

# TECHNICAL MANUAL

# IQN/F

## MODELS

- IQF FLAKES
- IQN NUGGETS

## **CORRECT USE OF THIS MANUAL**

### **DESCRIPTION OF CONTENTS**

This manual has been created to provide the installer with information to carry out a correct installation and for effective maintenance of the machine.

In addition, the user will find in the document a section referring to the cause of possible incidents, as well as complete information on the resolution of such incidents.

Therefore, it is recommended to keep the manual in a safe place to resolve any issues related to the operation of the machine throughout its lifespan.

### **RECEIVING AND INSTALLATION**

The installation technician who will be in charge of the receiving and installation, will find in the first part of this document the keys to perform the correct connection of the machine to the electrical, water and drainage network, as well as the conditions and limitations. In addition, this manual has complete information about the installation of various stacked equipment.

### **OPERATION**

The document has been prepared so that anyone can easily understand the principles of operation of the machine and quickly identify each of its statuses. In addition, the manual provides valuable guidance on the various menus and explains in detail each of the messages on the display in a technical appendix at the end.

### **SPECIFICATIONS AND REGULATIONS**

The user of the manual can always consult the technical information related to machine settings, production ranges, pressure switch settings or electricity, water and refrigerant filling consumption.

### **MAINTENANCE AND CLEANING**

In order for this document to become a complete guide for the installer, it has been decided to include a section with periodic maintenance and cleaning instructions, as well as a detailed explanation of how to clean each of the elements. It is essential to use this manual to guarantee the correct working life of the machine.

### **PROBLEM SOLVING**

The user has a table to solve the most frequent problems and to provide customer service. It is a scheme for the diagnosis of breakdowns with the most likely solutions.

### **QUALITY AND CUSTOMER SERVICE GUIDELINES**

This machine has been manufactured in strict compliance with all quality requirements. In this regard, for any incident you can contact the company that has installed the machine or the Customer Service of the manufacturer:

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# 1. INTRODUCTION

Thank you for purchasing a 'NIQ' range ice cube machine. You have purchased one of the most reliable ice machines on the market today.

Please read the instructions contained in this manual carefully, they contain important information regarding safety during installation, use and maintenance.

## 1.1- CAUTIONS

- The installation of this machine must be carried out by the Technical Assistance Service.
- Always disconnect the machine from the power supply before carrying out any cleaning or maintenance operation.
- Any modification to the electrical installation that is necessary for the perfect connection of the machine must only be carried out by professionally qualified and authorized personnel.
- Any use of the ice cube producer other than to produce ice, using potable water, is considered unsuitable.
- Modifying or attempting to modify this machine, in addition to voiding any form of warranty, is extremely dangerous.
- The machine should not be used by young children or disabled people without supervision.
- It should not be installed outdoor or exposed to rain.
- This machine must be grounded to avoid possible shock to persons or damage to the equipment. The equipment must be grounded in accordance with local and/or national regulations and legislation in each case. The manufacturer will not be considered responsible for any damage caused by the lack of grounding of the installation.
- To guarantee the efficiency of this machine and its correct operation, it is essential to follow the manufacturer's instructions, particularly with regard to maintenance and cleaning operations, which should only be carried out by qualified personnel.
- This equipment must be installed with adequate backflow protection to comply with applicable federal, state and local regulations.
- **WARNING: The intervention of unqualified persons, besides being dangerous, can cause serious damage. In case of breakdown, contact your dealer. We recommend that you always use original spare parts.**
- The company reserves the right to make changes in specifications and design without prior notice.
- WE REMIND YOU THAT MAINTENANCE AND CLEANING OPERATIONS ARE NOT INCLUDED IN THE WARRANTY AND WILL THEREFORE BE INVOICED BY THE INSTALLER.
-  This signal indicates "Risk of fire / Flammable materials" because of the use of flammable refrigerant.
- For compression-type appliances that use flammable refrigerants should additionally consider the substance of the warnings listed below:

- 
- Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction.
  - Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
  - Do not damage the refrigerant circuit.
  - Do not use electrical appliances inside the food storage compartments of the appliance, unless they are of the type recommended by the manufacturer.
  - Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.
  - In case of refrigerant leakage:
    - Do not generate flames close to the appliance.
    - Do not switch on/off or plug in/off the appliance.
    - To ventilate immediately the area where appliance is located by opening doors and/or windows.
    - Place a call to an authorized technical service.

## ***1.2- MACHINE DESCRIPTION***

- Modular machine
- AISI 304 stainless steel body
- 22" wide
- Electronic control with alarm diagnostics
- Control panel and front display
- Optical storage filling control

## 2. MACHINE RECEPTION

Inspect the exterior of the packaging. If it looks broken or damaged, make a CLAIM TO THE CARRIER.

To ascertain whether the machine is damaged, UNPACK IT IN THE PRESENCE OF THE CARRIER and make a note of any damage to the machine on the receipt or in a separate document. Since May 1, 1998 we have been complying with the European regulations on the management of packaging and packaging waste, placing the distinctive green dot on the packaging.

Always record the machine number and model. This number is printed in three places:

### 2.1.- PACKAGING

There is a label on the outside with the production number. (Image I)



Image I

### 2.2.- OUTSIDE OF THE UNIT

This is located on the back, with a label just like the one above.

### 2.3.- TYPE LABEL

This is located on the back of the machine. (Image II)

Check that the complete installation KIT is inside the machine, consisting of:

- The Manual
- Warranty card

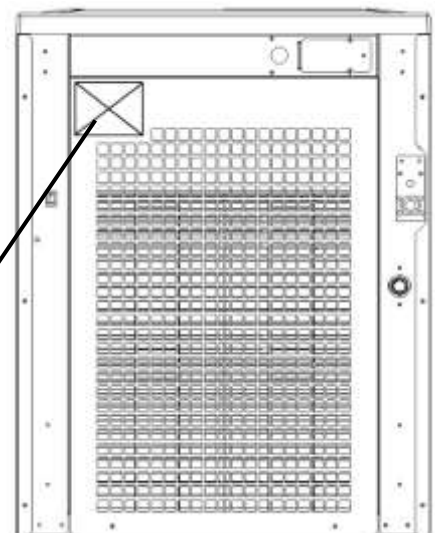
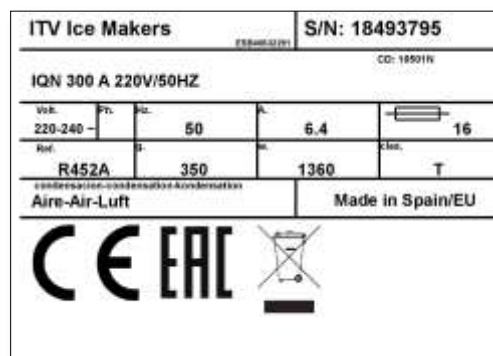


Image II



ATTENTION: ALL PACKAGING ELEMENTS (plastic bags, cardboard boxes and wooden pallets), MUST NOT BE LEFT IN THE REACH OF CHILDREN AS THEY ARE A POTENTIAL SOURCE OF DANGER.

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## **3. INSTALLATION**

THIS ICE MAKER IS NOT DESIGNED TO OPERATE OUTDOORS

Incorrect installation of the equipment may result in damage to persons, animals or property for which the manufacturer cannot be held responsible.

### **3.1.- LOCATION CONDITIONS**

ATTENTION:

The machines are designed to operate at an ambient temperature between 5°C and 43°C (41°F and 109°F) and with water inlet temperatures between 5°C and 35°C (41°F and 95°F).

Below the minimum temperatures, the gear motor is overloaded. Above the maximum temperatures the life of the compressor is shortened and the output is considerably reduced.

Do not place anything on the maker or in front of the frontal grille.

**For condensed air machines (Image III), if the front air intake is insufficient, the outlet is totally or partially obstructed, or if due to its placement it will receive hot air from another device, we strongly recommend, if it is not possible to change the location of the machine, to INSTALL A WATER CONDENSATOR.**

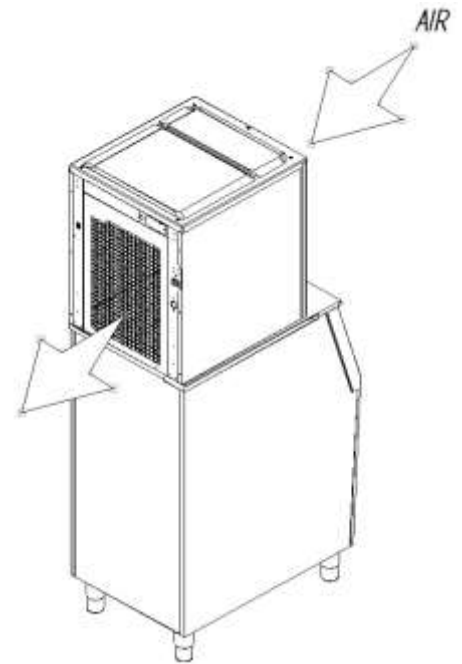


Image III

### **3.2- LEVELING**

It is important that the silo and the machine are level in both directions (Image IV)

### **3.3 -MINIMUM OBSTACLE DISTANCE**

(Image IV)



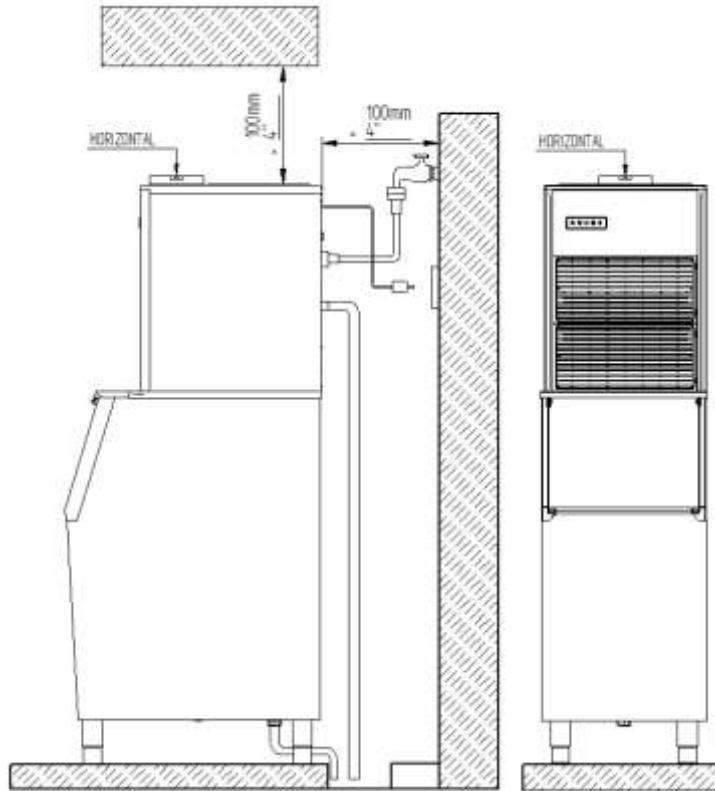


Image IV

### **3.4.- WATER NETWORK CONNECTION**

The quality of the water has a significant influence on the appearance, hardness and taste of the ice and the water condensate on the life of the condenser. Consult a specialist for treatment and filtration requirements.

Use the 3/8 FPT connection. The water connection needs to be dedicated (the only piece of equipment hooked to the water line). Water line from the water valve to the ice machine needs to be 1/4" nominal ID tubing.

In order to comply with the federal, state and local regulations, the machine must be connected with a proper backflow protection.

It is important that the water line does not pass near heat sources, or that the flexible hose or filter receives hot air from the machine. This would cause production to decrease as the water would be heated.

	Minimum	Maximum
Water pressure (psi)	0.1 MPa (1 bar -14.5 psi)	0.6 MPa (6 bar - 85 psi)
Water temperature	5°C (41F)	35°C (109F)

If the pressure is higher, install a suitable pressure reducer.

In water-condensing machines there is a separate inlet and outlet for the water condensation.

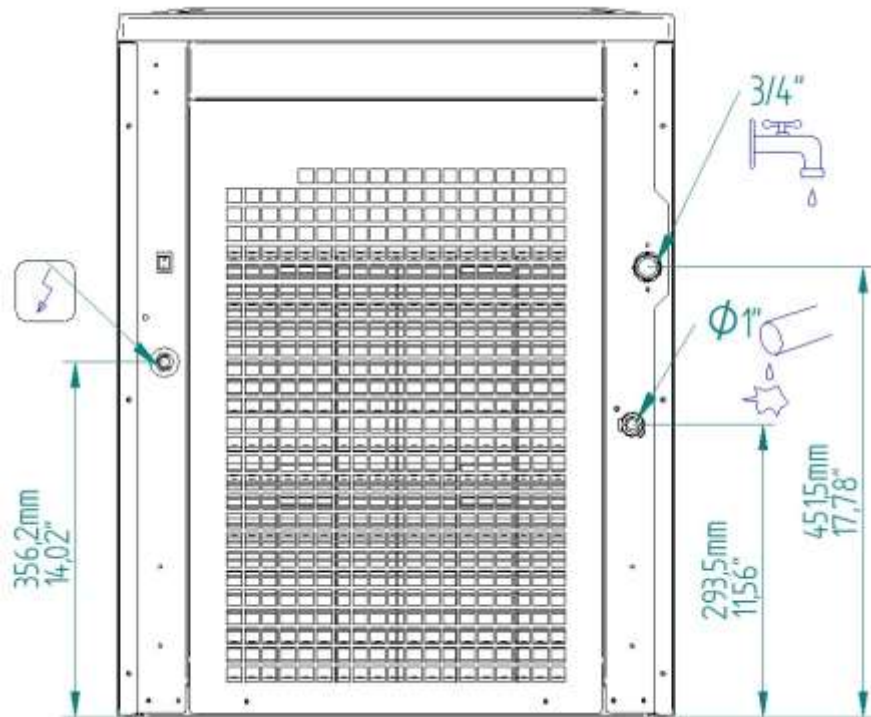


Image V

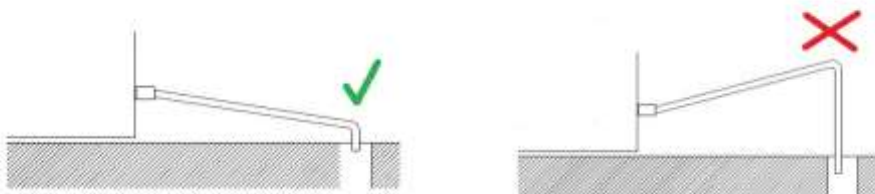
### 3.5- DRAINAGE CONNECTION

In air condensation machines, under normal operation, 100% of the water is converted to ice. Therefore, no water should escape from the drainage system. Only if the safety overflow is activated is the water led to the drain to avoid internal spillage. Also, during cleaning operations. Use the 3/4 FPT connection.

The drain must be lower than the machine by at least 150 mm. It must always be downwards.

It is advisable that the drainage pipe is of 25 mm (1 in) interior diameter and with a minimum gradient of 3 cm (1.18 in) per meter.

In water-condensing machines there is a separate outlet for this circuit.



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### **3.6.- POWER CONNECTION**

#### **THIS APPLIANCE MUST BE GROUNDED**

The ice machine must be grounded in accordance with national and local electrical codes

#### **THE MANUFACTURER SHALL NOT BE LIABLE FOR DAMAGE CAUSED BY FAILURE TO GROUND THE INSTALLATION.**

The machine's power supply is permanently connected.

All wiring must conform to local, state and national codes

It is advisable to install a remote switch for complete disconnection of the machine.

The voltage and current are shown on the type plate. Check that the mains voltage matches that of the appliance.

The maximum allowable voltage variation is  $\pm 10\%$  of the rated voltage on the ice machine model/serial number plate.

Voltage variations greater than 10% of that indicated on the plate may cause damage or prevent the machine from starting.

Install the fuse or protection element as indicated on the plate.

**ATTENTION:** The appliance requires an independent power supply of correct capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of correct capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.

### **3.7.- INSTALLATION OF EQUIPMENT ON TOP OF TANKS/BINS**

Modular units must be installed on tanks or bins following the instructions contained in this manual. (Image IV)

The strength and stability of the container-machine assembly must be checked, as well as the fastening of the components.

Check that the window in the silo lid leaves the ice outlet free.

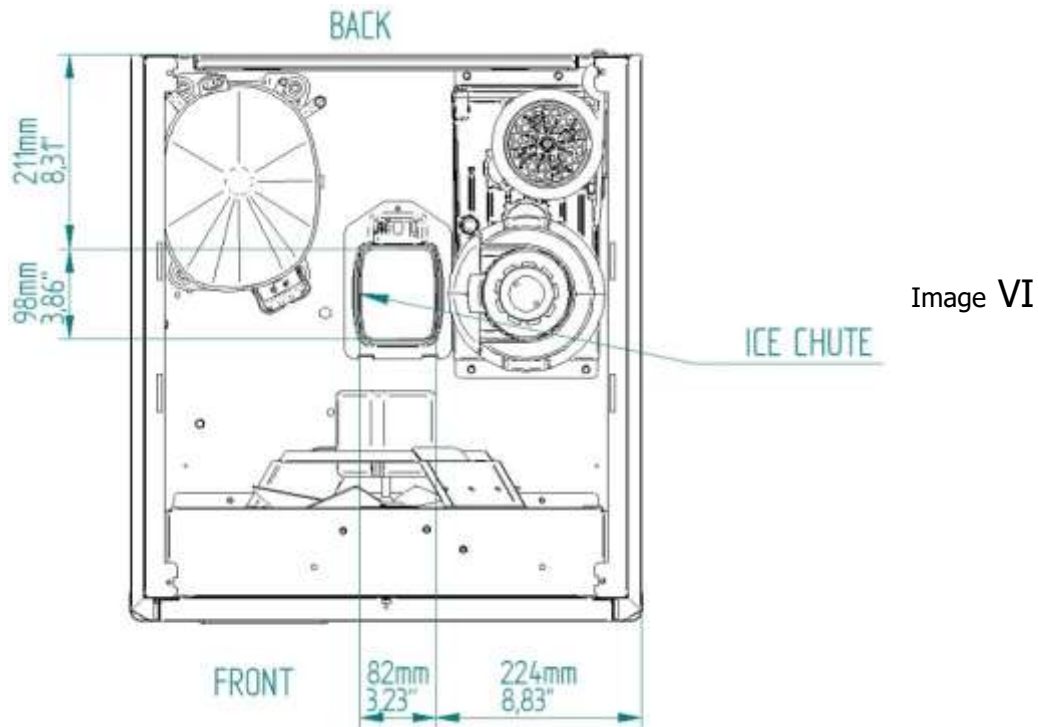


Image VI

## 4. START-UP

### 4.1.- PRIOR CHECKING

- a) Is the machine leveled?
- b) Are the voltage and frequency the same as on the type plate?
- c) Are the water and drainage fittings connected and operating?
- d) In case of Air Condensation: Is the air circulation adequate?
- e) Is the temperature of the room and the water appropriate?

	ROOM	WATER
MAXIMUM	43°C / 109.4°F	35°C / 95°F
MINIMUM	5°C / 41° F	5°C / 41°F

- e) Is the water pressure adequate?

MINIMUM	0.1 MPa (1 Bar) / 15 PSI
MAXIMUM	0.6 MPa (6 Bar) / 87 PSI

- f) Water conductivity must be at least 10 microSiemens.

NOTE: If the inlet water pressure is higher than 6 Bar (87 PSI), install a pressure reducer.

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## **4.2.- START-UP**

1. Open the water valve and check that there are no leaks.
2. Connect the machine to the power supply. Turn on the rear switch.
3. The button on the control panel, PE1 (see image VI), must be red, and when pressed, it will flash blue for 10 minutes.
4. After 10 minutes of the timer, the machine will start and PE1 will stay with a steady blue light.
5. Check that there is no element that brushes or vibrates.
6. Check that it produces ice correctly. \*It's normal that in the first few moments some water falls instead of ice\*.
7. Check that no alarm is on from the control panel. If so, restart the machine. If the problem persists, call the technical service.

## 5. CONTROL PANEL

The outer panel is located at the front of the machine in the upper left corner and has 5 buttons:

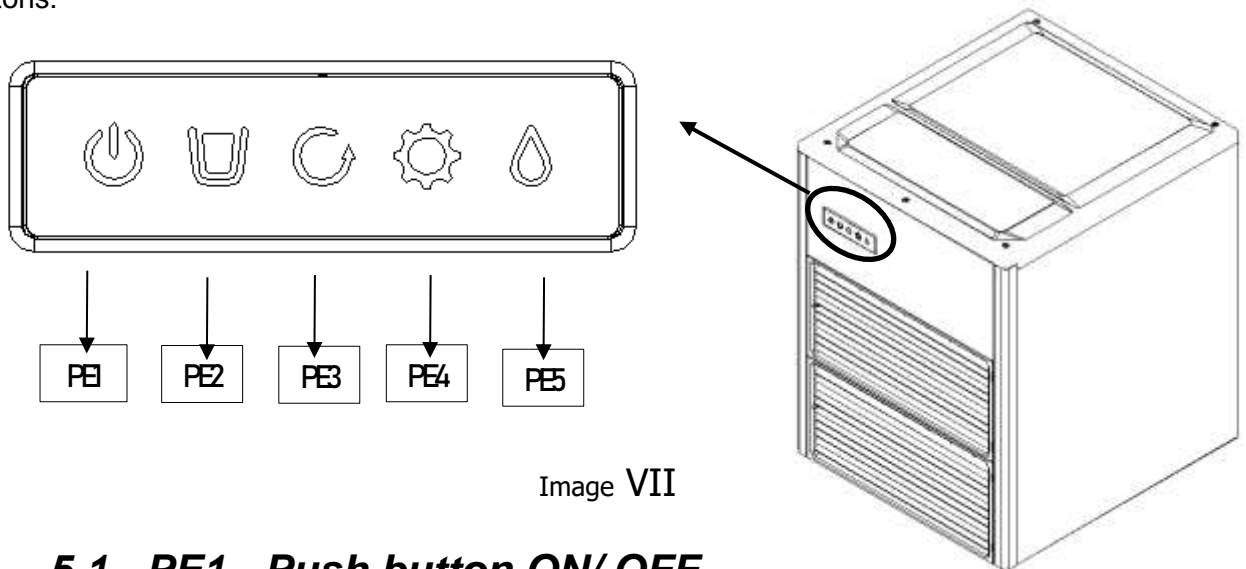


Image VII

### 5.1. PE1.- Push button ON/ OFF

When the machine is switched on from the rear switch, PE1 will be lit in red, which means that the machine will be in standby mode. When pressing the PE1 button, it will go to the timing state and the LED will flash blue. Once the timing period has elapsed, the LED will remain permanently blue and the machine will start to operate.

If an alarm is detected on the machine, pressing and holding the button for more than 3 seconds restarts the machine.

### 5.2. PE2.- STORAGE FULL

This LED will light up when the machine has stopped when the bin is full.

### 5.3. PE3.- GEARBOX MOTOR ALARM

This alarm has two states.

In the first one, the LED will remain flashing and the machine will carry out a timing and resume automatically. The machine will continue to operate in this state.

In the second state, the LED will remain in a steady position and the machine will be stopped until a reset is done.

### 5.4. PE4.-INTERNAL FAULT ALARM

This LED will remain on when there is an internal fault in the machine or a blockage at the evaporator outlet.

The machine with this alarm will remain stopped.

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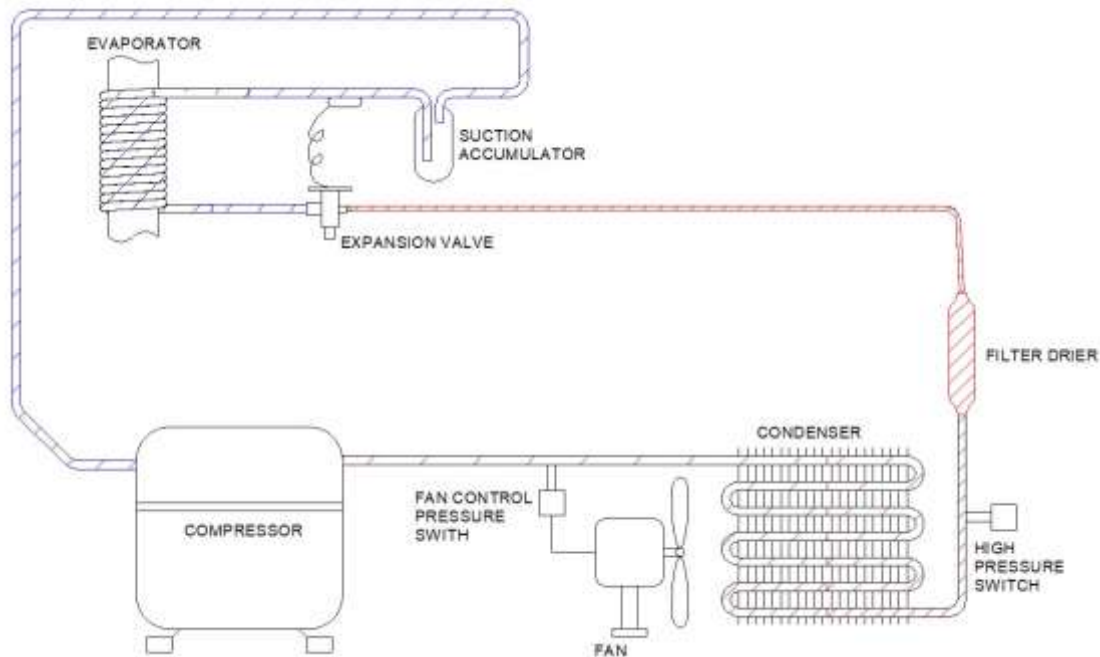
## 5.5. PE5.- WATER SUPPLY FAILURE ALARM

This LED indicates that there is no water supply and therefore the machine is stopped as it cannot make ice.

## 6. DESCRIPTION of COMPONENTS

### 6.1- Refrigeration equipment

Image VIII



This consists of the following components:

- Compressor.
- Condenser. Air or water.
- Evaporator. Stainless steel vertical tube with a cooling jacket. These are kept filled with water and an auger inside scrapes and removes the ice that forms.
- Thermostatic expansion valve.
- Safety high pressure switch. For the machine if a pressure higher than this value is reached:
  - o – R404A/R452 → 30 bar (435 psi)
  - o -R290 → 25 bar (362 psi)
- Fan cycle switch. Controls the fan (condensed air) or valve (condensed water) to maintain the high pressure at the set level:
  - o – R404A/R452 → 15.5-18 bar (225-261 psi)
  - o -R290 → 11.5-13.5 bar (167- 196 psi)

## 6.2- Hydraulic equipment

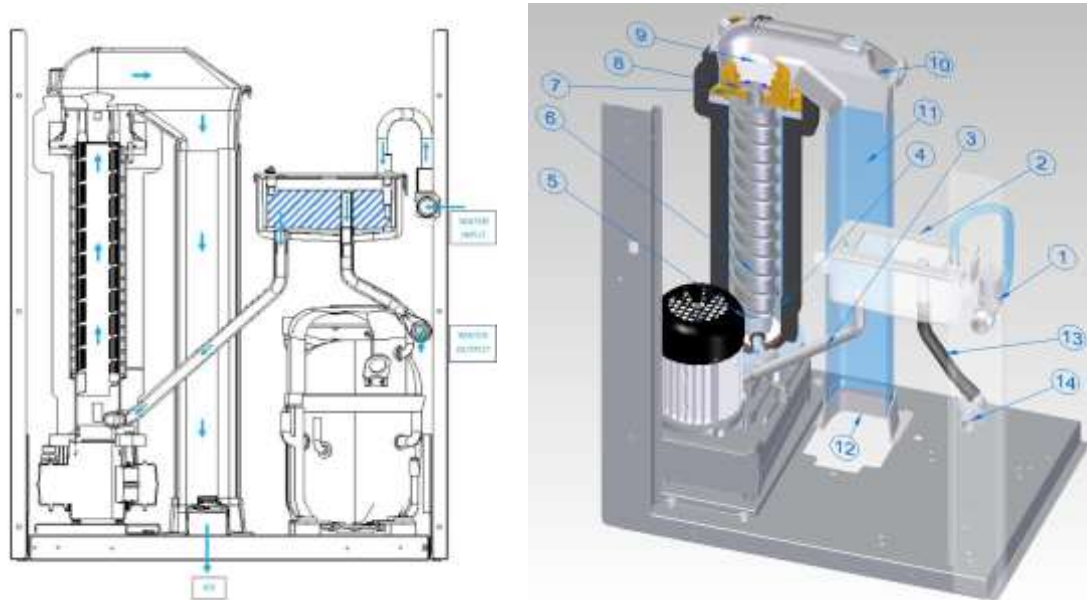


Image IX

- 1. Water inlet valve. Regulated by the control plate, it feeds the water tank.
- 2. Water tank. Maintains the water level inside the evaporator by communicating vessels. Stainless steel electrodes give the signal to the control board to maintain the internal level. A safety overflow provides drainage to prevent internal spillage in the event of malfunction.
- 3. Evaporator feed tube. Connects the water tank to the evaporator. A bypass with plug allows the system to be drained.
- 5. Evaporator seal. Axial type (graphite/stainless steel) avoids water loss through the reducer shaft.
- 10. Chutet. Directs the ice coming out of the evaporator into the discharge tube. A hinged lid with a safety switch will stop the machine in the event of a blockage.
- 11. Discharge tube. Directs the ice to the storage bin.



## 6.3- Electrical equipment

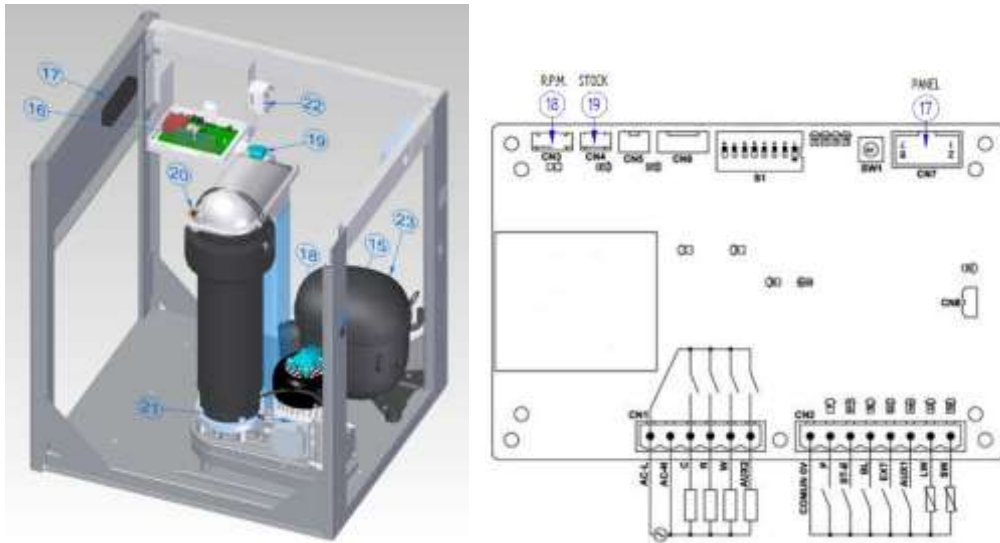


Image X

- 15. Main switch. Placed on the back of the machine. Cuts off the power supply.
- 16. Control panel. Placed in a tiltable plastic box (can be placed horizontally or vertically) that allows access from the cover or from the left side.
- 17. Control panel. Placed on the front of the machine, it has the start button and the signal lights.
- 18. Gyro sensor. Located on the motor of the gearbox. Detects the speed and direction of rotation of the same.
- 19. Full ice sensor. Located next to the discharge outlet, it stops the machine when the ice level reaches the set level.
- 20. Micro switch. Located at the outlet. For the machine in case of jamming.
- 21. Gear motor. Turns the auger inside the evaporator.
- 22. Contactor - Relay. Drives the compressor.

## 6.4- Ice making assembly.

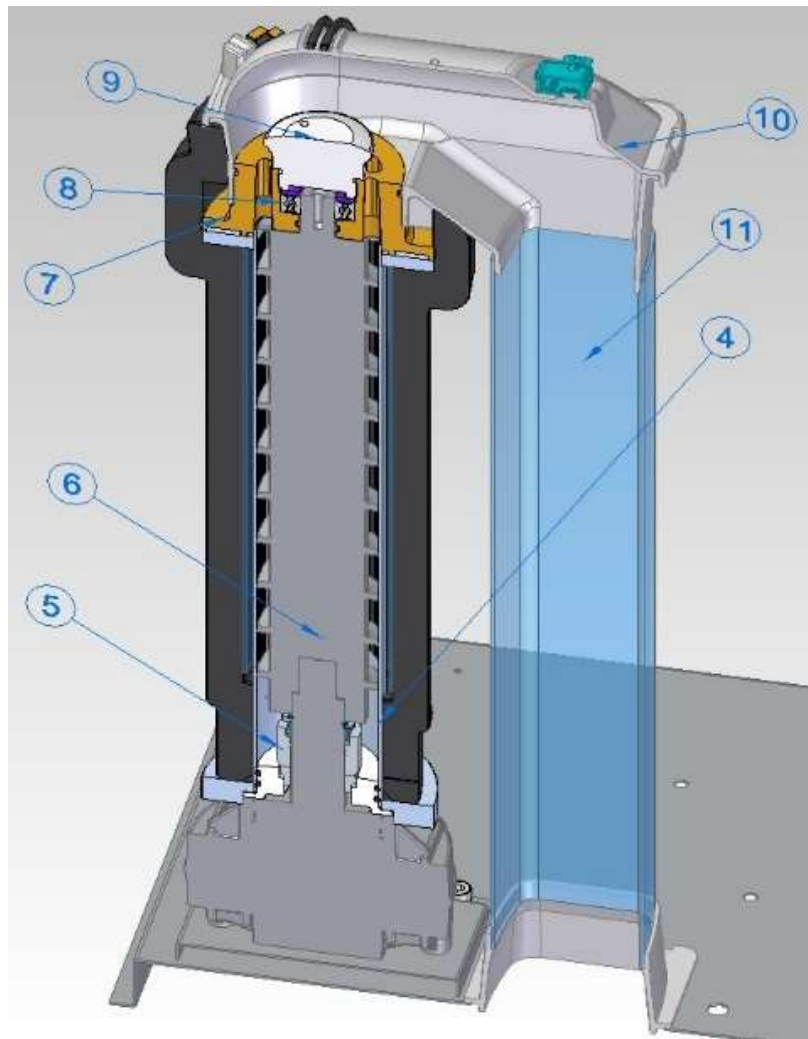


Image XI

-6. Auger. Cuts the ice that forms inside the evaporator and removes it by compressing it on the extruder.

-7. Extruder. It has a section-reduction nozzle. The number and shape depends on the machine and the type of ice produced.

-8. Bearing. Located inside the extruder. Supports the upper radial load of the auger and keeps it centered in the evaporator. The lower loads of the screw are supported by the gearbox shaft.

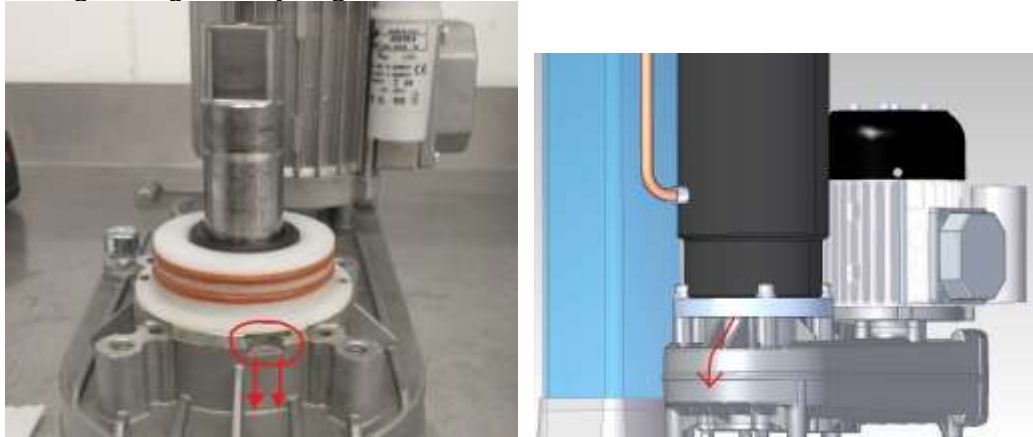
-9. Icebreaker. Splits the ice coming out of the extruder.

-10. Mouth and 11. Outlet tube. They direct the ice towards the lower outlet on the machine base.

## RECOMMENDATIONS WHEN EVAPORATOR AND EXTRUDER IS DISASSEMBLED

When the evaporator and extruder are going to disassemble for a change, is recommended inspect or change the following parts:

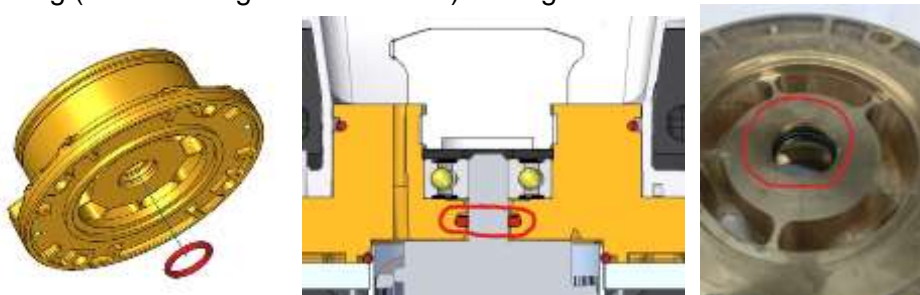
- Inspect possible water leak at the marked zone of gearmotor: the water flows through this geometry of gearmotor if there was a water leak.



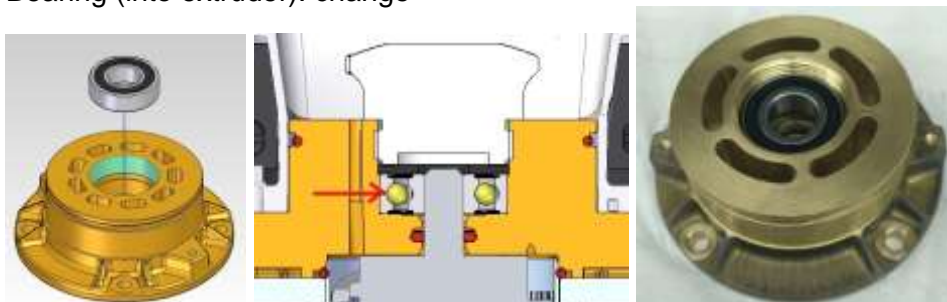
- O-rings: inspect
- Seal: change



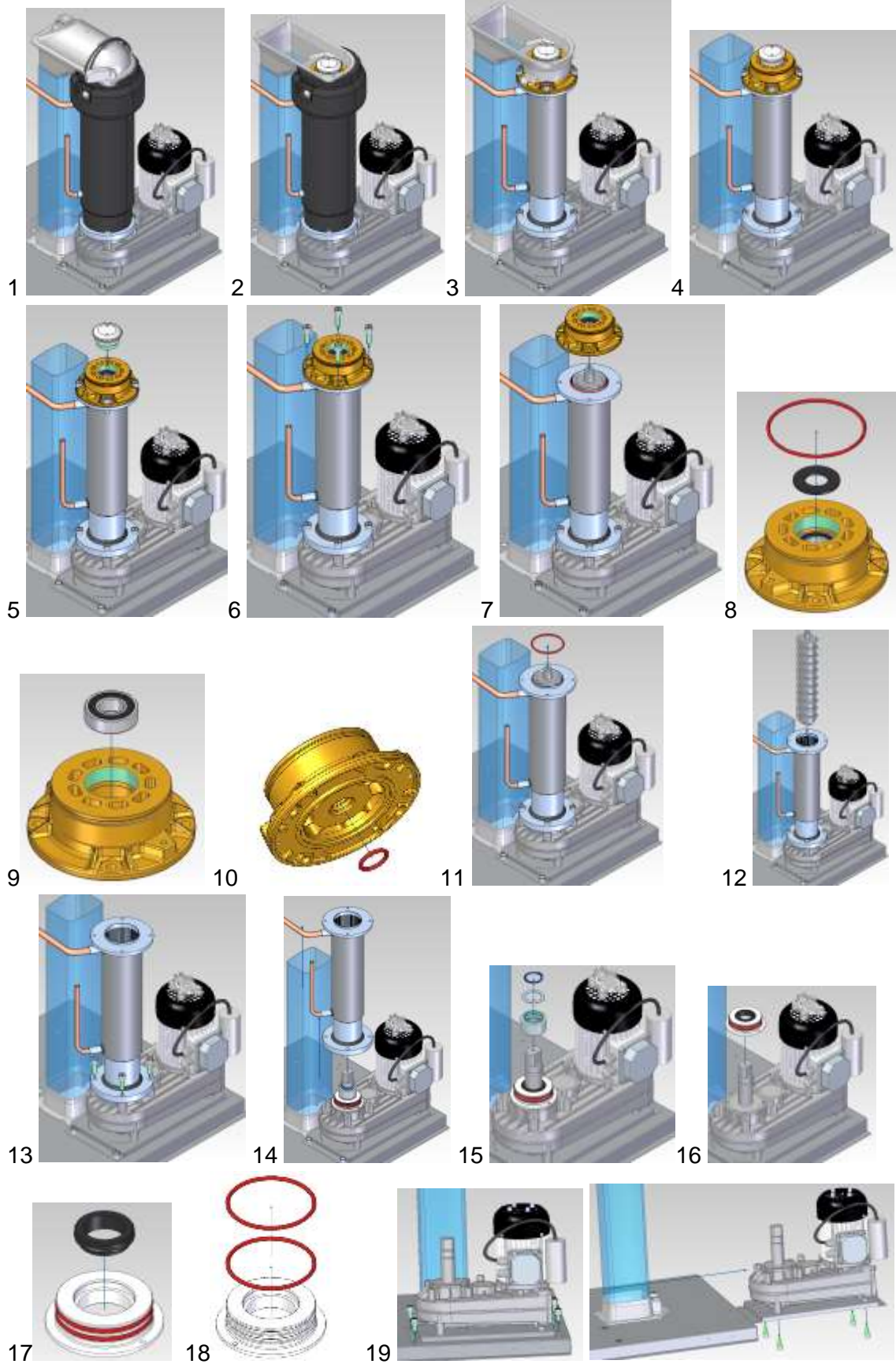
- O-ring (between auger and extruder): change



- Bearing (into extruder): change



## STEPS TO DISASSEMBLE EXTRUDER AND EVAPORATOR



-1. Remove the exterior panels of machine to have access to evaporator.



-2. Remove Ice exit cover



-3. Remove evaporator insulation



-4. Remove Ice exit plastic part



-5. Remove Ice Breaker with a tool like image (tool used to change the disc of Angle Grinder machines)



-6. Remove screws of extruder



-7. Remove extruder



-8. Remove gasket extruder and exterior O-ring



-9. Remove bearing extruder pressing it at the bottom with a tool, (be careful in order to do not damage the extruder).



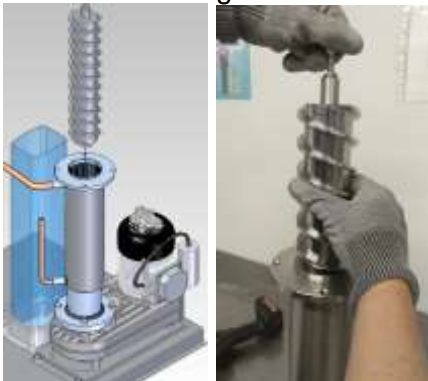
-10. Remove O-ring inside extruder



-11. Remove O-ring on top evaporator.



-12. Remove Auger: can be used the screw of extruder in order to remove it easily.



-13. Unscrew the 4 Allen screws of evaporator-gearmotor



-14. Remove evaporator above of gearmotor shaft (be careful with copper tubes in order to do not break the refrigeration circuit). The gearmotor can be removed from machine (see next point 19)



-15. Remove Seeger washer, washer, and seal turning counter clockwise



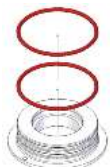
-16. Remove seal support plastic part of gearmotor shaft. Now can be changed the gearmotor if it is necessary.



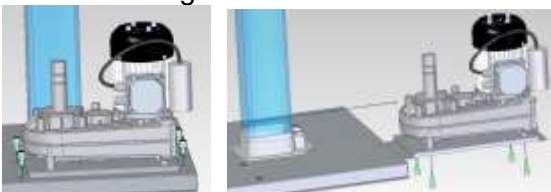
-17. Remove seal part of plastic part



-18. Remove the two O-rings.



-19. Remove gearmotor: unscrew the 8 screws of the bench and gearmotor support.



---

## STEPS TO CHANGE THE EXTRUDER KIT

- If the unit is working, turn it off from the main switch (rear one). If it is already stopped, first turn it on, let it work for about 15 minutes, and then turn it off.
- Open the ice exit plastic cover to access the evaporator top.
- Remove the ice exit plastic cover.
- Remove the insulation on top.



- Remove the ice inside.
- Unscrew the 2 Allen screws on the sides of the plastic cover.



- Remove the plastic cover



- Unscrew the 4 Allen screws attaching the head extruder.





- 
- Turn on the unit. Wait to have the linking light on the board and press the test button (circle one). The auger will move, pushing the ice and the extruder out.



- Clean the surface from ice.



- Place the O-ring.

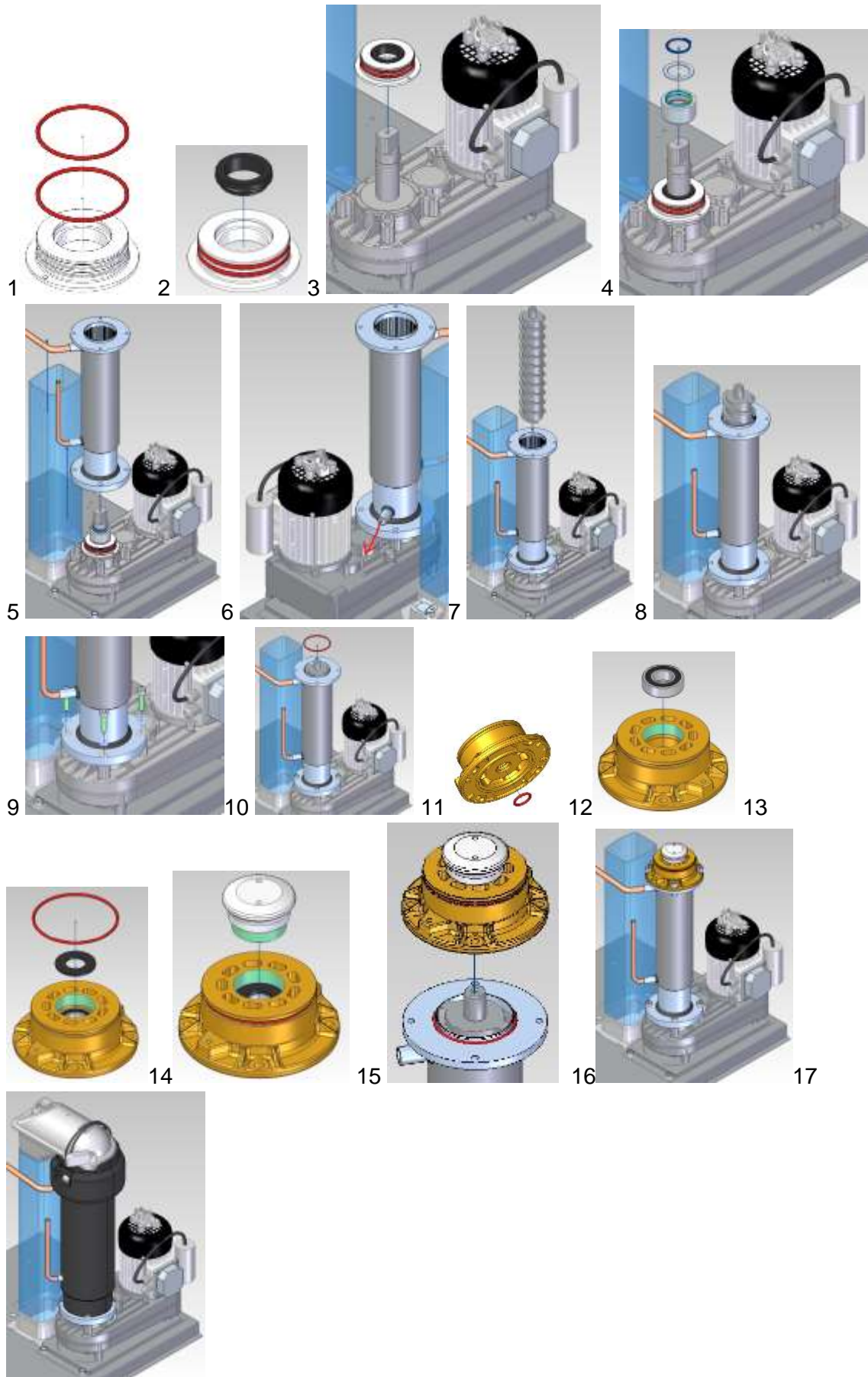


- Put the head extruder back in place, by pressing gently down.



- Screw the 4 Allen screws, place the plastic cover, screw the 2 Allen and place the plastic top on the evaporator.

## STEPS TO ASSEMBLY EVAPORATOR AND EXTRUDER





1. Place the two O-rings on plastic support



2. Submerge in alcohol this static part of mechanical seal evaporator without touch it with the hands.



Place static part into plastic support.



Add NSF approval grease to the two O-rings in order to improve the evaporator assembly



3. Put it on the gearmotor shaft and fitting the two pins gearmotor into the two holes of the plastic support



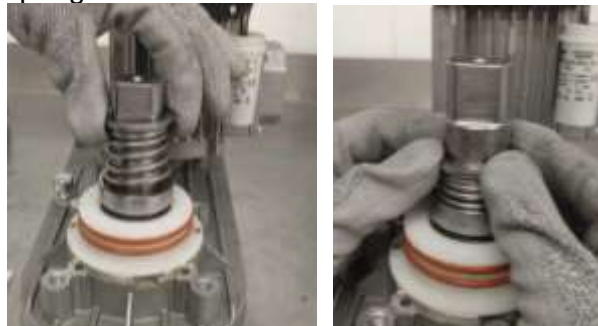
- 
4. Submerge in alcohol this dynamic part of mechanical seal evaporator.



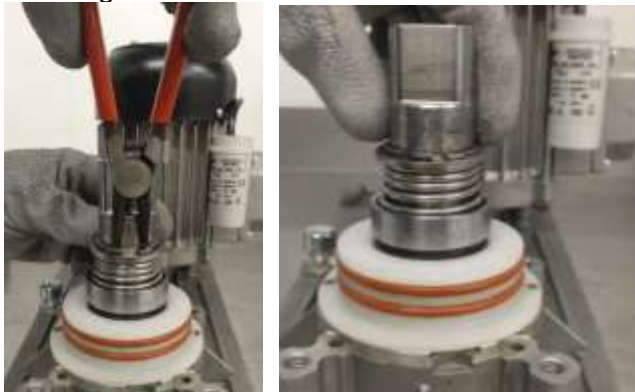
Put it on the gearmotor shaft with the spring at the top turning clockwise



Place the washer over spring and push it downwards in order to compress the spring



Fit Seeger washer into the shaft slot



5. Place evaporator on gearmotor

- 
6. Turn evaporator in order to fit the water inlet tube at the correct position



7. Place the auger into evaporator



8. Turn auger in order to fit to gearmotor shaft



The auger is at the correct position if it is above evaporator (0,024 inch máx (0,6 mm max) )



- 
9. Screw evaporator to gearmotor (the security washer must be in contact to the head screw)



10. Place O-ring on top evaporator



11. Extruder assembly



Clean the extruder with alcohol and dry with a cloth



Place the small o-ring into extruder slot at the bottom and add NSF approval grease on it



12. Place the bearing into extruder.  
 With a tool, press always the outer ring of the bearing in order to push it into the hole extruder. Can be used a tool with the approximate diameter (por example a hex pipe tool)



Add NSF approval grease to bearing



13. Place the gasket over bearing and add NSF approval grease on its top surface



Place the O-ring at external extruder slot and add NSF approval grease



14. Screw the ice breaker to extruder with the hand.



Tighten the ice breaker with a tool like image (tool used to change the disc of Angle Grinder machines)



15. Place the kit extruder on top evaporator.



16. Screw the kit extruder to evaporator at correct position in order to screw the ice exit plastic cover.



17. Place and screw ice exit plastic part to extruder, place evaporator insulation, place ice exit plastic cover and attach plastic cover with O-ring.





## **7. OPERATION**

### **7.1 - OPERATING PRINCIPLE**

The water enters, through a solenoid valve, into the water tank. The control board operates the valve to maintain the internal level at the height of the upper electrode of the bucket. A safety overflow sends the water to the drain if this level is exceeded.

A flexible hose feeds the water to the evaporator. The same water level is maintained in the evaporator by communicating cups as in the water tank. A bypass with a plug on this tube allows the system to be drained.

The water freezes on the internal surface of the evaporator. The screw scrapes it off and moves it to the top where the extruder is located. As it passes through the extruder nozzles, the ice is compressed, compacted and some of its moisture is removed. The shape of the extruder changes according to the type of ice to be obtained.

At the exit of the extruder is the icebreaker, a device that splits the ice into a uniform size.

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The mouth leads the ice to the outlet pipe so that it falls down to the bottom of the ice bin.

The lid of the mouth is held in place by a rubber band. In the event of jamming, a safety microswitch would detect the dislocation of the lid and stop the machine.

The rotation of the auger is provided by a geared motor located at the bottom of the assembly. An axial seal, its support and joints prevent water from escaping.

The rotation of the motor is controlled by a hall-effect sensor on the top cover of the motor. If an abnormal speed or direction is detected, a corresponding alarm is triggered.

On the top cover of the ice outlet is the optical sensor for stopping the machine when the store is full. It detects the height of the ice. It is set to stop when it reaches nearly half discharge tube level.

## **7.2 - OPERATING SEQUENCE**

When the rear switch is turned on, the machine is in stand-by mode. The front operating light is red.

A short press on it activates the machine. Goes to flashing blue and timer 10 min.

During this time the water inlet valve is activated until the level in the evaporator and the tank reaches the upper electrode.

After this time period, start the gearbox. One minute later the compressor starts. Soon after that, ice will start coming out of the machine. The first ice will be inconsistent and may come out with some water until the running conditions are reached.

Making ice lowers the water level in the water tank. When the upper electrode loses contact, a 5" delay activates the solenoid valve to restore the level. This cycle is repeated continuously while the machine is running.

When the storage sensor detects ice continuously for 20" (blue sensor LED on), the machine stops and the yellow LED on the front panel lights up.

When the ice is removed from the bin and the sensor is free, the machine will start again. If the stop time has been longer than than 10 min, the start will be instantaneous. If it is less, it will time out until a minimum stop time of 10 min has been completed.

At machine stops (except alarm stops) the auger is kept running for 3 min to empty the evaporator of ice.

To stop the machine manually, simply press the front button. It will turn red.

In the event of a shutdown due to an alarm, the corresponding light will come on. A long press on the start button can reset it. In case of recurrence, the problem must be solved.

The machine can be turned on with “Only Gearmotor Function”, so only the gearmotor is working (the rest of machine is stopped) in order to empty the evaporator of ice or to check the gearmotor.

To activate this function the machine must be stopped (stand by with start button with red colour), then do a long press on start button of display until the five buttons of display are flashing. To deactivate this function, press the start button until the machine goes to stand by.

## 8. ELECTRONIC CONTROL

Receives information from the machine components and controls the operation of the equipment.

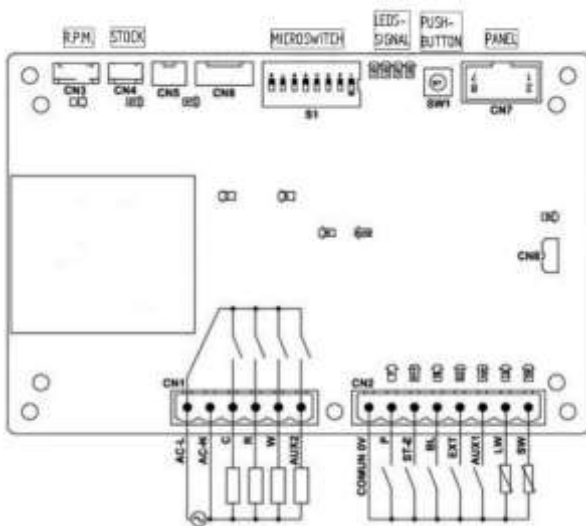


Image XII

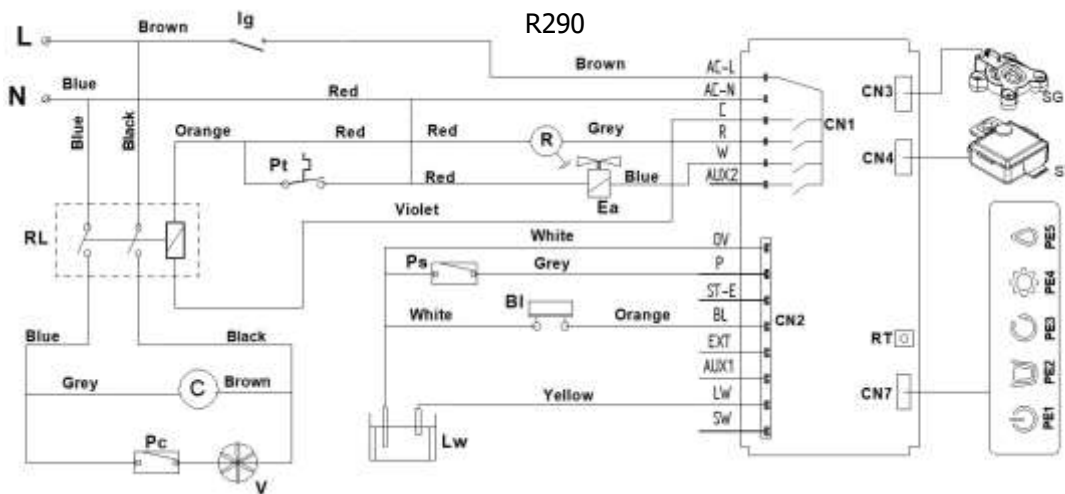
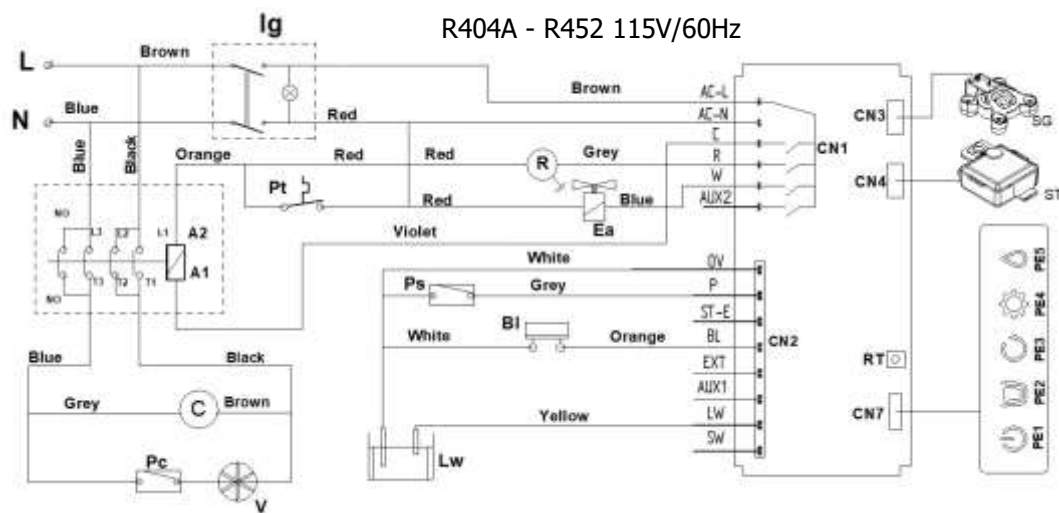
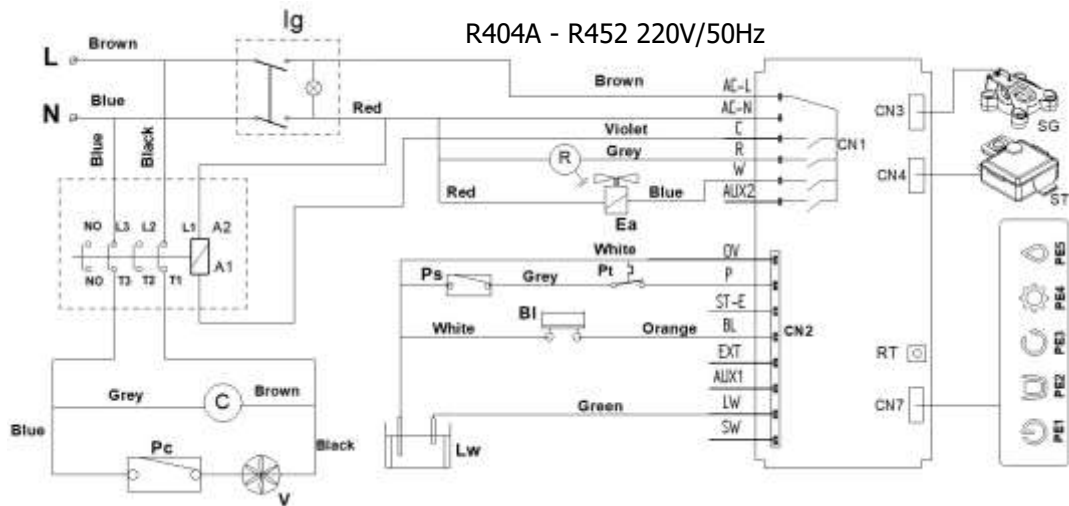


Image XIII

Ps- Presostato de seguridad / High Pressure Control  
 Pc- Presostato Condensación / Fan cycle control  
 Pt- Protector termico / Motor Termal Protection  
 Bl- Control de atasco salida de hielo /  
 Ice outlet block control  
 C- Compresor / Compressor  
 V- Ventilador / Fan  
 LW- Sonda nivel agua / Water level sensor  
 Ig- Interruptor On-Off / On-Off Switch  
 R- Motor reductor / Gearmotor  
 Ea- Electroválvula entrada agua / Water inlet electrovalve  
 SG- Sensor giro-r.p.m. motor-reductor / Gearmotor  
 turning-r.p.m. sensor  
 ST- Sensor almacén / Stock Sensor  
 RT- Pulsador / Push-button  
 RL- Relé / Relay  
Colores / Colors  
 Azul / Blue                      Violeta / Violet  
 Rojo / Red                        Blanco / White  
 Marrón / Brown                Verde / Green  
 Negro / Black                    Naranja / Orange  
 Gris / Grey                        Amarillo / Yellow

#### Paneles externos / External panels

PE1 - Pulsador / Push ON/ OFF + LED bicolor  
 Rojo - Apagado / Red - Off  
 Azul fijo - Encendido / Fixed blue - On  
 Azul Intermitente-Temporización / Blue Flashing-Timing  
 PE2 - LED fijo almacén lleno / Fixed LED Full Stock  
 PE3 - LED Fallo del motorreductor por velocidad o sentido giro  
 / LED Gear motor failure by speed or reverse rotation  
 PE4 - LED Fallo de presostato, atasco boca de salida o  
 falta de consumo de agua / LED Pressure switch fault,  
 ice outlet block or lack of water consum  
 PE5- LED Falta de agua / LED Lack of water

#### DIP Switches

S1- ON Rearme automático presostato /  
 Automatic reset pressure control  
 OFF Rearme manual presostato/  
 Manual reset pressure control  
 S2- ON Rearme manual de máquina tras corte luz /  
 Reset manual machine after power outage  
 OFF Rearme automático maquina tras paro luz /  
 Automatic manual machine after power outage  
 S3- ON Interruptor on/off externo habilitado /  
 External Power on/off switch enabled  
 OFF Interruptor on/off externo deshabilitado /  
 External Power on/off switch disabled  
 S4-ON Sensor externo de almacén habilitado /  
 External sensor stock enabled  
 OFF Sensor interno óptico de almacén habilitado/  
 External optical sensor stock enabled  
 S6-7-8 Configuración limites r.p.m. motor-reductor  
 Setting gearmotor r.p.m. limits

#### LEDS trabajo normal (fijos) / normal work (fixed)

LE0 - Encendido (fijo), arranque (intermitente) /  
 On (fixed), start (intermittent)  
 LE2 -Stock lleno / Full stock

#### LEDS alarmas (intermitente rápido) / alarms (fast intermittent)

LE0 - Temporizador de arranque / Start timer  
 LE1 - Presostato / Pressure switch  
 - Fallo circuito de agua / water circuit problem  
 LE2 - Atasco salida hielo / Ice outlet block  
 LE3 - Funcionamiento anormal del reductor /  
 gearmotor malfunction

#### Conectores /Connectors

CN3- Sensor giro-r.p.m. motor-reductor /  
 Gearmotor turning-r.p.m. sensor  
 CN4- Sensor almacén / Stock Sensor  
 CN7- Conexión Botonera / Connection Keypad

## **8.1 Connectors:**






- Relay supply and output (mains voltage):
  - L-N: Power supply
  - C: Compressor
  - R: Gearbox
  - W: Water inlet solenoid valve
- Inputs (low voltage):
  - P: Safety.
  - St-E : External stock stop (thermostat, photocell, etc.)
  - BL : Safety micro by closing the outlet.
  - Ext: External machine shutdown.
  - Lw: Water level probe in the tank.
- External pilot panel
- Gear motor speed and direction of rotation sensor
- Optical storage filling sensor.

## 8.2 Warning LEDs

- Output relays. C-R-W They indicate when the relay is activated.
- Input. Located next to its terminal block. They indicate that the input is active.
- Status LEDs. Red color. Continuously on, they indicate the working phase of the machine. Flashing lights indicate an alarm.

Status	L0	L1	L2	L3
Machine in Operation	C			
Initial Running Timer	I			
Shutdown due to a full tank			C	
<b>Alarm</b>				
Safety/thermal reducer control switch		I		
Lack of water		2I		
Lack of water consumption		3I		
Micro blocking of the outlet			I	
Low reduction speed				I
High reduction speed				2I
Reversing gearbox				3I
C-continuous / I- Intermittent / 2I two intermittent / 3I three intermittent				

## 8.3 Pilot panel

Icon	Description
	Push-button ON/OFF Red. Machine OFF. Standby Blue continuous. Machine operating Blue Intermittent. Timer running
	Storage full
	Gear motor alarm
	<ul style="list-style-type: none"> <li>• Safety pressure switch</li> <li>• Motor thermal protection</li> <li>• Safety switch at the outlet</li> <li>• Lack of water consumption</li> </ul>
	Lack of water

## 8.4 Dip switch. Configuration

Symbol	Description
S1	Resetting the safety pressure switch <ul style="list-style-type: none"><li>- <b>ON:</b> Automatic</li><li>- <b>OFF:</b> Manual</li></ul>
S2	Power failure stop: In case of stop due to power failure. <ul style="list-style-type: none"><li>- <b>ON:</b> You will need to press the PE1 button to start the machine.</li><li>- <b>OFF:</b> The machine will restart immediately without any action.</li></ul>
S3	External stop (EXT): Enables or disables the external stop input, depending on whether it exists or not. <ul style="list-style-type: none"><li>- <b>ON:</b> External stop enabled.</li><li>- <b>OFF:</b> External stop disabled.</li></ul>
S4	Determines the stop signal for full stock: <ul style="list-style-type: none"><li>- <b>ON:</b> External stock stop (ST-E) enabled (Thermostat sensor)</li><li>- <b>OFF:</b> Internal stock stop (ST-I) enabled (Optical sensor)</li></ul>
S5	Free
S6, S7 y S8	Speed limits for gearbox alarm: <ul style="list-style-type: none"><li>- 50 Hz. OFF-OFF-OFF</li><li>- 60 Hz. Off-OFF-ON</li></ul>

## 8.5 Optical stop sensor



Image XIV

This is located on the top lid of the ice outlet. Facing downwards, it measures the distance to the ice surface.

For correct operation, it is important to ensure that the bottom glass of the sensor, through which the reading is made, is perfectly clean. Use a paper or soft cloth with alcohol. Never use organic solvents that may damage the surface.

When the distance is less than the one set, it is activated. The blue LED on the sensor lights up. If this signal remains active, continuously, for 20 sec, the machine stops and the corresponding front light comes on.

With the factory setting, the shutdown occurs when the ice is about 20 cm (8") from the sensor. The procedure is as follows:

- 
- Place ice in the line of sight of the sensor at the desired distance. If another object or surface is used, the adjustment distance may differ slightly from that which will eventually be obtained with ice. Check.
  - Remove the protective cap and press the internal button for 5 sec. The LED will light up green and flash. After 5 sec, if the sensor has correctly read the new distance, it will remain green until you stop pressing the button. Replace the protective cap.
  - If after those 5 sec, and the sensor has not been able to read the new distance, the LED will light up red and fixed, thus indicating that the sensor has not saved the new value, and the previously established value will be saved.

## **8.6 Gyro sensor**

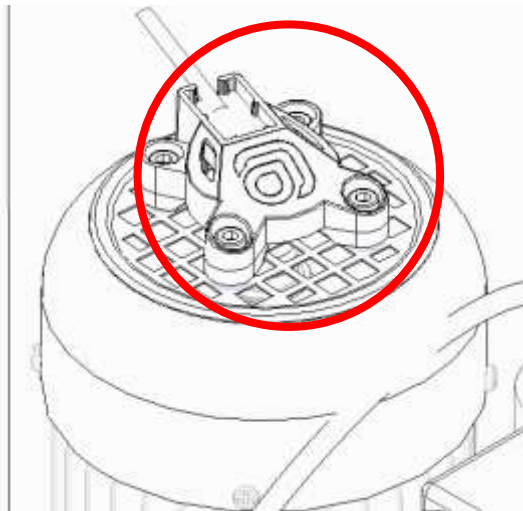


Image XV

Located in the motor's air vent. Works by Hall effect. A piece with a magnet rotates in conjunction with the motor shaft and allows the sensor to detect the speed and direction of rotation of the motor.

## **8.7 External shutdown**

By enabling the EX input with the S3 switch, it is possible to have a stop with a switch external to the machine.

## **8.8 Alarms**

The control board can detect some abnormal machine operation modes, stops the machine to protect it, and flags it for easy diagnosis. See the table in section 8.2 for the signaling codes.

In some cases, the machine is restarted after a time delay. If the fault is repeated, it stops completely.

To reset the alarm, turn off the power, using the rear switch or by unplugging the machine. It can also be reset with a long press of the front power button.



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### **8.8.1 Security entrance alarm P**

This is activated by the high-pressure safety switch or the thermal protector of the motor. It has two reset modes which are selected with the dip switch S1.

- S1 OFF. Manual. Remains stopped until reset.
- S1 ON. Automatic. After 1 h, if the reason for the alarm disappears, the machine starts again.

Possible causes:

- Dirty condenser. Clean.
- Faulty fan. Check. Replace.
- Defective safety pressure switch or condensation. Check. Replace.
- Air inlet temperature too high. Check installation conditions.
- High gear motor temperature.

### **8.8.2 Gearbox speed alarm**

The alarm limits are provided by the configuration of dip switches S6-7-8.

Stop the machine and, after about 30 min, start it again. If the fault occurs again, the machine stops permanently.

#### **- Low speed alarm.**

Indicates a gearbox overload.

Possible causes:

- Lime in the evaporator/auger/extruder assembly. Carry out cleaning procedure.
- Defective gear motor. Check capacitor. Replace.
- Damaged auger/ evaporator. Inspect.

#### **- High speed alarm**

This should not be evaluated during the initial 10 min and the machine is at full speed.

Possible causes:

- No ice being made. Check refrigeration equipment.
- The motor turns but not the output shaft. Check primary gearbox.
- Wrong 6-7-8 switch configuration.

---

### **8.8.3 Lack of water alarm**

The water inlet valve feeds the tank until the level reaches the upper electrode. This is done both during the startup time to ensure the filling of the system, and during the run to restore consumption.

The alarm will be activated when the solenoid valve remains open and the electrode does not receive a water level signal within 90 sec. The machine stops and signals the alarm.

Every 30 min the machine will try to reset the level. If it succeeds, it will start.

Possible causes:

- Lack of water supply. Check feed. Network, tap, filter, etc.
- Missing tank overflow pipe or loss of water in hydraulic circuit.
- Defective solenoid valve. Check, replace.
- Lack of connection between the electrodes: dirt, loose cable, etc.

### **8.8.4 Lack of water consumption alarm**

This is activated when there is no water consumption in the tank. It is not evaluated during the first 10 min of running.

If 35 sec pass without the upper electrode being exposed, the compressor will stop, keeping the gearmotor running. It will remain in this situation for 1 hour unless the water level in the tank drops during this time. This state is indicated on the plate with a triple flashing of LED 1.

After 1 hour the compressor is started. If the fault is repeated, the machine stops completely and the external general alarm light is displayed.

Possible causes:

- Clogging in the auger. Prevents the passage of water and the making of ice. In this case, the compressor stops, keeping the gearbox running, facilitating the system's self-recovery.
- Failure of the refrigeration equipment. Check.

### **8.8.5 Alarm for blockage at the outlet**



Imagen XVI

---

The top lid of the ice outlet is held in position by a rubber band. In the event of a blockage in the outlet, the pressure of the ice will lift the lid and activate the safety micro placed next to it.

The machine remains in this state until the ice melts and the lid returns to its position. At this point the alarm is stopped and the machine restarts.

The minimum stop time for this alarm is 30 min.

Possible causes:

- Broken rubber cap.
- Defective or incorrectly set stop sensor.
- Improperly placed cap.
- Switch not in position or loose connection.
- Icebreaker out of place.

# 9. MAINTENANCE AND CLEANING INSTRUCTIONS



You should wear rubber gloves and safety glasses when handling the cleaner or disinfectant for the ice machine.

All ice to be made during this procedure is unfit for human consumption and should be melted or discarded.

\* The maintenance procedures described in this manual are not covered by warranty.

## 9.1. Descaling Process

**Cleaning solution:** Prepare a solution of an appropriate product for cleaning ice machines. Do not use hydrochloric acid. We recommend the use of ScaleKleen (Everpure) part number 4033.

We recommend preparing a 10 liter / 2,6 gal solution according to the manufacturer's instructions (ScaleKleen) with the total amount of product / water needed.

5 liters / 1,3 gal for hand washing and 5 liters/ 1,3 gal liters for the water tank (D). Make more solution if necessary. For maximum effectiveness of the solution, use it after dilution.

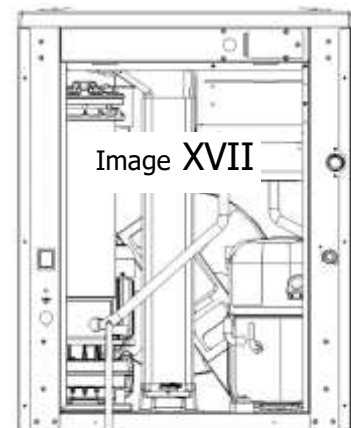


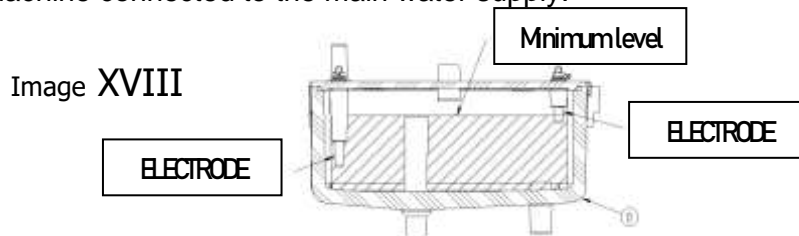
Image XVII

Drain the water by removing the hose cap.

1. Start the cleaning process when the ice machine stops long enough to ensure that all ice is melted inside the extruder and evaporator.
2. Remove all ice from the silo.
3. Remove the rear panel of the machine.
4. Remove the hose cap and drain the water into a container as shown in Image XVII.
5. Return the hose to its original position and reconnect it.
6. Remove the top panel.
7. Remove the water tank lid (A), O-ring (B) and ice outlet cover (C) and clean them by hand with cleaning solution.
8. Clean the fallen ice tube (E) with a brush also with the cleaning solution.
9. Place the ice outlet cover (C) in its original position.



10. Pour the cleaning solution into the water tank (D) until the solution overflows. This means that the system is full of solution. Allow the solution to stand for 10 min.
11. Keep the machine running to ensure that the electrodes inside the water tank (D) are covered with the cleaning solution at the minimum level as shown in picture XVIII by pouring the cleaning solution until it is finished, but always keep the machine connected to the main water supply.



## 9.2. Disinfection procedure

- **Disinfectant solution: mix a disinfectant solution using an approved food equipment agent. With sodium hypochlorite, to form a solution with 200 ppm free chlorine, dilute 35 ml / 0,01 gal of this 5.25% sodium hypochlorite solution (household bleach) with 10 liters / 2,6 gal of water.**

5 liters / 1,3 gal for hand washing and 5 liters / 1,3 gal for the water tank (D) For maximum effectiveness of the solution, use it after dilution. Make more solution if necessary.

1. Immediately after step 11 of the above cleaning process, start the disinfection process without stopping the ice making machine.
2. Then, to disinfect the machine, pour the 5 liter / 1,3 gal solution into the tank following the same procedure indicated in the cleaning process.
3. Once the disinfection solution is finished, leave the machine running for at least 1 hour, always connected to the main water supply. The ice produced must be disposed of.
4. Now, with the disinfectant solution intended for hand washing, clean the inside of the ice box with a cloth or sponge.

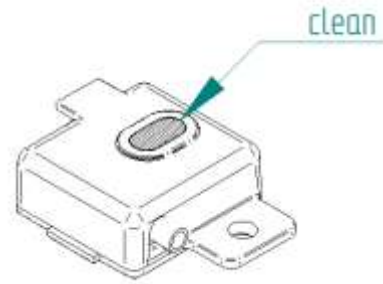
## 9.3. Waste disposal procedure

1. To ensure that no residue remains in the machine, rinse the water tank lid (A) and ice outlet lid (C) with water and place these items in their respective positions.
2. In addition, flush the ice drop tube (E) with the brush and the inside of the ice storage tank.
3. Replace the back panel and the top panel in their original position.
4. Then, let the machine run for 30 min on the freeze cycle and melt or discard all ice being made.

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## 9.4. Storage sensor cleaning

Image XIX



This must be done every time the machine is cleaned. Also in case the machine stops for full storage without being full.

Access is from the top of the machine. Remove the sensor from its holder by removing the fixing screw.

Use soft paper and alcohol to clean the dark glass area. **NEVER USE ORGANIC SOLVENTS THAT CAN DAMAGE THE PLASTIC SURFACE.**

Reassemble and check operation: LED off indicates free sensor. Blue LED on indicates sensor activated (presence of ice).

## 10. Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
None of the electrical parts work. Front display off	No power.	Check power supply and connection
	Rear switch OFF	Switch ONN
	Display connector loosed	Check. Insert
No ice in bin but ice pilot on. Machine stopped	Dirty optical bin sensor	Clean
	Defective or bad regulated bin sensor	Check adjustment, connection and sensor
	Wrong dip switches s3/S4 (external on/off)	check
Gearmotor alarm. Low speed	Scale at evaporator system	Descaling procedure
	Defective gearmotor	Verify motor capacitor and gearmotor
	Defective speed sensor	Verify sensor fitting and magnet support
	Damaged Auger / Evaporator/top bearing	Inspect
Gearmotor alarm.High speed	No ice being made	Check refrigeration equipment
	Motor turns but not output shaft	Replace gearmotor
	Wrong 6-7-8 switch stting	Check
Gearmotor alarm. reverse gyro	Wrong connection on motor box	check
Security alarm P. High pressure switch open	Dirty condenser	Clean
	Faulty fan	Check. Replace
	Defective pressure switch. Safety or condensation	Check. Replace
	Air inlet temperature too high	Check installation conditions
Security alarm P. Motor thermistor open	Motor fan blade loose	Chek
	Defective thermistor or motor	Check. replace
Lack of water alarm	Lack of water supply	Check feed. Network, tap, filter,...
	Missing tank overflow pipe or loss of water in hydraulic circuit	Check
	Faulty water inlet valve	Check valve: internal strainer, coil,...
	No conductivity between electrodes	Clean. Check wiring
Lack of water usage alarm	Faulty refrigeration system	Check
	Cloging in the auger	Wait for self recovery

PROBLEM	PROBABLE CAUSE	SOLUTION
Outlet blockage alarm	Broken rubber strip	Replace
	Faulty or wrong installed/connected blockage switch	Check
	Improperly placed cover	Check
	Ice breaker out of place	Check
Low ice production	Dirty condenser	Clean
	Air gap inside evaporator	Stops till internal ice melts
	To high temperature for incoming air or water.	Check installation conditions and air recirculation. Avoid water line in the air exhaust.
	Low compressor or refrigeration system performance	Check
Ice noise inside evaporator	Scale in Auger/Evaporator/Extruder	Carry out cleaning procedure
	Air in hydraulic system	Leave system unfroze. If problem continues perform cleaning
	Damaged auger/evaporator/extruder/bearing	Check
Flooding TXV. Compressor suction frozen.	Valve bulb not well tighted to tube or defective insulation	Check
	Faulty valve or setting	Adjust / Replace
Water leak at evaporator top	Defective or wrong installed extruder o-rings	Check
Water leak at evaporator bottom	Defective internal graphite seal	Replace. Carefully follow replacement instructions
	Seal support o-ring damaged or out of place	Check / Replace



## 11. Technical Data

MODELS	VOLTAGE / FREQUENCY	GAS	CUBE TYPE	TECHNICAL SHEET LINK	WIRING DIAGRAM LINK
<b>IQN 300</b>	220 V / 50 Hz	R452 / R404A / R290	NUGGET	<a href="https://n9.cl/ezngk">https://n9.cl/ezngk</a>	R404: <a href="https://n9.cl/8mhy">https://n9.cl/8mhy</a> R290: <a href="https://n9.cl/7foq8">https://n9.cl/7foq8</a>
<b>IQF 300</b>			FLAKES	<a href="https://n9.cl/8oakj">https://n9.cl/8oakj</a>	
<b>IQN 500</b>	220 V / 50 Hz	R290	NUGGET		
<b>IQF 500</b>			FLAKES		

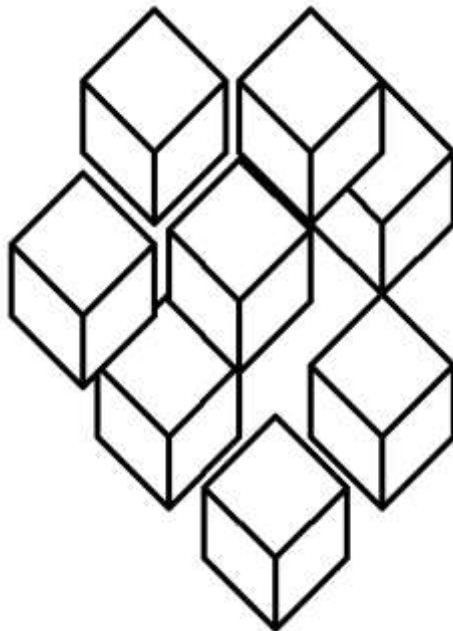
For more technical information scan the following QR code or click the link:



- Specification sheets
- User manual
- Exploded views
- CAD / REVIT drawings
- Technical videos



FLAKES



NUGGET