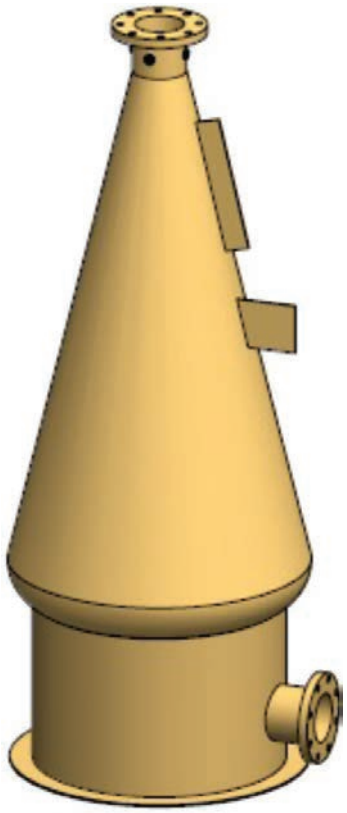
PENTAIR

AQUATIC ECO-SYSTEMS

OXYGEN CONE
(O2C-050 PSI)



INSTALLATION AND OWNER'S MANUAL

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

CUSTOMER SERVICE/TECHNICAL SUPPORT

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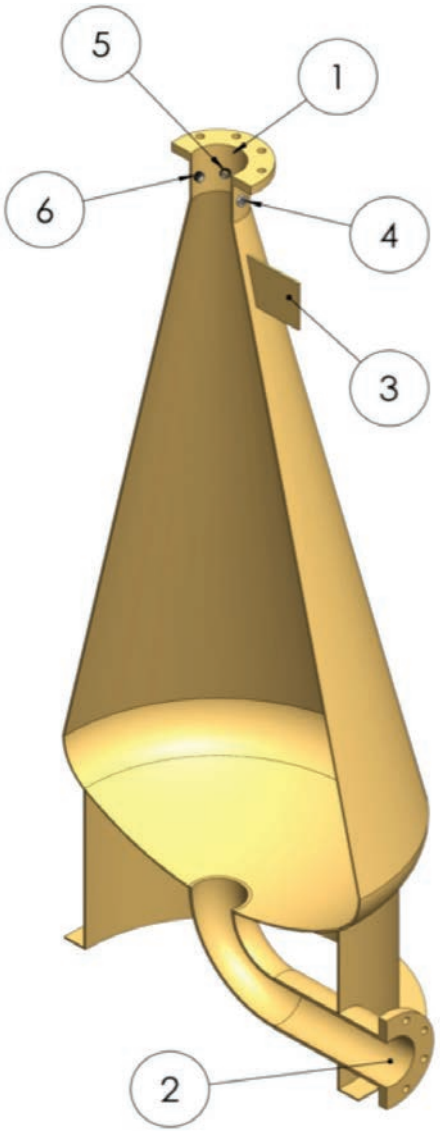
SECTION 1: GENERAL DESCRIPTION OF SYSTEM



Mark	Description
1	Inlet
2	Outlet
3	Flow Meter Support Bracket

Mark	Description
4	Gas Port
5	Pressure Gauge Port
6	Pressure Relief Port

Figure 1: Typical O2C-050

SECTION 2: THEORY OF OPERATION

The Oxygen Cone (O2C) also known as a Speece Cone is used to add oxygen to the process water. Process water enters into the O2C through the Liquid Inlet (LI) along with oxygen gas through the Gas Port (GP). Both the LI and GP are located at the top of the O2C where the water flows down through the Cone forcing the oxygen gas downward.

The process water and oxygen gas flow velocities reduce as they travel down the cone to the point that the upward bubble velocity is greater than the process water allowing the gas bubbles to shear and dissolve in to the water. Oxygenated process water exits through the Liquid Outlet (LO).

SECTION 3: INSTALLATION

The O2C is typically provided with (2) ¾ x ¼ 316SS bushings (Gas Port and Pressure Gauge), (1) ¾ x ½ 316SS bushing (optional Pressure Relief Valve) and Mounting Bracket (Flow Meter).

3.1 Installation Requirements

3.1.1 The O2C is to be installed on a level support pad or floor.

3.1.2 Pad or floor to be designed to carry the total operating weight of the O2C including the vessel and water along with any other design conditions.

3.1.3 When required for stability, wind load or seismic loads, the O2C shall have adequate hold down anchors installed.

3.1.4 Support surface to be smooth and free of any debris or occlusions that may damage the bottom of the O2C.

3.2 Setting the O2C

3.2.1 Set the O2C on pad or the floor taking care to orientate the fittings correctly.

3.2.2 Grout bottom flange to level O2C if necessary.

3.2.3 If required, install anchors.

3.2.4 Always utilize an anchor with a nut and jam nut. Lightly tighten nut and then install jam nut. This will allow for thermal expansion or contraction (316SS hardware is recommended).

3.3 Connections

3.3.1 All valves and piping to be supported independently.

3.3.2 The liquid inlet and outlet ports are both flange connections. Make sure to use a gasket between the flanges and the inlet and outlet ports on the O2C. Tighten the flange bolts in an alternating pattern to the specified torque.

3.3.3 A check valve shall be installed in between the system pump and the oxygen cone to prevent flow out of the O2C which can cause a vacuum pressure within the unit during shutdown. The O2C is not designed to withstand vacuum pressures.

3.3.4 A valve shall be installed downstream of the O2C outlet port to allow for pressure control in the unit.

3.3.4.1 This valve shall be installed as closely to the culture tank as possible in an effort to keep the pressure in the line and prevent the dissolved oxygen from coming out of solution.

3.3.4.2 The oxygenated process water shall enter the culture tank below the water surface. If the oxygenated process water is added above the culture tank water surface the super saturated oxygen will off-gas when it splashes into the tank.

3.3.5 Only use oxygen compatible/safe materials with the oxygen line, accessories and connections.

SECTION 3: INSTALLATION

3.3.6 Connect gas line with a flow meter and mount flow meter to support bracket.

3.3.6.1 Install a check valve and shutoff valve between the inlet gas fitting and the flow meter. Make sure the check valve is installed in the proper orientation such that it allows oxygen flow into the cone but prevents water backflow toward the flow meter. The shut off valve is useful in the event the flow meter needs to be removed for cleaning or servicing.

3.3.7 Install pressure gauge into the pressure gauge port.

3.3.8 Install pressure relief valve into the pressure relief port.

SECTION 4: O2C STARTUP

4.1 Make sure all valves on downstream side of the outlet port of the O2C are open prior to starting the pump to reduce the risk of over pressurizing the unit during startup (MAX 50 PSI).

4.2 Slowly start the water flow to the O2C. Make sure to monitor the O2C pressure gauge to assure the vessel pressure does not exceed 50 PSI.

4.3 Bring the flow to the required flow rate.

4.4 Start the oxygen flow to the O2C by first slightly opening the flowmeter valve and then opening the shut off valve.

4.4.1 Adjust the oxygen flow to the O2C with the oxygen flowmeter valve.

4.5 To adjust the pressure in the O2C use the valve downstream of the cone.

4.5.1 Closing the valve will increase the pressure in the O2C

4.5.1.1 DO NOT EXCEED 50 PSI

4.5.2 Opening the valve will decrease the pressure in the O2C

SECTION 5: NORMAL OPERATION

5.1 DO NOT RUN PRESSURE ABOVE 50 psi!

5.2 If the culture tanks require higher dissolved oxygen (DO) concentration:

5.2.1 If possible increase the process water flow through the O2C to the culture tanks

5.2.2 If the DO concentration in the culture tank is still lower than desired increase the oxygen flow to the O2C

5.2.2.1 If undissolved oxygen gas is flowing into the culture tank from the O2C outlet pipe then the pressure on the O2C needs to be increased to force the oxygen gas into solution. This can be done by closing the O2C outlet valve until no visible bubbles are entering the tank.

5.3 If the dissolved oxygen concentration is too high in the culture tanks:

5.3.1 Decrease the flow of oxygen to the O2C

5.3.2 Decrease the pressure and water flow to the O2C to conserve energy input to the process water pump.

5.3.2.1 Note: Be cautious decreasing the water flow to the culture tank as it will influence (typically negatively) other aspects of water quality within the culture tank

SECTION 6: SHUT DOWN

6.1 If gas control is not automatic, turn off gas supply before shutting down system.

⚠CAUTION

GAS IS EXPLOSIVE – USE CAUTION!

6.2 To shut down the O2C, drain all water from the unit using Liquid Outlet.

6.3 Leave liquid outlet valve open to ensure pressure cannot build up in the O2C.

SECTION 7: MAINTENANCE

7.1 No scheduled maintenance required.

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