biotek ozone

Dissolved Ozone Monitor
Owner's Manual

OM-1000

Please read this manual carefully before starting operation.

biotek ozone
www.biotek-ozone.com
distributor

Table of contents

Introduction

Thank you for purchasing our powerful ozone monitor. This instrument measures the concentration of ozone in water. The ozone monitor is easy to use and displays test readings fast.

OM -1000

Product		**Dissolved Ozone Monitor**
Model No.		OM-1000
Power	Voltage	9V battery*1
	Power consumption	25 mW
Concentration measurement range		0 - 6.0 ppm
Ambient air temperature range		10°C-35°C
Ozonated water temperature range		10°C-30°C
Accuracy		0 - 1.0 ppm：±0.2 ppm 1.0 - 6.0 ppm：±20%

material safety data sheet for ozone gas (cont.)

health hazard data (cont.)

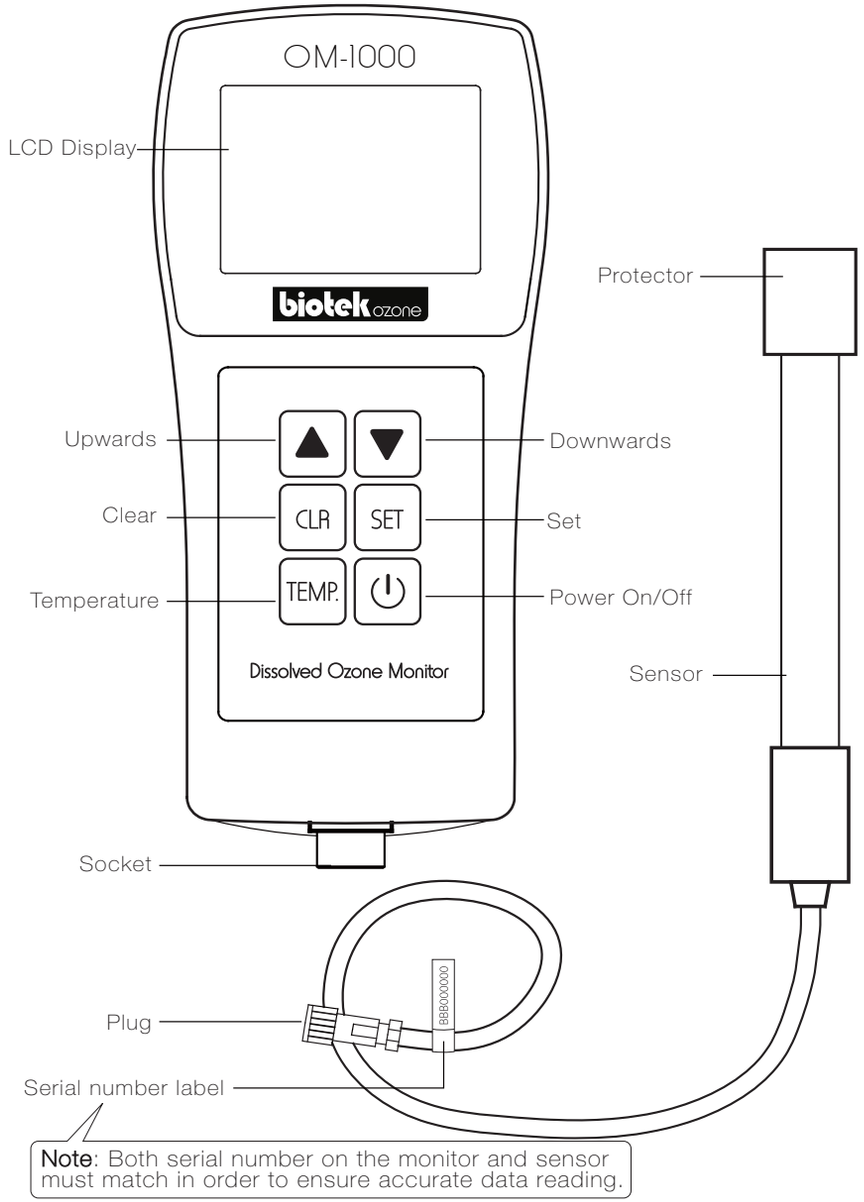
Effects of Single Overexposure	May cause irritation of the respiratory tract experienced as nasal discomfort, dryness, irritation of the throat, pain or congestion of the chest, difficult breathing or coughing. Irritation of the eyes, headache, nausea and drowsiness may also occur.

emergency first aid

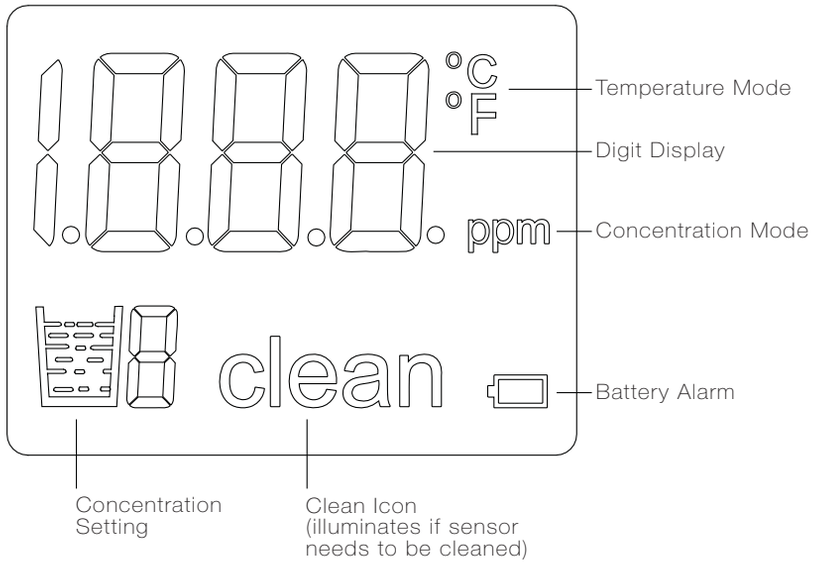
exposure	symptom /prevention	first aid
Emergency Overview	Ensure adequate ventilation in the area where ozone is present.	Remove from the presence of air containing ozone.
Inhalation	Irritating to respiratory system. Cough, headache, shortness of breath. / Ventilation.	Remove from the presence of air containing ozone. Administer oxygen if necessary. If breathing is difficult or discomfort persists, obtain medical attention.
Skin	Not an expected route of entry.	
Eyes	Irritating to eyes. / Ventilation. Face shield or eye protection with breathing protection.	Remove from the presence of air containing ozone. Rinse with water for several minutes and seek medical attention if necessary.
Ingestion	Not an expected route of entry.	

exposure control /personal protection

Engineering Controls	Ozone equipment should be operated with an ozone off-gas destruct process.
Ventilation	Ozone off gas should be collected and destroyed prior to release.
Respiratory	Respirator or self-contained breathing apparatus for concentrations greater than 0.1ppm.
Handling	Not applicable
Storage	Ozone gas cannot be stored. Ambient ozone gas monitors should be used for detection.



LCD display



1 The water temperature will be displayed in the temperature mode (°C is illuminated). Unit of measurement is either degrees Celsius or Fahrenheit.
2 The ozone concentration in water will be displayed as ppm in the concentration mode (ppm is illuminated).
3 The numerical values of the test readings are shown in the digit display.
4 Users will be reminded to replace batteries by a blinking light when the voltage gets low in order to ensure accuracy of test readings.
5 Concentration Setting: set before testing
6 Cleaning warning: After a total measurement time of more than three hours, the "clean" icon will illuminate, alarming the user that the sensor needs to be thoroughly cleaned according to the steps described in "Maintenance" on page 8.

technical information

material safety data sheet for ozone gas (cont.)

fire and explosion hazard (cont.)	
Extinguishing Media	Use extinguishing media appropriate for the fuel source.
Special Fire Fighting Procedures	Use self-contained breathing apparatus. Ozone is an oxidizer.
Unusual Fire and Explosion Hazards	Ozone can react explosively with readily oxidizable substances and reducing agents.
reactivity data	
Stability	Unstable. Decomposes to form oxygen under ordinary conditions thus is not encountered except in the immediate area where it is formed.
Reactivity	Reacts with any materials that can oxidize. Reactions with some materials such as alkenes, ether and other compounds are highly unstable and explosive.
Hazardous Decomposition	None. Ozone decomposes rapidly to oxygen (O_2).
Conditions to Avoid	Do not concentrate to high levels(>17%/wt.). The decomposition of ozone at high concentrations can become explosive.
Incompatibility	Avoid contact with materials that can oxidize.
health hazard data	
Incompatibility	The Occupational Safety and Health Administration (OSHA) requires that workers not be exposed to an average concentration of more than 0.10 ppm (of ozone gas) for 8 hours. The shorttermexposure limit of 15-minutes is 0.30 ppm.
Primary Route of Entry	Pulmonary system

technical information

material safety data sheet for ozone gas

product information	
Product Name	Ozone
Synonyms	Triatomic Oxygen, O_3
Chemical Formula	O_3
Description	Gaseous oxidant
Molecular Weight	48.0
Other Designations	None
hazardous components	
Components	Ozone Gas
Concentration	0-15% by weight
CAS#	10028-15-6
ICSC#	0068
physical data	
Boiling Point (760mm Hg)	-111.9°C
Melting Point	-192.7°C
Gas Density (0°C and 1 atm.)	2.14 g/l
Vapor Density (air=1)	1.6
Water Solubility (20°C, 4% ozone in oxygen)	19 mg/l
Specific Gravity	1.614
Odor	Pungent
Appearance and Odor	Colorless gas with pungent odor generally detectable at 0.01 to 0.04ppm and a sharp disagreeable odor at 1.00ppm.
fire and explosion hazard	
Flash Point	Not Applicable
Auto-Ignition Temperature	Not Applicable
Flammability	Non-Flammable but enhances combustion of other substances. Some reactions may cause fire or explosion.

button functions

⏻ To turn the power on and off. After turn on the system, it will automatically turn off every 10 minutes.

SET
- For choosing the appropriate mode: Press the SET button one time on the common mode into the appropriate mode. Press the SET button a second time to return to the common mode.
- Memory Mode: Press the set button for 2 seconds under the common mode.
- Quit:Press the set button under the memory mode or query mode.

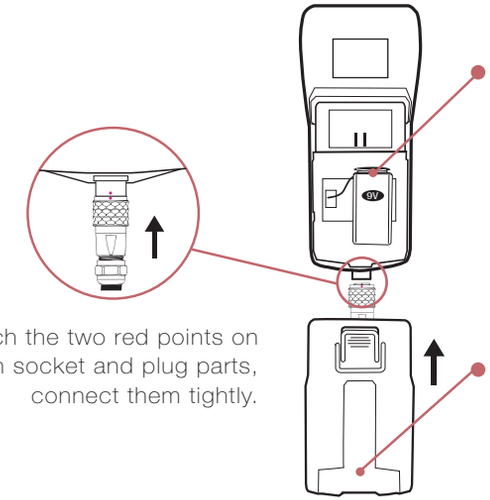
▲
- Common Mode: Increase range
- Memory Mode: Update the test result number
- Query Mode: Query the test result

▼
- Common Mode: Reduce range
- Memory Mode: Update the test result number
- Query Mode: Query the test result

CLR
- CLR Waring： Cancel the cleaning warning
- The test result memory is full: Clean the memory

TEMP. Press to enter the Temperature Mode, which will display the water temperature.

assembly instructions



- Open the back of the monitor and insert a 9 Volt battery.

(When replacing the battery, use one hand to hold the snap connector and the other to carefully remove the battery. Do NOT pull on the wire as this may loosen connections.)

Match the two red points on both socket and plug parts, connect them tightly.

- Close the monitor shell.

Common test mode

When the ozone concentration in water is suspected to lie between 0 to 2 ppm, the test steps are as follows: (If the actual concentration is higher than 2 ppm, the monitor will indicate this by showing “EPP” on the display. If “EPP” is shown for at least 3 seconds, follow the measurement steps described on page 6)

1 Prepare a clean beaker that can hold at least 1000 ml with a diameter of about 8 cm. (Do not use the small beaker provided with the monitor, it is for fluid level measuring only). Fill the beaker with ozonated water, remove the protector from the sensor and immerse 5 cm of the sensor.

2 Press the "ON / OFF" button.

3 Press the "TEMP." button to display the water temperature (the default display unit is ℃, press the “down” key ▼ to switch to ℉). At this important step the monitor will take the water temperature into account for the ozone concentration measurement.

4 Wait about 60 seconds, until the temperature display does not change any more, then press "TEMP." button again to go back to the concentration mode.

5 If the monitor has not been used for more than one day, leave the sensor in the beaker with ozonated water for another 2 minutes and press the "ON / OFF" button. Alternatively, rinse the sensor with ozonated water for 2 minutes and press the "ON / OFF" button. (This step 5) can be omitted if the monitor has been used within 24 hours)

6 Press the "SET" button.

7 Press the arrow keys until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 0.

8 Press the "SET" button again to exit.

9 Once again, fill the 400 ml beaker up with fresh ozonated water.

10 Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged at least 2 cm at all times. The concentration will be shown on the display.

11 Leave the sensor inside the beaker until the display shows a concentration of 0. Do not move on to 12) before the display is 0.

12 Repeat steps 9), 10), and 11) to do a second measurement.

13 Repeat steps 9), 10), and 11) to do a third measurement. Read the display for about 15 seconds while shaking the sensor as described in 10). The greatest value shown on the display during the third measurement is the ozone concentration reading in parts per million (ppm). (Note: Ignore the readings shown during the two previous measurements).

14 Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.

1 Keep the monitor away from water – the enclosure is not waterproof. If water contacts the monitor, turn the power off and wipe the water away and then put the machine to the ventilated place until it’s normal.

2 Do not let anything touch the bottom of the sensor. Always use the protector to cover the sensor when not in use.

3 Leave the sensor inside the beaker and wait for the display to show a concentration of 0 before testing one more time(about 10-30 seconds).

4 The testing solution temperature should lie between 10℃ and 30℃.
If there is large difference between the ambient temperature and ozonated water temperature, it is recommended to place the sensor into similar temperature tap water prior to testing to ensure accuracy.

5 The sensor electrodes need to be cleaned after 3 hours of total usage. When the “clean” icon illuminates, do as described in “Maintenance” on page 8.

6 Do not immerse the top of the sensor (where the cable is connected) in water.

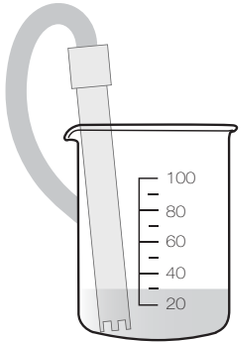
7 Carrying on numerous tests, if the temperature has already been tested at the first time and has no change, there is no need to test the temperature in the subsequent tests.

Trouble shooting

Issue	Cause	Solution
Start up failure. Device does not power on.	Battery is low	Replace battery. *When replacing the battery, use one hand to hold the snap connector and the other to carefully remove the battery. Do NOT pull on the wire as this may loosen connections.
Button defective or misplaced	Water gets into keyset	Switch off monitor immediately, place it in good ventilation while keeping the upper part higher (To avoid water during usage)
Reading is 0 ppm regardless of actual concentration	Plug not correctly connected to socket	Check the connection of cable plug with socket
Reading seems too low, actual concentration suspected to be higher	1.Battery voltage low 2.Sensor needs to be cleaned	1.Change battery 2.Clean sensor as described on page 8

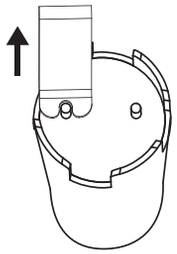
maintenance

When the "clean" icon illuminates, please clean the sensor according to method 1 described below:



Method 1:

Pour 30 ml of fresh 36% acetic acid (CH_3COOH) in a clean 100 ml beaker. Remove the protector from the sensor and immerse the bottom of the sensor as pictured on the left. Leave the sensor immersed for 12 hours. Make sure that the temperature of the acetic acid is above 16°C.
Clean the sensor with tap water and put the protector back on.



Method 2:

If method 1 cannot be carried out, an alternative method 2 may be used: Use the small blade provided with the monitor to carefully scrape the two golden electrodes at the bottom of the sensor as pictured on the left. Scrape upwards, away from the sensor. Scrape each electrode from 4 different sides. Scrape each side 2-3 times.
Clean the sensor with tap water and put the protector back on.

Recommended Cleaning Procedure:

Follow method 1 when “clean” is prompted for the first time. Follow method 2 when “clean” is prompted for the second time. Redo the process for subsequent cleanings.

Concentration Setting

Concentration of ozonated water sample（ppm）	Parts of ozonated water in beaker	Parts of tap water in beaker	Concentration Setting (number shown next to cup at bottom left of display)
0 - 2.0	1	0	0
2.0 - 4.0	1	1	1
4.0 - 6.0	1	2	2

Concentration setting factory default is set to 0, that is to test ozonated water with a concentration of 0 -2.0 ppm.

operation instructions

When the ozone concentration in water is suspected to be more than 2 ppm, the test steps are as follows:

1 Prepare a clean beaker of at least 1000 ml with a diameter of about 8 cm and put 200 ml tap water inside.
2 Add 200 ml ozonated water into the beaker.
3 Measure the water temperature of the mixture by pressing the "TEMP." button. Then pour the beaker content away.
4 Press the "SET" button.
5 Press the arrow keys ▲ ▼ until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 1.
6 Press the "SET" button again to exit.
7 Once again, first put 200 ml tap water into the beaker and then add 200 ml ozonated water.
8 Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged more than 2 cm at all times. The concentration will be shown on the display.
9 Leave the sensor inside the beaker until the display shows a concentration of 0.
10 If the LCD display shows "EPP" for more than three seconds during step 8) or 9), then the ozone concentration is above 4.0 ppm.
If no "EPP" is shown, pour the beaker content away and test a second time according to steps 7), 8), and 9) above. Then, test a third time according to steps 7), 8), and 9) and take the maximum reading of the third test as measurement result. Then, Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.
11 If display shows "EPP" for more than three seconds, pour the beaker content away and put 400 ml tap water into the clean beaker. Then, add 200 ml ozonated water. Measure the water temperature of the mixture by pressing the "TEMP." button. Then pour the beaker content away. Press the "SET" button. Press the arrow keys until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 2. Press the "SET" button again to exit. First put 400 ml tap water into the beaker and then add 200 ml ozonated water. Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged more than 2 cm at all times. The concentration will be shown on the display. Leave the sensor inside the beaker until the display shows a concentration of 0. According to the above-mentioned steps, do test 2 times more .Take the maximum reading of the third test as the final test result. Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.

Memory test mode

When the ozone concentration in water is suspected to lie between 0 to 2 ppm, the test steps are as follows: (If the actual concentration is higher than 2 ppm, the monitor will indicate this by showing “EPP” on the display. If “EPP” is shown for at least 3 seconds, follow the measurement steps described on page 8)

1 Prepare a clean 200 ml beaker with a diameter of about 7 cm. (Do not use the small beaker provided with the monitor, it is for fluid level measuring only). Fill the beaker with ozonated water, remove the protector from the sensor and immerse 5 cm of the sensor.
2 Press the "ON / OFF" button.
3 Press the "TEMP." button to display the water temperature (the default display unit is ℃, press the “down” key ▼ to switch to ℉). At this important step the monitor will take the water temperature into account for the ozone concentration measurement.
4 Wait about 60 seconds, until the temperature display does not change any more, then press "TEMP." button again to go back to the concentration mode.
5 If the monitor has not been used for more than one day, leave the sensor in the beaker with ozonated water for another 2 minutes and press the "ON / OFF" button. Alternatively, rinse the sensor with ozonated water for 2 minutes and press the "ON / OFF" button. (This step 5 can be omitted if the monitor has been used within 24 hours)
6 Press the "SET" button for 2 seconds under the common mode.
7 Press the arrow keys until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 0.
8 Press the "SET" button again to exit.
9 Once again, fill the 200 ml beaker up with fresh ozonated water.
10 Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged at least 2 cm at all times. The concentration will be shown on the display.
11 Leave the sensor inside the beaker until the display shows a concentration of 0. Do not move on to 12) before the display is 0.
12 Repeat steps 9), 10), and 11) to do a second measurement.
13 Repeat steps 9), 10), and 11) to do a third measurement. Read the display for about 15 seconds while shaking the sensor as described in.
14 The greatest value shown on the display during the third measurement is the ozone concentration reading in parts per million (ppm). At the same time press the " ▼ " button to memory the test result.(Note: Ignore the readings shown during the two previous measurements).
15 After testing press the "set "button again to quit the memory mode.
16 Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.

operation instructions

When the ozone concentration in water is suspected to be more than 2 ppm, or when “EPP” is shown on the display for at least 3 seconds, the test steps are as follows:

1 Prepare a clean 300 ml beaker with a diameter of about 8 cm and put 100 ml tap water inside.
2 Add 100 ml ozonated water into the beaker.
3 Measure the water temperature of the mixture by pressing the "TEMP." button. Then pour the beaker content away.
4 Press the "SET" button.
5 Press the arrow keys "▲""▼"until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 1.
6 Press the "SET" button again to exit.
7 Press the "set" button for 2 seconds.
8 Once again, first put 100 ml tap water into the beaker and then add 100 ml ozonated water.
9 Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged more than 2 cm at all times. The concentration will be shown on the display.
10 Leave the sensor inside the beaker until the display shows a concentration of 0.
11 If the LCD display shows "EPP" for more than three seconds during step 9) or 10), then the ozone concentration is above 4 ppm.
If no "EPP" is shown, pour the beaker content away and test a second time according to steps 8), 9), and 10) above. Then, test a third time according to steps 8), 9), and 10) and take the maximum reading of the third test as measurement result. Then, Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.
If display shows "EPP" for more than three seconds, pour the beaker content away and put 200 ml tap water into the clean beaker. Then, add 100 ml ozonated water. Measure the water temperature of the mixture by pressing the "TEMP." button. Then pour the beaker content away. Press the "SET" button. Press the arrow keys until the numerical value displayed next to the small cup at the bottom left of the display (Concentration Setting) shows 2. Press the "SET" button again to exit. First put 200 ml tap water into the beaker and then add 100 ml ozonated water. Completely submerge the sensor in the fresh ozonated water and rapidly shake the sensor back and forth 5 cm (six to eight times per second) without letting it touch the beaker wall. Make sure that the sensor is submerged more than 2 cm at all times. The concentration will be shown on the display. Leave the sensor inside the beaker until the display shows a concentration of 0. According to the above-mentioned steps, do test 2 times more .Take the maximum reading of the third test as the final test result.
12 After testing press the "set "button again to quit the memory mode.
13 Press the "ON / OFF" button, remove the sensor from the beaker, put the protector on, and put the equipment back into the case.

Query test result:

1 Under common mode ,press "▲" or "▼" to display the last test result.
2 Press "▲" to show the test result
3 Press "▼" to show the test result
4 Press "set" to quit the query mode