



HOSHIZAKI CARE TECH-TIPS

Danny Moore
Editor

Hoshizaki America, Inc.
618 Hwy. 74 South
Peachtree City, GA 30269
Care Facsimile: (800) 843-1056

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REMEMBER

Just a note to remind you that Tech Tips is published as a service. We are eager to provide helpful information to you. If you have questions or items that you would like to see covered, drop us a line by FAX. We will do our best to include it in a future issue.

KM THERMISTOR OPERATION & CHECKOUT

All KM series units utilize a thermistor in the control circuit. The thermistor is mounted to the evaporator outlet or suction line. It is sealed to the suction line using a high heat conductive sealant (Hoshizaki part number 60Y000-D1 or Radio Shack item number 276-1372). A protective copper cap covers the thermistor sensor and sealant, and is secured using foul tape, insulation and wire ties.

The heat conductive sealant is a very important element in the proper installation of the thermistor as it assures good heat transfer and proper operation.

The thermistor is used to check the outlet temperature of the evaporator. It has two functions; 1) to start the defrost completion timer in the control board during harvest, and 2) as a high temperature safety.

During harvest the evaporator is warmed by the hot discharge gas from the compressor through the hot gas valve. When the outlet temperature reaches 48°F, the thermistor resistance reading of approximately 3.9 K-ohms signals the control board through the board connector to start the defrost completion timer.

If the temperature of the evaporator outlet reaches 127°F the low resistance of the thermistor signals the control board to shut the unit down on a manual reset

High Temperature Safety. To reset this safety you must shut off power to the unit. When power is restored the unit will restart in the normal sequence of operation.

A thermistor is either good or bad. There is no intermediate failure. If the thermistor is good, the resistance reading at the connector will correspond to the temperature of the sensor end. A temperature/resistance chart can be found in the service manual or on key number 17 of the Hoshizaki service keys.

A bad thermistor will either be open (maximum resistance), or shorted (zero resistance).

The symptom of a shorted thermistor is that the unit will shut down on the high temperature safety. When the unit is reset, you will hear a relay click after two seconds, and the unit will not restart. If this occurs, unplug the thermistor connector from the control board and try to restart the unit. If the unit restarts in the normal sequence, the thermistor is shorted. In order to get the customer up and running, you can operate the unit with the thermistor disconnected until a replacement is installed. With the thermistor disconnected, a back-up timer will terminate harvest in 15 minutes on "C" boards and 20 minutes on Alpine boards. The result is a longer than normal total cycle time.

There are four different Hoshizaki part numbers for the KM series thermistors. The only difference is the length of the lead. The longest thermistor (part number 429006-03) can be used as a universal replacement for any KM model.

Because of the fact that the thermistor is sealed securely to the suction line and has a very simple function, failures rarely occur. It is however, misdiagnosed many times

because it is misunderstood. Now that you understand the function and symptoms of a bad thermistor, it should be much simpler to correctly diagnose.

FLAKER SAFETY'S

Mechanical failures in an auger style ice machine can be time consuming and expensive repairs. Hoshizaki has incorporated several safety's in our Flaker and DCM units which add protection against this type of failure.

The following safety's are included in all Hoshizaki F and DCM units.

1. Low water safety: Designed to protect against dry operation or possible freeze up in the evaporator due to low water flow. This safety utilizes the dual float switch and a 90 second timer to shut down the unit when water flow is interrupted. The unit will automatically restart when water flow is resumed.
2. Protect relay safety: This safety incorporates a relay in the gear motor circuit and will not allow the refrigeration system to operate unless the gear motor is running. If the gear motor fails during normal operation, the protect relay will shut down the compressor to protect against evaporator freeze-up.
3. Gear motor circuit safety's: The gear motor has two additional safety's which will operate if the gear motor is subjected to excessive load or improper voltage. A current type manual reset safety is located in the control box and will trip when the circuit amperage exceeds 9 amps above normal amp draw. This acts as a primary safety for the gear motor. A secondary internal thermal overload is included in the motor windings. Both will work in conjunction with the protect relay to shut the unit down.
4. Voltage protect relay: This relay will shut the unit off in case of a voltage surge and automatically restart the unit when the voltage is corrected.
5. High pressure switch: All Hoshizaki ice machines include an automatic reset high pressure safety switch to shut down the unit in case of high head pressures.
6. Fuse protection: a lamp buss-type fuse is utilized in the control circuit. Smaller units like the DCM-240 and F-250 have a fuse in the incoming power circuit.

7. Short cycle protection timer: A one minute timer is included to protect against short cycling the gear motor or compressor.

8. Compressor protection is provided either internally or by means of an external motor circuit protector. This is an automatic reset thermal type circuit breaker.

9. The F-1100 and F-2000 utilize a spout safety control to shut down the unit if the bin control fails for any reason. This is a manual reset safety and will notify the customer by means of a beeper (F-1100) or indicator light (F-2000) alarm that the unit is off on this control.

The gear motor current protector serves as a back-up for the bin control on other models.

These safeties protect the Flaker or DCM models from internal failures.

HOSHIZAKI BINS

Hoshizaki manufactures a complete line of storage bins to fit most any ice machine application. The bins are available with a stainless steel or poly vinyl coated galvanized steel exterior. The sizes range as follows B-300 - 22 inches wide, B-500 - 30 inches wide, B-700 - 44 inches wide, B-800 - 48 inches wide and, B-900 - 52 inches wide.

The bins are ARI rated and come with adjustable legs, a poly scoop and universal mounting brackets for any Hoshizaki ice machine application. A wide variety of PVC insulated top kits are available to match with any combination of Hoshizaki machine.

The interior of all Hoshizaki ice bins is a rotocast molded poly material. This durable material is easily cleaned with a neutral cleaner or ice machine cleaner solution.

A 3/4 female pipe thread connection is located at the back of the bin at the base. This drain should be piped separately using 3/4 inch piping all the way to the floor drain or drain connection. The drain line should have proper fall and include a six inch vent tee at the bin outlet for good drainage.

Be sure to make the proper drain connection and level the bin using the adjustable legs to assure proper bin installation.

COMING NEXT MONTH...

- 1.** KM Water System and Cleaning..
- 2.** Flaker /DCM Water System and Cleaning..
- 3.** Hoshizaki Refrigeration System Dryers..

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