



**INSTALLATION INSTRUCTIONS AND  
MAINTENANCE MANUAL  
FOR  
BALBOA WAVEZO<sub>3</sub>NE SANITATION SYSTEM**



BALBOA WATER GROUP  
www.balboawater.com  
3030 Airway Avenue, Suite B – Costa Mesa - CA - 92626 – USA

## Introduction of Waveo<sub>3</sub>ne Combo – Powerful Sanitation Method & The Science Behind It:

UVC radiation “kills” bacteria and viruses in the water exposed to the UV rays.

Ozone (O<sub>3</sub>) is a powerful oxidant that oxidizes organics contaminants in water.

UV generators and Ozone generators are being widely used for spa and hot tub applications today.

When combining Ozone and UV together in a reactor chamber, the sanitation power is multiplied.

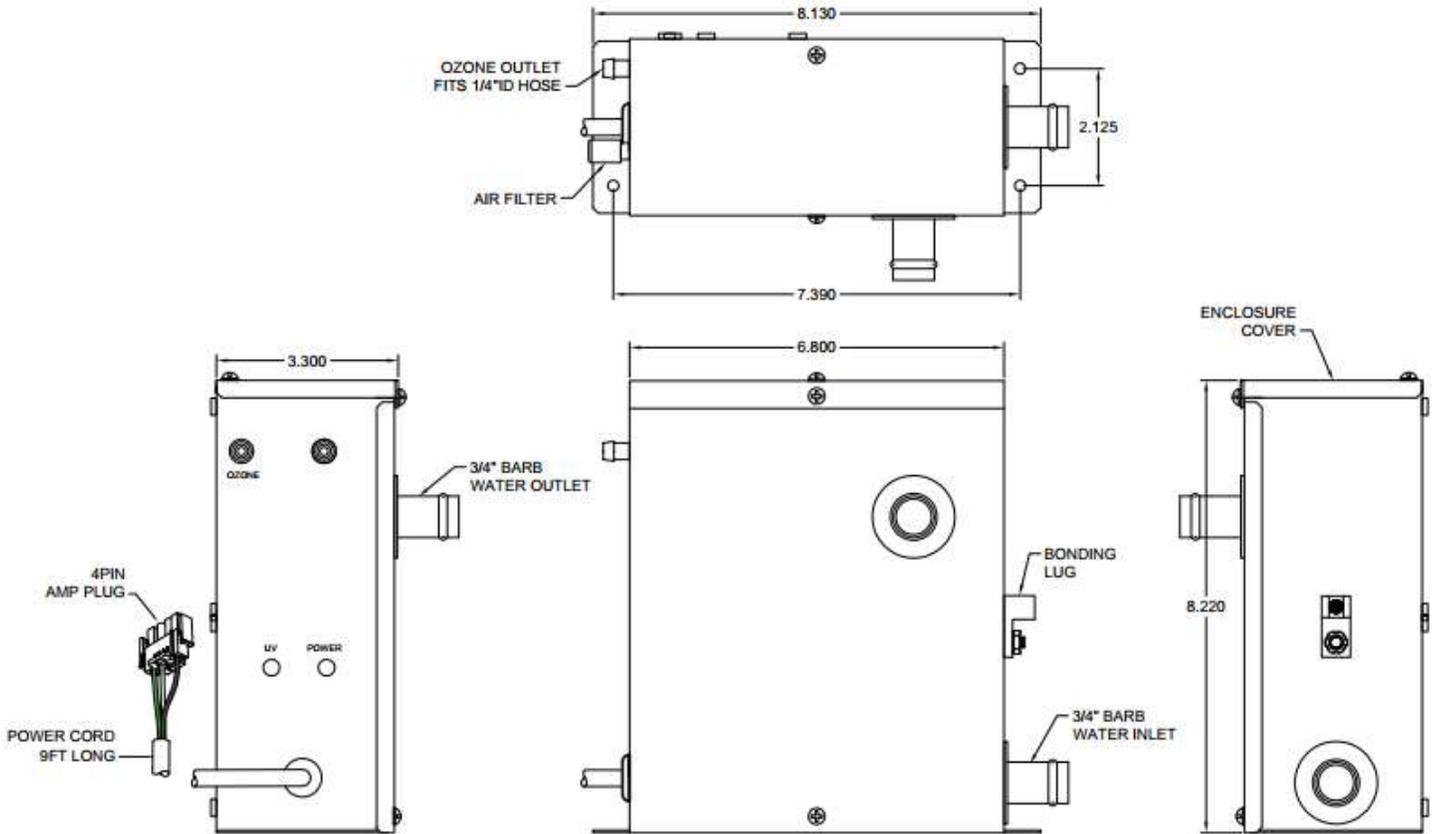
The science behind the phenomenon is called Advanced Oxidation Process or AOP.

- AOP utilizes the powerful oxidation ability of hydroxyl radicals.
- AOP is a chemical reaction process designed to remove organic and inorganic materials in the water through reaction with hydroxyl radicals.
- AOP is based on production of hydroxyl radicals. The more hydroxyl produced the better sanitation power.
- The chemical formula of hydroxyl radical is ( $\cdot$ OH).
- Hydroxyl radical is highly reactive. It is a strongest oxidant in water.
- Hydroxyl radicals oxidize unselectively both organic and inorganic contaminants.

Hydroxyl radicals are formed in the UV/Ozone chamber through a chain of chemical reactions:

1.  $O_3 + UV \Rightarrow O_2 + O$ .
2.  $O + H_2O \Rightarrow 2 (\cdot OH)$ . 2 Hydroxyl radicals
3.  $2 (\cdot OH) \Rightarrow H_2O_2$ . Hydrogen peroxide is an oxidant agent.
4.  $H_2O_2 + UV \Rightarrow 2 (\cdot OH)$ . 2 Hydroxyl radicals

**II. Dimensions:**



**III. Specifications:**

BWG PART NUMBER	SYSTEM VOLTAGE	LAMP WATTAGE	RATED AMPERAGE	SYSTEM FREQUENCY	FLOW RATE	QTY OZONE CELL	OZONE OUTPUT (0.8LPM)	CONNECTION SIZE	APPROVAL AGENCIES
59326	230V	7W	0.5A	50/60Hz	6 GPM	1	50 mg/h	3/4" BARB	UL/cUL/CE/RCM
59327	230V	7W	0.5A	50/60Hz	6 GPM	1	100 mg/h	3/4" BARB	UL/cUL/CE/RCM
59328	230V	7W	0.9A	50/60Hz	6 GPM	2	150 mg/h	3/4" BARB	UL/cUL/CE/RCM
59329	230V	7W	0.9A	50/60Hz	6 GPM	2	200 mg/h	3/4" BARB	UL/cUL/CE/RCM

**IV. Important Warnings & Safety Instructions:**

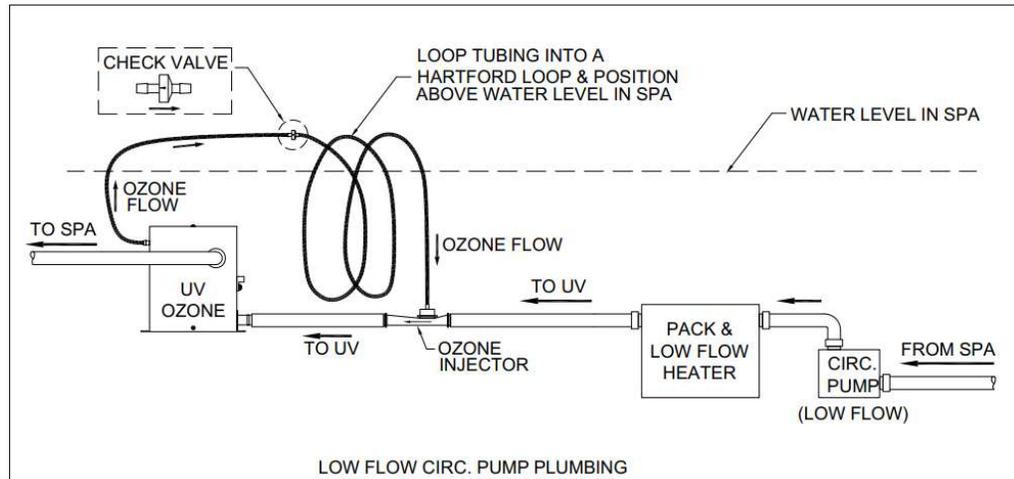
1. This unit is designed for use in spas only. It is not designed for use in potable drinking water. Misuse of this product may be harmful to your health and the environment.
2. This unit to be installed by spa manufacturers only.
3. This unit is not intended for end user installations.
4. This unit is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
5. Children being supervised not to play with the appliance.
6. This unit contains a UV-C lamp.
7. **WARNING:** Do not operate the UV-C lamp when it is removed from the unit enclosure. Do not operate if this unit is obviously damaged.
8. Unintended use of the unit or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin.
9. This unit must be installed completely underskirt of spas only.
10. This unit must be mounted securely to frame structure of the spas.
11. Spa water to be circulated from the spa through the unit with a pump & flexible hoses.
12. Maximum flow rate to be 6 GPM.
13. Maximum operating pressure at inlet is 20 pound/square inch = 137,895 pascals
14. See product label for appropriate electrical ratings.
15. This unit is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.

**V. Mounting:**

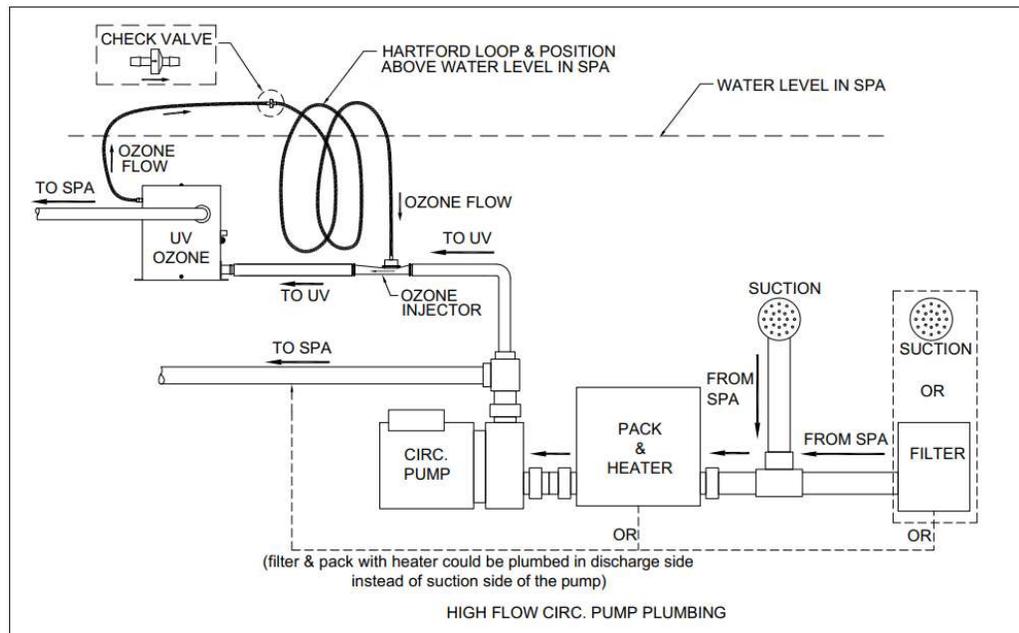
- a. This unit can be mounted on the spa floor or on the spa wooden frame with ozone outlet facing up.
- b. The unit has two mounting tabs with 2x holes on each tab. Use 4x #8x1" screws to bolt the unit to the spa floor or spa wooden frame.
- c. Clearance required:
  - i. 9" minimum from the front of cover:
  - ii. 9" minimum from the top of cover

**VI. Plumbing:**

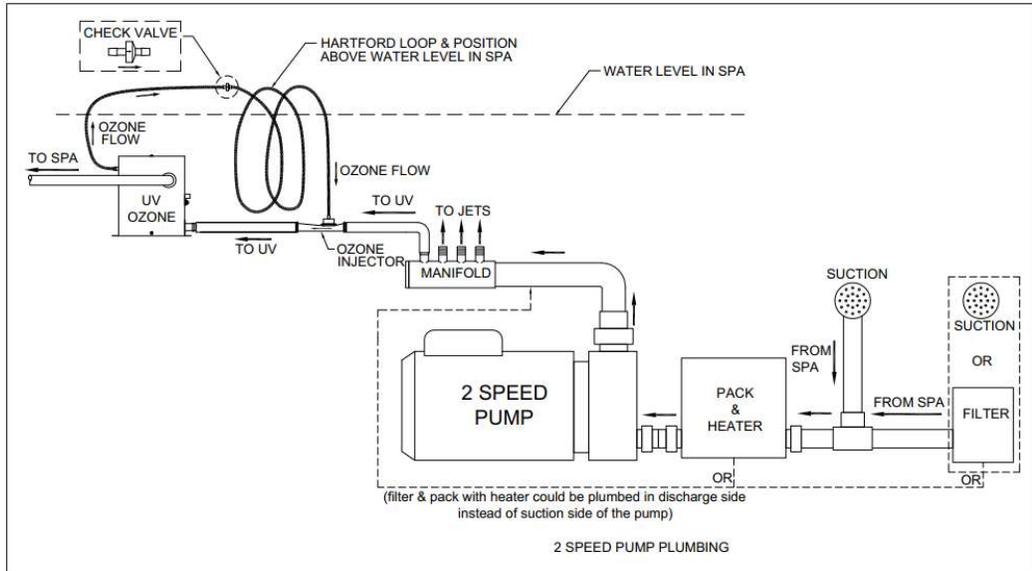
- A. Use 3/4" clear flexible hoses & 3/4" hose clamps for both inlet and outlet connections.
- B. Water inlet to be on the bottom of the unit.
- C. This unit can be plumbed with one of the bellow options:
  - a. Option 1:



- b. Option 2



c. Option 3:

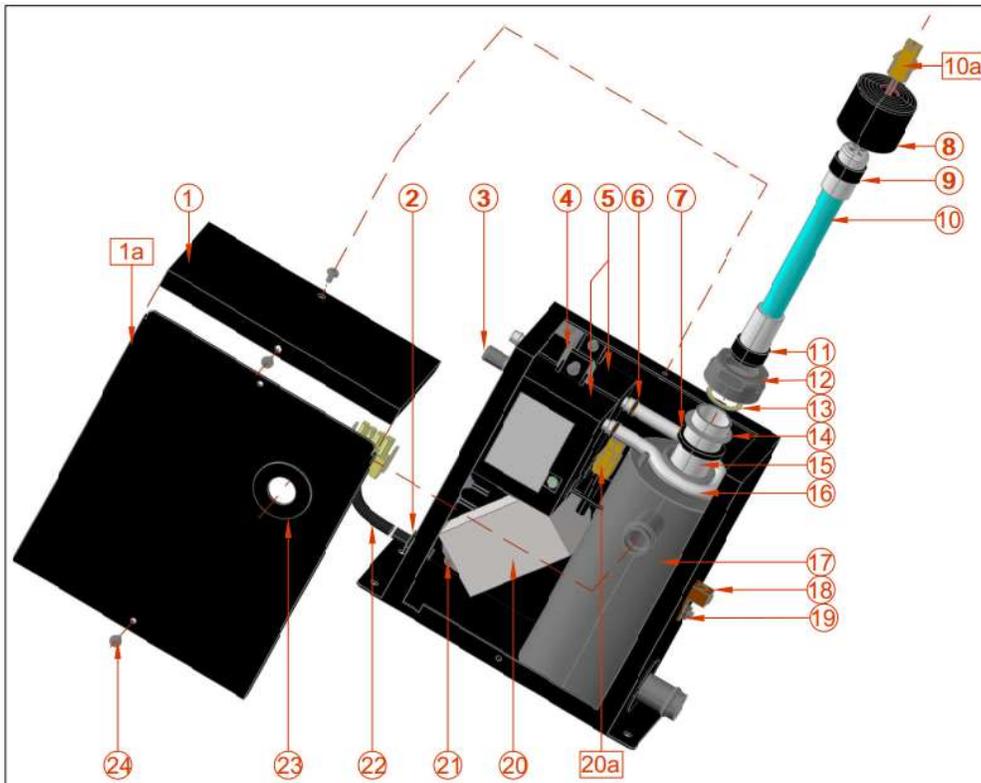


VII. **Electrical Connections:**

1. **Danger:** Turn the spa breaker to OFF position.
2. This unit must be connected to dedicated UV/Ozone mating connector on the spa controller's circuit board.
3. Electrical ratings are shown on the product label. This unit must be powered as rated only. Verify electrical ratings of this unit and spa controller before making connections.

VIII. **Bonding:** This unit is provided with a grounding lug (19) and must be electrically bonded to the spa common bonding grid. Connect the grounding lug with the spa common bonding grid with a #8 minimum solid copper wire.

IX. **Exploded drawing:**



KEY	DESCRIPTION
1	ENCLOSURE TOP COVER
1a	ENCLOSURE FRONT COVER
2	STRAIN RELIEF
3*	AIR FILTER
4**	BRACKET FOR DUAL OZONE CELL
5***	OZONE CELL
6**	OZONE HOSE CLAMP
7	QUARTZ SEAL GASKET
8	BOOT COVER
9	UPPER CUSHION
10	UV LAMP
10a	LAMP CONNECTOR
11	LOWER CUSHION
12	COMPRESSION NUT
13	PLASTIC WASHER
14	COMPRESSION WASHER
15	QUARTZ TUBE
16**	OZONE CONNECTION HOSE
17	REACTION CHAMBER
18	GROUND LUG
19	HEX NUT
20	ELECTRONIC BALLAST
20a	BALLAST CONNECTOR
21	8-32x1/4" SCREW
22	POWER CORD
23	RUBBER WASHER
24	8-32x5/16" SCREW

\*Item 3 as shown is for 2 ozone cells models. - \*\*Item 4, 6, 16 are for models with 2 ozone cells only. - \*\*\*Item 5 as shown is for 2 ozone cell models

**X. Maintenance:**

1. Quartz tube (15) to be cleaned every six (6) months of usage.
2. **Quartz tube (6) cleaning instructions:**
  - a. **Danger:** Turn the spa breaker to OFF position.
  - b. Open the spa controller's cover and disconnect the unit from the spa controller.
  - c. Drain the spa
  - d. **Warning:** Allow UV-C lamp (10) to cool down prior to removing from the unit. **Warning:** be very careful when handling broken glass to avoid injury.
  - e. **Danger:** Never look at the lit UV-C lamp (10). This can cause severe eye damage or blindness
  - f. Remove water hoses from the unit water inlet & outlet barbs & drain water out of the unit completely. Tips: fold the water hoses & secure with clamp locking pliers to stop water from running out from the spa before removing them from the unit.
  - g. Remove enclosure top cover (1) from the unit.
  - h. Make sure to use latex glove when handling the UV-C lamp (10).
  - i. Disconnect UV-C lamp connector (10a) from ballast connector (20a).
  - j. Slowly remove UV-C lamp (10) from quartz tube (15).
  - k. Remove quartz seal compression nut (12).
  - l. Carefully to remove quartz seal gasket (7) and metal compression washer (14) that go over the quartz tube. Do not use any metal tools. **Warning:** be very careful when handling broken glass to avoid injury.
  - m. Carefully remove the quartz tube (15). **Warning:** be very careful when handling broken glass to avoid injury, and wipe off any spilled water inside the unit.
  - n. Clean the quartz tube (15) with paper towel or cotton cloth. Do not use abrasive cleaner as they can scratch the quartz tube surface. Household tub and shower lime removal products can be used if needed. Rinse the quartz tube (15) with clean water to completely remove any cleaning products that were used.
  - o. Install the quartz seal gasket (7) over the opened end of the new quartz tube (15). Place the new quartz tube (15) into the unit with the domed end first making sure it is inserted and seated inside the quartz end holder on the bottom of the reaction chamber. Only about 1/8" of quartz tube (15) will be exposed when it is seated correctly.
  - p. Reinstall the compression washer (14) over the open end of the quartz tube (15). Push it against the quartz seal gasket (7).
  - q. Reinstall and **hand tighten** the quartz seal compression nut (12) by turning it clockwise until it stops. Add another quarter of a turn by using a pair of Channel Lock pliers.
  - r. Securely re-connect water hoses to the unit water inlet & outlet barbs
  - s. Fill the spa. Make sure no water dripping from the seal compression nut (12). If water is visible, STOP and tighten the compression nut another quarter of a turn with a pair of Channel Lock pliers to make sure a complete seal. Make sure there is no water leaking anywhere before proceeding to the next step.
  - t. Turn the breaker back on. Turn on the pump to circulate the water through the unit. Wait for 5 minutes and assure no water is dripping. If water is visible, STOP, fix the leak by repeating the quartz tube maintenance process from step (a) to step (r). Ensure no water dripping from the seal compression nut (12) or water inside quartz tube (15) before proceed next step.
  - u. Turn the pump OFF then turn the breaker OFF before proceed next step.
  - v. Slide the UV-C lamp (10) back inside the quartz tube (15).
  - w. Reconnect the UV-C lamp connector (10a) to the ballast connector (20a). Make sure the connector mate completely. Do not use force. Tip: line up locking tabs on connector (10a) with connector (20a).
  - x. Reinstall the enclosure top cover (1) then secure with screws removed previously.
  - y. Reconnect the water hoses back to the unit & secure with clamps.
  - z. Reconnect the unit to the spa controller and reinstall the spa controller's cover.
  - aa. Turn ON the power to the spa.
  - bb. Once power is activated you can check the LEDs to see if the unit is functioning. A solid green light indicates the unit is being provided power and should always be on. A solid blue light indicates that UV-C lamp is activated.
3. UV-C lamp (10) to be replaced every 12 months of usage.
4. Only use replacement UV-C lamp (10) recommended by spa manufactures and distributed by their certified dealers or distributors.
5. **UV-C lamp (10) replacement instructions:**
  - a. **Danger:** Turn the spa breaker to OFF position.
  - b. Open the spa controller's cover and disconnect the unit from the spa controller.
  - c. Drain the spa
  - d. **Warning:** Allow UV-C lamp (10) to cool down prior to removing from the unit.
  - e. **Danger:** Never look at the lit UV-C lamp (10). This can cause severe eye damage or blindness
  - f. Drain water out of the unit completely
  - g. Remove enclosure top cover (1).
  - h. Make sure to use latex glove when handling the UV-C lamp (10).
  - i. Slowly disconnect old UV-C lamp connector (10a) from ballast connector (20a).
  - j. Slowly remove old UV-C lamp (10) from quartz tube (15). Save the upper cushion (9) & lower cushion (11).
  - k. Install the upper cushion (9) & lower cushion (11) to the **NEW** UV-C lamp (10).
  - l. Slide the **NEW** UV-C lamp (10) into the quartz tube (15).
  - m. Reconnect the **NEW** UV-C lamp connector (10a) to the ballast connector (20a). Make sure the connector mate completely. Do not use force. Tip: line up locking tabs on connector (10a) with connector (20a).
  - n. Reinstall the enclosure top cover (1) and secure with the screws removed previously.

- o. Reconnect the unit to the spa controller and reinstall the spa controller's cover.
- p. Turn ON the power to the spa.
- q. Once power is activated you can check the LEDs to see if the unit is functioning. A solid green light indicates the unit is being provided power and should always be on. A solid blue light indicates that UV-C lamp is activated.
- r. **Warning:** The UV-C lamp used in this unit contains mercury. Properly dispose the old UV-C lamp in accordance with disposal laws. See [www.lamprecycle.org](http://www.lamprecycle.org).