



**Water Management Technologies, Inc.**

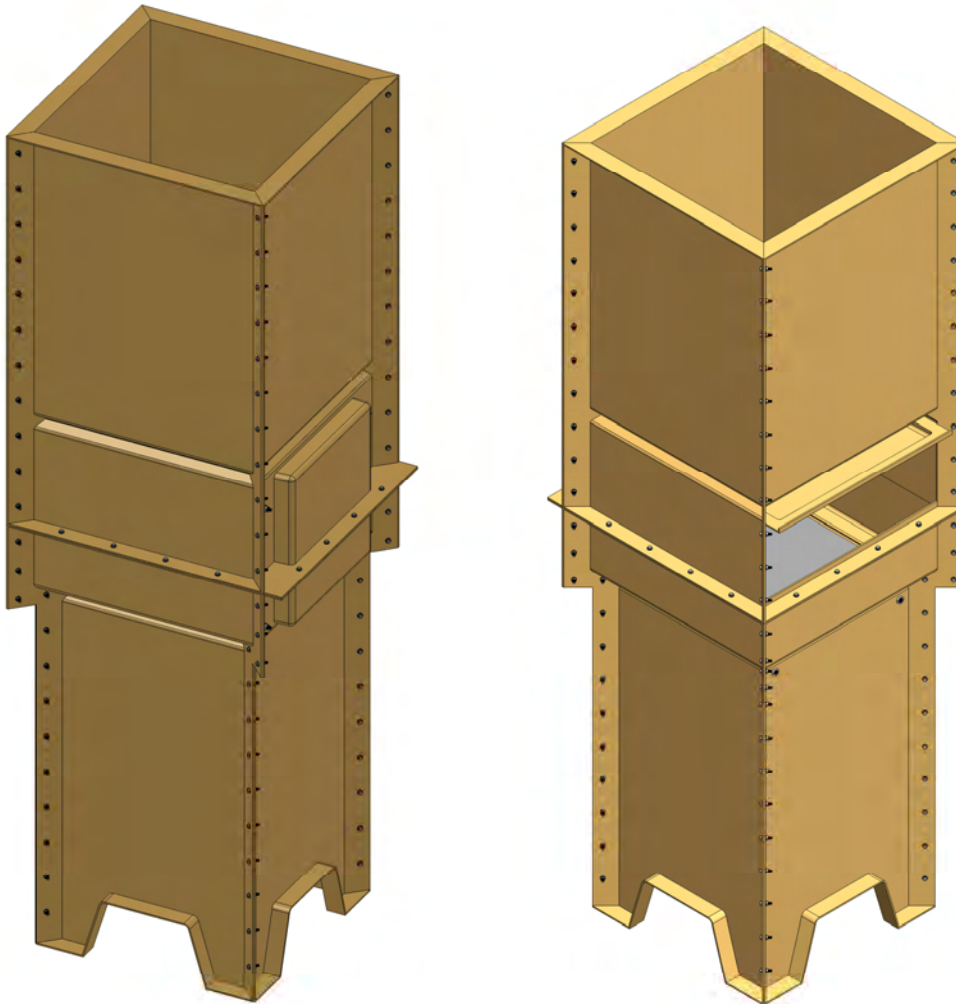
PO Box 66125, Baton Rouge, LA 70896 USA

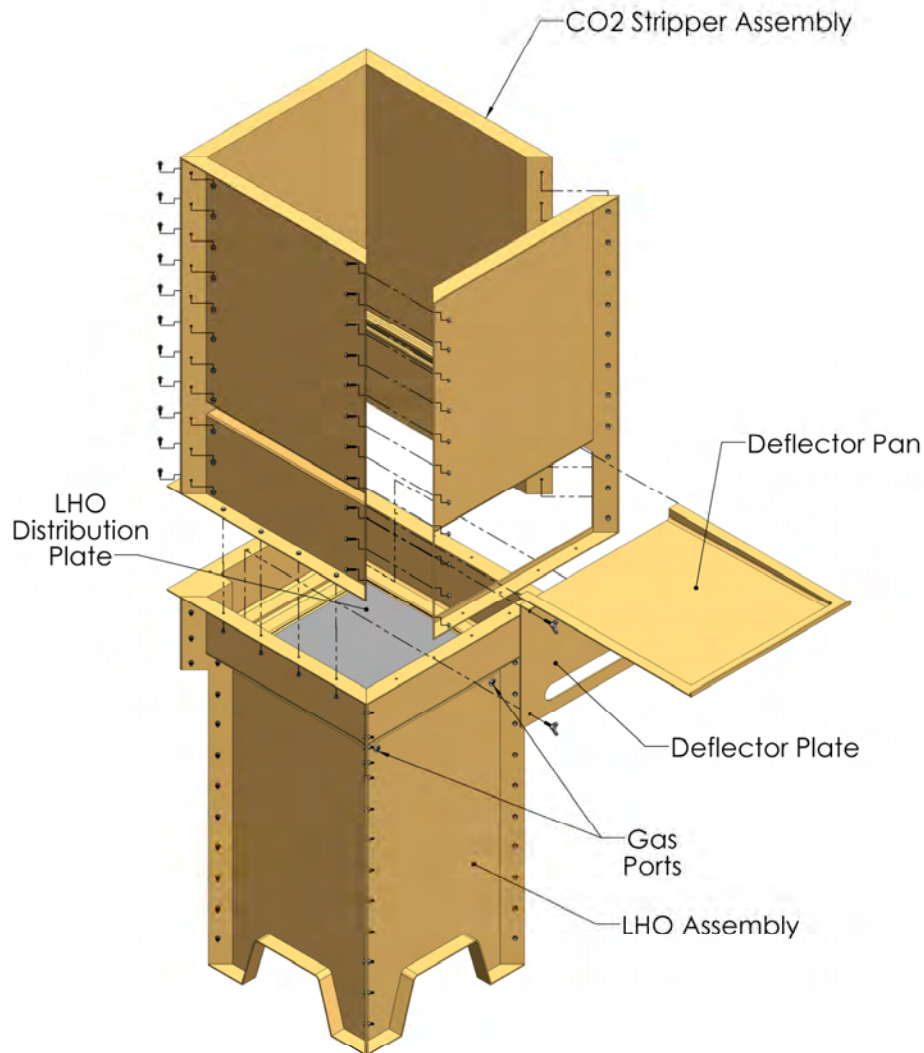
Phone: 225.755.0026 ▪ Fax: 225.755.0995

E-mail: [info@w-m-t.com](mailto:info@w-m-t.com) ▪ Web: [www.W-M-T.com](http://www.W-M-T.com)

# Water Management Technologies

## Free Standing Gas Management Tower (GMT) O&M Manual





### **Assembly:**

1. The LHO unit will come pre-assembled at time of shipment
2. Set LHO unit into the existing receiving basin and ensure unit is level, then anchor to floor.
3. Set up the four CO2 stripper section side wall panels on a clean and level surface. The panels are marked with matching flange designations and there is only proper way for the panels to match up.
4. Ensure that all matching flange surfaces are clean and free of any debris.
5. Loosely attach two panel together using provided hardware (**use graphite anti seize or similar on all 316ss hardware threads!**), then pull a bead of Sika Flex sealant (provided) along the vertical seam both inside and outside of the bolt pattern and tighten bolts to mostly closed, leave some flexibility to arrange other panels.
6. Repeat step #5 with the other two panels.
7. Once all panels are together, firmly tighten up all bolts on the four vertical seams.

8. Lift the CO<sub>2</sub> stripper section and place on top of the LHO section. The back transfer channel on the CO<sub>2</sub> section needs to match up with the corresponding section on the LHO base, in essence there is only one way for them to match up.
9. Use ~1/4" (or similar) shim blocks in the outside corners to lift up the CO<sub>2</sub> stripper section and loosely align all bolts through the two matching flanges.
10. Pull a bead of Sika-Flex sealant in the gap created by the shim blocks.
11. Pull the shim blocks and then tighten all of the bolts.
12. Install the back deflector plate into the unit with the associated hardware (wing nuts).
13. Slide the deflector pan into the slots on the CO<sub>2</sub> stripper and push back until the unit stops.
14. Connect your O<sub>2</sub> Gas Inlet to one of the gas ports (it does not matter which port you use for the in or out).
15. Using PVC pipe, make a offgas vent pipe. This should consist of a PVC threaded street 90 to match the threaded gas port (1/2") and a section of pipe (1/2). Thread the 90 fitting into the female fitting on the unit and turn until snug and the 90 pointing directly down. Measure the operating water level in the sump tank and then cut a piece of pipe, that when installed into the 90 in the vertical position, will be ~1-2" below the water level surface. Once complete, turn the 90 such that the pipe comes up and just out of the water.
16. If your unit was supplied with CO<sub>2</sub> media, install that into the shell. If you supplied your own media, ensure proper size and fit and then install into the unit.
17. Bring process water to the unit. Your unit may have an installed pipe connection, if so please attach to this location. If your unit has no connection, then pipe over top of the unit and ensure that your terminal end is such that it prevents significant agitation or turbulence on the distribution plate. If your unit has no connection and no distribution plate (standard open shell) then ensure with your over top piping that you are providing a method of inlet that creates as much spray or coverage of the media as possible.
18. If your unit was provide with a fan or fan connection, attach the fan at this time and then hook up electricity and any applicable ducting.

## **CO2 Stripper Operation & Maintenance:**

### **Theory of Operation:**

Dissolved Carbon Dioxide (CO<sub>2</sub>) is removed from the water by exposing the CO<sub>2</sub> laden water into the gas phase via a trickling water over a packed media bed exposed to air. The higher concentration of CO<sub>2</sub> in the water wants to reach equilibrium with the air and degasses out of the water. Exhaust fans are used to induce a high gas to liquid ration across the filter such that the process water is continually exposed to new fresh. Low CO<sub>2</sub> content air to aid in the removal of the CO<sub>2</sub> from the water.

### **Startup:**

1. Look over the unit (both the CO<sub>2</sub> and LHO modules) to make sure there is no debris or other matter that would prevent flow of process water through the GMT unit.
2. Make sure that all connections, inlet and outlet are made and ready for operation.
3. Turn on process flow to the GMT tower. Water will start to flow through the CO<sub>2</sub> distribution plate and through the rest of the unit. Water will begin to backup on the distribution plate until it reaches steady state operation.
4. Once steady state operation on the process flow as occurred, turn on the exhaust fans to induce air flow across the unit.

### **Shutdown:**

1. Turn off the process flow to the GMT tower.
2. Turn off the exhaust fans.
3. Clean off the distribution plate of any foreign matter of biofilm.

### **Maintenance:**

1. The CO<sub>2</sub> easy to operate and requires a minimal amount of maintenance. The only maintenance that the CO<sub>2</sub> system requires is to make sure that the distribution plate stays free and clear of any excess material or bio growth that may cause impediment to the system flow.
2. During periods of shutdown, or once yearly, the distribution plate and the side demister boxes should be removed and the media inspected for amount of biological growth and cleaned. Excess bio growth can lead to channeling of water through the unit and decreased performance as well as excess weight of the unit.

### **Troubleshooting:**

1. If the CO<sub>2</sub> level in the effluent is elevated.
  - a. Make sure that the exhaust fans are operating and that there is nothing reducing the performance of the fans.
  - b. Check the distribution plate to make sure that flow has not been interrupted to some portion of the plate causing channeling of water through the packed bed.

- c. Check the packed media bed to make sure that excess growth has not occurred in the bed causing channeling of water through the unit.
2. If water is overflowing over the top of the CO2 Stripper:
  - a. Check to see if the distribution plate is clogged, if it is, clean the plate of biofilm or any foreign matter that is clogging the holes.
  - b. Check the water flow of the system to see if it is in excess of the unit design.

## **LHO Operation & Maintenance:**

### **Theory of Operation:**

Oxygen injection / transfer, is conducted by injecting oxygen gas into the multi-segmented space between the distribution plate and the GMT sump water level surface below. Oxygen gas must pass, in a serpentine manner through the multiple sealed chambers until exiting the unit at the last chamber. The distribution plate on the top of the LHO is designed to carry water on the plate which seals the top of the unit and the internal baffles that create the segments extend down into the water column in the GMT sump to seal the bottom of the unit. Gas exchange and addition is carried out at the turbulent gas / water interface and via bubbles created at this zone and carried down and circulated in the submerged baffle zone.

### **Safety**

#### **CAUTION!!!**

**Oxygen is extremely flammable! The LHO should be submerged in no less than 14" of water, and should have no less than 1.5" of water on the distribution plate. Failure to maintain these standards can result in an accumulation of oxygen and greatly increases the risk of fire.**

### **Startup:**

1. Turn water onto the GMT unit as a whole, water will process through the CO2 section above and enter onto the LHO distribution plate via the transfer pipe and slotted flange assembly.
2. Water will flow through the distribution plate and through the LHO unit. Water will start to buildup on the distribution plate until it reaches steady operational level, this level should be below the top of the LHO side wall.
3. Once steady state operation is achieved, turn on oxygen gas flow to the unit and set to achieve desired outlet oxygen concentration.

4. Set burp tube to desired location. Locating the bottom of the burp tube into the receiving water will apply some backpressure to the air space and can alter operating level on the LHO distribution plate.

### **Shutdown:**

1. Turn of oxygen gas flow to the LHO unit.
2. Turn off the process flow to the GMT tower.
3. Clean off the distribution plate of any foreign matter of biofilm.

### **Flow-meter Package (if applicable):**

1. If you are provided with a base flow meter package, which consists solely of a manual flow meter, then use the dial on the flowmeter to set the desired gas flow into the LHO unit.
2. If you are provided with an automated base/boost flowmeter package (flow meter with solenoid package) then set up the unit as follows. Override the solenoid valve with the toggle switch on the panel to open boost flow through the solenoid and into the flowmeter. Use the valve on the flowmeter to set the allowable max flow during the boost operation of the package. Once allowable flow is set, reset the solenoid valve to normal operation by use of the toggle switch. Set the desired base flow to the LHO with the side loop needle valve. When boost is required, the solenoid valve will open and allow greater flow through the flowmeter and into the unit.

### **Maintenance:**

3. The LHO is easy to operate and requires a minimal amount of maintenance. The only maintenance that the LHO requires is to make sure that the distribution plate remains clean and free of excess material that may cause clogs.

### **Troubleshooting:**

3. If the correct amount of dissolved oxygen is not present in the water flowing from the LHO.
  - a. Check the amount of inlet gas flow and adjust up if necessary
  - b. Check the system water flow rate, toolittle or too much flow can alter the performance of the LHO.
  - c. Check the temperature of the water against the design temperature. Change in temperature will effect the overall performance of the LHO. Colder water will hold more gas than lower water.
4. If water is overflowing over the top of the LHO.

- a. Check to see if the distribution plate is clogged, if it is, clean the plate of biofilm or any foreign matter that is clogging the holes.
- b. If the burp tube is set such that the outlet is below the receiving water level, lift the burp tube up such that the outlet gas can vent to atmosphere and remove any gas backpressure inside the LHO unit.

## **Sump Operation and Maintenance:**

### **Operation:**

1. Water enters the sump from the LHO section of the GMT tower and exits via the outlet port.
2. The GMT sump section has a conical bottom with an fitting for a drain / dump valve. The drain / dump valve should be periodically opened to remove any buildup of organic matter in the bottom of the unit.
3. The GMT sump has an overflow assembly, the standpipe in the overflow assembly should be set to allow full operational flow to bypass out of the sump through this assembly without overflow of the sump tank.

### **Maintenance:**

1. The drain / dump valve should be periodically opened to remove built up organic matter..
2. General care and maintenance of the FRP material can be found at the end of the manual.

### **Troubleshooting:**

1. Water is going out of the overflow assembly.
  - a. Water flow has been blocked leaving or downstream of the GMT sump. Check that downstream valves have not been closed or cutback reducing the flow out of the unit.
  - b. Check to make sure that there is no foreign matter in the GMT sump which has blocked off the outlet.
  - c. Check the system flow to make sure that the flow is not greater than the design capacity of the unit.
2. Water level is dropping in the GMT sump and exposing the LHO baffles.
  - a. Water level of valves downstream have been altered allowing greater flow out of the unit or less headloss between the GMT sump and downstream location. Check to determine if levels or valves were changed. If need be, install a valve

on the outlet of the GMT sump to allow for manipulation of working water level in the unit.

- b. Drain / Dump valve has been left open or broken off.

## **Fiberglass Products – General Care and Maintenance:**

### **General Care & Cleaning of Gel Coat Surfaces**

For best results, keep the following in mind when caring for Gel Coated product:

- Test First – Always test your cleaning solution on an inconspicuous area before applying to the entire surface.
- Wipe Clean – Wipe surfaces clean and rinse completely with water immediately after applying cleaner. Rinse and dry overspray that lands on nearby surfaces.
- Don't Let Cleaners Soak – Do not allow cleaners to sit or soak.
- Avoid Abrasive Materials – Use a soft, dampened sponge or cloth. Never use an abrasive material such as a brush or scouring pad to clean surfaces.
- Do not use abrasive cleansers or acidic solvents on Gel Coated surfaces as they may cause surface dullness or discoloration.
- Wipe your unit with a soft cloth after each use to prevent a buildup of soap and scum.
- Extreme heat such as that generated by cigarettes or portable heaters can damage Gel Coated surfaces.
- Clean surfaces as needed with recommended cleaners.
- Products to Consider
  - Cinch Streak Free Multi-Surface Cleaner
  - Fantastik Antibacterial Heavy Duty
  - Lysol Disinfectant Mildew Remover with Bleach
  - Scrub Free Mildew Stain Remover
  - Super Iron Out Multi-Purpose Rust Stain Remover