



# HOSHIZAKI TECHNICAL SUPPORT TECH -TIPS

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Danny Moore  
151  
Writer/Editor

Hoshizaki America, Inc.

Volume

618 Hwy. 74 South  
Peachtree City, GA 30269

May 11, 1998

Ph: (800) 233-1940 Fax: (800) 843-1056 E-mail: techsupport@hoshizaki.com

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## ***F-2000MLE EPR VALVE***

The F-2000MLE is a **low side** flaker, designed to be used with a supermarket rack system. It consists of the basic flaker controls and the low pressure side of the flaker refrigeration system. The MLE sequence of operation remains the same as with a basic flaker.

The MLE model has a liquid line connection at the rear of the unit supplied from a common liquid line header on the rack. This connection provides a solid column of liquid refrigerant from the rack system to the MLE thermostatic expansion valve during the ice making cycle. A suction line connection returns the heat laden refrigerant vapor back to the rack system through a common suction line header. The rack system compressor moves the refrigerant through its condenser to remove the heat load and supply the high pressure medium temperature liquid to the liquid header.

Each line connection includes a solenoid valve in the unit to control the refrigerant flow. When the sequence calls for the compressor to operate, the solenoid valves are opened to allow refrigerant flow. When the MLE bin control is satisfied, the solenoids will close to stop the flow of refrigerant.

The MLE also includes an evaporator pressure regulating or "EPR" valve. The purpose of the EPR valve in this application is to protect the evaporator from getting too cold. The rack system may have the capability of supplying lower pressures than the MLE actually needs as it may be operating other lower temperature equipment as well. Colder evaporator

temperatures would result in unwanted stress on the gear motor assembly. To keep the

evaporator from getting too cold, the EPR valve is set to maintain no less than a -10° F evaporator temperature.

The Spolan EPR valve in the MLE unit is adjustable and is pre-set at the factory at the pressure which corresponds to -10° F on the P/T chart. For a R-22 unit, this setting is 16 psig. A pressure tap is included on the valve so that the pressure setting can be checked.

Some rack manufacturers or installers put an EPR valve on each suction line connection at the common suction line header. If you are installing a MLE unit, check to see if another EPR valve exist. If so, the extra EPR valve should be adjusted so that it does not "buck" the operation of the EPR valve in the MLE unit. It should be set at a lower pressure so that it does not restrict refrigerant flow.

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## ***R-404A CHARGING TIPS By: Kirk Goss***

In the next 18 months Hoshizaki will be changing over from R-22 to R-404A refrigerant on most of our KM cuber, DCM, and Flaker series units. As you may know, with this refrigerant changeover, the oil will also switch from mineral to polyol ester type.

On issues of charging a R-404A system, it must be charged in a liquid state only. The reason for this is that R-404A is a blend of three different types of refrigerants

which include R-125, R-143A, R-134A. The percentage of each refrigerant in this mixture is very important to the blend. To maintain the proper mixture, a liquid charge is necessary.

If R-404A is charged by vapor, it can easily alter the mixture of the refrigerant. This is due to the fact that all three of these refrigerants have different

boiling points at different pressures and temperatures. Separation of the blend could occur.

Given the characteristics of a blended refrigerant, it is understandable that when repairing a gas leak in the field it is necessary to always weigh in the entire name plate specified charge. If adding the remaining charge on the low side is necessary, use a liquid low side charger. This device allows continued charging of liquid by simply atomizing or flashing off the liquid before it enters the suction line.

When we talk about repairs in the field, the quality of the oil might be in question. Polyol ester oil is extremely hygroscopic. With its ability to absorb moisture, we must pay close attention to the condition of the oil in the system. This is especially true if the unit has been open to atmospheric pressure for longer than fifteen minutes. If the system has been open for an extended time, it might be necessary to change the compressor oil. If so, drain the oil from the compressor into a graduated container. Measure the amount and replace it with the same amount of fresh clean polyol ester oil.

If the system has a gas leak but still maintains a positive pressure, it is probably not necessary to change the oil. Just remember, when repairing a leak, keep nitrogen flowing through the system to keep it as dry as possible during the repair. Also, a drier specifically designed for use with polyol ester oils is required.

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### **SERVICE Q & A**

Question; What do I check if I am servicing a unit that has the new “E” control board installed and it is beeping 7 beeps every 3 seconds?

**Answer by Rodd Burger.** As you have read in previous articles on the “E” board, there are several audible alarms which alert the service technician to specific problems with the unit. In this article we will highlight the HIGH VOLTAGE SAFTEY which will be signaled by 7 beeps every 3 seconds.

First, let’s discuss how the control board determines that the machine is in a high voltage situation. This is one by the control board monitoring the voltage at

the K2 connector or the secondary output from the control voltage transformer. The proper voltage at the output should be within 10.5 to 12.0 volts. If this voltage increases due to primary voltage to the transformer increasing to 142 vac. or higher, the unit will shut down on a automatic reset high voltage safety. A red LED on the board lights up when the control voltage is correct. If the high voltage safety operates, this light will be extinguished.

Now, let’s discuss the possible causes for this situation. The first possibility would be if the supply power to the unit was installed incorrectly (improper wiring). A possible scenario could be that line voltage was supplied to the neutral wire on a 208-230 volt unit or 208-230 volts is being supplied to a 115 volt unit. This would cause the primary voltage to the transformer to be 208-230 meaning that the secondary voltage will exceed the boards threshold and shut down on the high voltage safety.

The second reason is the existence of a “stinger leg” or a “wild leg” in the voltage supply. This is a leg of power that supplies over 150 vac. to ground. This leg, if installed on the brown wire, will supply high voltage to the transformer primary causing higher voltage on the secondary. The unit will shut down on high voltage safety. To operate the machine using a stinger leg, it must always be connected to the black wire (compressor circuit) in the unit junction box.

The third possibility is if the unit experiences a voltage surge during normal operation. Any increase in the incoming voltage will increase the control transformer output. If this voltage surge reaches 142 vac. the unit

will shut down on the high voltage safety to protect itself from damage.

It is important to note that the high voltage safety protection will automatically reset itself when the wiring is corrected or when the voltage returns to normal. Check each of these items if the board signals 7 beeps.

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***COMING NEXT MONTH...***

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2. KM Electrical Circuits
3. Service Q & A

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