

CircuPool® **INDIGO₃**

Water Purification System Installation and Operation Guide



Models: **INDIGO₃-S** **INDIGO₃** **INDIGO₃-XL**

UV Ozone Systems

Advanced Swimming Pool Sanitation

IMPORTANT SAFETY INSTRUCTIONS

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

READ AND FOLLOW ALL INSTRUCTIONS in this manual before attempting installation. Failure to install in accordance with the installation instructions could void warranty and result in injury or death.

- One bonding lug for US models is provided on the external surface. To reduce the risk of electric shock, connect the local common bonding grid in the area of the swimming pool, spa, or hot tub to these terminals with an insulated or bare copper conductor not smaller than 8 AWG US.
- Follow all applicable electric codes.
- All permanent electrical connections should be performed by a qualified electrician.
- If electrically connecting this unit directly to pool controls ensure the controls are protected by a (G.F.C.I.) Ground Fault Circuit Interrupter.
- Install at least 5 ft from wall of pool water using nonmetallic plumbing. Install ozone generator no less than 1 ft above the maximum water level to prevent water from contacting electrical equipment.
- Mount the unit so that it is not accessible by anyone in the pool.
- Mount the unit with Ozone hose barb facing up and power cords facing down.
- System must be installed in an outdoor location, or indoors in a forced air ventilated room.
- For your safety, do not store or use gasoline, chemicals, or other flammable liquids or vapors near this or any other appliance.
- **WARNING:** For cord & plug connected units:
“Electric shock hazard - be sure to disconnect unit from power source before any routine maintenance is performed. Failure to do so could result in serious injury or death. Never attempt any servicing while unit is wet”
“Risk of electric shock. Connect only to properly grounded, grounding type receptacle.”
“Warning – To reduce the risk of electric shock, this device must be mounted to be inaccessible to a person in the pool”
“Warning – To reduce the risk of electric shock, replace damaged cord immediately.”
“Warning – Do not bury cord.”
- **WARNING:** Short term inhalation of high concentrations of ozone and long-term inhalation of low concentrations of ozone can cause serious harmful physiological effects. Do not inhale ozone gas produced by this device.
- **WARNING: UV Light is harmful to eyes and exposed skin.** Do not look directly at the Ozone producing lamp used in this device.

Install in accordance with the installation Instructions. SAVE THESE INSTRUCTIONS

TABLE OF CONTENTS

<u>Section 1</u>	<u>Section 3</u>
General Information..... 3	After Installation..... 7
Ozone Overview..... 3	Adjusting the Ball Valve..... 7
Product Description..... 3	Normal Operation..... 7
Specifications..... 3	What to Expect..... 8
<u>Section 2</u>	<u>Section 4</u>
Pool Water Chemistry..... 4	Maintenance & Service..... 8
Equipment Location..... 4	Visual Inspection..... 8
Mounting..... 4	Expected Service..... 8
Electrical..... 4	Troubleshooting..... 9
Plumbing..... 5	Appendix A..... 9
Creating AOP Sanitation..... 7	<u>Section 5</u>
	Warranty..... 10

This guide will provide recommendations for installing the **CircuPool INDIGO₃** series, a non-compressor driven Ozone Generator Water Purification System. The recommendations in this document are for Venturi Injected applications. All **CircuPool INDIGO₃** series residential swimming pool ozone generators utilize high output Very Ultra Violet lamp technology for the production of ozone. The following models are covered by this guide:

- INDIGO₃-S** for light-duty residential above ground or in-ground swimming pools
- INDIGO₃-M** for medium-duty residential in-ground swimming pools (or light-duty commercial pools)
- INDIGO₃-XL** for heavy-duty residential in-ground swimming pools (or medium-duty commercial pools)

Ozone Overview

Ozone is a gas which is produced in nature or by man. Ozone gas has a very short life cycle and must be produced on site for swimming pool use. Because of this short life cycle a residual sanitizer (chlorine) must be maintained, normally at a greatly reduced level. Ozone is thousands of times faster than Chlorine in oxidizing organic load in water. Ozone has been used in water treatment since the 1890’s and has been used in all International Olympics swimming pools since 1984.

There are great benefits to installing an ozone generator on swimming pools, such as improved water clarity; reduction of chemicals; a more complete spectrum of sanitation; better overall swimming experience; extended lifespan for salt chlorinators; reduction/elimination of odors, red burning eyes, itchy skin, bleached clothing, “ring-around-the-edge” oils & scum – just to name a few.

Product Description

CircuPool INDIGO₃ series ozone generators utilize High Output (VUV) Very Ultra Violet lamps to facilitate the production of ozone and are available for use in 110v or 220v 50/60hz power applications. **CircuPool INDIGO₃** series ozone generators are safe and harmless to your equipment when installed properly. **Caution should be used as looking directly at UV lamps will cause eye damage.** There are no moving parts to service. The models referenced in this document are designed for indoor or outdoor use on residential or simple commercial swimming pools.

Specifications

INDIGO₃-S

Enclosure Material.....Aluminum
Power Specifications
 Electronic Ballast
 Switchable Input Power 110/230 volts AC
 50/60 Hz
 Max. Input Current .38 amp @120 Vin
 Max inrush current 20A
 Surge Protection 3KV
 Thermal Protection 180 degrees F

INDIGO₃-M

Enclosure MaterialAluminum
Power Specifications
 Electronic Ballast
 Switchable Input Power 110/230 volts AC
 50/60 Hz
 Max. Input Current .38 amp @120 Vin
 Max inrush current 20A
 Surge Protection 3KV
 Thermal Protection 180 degrees F

INDIGO₃-XL

Enclosure MaterialAluminum
Power Specifications
 Electronic Ballast
 Switchable Input Power 110/230 volts AC
 50/60 Hz
 Max. Input Current .38 amp @120 Vin
 Max inrush current 20A
 Surge Protection 3KV
 Thermal Protection 180 degrees F



Pool Water Chemistry

To achieve optimal performance from the **CircuPool INDIGO₃** series system, it is recommended the following be performed prior to initial start-up:

- Run pool filtration continuously for 24 hours prior to starting to ozone system.
- Backwash or Clean Filter
- Test and Adjust water chemical balance to recommendations in the chart below. (These are standard levels that should be maintained continuously in the swimming pool.)

	<u>Swimming Pools</u>	<u>Spas</u>
Free Chlorine (FC)	1.0 - 3.0 ppm	3.0 - 5.0 ppm
Total Chlorine	< 0.5ppm above FC	< 0.5ppm above FC
pH	7.2 - 7.8	7.2 - 7.8
Total Alkalinity	80 - 120 ppm	80 - 120 ppm
Calcium Hardness	200 - 400 ppm	150 - 450 ppm
Stabilizer (Cyanuric Acid)	30 - 50 ppm	30 - 50 ppm
Saturation Index	-0.2 to +0.2 (0 Best)	-0.2 to +0.2 (0 Best)
Phosphates & Nitrates	None (0 Best)	None (0 Best)
TDS (w/ Salinity subtracted)	300 – 1200 ppm	300 – 1200 ppm

- Once the chemistry is balanced, shock the pool just prior to installing.

Equipment Location

Mount the **CircuPool INDIGO₃** electronic unit to a post or wall within 6 feet of power source - 110v or 220v timer, or electrical box or 120v receptacle (outlet). The unit should be mounted at least one foot above maximum water level and preferably out of direct sunlight, and out of reach of sprinklers or drainage spouts. The unit should also be located no closer than 5 feet from a body of water. Allow sufficient access for maintenance, all tubing, and electrical wires.

Mounting

Mount the **CircuPool INDIGO₃** electronic unit to a post or wall using the four mounting screw holes in the enclosure base. The unit's lower vent holes near electrical cable should not face upwards or be directly exposed to rainfall.

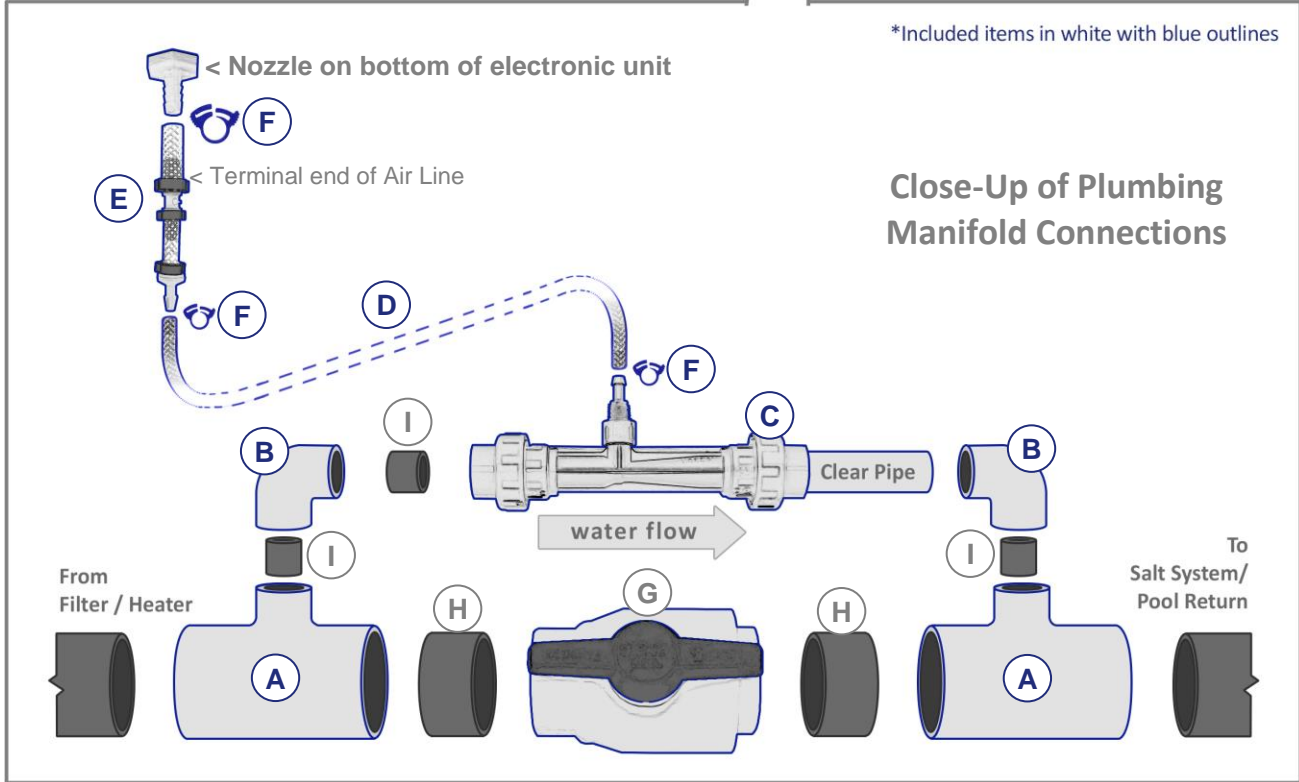
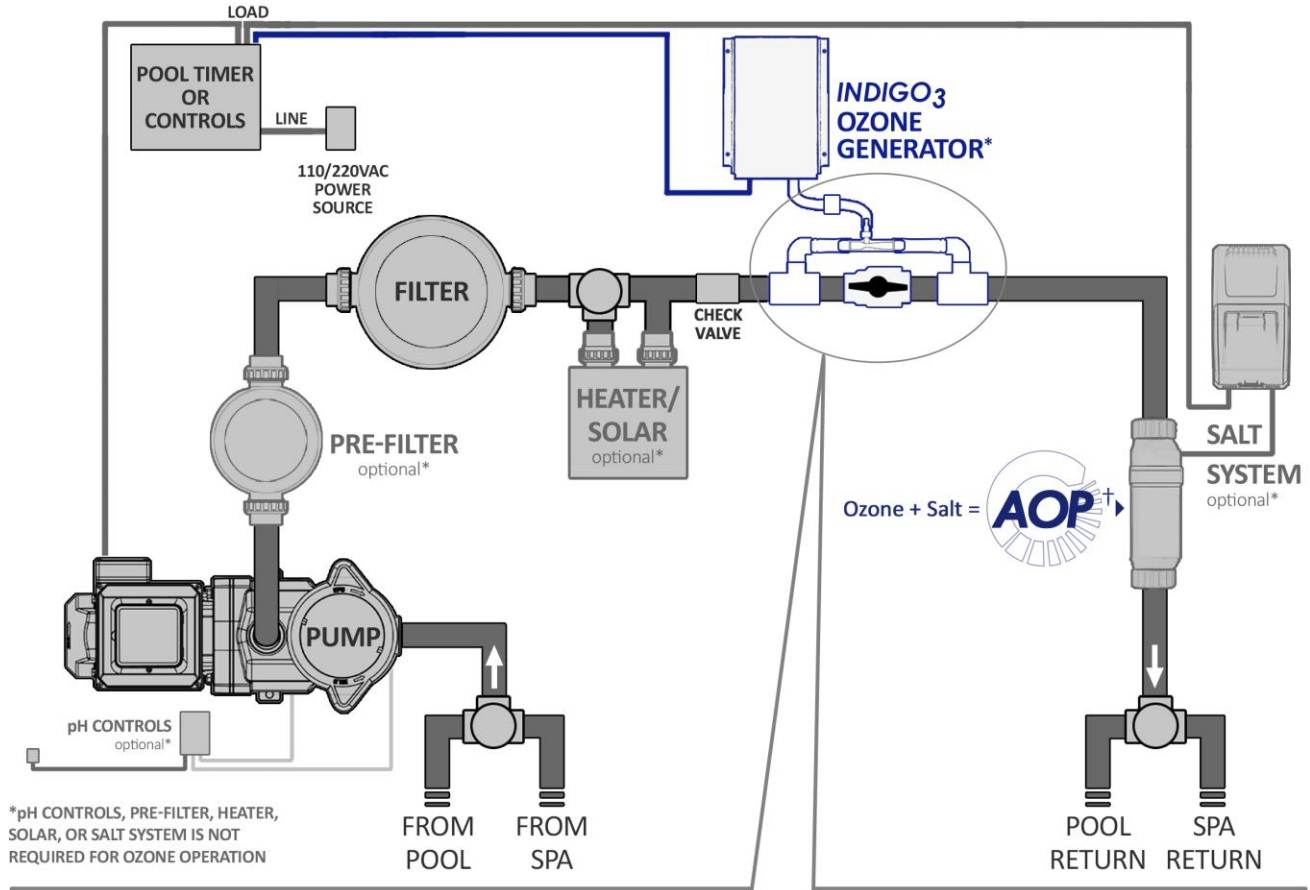
Electrical

All permanent electrical connections should be performed by a certified electrician in accordance with electrical codes. **CircuPool INDIGO₃** systems ship from the factory as 110/220V units for permanent hardwire connection. The electrical connection should be such that the **CircuPool INDIGO₃** electronic unit is supplied power only when power is supplied to the pool filter/circulation pump – for many people this is a pool timing clock. One bonding lug for US models is provided on the external surface. To reduce the risk of electric shock, connect the local common bonding grid in the area of the swimming pool, spa, or hot tub to these terminals with an insulated or bare copper conductor not smaller than 8 AWG US.

Plumbing

*See Appendix A for notes on installation with additional pool equipment

Figure 1. Overview / Equipment Layout:



† Combining the *CircuPool* INDIGO₃ ozone generator with *CircuPool* salt systems can create an Advanced Oxidation Process (AOP) for unrivaled sanitation & clarity! (see page 7)

Plumbing (Continued)

Installation Kit Components: (Diagram Part letters are cross-referenced in Figure 1 on previous page)

<u>Diagram Part</u>	<u>Quantity</u>	<u>Part Name</u>
(A)	2	2" Slip x 3/4" PVC Reducing Tees
(B)	2	3/4" x 3/4" PVC Elbows
(C)	1	Mazzei™ Injector with 3/4" Fittings and Clear Pipe
(D)	1	6' Section of 1/4" I.D. Polybraid Tubing
(E)	1	1/4" x 1/4" Kynar Check Valve
(F)	4	Quick Clamps
(G)	(1)	Bypass Valve

Additional Components Required for Installation (Not Included):

- | | | |
|-----|---------------|--|
| (H) | 12" (or less) | additional 2" PVC pipe – to connect between PVC Tees and Bypass Valve |
| (I) | 6" (or less) | additional 3/4" PVC pipe – to connect between PVC Tees, Elbows, and Mazzei™ Injector |

If your pool plumbing size is 1 1/2", you will also need reducer bushings.

Plumbing the Manifold:

The ozone generator manifold as constructed below is suitable for all filter types. This is the recommended configuration when plumbing space is available after the filter and heater; this configuration is also required with low-speed or variable speed pumps.

Plumb the manifold after the pool's filter and heater (if present), and before a saltwater chlorinator (if present) – see upper section of Figure 1. Construct the manifold as pictured in Figure 1, using PVC Primer and Cement to glue parts A, B, C, G, H, and I together in the plumbing. Make sure to pay close attention to the raised arrow that marks the direction of water flow on the Mazzei™ Injector, part C. If installation requires the Injector to be oriented vertically, the outflow side of the Injector must be facing upwards (in order for the venturi effect to create proper suction).

The ball valve, part G, is a required part of the installation. The purpose of the ball valve is to allow control of the water flow forcing its path to the injector. The injector needs sufficient flow to cause a venturi or suction action to draw air flow through the **CircuPool INDIGO₃** electronic unit's UV lamp chamber. The ball valve allows you to fine tune that flow based on your pool circulation equipment's unique performance requirements. When first installed, open ball valve to full flow position; adjustment will be made after installation, see next chapter.

Air Line Connections:

Once manifold is assembled, assemble your Air Line using the Polybraid Tubing, Quick Clamps, and Kynar Check Valve (parts D, E, and F). Connect Air Line to the Mazzei™ Injector nozzle (part C) with Quick Clamp. Air Line will connect the plumbing manifold to the electronic unit, but for now you can leave it unconnected from electronic unit's nozzle until completing instructions in next chapter to adjust the Ball Valve.

Note: Ensure Kynar Check Valve (part E) is installed where air flow is allowed toward the Mazzei™ injector. Air direction can be tested by blowing into the check valve at the terminal end of the Air Line. **Never suck on the 1/4" I.D. Tubing when connected to the electronic ozone generator unit.**

Installation Notes:

Check valves – if the pool equipment is mounted above the water line, a check valve (if not already present) is required in the plumbing in order to prevent the pump from draining and losing its prime when not in use. The location of the check valve can be anywhere between the pump outlet and the ozone plumbing manifold (see diagram).

Optional limited space installation - If plumbing space is too limited to add the ozone generator manifold, the system can be installed using the filter and/or heater for pressure differential. Contact customer service for complete instructions and to order parts if needed for alternate installation.

Creating AOP (Advanced Oxidation Process) Sanitation

When installed inline before a salt system (saltwater chlorinator), *CircuPool INDIGO₃* systems can enable a synergistic method of sanitation, AOP, that is even more effective than either ozone or chlorine! When used in combination, ozone passing through the salt system's electrolysis can create a new oxidizer, hydroxyl radicals ($\bullet\text{OH}$), one of the most powerful oxidizers available to safely disinfect swimming pool water. The hydroxyls also allow the ozone and chlorine to be even better at their job, multiplying the disinfecting power!

AFTER INSTALLATION

Section 3

Adjusting the Ball Valve (Testing Air Line Flow)

The ball valve will need to be adjusted in order to create suction into the Mazzei™ Injector - this is what draws the ozone generated by the electronic unit's UV lamp into the plumbing manifold. Start with the ball valve in the open full-flow position and, for testing purposes, have in hand the terminal end of the Air Line's check valve (ensure tubing is fully connected to Mazzei™ Injector and check valve is oriented in the correct direction).

Then, activate your circulation pump's normal operation and:

1. Place finger over terminal end of check valve at the end of the Air Line.
2. Slowly adjust the ball valve away from its open position.
3. Stop adjusting ball valve when your finger feels slight suction into the check valve and Air Line.

Note that after successful adjustment, the ball valve will still likely be in the mostly open position, as only a minimum amount of back pressure is required. When successful suction has been achieved, you should also see the infused gas passing through the clear tube that is included after the Injector.

Finally, connect Air Line to electronic unit's nozzle using quick clamp. Double check all connections; **system is now ready for use.**

Normal Operation

Confirm that the *CircuPool INDIGO₃* system is wired so that it turns on and off with your circulation pump. You may see bubbles from the ozone generator exiting the return jets of your pool, this is normal. Amount of bubbles depends on Air Line flow adjustment, circulation pump's flow rate, length of return piping, etc...

What to Expect

The ozone gas being injected into the pool's circulation system oxidizes (cleans and removes) organic contaminants thousands of times faster than the chlorine in the pool! This process will greatly reduce the amount of chlorination required, provide more complete sanitation, extend the lifespan of salt systems, improve water clarity, remove odors and harsh effects of chlorine pools, breakdown oils and organic matter, and more.

Initially, during the first 1-10 days of operation the pool water may see temporary "flocculation" occur. This amount of time will depend on the pool's filter media, how long the water has been in the pool, and other water quality factors. Fine particles (that were otherwise too fine to be filtered out) may begin to clump together, which can temporarily *decrease* water clarity, but this allows the filter to finally be able to capture them and the final result is *improved and increased* water clarity.

During this time, it is very important to keep a watchful eye on the pool filter for at least the first week, regardless of starting water condition. The increased amount of particles being captured will cause filter pressures to rise. Depending on pool conditions this could happen quickly; clean the filter as needed as soon as possible in order to prevent the possibility of clogged or damaged filter media.

MAINTENANCE & SERVICE

Section 4

Visual Inspection

Periodically inspect the unit to ensure it is functioning correctly by simply observing the end plate gaskets for a light blue glow while the system is in operation. To check that the venturi injector and bypass are working correctly simply observe to see if small bubbles are entering the pool. Periodically check the electronic unit's intake vent holes/ plug for the unlikely event of debris accumulation. **Do not look directly into the vent holes when lamp is operating.**

Expected Service

Lamp / Ballast – The VUV Lamp inside of the electronic ozone generator unit will eventually need to be replaced once it has reached the end of its operational life. If the electronic unit has power but the lamp has gone out, a replacement lamp can be easily ordered and simply installed with basic tools.

Tubing – It is recommended that the clear tubing used in the Air Line is replaced annually or as needed. The tubing should be replaced whenever cracks, wear, or evidence of water leakage is apparent. Shut down the electronic unit immediately if there is evidence of water leaking past the check valve into the electronics.

Troubleshooting

Plumbing issues - Verify suction into Air Line tubing by disconnecting terminal end of Air Line and placing finger over the end to feel for suction. If there is insufficient suction:

- Minor adjustment of the ball valve may be required to divert water through the injector. This especially may be true with two speed or variable speed pumps. Adjust the ball valve to accommodate flow through the venturi at lower speeds.
- Ensure tubing is straight and free of dips, loops, kinks, cracks or damage.
- Check tubing connections are firmly held by quick clamps.
- Check pump, filters, and skimmers to ensure full and normal water flow.
- Check Mazzei® injector for clogs; Mazzei® injector may be cleaned by unscrewing and removing the hose barb nut and a retaining rubber seal. Care should be used to not lose the internal ball and spring while taking the rubber seal off. Clean and reinstall in the reverse order of disassembly.

Electrical issues - If there is no emitted light blue glow observed, either a power source issue or a lamp/ballast issue exists. Check power source for correct voltage. Replace bulb if it has reached the end of its operational life. If supply voltage is correct and bulb has been replaced, contact customer service if unit is still dark.

APPENDIX A

Installation Notes for other types of pool equipment (if used):

- Pool Cleaners
 - Install ozone Plumbing Manifold downstream of plumbing leading to a pressure-side pool cleaner to prevent gas bubbles from affecting operation of the cleaner.
- Chlorine Tablet / Mineral Erosion Feeders
 - Install ozone Plumbing Manifold downstream of any erosion feeder to avoid gas accumulating in the feeder's canister.
- In-Floor Cleaning System
 - Ozone Plumbing Manifold should be installed on a different pool return leg than any In-Floor Cleaning System to avoid excess back pressure on the injector.
- Water Features
 - Avoid installing ozone Plumbing Manifold on any pool return leg with excessive back pressure such as those going to fountains, restrictive fittings or jets, etc...

CircuPool INDIGO₃ Ozone Generators carry the following Limited Warranty should failure occur due to faulty manufacture or materials, during normal use and service. For residential use, the manufacturer warrants to the original purchaser that the equipment shall be free of manufacturer's defects at the time of sale, and upon examination shall provide replacement parts in accordance with the following schedule:

Year One- No charge for parts.

Year Two- No charge for parts.

Year Three- Parts supplied at 66% of base price.

For Commercial use (any pool that is not for private single-family use, or the use of which is subject to regulation), parts are warranted against defect for a period of one year.

This limited warranty is subject to the following terms, conditions, and exclusions:

1. To obtain the benefits of this warranty, contact the warranty department for troubleshooting. You may obtain current contact information at www.circupool.com/help. Warranty claims must be initiated in a timely manner. Upon discovery of a defect, the warranty department will issue a Return Merchandise Authorization (RMA) and defective items and parts are to be shipped by customer to an authorized service representative, freight prepaid.

Upon examination, the determination of the cause of failure shall be made solely by CircuPool Products. The date upon which the claim is submitted and an RMA is issued shall solely serve to determine at what point the claim falls within the schedule of warranty proration, in comparison with the original purchase date. **No packages will be accepted without a RMA number.**

2. Should a defect in any item or part covered by the warranty become evident during the warranty's term, CircuPool Products will at its sole discretion repair or replace such item or part. CircuPool Products reserves the right to replace defective parts with new or refurbished parts. This warranty does not include the cost of labor or transportation charges for equipment or component parts to or from CircuPool Products, or the removal, reinstallation, or any such costs incurred in obtaining warranty replacements or repair.

3. This warranty extends to the original retail purchaser and original installation site only, beginning at the original date of purchase, and is non-transferrable.

4. The warranty contains the following exclusions. O-Rings, rubber gaskets, electrical fuses, and circuit-breaker components are normal replacement items subject to wear and are excluded from the warranty. Product discoloration, or any other cosmetic or superficial damage or deterioration, regardless of its cause, is not covered by this warranty. The warranty is not applicable to problems arising from circumstances outside the control of CircuPool Products, including, but not limited to the following:

- A. Damage or premature wear due to improper pool chemistry, and failure to maintain pool water chemistry in accordance with the recommendations contained in the owner's manual.
- B. Damage due to improper installation or connection to improper voltages, including materials and workmanship supplied by others.
- C. Damage due to negligence or failure to properly maintain equipment, including the maintenance of clean and tight electrical connections.
- D. Damage due to improper service, as well as unauthorized equipment modifications and use of non-genuine replacement parts.
- E. Damage due to misapplication, misuse, abuse, or failure to operate equipment as specified in the owner's manual.
- F. Problems resulting from tampering, accident, fire, flood, freezing, lightning, insects, or other natural elements, or other circumstances beyond the control of CircuPool Products.
- G. Damage due to over-tightening of threaded components or excessive pressure or stress.
- H. Premature bulb failure due to constant operation, or operation without use of timer or controls that synchronize with pump.

The liability of CircuPool Products shall not exceed the repair or replacement of defective items or parts under the referenced limited warranty terms. There are no implied warranties of merchantability or fitness for a particular purpose that apply to this equipment. Under no circumstances shall CircuPool Products, its agents, employees, and affiliates be liable for any loss, damage, injury, inconvenience or loss of time, incidental expenses such as labor and material charges, or any other incidental, or consequential damages, which may result from the use, installation, removal, or reinstallation of its equipment and parts.

This warranty is valid only in the United States of America. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. This warranty supersedes all previous publications. Any dispute between the original purchaser and CircuPool Products will be settled by binding arbitration, conducted in Harris County, Texas, under the rules of the American Arbitration Association.

CircuPool Products (888)-206-9938 www.circupool.com/help