

07/2018

Mod: ICE510MAS-R2

Production code: G510A HC



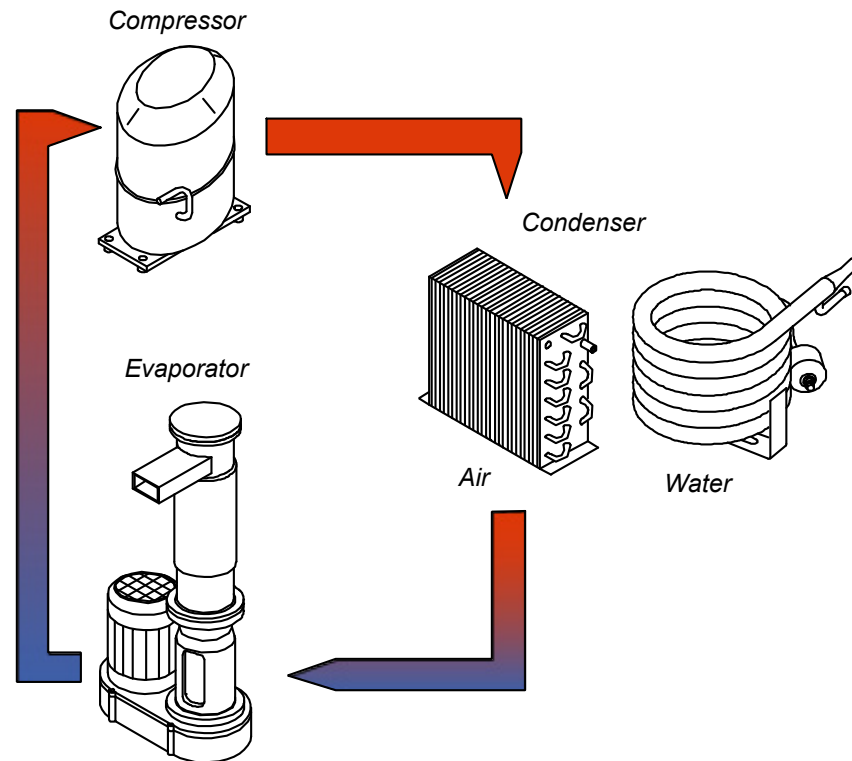
Diamond
catering equipment

GRANULAR ICE MAKERS “AUGER SYSTEM”

Last Update: 05/03/2014

G280-510 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, generated by the evaporation, and compresses them, 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 gases from the compressor and helps, in this way, the gas liquefaction.

The refrigerating fluid, in its liquid state, circulates in the **evaporator** that allows the optimal heat exchange with the outside water, taking away calories and producing therefore ice by freezing the water in it.

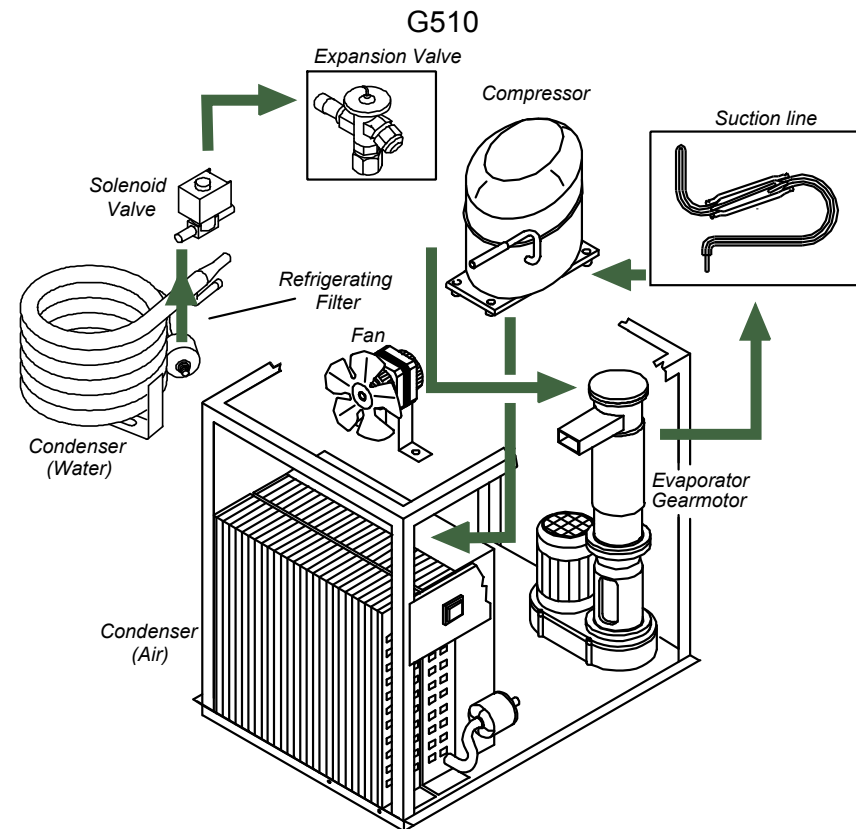
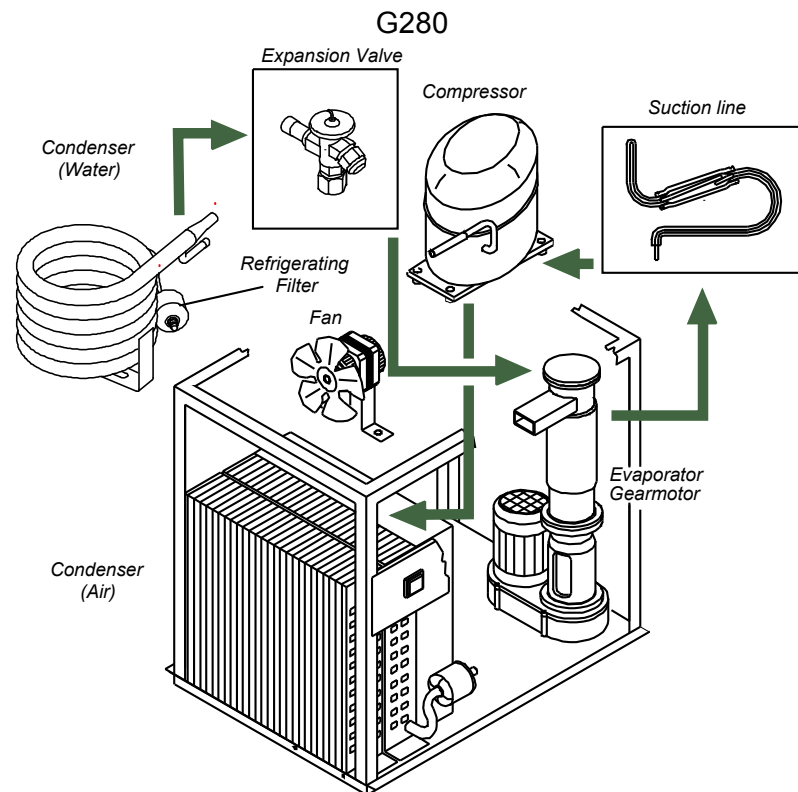
The ice makers of ‘G’ family do not have a built-in bin, so they have to be combined with an external bin, to be placed underneath the machine.

Refrigerating Circuit

The working of this machine is linear.

The ice machine begins producing granular ice about 10 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 all the components that allow the compression and the expansion of the refrigerating gas, thus producing the cold necessary to get ice.

Compressor

Receives the gases from the evaporator by the suction line and compresses them, increasing their pressure and temperature.

Condenser (Air/Water)

If 'Water', it is made up of a series of tubes, refrigerated by cold water.

If 'Air', it is a radiator, that exchanges heat with the ambient, and is refrigerated by the air ventilated by an electric driven fan motor.

Both of them carry away the heat, comprised in the gases from the compressor helping, in this way, the gas liquefaction.

Solenoid Valve (G510)

It stops the refrigerating fluid in liquid status when the ice maker is turned off.

Refrigerating Filter

The refrigerating filter stops possible impurities and the circuit humidity.

Expansion Valve

The expansion valve regulates the amount of refrigerating fluid in liquid state according to necessity. Flowing through the filter and the expansion valve the (refrigerating) fluid arrives to the evaporator in liquid state.

Evaporator

Allows an optimal heat exchange with the water in it and produces ice freezing the water.

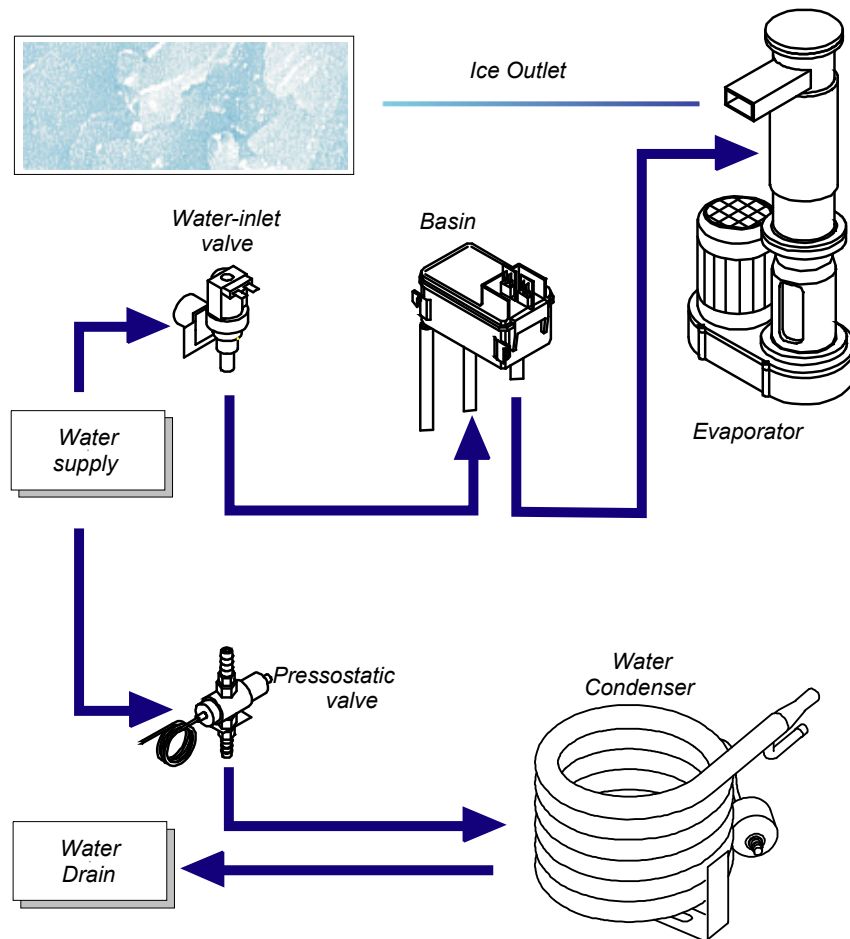
An endless screw, called 'Auger', operated by a gearmotor, ejects ice from the outlet hole.

Suction Line

Leads the refrigerating fluid from the evaporator to the compressor. The exceeding refrigerating fluid in liquid state that might be present in the circuit is kept by a boiler, in order to avoid damages to the compressor.

Hydraulic Circuit

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



The water supply circuit of the basin and evaporator is on all machines of the 'G' family, while the water supply circuit of the condenser is only on water cooled versions.

Water inlet valve

It starts working at the ice machine start-up.

It controls the water inlet from the water mains and lets the water flow into a basin that feeds the evaporator

Basin

It gets the water from the water inlet valve and feeds the evaporator.

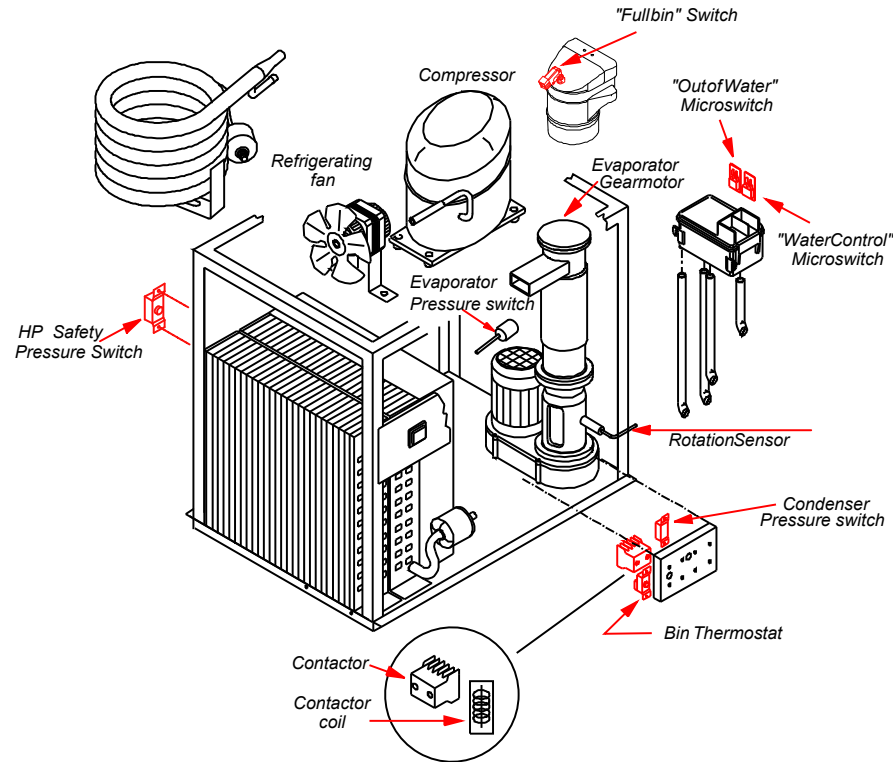
The water level is kept constant by a float, connected to a microswitch that controls the water-inlet valve.

Pressostatic valve (Water cooled version)

Only on water cooled models, it controls and keeps constant the condensing pressure, regulating the water flow in the condenser.

Electric Circuit

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



The rotation sensor supplies the contactor coil. The contactor feeds the compressor and the refrigerating fan.

The water inlet valve is connected the power mains (downstream the safety devices except the 'Out of water' microswitch) and it is driven by the 'Water level control' microswitch. The gearmotor is connected downstream all the safety devices.

Ice Machine Start up

By switching on the ice machine the gearmotor starts and the rotation sensor is energized (it has a stand by of about 10 minutes).

The compressor will start working after 10 minutes delay.

After the delay the rotation sensor feeds the contactor coil and starts to check the auger rotation speed. If the auger stops or slows down, the rotation sensor cuts power to the contactor coil for about 10 minutes. If the problem still persists, this procedure will be repeated and then the rotation sensor will definitively cut off power to the contactor coil. When the problem is solved switch off and restart the machine.



*Do not switch off the ice machine before the stand by time is over, in the attempt to restart the machine !!
This operation resets the timer of the rotation sensor and it will restart counting the 10 minutes delay.*

Electric Circuit (Continued)

Control Devices

'Water level control' microswitch – It controls the water level in the basin cutting off power to the water inlet valve, when the float (connected to the microswitch) perceives that the basin is full.

Condenser pressure switch – Only on air version it controls and keeps constant the condensing pressure, operating the fan motor.

Contacting coil – Powered by the rotation sensor, it closes the contacting contacts that feed the compressor.

Safety Devices

'Out of water' microswitch – It stops the ice machine when the float (connected to the microswitch) perceives that the basin is empty.

Bin thermostat – It stops the machine when it feels the temperature drop due to the ice accumulated in the bin. The probe is placed in the ice chute. When the ice is removed the machine restarts.

Evaporator pressure switch – It is connected to the evaporator, it stops the machine when the evaporation temperature drops under setting value. It has automatic reset: once the evaporation temperature rises beyond the setting the production restarts.

'Full bin' switch – Installed on the ice chute, stops the unit if the ice rises in the ice chute and bin thermostat fails to operate.

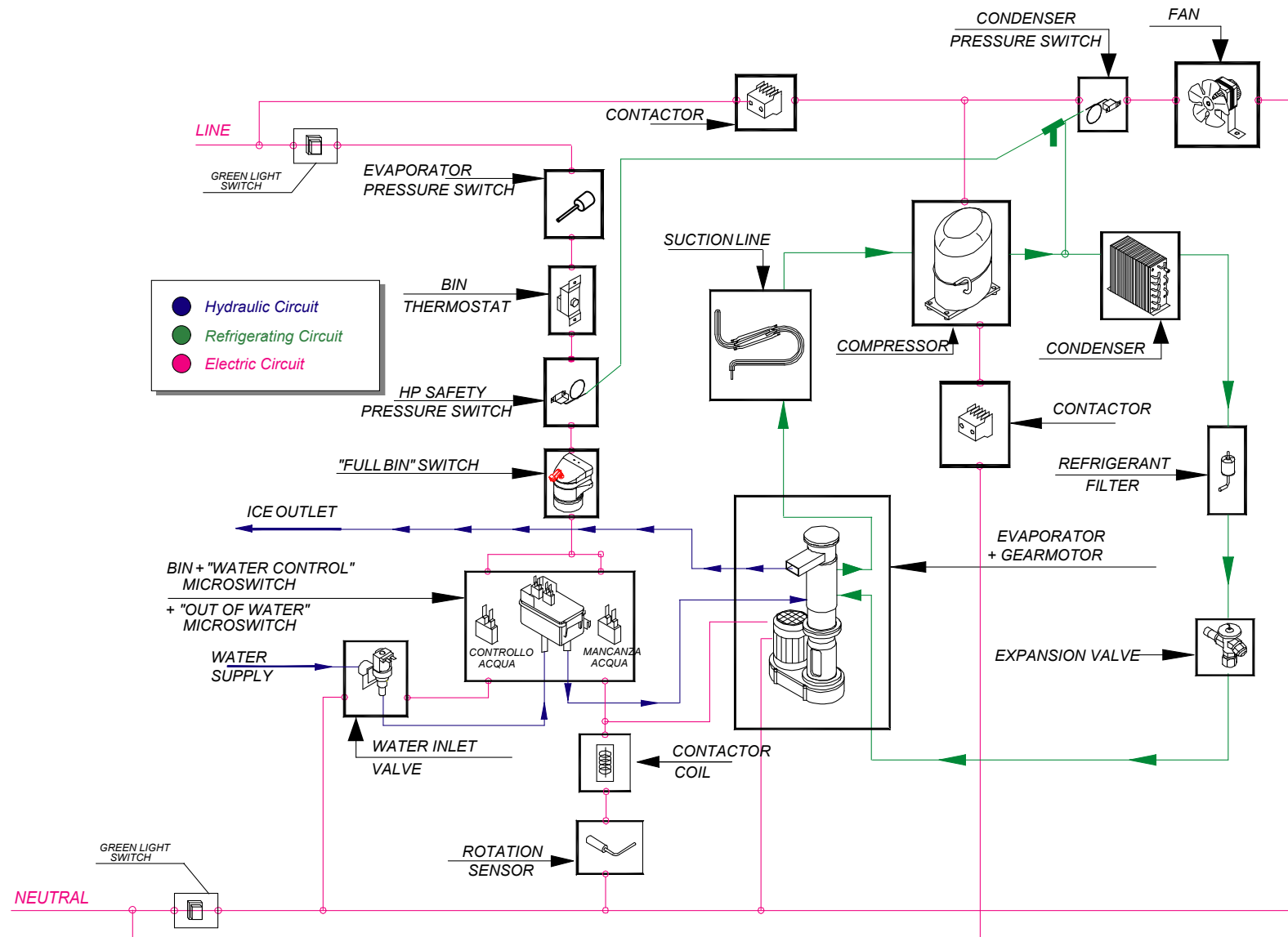
Electronic timer of the rotation sensor– It works when the ice machine is turned on and when it gets the signal by the safety devices.

It delays the compressor start-up, so that the ice there maybe in the evaporator can melt and the ice production process can begin again.

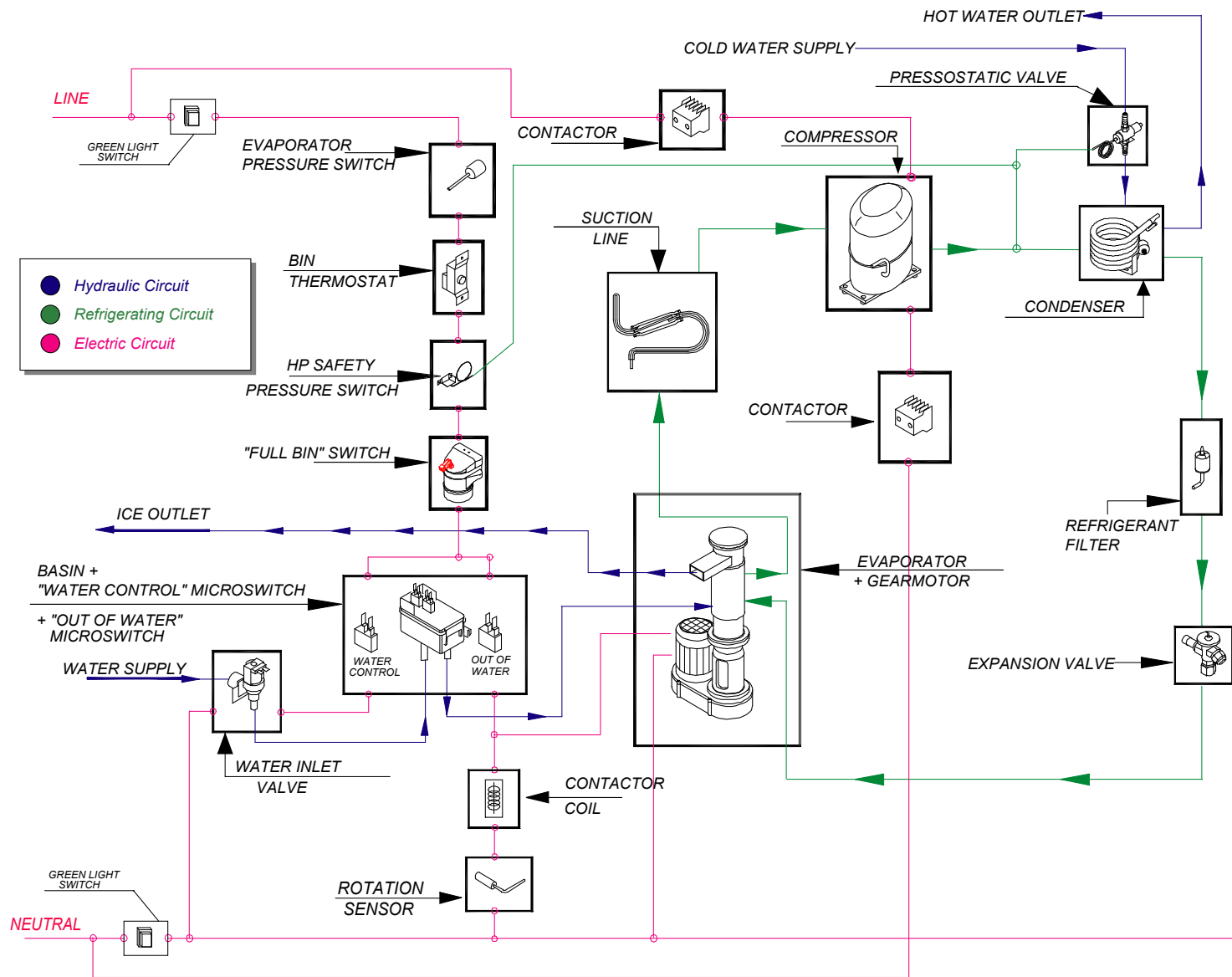
Rotation Sensor – It turns off the compressor if the auger stops or slows down.

Safety Pressure Switch – It will stop the machine working if there is condensation overpressure.

Working Scheme G280 (Air Version)



Working Scheme G280 (Water Version)



Working Scheme G510 (Air Version)

