



# Basic training – ITV machines differences

Service – Aprill 2018

# Machines by type of ice

## ICE MAKING

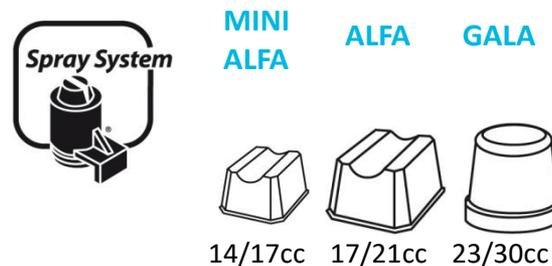
Ice is produced by freezing water. To freeze water, a thermodynamic process occurs extracting heat from the water, cooling down the water, until it freezes. To do such process, different components are used, all of them are known as the refrigeration system of an ice machine.

The ice machines are **cyclical** when heat is used to harvest the ice, every cycle is the sum of freezing and harvesting (ice dropping from the evaporator).

The ice machines are **continuous** when there is no change on the regime to harvest the ice, they freeze all the time.

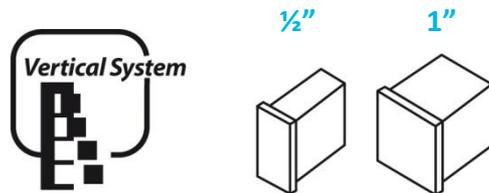
ITV ice machines produce different types of ice or ice cubes:

Spray system: System that produces the ice using an horizontal evaporator (comprised by the goblets where the water forms the ice cube). It uses a water pump to move the water. Cyclical machine.



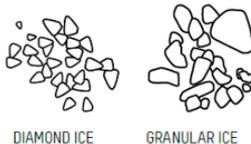
# Machines by type of ice

Vertical system: System that produces the ice using a vertical evaporator. Used in the half and full dice ice. Cyclical machine.

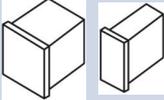


Axial system (Ice Queen): System that produces the ice using a cylindrical evaporator, with an auger that scratches the ice from the evaporator walls. It generates a granular ice, dry on the 50 and 85 versions (undercounter), humid in the rest. It is a continuous machine. It does not use a water pump.

## ICE QUEEN



# Machines by type of ice

ICE TYPE		WATER INJECTION TYPE	EVAPORATOR	WATER PUMP	ITV MACHINE
ALFA		SPRAY	HORIZONTAL	YES	ALFA NG
GALA		SPRAY	HORIZONTAL	YES	GALA NG
DICE / ½ DICE		SPRAY	VERTICAL	YES	SPIKA
GRANULAR		AXIAL (WITH AUGER)	TUBULAR	NO	ICE QUEEN

# Machines by type of ice



ALFA



GALA



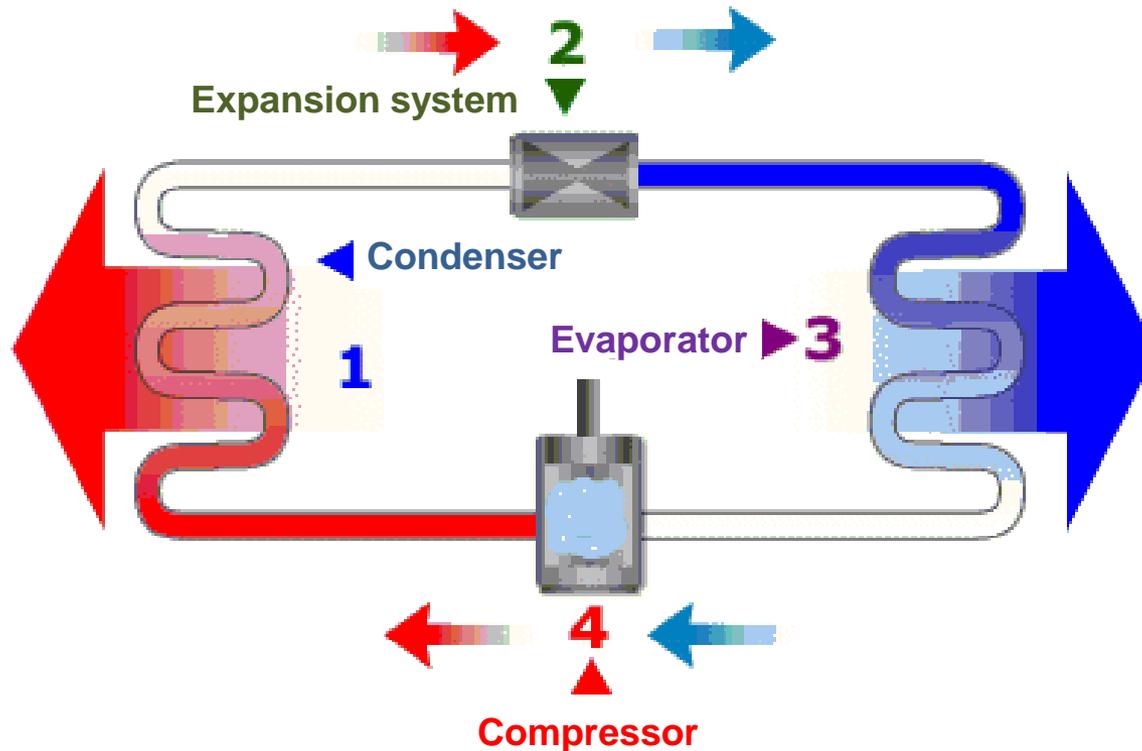
SPIKA



ICE QUEEN

# Refrigeration system

The refrigeration system, in charge of cooling down the water until becomes ice, it has the next principal elements:



# Compressor and condenser

## Compressor and condenser

- ✓ The condenser and the compressor are elements from the refrigeration system of the ice machines. Their function is to allow the machine to generate cold to form the ice and to produce heat to help harvesting the ice cubes. The compressor compresses the refrigerant gas that has the heat extracted from the water, to transfer that heat to the ambient using the condenser.
- ✓ In the granular ice machines (IQ) and the flake ice units (Scala), there is no need to produce heat to harvest the ice. Those are continuous machines, ice is formed in the evaporator wall and scratches to detach from the wall.



Different types of compressors

# Air vs water condenser

## Water condenser

- ✓ Water is used to refrigerate.
- ✓ The machines condensed using water have a high water consumption, they need water to make the ice and to refrigerate the condenser.
- ✓ Sometimes it has a fan to help with the refrigeration.



## Air condenser

- ✓ Air is used to refrigerate.
- ✓ The water consumption in the air condensed units is much lower, it only need water to make the ice.
- ✓ It always have a fan.



# Remote condenser

## Remote condenser

- ✓ Sometimes the machines do not have a condenser, those are remote units, and the condenser is out of the unit, is installed separately from the machine.
- ✓ It will be always air condensed.
- ✓ A refrigeration installation need to be done (piping, valves, ...) to connect the machine and the remote condenser.
- ✓ The models are the RC manufactured at ITV (Remote Condenser). The condenser is purchased from an outside supplier and the condenser is assembled and finished in the factory with a chassis.



RC Remote condenser

# Condensing unit

## Condensing unit (U/C):

- ✓ It is a part of the machine, includes the condenser, compressor, and some other elements (valves, piping, pressure switches, etc.).
- ✓ According to the condenser that they have, it can be water or air condensing units.



U/C Water



U/C Air

# Remote condensing unit

## Remote condensing unit (U/C):

- ✓ In ice makers generator or Split units, the condensing unit is not in the machine, they do not have a compressor or a condenser.
- ✓ The client can buy a remote condensing unit or not, depending on the installation of the units. That is explained in the Ice makers generators or split
- ✓ Now the remote condensing units are bought from an external supplier.
- ✓ A refrigeration installation needs to be done (piping, insulation, valves, etc.) to connect the ice machine and the remote U/C.

# Evaporator

The evaporator is where the ice is formed, through the irrigation of water on its surface. Depending on the unit we have the next types of evaporators:

- **HORIZONTAL:** Ice cube units, with the type of ices Alfa, Gala.
- **VERTICAL:** Evaporator for half and full dice ice, Spika units.
- **FINGER TYPE:** Quasar evaporator, with a 'central hole'.



Horizontal



Vertical



Tubular (Ice Queen)

# Compact vs remote unit

## Compact machines:

- ✓ In these units, the condensing unit (compressor and condenser) are integrated inside the machine, being a part of it. The condenser can be air or water.
- ✓ When the unit has an air condenser, it is indicated in the machine name with an A (air).
- ✓ When the unit has a water condenser, it is indicated in the machine name with a W (water).

## Remote machines:

- ✓ These machines do not include the condenser, it is apart. They do have the compressor inside.
- ✓ To function properly, these machines need a remote condenser, therefore an order of a remote machine always have to include a remote condenser.
- ✓ The remote condenser is always an air one.
- ✓ These machines usually are installed in places with poor ventilation, to allow the condenser use fresh air from the exterior. It also allows to prevent the hot air inside the local.
- ✓ By not having a condenser, they are more light than the compact ones.
- ✓ A refrigeration installation needs to be done (piping, valves, etc.) to connect the unit and the remote condenser.
- ✓ In the Scala machines, the remote unit does not include the condensing unit (nor the compressor or the condenser).

# Ice maker generator or Split

## Ice maker generator or Split:

- ✓ These units do not have the condensing unit, it comes apart. They do not have the compressor and the condenser.
- ✓ These machines usually are installed in places with poor ventilation or to avoid the noise generated by the condenser and compressor. It also allows to prevent the hot air inside the local.
- ✓ By not having a condenser and a compressor, they are more light than the compact and remote ones.
- ✓ There are two installation possibilities:
  1. Machines connected to a cold generation station
    - Sold without the remote U/C.
  2. Without a cold generation station
    - Sold with a remote U/C.
    - A refrigeration installation needs to be done (piping, insulation, valves, etc.) to connect the unit and the remote condenser.

# Resume of types of machines

MACHINE	Integrated compressor	Integrated condenser	Remote condenser	Remote condensing unit
COMPACTA	YES	YES	NO	NO
REMOTE	YES	NO	YES	NO
SPLIT <u>without</u> cold generation station	NO	NO	NO	YES
SPLIT <u>with</u> cold generation station	NO	NO	NO	NO

# IQ machines

## Compact IQ:

- ✓ It is an IQ machine with the condensing unit integrated inside the machine (compressor and condenser). The condenser can be water or air.



## Remote IQ

- ✓ It is a IQ generator, without the condensing unit.



# IQ machines

## Remote IQ + Remote condenser

- ✓ It is a model not included in the catalog.
- ✓ It is a remote IQ machine without condenser, with a remote condenser, to be installed apart. It will be 2 installations.
- ✓ Possible combinations:
  - REMOTE IQ 1300 + RC5S REMOTE CONDENSER



# IQ MACHINES

Model	Electrical connection
IQ 200C	ONE PHASE
IQ 300C	
IQ 300	
IQ 500	
IQ 900	ONE PHASE / THREE PHASE
IQ 1300	
IQ 2700	THREE PHASE
GIQ 1300	
GIQ 2700	

# SPIKA MS machines

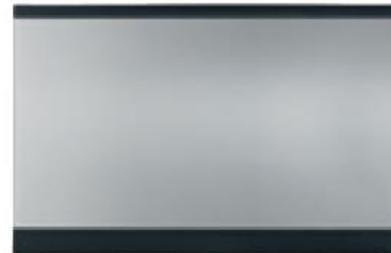
## Compact SPIKA MS:

- ✓ It is a machine with the condensing unit integrated (compressor and condenser). The condenser can be water or air.



## Remote SPIKA MS

- ✓ It is a machine without the condenser. It also have a remote condenser to be installed apart.
- ✓ It will be 2 intallations.
- ✓ Possible combinations:

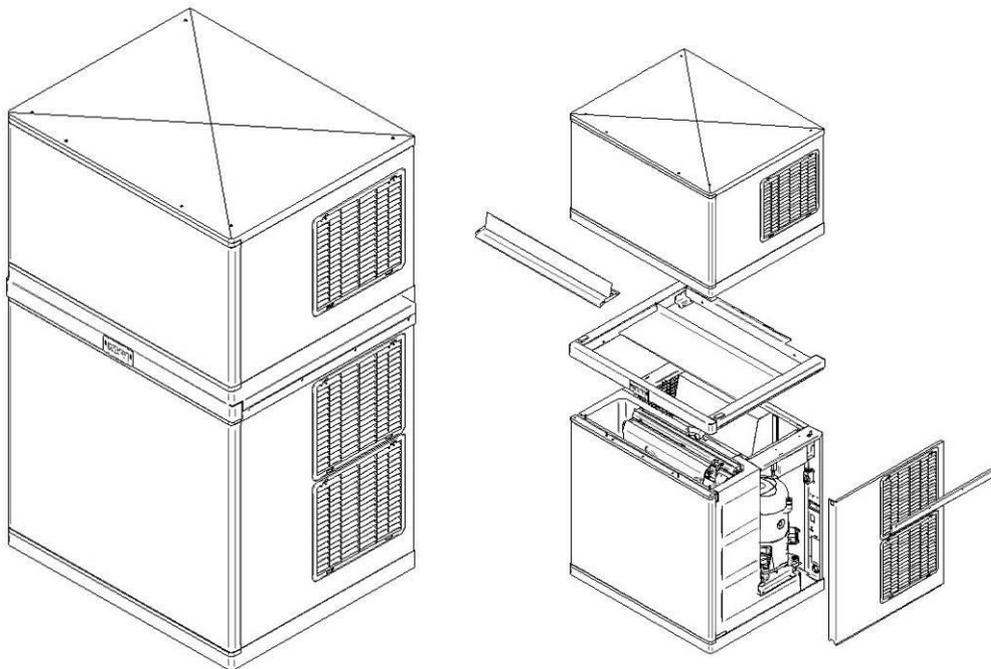


- REMOTE SPIKA MS500 + REMOTE CONDENSER RC5S
- REMOTE SPIKA MS1000 + REMOTE CONDENSER RC10S

# SPIKA MS machine

## SPIKA MS Stackable:

- ✓ It is possible to stack 2 SPIKA MS units, one on top of the other.
- ✓ In these case, the client needs a stack kit with the machines, that have a ramp for the ice and some other elements.



# Modular vs undercounter machines

## **Modular machines:**

Machines without an integrated stock bin.

They usually need a bin to stock the produced ice, usually placed below the ice maker. The clients can buy the bins manufactured by ITV or from other suppliers.

To stock the ice, some other options are available, such as mobile carts or cold storage rooms.

For most of our family units, the models that start with a M are the modular ones: MDP150, MS.



## **Undercounter machines:**

Machines with a stock bin integrated to allow stocking the produced ice.

Installed normally in catering, under the counter (like a dishwasher).



