SIMAG

Service / Installation Manual

Hollow Ice Cube

SDH SERIES

Dear Installer,

this manual is reserved for specialised technicians and is designed to provide:

- technical specifications of our products, designed and manufactured to a high quality standard
- start-up and operating instructions
- principles of operation
- ordinary and extraordinary cleaning and maintenance instructions.

We therefore advise you to read it carefully before installation and keep it for future reference.
If any step is not understood well, the Manufacturer remains available to provide any information.

For safety and warranty reasons, the use of original spare parts is mandatory.
The use of non-original spare parts releases the manufacturer from any liability and automatically invalidates all warranty rights.

SERVICE MANUAL

For any information, always state:

- product model
- serial number
- data in the purchase invoice

SAFETY

Pictogram explanation

In order to make reading clearer and more pleasant, symbols have been used within this manual to convey to the reader the meaning or importance of the information provided by the statements alongside them.

Indicates that caution is required when performing an operation described in a paragraph that bears this symbol. The symbol also indicates that maximum operator awareness is required in order to avoid unwanted or dangerous consequences.

Indicates important information to be read and complied with.

Indicates requirements relating to actions that must be avoided.

This symbol placed on the appliance or used in the manual identifies the areas with an electrical hazard.

Indicates grounding

Identifies the terminals which, when connected together, bring the various parts of an appliance or system to the same potential (not necessarily the earth potential)

Indicates that the paragraph marked with this symbol must be read carefully before the installation, use and maintenance of the product

Given the continuous progress in the design sector, the Manufacturer reserves the right to make changes to the production and instructions, without this entailing the obligation to update the production and previous instructions. If necessary, further copies or updates of these instructions must be requested from the Manufacturer.

Who is this manual for?

These instructions are primarily intended for the installer and maintenance personnel, who should read them carefully before working on the appliance. If you do not understand all the contents of the manual contact your local distributor before working on the appliance.

Intended use and classification

This appliance is an ice maker and must only be used for making ice (not as a container for bottles, cans, etc.)

The appliance is designed to be used in domestic and similar applications such as:

- the kitchen area for staff in shops, offices and other work environments;
- farms and by customers in hotels, motels and other residential-type environments;
- bed and breakfasts;
- catering services and similar applications, not for retail.

General warnings

Partial or total failure to observe these instructions and the following prescriptions, an installation, use, ordinary or extraordinary maintenance other than those indicated in the manual, improper use, tampering with or modification of the appliance or some of its parts (unless expressly authorised), use of non-original spare parts or spare parts not specific to the model, may:

- cause damage, injury or fatal accidents;

- void the warranty
- reduce or compromise the quality and safety characteristics of the appliance;

release the Manufacturer from any liability.

Installation must be performed by authorized and specialized personnel, complying with the instructions in this manual.

Personnel must be adequately trained and instructed on how to assemble the machine and how to operate on electrical and refrigeration systems.

Under no circumstances may the customer perform the operations described in this manual.

Before installation:

- check the compliance of the systems with the regulations in force in the country of use and with what is stated on the serial plate;
- check that you are familiar with all the safety and fire prevention regulations in force in the country of use;
- check that a high sensitivity (30 mA) differential magnetothermic switch to which the machine must be connected and a power socket with ground connection of the type used in the country of use have already been prepared in the vicinity of the appliance.

Do not transport, install or carry out maintenance work on the appliance without using the personal protective equipment prescribed in this manual.

Keep all ventilation openings in the casing of the appliance free of obstructions.

Do not place objects that cause poor ventilation on and around the appliance.

Ensure that the installation location offers adequate clearance around the machine, so that the required periodical maintenance work may be carried out in full safety.

If the machine is being repaired, display appropriate signals in visible locations indicating that the machine MUST NOT be used.

Before working on the machine, make sure that any hot parts have returned to room temperature.

Disconnect the appliance from the power supply before carrying out any installation or maintenance work, ordinary or extraordinary.

During the installation of the appliance, persons not involved in the installation activities are not permitted to pass or remain in the vicinity of the work area.

The appliance is NOT designed to be installed:

- in explosive atmospheres;
- outdoors, in places exposed to salt-laden sea air or direct sunlight and weather elements (rain, humidity, etc.).

The appliance must be easily moved for any extraordinary maintenance: pay attention that any masonry work subsequent to installation (e.g. construction of walls, replacement of doors with narrower ones, renovations, etc.) do not hinder movement.

The appliance must be transported by means suitable for its weight and size and wearing appropriate personal protective equipment. When moved, even for very small distances, the appliance should always be lifted, NEVER pushed or pulled across the floor.

If the appliance is on wheels, make sure to be gentle when moving it around, to prevent it from tipping over and being damaged. Also pay attention to any roughness of the sliding surface.

The appliance equipped with wheels cannot be levelled, so make sure that the support surface is perfectly horizontal, flat and free from roughness.

- Do not overturn or lay the appliance on its side for maintenance.

Unauthorised interventions, tampering or modifications not in accordance with this manual will invalidate the warranty.

- The rating plate provides important technical information that is vital in case of a request for maintenance or repair of the appliance: please do not remove, damage or modify it.
- It is absolutely forbidden to tamper with or remove the adopted safety devices (protective grids, danger stickers, etc.). The Manufacturer declines all responsibility if the above instructions are not complied with.
- Packaging material is potentially dangerous and must be kept out of the reach of children or animals, and properly disposed of according to local regulations.
- The appliance must be periodically checked by an authorised service centre. In order to ensure the best conditions of use and safety, such checks should be carried out in accordance with current national regulations or, preferably, every year.
- The stationary state of the appliance, detected by visual inspection, does not guarantee with certainty that it is switched off. In order to protect his own safety, the operator must check that the machine is not powered, that is, that its plug is disconnected or that the switch of the panel to which it is connected is in the "OFF" position.
- When installing the machine ALWAYS replace any pre-existing water supply pipes with the new ones supplied with it.
- WARNING: If the power cable is damaged, have it replaced ONLY by QUALIFIED PERSONNEL in order to prevent any risks.

We recommend the installation of a water softener filter on the water line upstream the machine.

Refrigerant gas safety warnings

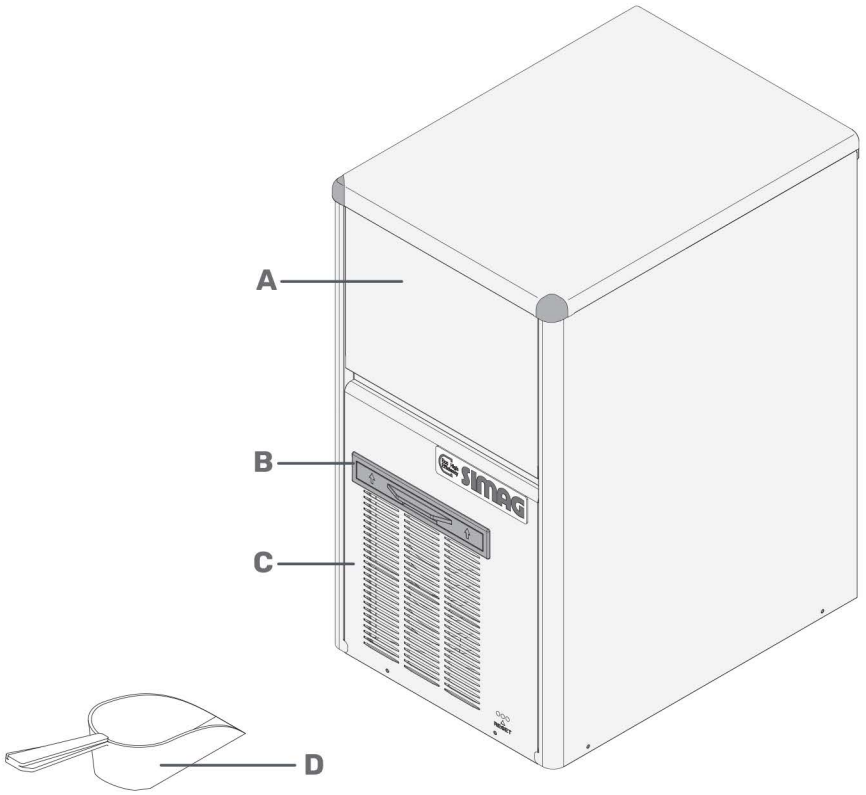
- The appliance contains fluorinated greenhouse gases governed by the Kyoto protocol, in the quantities indicated on the serial plate.
- The GWP (Global Warming Potential) of R290 gas is 3.
- Propane is a highly flammable gas. It is heavier than air, which means that in the event of a refrigerant leak it migrates to the ground.

Propane used in refrigeration systems is odourless. The system is hermetically sealed.

TECHNICAL DATA

Operating limits (for all models)

Parameters	Minimum	Maximum
Ambient temperature	10 °C	43 °C
Water temperature	5 °C	38 °C
Water pressure	0.1 MPa (1 bar)	0.5 MPa (5 bar)
Water hardness	7 °f 4°dH	18 °f 10°dH
Voltage tolerance with respect to the data indicated on the plate	-10 %	+10 %
Sound level produced by the operation of the appliance	<70 dB(A)	



KEY

A Ice container door
B Air filter (if present)
C Front or side air vents
D Ice scoop

SINGLE-PHASE 230V/50 Hz - TEMPERATURE 32 °C

AIR COOLING					
MODEL	**SDH 18**	**SDH 24**	**SDH 30**	**SDH 40**	**SDH 50**
VOLTAGE	230/50/1 - 50 Hz	230/50/1 - 50 Hz	230/50/1 - 50 Hz	230/50/1 - 50 Hz	230/50/1 - 50 Hz
Charge **R290 (g)**	85 gr	75 gr	115 gr	120 gr	115 gr
DEFROSTING SUCTION PRESSURE (bar)	1.7/7.7	2/8.8	10.6/10.6	3/9.2	2.2/8.4
DEFROSTING DELIVERY PRESSURE (bar)	12.5/8.3	12.3/9.5	3.5/8.9	11.3/11	10.6/9.5
SUCTION PRESSURE	3.6/1.7	3.4/1.8	4.4/1.2	3.7/1.6	4/2
DELIVERY PRESSURE	17.5/13.8	15.8/13.5	18.1/13.8	18.2/14.9	15.5/13

AIR COOLING				
MODEL	**SDH 64**	**SDH 84**	**SDH 100**	**SDH 170**
VOLTAGE	230/50/1 - 50 Hz	230/50/1 - 50 Hz	230/50/1 - 50 Hz	230/50/1 - 50 Hz
Charge **R290 (g)**	130 gr	150 gr	140 gr	150 gr
DEFROSTING SUCTION PRESSURE (bar)	3.5/8.6	1.6/7.4	1.4/6.7	1.6/6.8
DEFROSTING DELIVERY PRESSURE (bar)	7.3/11	13/11.5	11.8/11.6	10.5/11.6
SUCTION PRESSURE	3.9/1.7	2.7/1.6	2.6/1.4	2.8/1.5
DELIVERY PRESSURE	17.6/14.1	15.4/13.1	15.1/12.8	16/13.5

INSTALLATION

PRELIMINARY CHECKS

F01 After unpacking and before taking the appliance to the installation site:

(1) remove the front and rear panels (if present) and visually check that it has not been damaged during transport; if damage or anomalies are noted, do not proceed with the installation but inform the carrier or the manufacturer accordingly without delay;

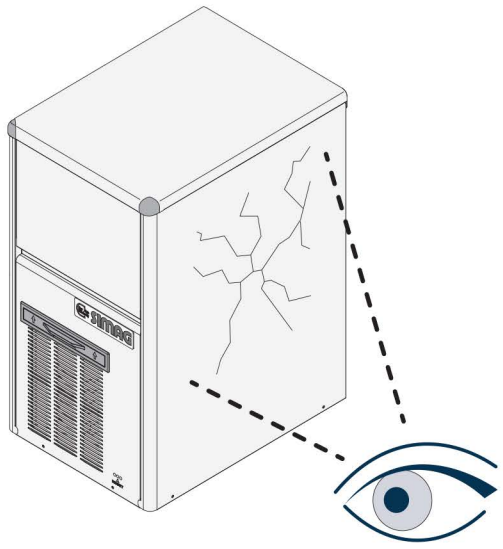
(2) remove all internal supports used for shipping and protective adhesive tapes.

(3) check that:

- the refrigerant circuit pipes do not touch other pipes or surfaces;
- that the fan turns freely;
- that the compressor is free to swing on its mounting brackets;

(4) also check that all components and accessories required for the model to be installed are present. The feet, if provided, are supplied disassembled and are stored inside the cell. If any components are missing or damaged, contact the manufacturer;

(5) clean all internal and external surfaces of the appliance with a clean cloth dampened with water.



F01

Before proceeding with the installation, dispose of the packaging in accordance with the regulations in force in the country of installation. This prevents it from being in the way when the appliance is being moved to the installation site, or children or animals from playing with it, with the risk of suffocation.

Materials used for packaging:
Pallet: wood
Corners: polystyrene
Outer box: cardboard
Straps, films, bags: plastic
Clips: metal
Note: depending on the packaging, all or only some of the materials indicated may have been used.

TRANSPORT

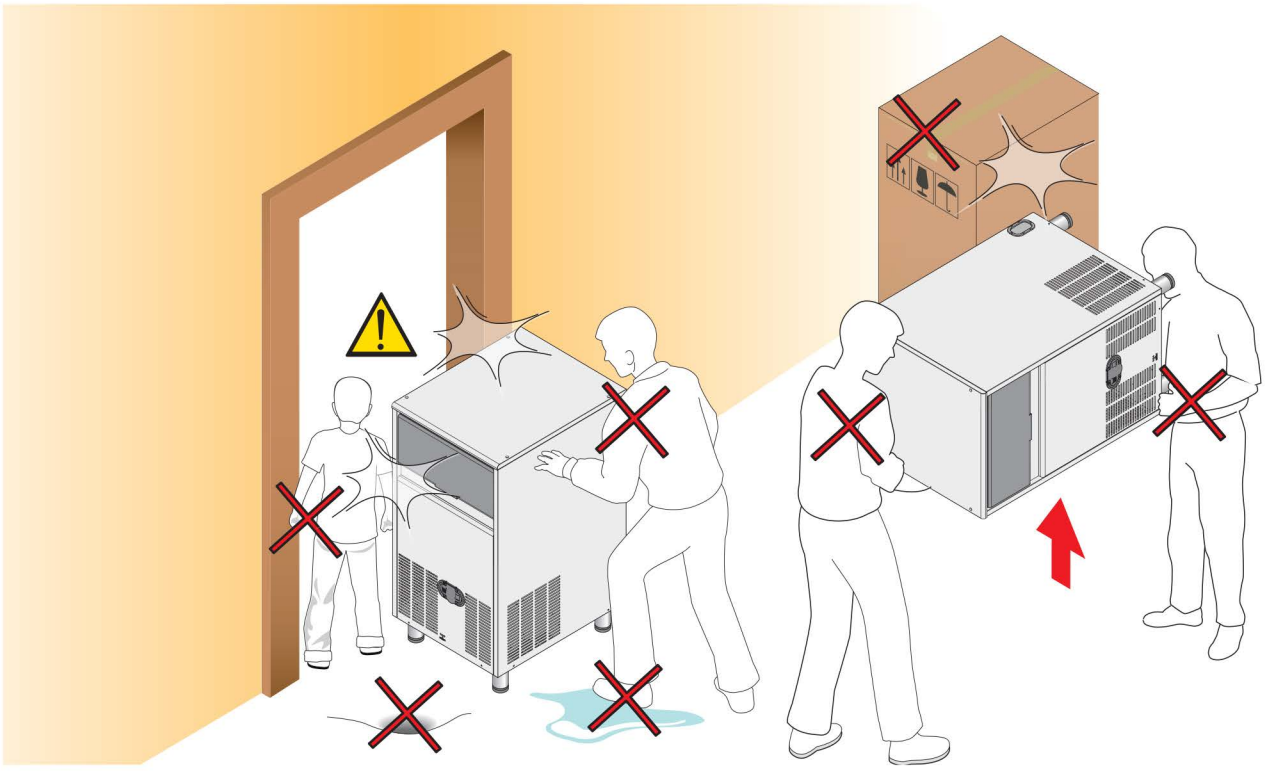
The manufacturer is not liable for any inconvenience caused by transport under conditions other than those specified in this chapter.

Transport and lifting of the appliance must take place:

- in **full compliance with the accident prevention regulations** and current laws, and with the utmost caution;
- by professionally qualified personnel, authorised and trained for the performance of these tasks and in **full possession of their physical and mental capacities**;
- **wearing all the appropriate PPE - Personal protective equipment**;
- **keeping the appliance in the vertical position**. If this is not possible, wait **24 hours** before putting it into operation;
- after ensuring that **no persons or objects** that may prevent the activities from being carried out in full safety are present in the working area;
- after ensuring that the **floor is smooth**, perfectly level, free of bumps and obstacles, and not slippery.

F02 Appliances must NOT be moved:

- manually;
- with straps;
- pulling or pushing them.

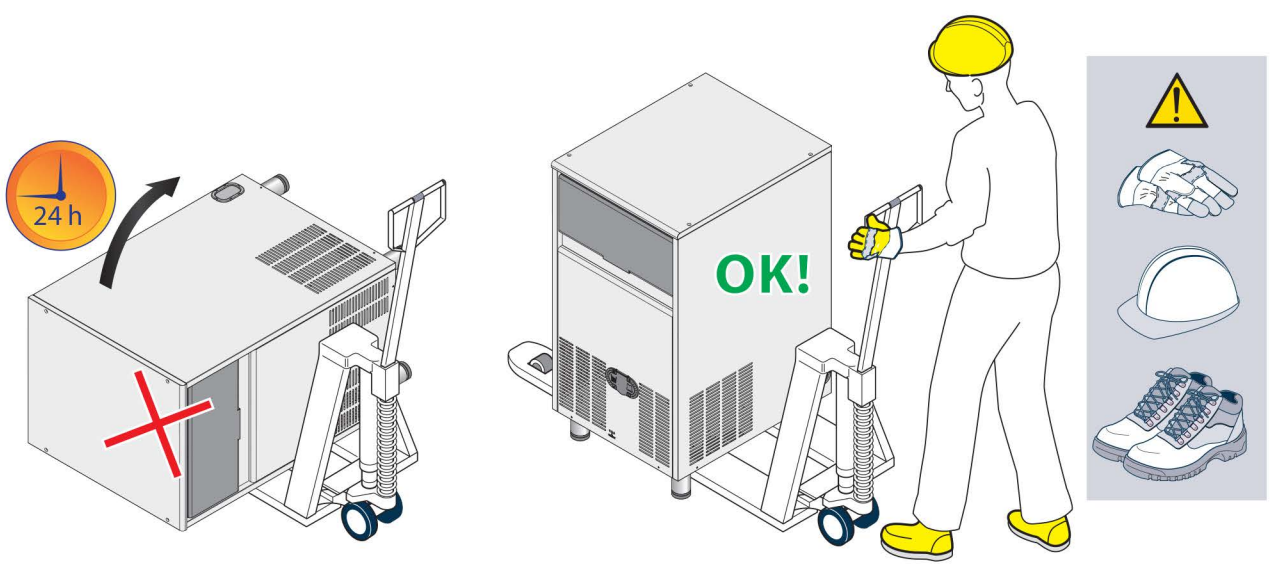


F02

Correct transport of the appliance

F03 Insert the forks of a **pallet truck** suitable for the weight of the appliance under the **sides** of the same, taking care not to damage the bottom.
Raise the appliance high enough so that it can be moved easily and take special care to balance the weight, as the centre of gravity does not coincide with the geometric centre of the appliance. Pay attention to the inclination when moving; **always keep the appliance in the vertical position**. If this is not possible, wait **24 hours** before putting it into operation.
When handling the appliance using a **pallet truck or forklift truck**, insert the forks on the inside of the feet (if present).
In case of mistake, do not try to counteract the load but drop it.

- Lifting equipment (pallet trucks, forklift trucks, etc.) must be suitable for the masses, dimensions and movements to be carried out.
- When lifting each part, make sure to use lifting equipment with a lifting capacity that is at least 20% greater than the weight of the part.
- It is forbidden to make modifications on one's own initiative or to use makeshift means to secure and lift machine parts.
- The use of lifting equipment other than that specified in these instructions is prohibited.
- No person should be in the vicinity of the machine during transport, except the person transporting it.



F03

POSITIONING

Installation Warnings

The installation of the machine must ONLY be carried out by authorised and qualified personnel.

This manual discusses the assembly instructions for various appliances, although only some of the currently available models are indicated.
Unless expressly otherwise specified, **the instructions are valid for all models**.
Appropriate personal protective equipment must be worn during the installation operations.
The installation location must meet the minimum installation requirements indicated by the manufacturer.
The machine must be installed following the methods and meeting the requirements described in these instructions, as well as allowing for the required free surrounding spaces.
The installer must assess the installation position of the machine and equipment in such a way as to ensure that the assembly and disassembly of its various components is simple and convenient, and guarantee the necessary clearance and access to the machine for maintenance purposes.

Preliminary Operations

CHECK OF THE SUPPLIED COMPONENTS

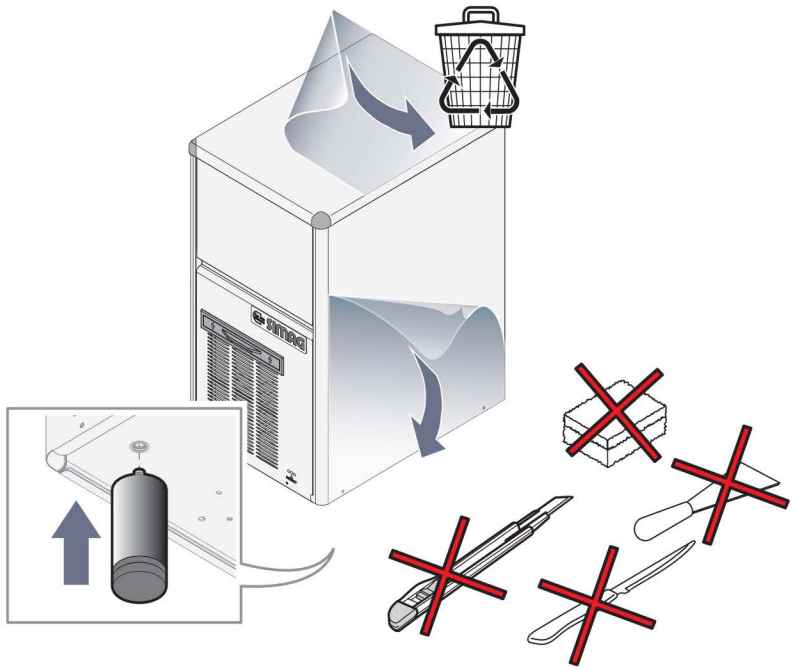
Check that all the components required for the installation have been received and are in good condition.
If any are missing, do not proceed with the installation but promptly inform the manufacturer or dealer.

REMOVAL OF THE PROTECTIVE FILMS

F04 Slowly peel off the protective films from the appliance. Clean any glue residues with a suitable solvent without using tools or abrasive or acid detergents, which could damage the surfaces.
Once removed, protective films must be kept out of the reach of children or animals, as they are potentially dangerous, and properly disposed of according to local regulations.

MOUNTING FEET

F04 Models are normally supplied with feet (except AC/EC 47-57): these must be fitted at the time of installation by screwing them tightly onto the fittings at the base.



F04

Positioning in the installation room

ROOM CHARACTERISTICS

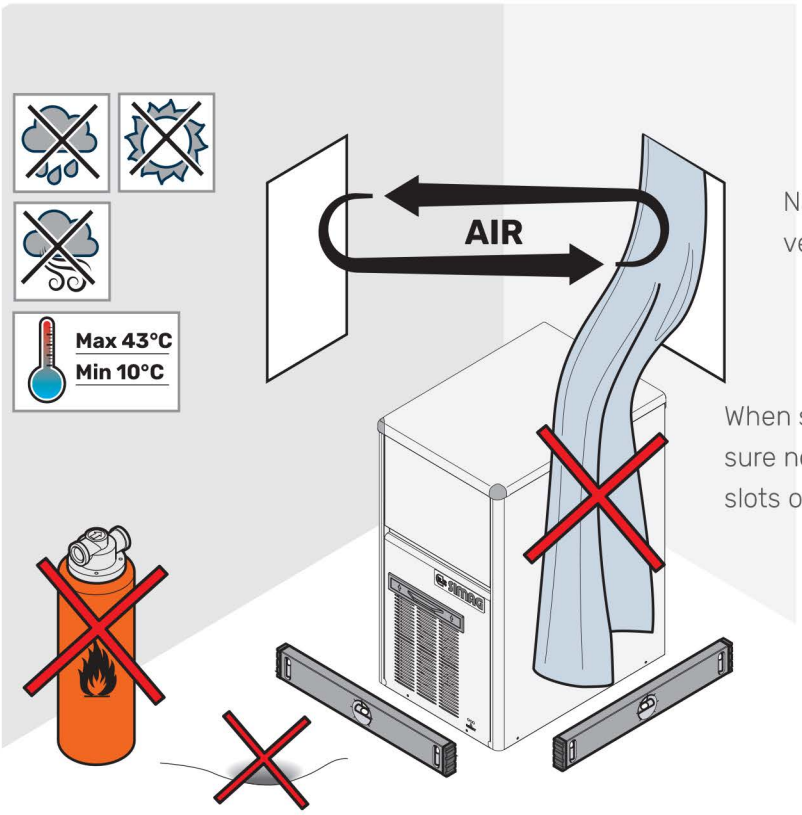
F05 WARNING. This ice maker is designed to be installed **inside** rooms solely dedicated to the **storage of foodstuffs** and which **comply with the current regulations** in terms of work safety, installations and fire prevention.

Prolonged periods of operation at temperatures outside the following limits constitute misuse according to the warranty terms and automatically void the warranty.

The manufacturer's warranty does not cover oxidation due to installation in marine environments or in the presence of salt air.

The appliance must not be exposed to vibrations, high-frequency noise, dust or foreign materials, as such exposure may lead to deterioration or mechanical failure. It must also not be exposed to the elements (rain, hailstones, fog, snow, etc.).

The appliance must be easy to move for any extraordinary maintenance that may be required. Pay attention that any masonry works subsequent to the installation (for example construction of walls, replacement of doors with narrower ones, renovations, etc.) do not hinder movement.



Natural or forced ventilation

When selecting the position, make sure not to obstruct the ventilation slots of the appliance.

The environment must not contain explosive or flammable materials or substances

MINIMUM DISTANCES TO BE RESPECTED

F06 Install the appliance:

- so that the electricity and water connection points are at easy reach;
- leaving the spaces indicated in the figure from any walls or other neutral appliances;
- at a distance of about **15 cm** from hot appliances (for example fryers, ovens, hotplates, etc.).

Always ensure that the position chosen for the installation allows for the convenient and easy removal of the ice cubes and that there is sufficient space for daily cleaning and extraordinary maintenance (for example repairs).

Also check that there are NO curtains or obstacles in the vicinity of the appliance that could obstruct or prevent proper air circulation through the ventilation slots.

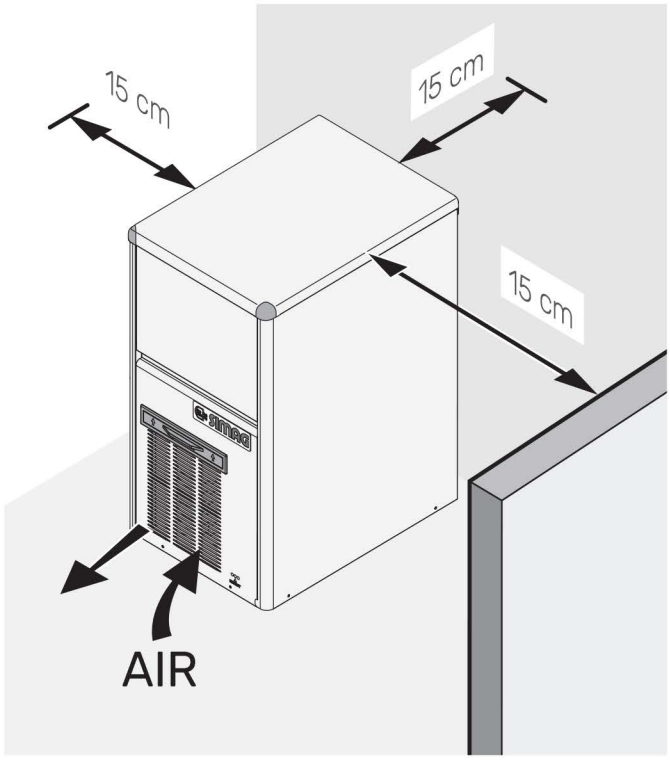
POSITIONING

AC | EC series appliance

Appliances must **only be placed on the floor**.
The floor on which the machines (AC | EC series) rest must be flat, smooth, fireproof and have the technical and structural characteristics to support the weight of the appliance and the ice cubes produced.
Slight unevenness of the floor can be compensated for by adjusting the feet of the appliance, rotating them until perfect levelling is achieved.

If, due to severe unevenness or slopes in the floor, the appliance cannot be set perfectly level, operation and drainage may be impaired!

Caution! Do not install the machine on containers with an area lower than the base of the machine.



F06

CONNECTIONS

Connection warnings

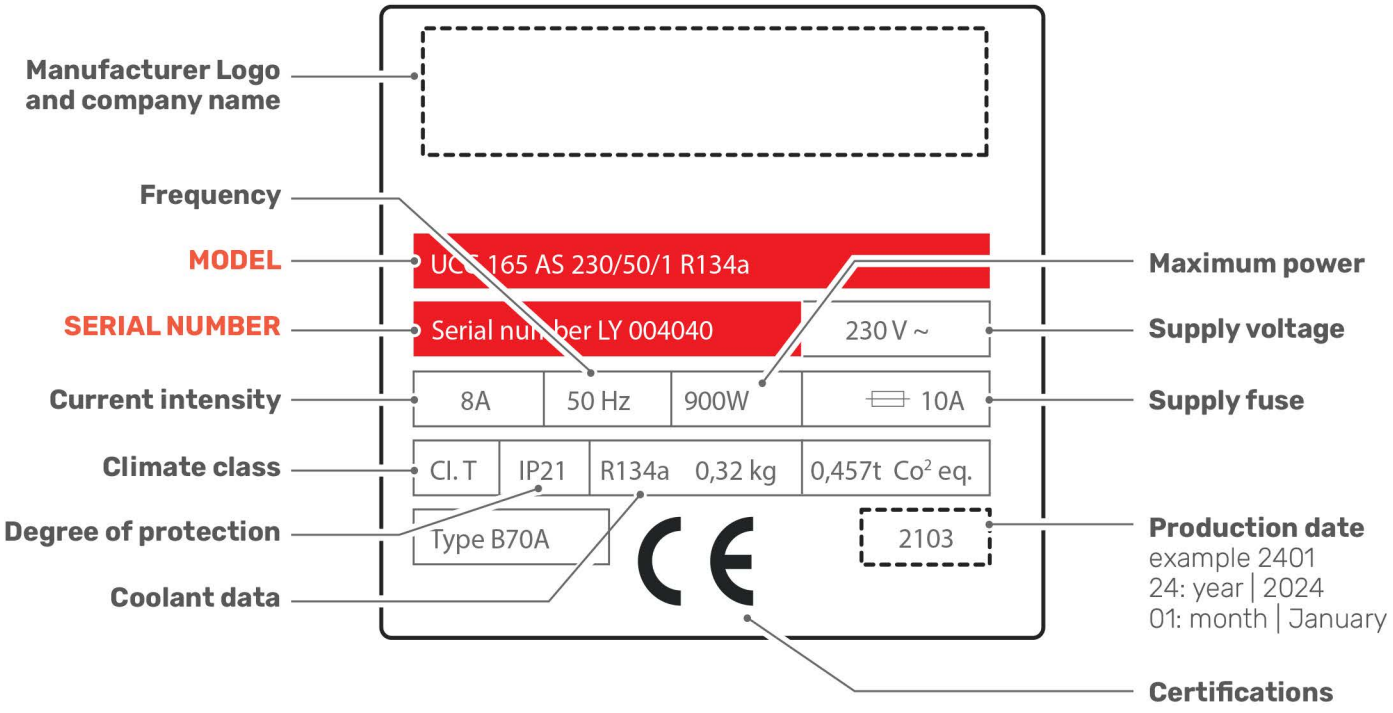
The appliance requires the following connections to the systems inside the room:

- **water** connection (1 or 2 water ports depending on the machine install);
- **electricity** connection.

All connections must be completed by qualified personnel, wearing personal protective equipment (for example gloves, safety shoes, etc.), in accordance with the regulations in force in the country of use and in compliance with the regulations on installations and safety at work.

Consult the rating plate

F07 Before completing the connections, it is necessary to **check the details** of the appliance to ensure that they match those of the system; all data can be found on the rating plate **located on the back of the equipment**.
The rating plate provides important technical information, which are also indispensable in the event of a request for maintenance or repair of the appliance. It is therefore recommended not to remove, damage or modify it.



F07

Water connection

Before connecting the appliance to the water mains, it is mandatory to carefully read the safety instructions on page **4** of this manual.
The following are supplied with the appliance:
Air models
- 1 reinforced plastic hose with 3/4" female fitting
- 1 X 20 mm diameter water outlet pipe, not threaded

CONNECTION TO THE WATER MAINS

The position of the inlet ports is different depending on the model. Refer to the data sheet of the appliance to be installed.

Air-cooled models

The appliance requires the following water connections:
- A 3/4" connection to the water mains in order to fill the machine with the drinking water required for making ice cubes.

CHARACTERISTIC OF INLET WATER

Water is the only ingredient for making ice; therefore, the characteristics of the incoming water must not be neglected. For example, a supply water pressure of less than 1 bar can cause malfunctions in the appliance. The use of excessively mineralised water could result in the production of opaque ice cubes and considerable fouling of the internal parts of the water circuit.

The incoming water must have the following characteristics:
- be **potable** (only the water used to create the ice cubes);
- have a **temperature** between 5°C and 38°C;
- have a **maximum conductivity** of 100µ S/cm
- have a **maximum hardness** of 17.8 °f

  if the water hardness is higher, use a water softener (not supplied). The choice of the type of softener is the responsibility of the installer. Damage to components due to limescale deposits is not covered by the warranty;
- have a **pressure** value between 1 Bar and 5 Bar. If the inlet pressure is lower than the indicated value, use a pump with a suitable flow rate (minimum flow rate 300 l/h); if it is higher, use a pressure reducer.

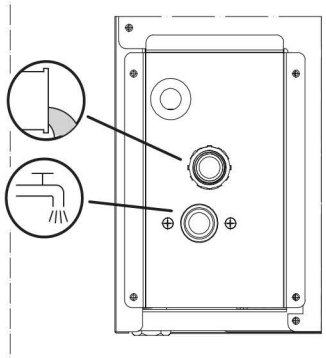
CONNECTION TO THE DRAIN

The position of the drains differs depending on the model. Refer to the data sheet of the appliance to be installed.

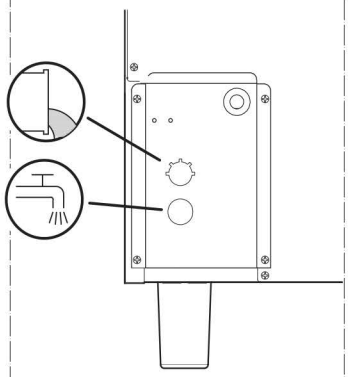
F08 Connect to the **ø 20mm "A" fitting** a **"T" drain pipe** made of rigid plastic and with a 18 mm internal diameter as extension (not supplied). The discharge of excess water takes place by gravity; to ensure a regular outflow, it is essential that the drain has an air vent and goes into an open siphon. The choice of the type and the fixing method is the responsibility of the installer; it is advisable to have a length and slope such to allow the proper drainage of condensate and to install a siphon.
An air gap of 2.5 cm must be maintained between the exhaust pipe and the evacuation area (grating or other receiving pipe). This ensures that potentially dangerous bacteria are NOT able to travel up the drain and contaminate the appliance.

F08 Water-cooled appliances require a separate water drain line to be connected to the 3/4" fitting marked "Water drain - water-cooled only".

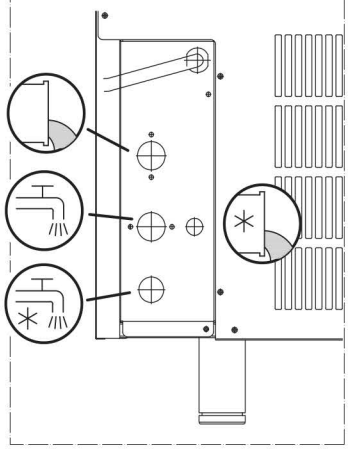
SDH 18 | 24 | 30 | 40



SDH 50 | 64 | 84

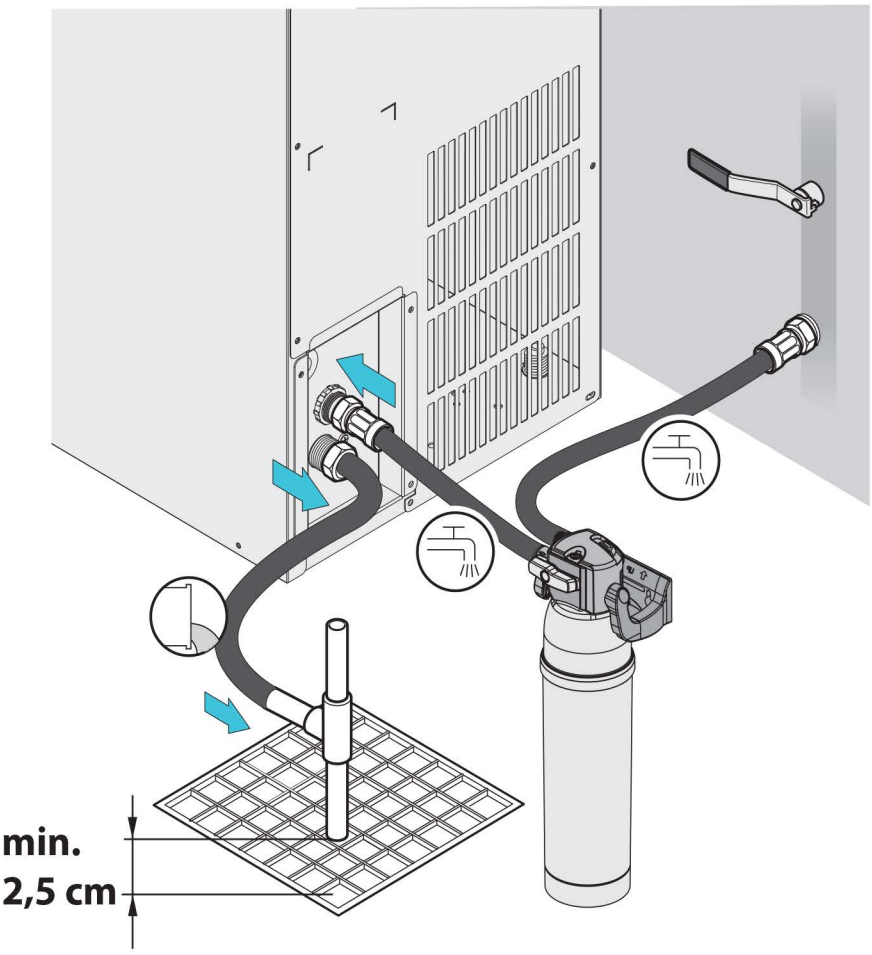


SDH 100 | 170



Max 38°C
Min 5°C

Max 18 °f | 10°dH **Max 5 Bar / 0,5 MPa**
Min 7 °f | 4°dH **Min 1 Bar / 0,1 MPa**
Min 100µ S/cm



A: ø 20 mm tray water drain

B: 3/4" gas drinking water inlet

C: 3/4" gas or 20 mm depending on model - water drain (water-cooled models only)

D: 3/4" gas inlet (water-cooled models only)

F: softener filter recommended (not supplied)
M: 3/4" drinking water connection
N: 3/4" water connection (water-cooled models only)
O: shut-off tap

Electrical connection

SAFETY WARNINGS

Before making any electrical connections, it is mandatory to carefully read the safety instructions on page **4** of this manual and always compare the system data with the data on the rating plate.

The connection to the power supply network must comply with the regulations in force in the country where the appliance is installed and must be carried out by **qualified personnel authorised by the manufacturer**. Failure to comply with these requirements may result in damage and injury, invalidates the warranty and releases the Manufacturer from all liability.

For the connection **do not use adapters or multiple sockets**. **It is not possible to lengthen or join** the power cable in any way. **Do not roll up** the cable on itself if it is too long, and take care that it is not pinched, crushed or in the way of people passing by.

The connection system must:

- have a **maximum voltage variation** of +/-10% from what indicated on the rating plate (low voltage can cause abnormal operation and can result in serious damage to protections and electrical windings);
- have suitable **earth connection** using a single seamless cable, not even interrupted by the circuit breaker. The yellow/green earth conductor must be at least 10 mm longer than the other conductors;
- have an easily accessible **thermal-magnetic ON/OFF switch**, with appropriate fuses (see rating plate) and with a contact opening distance such as to ensure complete disconnection in case of category III overvoltage conditions. Disconnection devices must be incorporated into the power supply in compliance with the installation rules. This switch is necessary to cut off the power supply to the machine if it is directly connected to an electrical panel or if its plug is positioned in a place that is difficult to access.

Each appliance must also be part of an efficient **equipotential system** that complies with the regulations in force in the country of installation.

Replacement of the power cable, if necessary, should only be carried out by a qualified and authorised technician. The cable may only be replaced with one of similar characteristics.

CONNECTION TO THE POWER GRID

The appliance can be supplied:

- with power cable and plug or
- with power cable without plug.

APPLIANCE WITH POWER CABLE AND SCHÜKO PLUG ALREADY FITTED

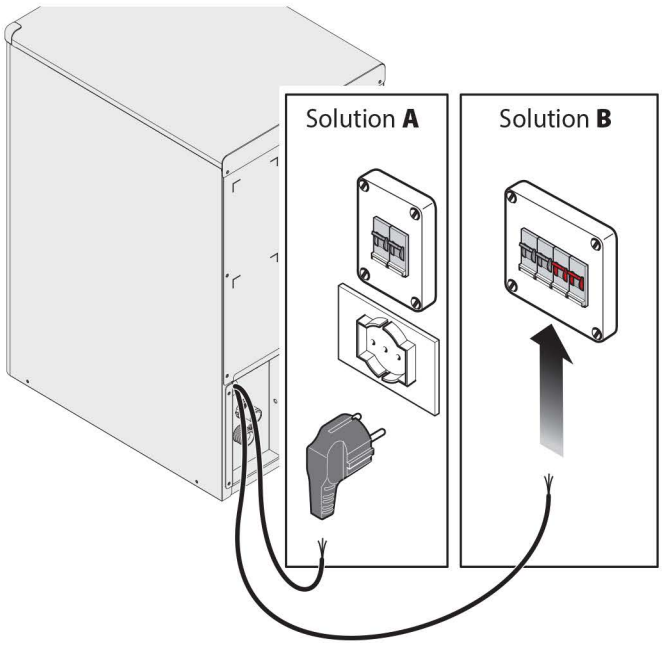
F09 To connect appliances **with power cable** and **schüko plug already fitted**, simply insert the plug into a socket with a capacity appropriate for the electrical characteristics of the machine, which can be found on the rating plate.

APPLIANCE WITHOUT A PLUG FITTED

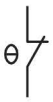
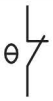
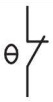
The connection must be carried out by qualified personnel in one of two ways:

- by fitting a **plug** appropriate for the electrical characteristics of the machine;
- by connecting to an **electrical panel** that complies with the regulations in force in the country where the appliance is installed.

All electrical data can be found in the data sheet of the appliance to be installed.

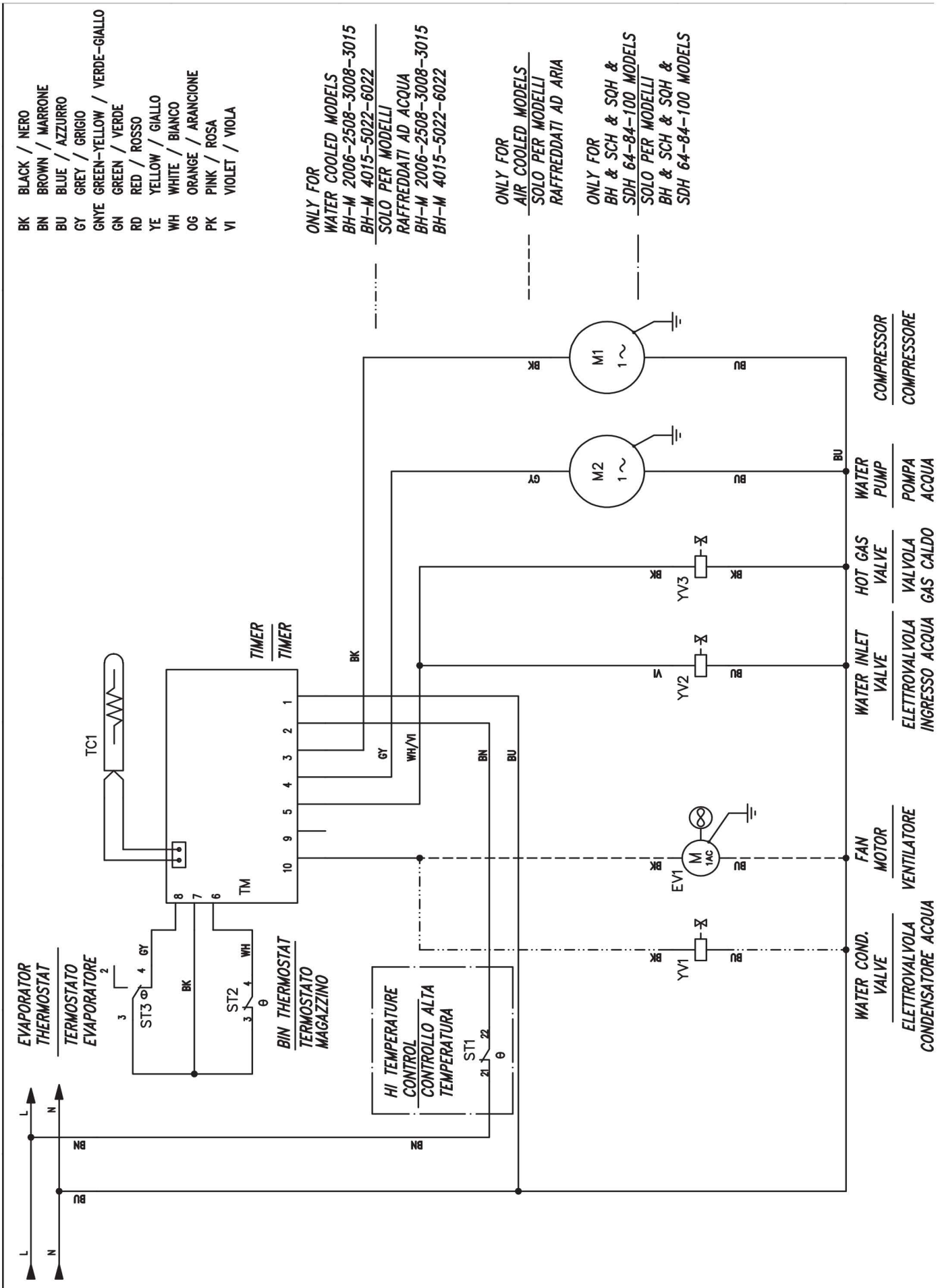


F09

	EV1	Fan
	M1	Compressor
	M2	Water pump
	SP1	Water pressure switch
	ST1	High-temperature control thermostat
	ST2	Storage thermostat
	ST3	Evaporator thermostat
	TC1	Condenser temperature sensor
	TM1	Electronic timer
	YV1	Condenser water solenoid valve
	YV2	Water inlet solenoid valve
	YV3	Hot gas solenoid valve

BN	brown
BK	black
BU	Blue
GY	grey
GNYE	yellow-green
GN	green

YE	yellow
OG	orange
PK	pink
RD	red
WH	white


BK BLACK / NERO
BN BROWN / MARRONE
BU BLUE / AZZURRO
GY GREY / GRIGIO
GNYE GREEN-YELLOW / VERDE-GIALLO
GN GREEN / VERDE
RD RED / ROSSO
YE YELLOW / GIALLO
WH WHITE / BIANCO
OG ORANGE / ARANCIONE
PK PINK / ROSA
VI VIOLET / VIOLA
ONLY FOR WATER COOLED MODELS BH-M 2006-2508-3008-3015 BH-M 4015-5022-6022
SOLO PER MODELLI RAFFREDDATI AD ACQUA BH-M 2006-2508-3008-3015 BH-M 4015-5022-6022
ONLY FOR AIR COOLED MODELS
SOLO PER MODELLI RAFFREDDATI AD ARIA
ONLY FOR BH & SCH & SQH & SDH 64-84-100 MODELS
SOLO PER MODELLI BH & SCH & SQH & SDH 64-84-100 MODELS
TIMER
TIMER
TM
TC1
EVAPORATOR THERMOSTAT
TERMOSTATO EVAPORATORE
ST3
ST2
BIN THERMOSTAT
TERMOSTATO MAGAZZINO
HI TEMPERATURE CONTROL
CONTROLLO ALTA TEMPERATURA
ST1
M1 1~
M2 1~
COMPRESSOR
COMPRESSORE
WATER PUMP
POMPA ACQUA
HOT GAS VALVE
VALVOLA GAS CALDO
YV3
WATER INLET VALVE
ELETTROVALVOLA INGRESSO ACQUA
YV2
FAN MOTOR
VENTILATORE
EV1
M 1AC
WATER COND. VALVE
ELETTROVALVOLA CONDENSATORE ACQUA
YV1
L
N
BK
BN
BU
GY
WH/VI
GN

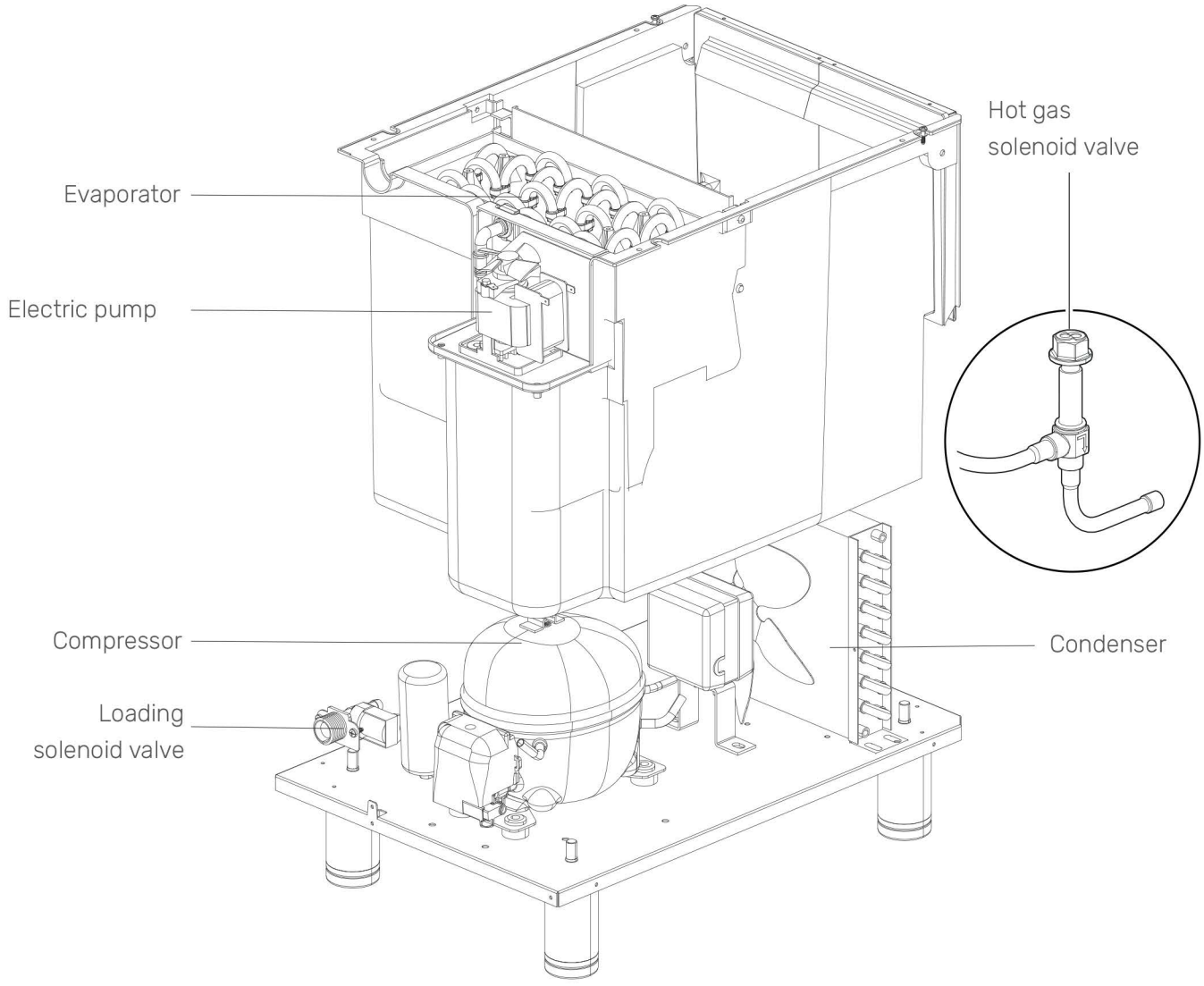
RUNNING TEST

After positioning and connecting the appliance, check that:

	it is level and that all specified clearances are as required	page **13**
	room temperatures never fall below 10°C, even during the winter months	page **13**
	all required electrical and plumbing connections have been completed	page **16**
	the water shut-off valve(s) is/are in the ON position (open)	page **17**
	the inlet pressure of the water circuit is at least 1 Bar	page **17**
	the refrigerant circuit and water circuit piping do not emit vibrations	page **17**
	the voltage of the power supply line is the same as that specified on the rating plate	page **19**
	the inside walls of the ice container have been cleaned and disinfected	user manual supplied with the appliance
	the compressor anchor bolts allow the compressor to swing on the supports	
	all the documentation relating to the appliance and the details of the authorised service centre have been handed over to the user	

NOTES

Air models



DESCRIPTION OF THE COMPONENTS

Pump

The **pump** only operates continuously during the freezing cycle by directing water towards the spray plate. From the spray plate, water is directed through sprayers into the inverted cups, undergoing, at this stage, some aeration to produce a solid, crystalline ice cube.

Water inlet solenoid valve - 3/4 male fitting

The water inlet **solenoid valve**, located at the rear of the appliance, is only energized during the defrost cycle. When energized, it allows a limited amount of water to flow to the top of the evaporator plate, assisting the hot gas during the cube detachment phase. This water is then discharged from the evaporator plate through the drain holes and into the collection tank below, where it is sucked by the pump and directed to the spray plate. Water-cooled models SDH 18- 24- 30- 40- 50- 64 have a second water inlet solenoid valve, electrically powered via the timer.

Hot gas solenoid valve

The **hot gas solenoid valve** essentially consists of two parts; the body and the coil respectively. During the defrost cycle, the coil at top of the hot gas valve is activated, attracting the plunger located inside the valve body. This opens the passage to the hot gas pumped by the compressor, allowing it to flow directly into the evaporator coil, detaching the ice cubes from the cups.

Container thermostat

The sensitive tube of the container **thermostat** (capillary tube) is inserted into the bulb holding tube secured to the wall of the ice storage cabinet and has the task of interrupting the operation of the appliance when the sensitive tube is covered by ice, and restarting it as soon as the ice has been removed. The container thermostat is calibrated directly at the factory to stop the appliance at 1°C and reactivate it at 4°C.

Evaporator thermostat

(cube size check)

The **evaporator thermostat** at the front of the electrical box is essentially a temperature control that closes its contacts 3-2 when the temperature drops (freezing cycle) and opens them, by closing contacts 3-4, when the temperature rises (defrosting cycle). This control determines the duration of the freezing cycle and consequently the size of the ice cubes. A low setting will produce ice cubes that are too full, whereas a high setting will produce incomplete ice cubes (too empty). The evaporator thermostat is set at the factory. When the thermostat contacts are closed, the timer that completes the freezing cycle is started, subsequently switching to the defrost cycle.

Fan (air cooling)

In models SDH 18 - 24 - 30- 40 -50, the fan works continuously and is connected to the compressor. In models SDH 64-84-100-170, the **fan** is connected to the electronic timer, whose operation is constantly controlled by the condenser probe.

Hermetic compressor

The **hermetic compressor** is responsible for circulating the refrigerant through the entire system. It draws in the refrigerant in the form of low pressure and low temperature vapour and then compresses it, causing its pressure and temperature to rise accordingly, transforming it into high pressure and high temperature vapour, which leaves the compressor through the drain valve.

Slide and spray plate

The water, forced by the pump inside the **spray plate**, flows out through the sprayers, whose task is to form a fan-shaped jet and direct it towards the cooled cups of the evaporator.

Safety thermostat

Located at the bottom of the electrical box, this is manually activated and stops the operation of the appliance when its bulb (anchored to the liquid line just before the dehumidifier filter) reaches a temperature of 70°C.

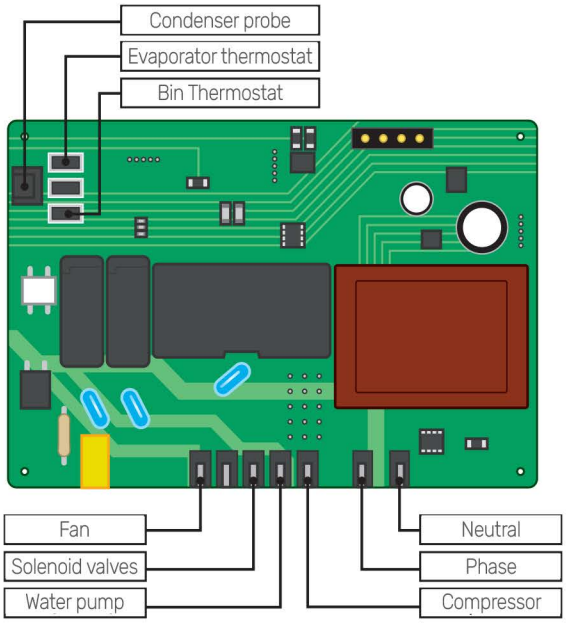
Pressostatic valve

(only for SDH 84- 100-170 water-cooled models)

The pressostatic valve maintains the high pressure in the refrigerant circuit at a constant value by varying the condenser cooling water flow. As the pressure rises, the pressostatic valve opens further to increase the flow of cooling water to the condenser.

Electronic timer

(on all models)



The Electronic Timer is equipped with a Dip Switch with two switch buttons and a potentiometer, which control its operation. The first switch (1) is set by the factory to the ON position in order to activate the compressor for normal machine operation. If set to OFF, it deactivates the compressor, only leaving the water pump running to flush the hydraulic circuit. The second switch (2) can be used to set the predefined additional time (Ta) of the second stage of the freezing cycle. It is factory set at 8 or 12 minutes depending on the machine model.

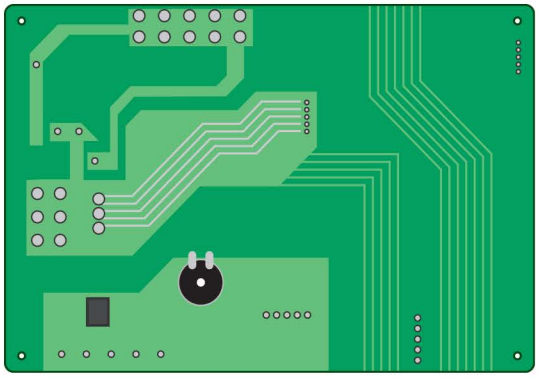


Table summarising the functions of the two microswitches

	No. 1	No. 2
ON	Standard Compressor Setting ON	Ta= 12"
OFF	OFF setting washing phase Compressor OFF	Ta= 8"

On the other hand, the potentiometer is used to adjust the defrost cycle time; this time is set at the factory according to the machine model and has an adjustment range from a minimum of 60" (clockwise rotation) to a maximum of 180" (counter-clockwise rotation).

Condenser probe

The **condenser temperature probe** (inserted between the fins of the air condenser, or in contact with the condenser coil in case of water condenser) detects the **condensation temperature** and transmits its variations to the electronic timer. Depending on the temperature, it activates or deactivates the fan (air cooling) or the solenoid valve (water cooling).

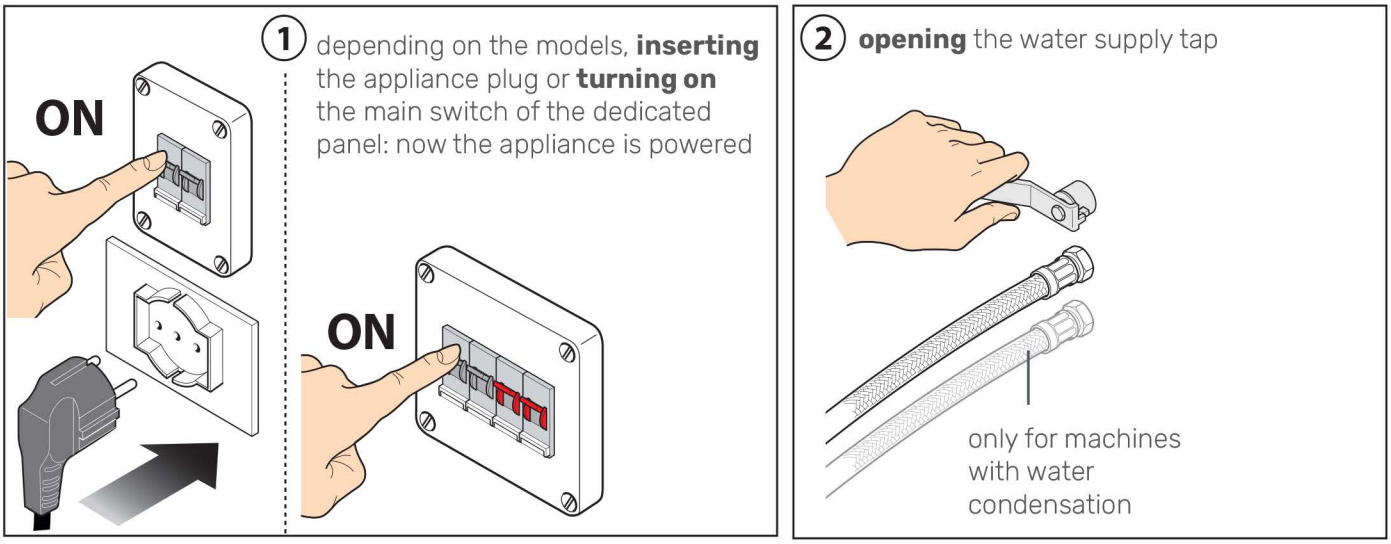
OPERATING PHASES

OPERATING PHASE

Start-up | loading

(1) **Power the appliance** inserting its plug into a socket with adequate capacity and turning the switch that powers the socket to ON or, if the appliance has been connected to an electrical panel, set the main switch of the panel to ON: the appliance is now powered up.

(2) Open the **water supply tap** so that it can be filled from the appliance.



F11

Ice cube production start

3 To improve the appearance of the cubes produced, some appliances have the option of making adjustments based on the temperature of the room where the appliance is located via an evaporator thermostat.

If present, rotate the knob:

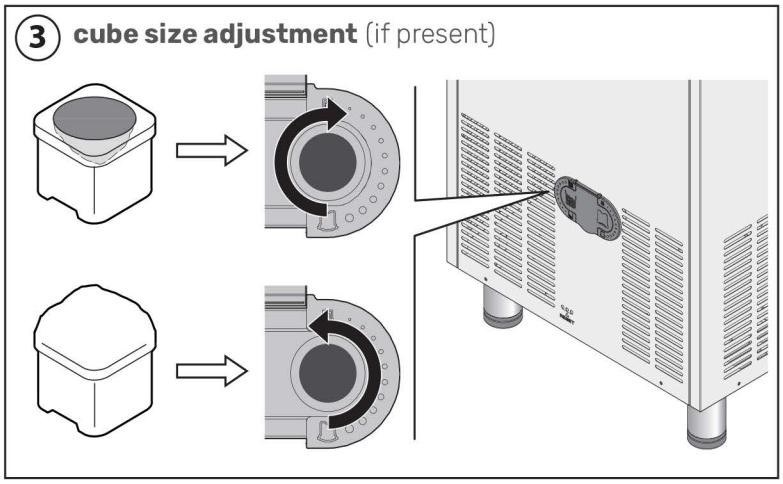
- to the right if the cube is empty.
- to the left if the cube is too full.

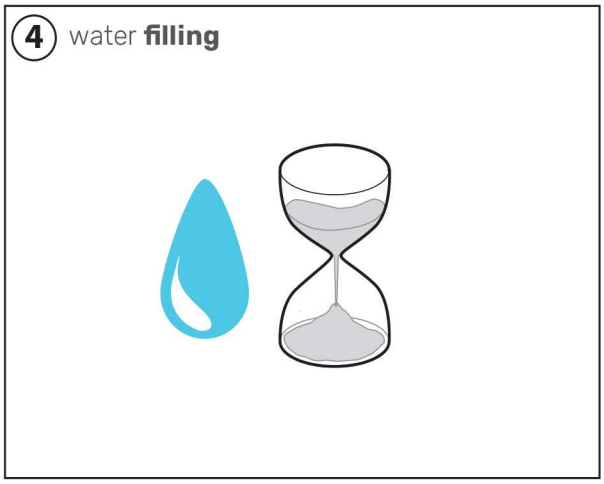
When the room temperature varies (for example when the seasons change), it may be necessary to turn the knob again.

The screw on the left is used to adjust the filling of the ice container (it changes the intervention temperature of the thermostat in the container); its adjustment is reserved to technical personnel and is normally carried out only once when installing the appliance.

If the ice cubes are not very deep and not perfectly transparent, it is possible that the appliance does not fill with water at the end of the freezing cycle or that the chemical/physical characteristics of the water supplied are not optimal (for example in case of excessive hardness it would be advisable to use a softener filter).

4 The appliance starts loading water automatically. After about **5 minutes** (the time varies depending on the model) loading is completed and the ice cube production cycle starts.





After about 20-30 minutes (depending on the model) the first cubes will be released which can then be removed from the container using the scoop provided. Subsequently, at intervals of about 20-30 minutes other ice cubes will be released continuously, without needing to press any button.

To avoid excessive filling of the built-in container and possible ice cube spills, inside the container there is a container thermostat stopping production if the maximum capacity level is exceeded. When the cubes are withdrawn and the level drops, the appliance automatically resumes production without the need for any operation on the part of the user. After taking the ice, the scoop must be placed inside the collection container; to avoid contamination of the ice, use only the scoop provided and sanitize it frequently.

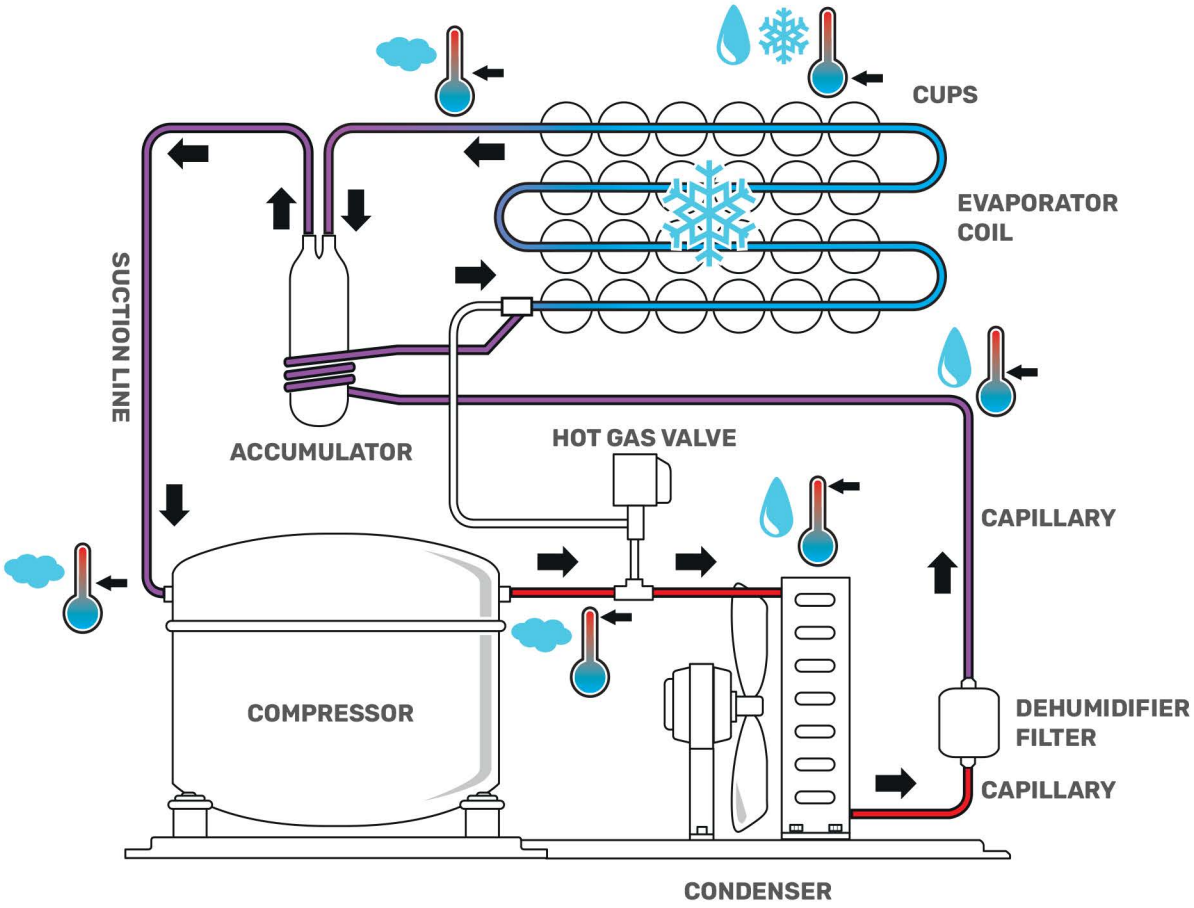
PRODUCTION PHASE (FREEZING CYCLE)

After about **5 minutes** loading is completed and the ice cube production cycle starts.

How the process happens | refrigerant state changes

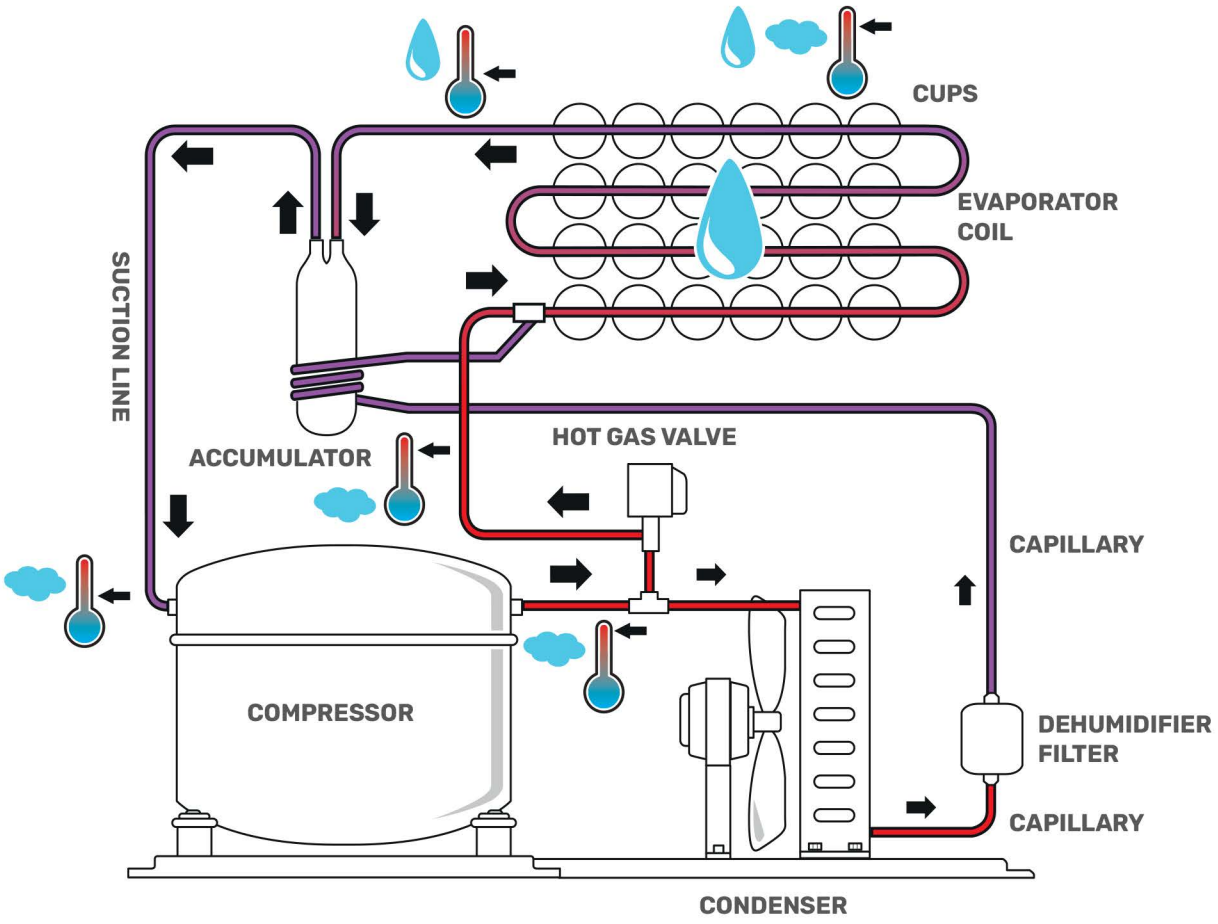
F12 Refrigerant in its **gaseous state** and at **high temperature** is pumped by the **compressor** and passes through the **condenser**, where it is turned into **liquid refrigerant**. The liquid line takes the refrigerant from the condenser to the **capillary tube**, through the **dehumidifier filter**.
As it passes through the capillary tube, the refrigerant in its liquid state gradually loses some of its pressure and, therefore, some of its temperature.
The water sprayed into the inverted cups of the evaporator via an **electric pump** releases heat to the refrigerant circulating inside the coil, causing its evaporation and its physical change of status, from liquid to **vapour**.
After going through the **accumulator**, the refrigerant in gaseous state is sucked back into the **compressor** via the **suction line**.

FREEZING PHASE

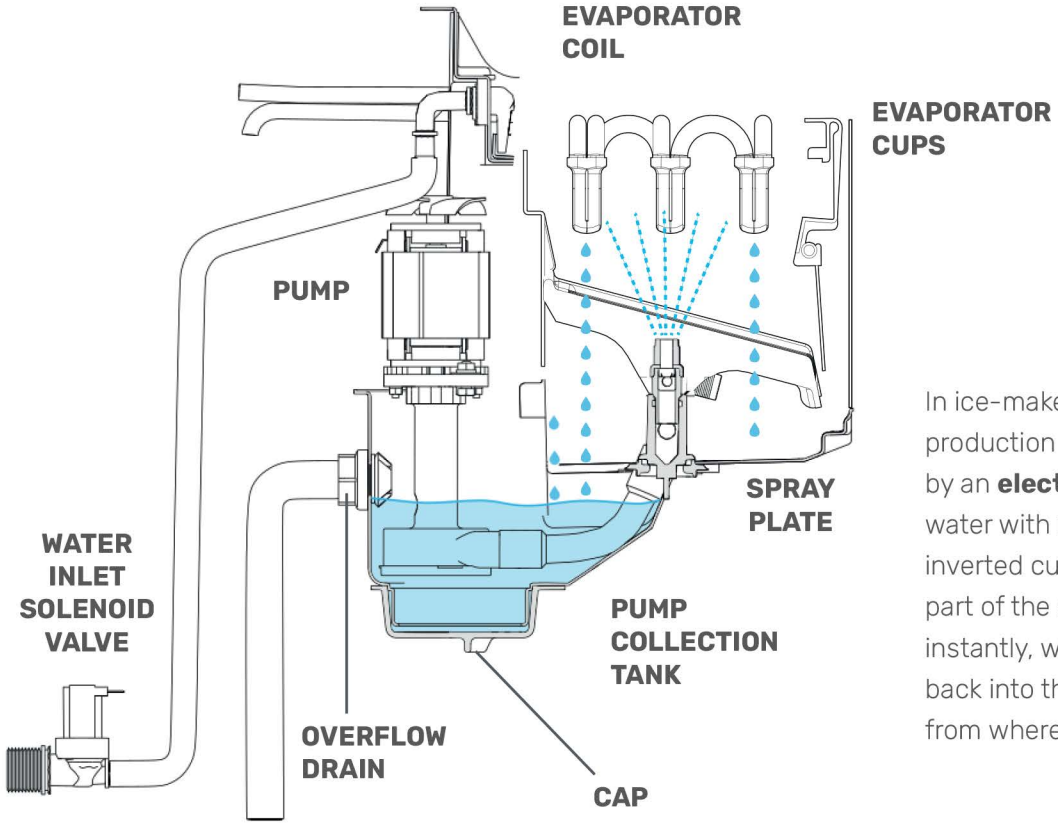


F12

DEFROSTING PHASE



F13



In ice-makers, the water used for ice production is kept constantly moving by an **electric pump** that sprays water with moderate pressure into the inverted cups of the evaporator. Here, part of the sprayed water freezes instantly, while the remainder falls back into the **recovery tank** below, from where it is recirculated.

F14

There is a second freezing cycle phase controlled by a timer. The components in operation during the freezing cycle are:

- COMPRESSOR
- PUMP
- FAN (air-cooled models)

Second freezing phase

(controlled by the board's electronic timer)

The second freezing cycle phase is controlled by the electronic timer integrated in the board; it is preset at the factory depending on the ice-maker model.
If necessary, it is still possible to set the duration of the second freezing cycle phase by adjusting the position of the switches.
The discharge pressure is controlled by a condenser probe in the fan, between 17 and 13.5 bar. These values are affected by the temperature of the environment in which the appliance is installed and increase proportionally as the latter rises.

In water-cooled models, the discharge pressure is maintained at 15 bar by means of a pressostatic valve.
The duration of the freezing cycle varies between 20 and 22 minutes.

When the evaporator thermostat reaches the temperature set using the knob (generally between -15 °C and -25 °C), the contact opens and closes. In this way, the timer starts counting the additional time, which can be 8 or 12 minutes depending on the model. At the end of the additional time, the system automatically starts the defrost cycle.

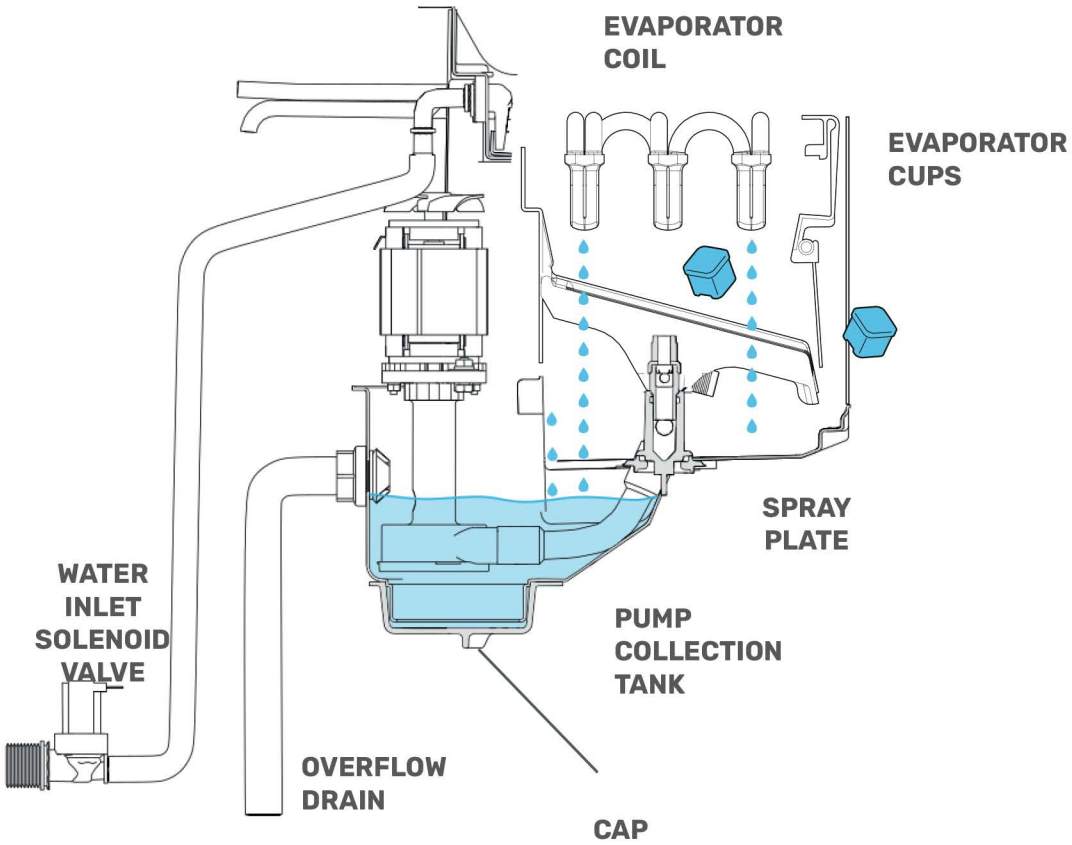
THAWING CYCLE

The timer completes the second part of the freezing cycle and the defrost cycle begins.
The components in operation are:

- COMPRESSOR
- WATER INLET VALVE
- HOT GAS VALVE

The incoming water passes through the inlet solenoid valve and the flow control, which is located inside it, to the top of the evaporator, from where it flows through drainage holes into the pump collection tank below.
The maximum water level in the tank is limited by an overflow pipe, the function of which is to direct excess water towards the drain.
The refrigerant in its gaseous state, pumped by the compressor, is now directly diverted from the open hot gas valve to the evaporator coil, following the most direct path, therefore not passing through the condenser.

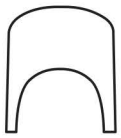
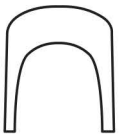
The hot gas circulating inside the evaporator coil raises the temperature of the cups, causing the detachment of the same from the ice cubes.
The loose cubes fall onto a tilted plane, from where they slide through the slatted curtain opening and fall inside the ice container.

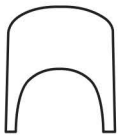
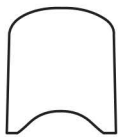


DIAGNOSTICS

ADJUSTING THE SIZE OF THE ICE CUBES

Before proceeding with any adjustments, use the troubleshooting section of this paragraph to check for possible problem causes. Do not make any adjustments until the refrigeration system of the appliance has settled down by performing several freezing and defrosting cycles.

	ICE CUBE PROBLEM	**SOLUTION**
 NORMAL ICE CUBE  ICE CUBE with excessive cavity	undersized ice cubes (excessive cavity)	The duration of the second part of the freezing cycle is too **short**. To increase it, turn the thermostat clockwise. If this is not sufficient, set switch 2 to ON (thus increasing from 8 minutes to 12 minutes).

	ICE CUBE PROBLEM	**SOLUTION**
 NORMAL ICE CUBE  ICE CUBE with excess ice	oversized ice cubes (convexity around the crown)	The duration of the second part of the freezing cycle is too **long**. To decrease it, turn the thermostat anti-clockwise. If this is not sufficient, set switch 2 to OFF (thus decreasing from 12 minutes to 8 minutes).

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDIES
Opaque ice cubes 	• Insufficient water	• See lack of water troubleshooting
	• Water dirty	• Use a water filter or purifier
	• Impurities build-up	• Use descaling fluid as instructed
Ice cubes of irregular and opaque appearance 	• Spray unit jets partially clogged	• Remove the cover and clean
	• Insufficient water	• See lack of water troubleshooting
	• Appliance not level	• Level as required
Inefficient defrosting	• Defrosting time too short	• Check or adjust the timer
	• Container thermostat faulty	• Replace the sensor
	• Clogged water inlet pipe	• Check the filter and the flow control.
	• Water inlet valve does not open	• Replace the valve
	• Hot gas valve does not open	• Replace the valve assembly
	• Clogged cup holes	• Clean the holes
	• Delivery pressure too low	• See wrong delivery pressure
Decline in production	• Inefficient compressor	• Replace
	• Leaking water inlet valve	• Clean or replace
	• Non-condensing gases in the system	• Download, empty and reload
	• Insufficient air circulation or room temperature too high	• Place the machine in a more ventilated environment.
	• Capillary tube partially clogged	• Drain, replace the dehumidifier filter, reinstate the vacuum and recharge
	• Leaking hot gas valve	• Replace
	• Lack of refrigerant	• Create a vacuum and load as per the nameplate
	• Excessive delivery pressure	• Check the fan/water inlet valve

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDIES
No defrosting	• Electronic board not working	• Replace the electronic board
	• Hot gas valve does not open	• Coil blown; replace
	• Water inlet valve does not open	• Coil blown; replace
Incorrect delivery pressure	• Condenser sensor not working	• Replace the condenser
	• Electronic board not working	• Replace the electronic board
	• Pressostatic valve poorly regulated	• Adjust the pressostatic valve
Excessive water on the machine base	• Leaking pipes	• Check, tighten or replace the pipes
The compressor cycles intermittently	• Low voltage	• Overload circuit check • Power supply voltage check
	• Non-condensing gases in the system	• Download, empty and reload
	• Compressor cables partially disconnected	• Check the various terminals
	• Mechanical problems	• Replace the compressor
Insufficient water	• Water sprays through the curtain	• Curtain position correct check
	• The water inlet valve does not open	• Replace the valve
	• Water leakage from the tank	• Locate and repair
	• Obstructed flow control	• Descale or replace the water inlet valve

MAINTENANCE

FOREWORD

The details of the maintenance and cleaning periods and procedures are supplied as a guide and should not be regarded as absolute and imperative. Cleanliness, in particular, is closely linked to the condition of the environment and the water used, and the amount of ice produced.
Each appliance must have its own individual maintenance plan, in accordance with its specific location.

Appliance cleaning

DAILY

Clean the **ice scoop** with the manufacturer's disinfectant mixed with warm water (1 ml in 1 litre of water, the dilution percentages are also indicated on the rear label of the product). Finish rinsing and drying it thoroughly.

MONTHLY

Clean the **ice collection compartment** with a soft cloth soaked with the manufacturer's disinfectant mixed with warm water (1 ml in 1 litre of water, the dilution percentages are also indicated on the rear label of the product). Finish with a thorough rinsing.

Clean the **external surfaces** with a soft cloth moistened with a specific product for stainless steel, free of acid, aggressive or abrasive agents. For how to use it, refer to the instructions provided by the manufacturer of the chosen detergent.

F15 Clean the front or side **"D" air vents** with a soft bristle brush or vacuum cleaner.

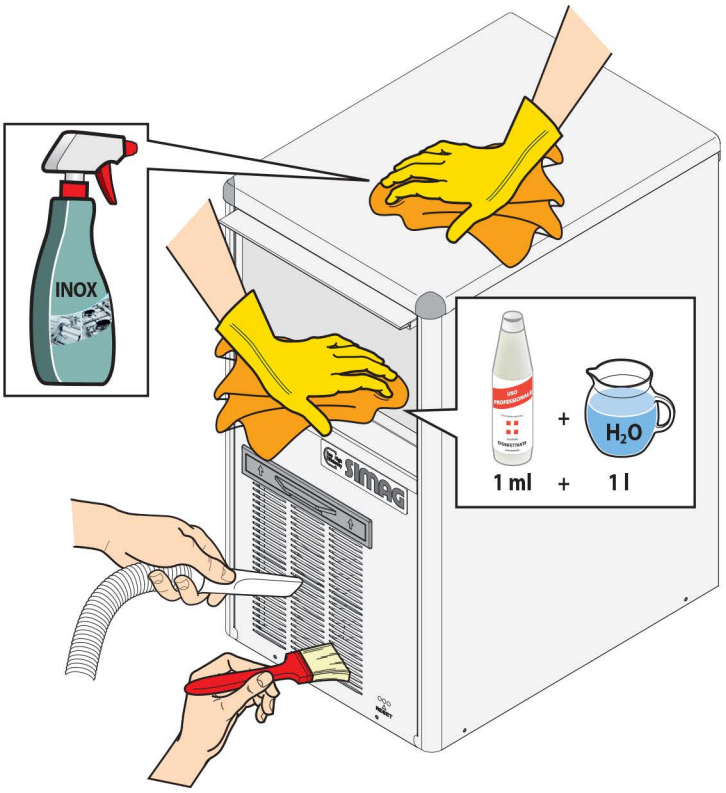
Clean the **control panel** and the **door** with a soft cloth slightly moistened with a neutral detergent suitable for delicate surfaces. For how to use it, refer to the instructions provided by the manufacturer of the chosen detergent.

EVERY 6 MONTHS / 1 YEAR

Contact the official local Dealer/Distributor for washing, descaling and sanitizing the water circuit.

EVERY YEAR

Contact your official local Dealer/Distributor for the annual maintenance plan.



F15

Cleaning the water circuit

Equipment required

Instructions for cleaning the water circuit

ACCESS TO THE APPLIANCE

- Remove the **front panel** and the **top panel** to access both the electrical box and the evaporator.
- Wait for the end of the defrost cycle and then stop the appliance using the external main switch.
- Remove all the ice stored in the container so that it does not become contaminated with descaling solution.

INITIAL WATER DRAIN

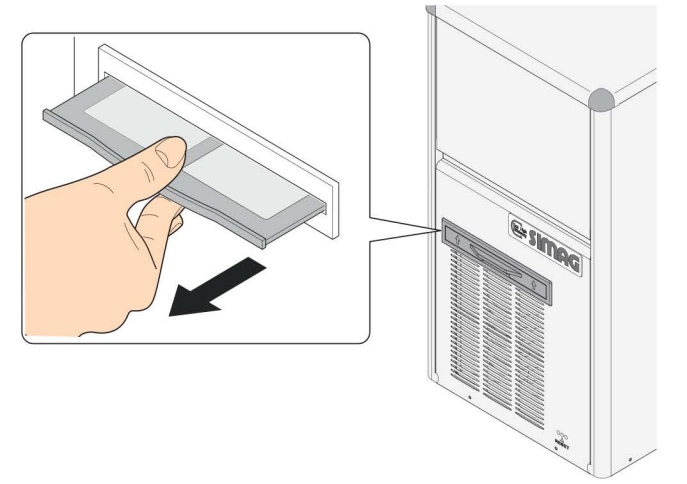
F16

- Remove the **plastic plug** under the water tank to drain the residual water along with the limescale deposits.

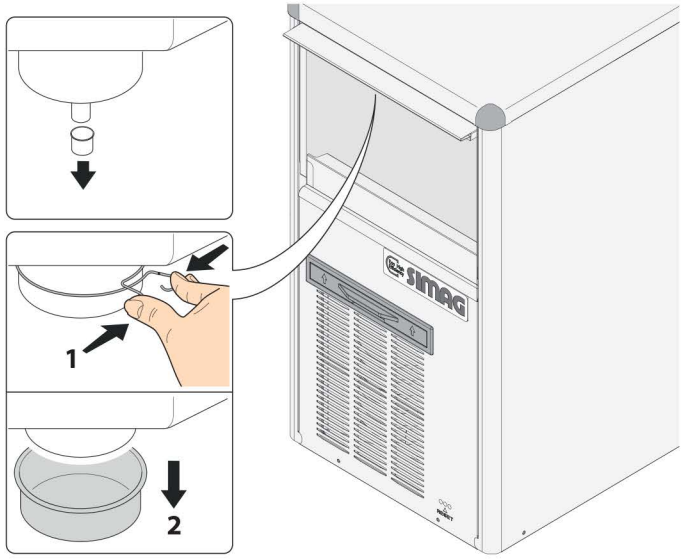
F17

WASHING THE REMOVABLE COMPONENTS

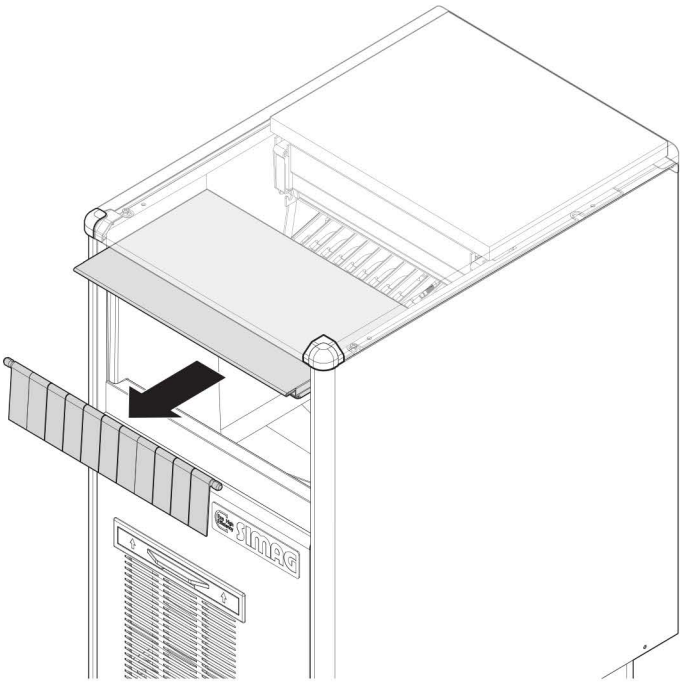
- Remove the removable plastic components: curtain, spray bar and other similar parts.
- In a clean container, prepare the descaling solution: mix 0.2 litres of product with 1-2 litres of warm (45-50 °C) drinking water.



F16



F17



F18

- Immerse the components in the solution, leave them to soak and, if necessary, brush gently to remove deposits.
- Rinse thoroughly with clean water.
- Replace the components before flushing the evaporator.

WARNING. The descaling agents for ice makers contain a solution of phosphoric and hydroxyacetic acid. This solution is corrosive and can cause intestinal disorders if ingested.

In case of ingestion, do not induce vomiting.

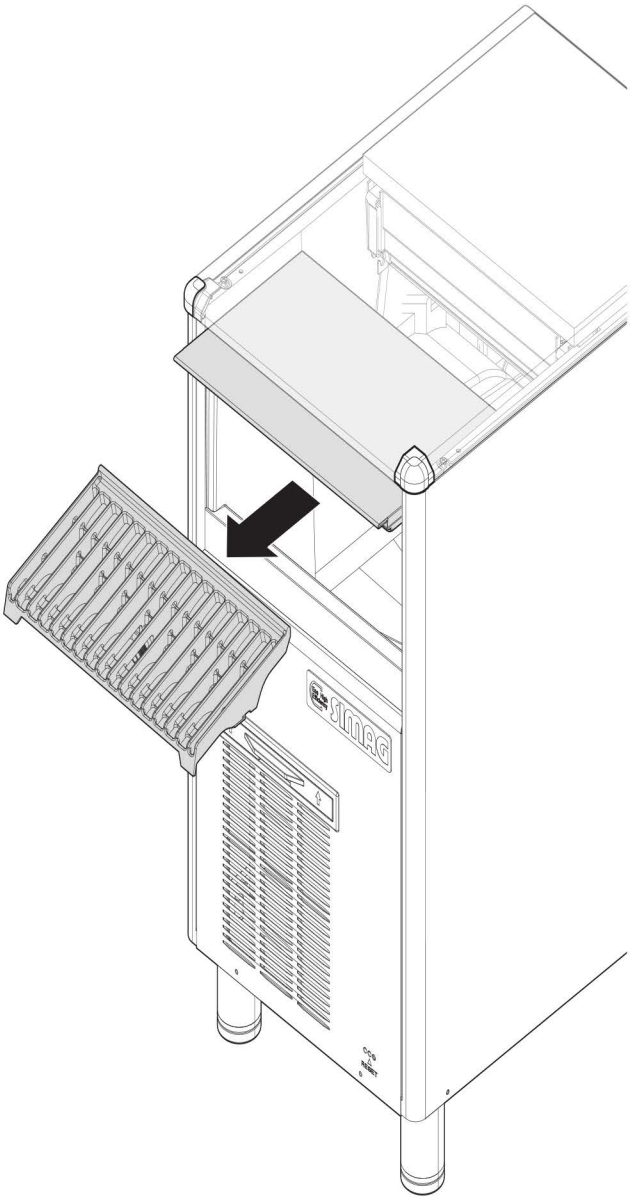
In case of ingestion, drink copious amounts of water or milk and immediately call the doctor. In case external contact, simply wash the area with water.

KEEP IT OUT OF THE REACH OF CHILDREN.

F18 **F19**

WASHING WITH DESCALING AGENT

- Remove the evaporator cover and slowly pour the prepared descaling solution between the copper moulds.
- Use a plastic brush to remove deposits in less accessible corners.
- Switch on the appliance using the main switch.
- Move the first dip-switch to OFF: this leaves the compressor switched off, while only the water pump runs.
- Allow the solution to circulate for about 20 minutes (without ice production).
- Switch the unit off at the main switch, remove the tank plug and drain the solution completely.
- Replace the plug.



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SANITISATION

- Switch the machine back on (main switch to **ON**).
- Pour a jug of water containing bactericidal solution on the top of the evaporator.
- Allow the solution to circulate for about 10 minutes.
- Switch off the appliance, remove the plug again and completely drain the solution.

WARNING

Do not mix bactericide with descaler: the combination can generate very aggressive acids.

RESTORING THE OPERATION

- Set the main switch back to **ON**.
- Allow the appliance to complete a defrost cycle to refill the water tank.
- When water is observed escaping from the drain, activate the compressor by setting the first dip-switch back to **ON**.
- The device then returns to normal operation.

FINAL OPERATIONS

- Refit the front and top panels of the appliance.
- Remove and discard the ice produced in the first cycle (it may contain acidic residues).
- Thoroughly clean the ice container with bactericidal solution and rinse with clean water.

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ed. 09 | 2025 rev. 00