

**Mobile Ozone Sparge Unit**

**MOSU10-52**

**RN 10059**

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***User Guide***

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*By*

***BISCO Environmental***

135 Robert Treat Paine Drive  
Taunton, Massachusetts 02780

Phone: (508) 738-5100

Fax: (508) 738-5127

Contact: *Ed Tierney*

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## **Safety Warnings**

*This section describes some of the safety concerns you should be aware of before proceeding with operation of this unit.*

### **Ozone Gas**

High concentrations of ozone gas can be dangerous to humans. Low concentrations can cause irritations to eyes, throat and respiratory system.

### **Electrical**

The MOSU10-52 has an ambient ozone alarm and other safety interlocks. Proper care must be used by a qualified electrician when making any internal adjustments or performing any maintenance procedures. The electrical supply to this system must be rated at 240vac / 40amps (L1, L2, N, G).

### **Safety Instructions**

- Follow all installation & operating instructions.
- Before applying power to the system be sure the main internal power disconnect switch is off.
- The electrical supply to this system must be rated at 240vac / 40amps (L1, L2, N, G).
- Be sure the power source is grounded and conforming with all electrical codes.
- Before operating this system be sure that the trailer is securely located on-site, with tire blocks in place.

## System Description

*This section briefly explains the primary components of the Mobile Sparge Unit and their basic functionality.*

### Oxygen Concentrator

The majority of ozone generators require a source of clean, dry, oxygen-enriched air for effective ozone production. To meet that need, the air preparation system used employs pressure swing absorption (PSA) technology to increase the concentration of oxygen and reduce the moisture content in the feed gas. This greatly improves the output capability of the ozone generator and prevents premature failure of critical internal components. The air preparation system delivers 90% +/- 3% oxygen purity at -100°F dew point.

### Ozone Generator

The ozone generators supply a total of 52 grams/hour with concentrations up to 6% by weight under 10 to 12 PSI to the ozone delivery pump (ODP). The feed gas from the oxygen generator system is supplied to the ozone generator. A stainless steel needle valve is supplied on the ozone generator outlet to control the internal flow and pressure.

### Control System

The control system utilizes a programmable logic controller to control the ozone sparge system. A Panel View 300 provides a human machine interface (HMI) for the operator.

#### Panel View 300

The Panel View 300 is a touch pad control interface device for the ozone sparge system.

### Ozone Gas and Airflow Delivery

#### Ozone Delivery Pump (ODP)

The ozone delivery pump is used to pull ozone gas from the ozone generator and deliver the ozone gas to the sparge port manifold. The ozone delivery pump is ozone gas resistant and is a single speed pump.

**Air Flow Booster Compressor (AFB)**

The air flow booster compressor blends between 1 to 6 SCFM of air with the ozone gas that is delivered to the solenoid valve manifold. The air flow booster compressor includes an after cooler, auto drain valve with timer, and adjustable air flow gauge (1 to 6 SCFM).

## Start-up and Calibration

*This section describes basic unit operation and instructions for calibration.*

### Turning On the Mobile Ozone Sparge Unit (MOSU)


#### TO TURN ON THE OZONE SPARGE SYSTEM:

1. Make sure that the service disconnect inside the ozone sparge trailer is in the “OFF” position.
2. The power cord should be interfaced to the power on-site (240V, 60Hz, 40Amp). Next, turn the service disconnect into the “ON” position. The “Main Menu” on the panel view will be activated.

H2O Engineering
Main Menu
(F1) System Status
(F2) System Config
(F3) View Totals
(F4) Next Menu

### Valve Configuration


#### TO SET THE VALVE CONFIGURATION:

1. From the main menu, press **F4: Next Menu**. The main menu appears.
2. Press **F3: Valve Config**. This will take you to the first valve setting screen 1-2.
3. At each valve setting, the valve must be “enabled” and a time value (0 – 99 minutes) must be set. Press the **Enter** key  after setting the time value in order for the valve to save the time.
4. Proceed to the next set of valves (Valve 1 through 10) by depressing the **F5 ←** or **→ F8** keys.

## Setting the Cycle Lag Time

The Cycle Lag Time allows the MOSU equipment cool down between cycles.

### TO SET THE CYCLE LAG TIME:

1. Press **F2: System Config**, then press **F2: Auto Mode Menu**.
2. Press **F4: Set Start Lag**.
3. From the **Set Start Lag** screen, press **F1: Set Lag Time**. This will allow the operator to numerically input a lag time (0 to 480 minutes). Press the **Enter** key  when done inputting the lag time.

## Starting the MOSU

### TO START THE OZONE SPARGE SYSTEM:

1. From the main menu, press **F2: System Config**, then press **F2: Auto Mode Menu**.
2. From the **Auto Mode Menu**, press **F1: Start**, or press **F2: Stop** to start or stop the MOSU.

**NOTE:** Place the threaded plugs into the outlet of the solenoid valve(s) that are not being used.

- The oxygen concentrator(s) flow gauge will read between 4 and 8 CFH.
- The ozone generator should indicate a orange LED light. This means that ozone gas is being produced. The ozone generator flow gauge should read 4 to 8 CFH, and the pressure gauge should read 9 to 12 PSI.
- The air flow booster compressor flow gauge reading will be dependent upon the back pressure on the sparge port. The pressure gauge reading will be dependent upon the back pressure on the sparge port. The air flow gauge maximum reading is 6 SCFM at a 0 PSI back pressure.
- The ozone sensor will shut down the ozone gas production when ozone gas concentrations have exceeded the high set point (.8 PPM). Ozone gas will be produced when the ozone sensor is below the set point.

## Determining the MOSU System Status

### TO DETERMINE THE OSS SYSTEM STATUS:

- From the main menu, press **F1: System Status**.

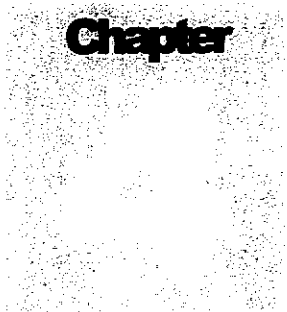
The **Status** screen will show:

- a. the date and time
- b. which valve is currently running
- c. the system mode (manual or auto)

## Viewing Valve Run Time and Total System Run Time

### TO VIEW THE VALVE RUN TIME AND TOTAL SYSTEM RUN TIME:

1. From the main menu, press **F3: View Totals**. The OSS Total Runtime will appear in hours and minutes at the top of the **View Totals** menu screen.
2. Press **F1: View 1-10** to view valve run times on valves 1 through 10.
3. From the **View Totals** menu, press **F3: Go to Reset Menu**.
4. From the **Reset Totals Menu** screen, press **F1: Reset System** to enter password.
5. Press **F2: Reset All Valves** to reset all valves.
6. Press **F3: Reset Individual** to reset individual valves.



# Chapter


## Alarms

### TO CLEAR A HIGH PRESSURE ALARM

1. If the high pressure alarm is activated, a HP alarm screen will be shown, indicating which valve(s) has seen a high pressure. From this screen, **F1 (acknowledge)** will clear the alarm and allow the corresponding valve back into operation.
2. To view the Alarm History log, go to main menu #2. Press **F1: Alarm List Menu**, then **F1: View List**.
3. In order to clear the alarm history log, press **F2: Clear List**.

## Setting the High Pressure Alarm Delay

### TO SET THE ALARM DELAY TIME

1. From the main menu, press **F4: Next Menu**. In the "Main Menu 2" screen, press **F2: Set Alarm Delay**. Next, press **F1: Set Delay Time**. The delay time can be set from 0 to 32,767 seconds. After setting the value, press the **Enter Key** . The value is factory set at 120 seconds. **\*\* Alarm delay time may need to be reset per job site sparge conditions.**

## Internal Ozone Alarm

### TO ACKNOWLEDGE AN INTERNAL OZONE ALARM:

1. If the Internal ozone alarm is activated ozone production will be stopped until the ozone level has dropped below the alarm set point in which ozone production will continue and an alarm screen will be shown, indicating the date and time of when the alarm took place. From this screen press **F4** to return to the Auto Mode Menu.

SYSTEM SHUTDOWN
INTERNAL OZONE
##/##/####
##:##:##
(F4) Auto Mode Menu

## High Temperature Alarm

### TO CLEAR A HIGH TEMP ALARM:

1. If the High Temp Alarm is activated, a High Temp Screen will be shown, indicating that the internal system temperature is above the alarm condition set point or has previously reached the high set point.
2. If the internal temperature is above the set point the system will not allow the alarm to be acknowledged. This will be indicated by flashing text reading "High Temp. Present". Once the temperature has dropped below the set point the text will change to "High Temp. Detected"
3. At this point press **F1: Acknowledge** to allow the system back into normal operation mode. Then press **F4: Auto Mode Menu** to return to the Auto Mode Menu.

SYSTEM SHUTDOWN
HIGH TEMP PRESENT
Acknowledge Required
(F1) Acknowledge
(F4) Auto Mode Menu

## Remote Ozone Alarm

### TO CLEAR A REMOTE OZONE ALARM: \*\* FUNCTION IS ONLY USED WHEN AN AMBIENT OZONE SENSOR HAS BEEN INTEGRATED TO THE OSU40-52 CONTROL SYSTEM.

1. The ozone sparge unit panel view will display a flashing "System Shutdown / Remote Ozone Present" screen when the ambient ozone sensor senses ozone above the high limit detection set point. When the ambient ozone level is below the high limit detection set point, the panel view will display an "System Shutdown / Remote Ozone Detected" screen. First, the ozone alarm must be acknowledged (required, depress F1). Then, the ozone sparge unit can be restarted by depressing F4 which display the Auto Mode Setup screen, and then depress F1 to start.

SYSTEM SHUTDOWN
REMOTE OZONE DETECT
Acknowledge Required
(F1) Acknowledge
(F4) Auto Mode Menu

## Remote Auxiliary Alarm

### TO CLEAR A REMOTE OZONE ALARM:

1. When a 120VAC signal is applied to this input terminal, the ozone sparge unit will shut down and a "Auxiliary Shutdown Detect" screen will be displayed on the panel view. The ozone sparge unit must manually be restarted on-site by the service technician.

SYSTEM SHUTDOWN
AUX SHUTDOWN DETECT
Acknowledge Required
(F1) Acknowledge
(F4) Auto Mode Menu

# Chapter

## Trouble Shooting

### AIR PREPARATION

PROBLEM/SYMPOM	POSSIBLE CAUSE	SOLUTION
Unit not operating	<ul style="list-style-type: none"> <li>- No power to system</li> <li>- Power switch in "OFF" position</li> <li>- Incorrect wiring</li> </ul>	<ul style="list-style-type: none"> <li>- Check main power to system</li> <li>- Turn switch to "ON" position</li> <li>- See "Installation Procedures - Electrical"</li> </ul>
Low air flow or no air flow	<ul style="list-style-type: none"> <li>- Flow meter out of adjustment</li> <li>- Fouled compressor inlet filter</li> <li>- Compressor not functioning</li> </ul>	<ul style="list-style-type: none"> <li>- Adjust flow meter See "Start-Up &amp; Calibration-Step 5"</li> <li>- Replace inlet filter</li> <li>- Rebuild or replace as required</li> </ul>
Compressor pressure relief valve making noise	<ul style="list-style-type: none"> <li>- Pressure relief valve not operating</li> <li>- Excessive backpressure in system</li> <li>- Pinched tubing</li> <li>- Compressor not functioning</li> <li>- ATF not operating</li> </ul>	<ul style="list-style-type: none"> <li>- Replace pressure relief valve</li> <li>- Check check valve for proper operation, replace as required.</li> <li>- Replace tubing</li> <li>- Rebuild or replace as required</li> <li>- Repair or replace ATF as required</li> </ul>
Indicator cartridge desiccant has changed from blue & white to all pink or white	<ul style="list-style-type: none"> <li>- Moisture has entered air prep system</li> </ul>	<ul style="list-style-type: none"> <li>- Check &amp; tighten fittings</li> <li>- Rebuild/replace compressor or ATF module as required</li> <li>- Replace indicating desiccant</li> </ul>
Unit is making excessive noise	<ul style="list-style-type: none"> <li>- Unit not properly secured to floor</li> <li>- Shipping damage</li> <li>- Fan blocked</li> <li>- Packaging material not removed</li> </ul>	<ul style="list-style-type: none"> <li>- Place unit on a flat level surface</li> <li>- Locate damage and repair/replace parts</li> <li>- Clear obstructions</li> <li>- Remove packaging material</li> </ul>

### OZONE GENERATOR

PROBLEM/SYMPOM	POSSIBLE CAUSE	SOLUTION
"Main Power" light is not illuminated or System is not "ON"	<ul style="list-style-type: none"> <li>- Lamp burned out</li> <li>- No power to unit</li> <li>- Switch is in the "OFF" position</li> <li>- Blown fuse</li> <li>- Incorrect wiring</li> </ul>	<ul style="list-style-type: none"> <li>- Replace light</li> <li>- Check circuit breakers</li> <li>- Turn switch to the "ON" position</li> <li>- Replace fuse</li> <li>- See "Installation Procedures - Electrical"</li> </ul>
Circuit breaker trips	<ul style="list-style-type: none"> <li>- Incorrect wiring</li> <li>- Circuit breaker amperage does not match draw</li> </ul>	<ul style="list-style-type: none"> <li>- See "Installation Procedures - Electrical"</li> <li>- Replace with correct circuit breaker</li> <li>- Assess damage, correct cause and rebuild as required</li> </ul>
Receive an electrical shock upon touching the unit	<ul style="list-style-type: none"> <li>- Incorrect wiring</li> <li>- Unit not grounded</li> </ul>	<ul style="list-style-type: none"> <li>- See "Installation Procedures - Electrical"</li> <li>- Ground unit according to local codes</li> <li>- Assess damage, correct cause and rebuild as required</li> </ul>
Drive Module - Main Power "Green" LED(s) not illuminated	<ul style="list-style-type: none"> <li>- No power to drive module from power supply</li> </ul>	<ul style="list-style-type: none"> <li>- Check main power to unit</li> <li>- Test voltage from power supply to drive module (see "Appendix - Drive Module Input Voltages")</li> <li>- Check for loose wires or connectors</li> </ul>
Transformer (XFMR) Power, "Green" LED not illuminated	<ul style="list-style-type: none"> <li>- If drive module "Main Power" LED(s) not illuminated, the "XFMR Power" LED will not illuminate</li> <li>- Blown drive module "on board" fuse</li> <li>- Drive board is in "Fault" mode</li> </ul>	<ul style="list-style-type: none"> <li>- Test voltage from power supply to drive module (see "Appendix-Drive Module Input Voltages")</li> <li>- Replace "on board" fuse</li> <li>- See Troubleshooting, "Fault" LED</li> </ul>

OZONE GENERATOR – continued

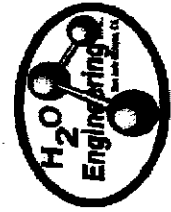
PROBLEM/SYMPTOM	POSSIBLE CAUSE	SOLUTION
Ozone Output, "Amber" LED not illuminated	<ul style="list-style-type: none"> <li>- If the Transformer (XFMR) Power LED is not illuminated, the "Ozone Output" LED will not illuminate</li> <li>- The Manual Ozone Output is turned down to 0%</li> <li>- Drive board is in "Fault" mode</li> </ul>	<ul style="list-style-type: none"> <li>- Check all wires and connectors</li> <li>- Turning the Manual Ozone Output knob clockwise will increase ozone output percentage and the "Ozone Output" LED will begin to illuminate (see "Installation Procedures - Electrical, Optional Equipment")</li> <li>- See Troubleshooting, "Fault" LED</li> </ul>
The "Ozone Output" LED(s) not responding to the remote 4-20mA control signal	<ul style="list-style-type: none"> <li>- The remote 4-20mA control signal is not sensed by the 4-20mA control board</li> </ul>	<ul style="list-style-type: none"> <li>- Check for loose wires or connections</li> <li>- See "Installation Procedures – Electrical"</li> </ul>
Fault, "Red" LED illuminated	<ul style="list-style-type: none"> <li>- Upon start-up the "Fault" LED will be "ON" for 30 seconds, this is normal</li> <li>- Loose wire harness connection from the drive board to the drive transformer</li> <li>- Failed drive board</li> <li>- Failed drive transformer</li> <li>- Broken dielectric</li> <li>- Excessive dirt or debris in the ozone reaction chamber</li> <li>- Loose or disconnected High Voltage Lead to transformer</li> <li>- High temp Limit</li> </ul>	<ul style="list-style-type: none"> <li>- Wait for the start-up to finish</li> <li>- Check all wires and connectors</li> <li>- Replace drive board</li> <li>- Replace drive transformer</li> <li>- Replace dielectric</li> <li>- Clean dielectric and replace O-rings reaction chamber</li> <li>- Clean dielectric and replace O-rings</li> <li>- Attach High Voltage lead to transformer</li> <li>- See "High Temp Limit" section below</li> </ul>
High Temp Limit	<ul style="list-style-type: none"> <li>- Unit is over heating</li> </ul>	<ul style="list-style-type: none"> <li>- Check fan for proper operation and clean fan filter</li> <li>- Check operating temperature</li> <li>- See "Installation Procedures - Getting Started...Equipment Placement"</li> </ul>
Fan not operating	<ul style="list-style-type: none"> <li>- Fan obstructed</li> <li>- Power supplies not operating</li> <li>- Fan inoperable</li> </ul>	<ul style="list-style-type: none"> <li>- Remove obstruction</li> <li>- Check main power, check fuses. Repair or Replace as required</li> <li>- Replace fan</li> </ul>
Low air flow or no air flow	<ul style="list-style-type: none"> <li>- Air prep system not operating properly</li> <li>- Fouled inline filter</li> <li>- Air leak</li> <li>- Incorrect wiring to air prep system</li> </ul>	<ul style="list-style-type: none"> <li>- See "Start Up &amp; Calibration" - Step 5</li> <li>- Change inline filter</li> <li>- Check all fittings, tighten as needed</li> <li>- See "Installation Procedures - Electrical"</li> </ul>

## Appendix A

### Diagrams

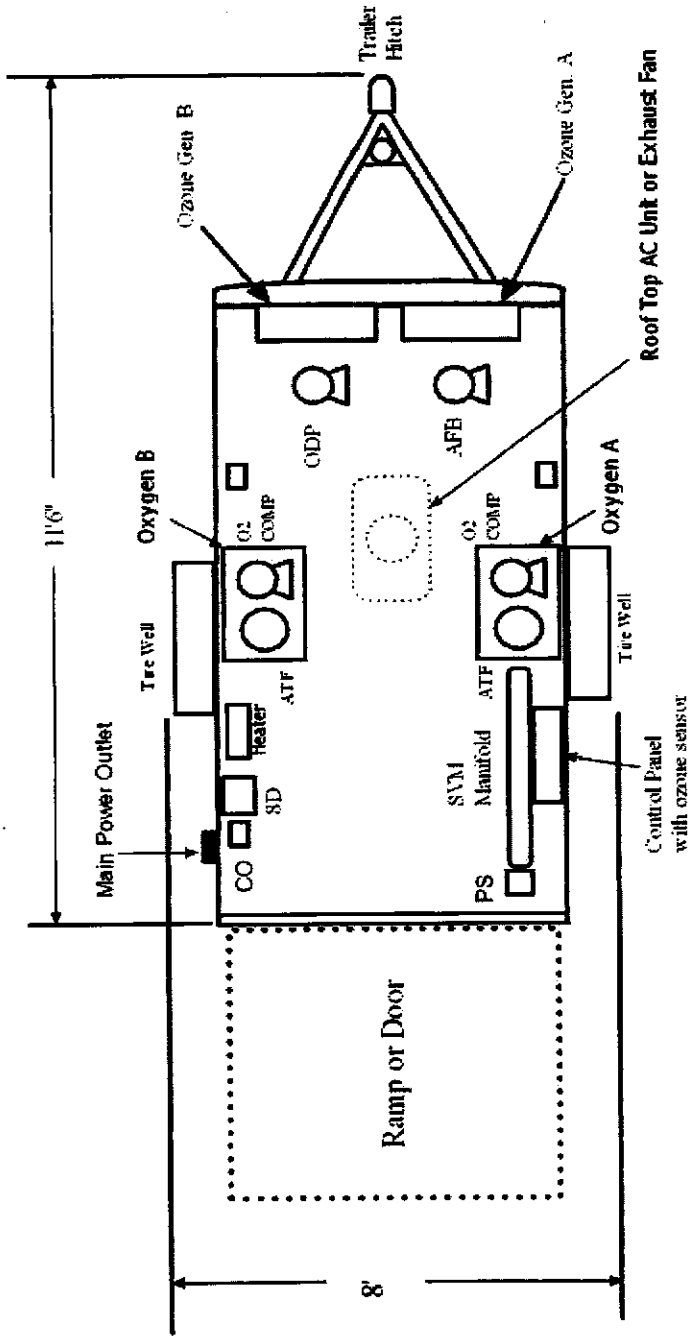
1. Panel View Screen Diagram
2. MOSU10-52 Trailer Layout Diagram
4. MOSU10,20-52 Service Parts List
5. MOSU Service Kits
6. Service and Maintenance Log
7. MSDS: Ozone Gas

1. Panel View Screen Diagram



H2O Engineering, Inc.  
 265 Prado Road Suite #1  
 San Luis Obispo, CA 93401  
 805-547-0303 Phone  
 805-547-0113 Fax  
 www.h2oengineering.com

Mobile Ozone Sparge Unit Trailer Diagram: MOSU10-52



**Note:**

1. SD - Main Power Service Disconnect.  
240V, 60Hz 40 Amp
2. O2 Comp. - Oxygen Compressor
3. ATF - O2 Module
4. SVM - Solenoid Valve Manifold (10 Valves)
5. CIDP - Ozone Delivery Pump
6. AFB - Air Flow Booster
7. CO - Convenience Outlet
8. PS - Pressure Switch

**MOSU10,20-52 Service Parts List**

No.	Item	Service Schedule	Quantity
1	Ozone Generator Reaction Chamber	**	4
2	Ozone Drive Board	**	4
3	3 Amp Fuse - Ozone Drive Board	***	4
4	4" Ozone Generator Fan Filter	***	4
5	10" Ozone Generator Fan Filter	***	1
6	Ozone Delivery Pump	**	1
7	Ozone Delivery Pump Rebuild Kit	***	1
8	1313 Oxygen Compressor	**	2
9	12C ATF Module	**	2
10	12C ATF Gear Motor	**	2
11	Oxygen Compressor Inlet Particulate Filter	*	2
12	Oxygen Indicator Desiccant	*	2
13	1/4" Oxygen Compressor PRV, 35 PSI	**	2
14	After Cooler Fan	**	1
15	After Cooler	**	1
16	Air Flow Booster Compressor	**	1
17	Air Flow Booster Compressor Inlet Particulate Filter	*	1
18	Booster Rebuild Kit	***	1
19	1/2" FPT→MPT PVC Check Valve	**	4
20	Water Separator Filter & O-Ring	*	1
21	Ambient Ozone Sensor Head	**	1
22	Solenoid Valve(s)	**	10 or 20
23	Solenoid Valve Rebuild Kit(s)	**	10 or 20
24	High Voltage Lead Tester	n/a	1
25	11/32 Nut Driver	n/a	1

\* Inspect Monthly / Rebuild or Replace as needed

\*\* Inspect Annually / Rebuild or Replace as needed

\*\*\* Replace / Rebuild Annually

## **MOSU Service Kits**

### ■ **SKM10-52-06 (Six Months)**

Air Flow Boost (AFB) Compressor Inlet Filter  
Oxygen Compressor Inlet Filter  
PVC Check Valves (4)  
Water Separator Filter & O-Ring

### ■ **SKM10-52-12 (12 Months)**

Ambient Ozone Sensor Head  
PVC Check Valves (4)  
Oxygen Indicator Desiccant  
Oxygen Compressor & AFB Compressor Inlet Filters  
Water Separator Filter & O-Ring

### ■ **SKM10-52-18 (18 Months)**

AFB Pressure Relief Valve  
Compressor Rebuild Kits (Oxygen, AFB, Ozone Delivery)  
Oxygen Compressor & AFB Compressor Inlet Filters  
PVC Check Valves (4)  
Solenoid Rebuild Kits  
Water Separator Filter & O-Ring



**OZONE**

**Material Safety Data Sheet**

SECTION I: MATERIAL IDENTIFICATION	
<b>IDENTITY:</b> OZONE (Gaseous)	<b>ISSUED:</b> February, 1992
<b>FORMULA:</b> O <sub>3</sub>	<b>REVISED:</b> September, 2001
<p><b>Description (origin/uses):</b> Occurs in atmosphere from UV light action on oxygen at high altitude. Commercially obtained by passing air between electrodes carrying a high voltage alternating current. Also found as a by-product in welding areas, high voltage equipment, or UV radiation.</p> <p>Ozone is used as an oxidizing agent in air and water disinfection: for bleaching textiles, oils, and waxes; organic synthesis as in processing certain perfumes, vanillin, camphor; for mold and bacteria control in cold storage.</p>	
<p><b>Cautions:</b> A powerful oxidizing agent, ozone generally exists as a gas and is highly chemically reactive. Inhalation produces various degrees of respiratory effects from irritation to pulmonary edema (fluid in lungs) as well as affecting the eyes, blood, and central nervous system.</p>	
<p><b>Manufacturer/Supplier:</b> H2O Engineering, Inc. 265 Prado Road #1 San Luis Obispo, CA 93401</p> <p>Phone: (805) 547-0303 Fax: (805) 547-0113 www.h2oengineering.com</p>	
SECTION II: INGREDIENTS AND HAZARDS	
<b>Ozone, CAS No. 10028-15-6; NIOSH RTECS No. RS8225000</b>	
<p>1991 OSHA PELs 8-hr TWA: 0.1 ppm vol. (0.2 mg/m<sup>3</sup>) 15-min STEL: 0.3 ppm vol (0.6 mg/m<sup>3</sup>)</p> <p>1996 IDLH 5 ppm</p> <p>1990 NIOSH REL Ceiling: 0.1 ppm vol. (0.2 mg/m<sup>3</sup>)</p>	<p>1991-1992 ACGIH TLV Ceiling: 0.1 ppm (0.2 mg/m<sup>3</sup>)</p> <p>1990 DFG (Germany) MAK TWA: 0.1 ppm (0.2 mg/m<sup>3</sup>) Category 1: Local irritant Peak Exposure Limit: 0.2 ppm 5 min momentary value, 8 per shift</p>
<p><b>Other Designations:</b> Triatomic oxygen; CAS No. 10028-15-6, NIOSH RTECS No. RS8225000</p>	
SECTION III: PHYSICAL DATA	
<p><b>Boiling Point:</b> ..... -169° F</p> <p><b>Vapor Pressure:</b> ..... &gt;1 ATM</p> <p><b>Vapor Density (AIR = 1):</b> 1.6</p> <p><b>Solubility in Water:</b> ... 0.49 ml @ 32° F (0° C), 30 ppm @ 68° (20° C)</p>	<p><b>Melting Point:</b> ..... -315.4° F (-193° C)</p> <p><b>% Volatile by Volume:</b> .. 100%</p> <p><b>Molecular Weight:</b> ..... 48 Grams/Mole</p> <p><b>pH:</b> ..... Not Listed</p> <p><b>Critical Temperature:</b> .. 10.22° F (-12.1° C)</p>
<p><b>Appearance and Odor:</b> Colorless to blue gas (greater than -169° F); characteristic odor often associated with electrical sparks or lightning in concentrations of less than 2 ppm and becomes disagreeable above 1-2 ppm. CAUTION: Olfactory fatigue develops rapidly, so do not use odor as a preventative warning device.</p>	
SECTION IV: FIRE AND EXPLOSION HAZARD DATA	
<p><b>Flash Point:</b> ..... Nonflammable</p> <p><b>Extinguishing Media:</b> .. Use large amounts of water spray or fog to put out fires involving ozone. Use appropriate fire-fighting techniques to deal with surrounding material.</p>	
<p><b>Special Fire Fighting Procedures:</b> Wear a self contained breathing apparatus with full facepieces operated in a pressure-demand or other positive-pressure mode.</p>	
<p><b>Unusual Fire/Explosion Hazards:</b> Decomposition of ozone into oxygen gas, (O<sub>2</sub>), can increase strength of fire.</p>	
SECTION V: REACTIVITY DATA	
<p><b>Stability:</b> Ozone is not stable. Hazardous polymerization cannot occur.</p>	
<p><b>Chemical Incompatibilities:</b> Ozone is chemically incompatible with all oxidizable materials, both organic and inorganic.</p>	
<p><b>Conditions to Avoid:</b> Ozone is unstable at room temperatures and spontaneously decomposes to oxygen gas. Avoid ignition sources such as heat, sparks, and open flame. Keep away from strong reducing agents and combustible materials such as grease, oils, and fats.</p>	
<p><b>Products of Hazardous Decomposition:</b> Ozone spontaneously decomposes to oxygen gas, even at room temperatures.</p>	

SECTION VI: HEALTH HAZARD DATA	
<b>Carcinogenicity:</b>	Ozone is not listed as a carcinogen by the NTP, IARC, or OSHA.
<b>Primary Entry:</b>	Inhalation
<b>Target Organs:</b>	Respiratory system, eyes, blood.
<b>Summary of Risks:</b>	There is no true threshold limit and so no exposure (regardless of how small) is theoretically without effect from ozone's strong oxidative ability. Ozone passes straight to the smallest bronchioles and alveoli and is not absorbed by mucous membranes along the way. Initial small exposure may reduce cell sensitivity and/or increase mucous thickness producing a resistance to low ozone levels. Short exposure to 1-2 ppm concentrations causes headache as well as irritation to the respiratory tract, but symptoms subside when exposure ends. High concentrations of ozone produce severe irritation of the eyes and respiratory tract. Exposure above the ACGIH/OSHA limits produce nausea, chest pain, coughing, fatigue, reduced visual acuity, and pulmonary edema. Symptoms of edema from excessive exposure can be delayed one or more hours. Inhalation of >20 ppm for an hour or more (>50 ppm for 1/2 hour) can be fatal.
<b>Acute Effects:</b>	Acute damage from ozone appears to be mainly from its oxidizing effect on contact with tissue.
<b>Chronic Effects:</b>	Respiratory disease. Deleterious effects on lungs and acceleration of tumors have been reported.
<b>Medical Conditions Generally Aggravated by Long-Term Exposure:</b>	History of respiratory or heart disorders.
<b>First Aid:</b>	Remove from ozone containing air, get prompt medical help*, administer oxygen if necessary. <b>Eye Contact</b> - Gently lift eyelids and flush eyes continuously with flooding amounts of water for 15 minutes or until transported to a medical facility*. <b>Inhalation</b> - Remove exposed person to fresh air, support breathing, administer humidified oxygen as needed, get medical help*. <b>Ingestion</b> - Highly unlikely since ozone is a gas until -169° F, * GET MEDICAL ASSISTANCE = APPROPRIATE IN-PLANT, PARAMEDIC, or COMMUNITY. Get prompt medical assistance for further treatment, observation, and support after first aid.
SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE	
<b>Steps to be Taken in Case of Spill/Leak:</b>	<ol style="list-style-type: none"> <li>1. Discontinue production</li> <li>2. Isolate and vent area</li> <li>3. Immediately notify personnel</li> <li>4. Deny entry</li> <li>5. Follow applicable OSHA regulations</li> </ol>
<b>Disposal:</b>	Provide ventilation to dilute and disperse small amounts of ozone (below OSHA PELs) to outside atmosphere. Follow federal, state, and local regulations.
<b>Handling/Storage Precautions:</b>	Ensure proper personnel training and establish emergency procedures.
SECTION VIII: CONTROL MEASURES	
<b>Respiratory Protection:</b>	High Level (>10ppm) - Self Contained Breathing Apparatus: MISH/NIOSH approved. Low Level (0.3 - 10 ppm) - Canister Type (carbon) respirator may be used.
<b>Eye Protection:</b>	Wear chemical safety goggles if necessary to work in high ozone (>10 ppm).
<b>Skin Gloves:</b>	Effects of ozone on skin are minimal to non-existent.
<b>Ventilation:</b>	Provide general and local exhaust ventilation to dilute and disperse small amounts of ozone into the outside atmosphere.
SECTION IX: SPECIAL PRECAUTIONS AND COMMENTS	
<b>Storage Segregation:</b>	Prevent ozone from coming into direct physical contact with strong acids or bases or with strong oxidizing/reducing agents.
<b>Engineering Controls:</b>	Install ventilation systems capable of maintaining ozone to concentrations below the ACGIH/OSHA exposure limits (see sect. II). Install ambient ozone monitor(s) configured to shut down ozone equipment and turn high speed ventilation on.

## Warranty

H2O Engineering, Inc. ("H2O") makes every effort to assure that its products meet high quality and durability standards and warrants the products it manufactures against defects in materials and workmanship for a period of one (1) year, commencing on the date of original shipment from H2O, with the following exceptions: 1) The warranty period shall begin on the installation date if the installation is performed within 90 days of the original shipment from H2O; 2) The warranty period shall begin on the date of the bill of sale to the end user if the installation date is more 90 days after the original shipment date. To validate the warranty, a warranty card, accompanied by a copy of the bill of sale, must be returned to H2O and must include the following information:

- End user name
- Complete address, including telephone number
- Date installed
- Complete model and serial number information
- Name of company from which the unit was purchased

Repairs and replacement parts provided under this warranty shall carry only the unexpired portion of this warranty or 90 days, whichever is longer.

### Items Excluded from the Warranty

This warranty does not extend to any product and/or part from which the factory assigned serial number has been removed or which has been damaged or rendered defective as a result of:

- an accident, misuse, alteration or abuse
- an act of God such as flood, earthquake, hurricane, lightning or other disaster resulting only from the forces of nature
- normal wear and tear
- operation outside the usage parameters stated in the product user's manual
- check valve/solenoid valve failure
- use of parts not sold by H2O
- damage which may occur during shipping
- service or unit modification not authorized by H2O
- failure to meet service requirements as outlined in the I & O manual

### Obtaining Service Under the Warranty

Any product and/or part not performing satisfactorily may be returned to H2O for evaluation. A Return Goods Authorization (RGA) number must first be obtained by either calling or writing your local authorized dealer, distributor or H2O direct, prior to shipping the product. The problem experienced with the product and/or part must be clearly described. The RGA number must appear prominently on the exterior of the shipped box(es). The product and/or part must be packaged either in its original packing material or in comparable and suitable packing material, if the original is not available. You are responsible for paying shipping charges to H2O and for any damages to the product and/or part that may occur during shipment. It is recommended that you insure the shipment for the amount you originally paid for the product and/or part. If, after the product and/or part is returned prepaid and evaluated by H2O, it proves to be defective while under warranty, H2O will, at its election, either repair or replace the defective product and/or part and will return ship at lowest cost transportation prepaid to you **except for shipments going outside the 50 states of the United States of America**. If upon inspection, it is determined that there is no defect or that the damage to the product and/or part resulted from causes not within the scope of this limited warranty, then you must bear the cost of repair or replacement of damaged product and/or part and all return freight charges. Any unauthorized attempt by the end user to repair H2O manufactured products without prior permission shall void any and all warranties. For service, contact your authorized dealer or distributor or H2O direct at (805) 547-0303.

### Exclusive Warranty

There is no other expressed warranty on H2O products and/or parts. Neither this warranty or any other warranty, expressed or implied, including any implied warranties or merchantability of fitness, shall extend beyond the warranty period. Some states do not allow limitations on how long an implied warranty lasts, so that the above limitation or exclusion may not apply to you.

### Disclaimer of Incidental and Consequential Damages

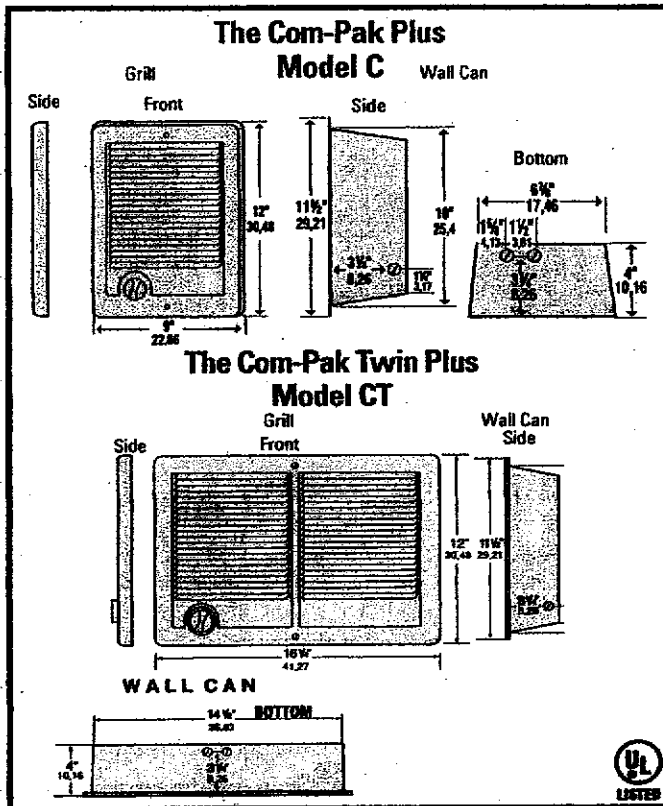
No responsibility is assumed for any incidental or consequential damages; this includes any damage to another product or products resulting from such a defect. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that above limitation or exclusion may not apply to you.



SAFETY & QUALITY

# The Com-Pak™ Plus

## OWNER'S GUIDE



### Features & Benefits

- Primary and Secondary Thermal Safeguards
- Commercial grade high temperature manual reset
- Over temperature one-time thermal device
- Nichrome element wrapped around mica insulators for durability
- Powder coat paint process eliminates sharp cutting edges
- Two year extended warranty
- Wall can designed for ease of installation
- Factory tested

#### Models:

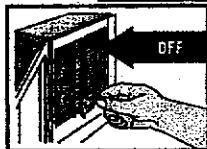
The Com-Pak Plus			
C021	*C021T	C152	*C152T
C051	*C051T	C202	*C202T
C052	*C052T	C208	*C208T
C072	*C072T	C101	*C101T
C102	*C102T	C151	*C151T
C122	*C122T		

The Com-Pak Twin Plus	
CT252	*CT252T
CT302	*CT302T
CT402	*CT402T
CT408	*CT408T

\*Standard built-in thermostat is single pole and has no "OFF" position

Tools Required:	Utility Knife
Phillips Screwdriver	4 1/2" Wood Screws
Straight Screwdriver	3 Insulated Wire Connectors
Wire Strippers	1 Strain Relief Connector

### IMPORTANT INFORMATION



#### ⚠ WARNING

Turn the electrical power off at the electrical panel board (circuit breaker or fuse box) and lock or tag the panel board door to prevent someone from turning on power while you are working on the heater. Failure to do so could result in serious electrical shock, burns, or possible death.

1. Read all information labels. Verify that the electrical supply wires are the same voltage as the heater.
2. All electrical work and materials must comply with the National Electric Code (NEC), the Occupational Safety and Health Act (OSHA), and all state and local codes.
3. The heater must be grounded to the grounding pigtail (copper wire) provided in the wall can.
4. If you need to install a new circuit or need additional wiring information, consult a qualified electrician.

5. Protect electrical supply from kinks, sharp objects, oil, grease, hot surfaces or chemicals.

#### ⚠ WARNING

DO NOT install the heater in a floor or behind doors. Overheating or fire may occur.

#### ⚠ WARNING

DO NOT install heater in any area where combustible vapors, gases, liquids, or excessive lint or dust are present. Fire or explosion may occur.

#### ⚠ WARNING

**Risk of Electrical Shock.** Connect grounding lead to grounding wire provided. Keep all foreign objects out of heater.

#### ⚠ WARNING

**Risk of Fire.** Heater must be kept clear of all obstructions: a minimum of 3' in front, 6" above and on both sides. Heaters must be kept clean of lint, dirt and debris. (See Maintenance Instructions)

**SAVE THESE INSTRUCTIONS**

# Installation Instructions

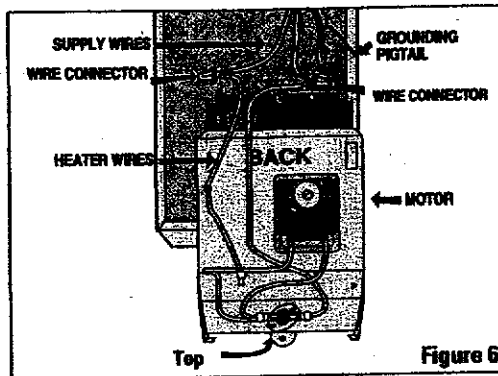
## Part Two

After you have followed all instructions in PART ONE for either new construction or an existing wall, you are ready to install the heater assembly.

**How do I insert the heater assembly into the wall can?**

### STEP 1 Install heater assembly

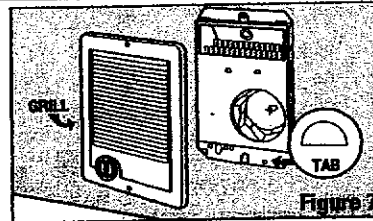
Turn heater assembly upside-down (element down) with motor facing you. Connect the supply wires to the heater wires with wire connectors (See Figure 6). Now rotate the heater so the element and fan are facing you (with the element 'up'). Insert the bottom edge of the heater assembly into the half round slots in the bottom lip of the wall can (See Figure 7). [IMPORTANT: Push wires into bottom of wall can during insertion. Be sure that supply wires are not caught between motor and wall can. Attach assembly at top with screw provided.]



### STEP 2 Install grill

Secure grill with the screws provided. If you have a built-in thermostat model, slide thermostat knob onto shaft. Turn power on at the electrical panel board.

Warranty is void if any material is sprayed on the element or blower. Use paint mask provided if walls are to be textured or painted.



## Operation & Maintenance

### How to operate your heater

- Once installation is complete and power has been restored, turn the thermostat knob fully clockwise.
- When the room reaches your comfort level, turn the thermostat knob counterclockwise until the heater turns off. The heater will automatically cycle around this preset temperature.
- To reduce the room temperature, turn the knob counterclockwise. To increase the room temperature, turn the knob clockwise.

### Maintenance

As needed, or every six months minimum.

- WARNING!** Before removing grill, turn the electrical power off at the electrical panel board (circuit breaker or fuse box). Lock or tag the panel board door to prevent someone from accidentally turning the power on while you are working on the heater. Failure to do so could result in serious electrical shock, burns, or possible death.
- Turn the heater thermostat all the way up and wait approximately 30 seconds (120 seconds for some electronic thermostats). If the heater turns on, you have turned off the wrong circuit breaker at the electrical panel board.
- If heater does not turn on, proceed with next step.
- Remove screws and take off grill.
- Wash grill with hot soapy water and dry immediately.
- While holding fan (to avoid damage or bending), use a hair dryer or vacuum on blow cycle to blow debris through the top element (Do not touch element).
- Vacuum fan area without touching the elements.
- Replace grill and secure with screws.

- Turn thermostat to desired setting.
- Turn power back on at the electrical panel board.

### About the Heater Temperature-Limiting Controls

The heater is protected by two temperature-limiting controls (for Model CT, four controls are used). The first is a high temperature manual reset limit control, designed to open the heater circuit when excessive operating temperatures are detected. The problem must be assessed and the limit must be reset to resume operation.

Further protection is provided by a secondary over-temperature switch, which will open the heater circuit in severe over-temperature conditions, or in the event of component failure. If this occurs, the heater must be repaired or replaced.

### Resetting the Manual Reset Limit Control

If the manual reset limit control has opened the heater circuit due to excessive operating temperatures, the heater will not work until the limit reset button is pressed. After allowing the unit to cool for at least 10 minutes and resolving the problem causing the limit to trip, use a narrow object such as a ball-point pen to access the reset button through the lower-left section of the heater grill. Press FIRMLY, and be sure to listen and feel for a click, indicating it has been reset.

Note that resetting the manual limit control may not restore heater operation if a severe over-temperature condition has occurred. See the Troubleshooting Guide on next page for more information.

**WARNING**  
Risk of Electrical Shock. Connect grounding lead to grounding wire provided. Keep all foreign objects out of heater.

**WARNING**  
Risk of Fire. Heater must be kept clear of all obstructions: a minimum of 3' in front; 6" on both sides and above. Heaters must be kept clean of lint, dirt and debris.

**WARNING**  
Turn the electrical power off at the electrical panel board (circuit breaker or fuse box) and lock or tag the panel board door to prevent someone from turning on power while you are working on the heater. Failure to do so could result in serious electrical shock, burns, or possible death.

## Wiring Diagrams

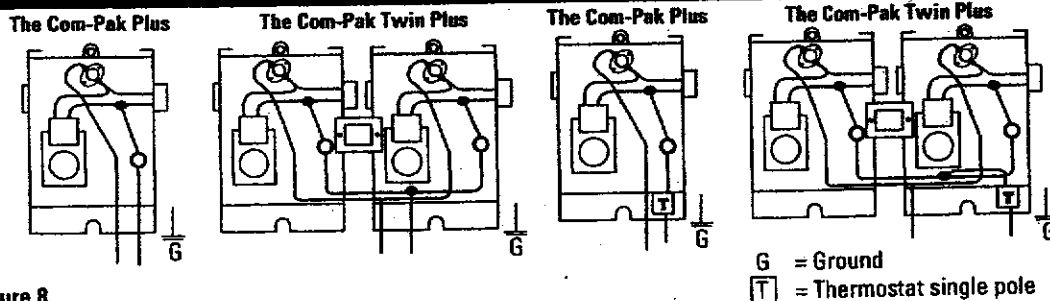


Figure 8

# Information and Operating Guide

The Customer Service phone number for MaxxAir is 800-780-9893, email is [maxxair@maxxair.com](mailto:maxxair@maxxair.com)

## Factory Tested

Every Turbo/Maxx ventilator is tested at the factory to ensure proper operation prior to shipment.

## Power Consumption

The Turbo/Maxx draws less than 4 amps at high speed (#3 setting) using 13.8 volts DC of power and under 1.4 amps at the lowest speed (#1 setting).

## Fuse Protection

The control console is protected by a factory-installed 7.5 amp non-reset replaceable automotive mini-fuse (located on the PC Board under the polarity light), a non-resettable fuse on the resistor board and an overheat protection switch within the motor. The Turbo/Maxx must also be connected to power wires that are fuse protected within the RV. We recommend a maximum of 7.5 amps fuse protection to this device.

## Air Flow Direction

The IN-OUT air direction switch is referred to as the "Rocker" switch. It changes the direction of the fan motor so that you may either pull air into the cabin or draw air out. It is imperative that the vent lid is open, and some other vent or window is also at least partially open to allow the powerful Turbo/Maxx motor to cool itself and to operate efficiently. Be sure to leave a window or other air vent open to give the Turbo/Maxx some fresh air to work with. This should be at a distance from the ventilator so that fresh air can travel through the entire living area before being exhausted by the Turbo/Maxx. Our Window/Maxx for sliding windows makes an ideal companion product for cross ventilation.

## Minimize Wear

When changing fan direction, it is advisable to stop the fan by turning the three-speed knob to the OFF position and wait about ten seconds before restarting the fan in the opposite direction.

## Thermostat Control (for Model 1200T only)

The overall temperature range of the thermostat on the 1200T model is set at the factory. Unless the Speed Control switch is in the "OFF" position, the Turbo/Maxx 1200T will be fully operable between 20 degrees F and 120 degrees F. To operate, set the fan to exhaust and turn the thermostat fully clockwise ("COOLER"). The fan should now be running. Slowly turn the thermostat counter clockwise until the fan just stops running. The thermostat has now "measured" the RV's existing temperature. The thermostat is designed to allow the RV interior temperature to rise approximately 5 degrees F from this setting before the fan will automatically restart and draw air into the RV from the outside. Turning the thermostat slightly more will increase this 5 degree range. When cooler air is drawn into the RV and the RV's interior temperature reaches its original setting the fan will automatically shut off. Positioning the thermostat knob fully clockwise ("COOLER") will allow the fan to run constantly.

## CAUTION!

When working on a Turbo/Maxx (cleaning the screen or fan blade), be certain to turn the speed control knob to the OFF position to avoid accidental starting. It would be advisable to turn the 12 volt vehicle power to the Turbo/Maxx OFF to be sure you are safe.

# Trouble Shooting Guide

**The Customer Service phone number for MaxxAir is 800-780-9893, email is [maxxair@maxxair.com](mailto:maxxair@maxxair.com)**

**Any trouble shooting of the Turbo/Maxx should be carried out after the wires have been completely disconnected from the printed circuit board (pcb) for at least ten (10) minutes.**

A sudden surge of power from another power source or the shorting or switching of two power wires connected at the PC board can severely damage it and jeopardize your own safety. Some system components run normally hot to the touch and should be allowed to cool prior to trouble shooting.

A circuit failure may appear to be the same as a blown fuse. Turn off your motor at the control box and your 12 volt power to the Turbo/Maxx. Check your fuses first. Resistor board components get hot even during normal operation. Do not put your hands in the motor/fan blade area within ten (10) minutes of shutting the unit off. The control console contains an automotive 7.5 amp mini-fuse. To gain access to this fuse, the console must be removed from the ceiling. Lift the control circuit board cover to replace the fuse. Caution: a blown fuse may indicate a severe electrical problem in your RV. You may wish to contact an RV Technician for assistance.

Should your Turbo/Maxx run on the incorrect speed setting, you probably have an incorrect 12 volt wire hook-up. Call MaxxAir's Customer Service Dept. for guidance, or review previous wiring instructions and make corrections as needed.

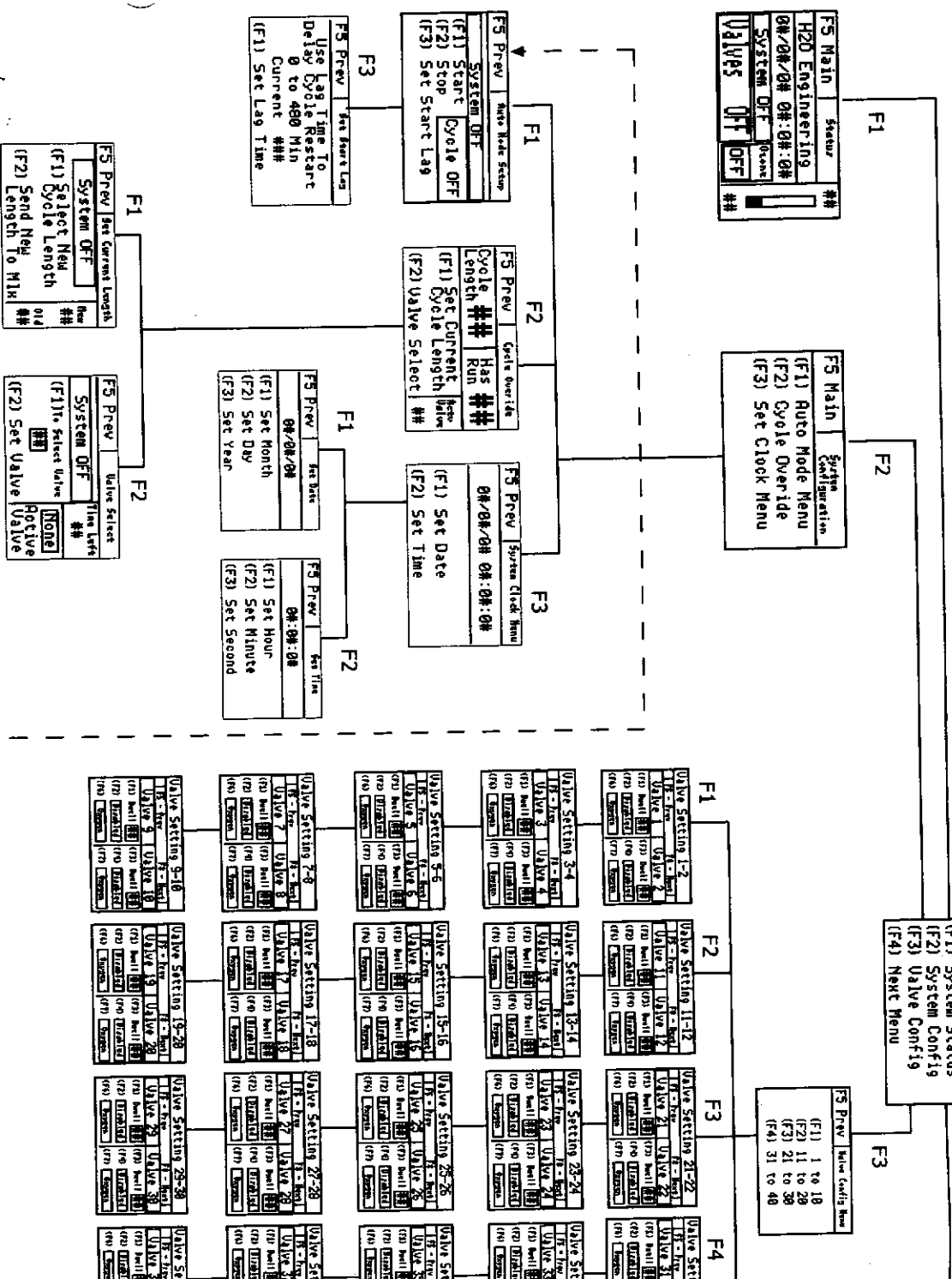
If the fan motor does not run, check the following:

1. Reconfirm the 12 volt power source polarity has been correctly connected to the proper terminals.
2. Use a volt meter or 12 volt test light to confirm 12 volt power is available at the power supply wires.
3. Disconnect all wires from the control box PC board and connect the 12 volt supply directly to the black and white fan motor leads. If the fan runs, you may have a problem with the PC or resistor boards. If the fan motor does not run, check for loose terminal connections on the roof that are located inside the TURBO/MAXX housing. **DO NOT CHANGE WIRES AROUND!** Your Turbo/Maxx was tested at the factory.

The state-of-the-art resistor board that is attached to your housing is protected by a 7.5 amp non-resettable fuse that will cut all power to the unit in the event circuit failure is experienced by the board. Jamming of the fan blade or an abnormal electrical occurrence can over-tax the fan motor or resistor board, creating excessive heat that will shut down specific components. These are not user serviceable parts and we suggest you call Customer Service for further instructions.

Once you are satisfied you have corrected a problem, the fan speed control should be switched to the OFF position for a minimum of five (5) minutes before restarting the system. This will allow the circuit and thermal cut-out device in the motor to cool and automatically reset.

# Panel View Screen Diagram (Rev. 5.2, 010107)



H2O Engineering, Inc.  
 265 Prado Road, Suite #1  
 San Luis Obispo, CA 93401  
 805-547-0303  
 805-547-0113 Fax  
 www.h2oengineering.com

\*\* This information is confidential, proprietary and/or privileged material. Any unauthorized review, distribution or other use of or the taking of any action in reliance upon this information is prohibited. 040100.

\*\* Note: Applicable program screens will only be functional in accordance with the appropriate product model.

F4

F5 Prev Alarm List Menu  
 (F1) Alarm List Menu  
 (F2) Set Alarm Delay  
 (F3) View Totals

F5 Prev Set Alarm Delay  
 Current #####  
 Delay  
 (F1) Set Delay Time

F5 Prev Alarm List Menu  
 (F1) View List  
 (F2) Clear List

F5 Prev Alarm List Menu  
 (F1) Alarm List Menu  
 (F2) Clear List

WARNING...  
 CLEAN ALARM HISTORY  
 F1 ABORT F2 CONT.

F5 Main Show Total Run  
 System Total Runtime  
 ##### Hr ##### Mn  
 (F1) View 1 - 20  
 (F2) View 21 - 40  
 (F3) goto Reset Menu

### Alarm Screens

ALARM  
 R11 High  
 (F1) Acknowledge

SYSTEM SHUTDOWN  
 TEMPERATURE DETECT  
 Acknowledge Required  
 (F1) Acknowledge  
 (F4) Auto Mode Menu

SYSTEM SHUTDOWN  
 FUEL SHUTDOWN DETECT  
 Acknowledge Required  
 (F1) Acknowledge  
 (F4) Auto Mode Menu

SYSTEM SHUTDOWN  
 HIGH TEMP PRESENT  
 Acknowledge Required  
 (F1) Acknowledge  
 (F4) Auto Mode Menu

SYSTEM SHUTDOWN  
 INTERNAL OZONE  
 ##/##/####  
 ##:##:##  
 (F4) Auto Mode Menu

F5 Prev Alarm List Menu  
 (F1) Alarm List Menu  
 (F2) Set Alarm Delay  
 (F3) View Totals

F5 Prev Set Alarm Delay  
 Current #####  
 Delay  
 (F1) Set Delay Time

F5 Prev Alarm List Menu  
 (F1) View List  
 (F2) Clear List

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 (F1) Alarm List Menu  
 (F2) Clear List

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