SC - 121-00
Dated: 7/1/00

SERVICE COMMUNICATOR

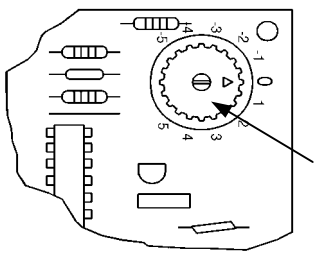
Subject: QM 20/QM 30 Ice Production, Refrigeration Diagnostics & Charging

The QM 20/QM 30 dice ice cube formation is slightly different from our previous models. Manitowoc ice machines have a unique cube shape. It is normal to have a dimple in the ice cube (a concave indentation in the cube). Ice cubes from the QM 20/QM 30 may appear to have a slightly larger dimple than other Manitowoc dice cube machines. Therefore, cube size for the QM 20/QM 30 is determined by measuring the slab weight (the combined weight of all cubes from one harvest cycle). To determine proper slab weight, follow the instructions listed below.

1. Ensure the air filter, front, and back panels are installed properly and close the bin door.
2. During the **third** harvest cycle open the bin door and catch the entire slab of ice.
3. Weigh the ice slab. The combined weight of all cubes from one harvest should weigh between 7 - 9 oz (200 - 270 g). If the slab weight is within this range, the ice machine is working properly and no further action is needed. If the slab weight is not within this range or you desire a slightly thicker or thinner cube, continue to step four.

WARNING
Disconnect electric power to the ice machine at the electric switch box before proceeding.

4. Remove the air filter.
5. Remove the two screws holding the front panel in place and remove the front cover.
6. Locate the ice thickness control dial on the control board (see figure). Turn the dial clockwise for a thicker cube or counter clockwise for a thinner cube.
7. Assure all of the panels and air filter are reinstalled properly and the bin door is closed. Repeat steps one through three.



The QM 20/QM 30 ice machines have a very small refrigerant charge, 4.59 oz. (130 grams) and we do not recommend diagnosing the ice machine using refrigerant pressures. For this reason we have not included refrigeration access fittings.
Verify that your water flow is even across the entire evaporator before diagnosing the refrigeration system. Mineral build-up on the evaporator assembly can cause water tracking and an erratic ice fill pattern. Clean with Manitowoc Ice Machine cleaner to remove any mineral build-up before entering the refrigeration system.

The following can be used for diagnostics:

Capillary Tube failures or low refrigerant charge will always result in a starving evaporator.

Assume 86°F (30°C) air temperature 68°F (20°C) water temperature.

Suction line temperature at the compressor will range from 86°F (30°C) three minutes into the cycle to 8°F (-13°C) at the end of the freeze cycle. An obstructed capillary tube or low refrigerant charge will have a suction line temperature higher than normal.

Discharge line temperature at the compressor will range from 168°F (76°C) to140°F (60°C) through the freeze cycle. An obstructed capillary tube or low refrigerant charge will have a lower discharge line temperature than normal.

Suction line temperature at the compressor will range from 64°F (18°C) to 111°F (44°C) through the harvest cycle. An obstructed capillary tube will not affect suction line temperature range during the harvest cycle. Low refrigerant charge will have a lower temperature than normal.

Discharge line temperature at the compressor will range from 180°F (82°C) to 150°F (60°C) through the harvest cycle. An obstructed capillary tube will not affect discharge line temperature range during the harvest cycle. Low refrigerant charge will have a lower temperature than normal.

Ice fill pattern will vary depending on severity of the obstruction or refrigeration loss. Ice fill patterns will range from no ice on the entire evaporator to thin only at the evaporator outlet (thin at the bottom, thick at the top of the evaporator).

After completing the procedure above, if you are unable to obtain a sheet of ice weighing between 7 - 9 oz (200 - 270 g) contact the Manitowoc Service Department at 1-800-545-5720 for further assistance.

MANITOWOC ICE, INC. 2110 S. 26th ST., PO box 1720, Manitowoc, WI. 54221-1720 USA
920-682-0161 • Service Fax 920-683-7585 Web Site - www.manitowocice.com

Charging Procedures
QM 20/QM 30 Ice Machines

The QM 20/QM 30 ice machines are critically charged. There are no refrigerant access ports on these ice machines.

1. Locate the high and low side process tubes. Install a piercing valve (saddle valve) on both the high and low side process tubes.

IMPORTANT
Remove piercing valves after charging. Unit is critically charged.

2. Recovery: Operate the recovery unit as directed by the manufacturer's instructions.
3. Replace cap tube assembly and line drier.

IMPORTANT
Purge system with nitrogen while brazing to prevent build up of copper oxide in the refrigeration system.

4. Pressure test system with nitrogen to verify no leaks are present.

IMPORTANT
Manifold gauges must be removed properly to ensure that no refrigerant contamination or loss occurs. A quick disconnect is required for the high side connection unless high side valve has shut off.

5. Evacuate system to 250 microns. Then allow vacuum pump to run for an additional 1/2 hour.

REFRIGERANT CHARGE

Important This unit is critically charged.		
Model	**Refrigerant Type**	**Quantity**
QM 20	R 134a	130 g (4.59 oz.)
QM 30	R 134a	165 g (5.78 oz.)

6. Manifold gauges must be removed properly to ensure that no refrigerant contamination or loss occurs. A quick disconnect is required for the high side connection unless high side valve has shut off. Using a digital scale add the proper refrigerant charge (shown on nameplate) through the high side.
7. Let the system “settle” for 2 to 3 minutes.
8. Place the toggle switch in the ICE position.
9. Close the high side on the manifold gauge set.
10. Make sure that all of the vapor in the charging hoses is drawn into the ice machine before disconnecting the charging hoses.
    A. Disconnect the water pump.
    B. Run the ice machine in the freeze cycle.
    C. Close the high side piercing valve (if required) and remove the high side hose with the quick disconnect.
    D. Open the high and low side valves on the manifold gauge set. Any refrigerant in the lines will be pulled into the low side of the system.
    E. Allow the suction pressure to reach 6.89-kPA (0 psi) while the ice machine is in the freeze cycle.
    F. Using a pinch-off tool, pinch off the high and low side process tubes and remove both piercing valves.
    G. Using an oxygen/acetylene torch seal the penetrations from the piercing valves.

Refer to QM 20 Installation Use and Care and Service Manual P/N 80-1057-3 or the QM 30 Installation Use and Care and Service Manual
P/N 80-1121-3, for complete service diagnostics.

Contact the Service Department if you require further assistance diagnosing The QM 20/QM 30 ice machines. They will need the temperatures as listed on the previous page, to diagnose the problem.