



HOSHIZAKI AMERICA, INC.

SERVICE BULLETIN

SB20-0012R1

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Subject: KM Thermistor troubleshooting

(This service Bulletin supersedes SB94-0013)

Part of the solid-state control system on the KM Cuber is the thermistor. The thermistor is typically very reliable component; however, many technicians may not understand its operation and may allow for misdiagnosis. Almost all thermistors that are sent back under warranty are found to have not fault. In this Service Bulletin we will discuss the operation and troubleshooting of the Thermistor.

The thermistor is mounted to the suction line and simply changes resistance as the temperature changes. The higher the temp the lower the resistance. The lower the temp the higher the resistance.

In the operation of the KM unit this temperature resistance is only used for three functions.

1. **Initiate Harvest termination:** The thermistor controls the temperature portion of the temperature time terminated harvest. The thermistor is mounted on the suction line and monitors the suction line temperature. During the harvest cycle when the temperature of the suction line rises to 48°F the resistance value of the thermistor will drop to be approx. 3.9KΩ. This signals the board to begin the defrost completion timer to complete the harvest cycle.
2. **High Temperature safety:** The thermistor provides a high temperature safety. If the suction line exceeds 127°F (Approx. 500 ohms) the unit will shut down on a manual reset one beep safety.
3. **Initiate anti slush cycle:** This signals the board to stop the pump during the freeze cycle, to prevent slushing in the sump tank. **Note: This function is not active on all units.** Please see the individual models service manual for further details.

Since the thermistor only has three functions it is very simple to troubleshoot. In general, the thermistor will only fail in one of two ways. Either an open circuit or a shorted circuit.

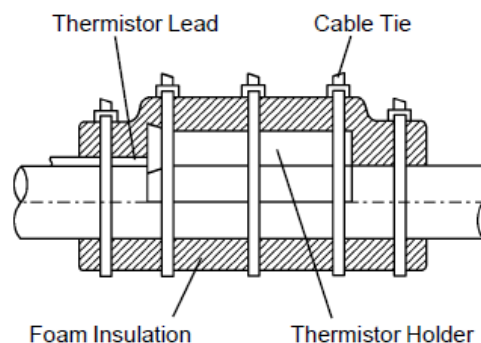
1. **Open:** In the case the resistance never gets down to 3.9K so the resistance is too high to signal the the unit to begin to come out of harvest cycle. The unit will run a 20-minute harvest cycle and the back up harvest timer will take the unit out of harvest and start the freeze cycle. If the thermistor is open the next harvest cycle will also be 20 minutes and the unit will shut down on a manual reset 2 beep alarm (Long Harvest).
2. **Shorted:** Since there is extremely low or no resistance on a shorted thermistor the unit thinks there is a high temperature issue and will lock out on a manual reset 1 beep alarm (High Temp)

To check the thermistor put your temperature probe on the suction line as close to the thermistor as possible. Remove the thermistor connector (K2) from the board and check the resistance. Compare your temperature and resistance to the chart below. Remember these resistances are K Ω (1000).

THERMISTOR TEMPERATURE/ RESISTANCE	
SENNSOR TEMP (°F)	RESISTANCE (K OHMS)
0	14.4
10	10.6
32	6.0
50	3.9
70	2.5
90	1.6

If the resistance does not match the temperature it is time to inspect the mounting of the thermistor to the suction line.

Check the condition of the mounting: The thermistor is mounted using a heat sink compound and a thermistor holder and then insulated. In the event that the thermistor needs to be removed from the suction line or it is already removed the thermistor can also be checked by putting the sensing end in ice water and confirming the resistance is 6.0K Ω



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If remounting the thermistor is necessary, clean the area of the suction line and re-install the thermistor and holder using a heat sink compound. Remember this compound conducts heat, for this reason silicone or caulking must **NOT** be used as they would insulate the thermistor from the suction line, preventing temperature transfer.

See table below for a list of thermistor kit part number as well as the part number for the conductive sealant.

Part number	Kit number	Description
425373-02	TS006	Thermistor with sealant
425373-03	TS002	Thermistor with sealant
427062-01	TS003	Thermistor with sealant
429006-02	TS004	Thermistor with sealant
429006-03	TS005	Thermistor with sealant
429006-04		
425373-05	TS006	Thermistor with sealant
455944-01	TS007	Thermistor with sealant
429006-05	N/A	Thermistor only
429006-06	N/A	Thermistor only
4A0683-01	N/A	Sealant only

If you have any questions concerning this change, please contact the Technical Support Department at tech-support@hoshizaki.com or 1-800-233-1940.