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COMMERCIAL REFRIGERATOR / FREEZER

SERVICE MANUAL

K220/F220/KG220/FG220
K420/F420/KG420/FG420

Table of Contents:

Scope of this Service Manual

This service manual is made in order to aid service technicians when servicing and troubleshooting on the Compact product range, and in particular related to the electrical controller (GCC).
The service manual is **not intended to be handed to end-users**, since unintended changes of settings potentially can cause situations where the temperature inside the cabinet cannot be kept as intended (high foodstuff temperatures can occur if wrong adjustments are made).
Another side effect of making unintended changes of the controller settings, is potentially causing damage to the refrigeration system.
Changing service level parameter settings to differ from the factory default, will void the warranty!
This service manual does explain how to access the different additional controller levels related to service. These levels are:

- Entering / adjusting factory default parameter settings (adjustable if necessary)
- Entering and using the I/O test area
- How to boot the correct software on a spare part controller

How to change the controller and what to take care of while doing so.

Furthermore, this manual does explain

- The layout of the controller and the different connections including the specifications of these.

Wiring diagrams for:

- K – Models (Refrigerators with solid door)
- F – Models (Freezers with solid door)
- KG– Models (Refrigerators with glass door)
- FG – Models (Freezers with glass door)

Safety information

Warning Lacking observation to these instructions might result in accidents with personal injury

Important If these instructions are not observed, the product might be damaged or destroyed.

Be aware that Hoshizaki has taken precautions to ensure that the safety of the product is in order.

Please read carefully the following information regarding safety.

It is important, that everyone who are to use or install he product, to have access to this manual.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in as safe way and understand the hazards involved.

Children should be supervised to ensure that they do not play with the appliance.

The appliance might contain parts with sharp edges in the compressor compartment, and in the inside compartment.

The appliance is not to be transported on a sack truck, there is a danger of losing the balance, causing danger to persons.

Do not pull the power cord to disconnect the appliance, or when moving the appliance.

Cleaning and user maintenance shall not be made by children without supervision.

WARNING: RISK OF FIRE / FLAMMABLE MATERIALS

IMPORTANT NOTICE

THESE APPLIANCES CONTAINS SMALL QUANTITY OF FLAMMABLE REFRIGERANT. ALL MACHINES ARE TO BE SERVICED ONLY BY TRAINED TECHNICIANS FOR HANDLING OF HYDROCARBON REFRIGERANT.

ALL ELECTRIC COMPONENT IN THIS COOLER ARE SPARK FREE, WHILE REPLACING PLEASE ENSURE THESE ARE REPLACED WITH GENUINE AUTHENTICATED COMPONENTS.

IMPORTANT REFRIGERANT AWARENESS

WARNING

Refrigeration system charged with flammable refrigerant

WARNING: RISK OF FIRE / FLAMMABLE MATERIAL

R600a (refrigerant grade propane only)
Ensure all operatives are aware of the cabinet being charged with highly flammable refrigerant.

R600a REFRIGERANT WARNING

These appliances contain small quantity of flammable refrigerant.
All machines are to be serviced only by trained technicians for handling of hydrocarbon refrigerant.
This cooler is design to operate at 220-240VAC, 50Hz only.

WARNING: Keep clear of obstruction all ventilation openings in the appliance enclosure or in the structure for building in.

WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.

Do not allow any sharp object to come in contact with the refrigeration system to avoid damage to the refrigerant circuit.

WARNING: Do not damage the refrigeration circuit.
Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.

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- Do not place electrical items or cooking equipment nearby. Keep away from substances which could cause ignition and ensure good ventilation is always available.
- Ensure careful installing, handling and disposing to avoid safety hazards. If accidental damage occurs, keep the appliance away from open fires or devices that produce sparks, unplug the appliance and call an authorized service agent. Thoroughly ventilate the room in which the appliance is situated for several minutes.

Installation

When receiving the cabinet, check the packaging material for damage.

If any damage occurs at the packaging material, it should be considered if the cabinet might have been damaged too. If the damage is substantial, please contact your dealer.

How to remove transport pallet:
The cabinet can be lifted off the pallet to remove wooden pallet and base tray (see Fig 1 and Fig 2)

This task requires at least 2 persons

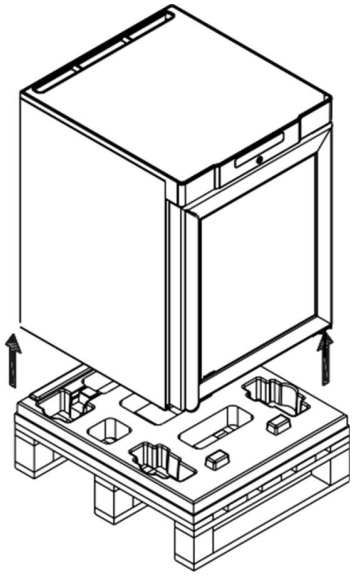


Fig.1

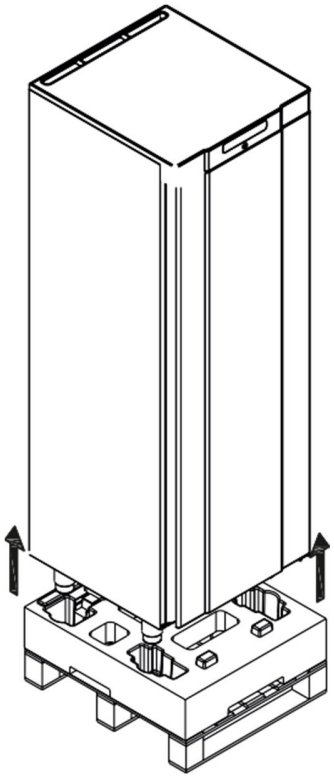


Fig.2

If the cabinet has been transported recently, it must stand upright at least 2 hours before it is started to allow the oil from the compressor to run back.

Because of the heavy weight of the product, the floor might be damaged or scratched when moving the product.

Correct set up gives the most effective operation.

The product should be located in a dry and adequately ventilated room.

To ensure efficient operation, it may not be placed in direct sunlight or against heat-emitting surfaces. The product is designed to operate in an ambient temperature between +16°C and +30°C.

Avoid placement of the product in a chlorine/acid-containing environment (swimming bath etc.) due to risk of corrosion.

Parts of the product is equipped with a protecting film, which should be removed before use.

Clean the product with a mild soap solution before use.

The set-up place must be level and horizontal

For versions with castors, the locking devices of the two front castors must be activated, when the product is in place, see Fig.3.

The base must be level, and the product may not be placed on frames or the like. For efficient closing of glass door on KG/FG models, cabinet must be leveled such that door will always get close automatically (may require some uplift from on front adjustable legs).

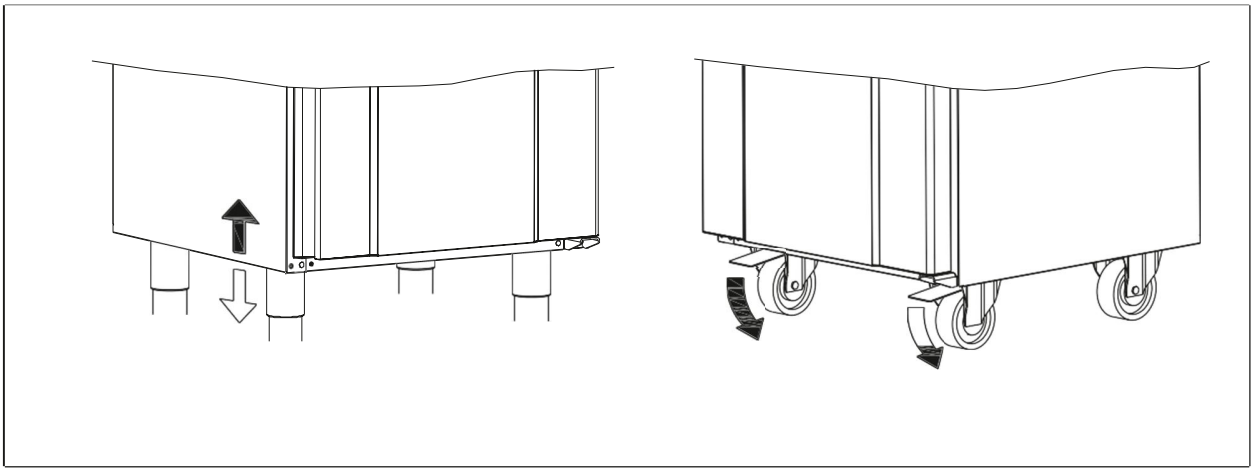


Fig.3

Cabinets equipped with a glass door, must be fastened to a stable surface to ensure the cabinet does not tilt, when the door is open. Brackets for fastening are supplied with the cabinet (fasteners not supplied, use fasteners according to wall material/type).

See how to mount brackets in Fig.4

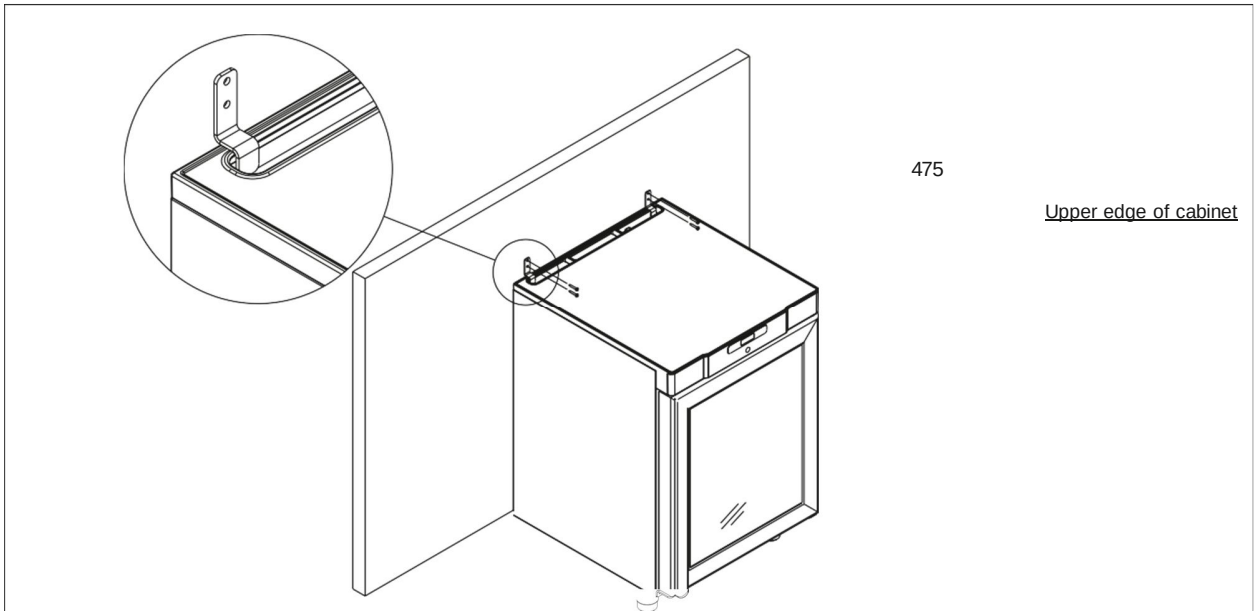


Fig.4

To ensure that user, surroundings and stored items are not injured/damaged if the cabinet tilts, these brackets must be mounted.

The cabinet can be installed freestanding, against a wall or COMPACT 220 can be built under a worktop.

The cabinet must have sufficient ventilation and free air circulation beneath, above and behind the cabinet. There must be a minimum clearance of 30 mm above the cabinet, and 20 mm at the sides (for cabinet built under worktop).

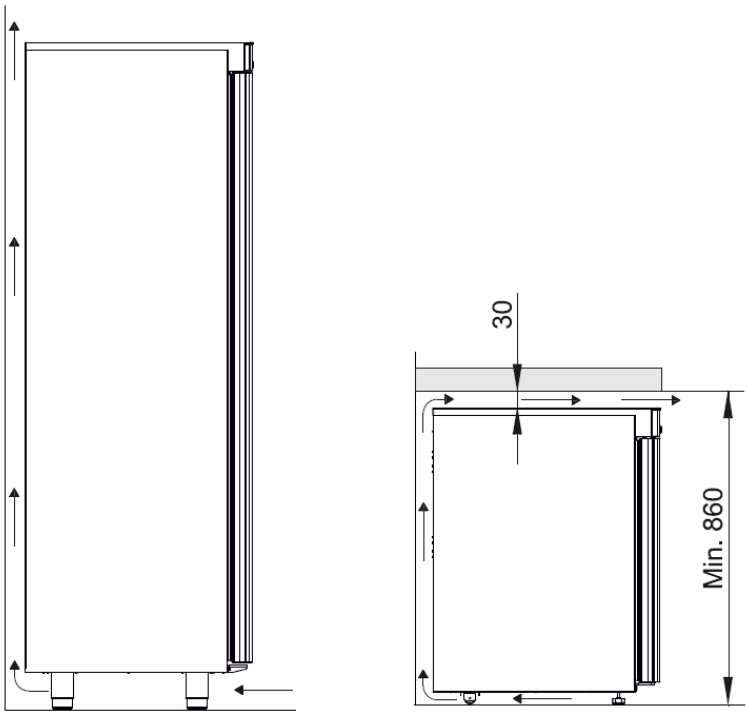


Fig.5

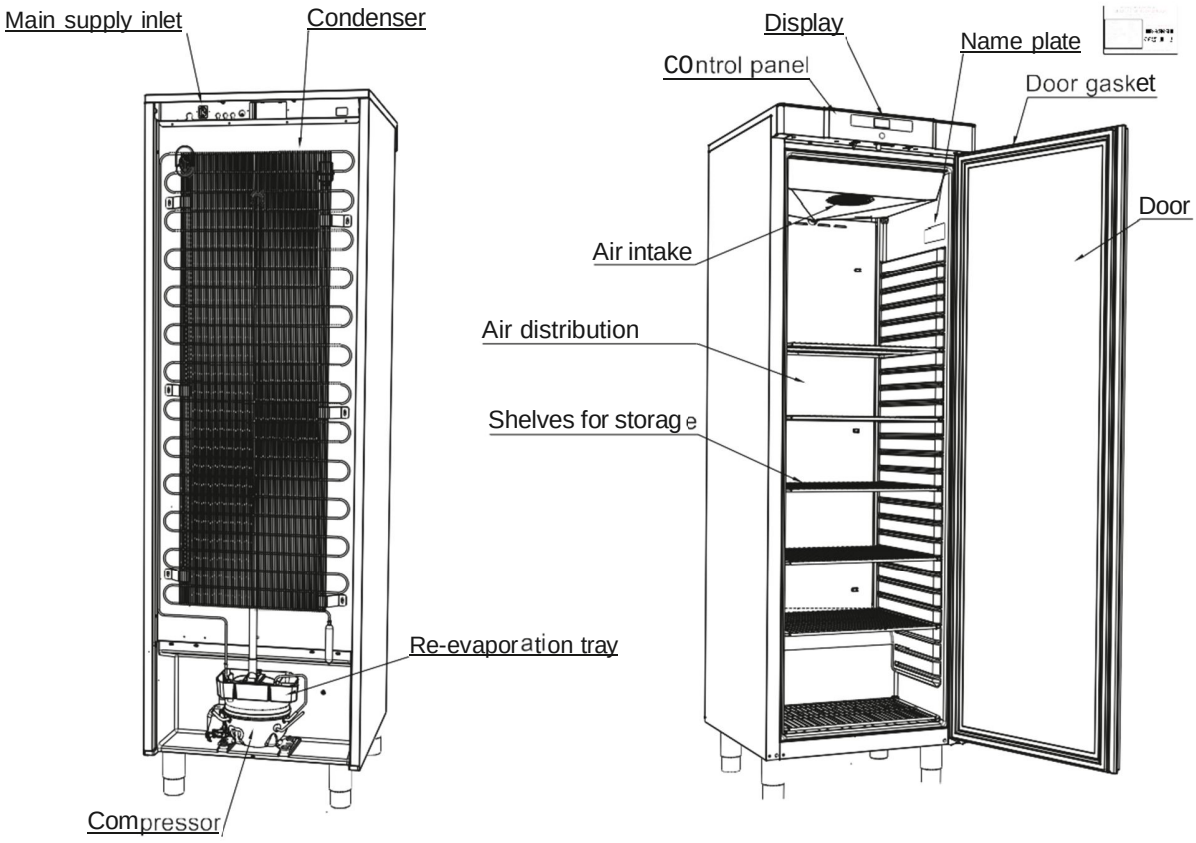
When moving to other place

- During secondary transportation or moving equipment to other places, make sure door is secured to its place.
- This will avoid sagging and door alignment issue after installation.
- Make sure there is no products are inside.
- Secure door with packing tapes to avoid rotation of door.

Optimizing the energy consumption

- Correct set up gives the most effective operation.
- The product should be located in a dry and adequately ventilated room.
- To ensure efficient operation, it may not be placed in direct sunlight or against heat- emitting surfaces. The product is designed to operate in an ambient temperature between +16° and +30°C.
- Do not keep the door open for too long.
- Do not set the temperature too low.
- The product should be placed as close as possible up against the wall.

General description



Refrigerant / GWP value

Refrigerators	Refrigerant	Charge kg	GWP	CO_2 equivalent
COMPACT K 220	R600a	0,036	3	0,11
COMPACT KG 220	R600a	0,029	3	0,09
COMPACT K 420	R600a	0,048	3	0,14
COMPACT KG 420	R600a	0,048	3	0,14
Freezers				
COMPACT F 220	R600a	0,034	3	0,10
COMPACT F 420	R600a	0,047	3	0,14
COMPACT FG 220	R600a	0,034	3	0,10
COMPACT FG 420	R600a	0,047	3	0,14

Electrical Connection

Read the text below thoroughly before electrical connection. Connect the power cord found at the back of the cabinet to main supply inlet (see fig.6).

The product is intended for connection to alternating current. The connection voltage (V) and frequency (Hz) are shown on the name plate in the cabinet (see Fig.6). Only the supplied cord is to be used.

Never use an extension cord for this appliance! If a wall socket is placed in a longer distance than a length of the supplied power cord, contact an electrician to establish a wall socket within the range of the supplied power cord.

If the product is defective, it must be examined by a properly skilled technician with proper knowledge of the product during the warranty period.

Outside the warranty period, it is advisable to use the service advised by your dealer. If this is not a case, assistance is required from a properly skilled technician with proper knowledge of the product.

Recommended to install protective device externally at installation site: MCB6A

Always disconnect the power if interruptions in power supply occur, and when electrical parts are removed/put on, and before cleaning and maintenance of the product.

Repairing of electrical/technical parts may only be performed by properly skilled technicians with proper knowledge of the product.

If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

Do not use the product before all coverings are installed, so that live or rotating machine parts cannot be touched.

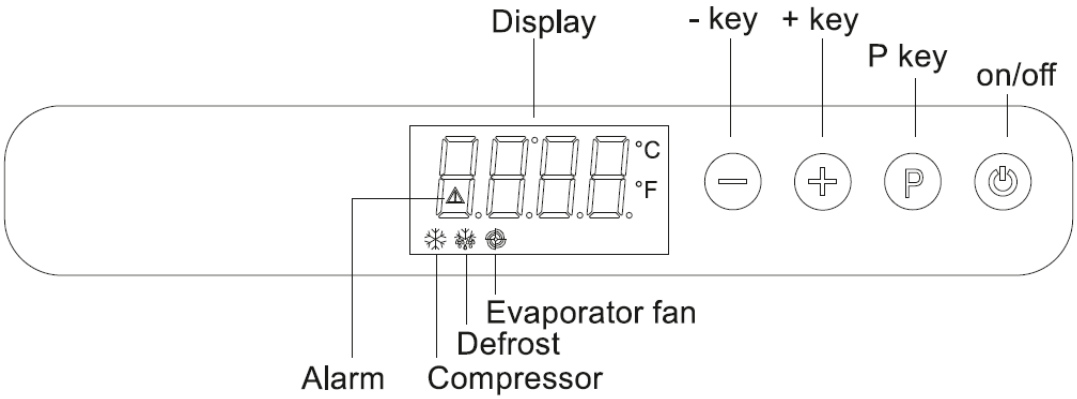
The product is not to be used outdoor.

All earthing requirements stipulated by the local electricity authorities must be observed. The plug and wall socket should then give correct earthing. If necessary, contact an electrician.

Make sure the product is switched off at the socket before service is performed on electrical parts. It is not sufficient to switch off the product by the 16 START/STOP key as there will still be voltage to some electrical parts of the product.

Starting up

Display



Connect the cabinet to main power

To turn on the cabinet, push for 2 seconds.
The display shows the actual cabinet temperature, and indicates that power is connected.
The cabinet is turned off likewise, by pushing for 2 seconds

Control lights

The following control lights are located at the display.

Compressor. This LED is on while the compressor is running. Flashes during temperature setting.

Defrosting. This LED is turned on during defrosting cycle.

Evaporator fan. This LED is turned on while the evaporator fan is running.

Alarm. This LED is turned on if an alarm occurs. See chapter on temperature alarm and errors.

Temperature setting

The temperature is set as follows:

Push the P button, the compressor lamp flashes.

Push + or − to set the temperature.

Push P again to save the set value. The compressor lamp

Temperature alarm

The controller is equipped with a temperature alarm, which constantly monitors the cabinet temperature. The ⚠ lamp lights, if an alarm has occurred.

The following alarms can be displayed.

AL low temperature alarm

AH high temperature alarm

Id open door alarm

Displaying alarm values:

Push the ⊖ button, and keep pushed for 1 second. Push ⊕ or ⊖ until “LS” is displayed. Now, push Ⓟ and one of the alarm codes above is displayed. Use the ⊕ or ⊖ button to select the wanted value. Push Ⓟ again, and the alarm values are displayed.

Example —alarm AH

8.0 the temperature alarm value is 8.0 C

Dur alarm duration

h01 the alarm lasted for 1 hour (continues)

n15 and 15 minutes

AH selected alarm value

Each value is displayed alternately for approx. 1 second.

To exit the alarm menu, push ⏻ and the selected alarm is displayed (in this example ⏻ ”AH”). Push again, and the current cabinet temperature is displayed.

Deleting alarms:

Push’ ⊖ and keep pushed for 1 second. Push ⊕ or ⊖ until “rLS” is displayed. Now push Ⓟ then push ⊕ or ⊖ within 15 seconds and set “149”.

Push  again, and the display flashes “- - - -” for 4 seconds. The alarms are now deleted, the  LED is turned off, and the controller returns to temperature display.

Error codes:

Pr1 If error Pr1 is displayed, it means that the temperature sensor is defect. Request service assistance. In the meantime, the cabinet will aim to maintain the set temperature.

Pr2 If error Pr2 is displayed, there are problems with the evaporator sensor. The sensor should be replaced as soon as possible. Request service assistance.

Defrosting:

K/KG 220/420:

Defrosting is automatically performed 4 times every 24 hours, by circulating the air inside the cabinet during compressor standstill periods. The defrost LED lights to indicate the defrosting cycle is running.

F/FG 220/420:

Defrosting is automatically performed 4 times every 24 hours, by a heating element mounted at the evaporator coil.

Manual defrosting:

If the cabinet is operating under severe load (frequent door opening and frequent replenishment), manual defrosting can become necessary

Manual defrosting is performed as follows:

Push  for 4 seconds, and defrosting is started. The defrost LED.  lights to indicate the defrosting cycle is running.

 Do not use sharp or pointed objects to accelerate the defrosting process.

Defrost water:

The cabinet produces water during defrosting, which is led into a tray in the compressor compartment. A re-evaporation pipe from the refrigeration system, placed in the tray, re-evaporates the water.

It is recommended to clean the tray and water trap when necessary - at least once a year. Remember to disconnect the cabinet before cleaning.

Be careful not to damage the re-evaporation pipe during cleaning.

Service parameters

The service parameters are set in the following way:

Keep ⊕ and ⊖ pressed, the display shows "**PA**".

Push Ⓟ, "**0**" is displayed. The value "**0**" is set by pushing ⊕ or ⊖ until "**-19**" is displayed (password for parameter setting).

Next, push Ⓟ, "**PA**" is displayed again.

Keep ⊕ and ⊖ pressed, the display shows the first parameter "**SP**".

Use the ⊕ and ⊖ keys to select the various parameters. Push Ⓟ to display the set value, changing the values are don by pushing ⊕ and ⊖. Save the settings by pushing Ⓟ.

To exit the parameter setting, push ⊕ and ⊖ for more than 4 seconds, or do not operate for 60 seconds.

Restoring default settings

To reset the controller to factory default settings:

Keep ⊕ and ⊖ pressed, the display shows "**PA**".

Push Ⓟ, "**0**" is displayed. The value "**0**" is set by pushing ⊕ or ⊖ until "**149**" (password for reset to default settings).

Next, push Ⓟ, "**PA**" is displayed again.

Keep ⊕ and ⊖ pressed "**def**" is displayed

After pushing Ⓟ "**0**" is displayed.

The value "**0**" is changed by pushing ⊕ or ⊖ to "**1**", next, push Ⓟ again.
The display will show "**dEF**" flashing for 4 seconds. The current temperature is displayed, and default settings are now restored.

Configuration parameter:

Sr.	Display on controll	Parameters	Min.	Max.	UOM	Chiller	Freezer
SET POINT							
1	Set	Working set point; see also r0 (Set point room temp., see r0)	r1	r2	°C/°F (1)	4.0	-20.0
MEASUREMENT INPUTS							
2	CA1	Offset cell probe (Offset room sensor)	-25.0	25.0	°C/°F (1)	**0**	**0**
3	CA2	Offset evaporator probe	-25.0	25.0	°C/°F (1)	**0**	**0**
4	P1	Celsius grade decimal point (for size displayed during normal operation) Decimal point 1=yes	0	1	----	**0**	**0**
5	P2	Temperature unit of measurement (2) 0=c° Temp.unit: 0=°C, 1=°F	0	1	----	**0**	**0**
6	P3	Evaporator probe function; 0 = probe absent (not connected); 1 = defrosting probe and probe for evaporator fan thermostatisation (defrost/evaporator fan) 2 = probe for evaporator fan thermostatisation (Defrost) 3 = cell probe also works as defrosting probe	0	3	----	**1**	**1**
7	P5	Filter for cabinet temperature display	0	15	----	**3**	**3**
8	P6	Set point differential (Hysteresis)	0	1	----	**1**	**1**
9	P8	Delay in display of variations in temperature detected by the probes, Delay of temp. display	0	250	ds	**5**	**5**
OPERATIONS							
10	r0	Working set point differential - Hysteresis	0.1	15	°C/°F (1)	2	2
11	r1	Minimum working set point - Min. set point temperature	-99.0	r2	°C/°F (1)	1	-25
12	r2	Maximum working set point - Max. set point temperature	r1	99.0	°C/°F (1)	12	-5
13	r3	Locking of working set point calibration (using the procedure described in paragraph 5.2) 1=yes	0	1	----	0	0
14	r4	Value of set Increase after energy saving cycle activation (Temperature increase during Energy saving (see l10))	0	99	----	0	0
15	r5	Decrease in temperature during Overcooling function; see also r6	0	99	°C/°F (1)	0	0
16	r6	Duration of Overcooling function; see also r5	0	240	min	30	30
COMPRESSOR PROTECTION SYSTEM							
17	C0	Delay in switching on of compressor after the instrument switches on (3) Compressor delay after power interruption	0	240	min	2	2
18	C1	Minimum time between two consecutive compressor start-ups; also delay in compressor start-up after conclusion of cell probe error ; overuled by C2+C3; Min. time between 2 compressor starts	0	240	min	5	5
19	C2	Minimum duration of compressor switch off time (4) Min. time between compressor stop and new start	0	240	min	3	3
20	C3	Minimum duration of compressor switch on time	0	240	sec	180	180
21	C4	Duration of compressor switch off during cell probe error (code “Pr1”); see also C5 Duration, compressor stop on room sensor error	0	240	min	10	10
22	C5	Duration of compressor switch on during cell probe error (code “Pr1”); see also C4 Duration, compressor operation on room sensor error	0	240	min	10	10

Sr.	Display on controll	Parameters	Min.	Max.	UOM	Chiller	Freezer
DEFROSTING							
23	d0	Defrosting interval (only if d8 = 0, 1 or 2) (8) 0= never activated (no defrost)	0	99	hr	6	6
24	d1	Type of defrosting 0= ELECTRIC - during defrosting the compressor will remain off and the defrosting output will be activated; evaporator fan activity will depend on parameter F2; 1=BY HOT GAS - during defrosting the compressor will be switched on and the defrosting output will be activated; evaporator fan activity will depend on parameter F2; 2=VIA STOPPING OF COMPRESSOR - During defrosting the compressor will remain switched off and the defrosting output will remain deactivated; evaporator fan activity will depend on parameter F2	0	2	----	2.0	0.0
25	d2	Evaporator temperature at end of defrosting (only if P3 = 1); see also d3 valid if P3=1	-99.0	99.0	°C/°F (1)	5	10

26	d3	if P3 = 0 or 2, defrosting duration;
		if P3 = 1, maximum defrosting duration;
		see also d2; 0= defrost will be never activated
			0	99	min	90	60

27	d4	Defrosting when instrument is switched on (only if d8 = 0, 1, 2 or 3) (3) 1=yes	0	1	----	0	0
28	d5	If d4 = 1, Delay in activation of defrosting after instrument is switched on ; see also i5 (3) if d4=0 minimum time between switching on and defrost activation	0	99	min	0	0
29	d6	Temperature displayed during defrosting 0 = cell temperature 1 = if at the time of defrosting activation, the cell temperature is lower then the " working set point + r0", at most working set point + r0 if at the time of defrosting activation the cell temperature is higher than the working set point +r0 at the cell temperature when the defrosting is activated	0	1	----	1	1
30	d7	Dripping duration	0	15	min	0	2
31	d8	Defrosting activation methods 0 = AT INTERVALS - defrosting will be activated once the instrument has been running for a certain amount of time, designated as d0 1 = AT INTERVALS - defrosting will be activated once the compressor has been switched on for time d0 2 = AT INTERVALS - defrosting will be activated once the evaporator temperature has been below temperature d9 for time d0 (10) 3 = IN TEMPERATURE - defrosting will be activated when one of the following conditions is present (10): - condition 1: “cell temperature - evaporator temperature” difference will have been higher than temperature d10 for time d12; see also d13 - condition 2: the temperature of the evaporator will have been below temperature d9 for time d14	0	3	----	0	0
32	d9	Evaporator temperature is higher than that at which the defrost interval counter is suspended (only if d8 = 2 or if d8 = 3 and for condition 2)	-99	99	°C/°F (1)	0	0
33	d10	“Cell temperature - Evaporator temperature” difference higher than that at which defrosting is activated; see also d12 (only if d8 = 3 for condition 1)	-99	99	°C/°F (1)	15	15
34	d11	Defrosting alarm switches off once maximum time limit has been reached (code “dFd”; only if P3 = 1 and in absence of an evaporator probe (code “Pr2”) 1 = SI	0	1	----	0	0
35	d12	Minimum consecutive time between the difference in the “cell temperature - evaporator temperature”, the difference must be higher than d10 in order for defrosting to be activated (only if d8 = 3 and for condition 1)	0	99	min	30	30
36	d13	Minimum time between two consecutive defrosting periods (only if d8 = 3 and for condition 1)	1	240	min	1	1
37	d14	Defrosting interval (only if d8 = 3 and for condition 2) 0 = defrosting for condition 2 will never be activated	0	240	min	30	30
38	d15	Minimum time that the compressor must be switched on before defrosting can be activated (only if d1 = 1) (11)	0	99	min	0	0

Sr.	Display on controll	Parameters	Min.	Max.	UOM	Chiller	Freezer
ALARMS							
39	A0	Temperature associated with the minimum temperature alarm (code "AL"), 0 = cell temperature 1 = evaporator temperature (12)	0.0	1.0	----	0.0	0.0
40	A1	Temperature below that at which the minimum temperature alarm is activated (code "AL"); see also A0, A2 and A11	-99.0	99.0	°C/°F (1)	-10.0	-10.0
41	A2	Type of minimum temperature alarm (code "AL"), 0 = alarm absent 1 = relative to working set point (that is "working set point - A1"; consider A1 without sign) 2 = absolute (that is A1)	0	2	----	1.0	1.0
42	A4	Temperature higher than that at which the maximum temperature alarm is activated (code "AH"); see also A5 and A11	-99	99	°C/°F (1)	10	10
43	A5	Type of maximum temperature alarm (code "AH"), 0 = alarm absent 1 = relative to working set point (that is "working set point + A4"; consider A1 without sign)) 2 = absolute (that is A4)	0	2	----	1	1
44	A6	Delay in maximum temperature alarm (code "AH") after the instrument is switched on (3)	0	240	min	120	120
45	A7	Temperature alarm delay (code "AL" and code "AH")	0	240	min	60	60
46	A8	Delay in maximum temperature alarm (code "AH") following the conclusion of evaporator fan (13)	0	240	min	15	15
47	A9	Delay in maximum temperature alarm (code "AH") following the disactivation of the door micro switch input (14)	0	240	min	15	15
48	A11	Differential of parameters A1 and A4	0.1	15	°C/°F (1)	2	2
EVAPORATOR FAN							
49	F0	Evaporator fan activity during normal operation 0 = switched off 1 = switched on; see also F13, F14 and i10 2 = in parallel with the compressor; see also F9, F13, F14 and i10 3 = dependent on F1 (16) 4 = switched off if the compressor is switched off, dependent on F1 if the compressor is switched on (16)	0	4	----	1	1
50	F1	Evaporator temperature above the limit at which the evaporator fan is switched off (only if F0 = 3 or 4); see also F8	-99	99	°C/°F (1)	-1.0	-1.0
51	F2	Evaporator fan activity during defrosting and dripping 0 = switched off 1 = switched on (setting parameter d7 to 0 is recommended) 2 = dependent on F0	0	2	----	1	0
52	F3	Maximum duration of evaporator fan disactivation after dripping; see also F7	0	15	min	0	2
53	F7	Evaporator temperature to activate fans during the fan stop phase (relative to working set point, that is "working set point + F7"); see also F3	-99	99	°C/°F (1)	0	0
54	F8	Parameter F1 differential	0.1	15	°C/°F (1)	2	2
55	F9	Delay in the switching off of evaporator fan following the switching off of the compressor	0	240	sec	0	0
56	F13	Time the evaporator fan remains turned off during function Energy Saving; see also F14 and i10 (only if F0 = 1 or 2)	0	240	min	5	5
57	F14	Time the evaporator fan remains turned on during function Energy Saving; see also F13 and i10 (only if F0 = 1 or 2)	0	240	min	1	1

Sr.	Display on controll	Parameters	Min.	Max.	UOM	Chiller	Freezer
DIGITAL INPUTS							
58	i0	Effect caused by the activation of the door micro switch input; see also i4 0 = no effect set this value if you are not using digital input all other will be meaningless 1 = the compressor and evaporator fan will be switched off (at most for time i3 or until the input is disactivated (19) 2 = the evaporator fan will be switched off (at most for time i3 or until the input is disactivated)	0	5	----	2	2
59	i1	Type of door micro switch input contact 0 = normally open (active input with closed contact) 1 = normally closed (active input with open contact)	0	1	----	0	0
60	i2	Delay in signaling of door micro switch input alarm (code “id”) -1= the alarm will not be signaled	-1	120	min	10	10
61	i3	Maximum duration of the effect caused by activation of the door micro switch on the compressor and the evaporator fan, -1= the effect will last until the input is disactivated	-1	120	min	-1	-1
62	i4	Storage of door micro switch input alarm (code “id”) (20) 1 = SI	0	1	----	0	0
63	i10	Time without activations of the door switch input (on condition that the cabinet temperature has reached the working set point) in order that function Energy Saving is activated automatically (it has effect on the evaporator fan only if F0 = 1 or 2) 0 = the function will never automatically be activated	0	999	min	1	1
SERIAL NETWORK (MODBUS)							
64	LA	instrument address	1	247	----	247	247
65	Lb	baud rate 0 = 2,400 baud, 1 = 4,800 baud, 2 = 9,600 baud, 3 = 19,200 baud	0	3	----	2	2
66	LP	parity 0 = none, 1 = odd, 2 = even	0	2	----	2	2

How to replace Evaporator Fan Motor

1. Unscrew the dew collector 3 screws as shown in fig 6.
2. Dew collector rested on inner box liner slot as shown in fig 7, remove it
3. Open dew collector and unscrew 2 screw of fan Motor as shown in Fig. 8 and remove 12VDC Fan motor from dew collector.
4. Remove fan motor connector from controller board.
5. Replace new 12VDC fan motor and refit dew collector vice versa.

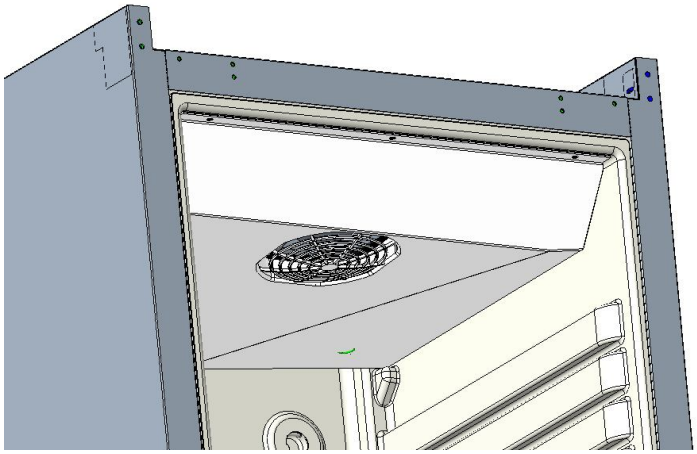


Fig. 6

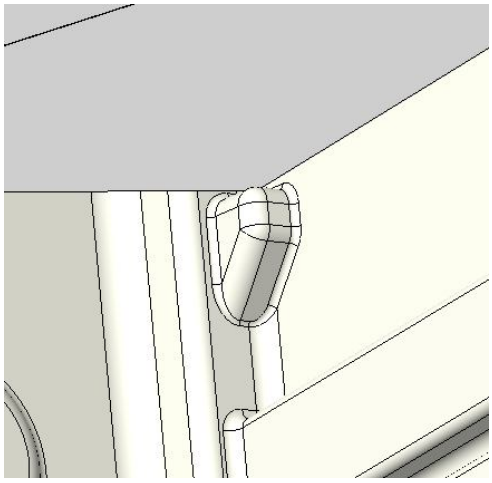


Fig. 7

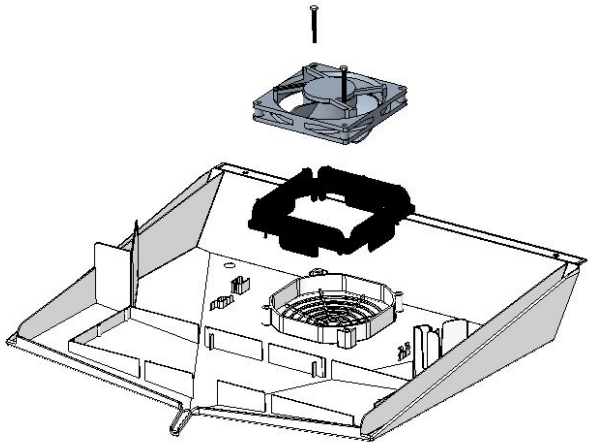


Fig. 8

How to replace Foil Heater

1. Switch off the main switch and remove plug from socket.
2. Unscrew the dew collector 3 screws as shown in fig 6.
3. Dew collector rested on inner box liner slot as shown in fig 7, remove it.
4. Open dew collector and remove foil heater from foil heater plate as shown in Fig. 9 and remove foil heater from dew collector. (FOIL HEATER 210/410 34.5W)
5. Remove foil heater wire connector from controller board.
6. Replace new foil heater ((FOIL HEATER 210/410 34.5W) and refit dew collector vice versa.

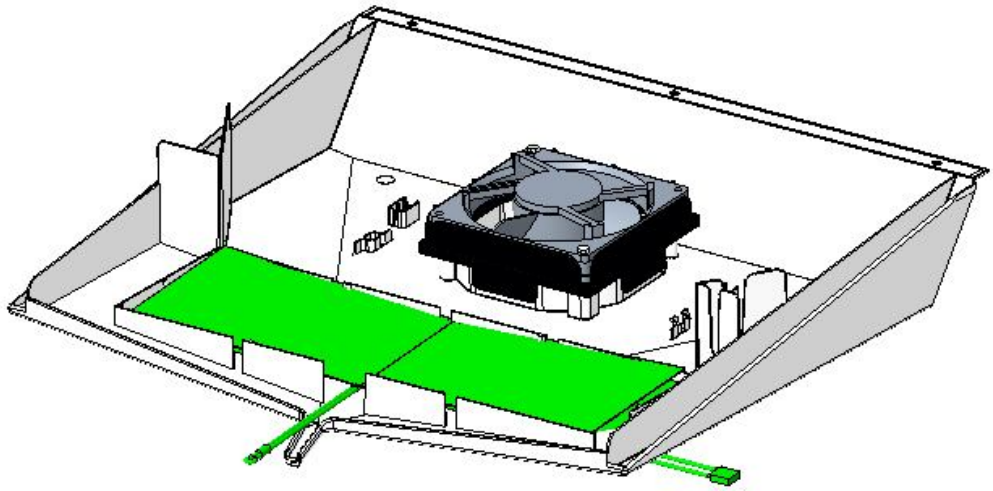


Fig. 9

How to replace Drip Tray

1. Switch off the main switch and remove plug from socket.
2. Remove tray by pulling outside as shown in figure 10
3. Be careful not to damage the re-evaporation pipe during remove tray.
4. Replace new drip tray.

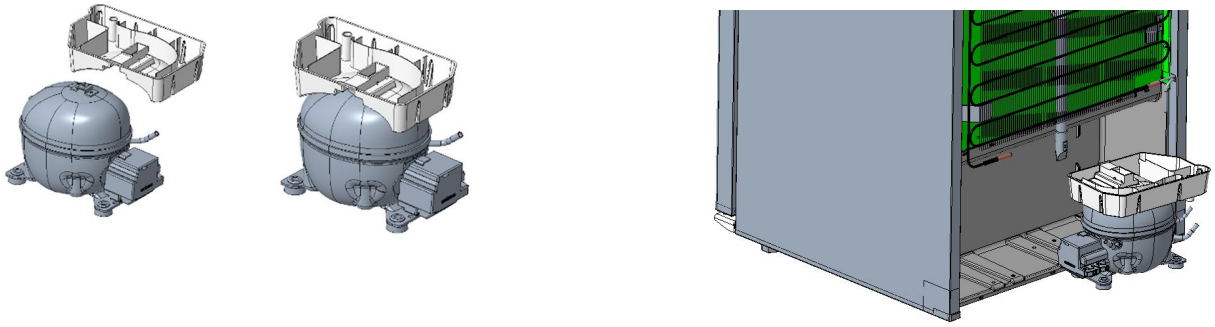


Fig. 10

Reversing the door (Applicable to K and F models)

The door can be changed from right hand hinged to left hand hinged, or vice versa.

1. Switch off the power at the mains socket.
2. Dismantle the four screws that hold the control panel (table top assembly) at front and back, pull the panel a little forward, and then tilt it upwards.
3. Dismantle the top hinge from position A, and lift off the door.
4. Dismantle the bottom hinge from position B, and mount it at position D.
5. Move the hinge cover plate from position C to position A.
6. Turn the door 180°, and fix it at the hinge position D

7. Mount the top hinge that removed from position A to position C.
8. Fasten the control panel again. Apply power to the cabinet again.

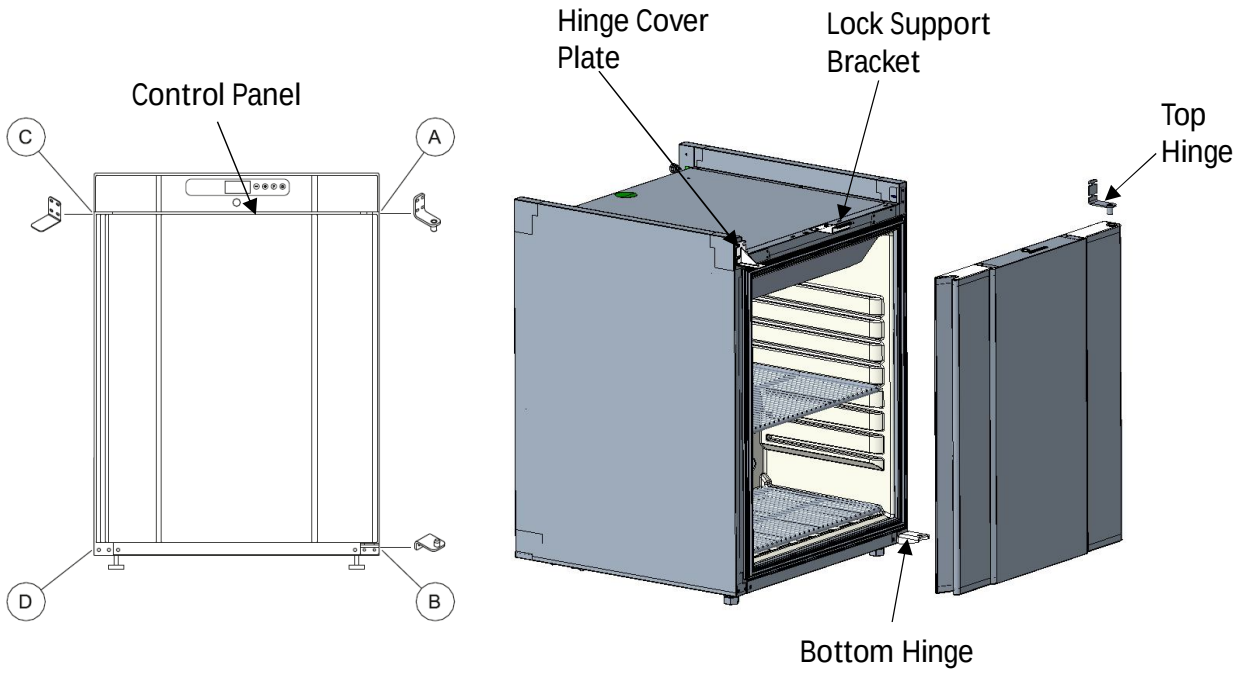


Fig. 11

Reversing the glass door (Applicable to KG and FG models)

The door can be changed from right hand hinged to left hand hinged, or vice versa.

1. Switch off the power at the mains socket
2. Dismantle the four screws that hold the control panel (table top assembly) at front and back, pull the panel a little forward, and then tilt it upwards.
3. Remove the connection from LED harness to the driver in control panel. Put this LED harness inside the door frame cavity.
4. Dismantle the top hinge from position A, and lift off the door.
5. Exchange the position of top hinge plate with torsional hinge pivot in the door.

6. Pull the LED harness from the door frame cavity (loose harness is kept inside frame) as shown in Figure 13.
7. Dismantle the bottom hinge from position B, and mount it at position D.
8. Turn the door 180°, and fix it at the hinge position D
9. Move the hinge cover plate from position C to position A and mount the top hinge to position C.
10. Reconnect the connection of the LED harness with the harness from LED driver.
11. Fasten the control panel again. Apply power to the cabinet again.

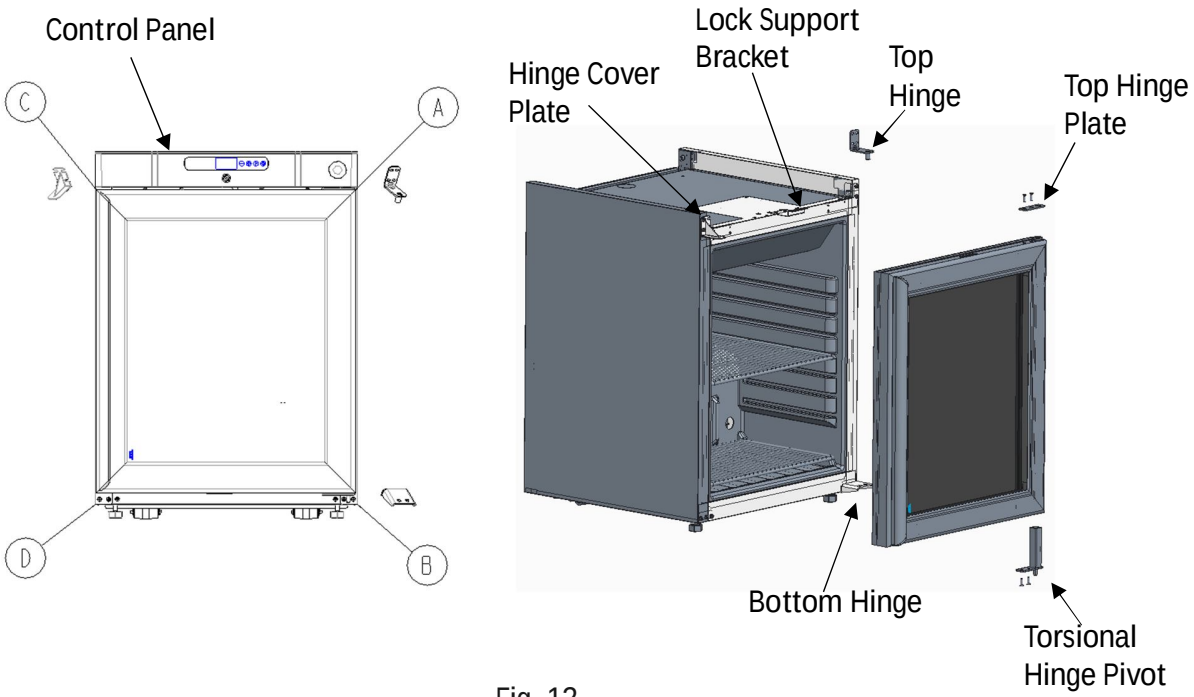


Fig. 12

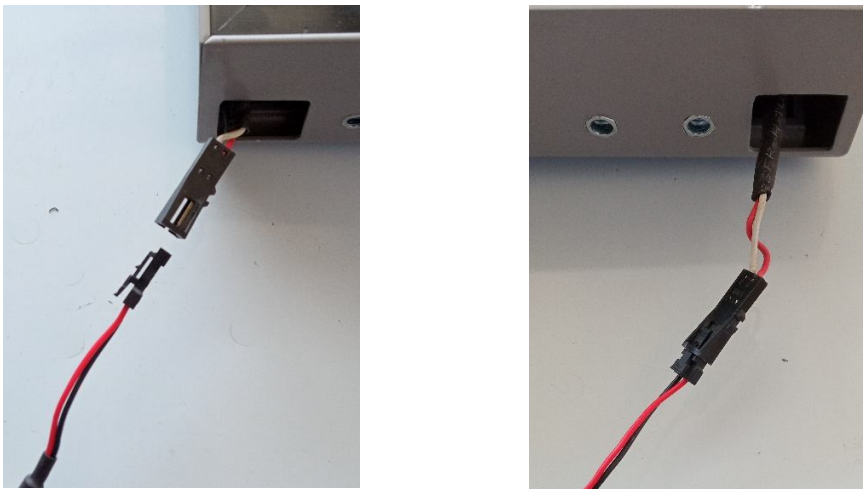


Fig. 13

How to replace Condenser Coil

1. Switch off the power at the mains socket.
2. Remove screws of condenser coil as shown in figure 12
3. Remove brazing joint as shown in figure 14
4. Remove condenser and replace new condenser and refax vice versa.

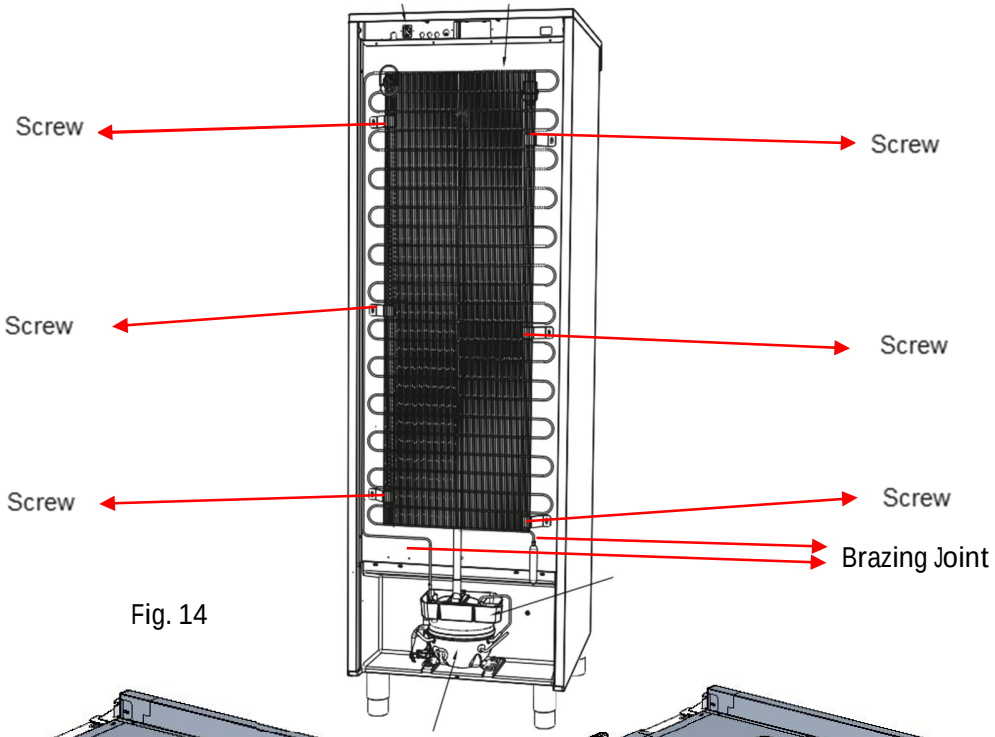


Fig. 14

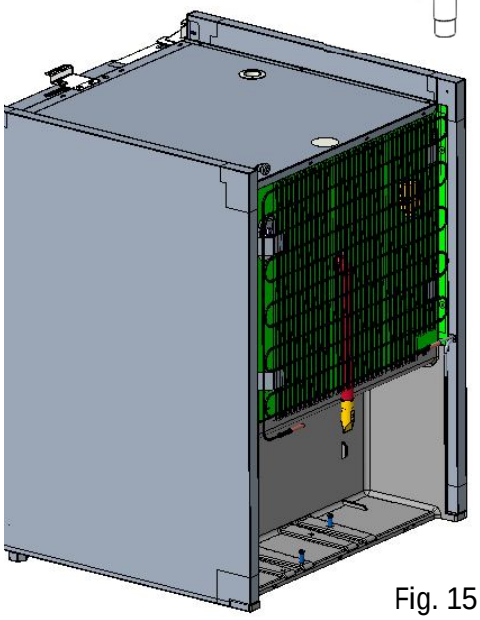


Fig. 15

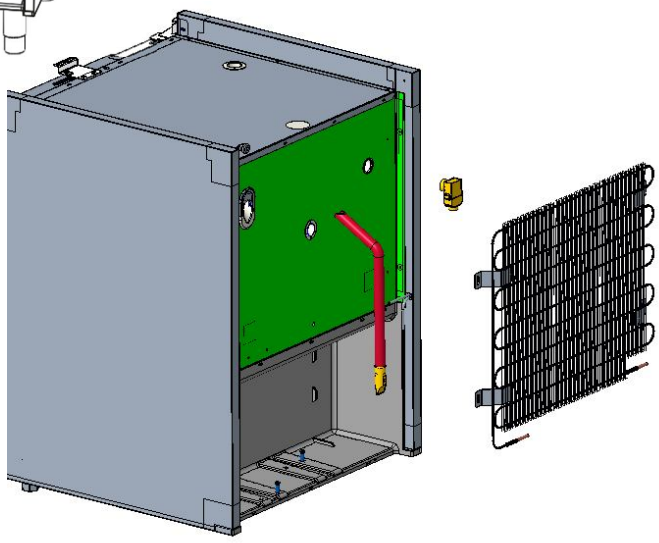


Fig. 16

How to replace Evaporator Coil

1. Switch off the power at the mains socket.
2. Remove the dew collector as shown in figure 6
3. To remove evaporator, condenser has to be removed first and suction tubbing should be made straight,
4. Remove coil by sliding on front side shown in figure 17
5. Pull down evaporator outside as shown in figure 18
6. Replace new evaporator, while replacing suction pipe needs to be bend down from rear by using hand tool.
7. Refit the new evaporator and make procedure vice versa.

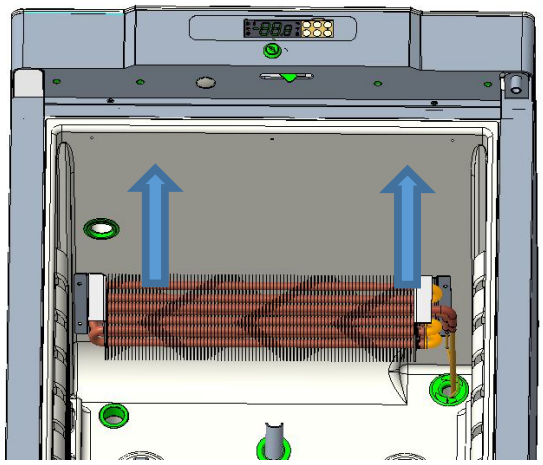


Fig. 17

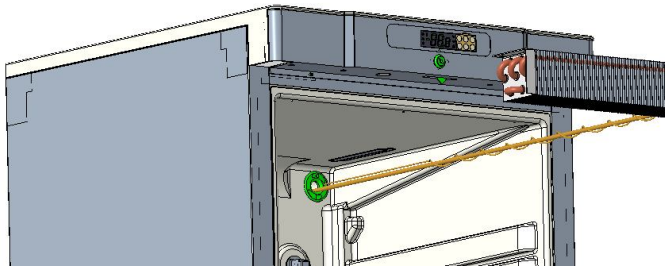


Fig. 18

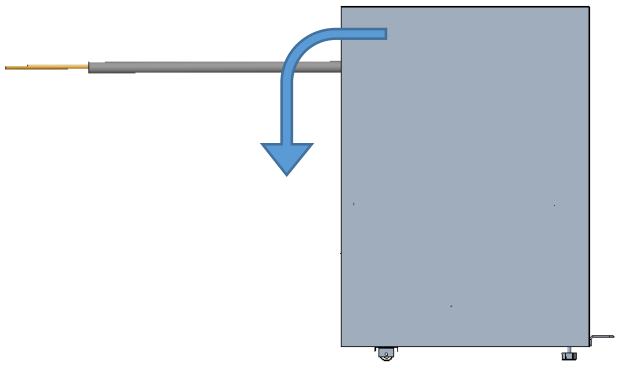


Fig. 19

How to replace Controller Board

1. Remove 2 screws of top cover as shown in figure 20
2. Open the panel as shown in figure 21.
3. Remove all connector from EVCO controller as shown in Fig 22.
4. Remove mounting screws along with controller cover plate.
5. Replace new EVCO controller and refit the panel vice versa.
6. In any case controller cover plate is not available, please add in assembly sequence to protect controller from lock lever assembly.

Note: - There is no need to set program. All program is already factory set.

Note: - Ensure proper connections, any misconnection controller damage or Probe damage.

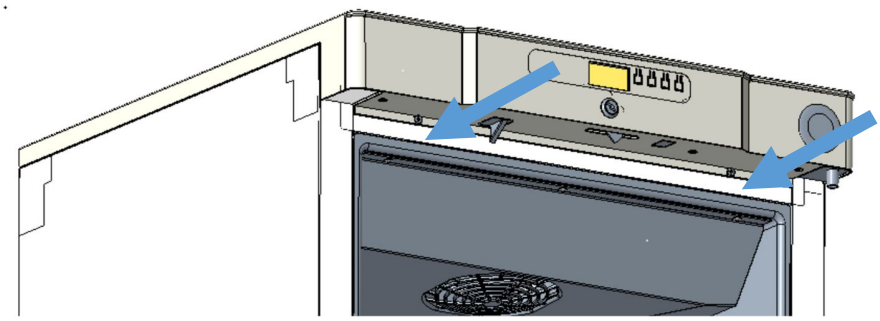


Fig. 20

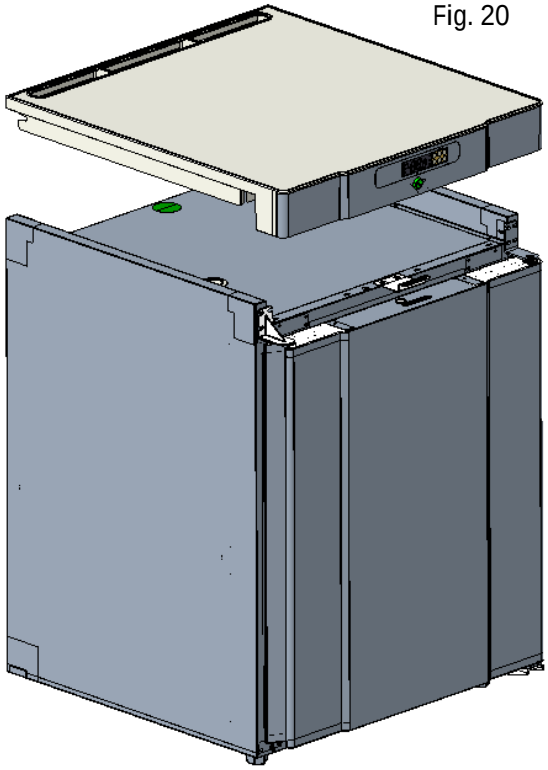


Fig. 21

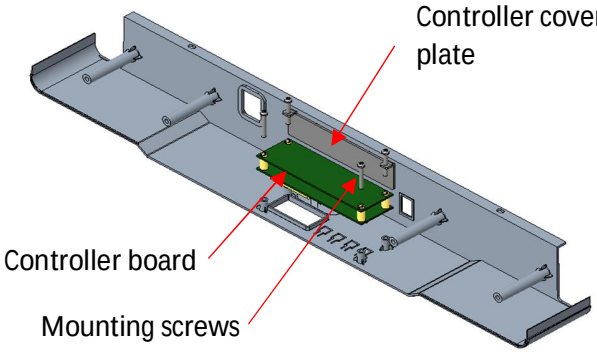


Fig. 22

How to replace Defrost Heater

1. Unscrew dew collector screw as shown in figure 23.
2. Remove defrost heater clip (7 Nos.) as shown in figure 24.
3. Remove wire connector (White).
4. Remove heater and replace new heater.
5. Reconnect wire connector and clips and refit the dew collector vice versa.

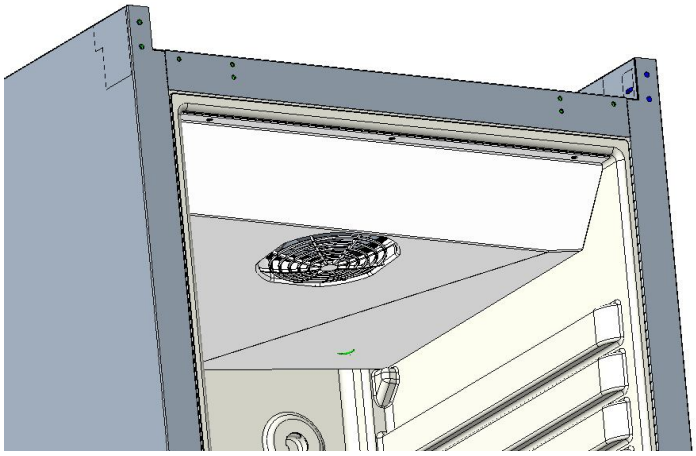


Fig. 23

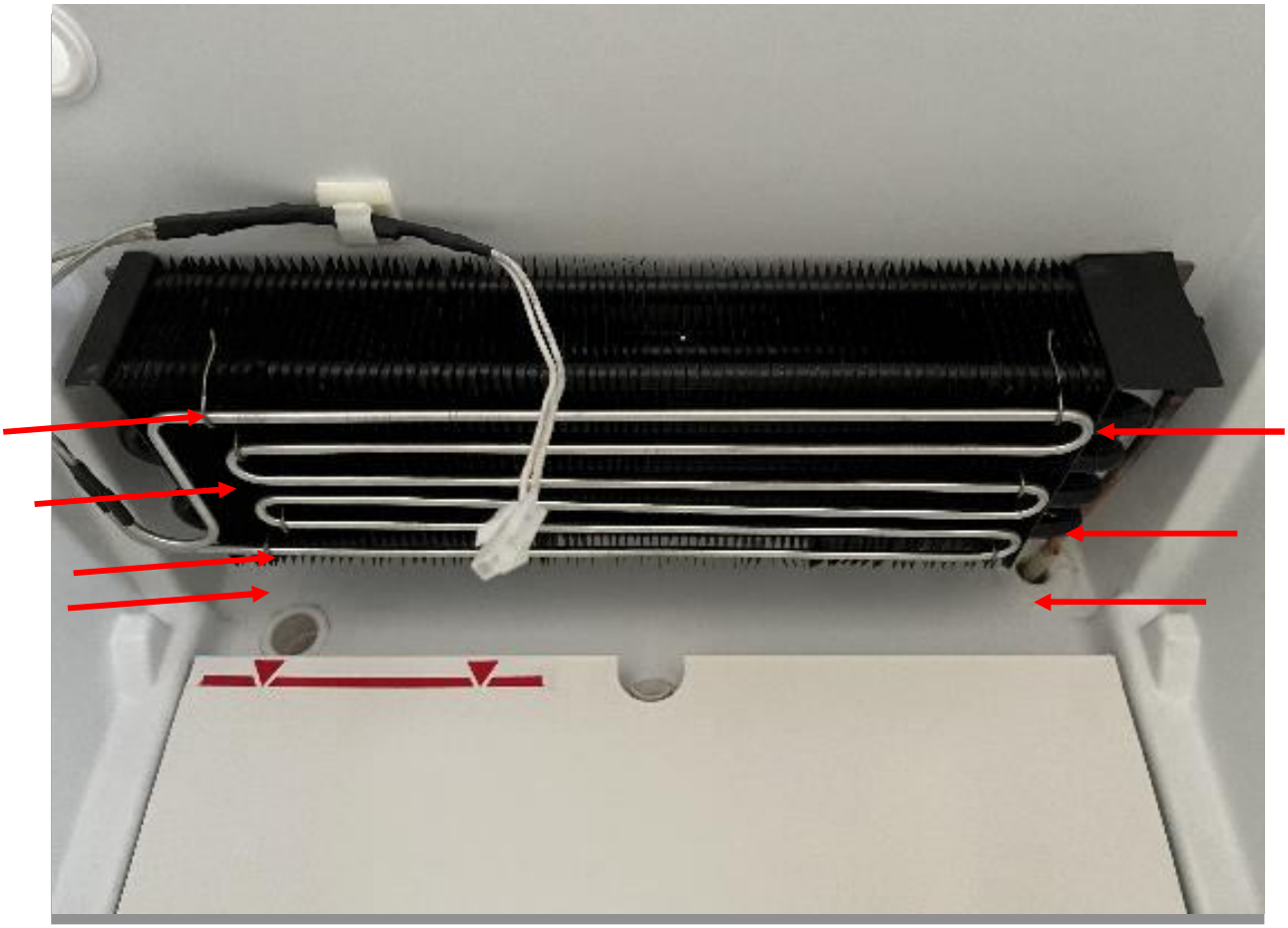


Fig. 24

Controller Connections

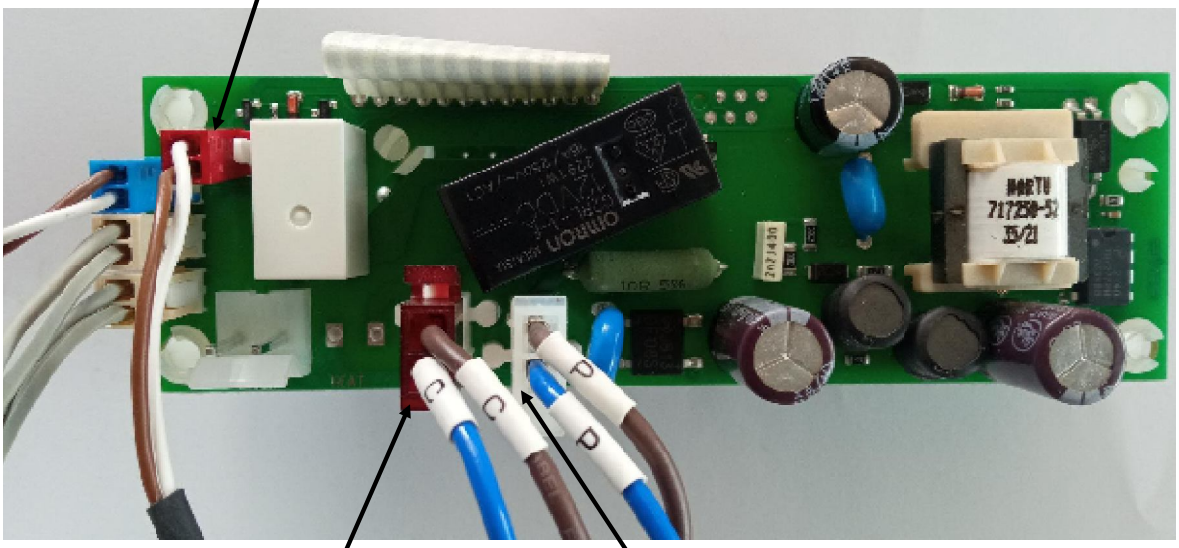


Fig 25

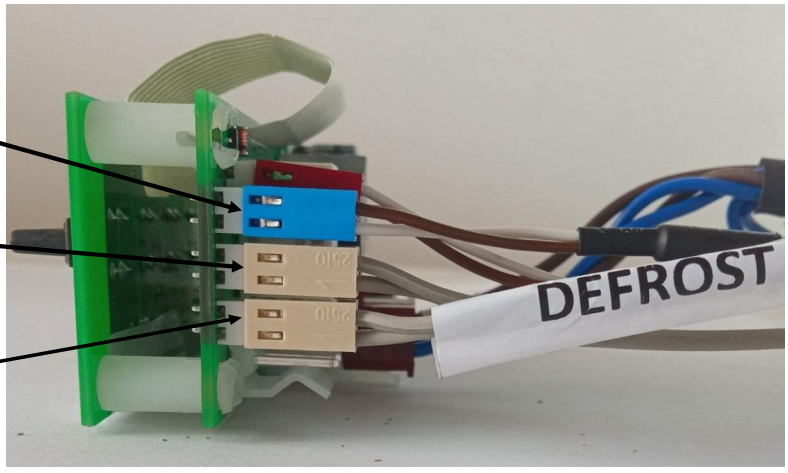


Fig 26

Evaporator Sensor Location

The evaporator sensor is positioned as indicated by arrow in the below figure.

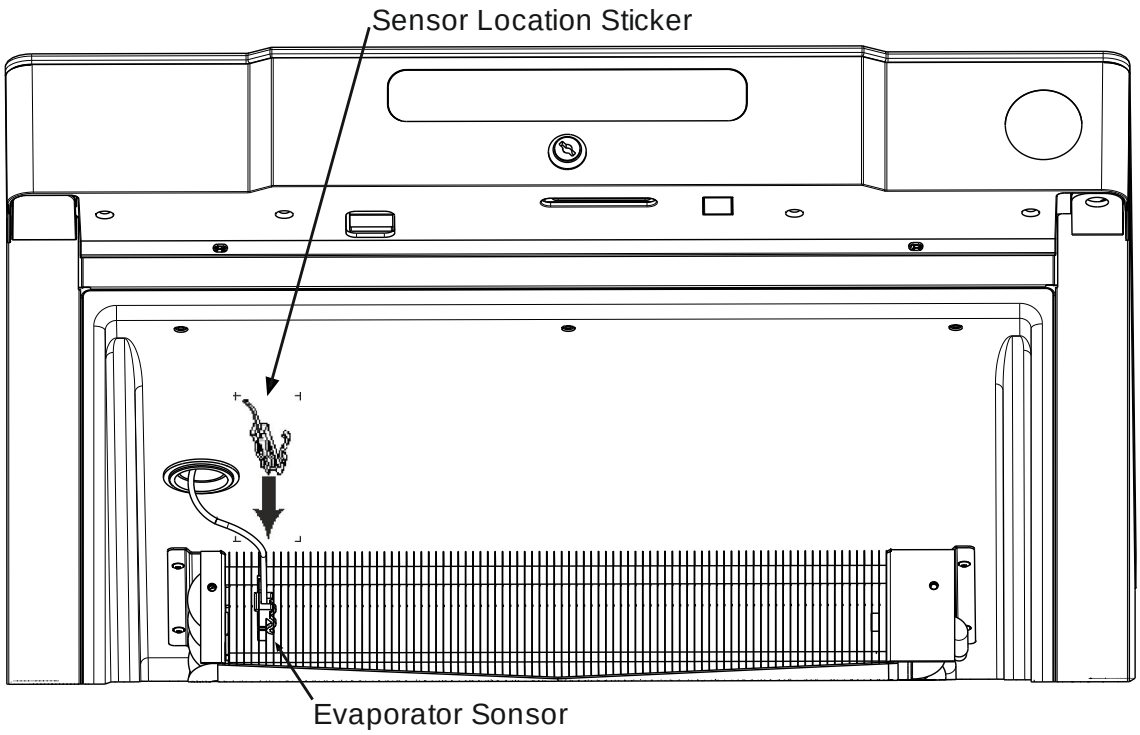


Fig 27

Air Duct Removal

1. Switch off the power at the mains socket.
2. Remove the shelves.
3. Remove air duct by pressing the air duct mountings.

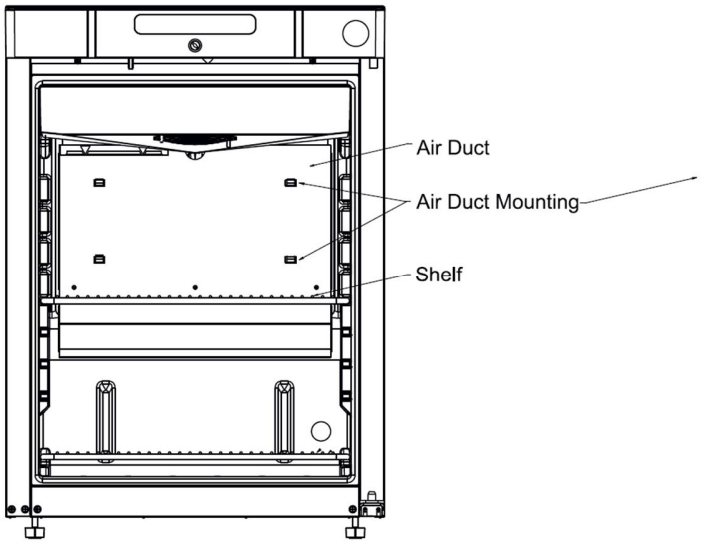


Fig. 28

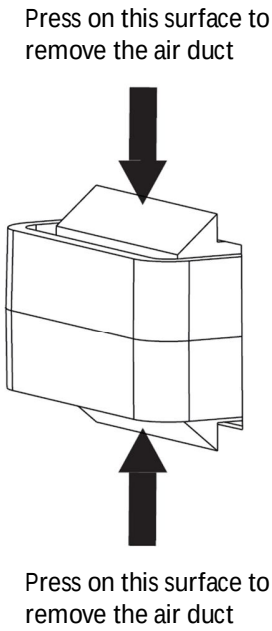
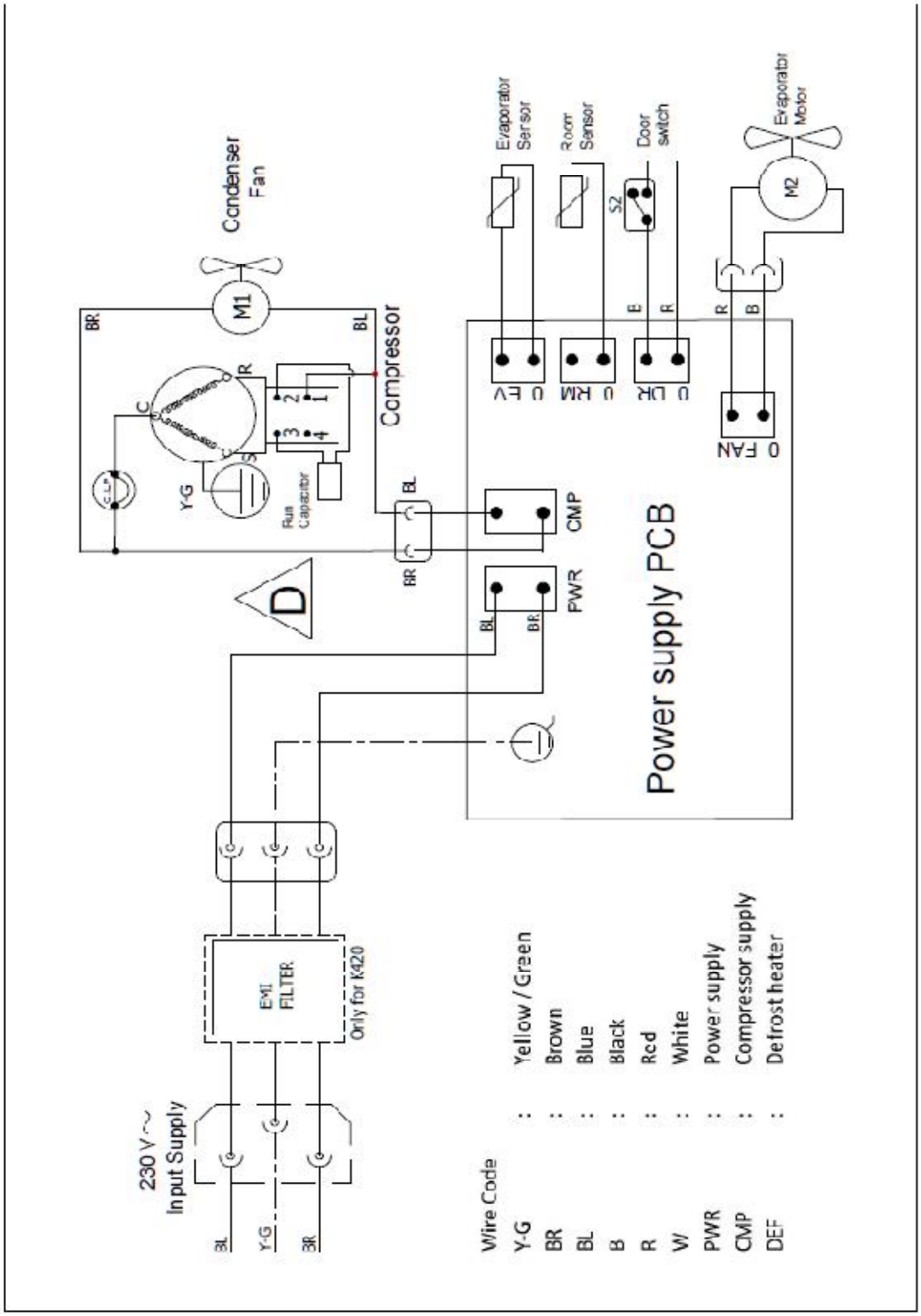
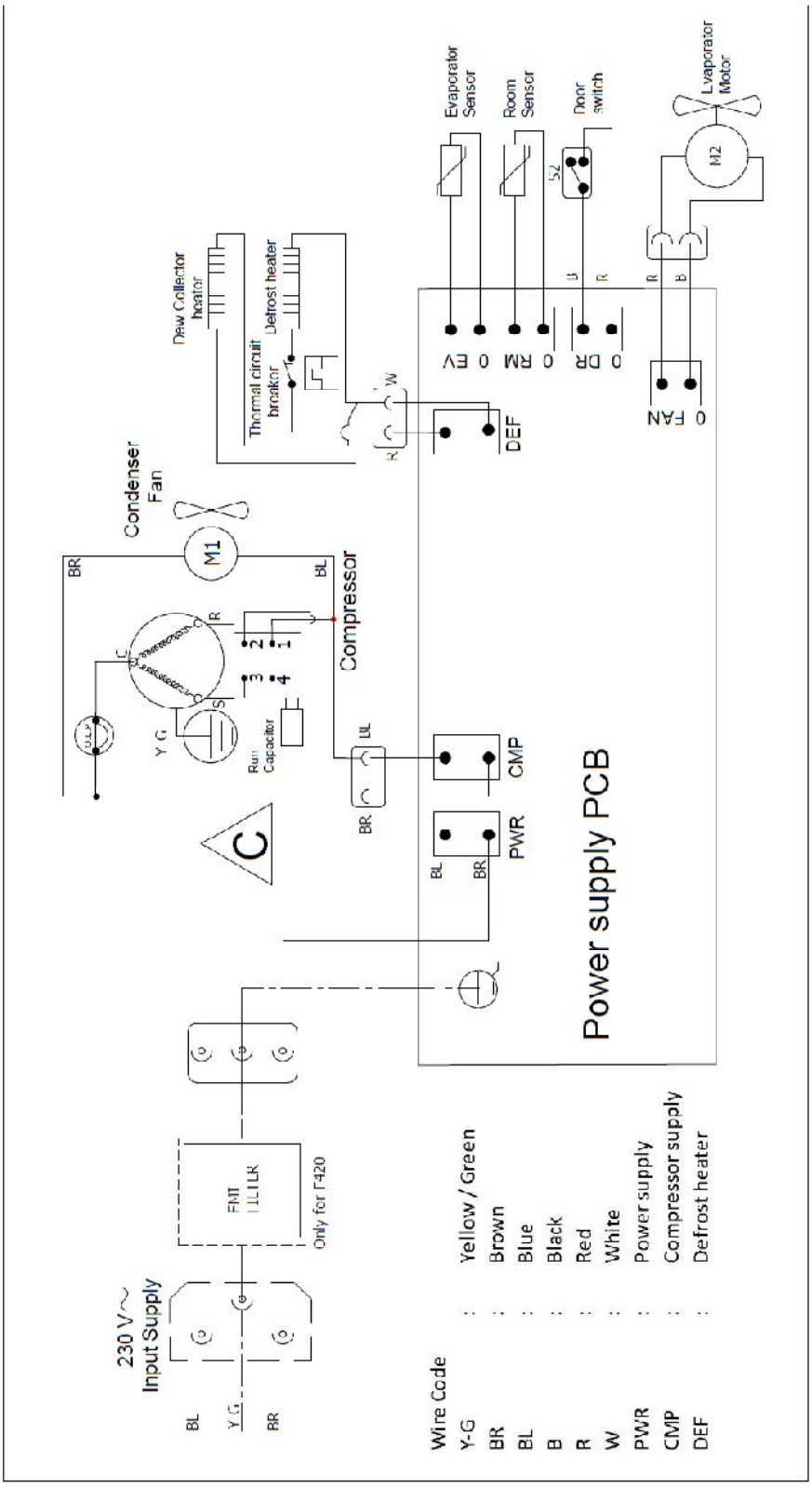


Fig. 29

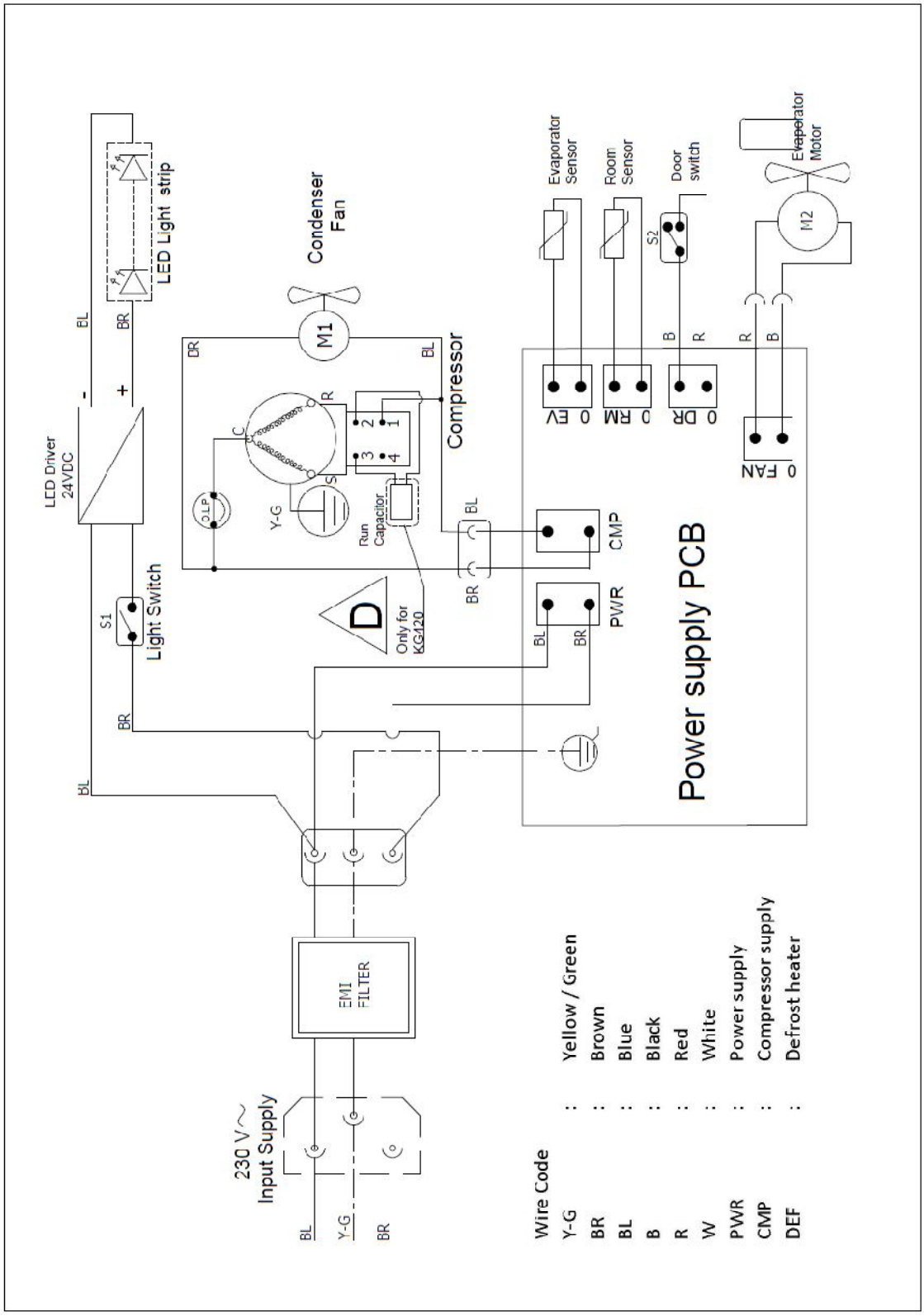
Wiring Diagram K220-K420



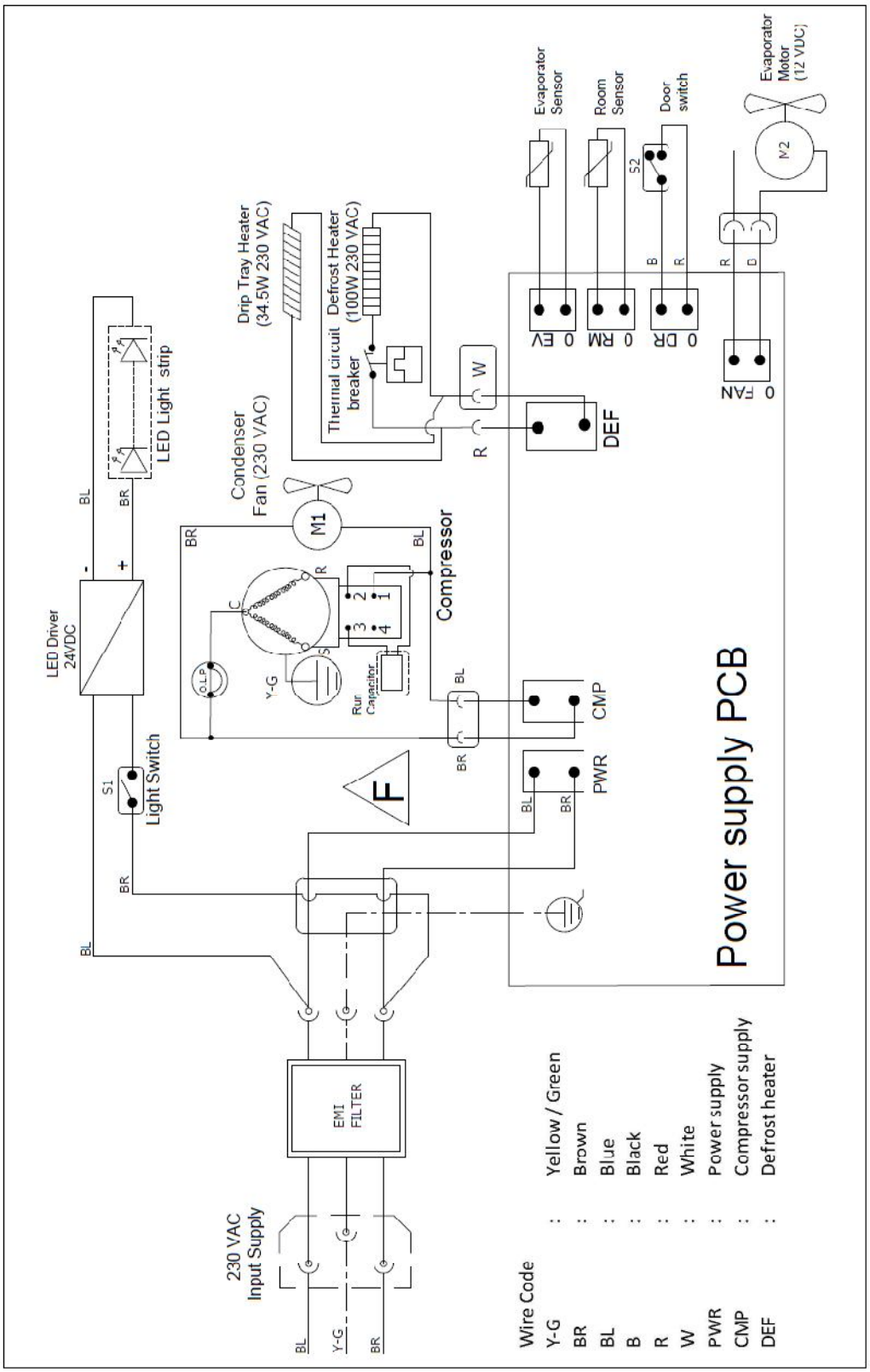
Wiring Diagram F220-F420



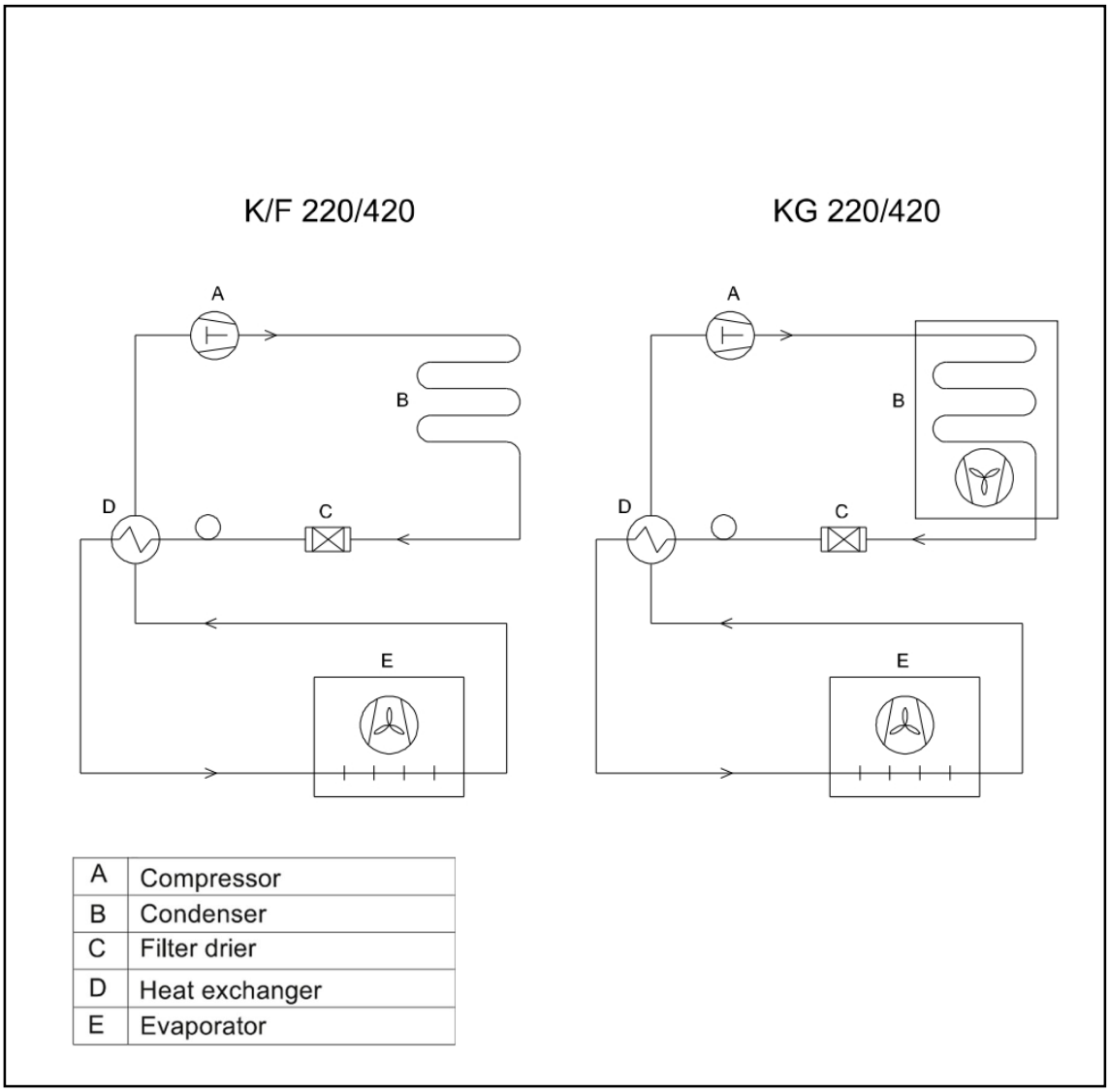
Wiring Diagram KG220-KG420



Wiring Diagram FG220-FG420



Piping Diagram



A	Compressor
B	Condenser
C	Filter drier
D	Heat exchanger
E	Evaporator