Scotsman Ice Systems

NEW AC SERIES

AC SERIES CUBERS

TECHNICAL SERVICE TRAINING

Welcome to another Scotsman technical service presentation. This one will cover the smallest units of new AC “..6” Series Ice Cube Machines.

Models are **AC 46, AC 56 and AC 86.**

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NEW AC SERIES

AC 46 A/W

Max. Ice Production = 24 kg/24h*

Max. Storage Bin Capacity = 9 Kg

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

Medium Gourmet
20 g

34,5 mm x 30,5 mm x 29,5 mm

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NEW AC SERIES

AC 56 A/W

Max. Ice Production = 32 Kg/24h*

Max. Storage Bin Capacity = 12,5 Kg

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

Small Gourmet
8 g

25,5 x mm 22,5 mm x 21 mm

Medium Gourmet
20 g

34,5 mm x 30,5 mm x 29,5 mm

Large Gourmet
39 g

41,5 mm x 38 mm x 35 mm

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NEW AC SERIES

AC 86 A/W

Max. Ice Production = 39 Kg/24h*

Max. Storage Bin Capacity = 19 Kg

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

Small Gourmet
8 g

25,5 x mm 22,5 mm x 21 mm

Medium Gourmet
20 g

34,5 mm x 30,5 mm x 29,5 mm

Large Gourmet
39 g

41,5 mm x 38 mm x 35 mm

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NEW AC SERIES

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**

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NEW AC SERIES

UNPACKING

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NEW AC SERIES

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.

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NEW AC SERIES

UNPACKING

Visually inspect the exterior of the machine then open the bin door and remove from the inside the:

- water supply inlet tube
- water outlet tube
- leg kit (only for AC 56 and AC 86)
- sanitizing bag

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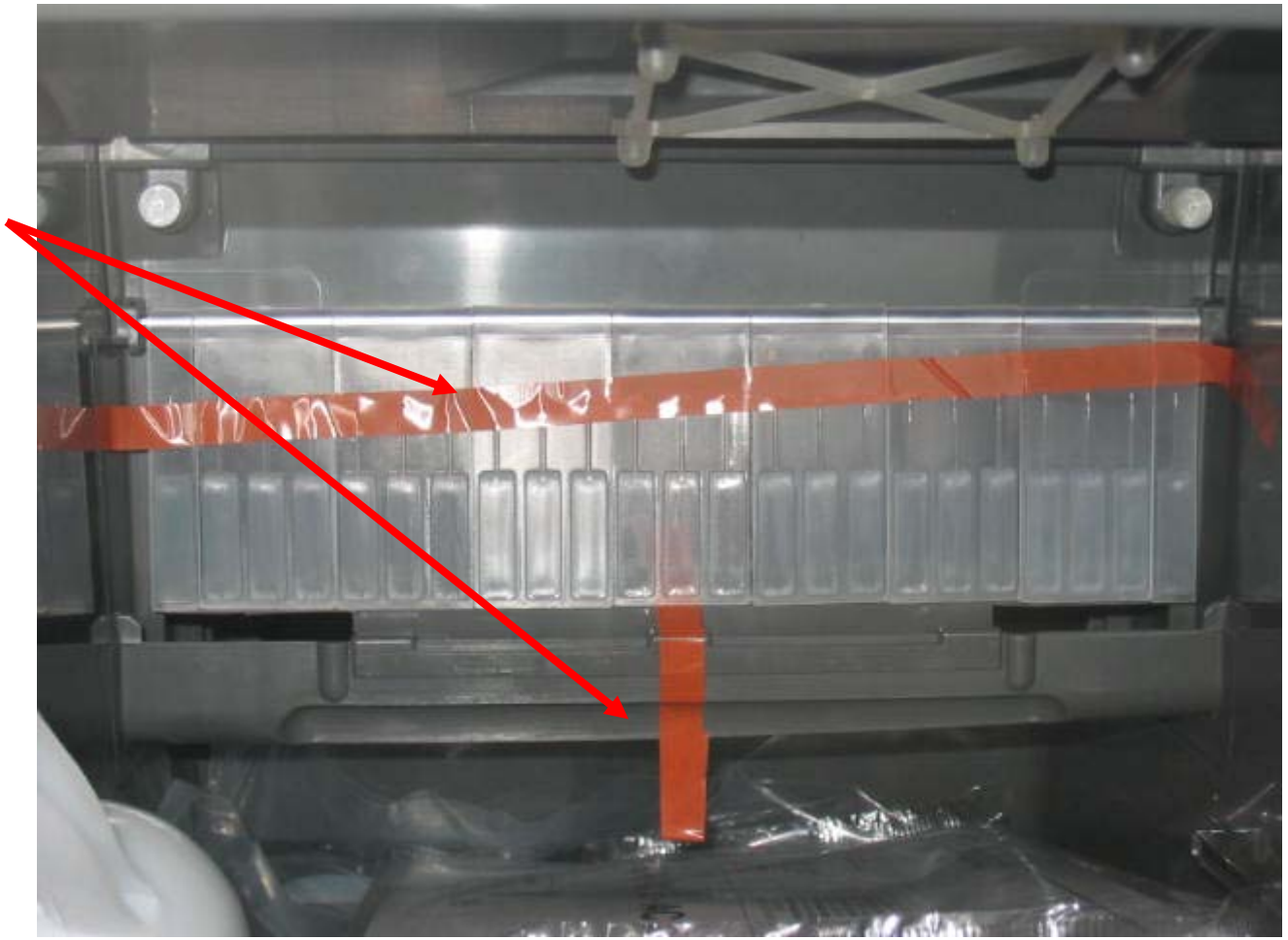
NEW AC SERIES

UNPACKING

Remove the adhesive tapes securing the curtain and the spray platen to the front of the water sump.



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NEW AC SERIES

INSTALLATION

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NEW AC SERIES

INSTALLATION

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.

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NEW AC SERIES

INSTALLATION

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

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

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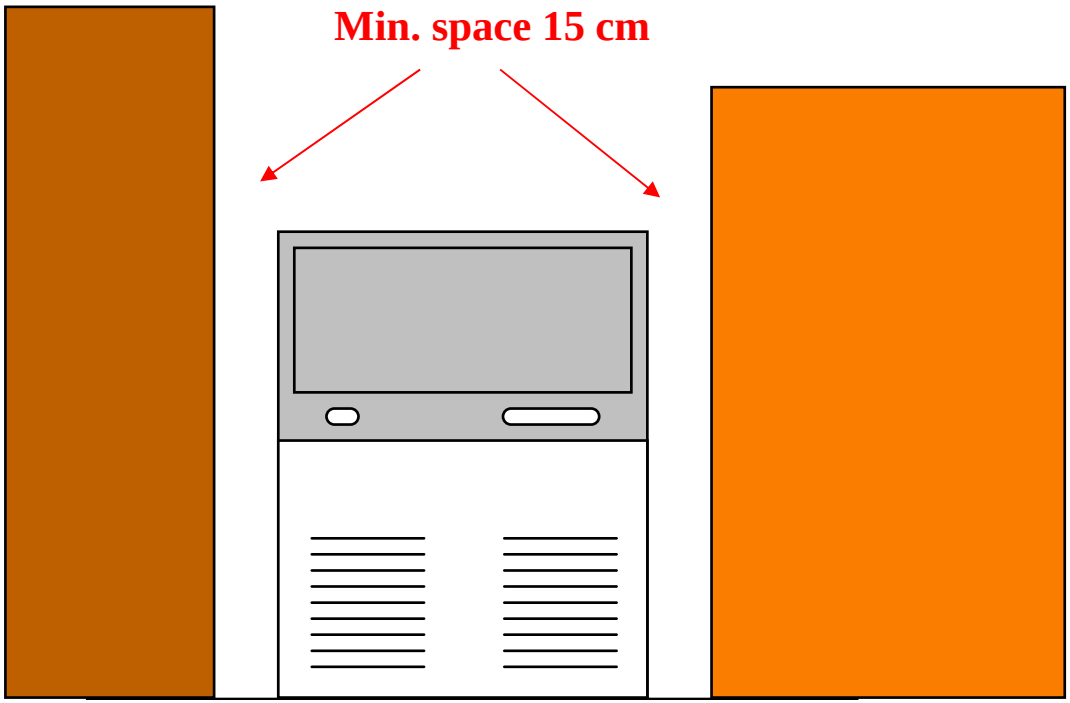
INSTALLATION

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



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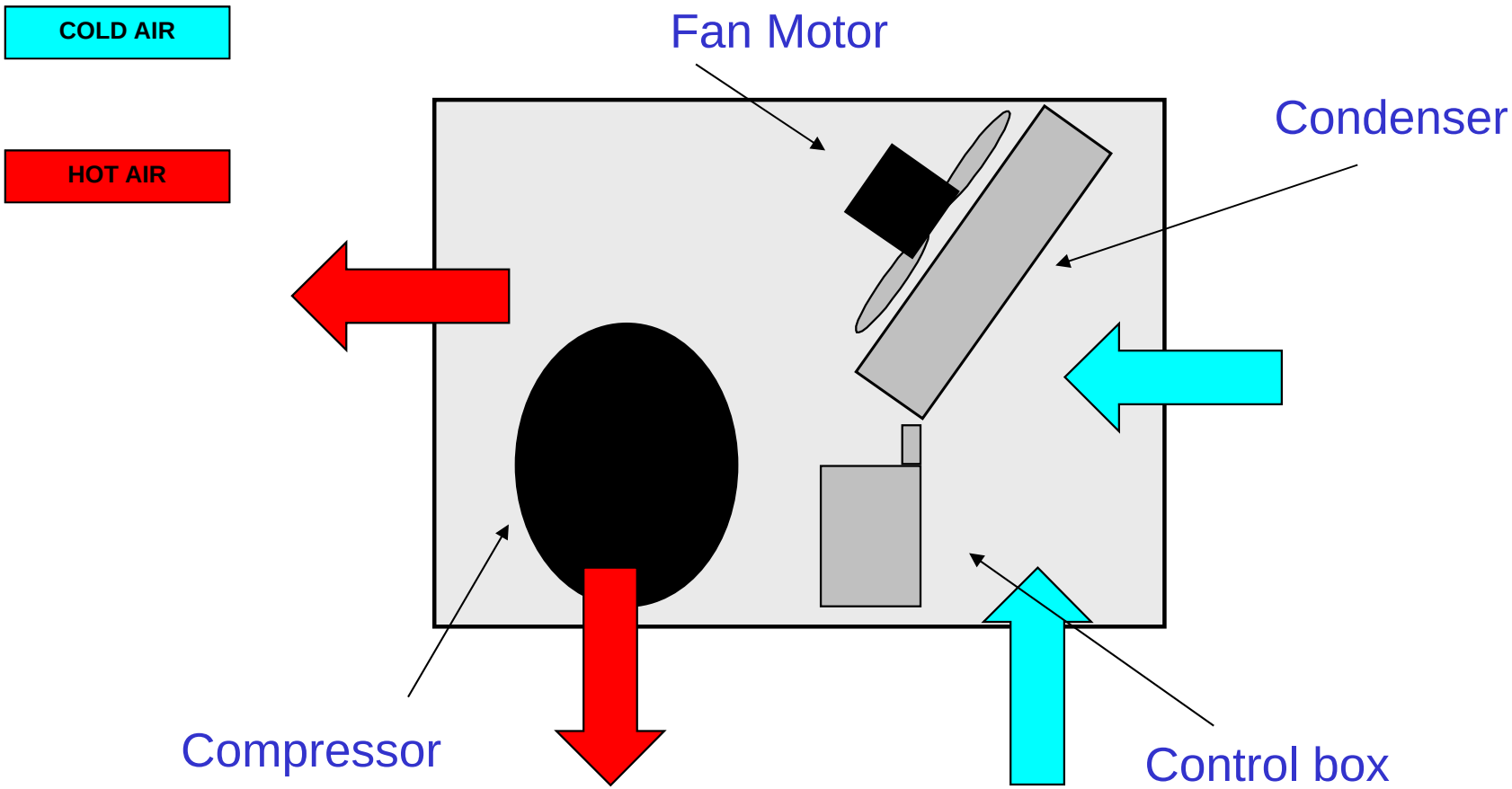
NEW AC SERIES

INSTALLATION - AIR CIRCULATION



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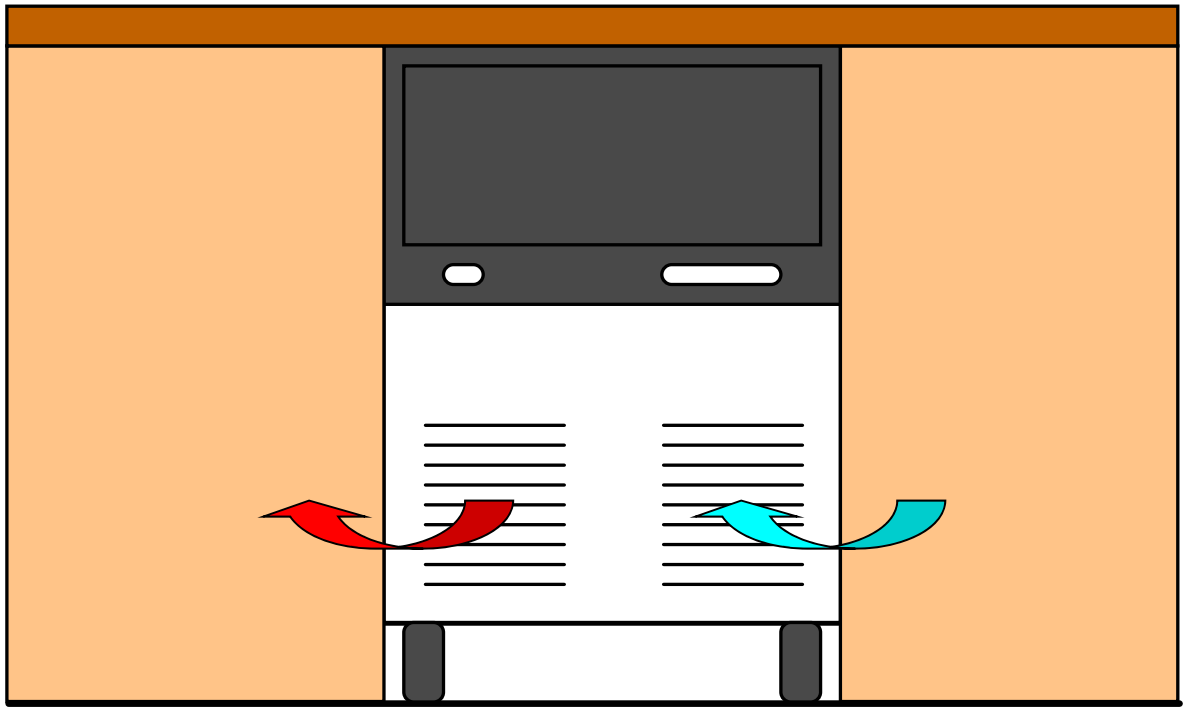
NEW AC SERIES

INSTALLATION

Installation under counter with no space of both sides are allowed but daily ice capacity can drop down to a maximum of 20%.



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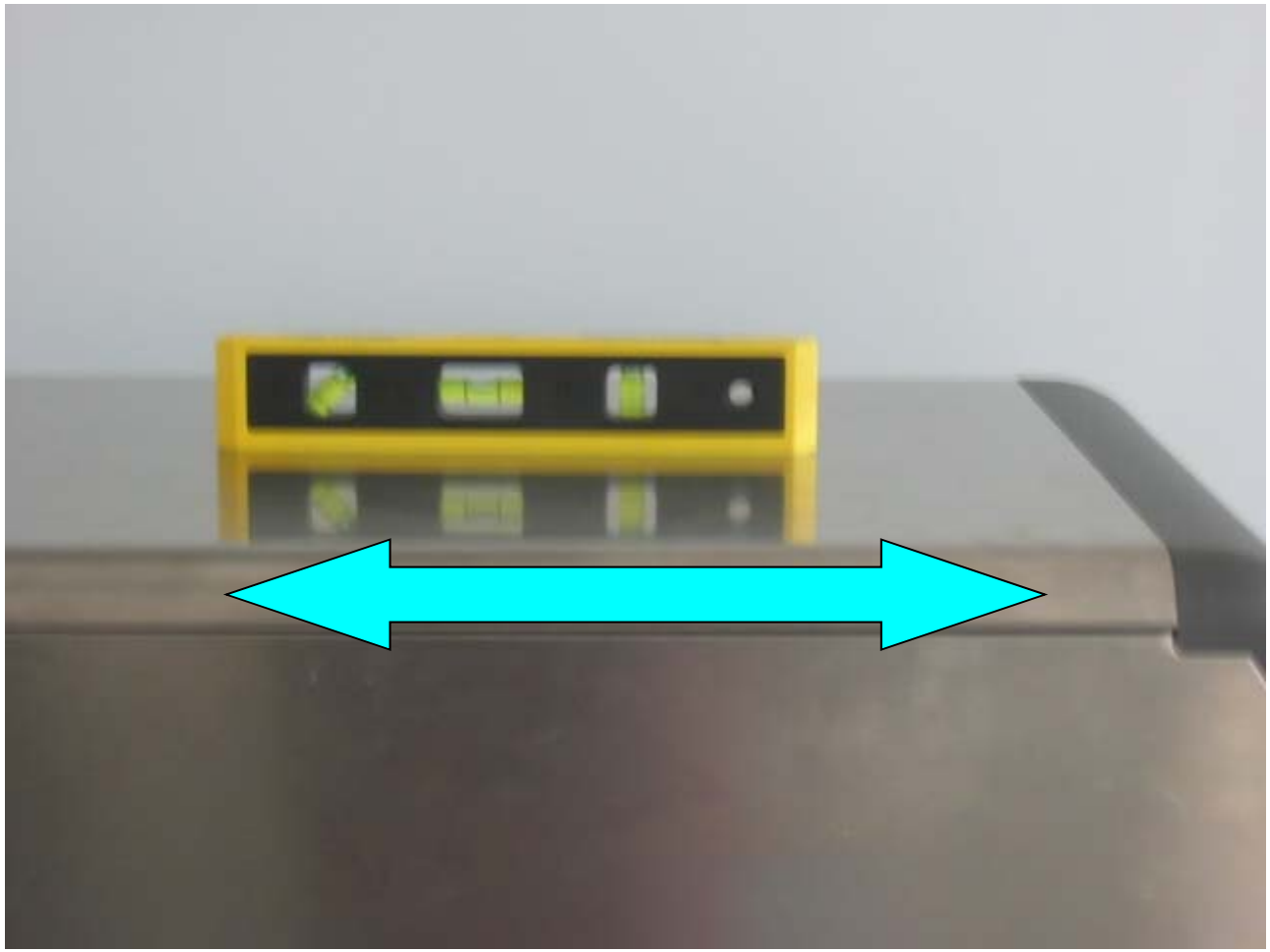
NEW AC SERIES

INSTALLATION

Level the unit on both directions front to rear and……



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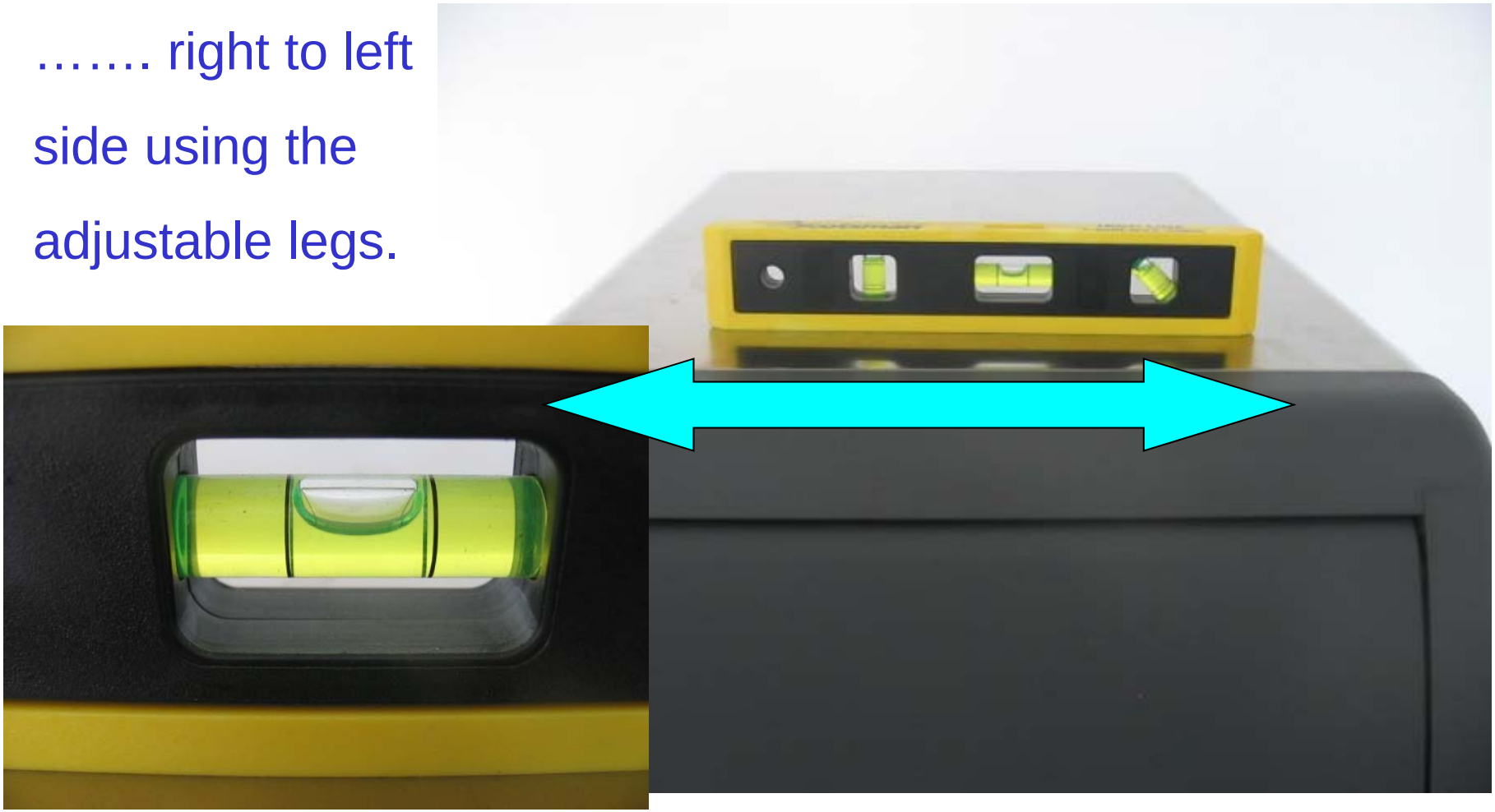
NEW AC SERIES

INSTALLATION

……. right to left side using the adjustable legs.



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NEW AC SERIES

INSTALLATION - ELECTRICAL

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

Maximum voltage variation should be ±10%.

Machine must be individually fuse protected.

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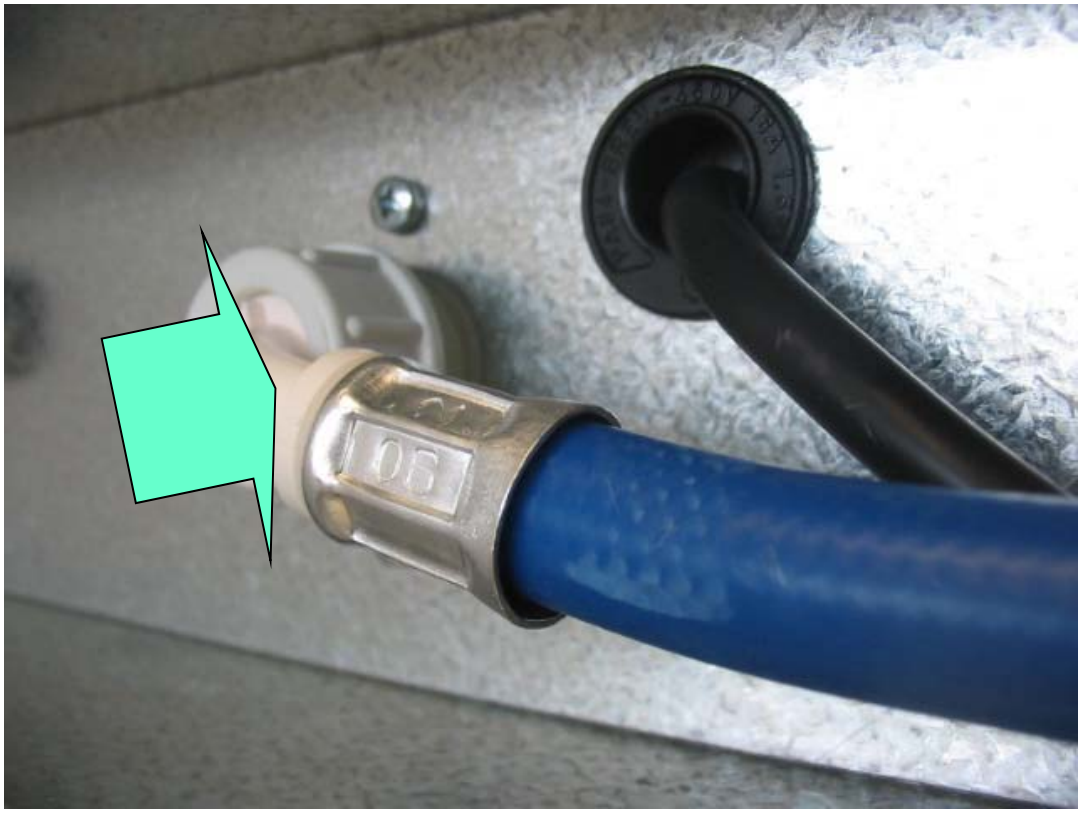
NEW AC SERIES

INSTALLATION – WATER IN

Connect the water inlet 3/4” male threat of the water inlet solenoid valve to the water supply line by means of the rubber hose provided with machine.

Install on water supply line closed to the machine a water valve (tap).



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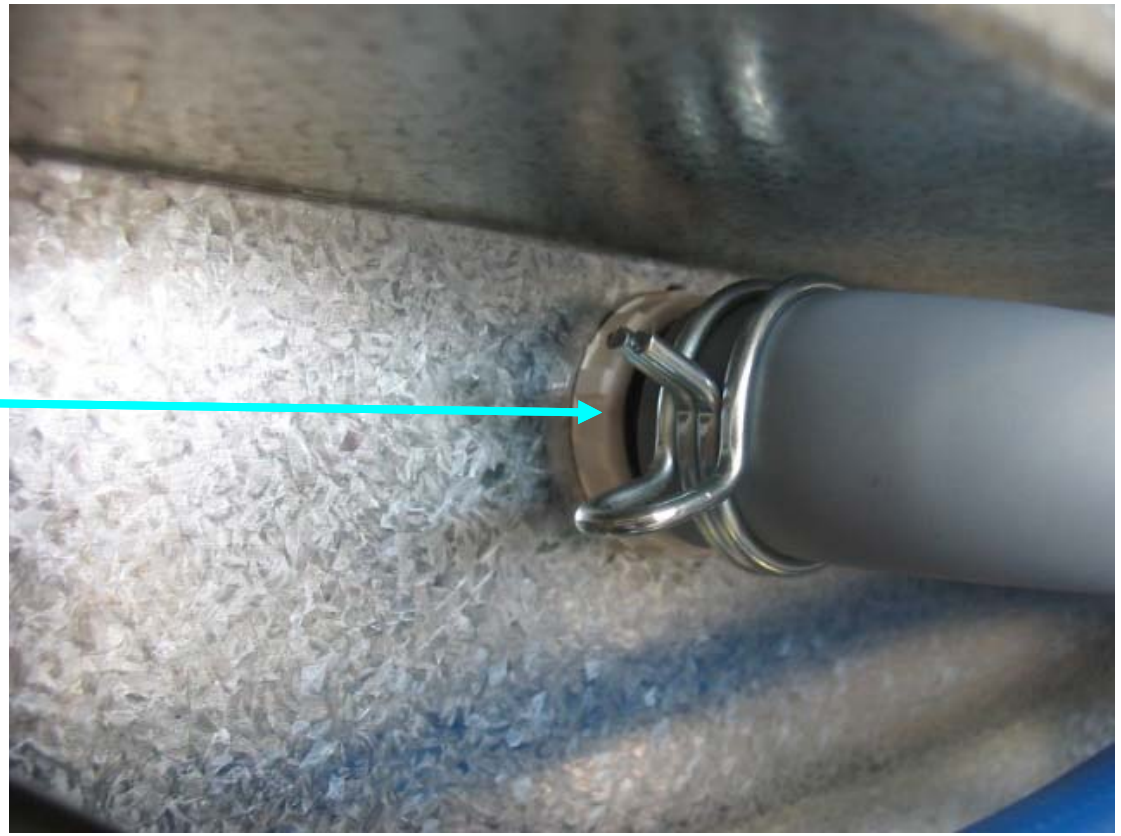
NEW AC SERIES

INSTALLATION – WATER DRAIN

Connect the 20 mm O.D. fitting of the water drain with the flexible hose supply with the machine securing it by proper clamp.



As water will be mainly drained under pressure (by water pump) it is not necessary to have a vented drain.

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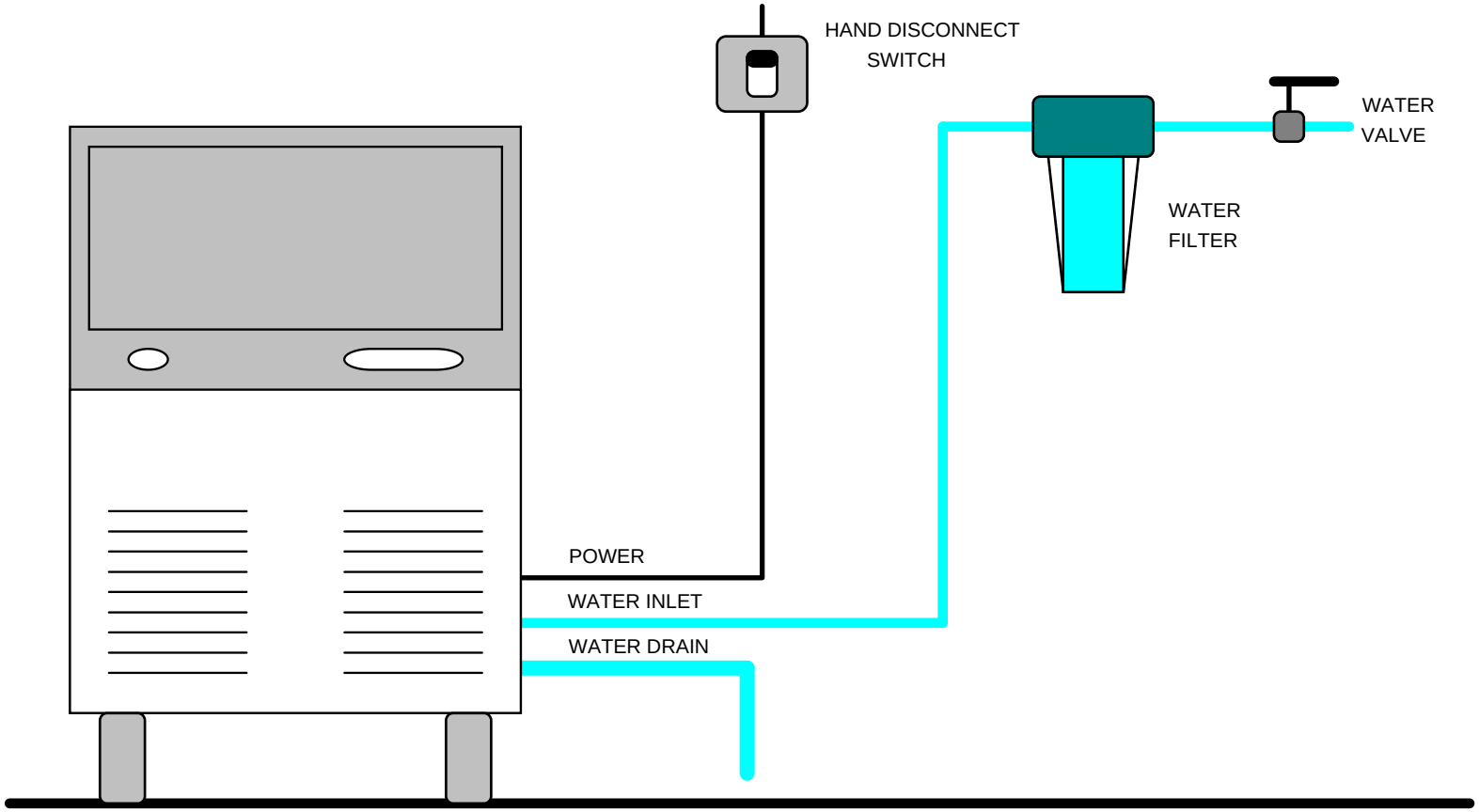
NEW AC SERIES

TYPICAL INSTALLATION

AIR COOLED VERSION



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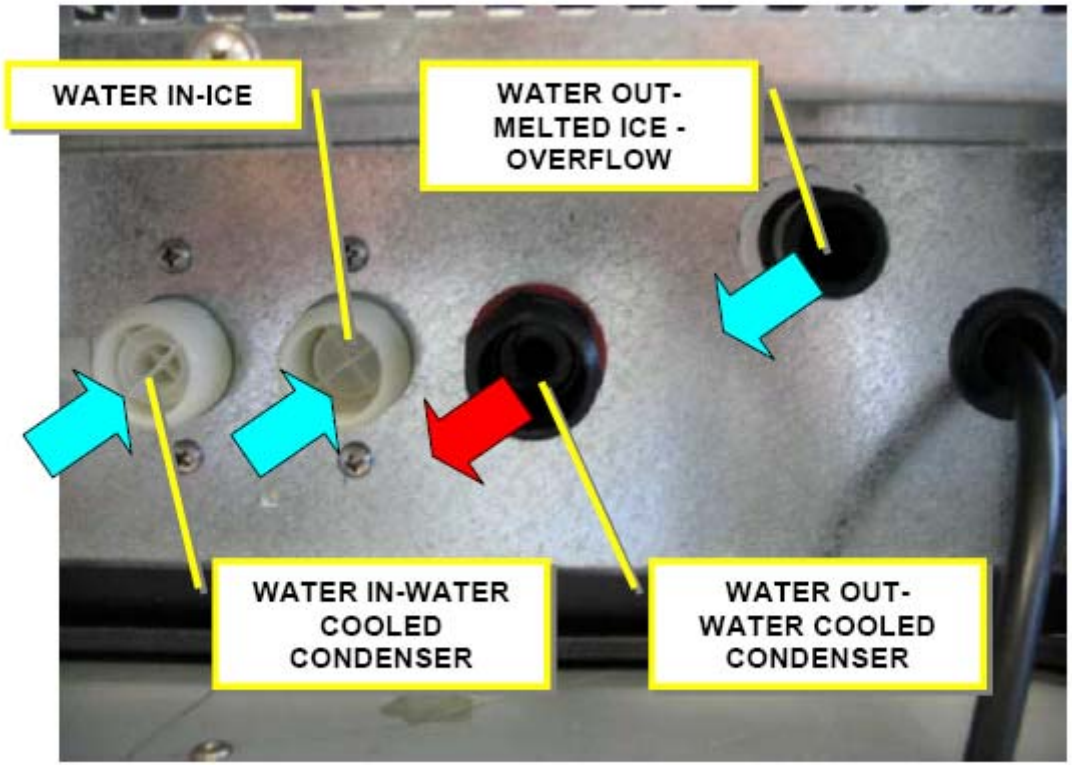
NEW AC SERIES

INSTALLATION

On the water cooled version there are two water inlet solenoid valve with two separated outlet fittings



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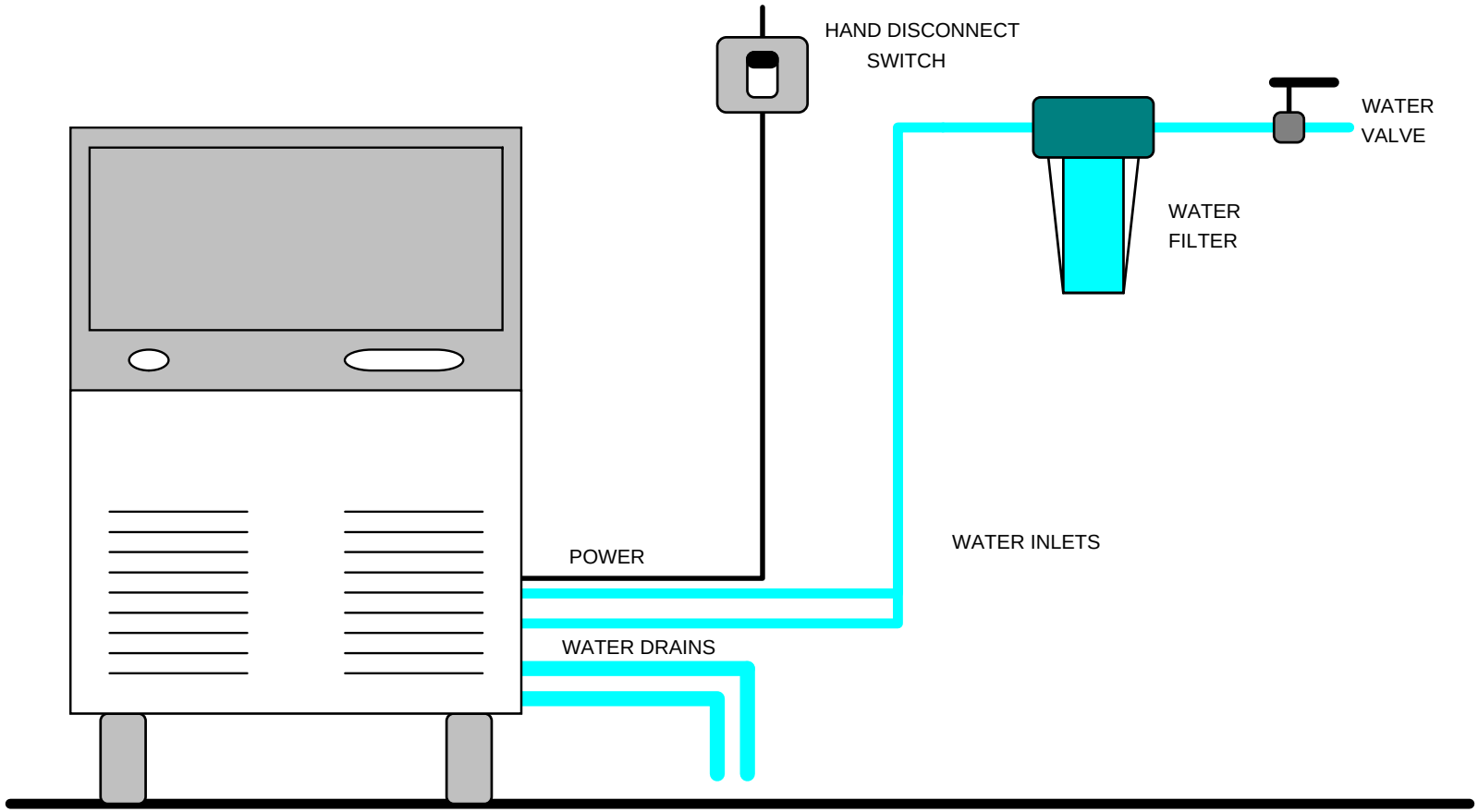
NEW AC SERIES

TYPICAL INSTALLATION

WATER COOLED VERSION



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NEW AC SERIES

INSTALLATION – SANITIZING BAG

Trace the sanitizing protecting bag into the storage bin then open it …….

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NEW AC SERIES

INSTALLATION – SANITIZING BAG

……. and take out the sanitizing bag.

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NEW AC SERIES

INSTALLATION – SANITIZING BAG

Open the storage bin door …….

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NEW AC SERIES

INSTALLATION – SANITIZING BAG

...and insert it under its rubber support located behind the bin door.

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NEW AC SERIES

INSTALLATION – SANITIZING BAG

Be sure to secure the rubber support in the plastic pins.

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NEW AC SERIES

INSTALLATION – SANITIZING BAG

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

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

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NEW AC SERIES

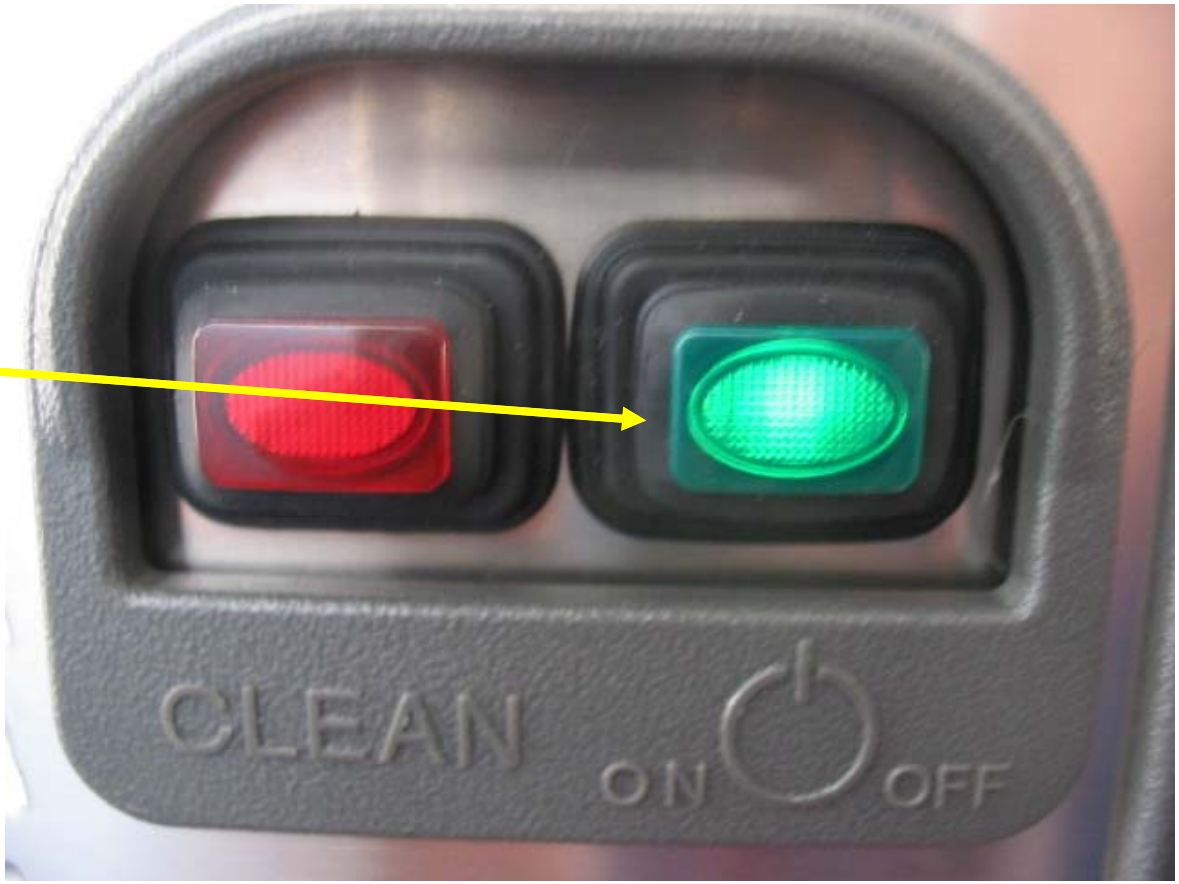
START UP AND OPERATIONAL CHECKS

Push the Green

Push Button

Switch to Start

Up the machine



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Move the “By-pass” Switch on the position II.

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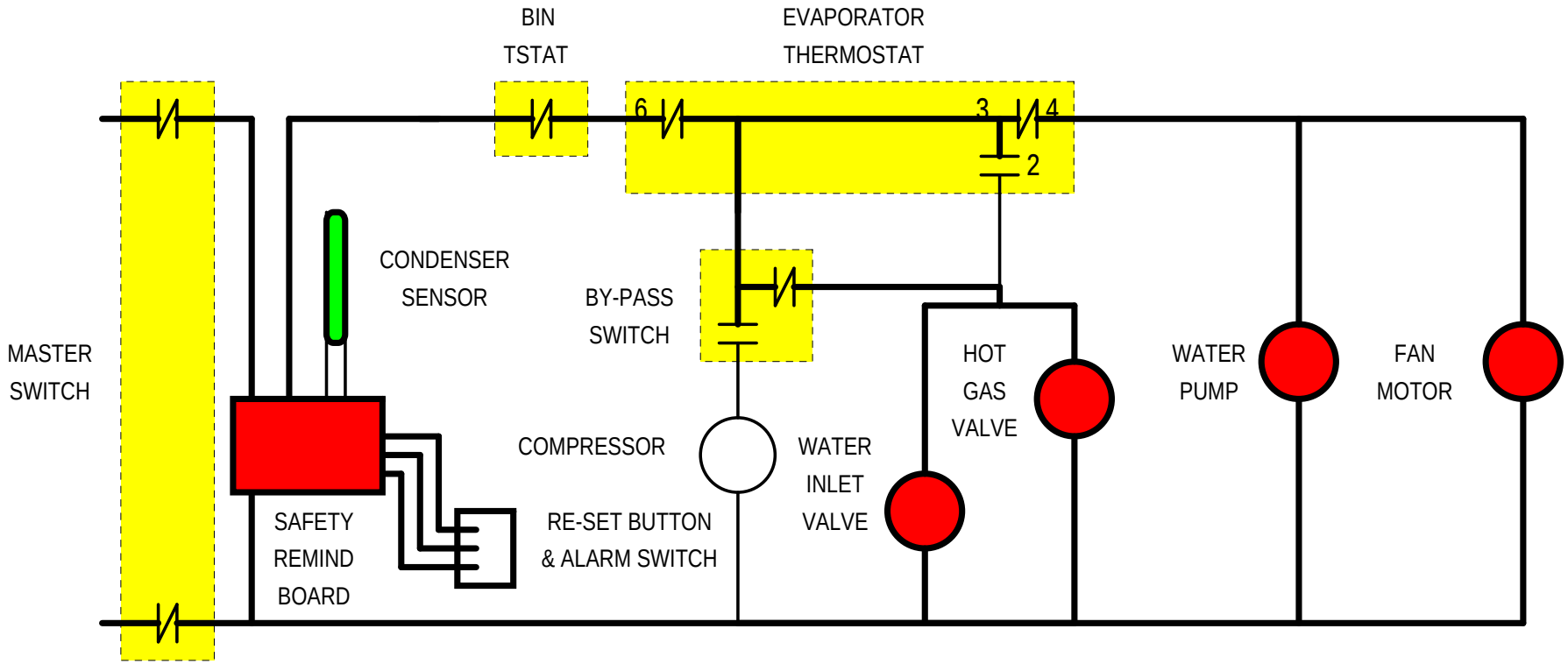
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

By doing so, both the water and hot gas solenoid valve are energized together with the water pump and fan motor.



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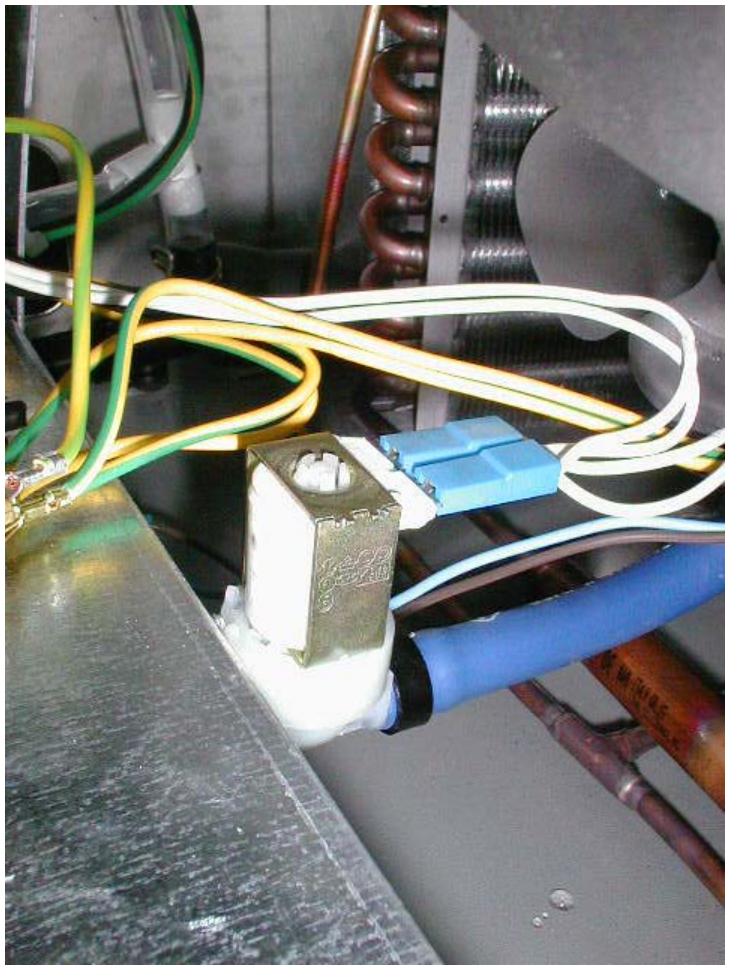
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

The components energized during this period are:

- **Water Inlet Solenoid Valve**



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Hot Gas Solenoid Valve**

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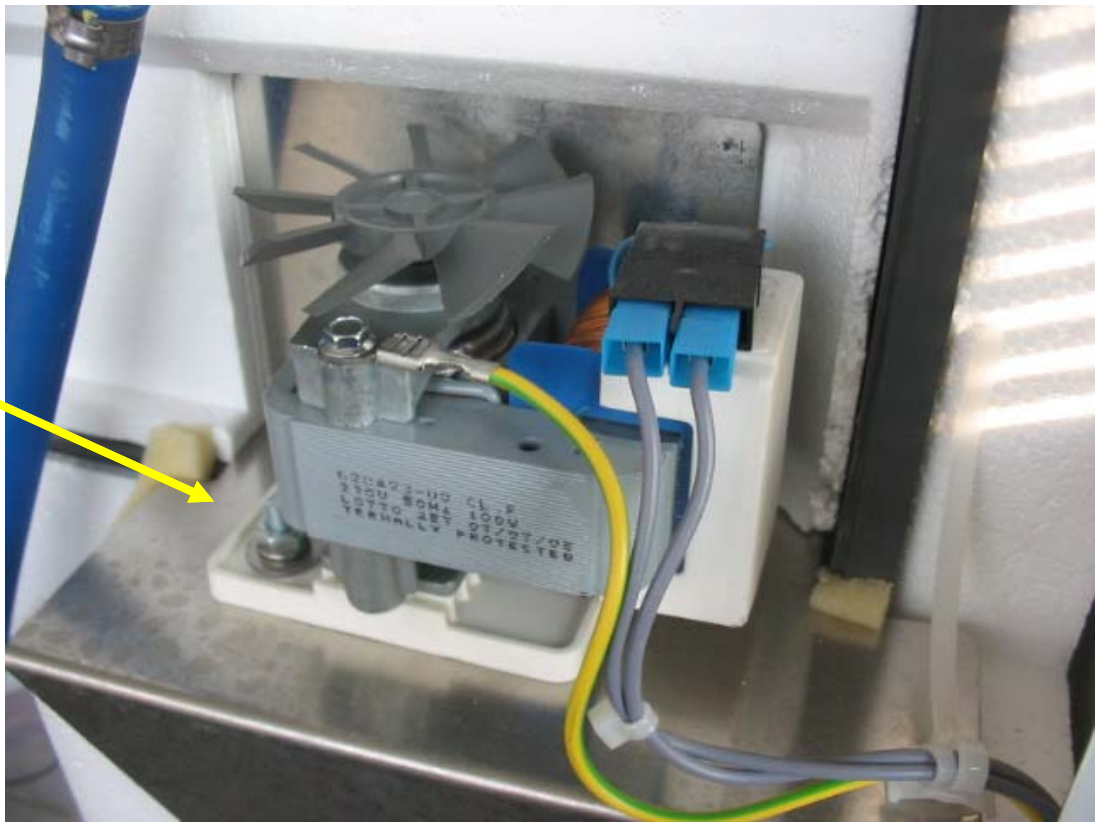
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Water pump**



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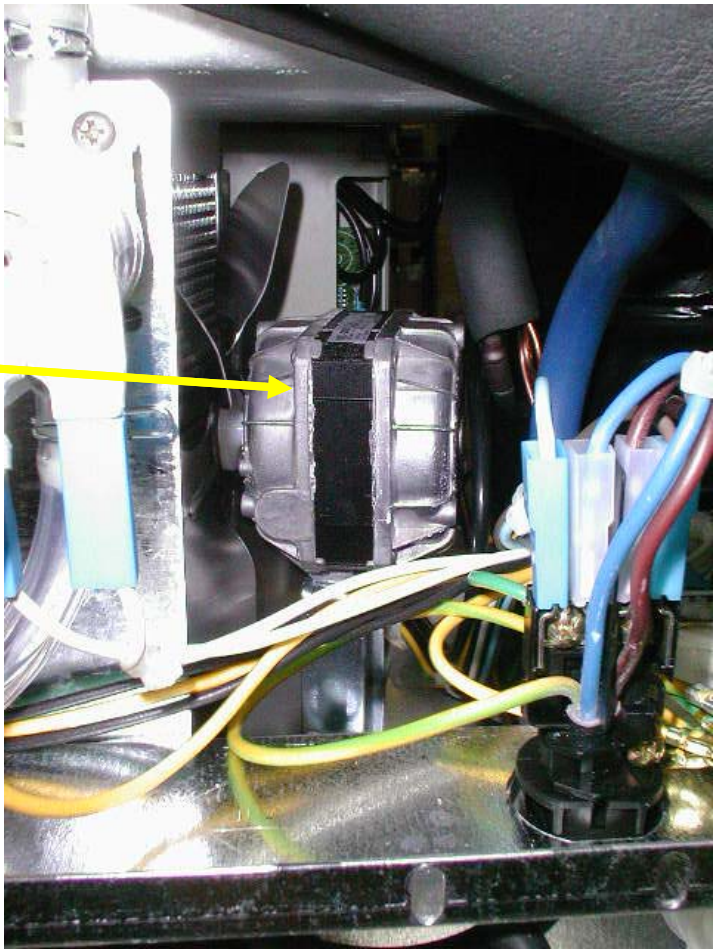
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Fan Motor**



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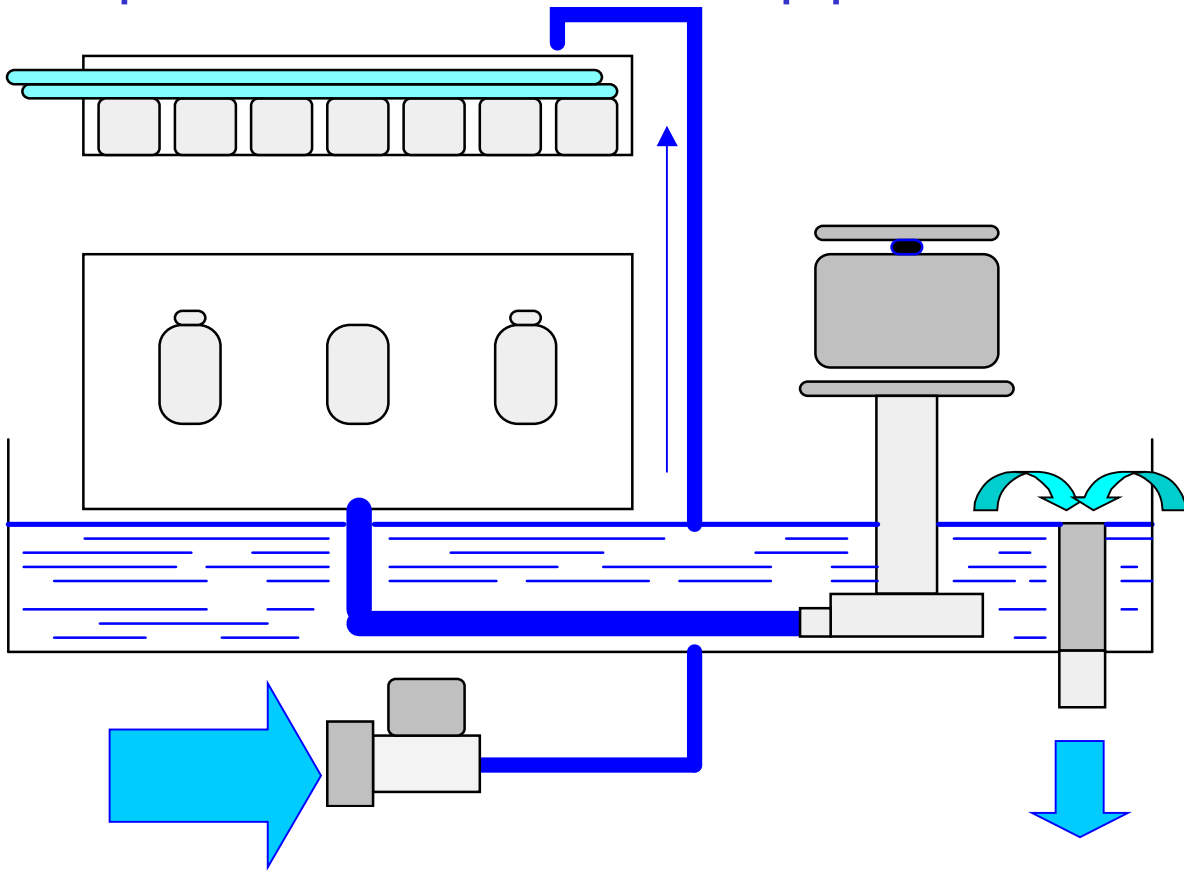
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

The Ice Machine starts up charging water till the water sump is filled up to the overflow stand pipe.



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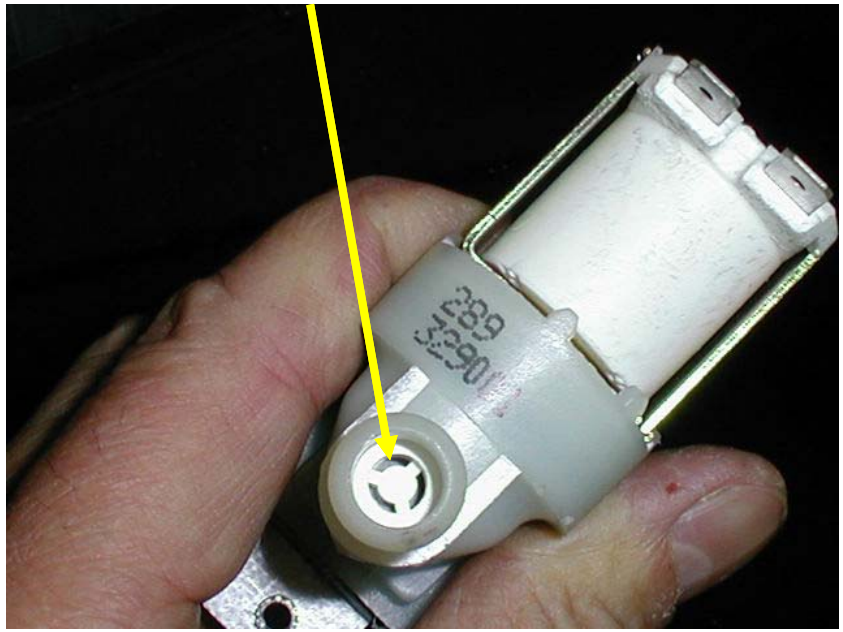
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

The water goes through the Water Inlet Valve then….

….flows into the small orifice of the “Flow Control” located on the outlet port of the same.



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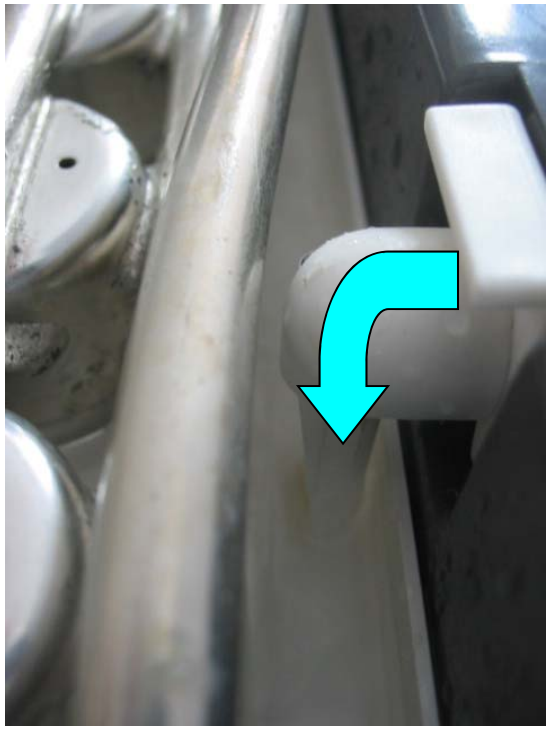
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Following the plastic hose the incoming water arrive on the upper side of the evaporator….



.... where it flows onto the plastic evaporator platen dribbling down through the holes located on the corners.

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Dribbled water is

collected down

into the water

sump….

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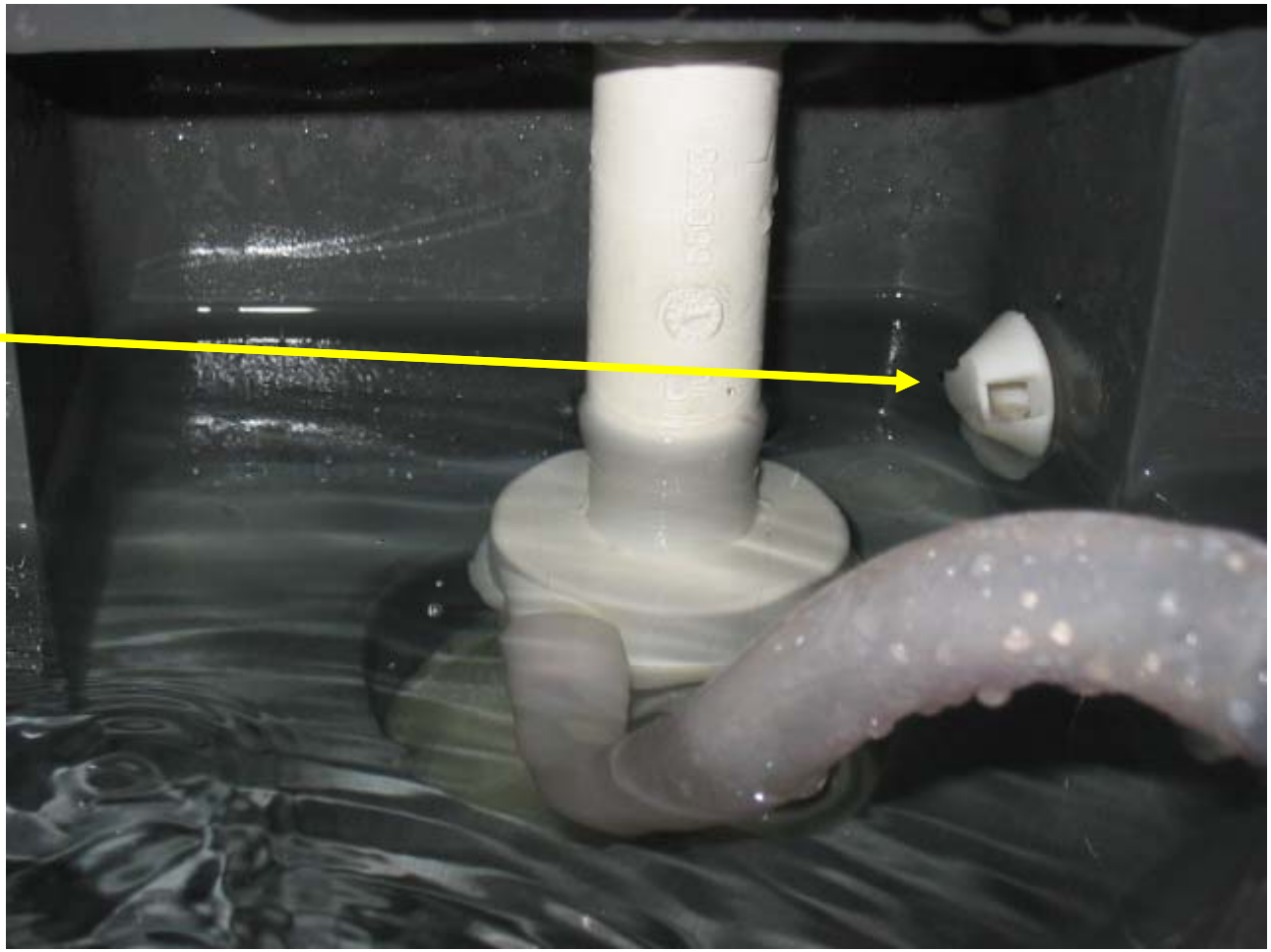
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

…. where is located the overflow that assures the proper water level and quantity for the next freezing cycle.



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

As soon as the water sump is full and water is going through the drain, move the “By-pass” Switch on the position I.

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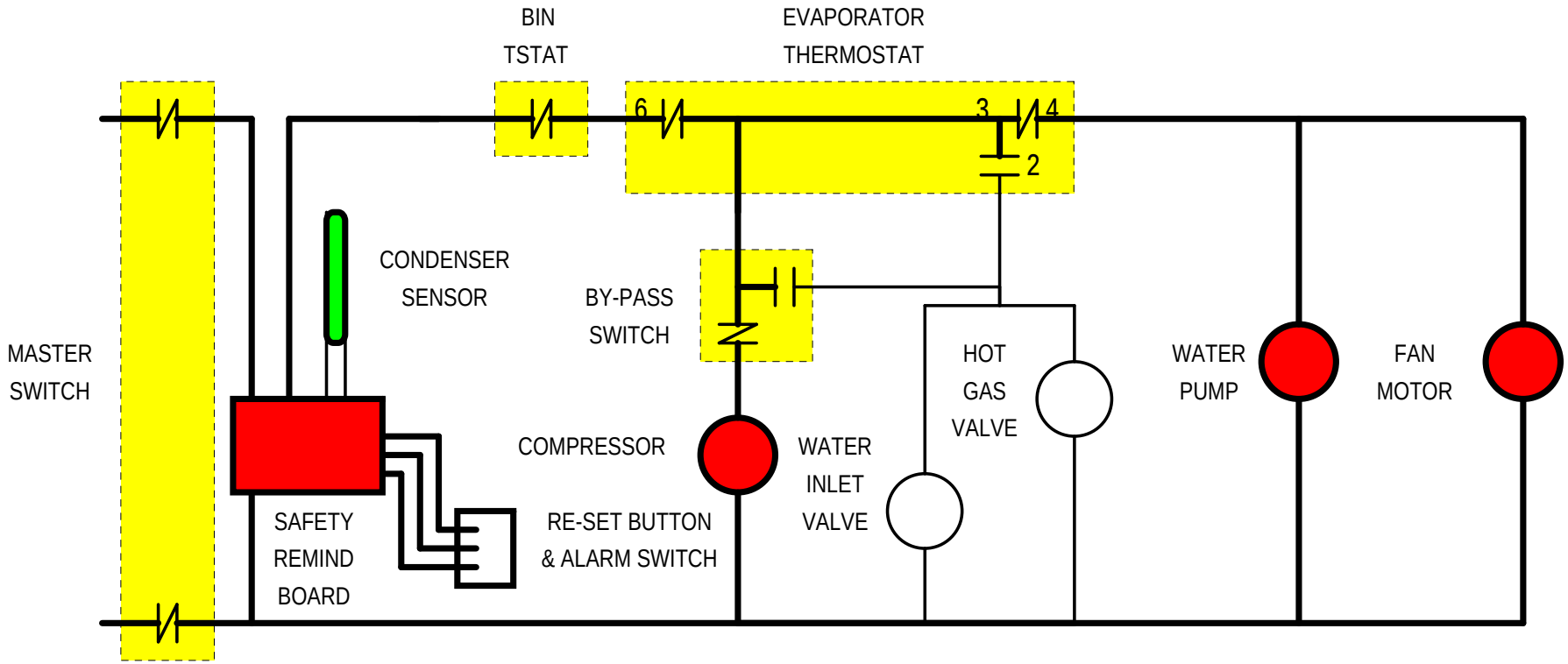
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

The machine start up now in the freezing cycle with the following components in operation.



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- Compressor

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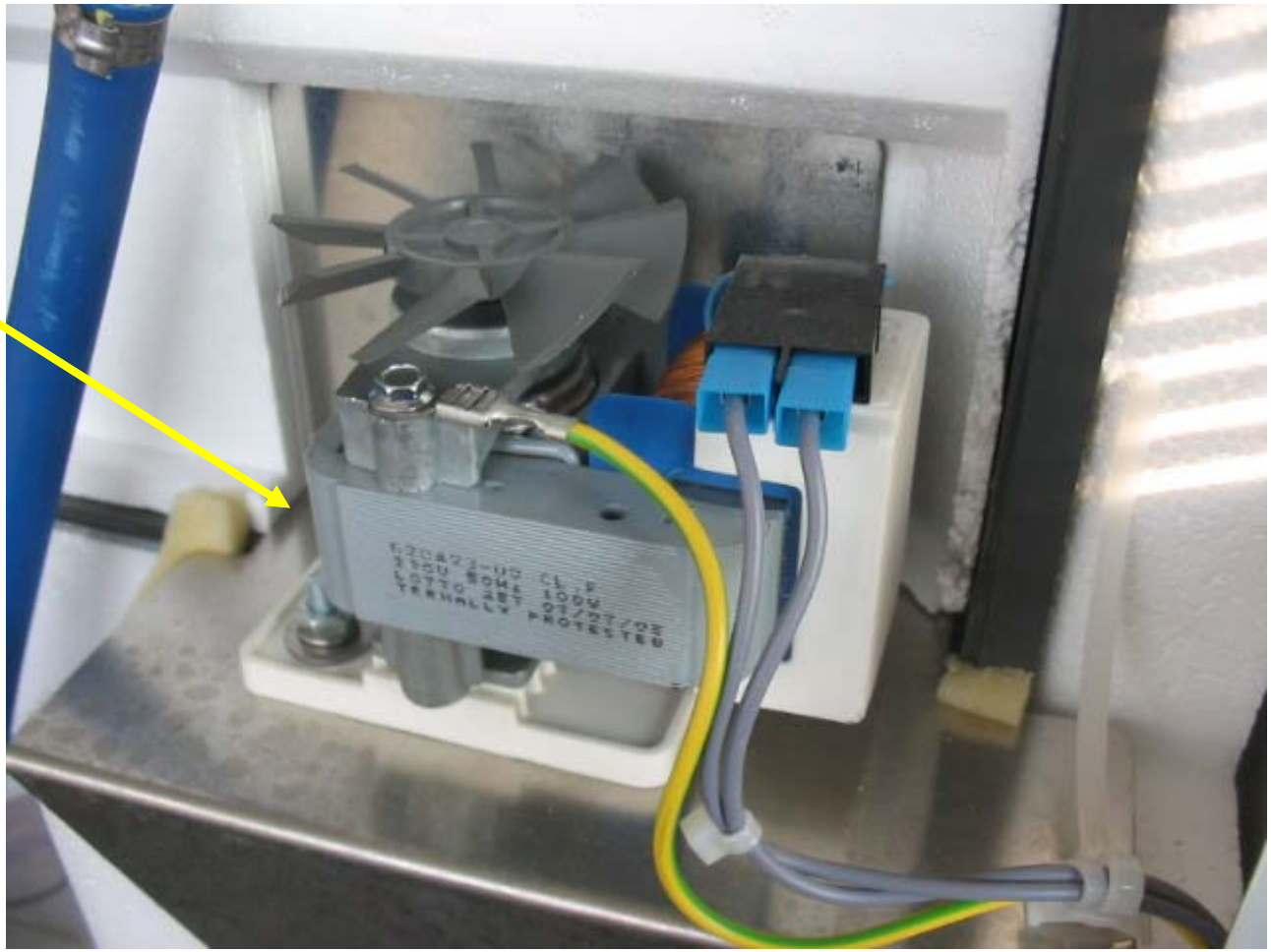
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Water Pump**



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Fan Motor (on air cooled version only)**

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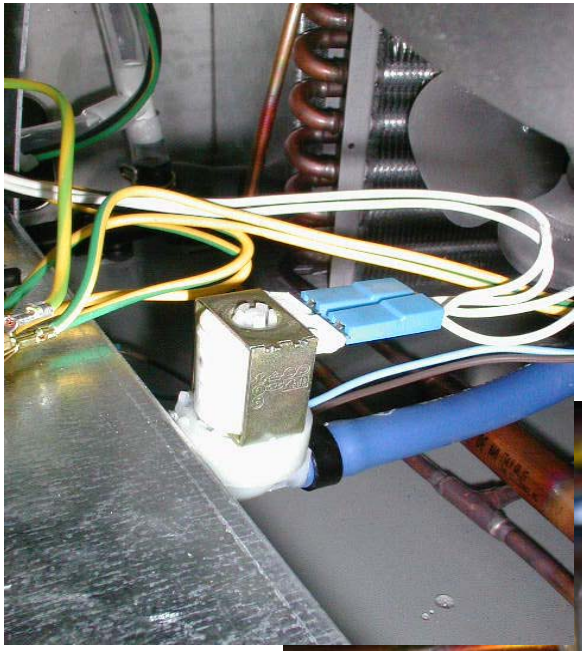
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Pressure control and Condensing Water Inlet (on water cooled version)**



Cut In 10 bar
Cut Out 7 bar

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Water is circulating by the water pump into the inverted tin plated copper molds of the evaporator…

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

…while the refrigerant is flowing into the serpentine welded on the upper side of the tin plated copper molds.

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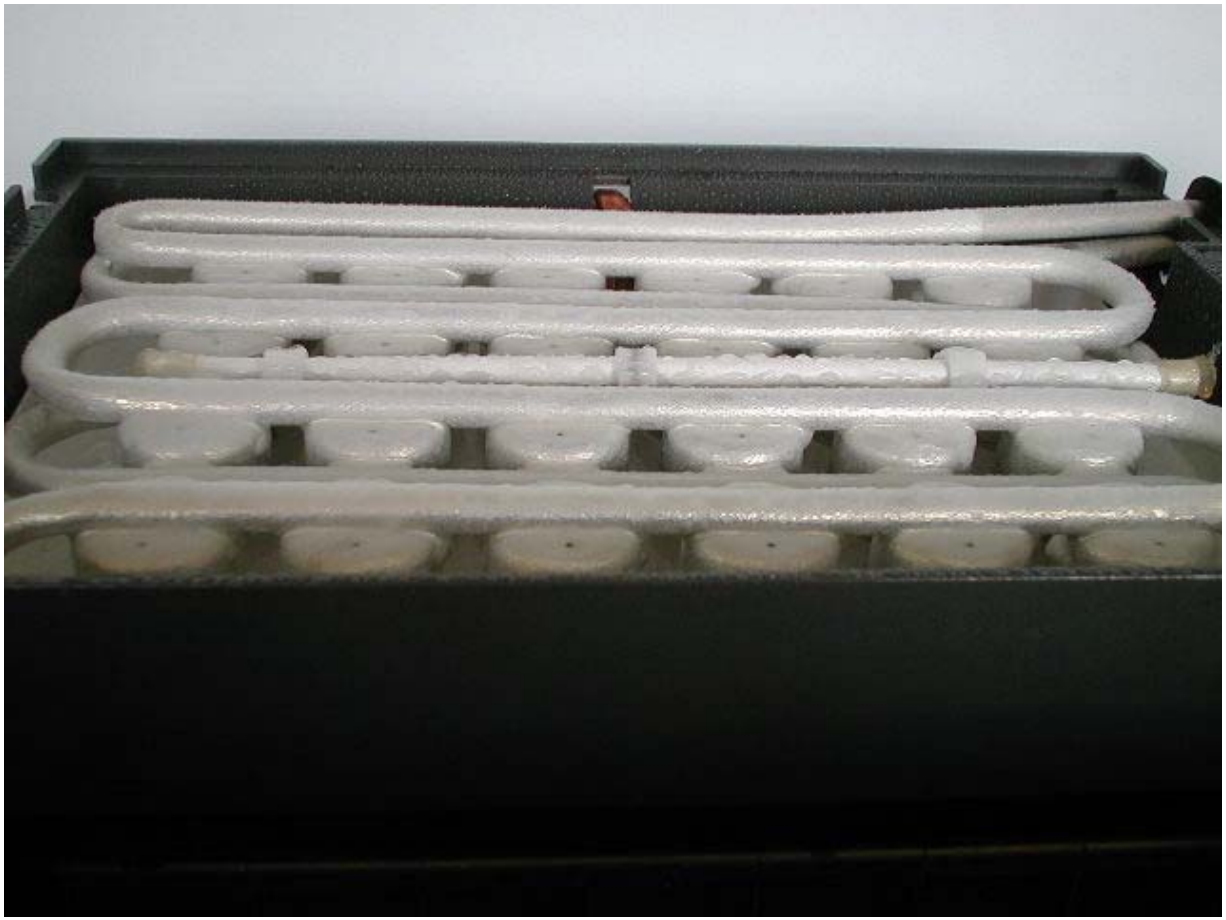
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Few minutes after the start up of the freezing cycle, the temperature of the evaporator serpentine is very cold with a larger extension of frost around the same.



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

The machine remains in the freezing cycle for an average time of 20-22 minutes (supposing an ambient/room temperature of 21ºC) till the evaporator thermostat reach its Cut In temperature of -25ºC.

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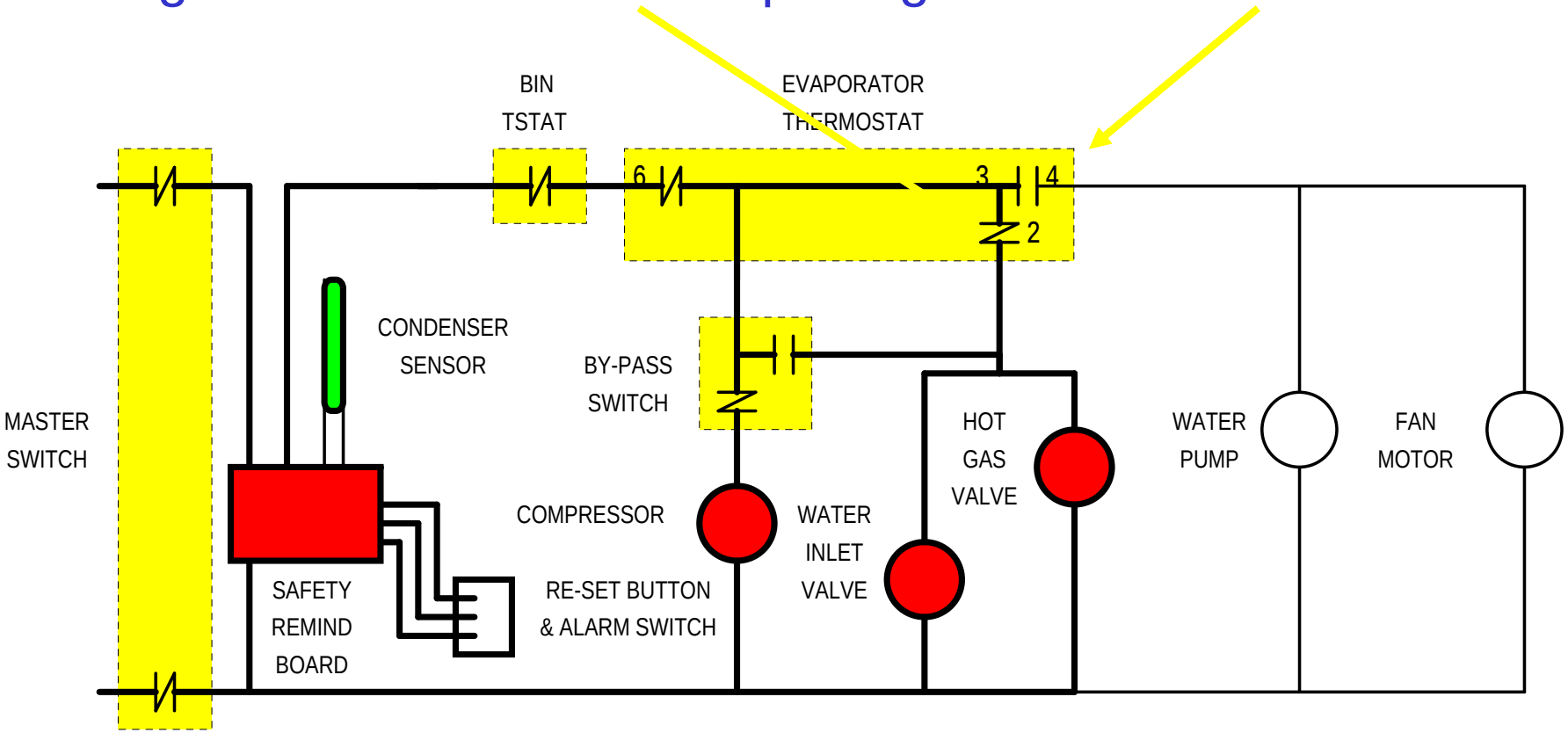
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

At this time the evaporator thermostat changes its position closing the contacts 3-2 and opening the contacts 3-4.



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

Once completed the freezing cycle the machine enters into the defrost or harvest cycle with the following electrical components in operation:

- **Compressor**

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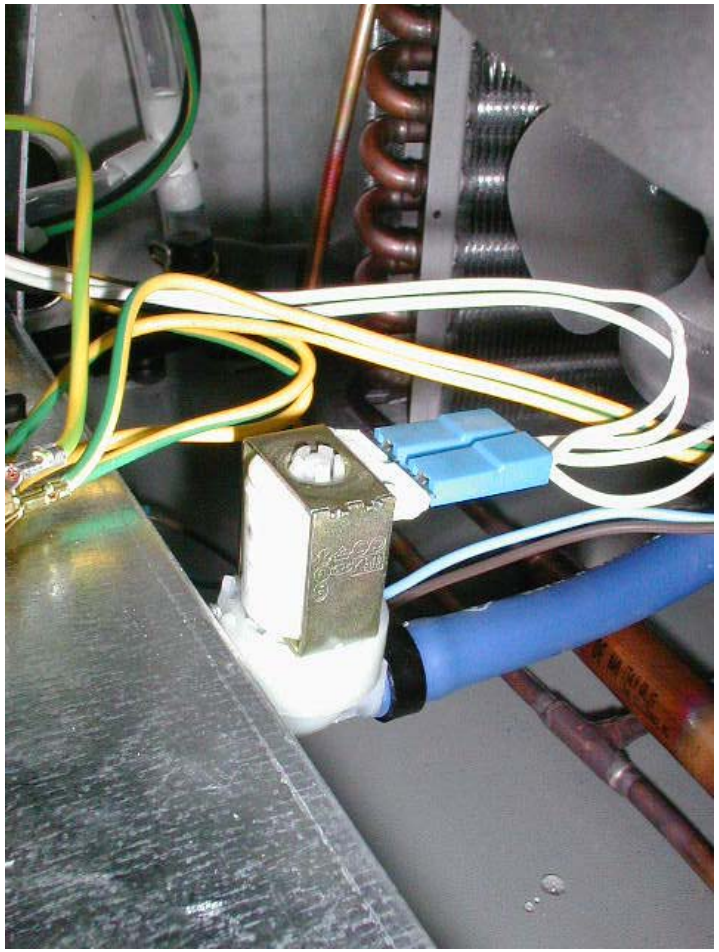
START UP AND OPERATIONAL CHECKS

- **Water Inlet Solenoid valve**



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

- **Hot Gas Valve**

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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

During the defrost or harvest cycle the combined action of refrigerant, in Hot Gas state, and incoming Water are going to partially melt the ice cubes in contact with the tin plated copper molts with the dropping down of the same through the curtain.

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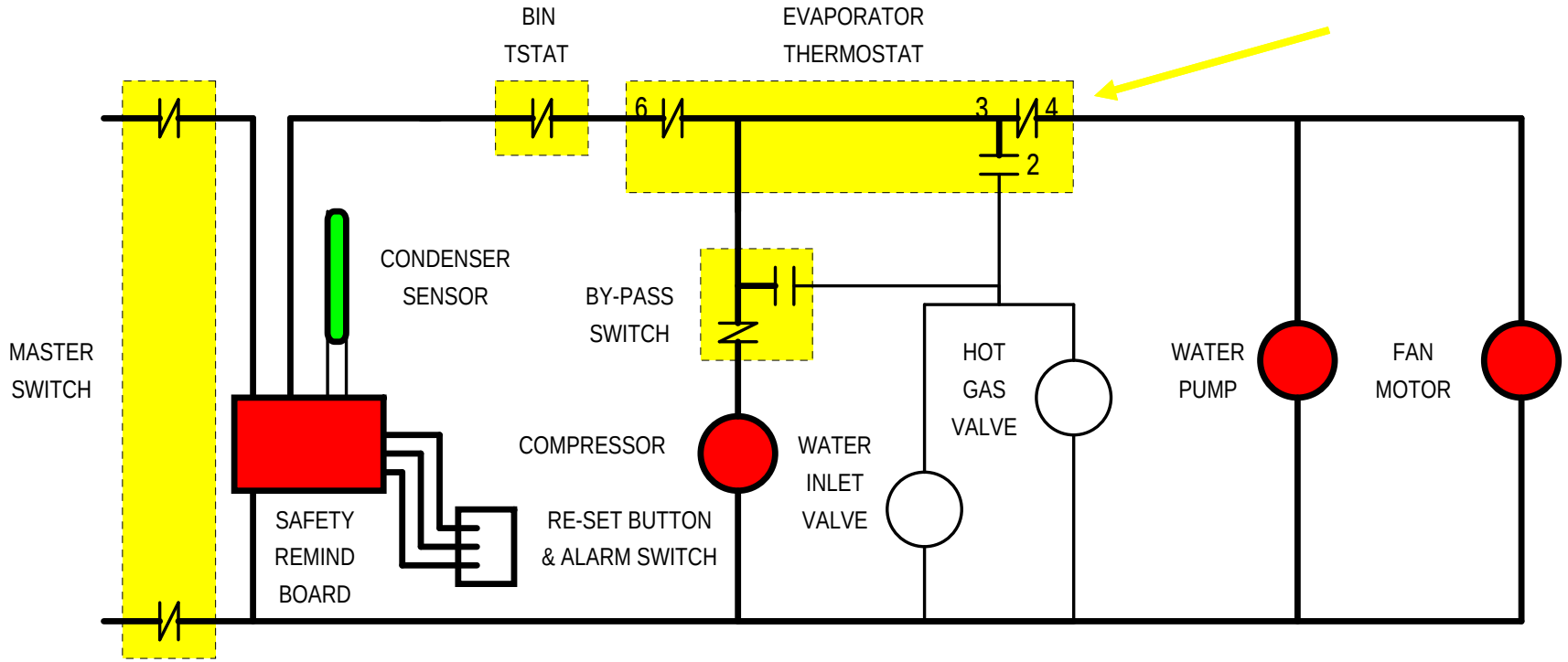
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

In the meantime the temperature of the serpentine as well as of the cube size control (evaporator thermostat) rises up to its warm Cut In temperature changing the position from 3-2 to 3-4 and closing again the power to the water pump and fan motor.



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START UP AND OPERATIONAL CHECKS

Holding an hand full of ice cubes in contact with the storage bin thermostat it is possible to test its operation.

Cooling down the bin thermostat to +1ºC….

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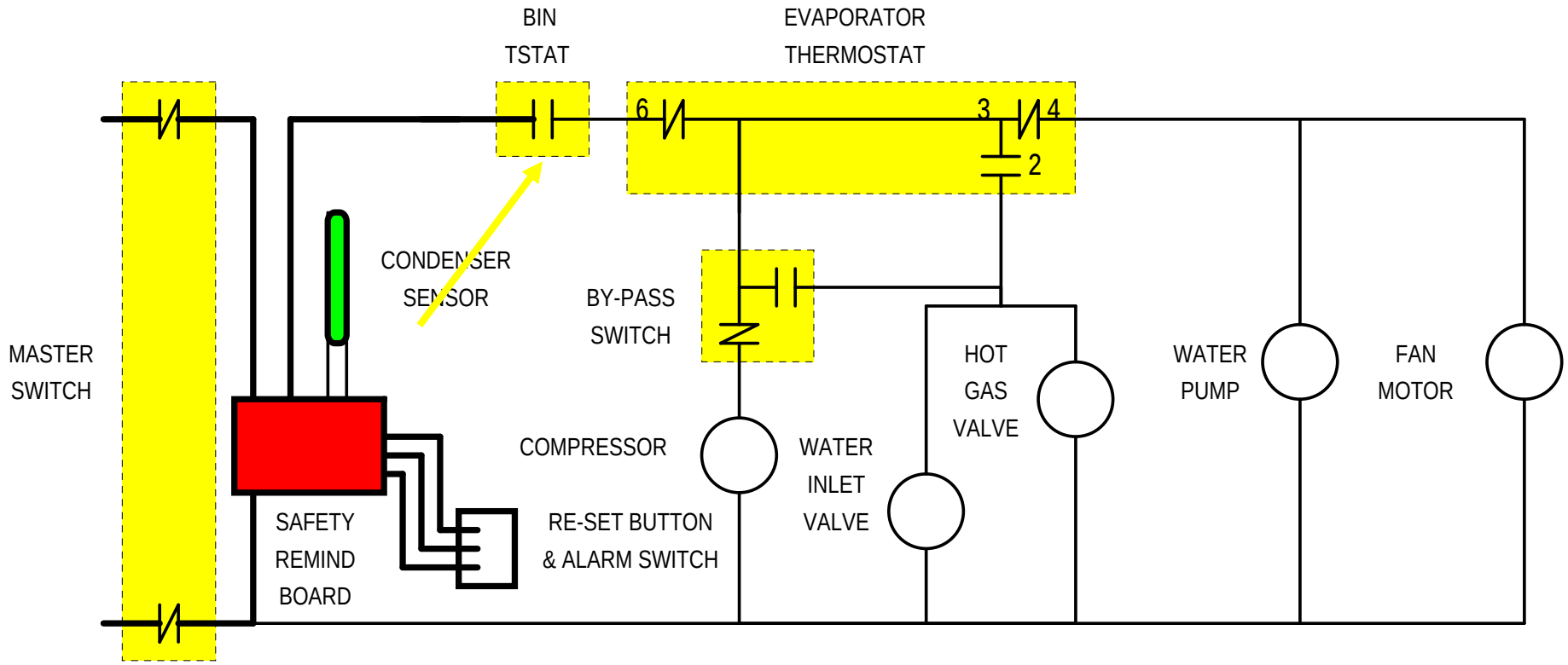
NEW AC SERIES

START UP AND OPERATIONAL CHECKS

…..the machine should stop to operate within 20-30 seconds.



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NEW AC SERIES

START UP AND OPERATIONAL CHECKS

If shorter, a small adjustment of the bin thermostat setting screw may be required.

If so just turn it clockwise by 1/16 of turn and recheck.

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NEW AC SERIES

OPERATING PRINCIPLES and COMPONENTS

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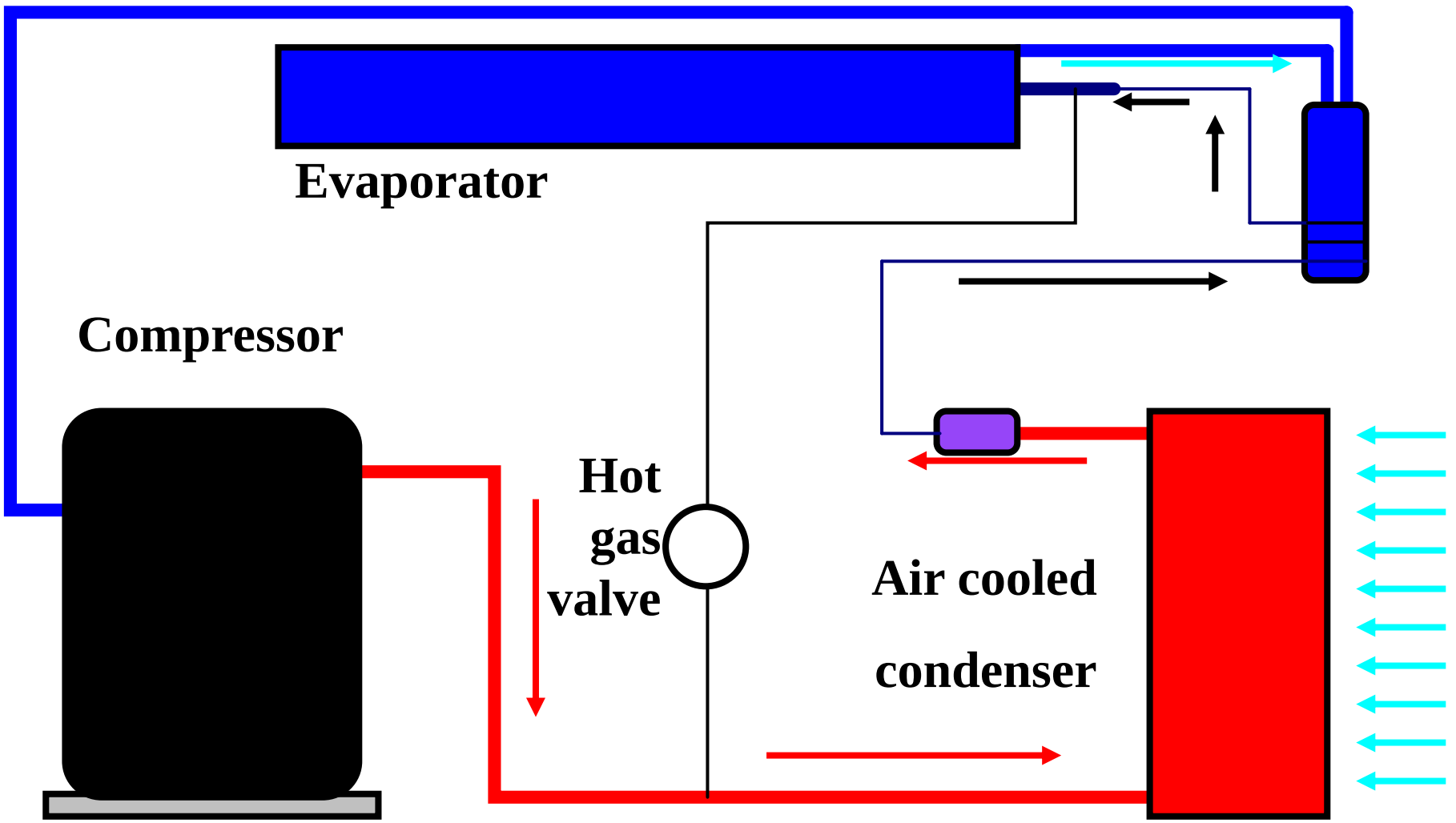
NEW AC SERIES

OPERATING PRINCIPLES - FREEZE



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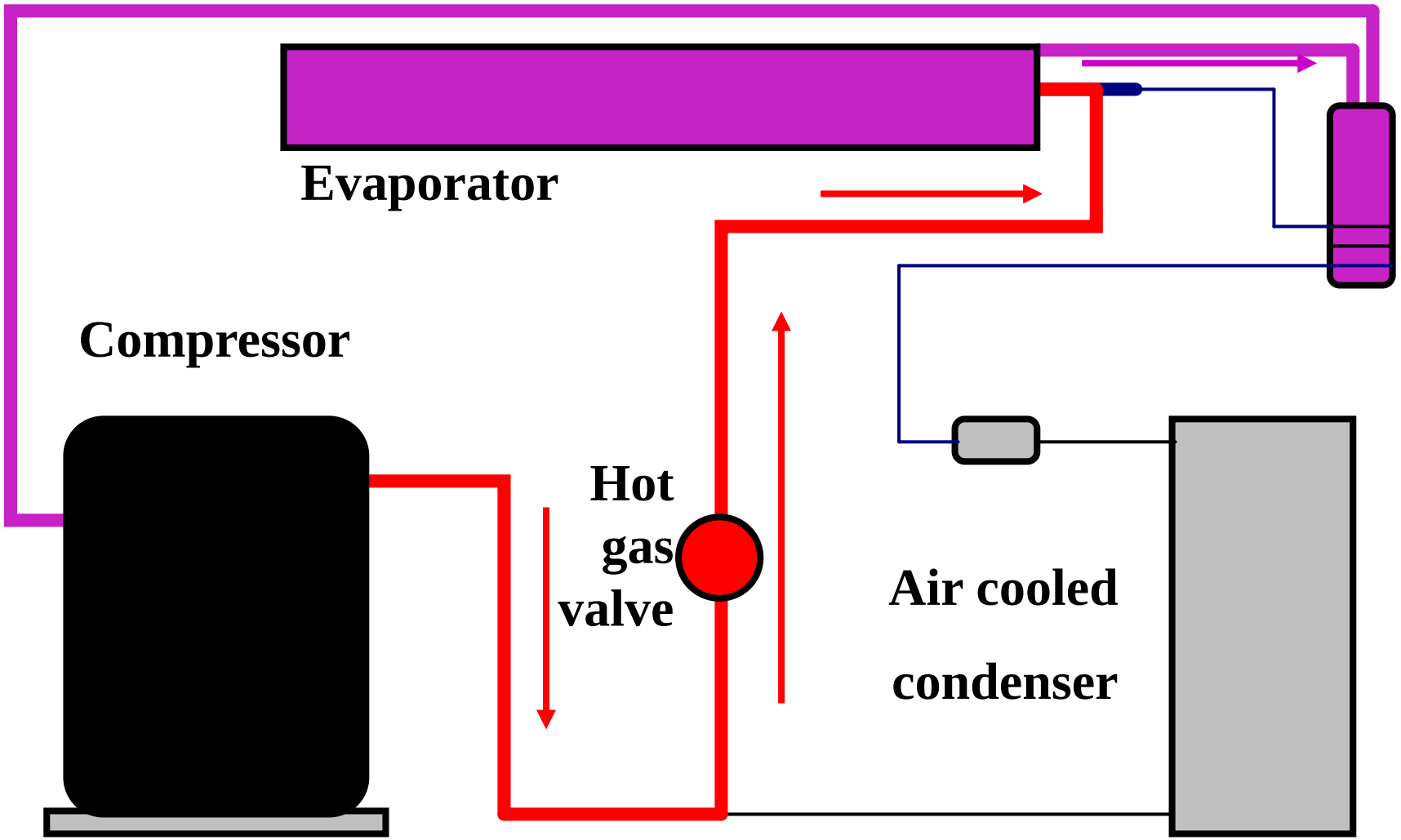
NEW AC SERIES

OPERATING PRINCIPLES - HARVEST



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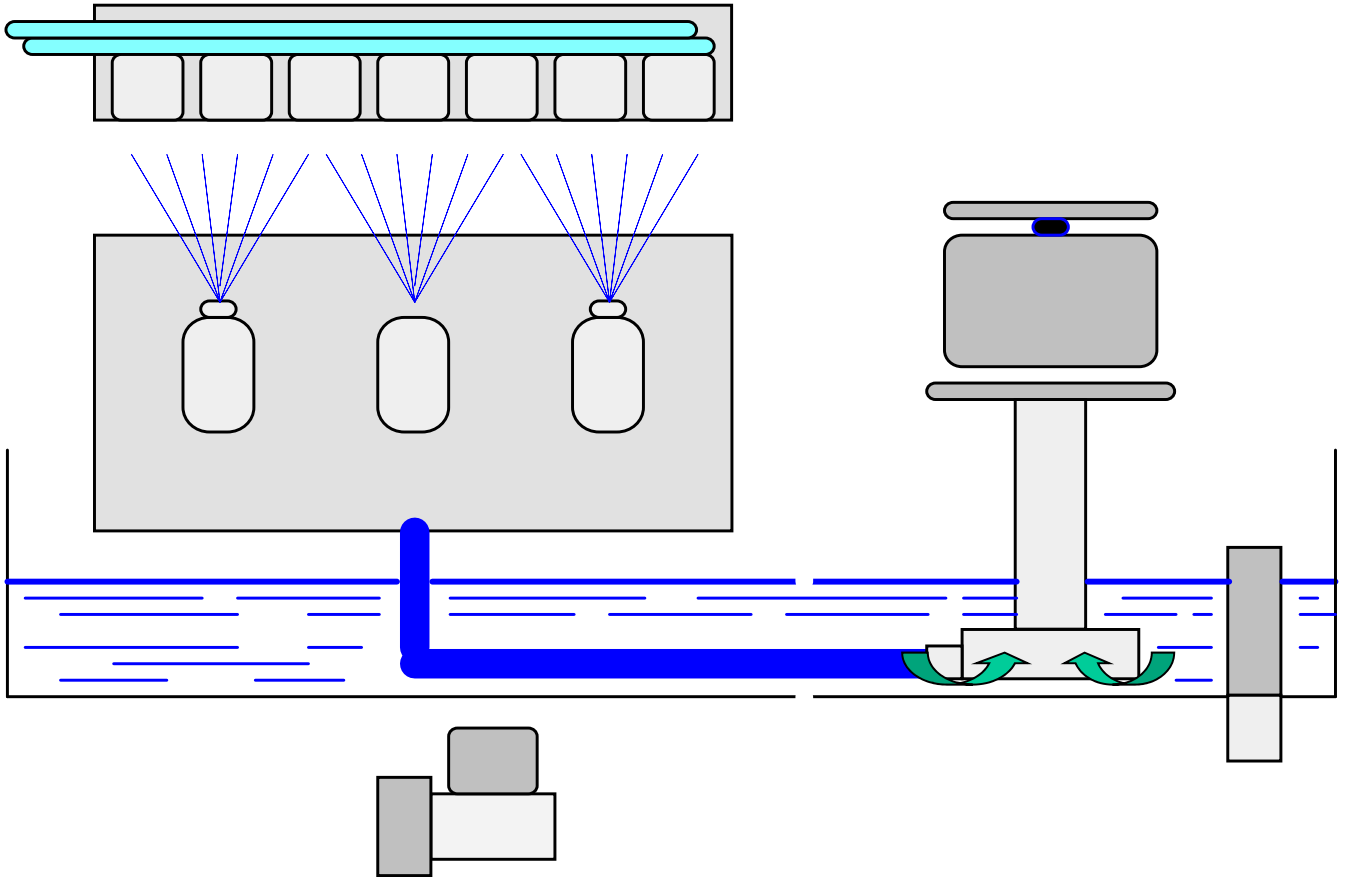
NEW AC SERIES

OPERATING PRINCIPLES - FREEZE



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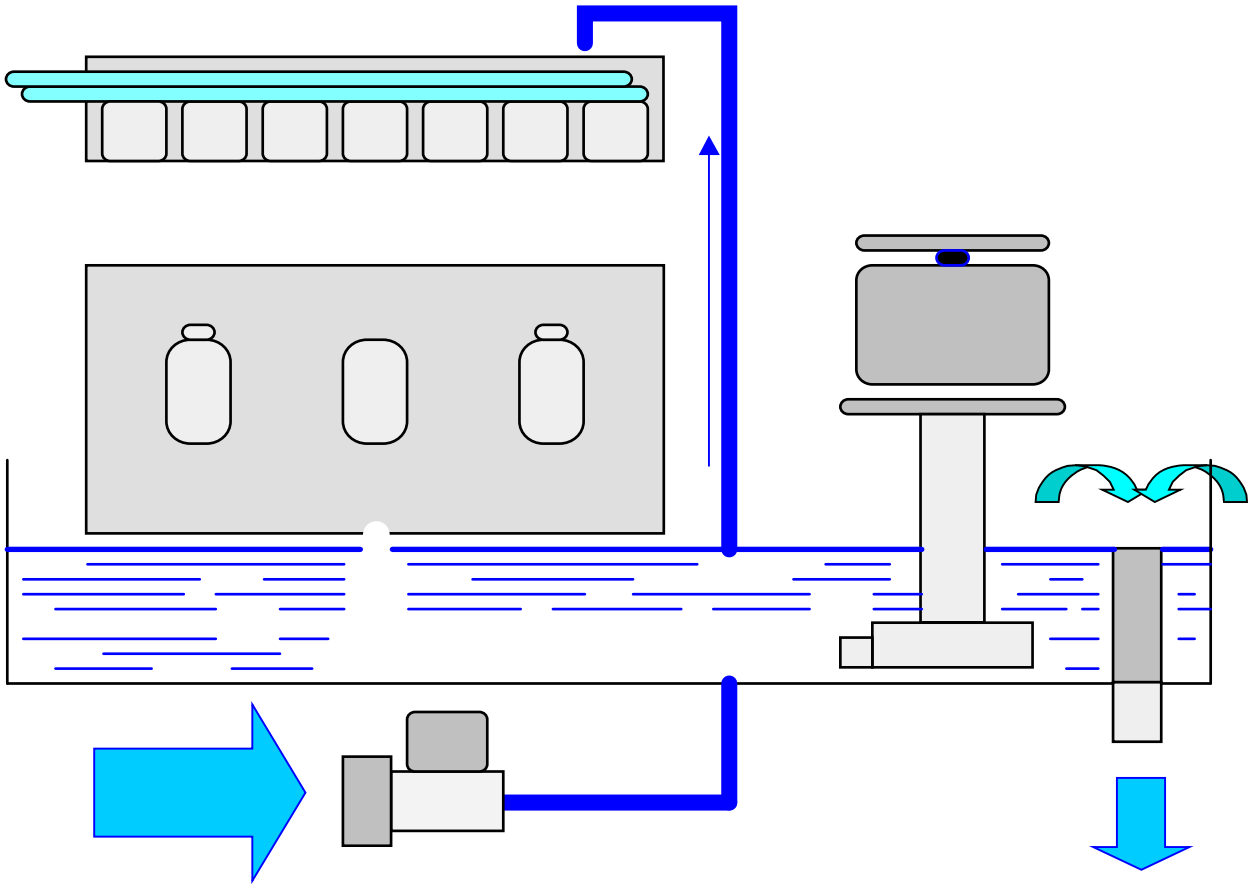
NEW AC SERIES

OPERATING PRINCIPLES - FREEZE



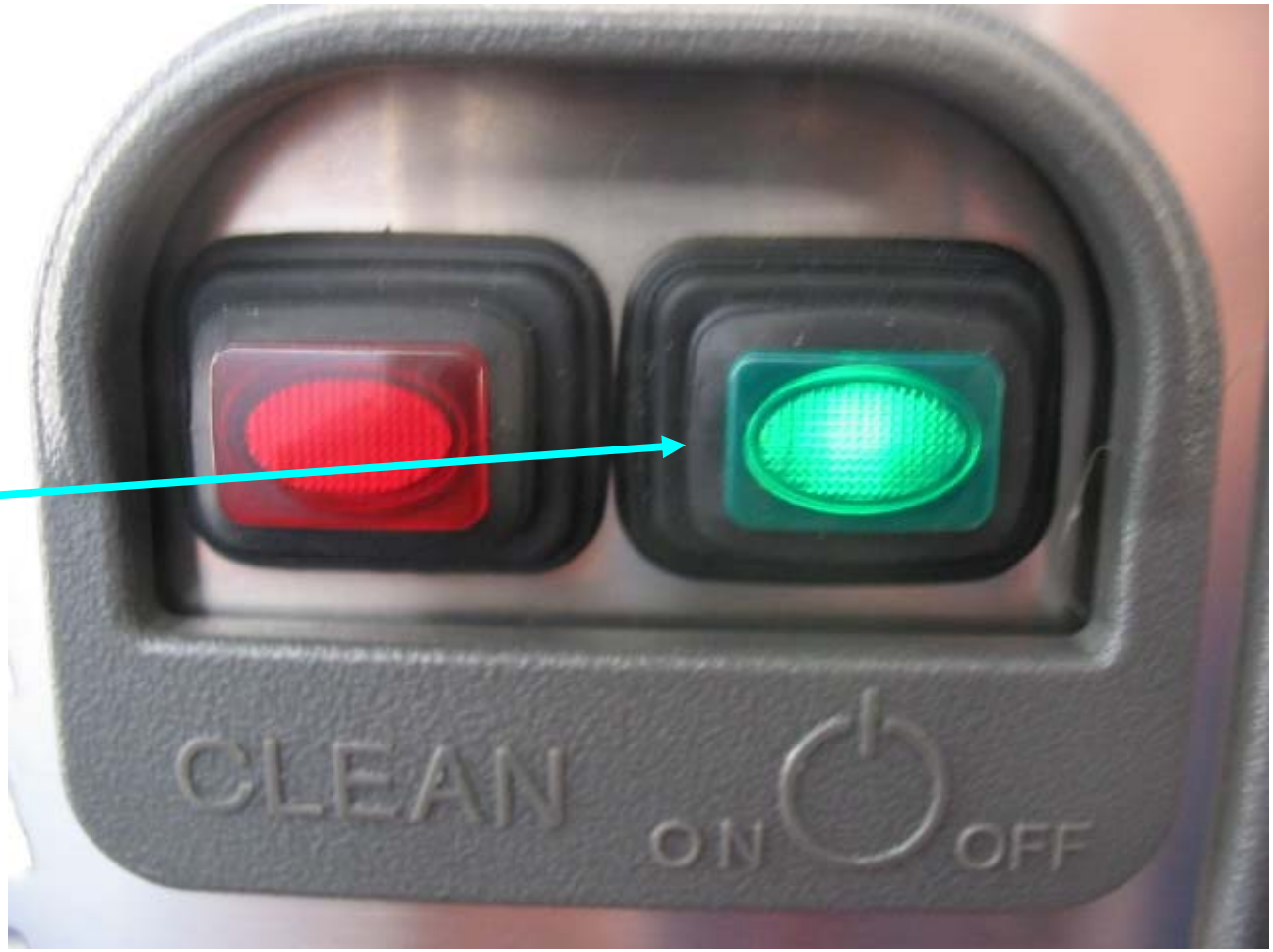
Scotsman Ice Systems

NEW AC SERIES

OPERATING PRINCIPLES – MASTER SWITCH

All AC units are equipped with a Green Lighted Master Push Switch located in the front panel.

By pushing it, it possible to Switch ON...



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NEW AC SERIES

OPERATING PRINCIPLES – MASTER SWITCH

… and
Switch OFF
the entire
machine.

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NEW AC SERIES

OPERATING PRINCIPLES – ALARM/RESET SWITCH

Beside the Green Master Switch is located a Red Alarm Light & Reset Switch.

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OPERATING PRINCIPLES – ALARM & REMIND BOARD

Both the Green Master Switch as well as the Red Alarm Light & Reset Switch are operating in conjunction with a small PC Board located behind the front panel.

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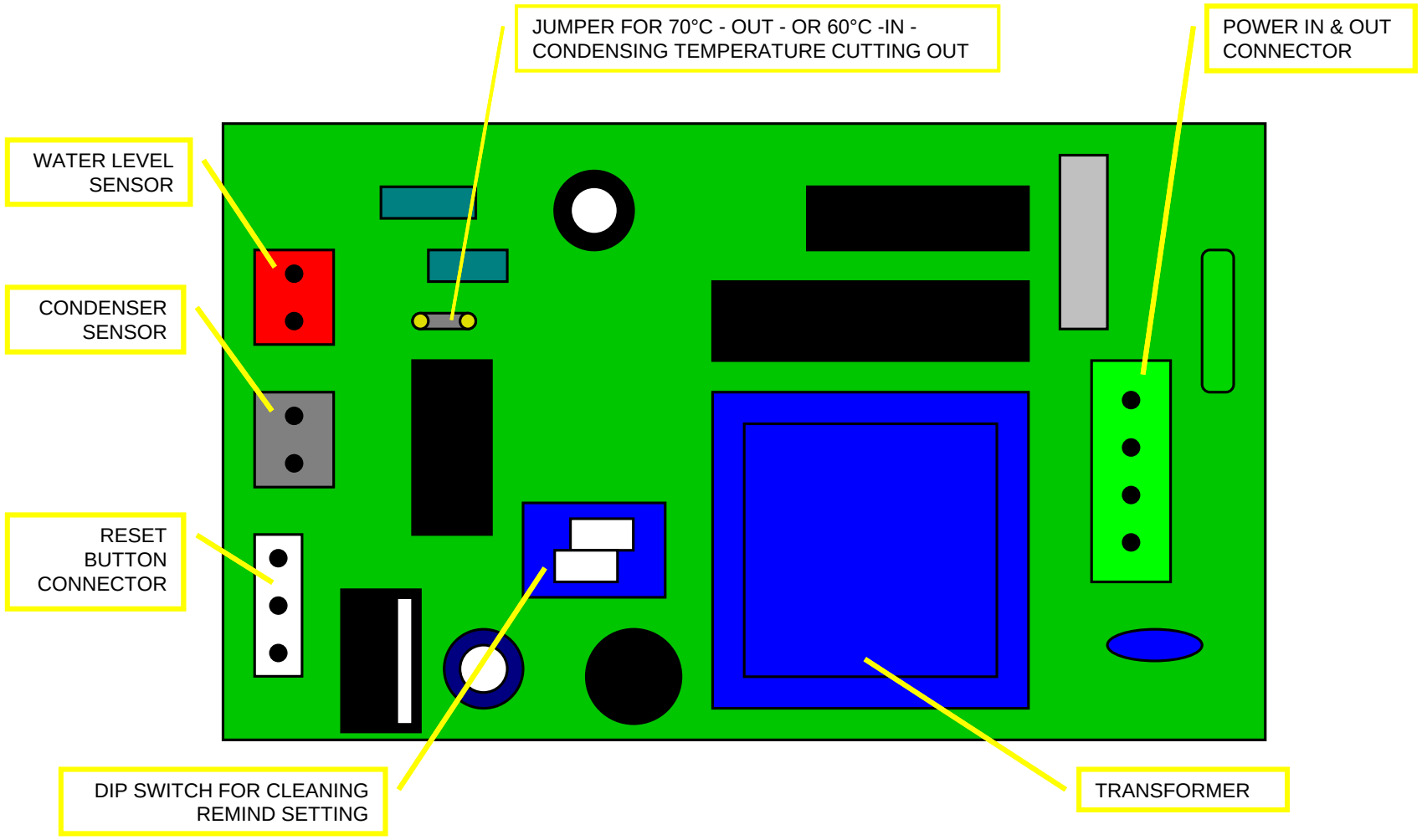
NEW AC SERIES

OPERATING PRINCIPLES – ALARM & REMIND BOARD



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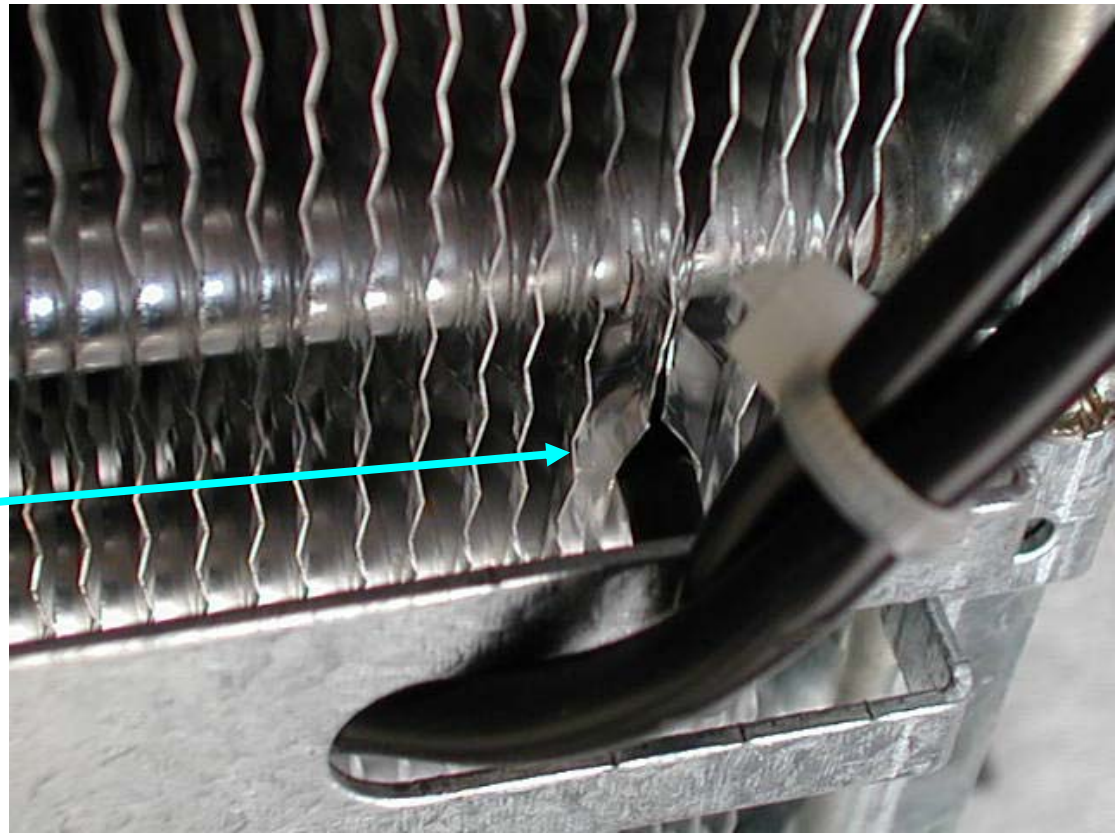
OPERATING PRINCIPLES – ALARM & REMIND BOARD

The Alarm & Reminding Board, operating in conjunction with the condenser sensor ...



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NEW AC SERIES

OPERATING PRINCIPLES – ALARM & REMIND BOARD

…has the main function to transmit, to the External Red Alarm Light, the proper signal according to the need of the machine.

Scotsman® Ice Systems

NEW AC SERIES

OPERATING PRINCIPLES – ALARM& REMIND BOARD

LIGHT TEMOIN LUCE	STATUS	REASON WHY SIGNIFICATION SIGNIFICATO
	**ON STEADY** FIXE *FISSO*	**UNIT IN OPERATION** MACHINE EN FONCTIONNEMENT *MACCHINA IN MOTO*
	RED LIGHT ON STEADY WITH MACHINE ON TEMOIN ROUGE FIXE AVEC MACHINE EN FONCTIONNEMENT *LUCE ROSSA FISSA CON MACCHINA IN FUNZIONE*	**CONDENSING TEMP. > 60°C - CLEAN AIR FILTER** TEMP. DU CONDENSEUR > 60°C - NETTOYER LE FILTRE *TEMP. CONDENSATORE > 60°C - PULIRE IL FILTRO*
	RED LIGHT ON STEADY WITH MACHINE OFF TEMOIN ROUGE FIXE AVEC MACHINE A L'ARRET *LUCE ROSSA FISSA CON MACCHINA FERMA*	**CONDENSING TEMP. > 70°C** TEMP. DU CONDENSEUR > 70°C *TEMP. CONDENSATORE > 70°C*
	**BLINKING SLOW WITH MACHINE ON** CLIGNOTANT LENT AVEC MACHINE EN FONCTIONNEMENT *LAMPEGGIANTE LENTO CON MACCHINA IN FUNZIONE*	**WATER SYSTEM NEED TO BE CLEANED** CIRCUIT HYDRAULIQUE A NETTOYER *PULIRE IL CIRCUITO IDRICO*
	BLINKING TWICE AND REPEAT WITH MACHINE OFF CLIGNOTANT DEUX FOIS ET REPETE AVEC MACHINE A L'ARRET *LAMPEGGIANTE A DUE IMPULSI CON MACCHINA FERMA*	**CONDENSER SENSOR OUT OF ORDER** SONDE CONDENSEUR HS *SONDA CONDENSATORE MALFUNZIONANTE*
	BLINKING FAST WITH MACHINE OFF CLIGNOTANT RAPIDE AVEC MACHINE A L'ARRET *LAMPEGGIANTE VELOCE CON MACCHINA FERMA*	**PROBLEMS IN PUMPING OUT WATER (EC SERIES ONLY)** PROBLEMES AVEC EVACUATION EAU (SEUL MODELES EC) *PROBLEMI DI SCARICO ACQUA (SOLO MODELLI SERIE EC)*

	**PUSH AND HOLD THE RED LIGHTED SWITCH FOR MORE THEN 20" TO RESTART THE CLEANING REMIND COUNTDOWN** APPUYER SUR LE BOUTON ROUGE 20 Secondes POUR REINITIALISER L'ALARME JUSQU'AU PROCHAIN DETARTRAGE *PREMERE IL PULSANTE ROSSO PER PIU' DI 20" PER FAR RIPARTIRE IL CONTEGGIO PER LA PROSSIMA DISINCROSTAZIONE*

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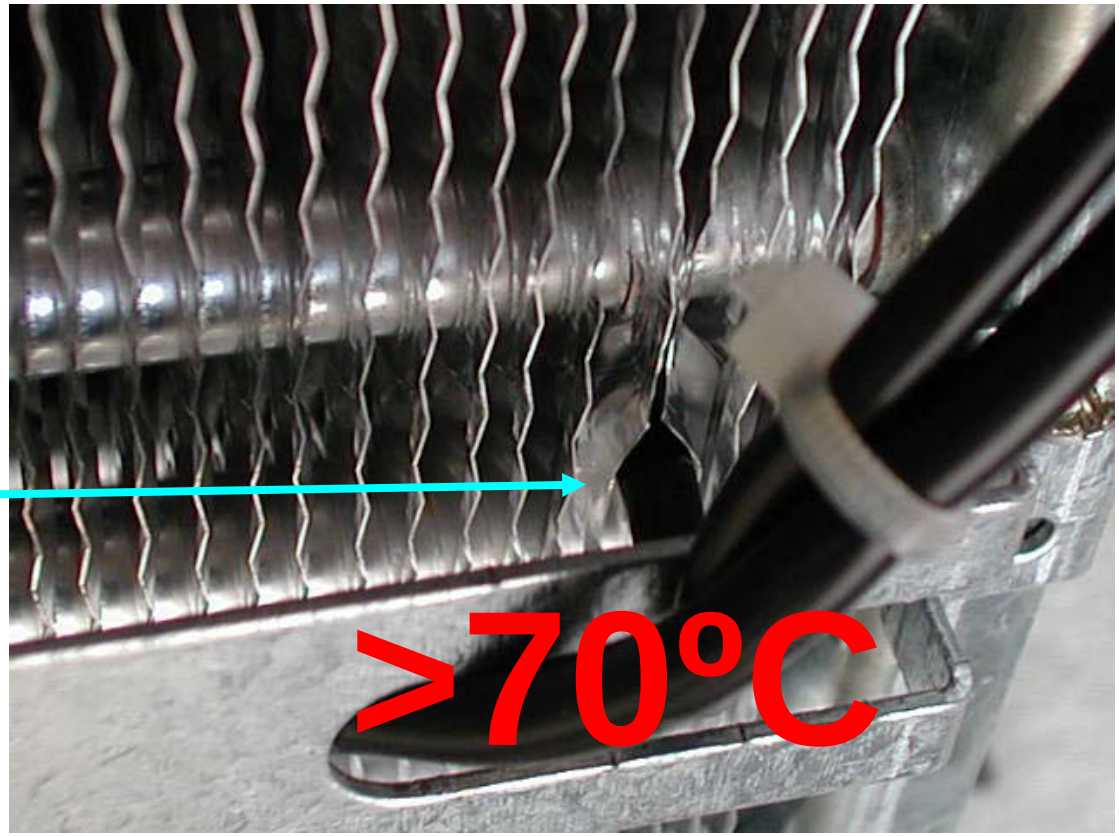
NEW AC SERIES

OPERATING PRINCIPLES – TRIP OFF

Whenever the condensing temperature rises up to 70ºC, the condenser sensor installed inside the condenser fins ….



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NEW AC SERIES

OPERATING PRINCIPLES – TRIP OFF

…send the signal to the Board to Switch Off immediately the operation of the machine.

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NEW AC SERIES

OPERATING PRINCIPLES – FILTER CLEAN

In case the Red Light is blinking FAST with the machine in operation it means….

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NEW AC SERIES

OPERATING PRINCIPLES – FILTER CLEAN

…. that the condensing

temperature is more

then 60°C but less

then 70° and the

condenser air filter

needs to be cleaned.

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NEW AC SERIES

OPERATING PRINCIPLES – WATER SYSTEM CLEAN

In case the Red Light is blinking SLOW with the machine in operation it means….

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NEW AC SERIES

OPERATING PRINCIPLES – WATER SYSTEM CLEAN

…. to proceed with the cleaning of the water system of the machine as detailed on the “Cleaning section”.

AC 46-56-86

MAINTENANCE

TOOLS REQUIRED

- Medium Phillips Screwdriver
- Medium Flat Screwdriver
- Pair of safety gloves
- Bucket
- Different types of brush
- Approved Cleaner/Sanitiser

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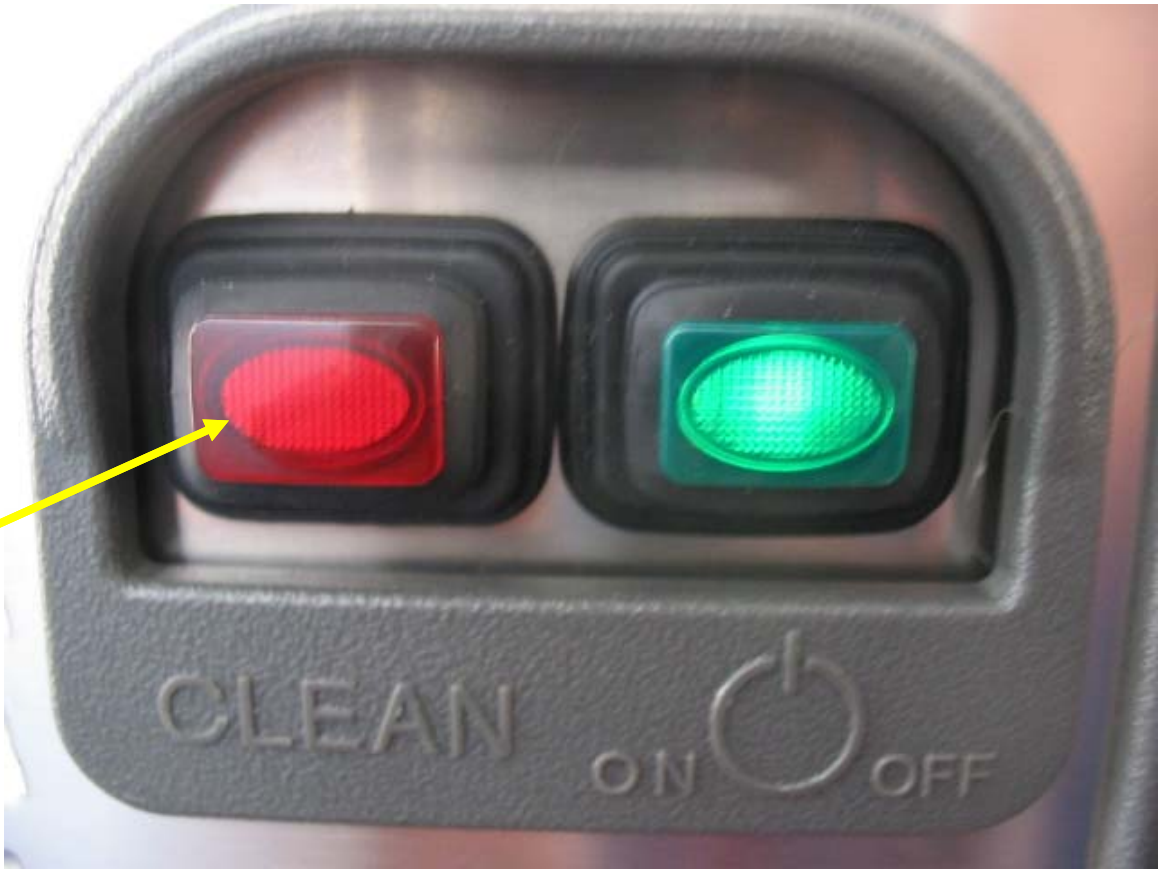
NEW AC SERIES

OPERATING PRINCIPLES – WATER SYSTEM CLEAN

Once water system is cleaned it's necessary to restart the count down timer, of the Remind PC Board, by pushing and holding for more then 20" the Red Re-Set button.



Scotsman Ice Systems

NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

The components of the refrigerant system of the Models AC 46, AC 56 & AC 86 are composed by:

- **COMPRESSOR**

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NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

- CONDENSER

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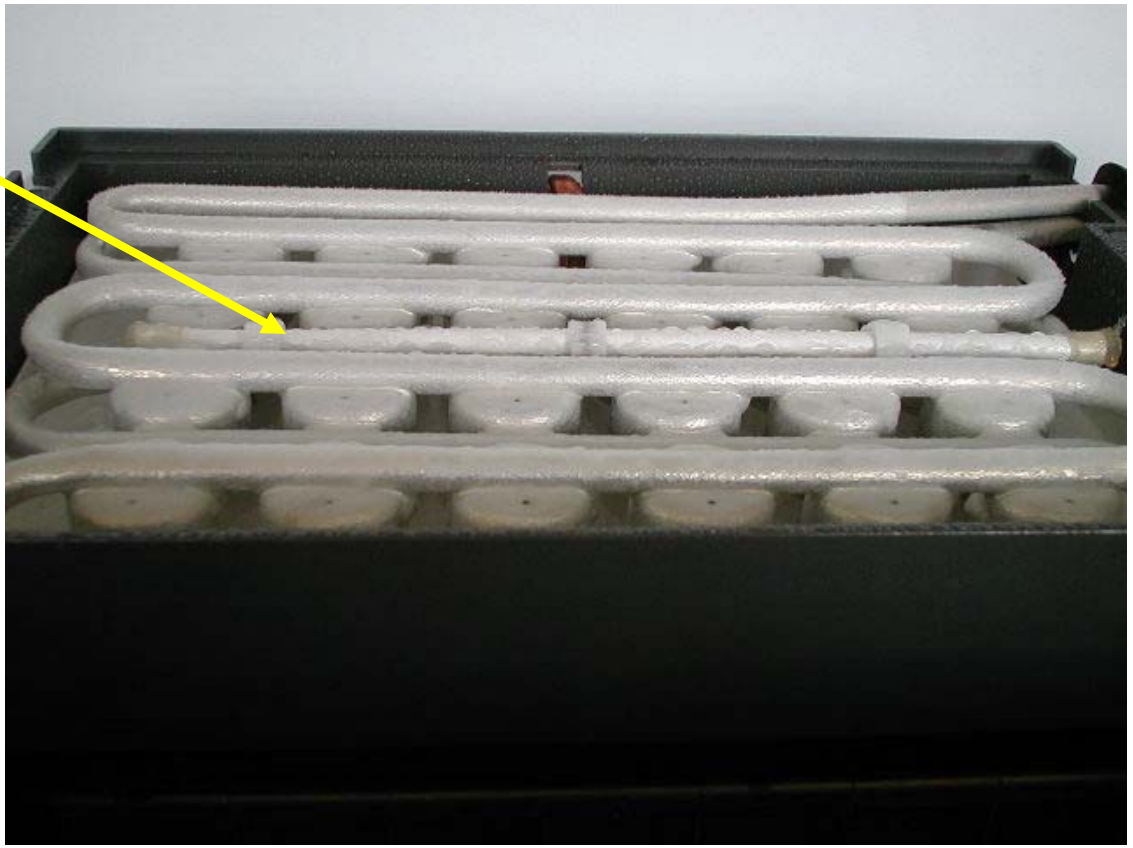
NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

- EVAPORATOR



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NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

- SUCTION LINE AND CAPILLARY TUBE

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NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

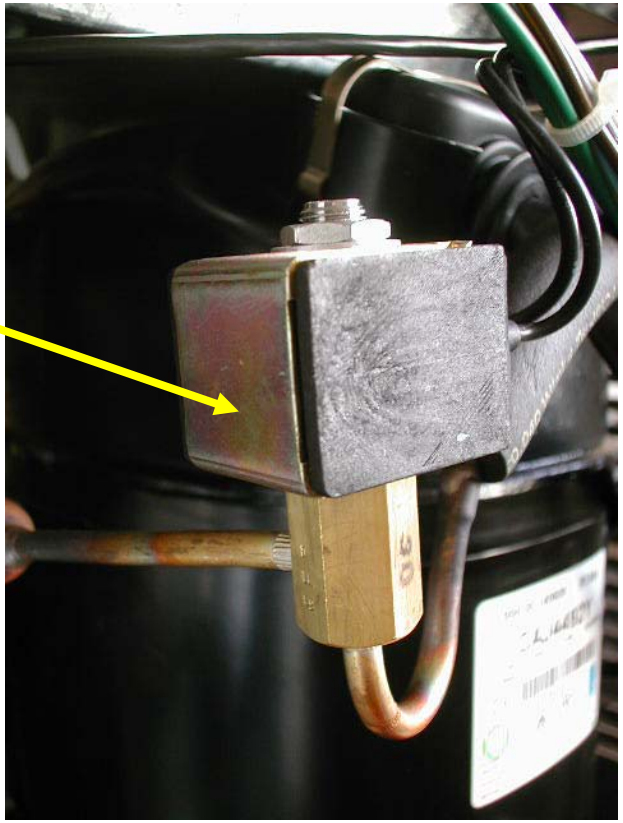
- DRIER

Scotsman Ice Systems

NEW AC SERIES

COMPONENTS - REFRIGERANT SYSTEM

- HOT GAS VALVE



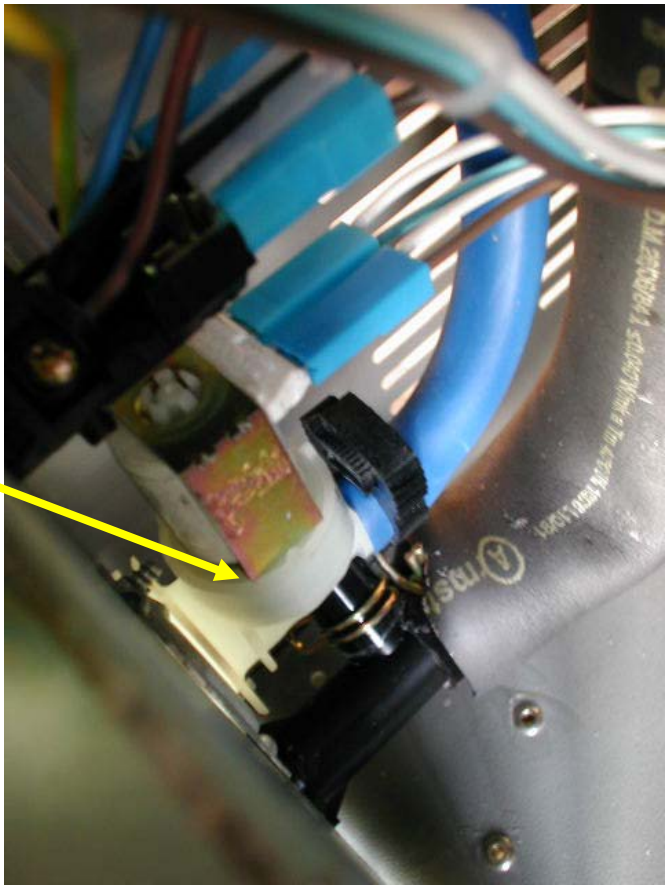
Scotsman Ice Systems

NEW AC SERIES

COMPONENTS - WATER SYSTEM

The components of the water system of the Models AC 46, AC 56 & AC 86 are composed by:

- **WATER INLET VALVE**



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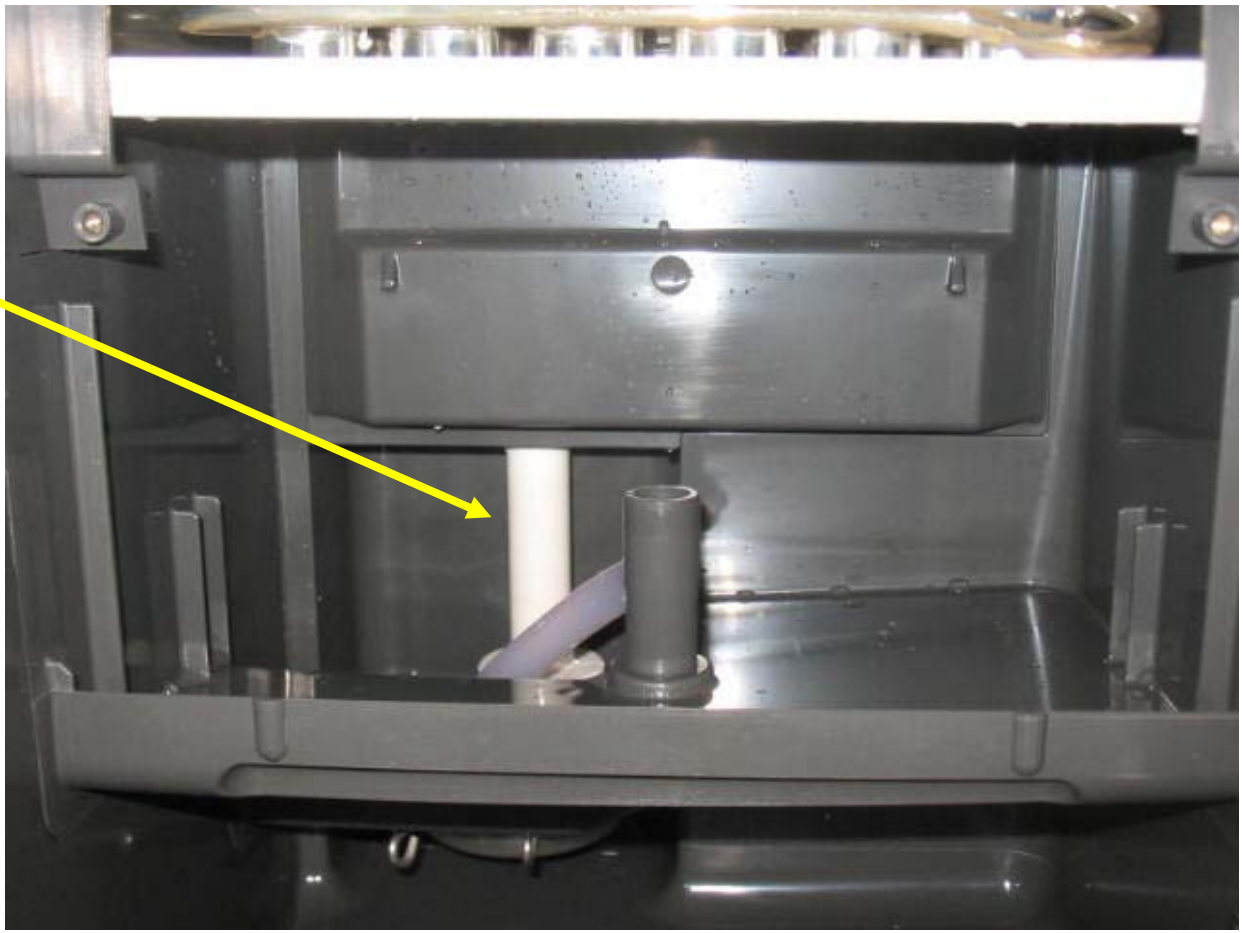
NEW AC SERIES

COMPONENTS - WATER SYSTEM

- WATER SUMP



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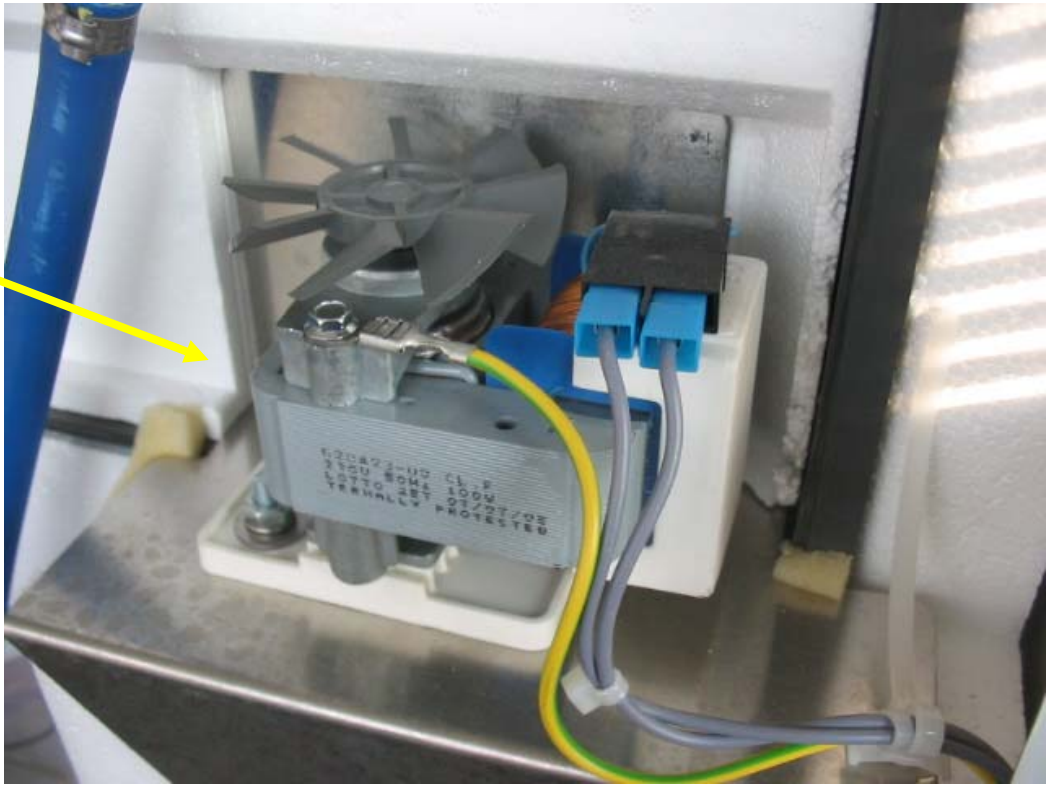
NEW AC SERIES

COMPONENTS - WATER SYSTEM

- **WATER PUMP**



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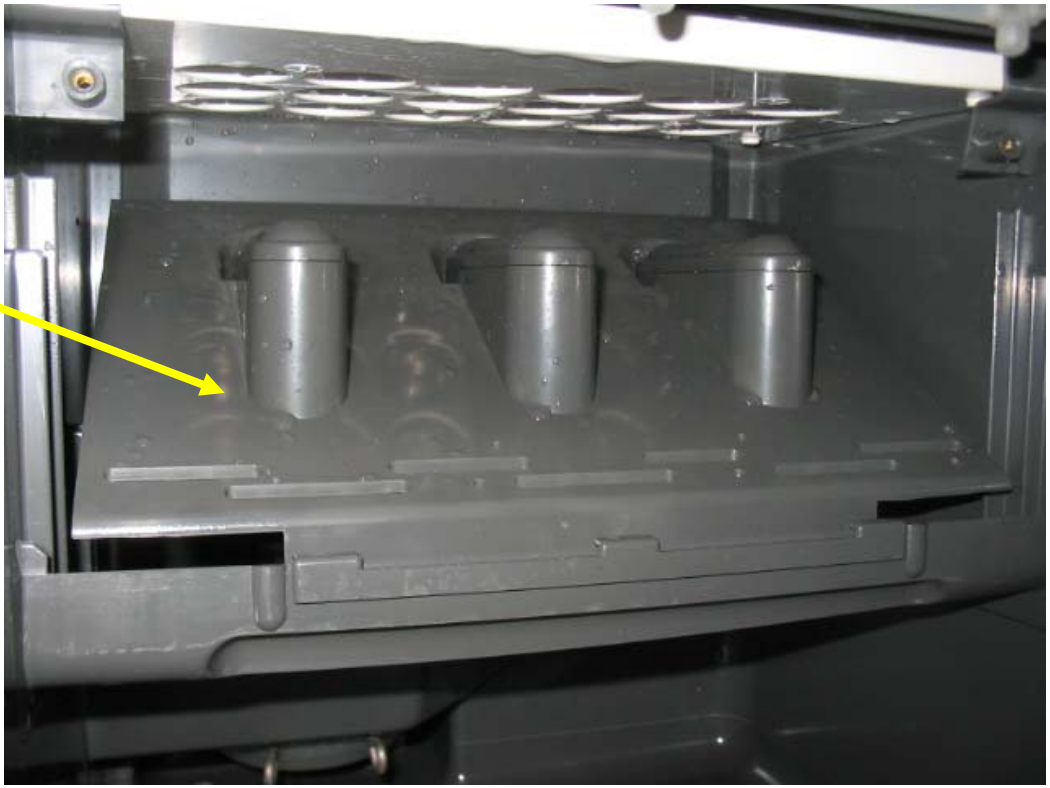
NEW AC SERIES

COMPONENTS - WATER SYSTEM

- SPRAY PLATEN



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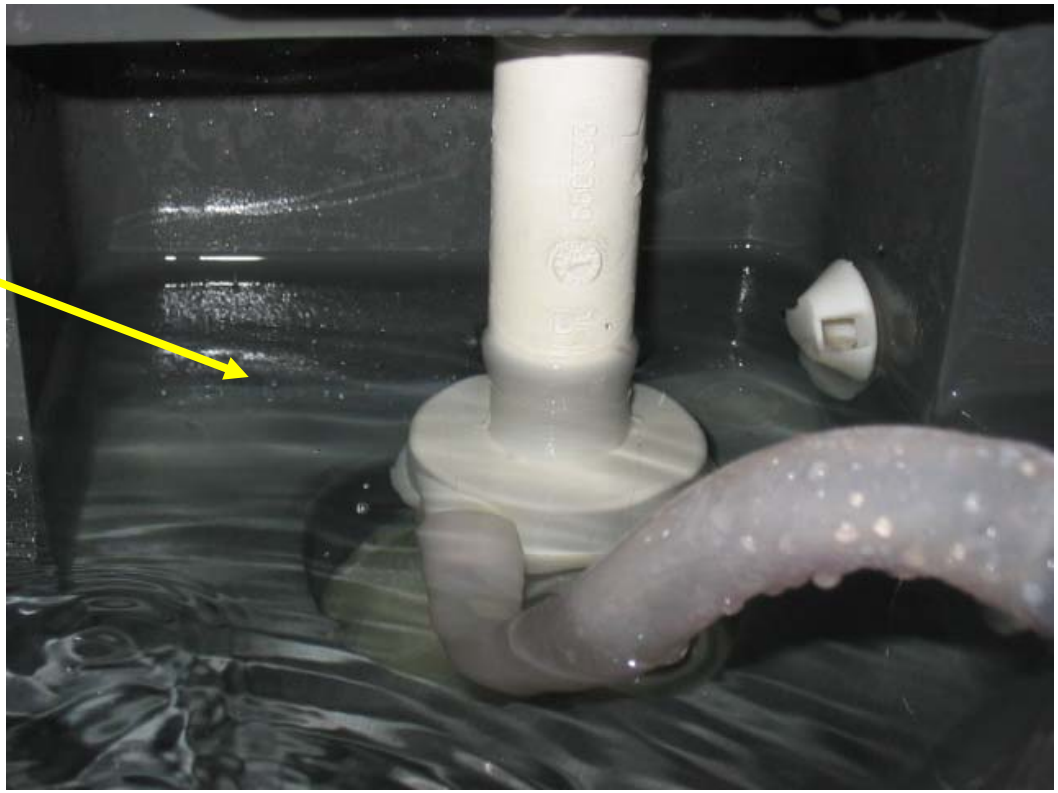
NEW AC SERIES

COMPONENTS - WATER SYSTEM

- OVERFLOW



Scotsman Ice Systems

NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

The components of the Electric System of the Models AC 46, AC 56 & AC 86 are composed by:

- **MASTER SWICH**

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NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- **ALARM-RESET SWITCH**

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NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- **EVAPORATOR THERMOSTAT**

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NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- **BIN THERMOSTAT**

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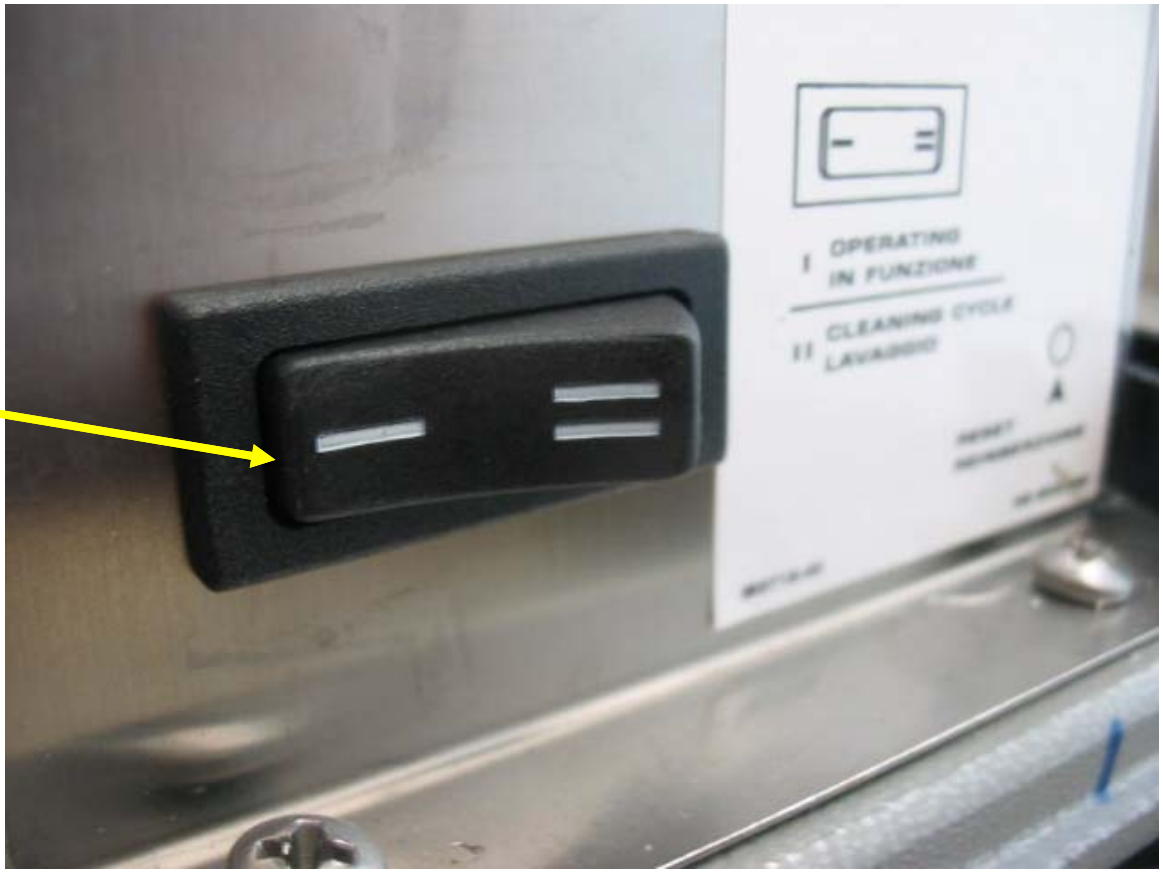
NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- **BY-PASS SWITCH**



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NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- **ALARM & CLEANING REMIND BOARD**

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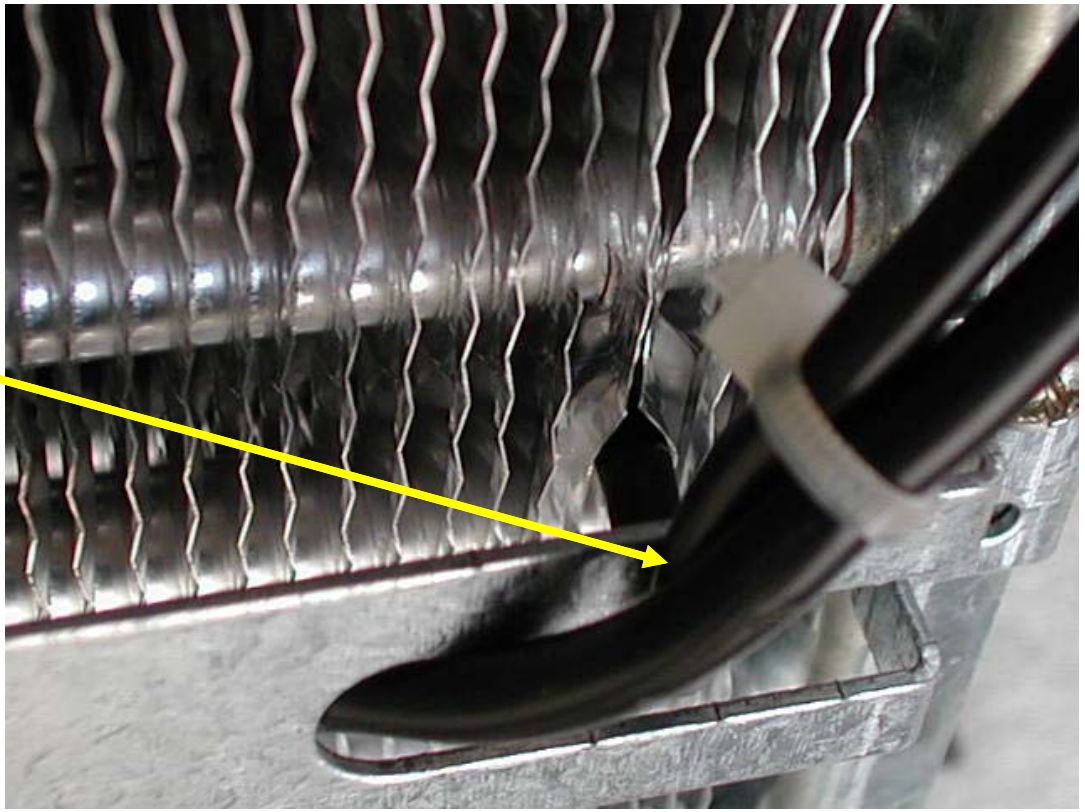
NEW AC SERIES

COMPONENTS - ELECTRICAL CONTROLS

- CONDENSER SENSOR

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END FIRST
HALF