21: Level switch assembly

8. Place a small amount of thread sealer on the threads of the new level switch and screw it (clockwise) into the tank. Once the level switch is in place, ensure the "NO" engraved on the switch is flat and visible when looking at the level switch from the top.
9. Connect the level switch wires to the main harness ensuring both sides of the connectors have matching GREEN heat shrink.

10. Fill up the tank with a 50/50 mixture of propylene glycol and water. Ensure that the tank is filled up to the filler neck.
11. Place the expansion cap back on the filler neck.
12. Connect the inlet hose to the inlet of the Oasis Heating Module and unclamp the inlet and outlet hoses so fluid can flow through.
13. Clean up any coolant that was spilt.
14. Connect the main 12VDC power to the Oasis Heating Module.
15. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.12 Primary Electric Heating Element

The tank must be drained before the electric heating element is installed. To drain the tank and install the primary electric heating element, do the following:

1. **IMPORTANT:** Ensure both AC element breakers are in the OFF position and that all incoming AC power is turned OFF before proceeding with the next step. Failure to do so can result in **SERIOUS INJURY** or **DEATH**.
2. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.
3. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON.
4. Clamp the inlet and outlet hose so no fluid can flow through them.
5. Open the radiator cap on the filler neck of the Oasis Heating Module.
6. Disconnect the inlet hose and connect a pump to the inlet tube on the Oasis Heating Module.
7. Use the pump to drain the coolant. Drain approximately 6 gallons out of the tank (the tank does not need to be fully drained).
8. Once the tank has been drained, disconnect the yellow connector with the matching BLACK heat shrink and unplug the connector going from the primary AC heating element to the primary AC relay (see Figure 23).

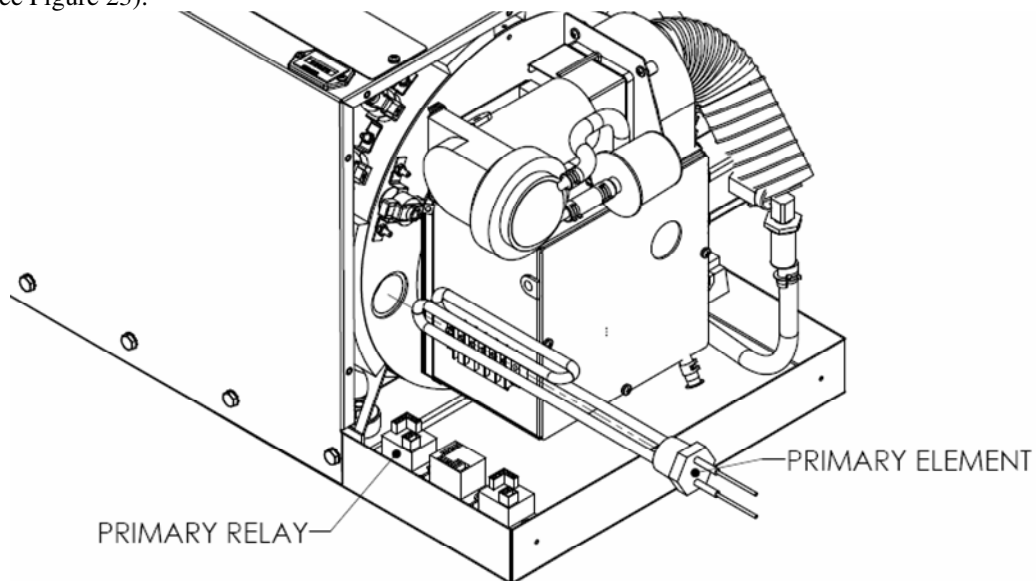


Figure 22: Primary element location

9. Unscrew the primary (left) AC heating element from the tank (counter-clockwise) using a 13/8" wrench.
10. Place thread sealer on the threads of the new AC heating element and screw it (clockwise) into the tank.
11. Connect the yellow connector on the new AC heating element to the yellow connector with BLACK heat shrink. Plug the other wire on the AC heating element to the primary AC relay.
12. Fill up the tank with a 50/50 mixture of propylene glycol and water. Ensure that the tank is filled up to the filler neck.
13. Place the expansion cap back on the filler neck.
14. Connect the inlet hose to the inlet of the Oasis Heating Module and unclamp the inlet and outlet hoses so fluid can flow through.
15. Clean up any coolant that was spilt.
16. Connect the main 12VDC power to the Oasis Heating Module.
17. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.13 Secondary Electric Heating Element

The tank must be drained before the electric heating element is installed. To drain the tank and install the secondary electric heating element, do the following:

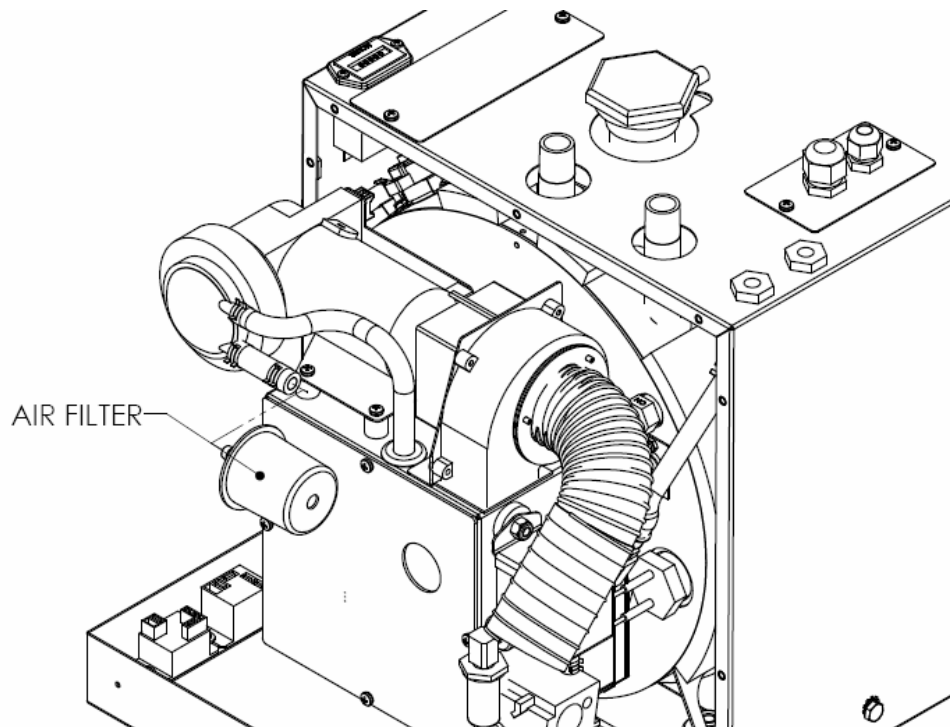
1. **IMPORTANT:** Ensure both AC element breakers are in the OFF position and that all incoming AC power is turned OFF before proceeding with the next step. Failure to do so can result in **SERIOUS INJURY** or **DEATH**.
2. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed. Once the front panel is folded down, loosen but do not remove the screws from the outer cover (screws are located on the inside of the cover). Lift up the outer cover to gain easy access to the components.
3. **IMPORTANT:** Disconnect the main power (12VDC) from the Oasis Heating Module. Disconnecting the 12VDC power ensures that the heater will not attempt to fire if the power button is accidentally turned ON.
4. Clamp the inlet and outlet hose so no fluid can flow through them.
5. Open the radiator cap on the filler neck of the Oasis Heating Module.
6. Disconnect the inlet hose and connect a pump to the inlet tube on the Oasis Heating Module.
7. Use the pump to drain the coolant. Drain approximately 6 gallons out of the tank (the tank does not need to be fully drained).
8. Once the tank has been drained, disconnect the yellow connector with the matching YELLOW heat shrink and unplug the connector going from the secondary AC heating element to the secondary AC relay (see Figure 5).
9. Cut the tie wrap that attaches the combustion fan air intake hose to the fuel pump.
10. Before proceeding with the next step, ensure that the fuel supply to the heater is shut off.
11. Disconnect the fuel line (using a pair of pliers on the hose clamps) from the inlet of the fuel regulator and from the outlet of fuel pump to the fuel return.
12. Remove the 2 nuts from the fuel pump (using a 7/16" socket) and move it out of the way of the secondary AC heating element.
13. Unscrew the secondary (right) AC heating element from the tank (counter-clockwise) using a 13/8" wrench.
14. Place thread sealer on the threads of the new AC heating element and screw it (clockwise) into the tank.
15. Connect the yellow connector on the new AC heating element to the yellow connector with the YELLOW heat shrink. Plug the other wire on the AC heating element to the secondary AC relay.
16. Attach the fuel pump to the burner box using the two nuts.

17. Connect the fuel line from the outlet of the fuel pump to the inlet of the fuel regulator and connect the fuel line from the fuel return to the outlet of the fuel pump. Ensure both fuel lines are secured with the hose clamps.
18. Secure the air intake hose from the combustion fan to the fuel pump using a tie wrap.
19. Open the fuel supply to the heater.
20. Fill up the tank with a 50/50 mixture of propylene glycol and water. Ensure that the tank is filled up to the filler neck.
21. Place the expansion cap back on the filler neck.
22. Connect the inlet hose to the inlet of the Oasis Heating Module and unclamp the inlet and outlet hoses so fluid can flow through.
23. Clean up any fuel or coolant that was spilt.
24. Connect the main 12VDC power to the Oasis Heating Module.
25. Put the outer cover back in place (tighten screws) and screw in the front cover.

### 4.3.14 Air Filter

To install the air filter of the air compressor do the following:

1. Turn off the power button (front panel of Oasis Heating Module) and allow the heater to completely power down (this will take 2 minutes). Remove the screws on the front panel of the Oasis Heating Module and fold down the front panel (do not disconnect the plug on the front panel). **IMPORTANT:** when folding down the front panel, place spacers underneath the panel which will prevent the buttons from being pressed.



**Figure 23: Air filter assembly**

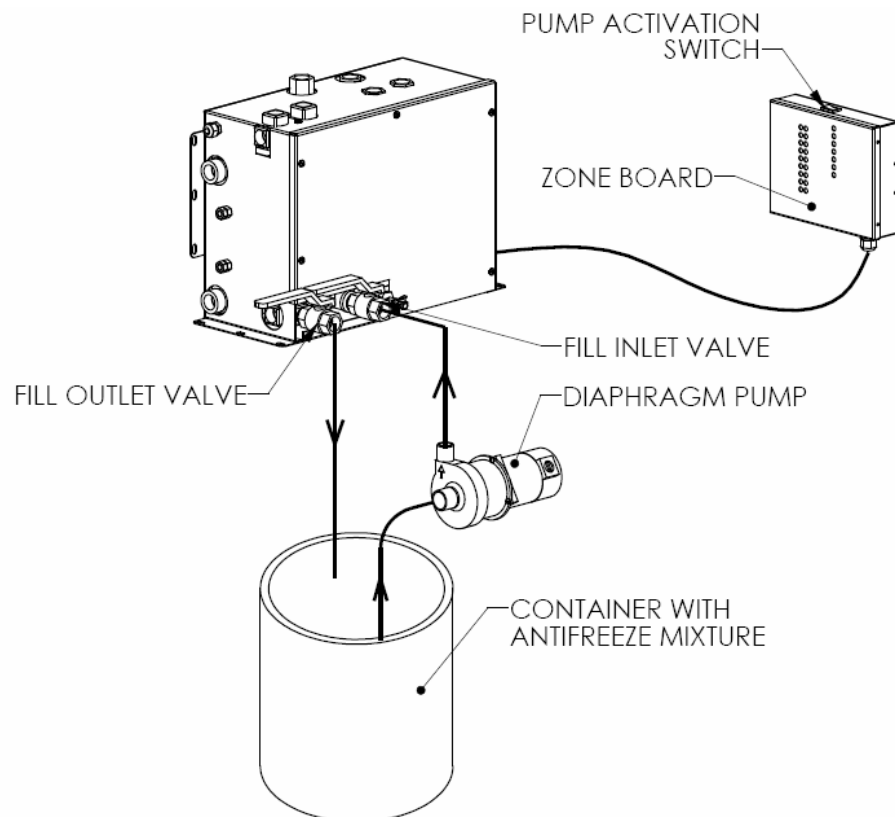
2. Remove the air filter (see Figure 24) from the hose that is connected to the air inlet of the air compressor (using a pair of pliers on the hose clamps).
3. Attach the new air filter to the hose that is connected to the air inlet of the air compressor.
4. Screw in the front cover.

### 5.0 Servicing the Oasis Distribution Module

#### 5.1 Filling the Coolant System

The Distribution module contains two valves with ½"NPT connections to be used for filling the heating loop. To initially fill up and bleed the air out of the system, do the following:

1. Connect a hose to the outlet of a diaphragm pump and to the "filling inlet" valve on the distribution module. Attach a hose to the inlet of a diaphragm pump and place the hose in a container filled with a 50/50 mixture of propylene glycol and water. (see Figure 24).
2. Connect a hose to the "filling outlet" valve on the distribution module and place the other end of the hose in the same container.
3. Open both valves on the Distribution module.



**Figure 24: Initial fill up Oasis system**

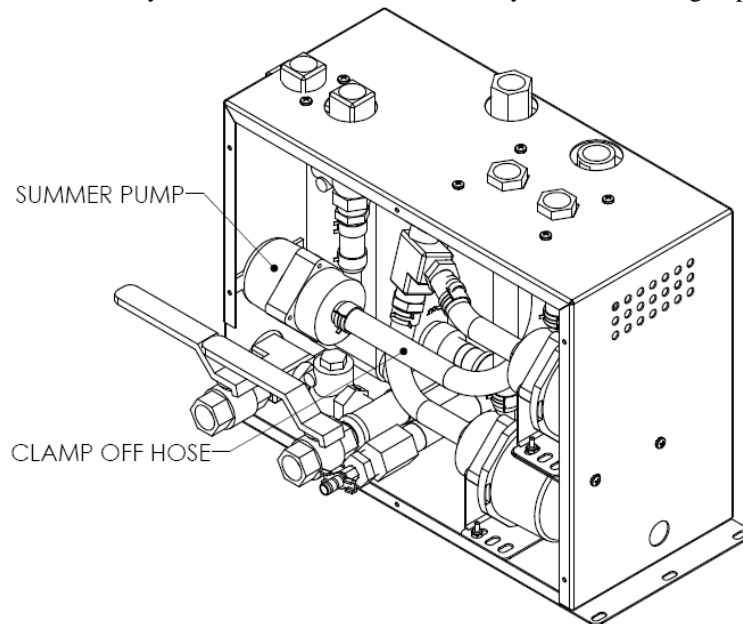
4. Turn ON the diaphragm pump. This will prime the pumps in the Oasis Distribution Module. It may be necessary to fill up the container with more coolant as the air is being bleed from the system.
5. Turn on the pump activation switch, located on top of the zone box, this will activate the pumps inside the distribution module and fill up both heating loops.
6. Once the coolant in the container remains at the same level and there appears to be no air in the return stream from the filling outlet hose, close the valves on the distribution module and stop the diaphragm pump.
7. Turn off the pump activation switch.
8. The Oasis heating system is ready to be operated.

### 5.2 Part Replacements

#### 5.2.1 Summer pump

To replace the summer pump, do the following:

1. Before proceeding with the next step, disconnect the Oasis Distribution Module from the harness that goes to the distribution module zone board. This ensures the pumps do not run while being serviced.
2. Open the front cover by loosening the 6 Phillips head screws.
3. Locate the summer pump as shown in Figure 25
4. Clamp the hose that is connected to the summer pump inlet so that no coolant can flow through it.
5. The outlet hose is closed by the built in check valve, that only allows flow to go up.



**Figure 25: Summer Pump replacement**

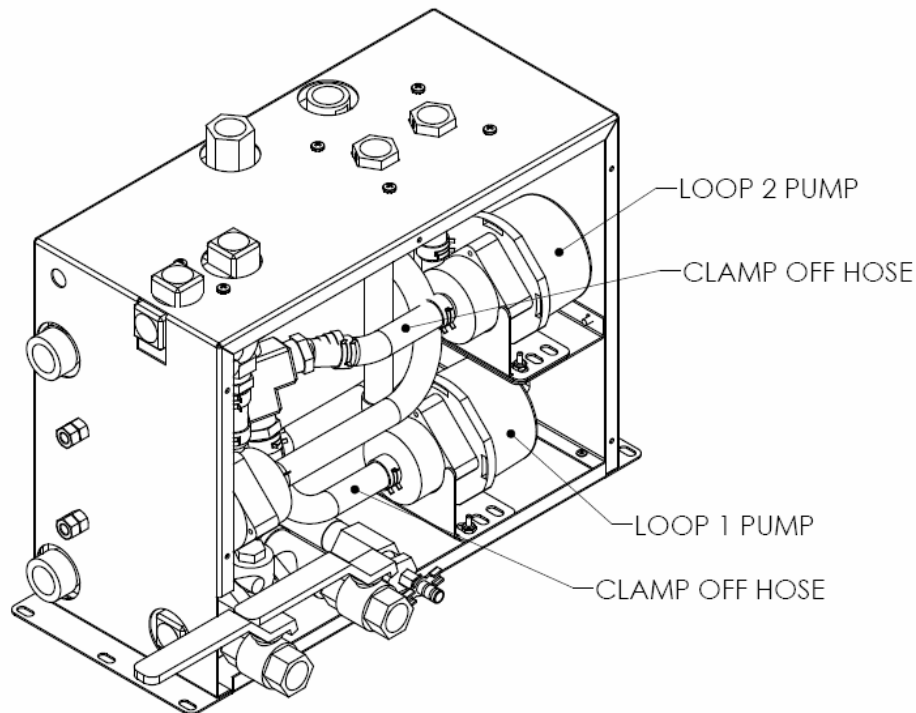
6. Remove the Spade connectors on the pump.
7. Move the hose clamps on the inlet and outlet of the pump to the other side.
8. Wiggle the pump until the hoses come off.
9. Install a new pump and reconnect the hoses.
10. Reconnect the spade connectors.
11. Remove the clamp from the summer pump inlet hose to allow coolant to flow through it.
12. Connect the Oasis Distribution Module to the harness that goes to the distribution module zone board.
13. If air was introduced into the system, it may be necessary to purge the system again. Run the Oasis heating module and see if heat is distributed throughout the system. If heat does not get distributed throughout the system, purge the system (see section 5.1)



### 5.2.2 Loop 1 and Loop 2 pumps

To replace the Loop 1 pump, do the following:

1. Before proceeding with the next step, disconnect the Oasis Distribution Module from the harness that goes to the distribution module zone board. This ensures the pumps do not run while being serviced.
2. Open the front cover by loosening the 6 Phillips head screws.
3. Clamp the hose that is connected to the Loop 1 pump inlet so that no coolant can flow through it.
4. The outlet hose is closed by the built in check valve, that only allows flow to go up.
5. Move the hose clamps on the inlet and outlet of the pump to the other side.
6. Remove the Spade connectors to the pump.
7. There is one nylock nut that is holding the pump in place. Remove this nut and carefully move the pump out of its place.
8. Wiggle the pump until the hoses come off.
9. Insert a new pump, tighten the nut and reconnect the hoses.
10. Reconnect the spade connectors.
11. Remove both clamps from the hoses to allow coolant to flow through them.
12. Connect the Oasis Distribution Module to the harness that goes to the distribution module zone board.
13. If air was introduced into the system, it may be necessary to purge the system again. Run the Oasis heating module and see if heat is distributed throughout the system. If heat does not get distributed throughout the system, purge the system (see section 5.1)



**Figure 26: Loop 1&2 pump replacement**

To replace the Loop 2 pump, do the following:

1. Before proceeding with the next step, disconnect the Oasis Distribution Module from the harness that goes to the distribution module zone board. This ensures the pumps do not run while being serviced.
2. Open the front cover by loosening the 6 Phillips head screws.
3. Clamp the hose that is connected to the Loop 2 pump inlet so that no coolant can flow through it.
4. The outlet hose is closed by the built in check valve, that only allows flow to go up.

5. Move the hose clamps on the inlet and outlet of the pump to the other side.
6. Remove the Spade connectors to the pump.
7. There are two Phillips head screws located on the side that is holding the pump bracket in place. Remove these screws and carefully move the pump bracket out of its place.
8. The pump is attached to the bracket with 2 nylock nuts. Remove these nuts and insert a new pump.
9. Tighten the new pump with 2 nylock nuts.
10. Insert the new pump inside the case, tighten the screws and reconnect the hoses.
11. Reconnect the spade connectors.
12. Remove the hose clamp from the hose to allow coolant to flow through it.
13. Connect the Oasis Distribution Module to the harness that goes to the distribution module zone board.
14. If air was introduced into the system, it may be necessary to purge the system again. Run the Oasis heating module and see if heat is distributed throughout the system. If heat does not get distributed throughout the system, purge the system (see section 5.1)