



Full Cube – 12 gr    Half Cube – 6 gr

# NW(H) SERIES DICE & HALFDICE CUBERS

## TECHNICAL SERVICE TRAINING

Welcome to another Scotsman Technical Service Presentation that  
cover all NW models



## NW(H) 308

Max. Ice production = 147 Kg/24h\*

Max. Storage Bin Capacity

- NB 193 = 129 Kg

\* 21/10°C = Air & Water Inlet Temperature



## NW(H) 508

Max. Ice production = 215 Kg/24h\*

Max. Storage Bin Capacity

- NB 193 = 129 Kg

\* 21/10°C = Air & Water Inlet Temperature



## NW(H) 458

Max. Ice production = 200 Kg/24h\*

Max. Storage Bin Capacity

NB 393 = 178 Kg

NB 530 = 243 Kg

\* 21/10°C = Air & Water Inlet  
Temperature



## NW(H) 608

Max. Ice production = 280 Kg/24h\*

Max. Storage Bin Capacity

NB 393 = 178 Kg

NB 530 = 243 Kg

\* 21/10°C = Air & Water Inlet  
Temperature



## NW(H) 1008

Max. Ice production = 456 Kg/24h\*

Max. Storage Bin Capacity

NB 530 = 243 Kg

NB 948 = 406 Kg

\* 21/10°C = Air & Water Inlet  
Temperature

# TOPICS

On the next slides are shown the following steps by steps procedures:

- **UNPACKING**
- **INSTALLATION**
- **START UP AND OPERATIONAL CHECKS**
- **OPERATING PRINCIPLES and COMPONENTS**
- **MAINTENANCE**
- **SERVICE ANALYSIS**

**UNPACKING**



The machines are supplied in a carton box secured by two plastic strips to a wooden base. Check first the outside conditions of carton box and wooden base then cut the two plastic strips, remove the tape and then the carton box.



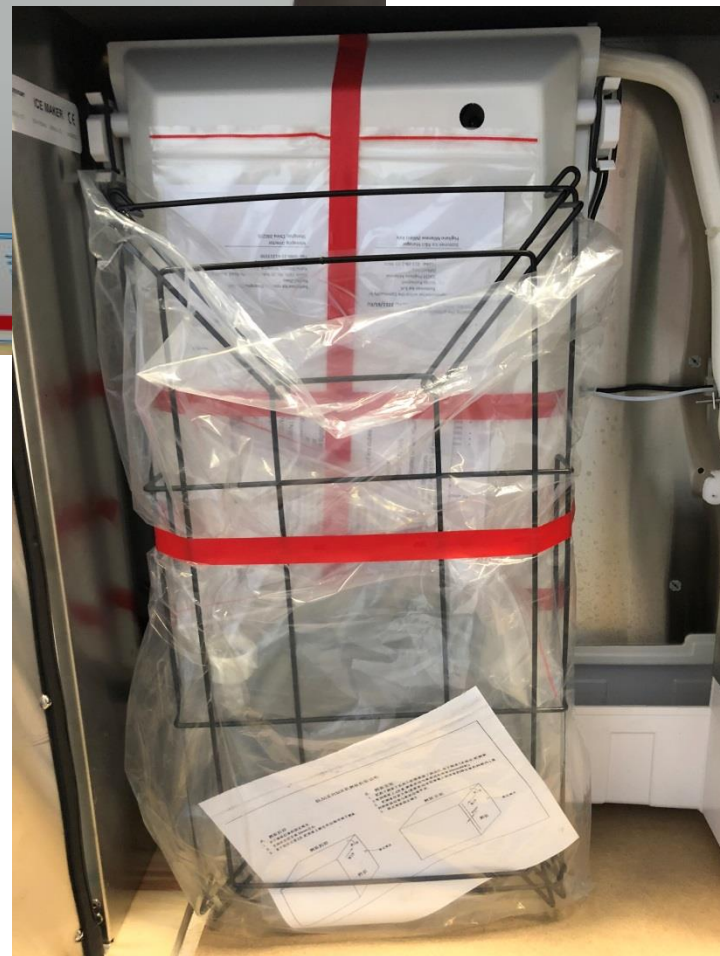
Visually inspect the exterior of the machine, then remove the front and both side panels, unscrews the two sides screws that secure the machine to the wooden base



Remove the water  
inlet and outlet  
hoses, the red  
adhesive tapes and  
the air baffle  
deflector



NW308 and 508  
are equipped with  
a top grid



Remove the front  
plastic deflector  
and take out the  
second red  
adhesive tape  
securing the ice  
thickness sensor





The Modular NW machines require for the installation the use of a companion storage bin to store the ice produced.

Storage bins required:

- **NB193 with NW 308 - NW 508**
- **NB 393/530 with NW 458 - NW 608**
- **NB 530/948 with NW 1008**



Unpack the storage bin and visually inspect the exterior then remove from the inside the carton box containing the legs as well as the drain hose and the plastic scoop



# INSTALLATION

Install the four  
legs and their  
adjusting leveling  
nuts on the  
bottom base as  
well as the water  
drain tube



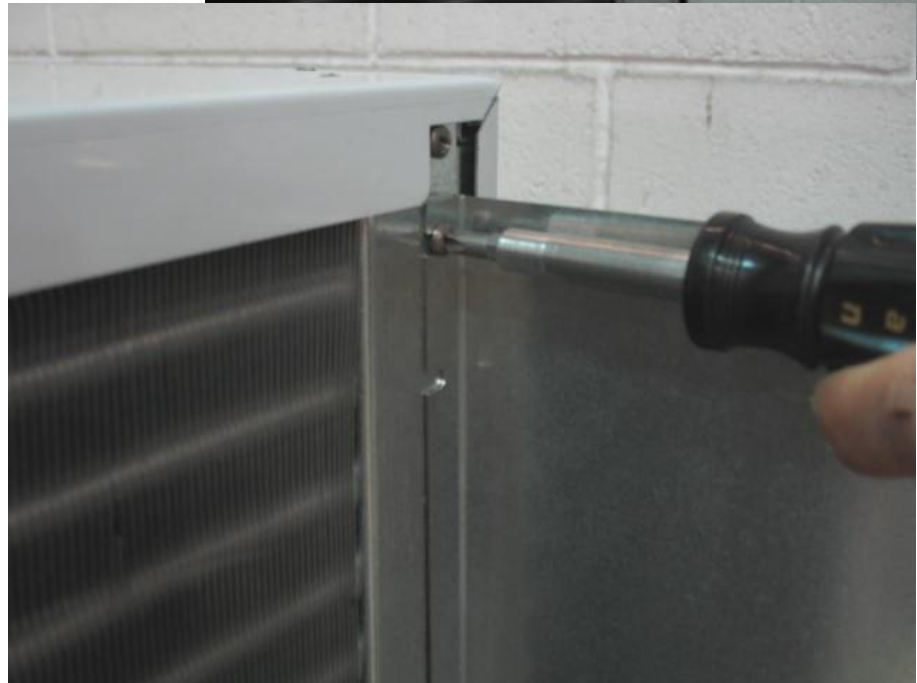


... install on top of the  
same the ice machine  
and secure it with the  
two sides screws.



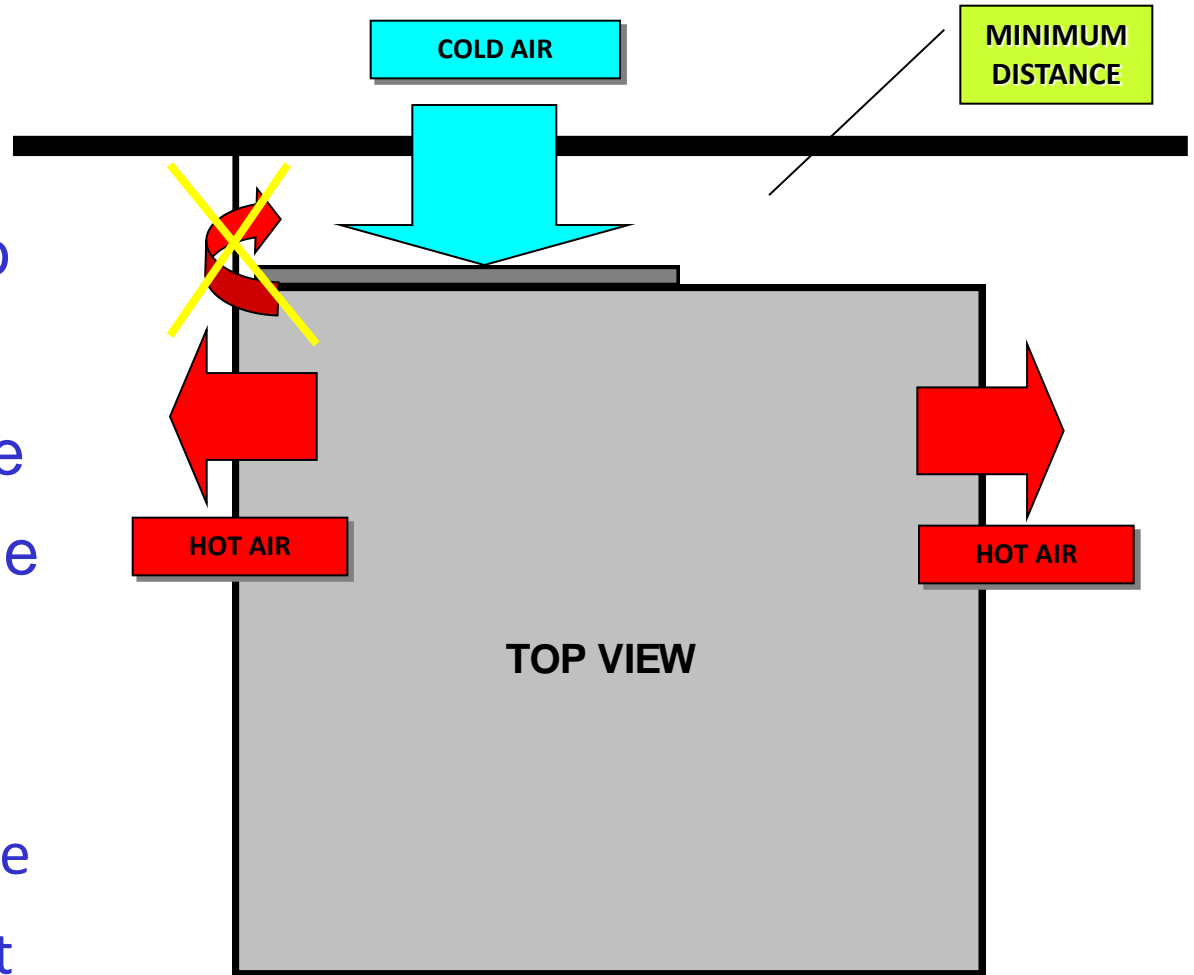
## NW 458-608-1008

On air cooled version  
unloose a little bit the  
screws securing the air  
cooled condenser to the  
unit frame, then install the  
metal plate (air baffle) on  
the back side of the  
machine



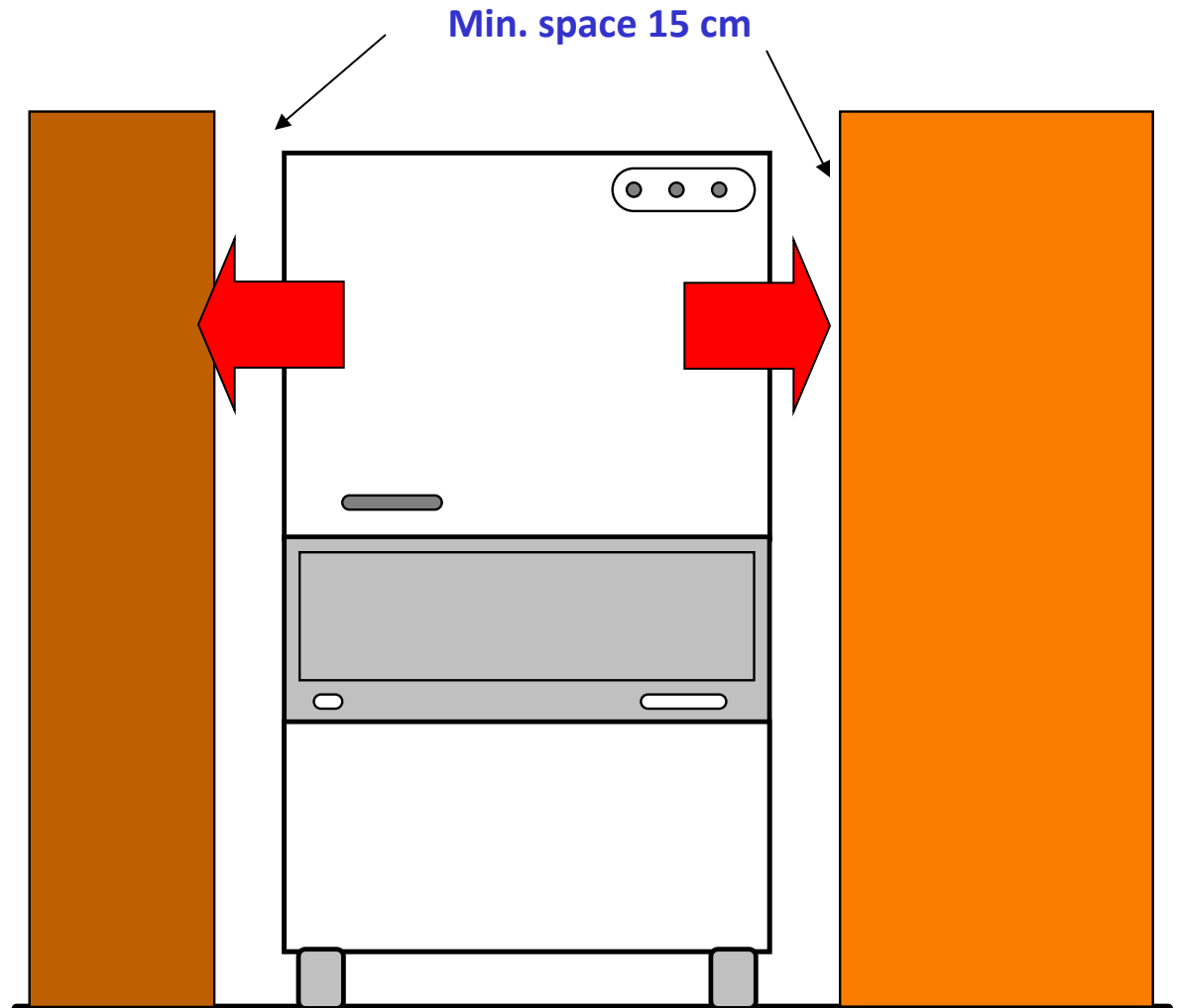
# NW 458-608-1008

The installation of the metal plate (air separator) grants also a minimum distance between the back side of the machine and the wall so to assure a correct and adequate ventilation minimize the possible recycling of hot air through the rear panel



# NW 458-608-1008

Adequate space must be left for proper water and electrical connections on the rear side of the machine and a minimum clearance of 15 cm on right side for best routing air.

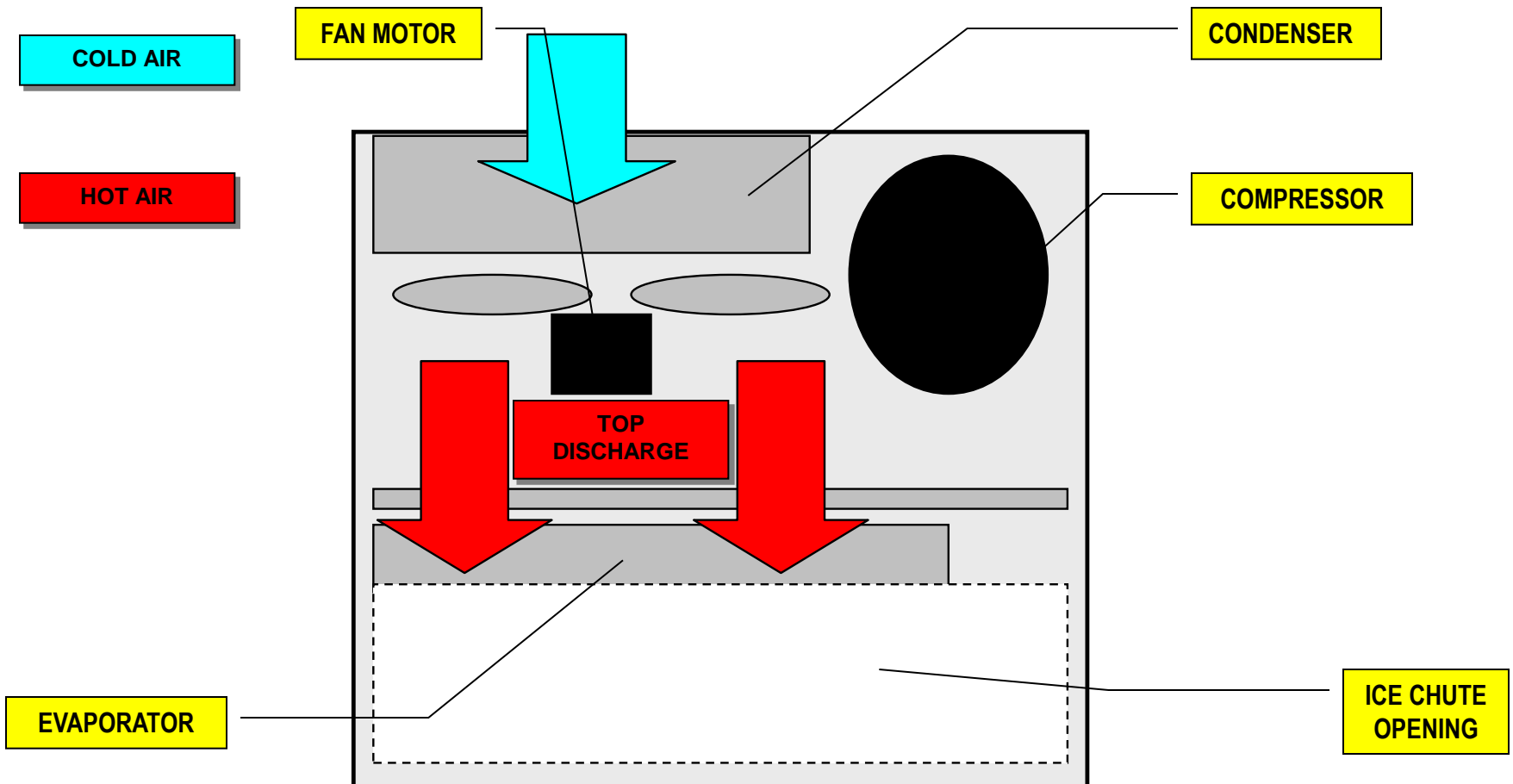


## NW 308-508

... install the grids on  
top panel



# AIR CIRCULATION NW 308-508



# NW 308-508 SPACE SAVING VERSION

Hot air exit from the top.

No need of side clearance from walls or other equipment.

Natural direction of hot air flow, from bottom to top.



Check the data plate of the machine located on the rear panel for correct voltage as well as for the proper wiring/fuse size.

Remember that all machines require a solid earth wire.





Check for the correct water and ambient conditions that should be:

- Min. ambient temperature 10°C (50F)
- Max. ambient temperature 40°C (100F)
- Min. water temperature 5°C (40F)
- Max. water temperature 35°C (90F)
- Min. water pressure 1 bar (14 PSI)
- Max. water pressure 5 bar (70 PSI)

Level the unit  
on both  
directions front  
to rear and  
right to left side  
using the  
adjustable legs  
of the storage  
bin



Install, on the cable supply with the machine, an adequate electrical plug according to the local standards and regulations.

Maximum voltage variation should be  $\pm 10\%$ .

Machine must be individually fuse protected.



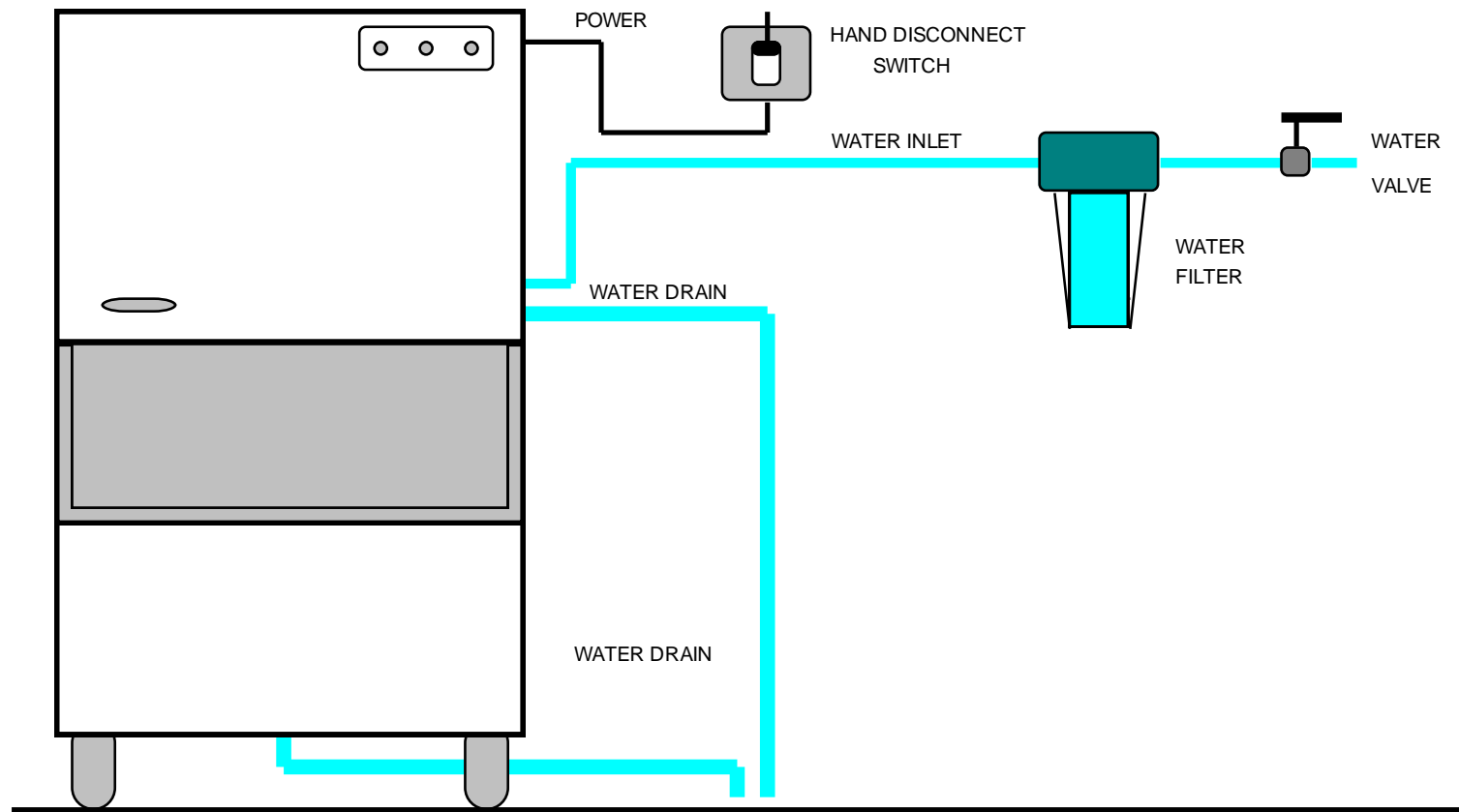
Connect the water inlet 3/4" male thread of the water inlet fitting to the water supply line by means of the rubber hose provided with machine.

Connect also the 20 mm O.D. fitting of the water drain with the flexible hose supply with the machine with its proper clamp.



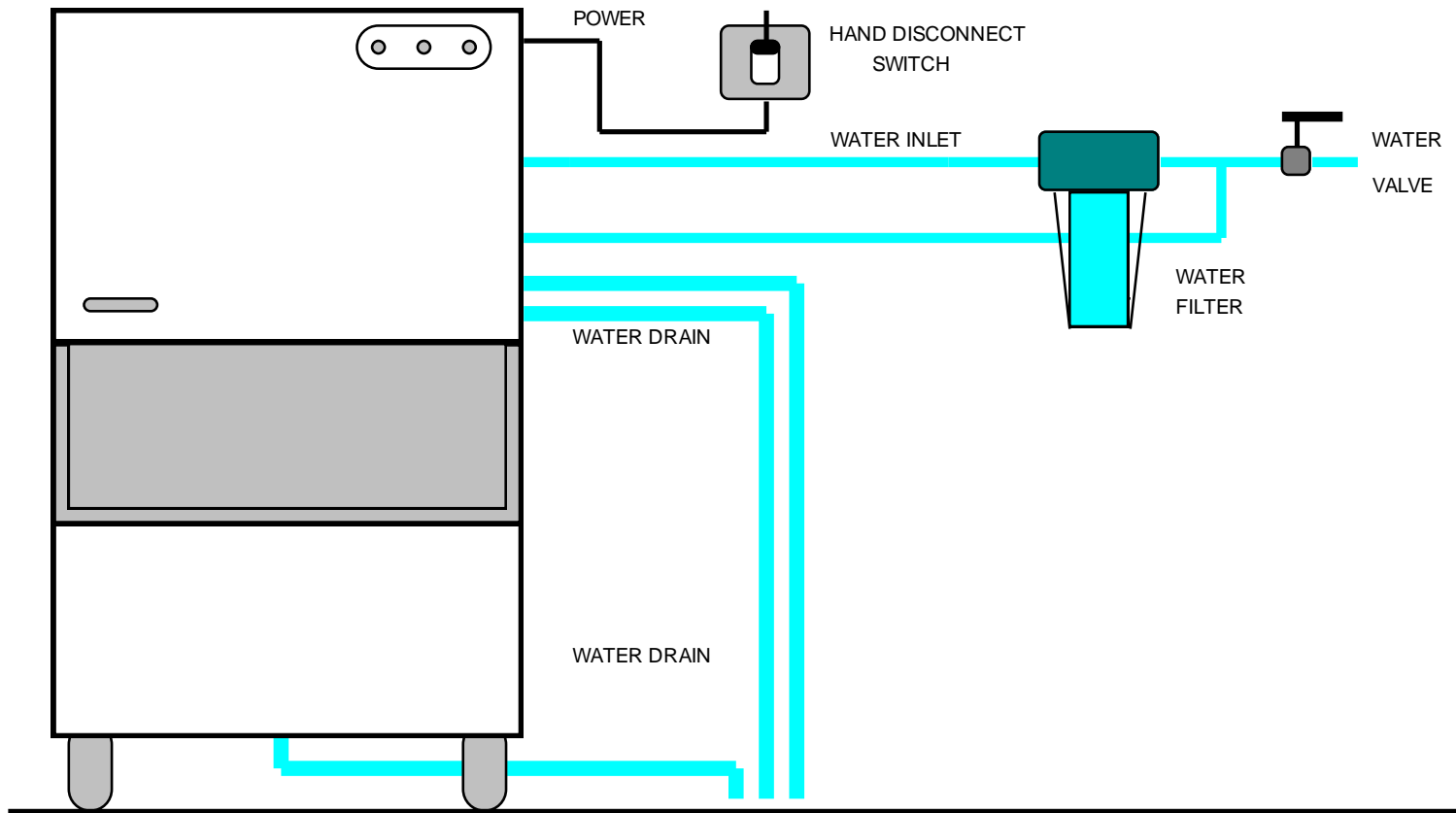
# TYPICAL INSTALLATION

## AIR COOLED



# TYPICAL INSTALLATION

## WATER COOLED



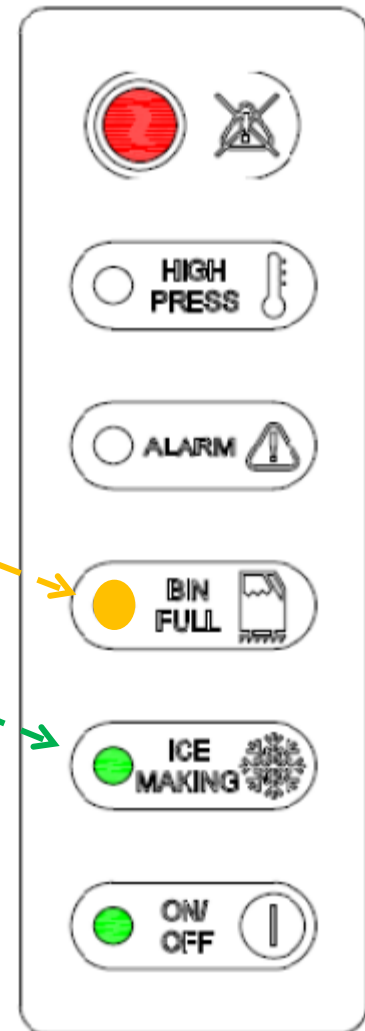
# **START UP AND OPERATIONAL CHECKS**

Open the water tap/valve and switch ON the power on the electrical supply line.





The machine enters in the first part of Start-up (Automatic clean) cycle that is used to rinse the water reservoir with the LED of ICE MAKING and BIN FULL blinking for 2 minutes.

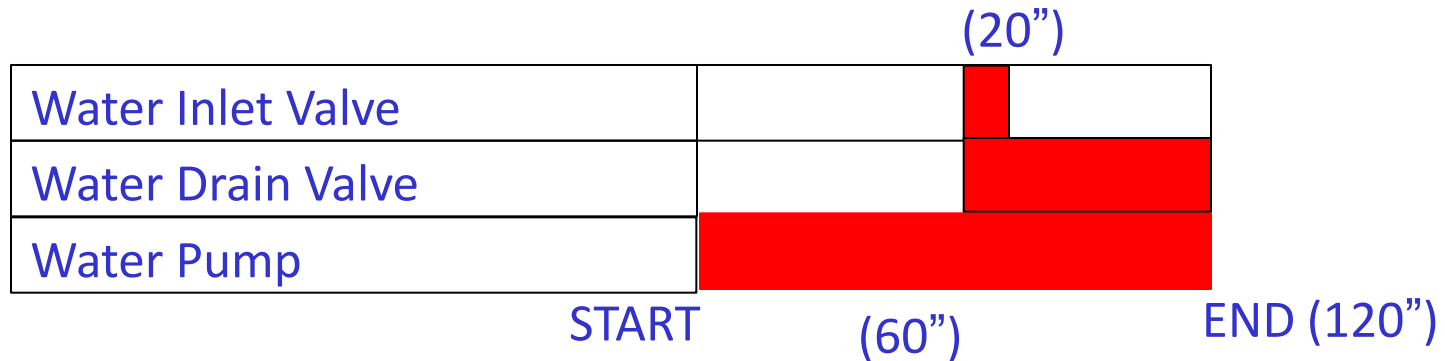


During these 2 minutes the components of water system work to purge and refill the water reservoir

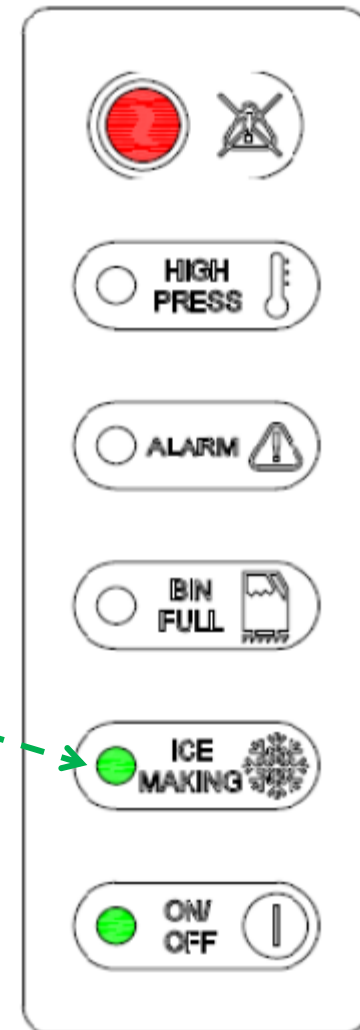
Water pump : 60"

Water pump + water inlet valve + drain valve : 20"

Water pump + water drain valve: 40"



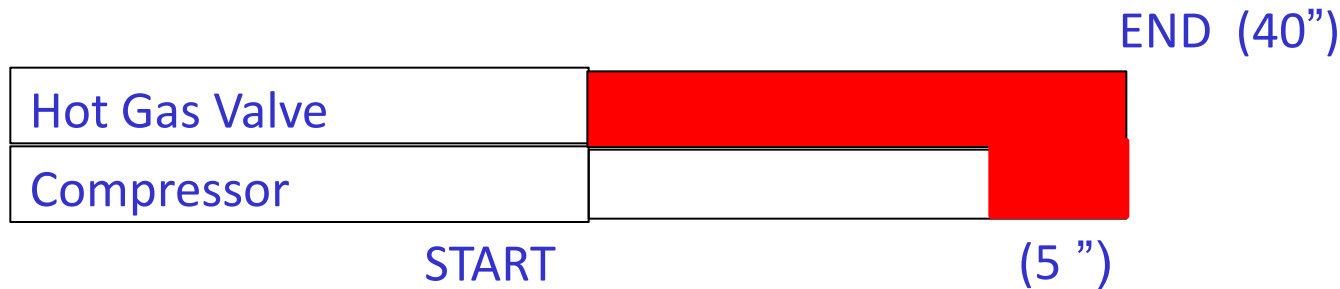
Once completed the first part of the Start-up cycle the machine enters in the pressure balance mode that takes 40 seconds, with the slow blinking of the second **Green LED** of making ICE



During the pressure balance mode the refrigerant pressure is checked with the following components in operation:

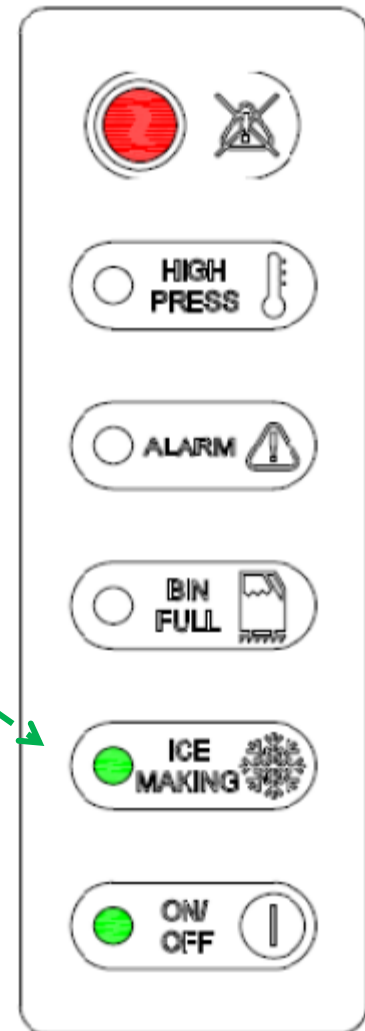
Hot gas valve: **35"**

Hot gas valve + compressor: last **5"**



Model **NW 1008 only** has a crankcase heater in the compressor. When the main power to the machine is switched ON, there is a time delay of 90 minutes during which only the compressor heater is energized with Green ICE Making LED Blinking slowly.

However, if the ambient temperature is higher than 25°C , the PC Board will automatically bypass this delay.



This delay can also be by-passed  
pressing the switch located  
on the rear panel of the  
machine. Once the delay is  
elapsed the machine enters  
in Start-up cycle doing water  
reservoir rinse and pressure  
balance

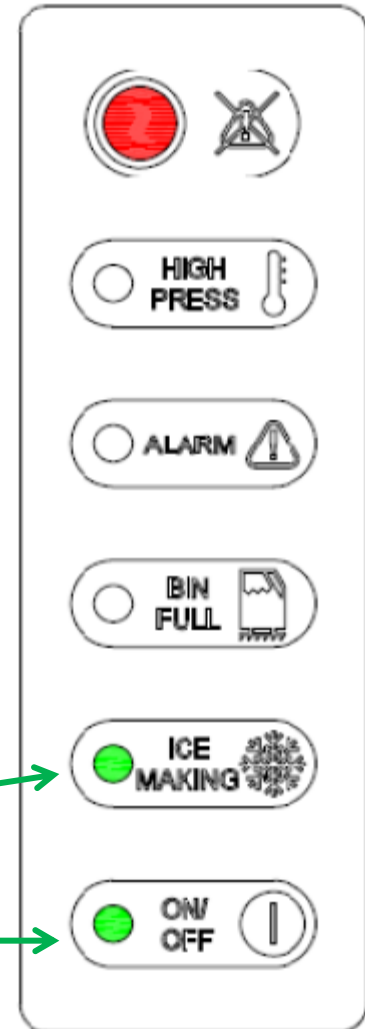


After the start up cycle the machine enters directly into the FREEZING CYCLE with the following components energized:

- Water Inlet valve
- Compressor
- Fan motor

The LED energized are:

- ICE MAKING (steady)
- ON/OFF (steady)



- Water is coming into the water through the Water Inlet Solenoid Valve till the water reservoir is filled up to the maximum level controlled by a water level sensor.
- The Water Pump starts up 40 seconds later.
- After few minutes (3-5) from the start up of the freezing cycle, the Water Inlet Solenoid Valve is activated again for few seconds to refill the water reservoir up to the maximum level so to reduce any possibility of slush ice formation.





The fan motor works in continuous mode for 3 minutes at the beginning of the freezing cycle

In the meantime the condenser sensor starts

to transmit the current to the PC Board to

keep in operation the Fan Motor in ON-OFF

mode or continuously

- If the condensing temperature is higher than  $35^{\circ}\text{C}$ , the fan motor works continuously
- If the condensing temperature is lower than  $35^{\circ}\text{C}$  the fan motor works in ON/OFF mode

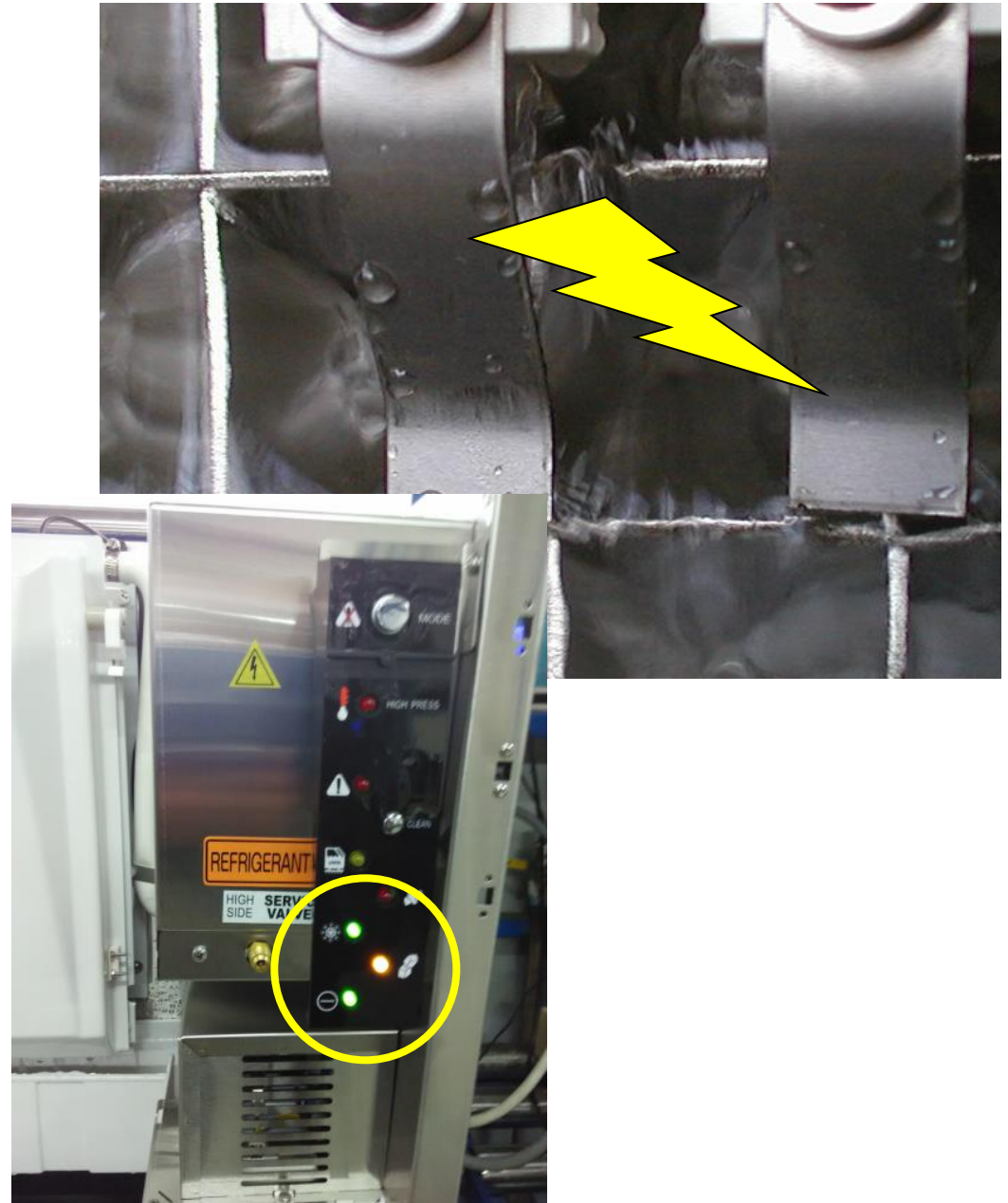


The machine remains in the freezing cycle with ice become thicker, till the metal plate of the ice thickness sensor are covered by the water cascading down through the front surface of the ice plate.



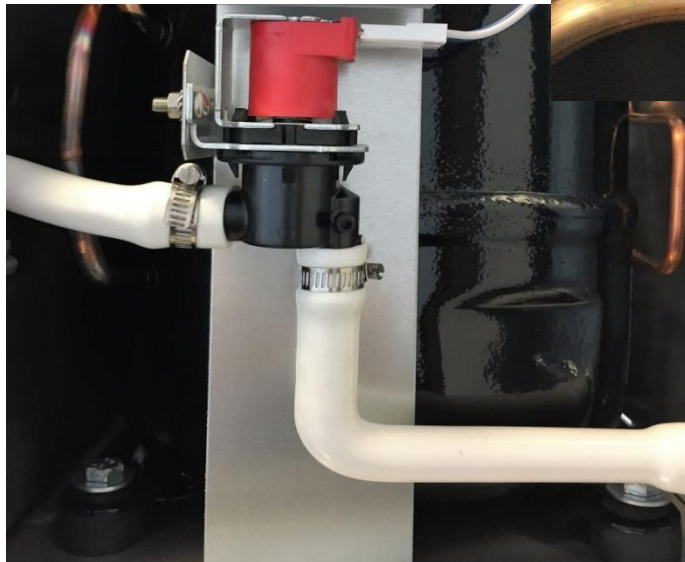
When the power is transmitted back continuously to the PC Board through the metal plate of the ice thickness sensor for more than 6 seconds, machine enters in the harvest cycle .

POWER , OPERATION and HARVEST lights are on steady



During the harvest cycle the components in operation are:

- **Hot Gas Valve**
- **Water Drain valve**





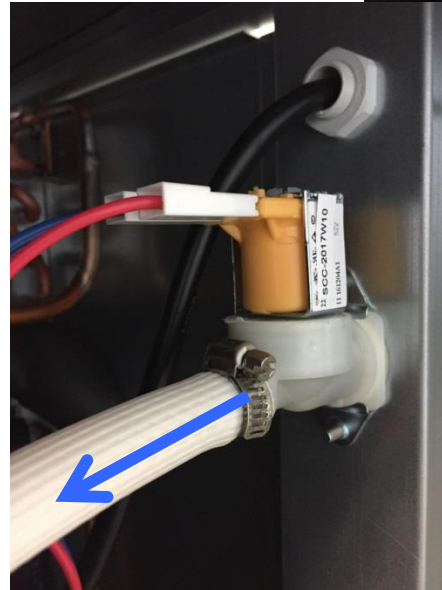
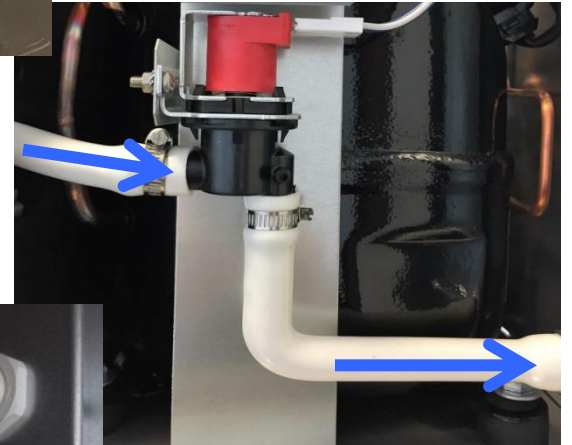
During the harvest cycle the components in operation are:

- **Water pump (according with DIP SWITCH n. 6 – 7 )**
- **Compressor**

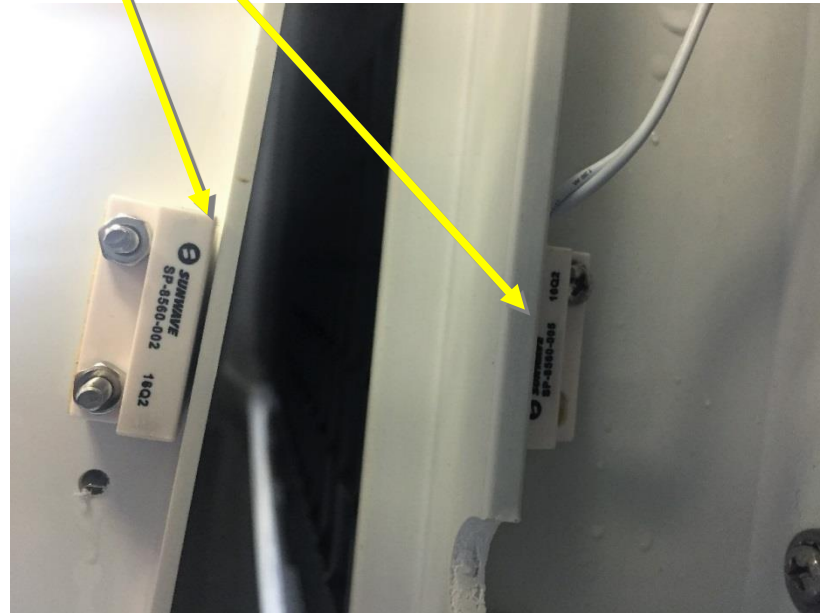


When the Harvest Cycle starts ,  
Drain Valve and Water Pumps  
purge out old water for a pre-set  
time according with Dip-SWITCH  
n.6-7.

After 20" of operation of Water  
Drain Valve also the Water inlet  
Valve will be activated for 10" in  
order to have a short flush of  
fresh water into the water sump  
while the Water Pump and Drain  
Valve are still in operation.



While the ice plate is falling down, it moves the front plastic cover out from the evaporator causing the activation of the magnetic switch to restart a new freezing cycle.

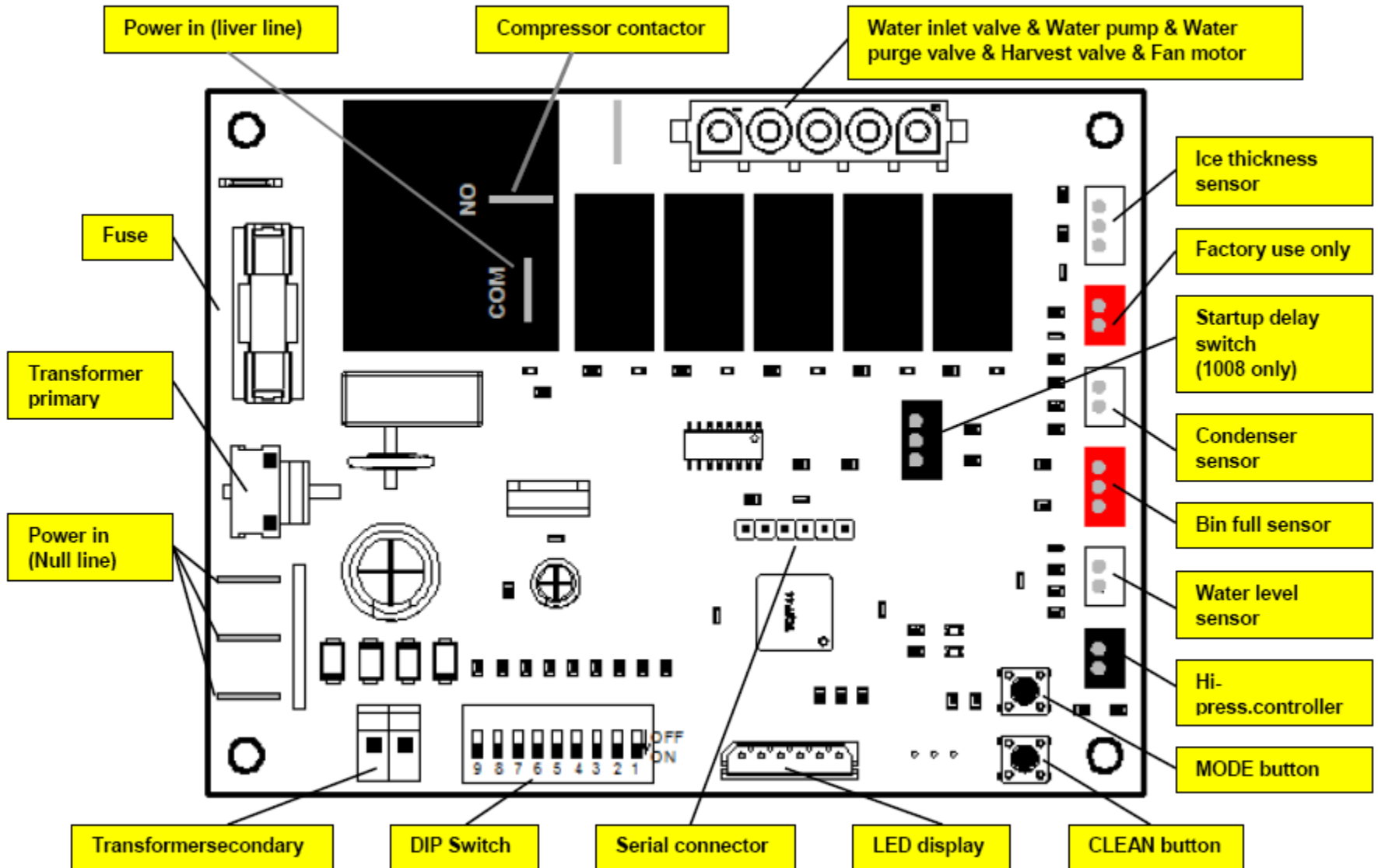


When the last ice plate discharged from the evaporator, the plastic deflector cover keeps in open position for **30"** . The ice full sensor transmit the signal to the PC Board, all the components stop working, and the **BIN FULL light is on steady**. The next freezing cycle will start three minutes later after the plastic deflector is closed.





# PC BOARD



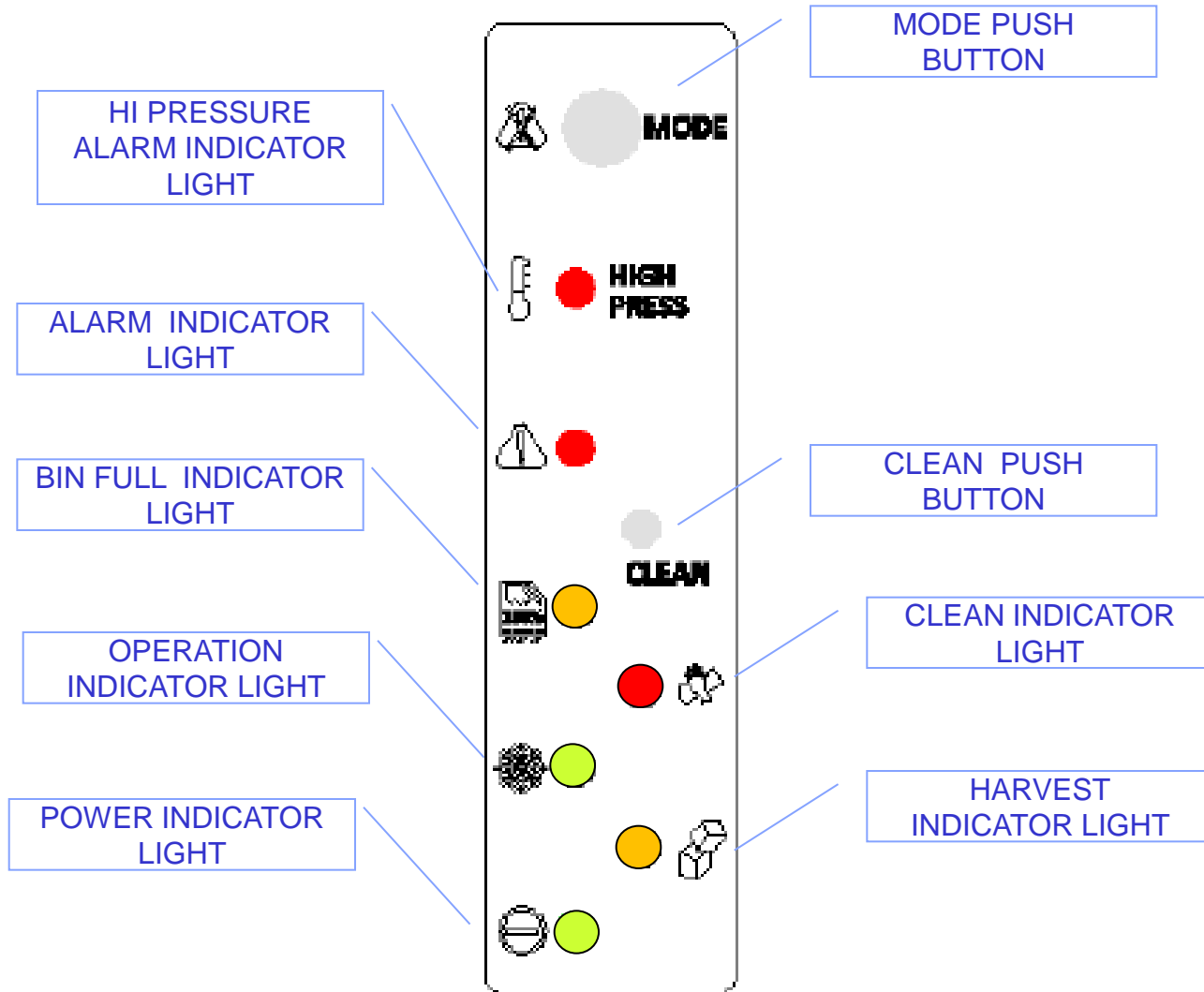
# MONITOR PANEL

It is located on the upper right side behind the front panel the monitor panel

It is composed by two push button ( MODE and CLEAN ) and seven indicator/alarm lights



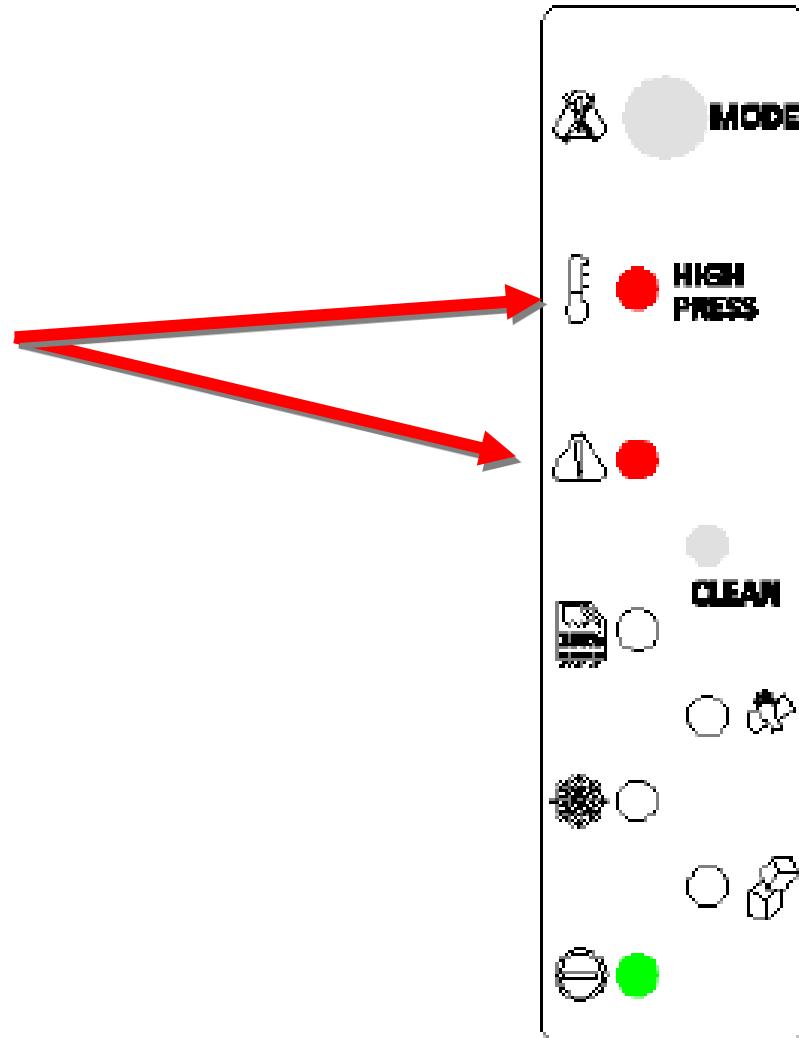
# MONITOR PANEL



# ALARM CONDITIONS

Both the last two **Red LED**  
are **ON STEADY** :

**CONDENSER SENSOR**  
**OUT OF ORDER**

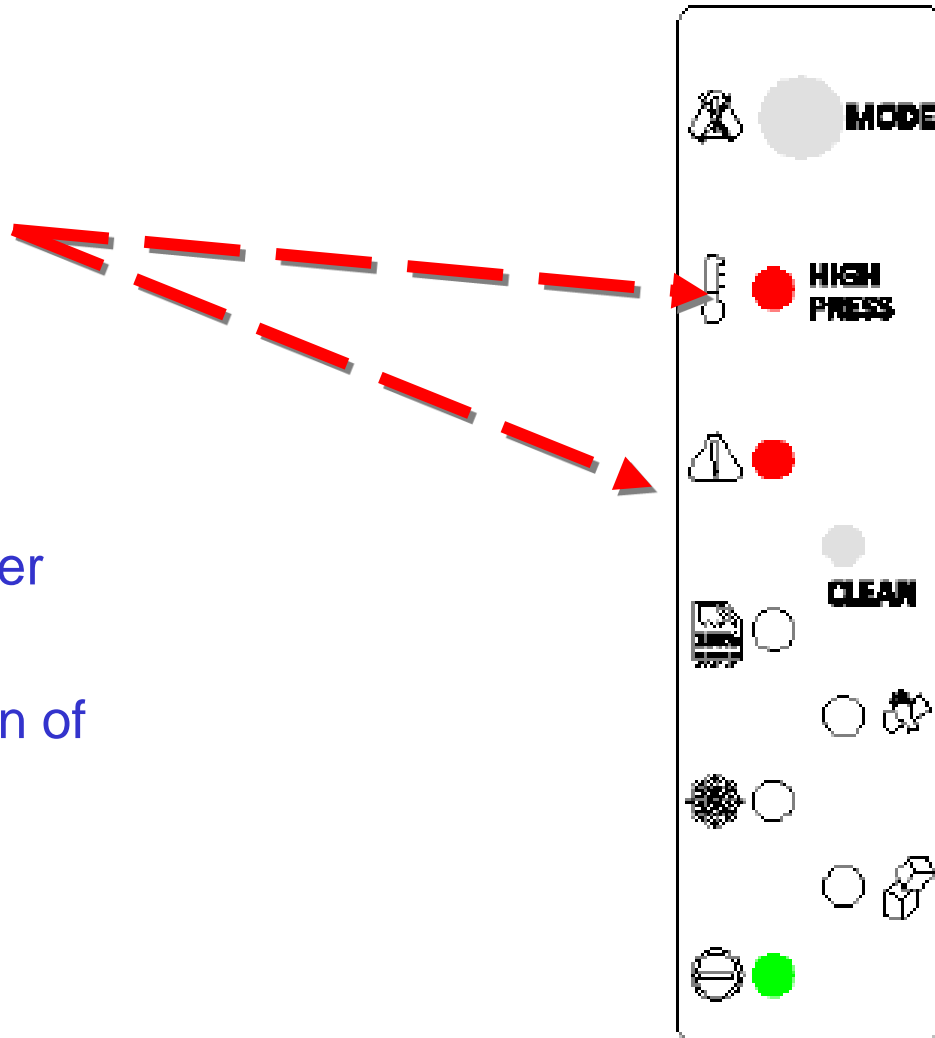


# ALARM CONDITIONS

Both the last two **Red LED**  
are **BLINKING SLOW**:

## WATER ERROR

Water level inside the water  
sump too low after 3 or 6  
minutes from the activation of  
the Water Inlet Valve  
according with setting of  
DIP SWITCH n.4



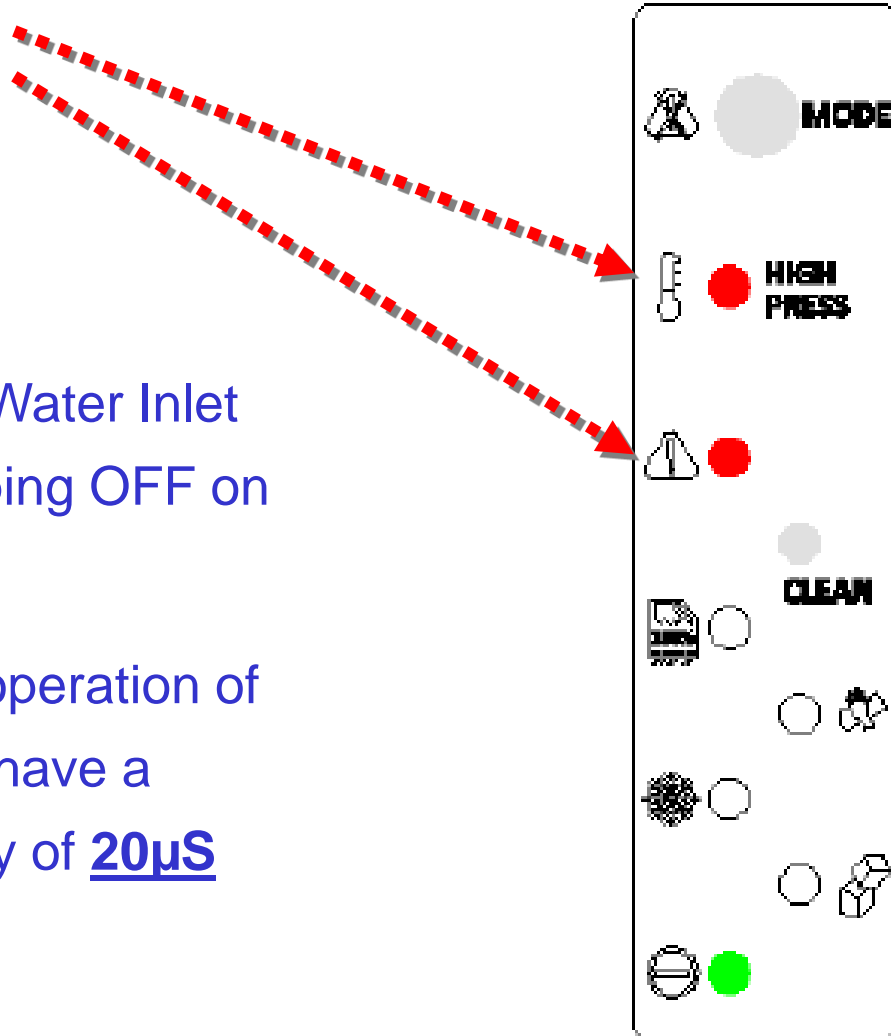
# ALARM CONDITIONS

Both the last two **Red LED**  
are **BLINKING FAST**:

## RESET MODE

Charging water through the Water Inlet  
Solenoid Valve after the tripping OFF on  
WATER ERROR

NOTE = to assure a proper operation of  
the machine the water must have a  
minimum electric conductivity of 20µS



# ALARM CONDITIONS

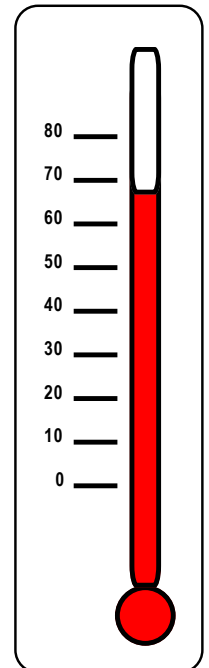
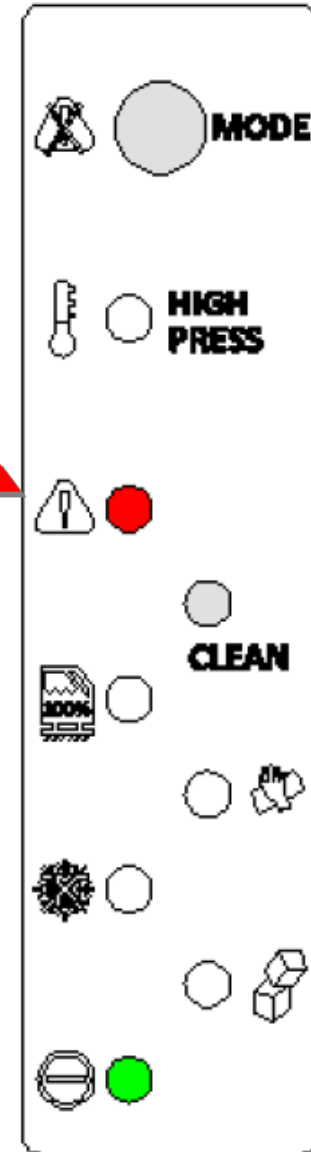
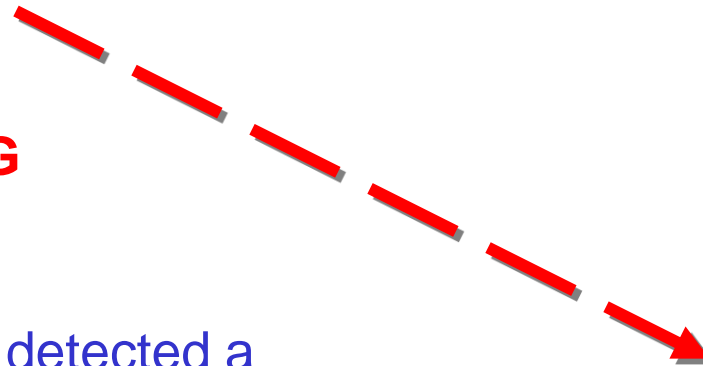
The Fourth **Red Led** is **BLINKING**

**SLOW:**

**TOO HI CONDENSING  
TEMPERATURE**

The condenser sensor detected a  
temperature **> 70°C**

**Reset Mode:** For the first two times,  
machine will automatic reset , it will  
stops when the alarm occurs the  
third time. Press MODE button to  
reset and go to start up cycle



# ALARM CONDITIONS

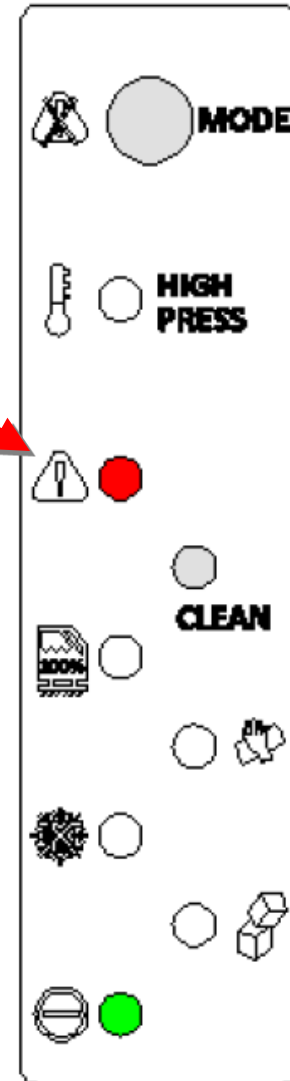
The Fourth **Red LED**

is **ON** steady:

**3 TIMES TOO LONG HARVEST**

**CYCLE TIME** (according with setting of  
DIP SWITCH n.3)

**Reset Mode:** Press MODE button to  
reset and go to start up cycle





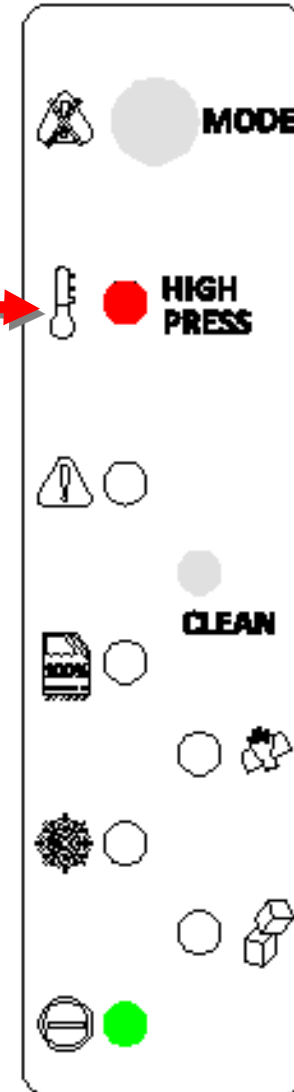
# ALARM CONDITIONS

The Fifth **Red LED**

is **ON STEADY**:

**TOO HI DISCHARGE PRESSURE**  
**(MORE THAN 33 BAR / 460 PSI )**

**Reset Mode:** Press **MODE** button to  
reset and go to start up cycle



# ALARM CONDITIONS

Both the third **YELLOW LED** and  
fourth **Red LED** are blinking fast :

## ICE THICKNESS SENSOR FAULT

When machine starts, if PC Board  
detects the Ice Thickness ON  
machine will stop

**Reset Mode:** Press MODE button to  
reset and go to start up cycle



## ALARM CONDITIONS

Whenever the machine remains in the Freezing Cycle for the Maximum time (30 or 40 minutes), the PC Board moves the unit directly into the Harvest Cycle.

# ALARM CONDITIONS

The PC Board is also checking the maximum time of the freezing cycle that changes according to the operation of the fan motor during the freezing cycle (room temperature):

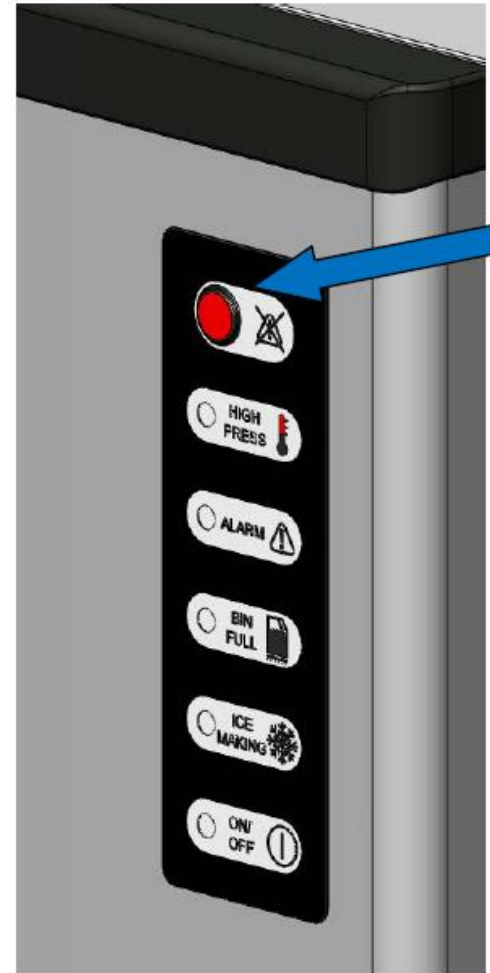
- **Fan motor in ON-OFF mode: Max. freezing cycle length equal to 30'**
- **Fan motor ON all the time: Max. freezing cycle length equal to 40'**

# PC BOARD SETTING

## MODE BUTTON FUNCTION

- To restart the machine is necessary press the MODE button.
- When machine is working, press MODE button to go to next process as follow:

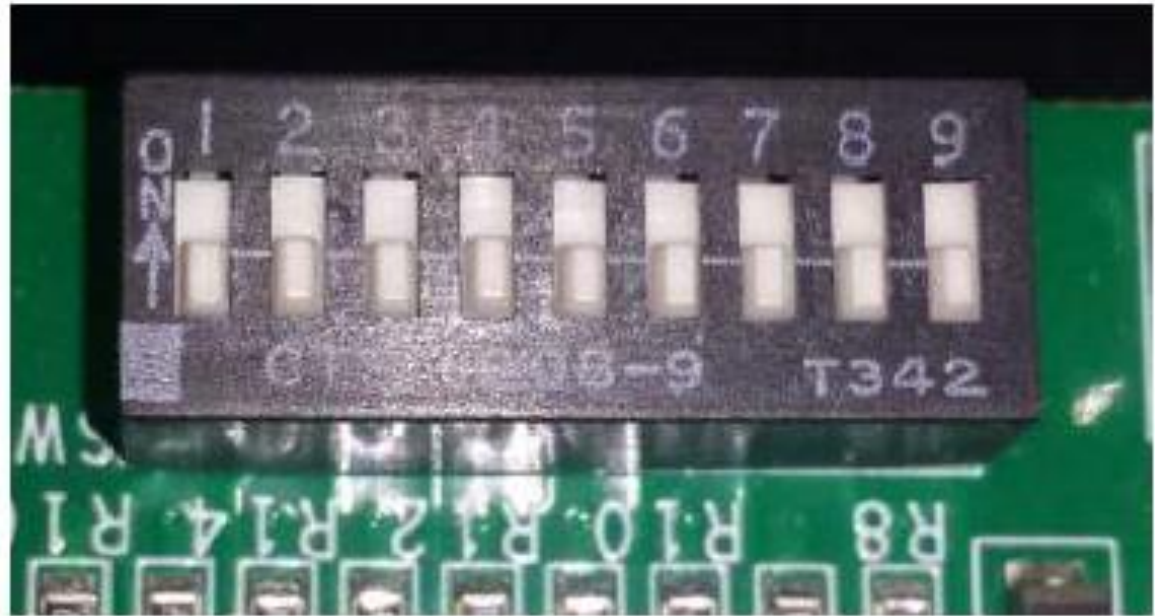
Start → Automatic Clean → Pressure  
Balance → Freezing → Harvest → Bin  
Full



# PC BOARD SETTING

Default Factory setting :

**All Dip-Switches OFF**

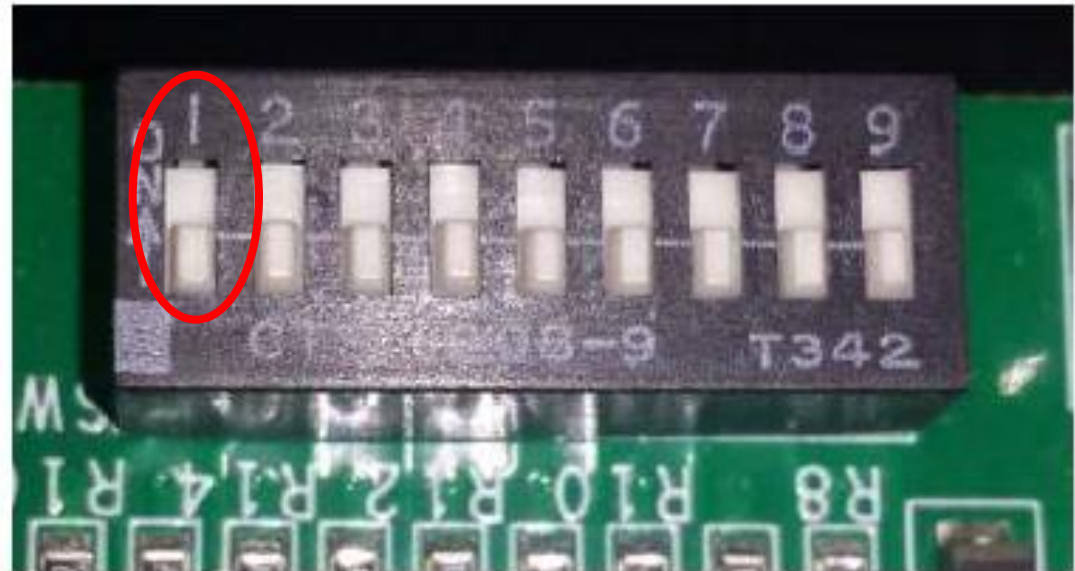


# PC BOARD SETTING

## DIP-SWITCH n. 1

OFF = Used on NW Series

ON = Factory use only



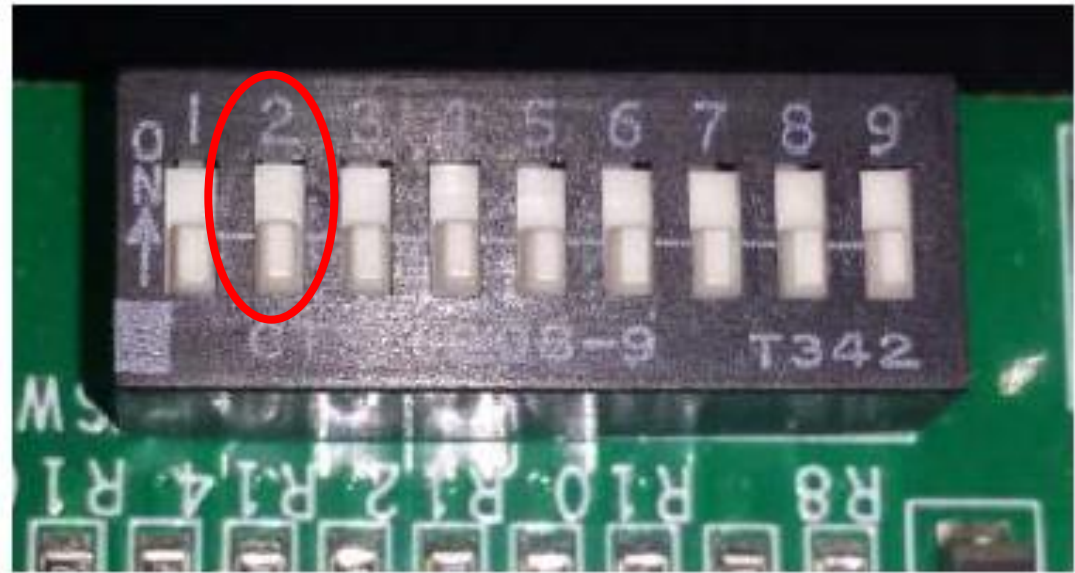
# PC BOARD SETTING

## DIP-SWITCH n. 2

OFF = No start-up time delay

ON = 90' start-up time delay

(Used on NW 1008 only)





# PC BOARD SETTING

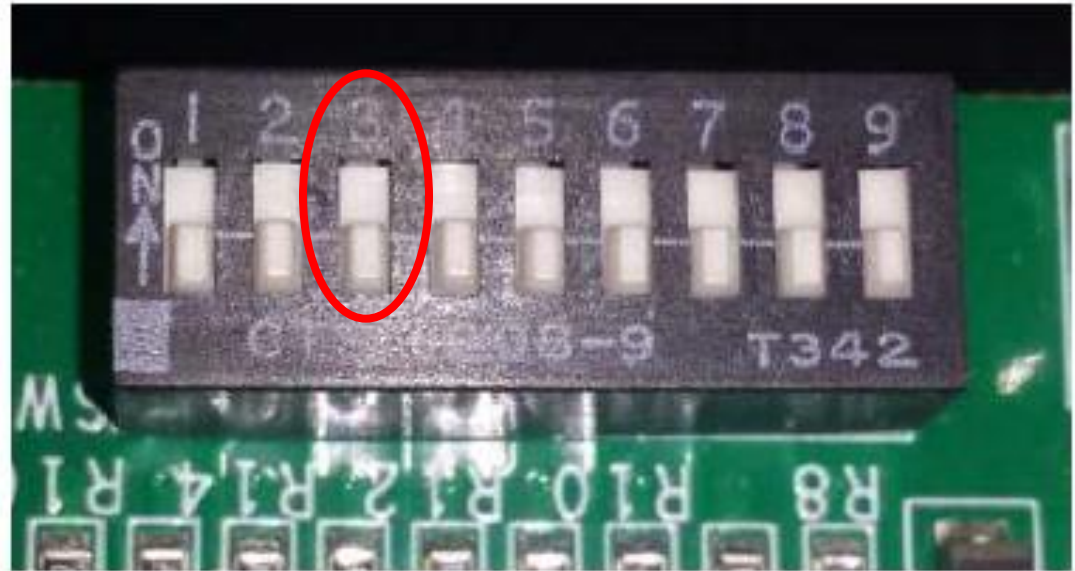
## DIP-SWITCH n. 3

OFF = 3' and 30" Max.

Harvest Time

ON = 6' max. Max.

Harvest Time

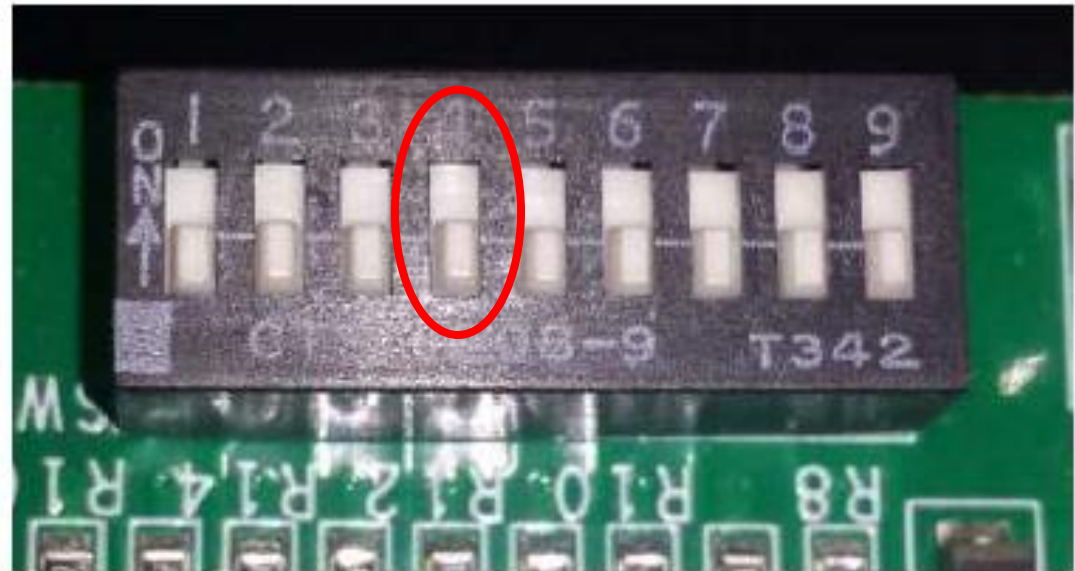


# PC BOARD SETTING

## DIP-SWITCH n. 4

OFF = 3' and 30" Water fill time

ON = 6' water fill time

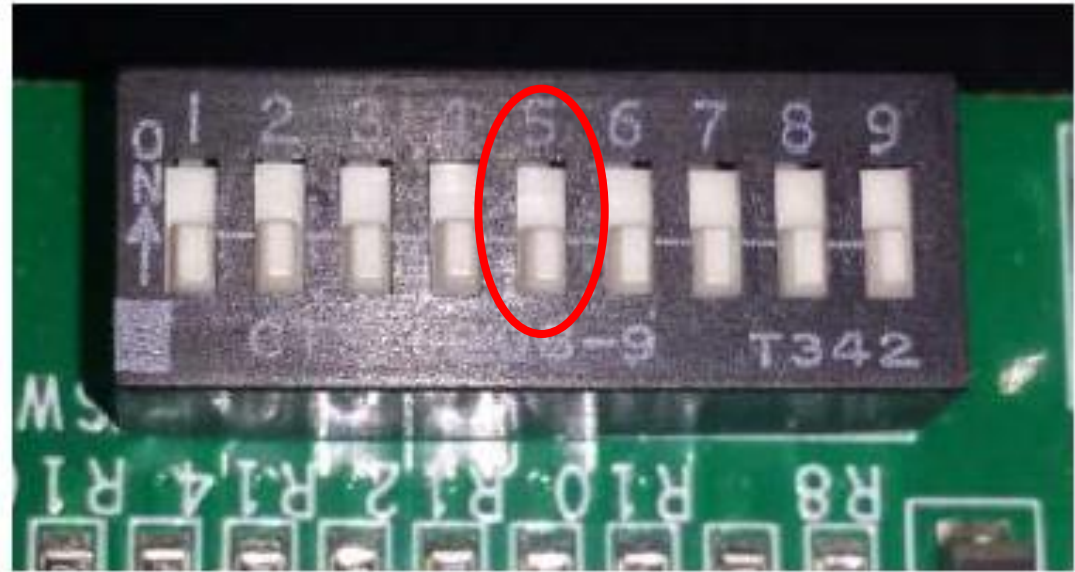


# PC BOARD SETTING

## DIP-SWITCH n. 5

OFF = Fill water in first 4' in  
freezing cycle

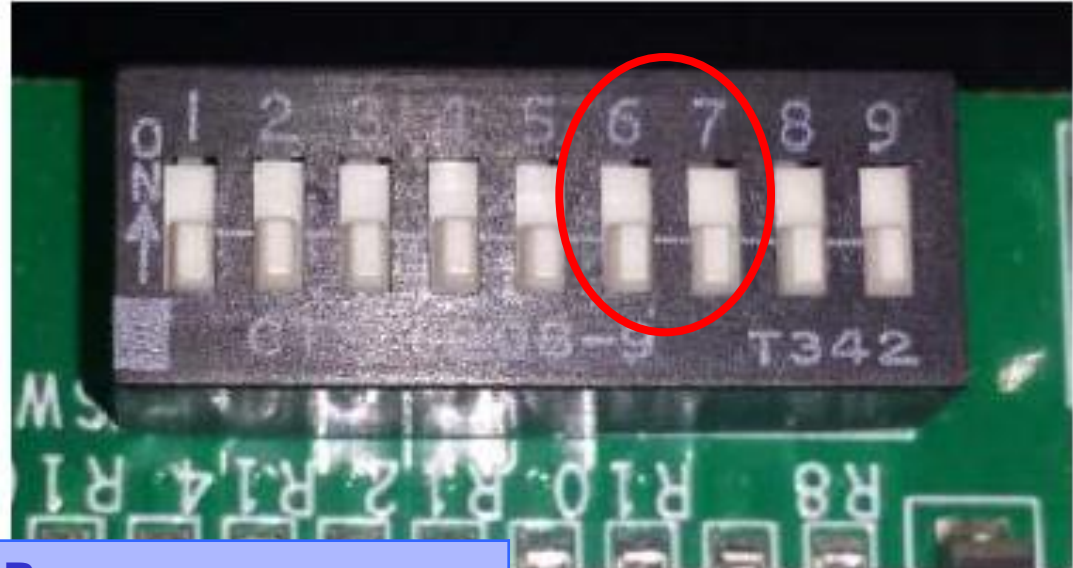
ON = Fill water in first 10' in  
freezing cycle



# PC BOARD SETTING

## DIP-SWITCH n. 6 - 7

### Purge water control



DIP n. 6	DIP n. 7	WATER PUMP
OFF	OFF	Works for 30 seconds
ON	OFF	Works for 6 seconds and 30 seconds every six harvest cycles
OFF	ON	Works for 30 seconds every three harvest cycles
ON	ON	Works for 30 seconds every six cycles

# PC BOARD SETTING

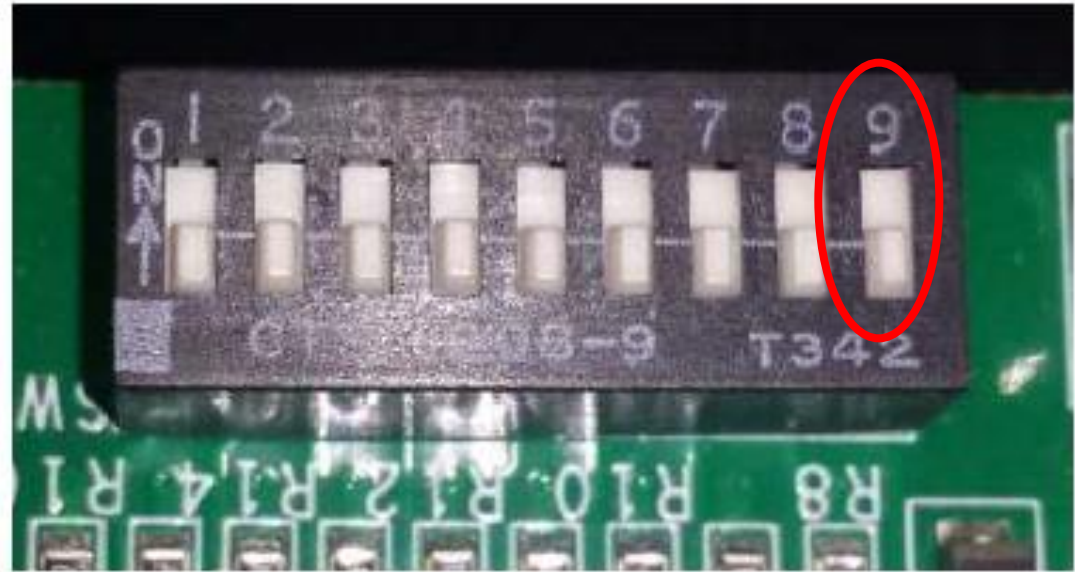
## DIP-SWITCH n. 8

FACTORY USE ONLY

## DIP-SWITCH n. 9

OFF = Machine will stop after clean procedure, need to press clean button to restart

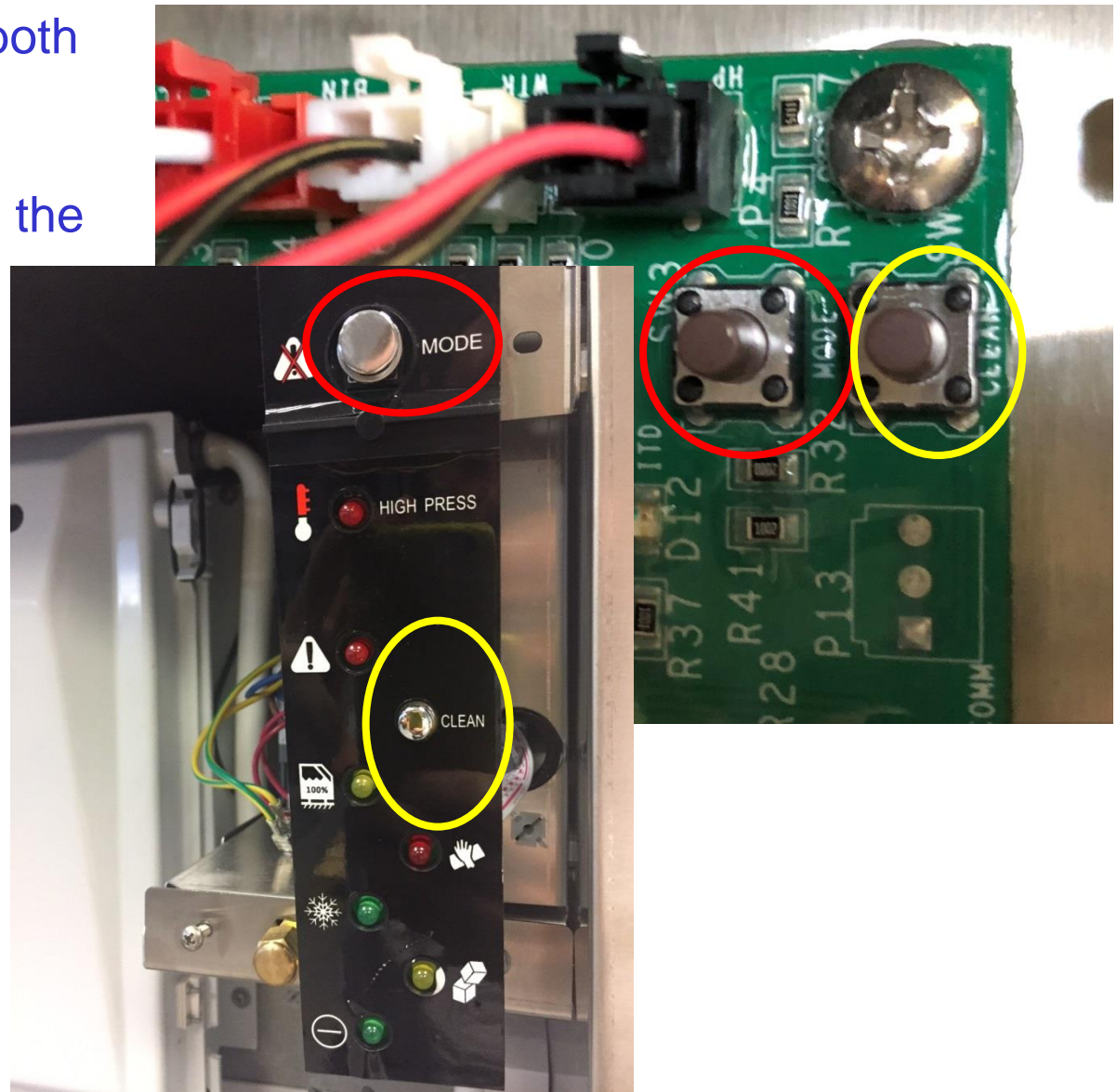
ON = Machine will restart automatically after clean procedure





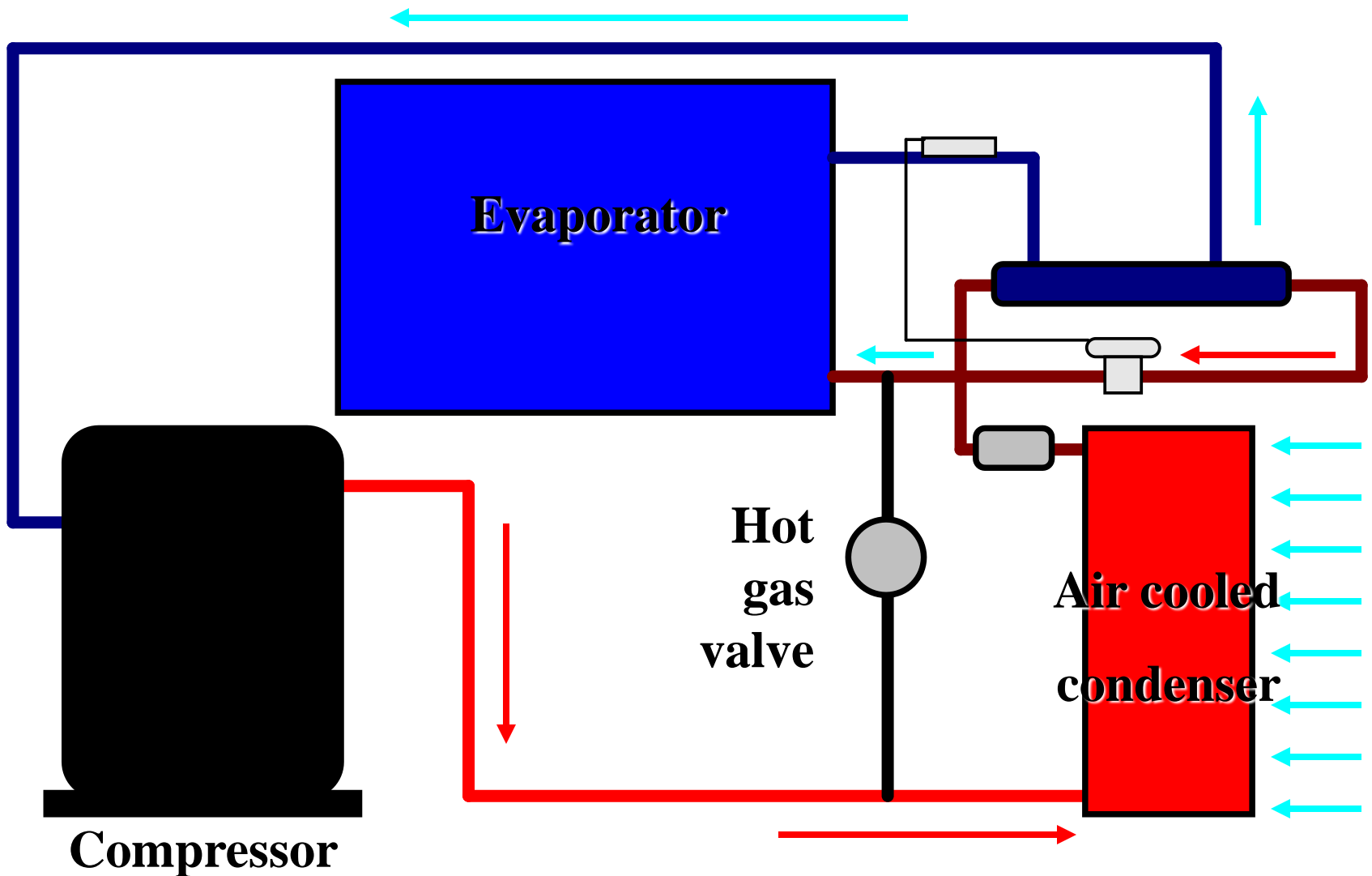
# PC BOARD PUSH BUTTON

PC Board and display are both equipped with MODE and CLEAN push button having the same function



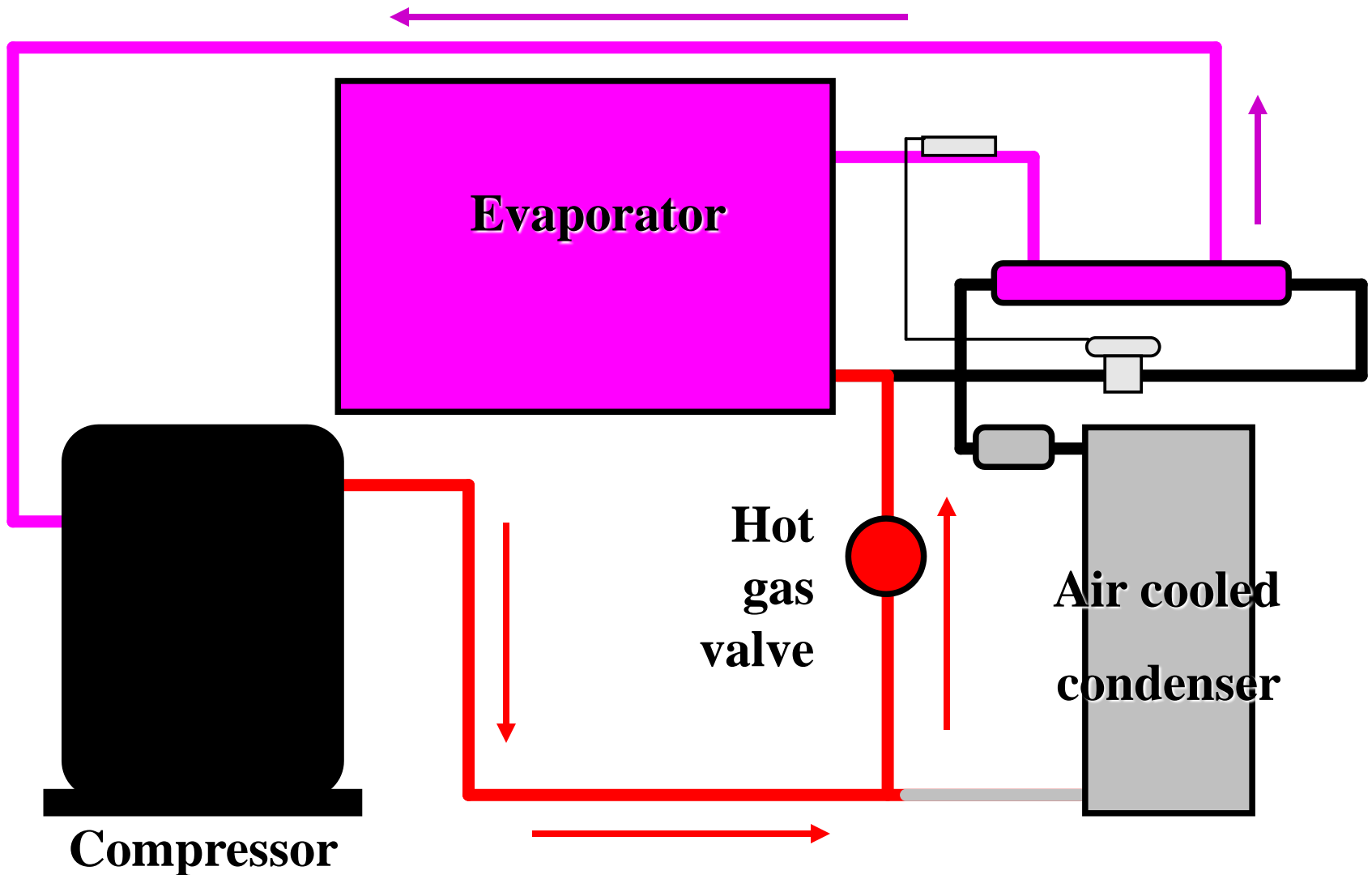
# **OPERATING PRINCIPLES and COMPONENTS**

# OPERATING PRINCIPLES - FREEZE



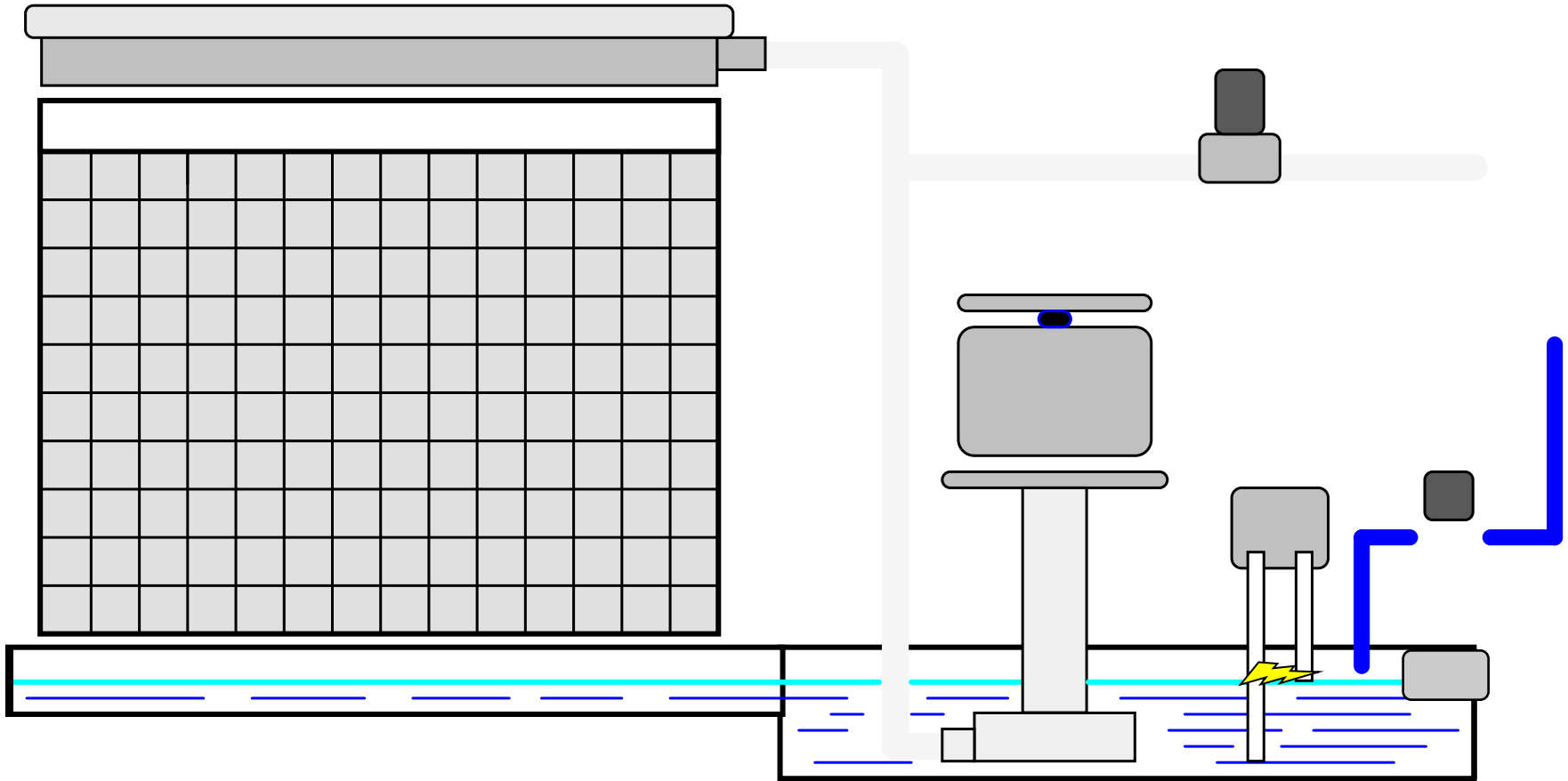


# OPERATING PRINCIPLES - HARVEST



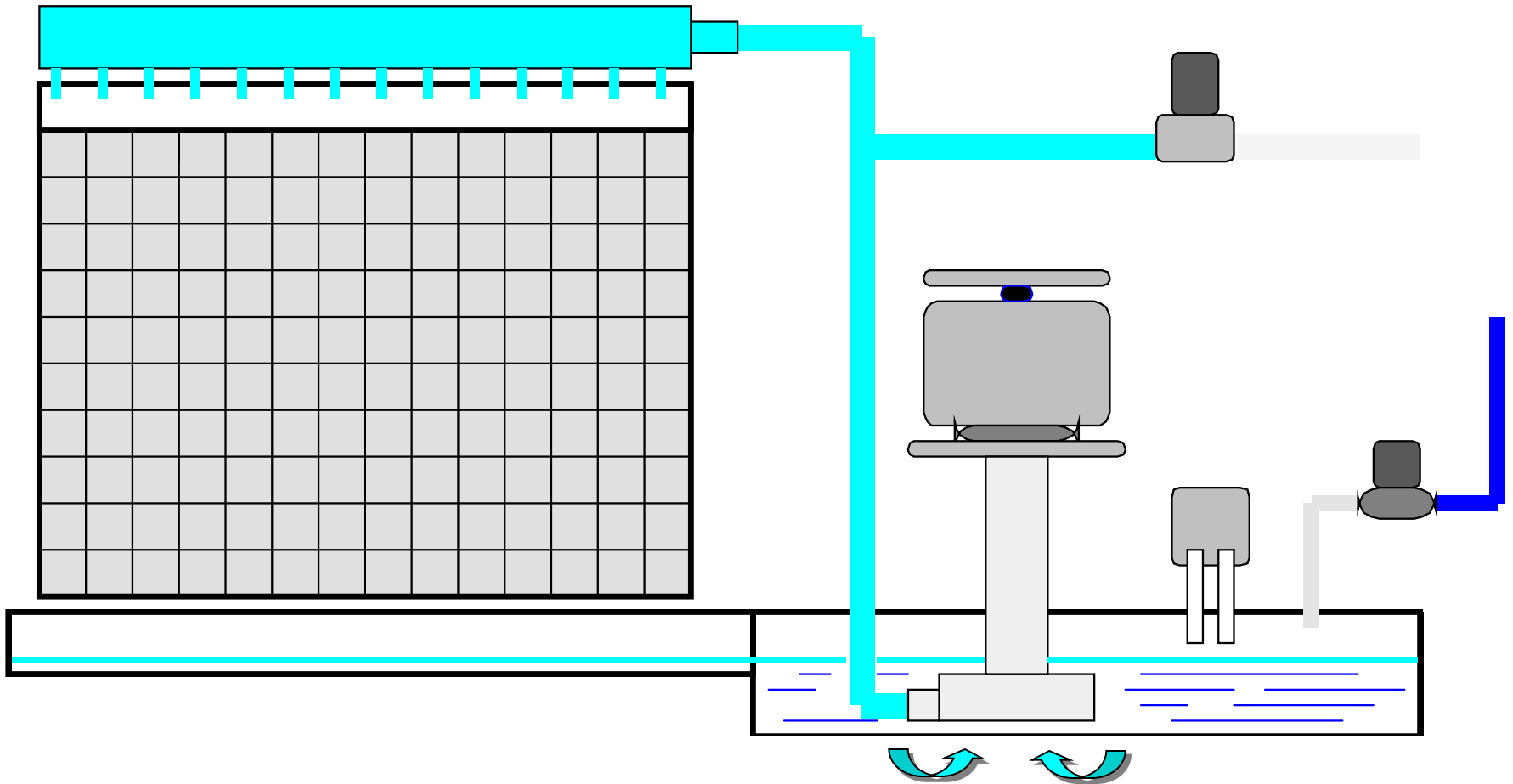
# WATER SYSTEM – FREEZING CYCLE

1° PART – 40"

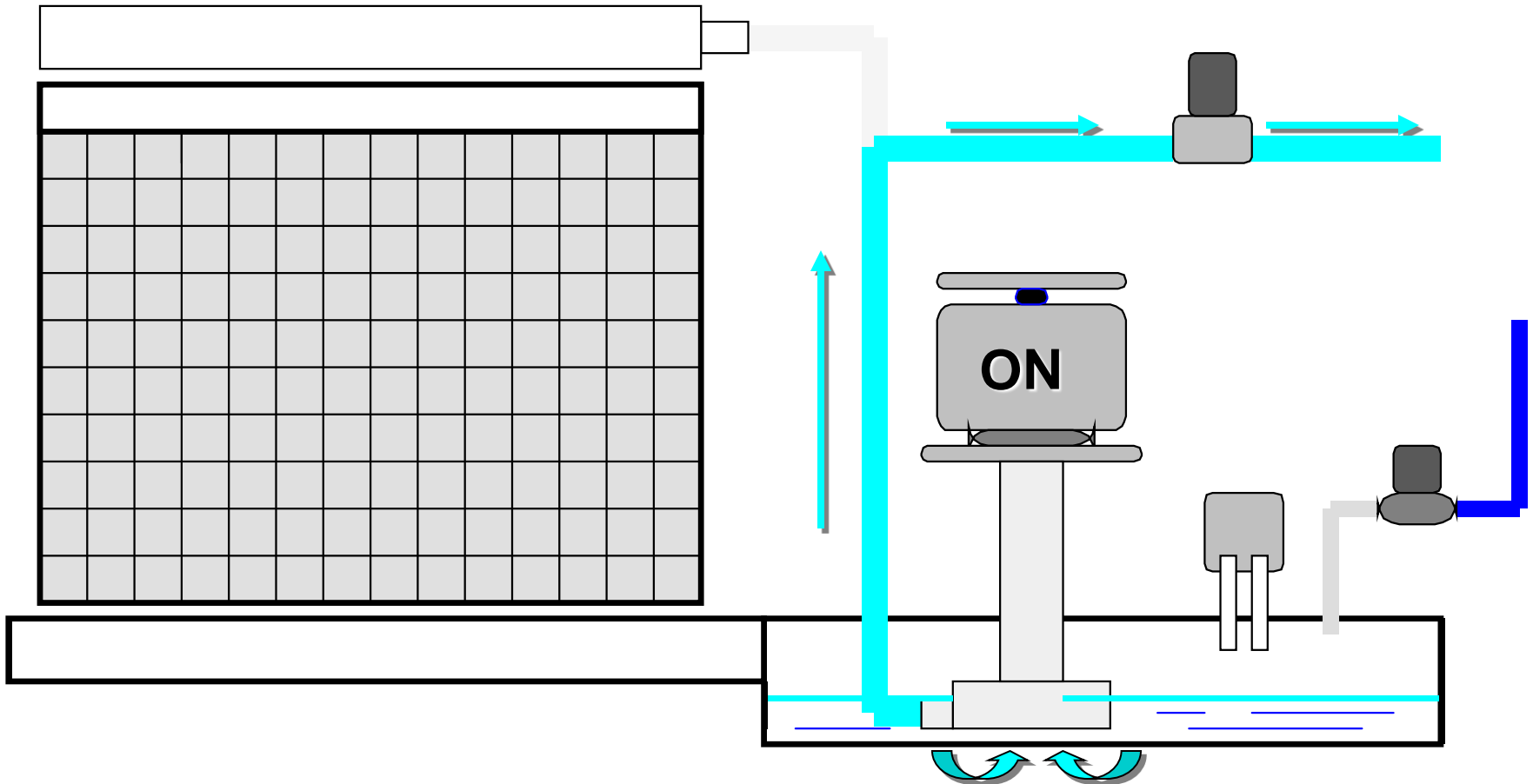


# WATER SYSTEM – FREEZING CYCLE

## 2° PART

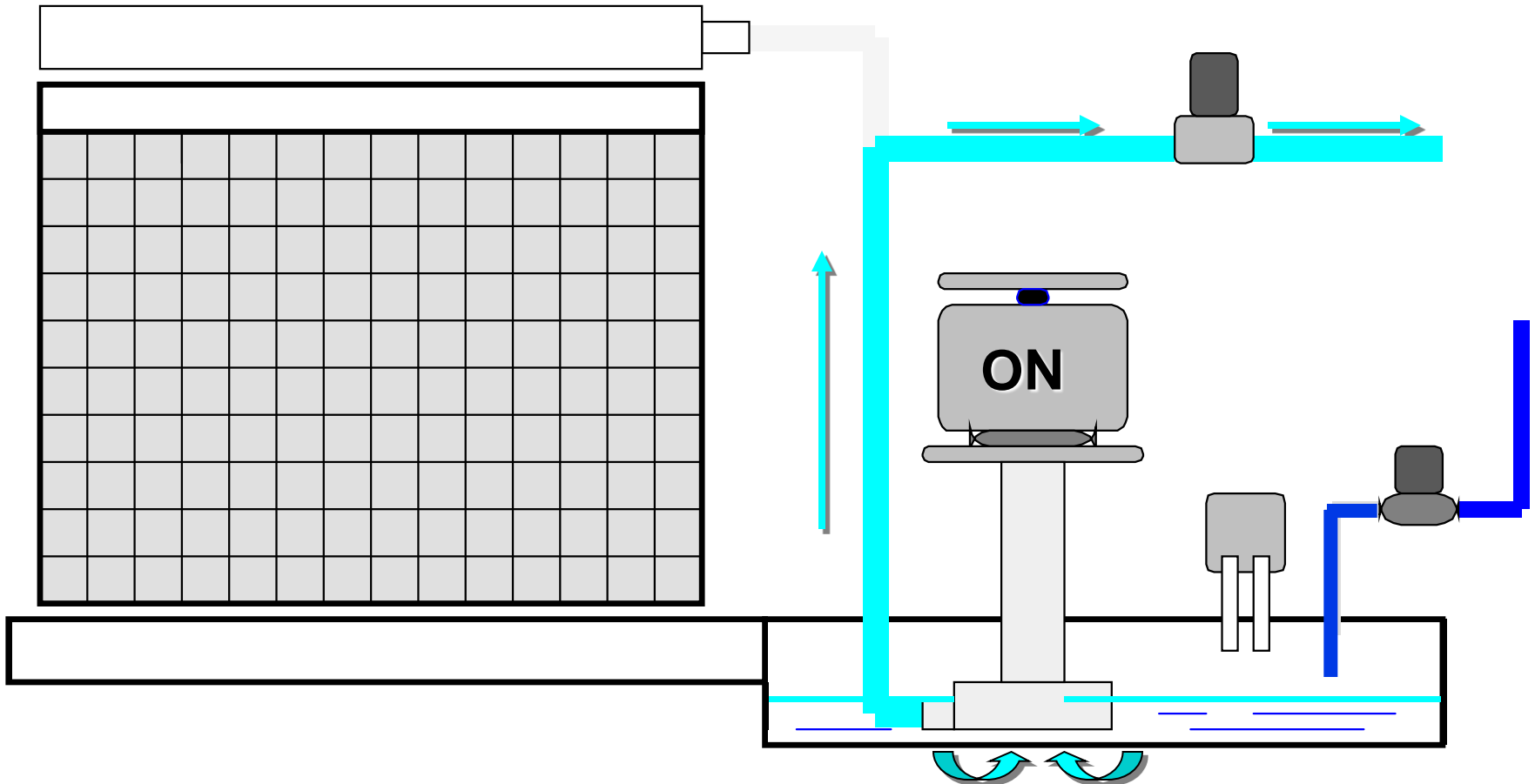


## First 20"



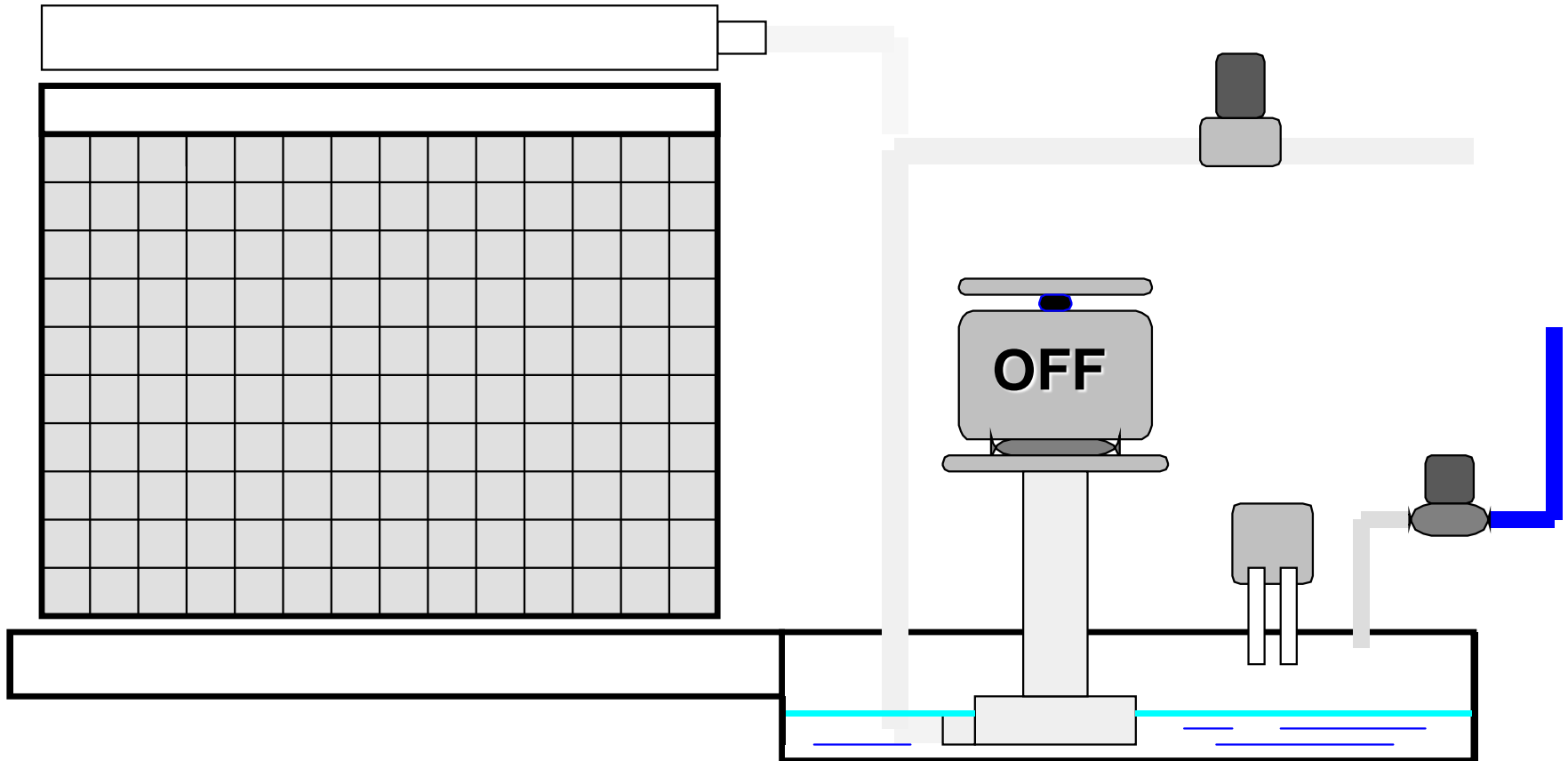
# WATER SYSTEM – HARVEST CYCLE

From 20” up to 30”



# WATER SYSTEM – HARVEST

From 30” up to the end of harvest cycle



# COMPONENTS - REFRIGERANT SYSTEM

The components of the refrigerant system of the NW series are:

- **COMPRESSOR**



# COMPONENTS - REFRIGERANT SYSTEM

- **CONDENSER**





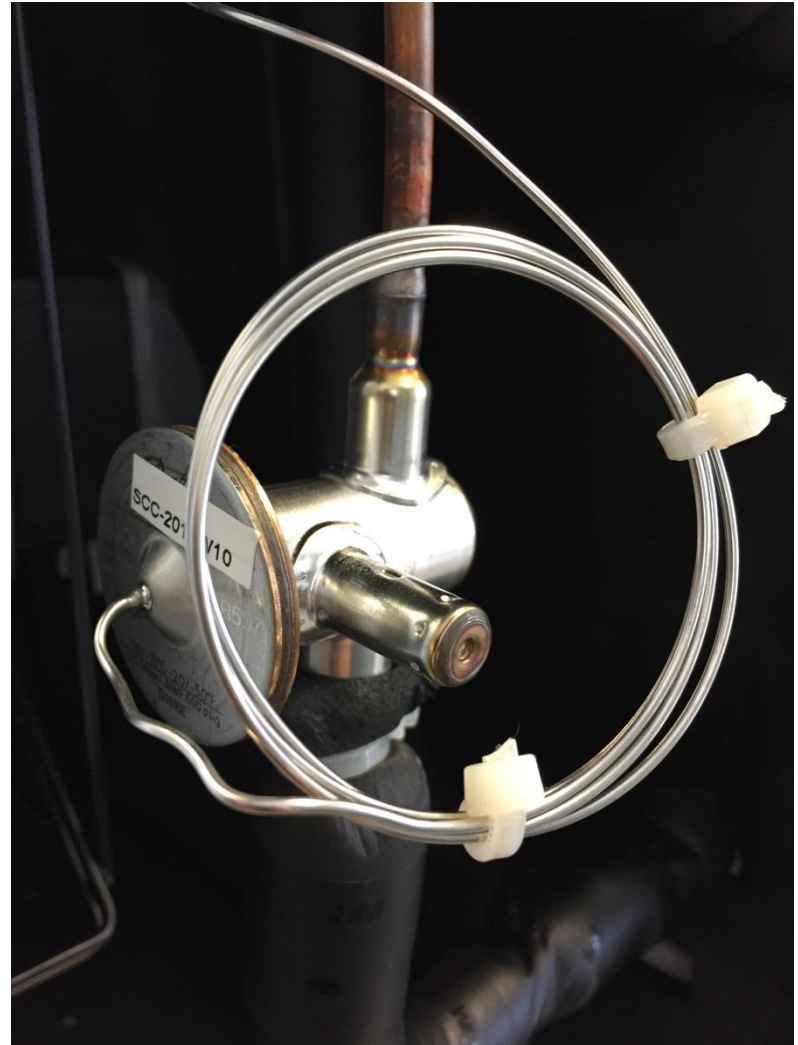
# COMPONENTS - REFRIGERANT SYSTEM

- EVAPORATOR



# COMPONENTS - REFRIGERANT SYSTEM

- TXV VALVE



# COMPONENTS - REFRIGERANT SYSTEM

- **DRIER**



# COMPONENTS - REFRIGERANT SYSTEM

- HOT GAS VALVE



# COMPONENTS - REFRIGERANT SYSTEM

- HIGH PRESSURE CTRL

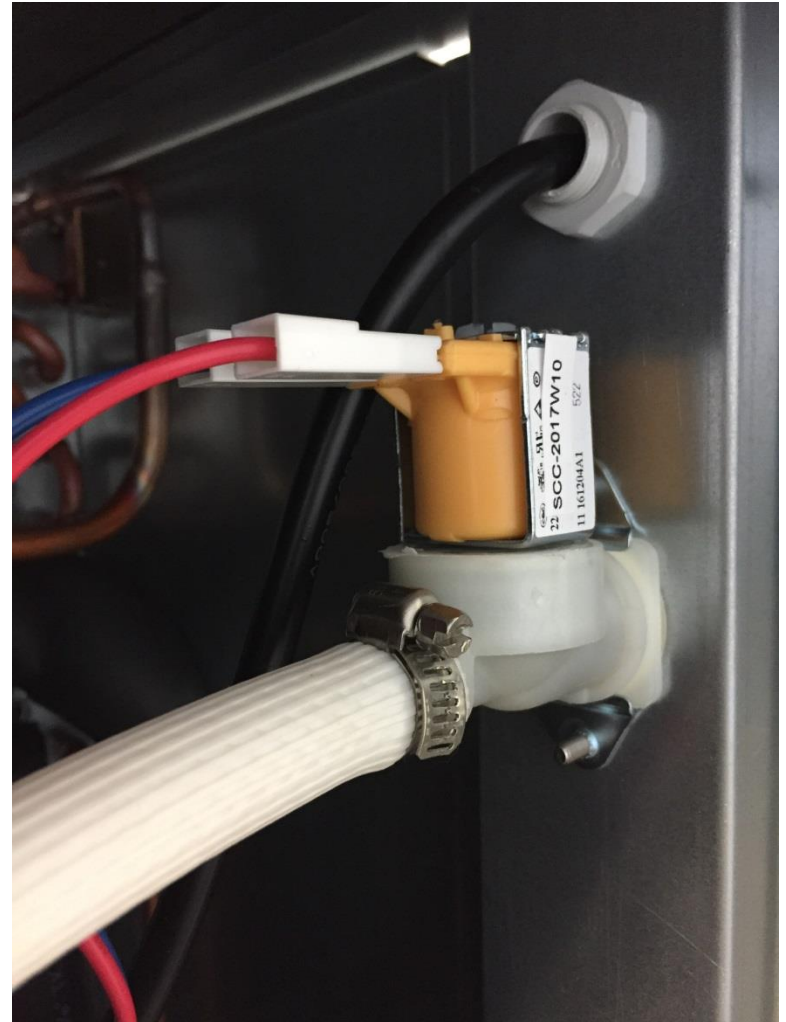




# COMPONENTS – WATER SYSTEM

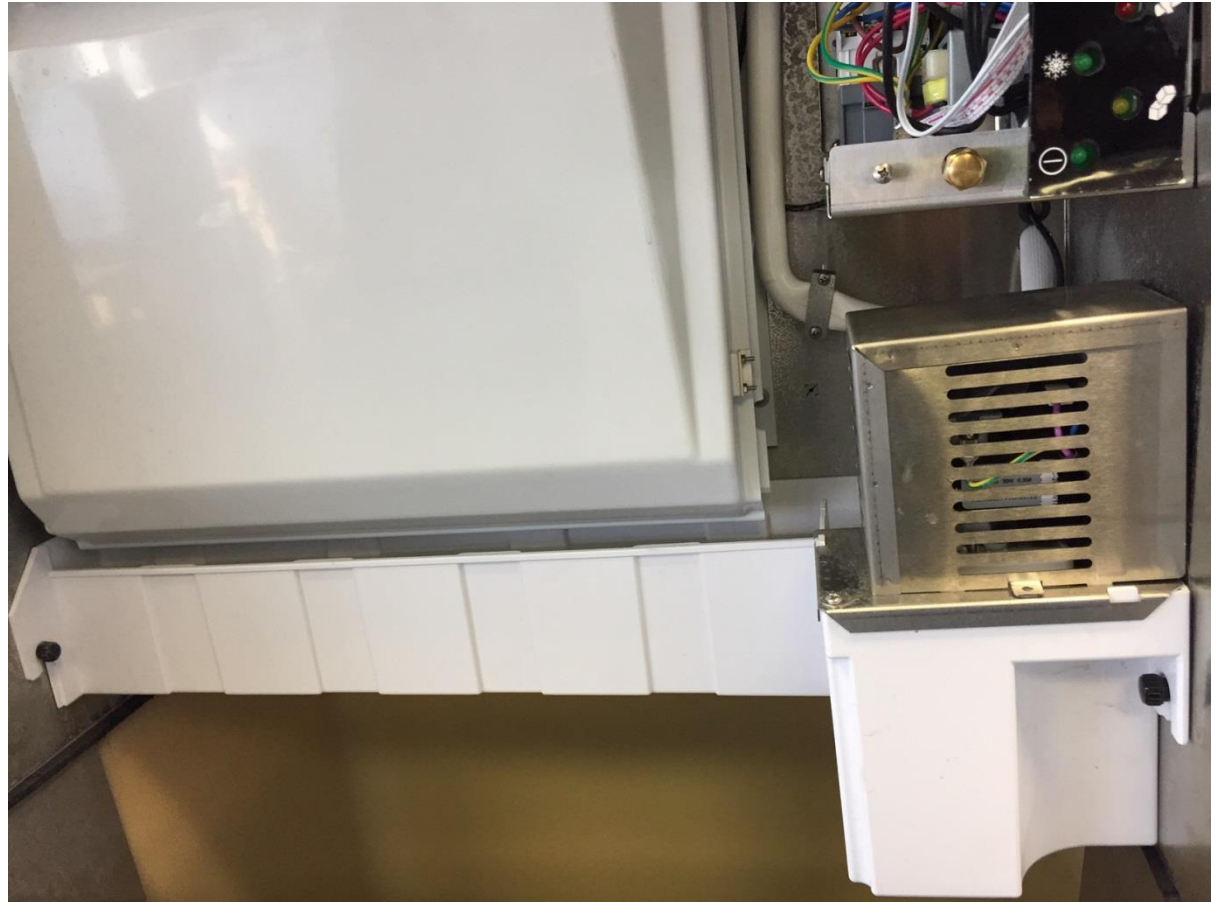
The components of the water system of the NW series are:

- **WATER INLET VALVE**



# COMPONENTS – WATER SYSTEM

- WATER SUMP



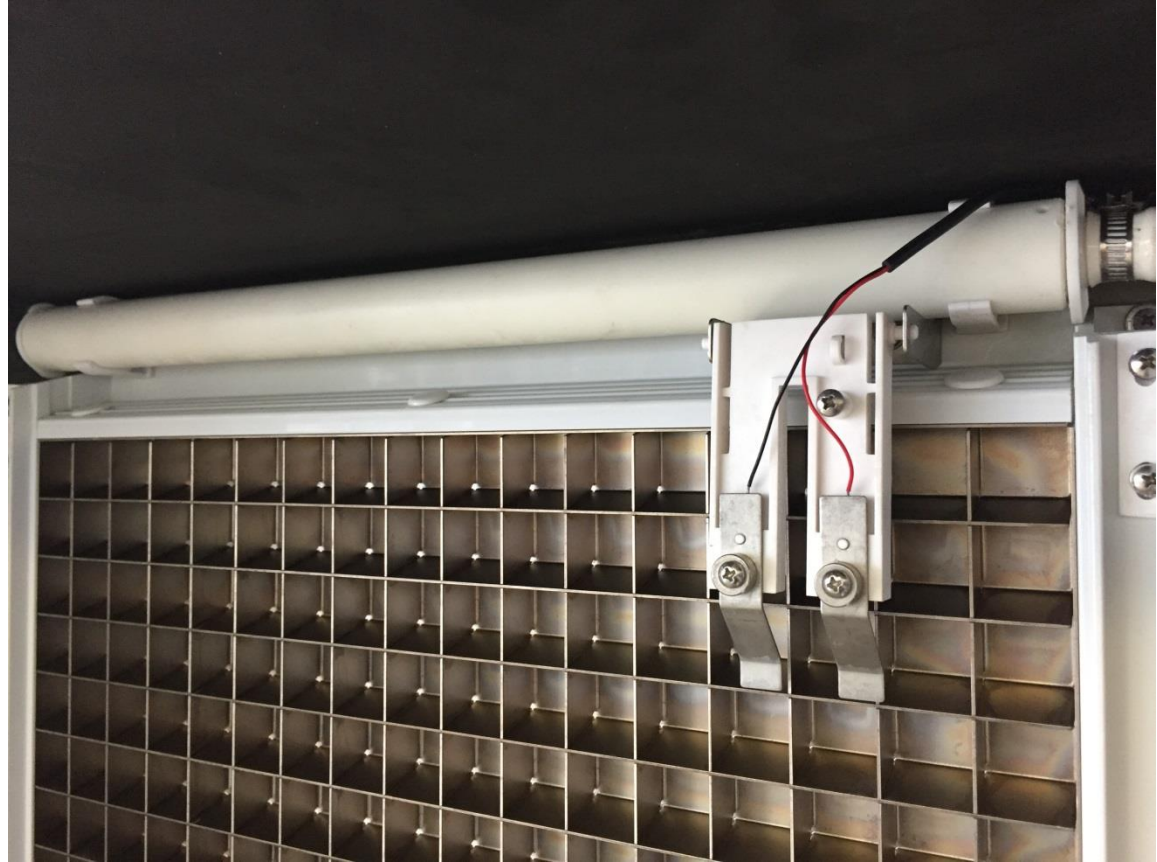
- **WATER PUMP**





# COMPONENTS – WATER SYSTEM

- WATER  
DISTRIBUTOR  
TUBE



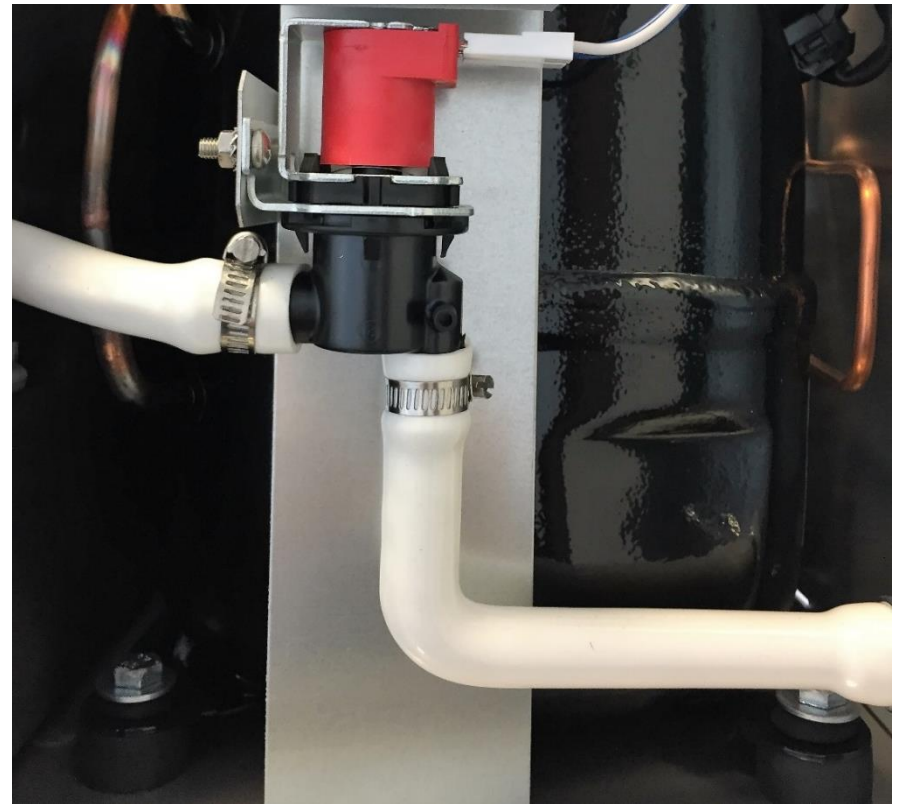
# COMPONENTS – WATER SYSTEM

- WATER FLOW ADJUSTERS



# COMPONENTS – WATER SYSTEM

- WATER DRAIN  
VALVE



## The components of the Electronic System of the NW Series Models are :

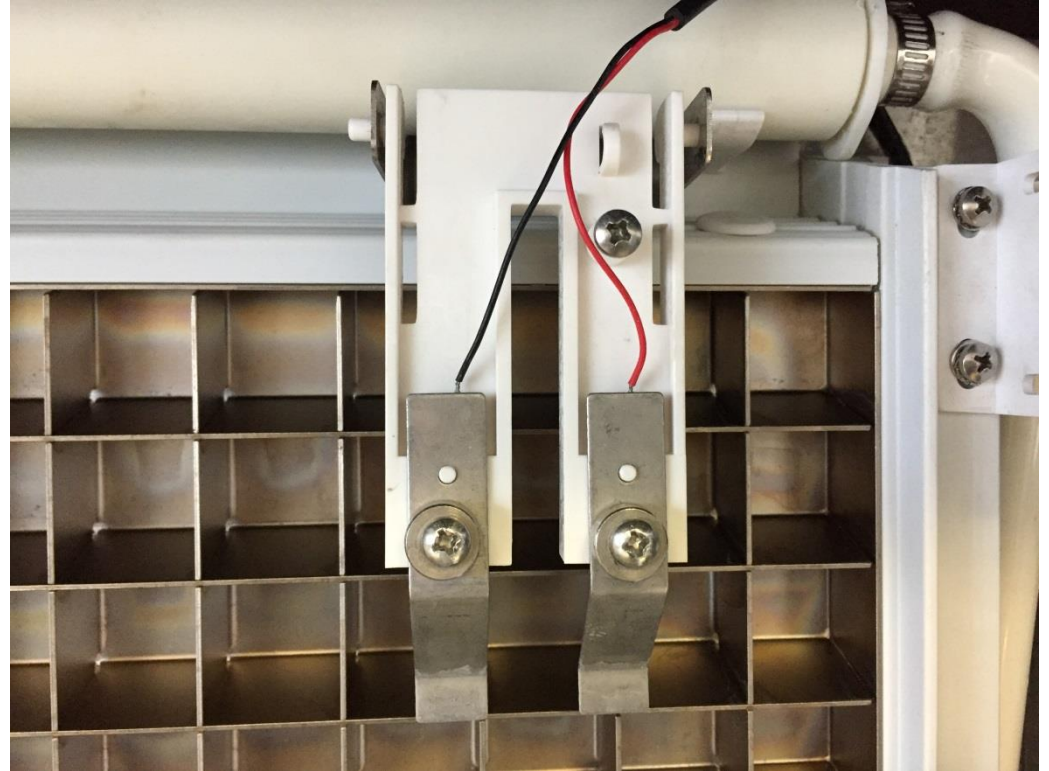
- **PC BOARD**





# COMPONENTS - ELECTRONIC CONTROLS

- ICE THICKNESS  
SENSOR



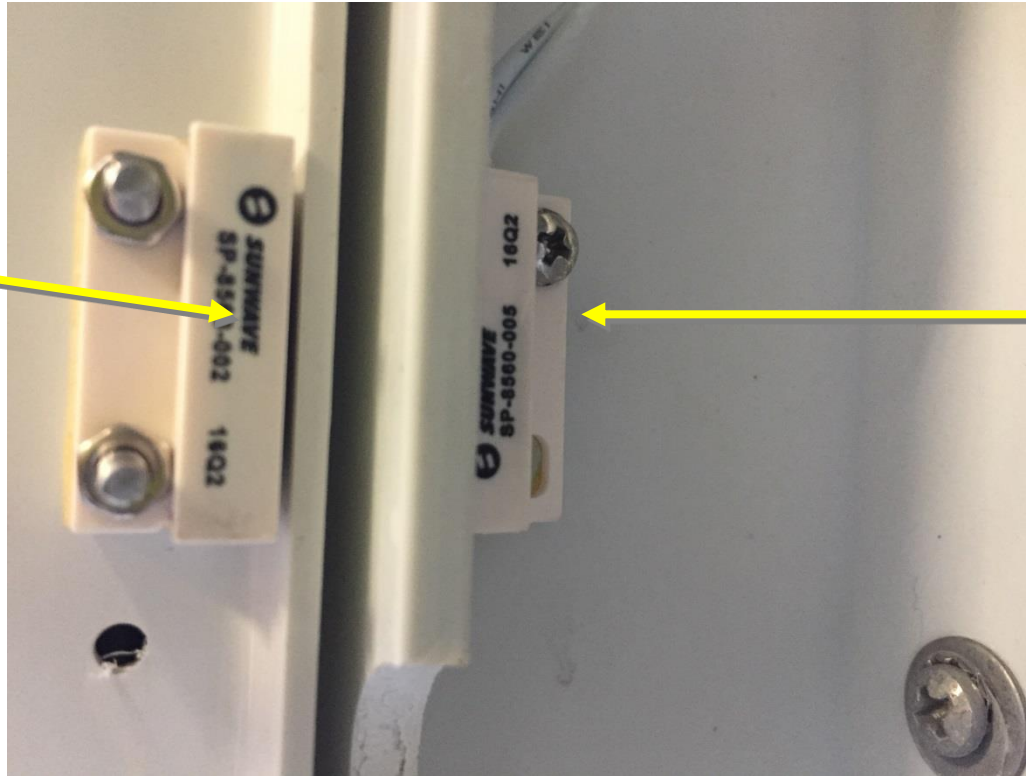
# COMPONENTS - ELECTRONIC CONTROLS

- CONDENSER  
SENSOR



# COMPONENTS - ELECTRONIC CONTROLS

- **MAGNET**



- **MAGNETIC SWITCH**

# COMPONENTS - ELECTRONIC CONTROLS

- WATER LEVEL  
SENSOR





# COMPONENTS - ELECTRONIC CONTROLS

- WATER LEVEL  
SENSOR

**NW 308-508**



A top-down view of two white ceramic coffee cups filled with black coffee, each on a matching saucer. The cups are placed on a light-colored wooden table. Behind each cup is a packet of brown sugar with a cartoon character on it. In front of the cups are several packets of white cream. A silver spoon rests on the saucer of each cup. The text "END FIRST HALF" is overlaid in large blue letters across the center of the image.

**END FIRST  
HALF**