Solid 'Low Water' LED Error

Horizon Elite Ice Machines

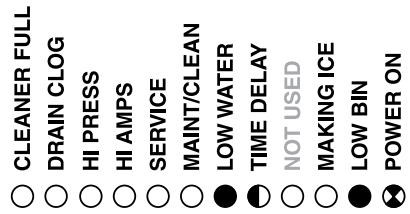
Technical Bulletin

Topic

The solid low water time delay is a soft error that occurs when the ice machine fails to detect the presence of water within 60 seconds of turning on power to the machine. It's intended to prevent burn-out of the fill solenoid's coil if/when water flow is not sensed. This error places the machine in time delay and the machine will attempt to restart after one hour. Cycling power to the machine or pressing the control board reset button will reset the error. This condition will impact ice production.

This condition will be present during the following scenarios:

1. The water inlet supply to the machine is shut off. The Shok-Blok pressure regulator and/or water supply check valve are not installed with the proper flow orientation
2. The fill solenoid has experienced either mechanical or electrical failure.
3. There is a problem with continuity to the control board in the water detection circuit.
4. Control board failure.
5. The water TDS is not above the required 10 ppm, therefore the water sensing probes do not detect water.
6. Site water pressure and flow is not adequate to fill the evaporator in the allotted time.

Ice machine disposition	Possible causes	Corrective action
Legend: ● ON ○ OFF ◐ ON or OFF ⊗ FLASHING		
7. Ice machine is not making ice. Solid 'LOW WATER' LED.  	1. Water supply is insufficient. 2. TDS is too low. 3. Low water pressure. 4. Defective water feed solenoid valve. Stuck in closed position. 5. No water feed output from PC board. 6. Plugged screen on inlet side of fill solenoid. 7. Plugged check valve. 8. Water sensing probe.	1. Restore water supply and check water filters. If evaporator was completely empty the reset button may have to be pressed to restart the ice machine. 2. Test TDS on incoming water line. TDS must be at least 10 ppm. 3. Ice machine will eventually start when water reaches the normal low level. 4. Replace water feed solenoid valve. 5. Replace PC board. 6. Remove and clean screen. 7. Remove and clean check valve. 8. Test the water sensing probe operation.

801 Church Lane • Easton, PA 18040, USA
(877) 612-5086 • +1 (610) 252-7301
www.follettice.com

Shok-Blok pressure regulator*

All Starbucks installations are required to have the Shok-Blok pressure regulator installed on the incoming water supply line. The fill solenoid is rated at 70psig, and the Shok-Blok limits water supply pressure to the machine to 40 psig. The Shok-Blok was sourced specifically by Starbucks to protect the ice machines fill solenoid from potential over pressurization that may occur when the booster pump cycles. **The Shok-Blok should not be removed.**

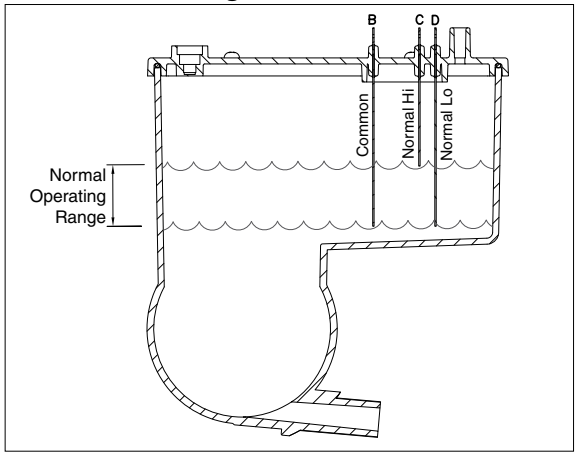
* The Shok-Blok pressure regulator allows water to flow in only one direction. Ensure that the arrow on the regulator is oriented in the direction of the water flow.

Action – Responding to Solid Low Water conditions:

Technicians responding to solid low water faults should evaluate the above conditions to determine root cause and take necessary action to remedy the fault.

1. Ensure the water supply valve to the machine is not shut off , and that the Shok-Blok pressure regulator and or water supply check valve are in the proper orientation.
2. Mechanical or electrical failure – Test for power output from the control board (while the LOW WATER light is on - there is a 30 second timeout) to the coil and ensure the valve is functioning mechanically. Ensure the proper voltage rating of any replacement valve.
3. Circuit continuity – Continuity of the water detection control circuit and input to the control board should be verified. Ensure proper orientation of the machine's water level sensing probe wires. (Orange wire must be on the center terminal). Scale buildup on the probes can render them inoperable, and scale buildup on the underside of the reservoir lid can cause scale bridges that can disrupt the circuit's logic. The scale should be removed using an ice machine cleaner and a Scotch brite pad. Clean the underside of the reservoir lid between the probes and rinse away any debris prior to reinstalling the reservoir lid.
4. Control board failure – The control board is supplied with inputs and provides outputs based on its programming. If the input does not produce the expected control board output, the control board should be replaced.
5. TDS – Total Dissolved Solids (TDS) is a measure of dissolved mineral content of water. All Technicians should carry a TDS meter. Follett ice machines require a minimum of 10 ppm TDS for conductivity in the water detection circuit. RO systems have the ability to completely remove all minerals. If the valve is functioning mechanically and electrically, measure the TDS of the water at the ice machine to verify TDS is above 10 ppm. If it is not, the RO system should be investigated.
6. Certain Starbucks store locations may experience issues with supply water pressure and flow attributed to RO system operation and/or the placement of appliances along the water supply header, and the water demands of those appliances. If all prior troubleshooting steps have been verified, and it has been determined that the water supply pressure and flow are the cause of the condition, report this through to Starbucks facilities team. Although removing the Shok-Blok may aid in remedying the condition, it should not be removed. Any Shok-Blok that has been removed should be reinstalled into the circuit.

Water level diagram



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Revision History

Revision	Date	By	Description of Change
R00	11/23	Chris Miller	—