



## Internal training – differences ITV machines

December 2021

# Machines by type of ice

## ICE MAKING

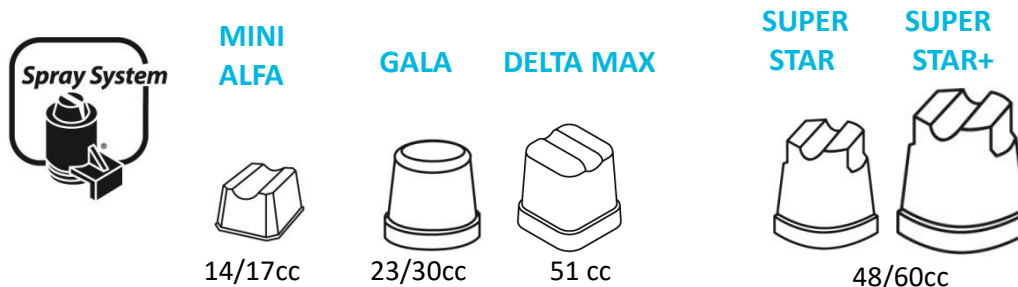
Ice is produced by freezing water. To freeze water, a thermodynamic process occurs extracting heat from the water, cooling down the water, until it freezes. To do such process, different components are used, all of them are known as the refrigeration system of an ice machine.

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.

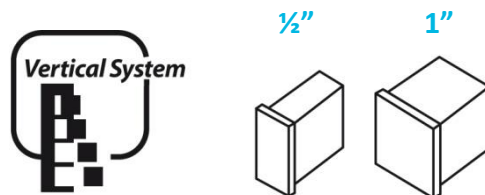


# Machines by type of ice

Palette system: System that produces the ice using an horizontal evaporator, where the water is push upwards to the evaporator by a turbine and palettes. Cyclical machine. It does not use a water pump.

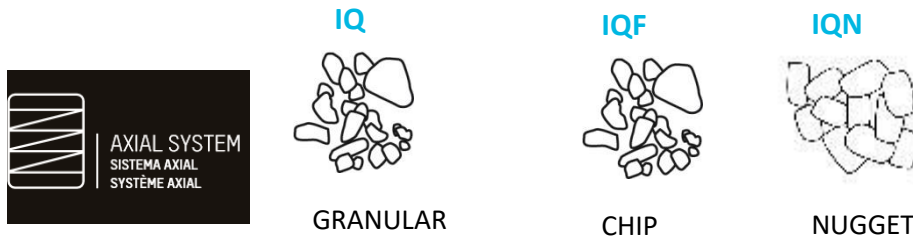


Vertical system: System that produces the ice using a vertical evaporator. Used in the half and full dice ice. Cyclical machine.



# Machines by type of ice

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 or nugget ice. It does not use a water pump.




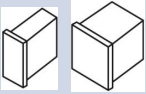



Axial system (Scala): System that produces an ice using a cylindrical evaporator, an auger takes off the ice from the evaporator walls. The ice is dry, thin, flake type, and subcooled. Continuous machine. It uses a water pump.

SCALA



# Machines by type of ice

ICE TYPE		WATER INJECTION TYPE	EVAPORATOR	WATER PUMP	ITV MACHINE
ALFA		SPRAY	HORIZONTAL	YES	NDP 20
GALA		SPRAY	HORIZONTAL	YES	GALA NG
DELTA MAX		SPRAY	HORIZONTAL	YES	DELTA MAX NG
SUPER STAR		SPRAY	HORIZONTAL	YES	SUPER STAR NG
SUPER STAR PLUS		SPRAY	HORIZONTAL	YES	SUPER STAR PLUS NG (MODULAR)
QUASAR		PALETTES	HORIZONTAL	NO	QUASAR
DICE / ½ DICE		SPRAY	VERTICAL	YES	SPIKA
GRANULAR		AXIAL (WITH AUGER)	TUBULAR	NO	ICE QUEEN
FLAKE 5		AXIAL (WITH AUGER)	TUBULAR	YES	SCALA

# Machines by type of ice



ALFA



GALA



DELTA



SUPER STAR / S.S.PLUS



SPIKA



QUASAR



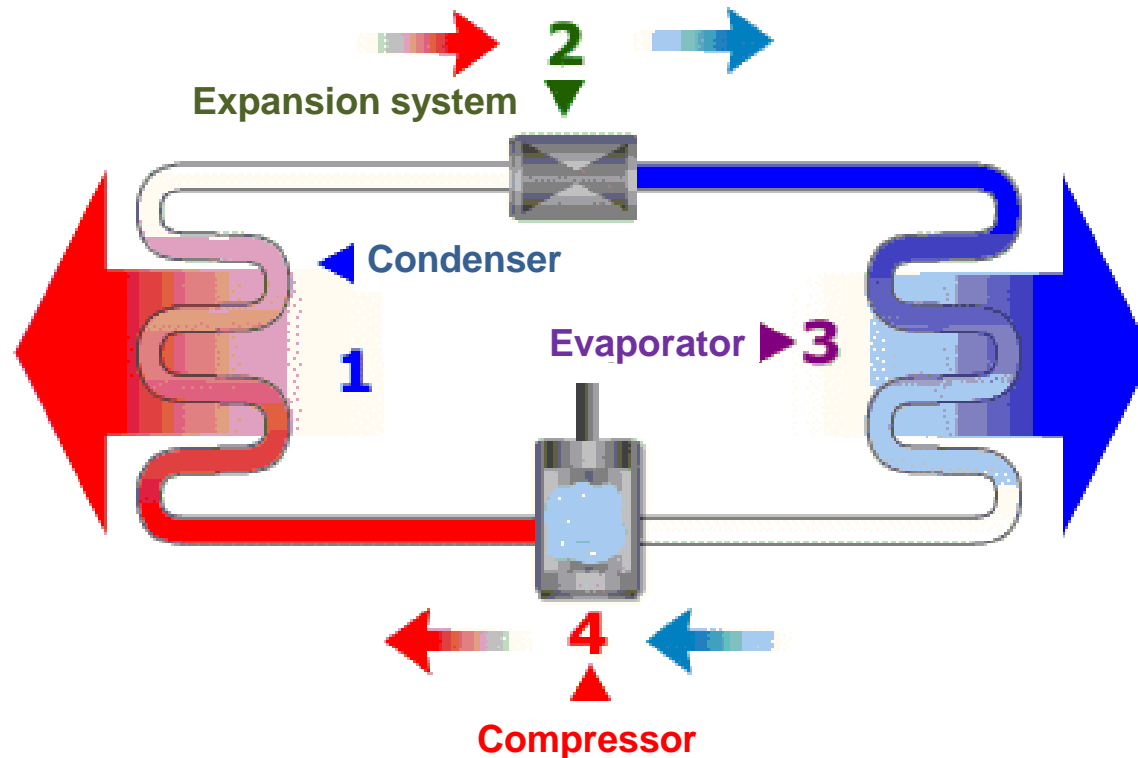
ICE QUEEN



SCALA

# 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*
- ✓ A refrigeration installation needs to be done (piping, insulation, valves, etc.) to connect the ice machine and the remote U/C.



**U/C Silensys**



**U/C Bitzer**

# 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, Delta, Super Star, Super Star Plus.
- **VERTICAL:** Evaporator for half and full dice ice, Spika units.
- **FINGER TYPE:** Quasar evaporator, with a 'central hole'.
- **TUBULAR:** Evaporator for the granular ice of the Ice Queen and the flake ice from the Scala.



Horizontal



Vertical



Tubular (Ice Queen)



Tubular (Scala)

# 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
REMOTE SCALA U/C	NO	NO	NO	YES
SPLIT <u>without</u> cold generation station	NO	NO	NO	YES
SPLIT <u>with</u> cold generation station	NO	NO	NO	NO



# SCALA machines

## Compact SCALA:

- ✓ A Scala machine with a condensing unit integrated inside the machine (compressor and condenser), all in the same base.



## Split SCALA

- ✓ It is a Scala ice maker, without the condensing unit.

## Split CO<sub>2</sub> SCALA

- ✓ Like the above but using CO<sub>2</sub> as refrigerant. Condensing unit not included. Keep in mind ITV does not seal CO<sub>2</sub> condensing units.



# SCALA machines

## Remote SCALA U/C (Split SCALA + Remote U/C)

- ✓ It is a ice maker Split Scala, with a remote condensing unit (U/C), to be installed apart. 2 independent packages.
- ✓ From the SCALA 400 until the 2000, SILENSYS condensing units are used:



SCALA 400 SPLIT + U/C SIL 2480Z  
SCALA 600 SPLIT + U/C SIL 2511Z  
SCALA 1000 SPLIT + U/C SIL 2516Z  
SCALA 1500 SPLIT + U/C SIL 2532Z  
SCALA 2000 SPLIT + U/C SIL 2544Z

- ✓ From the SCALA 3000, BITZER condensing units are used:



SCALA 3000 SPLIT + U/C USBB1200  
SCALA 5000 SPLIT + U/C USBB2500  
SCALA 10T SPLIT + U/C USBB4000

- ✓ Keep in mind ITV does not sell remote condensing units for Scala higher than 10 tons.

# SCALA machines

## Split SCALA + Remote U/C

- ✓ On request, it is possible to supply a Split Scala, with compressor and condenser apart. It will be 3 independent packages.
- ✓ Some clients also ask for a specific compressor, condenser, condensing unit, all on request.
- ✓ In addition, we have the models for boats and inland, using sea water (it needs a lower evaporating temperature) to make the ice, or with fresh water on a boat. Those are special models, more expensive, all made of stainless steel. We also have water condensers to work with sea water to use with these units.



# 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.



## GIQ Split

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

## GIQ Split CO<sub>2</sub>

- ✓ Like the above, but using CO<sub>2</sub> as refrigerant. Without the condensing unit.
- ✓ Keep in mind ITV does not sell CO<sub>2</sub> condensing units.



# IQ machines

## Generator IQ 550, 850:

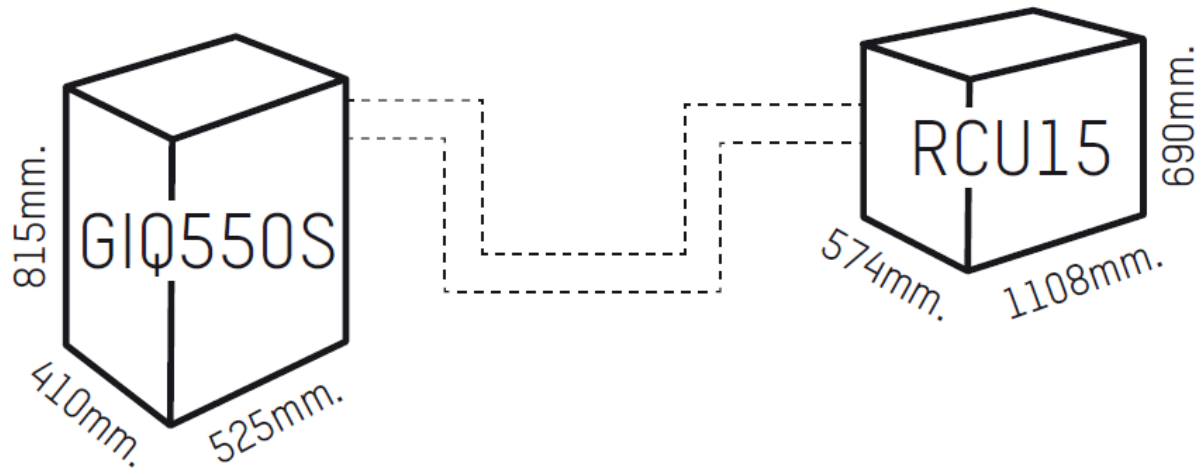
- ✓ It is an IQ machine, without the compressor and condenser. It has to work with a cold generation station (normally for supermarkets). We have de R404A version, 550 and 850 kg, and also de CO<sub>2</sub> version, 850 kg. They have an AC/DC drive and an expansion valve controlled by an automat.



# IQ machines

## GIQ Split + Remote U/C

- ✓ An ice maker generator, or GIQ Split, with the remote U/C, to be installed apart. It will be 2 installations.
- ✓ Possible combinations:
  - GIQ 550 SPLIT + Remote U/C RCU15
  - GIQ 1100 SPLIT + Remote U/C RCU30



# IQ machines

## Remote IQ + Remote condenser

- ✓ It is a model not included in the catalog. Around 600 units have been sold, 220V/60Hz, to our Mexican client Criotec.
- ✓ 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 550 + RC5S REMOTE CONDENSER



# MR400 machine

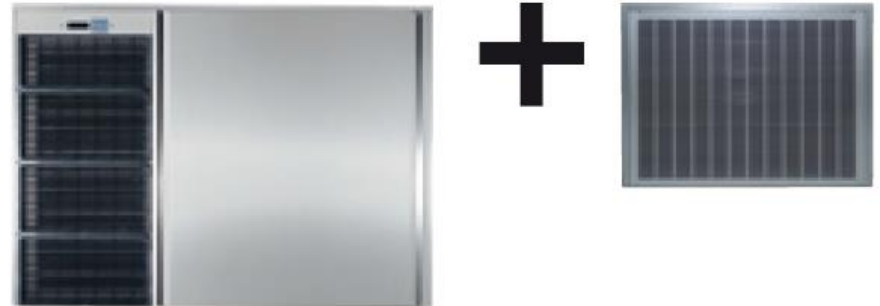
## Compact MR400:

- ✓ MR400 machine with the condensing unit (compressor and condenser) integrated. The condenser can be air or water.



## Remote MR400

- ✓ MR400 machine without the condenser. It has also a remote condenser to be installed apart, maximum 15 meters.
- ✓ It will be 2 installations.
- ✓ Possible combinations:



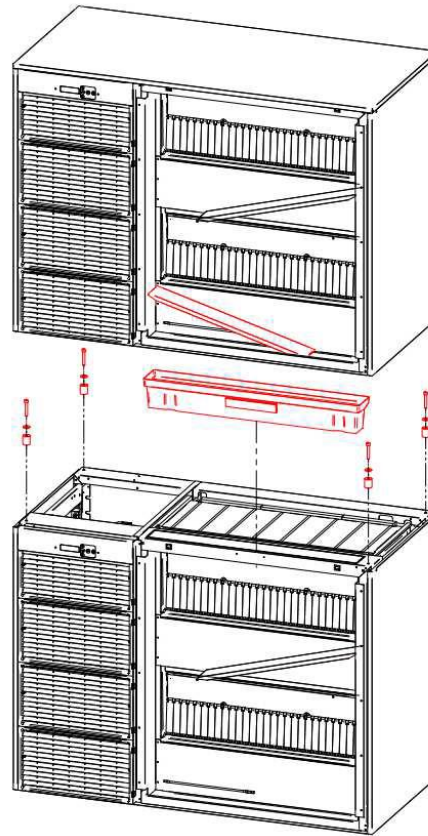
- REMOTE MR400 + REMOTE CONDENSER RC10S



# MR400 machines

## Stackable MR400:

- ✓ It is possible to stack two MR400 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.



# SPIKA MS machines

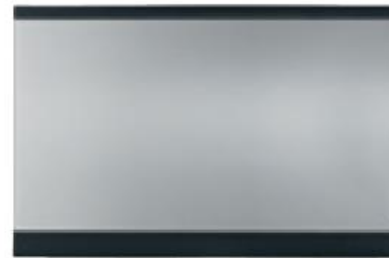
## Compact SPIKA MS:

- ✓ 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:

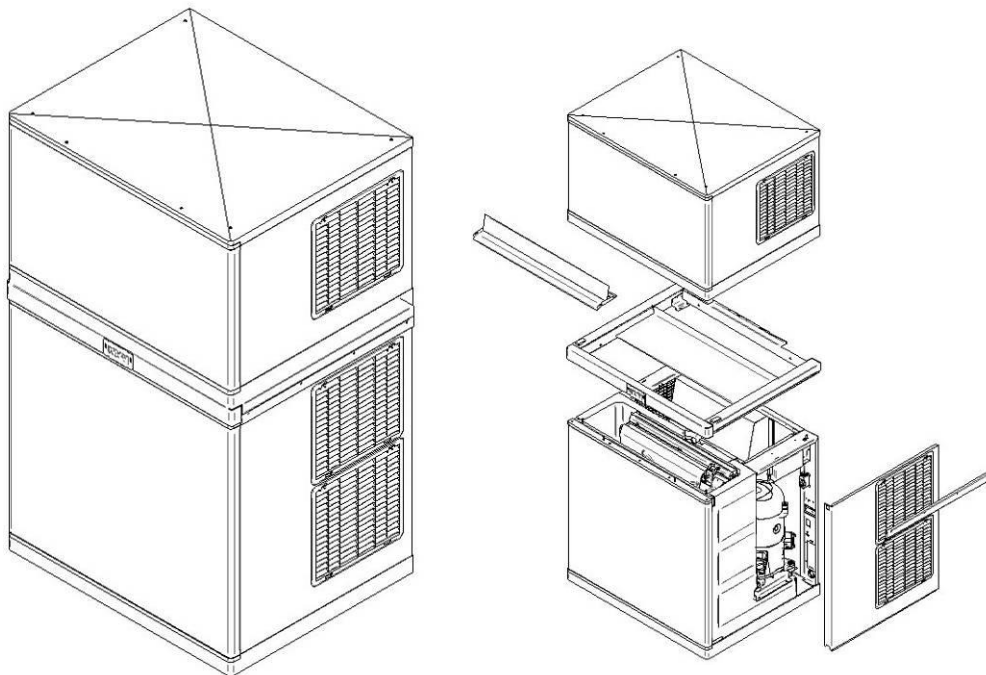


- REMOTE SPIKA MS220 + REMOTE CONDENSER RC5S
- REMOTE SPIKA MS410 + REMOTE CONDENSER RC10S

# 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: MQ200, MR400, 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).



