

OSCAR-in-a-Box Installation Manual, WA

January 2021

Manufactured by:

Lowridge Onsite Technologies, LLC

PO Box 1179
Lake Stevens, WA 98258
877-476-8823

info@lowridgetech.com

www.lowridgetech.com

OSCAR-in-a-Box System Layout

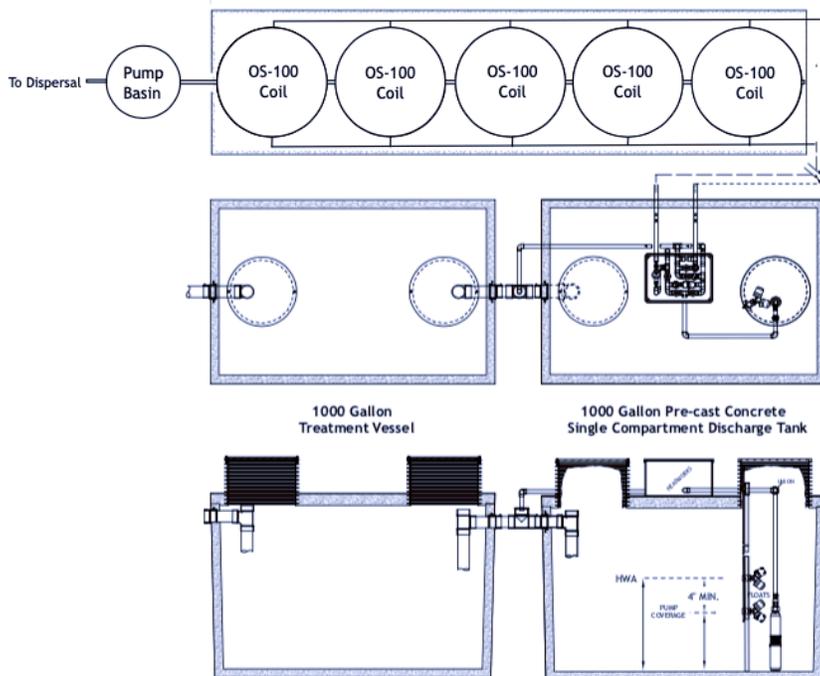


Table of Contents

System Overview

Prior to Installing an OSCAR-in-a-Box unit

List of Components

Loading and Unloading Instructions

Installation Steps:

1. Determine the orientation and position of the tanks.
2. Excavate the holes for tanks.
3. Setting tanks.
4. Plumbing
5. Install dosing pump and headworks.
6. Plumbing connections
7. Wire control panel, floats, and pump (power requirements).
8. Pump and float settings
9. Back fill and water test.
10. *OSCAR-in-a-Box* installation
11. Panel Operation and Start-up procedures.

Replacement Instructions:

1. Solenoid valves
2. *Coils*
3. Dose/Flush pump

Material Specifications:

1. Media
2. Treatment Vessels
3. Plumbing
4. Assembled Components
 - a. Headworks
 - b. *Coil*
5. Pump

System Description:

The *OSCAR-in-a-Box (OS-B)* treatment unit is comprised of 1,000 gallon septic tank, 1,000 gallon pump/surge tank, headworks, coils, C-33 sand, and control equipment.

Wastewater is collected in an approved septic tank. Effluent flows from the septic tank to the pump/surge tank. Effluent from the pump/surge tank is dosed through a 120 mesh disc filter to the *OS-B* coils installed in ASTM C-33 sand. Effluent discharged from the coils is treated by the ASTM C-33 sand prior to collection in the underdrain. Treated effluent flows from the underdrain through a boot into a pump basin or tank for final discharge.

Prior to Installing an *OSCAR-in-a-Box System*:

Before installing a *OS-B*, the installer must complete in-class and in- field training by representatives designated by *Lowridge Onsite Technologies, LLC*. The Installer must insure that no water softener discharge is plumbed into any of the drains that feed the system. The residential *OS-B* system 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 function.

List of components:

1. Control panel: *LF2P-RF-OS-AUXR*
2. Reverse flush Headworks: three (3) oil filter 0-100 psi pressure gauges, one (1) 3/4"-120 mesh, 130 micron *Arkal™* disc filter, five (5) Netafim 1" normally closed solenoid valves, 3/4" *ARAD* flow meter, and a container.
3. Float switches (4)
4. Dosing pump, 1/2 hp, Lowridge Onsite Technologies, 1/2 hp, 30 gpm, model LOT-30.
5. *OSCAR-* coils (OS-100B)
6. Misc. fittings and blank tubing

Unloading and un-packaging instructions:

Lowridge Onsite Technologies, LLC takes great care to manufacture and package the *OS-B* system 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.

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

Installation steps:

For reference, please see instructional videos on our website at: www.lowridgetech.com, click on “Training Video” page, select Washington State and then *OSACR-in-a-Box*.

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 as per the tank manufacturer’s recommendations. Take appropriate steps to insure the tanks will not settle after backfill.

Step 3: Setting tanks.

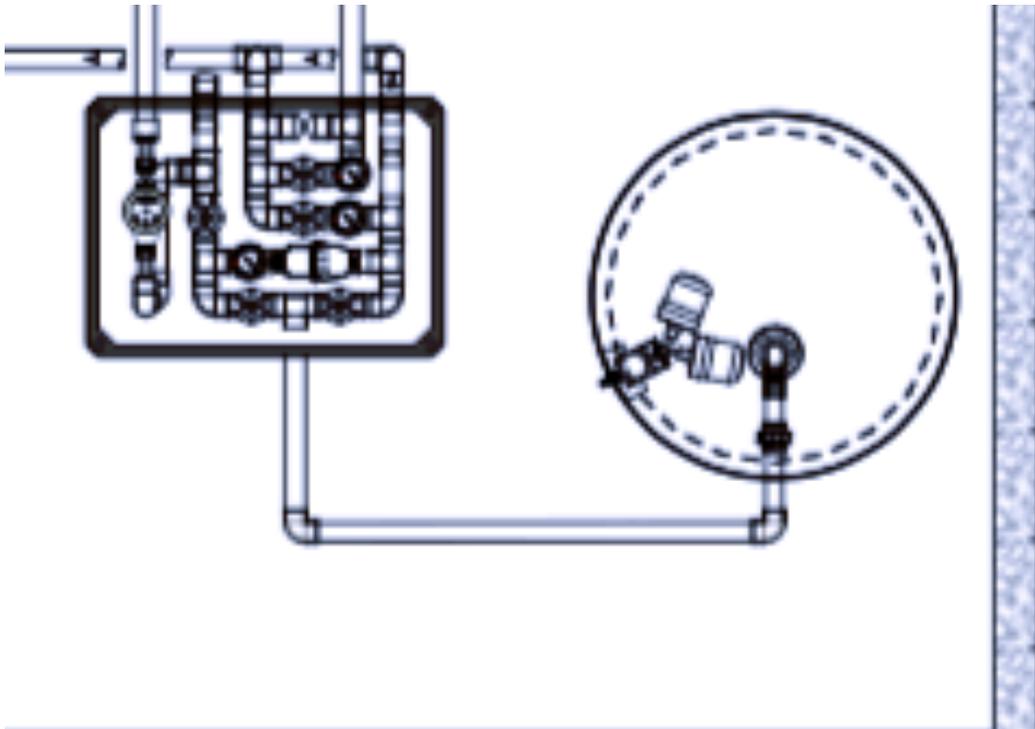
Tanks: Set tanks according to tank manufacturer’s recommendations.

Step 4: Install dosing pump.

Place the pump into the pump/surge 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 and flow meter.

The best installation location of the headworks is on top of one of the tanks. The tank top provides a solid base of support and acts as a barrier against mole and gopher infestation. If the risers are taller than 12”, cut an additional riser for an extension. 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, *OS-B* supply line, *OS-B* flush line, flush vent line to tank inlet. 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 on a post chest to eye level, **not** on the side of the house.

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 *OS-B* systems. Follow the wiring directions provided inside the control panel.

Power requirements for the *OS-B* system are as follows:

- Discharge pump, 110 volt, up to 18 amps start and 11 amps running
- Headworks solenoid valves: 24 volts, 0.4 to 0.6 amps

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 tanks to 2 inches above riser connections and mark water level. There should be no measurable water loss for 2 hours. Backfill tanks with appropriate material. At all times follow tank manufacturer's instructions. Hand-bed all pipes.

Step 10: *OSCAR-in-a-Box* installation.

Installation:

Excavate a hole to accommodate the dimensions of the containment vessel. Bottom of excavation should be level. Line the bottom of the excavation with sand. The sides may be supported by plywood or comparable materials. Place 30 ml PVC liner in excavation. Install slotted underdrain pipes as shown on design. Cover underdrain with clean, washed pea gravel. Pea gravel layer must be level. Place 12 inches of ASTM C-33 sand. Place and extra 1.5 inches to compensate for shrinkage. Install coils and connect to manifolds as shown on design. Cover coils with 6 inches of C-3 sand.

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. 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.

Step 11: Panel Operation and Start-up procedures.

Panel Operation:

The **LF2P-RF-OS-AUXR** control panel is a 110 volt universal panel for most single family *OS-B* systems. It has the capacity to operate three major outputs: Dose pump, discharge pump, and the “*Reverse Flush*” headworks. All logic is controlled by a Siemens Logo. The pump operation options are as follows:

- Dose Pump (Pump #1): is operated in a time-dose mode. Pump #1 pressurizes the *Coil*, back-flushes the disc filter and forward flushes the *Coil(s)* in three different cycles. The control panel allows the operator to determine the number of dose cycles before the disc filter flush and *Coil* flush cycles (default setting is 90 doses).
- Discharge Pump (Pump #3): The discharge pump is time-dosed. The bottom float switch operates as the “Timer On” float switch. The high level alarm float will override Pump #1 off as well as cause an audible and visual alarm signal.

The timers have the following factory default settings:

- Dose-pump: 3 minutes, 30 seconds 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).
- Discharge pump settings: 3 minutes 38 seconds off (DT off time) and 22 seconds on time (DT on time).

Start Up Procedures:

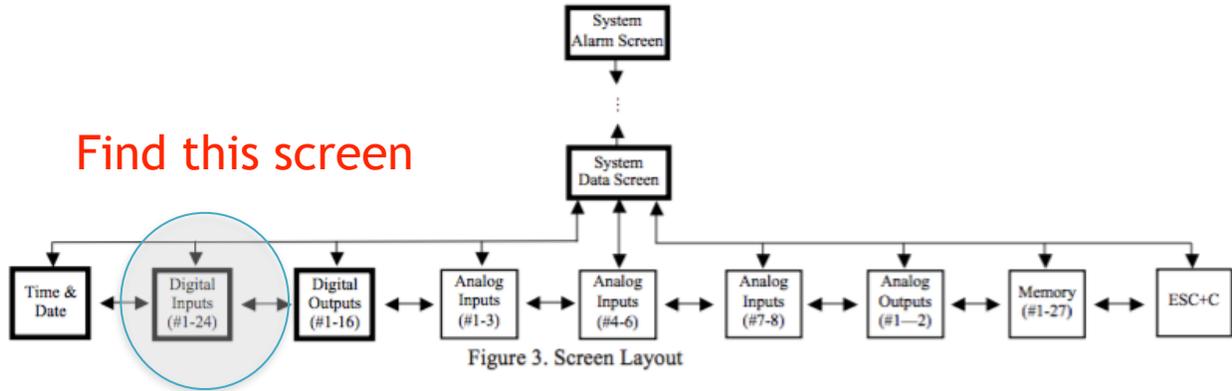
Prior to conducting any of the following procedures, inspect the wiring to insure the system is correctly wired. Pull all the float trees from the tanks and place across the tank openings so all the floats hang down. Now power up the system and turn all the breakers to the “ON” position and all of the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

- a. Test floats:

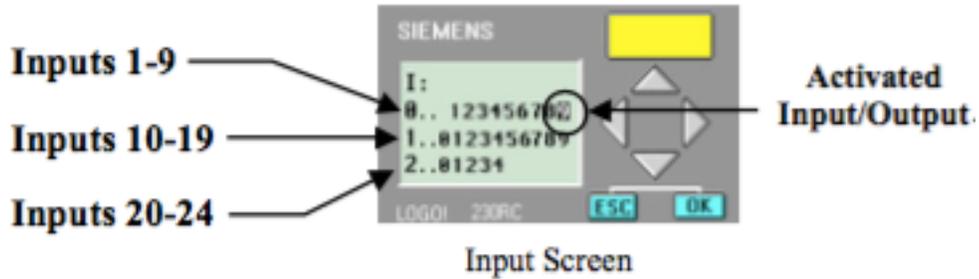
On the Seimens Logo scroll to the input screen as shown here:

Screen Navigation:

The screens are arranged in the order shown in Figure 3 below. To move between screens, use the four arrow keys. The screens of interest are shown in bold. Additional built-in screens will be present, but do not contain useful information.



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 recirc tank float
- 2 = top recirc tank float
- 3 = bottom discharge tank float
- 4 = top discharge tank float.

Test dose pump floats:

Lift top float. Input indicator “2” will back light and the alarm should sound and the beacon should illuminate.

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

Test the discharge floats:

Lift top float. Input indicator “4” will back light and the alarm should sound and the beacon should illuminate.

Lift bottom float. Input indicator “3” will back light.

Place floats back into tanks.

b. Test pumps and valves:

Dose/Flush pump and valves:

Place valve 1 & 2 toggle switch and pump 1 toggle switch to MAN position. Pump should dose and all three pressure gauges should stabilize about 50 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 should indicate the highest pressure, gauge 2 less than 1, 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 in the OFF position.

Discharge pump: Energize the discharge pump by switching the Pump #3 toggle switch to MAN.

Replacement Instructions:

There are several components that are critical to process performance: solenoid valves in the headworks, drip tubing in the *Coil*, 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 *Lowridge Onsite Technologies*.



LVET1GH2

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

To replace the *Coil* remove sand media from top of *Coil*, cut the 1/2" poly feed lines adjacent to the manifolds, fold the feed lines up, and remove *Coil*. Place the new *Coil* in the sand, fold down the feed lines and couple to the feed lines, and cover *Coil* with sand. *Coils* can be obtained from any *OS-B* system dealer or *Lowridge Onsite Technologies, LLC*.

Discharge pump, Lowridge Onsite Technologies, 1/2 hp, 30 gpm 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-in-a-Box

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

Treatment Vessels: All treatment vessels must on the WA DOH approved List of Registered Sewage Tanks. Man-hole openings must be 24” 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. Containment vessels can be concrete, polyethylene, or fiberglass.

Concrete: Where ever possible, concrete tank bodies should be single piece construction. Man-hole risers should be cast in-place.

Plumbing: All piping must be PVC. The 1” supply and flush lines must be sch40.

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

Headworks: the headworks for the *OS-B* is made of all 1” sch PVC pipe and fittings, 1” NC *Dorot* solenoid valves, 3/4” *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 inch or 1 inch PVC bracket.

Dose pump: Lowridge Onsite Technologies, LOT-30, 1/2 hp, 30 gpm

Discharge Pump: Determined by others.