



HOSHIZAKI TECHNICAL SUPPORT TECH -TIPS

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Volume 171
April 19, 2000

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WEB SITE UPDATE

Have you visited our web site lately? When you do, you will find some recent updates to the site. We try to provide good technical information at your fingertips.

From the web site, you can open, review, print and download each of the Tech-Spec's Technician's Pocket Guides. This includes the new R-404A guide and a Spanish version. We now update the Tech-Tips monthly and you can read, print, or download the latest issue or any previous issue. The previous Tech-Tips articles are listed by category so that you can choose the article and issue that you need. We also have information in Spanish and Portuguese for your reading pleasure. Be sure to check us out at www.hoshizaki.com.

ELIMINATING BYPASS COOLING

In late 1993, Hoshizaki began producing equipment using R-22 refrigerant. It is common knowledge, that compressors using R-22 refrigerant run a high discharge temperature. The discharge gas will run in the 200~220°F range. This higher temperature accounts for a large portion of R-22 compressor failures. It is also the reason that most other ice machine manufacturers shy away from using R-22.

Our Engineers found that the higher discharge temperature improved the harvest time on KM models however, compressor-overheat protection was needed. The KM refrigeration system design changed on the R-22 models to add this protection. **Bypass**

cooling is the term that Hoshizaki uses to describe the compressor cooling system.

In reality, bypass cooling is a form of liquid injection cooling which is commonly used in larger medium and low temperature supermarket systems. To cool the compressor, we add a capillary tube from the liquid line to the suction line. This capillary tube allows a small amount of refrigerant to meter into the suction line. When the gas enters the suction line, it flashes. This adds additional cool gas to the compressor dome to help reduce compressor temperature.

In some cases, a solenoid and additional switches or relays were added to provide on-demand bypass cooling. We will discuss the different controls and operation in a Tech-Tips future articles.

Now for the good news, the discharge temperature for an R-404A compressor will fall in the 170~180°F range. An R-404A system does not require bypass cooling. This eliminates the need for the extra bypass components and controls and allows us to go back to the basic KM refrigeration system design. You may have noticed the absence of the extra bypass components and controls on R-404A units. This is a big plus since fewer controls will mean fewer possibilities for problems and easier system diagnosis.

NATURAL BUILT-IN CLEANING

Scale buildup in an ice machine is inevitable however, there are some ways to help clean the water system using clean fresh water. The KM design allows for

built-in cleaning of the water system. In fact, the control board can be adjusted so that it cleans the reservoir twice during every cycle.

At the beginning of the first full harvest of ice, the KM unit cycles through a reservoir pump-out that purges Total De-solved Solids (sediment and minerals) down the drain. The length of pump-out is either 10 or 20 seconds. This pump-out can be adjusted to occur every 1, 2, 5, or 10 cycles after the first full harvest. The pump-out adjustment allows flexibility for varying water conditions. Every cycle (1/1) pump-out will provide maximum cleaning. The adjustment is made by changing the position of two dip-switches (#'s 5 & 6) on the control board.

At the end of harvest, a second cleaning occurs. This is an overflow flush of the reservoir. The overflow process allows any remaining sediment to overflow the reservoir standpipe and flush down the drain. The standpipe has a displacement cap placed over the top of it. The cap pulls the overflowing water from the bottom of the reservoir, dumping the sediment down the drain. The overflow flush period is also flexible and can be adjusted to provide more cleaning. Adjusting the defrost-completion timer longer accomplishes this. Extending the harvest cycle allows more flushing. The benefit is a cleaner reservoir, less scale build-up on the evaporator freezing-surface and better efficiency.

Adjustment of the defrost completion timer is accomplished by changing the position of two dip-switches (#'s 1 & 2) on the control board. The adjustment is 60, 90, 120, & 180 seconds. You will find a control board adjustment chart in the Tech-Spec's technician's pocket guide and in the box with a replacement control board.

The factory settings provide for the best operating efficiency and water savings. The control board adjustments are provided so that the service technician can easily provide for more built-in cleaning in a bad water location.

SERVICE Q & A:

I recently installed a KM-2400SRF3 unit. I noticed a line valve installed between the discharge line and the discharge inlet to the headmaster valve. What is the purpose of this valve?

Answer: The valve that you refer to is new and is included only on the KM-2400SRF3 model. It is a line stop valve that serves a specific purpose on the manufacturing line.

The KM-2400SRF3 is the largest KM model and has a total refrigerant charge of 24 lbs. Every KM unit is run tested on the assembly line before it is boxed for shipment. This includes the remote models. They are connected to a high capacity condenser system that supplies a solid column of liquid refrigerant to the unit during the run test. Once the test is completed, refrigerant is recovered by allowing the compressor to pump the charge through the system and into the condenser. The charge is held in the condenser system for the next unit test. The new line valve is used during this pump down process.

During recovery, the refrigerant pressure will reduce to a point where the headmaster valve will open to the bypass position. The line valve is closed during recovery so that the complete charge can be recovered without bypassing. Eliminating the possibility of refrigerant bypass speeds the pump down procedure.

When the total charge is recovered, the assembly-line test-person backseats the valve stem with a hex wrench. This allows for normal operation of the headmaster after installation. The valve should not be closed during normal operation of the KM-2400SRF3 unit.

This valve will allow one benefit during troubleshooting of the refrigerant system. If the head master is stuck in bypass, this valve can be closed off to allow refrigerant to flow through the condenser until the valve can be replaced. The valve should then be opened for normal operation. Remember that the head master valve will naturally open to bypass in case of a low refrigerant charge.

COMING NEXT MONTH...

1. The Batch Weight System
2. Bypass Cooling Controls
3. Service Q & A

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