



HOSHIZAKI TECHNICAL SUPPORT TECH -TIPS

Danny Moore
Writer/Editor

Hoshizaki America, Inc.
618 Hwy. 74 South
Peachtree City, GA 30269

Volume 156
December 7, 1998

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

REMOTE CONDENSERS

In the process of changing production over to R-404A refrigerant, we will have a period of time when both R-22 models and R-404A models are available in the field. The question has already arisen as to the possibility of using a URC condenser which is designed with one refrigerant with a ice maker head designed with another refrigerant. The following information will address this issue.

As you may know, R-22 and R-404A refrigerants are not compatible. They also use different types of refrigeration oil for lubrication which will not mix. Therefore, we must state emphatically that components which include different refrigerants should not be combined in an installation. Mixing the refrigerants will cause improper operation and possible damage to the refrigeration system components. This will result in an expensive and timely, clean up and repair that **will not be covered by warranty.**

The biggest question that arises is, "can I convert a R-22 URC condenser or line set, so that it can be used with a R-404A head?" This usually comes up in an emergency situation where time is critical for the customer or in a change out of the ice maker head. The answer; while it is not advisable and is not covered by warranty, it can be done.

To use a R-22 line set on a R-404A system, evacuate the holding charge of R-22 refrigerant through the schrader ports provided on the Aero-quip fitting for each line. This must be done prior to making connections to the unit head and condenser. Purge the

line thoroughly using an inert gas such as nitrogen to remove any stagnate refrigeration oil. Evacuate the lines again and add a holding charge of 15-30 psig. R-404A refrigerant gas. Reverse this procedure for a R-404A line set on a R-22 system.

Converting a condenser is more complicated and time consuming as the head master valve must be changed for the different refrigerant. Failure to install the correct head master will result in improper operation. The conversion should take place before the line set is installed.

The URC condenser contains a partial charge of liquid refrigerant. The first step in converting the condenser is to remove this refrigerant. Add a good quality bolt on line tap valve to the process tube of the condenser and recover the original refrigerant. Once the condenser is void of refrigerant, replace the bolt on line tap valve with a quality schrader valve and remove the original headmaster using proper piping practices.

Before installing the new headmaster, purge the condenser with nitrogen to remove any possible refrigerant oil. Install the correct OEM headmaster (R-22 / #4A0229-01, R-404A / #4A0229-03) and leak check the condenser. Evacuate and recharge with the correct refrigerant type and amount. Finally, mark the condenser nameplate and place a new refrigerant label over the original refrigerant label.

CYCLE COMPARISONS

Tech-Tips issue #120 included an article titled “Why Longer Cycles?”. It explained the benefits of having a longer cycle time. Here, we will take a look at a comparison of cycle times between the Hoshizaki KM cuber and a unit with shorter cycle times.

For comparison, we will look at 1300# models. The following chart shows the difference. This information was taken from available spec sheets.

70°F air/50°F water conditions

MODEL	Cycle time	Cycle/day	Cycle/year
KM-1300SAF	34.5	41.7	15220.5
KM-1300SRF	34	42.4	14412.5
Competitors 1300 air-cooled	13.6	106	38690
Competitors 1300 remote	13.2	109	39785

90°F air/70°F water conditions

MODEL	Cycle time	Cycle/day	Cycle/year
KM-1300SAF	39.2	36.7	13395.5
KM-1300SRF	34.2	42.1	15366.5
Competitors 1300 air-cooled	11.4	126	45990
Competitors 1300 remote	12	120	43800

A quick review of this information easily proves the benefit of longer cycle times. Longer cycles mean fewer cycles and longer life for the icemaker.

SERVICE Q & A

Question; I have a customer with a KM-630MAB cuber. I would like to convert the unit to R-22 refrigerant. What are the factory recommendations?

Answer by: Lonnie Clayton

From a factory standpoint, we do not recommend converting from R-502 to R-22. An R-22 system runs higher compressor temperatures. This means that some R-22 systems have to have additional compressor cooling engineered into the refrigeration system.

This additional cooling is accomplished in Hoshizaki ice machines by installing a liquid bypass capillary tube. This allows proper cooling for the compressor in models that exceed the compressor manufacturers operating temperatures.

The liquid bypass capillary tube allows liquid refrigerant to flow from the liquid line into the suction line. Spraying

a mist of liquid refrigerant into the suction line adds additional cooling vapor to the compressor crankcase. Some models require constant liquid bypass cooling. Others, are controlled with a liquid bypass control or through a related component circuit to provide (on demand) bypass cooling. The bypass control or related circuit energizes and de-energizes a liquid bypass cooling solenoid. The solenoid permits flow to the bypass capillary. Each capillary tube has been engineered at a specific length and diameter to allow appropriate liquid injection into the suction line.

R-502 operates at lower temperatures than R-22 eliminating the need for capillary tube injection cooling for compressors. Also, the R-502 TX valve will not operate correctly on R-22. If conversion took place, you would have to replace it with a R-22 TX valve.

To convert from R-502 to R-22 would put the compressor at a high risk of over heating. Liquid bypass cooling must be added using a liquid line capillary tube. The length and size will be the same as the R-22 model. A new liquid line drier must be installed and in most cases, the compressor must be changed for R-22. These changes would involve extended labor and a high cost to the customer.

Our only recommendation in this situation is to convert the R-502 system to R-402A / HP-80. HP-80 is the only refrigerant approved by Hoshizaki America for R-502 replacement. Follow the compressor manufacturer or Duponts change over instructions.

The instructions require you to remove the compressor and empty the mineral oil into an EPA approved container. Re-install the compressor and add the compressor manufacturers recommended amount of alkybenzene oil. Install a new liquid line drier. Evacuate the system to 500 microns or less and weigh in the HP-80 refrigerant, at approximately 80% of the nameplate rated R-502 charge. Start the unit and check for proper operation.

The best recommendation we could make would be to remain with the factories engineered refrigerant. If the customer still wants an R-22 system, they would be better served to purchase an R-22 unit. A system

designed, tested, and proven to operate correctly at R-22 temperatures.

COMING NEXT MONTH...

1. R-404A Units Technical Data
2. Service Training Update
3. Service Q & A

Volume 156 Page 2