

07/2018

# **Mod: ICE70AS-R2**

**Production code: GB601A HC**



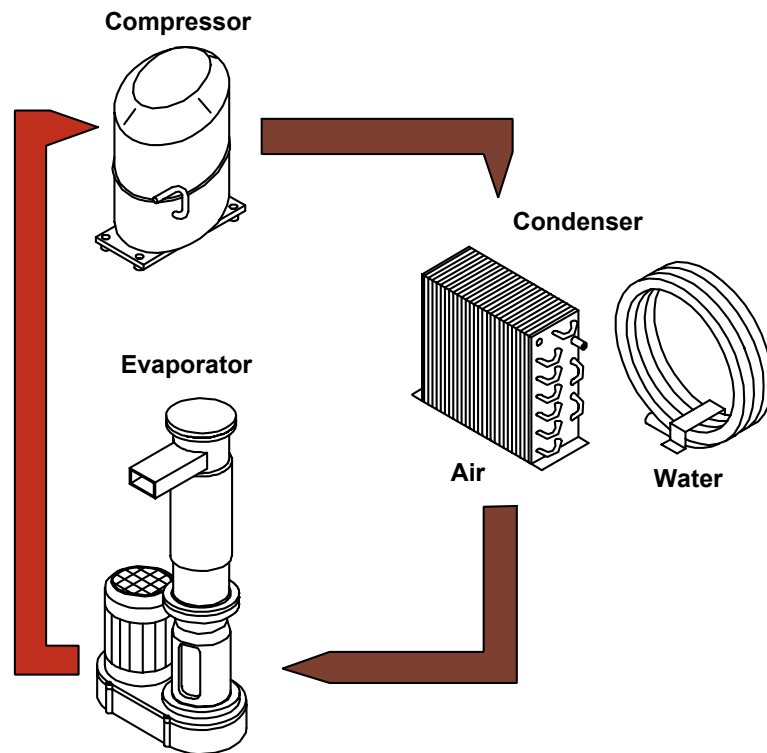
**Diamond**  
catering equipment

## GRANULAR ICE MAKERS “ARCHIMEDEAN SCREW SYSTEM”

Last Update: 01/06/2006

### GB Line

The following diagram shows the main concepts of the granular ice makers working.



Each ice maker uses the properties of compression and expansion of the liquefiable gases; its main principle is that each change of bodies state is got by producing or absorbing heat.

The **compressor** sucks up the gases, caused by the evaporation, and compresses them by increasing their temperature and pressure.

A **condenser**, made up of a series of tubes (refrigerated by cold water or ventilated air), carries away the heat, comprised in the gas that comes out from the compressor and, helps, so, the gas liquefying.

The refrigerating fluid, now in liquid state, circulates, then, in an **evaporator** that permits a perfect heat exchange with the out-room, by taking away calories and producing ice, which is got by means of the freezing of the present water.

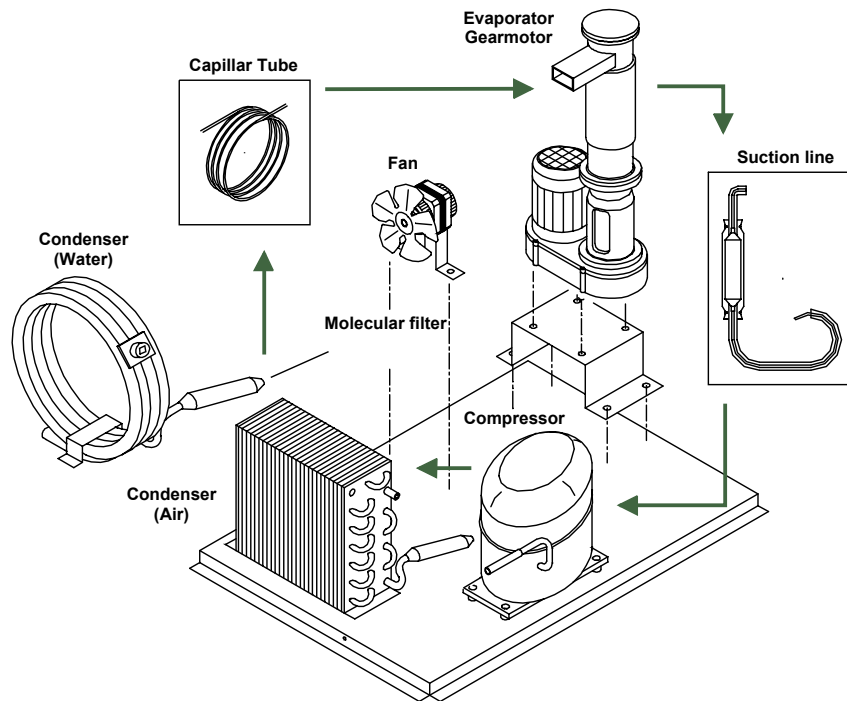
## Refrigerating Circuit

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The working of this machine is linear.

The ice machine begins producing granular ice some minutes after its starting up and goes on working continuously till it stops.

The following diagram shows the main concepts of the refrigerating circuit:



The refrigerating circuit includes the equipments set that permit the compression and the expansion of the refrigerating gas, by producing the cold necessary to get ice.

### Compressor

It sucks up the gases, generated by the evaporator, by means of a suction line and compresses them by increasing their temperature and pressure.

### Condenser (Air/Water)

If 'Water', it is made up of a series of tubes, refrigerated by cold water. If 'Air', it is made up of a radiator, that exchanges heat with the out-room, and is refrigerated by ventilated air, coming from a fan, run by an electric motor. Both of them carry away the heat, comprised in the gas that comes out from the compressor, by helping the gas liquefying.

### Molecular filter + capillar tube

The molecular filter stops possible impurities and the circuit humidity.

The gas, in liquid status, goes to the evaporator through this filter and the capillar tube.

### Evaporator

It permits an optimal heat exchange with the water circulating in it and produces ice by means of the water freezing itself. A worm screw, called 'Archimedean screw', put into rotation by a gearmotor, ejects ice from the outlet hole.

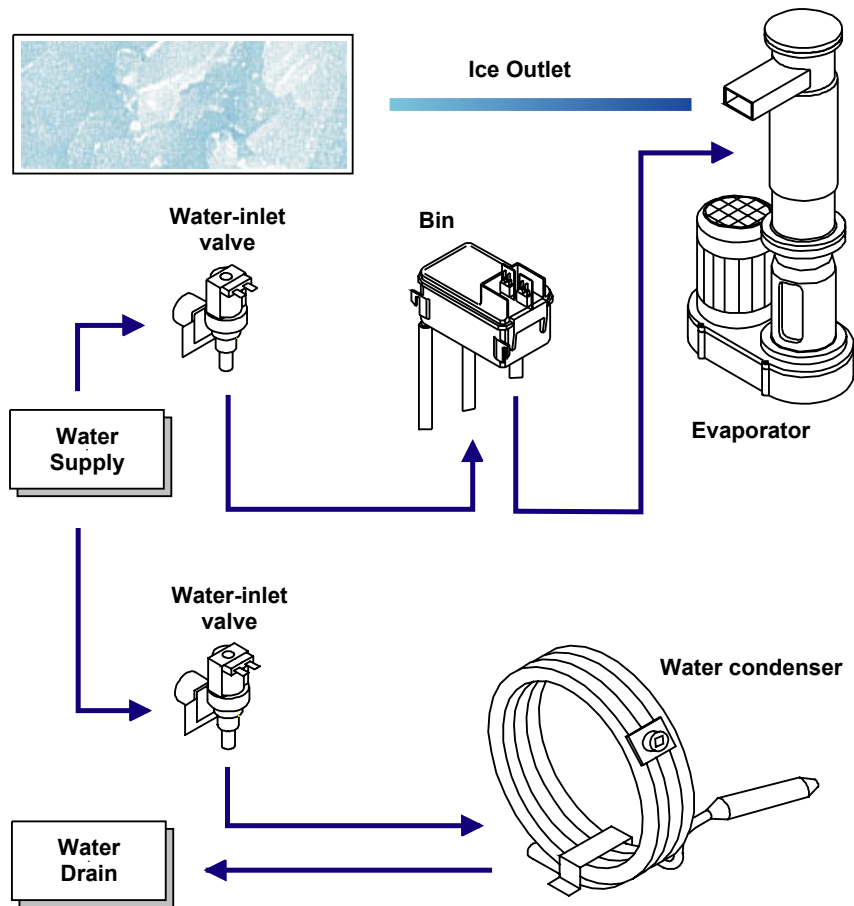
### Suction line

It permits the refrigerating gas circulation from the evaporator to the compressor. The liquid gas is trapped in a specific expansion boiler, that prevents its arrival to the compressor. The suction line also controls and keeps constant the circulation of the gas, coming out from the evaporator.

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## Hydraulic Circuit

The following diagram shows the main concepts of the hydraulic circuit:



The circuit of water supply of the bin and the evaporator is on all machines of the 'GB'-line; the second circuit is, on the contrary, only on water-cooled versions.

### Water-inlet valve

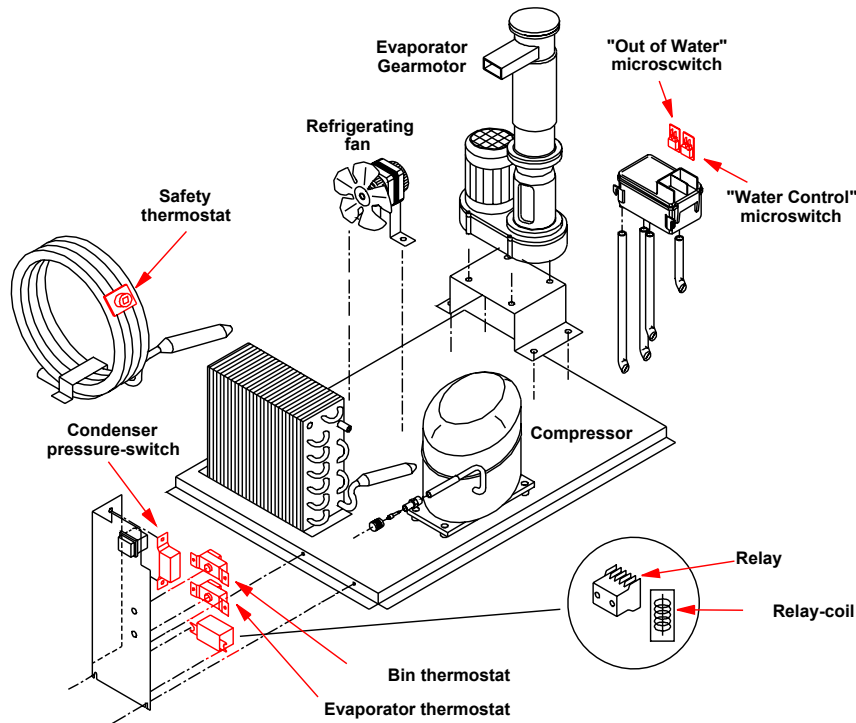
It is put into action by the ice machine starting-up. It controls the water-inlet from the water-supply and also allows the water to flow into a bin, that, at its turn, feeds the evaporator. The second valve allows the water to flow by means of the water condenser.

### Bin

It contains the water got by the above mentioned valve and feeds the cylindrical evaporator. The water flux is kept constant by a float, connected to a microswitch that controls the water-inlet valve.

## Electric Circuit

The following diagram shows the main concepts of the electric circuit:



The relay gives power to the Compressor, the Refrigerating fan and the Water-inlet valve for the water-condenser (see previous diagram).

The water inlet valve of the bin is directly connected to the water-supply (at the bottom of the safety gears except the 'Out of water' –microswitch) and it is energized by the 'Water Level Control' – microswitch.

### Controls Gears

**'Water Level Control' –microswitch** – It controls the water flux towards the evaporator, by cutting-off the power to the water-inlet valve, when the float (connected to the microswitch), perceives that the bin is full.

**Condenser pressure-switch** –It controls and keeps constant the condensing pressure driving the fan motor (air version) or the condenser water inlet valve (water version).

### Safety Gears

**'Out of water' –microswitch** – It stops the ice machine working, by cutting-off the power, when the float (connected to the microswitch), perceives that the bin is empty.

**Bin thermostat** – There is a little pipe in the bin that includes the bin thermostat feeler.

When the thermostat perceives a drop in temperature (due to the ice contact), it disconnects the power flux, by stopping the ice machine working.

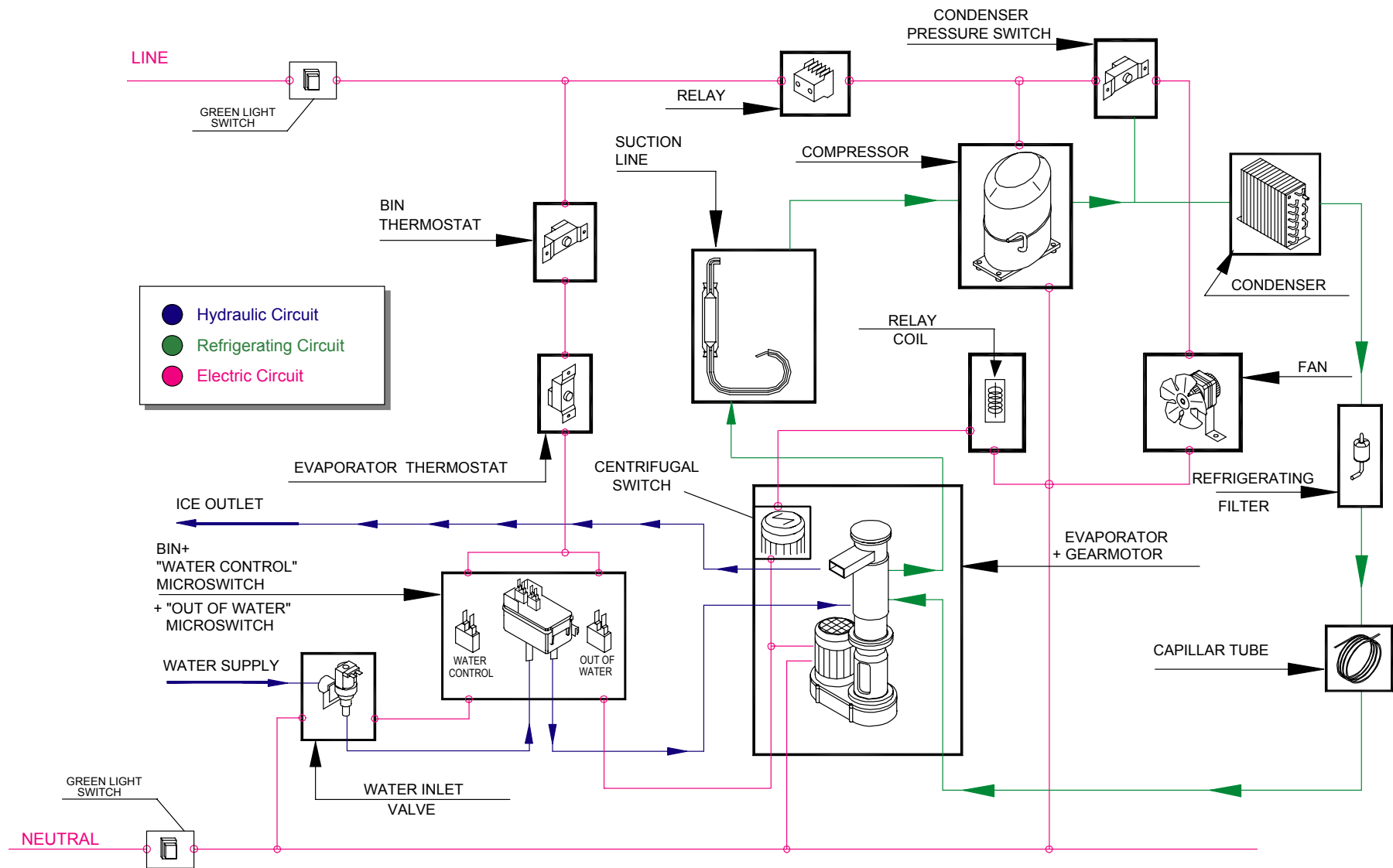
**Evaporator thermostat** – Connected to the evaporator, it stops the ice machine working, by disconnecting the power flux, should there be a gas leak or a break of the gearmotor gears.

**Safety thermostat** – Only assembled on water cooled machines. It is on the condenser.

It stops the ice machine working, by disconnecting the power flux, should there be a breakdown of the condenser itself or lack of the water-supply.

**Relay-coil** – Connected to the centrifugal switch it disconnects the power flux and stops the compressor, if there is a breakdown of the gearmotor.

## Working Scheme (Air Version)



## Working Scheme (Water Version)

