

Troubleshooting Practices



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Caution!

When power is applied to the control panel, the wires to the pump and floats may be energized. Do not service the pump or any electrical wiring in the pump vault without disconnecting the power at the circuit breaker(s) and/or fuse. Take appropriate precautions before working in the pump vault.

Discovering The Problem

In general, two situations will ultimately develop if a system fails. The user will be notified with an audible and visible alarm or the user will discover effluent ponding.

- Many circumstances can cause the alarm to sound, which will be described later.
- Effluent ponding indicates a failed alarm system, likely the result of a power problem.

Power Problem

All control panels have individual circuits for the pump power and controls/alarm power. The loss of the controls/alarm power will result in loss of the alarm system and possibly the pump controls.

- Check the controls fuse or circuit breaker.
 - In older panels, a 5A fuse is used to protect the controls/alarm. The fuse is located next to the circuit breaker on the left side. The fuse holder housing is beige with a black handle. The handle can be pulled out and rotated down. Inside the fuse holder, there are two fuses. The innermost fuse is the one that is used. The outermost fuse is a spare. Examine the fuse for a visible break or a blackened area inside the fuse indicating it is blown. If you have a voltmeter available, check the fuse for continuity.
 - In newer panels, a 10Amp circuit breaker is used to protect the controls/alarm. The controls breaker is labeled, "controls" and is located to the left of the pump circuit breaker(s). Check to see if the breaker is turned off or tripped. If the circuit breaker is off, it will be in the down position. To reset the breaker, move the switch to the upward position. If the circuit breaker is tripped, it will be in the center position. To reset to breaker, move the switch to the down position and then to the up position.
- Check the incoming power.
 - To check for power to the panel, use a voltmeter. One lead of the meter should be attached to the controls fuse or circuit breaker and the other lead should be attached to any terminal labeled "N" (do not use the back-plate). The meter should read 120VAC +/- 5%.

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-The control panel is usually fed power from the service panel in the home. Check the breakers in the service panel to make sure that power has not been cut off to the control panel.

*What caused the fuse or breaker to blow?

- The breaker and fuse are sized to protect the wiring in the panel, not the components. The components rarely require more than 1 amp to run. A blown fuse or tripped circuit breaker usually indicates a short circuit. This can be caused by water infiltration into the splice box, loose connections, or temporary power fluctuations.

Alarm is Sounding

- Inspect the tank to determine liquid level.

- The first step in diagnosing an alarm is to inspect the tank. Some systems include both low and high level alarm floats. It is important to know which type of alarm is occurring. In the process of inspecting the tank, the problem may be discovered. Look for potential problems such as tangled floats, or a clogged screen or cartridge.

- Correcting a low level alarm condition.

- There are four common causes of a low level alarm. They are: siphoning, tank leakage, a failed float, or bad wiring connections. During a low level alarm condition, pumping will be disabled in both automatic and manual modes.

-To manually test the floats, lift the bottom float, which is the redundant off & low level alarm. The alarm should go away. If the alarm does not go away, the bottom float may be faulty. Next, test the pump on & off float(s). Lift the redundant off & low level alarm float, followed by the pump on & off float or floats. Lower the pump on & off float(s), the pump should stop. If the pump does not stop, the pump off float may be faulty.

-If the floats do not appear to be functioning properly, check the wiring. The splice box should be examined for loose connections or the presence of water. Disconnect any suspected faulty float and test the system with a replacement float.

-Siphoning can be stopped by installing an anti-siphon valve into the pump discharge assembly.

-Leaky tanks are difficult to repair. Consult the tank manufacturer for recommendations.

- Correcting a high level alarm condition.

- There are many possible causes for a high level alarm condition. Most involve a pump problem.

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Pump Problem (testing manual operation)

The first step to diagnosing a pump problem is to test the panel in manual mode. In general, a pump that does not operate in manual mode will not operate in automatic mode.

- Check the pump in manual.
 - Place the HOA switch in manual. Check to see if the pump is running.
 - If the pump will not run and the panel includes a redundant off & low level alarm function, be sure that the alarm is not activated, as indicated by the illuminated pushbutton on the face of the panel.
 - If the panel has a contactor and it does not engage when the HOA switch is placed in manual, there may not be power to the controls. (see **power problem**, above)
- Check the pump circuit breaker and service panel breaker(s).
 - A 20 amp circuit breaker is used to protect the pump. The pump breaker is labeled, "pump" and is located on the right-hand side of the enclosure. Check to see if the breaker is turned off or tripped. If the circuit breaker is off, it will be in the down position. To reset to breaker, move the switch to the up position. If the circuit breaker is tripped, it will be in the center position. To reset to breaker, move the switch to the down position and then to the up position.
 - Check the breakers in the service panel to make sure that power has not been cut off to the pump circuit in the control panel.
- *What caused pump breaker to blow?
 - A tripped pump circuit breaker can be caused by water infiltration into the splice box, loose connections, a failing pump, or temporary power fluctuations.
- Check the voltage to the panel and from the pump terminals.
 - To check for power to the panel, use a voltmeter. For 120VAC systems, one lead of the meter should be attached to the pump circuit breaker and the other lead should be attached to any terminal labeled "N" (do not use the back-plate). For 240VAC systems the leads of the meter should be placed across the two poles of the pump circuit breaker. The meter should read 120VAC +/- 5% or 240VAC +/- 5% respectively.
 - To check for power to the pump, use a voltmeter. The leads of the meter should be placed across the two pump terminals (this will be #5 and #6 for "S" panels, #6 and #7 for "S RO"

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panels). The meter should read 120VAC +/- 5% or 240VAC +/- 5% respectively. Refer to the appropriate panel wiring diagram to determine pump connections.

- Check the pump.

- To check the pump, refer to *Servicing OSI Submersible Pumps* document.

Pump Problem (testing automatic operation)

If the pump works in manual, but not in automatic, it is likely a float problem. A less probable cause is a failed panel.

- Manual simulation of the floats.

- Place the HOA switch to the automatic position.

- Simulate the system operation by lifting the floats in the same order that the liquid would lift them (bottom first, top last).

- Each float should perform its designated function reliably.

- As each float is lifted, the transition should be smooth. If chattering (rapid cycling) occurs, a float may be failing. Chattering can also be caused by low voltage conditions.

- Control panel jumper test.

- Each float has a contact that completes a circuit when closed. This can be simulated with jumper wires at the float terminals in the panel.

- Disconnect all of the float wires from the panel. Label the wires for reference when reinstalling them.

- Use the jumper wires to simulate all of the float functions that are being used in the panel. If the jumper test is a success, there is likely a failed float or bad wiring.