



# HOSHIZAKI TECHNICAL SUPPORT TECH -TIPS

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## ***DEDICATED NEUTRAL***

By now, hopefully every person who installs a Hoshizaki single phase 208/230 volt unit knows that it requires a dedicated neutral wire. In this article, we will discuss why it is needed.

It is important to remember that Hoshizaki ice machines have many common components throughout the KM line. The 115 volt transformers, coils, motors, and control board are used in all models including 3 phase equipment.

National Electric Code states that any 208/230 volt unit containing 115 volt components requires a dedicated neutral wire as a 115 volt return or a transformer to provide the 115 volt circuit. In 3 phase equipment, a transformer is provided to power the 115 volt components. The dedicated neutral is used on single phase units due mainly to the additional cost and space requirements for adding a transformer.

A dedicated neutral simply means that the insulated neutral conductor runs directly back to the power panel neutral connection. It does not connect to any other neutral or ground wires along the way. It is isolated for this circuit only. This is necessary to provide for a safe return for the 115 volt circuit and eliminates the possibility of back feed voltage. An additional bond or ground wire is also required. This means that the typical single phase, 208/230 volt unit will include a 4 wire circuit (2-115 volt "hot legs", a dedicated neutral, and a ground).

Backfeed voltage can occur in any inductive load. It is the same as the back "EMF" used to energize the coil on a compressor start relay. If backfeed voltage

is present on a single phase 208/230 volt unit, it can be enough to actually energize a 115 volt component. In the KM unit, it may energize the contactor which will allow the compressor to continue to run, even when the control switch or bin control is "OFF".

The installation instructions spell out the requirement for a dedicated neutral. There is also a wiring tag attached to the pigtailed in the junction box. We have tried to highlight this requirement to assure correct wiring. It is also mentioned in the KM installation video. Now, if we could just figure out how to get those new installers to watch the video and read the instructions! Do you have any suggestions?

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## ***DCM -240 AGITATION***

The DCM-240 cubelet maker/dispenser now has built-in periodic agitation. This feature was added in the November 97 production run. The agitation was added to address ice bridging.

Ice bridging can occur for any one of the following reasons. A dirty, scaled up evaporator causes poor ice quality. Soft or mushy ice easily bridges in the small bin. Poor water quality or operation on a water softener system can produce the same effect. If the bin drain is plugged, water accumulates in the bottom of the bin and the ice freezes into a donut or chunks which will not dispense through the spout outlet. Also, in some cases, if the unit sits idle for a period of time without dispensing, the ice may bridge and not dispense.

Periodic agitation resolves ice bridging if the unit sits idle. This could occur simply because

the unit was not used overnight. Originally, the ice in the small bin was agitated only when the unit was making ice or when ice was being dispensed. Now, a timer will start the auger gear motor for 2 seconds of agitation every 90 minutes. This occurs whether the unit is running or not. As long as power is supplied, the 90 minute timer is counting.

A periodic agitation timer kit, Hoshizaki part number HS-0113 is provided for models produced prior to November 1997. See Service Bulletin number SB97-0011 for details on the kit.

Keep in mind that this kit is not a fix-all for ice bridging. If you are called out for a dispensing problem caused by ice bridging, it is important to check the unit to determine why the bridging is occurring. The unit may just require a thorough preventative maintenance cleaning. Always check to assure the unit is not connected to a water softener system. This will not only cause ice bridging but could also cause pre-mature bearing wear due to the salt content in the water.

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### ***SERVICE Q & A***

Question; I always thought that the KM float switch controlled the inlet water valve. Now, I hear that is not the case. Please explain it's function.

***Answer: by Duncan Sheridan*** To clear up any confusion, I offer the following explanation of how the float switch functions.

When you select the ice position with the toggle switch, the first component to energize is the inlet water valve solenoid. As water enters the reservoir, the water level raises the float to close the float switch contacts. After one minute the control board will start the harvest sequence if the float switch is in the up position (closed). The compressor and the hot gas valve will energize only if the float switch is closed indicating water in the reservoir.

The inlet water valve will remain energized for up to 6 minutes or the length of harvest, whichever is shorter. This is regardless of the float switch position while in the harvest/fill sequence. The float switch does not control

the level of water in the reservoir or the inlet water valve. The water level is

established by the height of the overflow stand pipe.

If the float switch contacts do not close during the initial fill, the only component that will remain energized is the inlet water valve solenoid. This provides a low water safety feature for the KM unit. The initial fill will repeat until the float switch closes.

During the fill/harvest sequence the float switch has another unique function, if the water level should drop so that the float switch contacts open during harvest, the control board will assume a low water condition exists just prior to switching into the freeze mode. If this condition exists, the control board will cycle the compressor and hot gas solenoid off, and the inlet water valve solenoid will remain energized. In this case, the initial fill sequence would begin again. This feature allows our water pump to operate only if there is water in the reservoir.

Once in the freeze cycle, the float switch also functions to initiate the next harvest cycle. As ice freezes on the evaporator, the water level drops. As the freeze cycle continues, the water in the reservoir drops to the level that allows the float switch contacts to open, initiating harvest. The control board will not allow a harvest cycle until the freeze cycle has lasted for at least 5 minutes.

To test the float switch operation, allow the machine to operate in the freeze cycle (water pump operating) for at least 5 minutes. Then, drain the water from the reservoir and the unit should sequence to harvest. If the control board remains in freeze cycle, disconnect the K5 connector on the board. If the harvest begins, the float may be stuck. Remove the float switch, turn the assembly upside down and pour a solution of ice machine cleaner into the cylinder. Allow it to soak for 15-20 minutes, rinse it completely, re-mount the assembly and re-check it.

As you can see, the float switch performs several different functions throughout the cycle. It does not however, control the inlet water valve.

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

1. Why Start the Compressor in Harvest.

2. Countertop Dispenser Applications.

3. Service Q & A

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