



Purity TEK™

PURITY AOP

Advanced Oxidation Process Pool Purification System

Model PAOP80



INSTRUCTIONS FOR USE

5900 Balcones Drive, Suite 4000

Austin, TX 78731

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UL/ANSI 1081, UL/ANSI 1563, CSA C22.2 No. 218.1

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Thank you for choosing an Advanced Oxidation Process Sanitizer from Purity AOP. Our equipment has been designed to provide long-term, reliable service. The sanitizer has been designed to enable fast, easy installation. Its design also enables easy maintenance. Please read these instructions carefully to ensure optimal operating conditions for your AOP Pool Purification System.



This Purity AOP Unit is designed for use in swimming pools, fountains, water features and waterfalls. It is not designed for use in potable (drinking) water installations. Use of this product in applications other than those indicated above will void your warranty and could be harmful to your health or the health of others.

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A: TECHNICAL CHARACTERISTICS

AOP SYSTEM	DESCRIPTION	AOP SYSTEM	DESCRIPTION
Dimensions	16" W x 16" H x 6" D	Housing Material	Metal, NEMA 4x
Weight	24 lbs.	Water Flow	15-100 GPM
Mounting	Wall or Rack	Ozone Production	600-900 mg per hr.
Orientation	Vertical	Pool Size	60,000 Gallons
Check Valve	316 SS Spring Loaded	Water Connection via Proprietary Injector	2" PVC Socket
Corona Discharge Cells	3 Corona Discharge Cells with Integrated Air Pumps (Cell Life 5 yrs average)	One (1) UVC Lamp; Lamp life - 16,000 hrs.; 5 yr avg	253.7nm Low Pressure-High Output
Dry Reactor Type	304 SS Reactor Material	Incoming Filter	6 Sq Inches of area
Validated Disinfection Performance Std	ANSI/NSF 50 ; 99.999% (Log 5 reduction)	Gas Delivery Hose	Braided Stainless Steel over PTFE (Teflon)™
Power (PAOP60-120V)	120 VAC, 60 Hz, 2 amps	Power (PAOP60-240)	240 VAC, 60 Hz, 1 amp
AOP INJECTOR	DESCRIPTION for Model PT2	CERTIFICATION & CONTACT INFO	
USE	AOP, OZONE or AIR INJECTION		PURITY TEK LLC
Dimensions	24" L x 7" W x 3" D		Technical Support:
Weight	3 lbs.		Steve Hansen, MGR
Water Flow	15 - 100 GPM		T: (512) 255-2271
Check Valve	Integrated		Ace Sorensen, MGR
Gas Flow Rate	5 to 7 LPM		T: (801) 687-1521
Gas Connection	1/2" MNPT		Email: info@puritytek.com
Installation	2" PVC Glue Socket	URL: www.puritytek.com	

B. WARNINGS AND SAFETY



IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS READ AND FOLLOW ALL INSTRUCTIONS:

WARNING FOR YOUR SAFETY – This product should be installed by a licensed service technician or similar person, qualified in electrical equipment installation. Improper installation and/or operation could cause serious injury, property damage or death. Improper installation and/or operation will void the warranty.

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK OR INJURY TO PERSON WARNING — To guard against injury when using this unit, basic safety precautions should always be taken, including the following:

- 1. READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**

2. **DANGER:** To avoid possible electrical shock, special care should be taken since water is employed in the use of this equipment. For each of the following situations, do not attempt repairs yourself; return the appliance to an authorized service facility for service or discard the appliance.
 - A. If any part of the system becomes submerged in water, **DO NOT** reach for it! First disengage the electrical source until it is completely dry. Then notify your installer for a system safety inspection.
 - B. Do not operate any appliance if it has a damaged cord or plug, or if it is malfunctioning or if it is dropped or damaged in any manner.
3. Do not use an appliance for anything other than its intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.
4. Always deenergize the power source before putting on or taking off parts, and before cleaning. Never yank any of the cords.
5. Never drop or insert any object into any opening.
6. This unit contains an ultraviolet bulb that can cause discomfort or injury to the eyes if viewing while operating. Prolonged exposure to the eyes can cause blindness. **DO NOT VIEW AN ILLUMINATED UV BULB WHILE OPERATING OR DURING MAINTENANCE.**
7. This unit produces Singlet Oxygen (O₁), Ozone (O₃), Nitric Oxide (NO), Nitrogen Dioxide (NO₂), and Nitric Acid (HNO₃), and can be present in the reactor and delivery hose. **WEAR GLOVES AND PROTECTIVE CLOTHING WHEN WORKING ON THE REACTOR OR DELIVERY HOSE.**
8. Read and observe all the notices on the appliance.
9. Warning—To reduce the risk of electrocution, keep all connections dry and off the ground. Do not touch the cables with wet hands.
10. **DO NOT** power this system with an extension cord or any type of temporary wiring. Power to the device must come through a properly rated conduit per the installation instructions.
11. Always check Local Ordinance and Building Codes for your city before installation of equipment.
12. **SAVE THESE INSTRUCTIONS**



WARNING When using electrical products, basic precautions should always be followed, including the following:

1. **DANGER: RISK OF ELECTRIC SHOCK.** Connect only to a circuit designed and installed to comply with all local codes and good electrical practices.
2. **Grounding is required.** The unit should be installed and grounded by a qualified service technician.
3. **Install to permit access for servicing.**

IMPORTANT: Follow the instructions EXACTLY and IN THE ORDER LISTED. Once installed, your UV unit will provide years of successful operation.

IMPORTANT SAFETY INSTRUCTIONS

*****PRIOR TO BEGINNING INSTALLATION INSTRUCTIONS*****

Visually inspect the unit for any damage. Contact the dealer/manufacturer for replacement parts.

C. SYSTEM INSTALLATION

Introduction

Forward -- The Purity AOP Unit is designed for use in swimming pools, fountains, water features and waterfalls. It is not designed for use in potable (drinking) water installations. Use of this product in applications other than those indicated above will void your warranty and could be harmful to your health or the health of others.

Introduction - How the Purity AOP System Works: The Purity AOP System begins with Corona Discharge Cells which convert Oxygen molecules (O_2) from ambient air into Ozone (O_3), a very effective disinfectant. The Ozone is sent through a chamber containing a UV lamp. The UV light is calibrated at 254 nm, which breaks the Ozone down to form Hydroxyl Radicals ($OH\bullet$). Hydroxyl Radicals are highly reactive, even more so than ozone. The Hydroxyl Radicals generated by the UV light are then injected into the pool's water circulation system where they oxidize and destroy all organic matter that can cloud the water and also eliminate harmful microorganisms like bacteria and viruses. AOP has an advantage over other water sanitation technologies in that it eliminates harmful pathogens just like UV, but in addition it also clarifies cloudy water by oxidizing organic matter. AOP leaves only harmless carbon dioxide and water. **CAUTION! THIS UNIT IS FOR RESIDENTIAL SWIMMING POOL USE ONLY. DO NOT USE THIS UNIT FOR POTABLE (DRINKING) WATER SANITIZATION.**

PRE-INSTALLATION

ADDITIONAL EQUIPMENT NEEDED FOR INSTALLATION – Two 2" PVC Unions, one for each side of the injector assembly to allow for easy removal of the injector for periodic clearing of debris.

Swimming Pool Turnover Rates - Most residential pools are designed to have the capacity of the pool turned over every 12 hours. Semi-commercial pools are normally designed for an 8-hour turnover flow rate. Check with your local jurisdiction for the required flow rate for your type of pool to be sure. Thus, as an example, using the same formula as above, a 20,000 gallon residential pool will need to have a pump capable of a 28 GPM flow rate and a 25,000 gallon Semi-commercial pool will need to have a pump capable of 52 GPM. Like pools and ponds, the Purity AOP system needs to be properly sized by flow rate.



Before accessing the connection terminals, ensure that all supply circuits are disconnected.

Check Local ordinances and building codes before installation of equipment. (See A. Technical characteristics)

Installation — Before starting the installation, PLEASE read this manual from cover to cover. A few moments spent initially becoming totally familiar with the Purity AOP system and its installation requirements will save a great deal of time (and expense) later. If you have questions that are not answered after you have completed the reading of this manual, contact your supplier or Purity AOP. We are ready to assist you at any time and we want your installation to go smoothly and the equipment to work properly.

PURITY AOP SYSTEM INSTALLATION

Model PAOP80

Injector (Vessel) Installation Instructions.

**** All Plumbing should be performed by a licensed plumber. ****

**** All electrical work should be performed by a licensed electrician****

IMPORTANT SAFETY INSTRUCTIONS

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

- 1. READ AND FOLLOW ALL INSTRUCTIONS**
- 2. WARNING - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.**
- 3. WARNING -- DO NOT ENERGIZE THE AOP SYSTEM UNTIL ALL STEPS DETAILED IN THESE INSTRUCTIONS HAVE BEEN COMPLETED.**
- 4. WARNING – Do not breathe the hydroxyl radical gas produced by the AOP System. Inside the delivery hose or reactor**
- 5. WARNING - Risk of Electric Shock. Connect only to a branch circuit protected by a ground-fault circuit interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.**
- 6. The unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.**

7. SAVE THESE INSTRUCTIONS

PURITY AOP INSTALLATION INSTRUCTIONS

1. The Purity AOP system can be used suction side or pressure side. Oxidizing gas from the AOP electrical box is delivered via a 10' long PTFE hose with Stainless Steel braiding.
2. For suction side, the braided hose can be connected to the drain port of the pump with the supplied ¼" MNPT fitting.
3. For pressure side, the braided hose connects to our injector assembly with the supplied ¼" MNPT fitting.
4. The AOP box should be located close enough to the pump drain port or the injector so the 10' long hose can easily reach the desired connection.
5. The AOP box must be mounted in an upright position. It can be mounted on a wall, rack, fence, or any sturdy surface. Four Mounting tables are included. See illustration below:



ELECTRICAL

WARNING: The incoming power must be OFF before opening the AOP box.

1. The Purity AOP system is available as either 120VAC, or 240VAC. The voltage is shown on the labels inside the door and next to the mains terminal block.
2. Wire connection on the mains block ate wired G – L – N or G – L – L
3. The total power draw is less than 2 amps.
4. The device should be connected to a relay in the main pool control box, so it is only ON when the filter pump is running

5. The unit comes with a ½" nonmetallic (Sealtite[®] style) conduit connector.

GAS HOSE

1. The gas from the AOP box is delivered with a PTFE hose with stainless steel braid and vinyl mesh.
2. The gas hose has straight connections installed. They can be replaced with 45 and 90 degree hose connections if desired.
3. 4AN x ¼" NPT adapters are loosely connected to each end of the hose. Use the fitting to connect the hose to the bulkhead located on the bottom of the box and the inlet of the injector.



When installing the 4an x 1/4" NPT fitting into the injector, be careful to not overtighten the connections on the injector itself. Overtightening can distort the visible orange O-ring shown in the last image. There is also a 2nd green O-ring inside the nut that connects to the injector. If that nut is overtightened, it can displace the green O-ring shown below.



IMPORTANT: We highly recommend installing unions on each end of the injector assembly so it can be easily removed for periodic clearing of any debris that gets past the pool filter. This is very important because the accumulation of debris in the injector can block delivery of the Hydroxyl Radical gas into the pool water.

For optimal performance, allow 10" of pipe between the inlet and outlet of the injector assembly from any elbow or branch tee fittings.

The water flow through the injector must match the two arrows on the injector assembly.

One arrow is on the side of the venturi. The other arrow is on the body of the check valve.



For any question concerning these instructions please contact your pool builder or system installer or PURITY TEK directly at: 512-255-2271 or by email at help@purityAOP.com

"This product complies with all applicable provisions of the United States Code of Federal Regulations (CFR) requirements including Title 21, Chapter I, Subchapter J, Radiological Health."

USE AND MAINTANCE



Allow the ultraviolet lamp to cool for at least 30 minutes before handling

Never look at the ultraviolet lamp when lit. This may cause severe injuries or burns and may even lead to loss of eyesight.

To avoid electric short-circuits; do not place the electric wires or the sanitizer in the pool water or in any other maintenance or cleaning fluid.

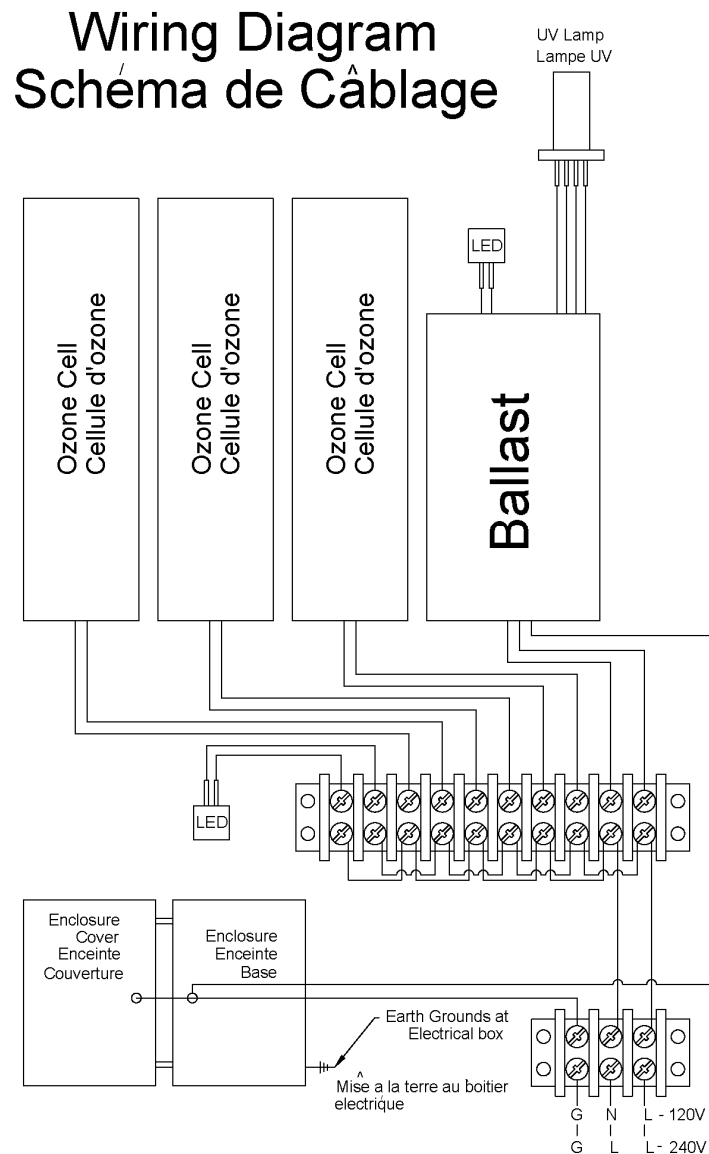
Do not restart the system until the electric unit, the covers exterior elements of the sanitizer are correctly put back in place.

When replacing any of the electrical components or carrying out annual maintenance of the system, make sure that the electrical elements are in place and correctly attached before switching on the sanitizer.

Do not use the Purity AOP sanitizer for any other use than that for which it was designed.

Hg-Lamp CONTAINS MERCURY. Manage in accord with disposal laws. www.lamprecycle.org

D. ELECTRICAL ENCLOSURE



PURITY AOP SSYETMS AE 120VOLT OR 240 VOLT.
DO NOT CONNECT 240 VOLT TO A SYSTEM MAKED 120 VOLY ONLY.
DO NOT CONNECT 120 VOLT TO A SYSTEM MARKED 240 VOLT ONLY.

E. START UP

1. Start the circulation pump.
2. Drain all air from your system through the air relief valve on the filter (if so equipped)
3. Check Purity AOP Unit for leaks - Make one final check for leaks in your piping and the injector. Repair any leaks before proceeding.
4. Check the chemical balance of your swimming pool (particularly pH, TAC*, and TH*). Adjust the chemical balance as per your pool chemical suppliers' instructions. - Remember, the Purity AOP system dramatically reduces the need for chemical sanitizers but does not eliminate the need for proper pool chemical balance.
5. Make sure the door is closed on the electrical box.

F. WINTERIZING

1. Your Purity AOP system can be damaged if allowed to freeze. The substantial pressure inside the injector caused by ice can break the injector. Therefore, you must protect your Purity AOP system from freezing. Damage due to freezing IS NOT COVERED under your Limited Warranty.
2. **Freeze damage** - Freeze damage can be avoided by keeping the water flowing at a minimum of 20 GPM. Freeze damage can also be avoided if all the pool equipment, including the Purity AOP system is maintained inside a warm enclosure.
3. **Freezing Weather Precautions** - If you do not plan to operate your Purity AOP system during freezing temperatures, you must take precautions to make sure all water is removed from inside the Purity AOP injector and all associated plumbing. Consult your system installer and follow their advice on how to properly drain the system.

G. UV LAMP REPLACEMENT AND QUARTZ MAINTENANCE

The Purity AOP system requires little maintenance during the year. The AOP Quartz/Lamp components protect the bulb. The outermost surface of the Quartz Sleeve is a specially formulated quartz, made specifically to allow the maximum amount of UV irradiation to pass through without diminishing the intensity. Debris and/or deposits on the surface of the quartz sleeve will negatively affect the system performance and its ability to transmit the UV rays from the lamp contained within it. The Quartz/Lamp assembly should be removed from the injector every six (6) months and inspected to make sure it is clean and that deposits are not attached to the outer surface.

H. FAQ

Here are a number of FAQ's that will answer some of the most common questions.

1. **Is the Purity AOP system compatible with saltwater pools?** – Yes.
2. **Do I need to turn my Purity AOP system off when I clean my filter?** – No.
3. **Will a time clock on my pool shorten my bulb life?** – The Purity AOP system is designed for daily ON/OFF cycles. And normal use will not shorten the bulb life.

4. **Is there any residual effect from Ozone, UV or Hydroxyl Radicals?** - No, UV light converts 100% of the Ozone to Hydroxyl Radicals. The Hydroxyl Radicals are used as a control and are applied only to the water that passes inside the Purity AOP injector. The only residuals from the Hydroxyl Radicals are harmless carbon dioxide and water.
5. **Can the Purity AOP injector be mounted vertically?** - Yes, the injector can be mounted in any orientation.
6. **Can the Purity AOP system be installed below the pond or pool waterline?** – Yes, but proper plumbing design is critical as additional valves may be required. The design and installation must be performed by a professional plumber who is familiar with that type of installation.
7. **Can multiple Purity AOP systems be used together for larger systems?** - Yes, you can add any number of Purity AOP systems to a plumbing bypass manifold system to allow for larger outputs and flow rates. Purity AOP also designs custom systems for high volume and high flow rate situations.
8. **Can the Purity AOP system be installed on a new or replastered pool immediately?** – Yes.

I. WARRANTY

WHAT IS COVERED

This Warranty covers defects in materials or workmanship in manufacturing of the UV unit, including housing corrosion causing leakage and plastic component degradation, except as provided below.

FOR HOW LONG

This warranty runs for the following periods from the date of installation, except in the case of replacement Lamp/Quartz components which run from the date of purchase ("Warranty Period"):

- Injector – 4 years.
- Electrical enclosure and hardware – 4 years.
- Electrical Components, Wiring, O-rings, Seals, and Lamp/Quartz assembly –18 months.

WHAT IS NOT COVERED

This warranty does not cover systems that were not installed in compliance with the instructions by a licensed plumber/contractor or that have been abused or operated incorrectly. It also does not cover the following:

- Incidental or consequential damages caused by a failure of the product.
- Mechanical Abuse
- Glass/quartz Component Breakage
- Improper Installation

- Damage caused by fire, flood or acts of God.
- Operation At Pressures Greater Than 60 PSI (4.13 Bar)
- Freeze Damage
- Improper Operating Voltage
- Costs of shipping to and from Purity AOP for covered items.
- UV units received with factory identification missing, mutilated, or altered, or systems received containing components not supplied by Purity AOP or modified in any way.

WHAT PURITY AOP WILL DO

Purity will replace the covered defective part of the system and send it to the User with installation instructions for a licensed plumber/contractor, via UPS Surface, at the User's expense.

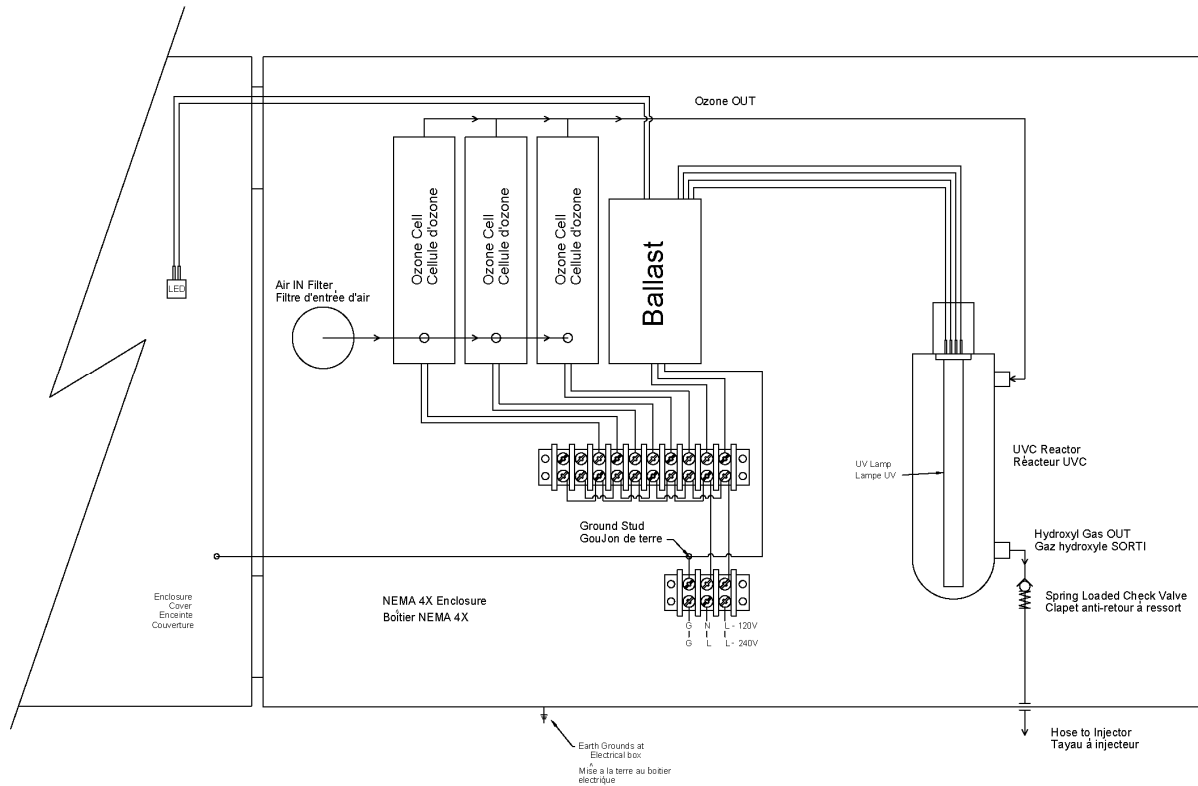
HOW TO GET SERVICE

To receive service under this Warranty, the User must contact Purity TEK within the Warranty Period to describe the problem to a customer service representative who will verify that the product is under warranty and determine whether a part or the system will be replaced. If so, Purity will send the User a Return Authorization Code (RAC). The User will be required to return the AOP unit freight prepaid to Purity for Limited Warranty evaluation, and accompanied by Purity's RAC, photocopy of original invoice and proof of a licensed plumber/contractor's installation. The User will be responsible for any freight damage associated with such return. Unit or component failures found to be covered under this Limited Warranty will be repaired or replaced (at Purity's option) without cost to the User and will be returned to the User via UPS Surface, at the User's expense. AOP units received unaccompanied by the required documentation will not be accepted by Purity for Warranty evaluation and will be returned to the User in the same condition as received, freight collect (COD) if the User fails to provide the required documentation within ten (10) days from date of notification of missing documentation from Purity AOP. Any unit returned to Purity COD or freight collect will be rejected from the freight carrier.

HOW STATE LAW APPLIES

This warranty gives you specific rights and you may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

L. SYSTEM SCHEMATICS



Purity Tek

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PH: 512-255-2271

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