HOSHIZAKI TECHNICAL SUPPORT
TECH -TIPS

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CORRECTION FOR LAST ISSUE

In last issue # 162 we reviewed the KM sequence of operation. The article states that the fan motor on the remote system starts during the 1 minute fill cycle. This is not correct. The remote fan actually starts with the compressor during the initial harvest cycle. As the article states, it's always good to review. A corrected copy is included with the first mailing in July.

NEW IM-51BAF MODEL

Hoshizaki America, Inc. has just released a new product to fill the 50 lb. product category. The IM-51BAF is a small self-contained cuber designed for either countertop or undercounter installation. The unit is 15 ½" wide, 22" deep, and 29 ½" high.

The IM-51BAF has a horizontal evaporator and uses an actuator motor to raise and lower a water plate for the ice making process. The unit is design after the original IM series, which has been produced by Hoshizaki Electric Company for over 45 years. The IM series is still in production in Europe and Japan and has proven reliability. Many IM models were sold in the US market in the mid-1980's and are still running today. Our IM-51 was designed and produced at our Peachtree City, GA facility.

There are several features that highlight the IM-51. The air inlet and outlet are in the front. This allows the unit to be enclosed by cabinetry around the top and sides without hindering airflow. A pull out air filter is located in the front louver for easy access. The control switch is hidden in the louver by a flip down access cover. The bin area can store up to 26 lbs. of square IM cubes.

A solid state control board provides the IM-51 operation so there are no thermostatic controls requiring seasonal adjustment. We will explain the sequence of operation in our next issue. The horizontal evaporator is tin dipped copper and produces 21 - 1" square cubes. Each harvest cycle yields .6 lbs of ice production. The average cycle time will be around 23 minutes @ 90/70°F conditions. A mechanical bin control using a magnetic proximity switch is located in the storage bin. The harvest is controlled by a thermistor mounted on the evaporator outlet side.

Now that you know that it is available, be on the lookout for this new model in the field.

R-502 REFRIGERANT CONVERSION

Prior to 1993, Hoshizaki used R-502 refrigerant in our ice machines. Since there are many R-502 units in the field, we have many questions as to what refrigerant to use when servicing the refrigeration system. Here are our recommendations for all R-502 units along with some tips for conversion.

First, if you have R-502 still available, use it. It may cost a little more but the time and effort you save will easily override the cost. You will also find that the unit will operate closer to specification when using the OEM design refrigerant. If you can't get R-502, we

recommend **R-402A / HP-80**. This is our only recommendation. Copeland says that HP-80 is a better choice for our equipment application.

When converting an R-502 unit to R-402A you must follow the generic conversion instructions provided by either the refrigerant or compressor manufacturer. (See Dupont # ART-9 or Copeland # 93-05 retrofit guidelines.) They instruct you to use Alkylbenzene oil in the system. This means that you will need to change the refrigerant oil in the compressor. It is important to remember that a new replacement compressor from the Hoshizaki will have a mineral oil charge in it. If you convert to
R-402A you must drain the mineral oil out and replace it with the same amount of Alkylbenzene oil. This is best done by inverting the compressor and draining the oil prior to installing it in the unit.

As for driers, replace the existing drier with a standard Hoshizaki drier or a properly sized non- OEM drier designed for use with R-402A. (Models below 1200 lbs. production use a 3 cu. in. drier. & above 1200 lbs. production use a 5 cu. in. drier.)

When charging the system with R-402A, it is important to remember that it is a near azeotrope mixture. This means it must be charged in a liquid state through the high side or flashed to the low side using a liquid dispensing device. The guidelines instruct you to start with 80% of the R-502 amount by weight and add a little as needed up to 90~95% for optimum the charge. The optimum charge amount will depend on the age and shape of the equipment. If a refrigerant leak occurs with R-402A in the system, we recommend a complete evacuation and recharge with virgin refrigerant.

No changes are needed for the TXV. You will find that the suction pressure increases slightly and the high side pressure increases by as much as 20%. The high-pressure switch will provide protection a little sooner with R-402A however, it will work fine in this application.

Lastly, this is the only R-502 conversion refrigerant recommendation by Hoshizaki. We understand that there are other possible alternatives available however, we have not taken the time to do the additional testing needed for approval. Since the unit is likely out of the warranty period you could use any compatible replacement you have experience with. The only drawback is that we have no experience or data for other alternatives.

SERVICE Q & A

Question: I am servicing an F-1000MAF that will not start up at all. I suspect a bad circuit-protect relay because when I jumped between terminals 1 and 5, the unit started up. I replaced the relay and the problem continued. What do I check next?

Answer by Frank Neely: (Frank is a new Technical Advisor in the Technical Support Department.)
This sounds like a high voltage problem. In taking technical calls, I have notice that there is some confusion in the operation of the circuit-protect relay. Let's take a look at what this relay is designed to do and how it works. Hopefully, a brief explanation will clear up this question.

The circuit protect relay is designed to protect the unit from a high voltage supply or voltage spikes. Perhaps it should be called the voltage protect relay. If you look at the relay coil voltage, you will see that it is rated at 220/240 volts but the relay is wired to a 115 volt supply circuit. The relay coil will actually energize at approximately 140 volts. This will open the contacts between 1 and 5 which will de-energize the control transformer, gear motor, and fan motor. This provides an automatic high-voltage shut down with automatic restart. When the voltage returns to a normal range, the relay coil de-energizes and the unit restarts.

This relay application is very similar to the operation of a potential relay. When the voltage increases, the relay energizes to open the power supply circuit to the unit. When the voltage goes down, (to the normal range) the relay de-energizes to allow the unit to operate.

In your case, it is very possible that the incoming voltage is high and the relay coil has opened terminals 1 and 5. When you replaced the relay and turned the power back on, the new relay energized also. If you study the wiring diagram carefully, you will find that this

is a fairly simple application that is effective in protecting a customer's investment.

COMING NEXT MONTH...

1. IM-51 Sequence of Operation
2. R-12 Refrigerant Conversion
3. Service Q & A