ITV

GENERAL PROCESSES FOR HANDLING, REVISION AND REPAIR OF THE MACHINES.

ICE QUEEN MODELS

1. INTRODUCTION.

After many years producing ice-cube making machines, the experience we have acquired has led us to ensure that our machines are not only efficient and reliable but also in the event of any maintenance, cleaning or repair, are easy to assemble and dismantle, that the parts are accessible and their operation is fundamentally comprehensive.

Even so, we believe that it is necessary to explain in visual and simple terms all those operations that can be carried out on an I.T.V. machine.

With this manual we endeavour to ensure that any handling of our machines does not become a headache or pose a risk for the person involved.

We also offer advice as a safety and preventative measure, if any element of these machines requires handling (we remind you that they are made of stainless and galvanised steel, that there are elements of a certain weight and that the machines operate with electricity). Therefore, whenever any operation is to be carried out, it is necessary to unplug the machine and use gloves.

2. GENERAL PROCESSES

As you will see below, there is a series of necessary operations to be carried out, whenever carrying out any process with the ITV Ice Queen machine. They are simple operations and do not require many tools, only a little patience and care, as well as:

- A crosshead screwdriver.
- A flathead screwdriver.
- An extractor.
- A set of Allen keys.
- 7mm- socket wrench
- 12-13 mm wrenches
- 10-mm wrench.

To access the ice production area it is necessary (note. - in the photographs shown below, the parts extracted at one point continue to appear in the photos of successive points to provide a better perspective of the position of each element on the machine).

2.1. Remove the upper cover of the machine by unscrewing the 4 galvanised steel screws (two on each side of the machine, figure 1) and pull upwards.

Figure 1

2.2. The aeration grilles shall be removed. Two screws per grille, that is, one on each side (figure 2).

Figure 2.

2.3. It will be necessary to remove the 6 screws that secure the side panels to the base of the machine (figure 3) and the screws that secure the rear panel (figure 4).

Figure 3.

Figure 4.

2.4. Straighten the securing pivots of the upper front using pliers (figure 5).

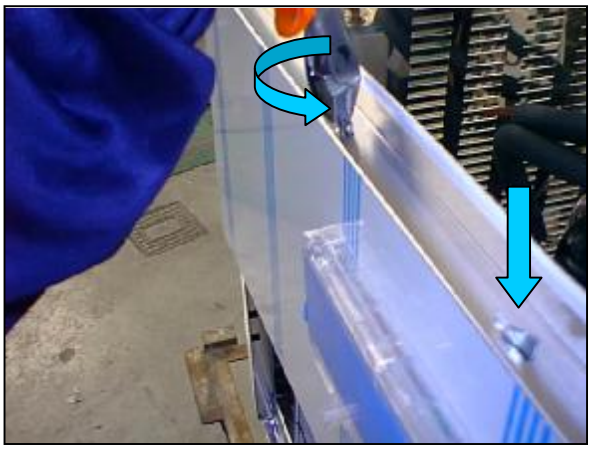


Figure 5.

2.5. The 4 screws are removed that secure the upper front to the sides (figures 6 and 7).

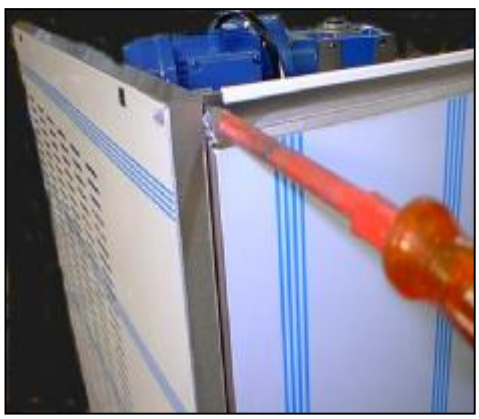


Figure 6.

Figure 7

Once the body is removed, all the necessary operations can now be carried out on the machine.

3. REDUCER MOTOR.

3.1. To remove the reducer, firstly disconnect the power supply. For this, unscrew the 4 screws that secure the lid of the electrical box of the reducer motor, as shown in figure 8.

Figure 8.

3.2. After simply removing the nuts that secure the electrical terminals to the connections of the reducer motor using a 7-mm wrench (in figure 9 socket wrench, and the crosshead screwdriver for the earth wire.

Figure 9.

IMPORTANT REMEMBER THE LAYOUT OF THE COIL CONNECTIONS AND WHERE THEY ARE CONNECTED TO THE INTAKE CURRENT!

3.3. Once this operation is completed, the fixing screw of the spindle or worm to the reducer motor with a 13-mm wrench (figure 10), or corresponding Allen key.

Figure 10.

3.4. Then, remove the 4 screws securing the reducer motor to the bridge using two 13-mm wrenches (in figure 11, two 12-13 mm wrenches)

Figure 11.

3.5. As with the loose reducer motor, an extractor shall be used to remove it from its position (in figure 12, the extractor is fitted to the reducer motor with two M6 Allen head screws.

Figure 12.

4. EVAPORATOR

Once the reducer motor is removed, it is very simple to free the evaporator, so that it can be extracted from its position on the bridge as follows:

4.1. Remove the 4 stainless steel screws that secure the guillotine sheets that fix the evaporator to the bridge (figure 13).

Figure 13

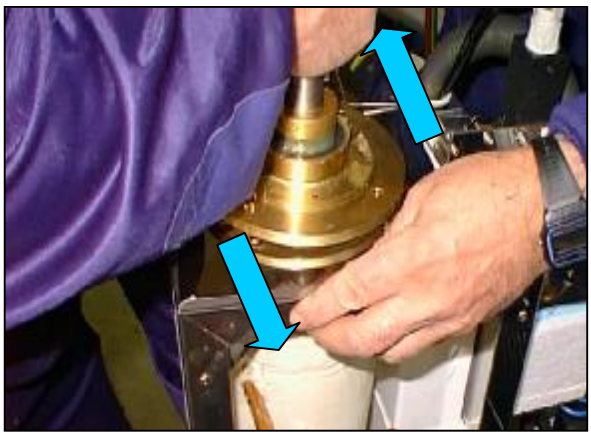
Empty as much the coolant as possible, loosening the howitzers, avoiding excessive outflow that might carry away part of the compressor oil blended with the coolant.

4.2. Once empty, the capillary tubes and coolant outflow tubes from the evaporator are unwelded with care (figure 14) and the openings of the tubes are suitably covered to avoid penetration of moisture.

Figure 14.

4.3. Now it is necessary to remove the guillotine sheets fixing the evaporator to the bridge (figure 15).

Figure 15



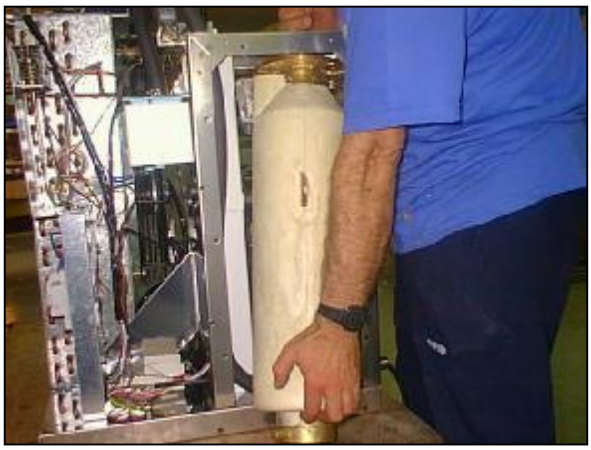
4.4. The water inflow hoses shall be loosened (as well as the drainage hose in the corresponding models) pulling with sufficient force (figure 16 & 17)

Figure 16.

Figure 17

4.5. At this point it is now possible to remove the evaporator from its position in the machine along one of the sides of the bridge (we advise that at least two people carry out this operation due to the weight of the evaporator unit, figure 18).

Figure 18.



The replacement evaporator is assembled in reverse action.

IMPORTANT NOTE!
REMEMBER THAT IT IS NECESSARY TO EMPTY CORRECTLY, AND FILL THE COOLANT (IF CONCERNING R404a) IN LIQUID STATE AND THROUGH THE LOW PRESSURE INTAKE.

5. SPINDLE.

When changing the spindle, the reducer motor must be removed as explained in chapter 2, and the subsequent steps followed.

5.1. Before removing the guillotine sheets that fix the evaporator to the bridge, a wooden block or any other element must be placed to keep the evaporator raised (figure 19) enabling access to the screws that secure the fixing plate of the evaporator (figure 20), as well as the M8*10 screw located in the lower bearing (figure 22). The guillotine sheets shall be removed. (figure 15)

Figure 19.

5.2. Now the 5 Allen screws located in the evaporator can be removed easily, which secure the fixing plate to the evaporator itself (figure 20).

Figure 20.

5.3. Once the five screws have been removed, the plate is removed with a suitable extractor or by knocking the plate upwards with a nylon mallet, holding the spindle to achieve the desired effect (figure 21).

Figure 21.

5.4. Now it is advisable to remove the M8*10 screw from under the evaporator (figure 22) with the 13-mm wrench (there is an easily-extractable black plastic lid in the machine. By pushing it downwards with any appropriate tool, access is gained to the said screw from underneath the machine).- It comes with a white nylon washer.- Remember to replace the screw and washer before inserting the new spindle.

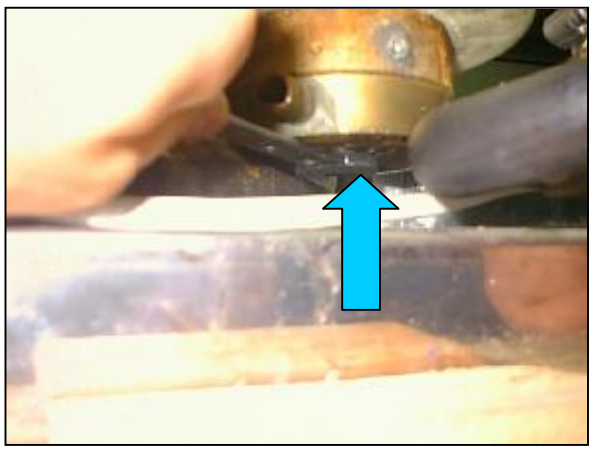


Figure 22.

5.5. Now it is necessary to pull upwards from the spindle with sufficient force to avoid causing any type of crack or leak in the corresponding pipes (it is advisable to use gloves for safety due to the WEIGHT OF THE SPINDLE, figure 23).

Figure 23.

5.6. As can be seen in figure 24, it is important to remember the brass nut in the assembly of the new spindle, which will provide sufficient distance between the reducer motor and the evaporator plate.

Figure 24.

Once the spindle is extracted, assembly is carried out by reverse action, always ensuring to place sufficient grease on the inner end of the spindle before inserting it into the evaporator, and at its upper end before coupling the reducer.

Also remember that the water inflow pipe must be connected at the end of the assembly process.

Only the correct positioning of the plate during assembly is mentioned, as the final position must be as exact as possible for the ice to exit the evaporator correctly, also so that the Allen screws may be tightened without a problem:

5.7. Checks shall be carried out to ensure that the part of the plate inserted into the evaporator positions it longest area coinciding with the right hand wall of the evaporator opening, as shown in figure 25.

Figure 25.

5.8. Afterwards, knock the plate for perfect insertion into the evaporator (if the holes do not fit perfectly, the position may be adjusted by carefully knocking with a screwdriver, or with the spindle key in 1 of the 4 holes of the flange plate, in the correct direction, until achieving perfect positioning. Figure 26).

Figure 26.

5.9. Once the plate is perfectly positioned, the Allen screws shall be fitted, the guillotine sheets, ensuring that the opening of the evaporator faces the ice drop tube, the stainless steel screws that secure them, then (remember to put the brass washer on the spindle), the key, a little grease on the spindle end, the reducer motor and its fixtures.

NOTE.- It is possible that the reducer fails to couple easily to the spindle end, therefore it is important to grease this part of the worm. It is advisable to use a metric stud, screw it on the end of the spindle together with the steel washer and a nut to help the reducer motor fit snugly onto the spindle.

5.10. Afterwards connect the power and supply the machine with electrical current and water.

6. VENTILATOR IN AIR CONDENSER MACHINES.

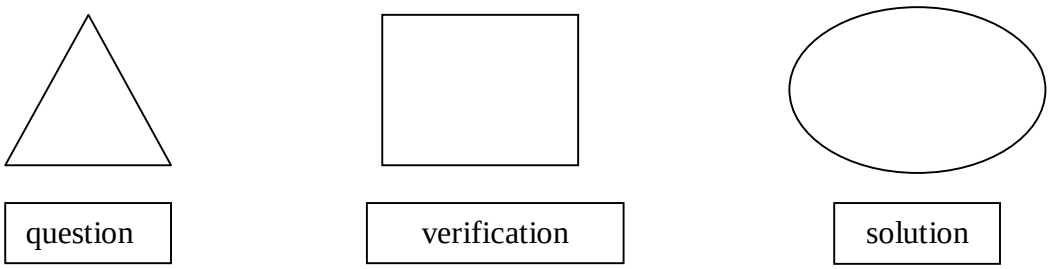
To replace the ventilator, simply access it, either by removing the entire body of the machine as explained in chapter 1, or by simply removing the panel or upper cover, the rear panel and the corresponding side (left).

6.1. Having gained access, disconnect the ventilator (brown wire to the high pressurestat, blue wire to the electrical card and yellow-green earth wire) and with the help of a 10-mm wrench, loosen the screws that secure the condenser (figure 27).

Figure 27.

7. PROBLEM-SOLVING TREES.

Further to explanation of the regular intervention of a machine before repairing it, a simplified outline is presented below. This is so that anyone faced with a problem with an I.T.V Ice Queen ice-making machine can simply follow the steps and verifications in order to find and subsequently rectify any possible fault that it may have. We must reiterate it is only a guide, through the symptoms presented by the machine.
The trees comprise the following symbols:



Question.- request a 'yes' or a 'no' and the response will lead you to either a new question box or a verification box.

Verification.- it will suggest an element to check and possibly, if necessary the use of the instructions enclosed in points 1 & 2 of this manual for access. The result of this box will lead to a new direction to be verified or the definitive solution.

Solution.- it will indicate the component or factor that is most probably the cause of the anomaly in question and the solution to adopt. Subsequent sections of this manual will explain in detail how the majority of necessary operations are carried out to change or regulate the element in question.

It is advisable to follow these trees together with the rest of the technical manual, as in the method of finding the problem and resolving it will be the most logical and simple possible, as well as time-saving.

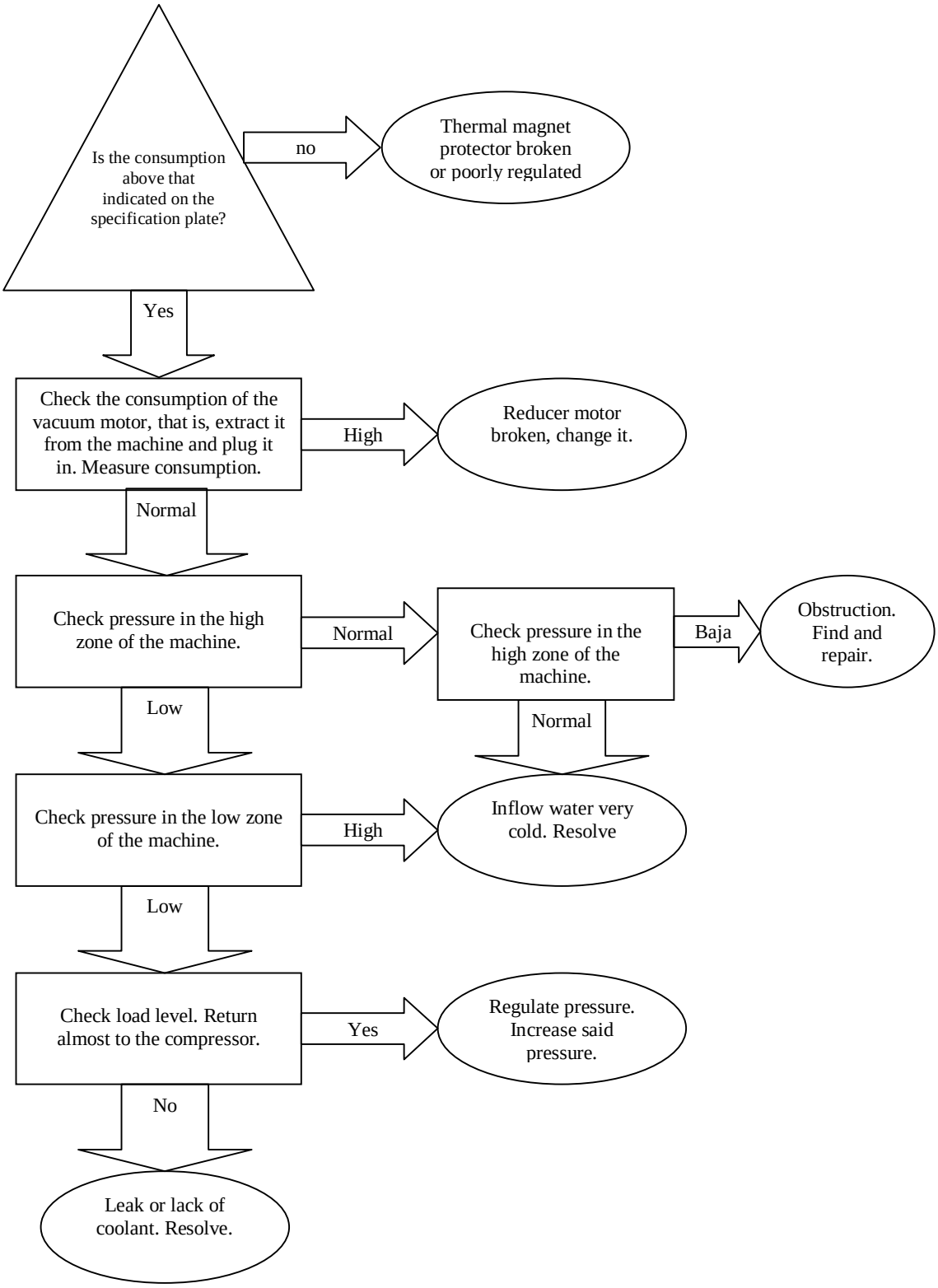
It will become clear that these machines have problem warning lights, as can be seen in figure 28 and from left to right, the stop warning light due to electrical overload of the reducer motor, the lack of water for production, full ice recipient and that of machine in operation.

Figure 28.

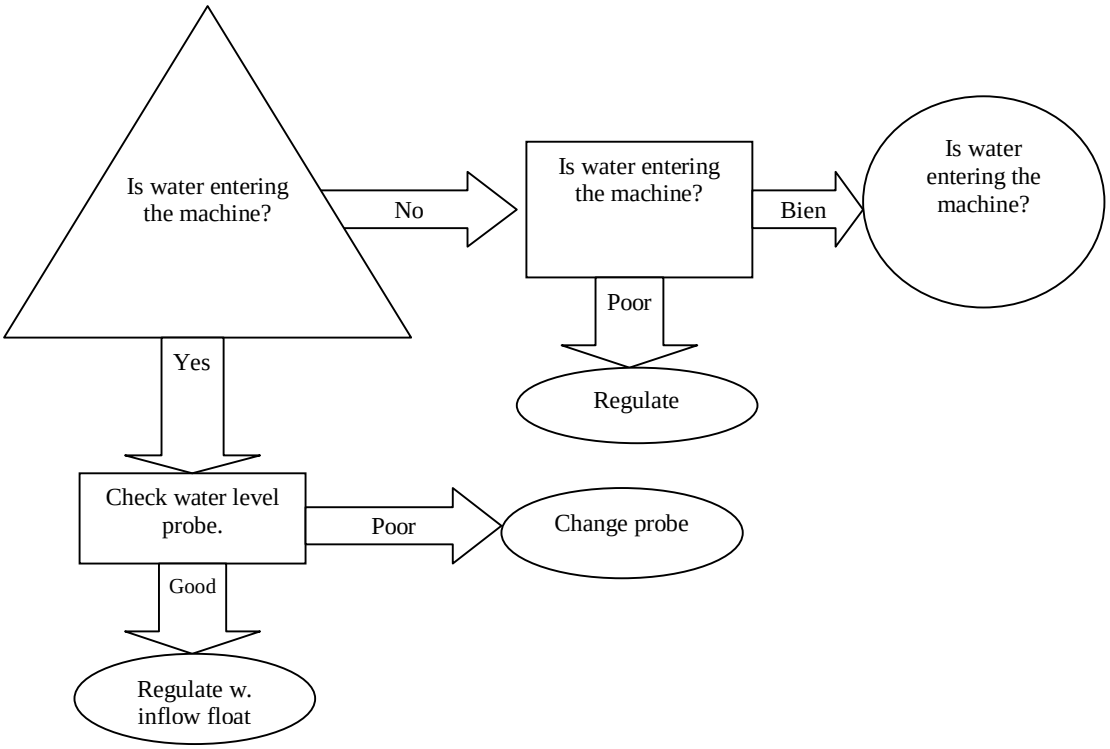
The possible causes of the said problems and how to resolve them are detailed below.

Note.- in three-phase machines a warning light is added in case two of the phases are interchangeable in their connections.

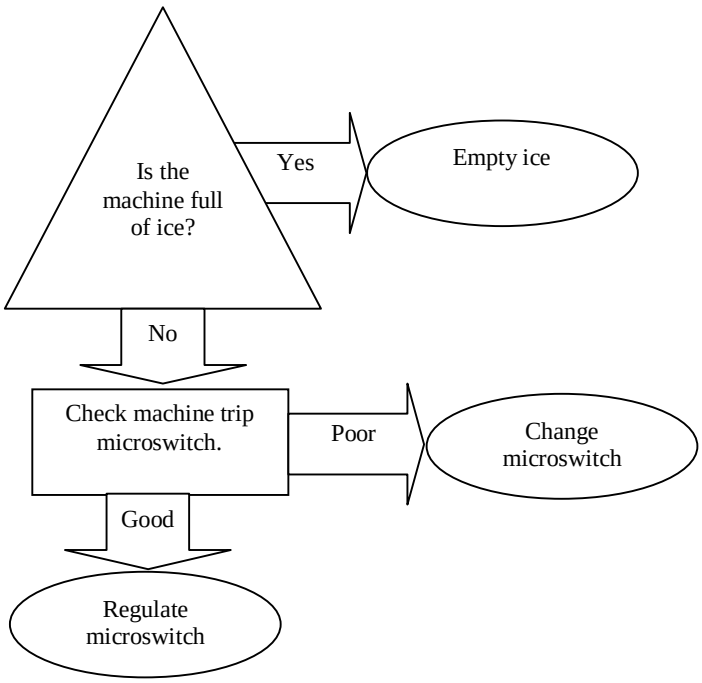
7.1. Overload or Thermal Magnet Warning Light Illuminated, Machine Stopped.



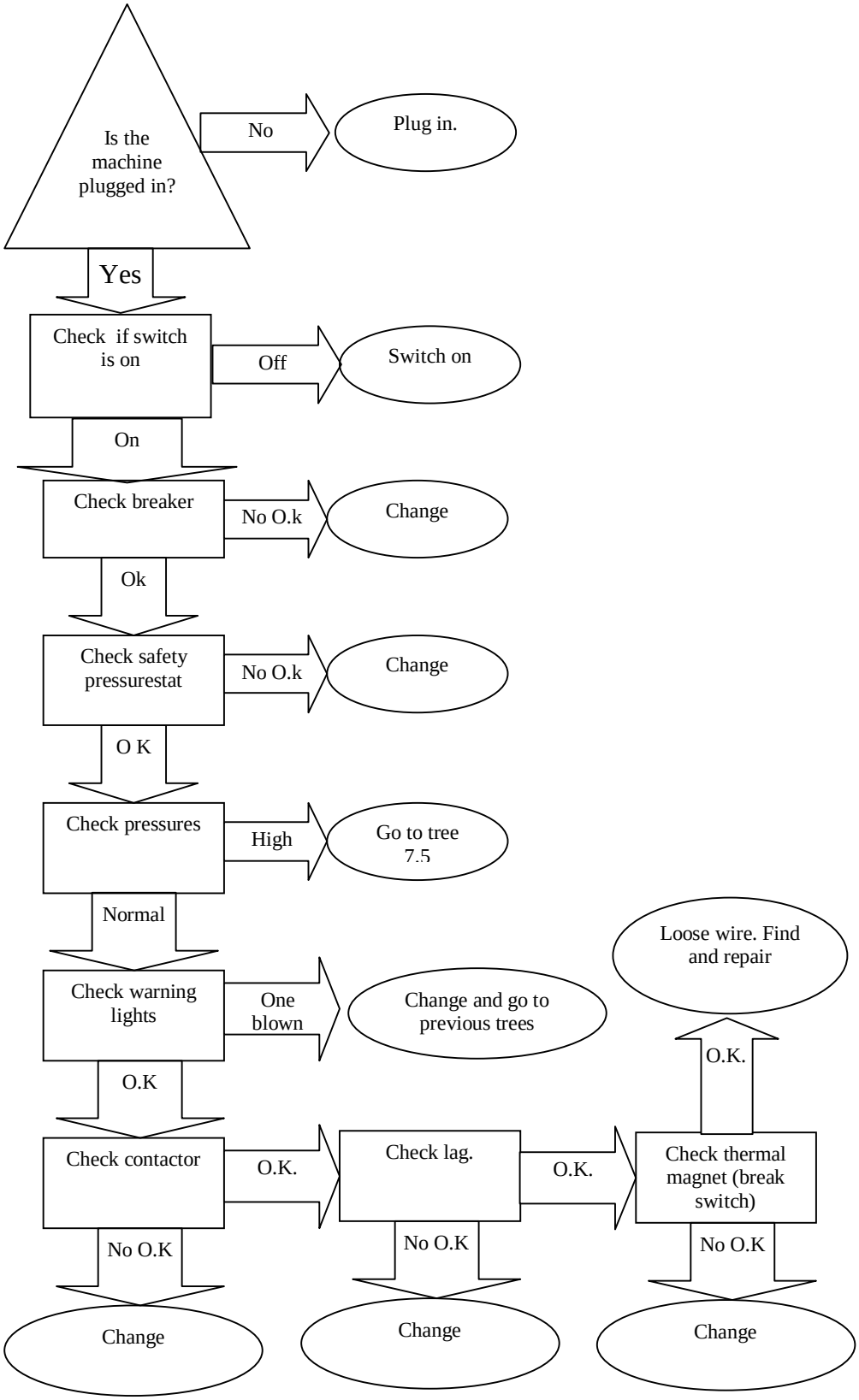
7.2. Water Shortage Warning Light Illuminated, Machine Stopped.



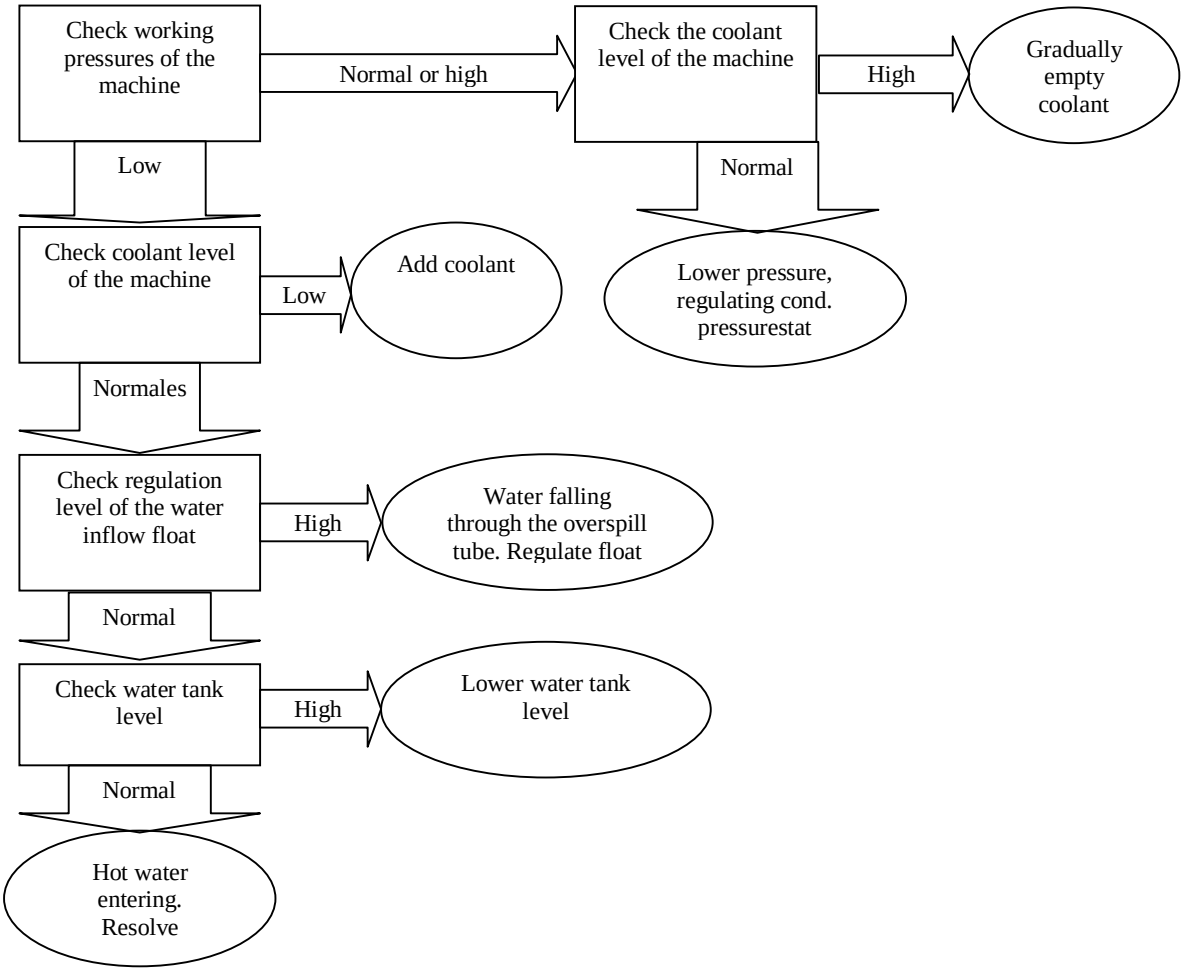
7.3. Full Bin Warning Light Illuminated. Machine Stopped.



7.4. Machine stopped, No Warning Lights Illuminated.



7.5. Ice soft and very moist.



8. MACHINE ELEMENTS; DESCRIPTION, PROBLEMS & SOLUTION.

You have already seen how to access all the machine components, now you will see the mission of each element and the corresponding symptoms in the event of breakage or in certain cases, deregulation.

We shall divide the machine into cooling system, mechanical system and safety system.

8.1. Cooling System.

Access.- the easiest way is to remove all the body parts that enable us to gain access (this will depend on the machine's position)

The most important components of the Ice Queen machine, with regard to the cooling system are:

Compressor.

Evaporator

Condenser

Capillary – expansion valve

Dehydrator filters

Hot gas valve (only in Ice Queen 550 for the by-pass system)

8.1.1. Compressor.

It is necessary to know that the compressors assembled by ITV in its ice-making machines are hermetic.

§ Function.

As is well known, the compressor pushes coolant through the entire cooling system (condenser, filters, capillary, evaporator) to achieve absorption of the water heat in the evaporator and form a layer of ice, which shall be cut by the reducer motor spindle unit.

Physically, the compressor's role is to increase the coolant pressure, thanks to an external working contribution, to a level above that corresponding to the temperature of the coolant fluid of the condenser.

- Problems

The compressor can breakdown or have low output.

The breakdown occurs when the electrical current reaches it and the compressor fails to work. IMPORTANT!!! THE FACT THAT THE COMPRESSOR IS NOT WORKING DOES NOT NECESSARILY MEAN THAT IT IS BROKEN. ENSURE THE CORRECT OPERATION OF THE ELECTRICAL COMPONENTS BEFORE REACHING SUCH A CONCLUSION.

Therefore, it will be necessary to ensure that the motor-protector, relay and start-up or permanent condenser (where appropriate) operate correctly.

PROBLEM	POSSIBLE CAUSE	SOLUTION
The compressor works but fails to transmit pressure	Breakdown in the compressor valves	Change the compressor
The compressor fails to operate electrically	Compressor coils cut or shut down	Change the compressor
The compressor works electrically but fails to pump	Rotor blocked	Change the compressor

§ How to replace the compressor.

Empty the coolant from the machine.

Unweld the coolant inflow & outflow pipes from the compressor (figure 29).

Figure 29.

Remove the screws that fix the compressor to the bench and remove the compressor (figure 30)

Figure 30.

Remove the screws that fix the electrical circuit to the bench (figure 31).

Figure 31.

Disconnect the electrical equipment wires from the compressor.

Place the new element and weld the inflow and coolant outflow pipes.

Connect the electrical components of the compressor.

Change the dehydrator filter.

Empty the cooling system.

Fill machine with coolant.

8.1.2. Pressure switches & pressurestat valve.

§ Function.

It switches the electrical terminals to change the operation manoeuvre according to the pressure existing in the system. In this way, the condensation pressure switch will feed the ventilator, when the pressure in the system reaches a specific value and the current is cut as the pressure switch gradient reduces the pressure. The safety pressure switch will cut the current of the entire machine when the pressure rises up to the tare value and will return supply when the pressure drops again until the closing value.

§ Problems.

8.1.2.1.Condensation Pressure Switch.

It may remain permanently closed, whereby the ventilator operates continually causing a drop in pressure and quite possibly problems at the time of releasing ice cubes (possible formation of a sheet of ice in the evaporator, blocking the reducer motor and stopping the machine by thermal magnet trip). Or it may remain permanently open, whereby the ventilator fails to operate, causing the machine to stop due to high pressure.

8.1.2.2.Penn pressurestat valve (water condensation machines).

This concerns an element whose aim is to regulate the water flow that passes through the condenser to take the necessary heat to the coolant fluid, thus achieving the necessary working pressure.

It can cause, mainly, two breakdowns. The first would be that it always remains closed whereby the high pressure would increase until causing the machine to stop due to the high pressure pressurestat (by observing whether water flows out of the condensation drain it will be possible to know if this has occurred).

The second could be that the valve seal is damaged, with which water would pass through it although it is closed to the maximum. The problem caused would be a drop in condensation pressure, impeding the release of the ice cubes, thus requiring repeated regulation of the valve until carrying out the repair.

8.1.2.3.Safety Pressure Switch.

As with the condensation pressure switch, it can remain continually closed, whereby in the event of excessive pressure increase, the system will remain unprotected, probably breaking the compressor by failing to disconnect the system. Or it can remain continually open, causing the machine to stop, although the pressure is correct.

§ How to replace a pressure switch.

For the condensation pressure switch, unscrew the rear bridge of the machine.

Empty coolant.

Disconnect electrically.

Unweld the element.

Replace the new element with extreme care not to obstruct the inflow orifices with material.

Change the dehydrator filter,

Empty it and fill with coolant

8.1.3. Condenser.

§ Function.

This carries out the exchange of heat required to take to the coolant fluid under ideal conditions for a new expansion.

§ Problems.

The most common is that the condenser (especially if it is air) is excessively dirty and is unable to carry out its mission.

Therefore, machine stoppage by the high-pressure switch can be due to: a dirty condenser, both water and air, a breakdown in the ventilator or in the condensation pressure switch (in air-condensed machines); in the breakdown or poor regulation of the Penn pressurestat in water condenser machines.

§ How to replace it.

Empty the coolant from the machine.

Disconnect the water pipes (water condensed).

Unweld the condenser coolant inflow and outflow pipes.

Remove the broken condenser.

Position the new condenser and weld the coolant inflow and outflow pipes again

Change the dehydrator filter.

Connect the water pipes.

Empty the cooling system.

Fill the machine with coolant.

1.1.1. Ventilator.

§ Function

The ventilator circulates an air current that favours the dissipation of the heat extracted in the condenser to give the coolant fluid the correct temperature (pressure) for the perfect expansion of the said fluid in the evaporator.

§ Problems.

If the ventilator fails to operate, the machine will stop due to high pressure.

IMPORTANT!!! IF THE VENTILATOR FAILS TO OPERATE, FIRST CHECK THE PRESSURE SWITCH.

§ How to replace it.

Disconnect power

Remove the screws that fix it to the machine bench (or where appropriate directly to the condenser), disconnect it electrically and extract it.

Evaporator.

§ Function.

The coolant fluid passes the coil and absorbs the heat, and the water comes into contact with the cylinder welded to the said coil causing it to freeze and form a layer of ice.

§ Problems.

The only problem that may arise in an evaporator is a leak, which would lead to a pressure drop in the system, the ice will be too soft until reaching a point when no ice forms at all.

§ How to replace the evaporator.

By accessing the evaporator as indicated in chapter 2 of this manual, carry out the following:

Empty the system of coolant.

Unweld the coolant inflow and outflow pipes (the capillary reaches the inflow pipe)

It is recommended to separate the compressor from the condenser and the low-pressure zone, empty it of oil, allow a pressurised dehydrating fluid pass such as R141b. Afterwards and in similar form pressurised Nitrogen, in order to eliminate any possible moisture that has entered and put the oil back into the compressor.

Continue in similar form as with the condenser.

Change the dehydrating filter.

All the parts unwelded for these operations will be welded again.

The new evaporator will be positioned and welded

Empty the system.

And the necessary amount of coolant will be inserted for correct operation.

8.1.4. Capillary tube- Expansion valve.

§ Function.

Capillary: Reduces the pressure and temperature of the coolant fluid to evaporation levels.

Expansion valve: Reduces the pressure and temperature of the coolant fluid to evaporation levels and supplies the required amount of coolant to the evaporator under the planned working conditions and enables rapid balance of pressures during the stoppage period of the machine.

§ Access.

It is necessary to remove the rear panel, as well as leaving both the evaporator and the cooling unit accessible (chapter 1).

§ Problems.

The only problems that can occur with the capillary are:

Leak or obstruction. The obstruction (closed valve) is diagnosed when measuring the working pressures, the low pressure tends to fall and the high pressure increase.

In both cases it is necessary to change the capillary.

§ How to replace the capillary-expansion valve.

Empty of coolant.

Unweld the capillary

Place the new element with extreme care, ensuring not to obstruct the inflow and outflow orifices with the material.

Unweld the valve:

Weld the new valve, placing its bulb at the evaporator outlet, with extreme care ensuring that the capillary that joins both elements does not scrape at any point (scraping causes leaks which would close the valve causing the compressor to work empty for several minutes as all the coolant would remain trapped in the high pressure zone of the machine).

Change the dehydrating filter.

Empty and fill with coolant.

8.1.5. Dehydrating Filter.

§ Function.

To trap small particles of moisture or contaminants. This element must be changed whenever the cooling system is opened.

§ Problems.

If there is a large amount of damp particles or contaminants, frost may appear on the filter, and it can be checked because the inflow pressure will be very low.

In this case the element must be replaced.

§ How to replace it.

Empty the system of coolant.

Unweld the element.

Place the new element and weld it IMPORTANT: THE DIRECTION OF PASSAGE OF THE GAS THROUGH THE FILTER !!!!

Empty and fill with coolant.

8.1.6. Hot gas valve. (only in some Ice Queen 550 models)

§ Function.

Occasionally, with the initial operation of the machine, significant depressions occur in the aspiration zone of the unit, which cause a sharp drop in temperature in the evaporator and consequently the formation of sheets of extremely hard ice, which impedes movement of the cutting spindle (blocks of the reducer motor switch trip).

Therefore, some versions of the Ice Queen 550 model have a by-pass system that links the compressor discharge zone with the aspiration zone, so that, in the event of the aforementioned sudden depressions, the hot gas valve allows the passage of coolant at high pressure to its aspiration, raising the low pressure sufficiently to avoid the aforementioned problem.

- Problems.

Its breakdown can cause the spindle to block the evaporator, causing the reducer motor to brake and the machine to stop by tripping the switch, or that it never closes, whereby the ice produced will be very soft or fails to form at all.

If it appears that the by-pass is operating even with pressures under those regulated it can also be due to an erroneous connection of the coil that opens it and that is making it operate continuously.

§ How to replace it.

The same way as the dehydrating filter.

8.2. Mechanical motors.

8.2.1. Reducer motor.

- Function.

The motor reducer's aim is to rotate the cut screw. This separates the ice layer formed inside the evaporator cylinder and makes it rise along this it until it falls into the collection tray or bin.

- Problems.

In the event of breakdown the reducer motor stops rotating and this can be verified by checking whether any ice drops as the screw fails to start up.

A sheet of ice will form inside the evaporator.

It is important to check that the working pressures and room and water temperatures are correct, as pressures or temperatures below those recommended can cause a block of ice to form in the evaporator and stop the reducer motor and consequently the machine by magnetothermal protection.

- How to replace the reducer motor.

The process of changing the reducer motor is explained in chapter 3 of this manual.

8.2.2. Spindle

- Function.

This element loosens the layer of ice that is stuck to the evaporator cylinder when the water enters it and freezes upon heat extraction by evaporation of the coolant fluid.

- Problems.

The only problem that may occur is its fracture, quite improbable unless it is caused by poor handling by the mechanic carrying out any type of repair or alteration on the machine. The effect will be failure to produce ice in spite of all the visible operation of all the machine's components.

- How to replace the spindle.

The replacement of this element is explained in chapter 5 of this manual.

9. THE SAFETY STOP SYSTEMS OF THE MACHINE:

9.1.1. Stoppage due to full ice bin

- Function.

All the Ice Queen models have a micro switch located in the upper part of the machine (opposite the reducer motor, figure 32) which, when the bin is full of ice and this rises up the drop pipe from the evaporator, it pushes the tipping plate that triggers the micro switch and causes the entire machine to stop (it is identified by an orange light).

Figure 32.

- Problems.

If this stop system fails to operate, the ice filling the bin through the drop opening could return to the evaporator, causing a blockage of the cut worm and thus damaging the reducer motor.

Or it can cause the machine to stop without being full.

Verification of the correct operation of this protection system in the first case can be carried out by lifting the stop tipping plate manually and observing whether the machine stops.

For verification in the second case, it will be necessary to measure the difference in potential between the micro switch terminals and ensure that the current passes across the element when the tipping arm is triggered.

9.1.2. Stoppage due to excess of electrical consumption of the reducer motor (thermal magnetic protection or so-called breaker switch)

- Function.

All Ice Queen models include a thermal magnetic protector that guards against possible increases in current passing through the reducer motor coils, which could burn them. Therefore, if there is an increase in consumption, the breaker switch would cut the electrical current to the machine, with the said problem indicated via a red warning light. The current that actually passes through the motor coil shall be measured using a clamp ammeter around the blue wire (neutral), which feeds the motor and is connected to the thermal magnetic protector in T2 (figure 33).

Figure 33.

- Problems.

If the breaker switch fails or the breaker switch regulation varies, it could cause the breakdown of the reducer motor, as the passage through the windings of an excessive current (greater than that indicated on the specifications plate) for a prolonged period of time will cause irreparable damage to the motor.

Note.- the maximum consumption of each reducer for each Ice Queen machine is specified in the specifications plate of the reducer motor. We summarise all the forms in the following table:

Machine	Reducer (ROSSI)	Av. consumption	Max. consumption	Prot. regulation
Ice Queen 135/150	MR 2IV40 V03A-HFM63B4	1.1 Amperes	1.45 Amperes	1.4 Amperes
Ice Queen 175/200	MR 2IV40 V03A-HFM63C4	1.3 Amperes	1.95 Amperes	1.9 Amperes
Ice Queen 355/400	MR 2IV40 V03A-HFM63C4	1.7 Amperes	2.75 Amperes	2.5 Amperes
Ice Queen 475/550	MR 2IV40 V03A-HFM63C4	1.7 Amperes	2.75 Amperes	2.5 Amperes

9.1.3. Stoppage due to lack of water (protection by level probe)

- Function.

The Ice Queen machines also include a magnetic micro-float switch system that causes the machine to stop in case water fails to enter the tank (figure 34).

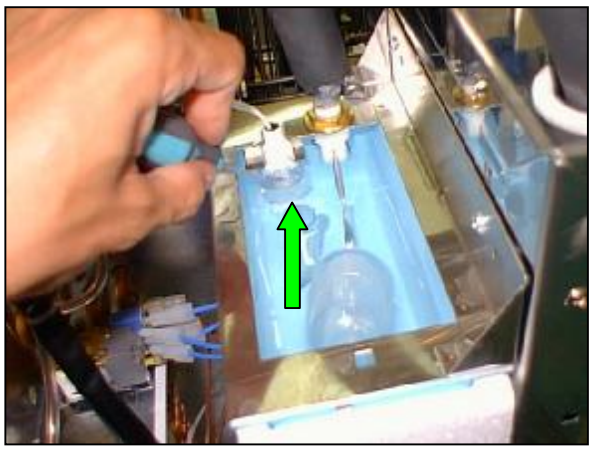


Figure 34.

- Problems.

The said protection is important as if the machine operates without water, heat exchange is not possible in the evaporator with the water and the working pressures could drop to dangerous levels.

It is necessary to remember in this point, that only the Ice Queen 475/550 model has a stop warning light for this problem.

9.1.4. Time-lag control.

- Function.

These machines contain a time-lag system that prevents the apparatus from starting up again until 3 minutes after the last stoppage (figure 35).

Figure 35.

- Problems.

This system is necessary to prevent the machine from starting up with the evaporator full of ice.

Verification is carried out by stopping the machine manually and trying to start it again after 3 minutes. On failing to start, it is necessary to wait, with the general breaker switch in ‘on’ position to ensure that after 3 minutes, the machine starts on its own. If the machine starts before 3 minutes, it will be necessary to change the said time-lag system.

The machine may also fail to start if the part is broken.

10. MOST COMMON REGULATIONS.

10.1. Regulation of the ventilator control pressurestat:

It will be necessary to control the working pressure via manometers, in this case in the high-pressure zone. It shall be verified that the pressurestat makes the ventilator work when the pressure reaches 17 bars (kg/cm^2) approximately 42ºC (for the R404a) and on reaching 16 bars (kg/cm^2) 40ºC.

If this is not so, three things may occur: 1 that the ventilator never stops thus causing the pressure to drop excessively and running the risk that the worm is blocked with ice (the pressurestat is poorly regulated or broken, try to loosen the control screw); 2 that the ventilator starts up and stops but at pressures different to those indicated (in this case, manipulate the control screw of the pressurestat until attaining correct operation, figure 36); and 3 that the ventilator never operates (poorly regulated or broken pressurestat, try to loosen the screw to see if the pressurestat can be started), in this case it is highly probable that the machine stops for safety (safety pressurestat) on excessive increase in pressure.

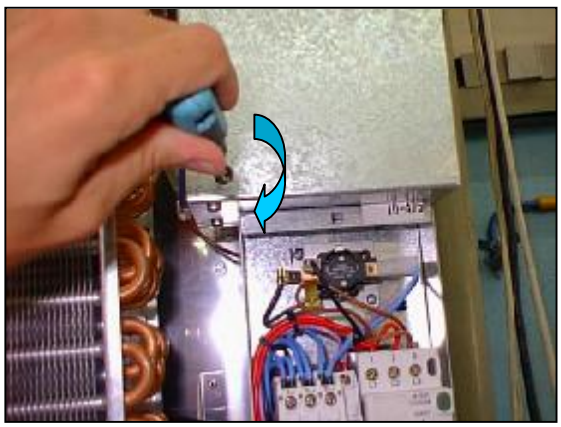


Figure 36.

NOTE.- both in the first and last case it is possible that the broken element is the 0.1µF condenser and is causing the abnormal operation, whereby, in both cases it is recommended to connect directly to the pressurestat without passing through the said condenser and observing the operation. If failure of this element is verified, replace it.

10.2 Control of the tank height to obtain ice with more or less moisture.

The machines can regulate the moisture of the ice outflow in a simple manner. For this, lower or raise the water tank from its position on the bridge. There are holes located for securing the tank by simply removing the two galvanised screws, moving the tank to the new position (lower if drier ice is required or upwards if moist ice is required) and screw again (see figure 37)

Figure 37.

For this operation close the water tap as the water pipes connected to the tank may work loose. Failure to do so could cause significant water loss, possibly wetting electrical elements causing them to fail.

10.3. Control of the low-pressure pressurestat (only in Ice Queen 550).

This element connects and disconnects the by-pass system to increase pressure in the system in the early stages of the machine's operation. Therefore, it measures the pressure in the low zone of the system and if it drops under 0.9 bars it will connect to the opening coil of the by-pass allowing the hot gas to pass to the low pressure zone of the compressor and on increasing to 1.3 bars, it will disconnect it.

Regulate by turning the screws fitted to the element for this purpose (figure 38).

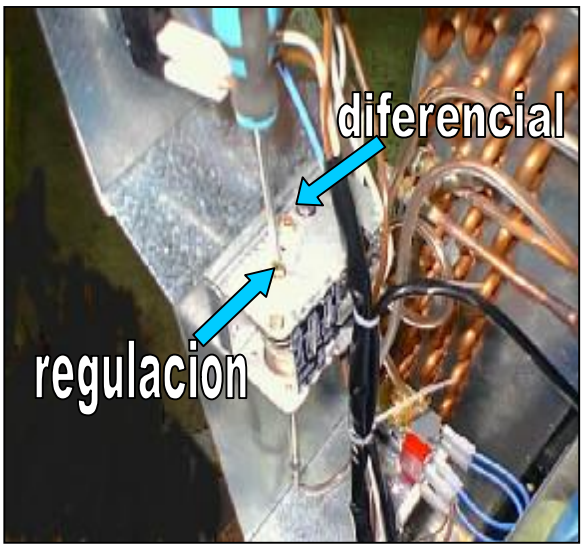


Figure 38.

The regulation screw will control the pressure at which the by-pass system is connected, therefore it is necessary to ensure regulation at 0.9 bars. The differential screw controls the pressure increase that must be produced before ordering the disconnection of the by-pass and that is often regulated at 1 bar.

10.4. Control of the water inflow float.

The mission of this element is to allow the inflow of water to the regulated level. It is important that there is no water by both defect and excess, as in the first case the machine may be stopped by the level probe (section 9.1.3) and in the second, surplus water fall may fall through the overspill tube from the tank and wet the ice already formed and deposited in the bin, ruining it.

Regulation of the said element involves folding the securing rod of the float by hand until obtaining the correct water level required (the element can be seen in figure 34 of this manual).

In short, these are the fundamental elements that comprise an ITV machine Pulsar model, and we hope that this manual helps in the revision, repair and installation of any of our machines.

We hope that you continue to place your trust in us.

Thank you.

I.T.V. After Sales Assistance Department