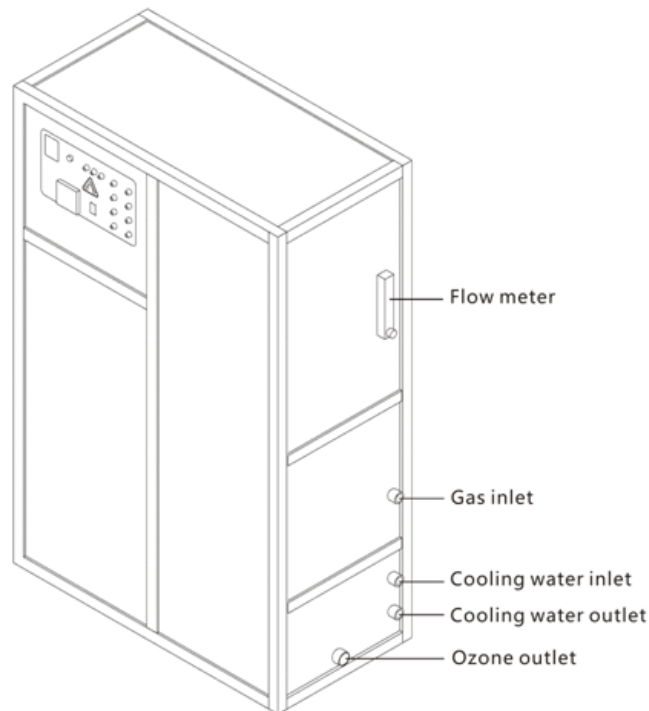




HARNESSING NATURE'S TECHNOLOGY

DIGITAL INTEGRATED POWER SUPPLY OZONE AQUAZONE 200G TO 400G OZONE GENERATOR USER MANUAL

200G 300G 400G 600G



Note

Equipment should be installed in a clean environment with good ventilation.

To prevent backflow water, gas-liquid mixing connections should be installed strictly according to this guide.

At least allow 5 seconds to turn on and off the ozone generator.

Please keep the equipment clean and dry.

It is prohibited to operate the equipment before connecting with cooling water.

PLEASE READ THROUGH THIS USER MANUAL BEFORE INSTALLING THE EQUIPMENT

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- **The scope of the user manual**
 - The user manual is for our Aquazone 200g - 400g series products.
- **Purpose of the user manual**
 - Served as the instruction for operation personnel
- **Knowledge required for understanding the user manual**
 - You will have a better understanding of the user manual if you have a mechanical and electrical background, and will qualify for the equipment maintenance.

SAFETY NOTES

SAFETY PRECAUTIONS

- Qualified special grounding cable, reliable grounding, and safety grounding are required, otherwise electric shock and other dangers may occur. The grounding cable must be connected to the dedicated grounding device of the building; otherwise installation personnel should refuse to install the equipment. If there is no dedicated grounding device, it should be installed by professional technicians (the grounding cable must not connect to the gas or water pipe, lightning rod/conductor, or telephone cable)!
- Ozone is a strong oxidising gas, and the ozone system must shut down when there is Ozone leakage. Then check the leakage point, and repair it before restarting the system. Otherwise, ozone leakage will lead to equipment oxidised and is harmful to staff around.
- Staff is prohibited to enter the space when the machine is being used for space sterilisation. In other words, business time and sterilisation time should be staggered. People are allowed to enter after sterilisation has been finished for two hours
- Loaded power should be configured with an isolator especially in high moisture locations. Otherwise, it may cause fire.
- The equipment cannot be installed in areas with high moisture or smoke, to avoid potential danger.
- Unauthorised disassembly, movement and reassembly are prohibited.
- The equipment can only be installed by qualified personnel.
- Improper installation may lead to ozone leakage, electricity short circuit and fire.
- The equipment should be installed in a place where it is convenient for maintenance. Please refer to the relevant chapter for maintenance. Users should supervise the installation personnel to read the user manual carefully, arrange the installation order, and fully prepare before installation.
- The equipment must not be installed in an area with risk of Ammonia leakage or explosion.

IMPORTANT NOTES

Installation personnel must be qualified technicians and maintenance personnel must be trained before maintenance.

- The equipment must prevent water from going into the inside.

- During operation, the equipment generates high voltage. Hence, it is prohibited to open the equipment control panel and power control cabinet.
- There is a safety breaker in the front enclosure, and when the front enclosure of the equipment is open. The equipment will stop working automatically. Hence, it is forbidden to open the front enclosure during operation.
- The equipment should be equipped with a dedicated electrical distribution cabinet, and proper grounding device.
- The equipment comes with operation instruction, and the operation personnel should be trained before operation.

SAFETY NOTE

- Make sure input and output pipes are connected correctly. Incorrect connection will lead to leakage or damage of the equipment.
- Equipment should be installed with enough space for better heat dissipation and maintenance.
- Do not use any damaged parts, otherwise it may lead to accidents or damage to the equipment.
- During installation or operation, make sure no ozone leakage and the wiring cable size meets the requirement, in order to avoid fire risk.
- To move the equipment, it is required to be guided by professionals.
- The equipment is water-cooling, and the heat will need to be dissipated out of the equipment in time. Hence, the equipment room has to be in good ventilation and install an exhaust fan if necessary. The ambient humidity must not be higher than 90%, otherwise, there will be water drops inside the equipment causing electricity leakage or fire.
- Incorrect wiring will lead to electrical parts damaged or even dangerous.
- Users must not change electrical cables or power connectors unless authorised.

OPERATION NOTES AND MAINTENANCE

- Do not rinse the equipment.
- Do not clean the equipment with hot water higher than 60°C, which may cause deformation or colour fading.
- Volatile solution or organic solvent must not be used; otherwise it may damage the equipment surface.
- Clean the ozone module inner chamber and discharge tubes carefully by soft cloth moistened with alcohol every year (very important)!
- The power source should be disconnected during the non-operation period.
- Make sure the inlet and outlet valves are closed during the non-operation period.
- Make sure the valves are working normally, and filters with regular maintenance.
- Keep the ambient area clean, dry, with a ventilation device installed.
- Do not damage the wiring cable, otherwise it will cause electric shock.
- Do not use flammable spray material to spray on the equipment, which may cause fire.
- Inlet or outlet must not be blocked; otherwise equipment performance will be lowered and out of order! Do not put sticks or other things to the inlet or outlet! Otherwise, it may touch the electric components and cause danger!

- Do not use heating appliances near the equipment, which may lead to melt of the plastic components.
- Keep the equipment external clean.
- During a long non-operation period, the power source should be disconnected and the equipment be covered with plastic sheeting.
- To ensure safety, maintenance can only be conducted with equipment power off.
- Touch screen is an accurate device, and hands should be clean when touching, or touched by soft, sleek sticks instead of wet, sharp objects.

PRODUCT DESCRIPTION

This product uses heat-resistant HQG non- glass structure dielectric (BNP patent), the structure is extremely stable, long lifespan, high discharge efficiency, and not easy to damage in the case of back flow water.

FEATURES

- The ozone generator utilised the HQG ozone generation cell patented, and has been proved to be very reliable, long service life, high ozone concentration, and is not easily damaged by back flow water.
- The PSU is utilising the digital integrated power supply unit which has comprehensive control and protection. The modular design has also made it quite simple for maintenance.
- Anti- moisture HV transformer design. The HV transformer is sealed with epoxy resin and enables the ozone generators working in some harsh environments.
- Standard 4 ~ 20mA signal control. The equipment can be precisely controlled by different types of ozone measuring devices and has met the requirements of many world leading beverage and bottled water companies.

ACCESSORIES

- Ozone duct 8m with PVC material, and is only used for commissioning, and PTFE tube or 304 stainless steel pipe is recommended after the commissioning.
- 1 piece 304 stainless steel non-returning check valve; non-returning check valve has to be installed when there is possible back flow water in ozone system and should be installed in the gas-water mixer suction port; non-returning check valve cannot guarantee to prevent back flow water completely, and back flow water protection device should be used in water treatment (especially for swimming pool, pressure mixing tank).
- 1 *Manual, 1* ozone output connector, 1 set of the cooling water connector

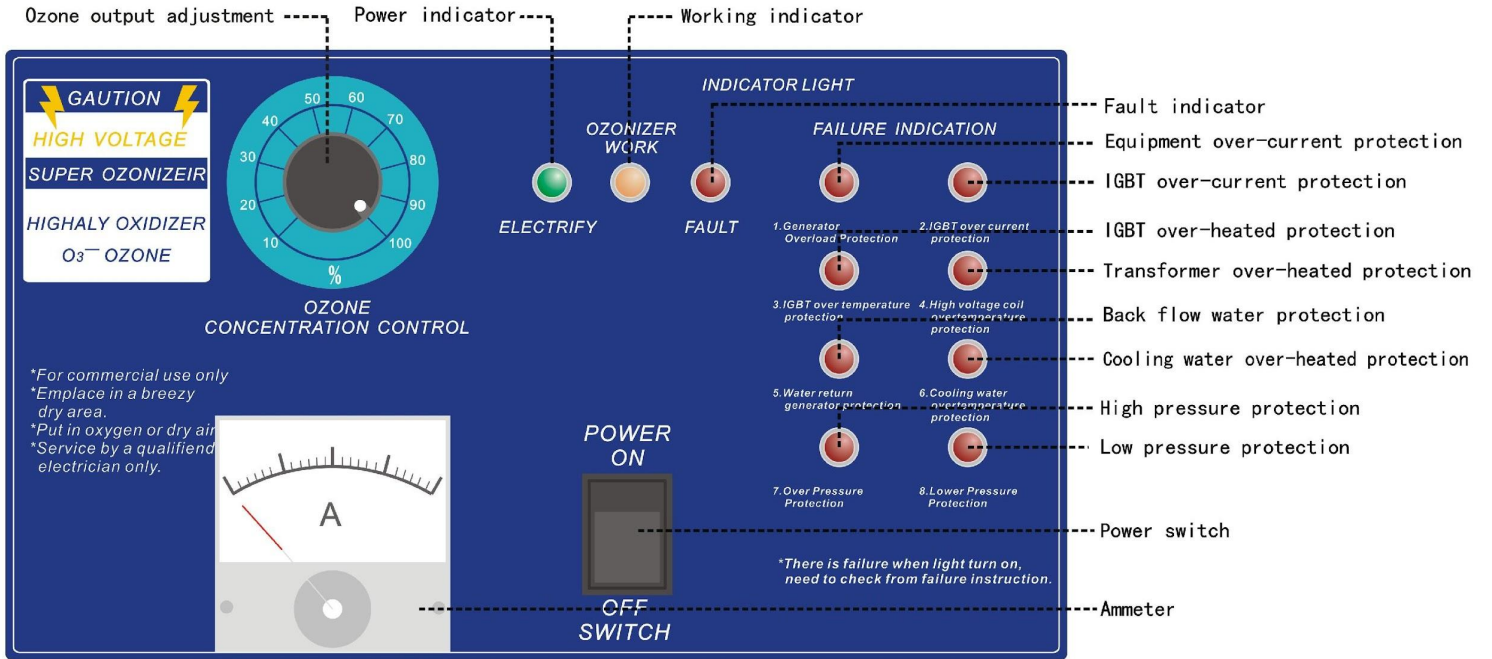
SPECIFICATIONS

Model Parameter	200G	300G	400G	600G
Capacity (g/hr)	200	300	400	600
Voltage	3*380V			
Frequency	50/60Hz			
Rating current	3*3.5A	3*5A	3*3.5A each set Two sets modular design	3*5A each set Two sets modular design
Power	2.5	3.5	4.8	7.0
Working pressure	≤0.2bar			
Cooling water flow (25°C)	6LPM	10LPM	12LPM	20LPM
Ambient temperature	<40°C			
Ambient humidity	<70%			
Cooling water input/output interface	1/2" inner thread			
Oxygen input interface				
Ozone output interface				
Cable size (mm ²)	5*1.5			5*2.5
Dimension (mm)	1000*500*1550		100*800*15500	
Weight (kg)	85	95	150	170

CONTROL PANEL AND INTERFACE

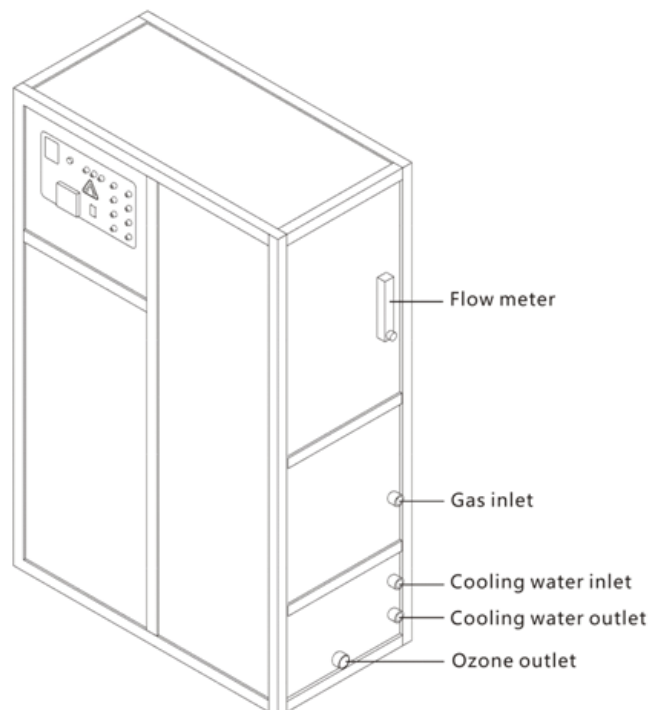
4.1 CONTROL PANEL DESCRIPTION

- **Ozone regulating knob**
 - Amount of ozone can be adjusted by adjusting the working current and the adjustable range is from 0% to 100%
- **Power indicator**
 - Light up when equipment work normally
- **Operation indicator**
 - Light up when equipment work normally and extinguished when equipment is abnormal
- **Fault indicator**
 - Extinguished when equipment is normal and light up when a fault is detected;
- **Power switch**
 - Ozone generator on/off control. 30 second delay and then start making ozone.
- **Ammeter**
 - Ozone generation working current. The working current cannot exceed the current in the specification.
- **Equipment overcurrent protection**
 - This feature is reserved
- **IGBT overcurrent protection**
 - This feature is reserved
- **High voltage transformer overheat protection**
 - When the indicator lights up, check whether high voltage transformer cooling fan is working, the ambient temperature is too high and the equipment cooling fan dust filter is blocked
- **Back flow water protection:**
 - The indicator lights up when back flow water is detected. Checking non-returning valve and backflow water prevention devices (if applicable) is normal.
- **Cooling water overheat protection**
 - The indicator lights up when the discharge tube temperature is too high. Check whether the cooling water valve is open and the flow rate is too low ;
- **High pressure protection**
 - This feature is reserved
- **Low pressure protection**
 - This feature is reserved

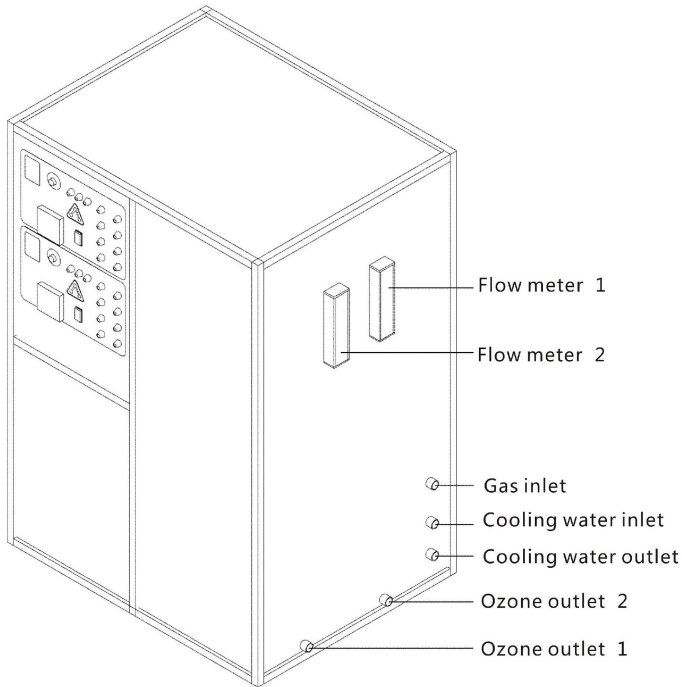


- **Equipment side interface description**
 - Flow meter
 - Ozone generator input gas flow display
- **Gas source input**
 - Either oxygen input or air input
- **Cooling water inlet**
 - It is advised to use tap water for cooling water. If use other water or circulating water, Polypropylene (PP) cotton water filter should be installed before cooling water inlet, otherwise impurities in the water or metal oxides will lead to insufficient heat dissipation.
- **Cooling water outlet**
 - Outlet water temperature should be lower than body temperature (feeling cool), otherwise, a higher flow is required.
- **Ozone outlet**
 - A non-returning check valve and backflow water prevention device have to be installed between the ozone outlet and the venturi injection device in the water treatment application, preventing back flow water from going into the equipment!
- **4 ~ 20mA signal receiving port**
 - Automatically adjust the amount of ozone when received 4-20mA analog signal
- **Power cable**
 - 220V 50Hz and the power must come with the ground cable, otherwise may lead to electric leakage when the equipment gets wet!

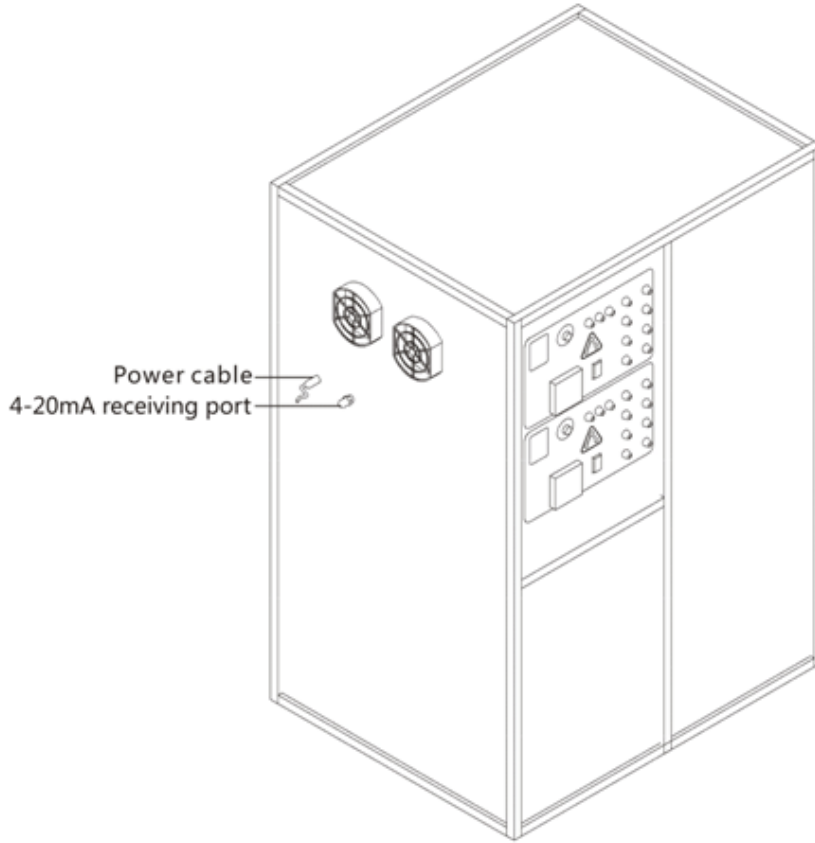
300G INTERFACE



200G, 400G AND 600G INTERFACE (TWO SETS,MODULAR DESIGN)



4~20mA ANALOG SIGNAL RECEIVING PORT



INSTALLATION AND MAINTENANCE

INSTALLATION PLACE REQUIREMENT

Equipment should be installed indoors, with clean, adequate light and a good air circulation environment. It is prohibited to be installed in the environment of exposure to sunlight, rain, water vapour, moisture, corrosive gas, explosive gas and dust.

Environment temperature should be lower than 40°C, humidity lower than 70% (preferably, install air conditioner for cooling and drying). Environment temperature too high may lead to equipment cease and lower ozone generator production. High humidity may lead to controlling circuit malfunction or damage.

The distance between equipment and wall, ceiling should be more than 600mm, which is convenient for future maintenance.

Equipment should be installed on solid, horizontal ground. Installing on uneven ground may lead to a high level of equipment noise and vibration.

PIPING INSTALLATION

- **Gas input pipe**
 - DN20 PVC or 12*8 PU pipe is suggested. The inner diameter needs to be over 15mm if the gas source is air and over 8mm if it is oxygen.
- **Cooling water pipe**
 - DN20 PVC is suggested. The inner diameter needs to be over 10mm.
- **Ozone output pipe**
 - 304/316 stainless steel pipe or PTFE pipe is suggested. The inner diameter needs to be over 15mm if the gas source is air and over 8mm if the gas source is oxygen. Otherwise, the inner pressure is too high which will lead to arcing, and main circuit board damage.

ELECTRICAL CONNECTION

- The connection cable size should not be less than specified in the specification, and when cable length is more than 10 meters, a bigger size should be used.
- The power source should meet the voltage and frequency requirement.
- The voltage fluctuation cannot be too high, and it should be within the range of -10%~+10% of the nominal voltage. It cannot be used if voltage is out of range, otherwise it will cause equipment damage, and voltage stabiliser or regulator should be used to meet the voltage range.
- Voltage unbalance of the three phases cannot be too high, and should be within 5%. Stabiliser should be used if there is high fluctuation.

ON / OFF PROCEDURE

- Check before operation: check whether equipment input piping, cooling water piping, ozone output piping are in good connection, whether power sources meet the equipment voltage requirement.

- Operation procedure: turn on the cooling water valve, and turn the knob on the control panel to the minimum. Press the power switch on the control panel, and the equipment starts operation, with working current to be 0, fault indicator lights up; slowly turn the knob clockwise, and the working current increases. When the knob is turned to 100%, namely the equipment reaches its rated current, the fault indicator extinguishes, and the working indicator lights up.
- Shut down operation: turn the knob on the control panel to the minimum, and then turn off the power switch on the control panel and the equipment stops operation.

NOTES

- For the dual set ozone generator (200G / 400G / 600G), when only one set is operating, the flow meter of the other set which is not operating should be turned off. Otherwise, the gas source will also go to the non-operation ozone module, and lead to lower concentration of ozone output!
- For the dual set ozone generator (200G/400G/600G), a stainless steel ball valve should be installed at each of the ozone outlets. When only one set is operating, the ball valve for the other set should be turned off!

MAINTENANCE AND TROUBLESHOOTING

WARRANTY TERMS

BIOZONE AFTER SALE SERVICE COMMITMENT

- All products (not including consumable material, accessories and the L series products) from Biozone are warranted for one year from the date of purchasing.
- The following occasions are excluded from the warranty, and Biozone may charge for the repairing materials.
- Product damages due to high humidity working environment or oxygen concentrator flooded by water.
- Product damages due to unauthorised operation unless instructed by Biozone or Biozone authorised distributor.
- Product damages due to natural disaster, or any other force majeure.
- The warranty is valid for factory defects and not for misuse or not following the instructions or not keeping the unit clean and serviced and maintained.
- Fail to provide proof of purchase or serial numbers are not attached to the units.
- If on-site service is required, customers will be required to pay for the cost of travelling, and Biozone or distributor can decide to come or not according to the distance.
- **In the case that the sterilisation standard is not met due to improper operation or malfunction of the product, Biozone does not take any responsibility.**

MAINTENANCE ITEMS

- Fan filtering net cleaning/replacement: the dust net needs regular cleaning due to accumulated dust from the air (refer to the maintenance cycle table below). Turn off the power before cleaning, and take off the cover of the fan. Then take out the stainless steel fan filtering net, clean it with clean water, and do not re-assemble it until it is dry.

- High voltage parts water removal: during the humid season, there is moisture on the connecting cable of the transformer (the high voltage unit), transformer, and the connecting cables of the ozone module. Dry it with cloth and hair dryer. Otherwise, it may lead to damage to the equipment.
- Ozone module inner chamber, discharge tube cleaning/ replacement: accumulate small partial on the inner chamber and electrode from the gas source will lower the ozone production and concentration. Hence, they need to be cleaned regularly.

MAINTENANCE CYCLE TABLE

Item	Content	Circle								Remark
		day	week	month	Three month	Half year	One year	Two year	Three year	
Fan filter net	Clean, replace			○			●			Cycling clean
Dry moisture on high voltage parts	Clean			○						Maintain during humid season
Inner side of internal and external electrode	Clean						○			Regular clean when used in beverage and food industry
Internal electrode	Replace							●		Replace if high demanded
External electrode	Replace								●	Replace if high demanded
Fault detection circuit board	Replace							●		Replace if high demanded
Transformer (high voltage unit)	Replace								●	Replace if high demanded

Note

- ○ : means inspection, adjust or clean; ● : means replacement
- The above table is the suggested maintenance/ replacement cycle from manufacturer and customer can also conduct the maintenance/replacement according the actual operation environment and intensity of work
- All maintenance/replacement can only be conducted when the power is off and pressure release, ensuring the safety of the operation personnel.

TROUBLE ANALYSIS AND INSPECTION (TABLE 6-2)

Number	Problem	analysis	inspection
1	No power	Power plug/ power cabinet no power Internal fuse broken	Check the power source. Replace the fuse and check if the voltage is normal.
2	No flow from ozone outlet	Gas source is not connected. Flow meter has not been turned on Internal piping leakage Internal piping folded	Reconnect gas source Turn on flow meter Check if there is leakage in the connectors, and tighten it if any is found. Straighten out the connection.
3	Alarm is on and no working current	(1) Ozone adjustment knob has not been turned on. (2) Transformer (HV transformer) over temperature protection—4# indicator on (3) Backflow water protection—5# indicator on (4) Cooling water over temperature protection—6# indicator on (5) Issue with 4-20mA signal. (6) Ozone adjustment knob short circuit (7) Digital power supply unit issue.	(1) Turn up the knob to increase output Clean fan filter net; Transformer (high voltage unit) cooling fan damaged; transformer temperature control damaged or in poor contact. (3) Completely dry water in ozone module; check backflow water reason. (4) Open the input water valve or increase cooling water flow. (5) Disconnect the 4-20mA signal and check. (6) Replace potentiometer. (7) Replace the digital power supply unit.
4	Low ozone output, low current (over 0.5A but lower than rating current)	(1) Adjustment knob turned to be small percentage. (2) Abnormal feedback signal from ozone monitoring device (3) Excessive gas pressure inside ozone module, causing high pressure inside the ozone generator. Working pressure should be less than 0.2 bar.	(1) Turn the knob to higher percentage. (2) Disconnect the 4-20mA feedback signal connector. (3) Decrease gas input flow or increase negative pressure for the injection.
5	Low working current (lower than 0.5A), no ozone output	(1) Back flow water in the ozone module. (2) Excessive gas pressure inside ozone module (3) Abnormal feedback signal from ozone monitoring device (4) Transformer connecting cable/ grounding cable is open circuit. (5) Quartz electrode damaged (6) Transformer damaged	(1) Completely dry water in ozone module; check backflow water reason. (2) Decrease gas input flow or increase negative pressure for the injection. (3) Disconnect the 4-20mA feedback signal connector. (4) Re-connect transformer and grounding cable. (5) Replace quartz electrode. If no new quartz electrode is available, only remove the steel wire on the damaged electrode (Do not remove the quartz electrode or the concentration will be decreased). (6) Replace transformer

PSU ERROR CODE AND SOLUTION

Error code	Description	Possible cause	Solution
E001	PSU Over current	Input voltage too low	Check the mains voltage, and make sure correct and firm connection
E002		Working current changes too fast	Slower regulation control
E003		Rapid changes on the load or problem with the loads	Check ozone cell and HV transformer
E004	PSU over voltage	Input voltage abnormal	Check the mains voltage, and make sure correct and firm connection
E005		Working current changes too fast	Slower regulation control
E006		PSU output voltage increase too fast	Change settings on the parameters
E007		Rapid changes or problem with the loads	Check ozone cell and HV transformer
E008	Phase loss	PSU input R, S, T phase loss	Check the mains voltage, and make sure correct and firm connection
E10	IGBT protection	PSU Output short circuit Load short circuit or abnormal Cooling fan channel blocked or cooling fan issue Ambient temperature too high	Check PSU output cables Check HV transformer and the connections Clean the cooling channels, replace cooling fan Lower ambient temperature
E11	PSU IGBT over heated	Cooling fan channel blocked or cooling fan issue Ambient temperature too high	Clean the cooling channels, replace cooling fan Lower ambient temperature
E12	rectifier modules over heated	Cooling fan channel blocked or cooling fan issue Ambient temperature too high	Clean the cooling channels, replace cooling fan Lower ambient temperature
E13	PSU overload	PSU input voltage too low PSU Over current	Check the mains voltage, and make sure correct and firm connection Decrease the current by setting to lower ozone

Note

- If the problem still exists after the above inspection, please contact our company or local distributor.
- All maintenance/replacement can only be conducted when the power is off and pressure released, ensuring the safety of the operation personnel.
- When servicing a SOZ series ozone generator with multi-set individual control, make it clear of the component in each set (AB set: breaker, contactor, relay, digital power supply unit, transformer, ozone cell, cooling pipe, control panel).

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