

OZOTECH™

Power Prep Phoenix Oxygen Concentrator

Operation & Maintenance Manual

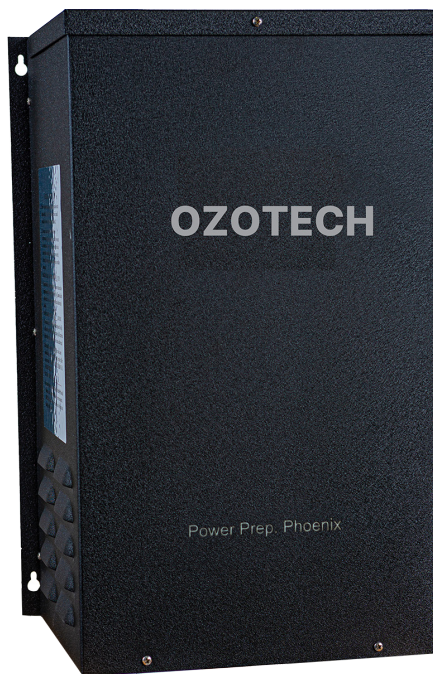


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1.0 Caution

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

- This product produces high concentrations of oxygen. Do not install in close proximity to possible sources of ignition.
- As with all electrical devices, this equipment should never be allowed to come in contact with water.
- Only personnel trained in the safe handling of oxygen, and/or a qualified electrician should be allowed to set up, maintain and operate this equipment.
- Do not allow product (oxygen) to come in contact with oils, greases or solvents. Spontaneous combustion may result from contact.
- The equipment must be operated using a grounded electrical outlet. Circuit must be protected (fuse or circuit breaker).
- Ozotech, Inc. assumes no liability for damages or injuries incurred by misuse of this product.
- Do not use an extension cord to supply power to this equipment.
- Use a power conditioner if line voltage fluctuates outside of specified range.
- Unit must never be run with output air flow rate exceeding manufacturer's specifications.

2.0 Theory of Operation

Your Power Prep Phoenix is a state-of-the-art air preparation device designed to produce extremely dry, oxygen enriched feed gas for use in ozone generation. The technology utilized to perform this function is known as Pressure Swing Adsorption (PSA) Air Preparation (Section 2.1).

2.1 Pressure Swing Adsorption (PSA) Air Preparation

Pressure Swing Adsorption is a reliable and economical way to produce superior feed gas, on site, for ozone generation applications. The Power Prep Phoenix is designed primarily as a “heatless” air dryer, capable of reducing dew point of the feed gas to -100°F, with oxygen concentrations of up to 70% possible at low air flow rates.

Adsorption is a phenomena where impurities, (in this case water vapor, nitrogen, etc.), are added to the surface of a desiccant media. The desiccant media used in the Power Prep Phoenix is Molecular Sieve, and if used in accordance with operating conditions, is completely self-regenerative.

As ambient air enters the unit, it is compressed (pressurized) and passed through a 4-way solenoid valve. The valve “splits” the air into two parallel paths, and directs it through one of two desiccant towers (Sieve Beds). For a pre-set period of time (called a cycle), the “filtering” action of the molecular sieve allows oxygen and dry air to pass through the bed, while collecting the impurities. During this cycle, the Sieve Bed is under pressure greater than atmospheric. At the end of the cycle, the 4-way valve re-directs the air flow into the second Sieve Bed. At the same time, the first Sieve Bed, which has collected the impurities, “purges” by depressurizing and forcing the impurities, along with a portion of the oxygen and dry air created, out through the purge orifice. In this manner, the molecular sieve is regenerated and is ready to perform its “filtering” in the next cycle.

3.0 Operating Conditions

Your Power Prep Phoenix 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 Ambient Temperature

Temperature range = 40°F (Minimum), 90°F (Maximum)

Controlling operating temperatures, both ambient (environmental), and internal is the single most important factor in maintaining the function of your unit.

Effort must be taken to provide a cool, clean operating environment. Pressure Swing Adsorption is most effective and reliable (produces highest concentrations of oxygen), if internal air temperatures are kept at 70°F. Controlling the ambient temperature is the only way to keep internal temperatures in this range.

Internal air temperature should never be allowed to exceed 110°F, regardless of oxygen output. Failure to keep air below this temperature may cause permanent damage to the molecular sieve material.

3.2 Operating Environment

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, left and right side of the unit to eliminate restriction of air flow.

In addition, choose a location that is free of ambient ozone gas. Refer to Power Prep Phoenix installation manual for methods of equipment installation that will minimize the chance of an ozone "leak".

3.3 Output Air Flow Specifications

Range = 0 - 6.6 Standard Cubic Feet / Hour (SCFH)
0 - 3 Liters / Minute (LPM)

It is possible to obtain higher flow rates from your unit than it is designed to produce. It is not, however, recommended. As shown in the Theory of Operation of Pressure Swing Adsorption (Section 2.1), a portion of the dry air and oxygen produced by PSA is used to regenerate the Molecular Sieve during the purge cycle. If the unit is run at higher flow rates than specified, the amount of oxygen available to purge the Molecular Sieve is reduced. Prolonged operation in such a condition will cause the Molecular Sieve to become saturated with impurities.

In some circumstances, such as environments of very low relative humidity, it may be possible to run the unit at higher flow rates for extended periods of time without causing permanent damage to the Molecular Sieve. However, this is unpredictable, and largely a function of the user's unique operating conditions. For this reason, the manufacturer will not honor warranty for units that are damaged by operation outside of manufacturer's specifications.

3.4 Input Power Requirements

Ozotech, Inc., offers the Power Prep Phoenix in a variety of configurations to accommodate a wide range of world supply voltages and frequencies. Refer to voltage label on the side of the unit for specific voltage and frequency requirements. 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 = 450 W (Nominal)

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

3.5 Features

- Produces 6.6 SCFH oxygen at up to 4 psi.
- The Power Prep Phoenix operates at 79 decibels.
- Easy to operate and maintain.
- Dimensions: 18.50" x 18.40" x 11.80" (50 x 46.73 x 30 cm)

4.0 Maintenance

The Power Prep Phoenix is delivered factory tested, calibrated, and adjusted for maximum efficiency and long life. No adjustments, other than fine-tuning the output 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.

By drawing upon years of practical experience, Ozotech, Inc. has developed series of maintenance kits designed to assist you in following the scheduled maintenance program. Each kit contains the correct quantity and type of maintenance parts for your specific model of equipment. Make sure that you use the correct Ozotech, Inc., maintenance kit for your particular application. Refer to the Spare/Replacement Parts section of this manual for maintenance kit information.

Performing any other modifications or adjustments to internal components will cause the unit to function outside of manufacturer's specifications, and will cause damage to the unit not covered under terms of warranty.

4.1 Compressor Intake Filter

Located inside the chassis on the compressor intake port, this item filters the air being drawn into the compressor.

Frequency of Maintenance

Every 600 hours, clean and inspect for damage. A gentle stream of compressed air (10-15psi) works well for cleaning. **Note:** Depending on the severity of your specific environment, it may be necessary to increase frequency of maintenance.

Frequency of Replacement

Every 2,400 hours, or when showing signs of damage or excessive fouling. Note: Depending on the severity of your specific environment, it may be necessary to increase frequency of replacement.

To access/remove the Compressor Intake Filter:

1. Disconnect equipment from power source and remove chassis cover.
2. Unscrew intake filter. Remove filter cap to access filter media.

4.2 Maintenance of Compressor

Maintenance of the compressor, other than Filter Maintenance/Replacement described in Section 4.1, is required only once per year, unless the compressor output falls below manufacturer's specifications. In this case, the unit should be taken out of operation immediately. Continued operation could result in damage to additional components.

Failure to monitor and keep your unit operating within the specified pressure ranges will cause damage to the Sieve Bed Set that may not be repairable.

4.2.1 Unit Output Pressure

Unit Output Pressure must be maintained at specified value in order to maintain sufficient pressure within the system. Loss of system pressure will result in reduced purge capability.

Frequency of Maintenance: Every 2,400 hours (3 months)

To check Unit Output Pressure:

1. Verify that unit is disconnected from power source.
2. Remove tubing from output of Flow Meter.
3. Connect a pressure gauge (0-15psi) to output of Flow Meter.
4. Using extreme caution, turn unit on and allow to run for five minutes. Verify that air flow is set at 6.6 SCFH.
5. Evaluate Unit Output Pressure. Acceptable pressure range is 3.5-4psi.
6. If Unit Output Pressure is within specification, your unit may be returned to service. Reverse steps (2 & 3).
7. If Unit Output Pressure is not within specification, refer to Troubleshooting Guide (Section 6.0). Do not attempt to operate your unit until problems have been corrected.

5.0 Spare/Replacement Parts

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

Part No.	Description	Applicable Model
31072	Flow meter, 0-10 SCFH	All models
32179	Compressor, 115Vac/60Hz	Power Prep Phoenix, 115Vac/60Hz Power Prep Phoenix, 230Vac/60Hz
32180	Compressor, 230Vac/50Hz	Power Prep Phoenix, 230Vac/50Hz
40002	Fan	All models
39021	Pressure Regulator	All models
32178	Sieve Bed Set	All models
43053	4-Way Solenoid Valve	All models
33106	Cycle Timer Assembly	All models
40108	Step-down Transformer	Power Prep Phoenix, 230Vac/50Hz
40098	Step-down Transformer	Power Prep Phoenix, 230Vac/60Hz
33173	Maintenance Kit PP Phoenix	

6.0 Troubleshooting Guide

Troubleshooting should be performed by a qualified electrician, in accordance with sound electrical safety practices.

Symptom	Possible Cause	Remedy
Unit does not turn on	Unit is not connected to power source, or is connected to improper power source.	Refer to label on side of chassis for voltage/frequency requirements. Connect unit to proper power source.
Beads in desiccant indicator have turned from blue to pink (or clear)	Unit is not cycling.	Refer to Symptom titled "Unit runs but does not cycle".
Unit runs but does not "cycle".	Cycle timer is not receiving power; wires have come off of timer.	Connect cycle timer per wiring diagram.
	Compressor output has fallen below manufacturer's specification.	Check pressure as described in Section 4.2.1.
	There is an internal air leak.	Inspect tubing connections, either visually or with the aid of a leak checking solution specifically designed for use with oxygen.
	Compressor requires service.	Check pressure as described in Section 4.2.1.
"Unit Output Pressure", is out of manufacturer's specifications.	Unit is connected to improper power source	Refer to label on side of chassis for voltage/frequency requirements.
	There is an internal air leak.	Inspect tubing connections, either visually or with the aid of a leak checking solution specifically designed for use with oxygen.
Unit does not produce adequate concentration of oxygen.	Air flow rate is too high.	Adjust air flow meter to lower setting.
	Unit is running too hot.	Refer to Operating Conditions (Section 5.0) and Compressor Intake Filter (Section 4.1) for maintenance information.
	Compressor requires service.	Check pressure as described in Section 4.2.1.
Unit does not produce adequate concentration of oxygen, even with air flow rate reduced and compressor output within specification.	Sieve Bed set has been damaged.	Refer to Spare/Replacement Parts for replacement part information.
	There is an internal air leak.	Inspect tubing connections, either visually or with the aid of a leak checking solution specifically designed for use with oxygen.

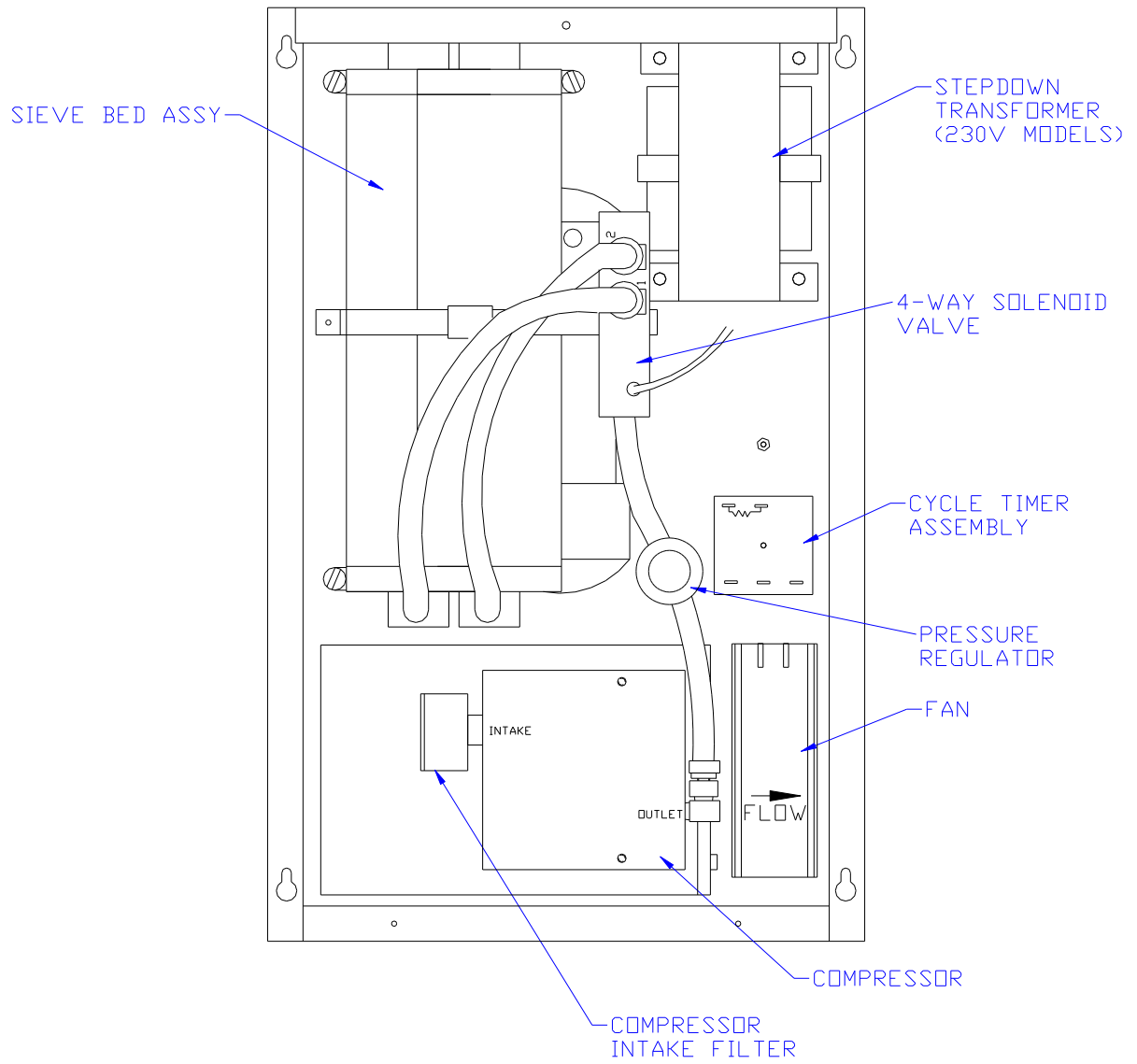


FIGURE 1 - Component Layout Diagram, Power Prep Phoenix, All Models

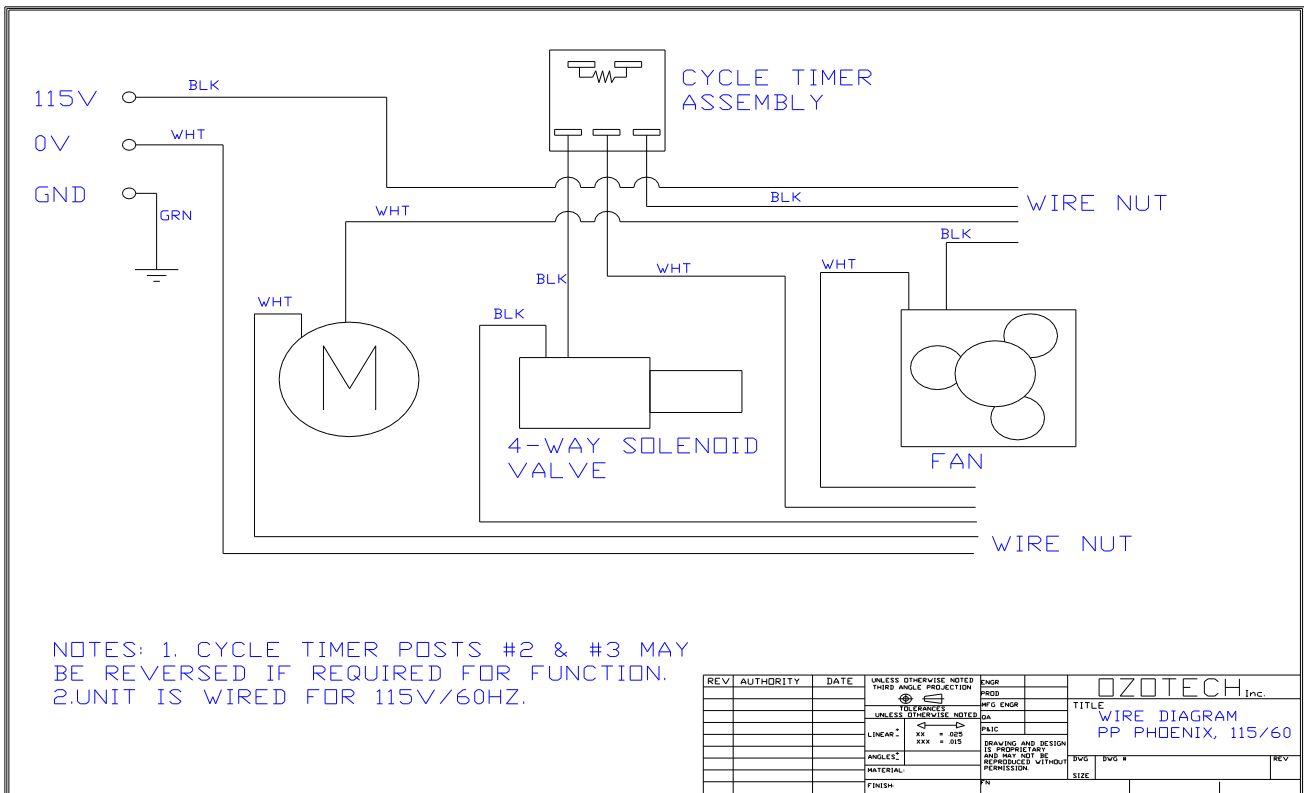


FIGURE 2 - Wiring Diagram, Power Prep Phoenix, 115Vac/60Hz

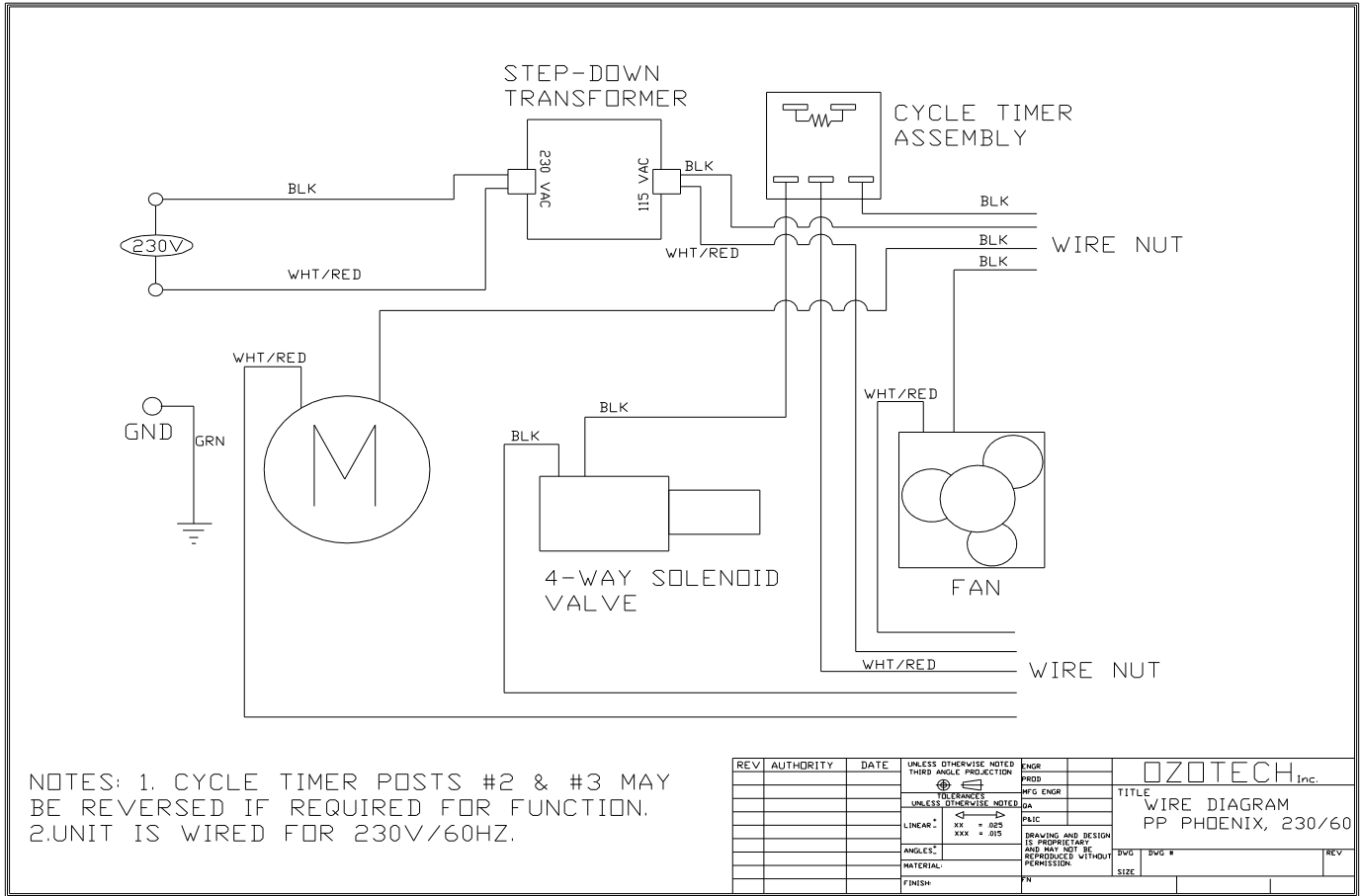


FIGURE 3 - Wiring Diagram, Power Prep Phoenix, 230Vac/60Hz

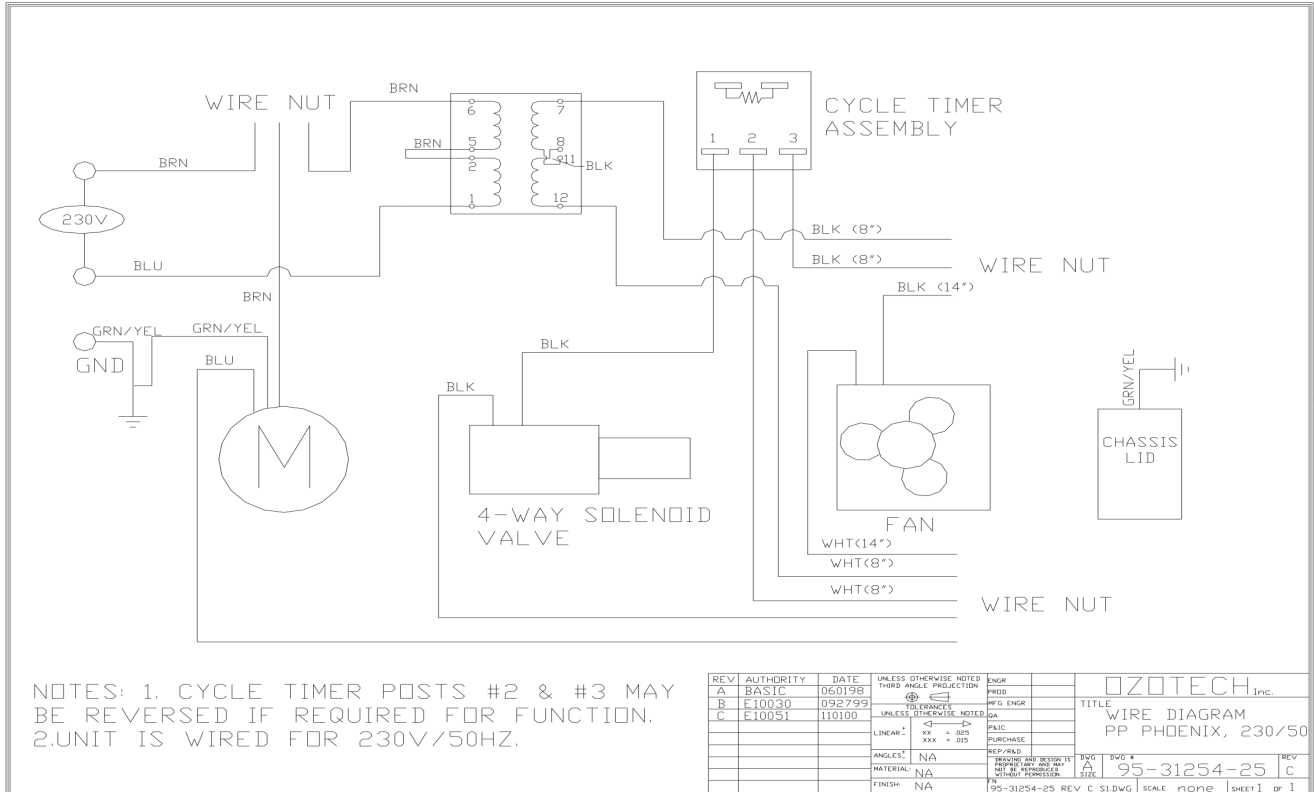


FIGURE 4 - Wiring Diagram, Power Prep Phoenix, 230Vac/50Hz

7.0 Installation

Hookup of the Power Prep Phoenix is very simple. Basically, all that is required is an air-flow meter between the output tubing and the ozone generator input connection (unless your ozone generator is equipped with its own flow meter). Based on customer inputs, we have also included a desiccant indicator that is meant to be installed between the air-flow meter and the ozone generator. This device will provide you with instant information as to how well your equipment is functioning. When the desiccant beads are blue, your equipment is producing dry air; if the beads are pink (or clear), the equipment requires attention.

Note: If the nature of your application is such that the Power Prep Phoenix will be used without an ozone generator, **THE AIR-FLOW METER IS STILL REQUIRED.**

The following steps have been separated into two basic types of system hookup. One for use with ozone generators having an integral air flow meter, the second for use with ozone generators without an integral air flow meter.

System Hookup with Integral Air flow meter (Refer to Figure 1)

1. Locate the output tubing of your Power Prep Phoenix. Attach the output tubing to the input of the ozone generator.
2. Cut the Power Prep Phoenix output tubing, approximately 24 inches from the chassis, and install the desiccant Indicator in-line. Proceed to Step 3.

System Hookup without Integral Air flow meter (Refer to Figure 2)

Note: Utilize the output tubing of your Power Prep Phoenix as splicing material. All of the connections terminate in hose barb type fittings.

1. Locate the output tubing of your Power Prep Phoenix. Cut the tubing approximately 24 inches from the chassis. Install the air flow meter in line.
2. Install the Desiccant Indicator in line, immediately after the air flow meter. Connect the output of the Desiccant Indicator to the air input of the ozone generator.
3. It is important to calibrate the air flow rate through your Power Prep Phoenix in order to maintain a negative pressure in the ozone delivery line. This has several benefits. Most important is protection for the PSA component of your unit. As shown in the Operation/Maintenance manual, ambient or “free” ozone can be drawn into the Power Prep compressor, causing failure. By following the calibration steps outlined below, the risk can be avoided.
 - 3a. With the Power Prep Phoenix disconnected, use a flow meter set to its full open position to check the flow rate of your venturi.

7.0 Installation (contd.)

- 3b. Set the air-flow rate through your Power Prep Phoenix by adjusting the flow-meter. Use the number found in Step (3a) to determine the proper air flow rate for your Power Prep Phoenix. For example, assume that you find that your venturi draws 5 SCFH. Your Power Prep Phoenix flow rate should be set at any value less than 5 SCFH. Regardless of venturi flow rate, never allow your Power Prep Phoenix to flow more than 6.6 SCFH.
4. Once you have finished installation, perform this basic checkout procedure to verify that the Power Prep Phoenix is operating properly. Beads inside desiccant indicator are blue (usually after a few minutes operation). Listen closely for the puff of air that indicates correct cycling (purging). The unit should cycle approximately every 16 seconds.

Optimizing Ozone Generator Air-flow Rates

Every ozone generator has an optimum air-flow rate at which it will produce the highest possible concentration of ozone. Typically, the slower that air is passed through a unit, the higher the concentration of ozone will be. Ozotech, Inc.'s, smaller models (PCS and AW series') operate efficiently at air flow rates between 1-3 SCFH. The larger models (OZ1BTU and OZ2BTU) operate efficiently between 3-6 SCFH. Refer to the information specific to your ozone generator when determining an optimum flow rate for your application.

We strongly suggest that the final step in your installation process be placement of the Operation/Maintenance Manual in a convenient location, near the Power Prep Phoenix. If you are not the end-user of this product, you must provide your customer with the Operation/Maintenance Manual. The information contained therein is vital to equipment performance, reliability and warranty eligibility.

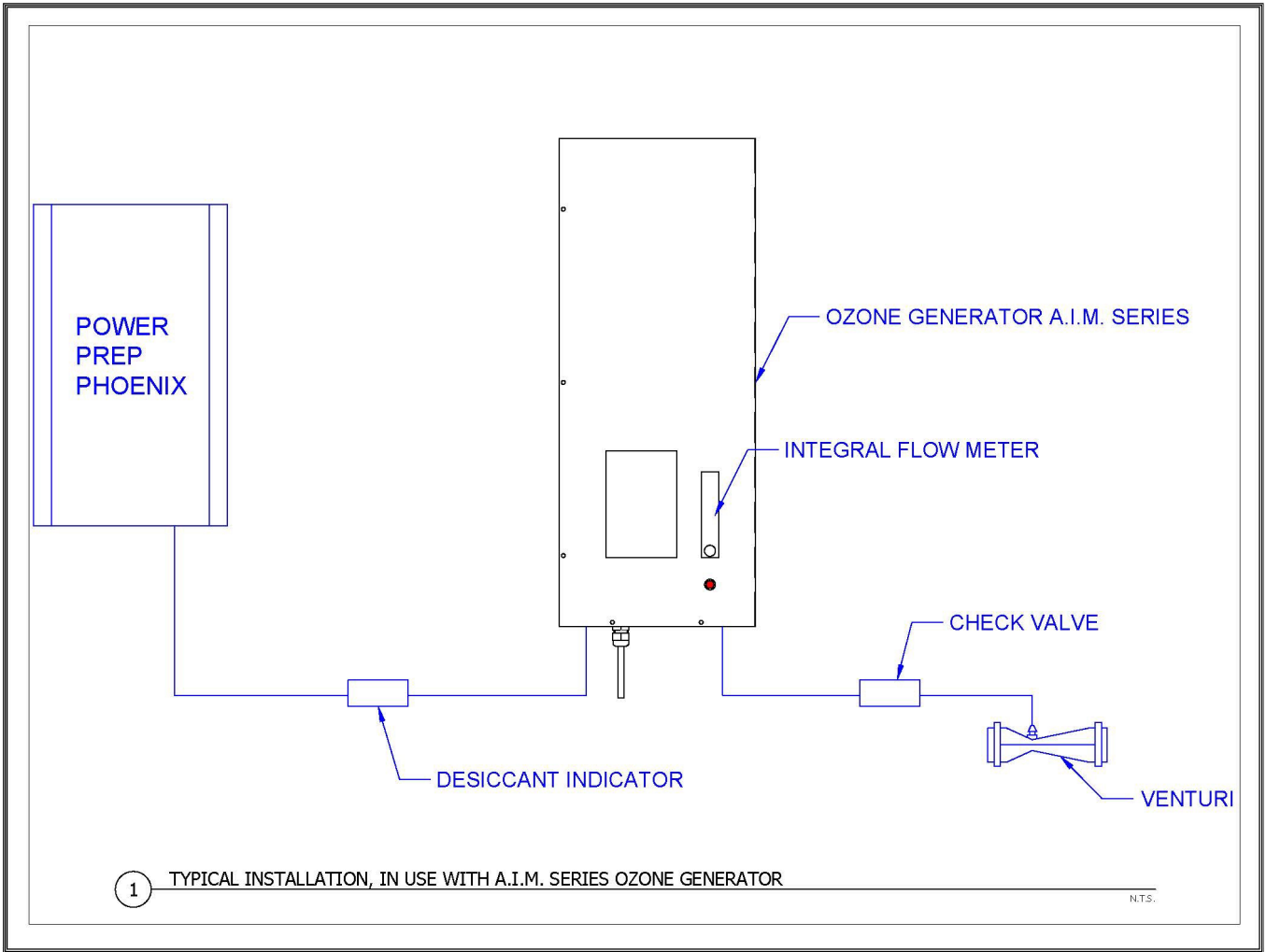


FIGURE 5 – Typical Installation, in use with a BTU Series Ozone Generator

9.0 Limited Warranty

OZOTECH, Inc., warrants the Power Prep Phoenix oxygen concentrator to be free from defects in parts and workmanship for (12) months from date of invoice, under conditions of normal use. The corona discharge 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](#)

10.0 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 the serial number of unit to be returned.
- ✓Obtain model number/name of unit to be returned.
- ✓Contact Ozotech, Incorporated and request a Return Material Authorization (RMA) form. Make sure to give the factory representative an accurate and current shipping address.
- ✓Enclose 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.
- ✓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.