Epta		COQ

EIS 165.3 N/P KW Service Manual (short version)

EIS 165.3 N/P KW

Service Manual

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1. AMOUNT OF REFRIGERANT IN THE EQUIPMENT

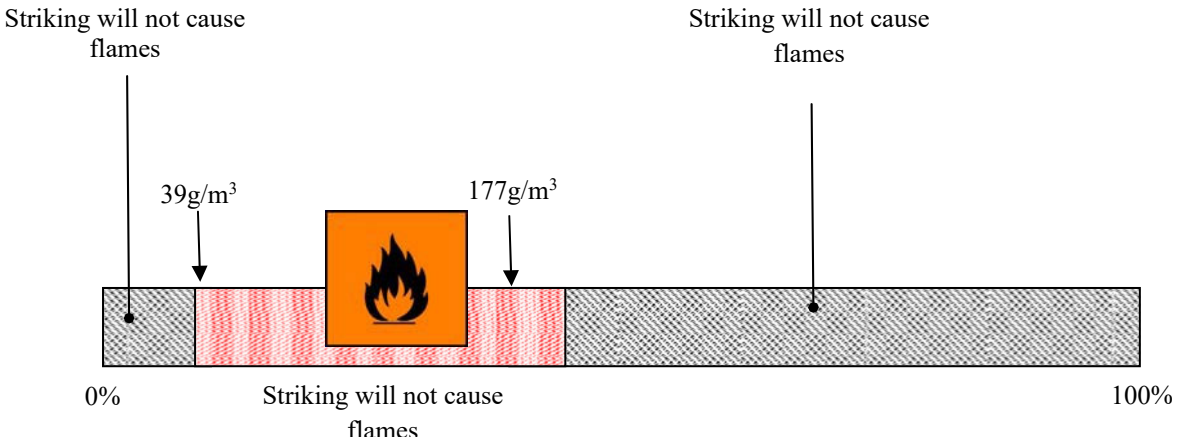
The most prominent feature of the EIS 165.3 N/P KW versions is that they use a natural gas: propane (R290).

MODEL	AMOUNT OF PROPANE* [grams]	
EIS 165.3 N/P KW	270	

(*) The propane refrigerant R290 to be used must be technical-gas rated, with purity grade above 99,5%.

PROPANE IS HEAVIER THAN AIR, WHICH MEANS THAT IT WILL TEND TO CONCENTRATE NEAR THE FLOOR OF THE ROOM.

The flammability limit percentage (in a volume of air) is between 2,2% and 9,2% (at 25°C and 1bar).
In mass terms:

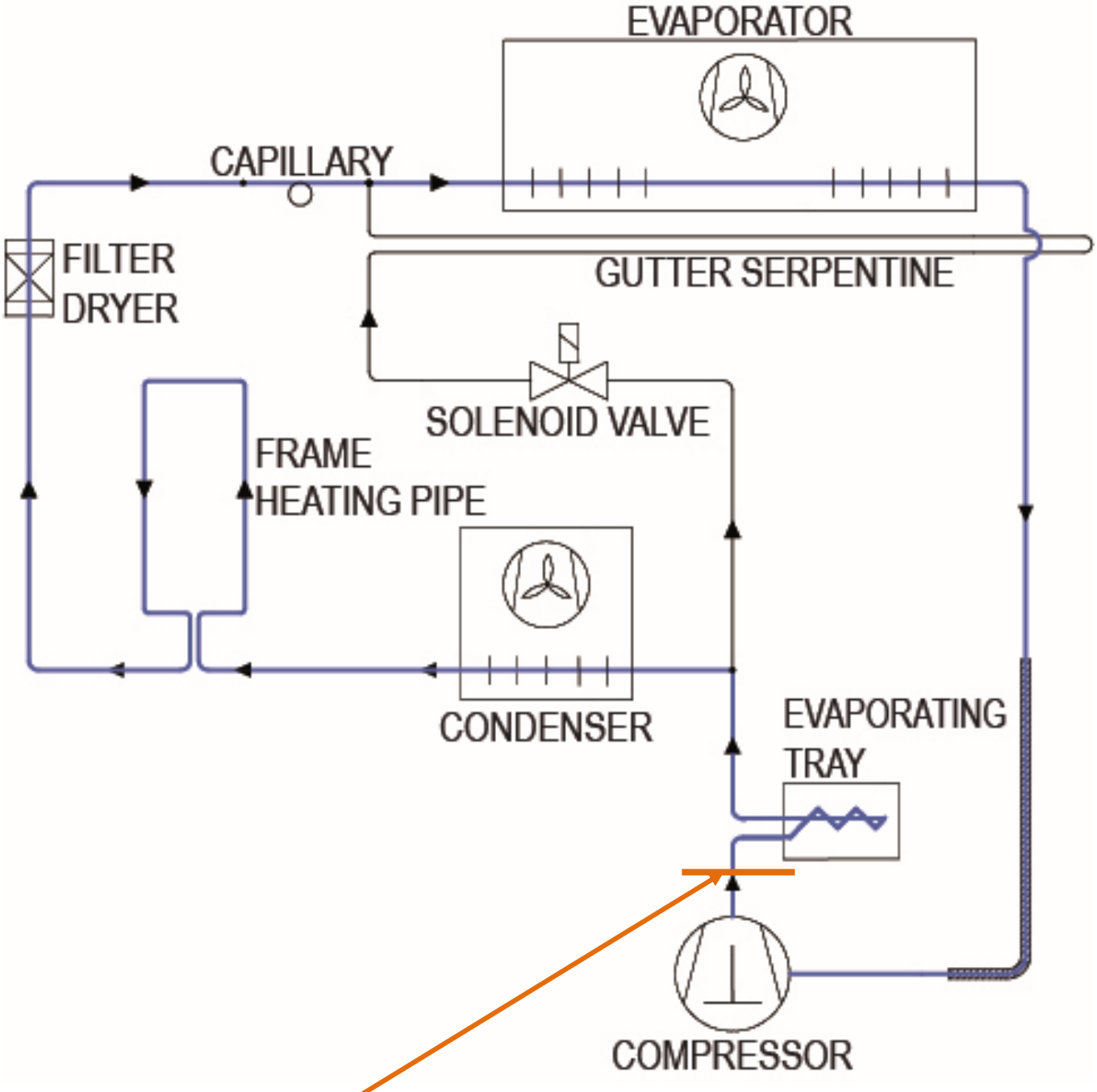


If the entire amount of refrigerant is released in the chest of a EIS 165.3 N/P KW, this would be a flammability zone event.

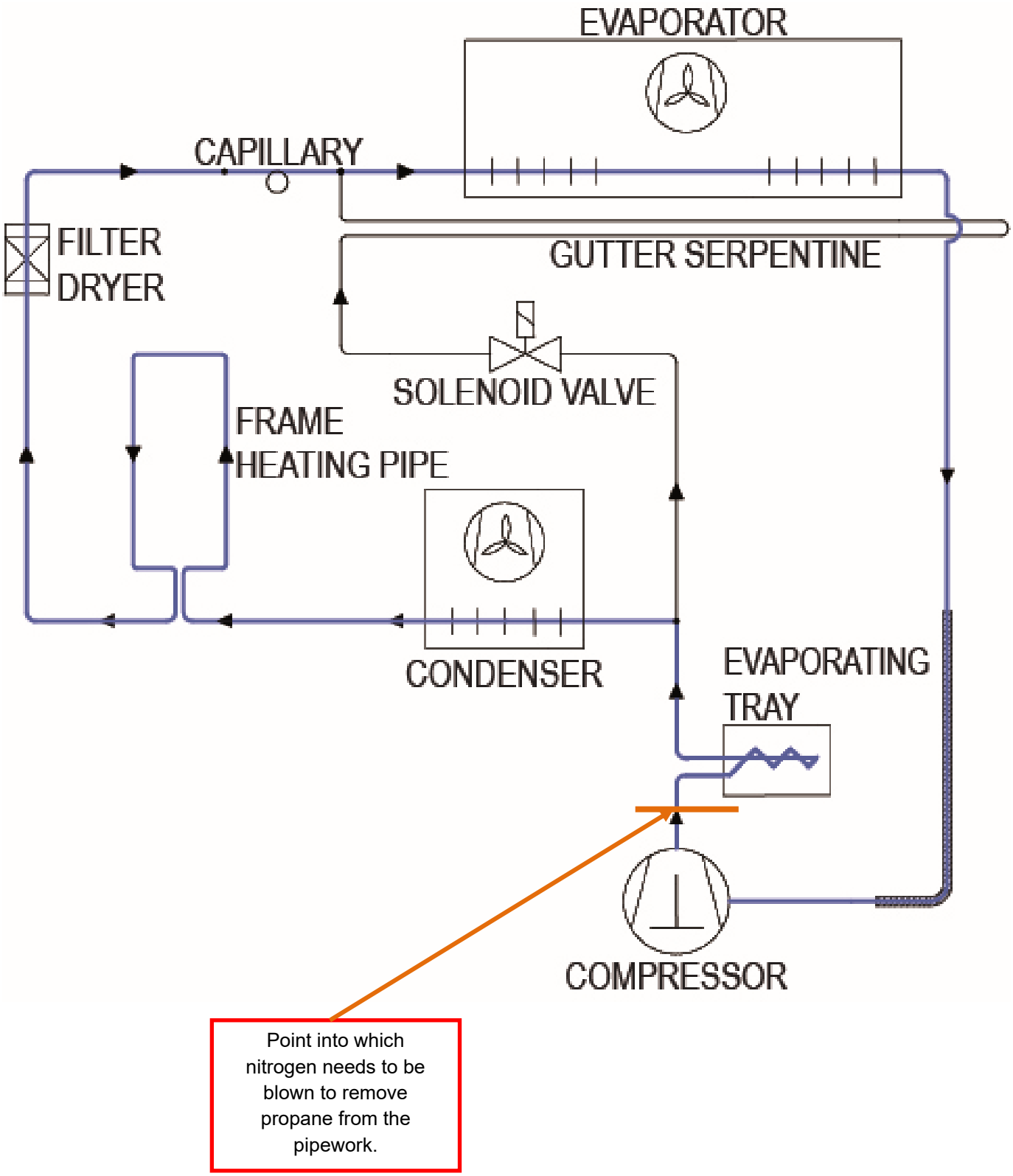
2. REFRIGERATION SCHEMATICS FOR THE EQUIPMENT

2.1 REFRIGERATION DIAGRAM FOR THE COOLING CYCLE EIS 165.3 N/P KW

GROUP 1 – LEFT SIDE – REFRIGERANT CHARGE 130g



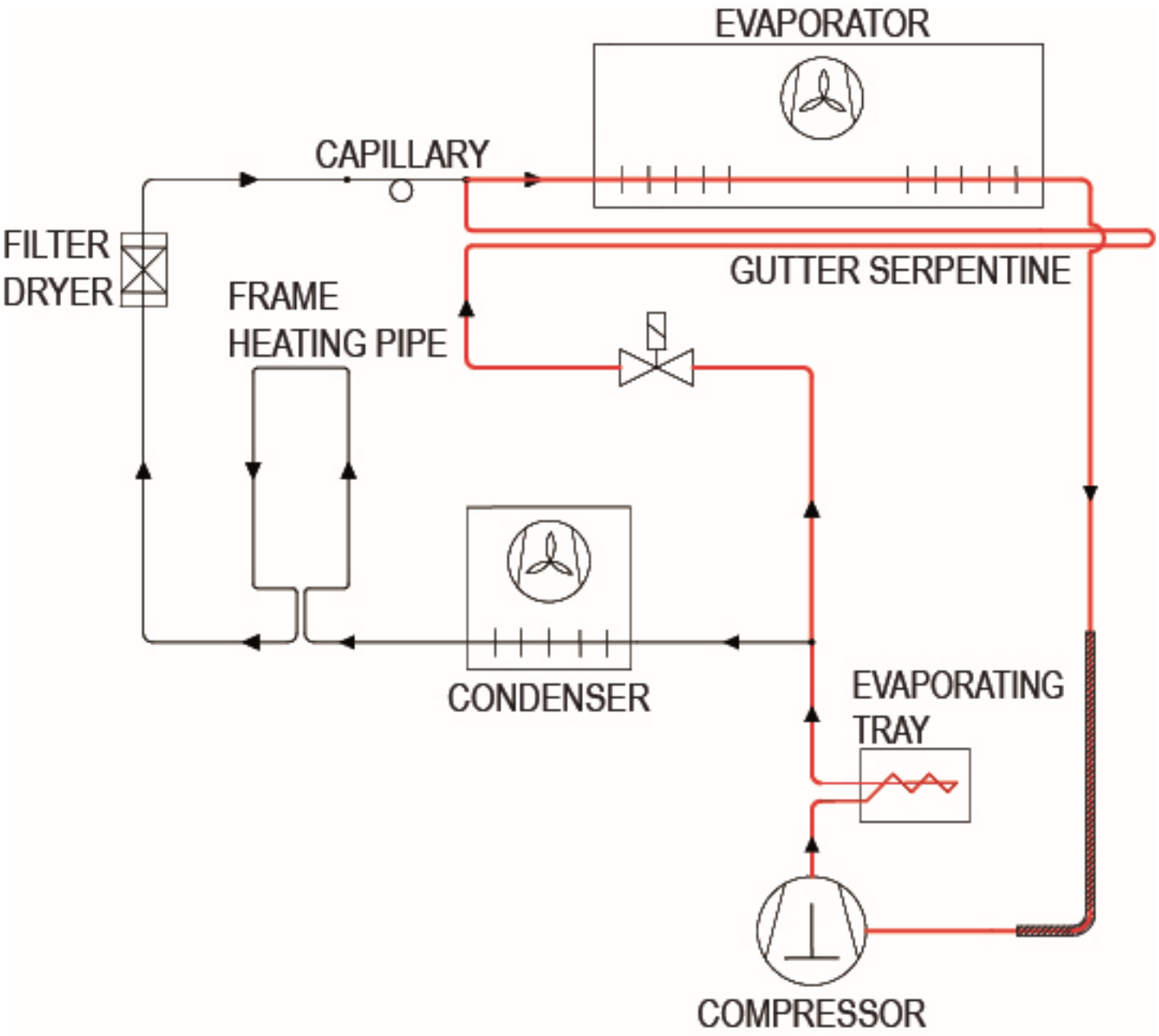
GROUP 2 – CENTRAL SIDE – REFRIGERANT CHARGE 140 g



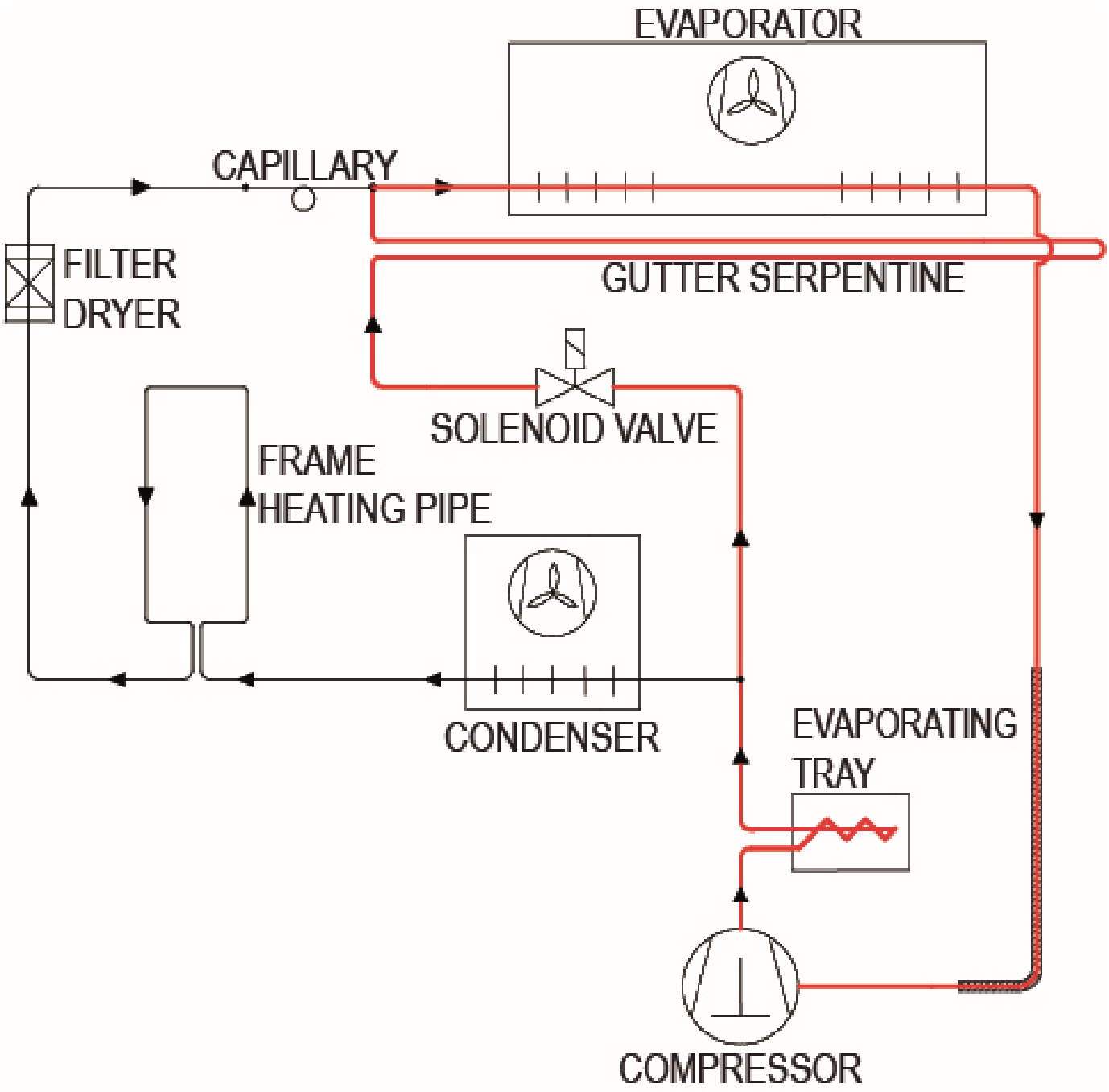
2.2 REFRIGERATION DIAGRAM FOR THE DEFROST CYCLE - EIS 165.3 N/P KW

The open solenoid valve runs gas through the drip trough and then sends it straight to the evaporator.

GROUP 1

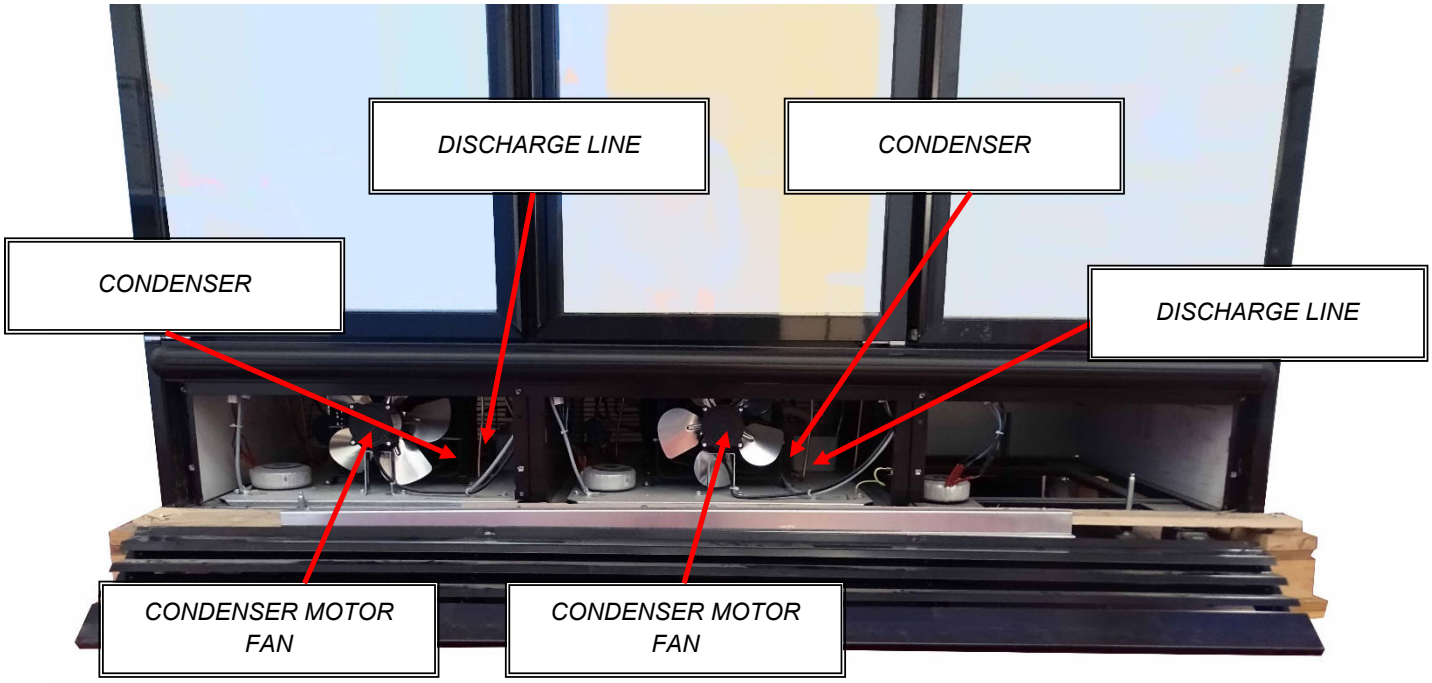


GROUP 2

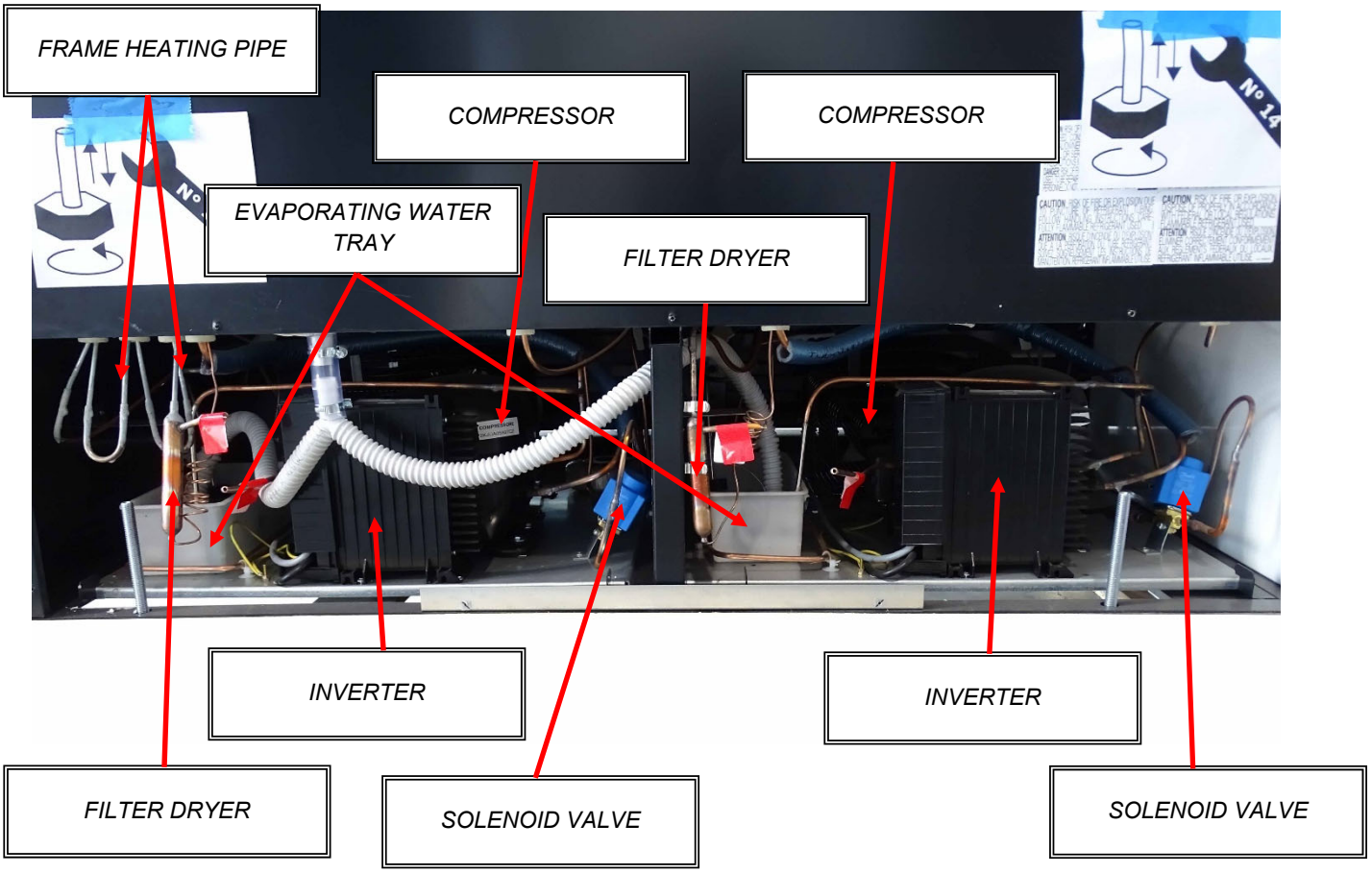


2.3 VIEW OF THE MOTOR COMPARTMENT AND RELEVANT PIPEWORK EIS 165.3 N/P KW

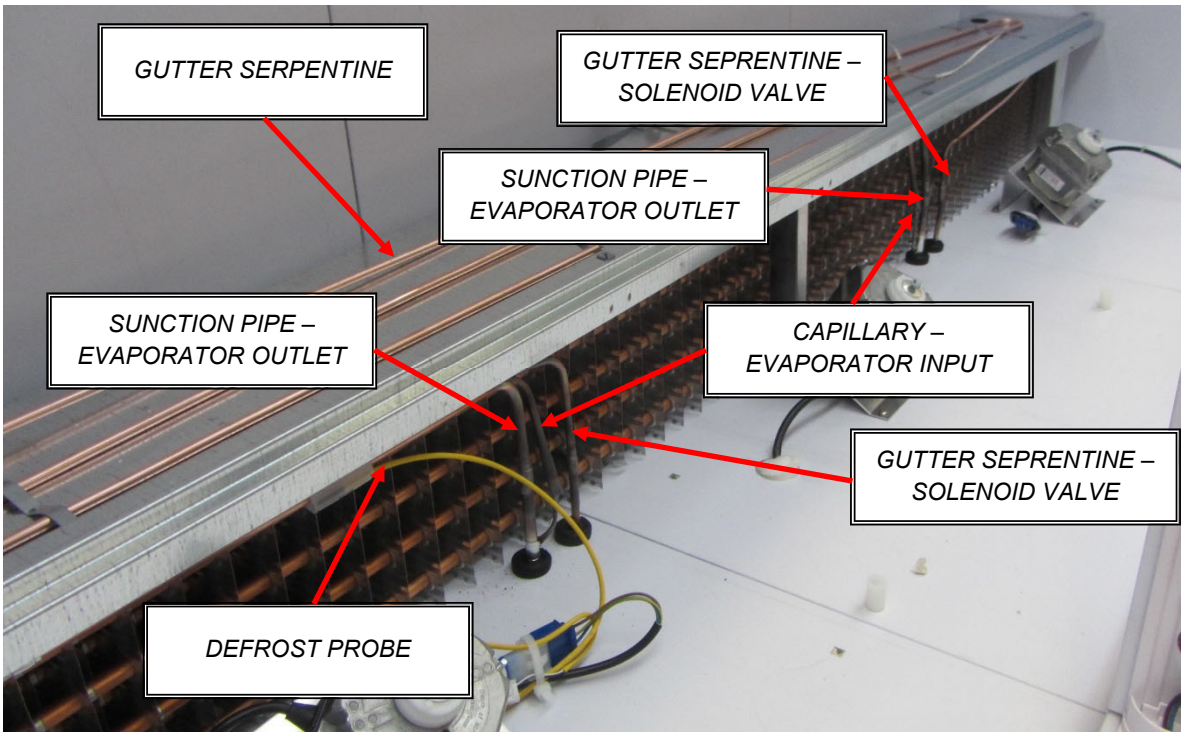
VIEW OF MOTOR COMPARTMENT – FRONT SIDE



VIEW OF MOTOR COMPARTMENT – REAR SIDE

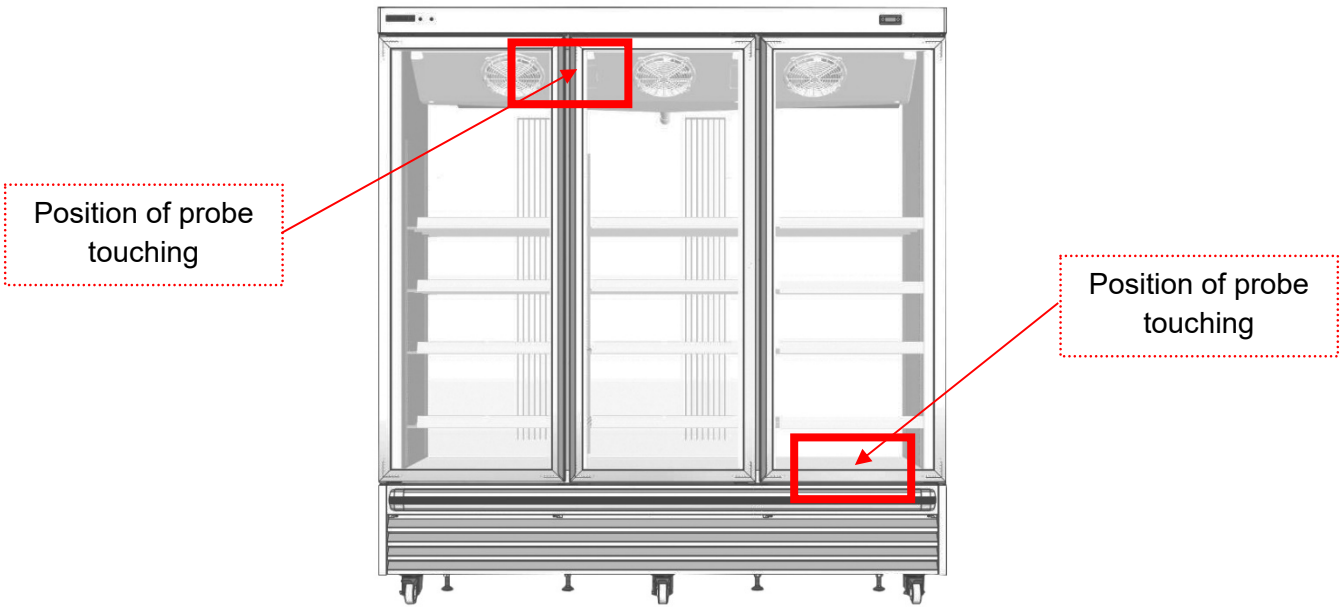


2.4 VIEW OF THE EVAPORATOR COMPARTMENT AND RELEVANT PIPEWORK - EIS 165.3 N/P KW



3. POSITION OF PROBES IN THE CABINET

There are two probes in the EIS 165 N/P KW model.



Model	*Position of probe*	Probe Colour	Function	Probe Epta code
EIS 165 N/P KW	Evaporator Tank – motor compartment	Yellow Grey	Defrost Display - Thermostat	I0205786 I0205805

4. ALARMS FOR EIS 165.3 N/P KW (Dixell Contreller)

ALARM	CAUSE	OUTPUTS
"P1"	Temperature probe damage	"Con" and "COF" compressor outputs.
"P2"	Evaporator probe damage	Timed defrosting
"HA"	Maximum temperature alarm	Outputs unchanged
"LA"	Minimum temperature alarm	Outputs unchanged

Probe alarms **P1** and **P2** start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe. Temperature alarms **HA** and **LA** automatically stop as soon as the temperature returns to normal values.

5. REPLACEMENT OF COMPONENTS AND REPAIR OF A LEAK

The instructions below, which involve opening the refrigerating circuit, must be performed in a place with sufficient air circulation and at any rate not in the sales area.

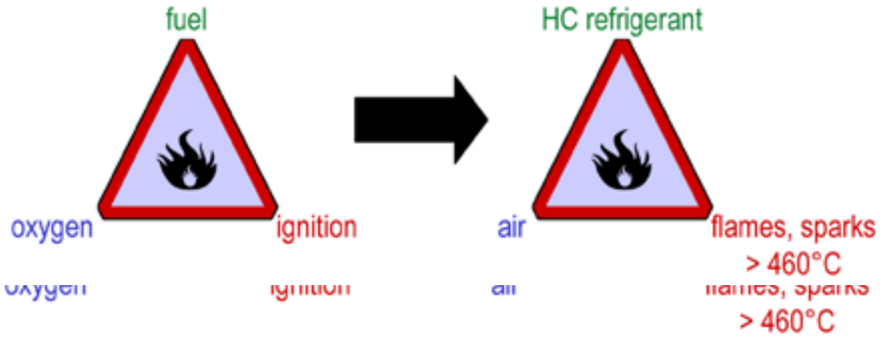
5.1 SAFE OPERATING PROCEDURES FOR REFRIGERATION UNITS USING R290

Before carrying out any kind of maintenance operation on the refrigerator, make sure that the machine is disconnected from power (unplugged).

R290 (Propane CH3CH2CH3) is a flammable natural refrigerant (Hydrocarbon HC) having lower explosive limit (LEL %V/V) = 1.7.

The very low quantity of refrigerant used and the safe design (possible ignition sources enclosed in a metal box, far from the potential explosive areas) make this unit totally safe in use. Caution must be used during servicing and with this respect it is essential to understand the basic concept of flammability.

Three ingredients are needed for a fire: a fuel at the right concentration, a supply of oxygen normally from air, and a source of ignition. The common way of illustrating this is by means of the fire triangle



If you control these components, for example, by eliminating at least one but preferably two of these, fire can be prevented.

In order to achieve this, three general guidelines should be followed during servicing:

F1. Containment of the substance;

F2. Avoidance of ignition sources;

F3. Use of ventilation.

F1. Containment

The flammable substances must be kept within a suitably designed and constructed "container", be it a suitable cylinder or a refrigeration system. If the substance leaks, it should be prevented from spreading to other areas.

F2. Ignition sources

Ensure that all the obvious and unobvious ignition sources have been removed from the equipment and handling areas. Ignition sources can vary greatly and these sources may include sparks from electrical equipment or welding and cutting tools, hot surfaces, open flames from heating equipment, smoking materials, etc.

F3. Ventilation

There should be adequate airflow where flammable substances are stored and used.
Good ventilation will mean that any vapor arising from a leak or a release will be rapidly dispersed. In case one of the components of the refrigerating hermetic circuit (compressor, dryer, condenser, evaporator, capillary, refrigerant) needs to be serviced, the basic safe guideline must be always followed:

NEVER USE FLAMES OR HEAT SOURCES IF FLAMMABLE REFRIGERANT IS PRESENT INSIDE THE REFRIGERATING CIRCUIT

Flames can be used only when there is evidence that no flammable substance is still inside the circuit or the circuits; IN CASE OF MULTIPLE CIRCUITS NONE OF THEM MUST CONTAIN FLAMMABLE SUBSTANCES in case heat sources are to be used: all circuits need to be emptied and absence of flammable substances must be proved.

IMPORTANT

Provisions for all jobs involving the opening of the refrigerating circuit:

- SHUT DOWN THE POWER SUPPLY
- MANDATORILY WEAR GLOVES AND GLASSES
- DO NOT WORK WITH OPEN FLAMES BEFORE THE PIPEWORK HAS BEEN CUT!
- REMOVE ALL SPARK SOURCES FROM THE WORK AREA (LIGHTERS, LAMPS, CIGARETTES).

5.2 PROTECTION TOOLS AND DEVICES FOR SERVICING

Protection tools:

Devices for servicemen:

	**LOW PRESSURE SUCTION GAUGE**
	**REFRIGERANT PINCH OFF TOOL**
	**ELECTRONIC LEAK DETECTOR**
	**REFRIGERAT JUNCTIONS**
	**LOCKRING JOINT PLIER**
	**LOCKRING JOINT WITH CLOSED SIDE**
	**REFRIGERANT GAS BOTTLE**
	**NITROGEN GAS BOTTLE**

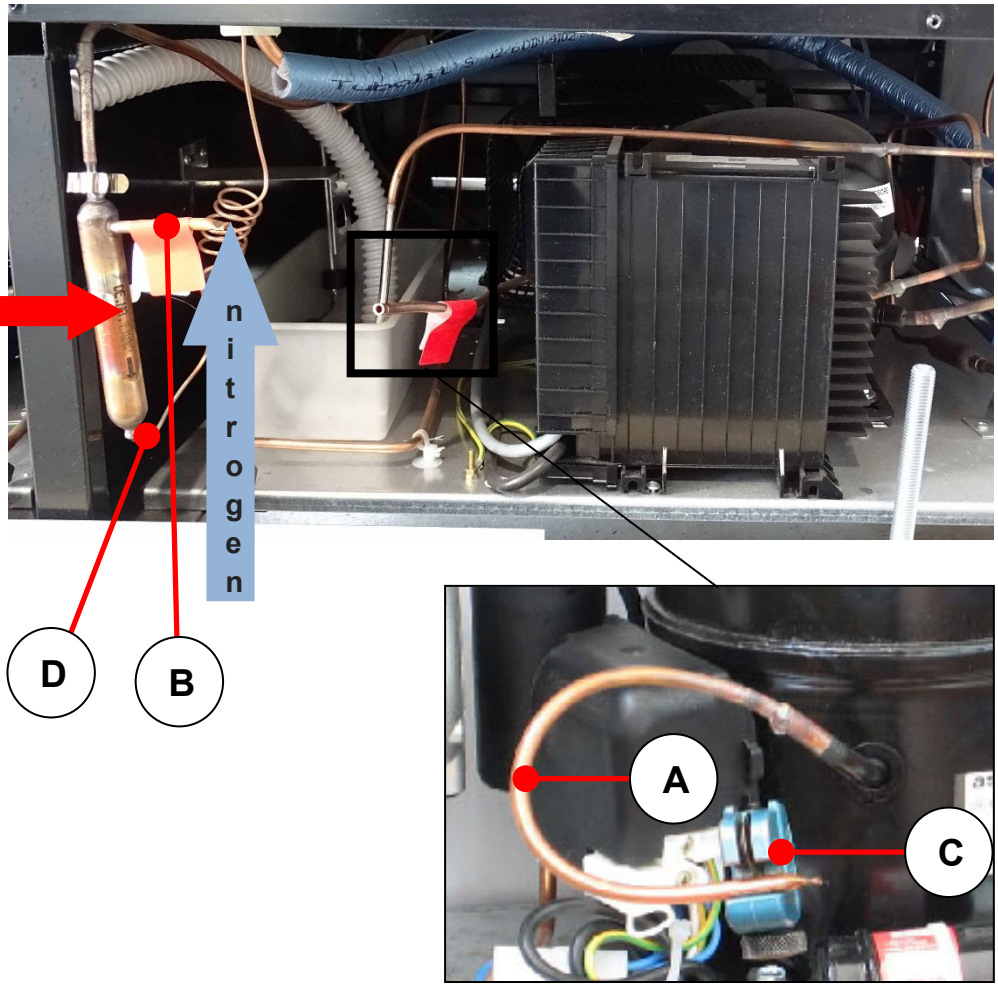
	**REFRIGERANT SCALE**
	**VACUUM PUMP**
	**LOKPREP SEALANT**
	**ORBITAL CUTTER**
	**SCREWDRIVER**
	**WRENCH n°10**

5.3 HOW TO EMPTY THE COOLING CIRCUIT AND PROVE IT BEFORE SERVICING

The refrigerating unit has a double servicing pipe, on the low (**A**) and on the high (**B**) pressure sides: in order to totally remove the flammable refrigerant from the refrigerating circuit both pipes are to be opened by using an orbital cutter (**C**).
Cut the capillary tube (**D**) exiting the filter dryer.
When the inside pressure is equalized with the ambient pressure, blow nitrogen at 10 bars in the circuit through the service pipe on high pressure side (**B**) and check that it flows out through the other service pipe on the low pressure side; continue to blow nitrogen for at least 5 minutes.

At the end of this procedure **NO FLAMMABLE REFRIGERANT CAN REMAIN INSIDE THE CIRCUIT IN SUCH A QUANTITY TO BE DANGEROUS WHEN FLAMES OR HEAT SOURCES ARE USED**.

Also cut the pipe entering the filter and replace the filter dryer with a new one.



5.4 COMPRESSOR REPLACEMENT

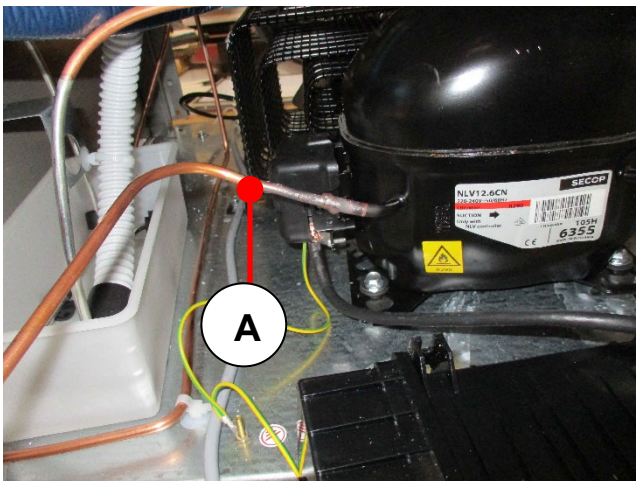
EIS 165.3 N/P KW

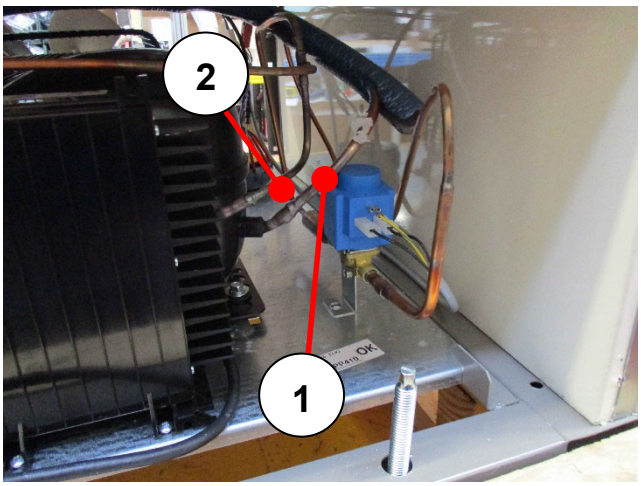
Epta code: 45911034 (2 pc)
Model: SECOP NLV12.6CN 198-254V 50/60HZ

Epta code for filter: I0145073 (2 Pc)
Model: Filter gr 15 øi 5-3.2
Note: when the compressor is replaced the filter drier must be replaced too

5.5 UNSOLDER COPPER PIPE TUBE

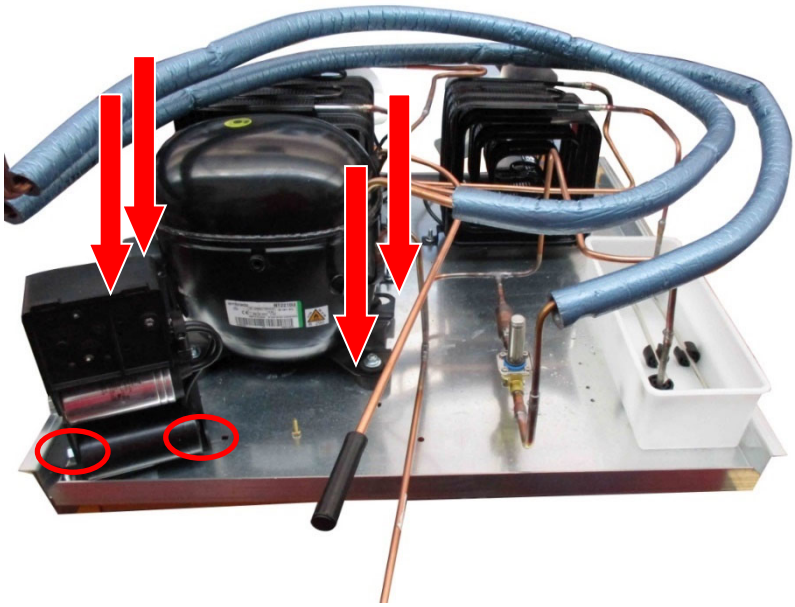
After being that no more refrigerant gas is inside the thermodynamic circuit, unsolder from compressor the charge pipe (**A**), the suction pipe (**1**) and the discharge pipe (**2**).





5.6 COMPRESSOR REMOVING

Unscrew the 4 screws of compressor by using the wrench n°10.
Using the screwdriver for unscrew the compressor box (if present).



Picture example of motor compartment

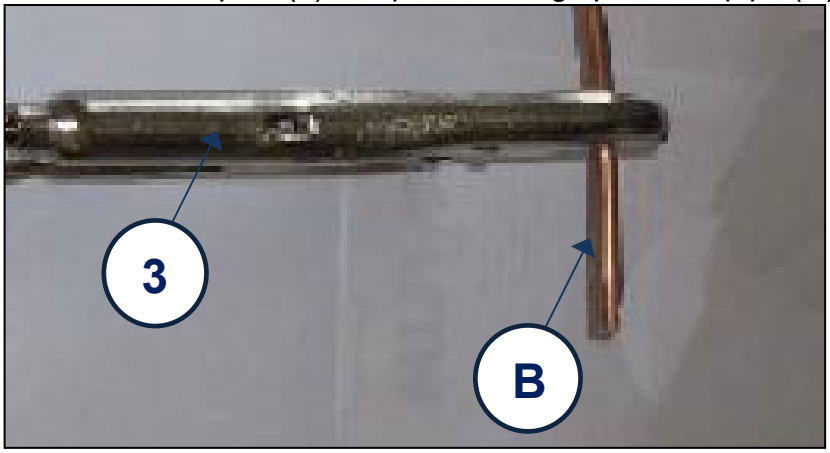
5.7 NEW COMPRESSOR INSERTION

By using 4 screws fix the new compressor to motor base (wrench n°10) and then screw compressor box (screwdriver).
After secure the compressor to the base, solder the discharge and suction piping, then also solder the capillary tube onto the filter after cutting it diagonally and fitting it in by max. 3cm. Solder the pipe exiting the condenser to the filter inlet. When the circuit is closed, charge the circuit with helium/nitrogen up to a pressure of 8 bar. Close the circuit to hold the pressure in, then search for circuit leaks using a leak detector. Adjust the sensitivity of the electronic leak detector (when available) and test each and every soldering. The sensor will beep when a leak is found. Connect the vacuum pump to the compressor and filter service intakes and hold the vacuum for at least 30-40minutes (value depending on pump features). The vacuum degree to be achieved is below 15 Pa or 0,15 mbar .
WARNING! Wrong vacuum execution may cause problems on the refrigerator performance.

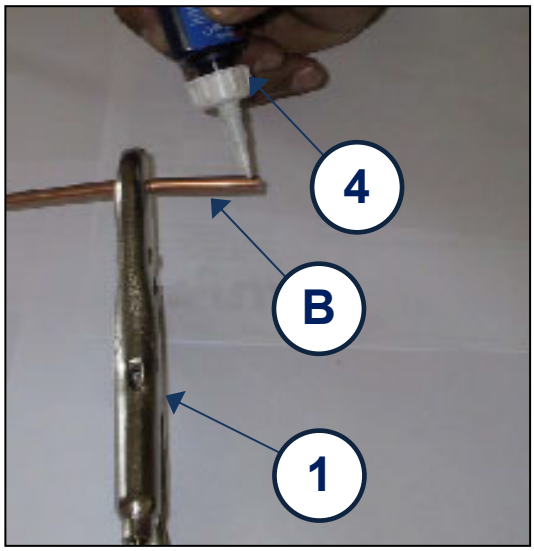
5.8 HIGH PRESSURE PIPE CLOSING

After 30-40 minut of vacuum operation, disconnect the vacuum machine only on the high pressure pipe (**B**).

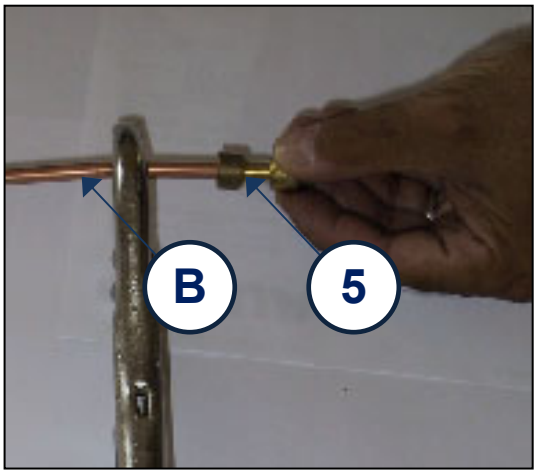
- Take the plier (**3**) and pinch the high pressure pipe (**B**), then remove refrigerant junction.



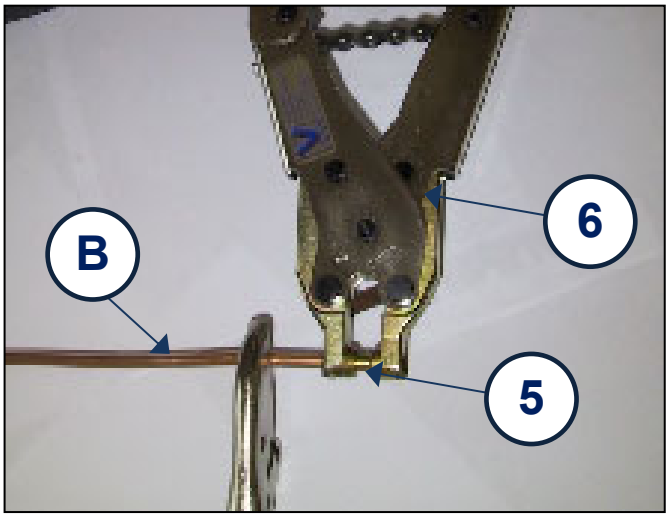
- Put a drop of Lokprep sealant (**4**) on the high pressure pipe (**B**).



- Insert lockring joint (**5**) on the high pressure pipe (**B**). Rotate the joint (**5**) for correctly distribute the sealant (**4**).

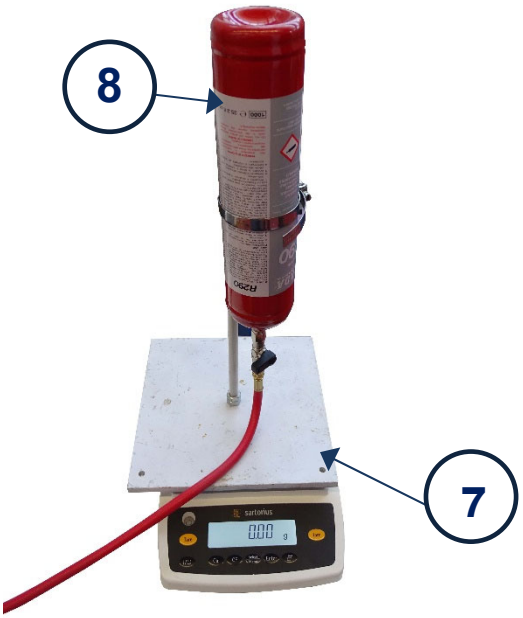


- By using the lockring plier (**6**) fix joint (**5**) on the copper pipe (**B**).



5.9 REFRIGERANT GAS CHARGING AND THERMODYNAMIC CIRCUIT CLOSING.

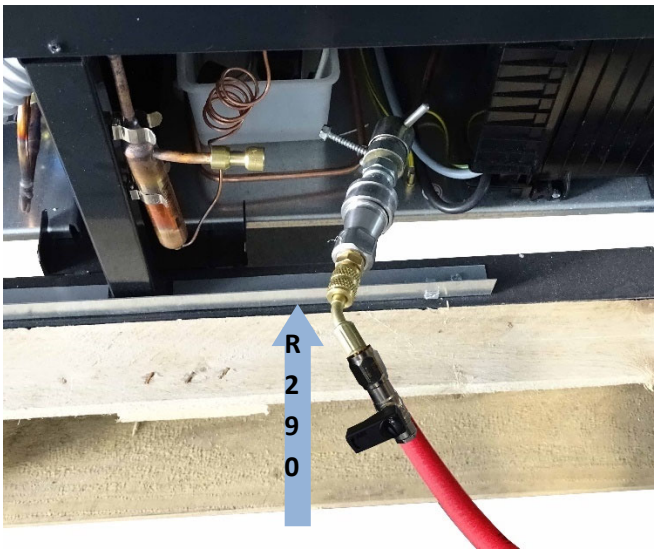
Check the refrigerant charge on the data label inside the cabinet.
Using a refrigerant scale (**7**), verify the quantity of refrigerant gas in the gas bottle (**8**).



REFRIGERNAT CHARGE:

- **Lateral Side Circuit:** Refrigerant Charge 130 g
- **Central Side Circuit:** Refrigerant Charge 140 g

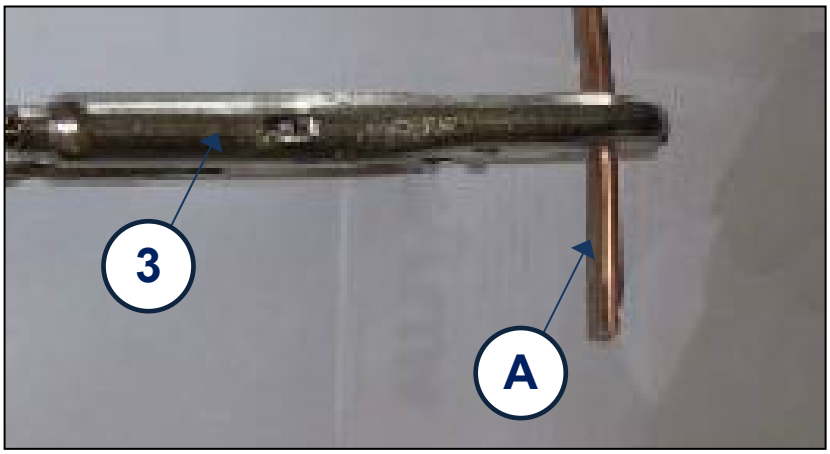
Disconnect the vacuum machine from the low pressure pipe (**A**); connect the gas bottle (**8**) to the circuit.



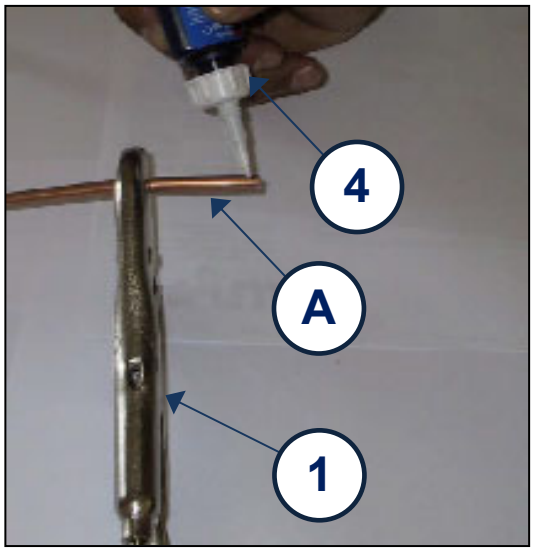
WARNING! in order to avoid damages on the thermodynamic system or danger for technical assistant; be sure to have connected the gas bottle to the refrigerator circuit.

The refrigerator must be ON for 5-6 minutes, then disconnect the refrigerator from current.

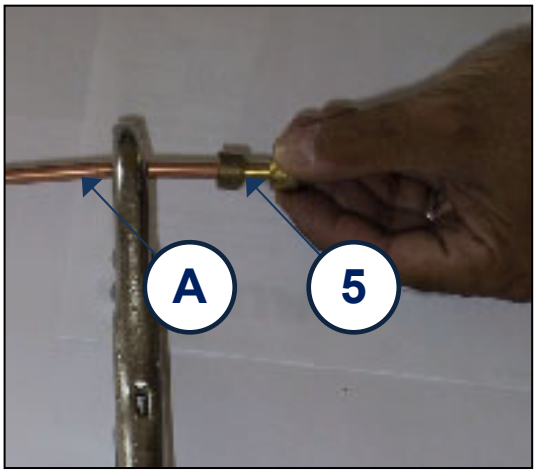
- Take the plier (**3**) and pinch the low pressure pipe (**A**), then remove refrigerant junction.



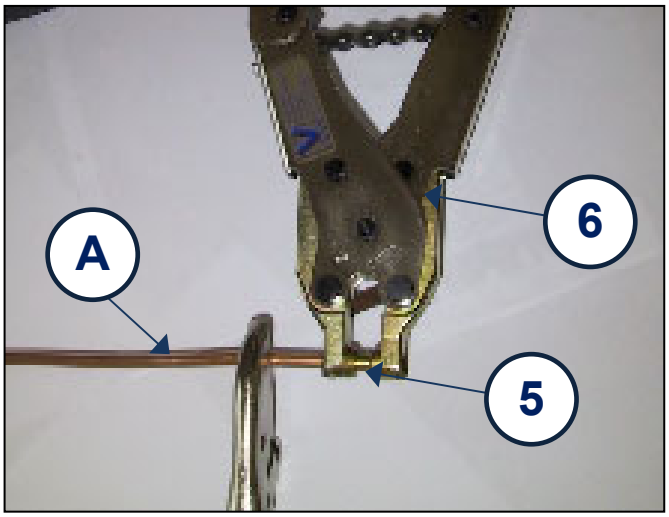
- Put a drop of Lokprep sealant (**4**) on the low pressure pipe (**A**).



- Insert lockring joint (**5**) on the low pressure pipe (**A**). Rotate the joint (**5**) for correctly distribute the sealant (**4**).



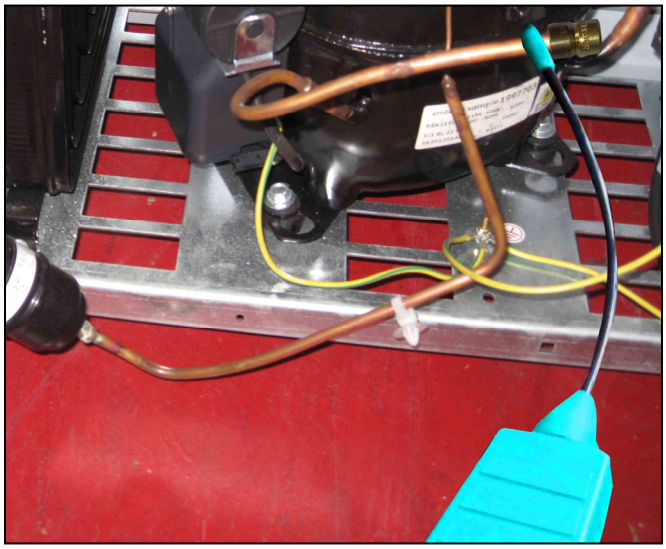
- By using the lockring plier (**6**) fix joint (**5**) on the copper pipe (**A**).

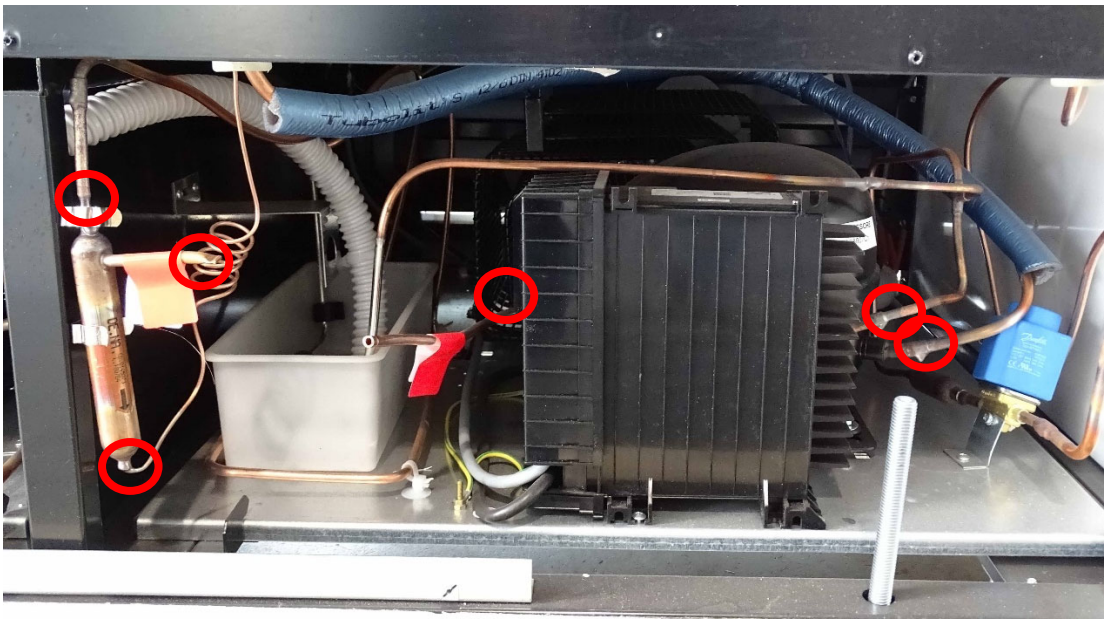


5.10 CHECK THE CORRECT CLOSING OF THERMODYNAMIC CIRCUIT

Use the electronic leak detector (**9**) in order to check if leak of gas are present.

- End of high pressure pipe (lockring joint).
- End of low pressure pipe (lokring joint).
- Suction pipe welding.
- Charge pipe welding.
- Discharge pipe welding.

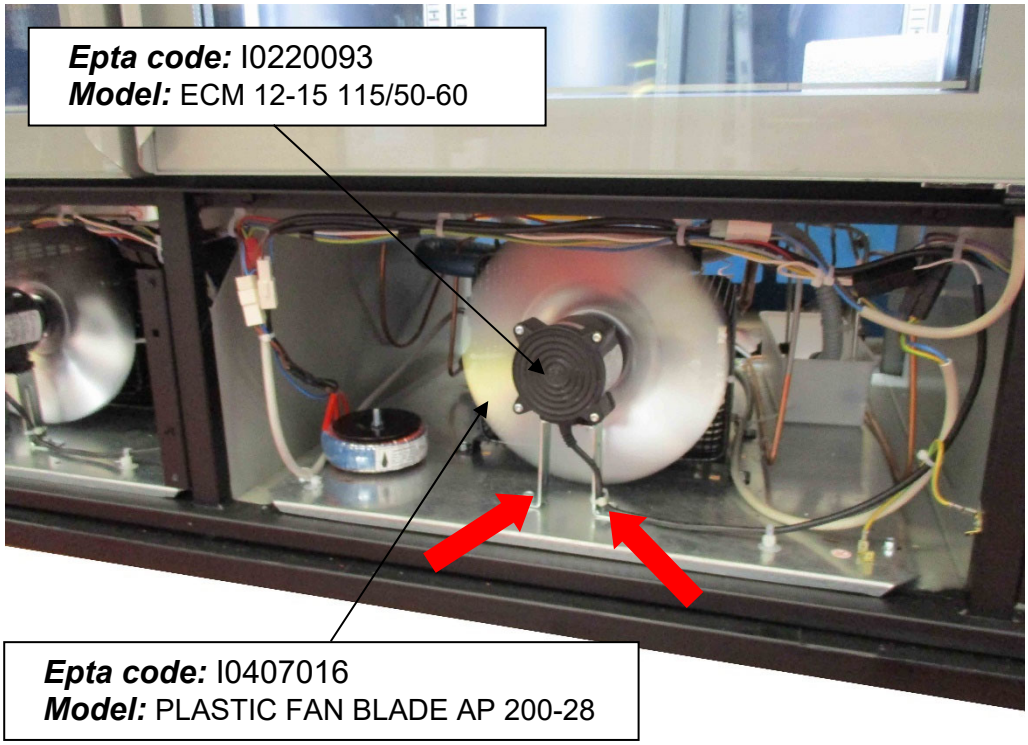




5.11 REPLACEMENT OF CONDENSER MOTOR FAN

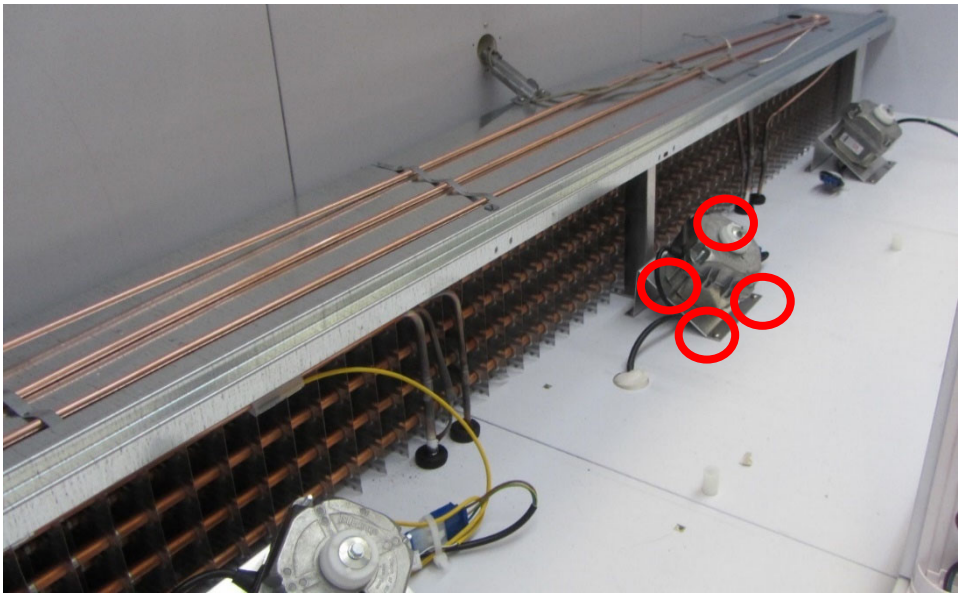
Disconnect the motor fan by disconnecting the terminal junction shown in figure, releasing wires from cable ties.

Remove the hexagonal-head screw, marked in figure; extract the motor fan from compressor compartment; unscrew the hexagonal-head screw fixing the motor fan blade and remove the screws fastening the motor to its metal support.

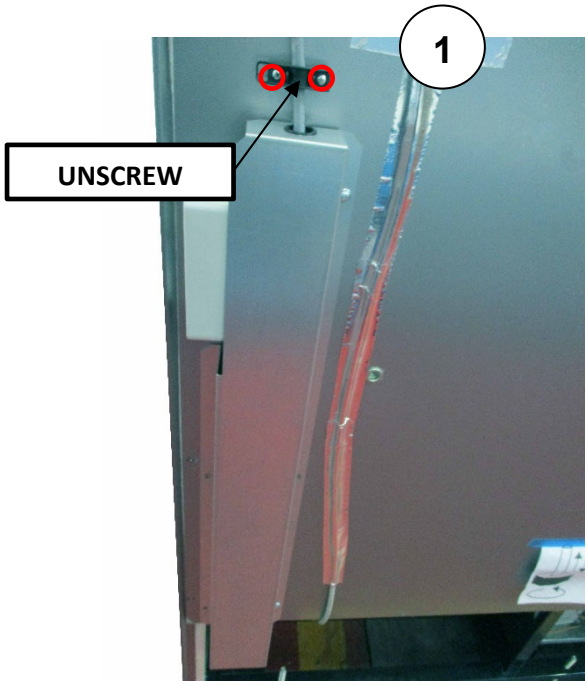


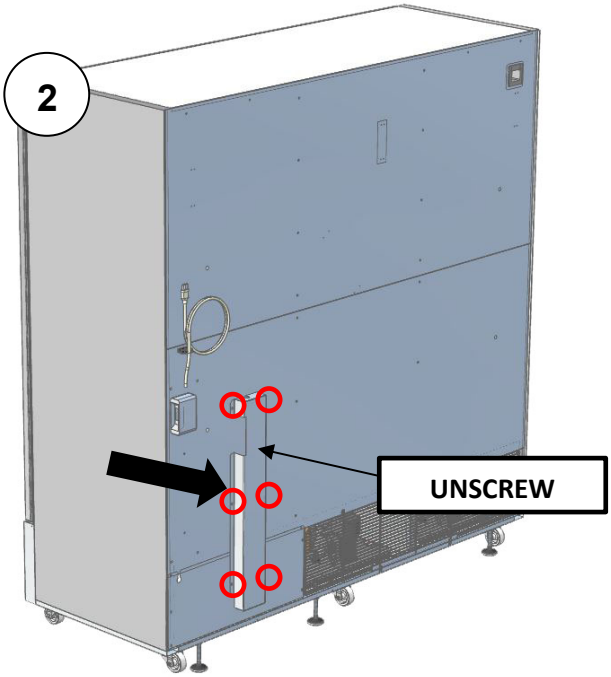
5.12 REPLACEMENT OF EVAPORATOR MOTOR FAN

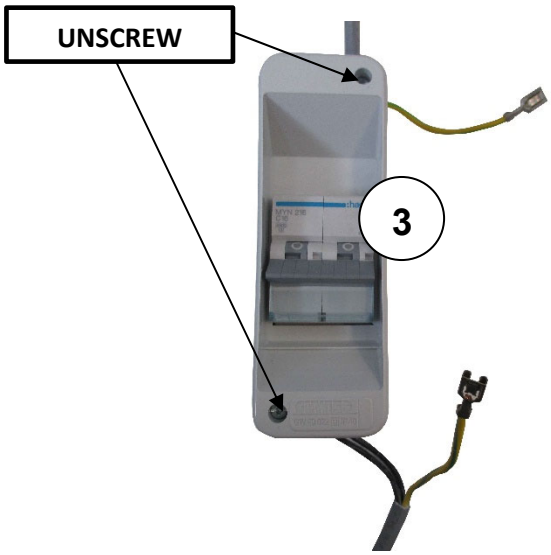
1 – Unscrew and remove evaporator cover.
2 – Disconnect the motor fan connectors.
3 – Unscrew and remove the motor fan.

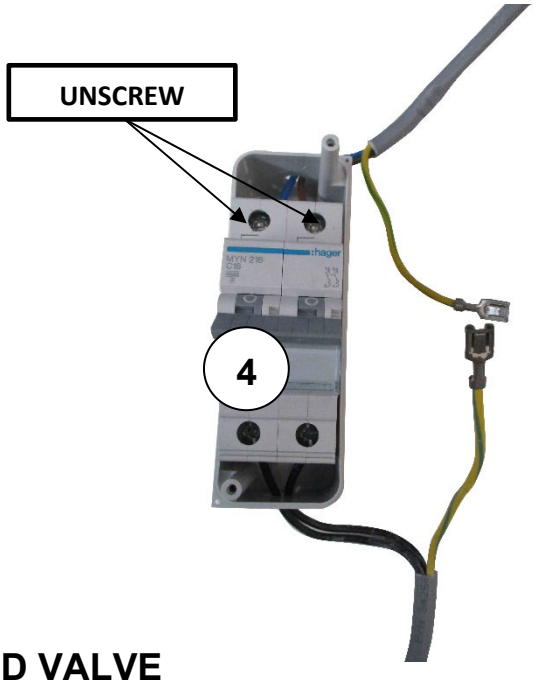


5.13 REPLACEMENT OF POWER CORD









5.14 REPLACEMENT OF SOLENOID VALVE

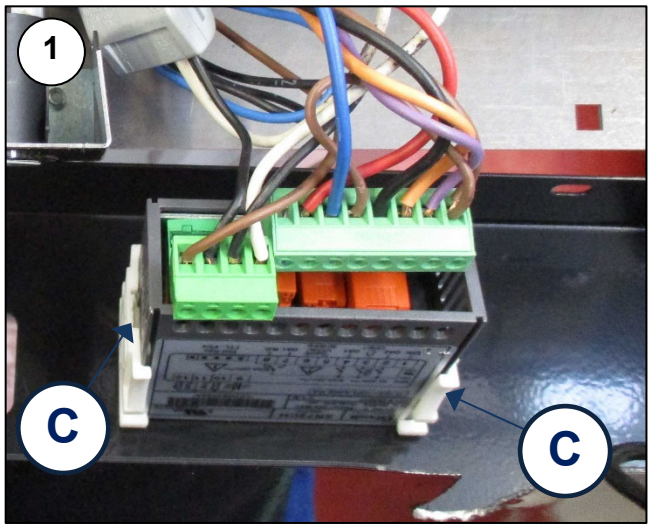
1) Disconnect the valve connector.
2) By using the screwdriver, remove the valve coil.
3) Unscrew the solenoid valve.
4) Unsolder and replace the mechanic filter.

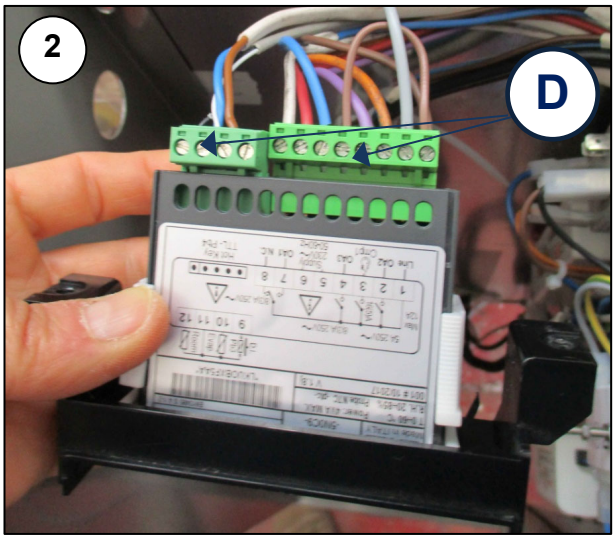
Epta code Solenid Valve: I0189033
Model: SOLENOID VALVE EVR3 115/60 U.L.

Epta code Mechanic filter: I0145001
Model: MECHANIC FILTER D.MM17X74

5.15 REPLACEMENT OF POWER CORD REPLACING

1 – Remove the lateral clips (**C**).
2 – Disconnect the rear connector (**D**).
3 – Remove the electronic controller.





Epta code Electronic controller: 52997031
Model: ELECTRONIC CONTROL DIXELL XR72CH 4N0F9 120VAC

5.16 REPLACEMENT OF LED BARS

ELECTRONIC BALLAST

- ***Epta code for ballast***: I3305398
- ***Model*** : EL.BALLAST LPV 100-24

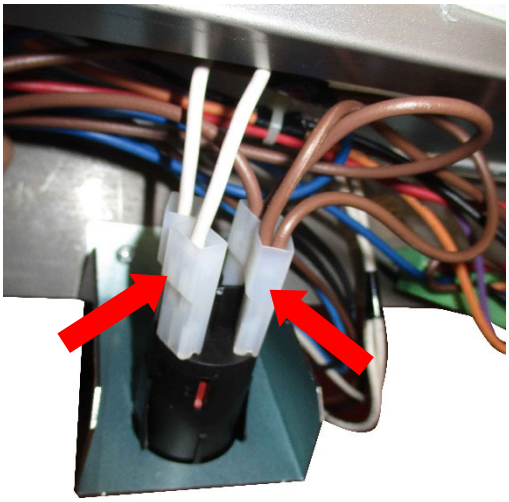
- ***Epta code for ballast*** : I3305723
- ***Model*** : EL.BALLAST APV 16-24

LED BARS

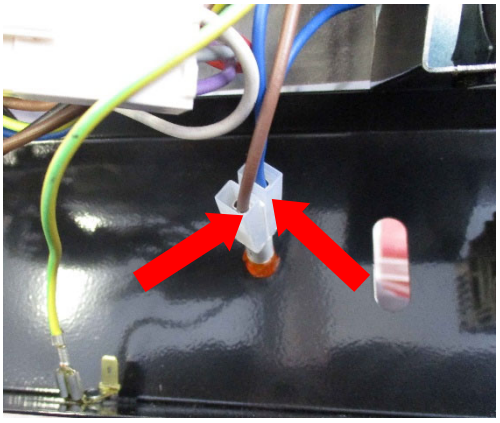
- ***Epta code for LED lamp***: I0225233 – LED LAMP SV-FPP54-3014/50-6500-128416

5.17 REPLACEMENT OF TEMPERATURE SWITCH

1) Unscrew and remove upper command panel.
2) Disconnect and remove the temperature switch



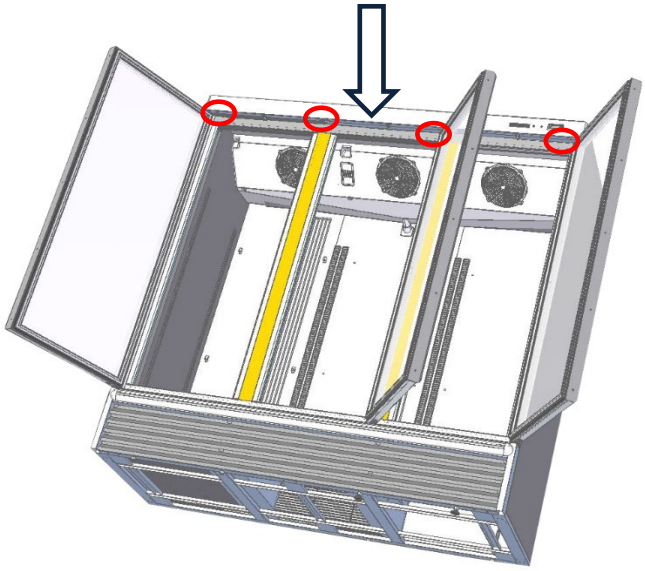
5.18 REPLACEMENT OF TEMPERATURE YELLOW LIGHTS



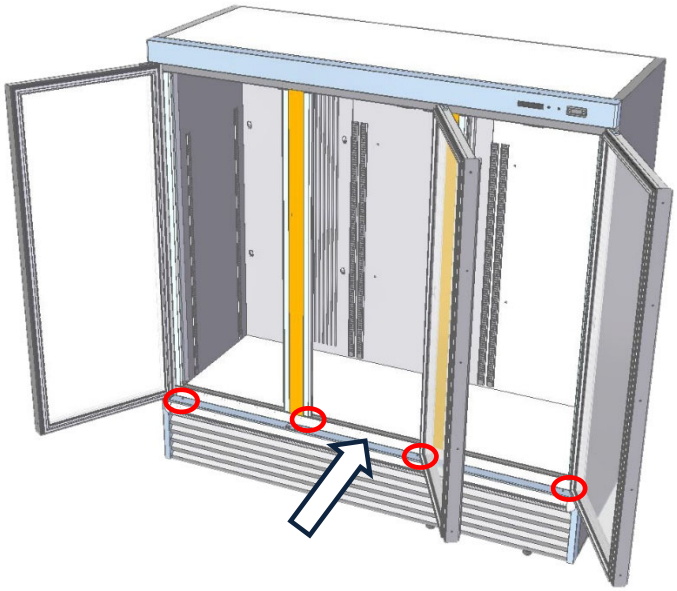
1) Unscrew and remove upper command panel.
2) Disconnect and remove the temperature light

5.19 REPLACEMENT OF DOOR AND DOOR GASKET

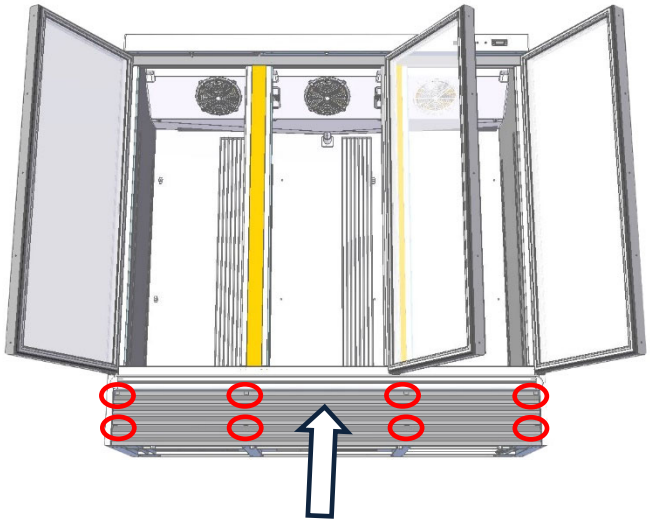
1) Unscrew and remove upper command panel.



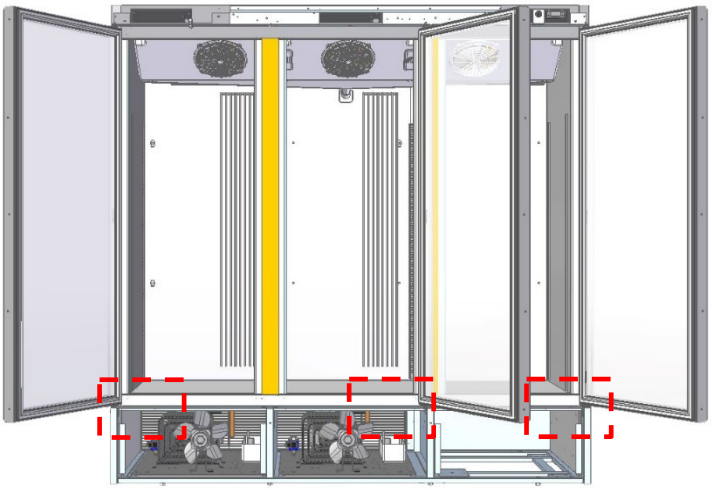
2) Unscrew the bumper.

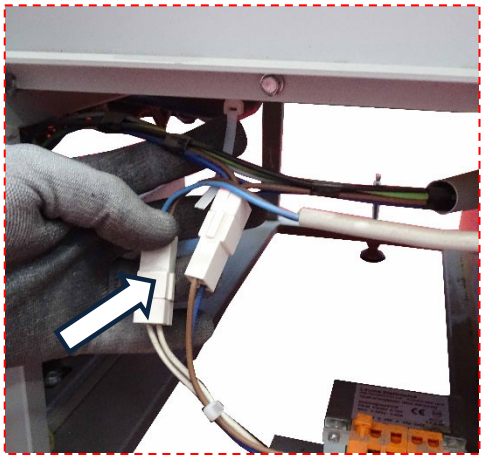


3) Unscrew the front grid.



4) Open the fasteners and disconnect the connectors.

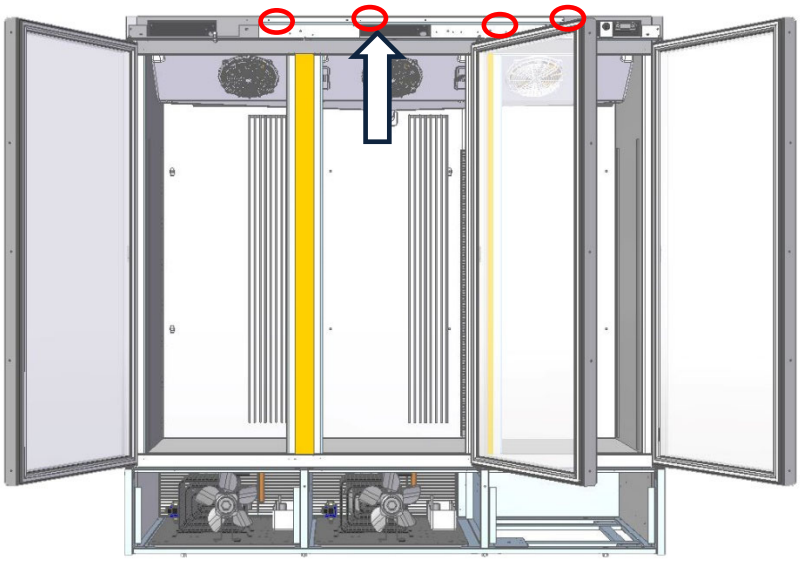




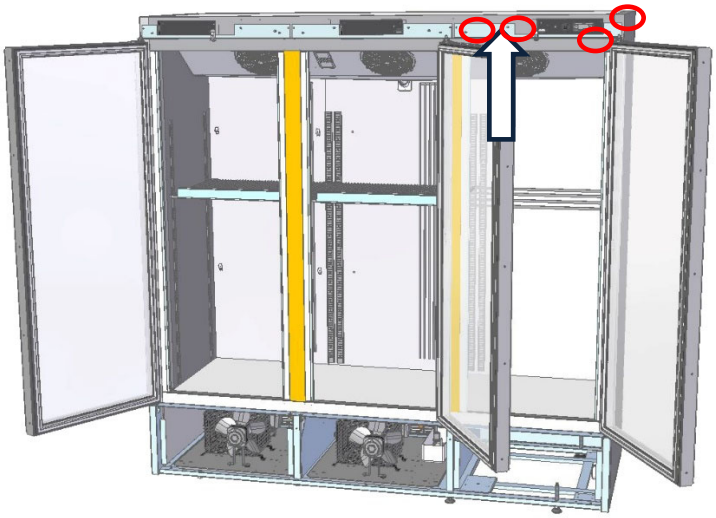
5) Disconnect the wires from connectors.

6) Unscrew and remove the electric components panel.

WARNING! Pay utmost attention during next steps; so as avoid the fall of the door.



7) Unscrew and remove upper door support.

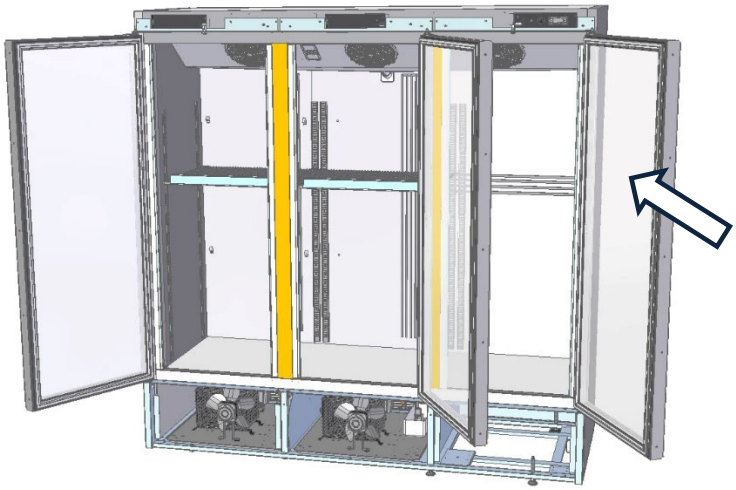


8) Unscrew the door hinge screw.

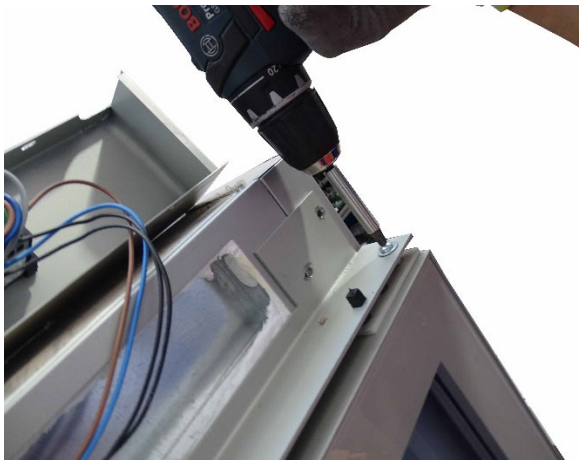
9) Remove the door and the heater wires from the lower support.

10) Insert the wires into the lower frame (shown as in picture) through the fairlead ring.

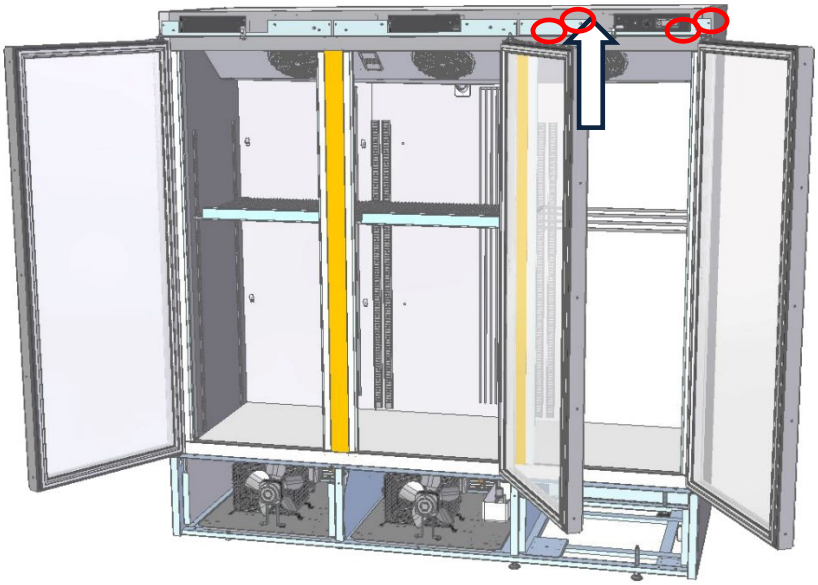
11) Insert again the door.



12) Screw the door hinge screw (use the same screw previously removed).

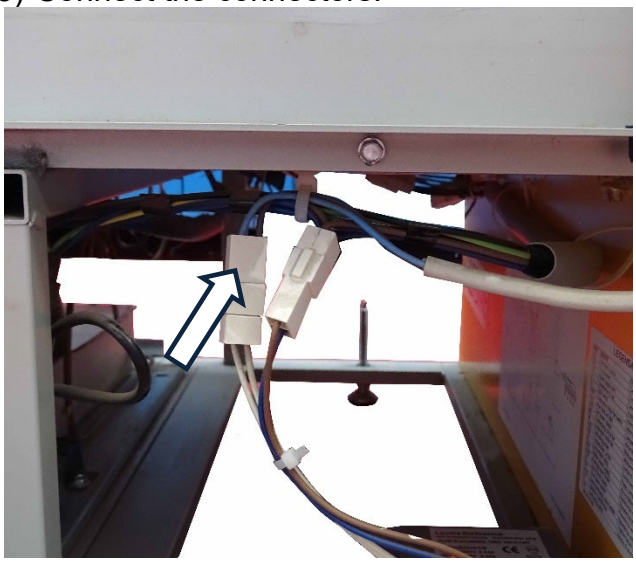


13) Insert and screw the upper door support (use the same screws previously removed).

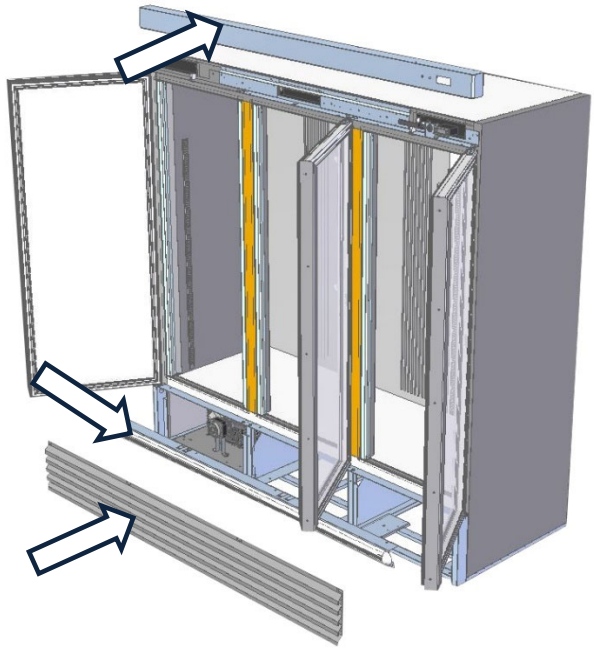


14) Insert the wires in the connectors previously removed.

15) Connect the connectors.



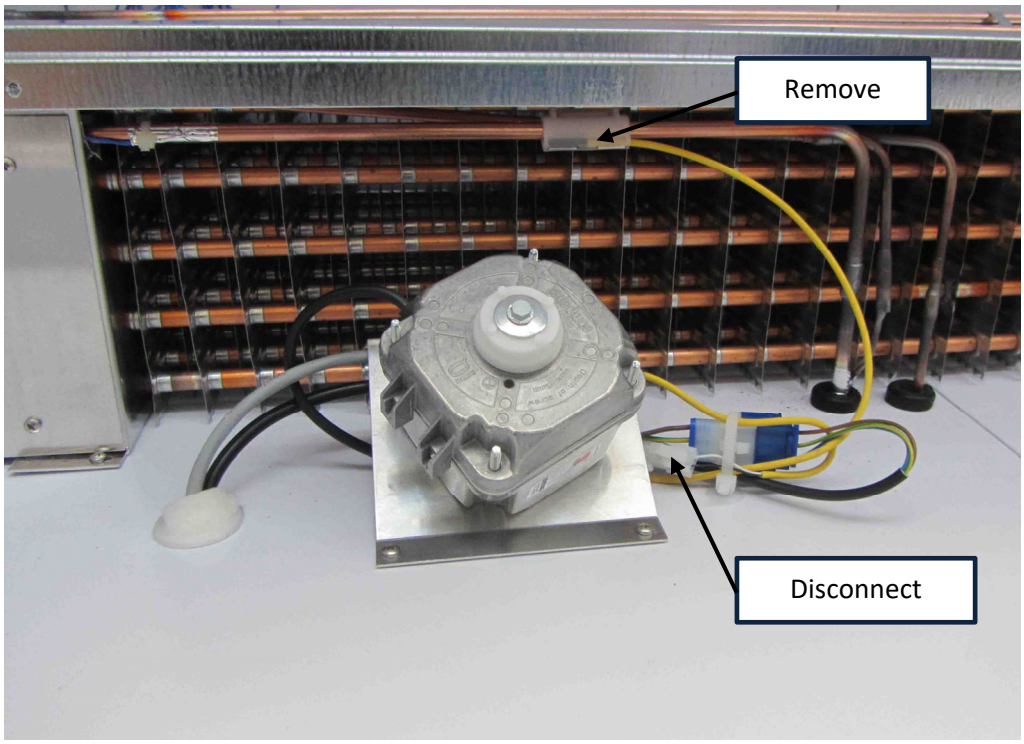
16) Insert and fix all component previously removed.

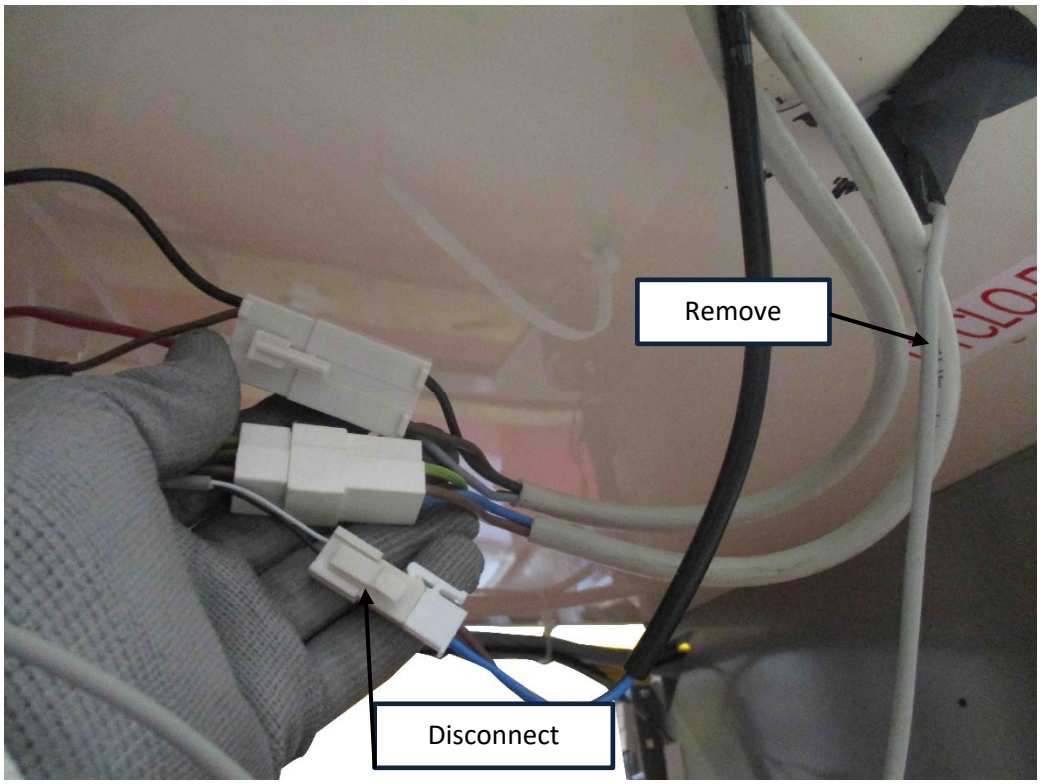


17) Remove the magnetic gasket from door frame, pulling it out manually from its housing.

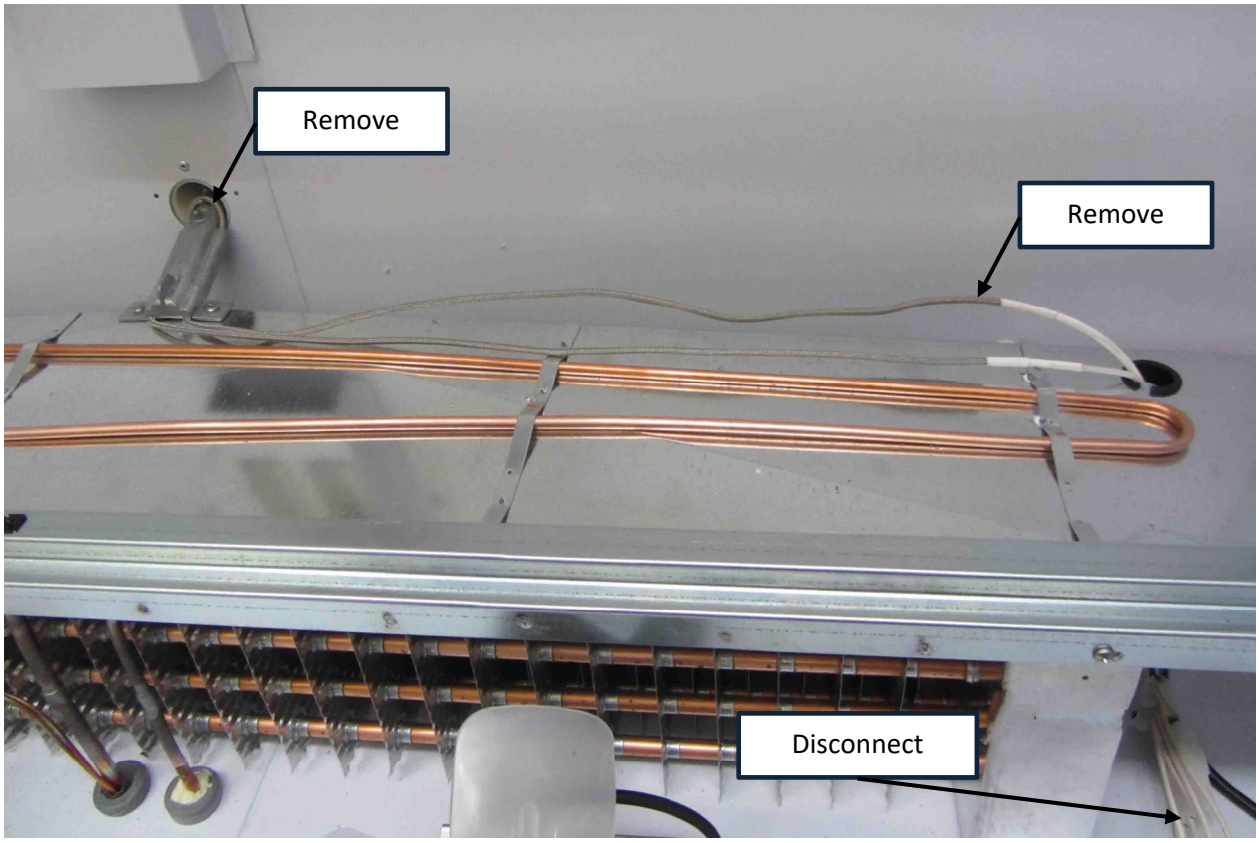
5.20 REPLACEMENT OF PROBS

Position of probe	Probe Colour	Probe Epta code
Evaporator Tank – motor compartment	Yellow Grey	I0205786 I0205805

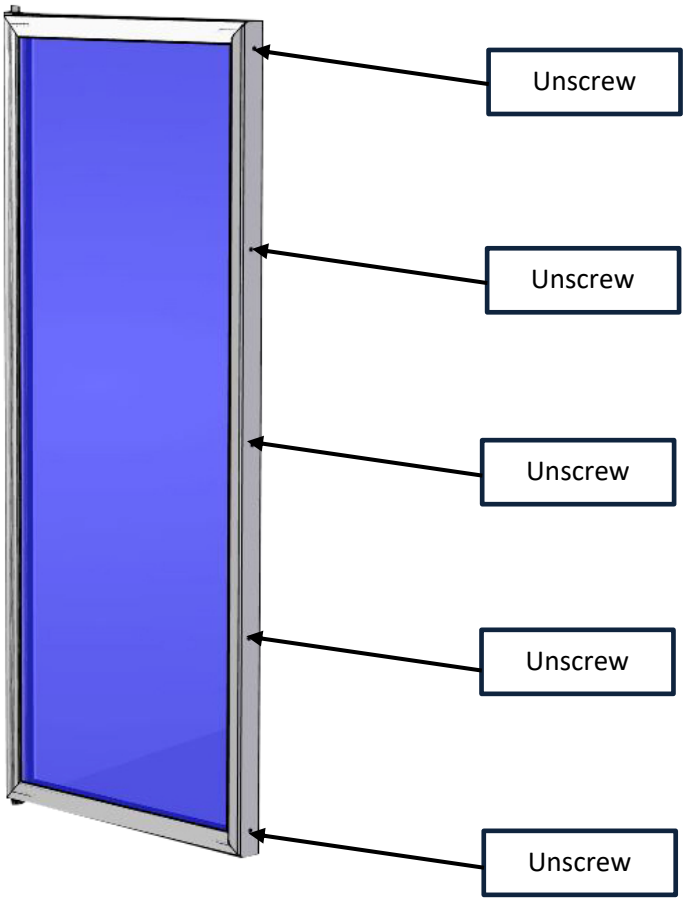




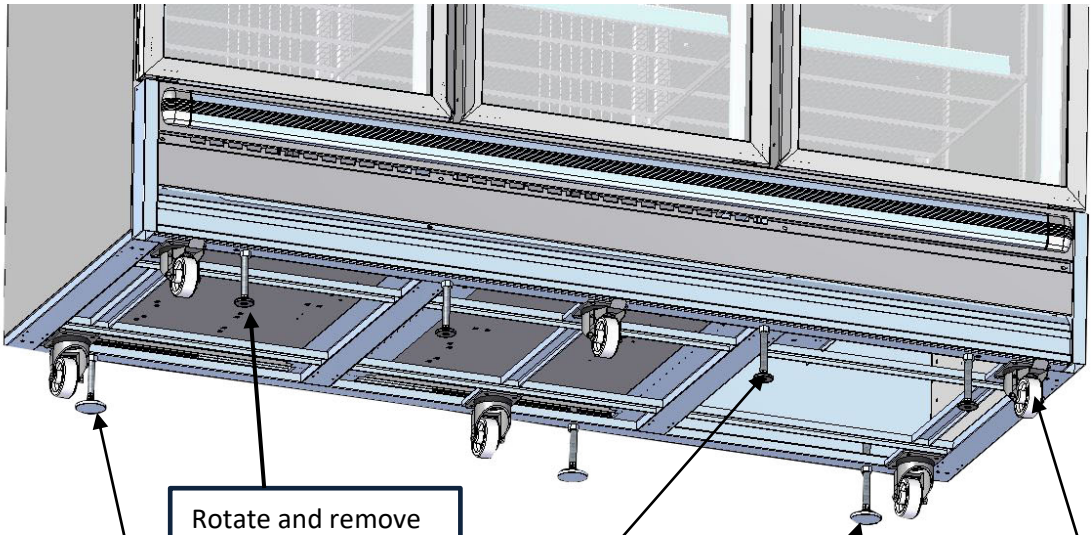
5.21 REPLACEMENT OF DEFROST HEATER



5.22 REPLACEMENT OF DOOR HANDLE



5.23 REPLACEMENT OF FEET CASTORS



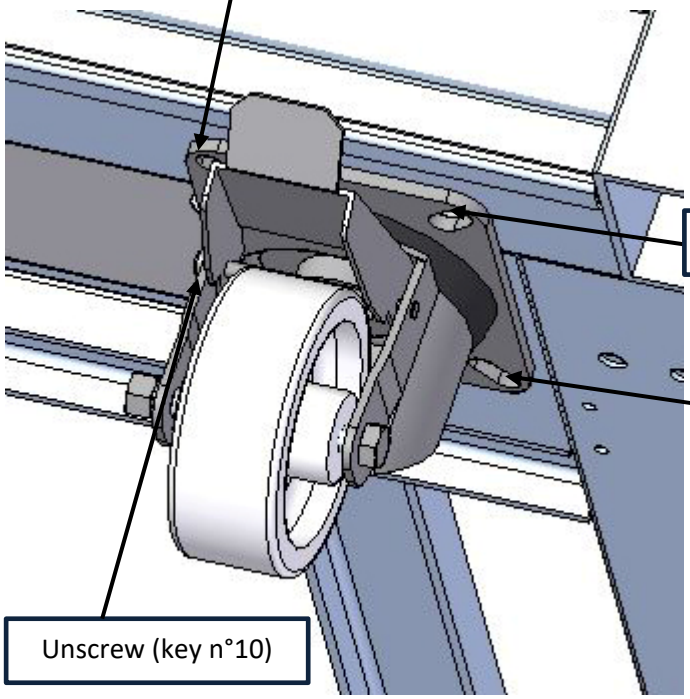
Rotate and remove

Epta code: 57185000
Model: Adjustable feet 150mm Ø60

Epta code: I0402001
Model: Pirouette wheels

Epta code: 57185000
Model: Adjustable feet 12MAX100

Epta code: I0402003
Model: Pirouette wheels with brake



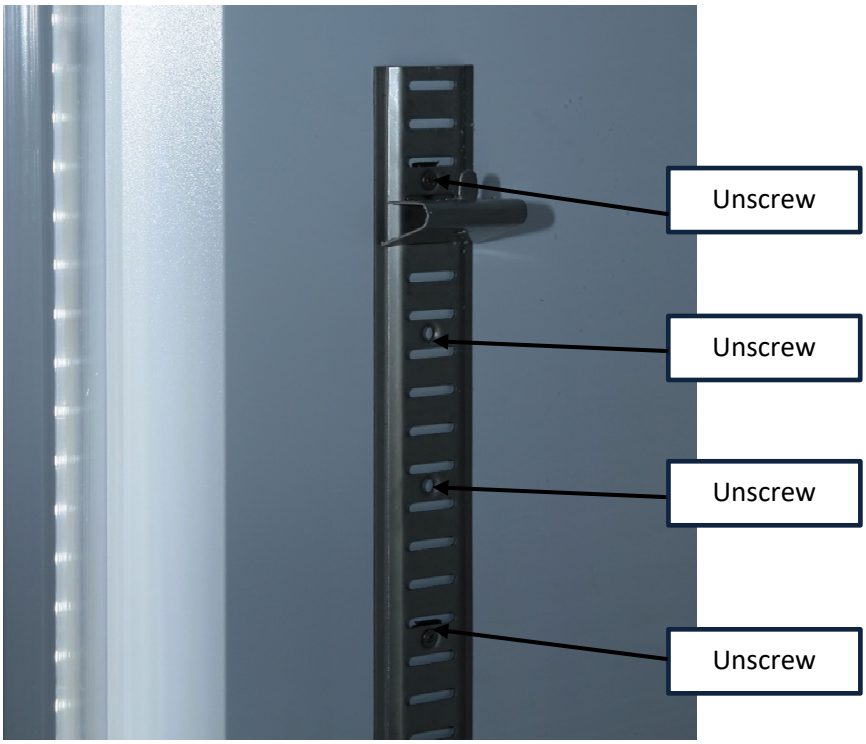
Unscrew (key n°10)

Unscrew (key n°10)

Unscrew (key n°10)

Unscrew (key n°10)

5.24 REPLACEMENT OF SHELF RACK



6. MAIN CABINET FUNCTIONS

6.1 DISPLAY UNIT AND MAIN PARAMETERS

1. Light switch
2. Automatic defrosting button
3. Button to show set temperature
4. Button to decrease temperature
5. Button to increase temperature

6.2 USE OF LEDS

SIGNAL	MODE	FUNCTION
❄	ON	Compressor enabled
	FLASHING	Anti-short cycle delay enabled
❄	ON	Defrost enabled
	FLASHING.	Drip time in progress
	ON	Fans enabled
	FLASHING	Fans delay after defrost in progress
	ON	An allarm is occurring
	ON	Continuous cycle is runnirng
ECO	ON	Energy saving enabled
	ON	Light on
AUX	ON	Auxiliary relay on
°C/°F	ON	Measurement unit
	FLASHING	Programming phase

6.3 HOW TO CHANGE A PARAMETER VALUE

To change any parameter, operate as follows:

1) Enter the Programming mode by pressing both **SET+DOWN** keys for 3 sec (the "°C" or "°F" LED will start blinking).
2) Select the required parameter and then press the **SET** key to display its value.
3) Use **UP** or **DOWN** keys to change its value.
4) Press **SET** to store the new value and move to the following parameter.

To exit: press both **SET+UP** keys or wait for 15 sec without pressing any key.
NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

6.4 EIS 165.3 N/P KW PARAMETERS

DIXELL Model : XR72CH 4N0F9 120VAC - COD. IARP 52997031									
EIS 165.3 N/P KW- COPY CARD COD. 57205000 Release 01_18									
U.M. TEMPERATURE: °F - SET POINT: 39°F									
Firmware : 1.8									
Memo :									
Group	**Parameter**	**Description**	**COPYCARD**	**Original**	**Visibility**	**Min**	**Max**	**Unity**	**Comment**
Probe	ot	Probe P1 calibration	0	0	Pr1	10,4	53,6	°F	
Probe	P2P	Probe P2 presence	Yes	Yes	Pr1				
Probe	oE	Probe P2 calibration	0	0	Pr2	10,4	53,6	°F	
Probe	P3P	Probe P3 presence	no	no	Pr2				
Probe	o3	Probe P3 calibration	0	0	Pr2	10,4	53,6	°F	
Probe	P4P	Probe P4 presence	no	no	Pr2				
Probe	o4	Probe P4 calibration	0	0	Pr2	10,4	53,6	°F	
Probe	pbC	Select probe type	ntC	ntC					
Regulation	SEt	Set point	36	-5,8		-7,6	14	°F	
Regulation	Hy	Compressor regulation hysteresis	2	44,6	Pr1	32,2	78	°F	
Regulation	LS	Set Point min	36	-22	Pr2	-68	-6	°F	
Regulation	US	Set Point max	42	14	Pr2	-5,8	302	°F	
Regulation	odS	Output delay at start up	0	1	Pr2	0	255	min	
Regulation	AC	Anti-short cycle delay	3	3	Pr1	0	50	min	
Regulation	Ac1	Starting delay 2nd compressor	1	0	Pr1	0	255	sec	
Regulation	rtr	P1-P2 percentage for regulation	100	100	Pr2	0	100		
Regulation	CCt	Continuous cycle duration	00:00	00:00	Pr2			hour	
Regulation	CCS	Set point for continuous cycle	39	23	Pr2	-67	302	°F	
Regulation	Con	Compressor ON time with faulty probe	10	8	Pr2	0	255	min	
Regulation	CoF	Compressor OFF time with faulty probe	8	6	Pr2	0	255	min	
Regulation	CF	Temperature measurement unit	°F	°C	Pr2				
Regulation	rES	Resolution (per °C) : decimal , integer	dE	dE	Pr1				
Regulation	Lod	Local dispaly : default display	P1	P1	Pr2				
Regulation	Red	Local dispaly : default display	P1	P1	Pr2				
Regulation	dLy	Display temperature delay	00:00	10:00	Pr1			min	
Regulation	dtr	P1-P2 percentage for display	100	50	Pr2	1	99		
Defrost	tdF	Defrost type : resistance , invertion	in	in	Pr1				
Defrost	dFP	Probe 1 selection for defrost	P2	P2	Pr2				
Defrost	dSP	Probe 2 selection for defrost	nP	nP	Pr2				
Defrost	dtE	Defrost termination temperature	48	15	Pr1	-67	122	°F	
Defrost	dtS	2nd Defrost termination temperature	48	57,6	Pr2	-67	122	°F	
Defrost	idF	Interval between defrost cycles	6	6	Pr1	0	120	hour	
Defrost	MdF	Maximum length for defrost	30	20	Pr1	0	255	min	
Defrost	MdS	Maximum length for 2nd defrost	0	0	Pr2	0	255	min	
Defrost	dSd	Start defrost delay	0	0	Pr2	0	255	min	
Defrost	dFd	Displaying during defrost	dEF	dEF	Pr2				
Defrost	dAd	MAX display delay after defrost	30	15	Pr2	0	255	min	
Defrost	Fdt	Draining time	4	4	Pr2	0	255	min	
Defrost	dPo	First defrost after start-up	no	no	Pr2				
Defrost	dAF	Defrost delay after fast freezing	00:00	00:00	Pr2			hour	
Fans	FnC	Fan operating mode	O-n	O-n	Pr1				
Fans	Fnd	Fan delay after defrost	6	7	Pr1	0	255	min	
Fans	FCt	Differential of temperature for forced activation of fans	0	32	Pr2	32	122	°F	
Fans	FSt	Fan stop temperature	122	122	Pr1	-67	122	°F	
Fans	Fon	Fan on time with compressor off	0	0	Pr2	0	15	min	
Fans	FoF	Fan off time with compressor off	0	0	Pr2	0	15	min	
Fans	FAP	Probe selection for fan management	P2	P2	Pr2				
Ausiliary	ACH	Type of action ausialiary regulator	cL	cL	Pr2				
Ausiliary	SAA	Set point ausialiary regulator	0	32	Pr2	-68	302	°F	
Ausiliary	SHy	Differential for ausialiary regulator	4	35,6	Pr2	32,2	78	°F	
Ausiliary	ArP	Select probe for ausialiary regulator	nP	nP	Pr2				
Ausiliary	Sdd	Block regolator AUX during defrost	no	no	Pr2				

Alarm	ALC	Configuration alarms : relative / absolute	Ab	Ab	Pr2				
Alarm	ALU	Maximum alarm temperature 1	302	122	Pr1	-58	302	°F	
Alarm	ALL	Low temperature alarm	-67	-58	Pr1	-68	-58	°F	
Alarm	AFH	Differential for temperat. alarm recovery 1	34	35,6	Pr2	32,2	78	°F	
Alarm	ALd	Temperature alarm delay 1	255	60	Pr2	0	255	min	
Alarm	dAo	Delay of temperature alarm at start up 1	0	02:00	Pr2			hour	
Alarm	AP2	Probe for temperat. alarm of condenser 2	P2	P2	Pr2				
Alarm	AL2	Alarm threshold of low temperature probe 2	-67	-67	Pr2	-67	302	°F	
Alarm	AU2	Alarm threshold of high temperature probe 2	140	140	Pr2	-67	302	°F	
Alarm	AH2	Differential for temperature alarm probe 2	36	36	Pr2	35,2	77	°F	
Alarm	Ad2	Delay alarm temperature probe 2	1	1	Pr2	0	255	min	
Alarm	dA2	exclusion alarm temperature at power-on	00:00	00:10	Pr2			hour	
Alarm	bLL	Compressor block for per low temperature alarm 2	no	no	Pr2				
Alarm	AC2	Compressor block for per high temperature alarm 2	yes	yes	Pr2				
Alarm	tba	Manual deactivation of Relay alarm	y	y	Pr2				
Alarm	AoP	Alarm output Polarity	CL	CL	Pr2				
Configuration	oA1	Configuration function exit AUX1	dEF	dEF	Pr2				
Configuration	oA2	Configuration function exit AUX2	FAn	FAn	Pr2				
Configuration	oA3	Configuration function exit AUX3	LiG	LiG	Pr2				
Digital input	i1P	Polarity digital input	cL	cL	Pr1				
Digital input	i1F	Function digital in	Es	dor	Pr1				
Digital input	did	Alarm delay from digital configurable in	0	255	Pr1	0	255	min	
Digital input	nPS	Numbers of action of preassure switch	15	15	Pr2	0	15		
Digital input	Odc	Open door control : fans and compressor	no	no	Pr2				
Alarm	rrd	Restart regulation with open door alarm	Yes	Yes	Pr2				
Energy Saving	HES	Temperature increasing at Energy Saving	-44	32	Pr2	-22	76	°F	
Other	Adr	Serial address	1	1	Pr2	1	247		
Configuration	onF	Configuration button OFF	nu	nu	Pr2				
Configuration	LPC	Configuration LIGHT function button	Lig	Lig	Pr2				
Other	Adr	Address serial	1	1	Pr2	1	244		
Other	dP1	Display probe P1	0	0	Pr2				
Other	dP2	Display probe P2	0	0	Pr2				
Other	dP3	Display probe P3	0	0	Pr2				
Other	dP4	Display probe P4	0	0	Pr2				
Other	rSE	Display regulation set (SET + ES + SETd)	0	0	Pr2				
Other	rEL	Release firmware code (read only)	0	0	Pr2				
Other	Ptb	Identify EEPROM map	1	1	Pr2	0	65535		

6.5 TEMPERATURE SETTING

Each refrigerating appliance is provided with an electronic control for automatic maintenance of the appropriate pre-established temperature inside the tank.

This temperature adjuster is gauged by the factory and should not be touched by the user.

Only if the average internal temperature is too cold or not cold you can increment or decrement the temperature:

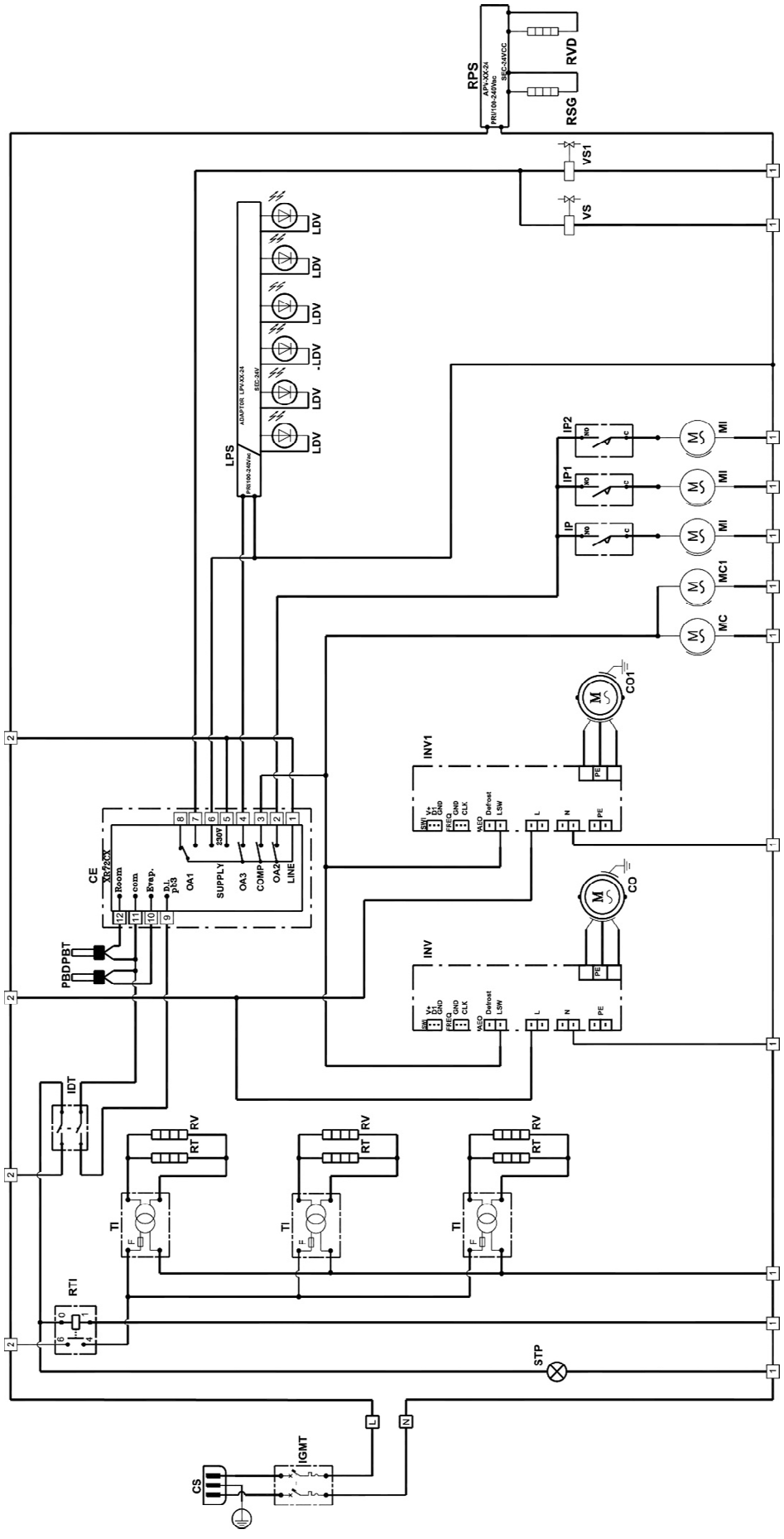
- **Press the (*Set*) (2 sec.) key** in order to see on display the temperature set point.
- **Press the (▲) key or the (▼) key** in order to increment or decrement the temperature set point.
- **Press the (*Set*) key** in order to store the **new** temperature set point.

7. WIRING DIAGRAM

7.1 WIRING DIAGRAM LEGEND

REF	DEVICE
CE	ELECTRONIC CONTROL
CO / CO1	COMPRESSOR
CS	POWER SUPPLY CORD
F	TRANSFORMER FUSE
IG	GENERAL SWITCH
IDT	POSITIVE TEMP. RANGE SWITCH
INV / INV1	INVERTER
IP / IP1 / IP2	EVAPORATOR MOTOR FAN SWITCH
LDV	INNER TANK LED LIGHT
LPS	LOD POWER SUPPLY
MC / MC1	CONDENSING MOTOR FAN
MI	EVAPORATOR MOTOR FAN
PBD	DEFROSTING PROBE
PBT	TEMPERATURE PROBE
RMI	EVAPORATOR MOTOR FAN RELAY
RTI	TRANSFORMER RELAY
RPS	HEATER POWER SUPPLY
RSG	DRAINAGE PIPE HEATER
RT	DOOR FRAME HEATER
RV	DOOR GLASS HEATER
RVD	DECOMPRESSION VALVE HEATER
STP	POSITIVE TEMP. RANGE LIGHT
TI	ISOLATION TRANSFORMER
VS / VS1	DEFROSTING VALVE

7.2 WIRING DIAGRAM

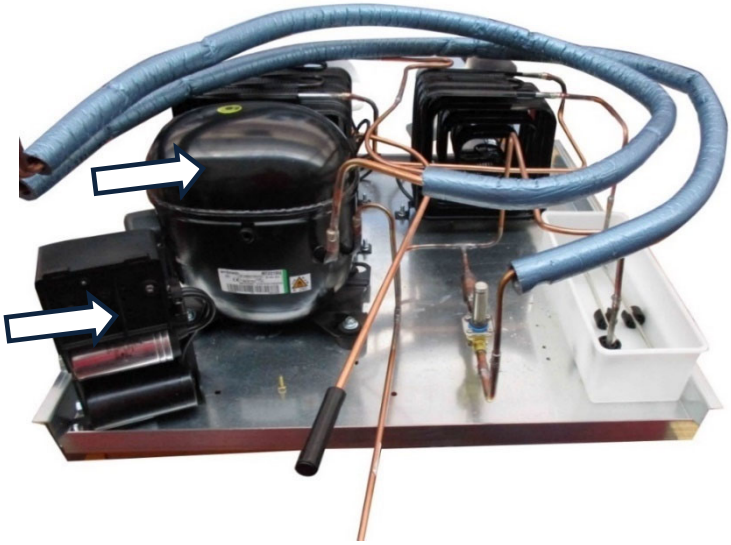


8. COMMON PROBLEM AND TROUBLESHOOTING

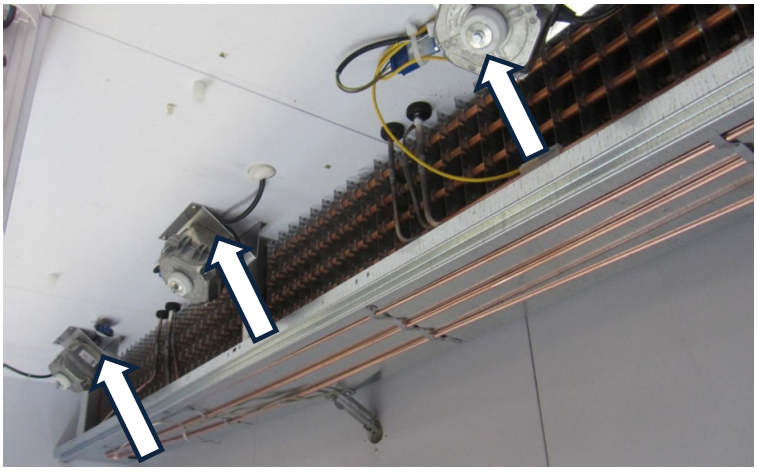
8.1 UNIT NOT IN TEMPERATURE

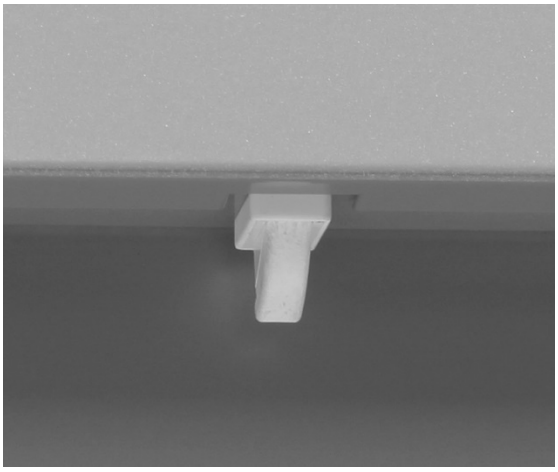
- Check controller display temperature, icons and possible alarms.

- Check compressor and inverter connections and functionality.

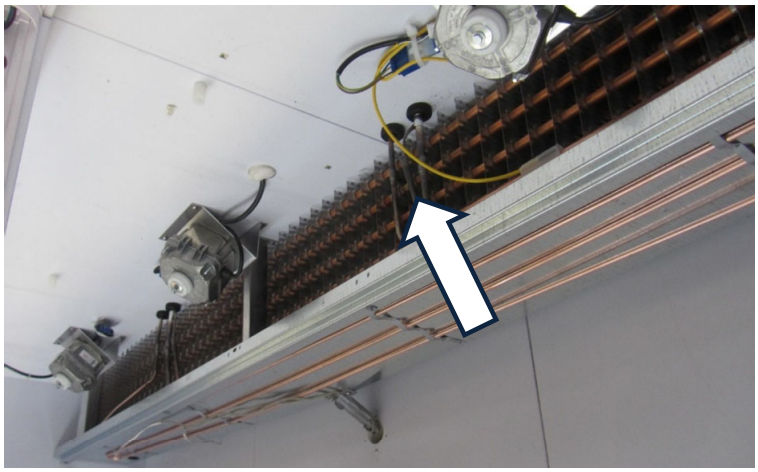


- Check that internal fans are correctly running; if not, check top switches and connectors inside the carter.

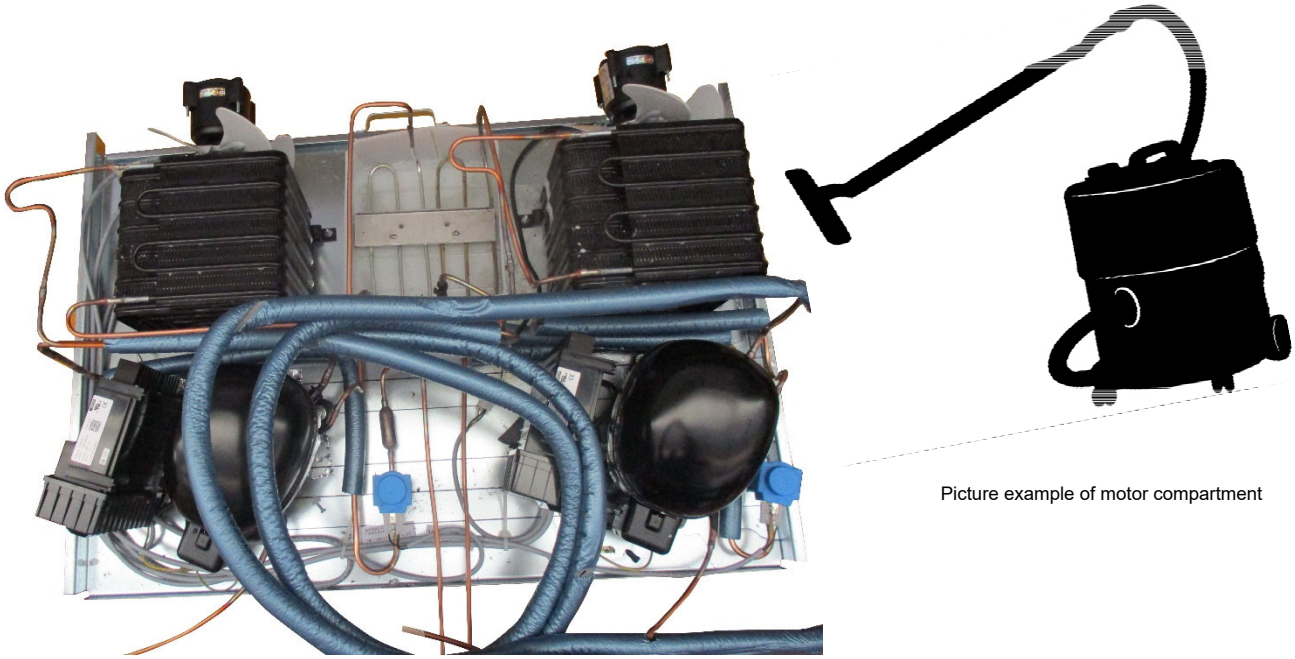




- Check evaporator status: if iced-up, the unit must be emptied, switched off and completely defrosted. check controller parameters, probes and door gaskets status.



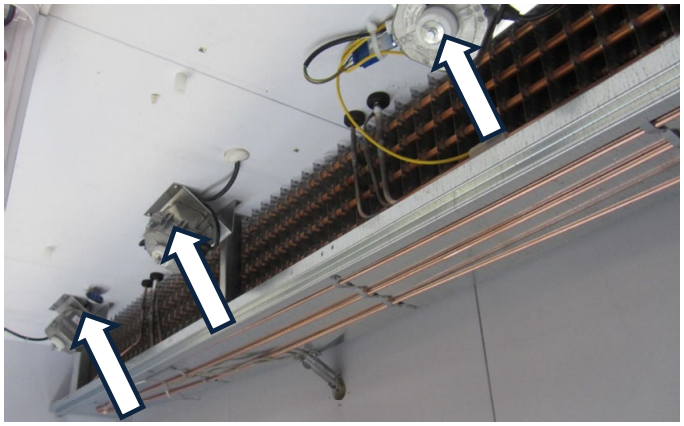
- Check condenser status: if needed, proceed in cleaning from dust (with vacuum cleaner or blower) and other materials that may affect air flow.

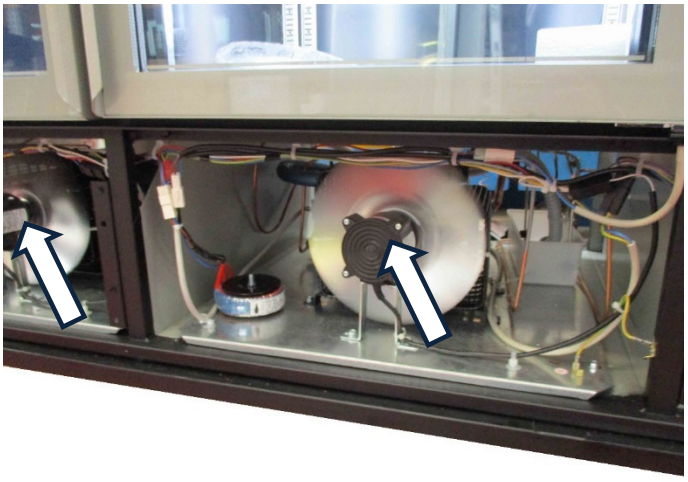


Picture example of motor compartment

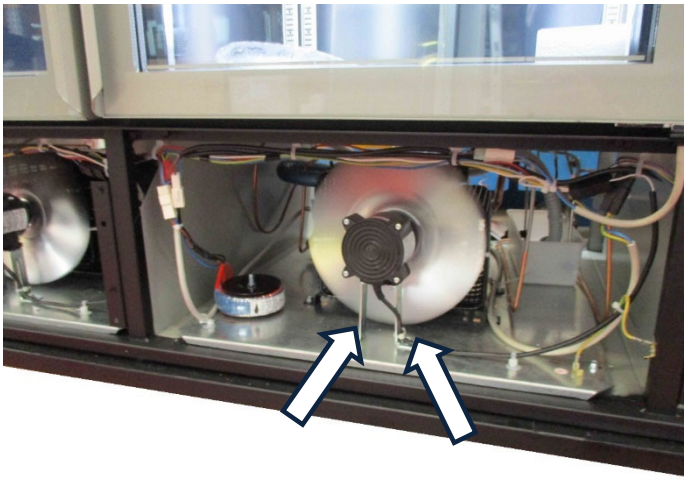
8.2 NOISY UNIT

- Check presence of abnormal objects touching fans blades both on evaporator and motor side.





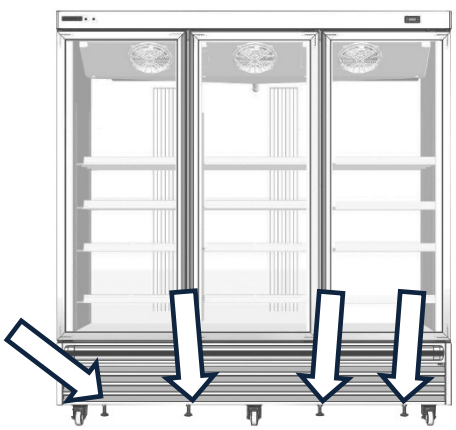
- Check presence of abnormal objects touching fans blades both on evaporator and motor side.



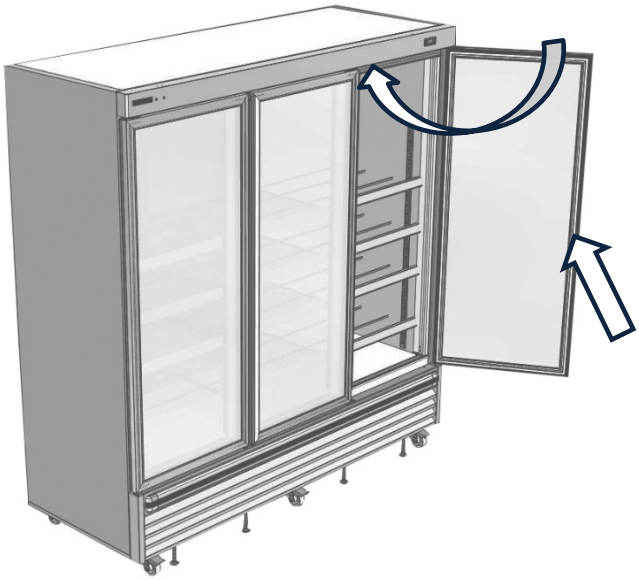
- Check interference of tubes and cables with fans blades.

8.3 PRESENCE OF WATER ON THE FLOOR OR ABNORMAL ICE INSIDE THE TANK

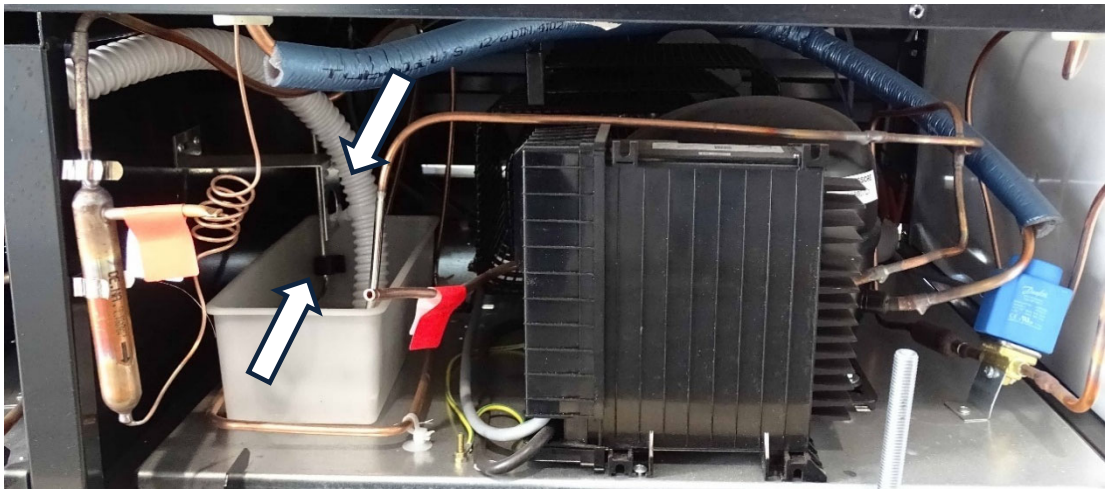
- Check alignment of the cabinet by means of adjustable feet.



- Check doors closing system and gaskets status.



- Check water drainage components (defrost tray, discharge and discharge heater inside the carter, drainage pipes and water evaporation tray inside the motor compartment).



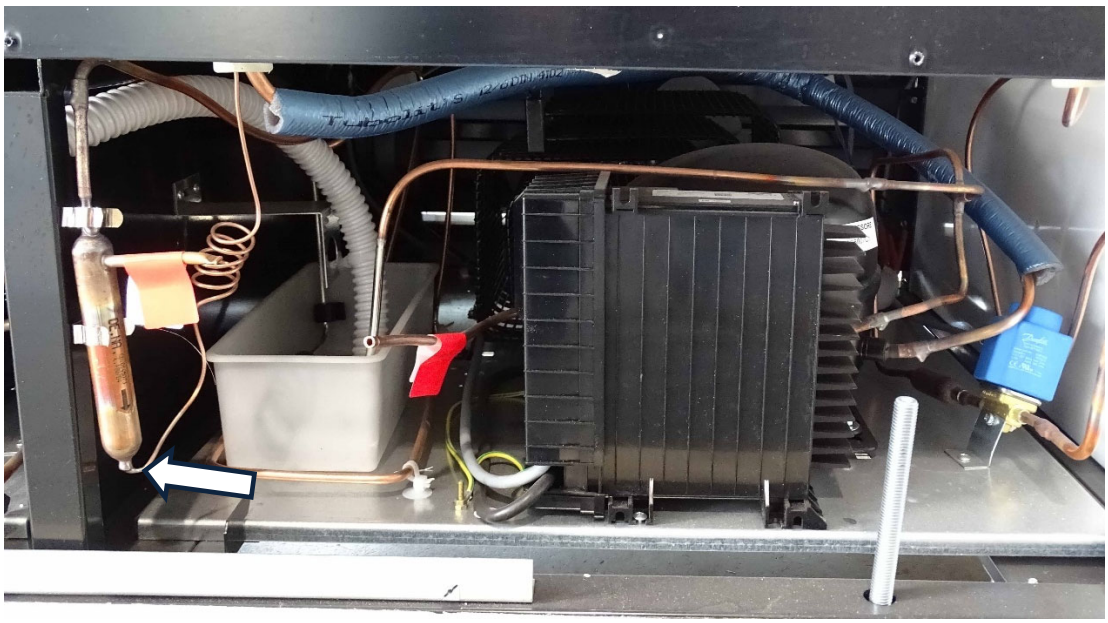
8.4 POSSIBLE PROBLEMS AFTER CIRCUIT REWORKS

- Incorrect gas charge symptoms:

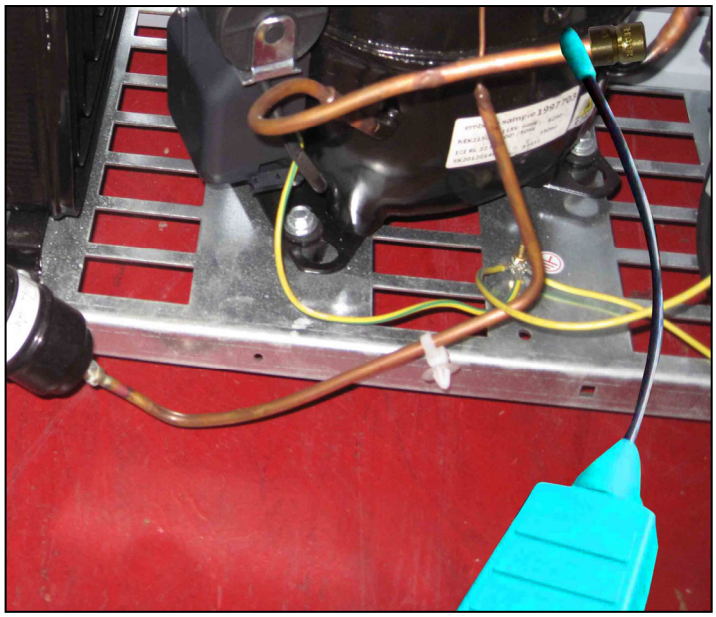
  - insufficient quantity: cold condenser, unit not in temperature or slow to pull down

  - excessive quantity: iced return line to the compressor.

- Obstruction or incorrect circuit cleaning: initial part of capillary tube shows ice or frost.



- Leakage: check with a HC-compatible detector.



8.5 INVERTER TROUBLESHOOTING

PROBLEM	*REASON*	*ACTION*
Compressor doesnt start	No cable to compressor	Check if cable is mounted correctly on compressor fusite.
	Supply voltage too low	Supply voltage must be above 90Vac
	No signal from thermostat	Check connection.
	Locked rotor	Capillary blocked? Locked rotor doesnt heat up the compressor as it is electronically detected and last less than 1 second. Blocked rotror can be seen as a
	Discharge Pressure too high	Max differential pressure 300 psi. Start attempts can be seen as short vibrations at the compressor.
	Inverter too hot	Max inverter temperature 200'F Check airflow around electronic.
Compressor stops	Temperature too high at inverter	Check air-stream from fan. Must be >= 3m/sec
	Load too high at Compressor	Condenser too hot?
	Line Voltage too low	Line voltage below 80Vac
	Signal lost from temperature controller	Cable or connector defect?
Compressor doesnt run at full speed.	Load too high	Motor torque decreases above 4000 rpm. At high load, the motor will lose speed.
	Signal not correct	Speed = signal frequency *30. Speed should increase linear between 66Hz and 150Hz
	Settings for max speed set wrong	Check with T4C if a „forbidden speed" area has been defined.
No communication with Tool4Cool (T4C)	Missing product - key	Product key must match code-number.
	Missing .enc file (parameter definition file)	.enc file must match code number + software version.
	Baud rate wrong	Baud rate setting in T4C must be 9600.

Diagnostics:

Failure reported by LED

The electronic unit has 2 LED's which can be observed when the cable cover is removed.

In case of a failure, the red LED sends a sequence of light pulses, that relates to the failure.

Number of flashes	Failure	Reason
1	Supply voltage low	105N4710:Supply voltage below 170Vac 105N4760: Supply voltage below 80Vac
2	NA	
3	Motor stop	High pressure, Locked rotor
4	Motor speed out of range	Motor speed below 2000 rpm or above 4500 rpm
5	Electronic over-heated	Insufficient airflow or load too high.
6	NTC sensor defect	Hardware failure, replace unit
7	Input signal failure	Input frequency out of range. Frequency signal either distorted or above 200Hz

Failure reported by Tool4Cool

Main Error	Sub Error		Reason
		Supply voltage low	105N4710:Supply voltage below 170Vac 105N4760: Supply voltage below 80Vac
2	0	Motor failure	High pressure, Locked rotor
2	1	Motor speed too low	Load too high
2	2	Motor speed critical low	Load too high, motor stopped
2	3	Motor speed too high	No load (system leak?)
3	0	Motor current too high	
4 5 6 7 8 9	0	Various Motor failures	Defect compressor Defect electronic
91		Electronic over-heated	Insufficient airflow or load too high.
20 21		Input signal failure	Input frequency out of range. Frequency signal either distorted or above 200Hz