



OSO Research & Development Ltd.

www.osornd.com

Our team at Oso Research & Development has been working in the Greenhouse and Indoor Growing Industry since 1985. Throughout our years of research we have developed fertilizers, electronic atmospheric controllers and growing systems.

Supplying plants with what they need for optimum growth has been relatively simple:

- More sunlight – supplement with HID lighting
- Food – formulated high-quality nutrients
- CO₂ – injection of CO₂ gas, CO₂ generators
- Climate control – ventilation fans, air conditioners, humidifiers, de-humidifiers, heaters
- Water – filters, RO units

The one problem that could not be accomplished was achieving higher levels of oxygen to the root zone. This has been tried with NFT systems, flood and drain, drip, spraying, fogging, supplementing H₂O₂ and air pumps with air stones in the water. These are all beneficial, but most fall short in optimizing the root zone environment and the oxygen needed by the plants.

Why do we need higher oxygen levels in the water and at the root zone? Plants take in oxygen through their roots 24/7. When oxygen combines with the sugars that the plants produce at a molecular level, it creates energy for the plant to use for building cell structure and controlling the stomata in the plants' leaves. When oxygen levels are increased this process is accelerated. As well, when water warms; oxygen levels decrease, making oxygen supplementation necessary. In the past the industry has tried to counter this by using expensive chillers that consume large amounts of electricity. *Raising oxygen levels could help to alleviate some of this problem.*

We at OSO Research & Development have accomplished this – **OXY-GEN The Missing Link** – by pulsating electrical frequency through our proprietary plates. As the nutrient solution flows over the plates, the water is stimulated, separating the oxygen in the H₂O and leaving it suspended in the water. This raises the oxygen levels, and leaves the water negatively charged -- making it easy for the plant to take up the negatively charged water, along with the abundant amount of

oxygen and nutrients. The results – increased oxygen levels, healthier water, increased fertilizer uptake, faster-growing, and larger-producing plants. This is all accomplished with one or less amps of electricity, in nutrient tanks up to 400 gallons.

OXY-GEN INSTRUCTIONS

The OXY-GEN should be used with a 24 hour timer (not included) able to cycle one hour on / one hour off.

1. Remove the **OXY-GEN** components from the box.
2. Mount the Microprocessor Controller unit at eye level (in a dry area)
3. Choose whether the Contact Chamber will be plumbed into the nutrient tank as in Diagram 1 or outside the nutrient tank as in Diagram 2 & 3.
4. If mounted outside the Nutrient Tank as in Diagram 2, it is important to use ball valves and unions before the intake of the pump and after the Contact Chamber, or on both sides of the Contact Chamber when using it inline as in Diagram 3. This is to avoid draining the tank when you clean the Contact Chamber or when you have to change the Contact Chamber or the pump.
5. The Contact Chamber can be used in the water, screwed directly onto the pump as in Diagram 1, plumbed in as in Diagram 2 outside the tank, or used inline with the main feed line as in Diagram #3. If you choose to do the latter, the magnetic drive pump is not used and the Microprocessor Controller unit is put on the same time schedule as the main feed pump. The ball valve on the main feed line should be turned just enough to divert a sufficient amount water through the Contact Chamber as in “Diagram #3 Main Ball Valve #1.”
6. The Contact Chamber may be secured vertically or horizontally in the Nutrient Tank. If the chamber is to be mounted horizontally, keep the outflow end of the Contact Chamber slightly higher than the Pump end and ensure the plates are lying horizontally as in Diagram 1 Option A – Item 3. **(CONTACT CHAMBER MUST BE MOUNTED AWAY FROM DIRECT LIGHT)**. If the Contact Chamber is going to be used in direct light, cover the Contact Chamber. Be sure all water lines are black poly pipe so that light cannot get through them.
7. Connect the 2 wires from the Contact Chamber to the leads coming from the Microprocessor Controller Unit. It does not matter which connectors go to which wire. The same applies to the wires going to the transformer – they are polarity neutral.
8. Plug the pump directly into the wall and ensure there is flow through the Contact Chamber. The pump **must run continuously** (even in the Microprocessor’s off cycle) to help prevent a buildup on the plates. This is only if you are using the magnetic drive pump. If you are using the Contact Chamber in line with a main feed pump that comes on and off, you might have to clean the Contact Chamber more often (see “MAINTENANCE”.)

9. Plug the Microprocessor's transformer into the timer – set timer to run continuously for 12 hours on and 12 hours off per day. We recommend having the unit come on 1 hour before the plants' light cycle and run continuously for the next 11 hours - then off (to stay within the warranty of the unit). If you need higher oxygen levels because of unhealthy plants you can run the On cycles longer and in very high demand with very sick plants 24 hours a day until the plants are well again. Once plants have recovered, return to regular cycles. Running the **OXY-GEN** 24 hours per day without use of a timer will shorten the life of the Oxy-Gen unit. (See warranty) The timing cycle is the same for tanks from 20 gallons to 400 gallons. If tanks larger than 400 gallons are to be used, we recommend a second **OXY-GEN** unit be put in place. In larger tanks one Oxy-Gen unit is used in the tank and one is used in the feed line to come on during the feed cycle. See diagram #3.
10. *Briefly* shut the pump off. You will see a turbulence of oxygen being created at the plates. (If you submerge a waterproof LED flashlight into the tank, you will see billions of suspended oxygen bubbles in the water.)
11. **The OXY-GEN Generator must not be operated for long periods of time without water flowing over the Contact Chamber.**
12. If the unit should short out, the “**SHORT**” light will appear on the Microprocessor Controller. In the event that this should happen, once the short is corrected, the unit will commence operating normally. There is no fuse to replace. This is electronically protected and will continue to try to reset itself until the short has been corrected.
13. The **OXY-GEN** operates between 200 – 3000 ppm nutrient levels – the higher the nutrient levels, the higher the oxygen levels. **Optimum operating levels are between 1200 – 2200 ppm.** The higher the output of oxygen – the shorter the plate life.
14. A Magnesium/Calcium supplement added to the nutrient is both beneficial to the plant and to the oxygen production.

The polarity going to the plates is constantly being reversed to help prevent the buildup of minerals on the contact plates. A small amount of buildup may occur around the edges and the back of the contact plates. This is normal. Refer to the following Maintenance notes for cleaning instructions.

For optimal performance it is recommended that the **OXY-GEN's** Contact Chamber be cleaned every 2-3 months - more if necessary - and replaced on an annual basis.

MAINTENANCE

To clean the Contact Chamber:

- Mix a **solution** of equal parts 50/50 water and “CLR” (hardware store). “CLR” has been laboratory tested and approved for use on our proprietary plates with no harmful effects. ***Any other cleaner or solvent could be damaging to the plates.***
- Shut off the **OXY-GEN** unit.
- Disconnect the Contact Chamber from the Microprocessor Controller.
- Shut off the pump.

- Close the 2 ball valves if the Contact Chamber is mounted outside of the Nutrient Tank.
- Unscrew the Contact Chamber from the pump or feed line.
- Screw the ½" PVC threaded plug (provided) into either end of the Contact Chamber.
- Place the Contact Chamber upright in a bucket or pail.
- Fill the Contact Chamber with the **solution**.
- Leave the **solution** in the chamber for 1 hour. Empty and rinse well with warm water at garden hose pressure. Repeat if necessary.
- **NEVER USE BLEACH OR CHLORINE BASED CLEANERS. NEVER USE A PRESSURE WASHER. DO NOT USE A BOTTLE BRUSH TO CLEAN THE INSIDE OF THE CONTACT CHAMBER OR PLATES. NEVER PUT THE CONTACT CHAMBER IN A DISHWASHER. THIS MAY CAUSE DAMAGE TO THE CONTACT CHAMBER AND PLATES AND VOID WARRANTY.**
- Re-mount the Contact Chamber.
- Reconnect the wires.
- Open both ball valves if Contact Chamber is mounted outside of the Nutrient Tank.
- Turn on the pump.
- Make sure there is flow through the Contact Chamber before you plug in the **OXY-GEN** unit.
- Plug in the **OXY-GEN** unit.

WARRANTY

- Microprocessor Controller Unit - 1 year warranty at 50% duty cycle
- Transformer and Pump - 6 months warranty.
- Contact Chamber and plates - 6 months warranty at 50% duty cycle (pro-rated from the date of purchase).
- **WARRANTY TAGS WITH SERIAL NUMBERS MUST REMAIN IN PLACE AND PROOF OF PURCHASE DATE PROVIDED IN THE EVENT OF A WARRANTY CLAIM.**

Warranty does not cover damage done through mis-use, or improper cleaning of Contact Chamber by use of chemicals other than specified in Maintenance instructions.



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