

**OSCAR-XO2 Installation Manual, WA**

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Manufactured by:

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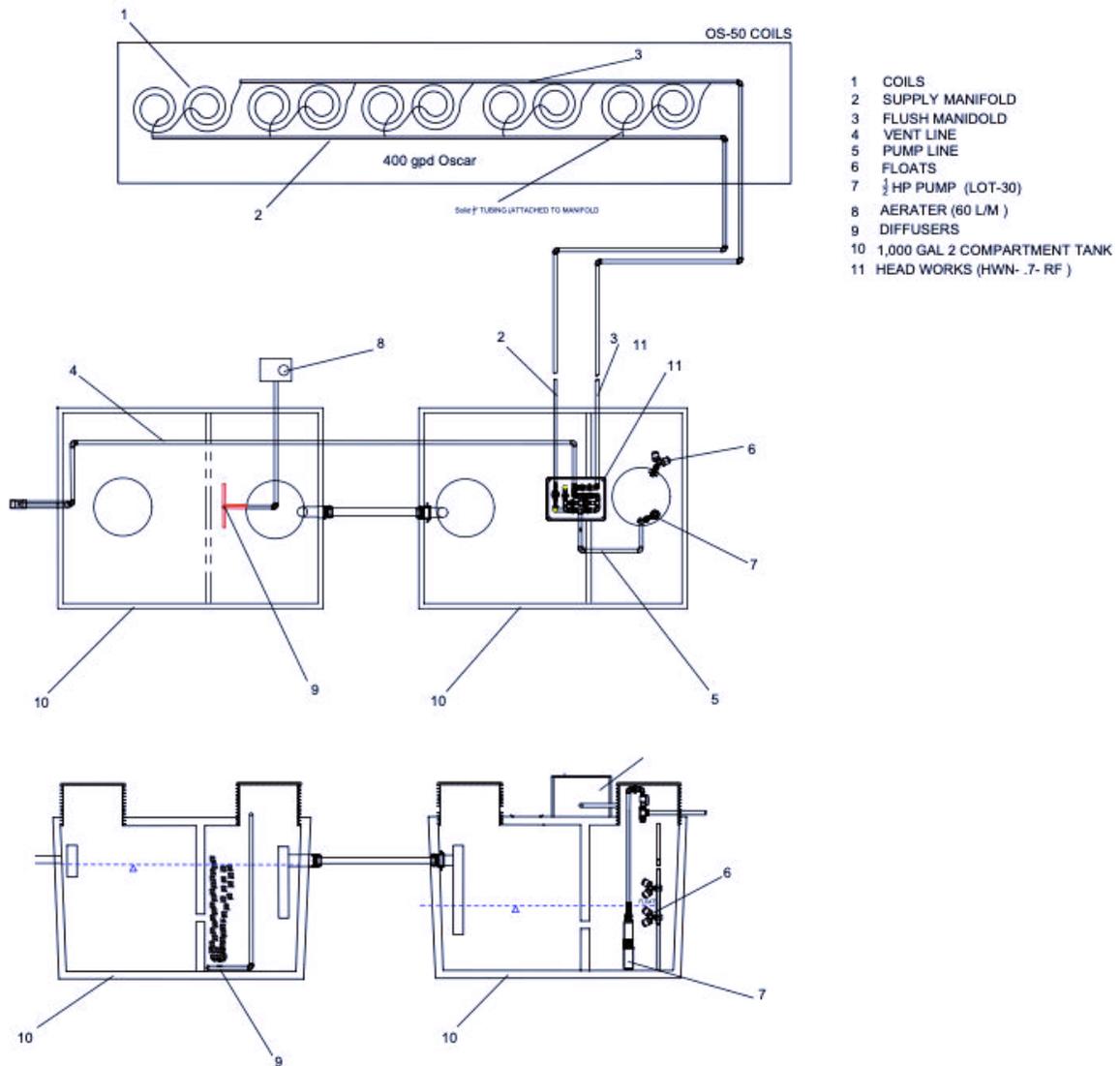
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# System Description:

## OSCAR-XO<sub>2</sub>



- 1 COILS
- 2 SUPPLY MANIFOLD
- 3 FLUSH MANIFOLD
- 4 VENT LINE
- 5 PUMP LINE
- 6 FLOATS
- 7 1/2 HP PUMP (LOT-30)
- 8 AERATER (60 L/M )
- 9 DIFFUSERS
- 10 1,000 GAL 2 COMPARTMENT TANK
- 11 HEAD WORKS (HWN- .7- RF )

The OSCAR-XO<sub>2</sub> treatment unit is comprised of two systems: a septic chamber, aeration tank, clarifier, and pump chamber (XO<sub>2</sub>). The second half is the OSCAR: coils, C-33 sand, reverse flush headworks, and control equipment.

Wastewater is collected in the septic chamber where gross and suspended solids are settle out. The waste stream is aerated and settled again through a second set of chambers. By the time the wastewater passes through the clarifier and reaches the pump chamber the expected average waste strength will be 30 mg/l CBOD5 and 5 mg/l TSS, and 100,000 FC/100 ml, MPN. Effluent from the pump chamber is dosed through a 120 mesh disc filter to the OSCAR coils, installed in ASTM C-33 sand. Effluent discharged from the coils is treated by the ASTM C-33 sand prior to infiltrating into the receiving soil and final discharge. Final discharge is expected to reach 2 mg/l CBOD, 1 mg/l TSS, and 36 FC/100 ml of effluent.

## Prior to Installing an OSCAR-XO<sub>2</sub> Unit:

Before installing a OSCAR-XO<sub>2</sub> systems, the installer must complete in-class and in-field training by representatives designated by *Lowridge Onsite Technologies, Inc.* The Installer must insure that no water softener discharge is plumbed into any of the drains that feed the system. The residential OSCAR-XO<sub>2</sub> unit is intended to treat **only** wastewater generated by normal activities from laundry machines, toilets, showers, and kitchen and bathroom sinks. No special chemical additives are needed for the normal functioning of the OSCAR-XO<sub>2</sub> unit.

## List of components:

1. Control panel: *LF1P-RF-AR*
2. Reverse flush Headworks: three (3) oil filter 0-100 psi pressure gauges, one (1) 3/4"-120 mesh, 130 micron *Arkal*<sup>™</sup> disc filter, five (5) Netafim 1" normally closed solenoid valves and container.
3. Float switches (2)
4. Discharge pump, ½ hp, LOT-30.
5. 3/4" *ARAD* flow meter
6. OSCAR coils
7. Aerator.
8. Misc. fittings and blank tubing

## Unloading and un-packaging instructions:

*Lowridge Onsite Technologies, Inc* takes great care to manufacture and package the OSCAR-XO<sub>2</sub> unit to prevent damage during shipping and handling. It is expected that everyone from the manufacturing personnel to the installation crew take reasonable steps not to drop, throw, or damage the product. Do not handle the *Coil* by the tubing.

If there are defects in any of the components, call *Lowridge*.

## Installation steps:

For reference, please see instructional videos on our website at: [www.oscaronsite.com](http://www.oscaronsite.com), click on “Training Video” page, select Washington State and then *OSCAR-XO2*.

### Step 1: Determine the orientation and position of the tanks.

Some designs will have specific locations for the system components based on required set-backs, elevation, logistical issues, or aesthetic concerns. Before excavating begins, verify that the proposed locations of the tanks are laid out in a manner that will allow for efficient pipe connections.

### Step 2: Excavate the holes for tanks.

Excavate the tank holes by leaving 6-12 inches of space between tanks and excavation sides. Take appropriate steps to insure the tanks will not settle after backfill.

### Step 3: Setting tanks.

**Tanks:** Bed tanks is sand, pea gravel, or 5/8- inch crushed rock. Sand must be water settled in fill in any voids along tanks.

### Step 4: Install dosing pump.

Place the pump into the pump tank. Attach a 1” union on the horizontal supply line and exit the tank through the riser wall. Make sure to use an appropriate grommet or other method to insure the protrusion is water tight.

### Step 5: Install headworks.

Install the headworks on top of one of the pump tank. Plumb the pump and headworks at right angles as shown below.

## Step 6: Plumbing connections

The headworks has four plumbing connections: pump line from dosing pump, *OSCAR* supply line, *OSCAR* flush line, and vent line from headworks to inlet of septic chamber. Plumb the connections to the headworks so that the pipes are supported by the top of the tank or hand bed the pipes before backfilling the system.

## Step 7: Wire control panel, floats, and pump.

Mount the control panel chest to eye level.

Always use PVC electrical conduit between the splice boxes and the control panel and follow all applicable electrical codes. Do not use direct burial wire on *OSCAR-XO2* systems. Follow the wiring directions provided inside the control panel.

Power requirements for the *OSCAR-XO2* system are as follows:

- Discharge pump, 110 volt, up to 18 amps start and 11 amps running
- Headworks 24 volts, 0.4 to 0.6 amps\
- Aerator requires 10 amp, 110 volt.

## Step 8: Floats and Pump settings.

Set float using the floats and float clips provided. The bottom float (Timer enable float) should be set at a minimum of 24 inches above the bottom of the tank to insure the entire pump motor and wet end are completely submerged. The top float (high level alarm) should be set at least 4 inches above the bottom float. A greater distance can be used if a large working volume is required.

## Step 9: Back fill and water test.

Prior to backfilling, all tanks should be water tested and all start-up procedures must be completed. Fill and back fill tanks in 12 inch lifts. Water test tank tanks by filling to 2 inches above riser connections and mark water level. There should be no measurable water loss for 2 hours. Backfill tanks with sand, pea gravel or crushed rock to at least mid-seam of tank body. Back fill the to top of the tanks to final grade with appropriate soil free of sharp rocks..

## Step 10: *OSCAR* installation.

### Installation:

Before preparing the basal area for the sand layer the soil moisture content must be checked to prevent smearing the soil interface. Dig a small excavation in the basal area with a hand shovel. The excavation need only be 12 inches wide and 12 inches deep. If the exposed

sides of the excavation are shiny without any cracks or crumbled edges, the soil is too moist. If the exposed soil surface crumbles and cracks, the soil is dry enough for preparation.

To prepare the soil interface, stake the basal area and remove any forest duff and forest under-growth, if present. Trees and stumps should be left in place. In pasture or lawn areas, mow the grass as short as possible. After removing as much loose organic material as possible, prepare the soil surface 2-3 inches deep parallel to the contour throughout staked basal area. The teeth of a backhoe bucket can be used. Do not intentionally remove sod.



Apply the base layer of sand media as per the design. The top of sand layer under the coil must be level.



Place the coils and connect the supply and flush manifolds as prescribed in the design.

Place the final 6 inches of sand media. It is recommended to immediately broadcast grass seed or plant a ground cover, preferably periwinkle (vinca-minor). A layer of natural mineral soil can be added to cover the sand, but is not needed to establish plant growth. Do not use a manufactured top soil mix. Also, avoid soil that is high in organic matter. A couple of inches of beauty bark could be used to top dress the sand. In very dry climates it may be necessary to place a thin layer of decomposed granite or washed gravel over the sand to prevent wind erosion in the summer months.

## Step 11: Panel Operation and Start-up procedures.

### Panel Operation:

The **LF1P-RF-AR** control panel is a 110 volt panel for most single family **OSCAR-XO2** systems. It has the capacity to operate three major outputs: a discharge pump, aerator, and the “*Reverse Flush*” headworks. Also, the panel is equipped with a current sensor to monitor electrical flow to detect aerator failure. All logic is controlled by a Siemens Logo. The pump operation options are as follows:

- Discharge Pump (Pump #1): is operated in a time-dose mode. Pump #1 pressurizes the **OSCAR-XO2** and back-flushes the disc filter and forward flushes the **OSCAR-XO2 Coils**.
- Aerator: A current sensor is included to warn of aerator failure. If power to the aerator is interrupted an alarm and warning light would be activated.

The timer has the following factory default settings:

- Discharge pump dosing: 3 minutes off, 30 seconds on. (V1\_OFF, V1\_ON)
- Disc filter flush: after pre-set number of dose cycles have completed (90 doses), the disc filter flush “ON” cycle runs for 15 seconds. (V2\_ON).
- *Coil* flush: after Disc filter flush is completed, the *Coil* flushes for 2 minutes (V1V3\_ON).
- The top float has a delay parameter setting for the alarm to signal. The factory setting for the delay is 6 hours. If the system catches up and the top float drops, no alarm will sound.

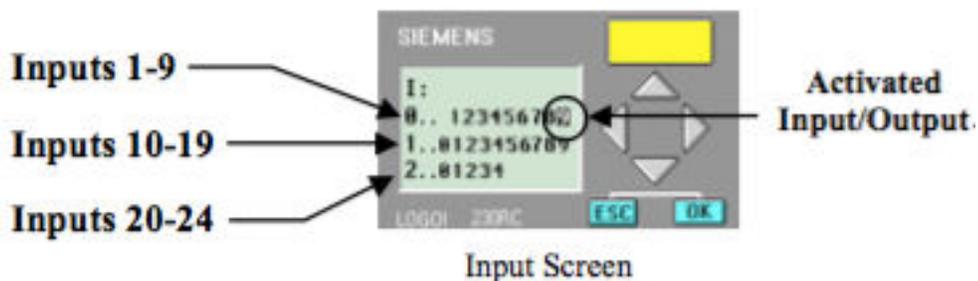
### Start Up Procedures:

Prior to conducting any of the following procedures, inspect the wiring to ensure the system is correctly wired. Pull the float tree from the tank and place across the tank opening so all the floats hang down. Now power up the system and turn all the breakers to the “ON” position and all of the toggle switches in the off position. Ensure there is enough water in tanks to conduct pump tests.

#### a. Test floats:

When the system is first energized it will always display the same screen. Use the down arrow on the LOGO until you find the displays a date and time. (It doesn't matter if the correct date is entered). Now, with the right arrow push it once to the display that shows a capital “I” in the upper left corner.

The actual screen will look like this:



When lifting the floats check this screen to determine if the floats are wired into the correct position. When the floats are lifted a corresponding digit will be back lit. The input values are as follows:

1 = bottom float  
2 = top float

Test floats:

Lift top float. Input indicator “2” will back light.

Lift bottom float. Input indicator “1” will back light.

Test the alarm beacon:

Temporarily change the delay setting from 6 hours to 6 seconds. Lift float and six seconds the alarm will sound and the beacon will light. Reset the delay to 6 hours.

Place floats back into tank.

b. Test pumps and valves:

Discharge pump and valves:

Place valve 1 & 2 toggle switch and pump 1 toggle switch to MAN position. All three pressure gauges should stabilize about 50 psi. Gauge 3 may read as low as 40 psi. No water should be flowing into septic tank.

Place valve 3 & 4 toggle switch to MAN and valves 1 & 2 toggle switch to OFF, pump #1 in MAN. Pump should run, pressures should change: gauge 2 highest pressure, gauge 1 less than 2, and gauge 3 should indicate 0 psi. Water should be flowing into septic tank very rapidly.

Place valves 1 & 2 and valve 5 in MAN position and valves 3 & 4 in OFF position, and pump 1 in MAN. Pressure on gauge 1 & 2 should indicate about 40 psi, and gauge three should indicate between 0-3 psi and water should be flowing into septic tank at a moderate rate.

Position all toggle switches to AUTO.

c. Check timer default settings:

V1 OFF = 3 minutes

V1 ON = 30 seconds

V2 OFF = 30 seconds

V2 ON = 15 seconds

V1V3 OFF = 30 seconds

V1V3 On = 2 minutes

## Replacement Instructions:

There are several components that are critical to process performance: solenoid valves in the headworks, drip tubing in the *Coil*, aerator in the aeration tank, and the discharge pump.

**Solenoid Valves, 2-way throttling valve, Netafim part number, LVET1GH2:**

To replace remove six screws, remove bonnet, remove and replace bonnet and tighten screws. Valves can be purchased from distributors of *Lowridge Onsite Technologies, Inc.*



**LVET1GH2**

**Coil, laterals of Netafim Bioline, 08WRAM.4-06V500:**

To replace the *Coil* remove sand media from top of *Coil*, cut the 1/2 inch poly feed lines adjacent to the manifolds and remove *Coil*. Place the new *Coil* in the sand, couple to the feed lines, and cover *Coil* with sand. *Coils* can be obtained from any *OSCAR* dealer or *Lowridge Onsite Technologies, Inc.*

**Discharge pump, model LOT-30:**

Cut power to pump, disconnect wire connections in splice box, remove pump from tank, and disconnect pump from piping. Connect new pump piping, connect wiring in splice box, place pump into tank, and re-energize power to pump circuit.

## Material Specifications:

**Media:**

**OSCAR**

ASTM C-33 concrete sand as per WADOH *Recommended Standard & Guidance for Intermittent Sand Filter.*

**Septic, aerator, clarifier, and pump tanks:** All tanks must be either *Lowridge 1,000 or 1,500* gallon polyethylene tanks. Man-hole openings must be 24 inch or greater nominal size to surface grade with a locking lid to preclude un-authorized access. All tanks must be water tight to the riser lid opening. All protrusion through the riser wall for electrical conduits and other piping must be sealed to preclude any water infiltration.

**Plumbing:** All piping must be PVC. The 1 inch supply and flush lines must be sch 40.

**Assembled components:**

*Lowridge* assembles the following components: headworks, *Coil (partially assembled)*, and *Coil* manifold connections.

Headworks: the headworks for the *OSCAR-XO<sub>2</sub>* is made of all 1" sch PVC pipe and fittings, 1 inches NC *Dorot* solenoid valves, 3/4 inches *Arkal* disc filter (120 mesh, 130 micron), Three oil filled pressure gauges, and a polyethylene valve box with lid.

Coil: The *Coil* is constructed of Netafim Bioline™ (0.42 gph emitter at 6 inch spacing) attached to a 1/2 inches or 1 inches Sch 40 PVC bracket.

Tanks: All tanks are to be *Lowridge* approved tanks: single piece, polyethylene.

**Discharge Pump:** The discharge pump is an *Lowridge Onsite Technologies*, 1/2 hp, 30 gpm, model LOT-30.