HOSHIZAKI TECHNICAL SUPPORT
TECH-TIPS

Danny Moore
Writer/Editor

Hoshizaki America, Inc.
618 Hwy. 74 South
Peachtree City, GA 30269
Care Facsimile: (800) 843-1056

Volume 139
May 7, 1997

DCM ICE

DCM stands for Dispenser Cubelet Machine. The ice produced by this auger style unit has a unique shape and falls in the 90% hardness range. This harder cubelet dispenses easily and has less problems with bridging in the small, air tight DCM storage bin. A Hoshizaki flaker can be converted to produce the cubelet style ice, however the converted cubelet will fall in the 85% hardness range. The DCM ice is generally preferred in health care applications because it is easy to chew than cubes.

The evaporator and auger in the DCM series is slightly different from that of a flaker. The difference in the evaporator is two short keys that are welded vertically to the inside of the cylinder. The smaller DCM-240 has a single key. The purpose of the keys is to cause the ice to pack tighter on the auger as it moves upward. This squeezes more water out of the ice and provides a harder cubelet as it is extruded. The auger on the DCM-450 & 700 units has two keyway slots cut vertically down the flight or screw of the auger.

It is important to remember that all DCM models have these cylinder keys welded inside. This makes auger removal different from typical auger type units. You cannot lift the auger straight out like you do on a flaker unit. When removing the auger for inspection on the small DCM-240, you must lift upward on the auger and turn it clock wise to "unscrew" it past the key in the cylinder.

To remove the auger from the larger DCM's, you must align the keys with the auger slots. Do this by lifting the auger up slightly until the spline at the bottom of the auger clears the coupling. Next, rotate the auger to align the keys with the slots. Once they are aligned , lift it straight up and out of the evaporator cylinder. You may find it necessary to
remove the extruding head in order to visually see the keys and slots. Keeping upward pressure on the auger as you rotate it clockwise will allow the auger to come out as the slots reach the keys .

Service Tip: Cleaning the water system on a flaker or DCM before you pull the auger allows for easier removal.

HEAD PRESSURE CONTROLS

Proper head pressure is very important to remote ice machine operation. The head pressure must fall into an acceptable range so that basic refrigeration can occur. It is also important for adequate hot gas defrost. Head pressure is generally not a problem for warmer climate applications. In colder climates however, some type of head pressure control is needed.

The choices are limited. A fan cycling device can be used to cut off the condenser fan for a period of time. Some type of air flow control, like a damper system, can be used to restrict the condenser air flow. Lastly, a three way valve can be used to back up liquid in the condenser and divert discharge gas directly to the receiver. Hoshizaki remote systems use a head pressure control valve typically called a headmaster valve.

The headmaster valve is preferred in our application because it normally provides a 5-10 PSI operating range for the head pressure. Air flow and fan cycling

devices can vary the head pressure as much as 40-50 PSI. For our application, the narrow range provides better operation. The headmaster used on KM-500~1200 models is a Sporlan LAC-4 190 PSI valve. KM-1600 & 2000 Models use a 157 PSI setting and the KM-2400 uses a LAC-5 140 PSI setting.

The headmaster valve is a modulating valve that limits the flow of liquid from the condenser while at the same time regulating the flow of hot gas around the condenser to the receiver. This mixing of liquid and hot gas creates a high pressure at the condenser outlet which causes liquid to back up in the condenser. This reduces the effective condenser surface causing a rise in condensing pressure and maintaining a more constant receiver pressure.

Proper refrigerant charge is imperative for correct operation of a head master. Always check for the correct charge before condemning a headmaster.

SERVICE Q & A

Question: The freeze cycle is longer than normal, what should I check?

Answer: ***by Keith Johnson*** This is a common question asked by service technicians and is relatively easy to diagnose. First, remember that there are back-up timers incorporated in the solid state control board. This includes a five minute short cycle protection timer and a sixty minute maximum freeze timer. The board has the freeze cycle under control for the first five minutes. This is the short cycle protection timer. After five minutes, the board waits for the float switch to open contacts. This occurs when the water level in the reservoir drops to a certain point.

In order to determine what the freeze cycle should be running, check the reference material. This information is found in the Tech-Specs or individual service manuals. By referring to the production charts, determine approximately how long the freeze cycle should be. This time will be affected by ambient conditions and water temperature and should be used as a guideline.

If it has been determined that the freeze cycle is too long, there only a few things that could cause this. Here is a list of what to check.

FLOAT SWITCH: The float switch initiates the KM cuber harvest. If in 60 minutes, the float switch failed to open its contacts, the board will automatically put the unit into harvest. The symptoms of a stuck float switch is a consistent 60 minute freeze cycle. The cube will be larger than normal. Also the reservoir may run short of water before 60 minutes expires causing the pump to suck air. When the freeze cycle is started, the board starts the maximum freeze timer. If the contacts stick closed, this would cause a long freeze cycle. The float switch can be checked by using a simple ohm meter. If the float is in the up position, the switch is closed. If the float is down, the switch is open. The float switch could be dirty. Clean it and recheck the contacts. If the float switch is still reading closed when it should be open replace it.

WATER VALVE: Another cause of a long freeze cycle may be a leaking water valve. The water valve should shut completely off when de-energized. If it fails to do so, it will continually let water in the reservoir. This will lengthen the freeze cycle. The actual increase in cycle time will depend on how much water is seeping past the water valve diaphragm. If the water is flowing excessively, no ice will be made. In this case clean the bleed port in the valve diaphragm, replace the diaphragm, or replace the water valve. The symptoms would be up to a 60 minute freeze cycle if the valve was leaking excessive water into the reservoir.

CONTROL BOARD: The control board could cause a long freeze cycle. To check this disconnect the float switch from the board after five minutes in the freeze cycle. The machine should go directly into the harvest cycle. If this does not occur, the board should be replaced.

Each of these problems will produce an oversized cube. Long cycles can also be caused by a refrigeration problem. A long freeze cycle that produces a small cube or no cube at all will most likely be linked to a weak compressor, expansion valve, or some other refrigeration problem. Use basic refrigeration principals to diagnose these areas**.**

COMING NEXT MONTH...

1. Diagnosing Head Pressure Problems

2. Small KM Cubes
3. Service Q & A Volume 139 Page 2