Scotsman®
Ice Systems

NEW MF..6 SERIES

TECHNICAL SERVICE TRAINING

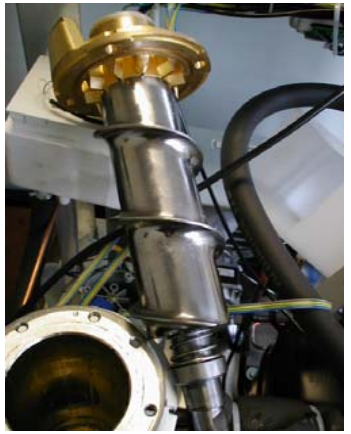
Welcome to another Scotsman technical service presentation, it will cover the MF Series Ice Flaker and Superflaker Machines models **MF 26, MF 36, MF 46, MF 56** and **MF 66.**

Flake Ice

Residual water content 25%

Superflake Ice

Residual water content 15%



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MF 26 A/W Model

Max daily Production = 120 Kg/24h*

* 10/10°C = Water and Air Temperature

Flake Ice

Residual water content 25%

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MF 36 A/W Model

Max Daily Production = 200 Kg/24h*

* 10/10°C = Water and Air Temperature

Flake Ice

Residual water content 25%

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MF 46 A/W Model

Max Daily Production = 320 Kg/24h*

* 10/10°C = Water and Air Temperature

Superflake

Residual water content 15%

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MF 56 A/W/RC Model

Max Daily production = 600 Kg/24h*

* 10/10°C = Water and Air Temperature

Superflake Ice

Residual water content 15%

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MF 66 A/W/RC Model

Max daily production = 1150 Kg/24h*

* 10/10°C = Water and Air Temperature

Superflake Ice

Residual water content 15%

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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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UNPACKING

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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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UNPACKING

Visually inspect the exterior of the machine then unloose the screws of the front/top panel.

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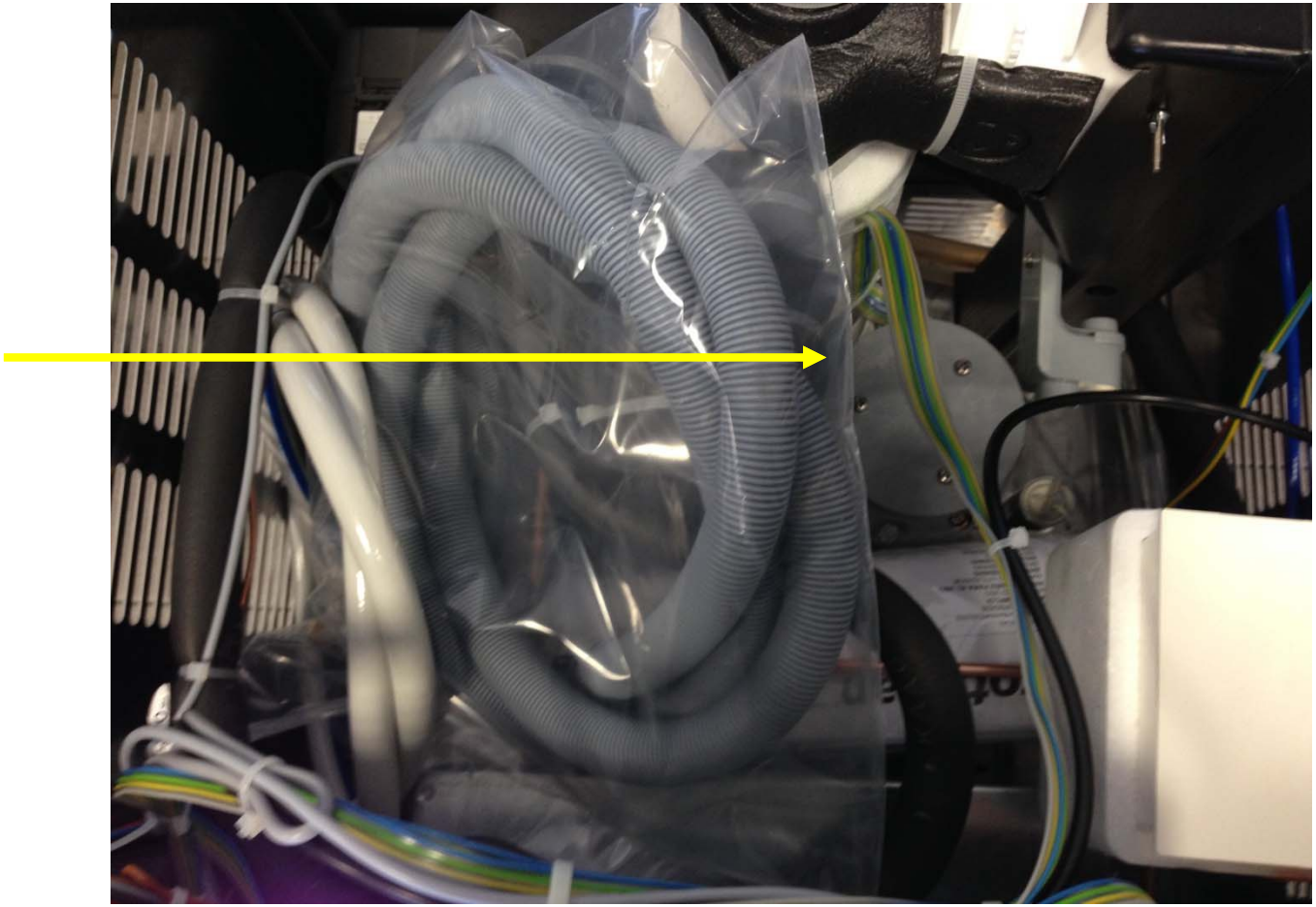
UNPACKING

Remove the top panel then take out the water inlet and outlet hoses.



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UNPACKING

Remove the two holding screws securing the ice machine to the wooden base….

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UNPACKING

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

Storage bins required are:

- **SB 193 for MF 26 - 36**
- **SB 393 for MF 46 - 56**
- **SB 550 for MF 46 - 56**

SB 193

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UNPACKING

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.

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INSTALLATION

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NEW MF..6 SERIES

INSTALLATION

Install the four legs and their adjusting/leveling nuts on the legs socket as well as the drain tube with its clamp on the base of the storage bin

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INSTALLATION

Then install the machine on the storage bin with the proper adapter kit if necessary

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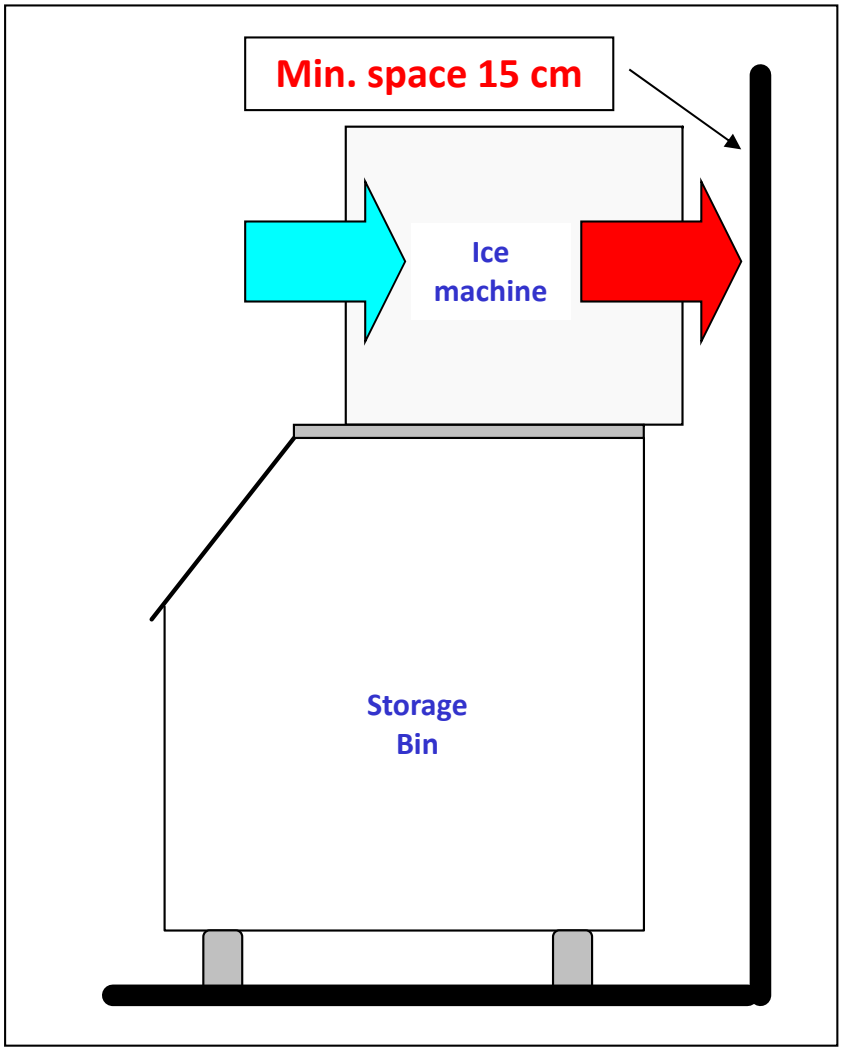
INSTALLATION

Adequate space must 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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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 MF..6 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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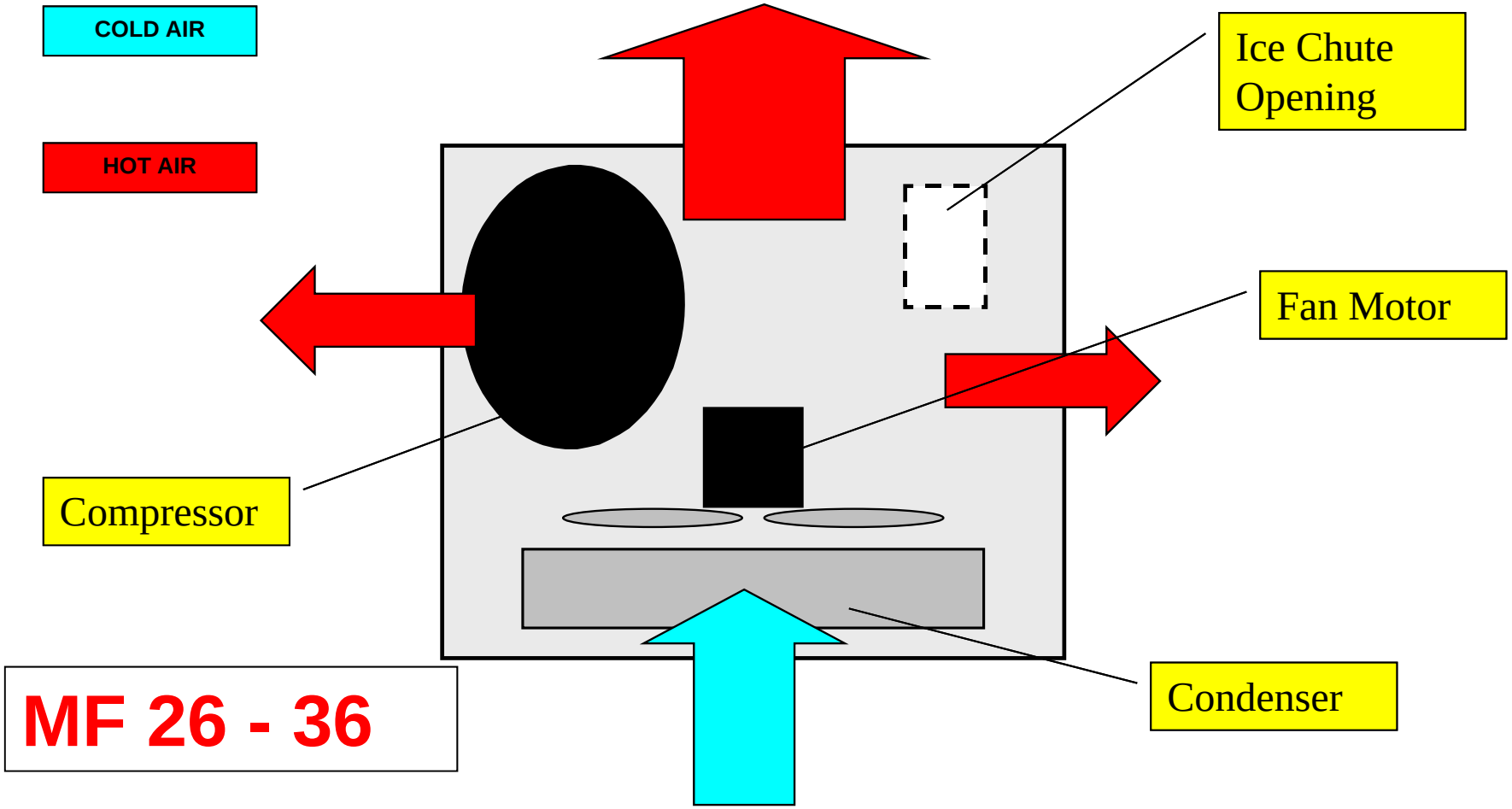
INSTALLATION - AIR CIRCULATION



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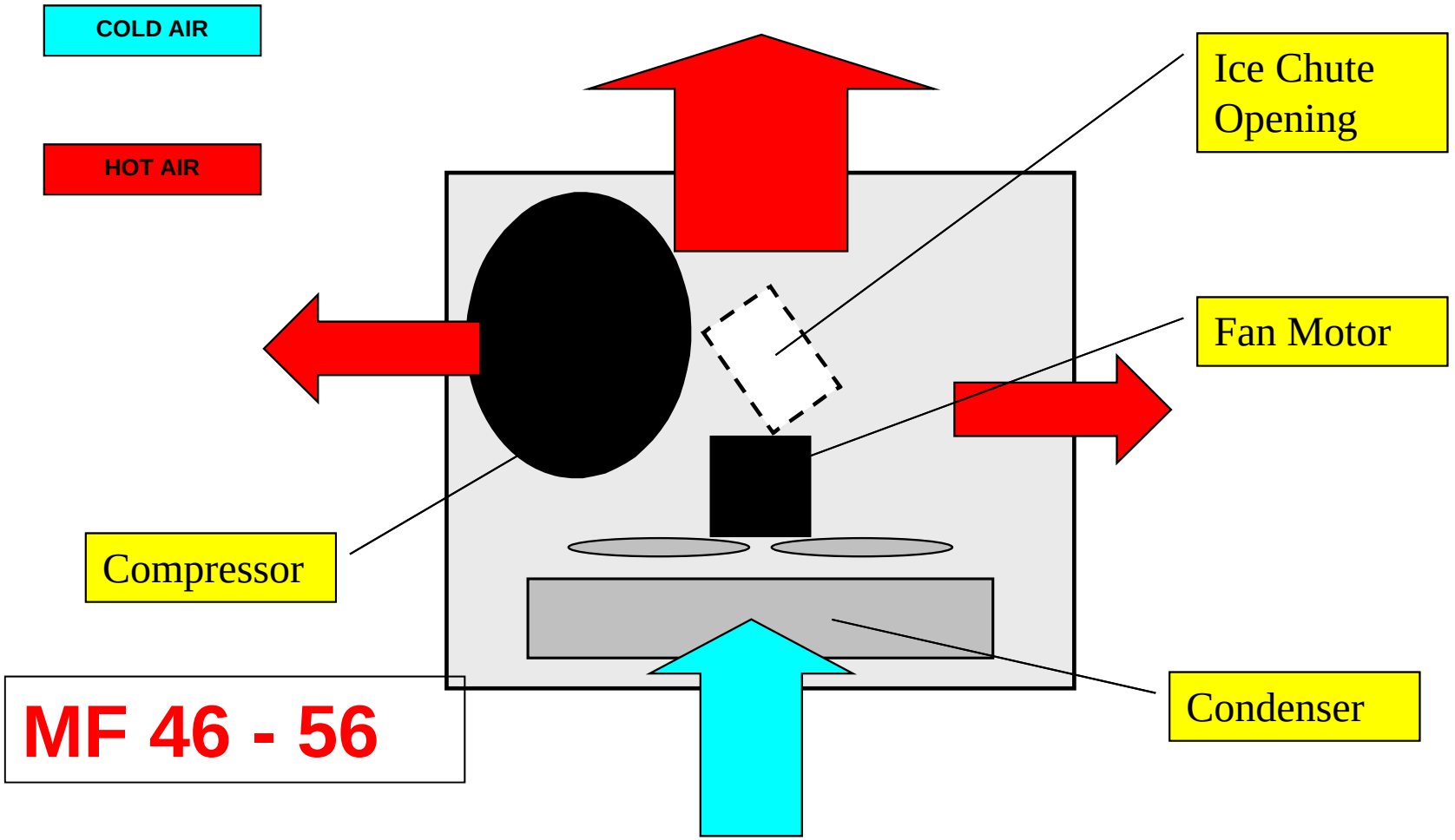
NEW MF..6 SERIES

INSTALLATION - AIR CIRCULATION



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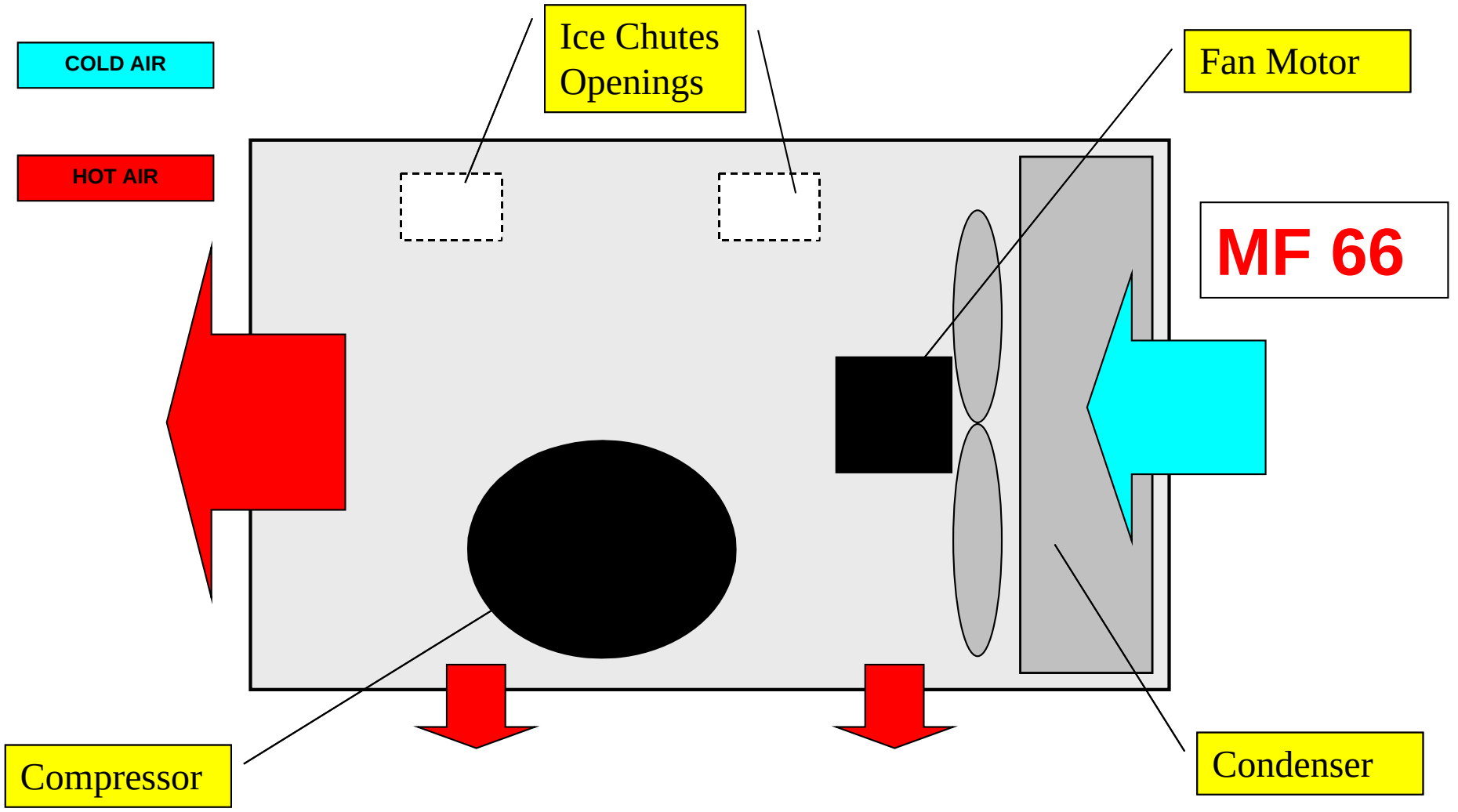
NEW MF..6 SERIES

INSTALLATION - AIR CIRCULATION



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INSTALLATION

Level the unit on

both directions front

to rear and right to

left side using the

adjustable legs of the

storage bin.

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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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INSTALLATION-WATER IN

Connect the 3/4” water inlet male threat 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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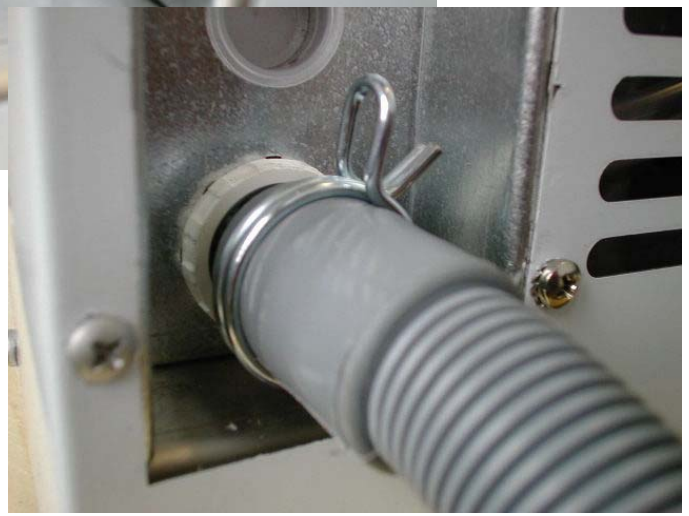
INSTALLATION-WATER DRAIN

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



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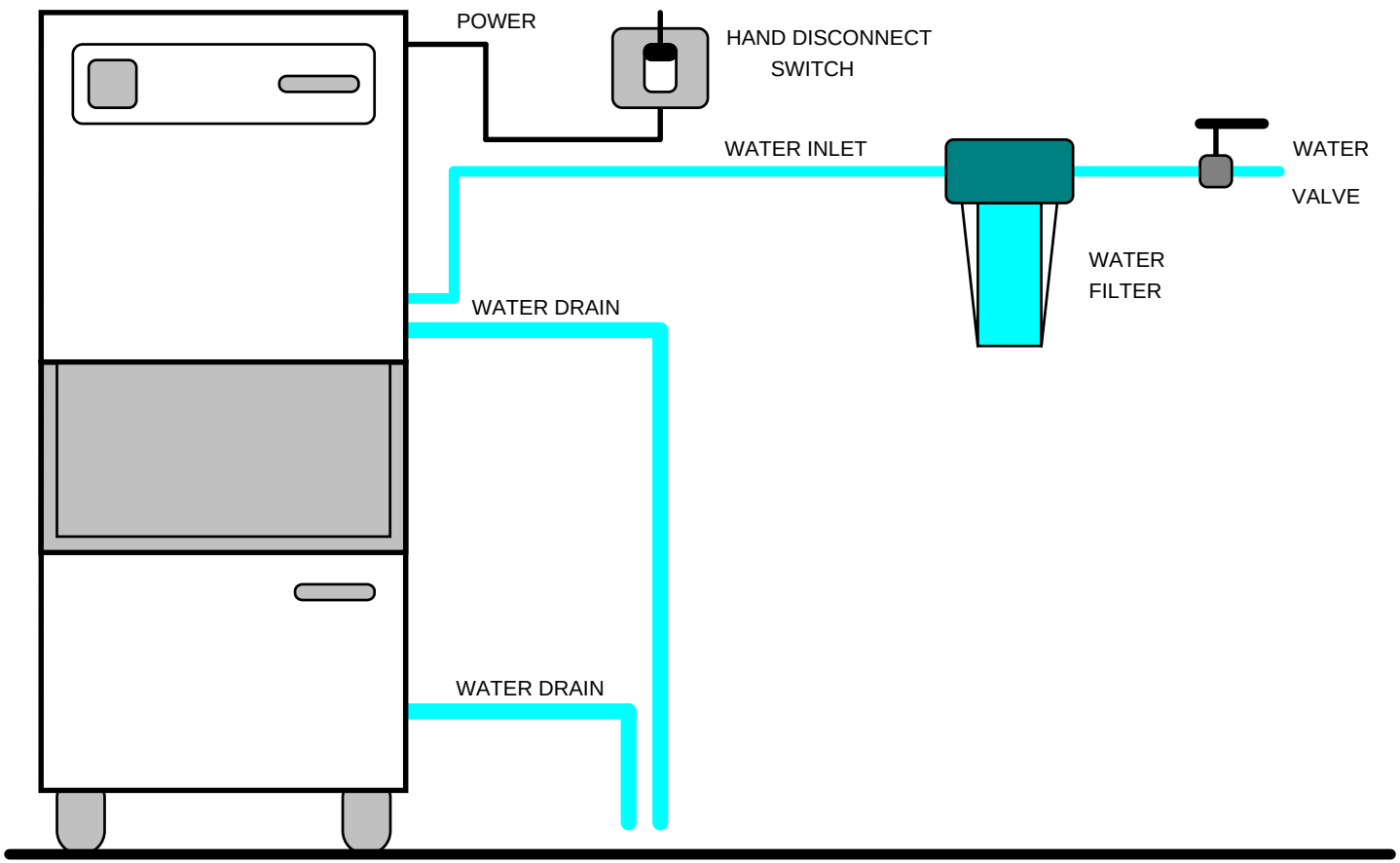
AIR COOLED TYPICAL INSTALLATION



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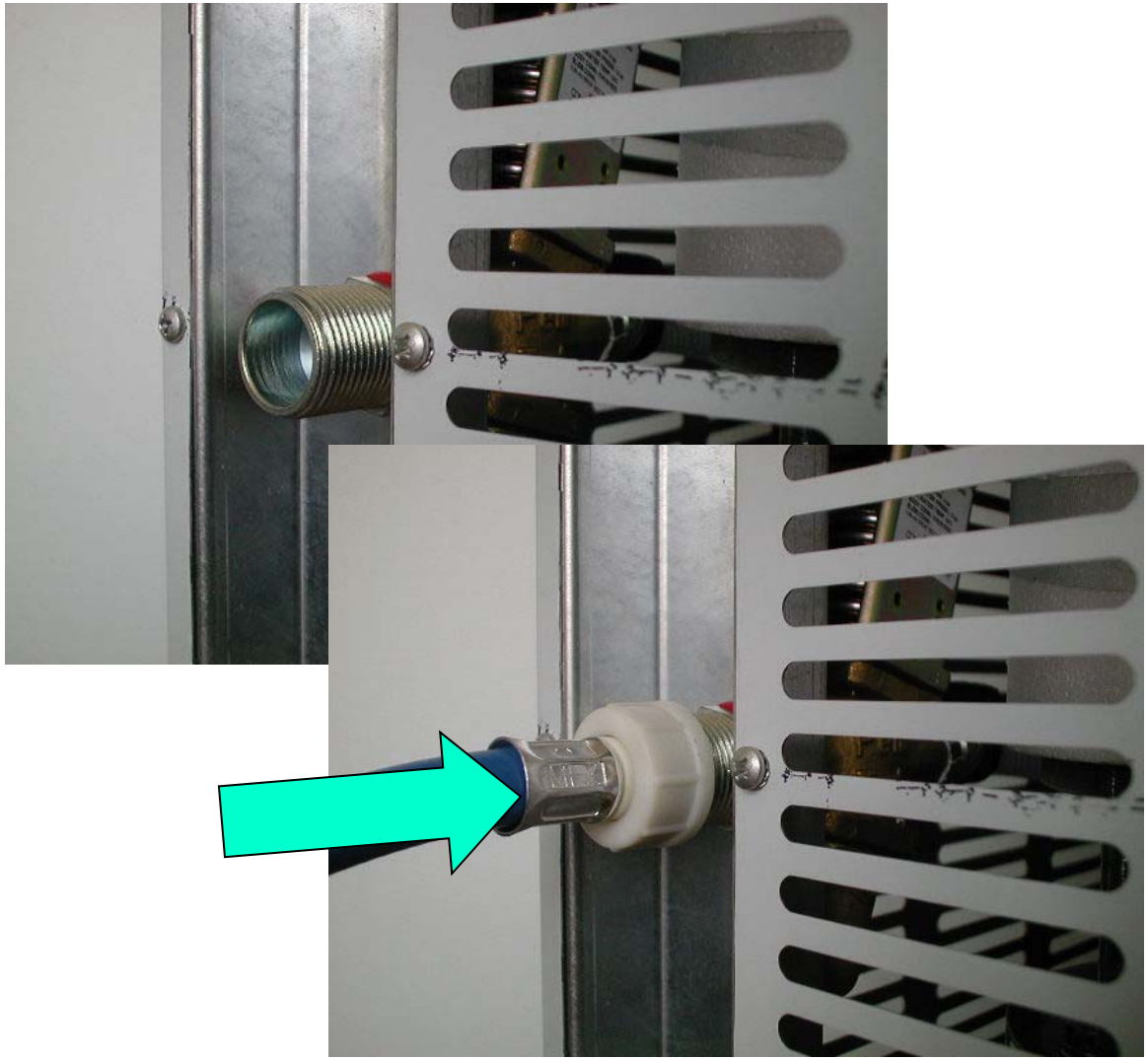
NEW MF..6 SERIES

INSTALLATION-WATER IN

On the water cooled version there is a separate 3/4” male thread water inlet fitting connected directly to the water regulating valve that must be connect to the water supply line by means of the rubber hose provided with machine and……



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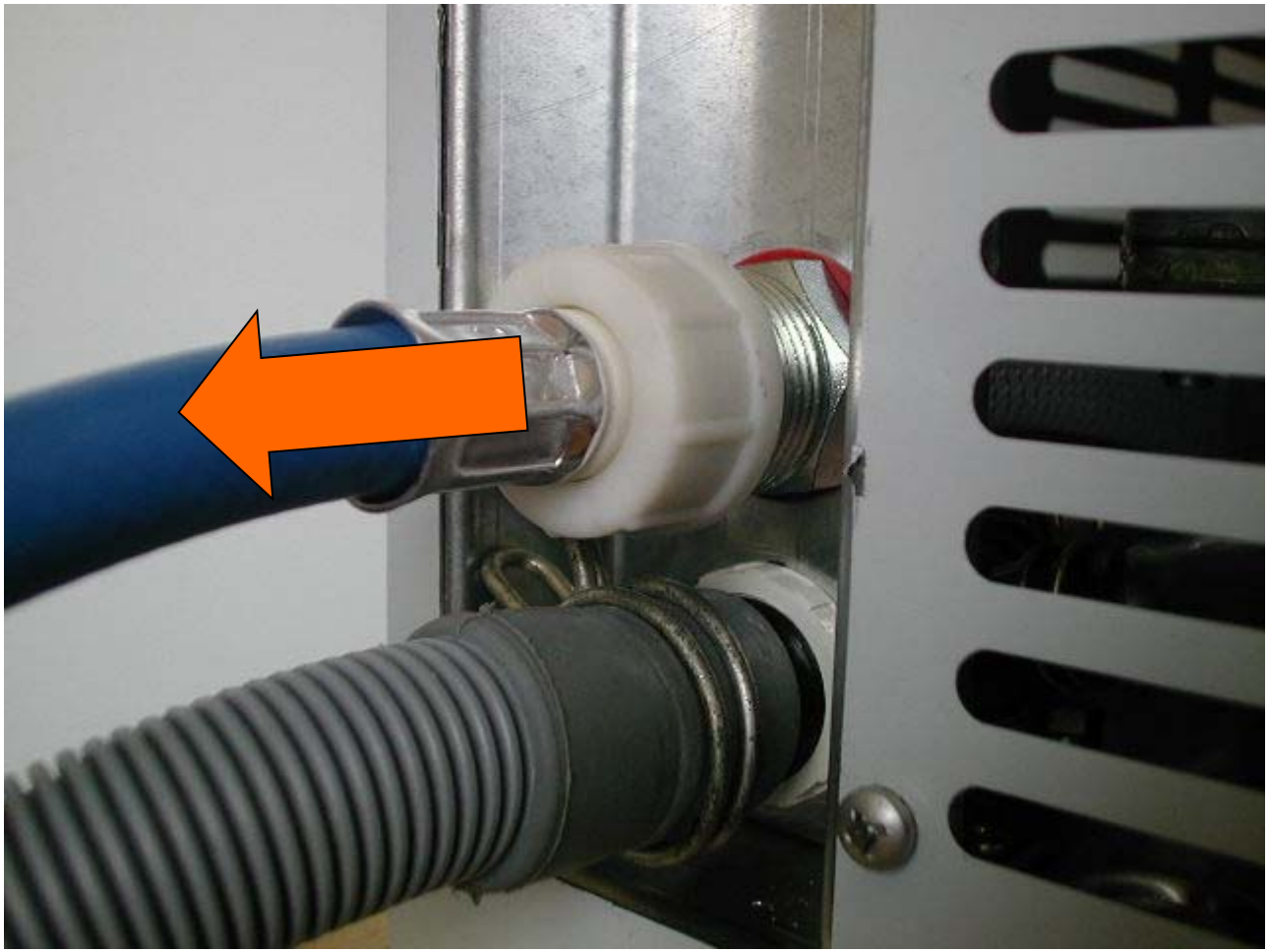
NEW MF..6 SERIES

INSTALLATION-WATER DRAIN

.....a separate water drain fitting (3/4” gas male) that must be connected to the drain receptacle with a separate hose.



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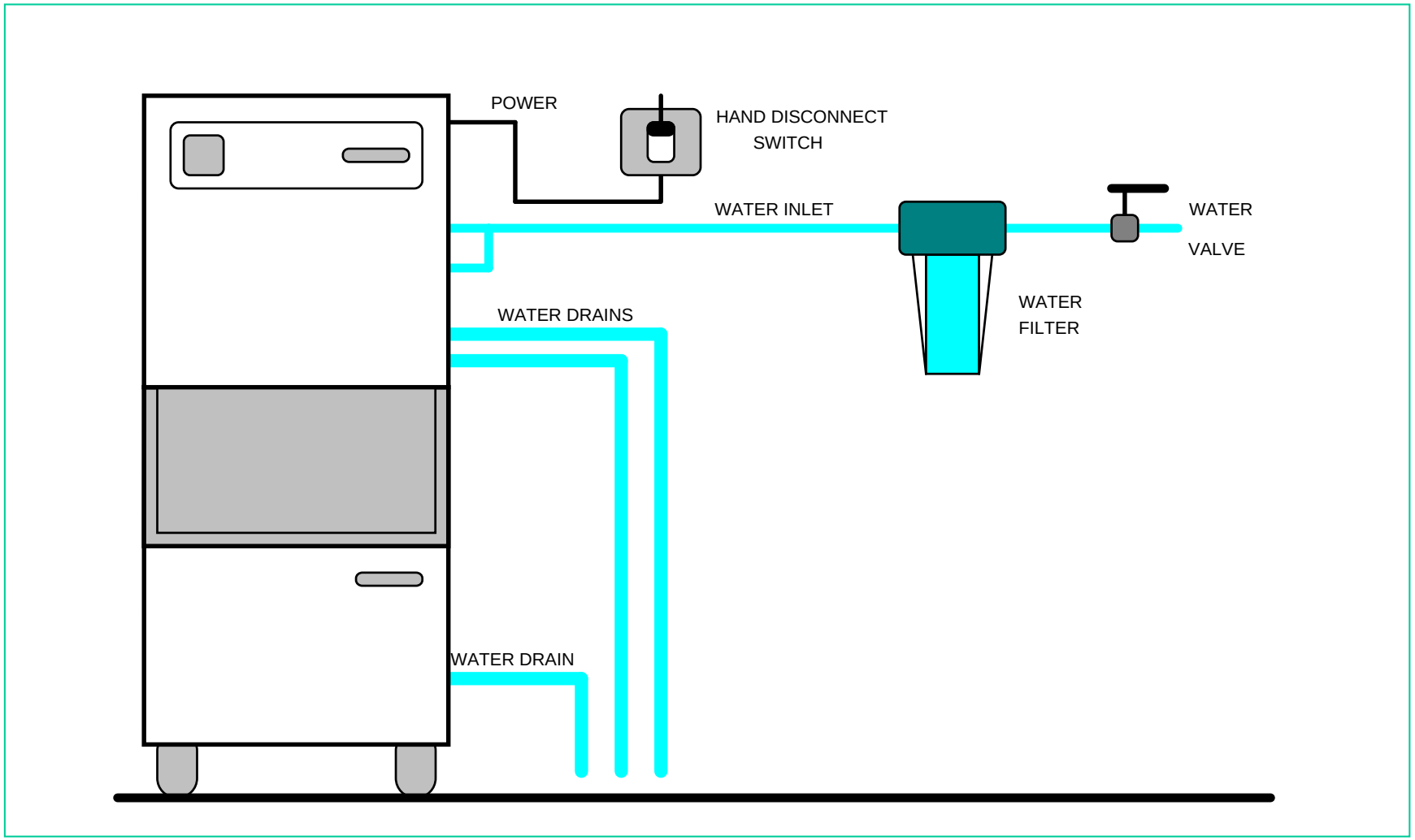
NEW MF..6 SERIES

WATER COOLED TYPICAL INSTALLATION



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START UP
and
OPERATIONAL
CHECKS

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NEW MF..6 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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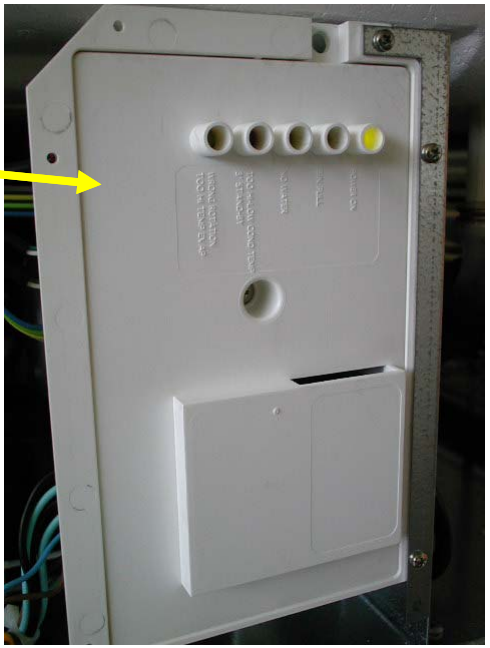
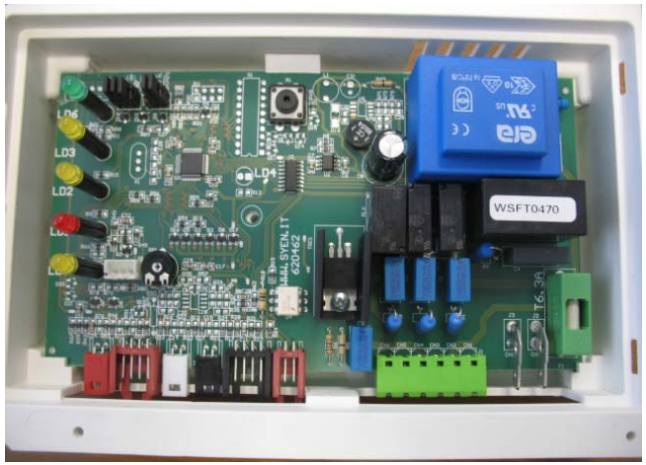
COMPONENTS-ELECTRONIC CONTROLS

PC BOARD





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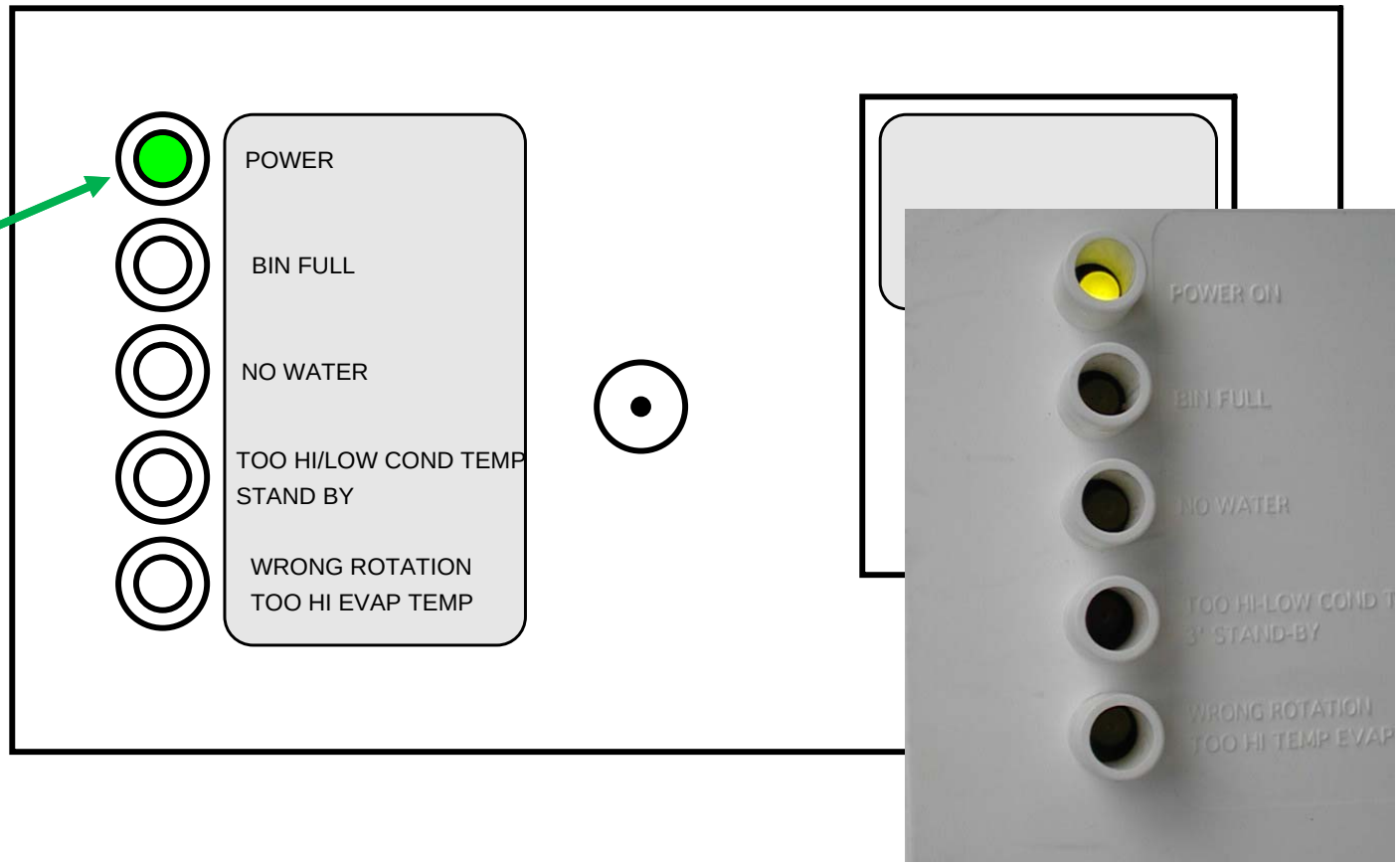
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

On PC Board the LED energized are:

- **Power**



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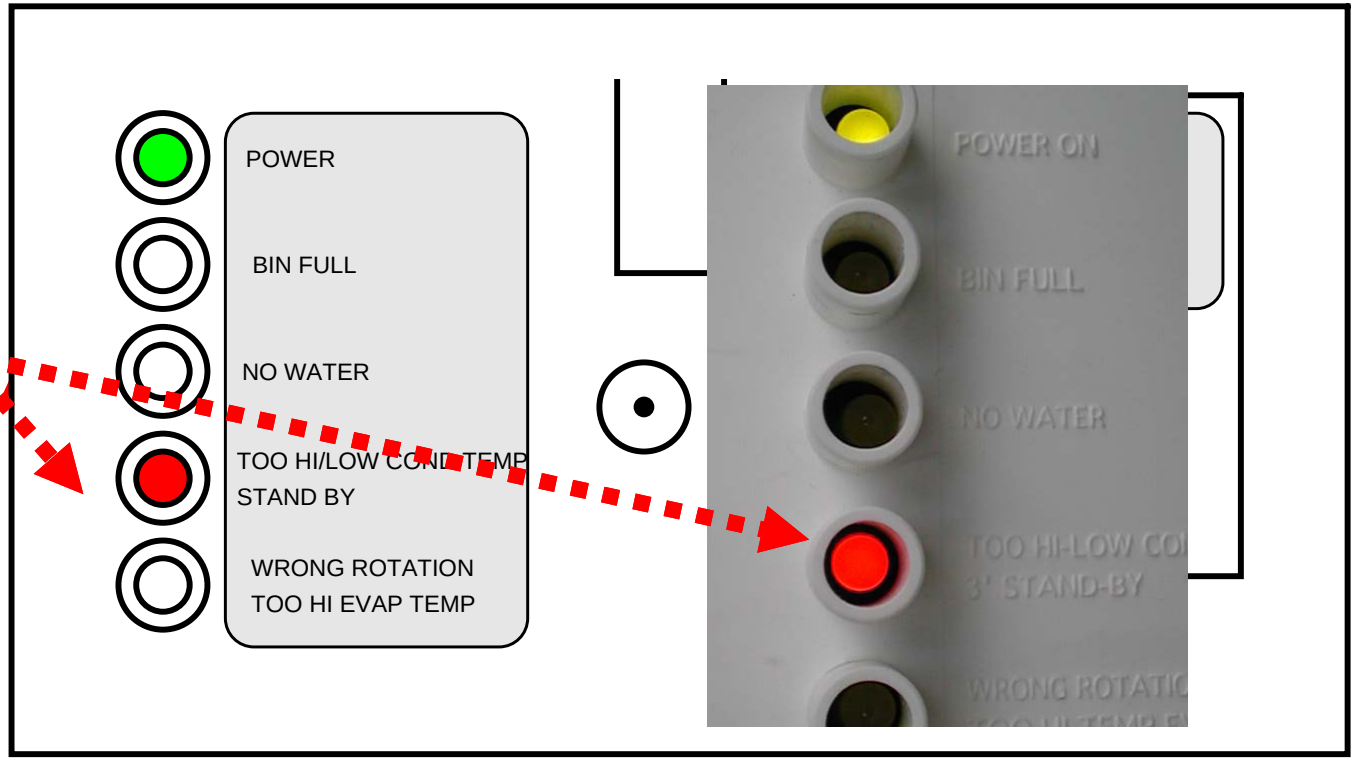
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

- Power

- **3’ Waiting time (60’ ONLY FOR MF 66 Model)**



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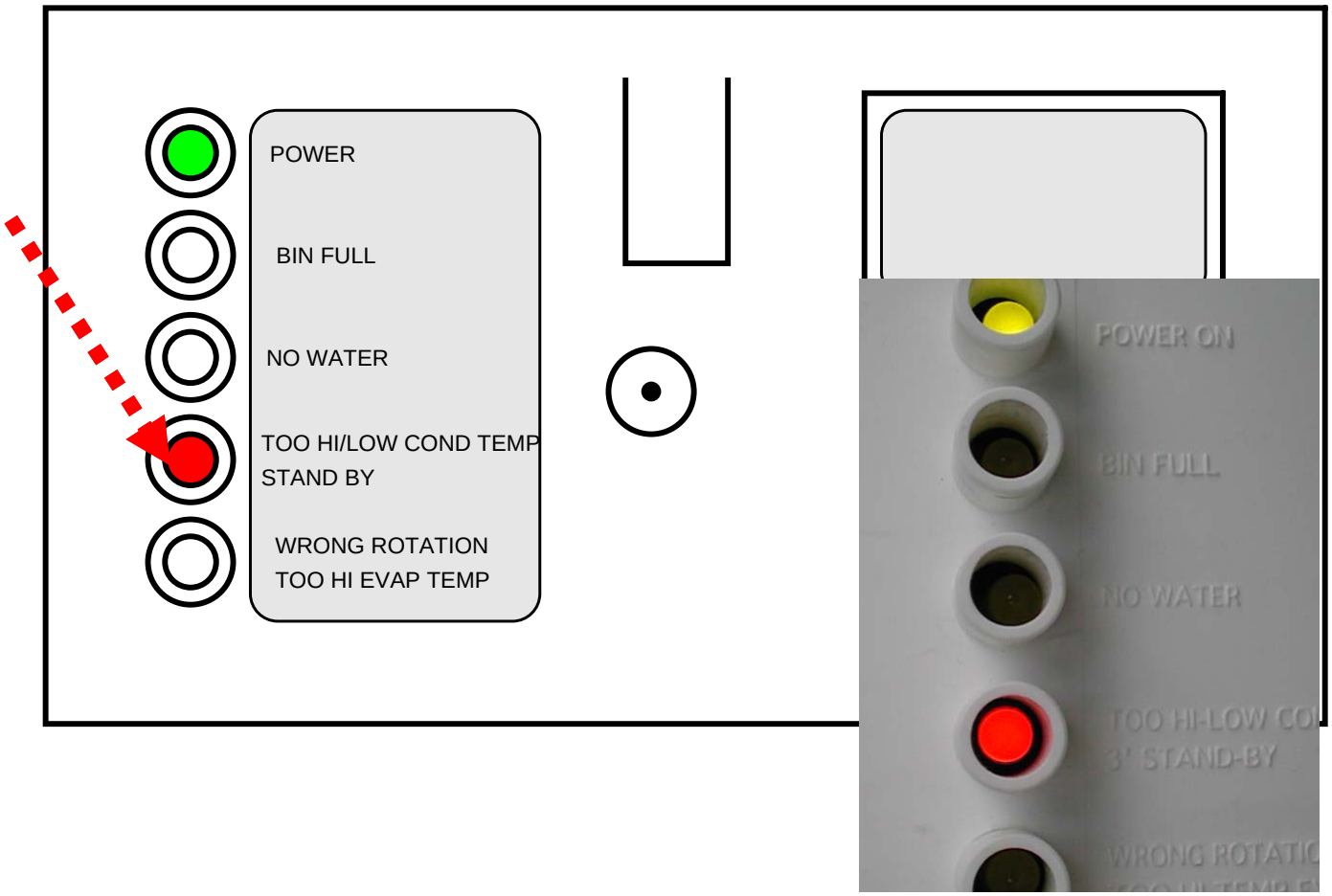
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

The RED LED starts blinking for the first 3’ (or for 60’ on MF 66) while .....



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NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

…..the water is entering

through the float valve

flowing then into the

vertical evaporator till it

reaches the same level

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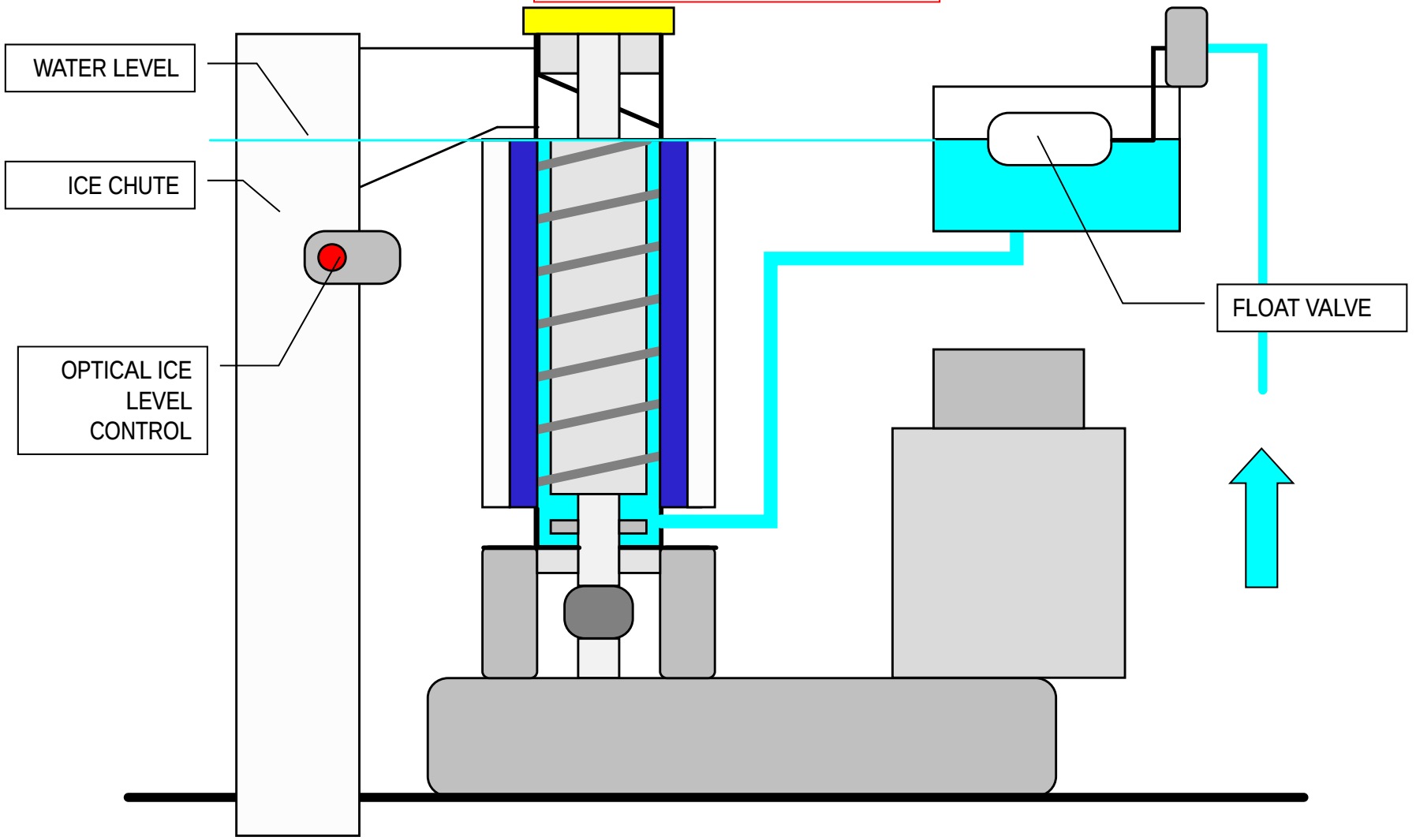
NEW MF..6 SERIES

MF 26 and 36



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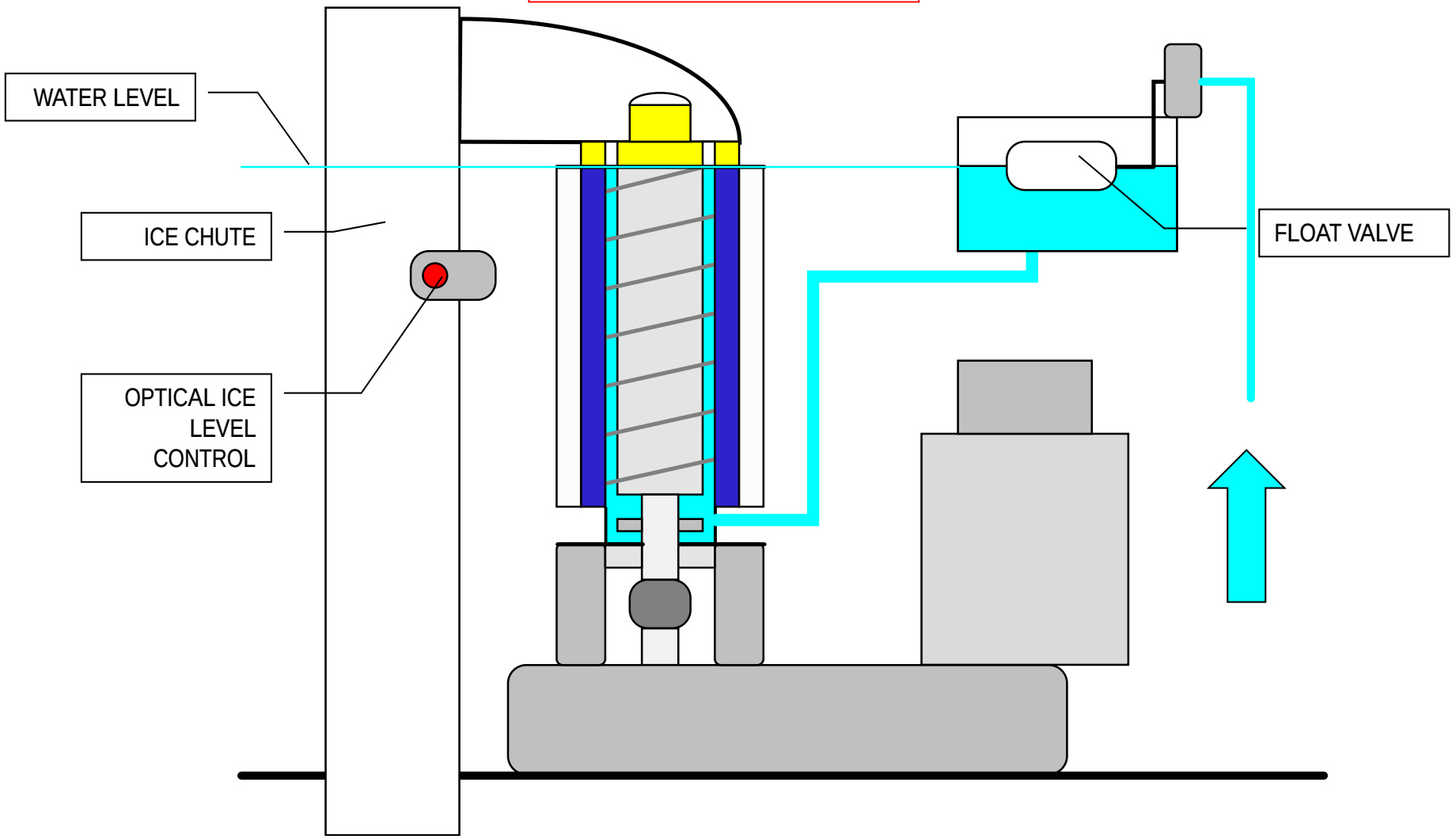
NEW MF..6 SERIES

MF 46-56-66



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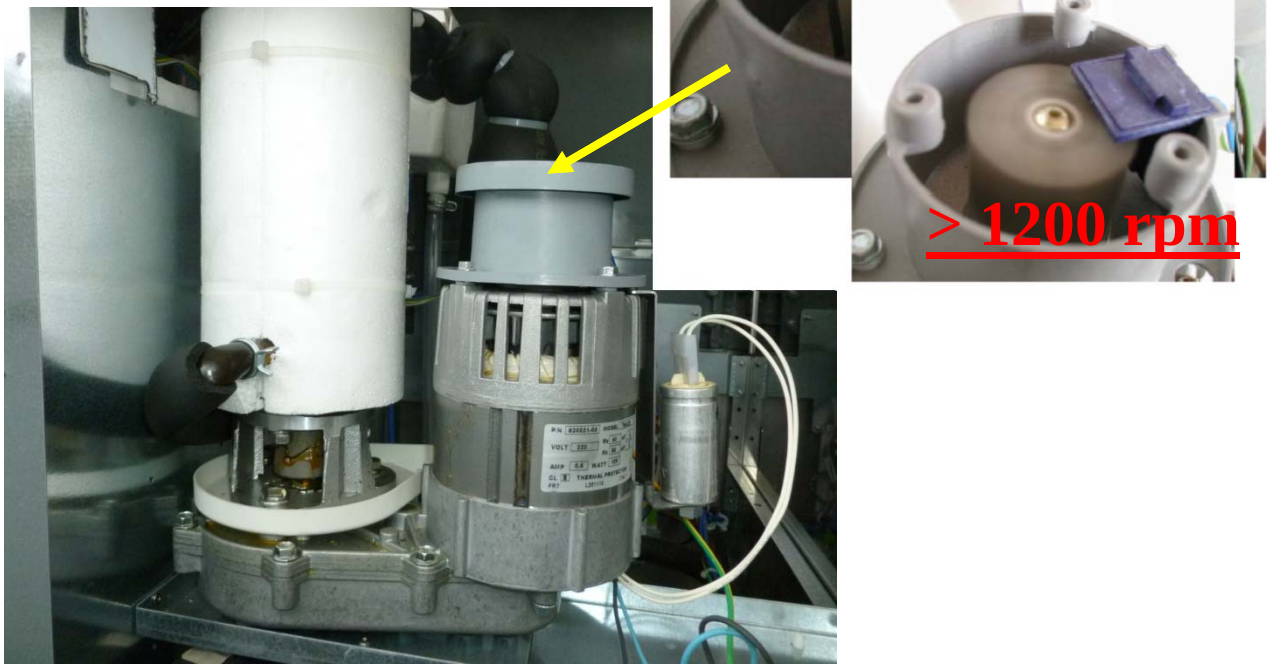
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

After the first 3’ of waiting time (60’ for MF 66 model) the PC Board supply the power to the drive motor and….



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NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

.....few seconds

later starts up the

compressor

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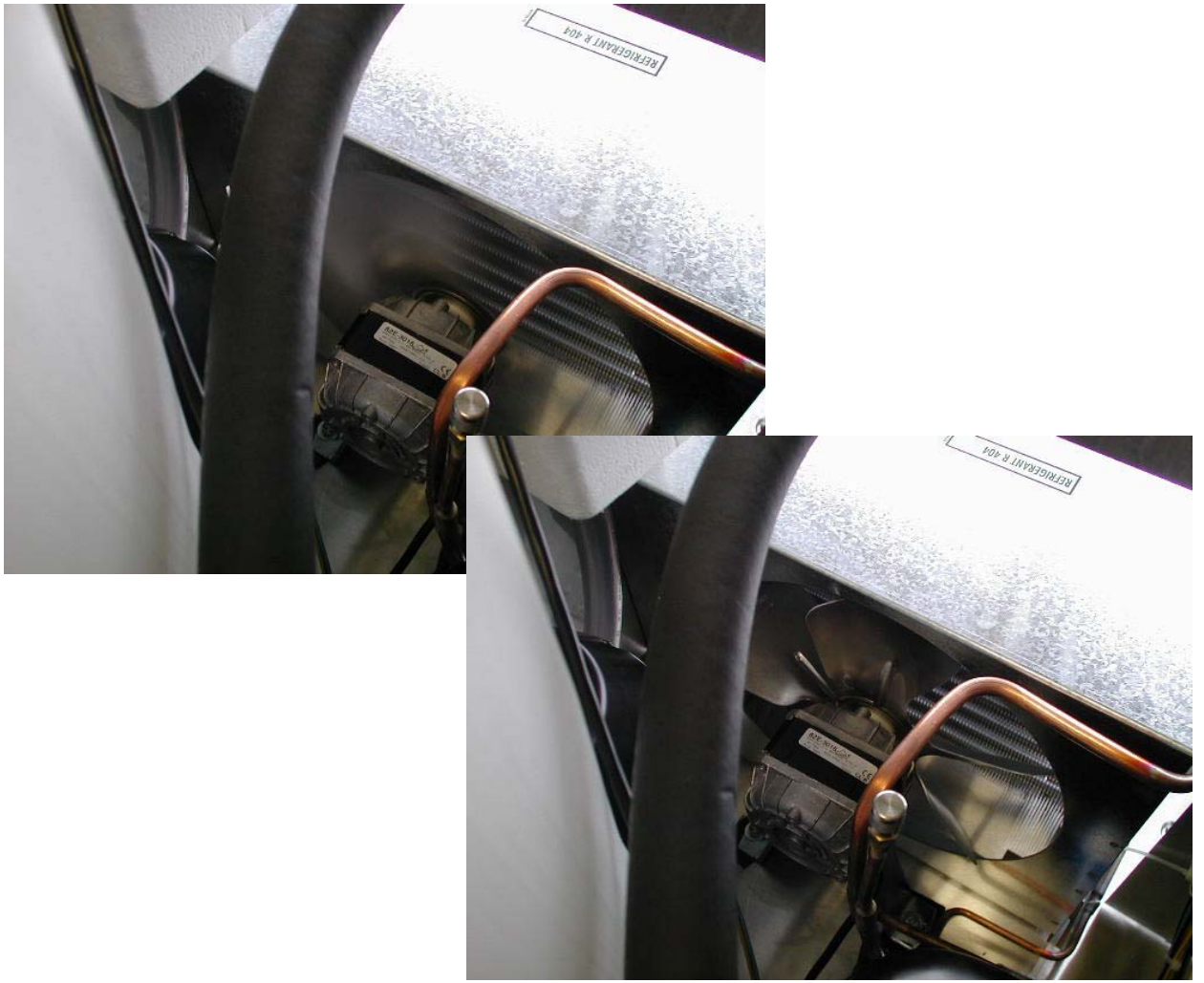
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

On the air cooled version, as soon as the condensing temperature rises up to the CUT IN value of the condenser sensor, the fan motor starts to turn in **ON / OFF MODE**



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NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

After two-three minutes the first pieces of flakes ice are discharged through the spout of the freezer dropping down into the storage bin

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START UP AND OPERATIONAL CHECKS

The machine remains in operation producing continuously the flakes ice till the storage bin is completely full.

When same ice is accumulated into the ice chute ....

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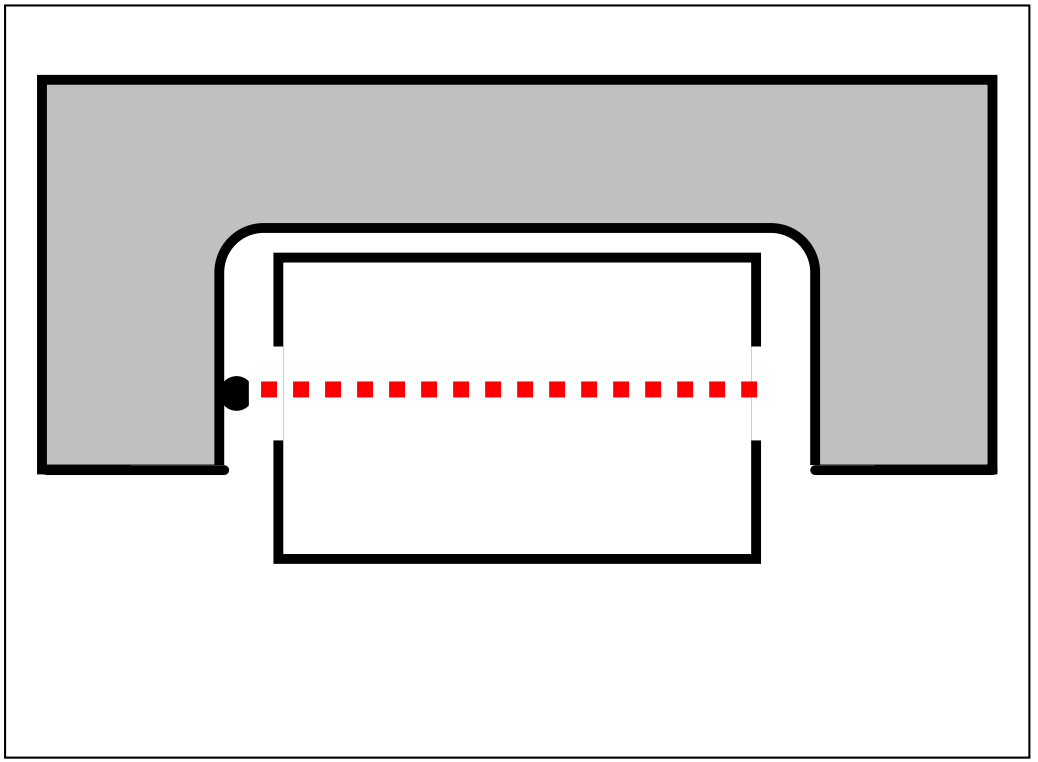
START UP AND OPERATIONAL CHECKS

……it breaks the

Infrared beam

of the Optical

Ice Level control



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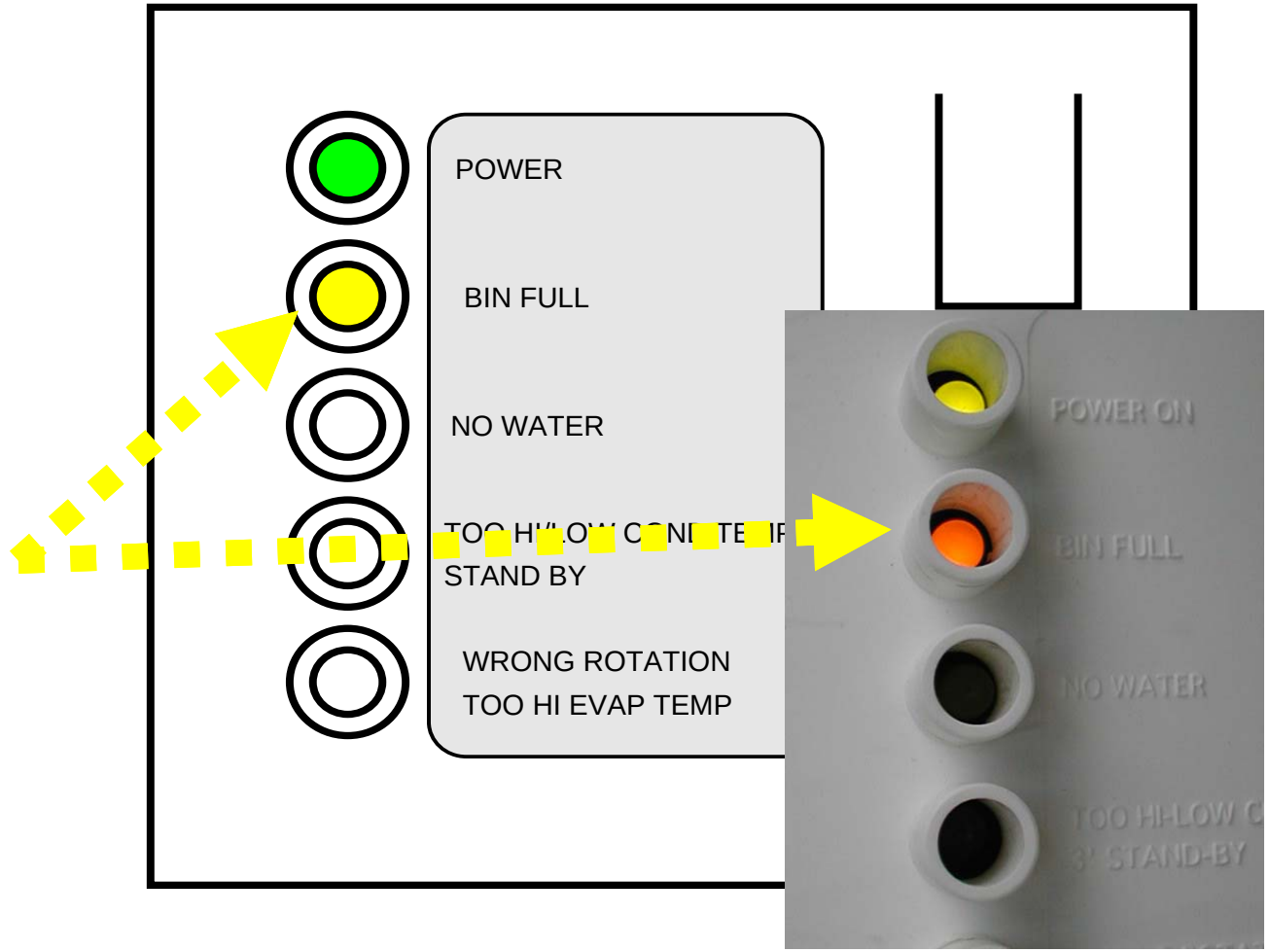
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

The breaking will cause the immediately the SLOW blinking of the **YELLOW LED** .....



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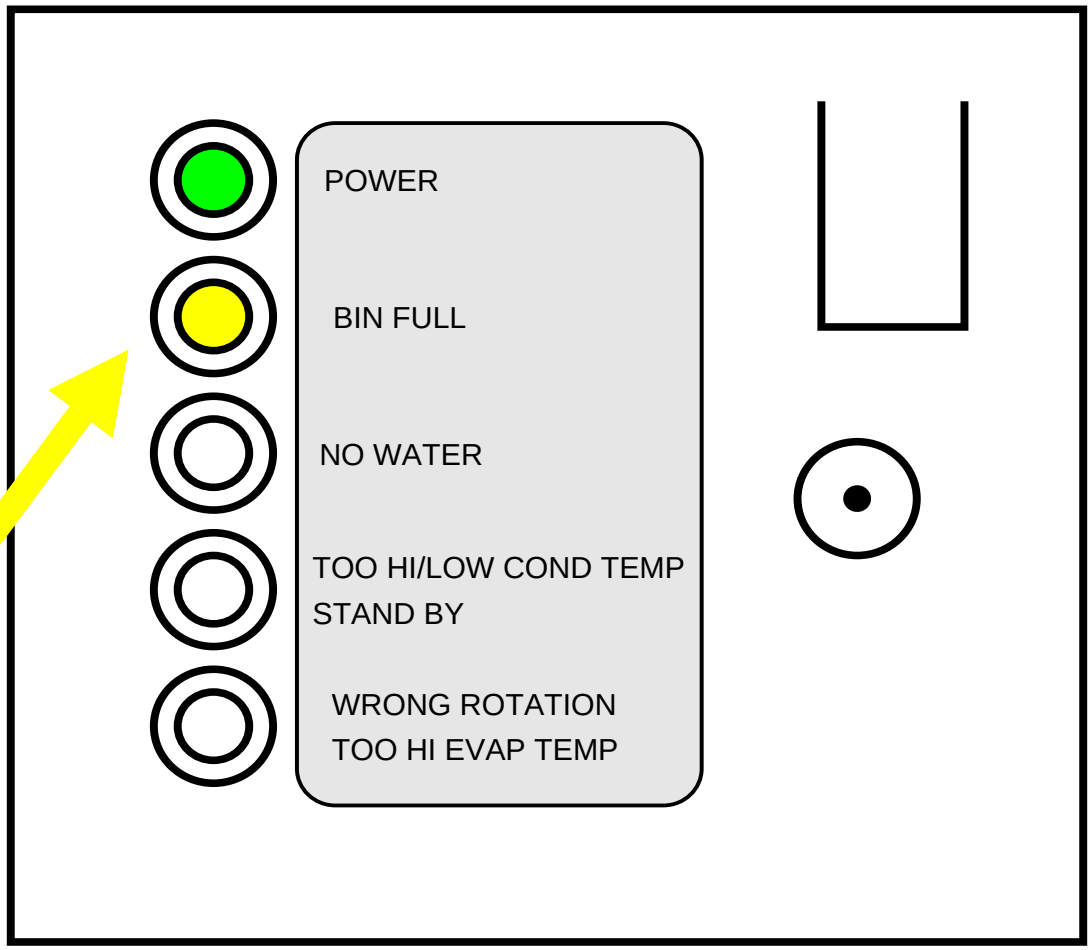
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

……and after approximately 10 seconds the **PC Board switches OFF** the operation of the compressor only with the light **ON of bin full YELLOW LED.**



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START UP AND OPERATIONAL CHECKS

The PC Board keeps also the drive motor in operation for additional 3' after the tripping OFF at Bin Full, in order to clean up all ice from the inside of the evaporator.

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NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

This kind of Trip-OFF delay happens at :

- ♦ No water
- ♦ Too hi evaporating temperature
- ♦ Too hi condensing temperature

Only when the unit Trips OFF at Wrong/No/Slow rotation, the gear motor stops immediately.

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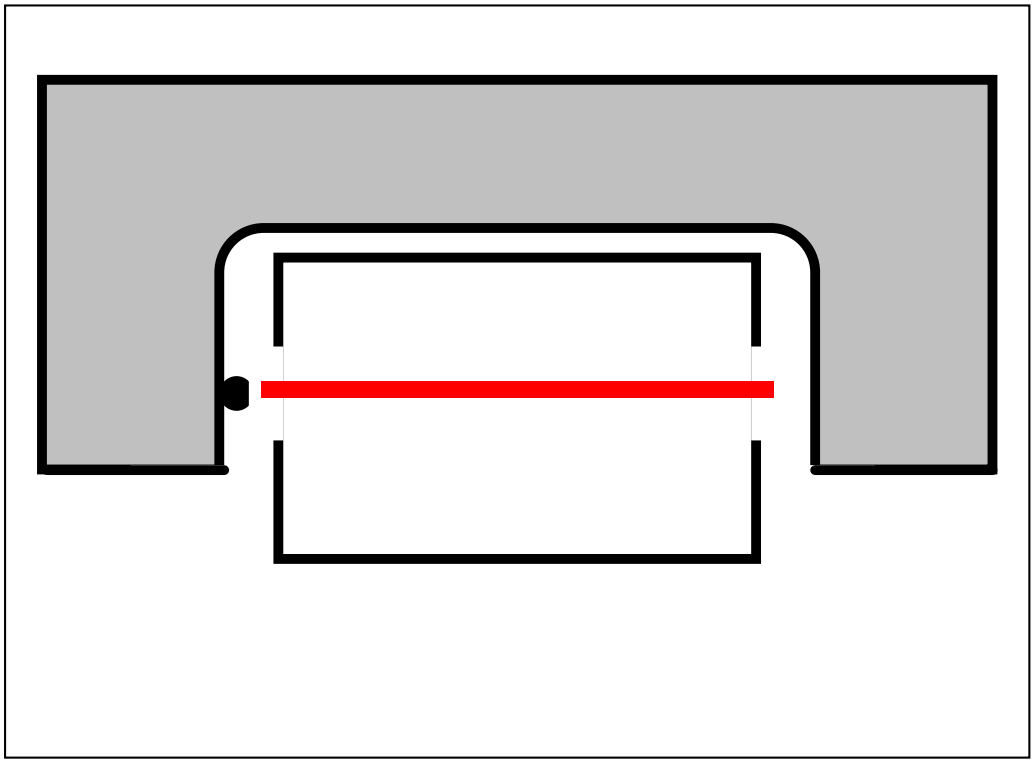
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

When ice is removed from the Optical Ice Level Control the Infrared beam is resumed immediately.....



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NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

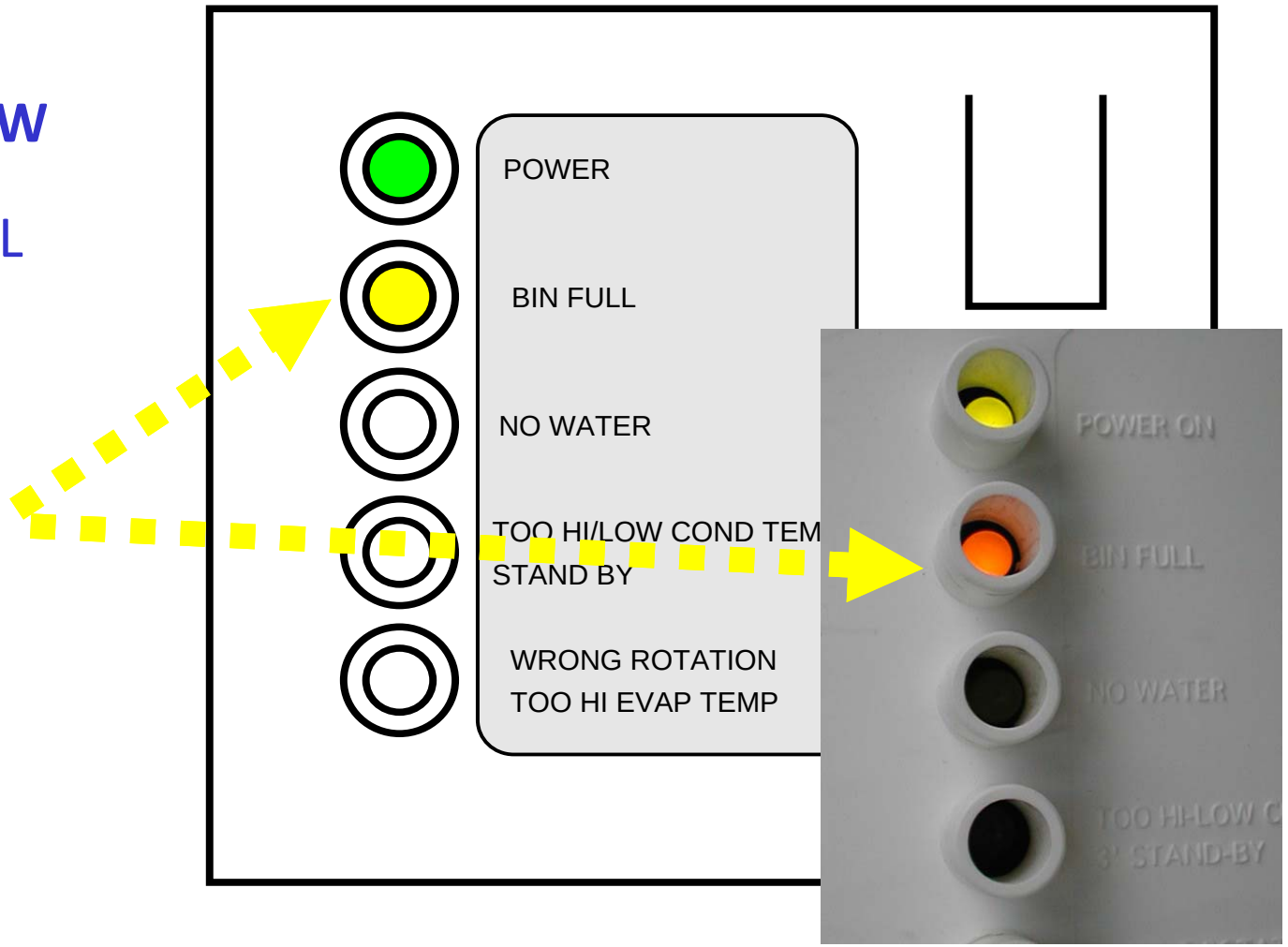
And the **YELLOW**

LED of BIN FULL

will blink FAST

for 10 seconds

.....



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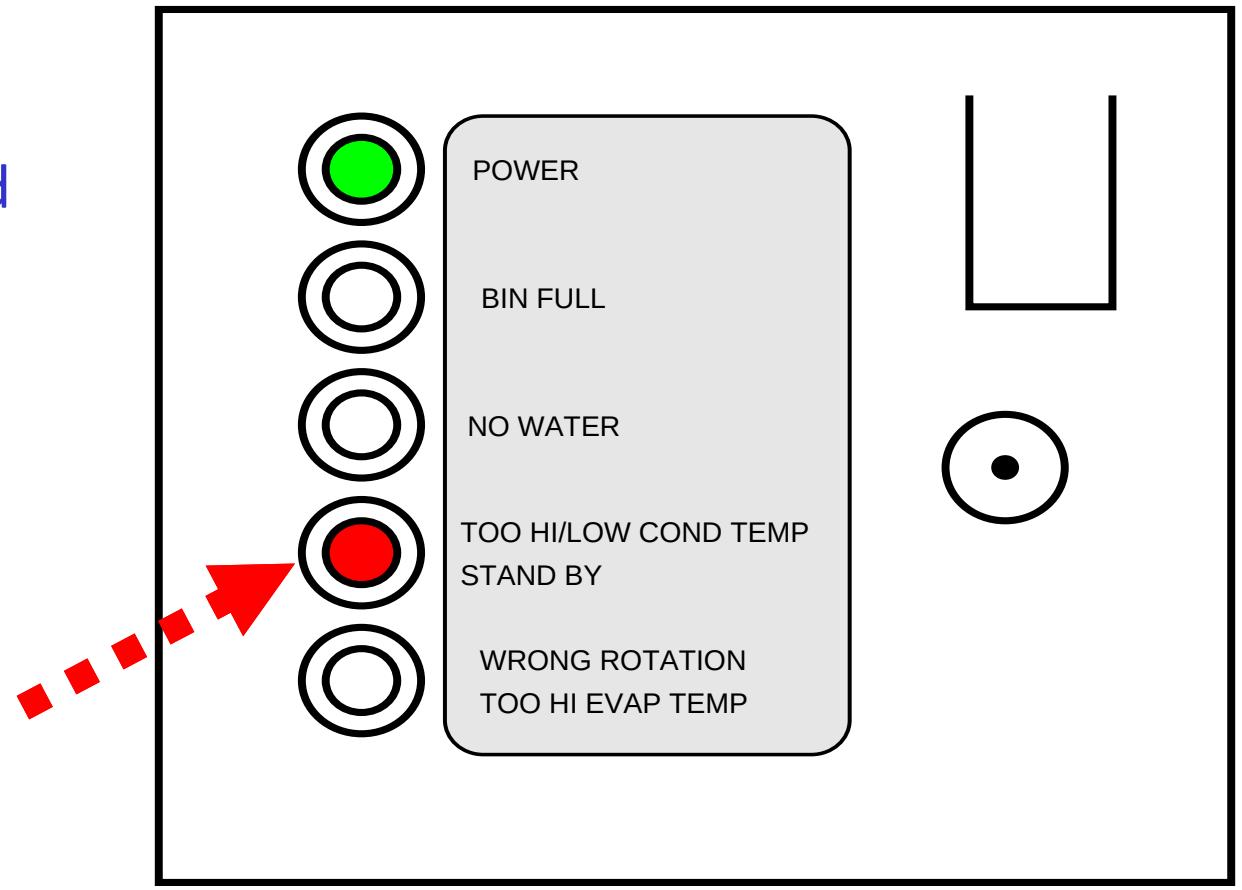
NEW MF..6 SERIES

START UP AND OPERATIONAL CHECKS

……few seconds later the YELLOW LED is extinguished and in the meantime the RED LED starts back blinking for the 3 minutes waiting time.



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NEW MF..6 SERIES

OPERATING PRINCIPLES and COMPONENTS

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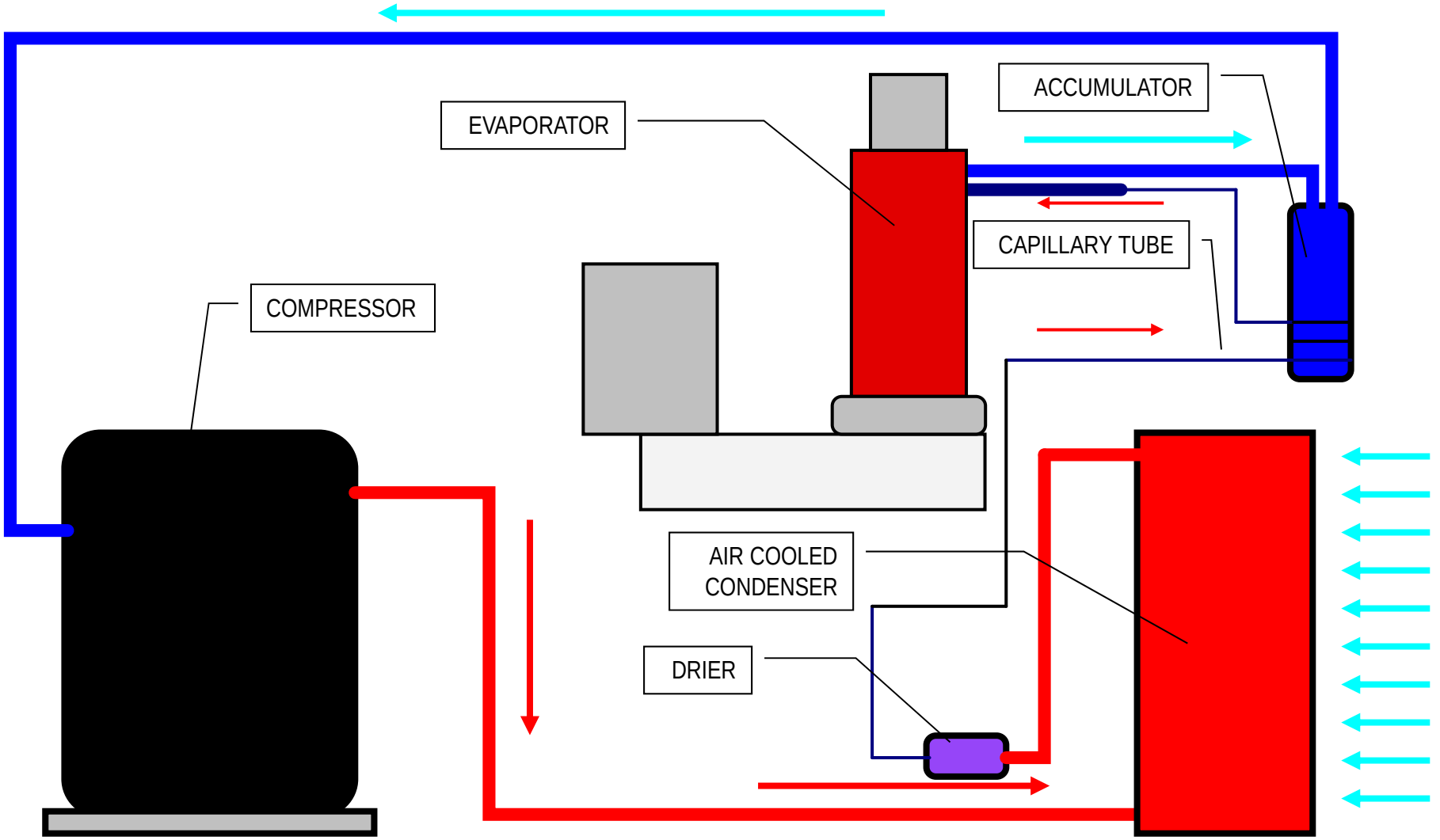
OPERATING PRINCIPLES – REFRIGERANT



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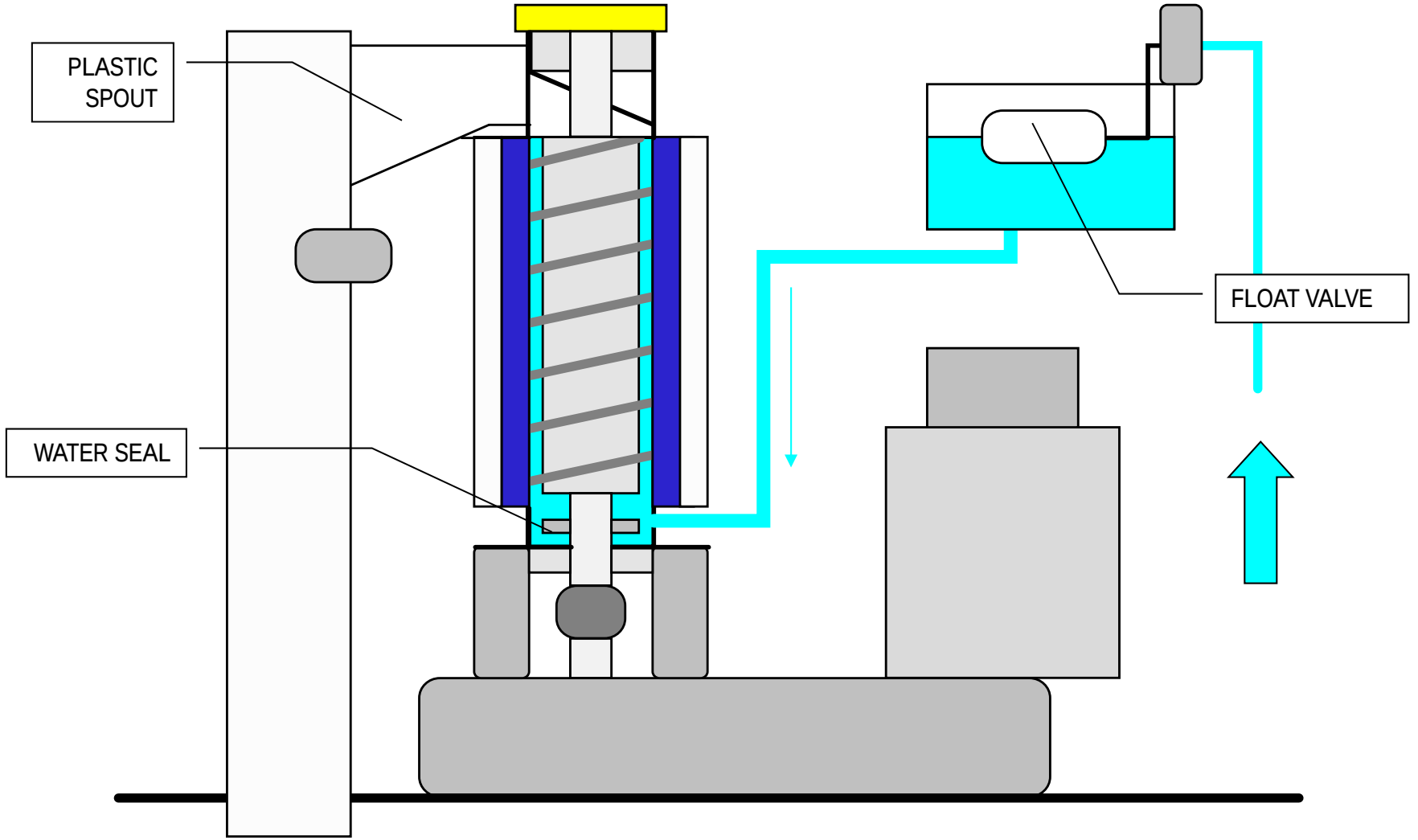
NEW MF..6 SERIES

OPERATING PRINCIPLES – WATER (MF 26-36 ONLY)



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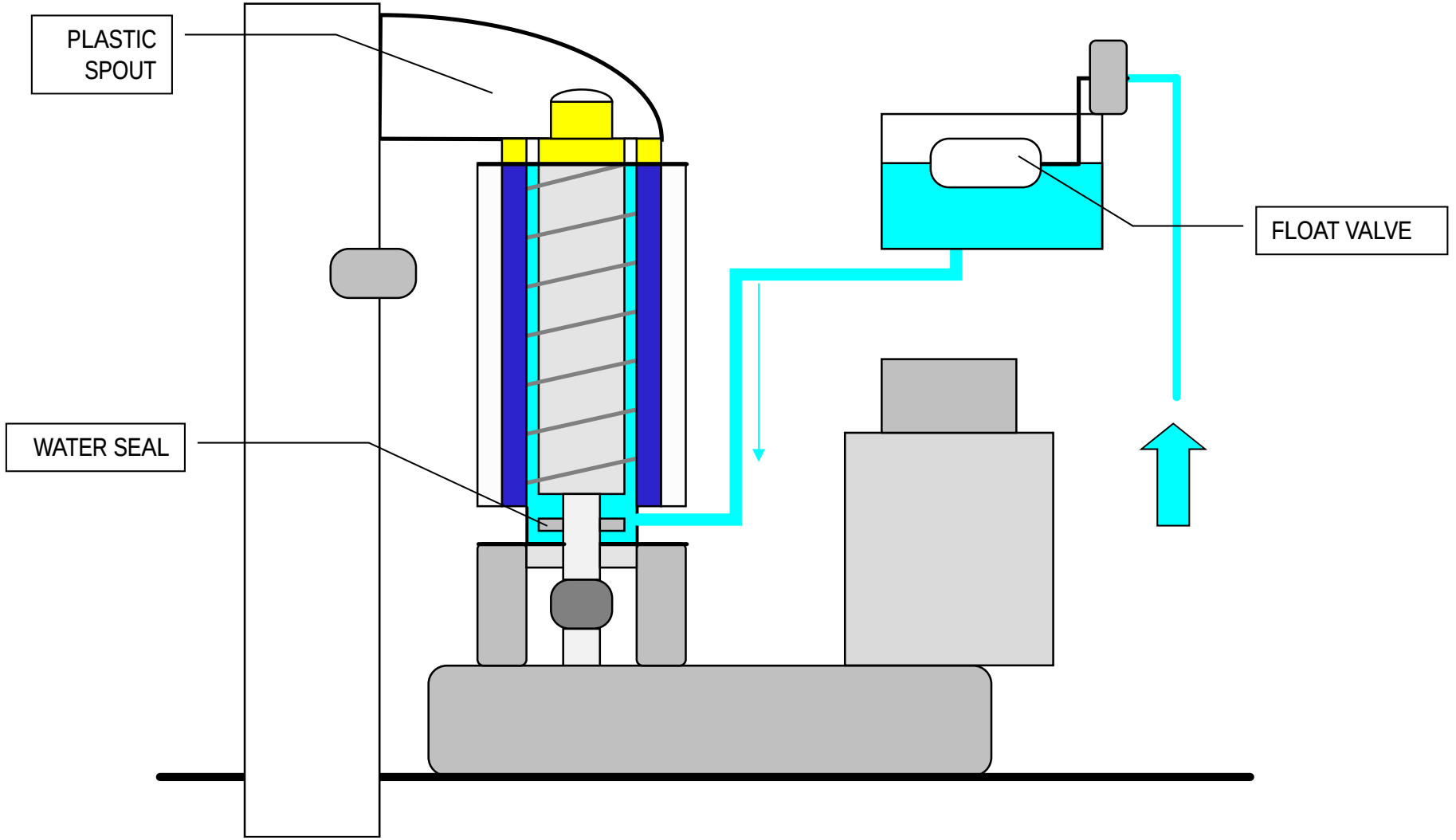
NEW MF..6 SERIES

OPERATING PRINCIPLES – WATER (MF 46-56-66 ONLY)



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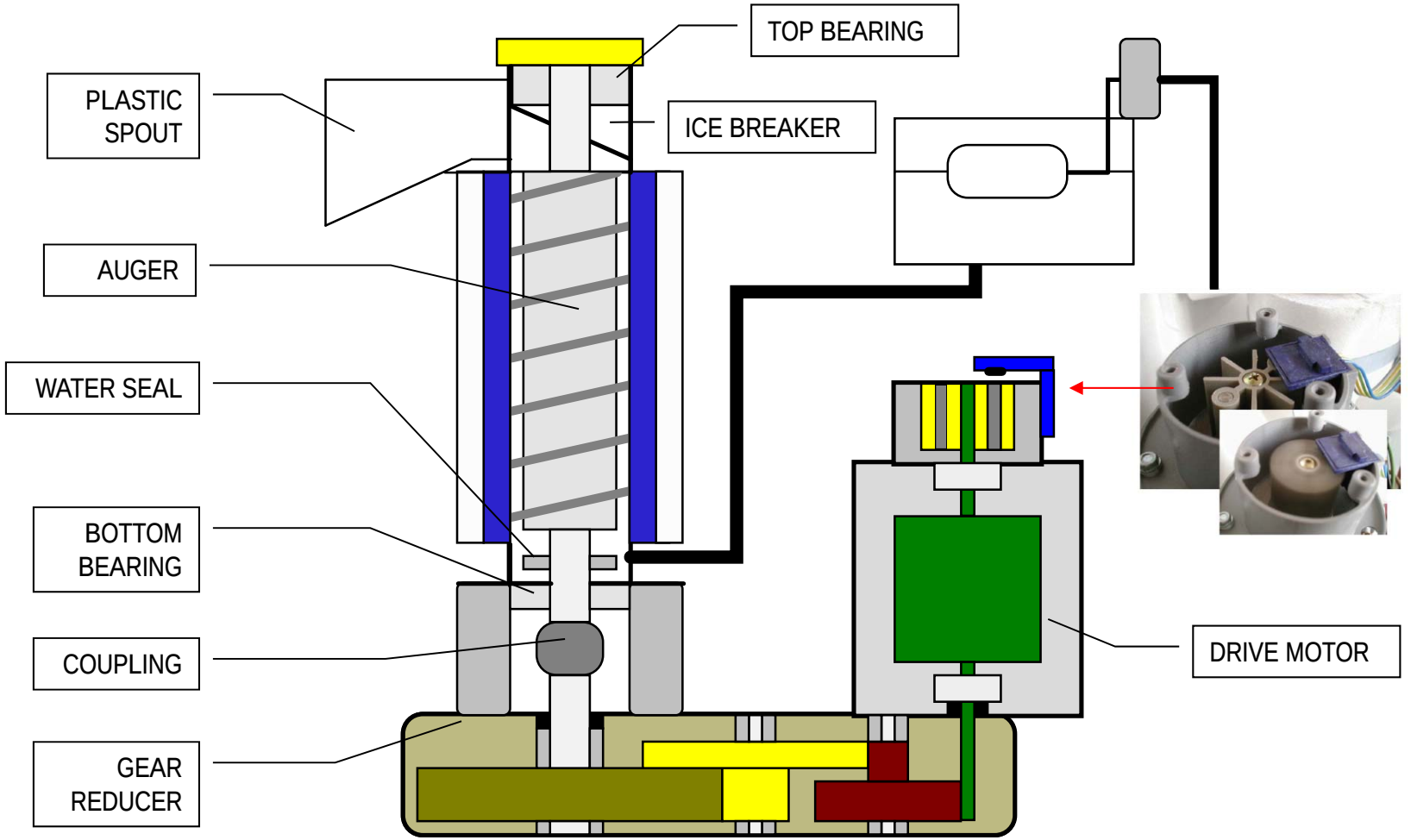
OPERATING PRINCIPLES – MECHANICAL



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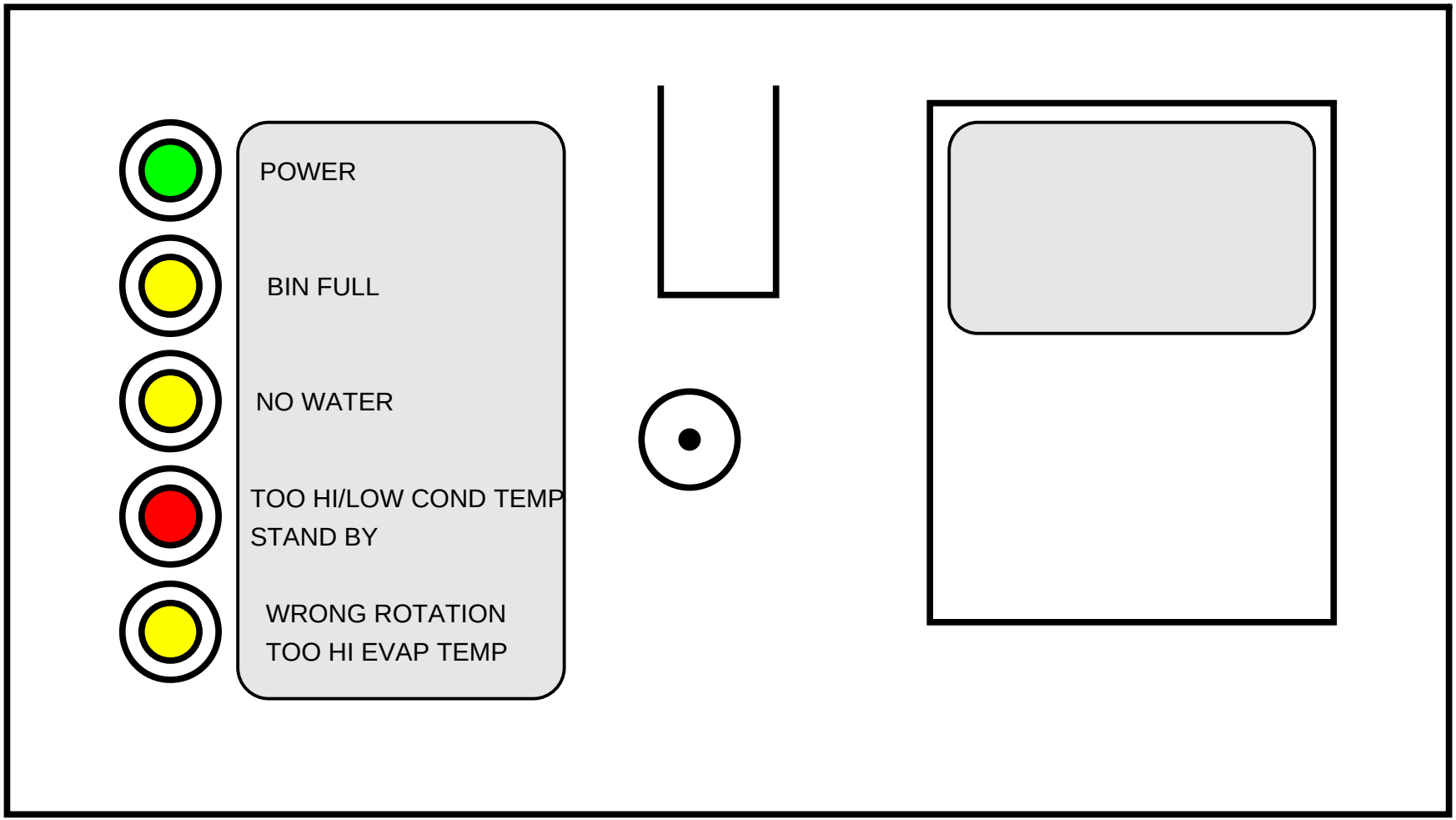
OPERATING PRINCIPLES – PC BOARD



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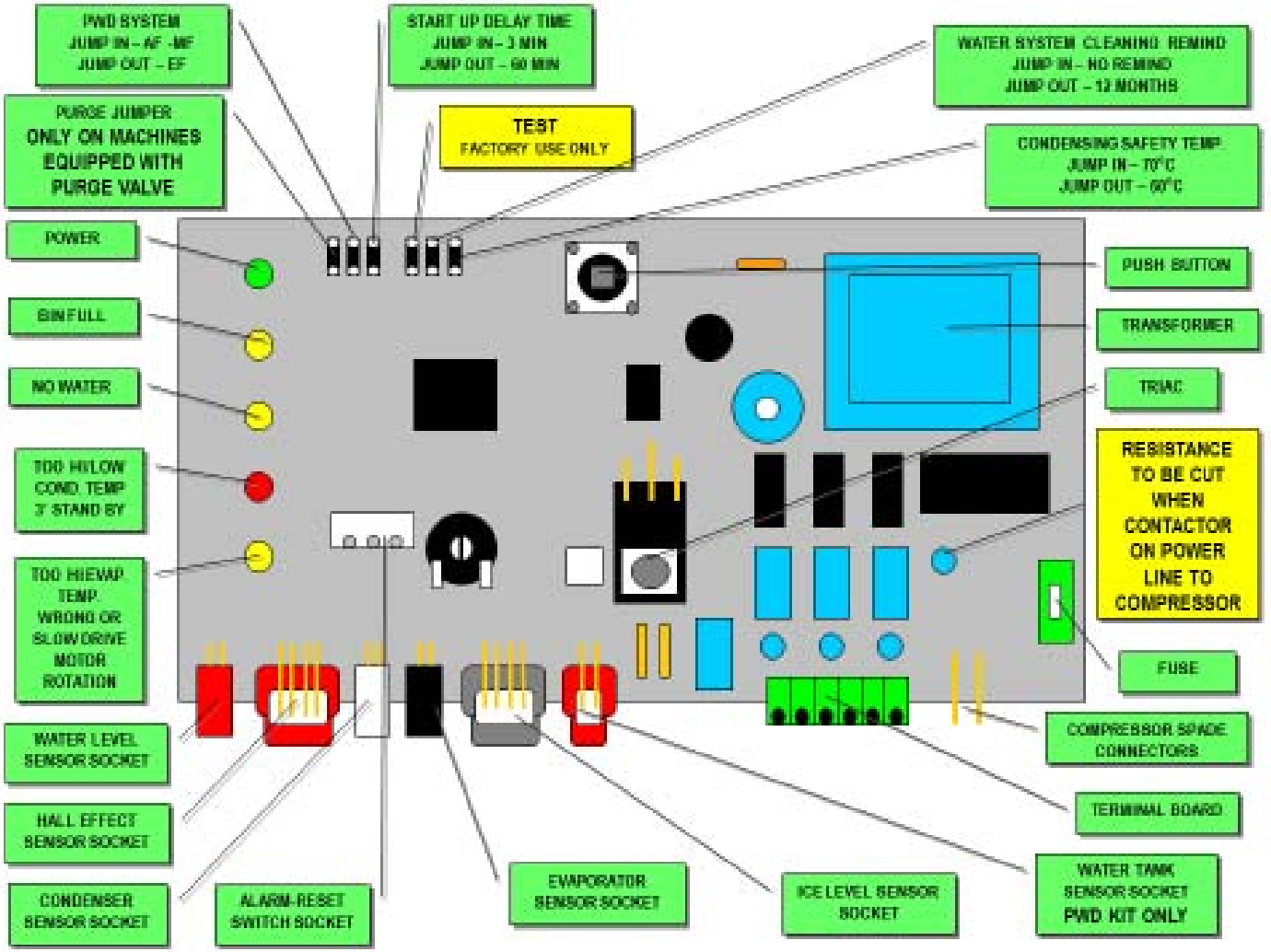
NEW MF..6 SERIES

OPERATING PRINCIPLES – PC BOARD



Scotsman® Ice Systems

NEW MF..6 SERIES

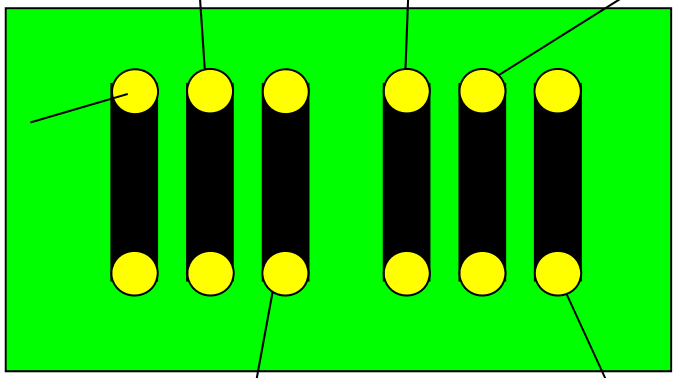
OPERATING PRINCIPLES – PC BOARD JUMPERS

AF/EF MODELS
JUMP IN = AF
JUMP OUT = EF

TEST FACTORY USE ONLY

WATER SYSTEM
CLEANING REMIND
JUMP IN = 0 MONTHS
JUMP OUT = 12 MONTHS

PURGE & WATER INLET VALVE
JUMP IN=NO WATER INLET & PURGE VALVES
JUMP OUT = WATER INLET & PURGE VALVE ON



START UP DELAY
JUMP IN = 3'
JUMP OUT = 60'

CONDENSER SAFETY TEMPERATURE
JUMP IN = 70°C
JUMP OUT = 60°C

Scotsman Ice Systems

NEW MF..6 SERIES

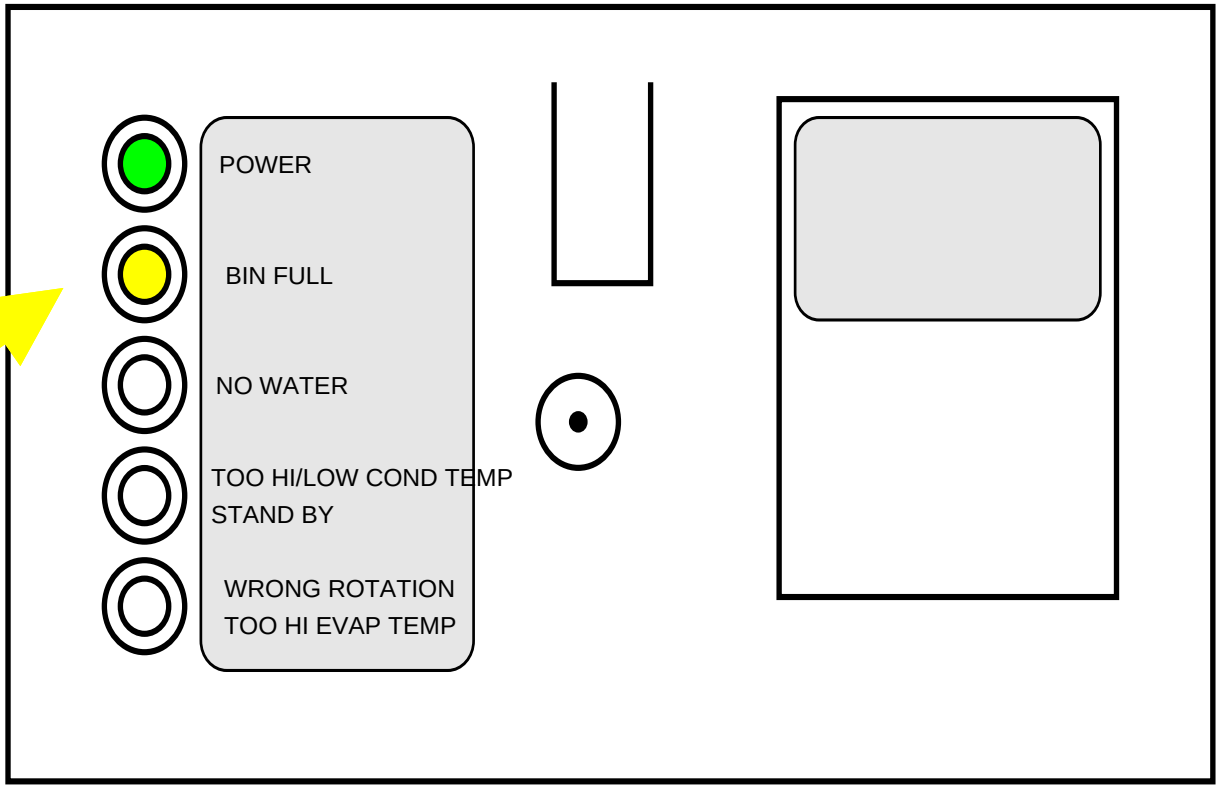
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

BIN FULL CONDITION:

Bin Full Yellow LED

ON STEADY



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NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

OPTICAL ICE LEVEL CONTROL

Scotsman Ice Systems

NEW MF..6 SERIES

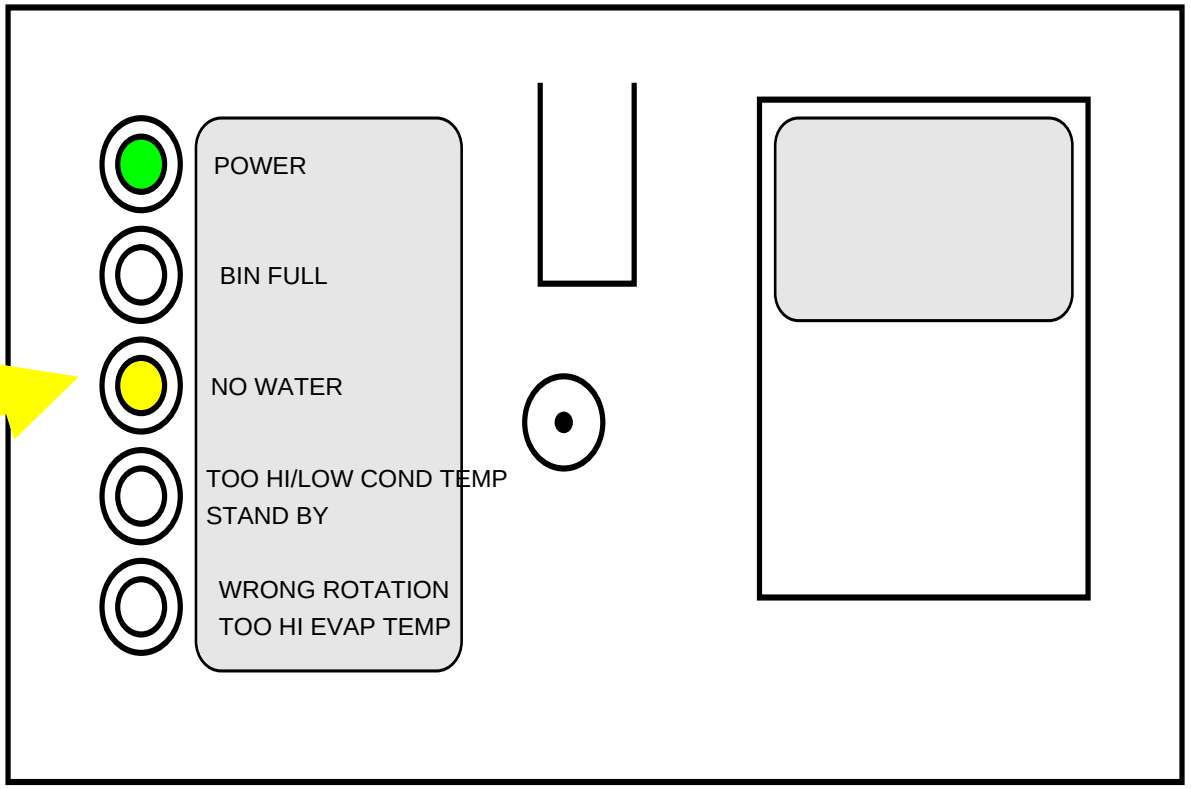
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

NO WATER ALARM:

No Water Yellow LED

ON STEADY



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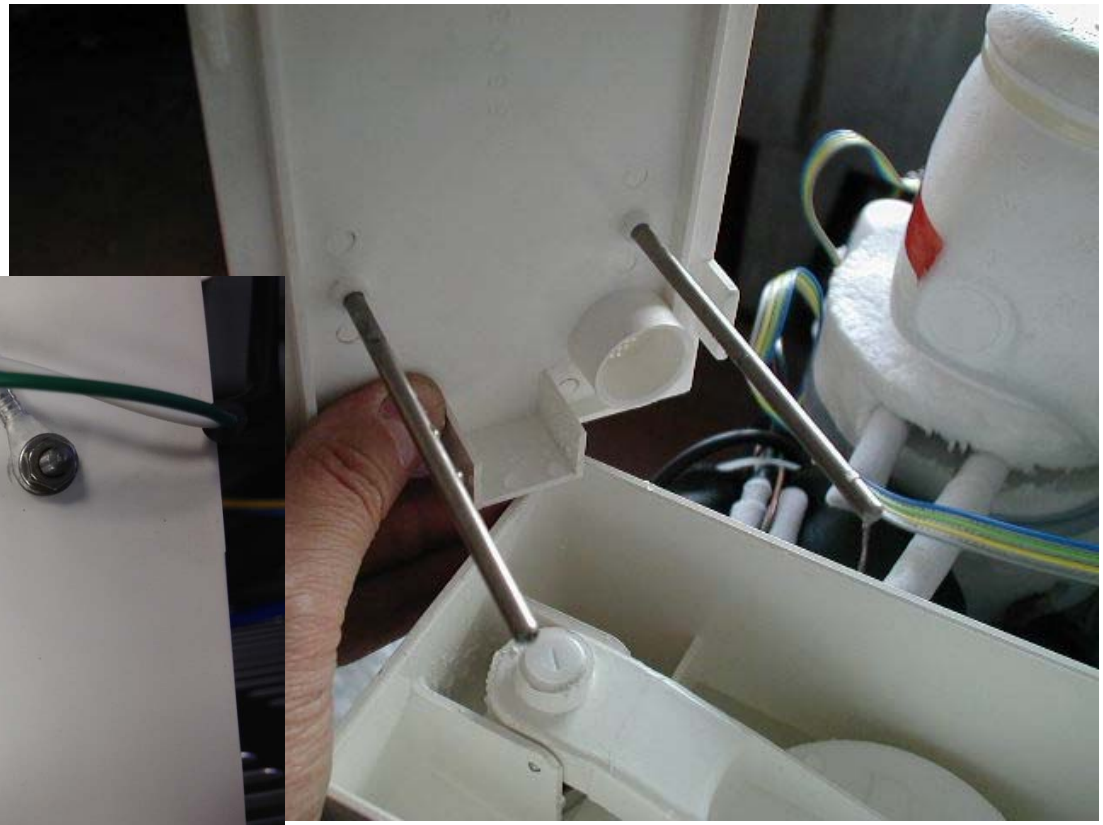
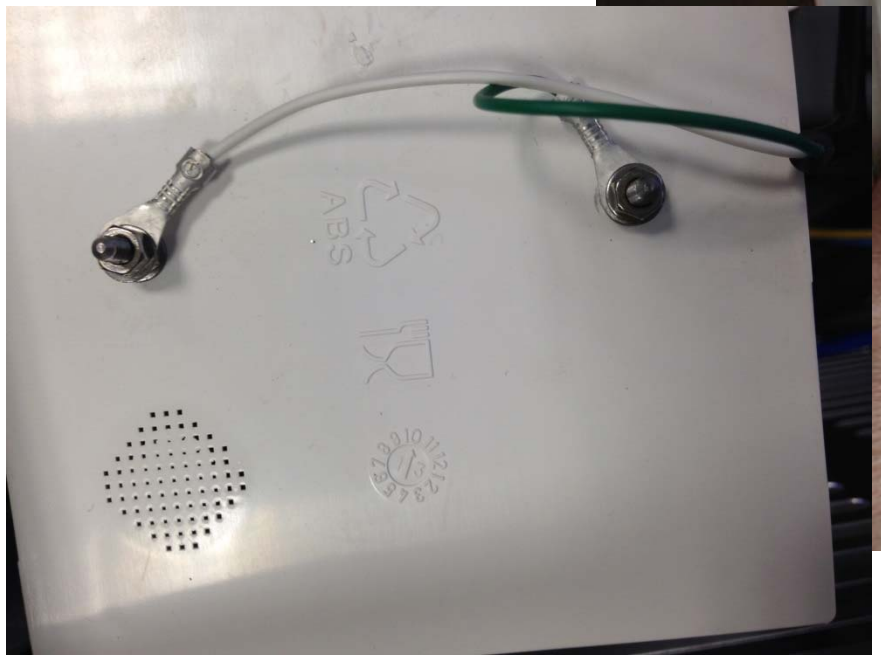
NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

WATER LEVEL SENSOR





Scotsman Ice Systems

NEW MF..6 SERIES

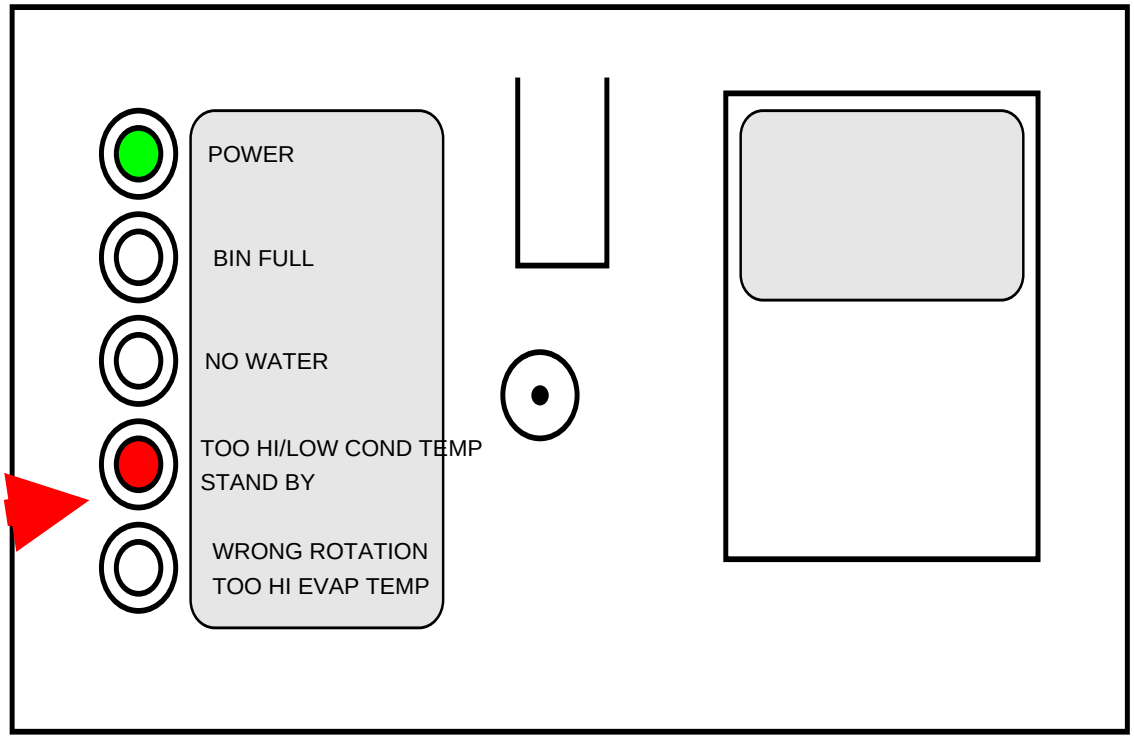
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

START UP DELAY TIME
3’ or 60’ (ONLY on MF 66)

Too Hi/Low Cond. Temp-
Stand-by RED LED

BLINKING



Scotsman Ice Systems

NEW MF..6 SERIES

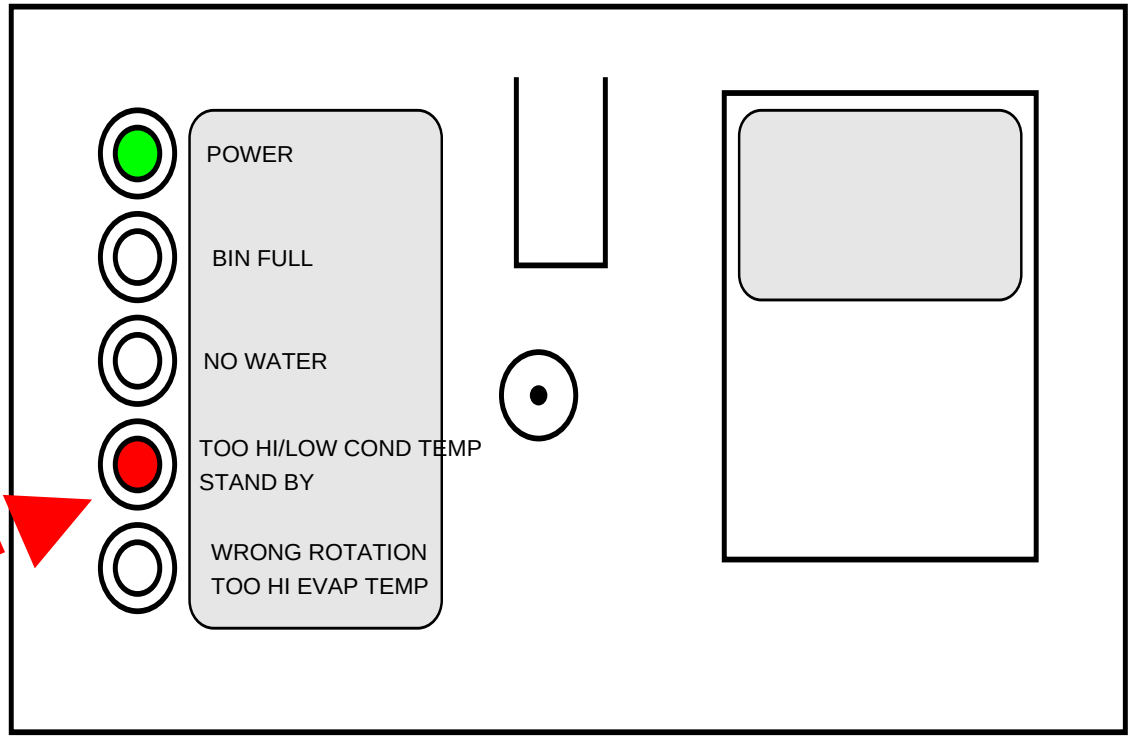
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

TOO LOW AMBIENT TEMPERATURE (<+3ºC)

Too Hi/Low Cond. Temp- Stand-by RED LED

BLINKS THREE TIMES AND REPEAT

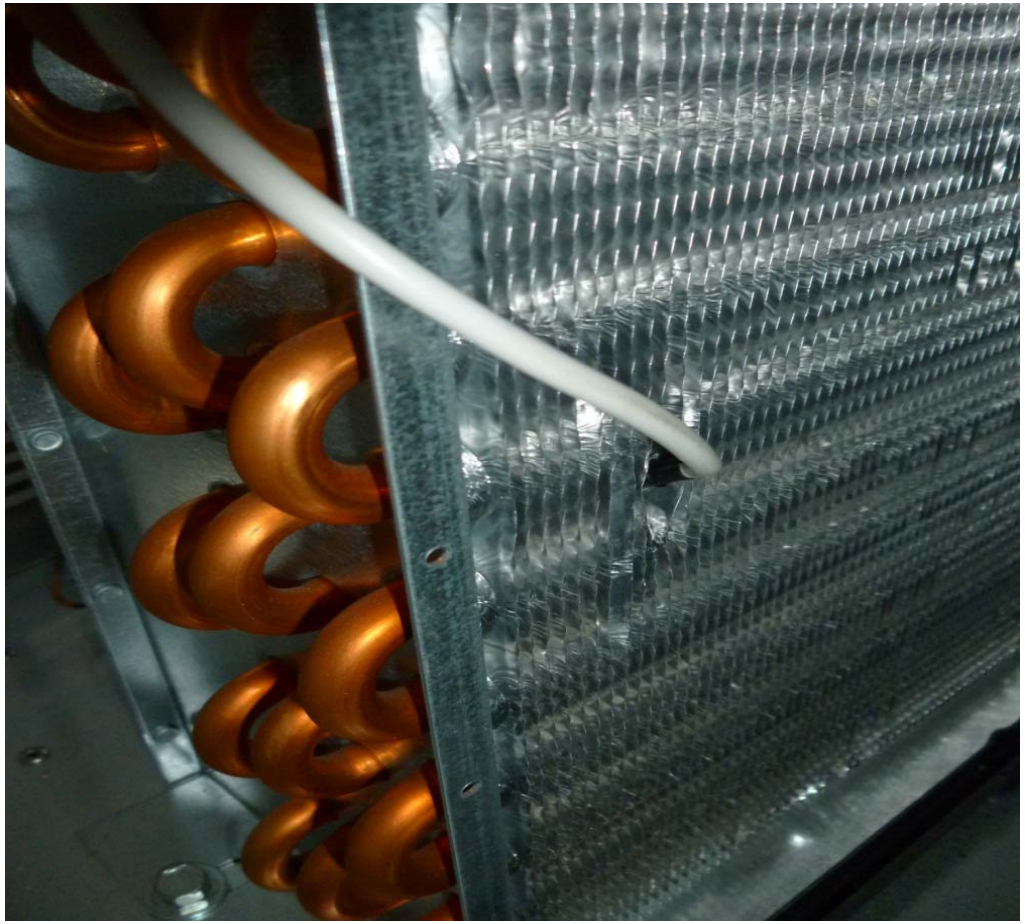


Scotsman®
Ice Systems

NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

CONDENSER
SENSOR



Scotsman Ice Systems

NEW MF..6 SERIES

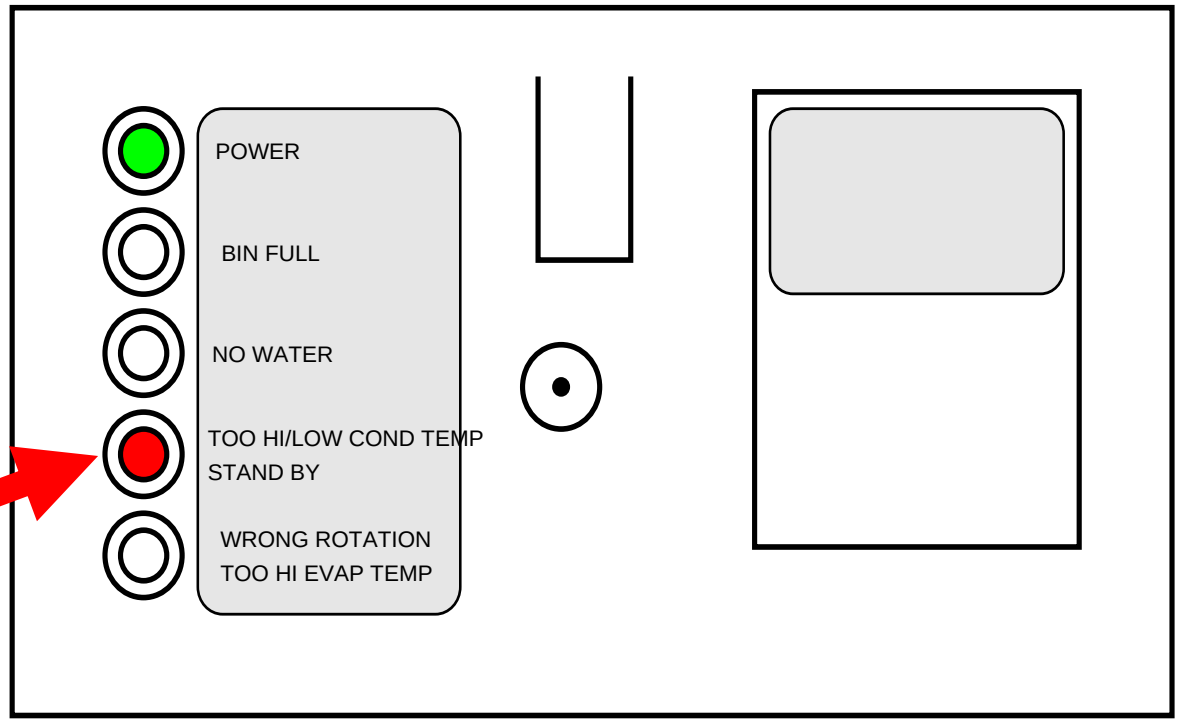
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

TOO HI CONDENSING TEMPERATURE (>60ºC or >70ºC)

Too Hi/Low Cond. Temp- Stand-by RED LED

ON STEADY

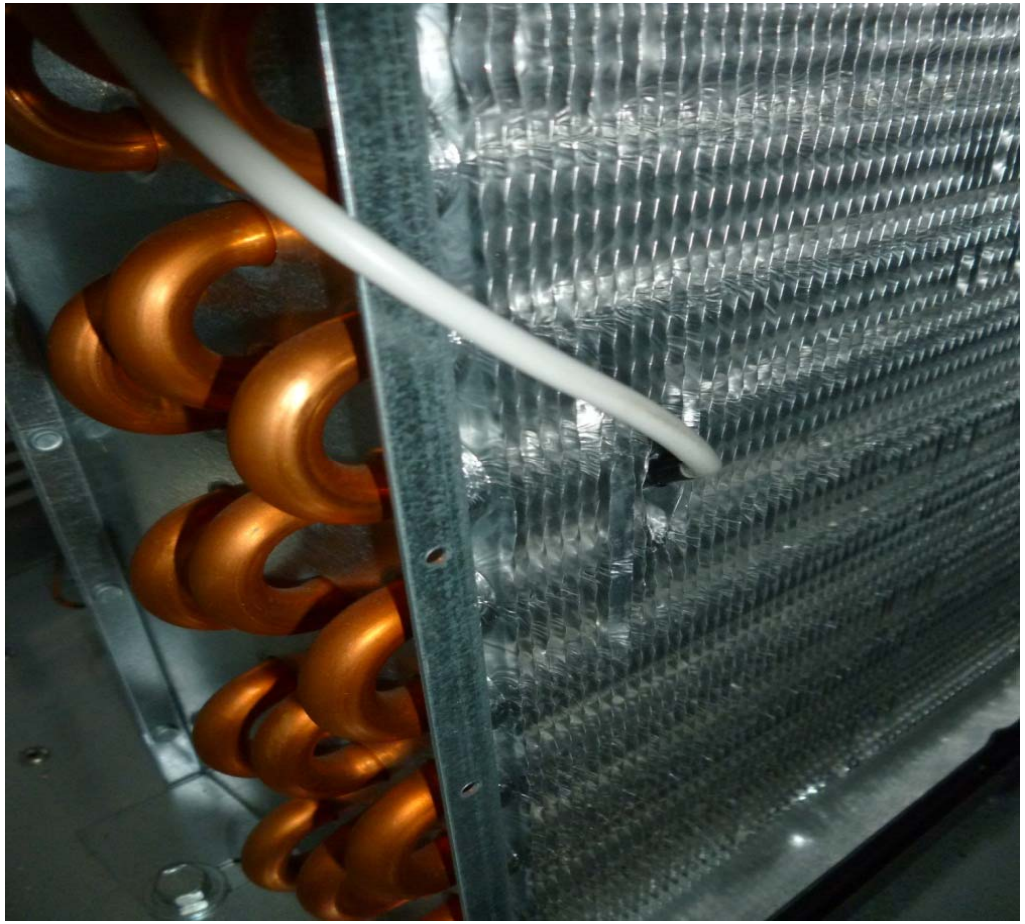


Scotsman®
Ice Systems

NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

CONDENSER
SENSOR



Scotsman Ice Systems

NEW MF..6 SERIES

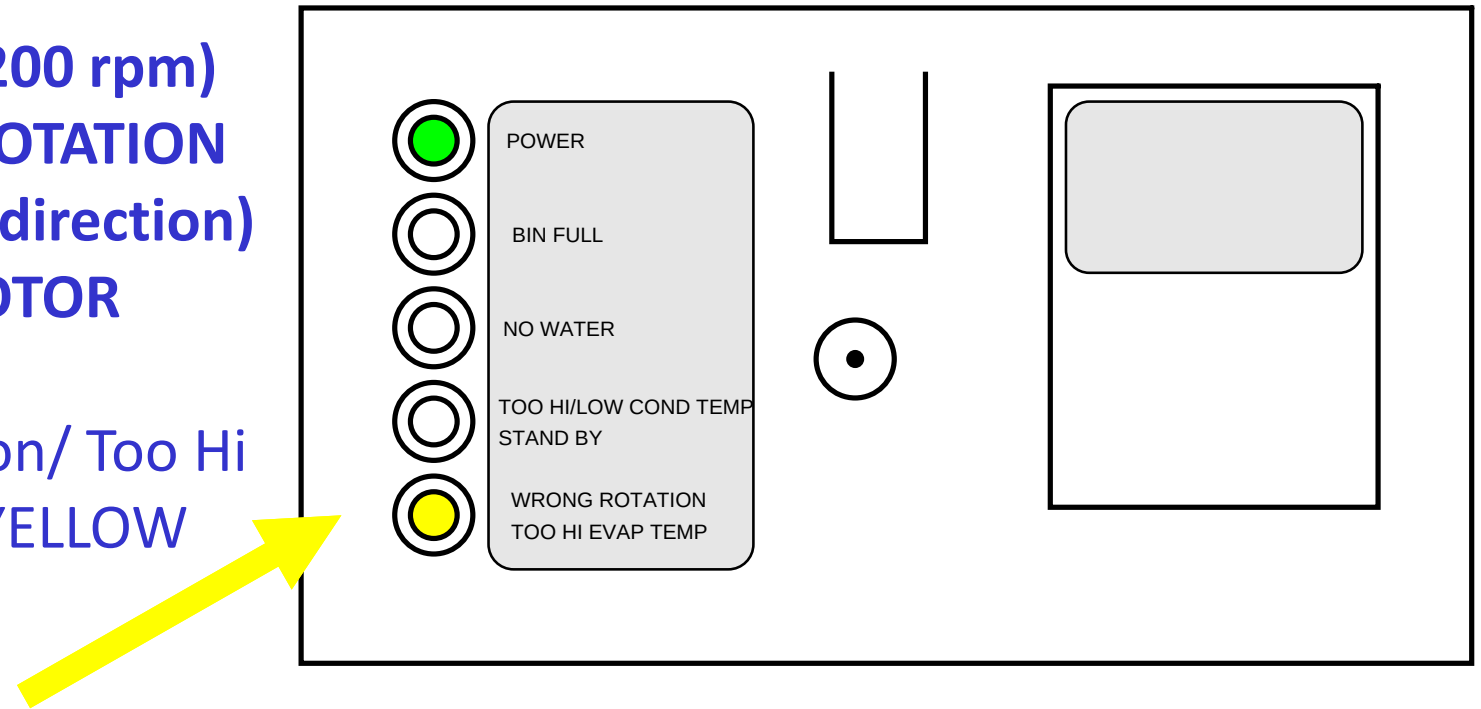
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

- **NO**
- **SLOW (<1200 rpm)**
- **WRONG ROTATION (Opposite direction)**

OF DRIVE MOTOR

Wrong rotation/ Too Hi Evap. Temp. YELLOW LED



ON STEADY

Scotsman Ice Systems

NEW MF..6 SERIES

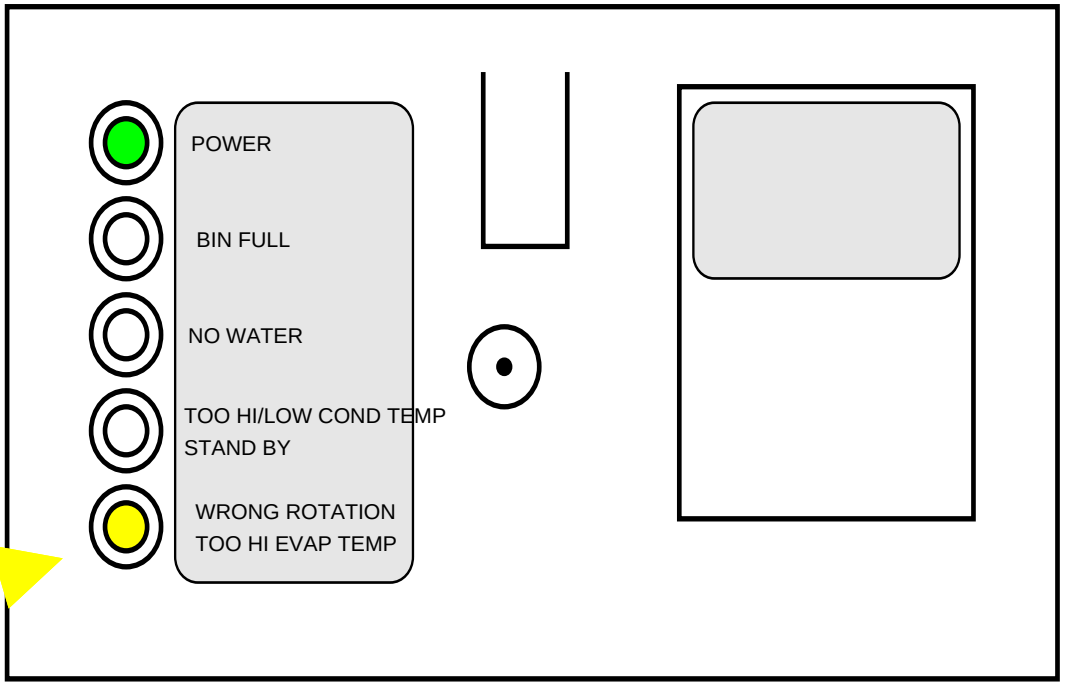
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

TOO HI EVAPORATOR TEMPERATURE

Wrong rotation/ Too Hi Evap. Temp. YELLOW LED

SLOW BLINKS AFTER 10' OF OPERATION



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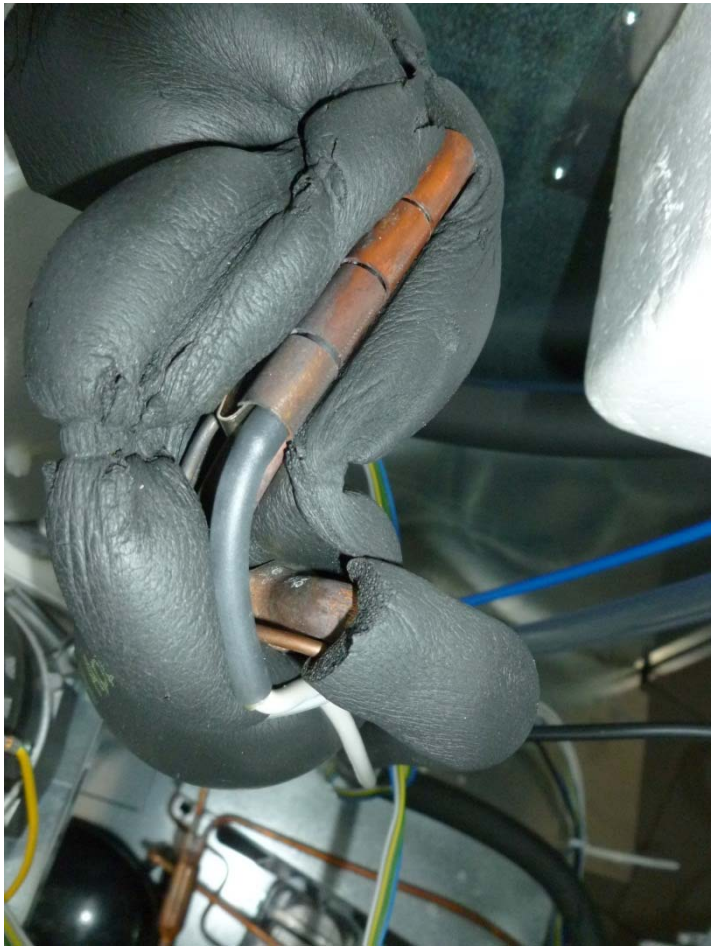
NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

EVAPORATOR
SENSOR



Scotsman Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

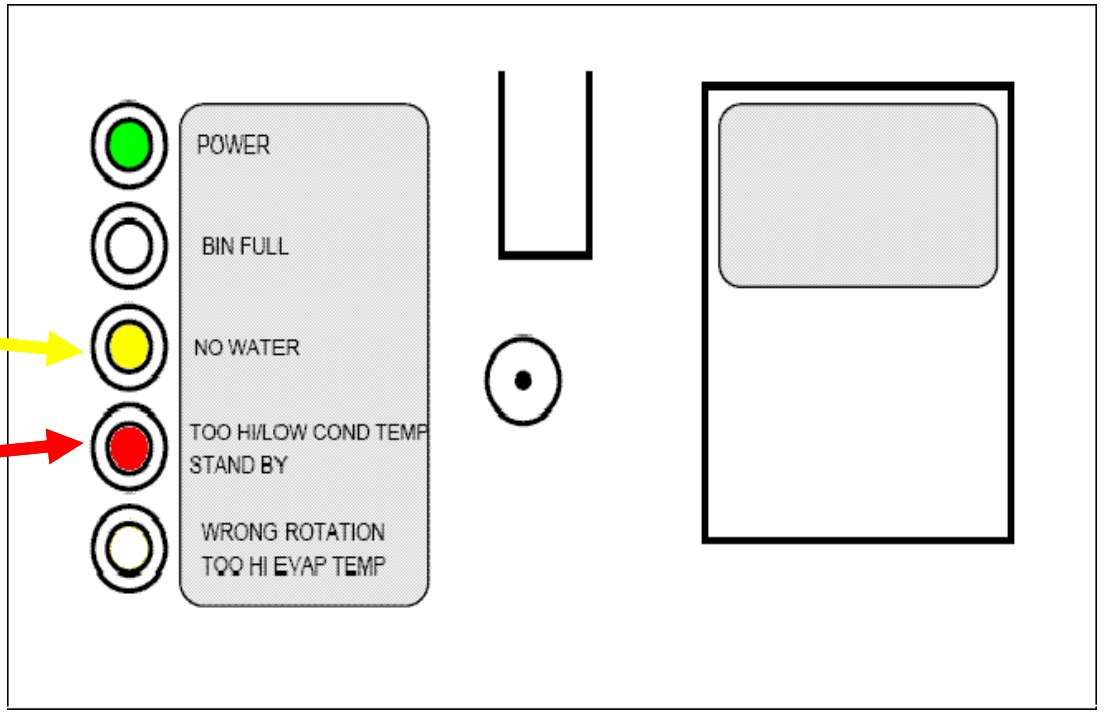
CONDENSER SENSOR OUT OF ORDER

No Water YELLOW LED

+

Stand-by Red LED

BOTH ON STEADY



Scotsman Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

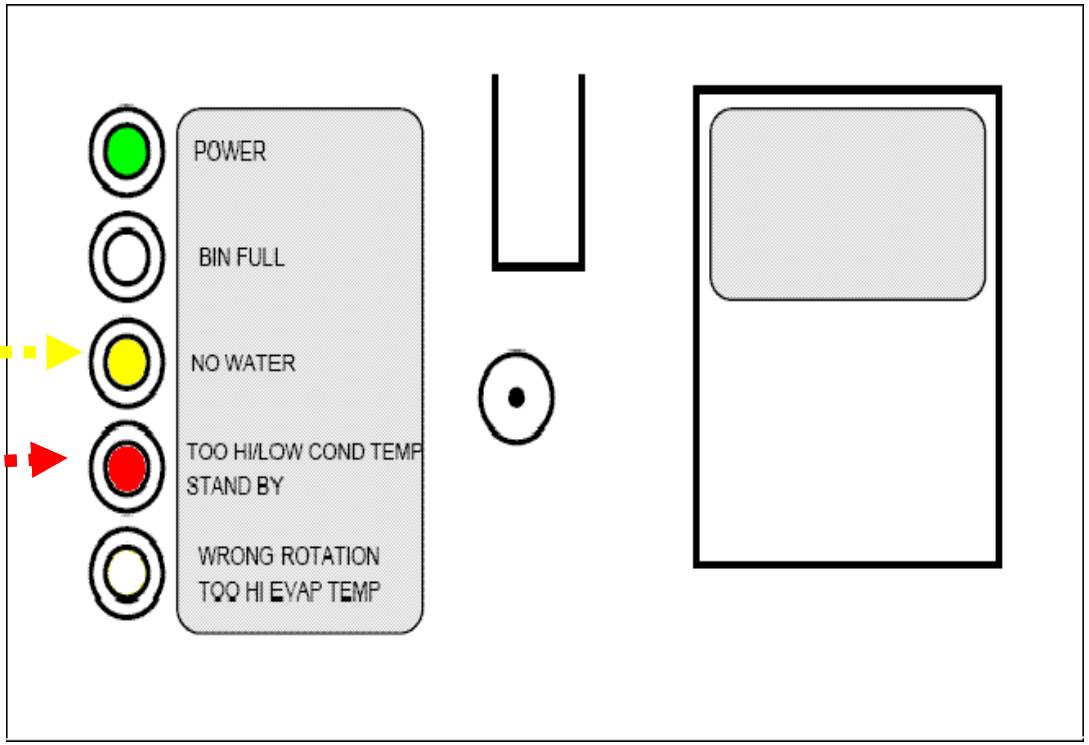
EVAPORATOR SENSOR OUT OF ORDER

No Water YELLOW LED

+

Stand-by Red LED

BOTH BLINKING



Scotsman Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

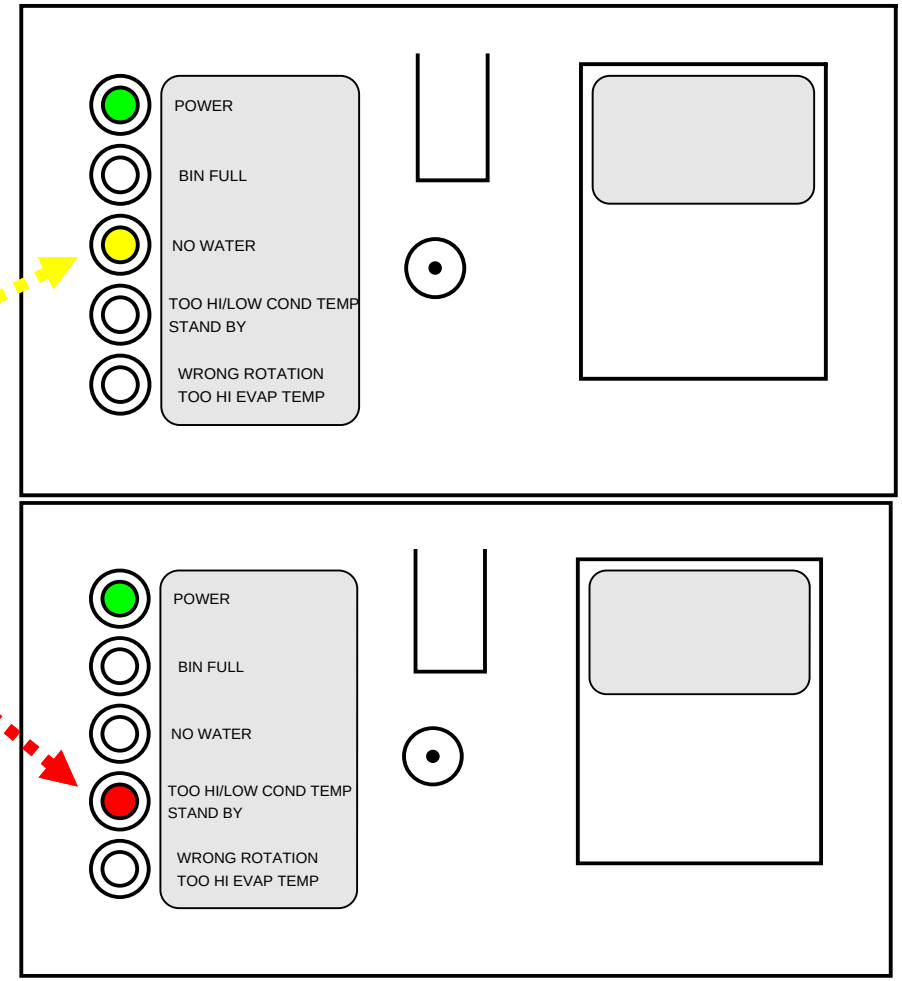
ICE LEVEL CONTROL OUT OF ORDER

No Water YELLOW LED

+

Stand-by Red LED

BLINKING ALTERNATE



Scotsman Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

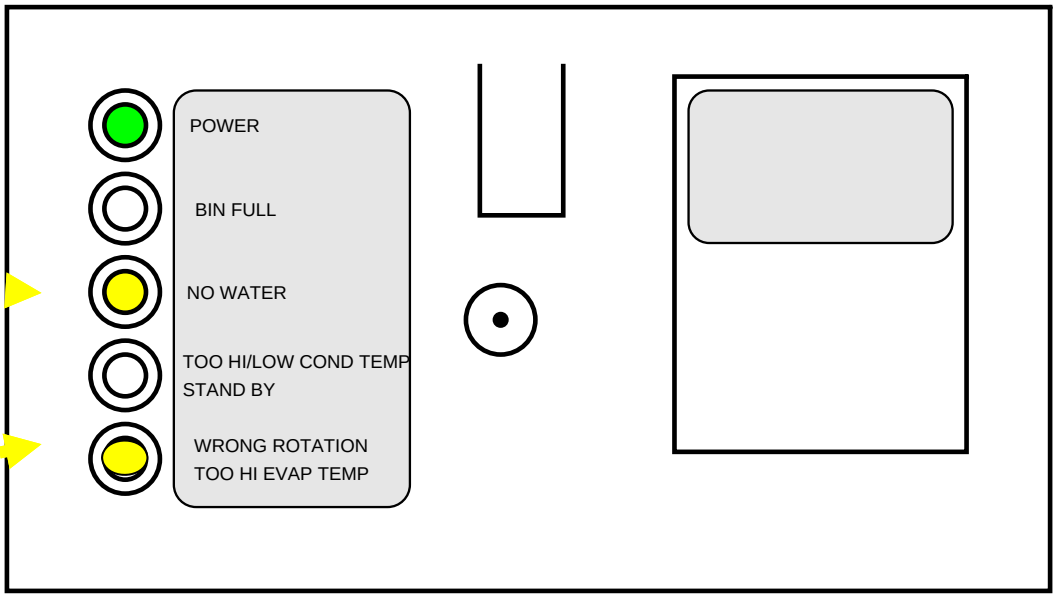
WATER CIRCUIT CLEANING REMIND (6 or 12 months)

No Water YELLOW LED

+

Wrong Rotation YELLOW LED

BOTH BLINKING



NEW MF..6 SERIES

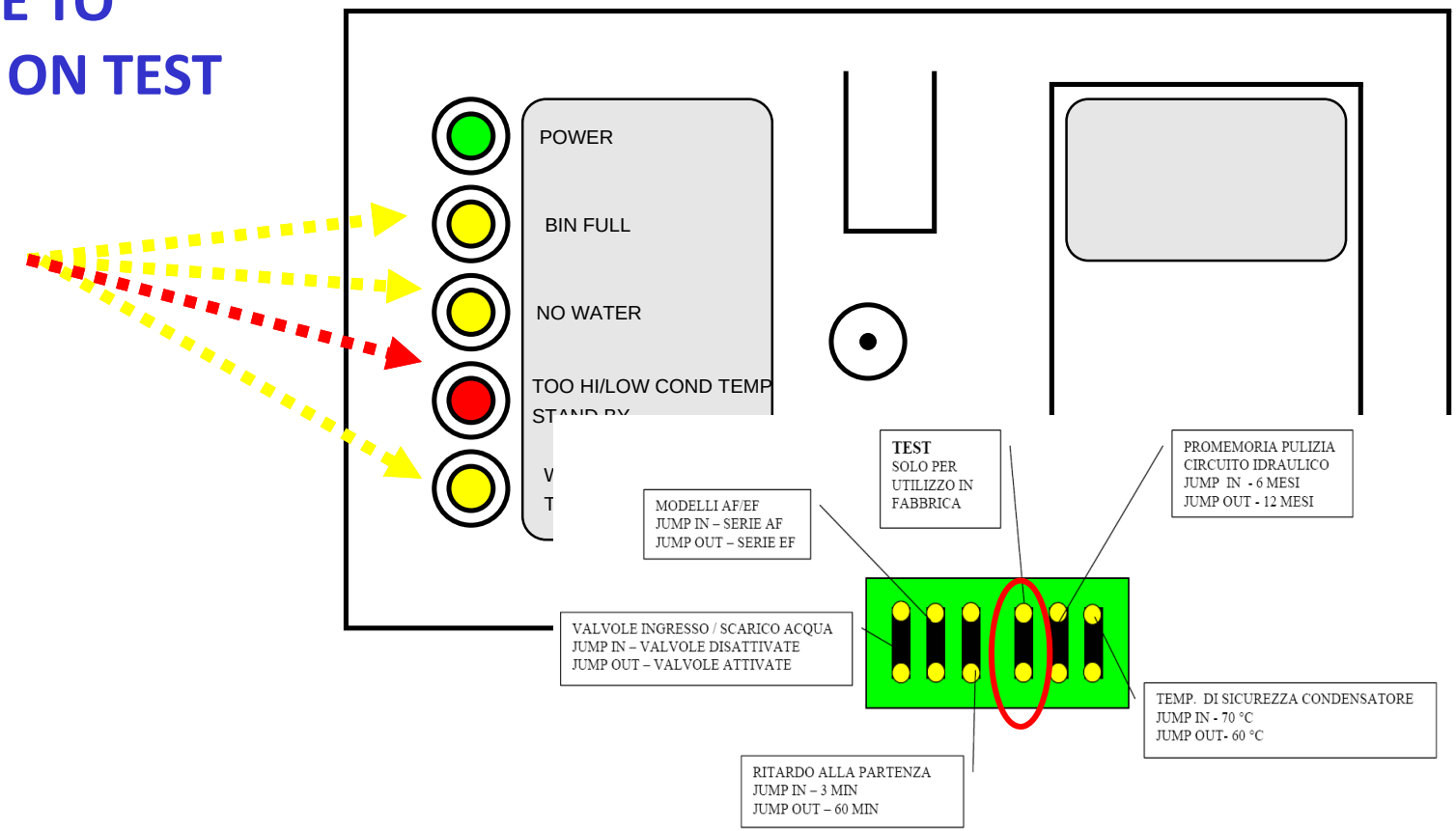
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

UNIT OFF DUE TO JUMPERS IN ON TEST CONTACTS

ALL LEDs

BLINKING



NEW MF..6 SERIES

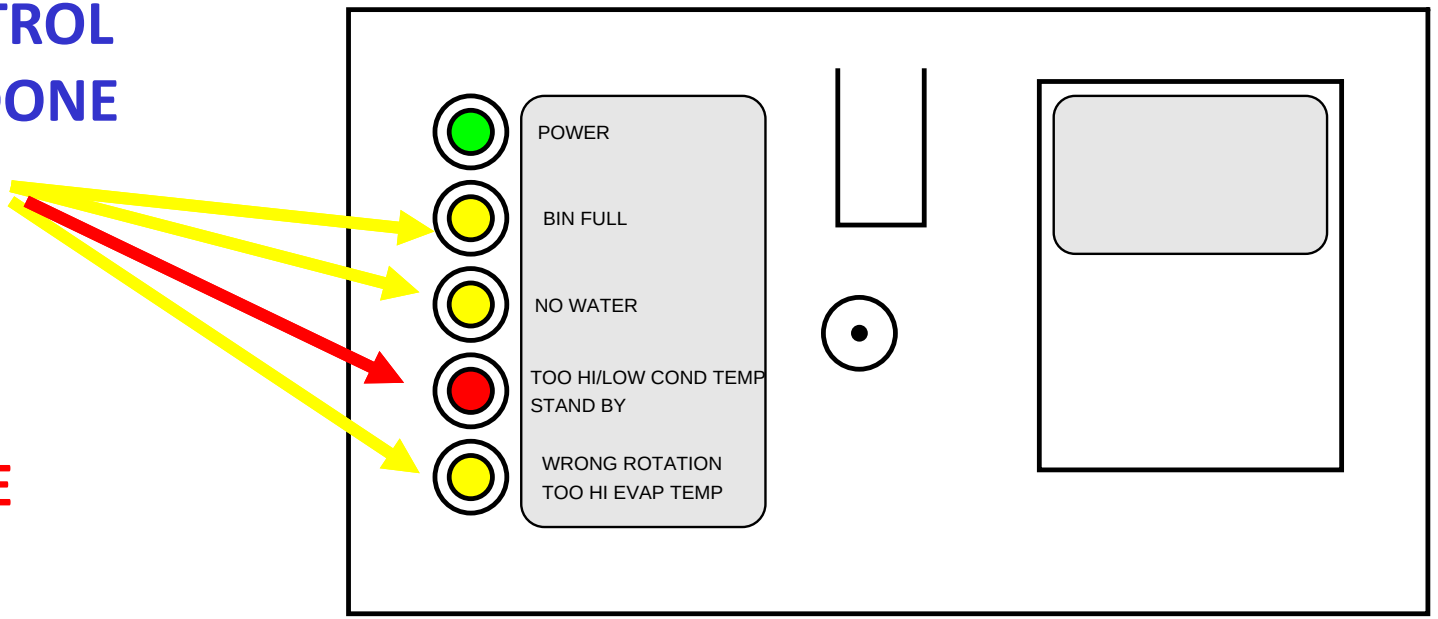
OPERATING PRINCIPLES – PC BOARD

ALARM CONDITION and LED MEANINGS

ICE LEVEL CONTROL CALIBRATION DONE

ALL LEDs

BLINKING ONCE



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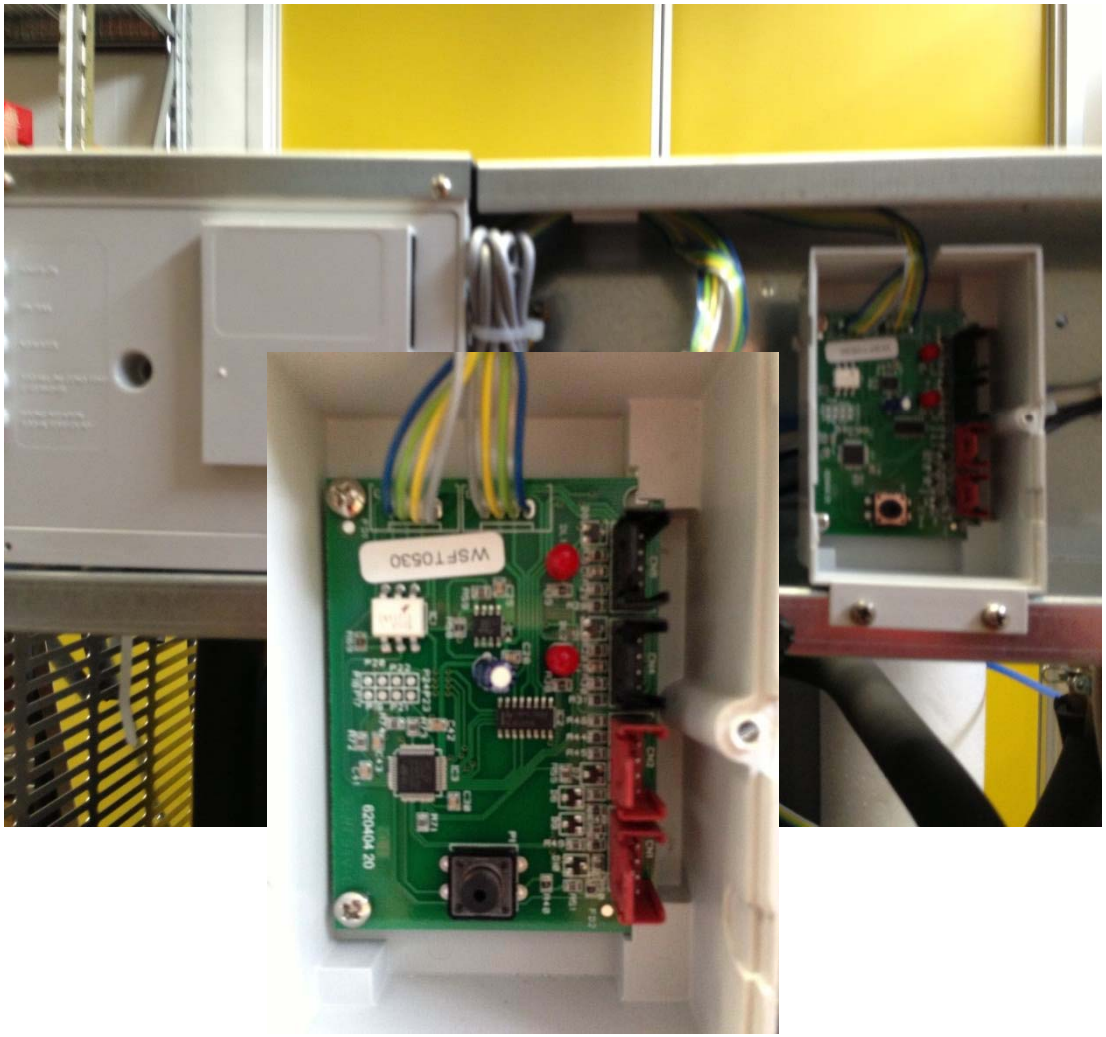
Ice Systems

NEW MF..6 SERIES

COMPONENTS-ELECTRONIC CONTROLS

INTERFACE PC BOARD

(MF 66 ONLY)



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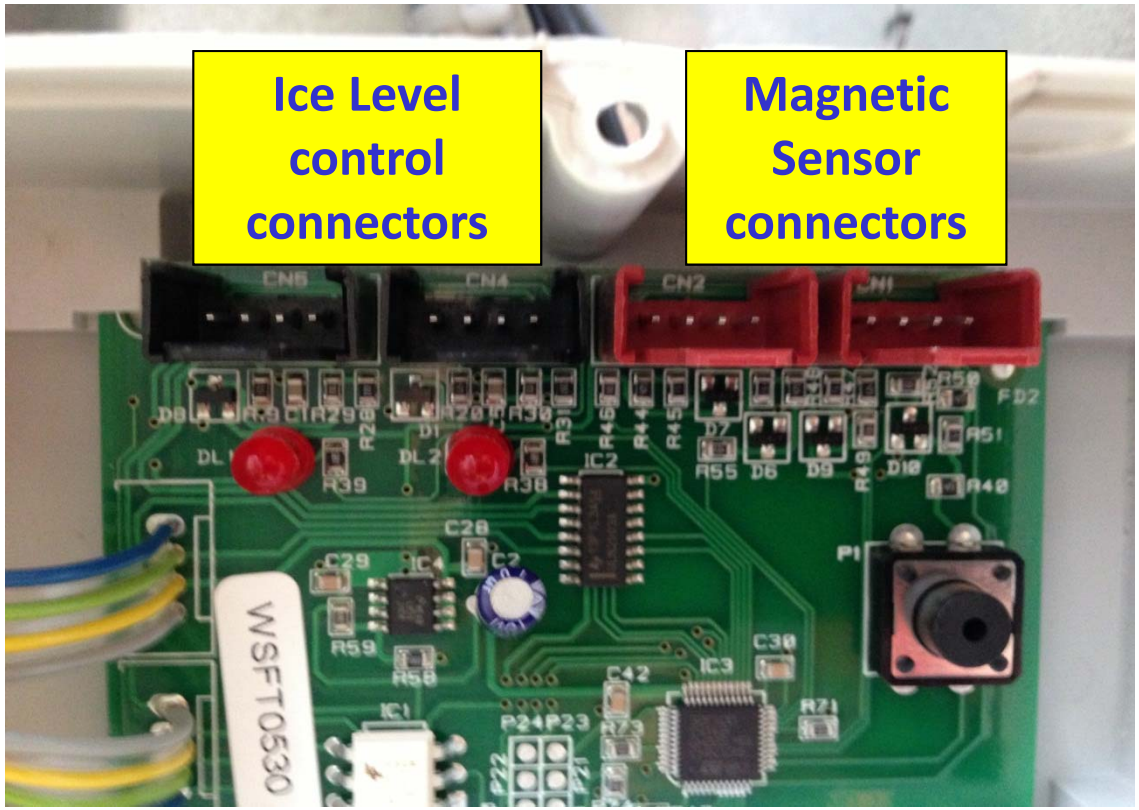
NEW MF..6 SERIES

OPERATING PRINCIPLES – INTERFACE PC BOARD

(MF 66 ONLY)

The model MF 66 is equipped with a second PC Board connected to the Main One by means of two cable connectors



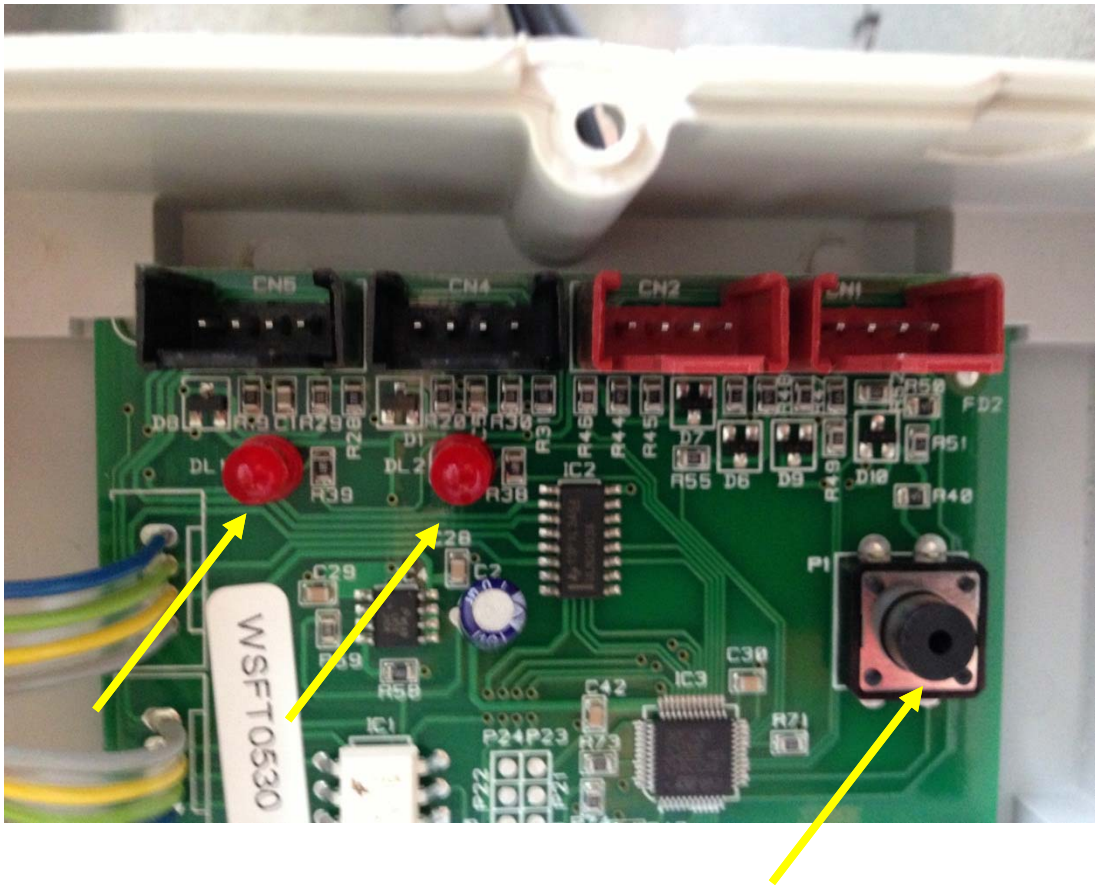
Scotsman Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – INTERFACE PC BOARD

(MF 66 ONLY)

The Interface PCB is equipped with one Push Button for IR Calibration and two Red LED (one for each Optical Ice Level Control)



Scotsman®
Ice Systems

NEW MF..6 SERIES

OPERATING PRINCIPLES – INTERFACE PC BOARD

It is **imperative** that both PC Boards used on model MF 66 must be of the **same manufacturer** (SYEN or Pro.El.Ind.).

If not the Main PC Board will keep the machine OFF all the time at Storage Bin Full - Yellow LED ON - without any ice into the storage bin.


Scotsman
Ice Systems
END FIRST
HALF