OZOTECH™

AIM P30 & P50 Ozone Generators

Operation & Maintenance Manual

M43-31386 REV C

OZOTECH, Inc. • 1015 South Main Street, Yreka, CA 96097 • Ph. 530.842.4189 • ozotech.com

Table of Contents

List of Figures

Dear Valued Customer:

Welcome to the AIM P30 and AIM P50 ozone generator user manual!

Congratulations on your purchase of an AIM P Series generator! This comprehensive user manual is designed to be your ultimate guide to unlocking the full potential of your new AIM P Series generator. Whether you're a first-time user or an experienced water treatment professional, this manual will provide you with the knowledge and insights you need to make the most out of your AIM P Series generator.

What's Inside

In this manual, you'll find clear and concise instructions on how to set up, operate, and maintain your AIM P Series generator. We've organized the content in a logical sequence, from initial unboxing to advanced usage techniques, making it easy for you to navigate and find exactly what you need. Each section is accompanied by illustrative diagrams, helpful tips, and troubleshooting suggestions, all aimed at enhancing your experience.

Your Feedback Matters

We're dedicated to continuous improvement, and your feedback is invaluable to us. If you have suggestions for improving this manual please contact us. If you encounter any challenges, please reach out to your local dealer.

Thank you for choosing Ozotech.

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1.0 Caution

Read the following safety guidelines thoroughly before attempting to operate or install your equipment.

As with all electrical devices, this equipment should never be allowed to come in contact with water.

Only qualified personnel should be allowed to set up, maintain and operate this equipment

The equipment must be operated using a properly grounded electrical circuit that is protected by either a fuse or circuit breaker.

Do not use an extension cord to supply power to this equipment.

Use a power conditioner if line voltage fluctuates outside of specified range.

Units must never run with internal air flow rate or pressure below manufacturer's specifications.

Unit must be disconnected from power prior to performing service or repair.

* Ozotech, Inc., assumes no liability for damages or injuries incurred by misuse of this product.

2.0 Theory of Operation

Your AIM P Series ozone generator is a state-of-the-art device designed to produce a significant amount of highly concentrated ozone by means of our proprietary Advanced Impedance Management technology, "AIM". The technology utilized by Ozotech, Inc., to generate ozone is known as "Plasma Discharge".

By supplying a high purity oxygen feed gas through the ozone generator, along with the proper amount of back pressure applied, concentrations above 7.5% by weight, (or an output of around 50 grams per hour). Your AIM P Series generator will come pre-set to operate in "Manual Ozone Adjustment" mode. This means that after installing your AIM P Series ozone generator, simply turning the "Ozone Enable" switch to "Ozone ON".

The "Manual Ozone Adjustment" knob can be adjusted to dial the % of power you want the generator to run at. This will be shown on the "Power Display". If you are planning on running the system with a 4-20mA, 0-10VDC or a 0-5VDC (0-10mA maximum) external signal, you will need to remove power at the source of the unit and run the appropriate signal cables to the "External Signal Port" terminal block.

Replace the lid and reestablish power. Move the "Ozone Enable" switch to "ON". If using a remote signal turn the "Signal Input" switch to "Remote Signal". You can now use your controller to operate your generator.

2.1 Plasma Discharge Ozone Generation

Plasma discharge generators create ozone through the action of high voltage, low current electrical "arcs" across an air space. When oxygen (O2) is passed through the air space, some molecules are split, resulting in "free" oxygen atoms which quickly attach themselves to intact O_2 molecules.

The result is a very unstable form of oxygen, O_3 (ozone). It is the extra atom of oxygen that gives ozone its superior oxidation capabilities. Unlike other oxidants, such as chlorine and hydrogen peroxide, ozone reverts back into oxygen over time making it an environmentally friendly oxidizer.

3.0 Operating Conditions

Your AIM P Series ozone generator requires special operating conditions in order to maintain performance and reliability. Warranty coverage of your equipment is contingent upon strict compliance with the operating conditions specified in this manual.

3.1 Operating Environment

EXTERNAL
Choose a location for your equipment that is clean, dry, and free of excessive airborne particles. Your equipment requires a constant flow of clean air for proper internal cooling. A minimum of six (6) inches clearance is required around the front, bottom, left and right sides of the unit to eliminate restriction of air flow. Direct exposure to moisture must be avoided. The AIM P Series ozone generator chassis is designed to be drip-proof. It is not watertight.

Mount your AIM P Series ozone generator in the best possible operating environment available at your installation site.

INTERNAL
The operating environment inside the chassis is also important. Maintaining a clean, dry unit will increase overall performance and extend service life. A common cause of failure is un-contained corona (electrical arcs) within the chassis environment. Moisture and dust are facilitators of this condition. They both help create a “path” for the plasma to develop and follow. Once established, the plasma usually does not stop until it has become severe enough to cause catastrophic failure of the plasma discharge, and subsequently blows the fuse. Note: If this condition develops, contact the manufacturer.

3.2 Internal Air Flow Specifications

As mentioned in the Theory of Operation section, plasma discharge relies upon a flow of high purity oxygen passing through the ozone generator.

The rate at which air is drawn (or forced) through the ozone generator is user adjustable. You may fine tune the flow rate to best suit your specific application. However, in no case should the air flow rate be allowed to drop below the minimum values specified below. Failure to provide minimum air flow rates may allow your ozone generator to develop too much heat, possibly leading to equipment failure.

Model	**Minimum Air Flow Rate in Standard Cubic Feet per Hour (SCFH)**
AIM P30/AIM P50	10 @ (5psi of back pressure)

3.3 Preparation of Input Air

Regardless of the method of ozone generation, properly preparing the input air (feed gas) will pay huge dividends in performance and reliability. Ozotech, Inc. does not recommend the use of any AIM Series ozone generator without air preparation. Warranty coverage of your ozone generator is contingent upon operation with air preparation equipment.

The key to air preparation is in the removal of Hydrogen (H) and Nitrogen (N) found in ambient air. When atoms of Hydrogen and Nitrogen are subject to plasma discharge, by-products such as Nitrous acid (HNO_2) and Nitric acid (HNO_3) are formed. The formation of these compounds inhibits performance and increases the frequency of maintenance.

To understand how performance is affected, we must recall from the Theory of Operation section that ozone is created by splitting an oxygen molecule (O_2), and then joining the liberated oxygen atoms (O) with intact oxygen molecules.

Imagine that in addition to oxygen molecules, your feed gas also contains Hydrogen and Nitrogen atoms. After being subjected to plasma, some of the Hydrogen and Nitrogen atoms will attach themselves to intact oxygen molecules, forming HNO_3, or Nitric acid. Others will attach themselves to ozone molecules, forming HNO_2, or Nitrous acid. It is the formation of these compounds that reduces performance potential. It is simple to understand why. If ozone molecules were not being "used" by Hydrogen and Nitrogen in the formation of acids, more would be available to be used in oxidation. Likewise, if oxygen molecules were not "used" to form acids, they would be available for the creation of more ozone.

Increased service life and reduction in maintenance are gained due to the same principle. With less HNO_2 and HNO_3 being formed, plasma discharge maintenance can be reduced without the risk of acid buildup. Since both HNO_2 and HNO_3 are highly conductive, they are capable of producing a path for corona (electrical arcs) inside of the Plasma block. As stated previously, once an arc has started, catastrophic failure is the usual result.

Your AIM P Series ozone generator must be used with a positive pressure air preparation device. Negative pressure devices, such as heat-regenerated desiccant air dryers rely upon the action of the venturi injector to draw air through the generator (and the dryer). This method is not utilized with the AIM P Series generator, due to it introducing moisture laden ambient air. Positive pressure devices, such as the $ProO_2$ or AirSep series oxygen concentrators utilize an internal air compressor to push prepared air through the generator.

Your AIM P Series generator is designed for **not more than 50 psi** of internal pressure.

3.4 Input Power Requirements

The AIM P30, powered by 115 or 230VAC at 50/60Hz, accommodates a wide range of world supply voltages and frequencies. The AIM P50 is powered by 115VAC 50/60Hz or 230VAC 50/60Hz. It is extremely important that your equipment is provided with the appropriate operating power source. Most supply voltages fluctuate, so it is necessary to monitor your voltage and assure it is within acceptable variance values listed below.

Voltage = (Specified) +/- 5%
Frequency = (Specified) +/- 5%

Power Consumption, AIM P30:	Stand-By Mode = 16 Watts Ozone Enabled Mode (@100% power) = 207 Watts
Power Consumption, AIM P50:	Stand-By Mode = 16 Watts Ozone Enabled Mode (@100% power) = 300 Watts

Wiring for 115 VAC: Connect the Line wire (Black) to "L1", the Neutral wire (White) to "N", and the Ground wire (Green, Green/Yellow, or bare) to ⏚ on the input terminal block.

Wiring for 230 VAC: Connect the Line 1 wire (Brown) to "L1", the Line 2 wire (Blue) to L2 wire, and the Ground wire (Green, Green/Yellow, or bare) to ⏚ on the input terminal block.

Note: If your line voltage fluctuates beyond acceptable variance, it will be necessary to connect your equipment to a line conditioner.

4.0 Maintenance

AIM P Series generators are designed and delivered for maximum efficiency and long life. No adjustments, other than fine-tuning the air flow rate to match user-specific requirements, should be made by the end user. Simple maintenance and appropriate operating conditions are the only requirements to keep the unit functioning within manufacturer's specifications. There must be at least 5psi of back pressure applied when operating the AIM P Series generators. This is accomplished by using the labeled "back pressure adjustment" control knob located on the front of the generator.

Performing any other modifications or adjustments to internal components will cause the unit to function outside of the manufacturer's specifications and will cause damage to the unit not covered under terms of warranty. Maintenance should only be performed by qualified individuals. Your ozone generator operates under conditions of high voltage; maintenance personnel should be trained in electrical safety.

4.1 Plasma Block Maintenance

AIM P Series plasma generators are completely intrinsic modular units, with no user maintenance involved. If at some point a noticeable decrease in ozone production presents itself over time, moisture has most likely accumulated inside the plasma block causing a build up of nitric acid. If this should occur perform the below procedure.

Plasma Block Nitric Acid Removal Process (See illustration #1)

a. Disconnect all power from the AIM P Series generator at its source.

b. Disconnect the “Air Inlet” and “Ozone Outlet” lines from the Plasma Block itself.

c. Connect customer supplied tubing lines, (3/8” ID PVC tubing), to the Plasma Block inlet and outline ports.

d. Run isopropyl alcohol from the air inlet line until it starts to exit the ozone outlet line.

e. Work the alcohol back and forth through the Plasma Block.

f. Discharge the alcohol through the ozone outlet port until the alcohol exits clear, and free of any yellow/brown tinge indicating nitric acid.

g. Reconnect the generator’s original “Air Inlet” and “Ozone Outlet” lines.

h. Operate the oxygen concentrator or bottled oxygen through the generator for approximately 10 minutes to ensure the alcohol is cleared out of the Plasma Block prior to reapplying power to the unit.

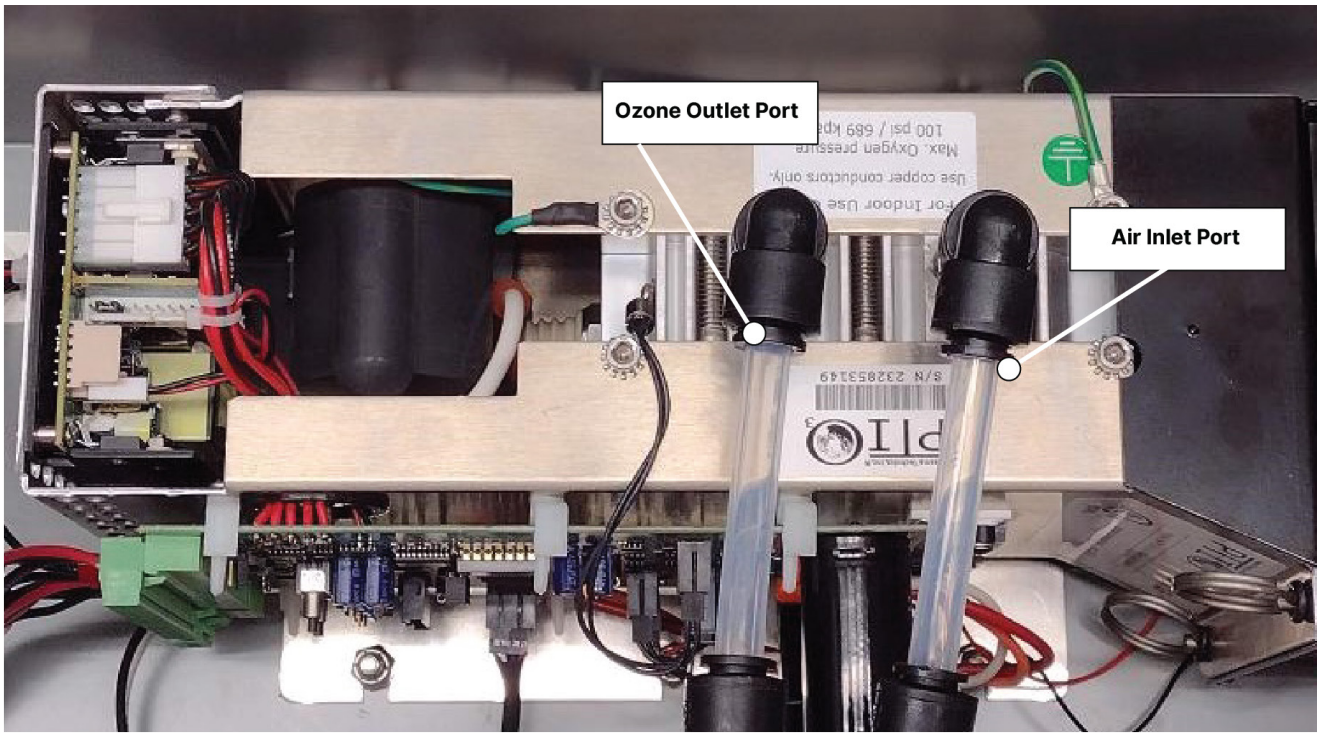


Figure 1: Air Inlet & Ozone Outlet Ports

4.2 Intake Filter Maintenance

The intake filter is located on the side of the chassis, as shown in figure 2. This filter removes dust particles from the air drawn into the chassis. Proper cooling of internal components requires filters to be clean, dry, and intact.

1. Remove the top inside screws of the louver.
2. Loosen, but don't remove the bottom two screws of the louver.
3. Remove the intake filter from behind the louver.
4. Clean or replace the intake filter as needed.
5. Install intake filter in reverse order.

Frequency of Maintenance
- Every 2,190 hours = 3 months (730.485 hrs. /month)

To Clean Intake Filter
- Remove filter media. Wash gently in soap and water. Dry thoroughly. Inspect for tears, holes, etc. If the filter is intact, replace by reversing the previous step.

Note: Depending on the severity of your specific environment, it may be necessary to increase frequency of maintenance.

Frequency of Replacement
- Every 4,383 hours (6 months)

To Replace Intake Filter
The replacement procedure is identical to maintenance procedure.

Note: Depending on the severity of your specific environment, it may be necessary to increase frequency of maintenance.

4.3 Chassis Maintenance

Proper maintenance of your generator chassis will provide more than aesthetic advantages. Dust and moisture can contribute to a path for electrical arcs. A clean internal environment will reduce the likelihood of corona outside of the plasma block.

Frequency of Maintenance
- Every 2,190 hours (3 months)

To Maintain Chassis
- Disconnect unit from power source.
- Remove chassis lid.
- Using a clean, dry cloth, carefully wipe out the inside of the chassis and all internal components to remove any dirt or debris. Use a low pressure (≤20 psi) stream of compressed air or a can of compressed air to blow dust from electrical components.
- Using a damp cloth, clean the outside of the unit. A mild detergent may be used.
- Thoroughly dry chassis, inside and out.

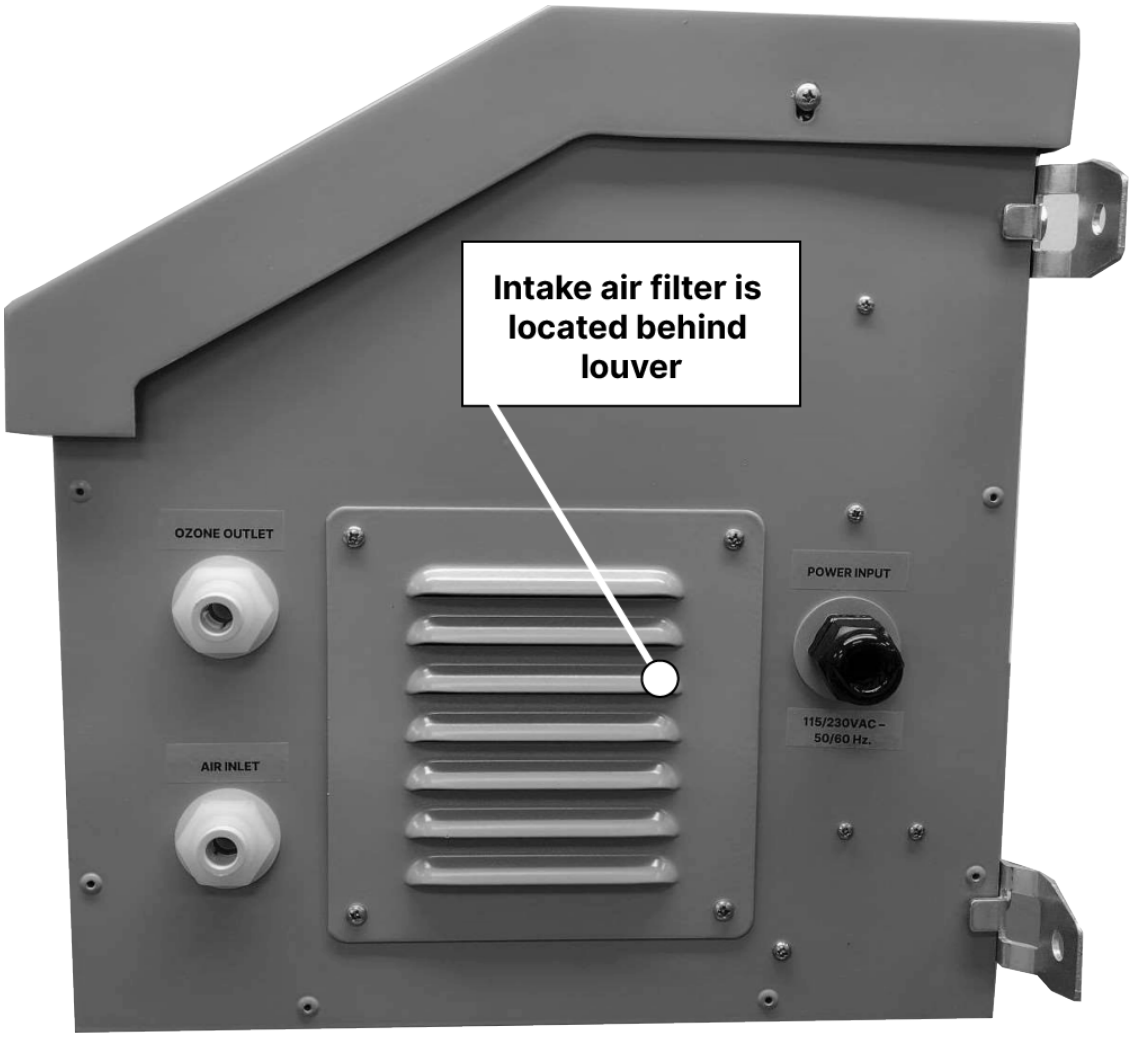


Figure 2: Intake Filter Location

4.4 Check Valve & Vacuum Prevention Device Replacements

We strongly suggest that tall check valves and vacuum prevention devices are closely inspected as often as possible, such as each time maintenance of any type is performed. If water is visible between the check valve and the ozone generator, cracks are visible in the check valve body, or foreign matter has built up on the internal O-ring, replacement should be performed immediately, regardless of elapsed time since last replacement.

The minimum required replacement schedule is listed below, and must be performed on schedule, even if the check valve appears sound to maintain warranty terms.

Frequency of Replacement
- Every 6 months

To Replace Check Valve (See figure 3)
- Disconnect unit from power source.
- Allow the ozone generator to clear of ozone gas.
- Remove tubing from check valve barb fitting on both sides.
- Trim approximately one inch from the end of each tube, to remove distortion caused by the barbed adapter.
- Place new check valve assembly in-line, between ozone generator and venturi injector. Check valve flow direction must point toward the venturi. (See figure 3)

Frequency of Replacement
- Every 12 months

To Replace Vacuum Prevention Device (See figure 4)
- Disconnect unit from power source.
- Allow the ozone generator to clear of ozone gas.
- Unscrew the vacuum prevention device.
- Install the new vacuum prevention device.

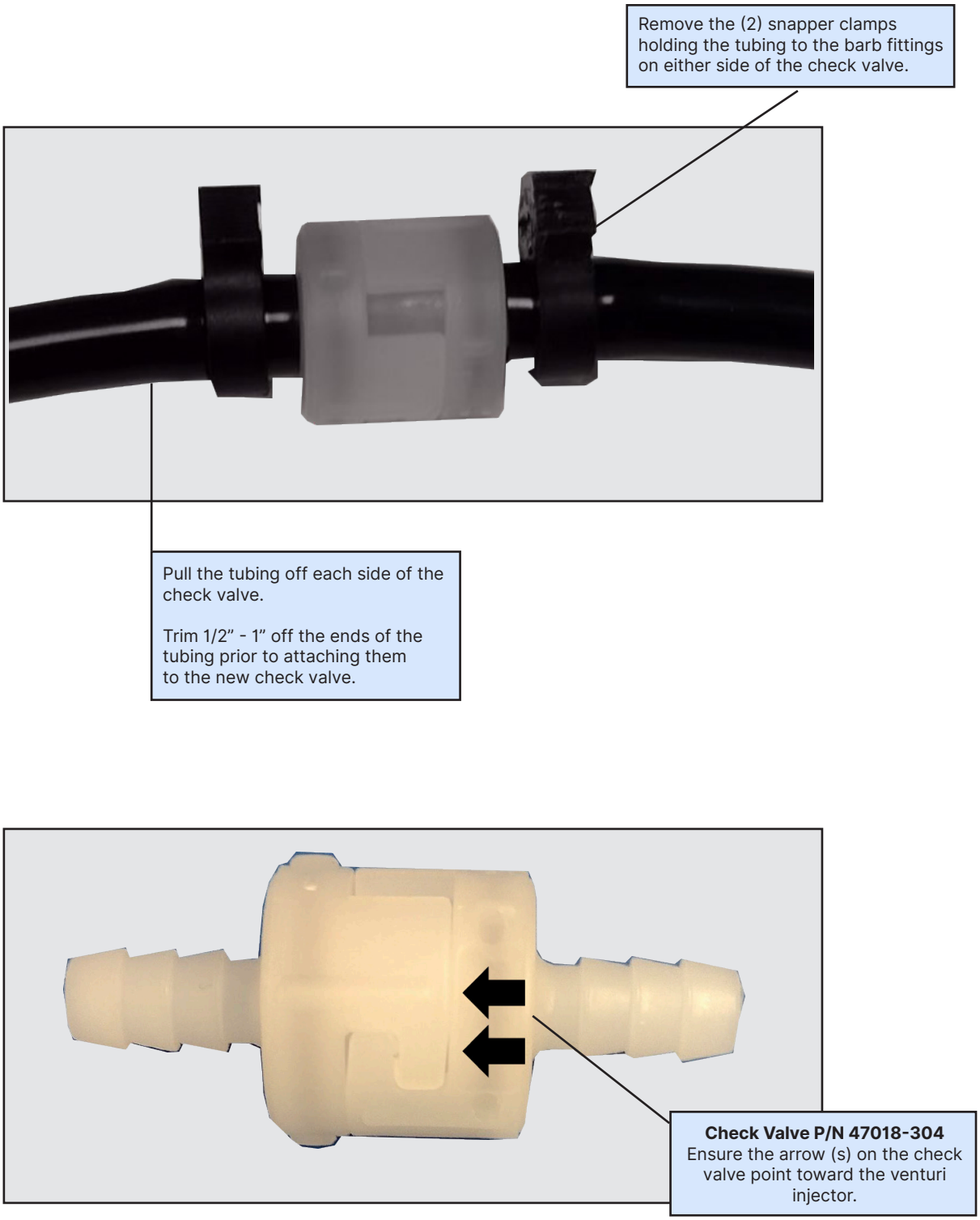


Figure 3: Check Valve Replacement

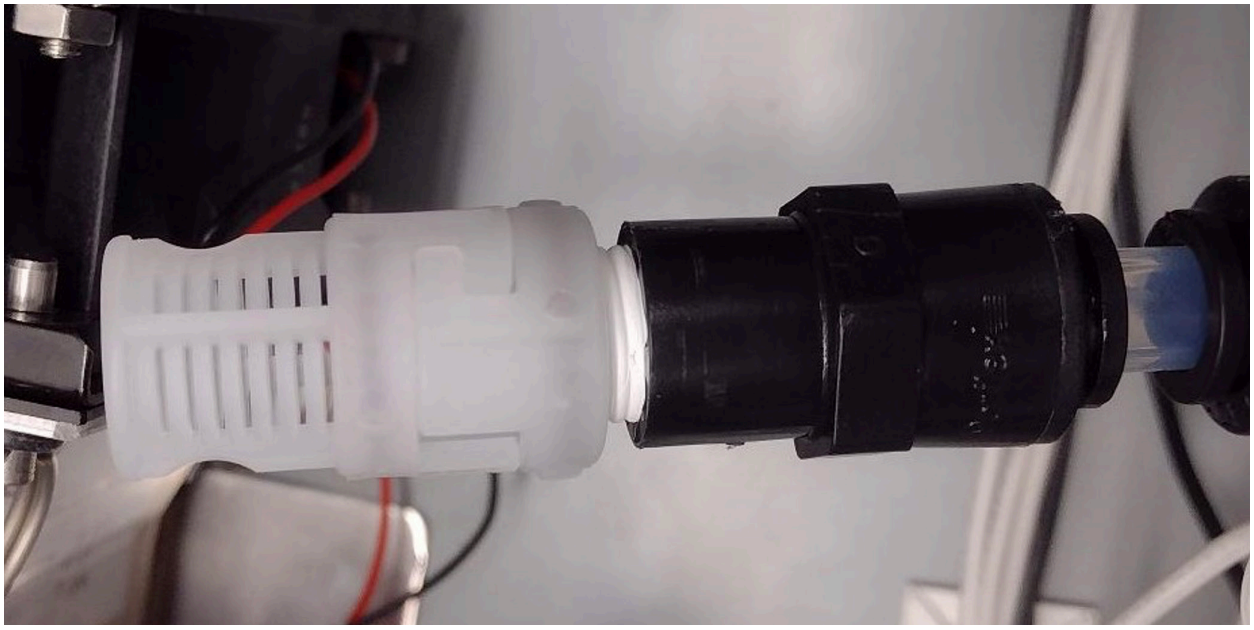


Figure 4: Vacuum Prevention Device

5.0 Fusing

There are fuses connected to live source conductors that are accessible from the outside of the chassis. Figure 5 below shows the fuse locations.. Fuse size and value is listed below:

Model AIM P30 115/230 Vac Models	**Fuse Size** 5mmx20mm	**Fuse Value** 5 Amp Slow Blow, IEC127
Model AIM P50 115 Vac Models	**Fuse Size** 5mmx20mm	**Fuse Value** 10 Amp Slow Blow, IEC127
Model AIM P50 230 Vac Models	**Fuse Size** 5mmx20mm	**Fuse Value** 10 Amp Slow Blow, IEC127

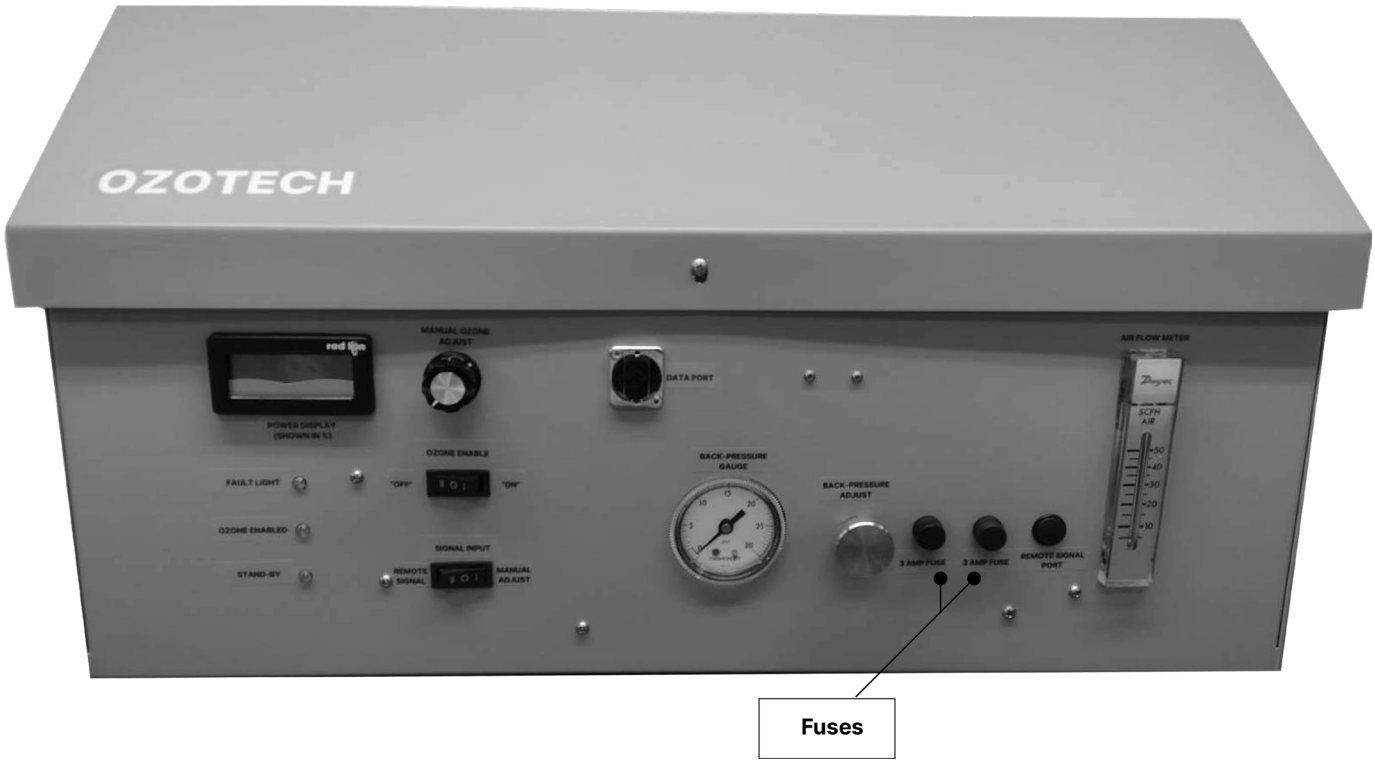


Figure 5: Chassis Component Details (Front)

Figure 6: Chassis Component Details (Right Side)

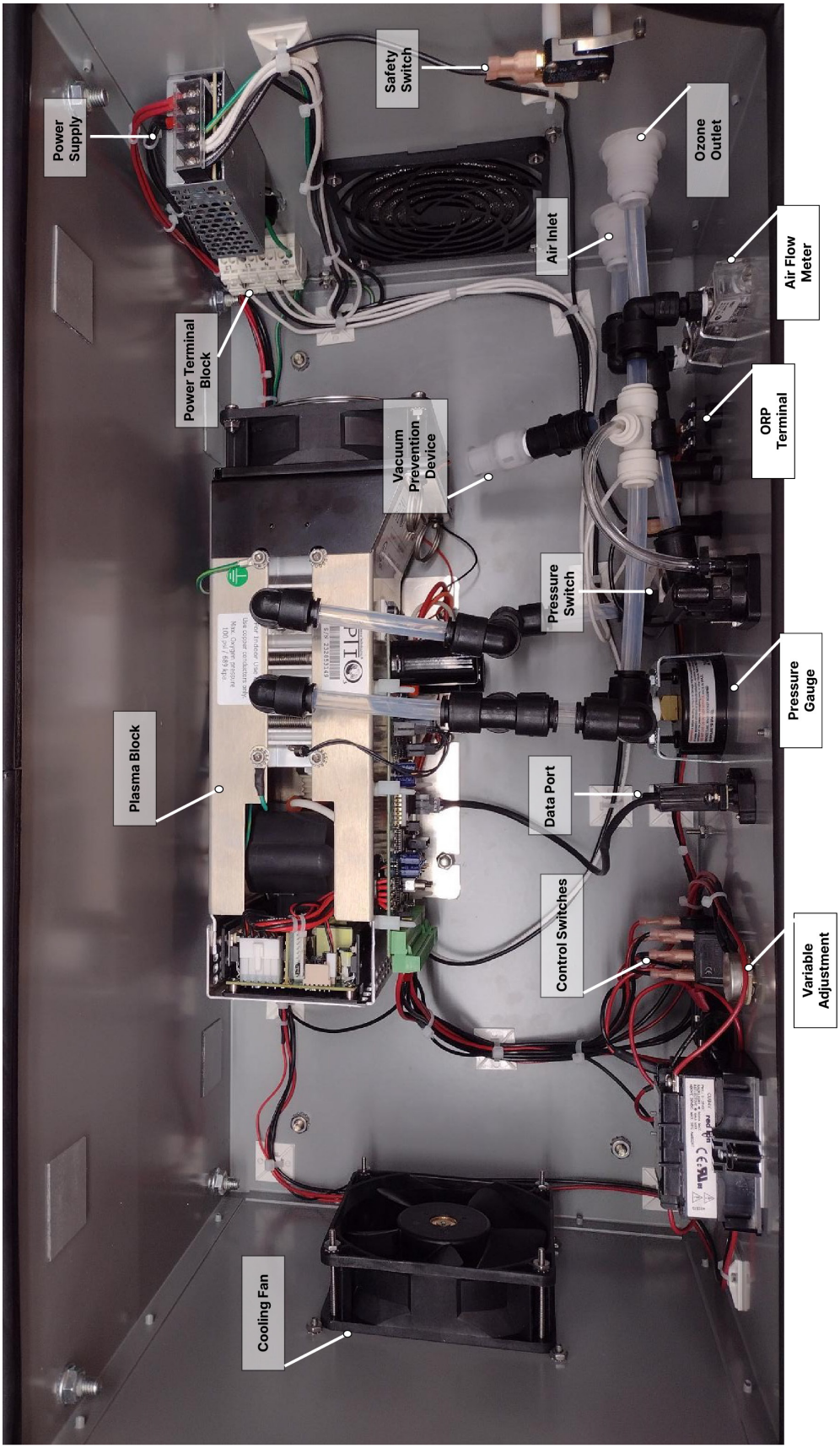


Figure 7: AIM P30 Internal Components

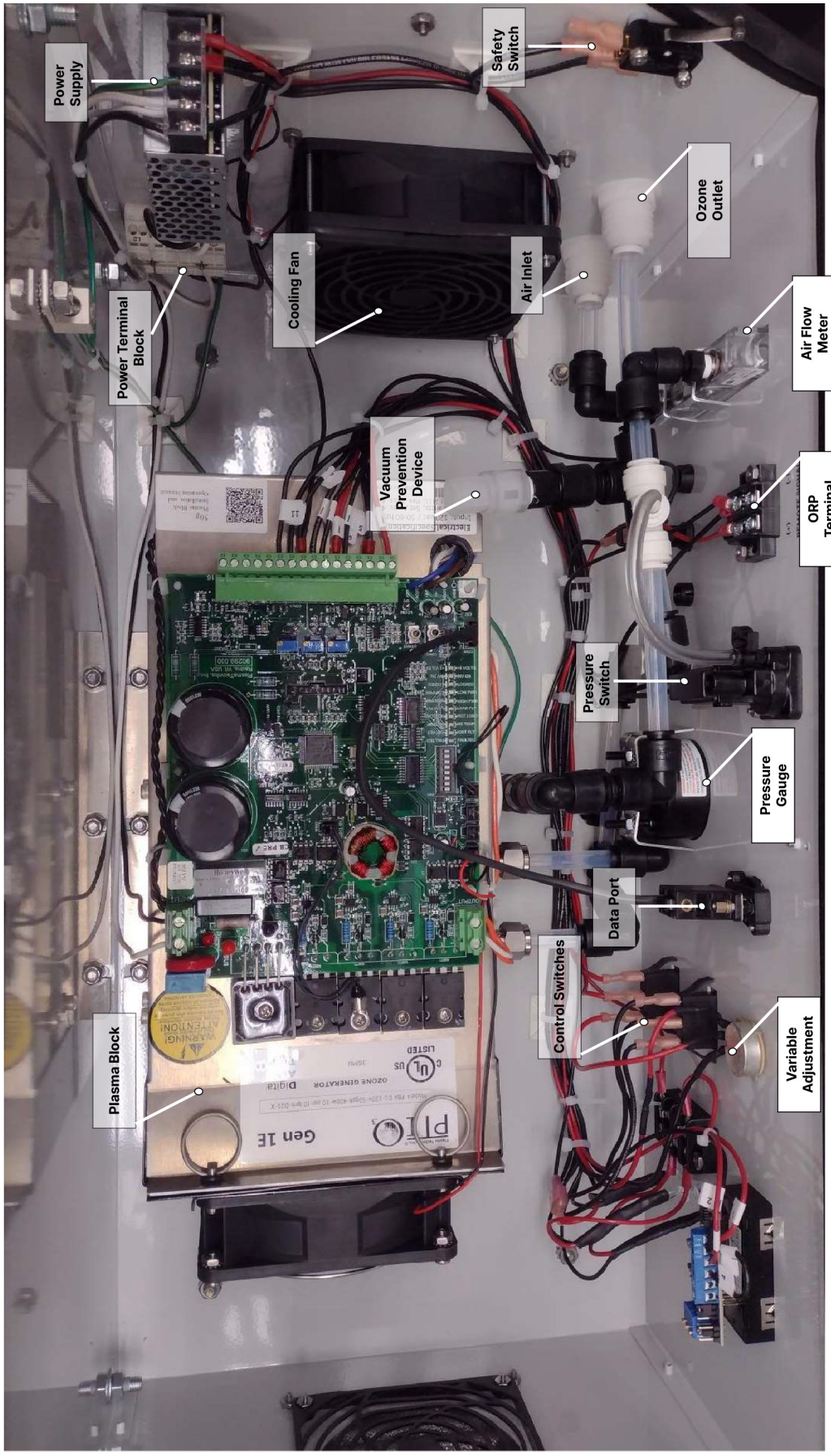


Figure 8: AIM P50 Internal Components

6.0 Spare/Replacement Parts

(*) Denotes recommended spare maintenance parts with initial purchase. Followed by quantity, per unit, recommended for one year's scheduled maintenance.

Part #	Description Applicable	Model
40137	Plasma Block Ozone Generator	AIM P30
40138	Plasma Block Ozone Generator, 115Vac	AIM P50
40139	Plasma Block Ozone Generator, 240Vac	AIM P50
43382	Digital Power Display	All AIM P Models
40013	Fan Guard	All AIM P Models
38097	Filter Media	All AIM P Models
43404	Fuse, 5A S.B., IEC127	AIM P30 Models
43403	Fuse, 10A S.B., IEC 127	AIM P50 Models
43377	Control Switch	All AIM P Models
47076	Back-Pressure Valve	All AIM P Models
32367	Back-Pressure Gauge	All AIM P Models
47018-304	Check Valve, ½#* (Qty = 2)	All AIM P Models
44245	Tubing, FEP 1/4"I.D. x 3/8"O.D.	All AIM P Models
40080PS	Power Supply (115/220vac – 12VDC)	All AIM P Models
45268	Vacuum Prevention Device	All AIM P Models

Note: Spare parts are listed for only the most commonly purchased models. For options not included in this section, consult your dealer.

7.0 Troubleshooting Guide

A qualified electrician should perform troubleshooting, in accordance with sound electrical safety practices.

Symptom	Possible Cause	Remedy
Indicator light does not turn on.	Unit is not connected to a power source or is connected to improper power source.	Refer to power input labeling on the right-side panel of the chassis and or section 3.4 of this manual. Connect unit to proper power source.
	Unit does not have appropriate back pressure	Turn the output adjustment knob clockwise to turn unit 'ON'.
	Chassis lid Interlock Switch is not engaged	Ensure Lid Interlock Switch engages when lid is closed. Bending actuator arm upwards if necessary.
	Fuse is blown.	Visually inspect unit and compare to wiring diagram. Inspect plasma block for damage. Inspect wire from High Voltage Transformer to plasma block for disconnection or burn marks. Repair any and all problems prior to placing unit in service or contact factory for service information.
	Light has failed.	Replace specific light assembly. Refer to Section 6.0 Spare/Replacement Parts for replacement part information.
Unit keeps blowing fuses	Electrical short circuit	Visually inspect unit, and check for loose connections. Inspect printed circuit board for burn marks. Inspect HV wire from printed circuit board to ozone cell for disconnection or burn marks. Repair any and all problems prior to placing unit in service or contact factory for service information.
	Incorrect fuse value and type are being used.	Replace with appropriate size/type fuse. Refer to Section 6.0 Spare/Replacement Parts for replacement part information.
	Unit is connected to improper power source.	Refer to power input labeling on the right-side panel of the chassis and or section 3.4 of this manual.
Unit does not produce adequate concentration of ozone.	Air flow rate is too high.	Adjust air flow meter to lower setting, within range specified in Air Flow Specification section 3.2 of this manual.
	Does not have appropriate back pressure.	Adjust back pressure to at least 5 psi.
	Unit is running too hot due to insufficient cooling air flow.	Refer to Air Flow Specification section 3.2 of this manual.
	Unit is connected to improper power source.	Connect unit to proper voltage. AIM P30 is 115VAC/50 or 60 Hz. Refer to the AIM P50 power label for proper voltage and frequency.

7.0 Troubleshooting Guide Cont.

Symptom	Possible Cause	Remedy
Unit does not produce adequate concentration of ozone, even with air flow rate set at levels that previously produced adequate ozone concentration.	Plasma block requires maintenance.	Refer to Section 4.1 Plasma Block Maintenance Section of this manual.
	Air preparation device is not functioning at prior level of performance.	Inspect/maintain air preparation equipment in accordance with manufacturer recommendations.

8.0 Limited Warranty

OZOTECH, Inc., warrants the AIM P30 and AIM P50 ozone generators to be free from defects in parts and workmanship for (12) months from date of invoice, under conditions of normal use. The plasma cell is warrantied against catastrophic electrical failure for 3 years from date of invoice. All other parts, repaired or replaced, will be warranted only for the remainder of the original warranty period.

OZOTECH, Incorporated will refund the purchase price, perform repairs or replace equipment, at the option of OZOTECH, Incorporated.

The warranty shall be null, void, and non-binding upon OZOTECH, Incorporated if OZOTECH, Incorporated (or authorized service center) determines the cause of malfunction or defect to be a result of:

1. Failure to perform proper maintenance as defined and recommended in this manual.

2. Failure to adhere to and provide proper operating conditions, as defined in this manual, including operation outside of temperature range, operating in wet or dirty environment, operation outside of manufacturer's specifications.

3. Adjustments made by user other than product output flow rate within ranges specified by manufacturer.

OZOTECH, Incorporated assumes no liability for damages incurred by deliberate or incidental misuse of this product, or damages incurred in transit.

Read Limited Product Warranty>Link

9.0 Service Returns

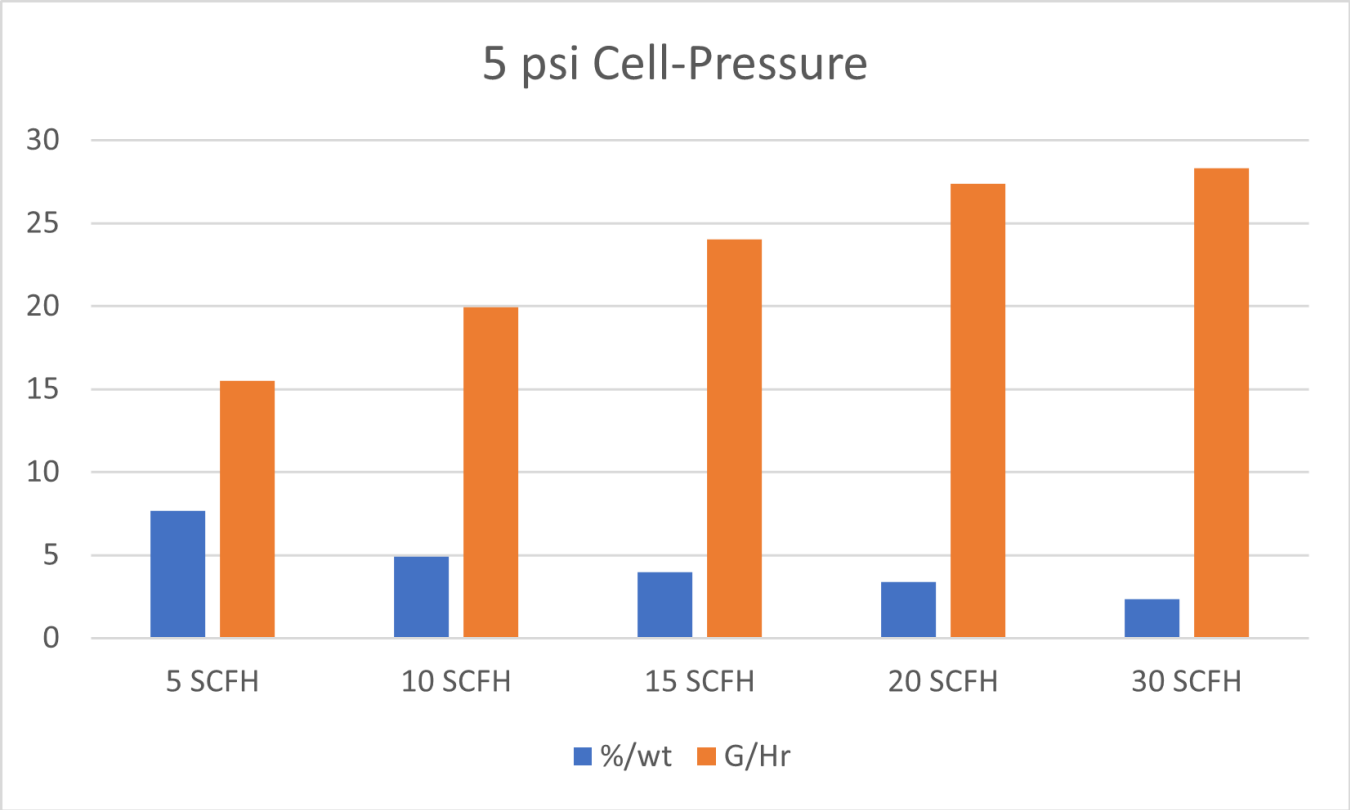
If the need arises to return your equipment for service, the following procedure must be followed to ensure accurate and timely processing of repairs.

- ✓ Obtain model number/name of unit to be returned.
- ✓ Contact Ozotech, Inc and request a Return Material Authorization (RMA) form. Make sure to give the factory representative an accurate and current shipping address.
- ✓ Provide a description detailing the problem with the unit. Be as specific as possible.
- ✓ After receipt of RMA form, package unit for shipment. Enclose the RMA form with the unit. Use the original packaging materials if possible. If not, please package the product to ensure against shipping damage.
- ✓ Clearly write the RMA number on the outside of the shipping package.
- ✓ Verify that the address is correct and current.
- ✓Shipments that are not factory authorized will be refused.

It is recommended that you ship with a reputable and reliable shipping company, and that the contents of the package are insured. Ozotech, Inc. accepts no responsibility for damage or loss of equipment in transit.

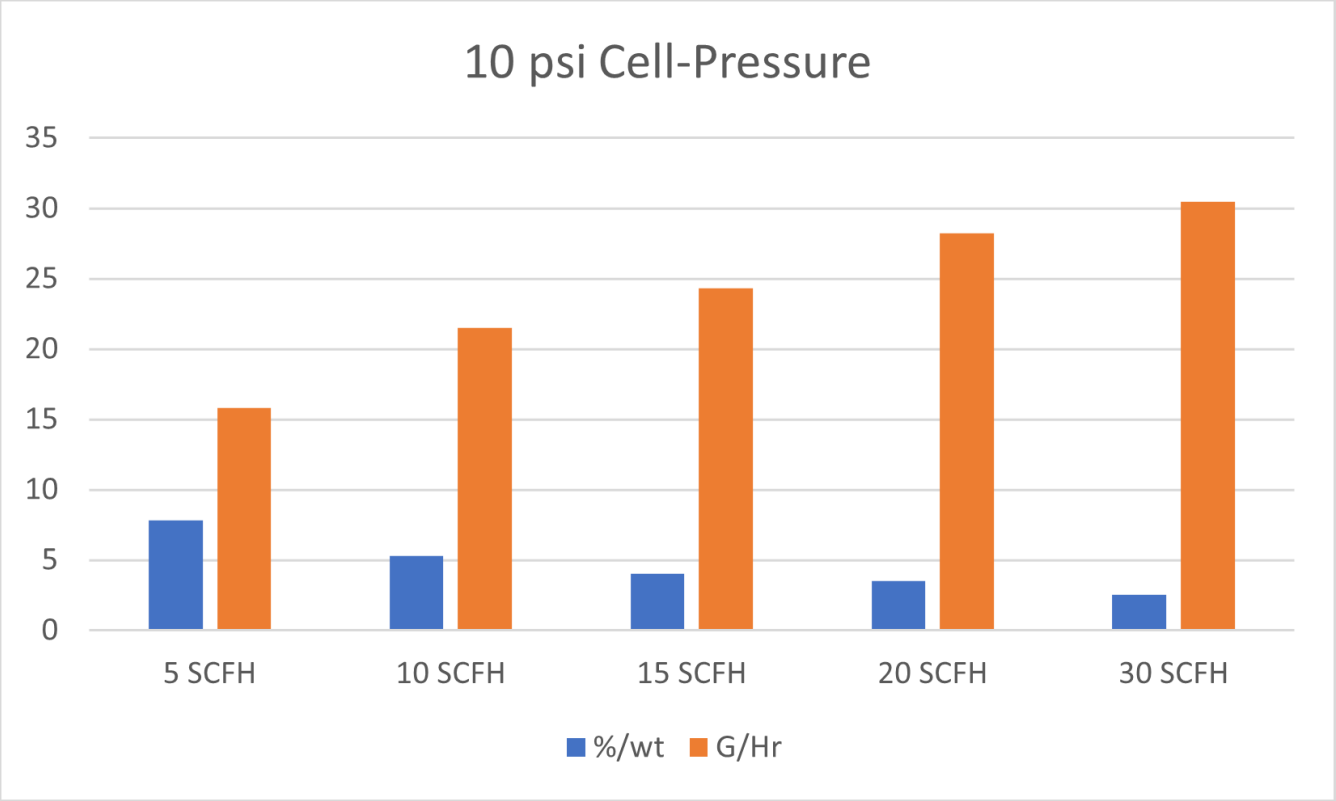
ALL FREIGHT CHARGES INTO THE FACTORY MUST BE PREPAID.
If the repair is covered under warranty, the factory will pay return shipping charges (surface rates only) to the address listed on the RMA, within the Continental United States.

If the repair is not covered under warranty, the returning party is responsible for payment of return shipping and handling charges, as well as labor and equipment costs associated with the repair.



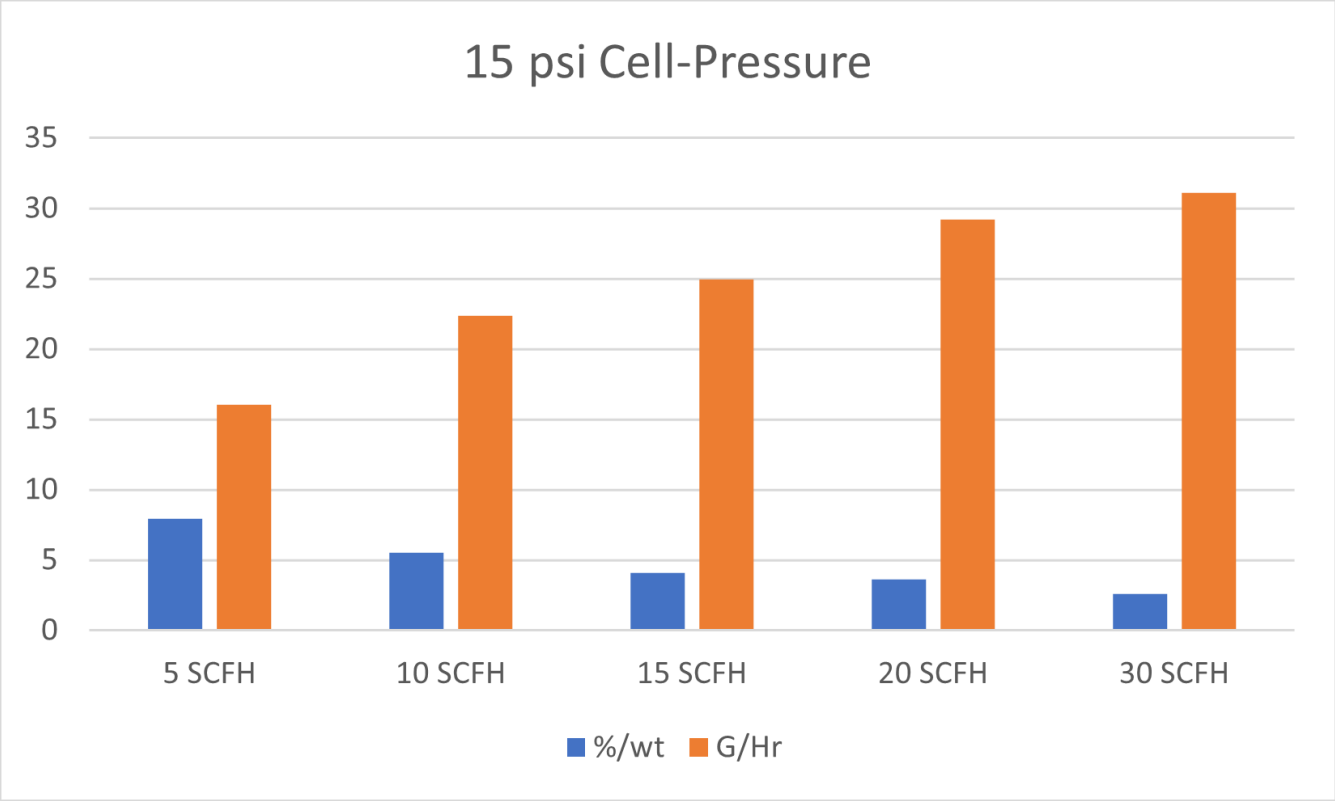
70˚F Ambient Temperature
84˚-86˚F Block Temperature
242 Watts
120 VAC/60Hz
Feed gas: 95% O2 Purity
2,500 ft. msl

Figure 9: Performance Graph (AIM P30 @ 5 PSI)



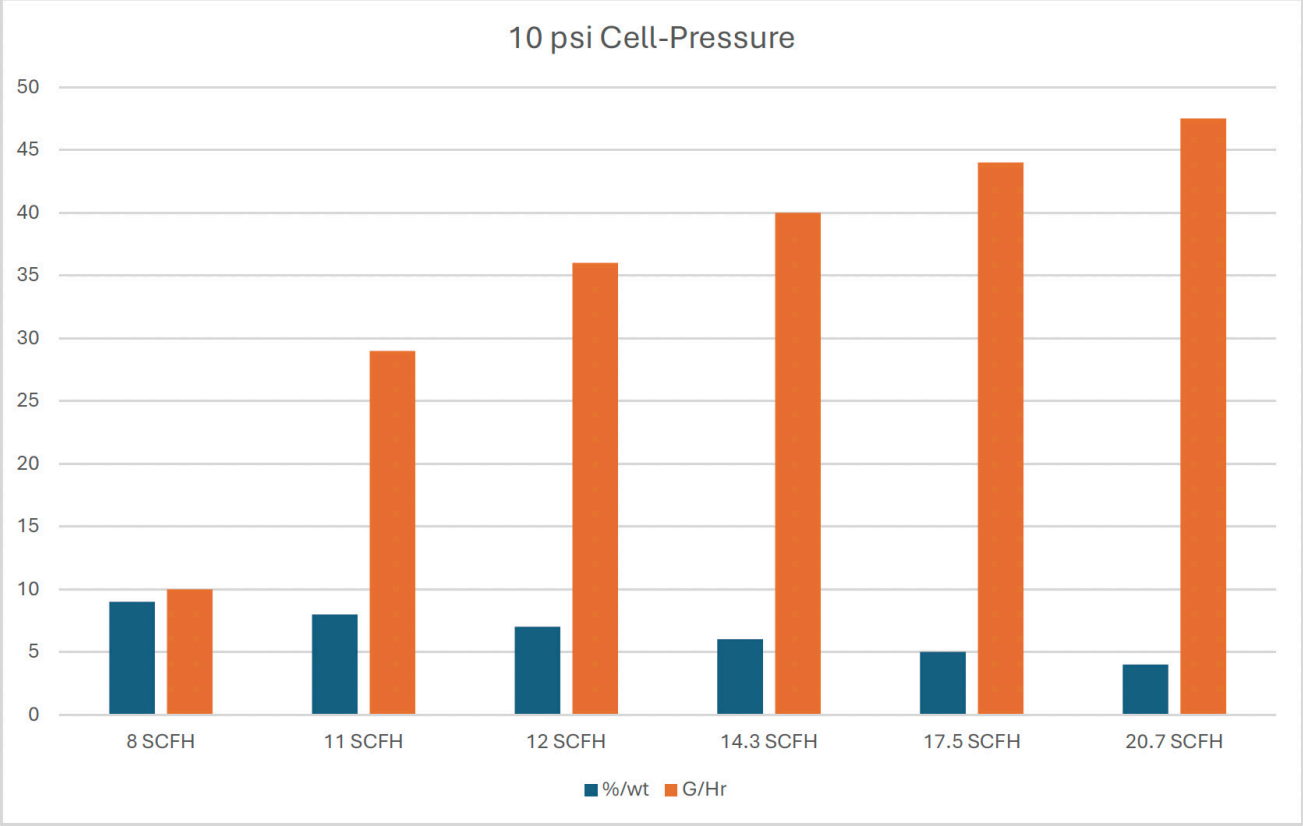
70˚F Ambient Temperature
84˚-86˚F Block Temperature
242 Watts
120 VAC/60Hz
Feed gas: 95% O2 Purity
2,500 ft. msl

Figure 10: Performance Graph (AIM P30 @ 10 PSI)



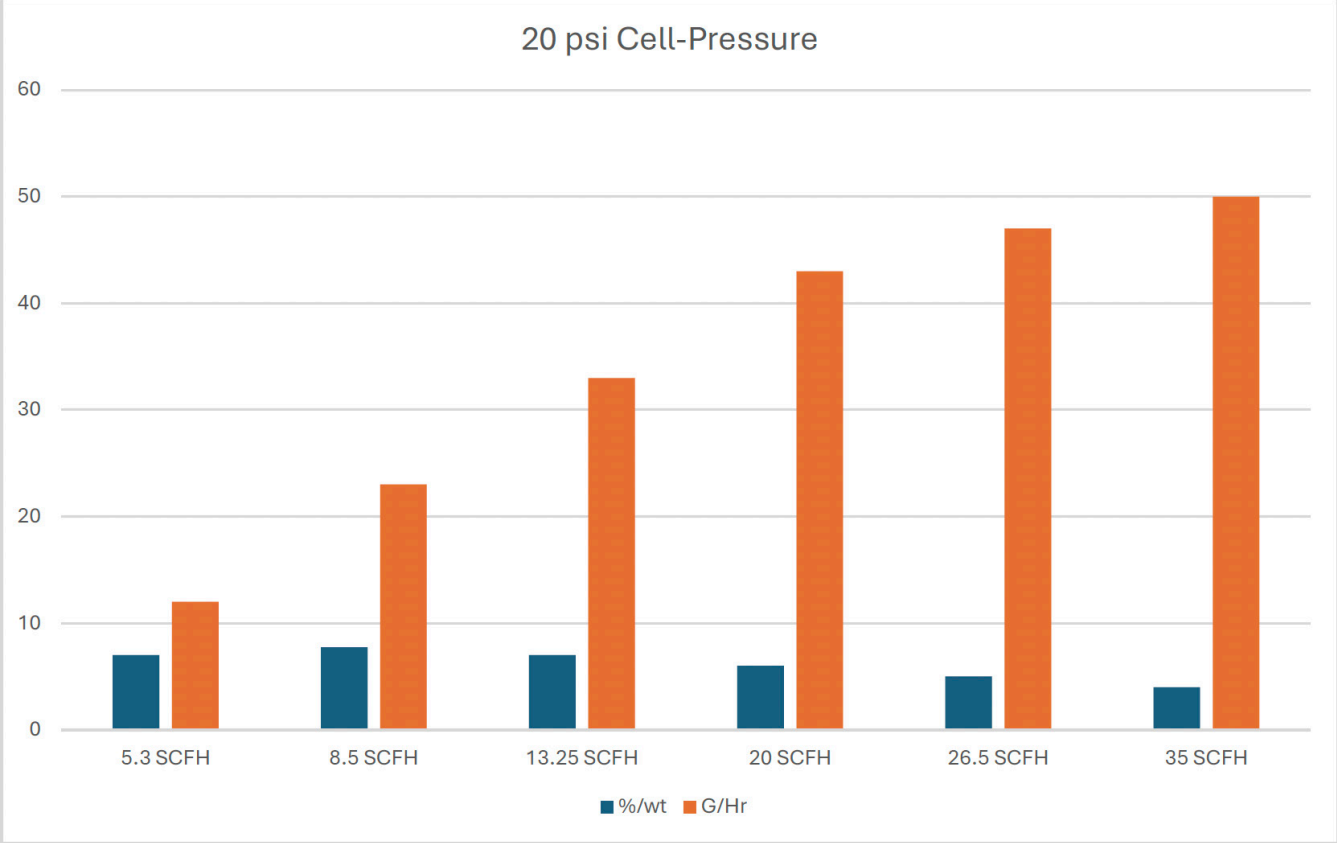
Air Cooled
70˚F Ambient Temperature
84˚-86˚F Block Temperature
242 Watts
120 VAC/60Hz
Feed gas: Compressed O2
2,500 ft msl

Figure 11: Performance Graph (AIM P30 @ 15 PSI)



Air Cooled
70˚F Ambient Temperature
92˚-99˚F Block Temperature
400 Watts
120 VAC/60Hz
Feed gas: Compressed O2
2500 ft. msl

Figure 12: Performance Graph (AIM P50 @ 10 PSI)



Air Cooled
70˚F Ambient Temperature
92˚-99˚F Block Temperature
400 Watts
120 VAC/60Hz
Feed gas: Compressed O2
2500 ft. msl

Figure 13: Performance Graph (AIM P50 @ 10 PSI)

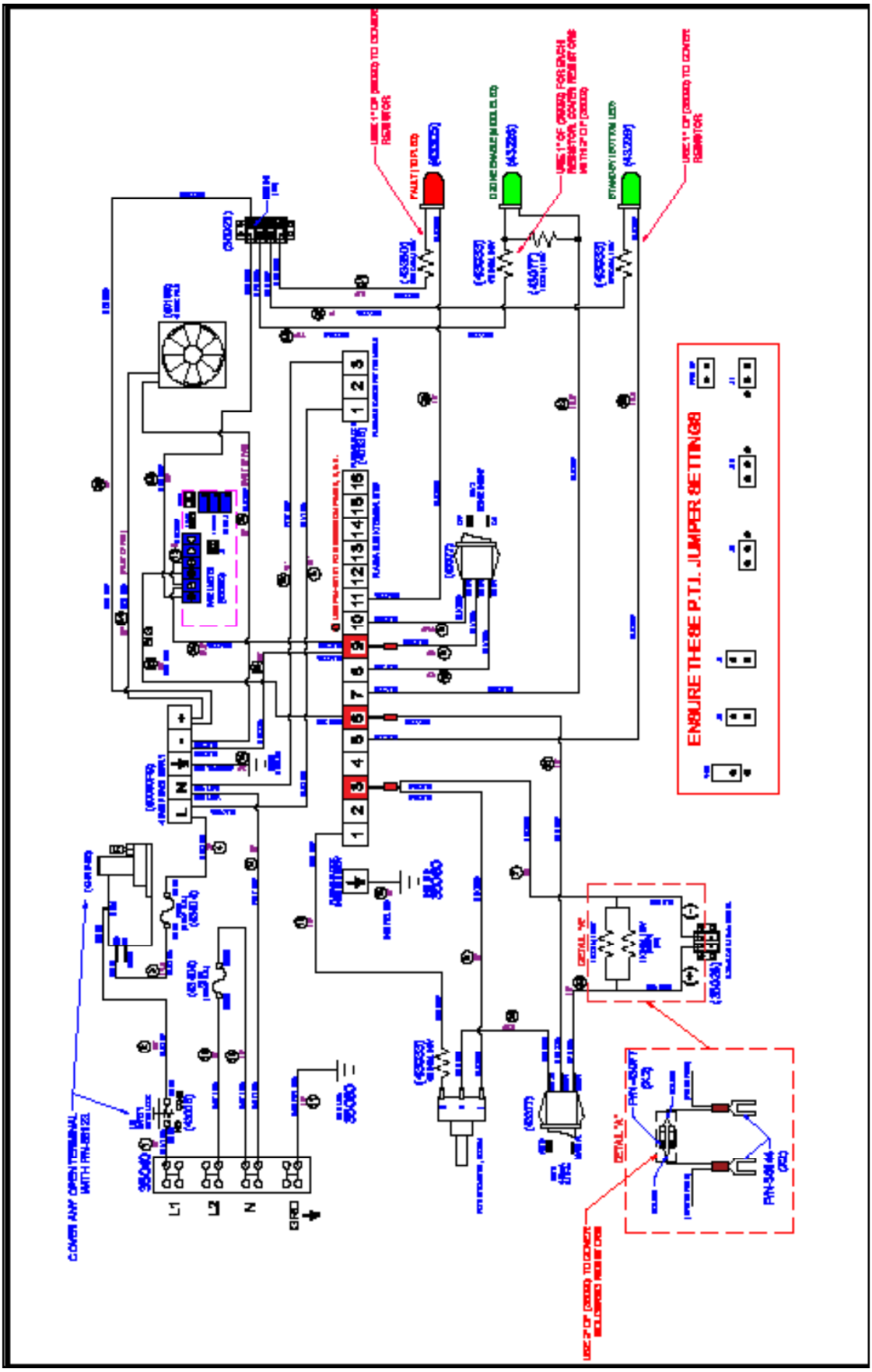


Figure 14: AIM P30 115/230 Vac Wiring Diagram

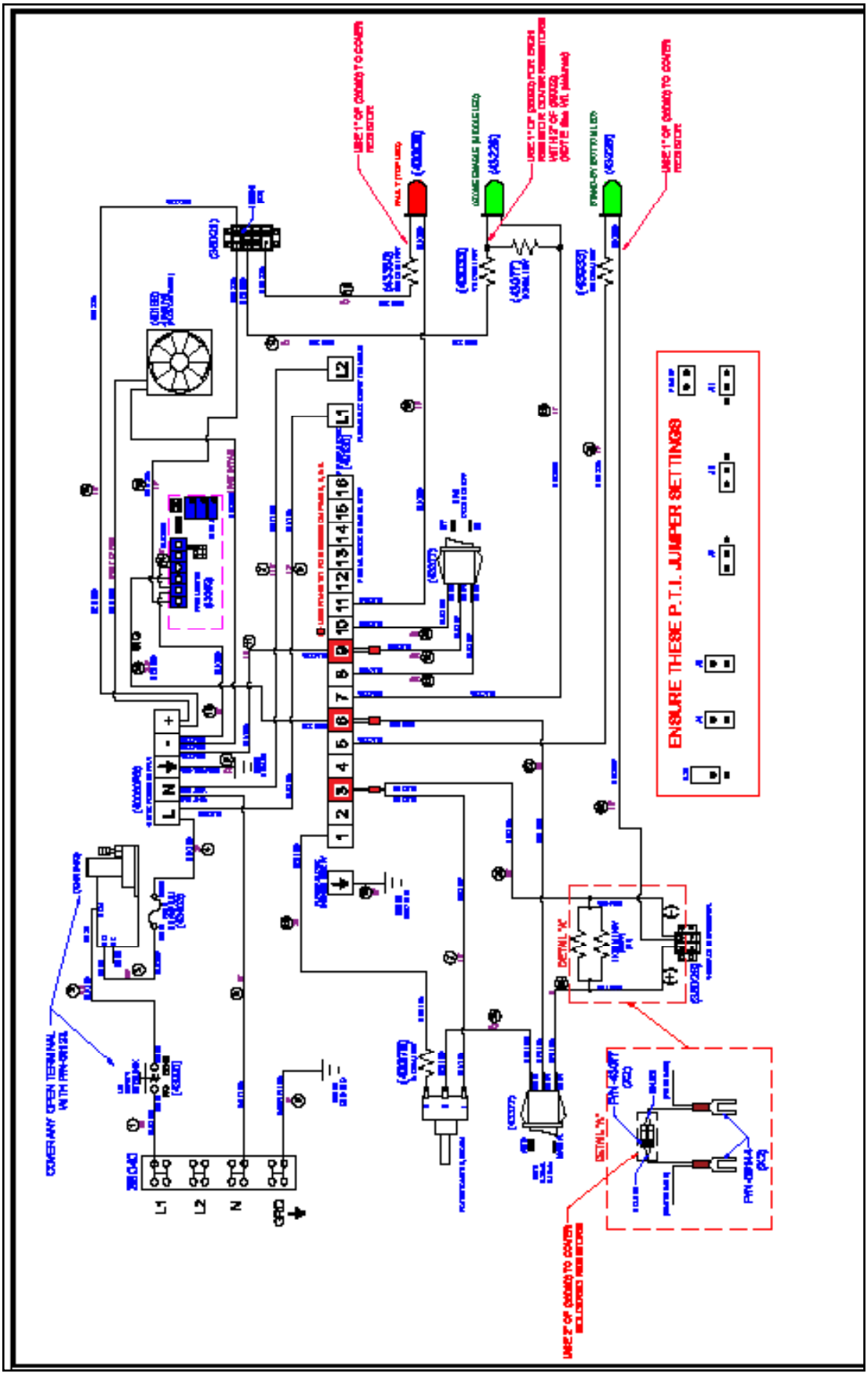


Figure 15: AIM P50 115 Vac Wiring Diagram

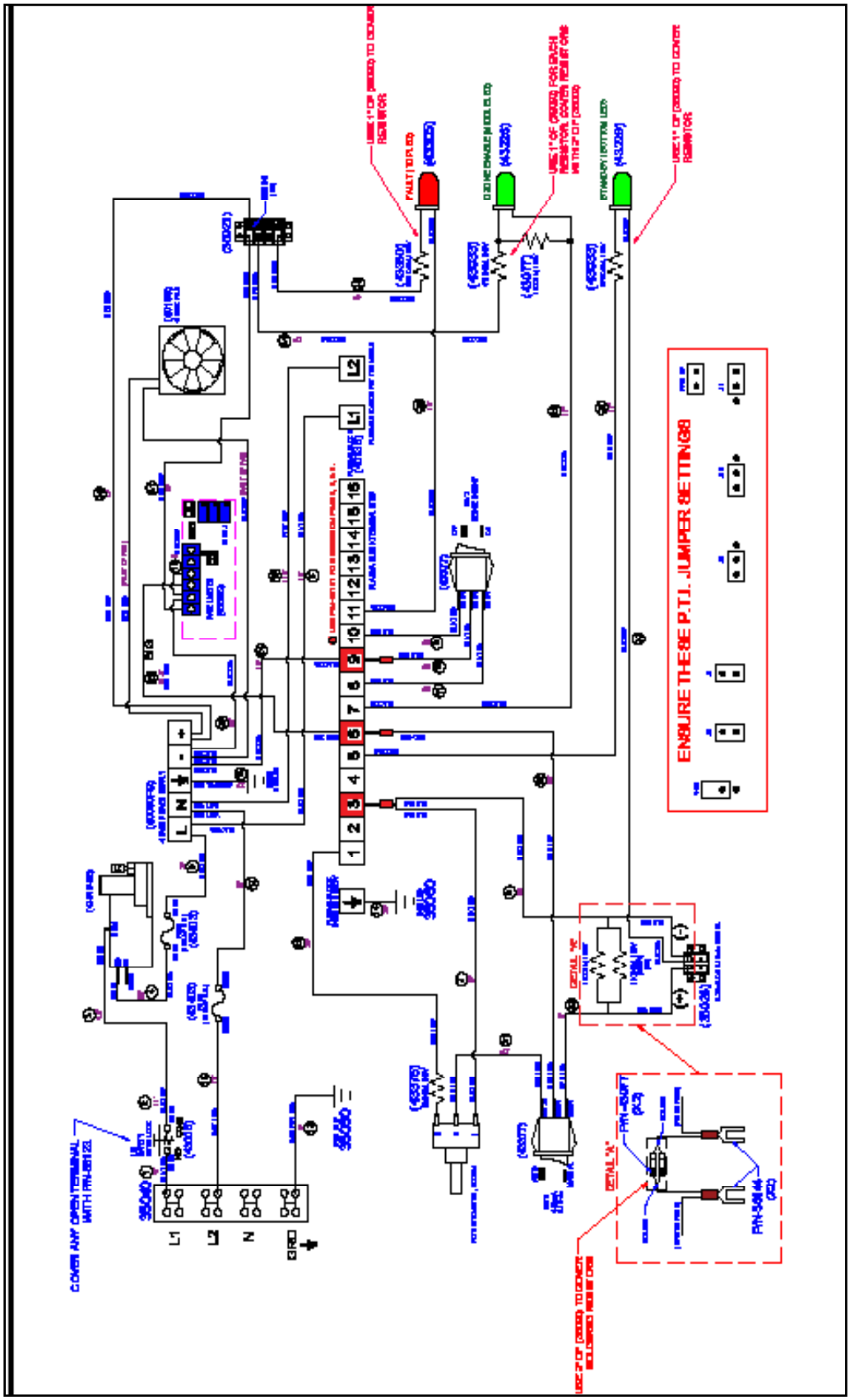


Figure 16: AIM P50 230 Vac Wiring Diagram