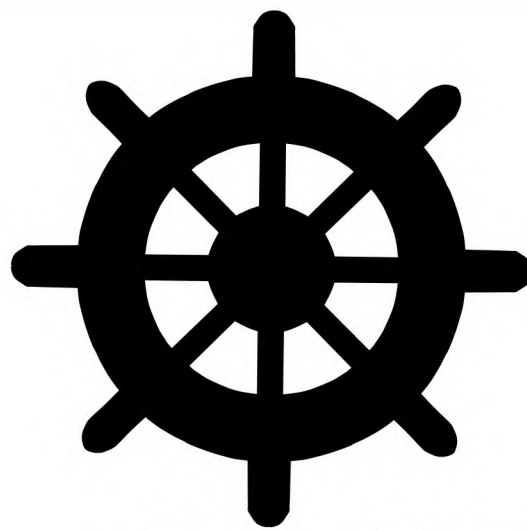


# MARINAIRE COMPLETE ERROR CODE TROUBLESHOOTING MANUAL

PAGES 2-7.....	CONTROL PANEL TROUBLESHOOTING MANUAL
PAGES 8-11.....	E1 /E9 ERROR TROUBLESHOOTING MANUAL
PAGES 12-13.....	E3/E6/E9 ERROR TROUBLESHOOTING MANUAL
PAGES 14-24.....	E4 ON COOLING TROUBLESHOOTING MANUAL
PAGES 25-32.....	E4 ON HEATING TROUBLESHOOTING MANUAL



# **MarinAire<sup>®</sup>**

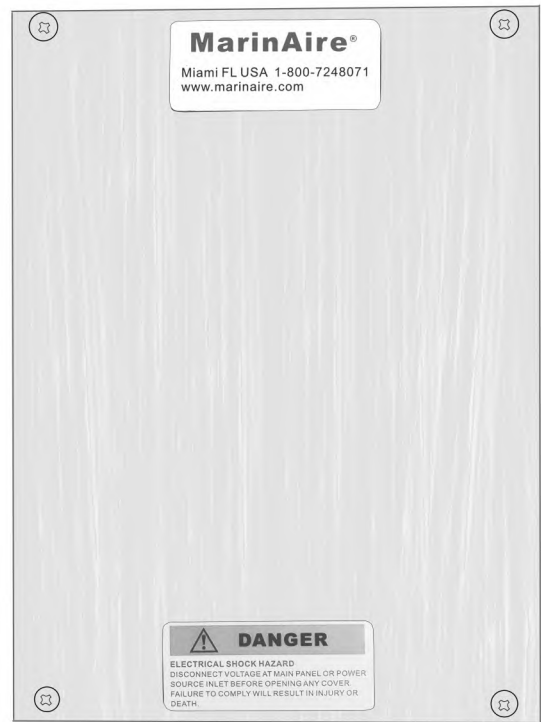
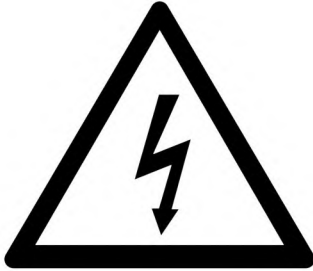
## **Control Panel Troubleshooting Manual**

This manual is intended for professional use only.  
Read this manual thoroughly.  
Always practice electrical safety.  
Always turn off power at the breaker before servicing.

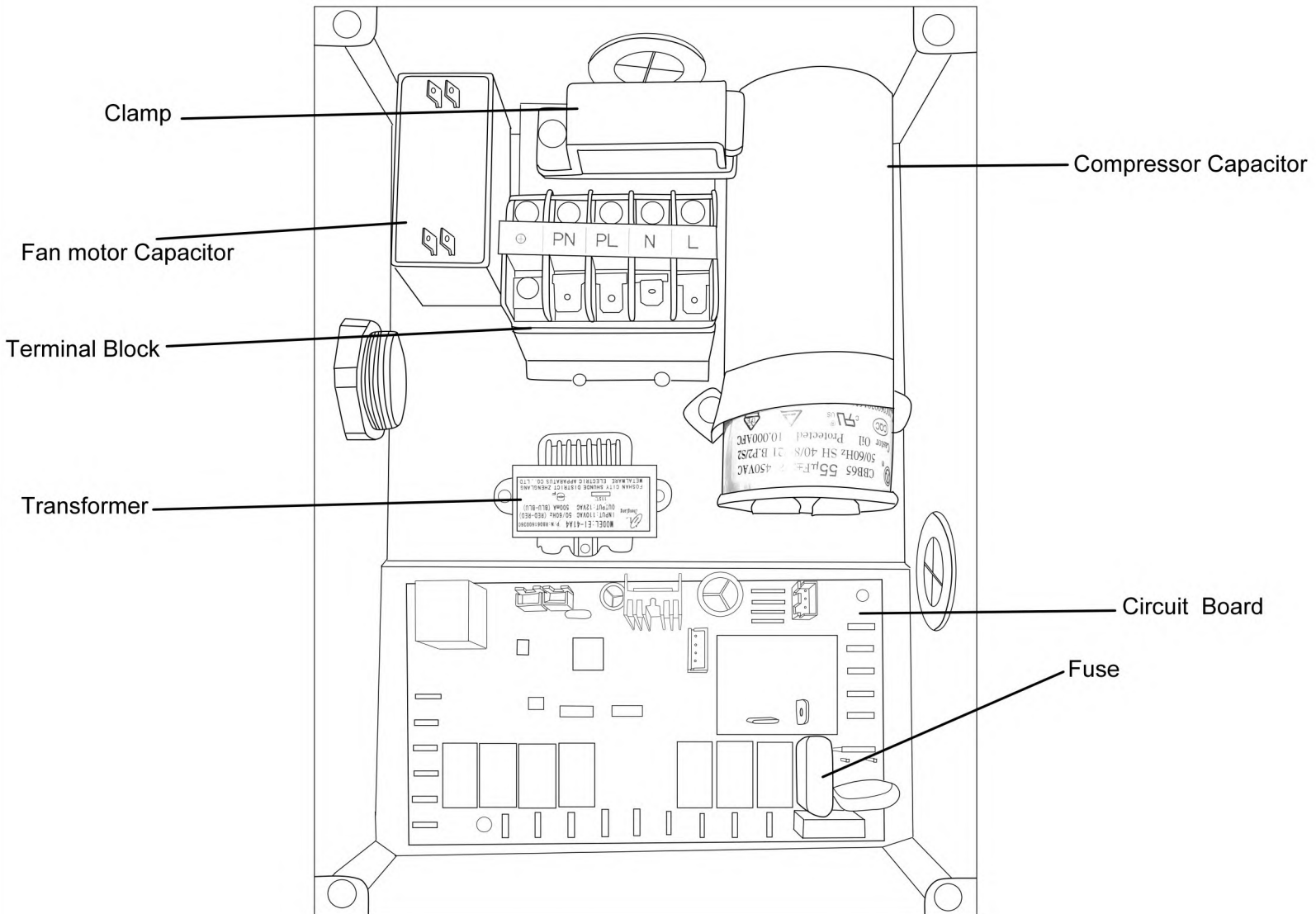
# STEP 1

Turn off the power at the breaker.

Locate the silver electric box, and unfasten the 4 screws to remove the lid.



## Electric Box Diagram



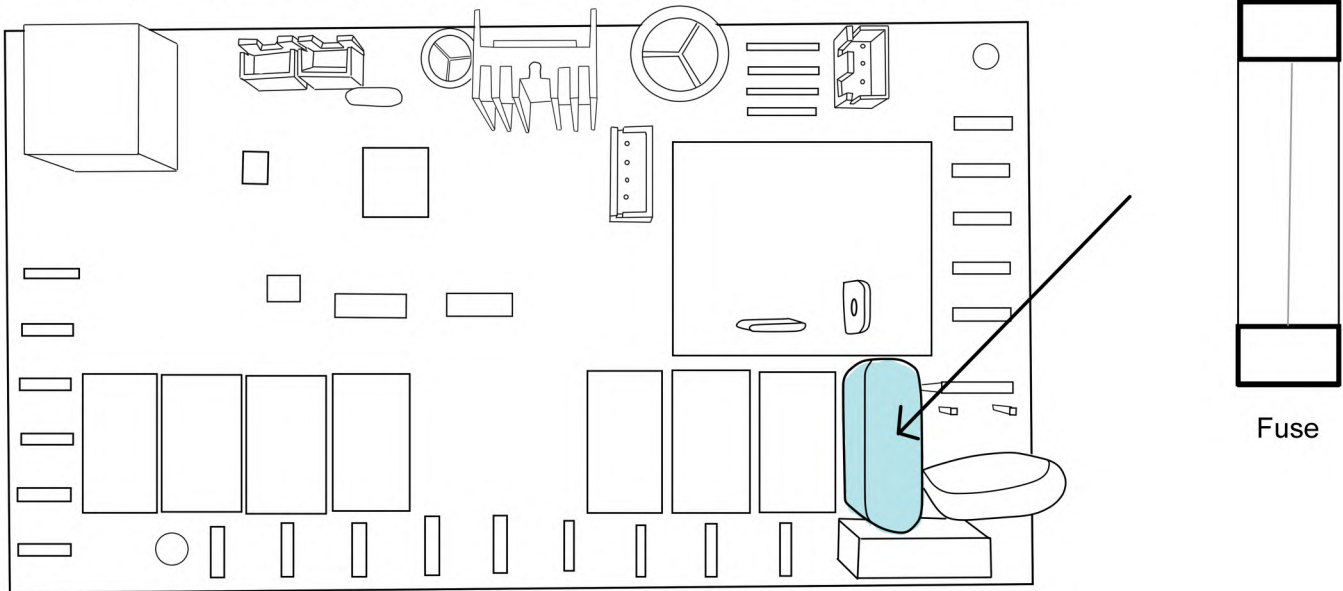
## STEP 2

Locate the blue plastic fuse cover on the circuit board.

Gently remove the fuse cover.

The fuse will be underneath it.

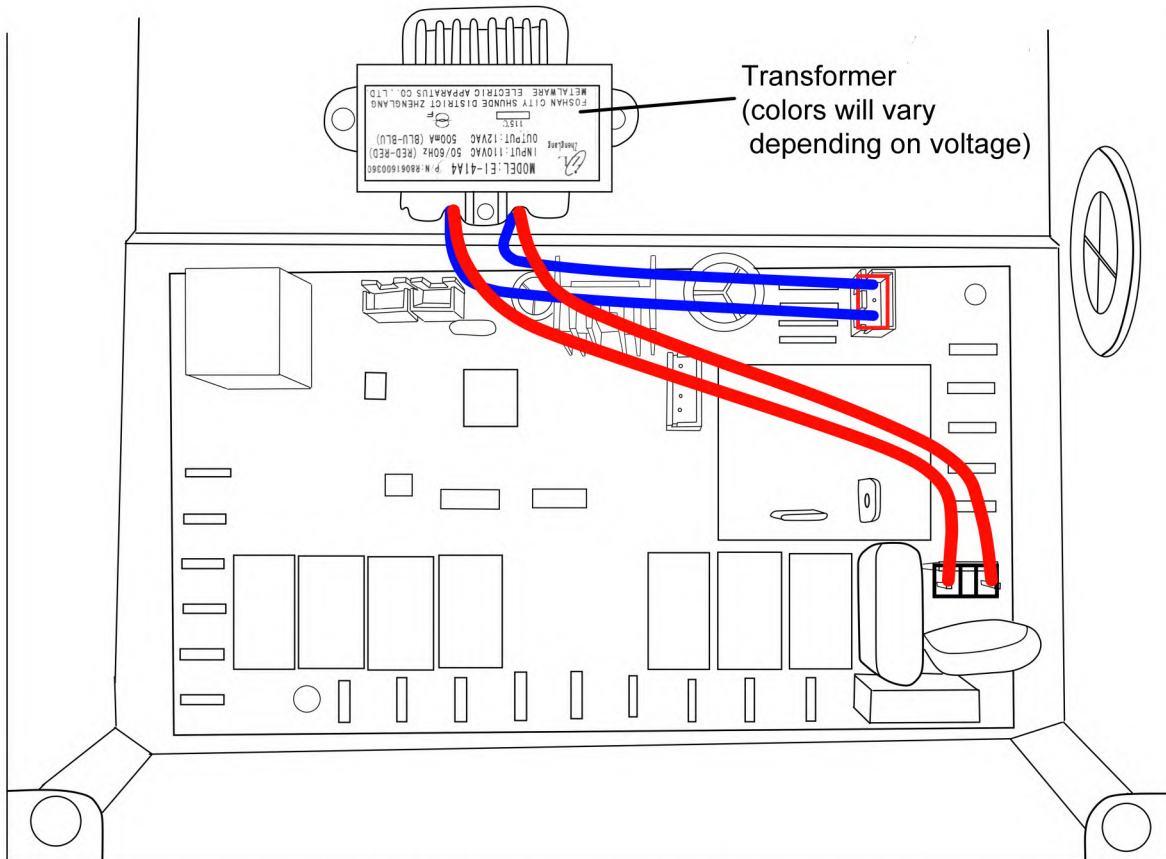
If damaged, you may replace it with a 5 AMP 5x20 mm fuse.



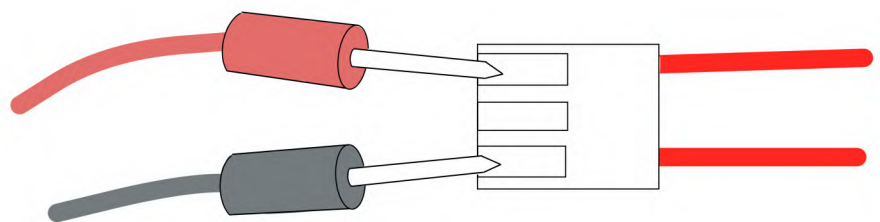
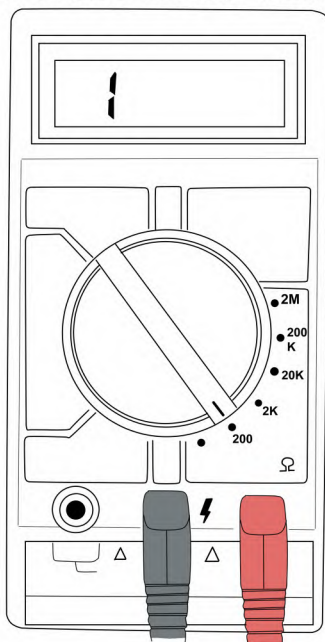
If the fuse is good, or continuously burns out after replacement, proceed to Step 3.

## STEP 3

Locate the transformer in the middle of the electric panel. Unplug both cables.



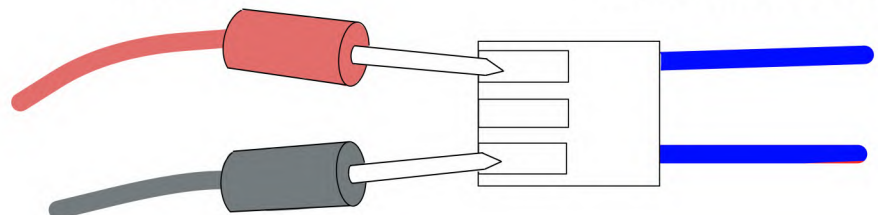
Using a multimeter set to Ohms, measure the continuity between the two pins in each cable. If there is no continuity, please contact customer support to purchase a new transformer. Have your Model/Serial number handy.



Checking for continuity between the two pins

Multimeter

Transformer Cables

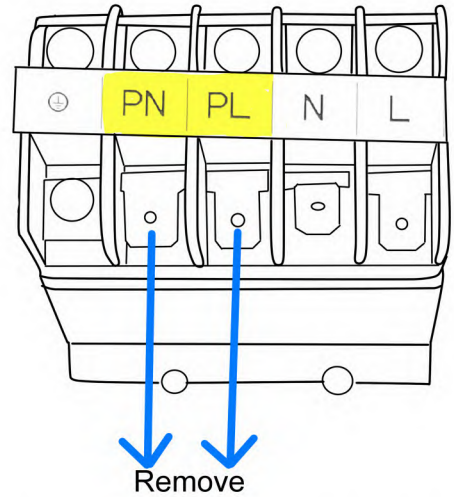


If the transformer has continuity, and the fuse keeps blowing proceed to Step 4. If the transformer has continuity and the fuse is good, please contact customer support to purchase advised parts.

## STEP 4

Locate the terminal block in the electric panel.

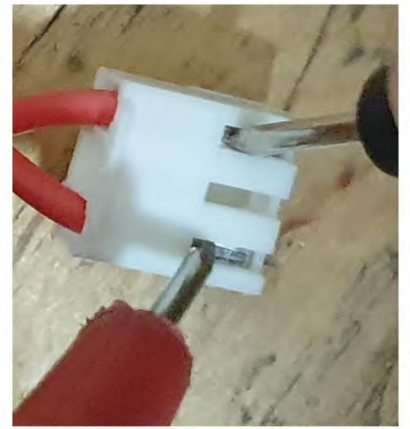
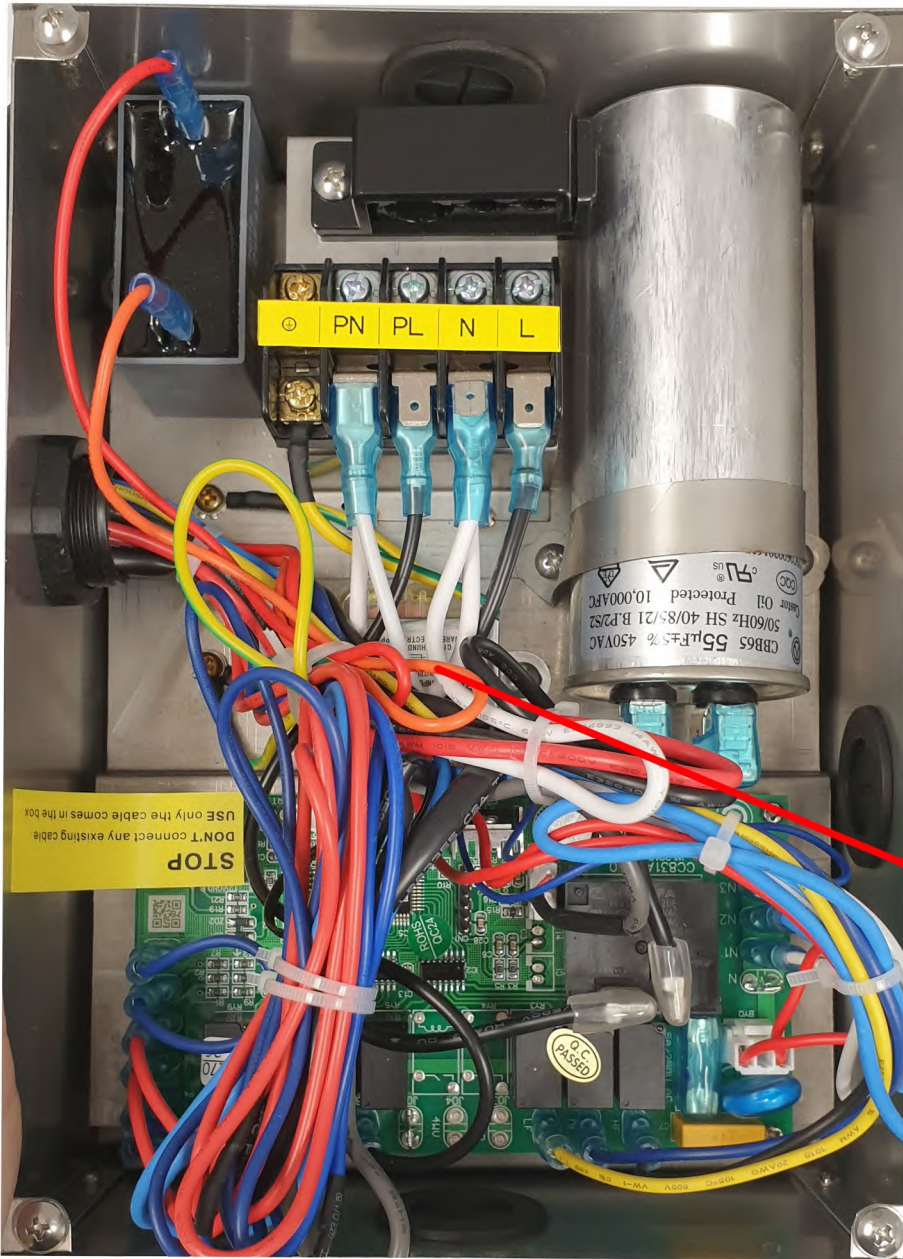
Disconnect the pump wires from PN and PL.  
Replace the blown fuse, ensure the fuse is good.  
Turn on the breaker and let the unit run shortly.



If the fuse does not blow when the pump is disconnected, this indicates that there is an issue with the pump wiring or the pump.



# Reference Images

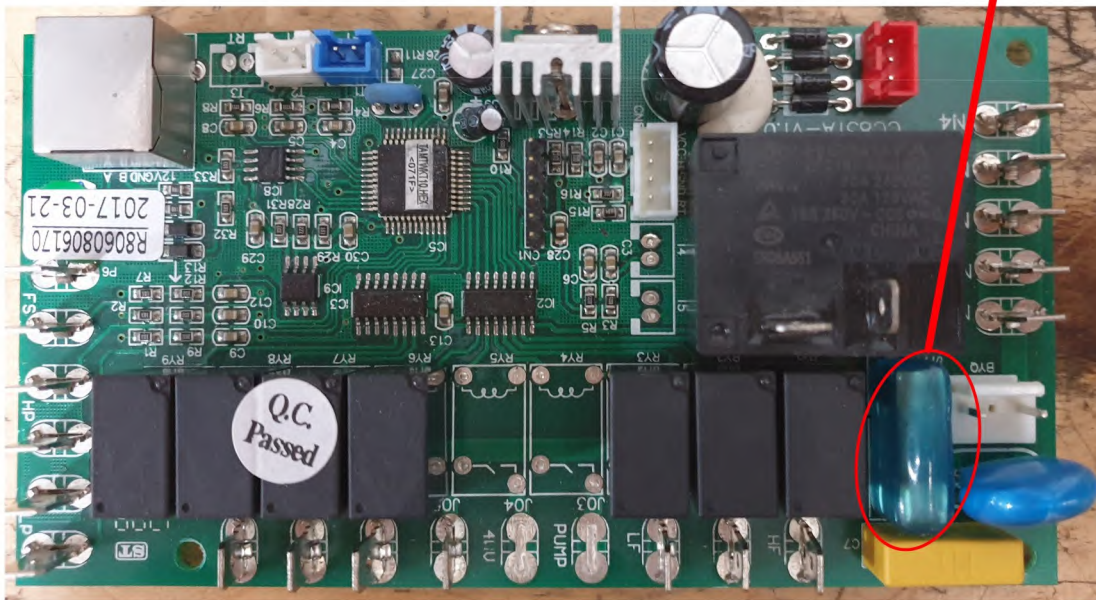


Checking for continuity

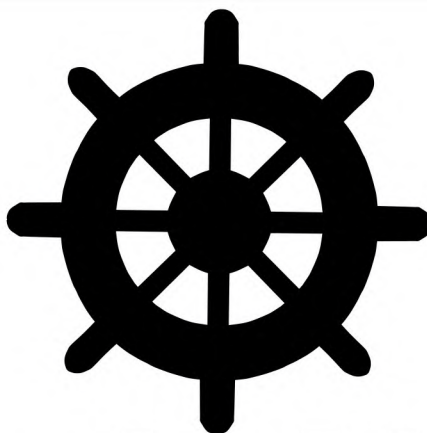


Transformer

Fuse Cover



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## **E1 / E9 Troubleshooting Manual**

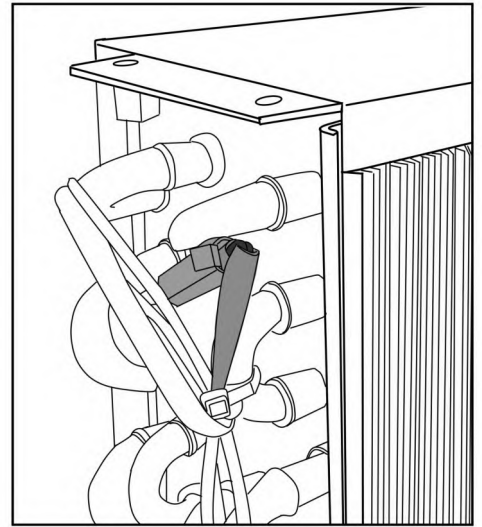
This manual is intended for professional use only by Certified Electricians.  
Read this manual thoroughly.  
Always practice electrical safety.  
Always turn off power at the breaker before servicing.



If your device displays **E1**, it means that the evaporator coil is getting too cold. Once the evaporator coils temperature gets below 30°F ( -1°C ), then the compressor will be turned off to prevent the coil from freezing. The unit will then display E1. This may happen on air conditioning mode or on dehumidifying mode and if the air flow is insufficient .

If your device displays **E9**, it means that the evaporator coil is getting too hot. Once the coils temperature gets above 145°F ( 62°C ), then, the compressor will be turned off to protect the unit. And, the unit will display E9. This may happen only on heating mode and once the air flow is insufficient.

MSBA units have a temperature sensor located on one of the evaporators copper tube. Please view the darker highlighted area on the illustration on the right to locate the temperature sensor. Note that the sound shield must be removed in order to view it.



## Checkpoint: Minimum Ducting Requirements

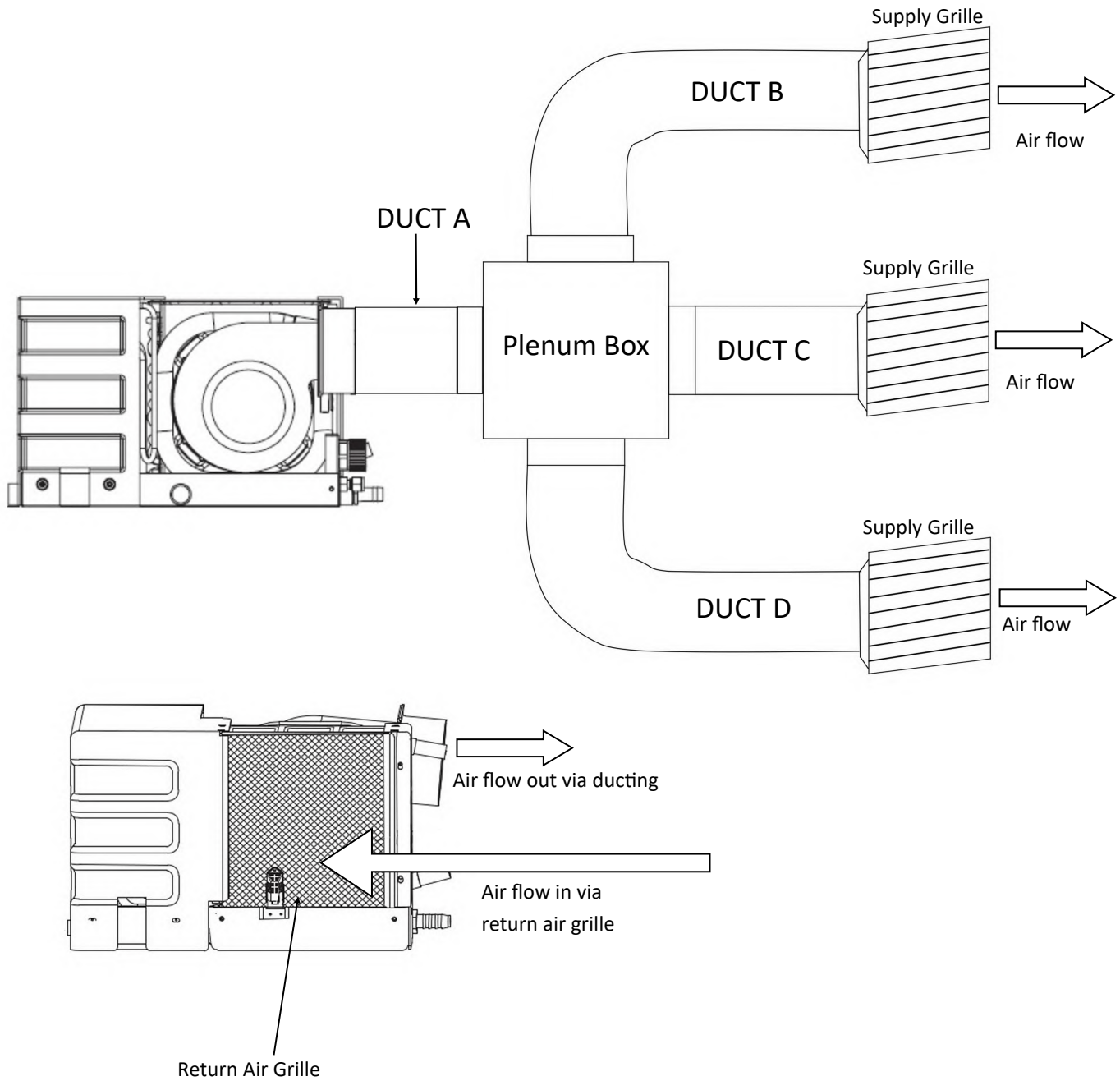
Please view the **Airflow Diagram** in the next page as a guideline for the chart provided below.

	<b>Return Grille</b>	<b>DUCT A</b> Max Length 2 ft	<b>DUCT B</b> Max Length 20 ft	<b>DUCT C</b> Max Length 20 ft	<b>DUCT D</b> Max Length 20 ft	<b>DUCT E</b> Max Length 20 ft
<b>MSBA6</b>	10X10	4"	4"	3" to 4"	OPTIONAL	OPTIONAL
<b>MSBA9</b>	12X12	6"	4"	4"	OPTIONAL	OPTIONAL
<b>MSBA11</b>	12X14	6"	6"	4"	OPTIONAL	OPTIONAL
<b>MSBA14</b>	14X14	6"	6"	6"	3" to 4"	OPTIONAL
<b>MSBA16</b>	14X14	6"	6"	6"	3" to 4"	OPTIONAL
<b>MSBA20</b>	16X16	7"	8"	6" to 8"	3" to 6"	OPTIONAL
<b>MSBA24</b>	16X16	7"	8"	6" to 8"	3" to 6"	OPTIONAL

Please make sure that all vents are open and that air is flowing freely in to the cabin. Check for leaks of air within the ducting and make sure that everything is secure. All vents and diffusers should be open and there should be no blockages to the return air grille. Also make sure that all air filters are clean including the one that comes with the unit. The return air grille should be positioned adjacent to that of the unit, not far above or below.

If you are skeptical of your ducting, an easy way to test it would be to remove the ducting from the blower and let the unit run freely and directly in to the cabin. Note that there should be no walls/covers/filters blocking the unit in from any side, as that could also result in poor air flow and would not be a good way to test your problem.

# Airflow Diagram



**Note:** Airflow restrictions is the only cause for E1 or E9 errors. Often times, users might initially suspect that their temperature sensor is faulty. This is not possible with E1 or E9.

If the temperature sensor has malfunctioned, then the thermostat would display an E3 error.

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( REMEDY FOR E3, E6 an E9 ERROR CODES)

Dear Customer,

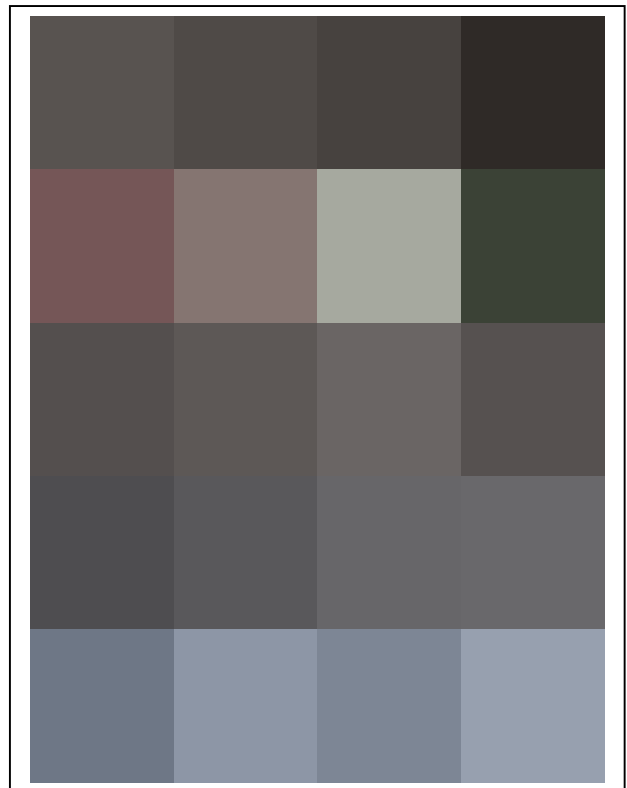
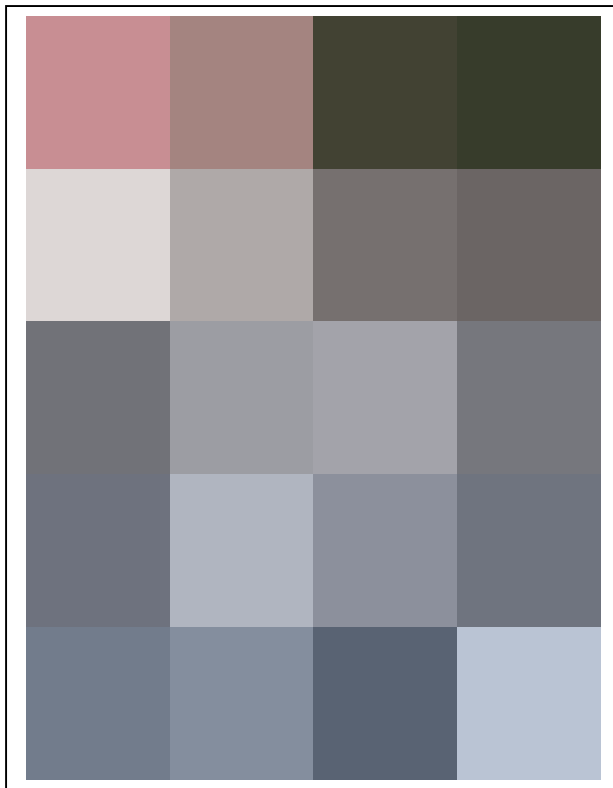
Enclosed, please find the Evaporator Coil sensor ( The one with Blue plug).

You may replace the original sensor with this one.

Or, there is an easier alternative location to install this new sensor. You can keep the original sensor in its place and unplug the blue plug from the circuit board..

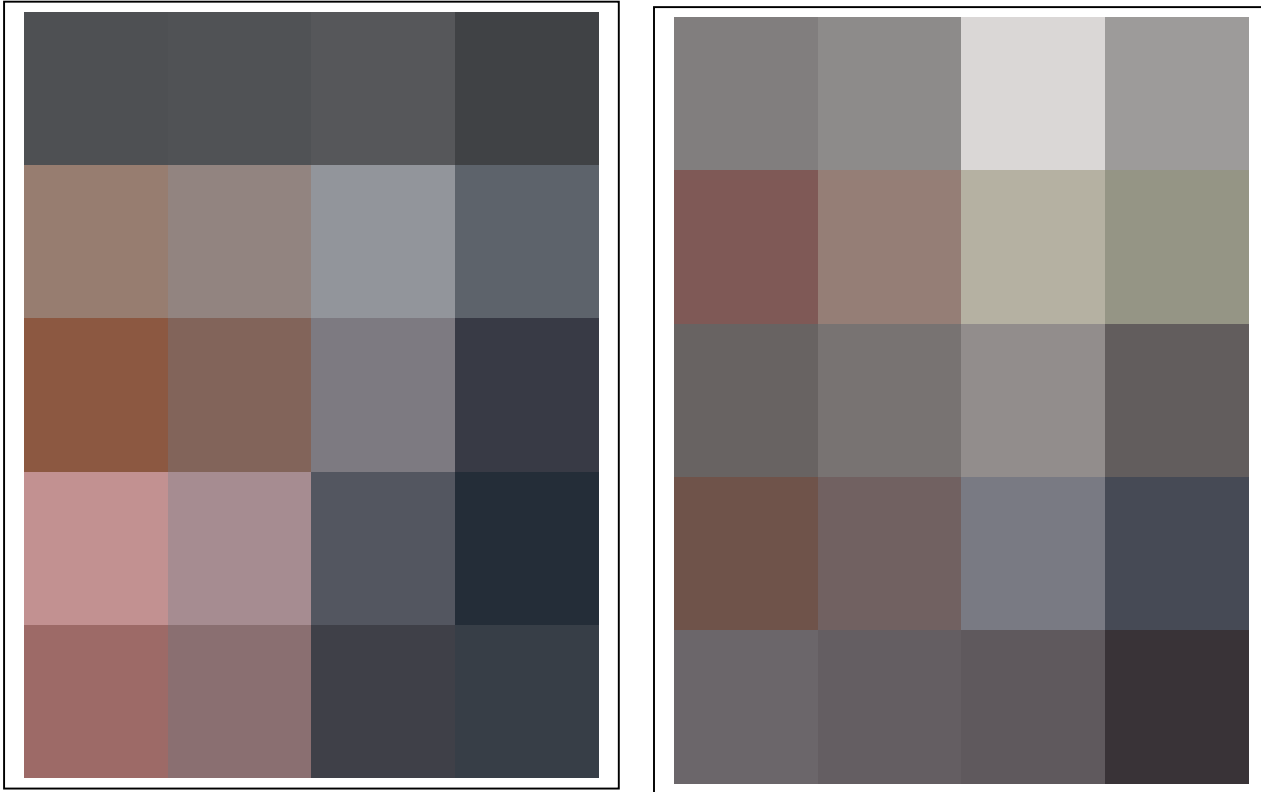
Then Install this sensor as shown in below images and plug the blue socket in the circuit board.

1) Remove the Cover

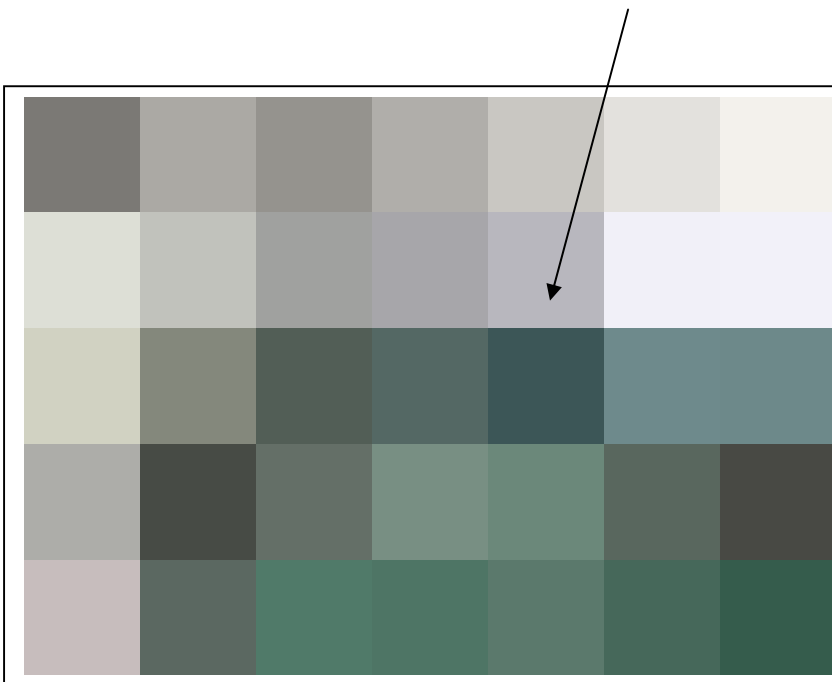


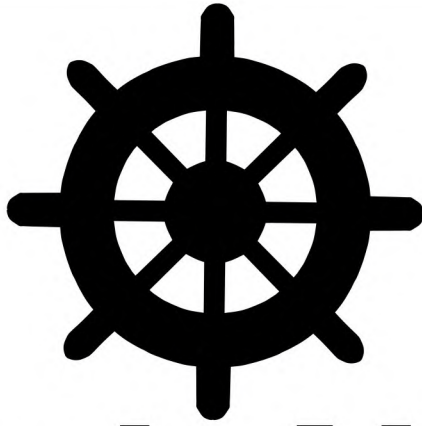


2) Install the sensor as shown. And assemble the cover again.



3) Unplug the existing blue socket and plug the new one





**MarinAire<sup>®</sup>**

## **E4 Error Code Troubleshooting Manual**

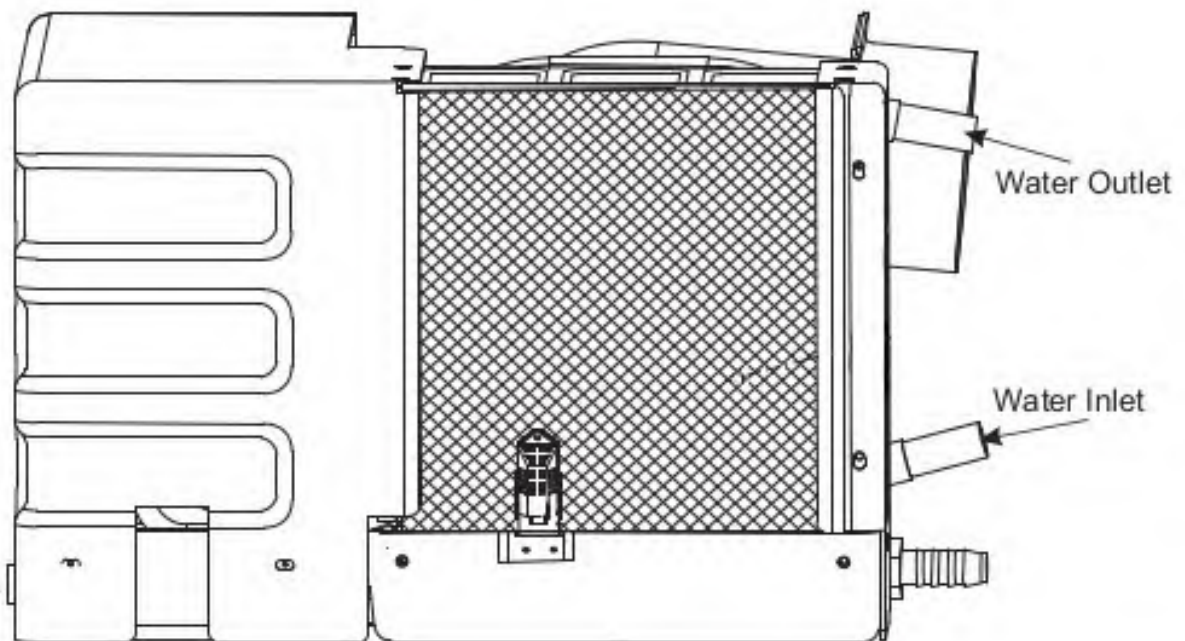
This manual is intended for professional use only by Certified Electricians.  
Read this manual thoroughly.  
Always practice electrical safety.  
Always turn off power at the breaker before servicing.

If your unit is displaying an E4 error code during **cooling** or **dehumidifying** mode, then the unit is experiencing a water flow issue. This manual will guide you through step-by-step procedures to diagnose the type of water flow issue you might be experiencing, and will also guide you on how to solve it.

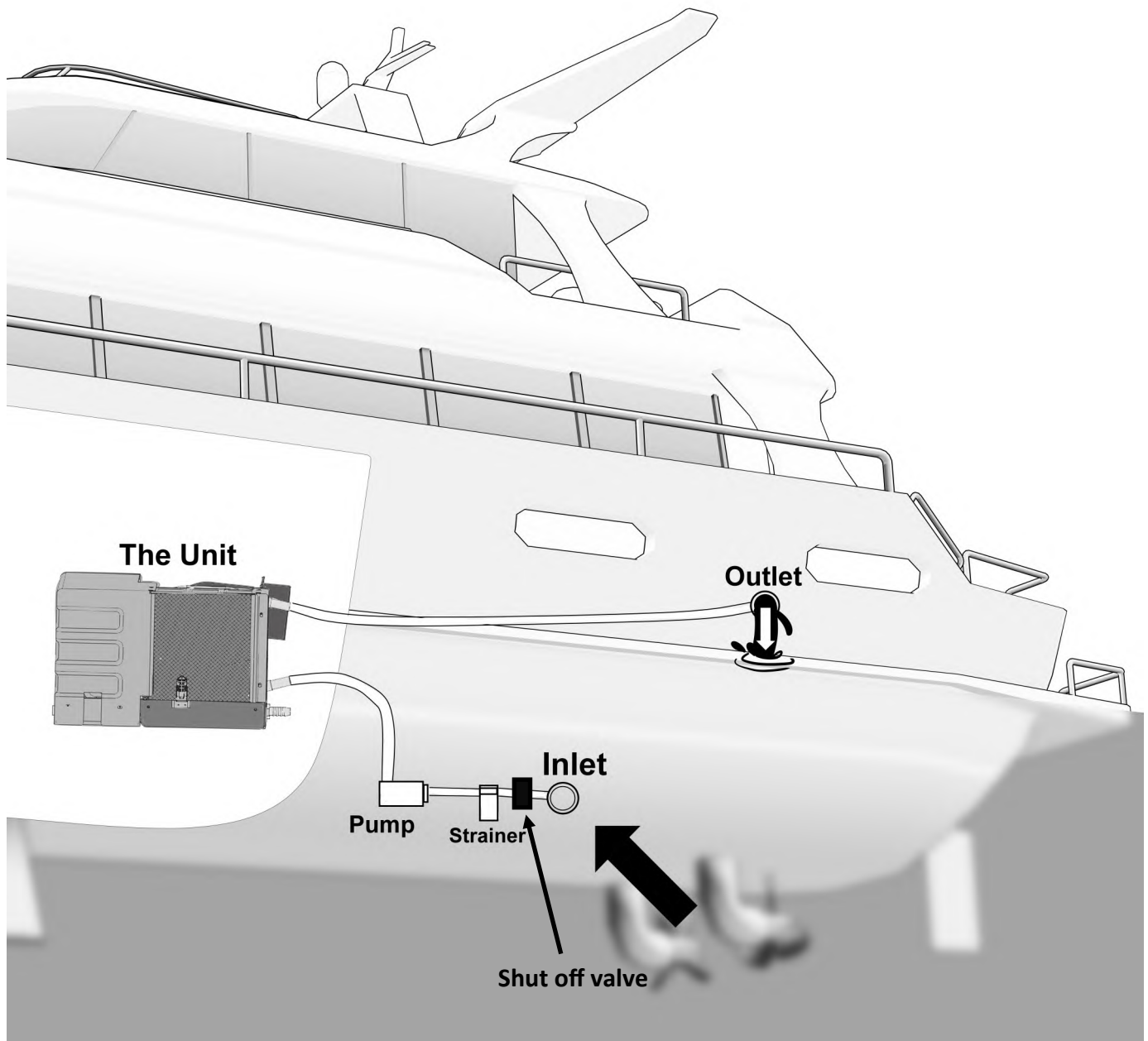
**NOTE:** When most customers call in for an E4 issue, they will visually diagnose their water flow by looking at the water flowing out of their outlet. Oftentimes a reduction in water flow is not visually significant enough to diagnose through sight or touch, it must ALWAYS be tested. Luckily, testing for water flow is easy!

Please read through this manual carefully, and conduct the tests in the order that they are given.

## Important Unit Anatomy for E4



# Important Plumbing Anatomy for E4



Most marine air conditioners have a plumbing set up similar to the illustration above. Please familiarize yourself with these components and locate them on your boat.



# CHECKPOINTS

Prior to testing for E4, we will conduct some preliminary tests for obvious problems.

First ensure that your pump is the correct GPH for your unit and that your pump is magnetic. Any type of pump other than a magnetically driven pump is not recommended. (ie. sprinkler pump, pool pump, cal, little giant.. Etc..)

Next, use the chart below to determine if your pump GPH is adequate for your unit. If you are running multiple units on a single pump, add the GPH per unit.

(for example: for two MSBA6K2's..... 300 GPH + 300 GPH =600 GPH pump minimum req.)

\*Note that this chart is only for units that are branded as MARINAIRE TECHNOLOGIES INC. If you have any other type of brand please consult with them to find out their minimum water flow requirements as they may be drastically different from the figures below.

## RECOMMENDED PUMP SIZES PER MODEL

MSBA6K/C2	300 GPH
MSBA9K/C2	300 GPH
MSBA11K/C2	500 GPH
MSBA14K/C2	500 GPH
MSBA16K/C2	500 GPH
MSBA20C2	1000 GPH
MSBA24C2	1000 GPH

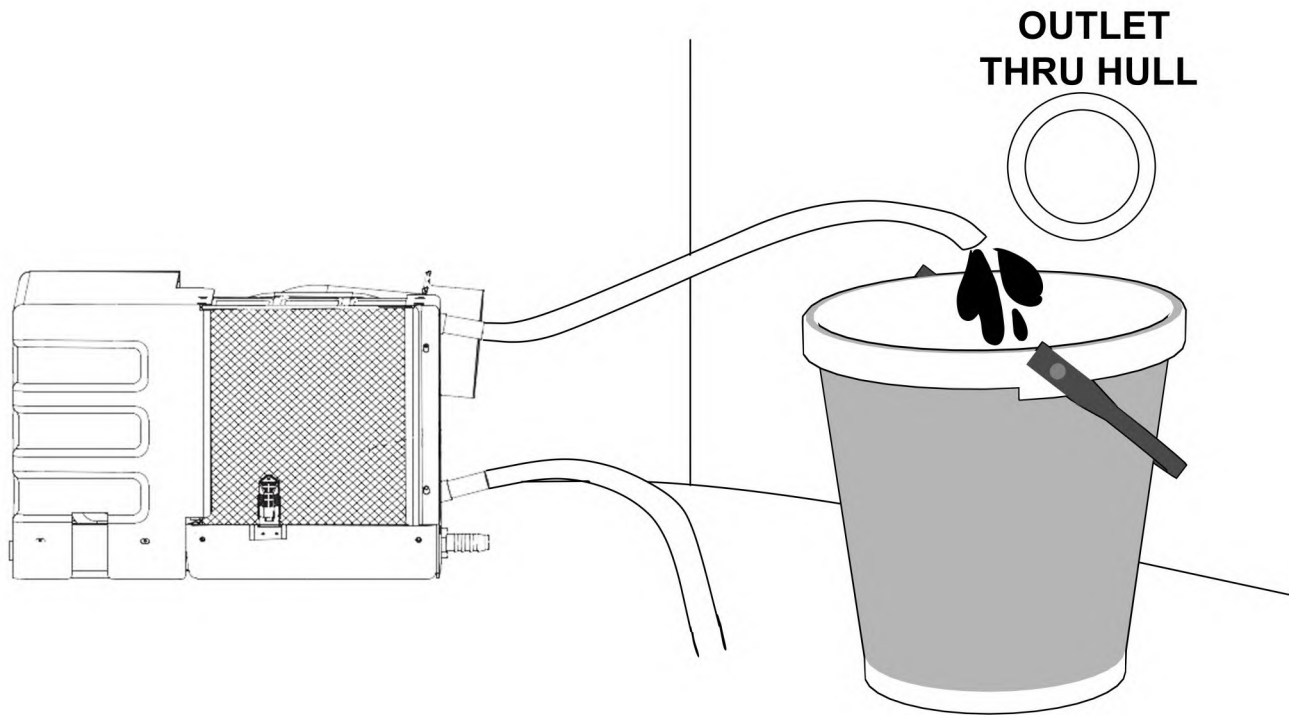
## RESETTING THE UNIT

First, turn the power off at the breaker. Once you ensure that the power is OFF, please go to your thermostat and press the POWER button two times. Make sure that the screen is completely blank. This should reset the unit. Turn the power back on at the breaker. In most cases, E4 should disappear (this has not solved your problem yet– E4 will return shortly!).

Please ensure that your strainer and filter are clean and that there is water coming from the outlet. If there is water coming out of the outlet please move on to TEST 1.

If you have absolutely no water, move on to TEST 2 or check/replace your pump.

# Test 1: The Bucket Test



The bucket test will measure the GPH output of your water. Please unhook the hose from the outlet of the unit as depicted above and position it inside a 5 gallon bucket. The inlet side of the hose should be left as is, with the strainer, pump, etc, attached. You will measure how many seconds it takes to fill the bucket according to the BTU of your unit. Please check the chart below:

6000 BTU	Must be filled within 120 sec
9000 BTU	Must be filled within 100 sec
11000 BTU	Must be filled within 75 sec
14000 BTU	Must be filled within 65 sec
16000 BTU	Must be filled within 55 sec
20000 BTU	Must be filled within 40 sec
24000 BTU	Must be filled within 35 sec

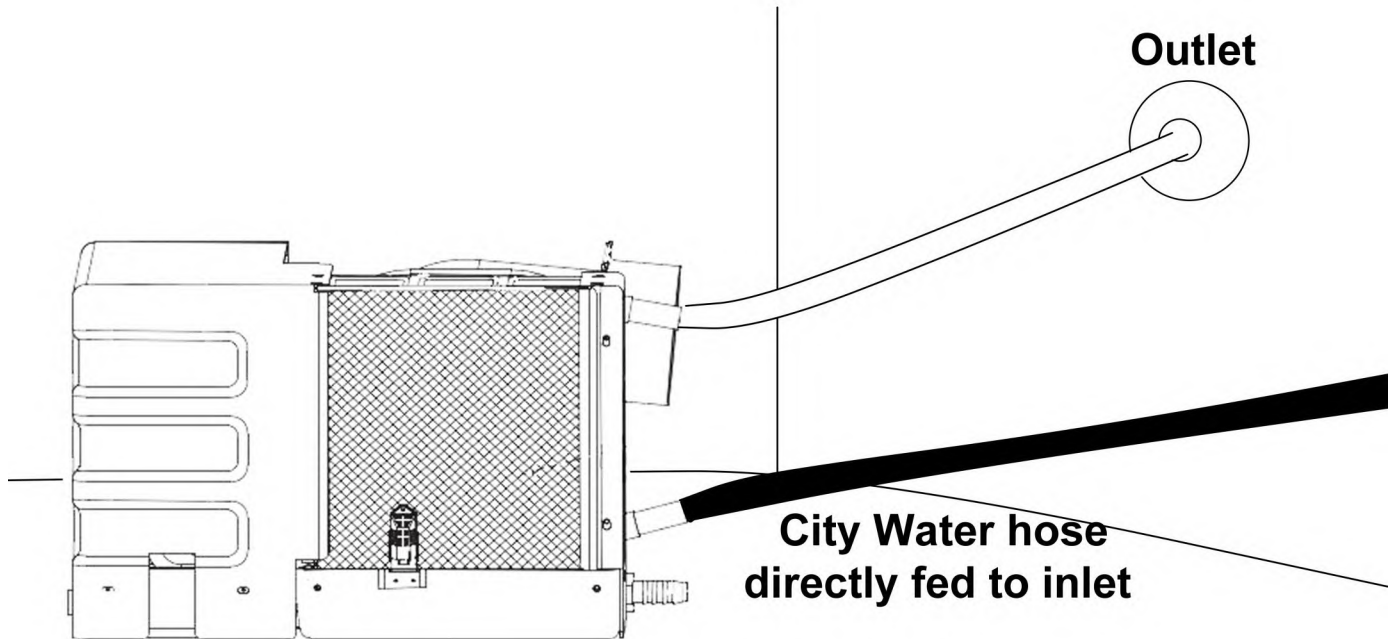
If you are not getting the water flow rates as listed in the table, then there could be a few issues causing this to happen:

The most common reason for an E4 error is a blockage in the hoses/lines. This blockage is usually made up of sand/seaweed/muscles and other water debris. Often times, boat owners must flush their lines with fresh water a couple of times before E4 is cleared. It is common for boat owners to repeat the flushing process or to replace the hoses completely. However, note that replacing the hoses does not flush out the unit.

Another culprit of low water flow could be due to improper plumbing installation or an improper pump. For example, very long hoses with too many turns and bends will require a higher GPH pump than recommended. The hose could also be kinked, etc. You must fix these issues until you get the flow rates at the table.

If your unit has adequate water flow according to the table above, then move to TEST 2.

## Test 2: Connecting to city water



Sometimes a water flow issue might be more complicated. In this case, please connect city water **DIRECTLY** to the inlet of the unit as illustrated above.

Once you connect the unit to city water, let it run for about one hour and periodically check to see if you get an E4 error. Have the unit on cooling mode only. Do not set it to auto mode as the unit may switch to heating.

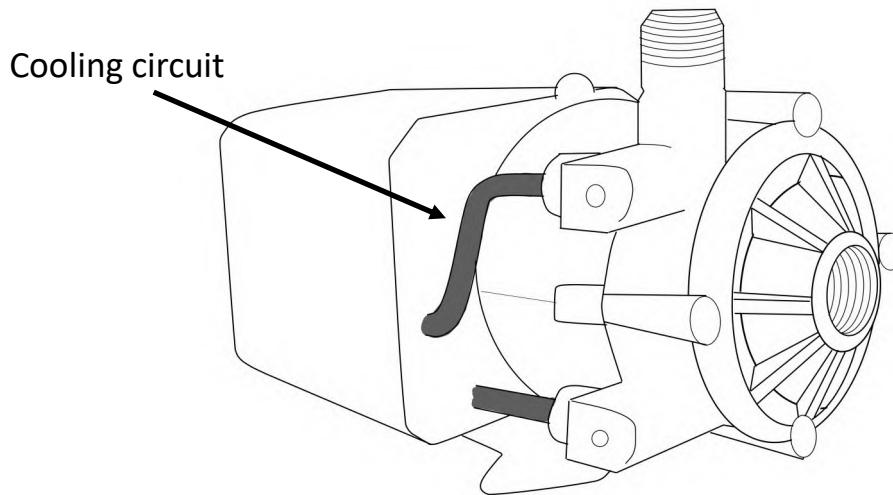
If E4 has disappeared while connected to city water, this indicates that there is no problem with the unit.

If you are sure the unit has been flushed and that you have the correct GPH of pump, another possibility is a faulty pump phenomenon that we refer to as “intermittent stopping”. Please refer to Test 3 to check for intermittent stopping.

If you get an E4 error while connected to city water **AND** when you have reset your unit through the circuit breaker, please move to Test 4.



## Test 3: Checking for intermittent stopping



While it is uncommon, intermittent stopping of the pump is a possibility.

Remove the pump cap from your pump and check the impeller. Make sure that the inside of the pump is clean and that the impeller can spin freely. Occasionally, the cooling circuit of the pump may be clogged. This is what causes intermittent stopping. Not all pumps will have this line visible or easy to reach. The pump depicted above is a march pump. If your pump does not have this line, your next best option is to replace your pump or to call the pump manufacturer for assistance.

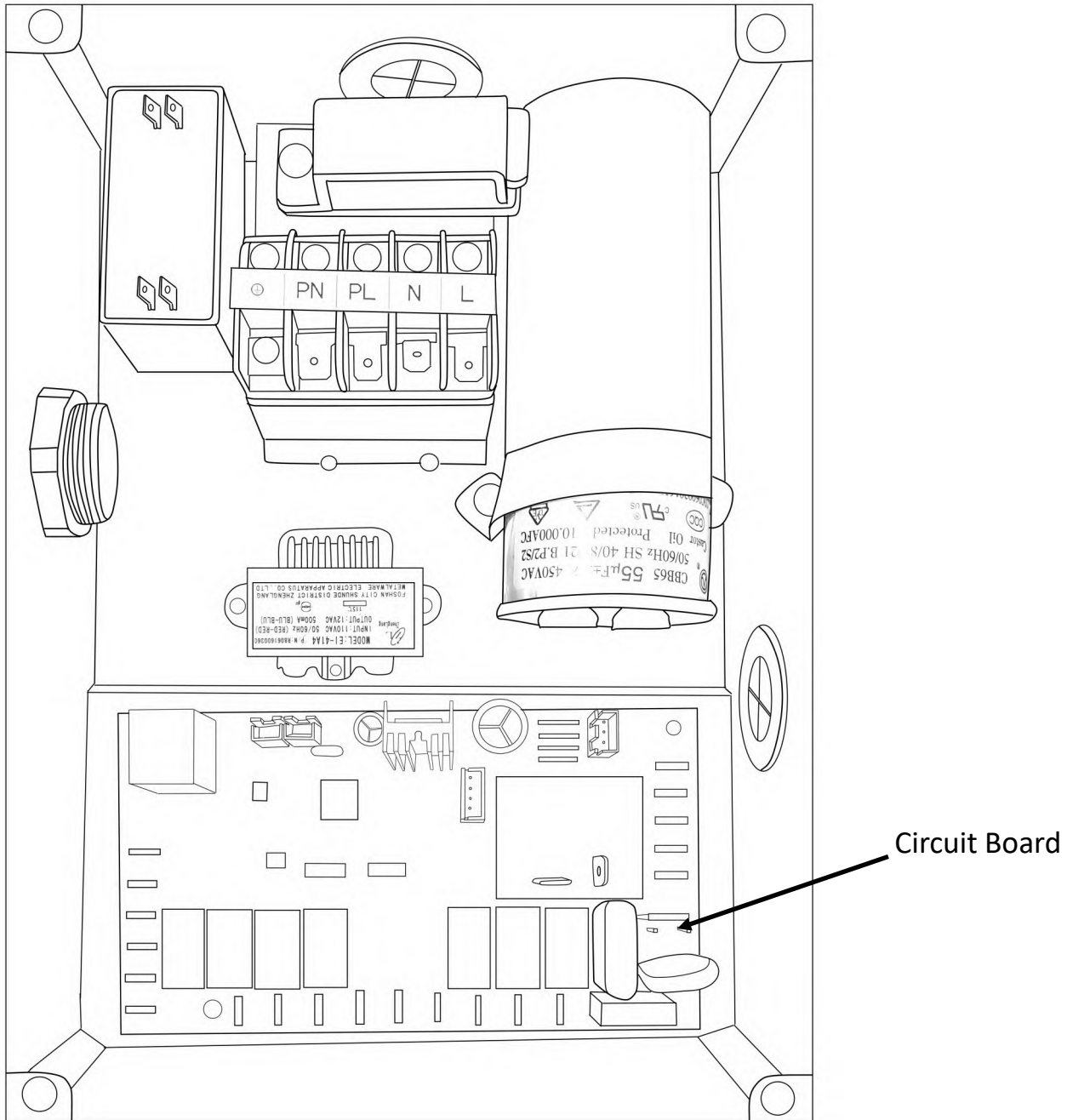
Please locate your pump and identify the cooling circuit as illustrated above and flush it out. If you require assistance, please contact the pump manufacturer.

# Test 4: Circuit Board

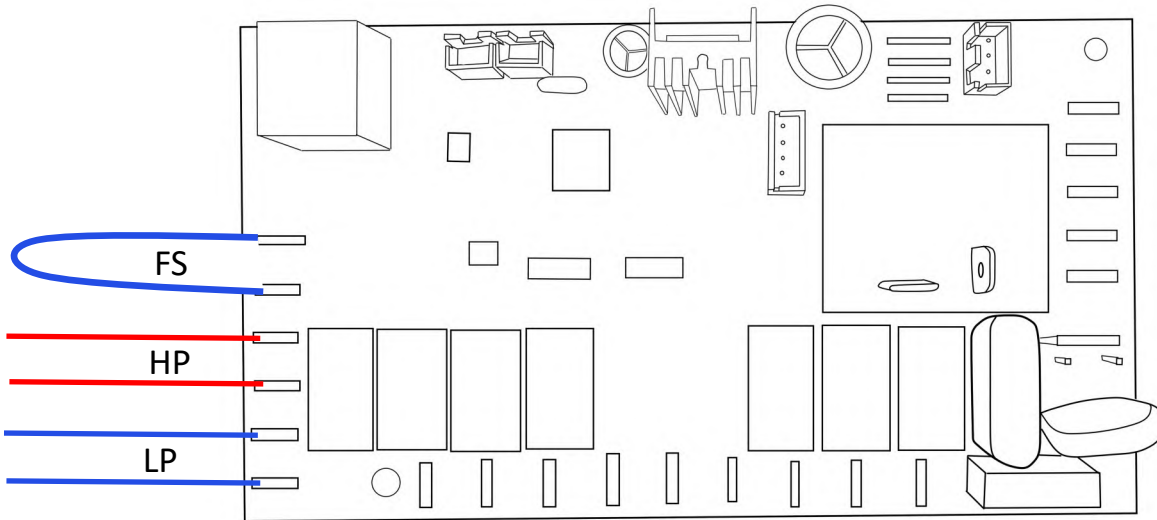
If your unit displays E4 immediately after resetting the unit AND when connected to city water, then there may be a problem with the circuit board connections.

Please turn off all power at the circuit breaker and locate your units electric panel.

Unscrew the metallic lid and locate the green circuit board at the bottom of the panel.



# Checking the Cables:



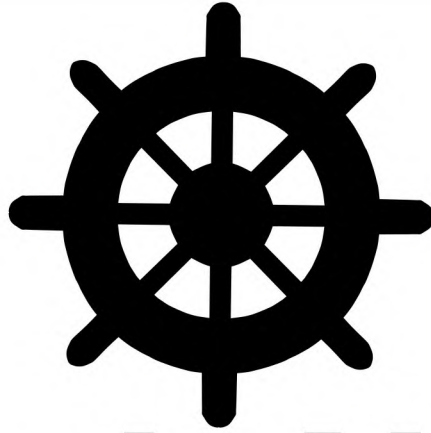
On the lower left corner of your circuit board, you should be able to identify 6 sets of cables, 2 of which are looped if you do not have a flow switch.

On the circuit board itself, they are labeled FS, HP, and LP, respectively.

The two HP cables will either be red or labeled “HP” around the wires on a small ring.

Ensure that the HP cables are plugged in to the correct terminals and that they are making contact with the circuit board.

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**Medley, FL 33178**



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**Heating Mode\***  
**E4 Error Code Troubleshooting Manual**

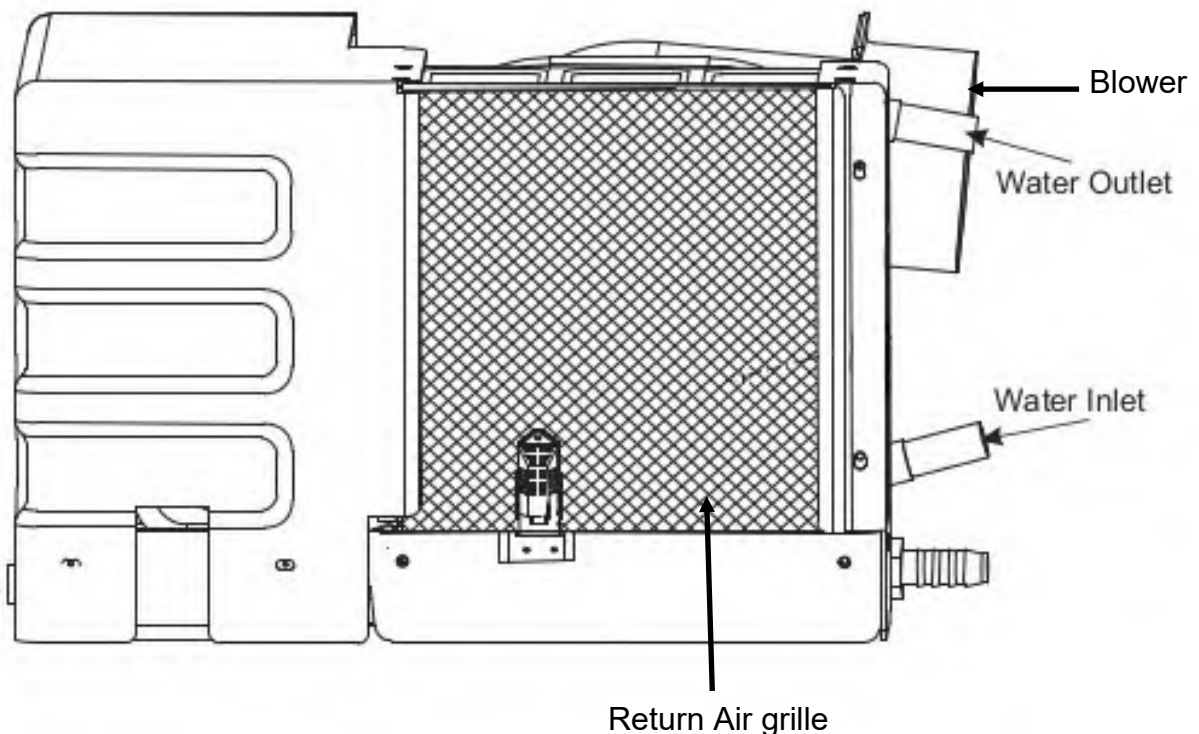
This manual is intended for professional use only by Certified Electricians.  
Read this manual thoroughly.  
Always practice electrical safety.  
Always turn off power at the breaker before servicing.

If your unit is displaying an E4 error code during **heating mode**, then the unit is most likely experiencing either a water flow or an air flow issue. This manual will guide you through step-by-step procedures on how to diagnose what might be causing the error, and will also guide you on how to solve it.

Please note that the pressures may get high if the water inlet temperature is high and above 70° F (21° C). **With the combination of the warm waters, insufficient airflow and high setting temperature, the pressures may go above the limit even if the water temperature is below 70° F.** Then the pressures will rise and then the high pressure switch will cut the operation to protect the unit. Once the airflow is insufficient on heating mode, the heat will not be removed sufficiently from the coil. Please check and make sure that you have appropriate size of ducting based on the capacity of your unit, all the vents & diffusers are fully open, the return grill size is appropriate, filters are clean and there is no obstruction to the air flow. Improving the air flow may automatically resolve the issue.

Please read through this manual carefully, and conduct the tests in the order that they are given.

## Important Unit Anatomy for E4



## Checkpoint 1: Measuring the water temperature

Occasionally, users will attempt to run heating mode during warm weather to test it's capability, and get E4. Heating mode is only intended for use during cold weather. To run heating mode, the water temperature must be between 40° F to 70° F. Please measure your water temperature and ensure that it is within range.

A quick note on thermometers:

Electric thermometers with a K-type probe are the most reliable ways to measure temperature. This is the only type of thermometer we recommend. Any other type of thermometer (such as the traditional mercury thermometer) will not be as accurate.

## Checkpoint 2: Minimum Ducting Requirements

Please view the **Airflow Diagram** in the next page as a guideline for the chart provided below.

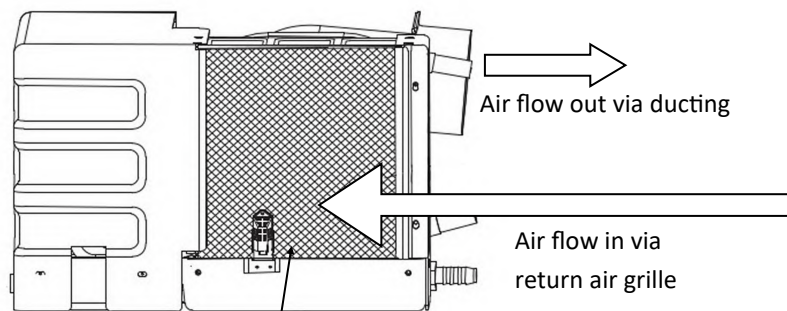
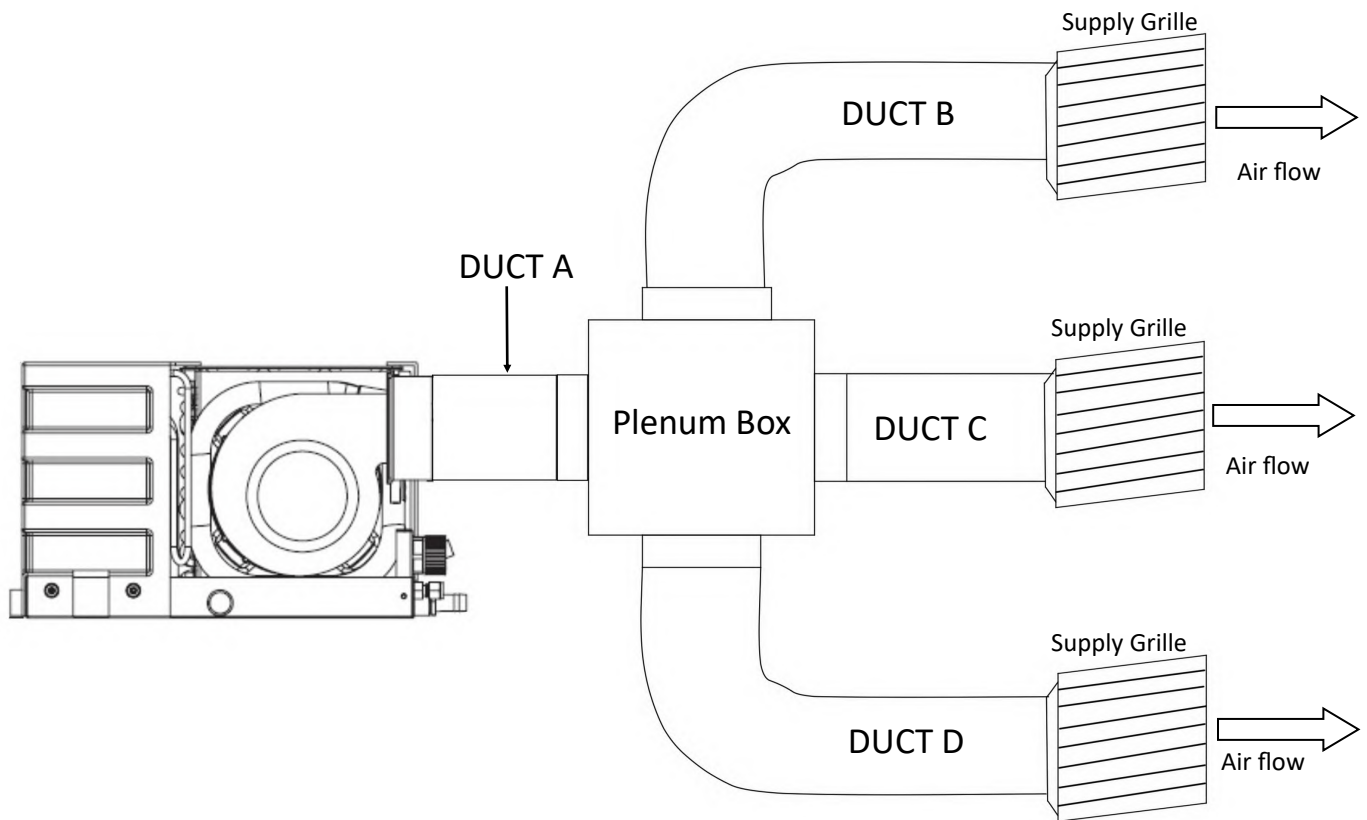
	<b>Return Grille</b>	<b>DUCT A</b> Max Length 2 ft	<b>DUCT B</b> Max Length 20 ft	<b>DUCT C</b> Max Length 20 ft	<b>DUCT D</b> Max Length 20 ft	<b>DUCT E</b> Max Length 20 ft
<b>MSBA6</b>	10X10	4"	4"	3" to 4"	OPTIONAL	OPTIONAL
<b>MSBA9</b>	12X12	6"	4"	4"	OPTIONAL	OPTIONAL
<b>MSBA11</b>	12X14	6"	6"	4"	OPTIONAL	OPTIONAL
<b>MSBA14</b>	14X14	6"	6"	6"	3" to 4"	OPTIONAL
<b>MSBA16</b>	14X14	6"	6"	6"	3" to 4"	OPTIONAL
<b>MSBA20</b>	16X16	7"	8"	6" to 8"	3" to 6"	OPTIONAL
<b>MSBA24</b>	16X16	7"	8"	6" to 8"	3" to 6"	OPTIONAL

Please make sure that all vents are open and that air is flowing freely in to the cabin. Check for leaks of air within the ducting and make sure that everything is secure. All vents and diffusers should be open and there should be no blockages to the return air grille. Also make sure that all air filters are clean including the one that comes with the unit. The return air grille should be positioned adjacent to that of the unit, not far above or below.

If you are skeptical of your ducting, an easy way to test it would be to remove the ducting from the blower and let the unit run freely and directly in to the cabin. Note that there should be no walls/covers/filters blocking the unit in from any side, as that could also result in poor air flow and would not be a good way to test your problem.



# Airflow Diagram



Return Air Grille

## Checkpoint 3: Checking the Water Flow

If you have already confirmed the last two checkpoints, the final point to check would be the waterflow. If you are getting E4 during heating, there is a possibility that your unit might be getting too much water flow/pressure. Water flow must not exceed the recommended flow rate.

First ensure that your pump is the correct GPH for your unit and that your pump is magnetic. Any type of pump other than a magnetically driven pump is not recommended. (ie. sprinkler pump, pool pump, cal, little giant.. Etc..)Next, use the chart below to determine if your pump GPH is adequate for your unit.

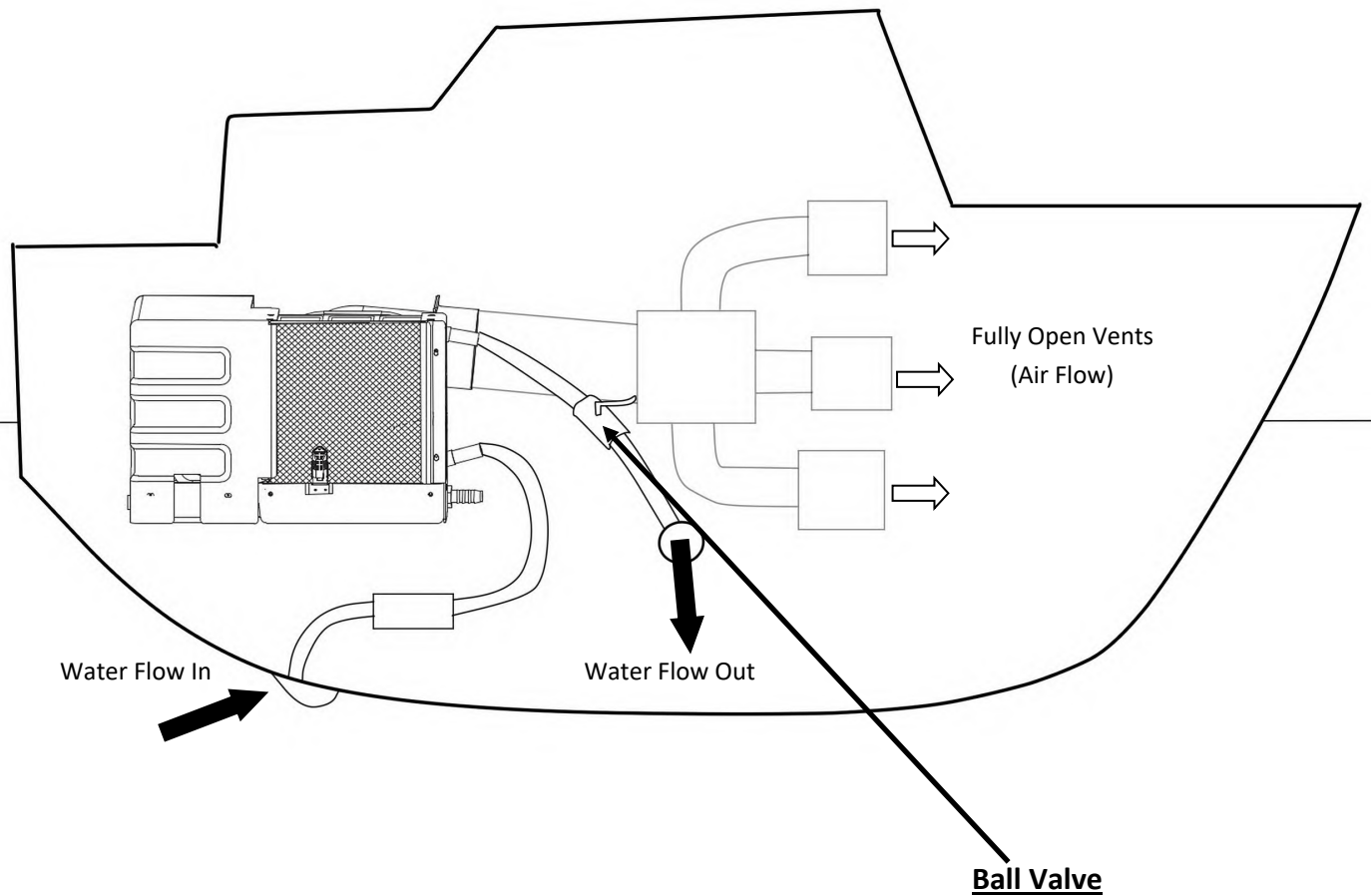
If you are running multiple units on a single pump, add the GPH per unit.

(for example: for two MSBA6K2's..... 300 GPH + 300 GPH =600 GPH pump minimum req.)

\*Note that this chart is only for units that are branded as MARINAIRE TECHNOLOGIES INC. If you have any other type of brand please consult with them to find out their minimum water flow requirements as they may be drastically different from the figures below.

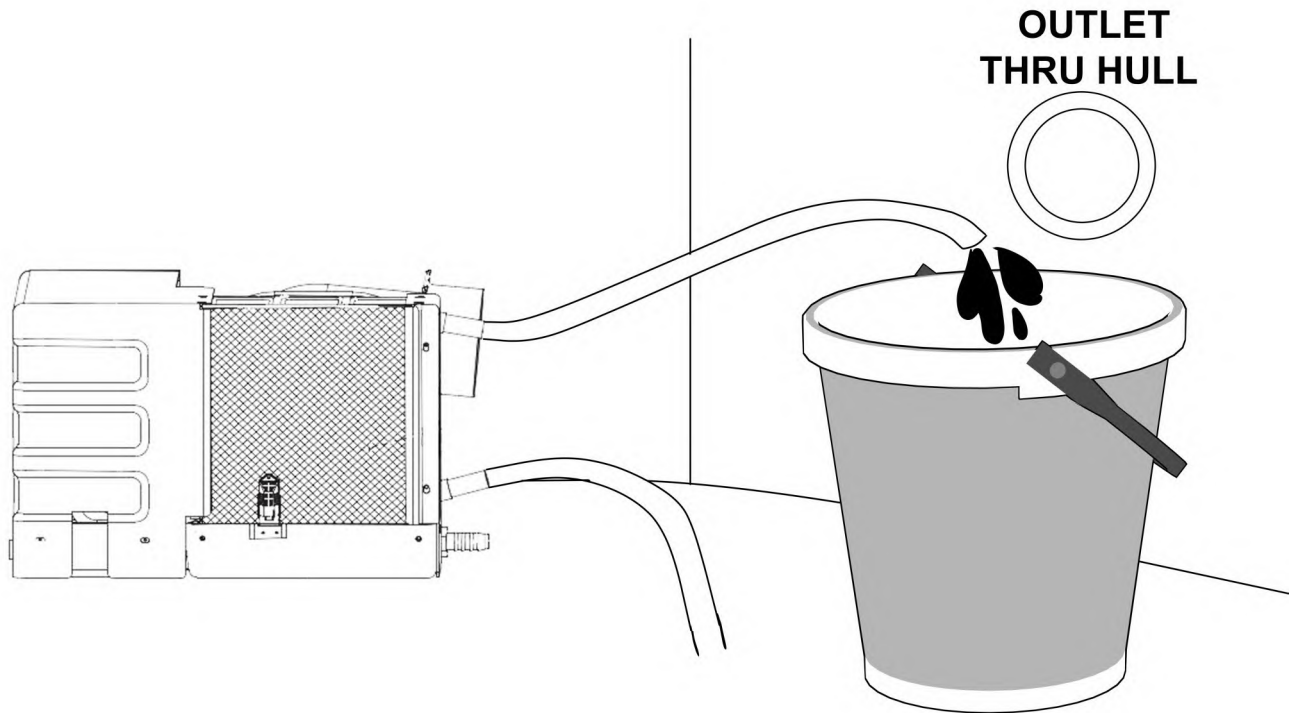
MSBA6K/C2	300 GPH
MSBA9K/C2	300 GPH
MSBA11K/C2	500 GPH
MSBA14K/C2	500 GPH
MSBA16K/C2	500 GPH
MSBA20C2	1000 GPH
MSBA24C2	1000 GPH

## How to Reduce the Water Flow



Water flow must not exceed the recommended flow rate. You can adjust (lower) the water flow rate from the ball valve shown in the above installation. The ball valve must be installed between the unit and the output thru hull. If you are curious about your water flow rate, you can always measure it with a bucket test.

# The Bucket Test



The bucket test will measure the GPH output of your water. Please unhook the hose from the outlet of the unit as depicted above and position it inside a 5 gallon bucket. The inlet side of the hose should be left as is, with the strainer, pump, etc, attached. You will measure how many seconds it takes to fill the bucket according to the BTU of your unit. Please check the chart below:

NOTE: When most customers call in for an E4 issue, they will visually diagnose their water flow by looking at the water flowing out of their outlet. Oftentimes water flow is not visually significant enough to diagnose through sight or touch, it must ALWAYS be tested.

6000 BTU	Must be filled within 120 sec
9000 BTU	Must be filled within 100 sec
11000 BTU	Must be filled within 75 sec
14000 BTU	Must be filled within 65 sec
16000 BTU	Must be filled within 55 sec
20000 BTU	Must be filled within 40 sec
24000 BTU	Must be filled within 35 sec

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