

	<b>SIDE BY SIDE</b>	
<p>© Electrolux Home Products S.p.A.          Spares Operations Italy          Corso lino Zanussi, 30          I - 33080 Porcia (PN)          Fax +39 0434 394096</p>		
	<b>BEST</b>	
	<b>FACTORY: ZS</b>	
<p>S.O.I.</p>	EN	
<p>Edition: 03.2008 - Rev. 01</p>		

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# 1 INTRODUCTION

This manual describes the SIDE BY SIDE refrigerators, BEST models with DIGITS display produced in the Susegana factory called ZS.

These models consist of 2 independent appliances (COMBI FIFTY TOTAL NO FROST + REFRIGERATOR) by means of a mounting kit.

The COMBI FIFTY TOTAL NO FROST features:

- Total No Frost (no frost freezer, no frost wine cellar)
- free standing
- traditional or electronic single compressor see S.M. 599706047
- electronic control (electronic board ERF2050)
- digit display
- air flow regulator (damper)

The REFRIGERATOR features:

- static
- free standing
- single-compressor
- electronic control (electronic board ERF2000)
- digit display
- DAC 1.1 see Service Manual 599353135

The mounting kit comprises the following components:

- top
- plinth
- side plinths
- handles
- brackets
- screws
- adjustable feet

They are appliances with the following PNCs:

PNC appliance complete	MODEL appliance complete	PNC appliance single	MODEL appliance single	BRAND	DESCRIPTION
925807501	JLWFF1101	923807500	JLWFF1101R	John Lewis	Refrigerator
		925807500	JLWFF1101C	John Lewis	Combi
		925989644	SBSKITB	John Lewis	Mounting kit
925807503	S75598KG	923807501	S70338KA	AEG - Electrolux	Refrigerator
		925807502	S75267KG	AEG - Electrolux	Combi
		925989645	SBSKITA	AEG - Electrolux	Mounting kit

925807511	KE680-1-3T	923807505	KE680-1-2T	Küppersbusch	Refrigerator
		925807510	KE680-1-2T	Küppersbusch	Combi
		925989649	KE680-1-2T	Küppersbusch	Mounting kit
925807509	JLWFF1101	923807504	JLWFF1101R	John Lewis	Refrigerator
		925807508	JLWFF1101C	John Lewis	Combi
		925989644	SBSKITB	John Lewis	Mounting kit



Warning: The 2 appliances (COMBI FIFTY and REFRIGERATOR) must be connected to the power supply by means of the relative supply cables. It is forbidden to modify the 2 supply cables.

Characteristics of COMBI FIFTY TOTAL NO FROST appliance:

The controls of the COMBI FIFTY TOTAL NO FROST appliance are inserted in the higher part of the wine cellar.

The power control board is ERF2050.

The user interface board is ERF2000 (DIGIT display).

The appliance features a single-compressor, but it is possible to switch off only the wine cellar by means of the relative ON/OFF button.

The temperatures regulation is the following:

- from +16 to +5 °C for the wine cellar
- from -15 to -24 °C for the freezer

The DIGIT display enables to show the temperatures of the two compartments.

The appliance has the following functions:

- Quick Freeze
- freezer temperature alarm

The appliance consists of the following compartments:

- freezer;
- wine cellar;

The evaporating circuit consists of:

- cold module (freezer compartment);

Characteristics of the REFRIGERATOR appliance:

The controls of the REFRIGERATOR are inserted into the higher part of the cooler compartment.

The power control board is ERF2000.

The user interface board is ERF2000 (DIGIT display).

The appliance features a single-compressor.

The temperatures regulation is the following:

- from +8 to +2 °C for the cooler

The DIGIT display enables to show the temperature of the compartment.

The appliance has the following functions:

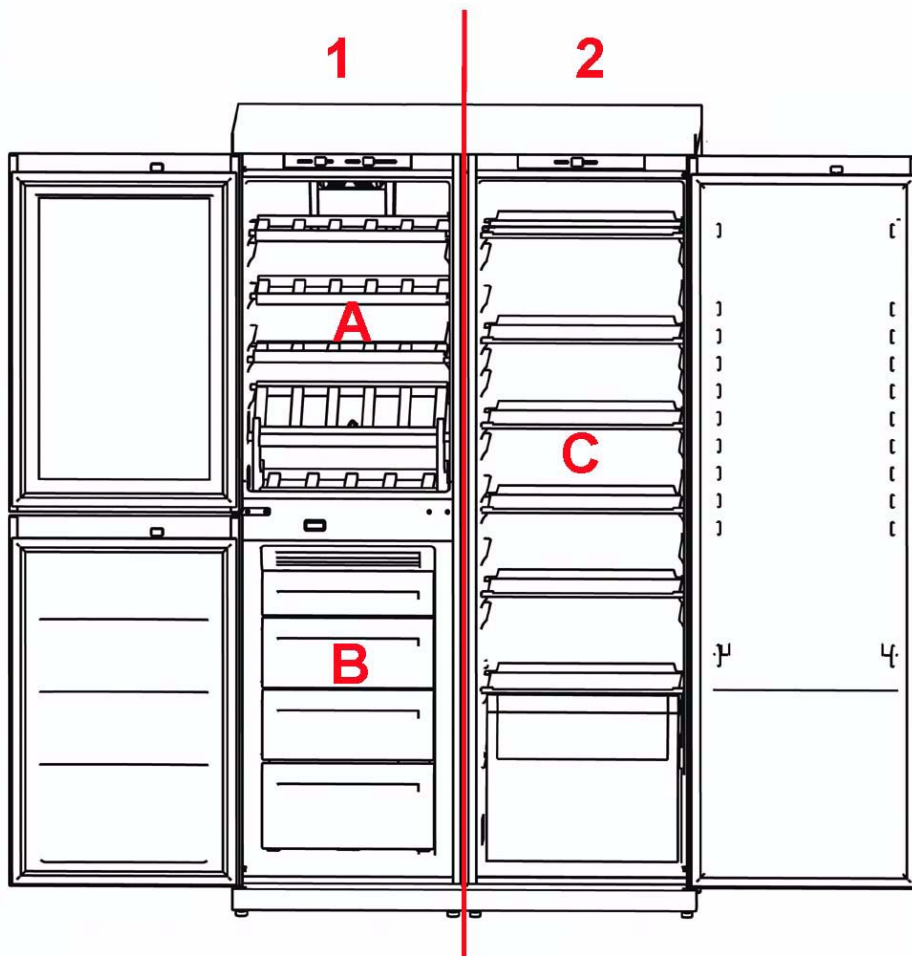
- QUICK COOL
- HOLIDAY cooler compartment

The appliance consists of the following compartment:

- cooler;

The evaporating circuit consists of:

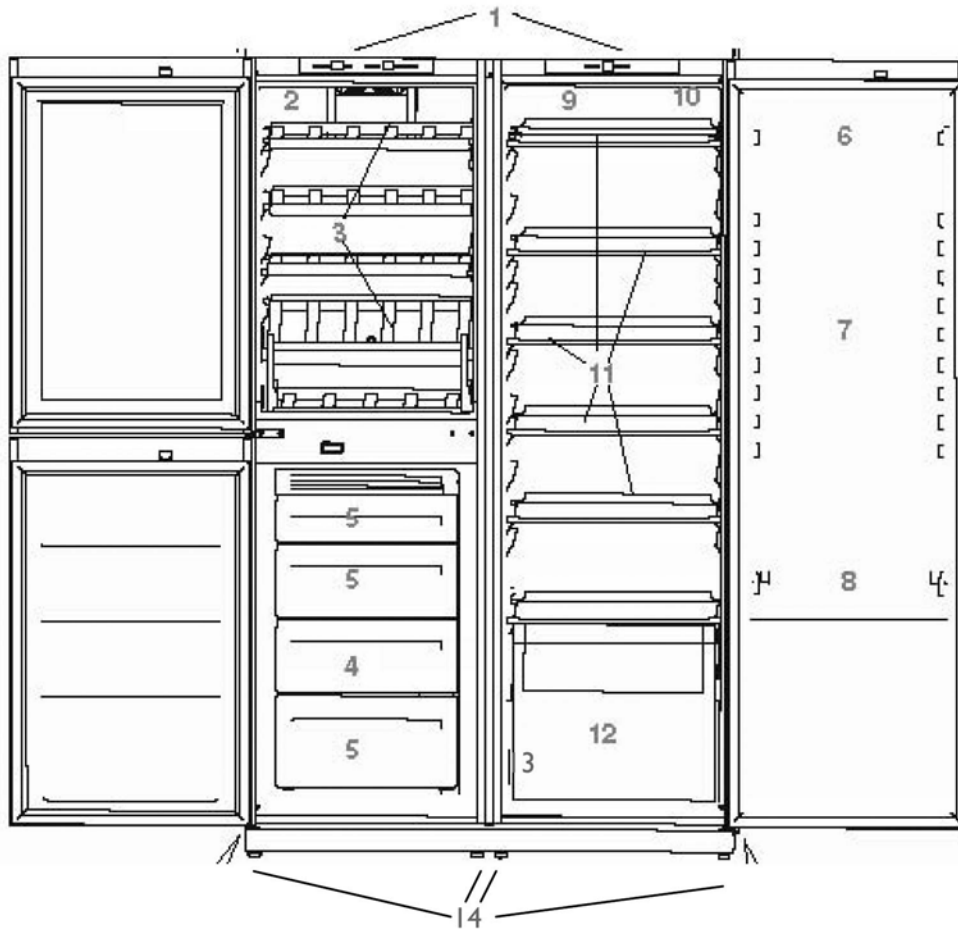
- retractable evaporator;



Key:

- |   |                            |
|---|----------------------------|
| 1 | COMBI FIFTY TOTAL NO FROST |
| A | wine cellar                |
| B | freezer                    |
| 2 | REFRIGERATOR               |
| C | cooler                     |





Key:

- 1. appliance controls
- 2. lamp
- 3. bottle shelves
- 4. fresh food freezing compartment
- 5. frozen food preserving compartment
- 6. butter shelf
- 7. can shelves
- 8. bottle shelf
- 9. DAC 1.1
- 10. lamp
- 11. glass shelves
- 12. crisper
- 13. rating plate
- 14. adjustable feet

Characteristics of COMBI FIFTY TOTAL NO FROST appliance:

1 sensor detects the temperature of the wine cellar:

- cooler temperature sensor (placed inside the air vent grid)

1 NTC sensor detects the temperature of the freezer compartment:

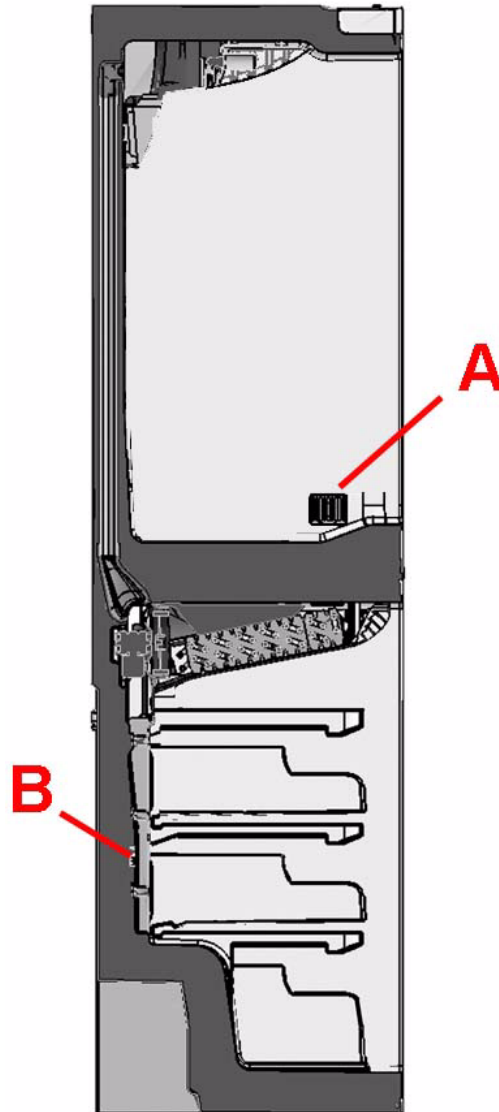
- freezer temperature sensor (located in the freezer cell)

The battery evaporator defrosting is driven by the electronic board by means of the detection of temperature of the sensors and depends also on the opening of the doors.

Key:

A = temperature sensor wine cellar

B = freezer temperature sensor



cd001618

The sensors A and B feature the foamed cable inside the cabinet, therefore they are not replaceable (for further information, please see Service Bulletin 599374122).

Characteristics of the REFRIGERATOR appliance:

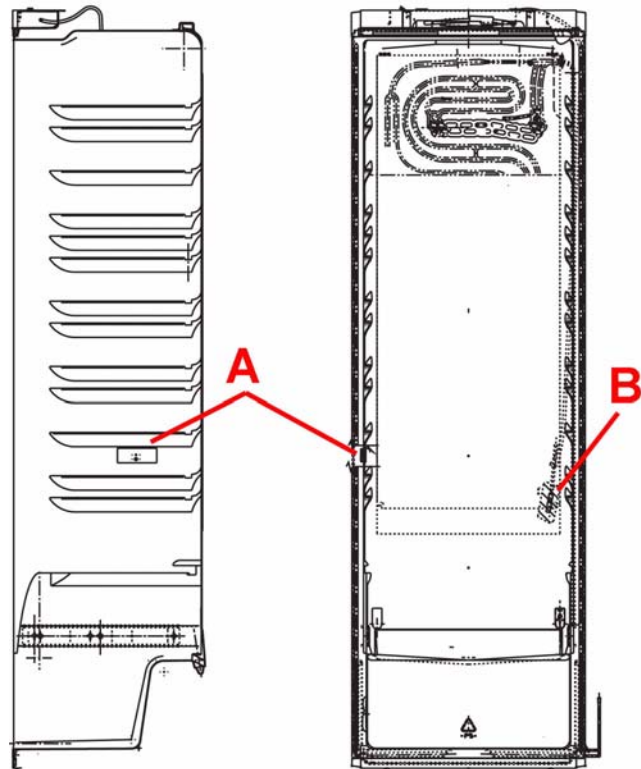
2 sensors detect the temperature of the cooler:

- cooler air temperature sensor (located in the liner, left side)
- evaporator temperature sensor (located in the liner in contact with the retractable evaporator)

Key:

A = cooler temperature sensor

B = evaporator temperature sensor



The sensors A and B feature the foamed cable inside the cabinet, therefore they are not replaceable (for further information, please see Service Bulletin 599374122).

## 2 AIR CIRCULATION

### 2.1 COMBI FIFTY TOTAL NO FROST

Characteristics of the COMBI FIFTY TOTAL NO FROST:

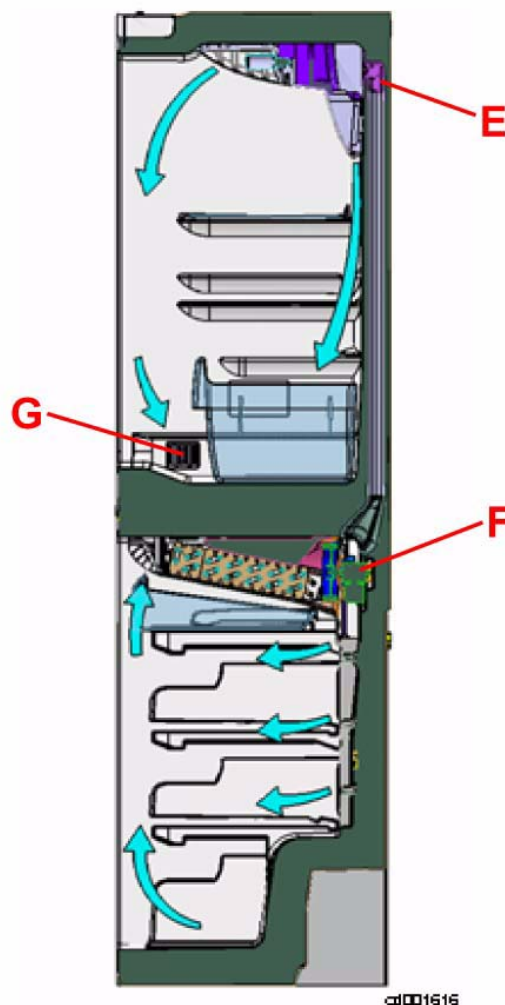
Unlike in the PARTIAL NO FROST refrigerator, in the TOTAL type the cooler and the freezer communicate each other, therefore, the battery evaporator cools both compartments.

The cold produced by the battery evaporator in the freezer compartment, is distributed by the fan F placed behind the cold module.

Cooler compartment air flow: the cold air is pushed by the fan into the foamed duct and exits from the air flow regulator (damper) E located in the rear part of the diffuser-lamp holder.

The air returns in the freezer compartment by means of some foamed ducts entering the air vent grids G.

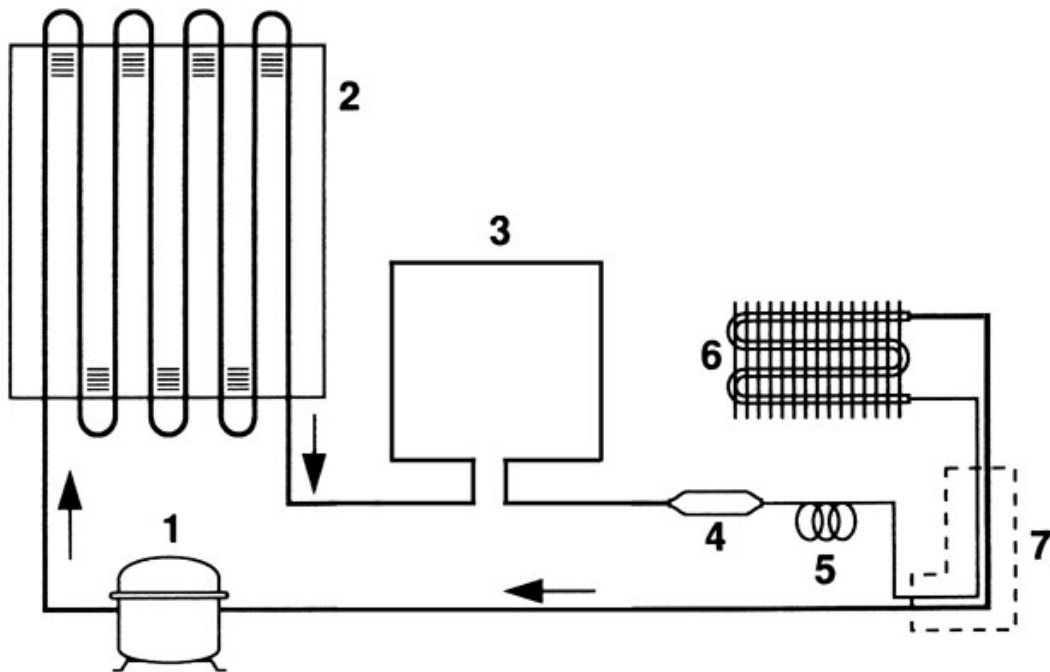
Freezer compartment air flow: the cold air is pushed into the compartment through the air screen and returns into the cold module through the front air vent grid.



The fan stops in case of opening of the freezer door or of the cooler door.  
To simulate the door closed, use a magnet and put it next to the magnetic sensor located on the intermediate crossbar or the magnetic sensor located on the electronic board.

### 3 REFRIGERATION CIRCUIT

#### 3.1 COMBI FIFTY TOTAL NO FROST

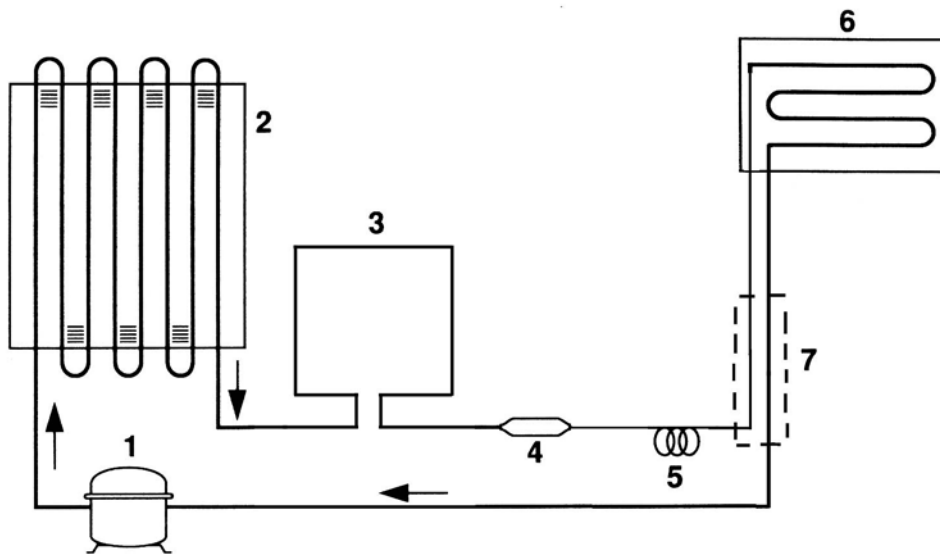


ed001617

Key:

1. compressor;
2. condenser;
3. anti-condensation coil;
4. dehydrator filter;
5. capillary;
6. battery evaporator (freezer compartment);
7. exchanger.

## 3.2 REFRIGERATOR



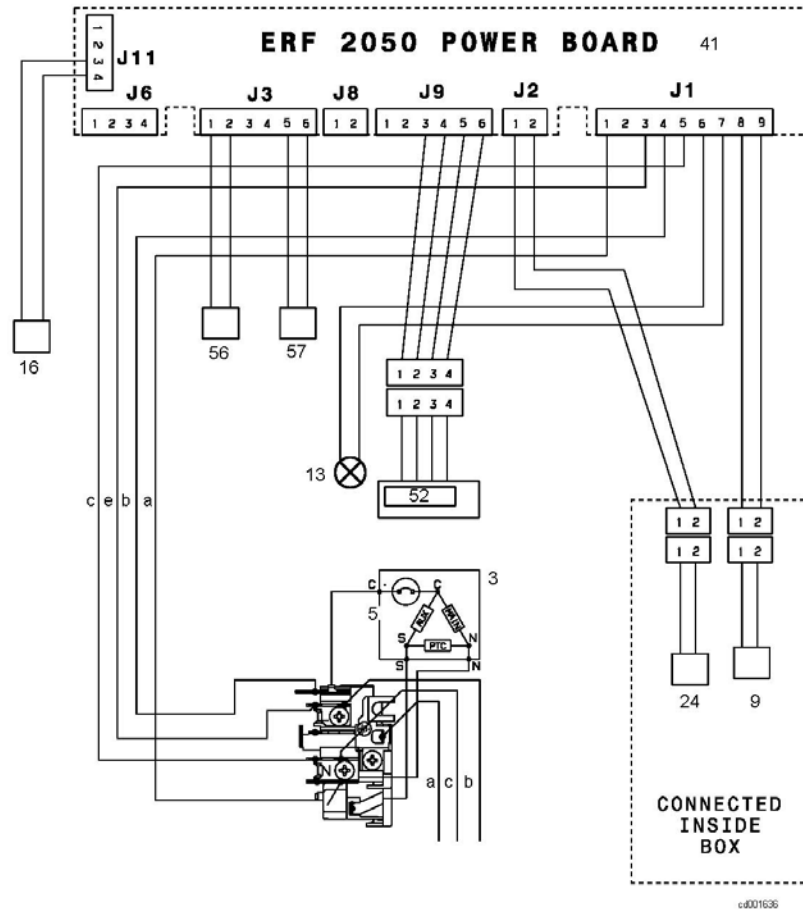
Key:

1. compressor;
2. condenser;
3. anti-condensation coil;
4. dehydrator filter;
5. capillary;
6. retractable evaporator (cooler compartment);
7. exchanger.

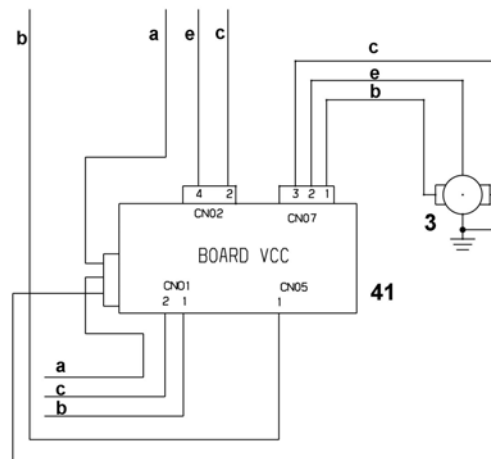
# 4 ELECTRIC WIRING

## 4.1 COMBI FIFTY TOTAL NO FROST

( Check the specific diagram for each model ! )



VERS. B



Key:

For traditional compressor:

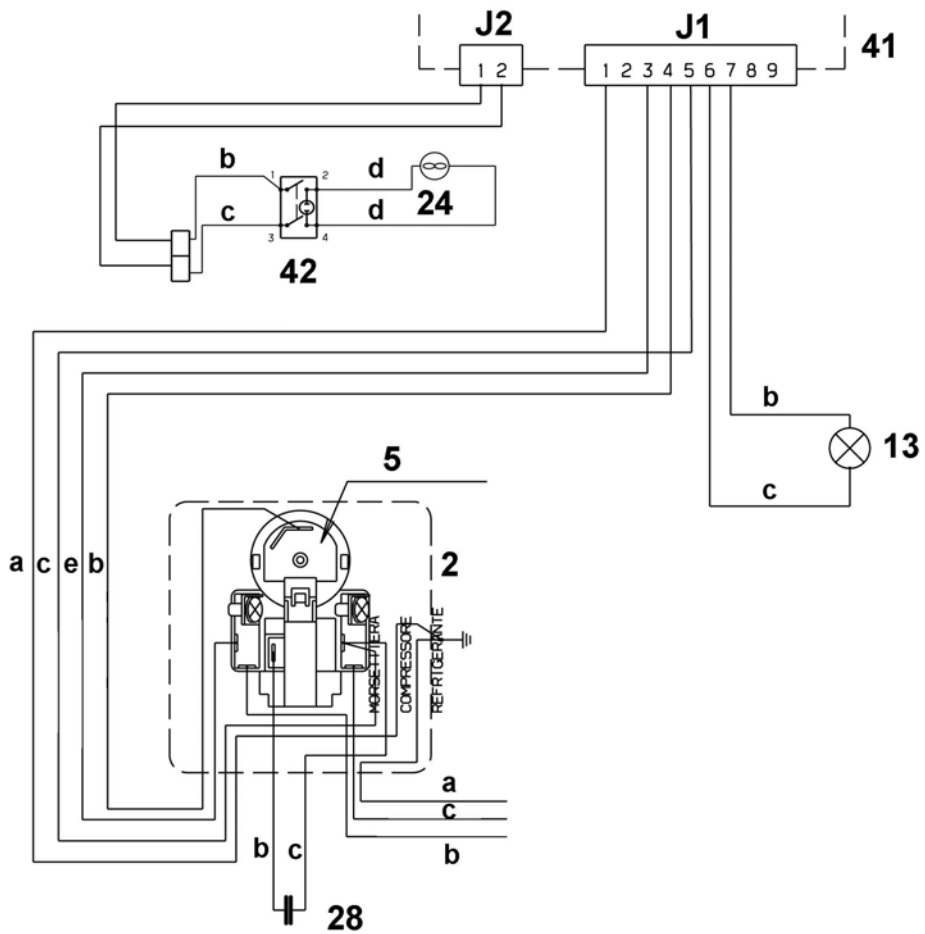
3. compressor
5. motor protector
9. defrosting heater
13. lamp
16. freezer door switch
24. battery evaporator fan
41. electronic board ERF 2050
52. air flow regulator (damper)
56. cooler air temperature sensor
57. freezer air temperature sensor

VERS. B = for electronic compressor:

3. electronic compressor
  41. compressor electronic board
- 
- a. yellow-green
  - b. brown
  - c. blue
  - d. white
  - e. black
  - f. grey
  - g. red



## 4.2 REFRIGERATOR



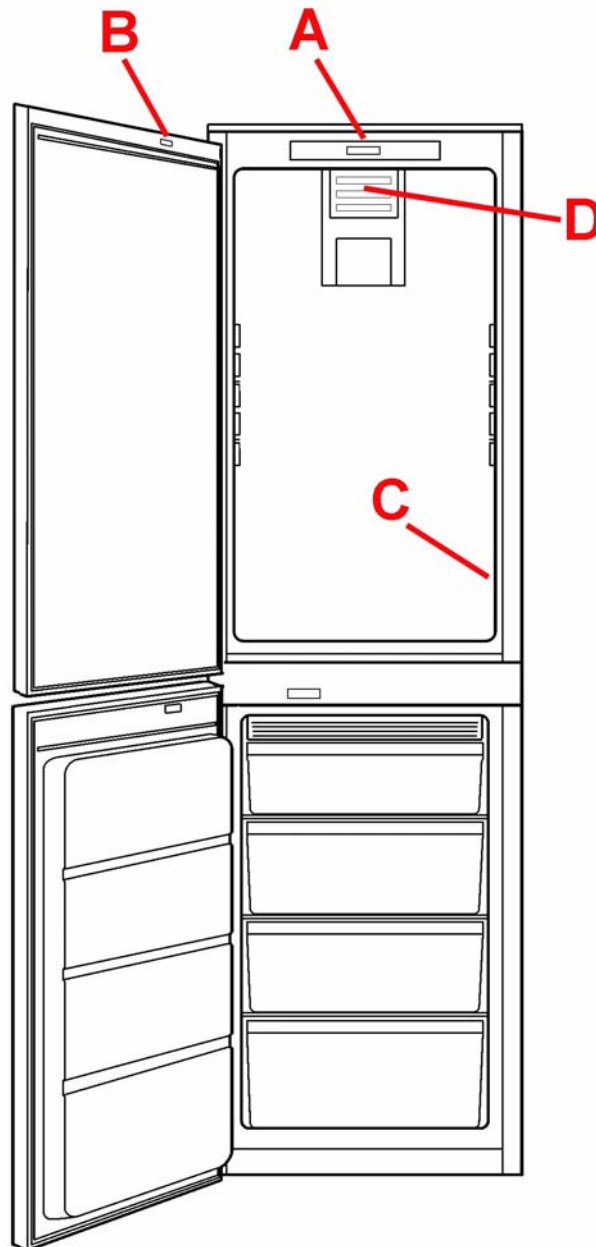
- 2. compressor
- 5. motor protector
- 13. lamp
- 24. D.A.C. fan 1.1
- 28. running capacitor (only for the models that feature it)
- 41. electronic board ERF 2050
- 42. D.A.C. fan switch 1.1

- a. yellow-green
- b. brown
- c. blue
- d. white
- e. black
- f. grey

## 5 COMPONENTS

### 5.1 COMBI FIFTY TOTAL NO FROST

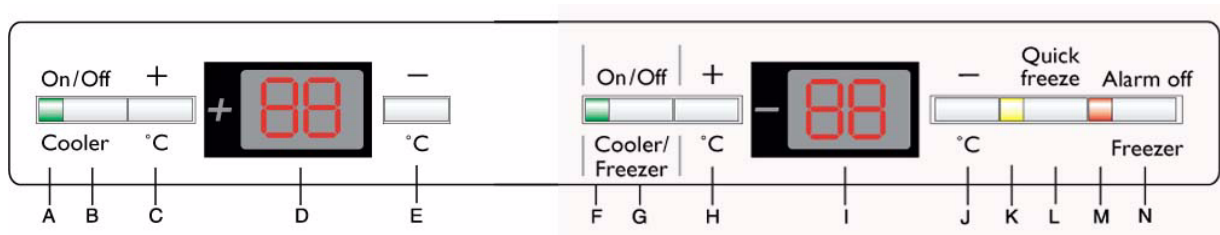
#### 5.1.1 Wine cellar compartment



Key:

- A. Control panel
- B. Magnet for wine cellar door switch
- C. air temperature sensor for wine cellar
- D. air flow regulator (damper)

### 5.1.1.1 Control panel



Key:

WINE CELLAR compartment

- A. ON/OFF lamp for wine cellar
- B. ON/OFF button for wine cellar
- C. temperature increase button (+) for wine cellar
- D. wine cellar temperature displaying
- E. temperature decrease button (-) for wine cellar

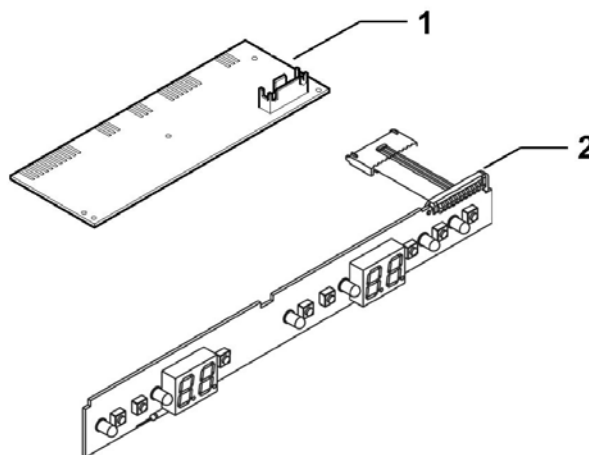
FREEZER compartment

- F. ON/OFF lamp for wine cellar + freezer
- G. ON/OFF button for wine cellar + freezer
- H. freezer temperature increase button (+)
- I. freezer temperature displaying
- J. freezer temperature decrease button (-)
- K. QUICK FREEZE lamp
- L. QUICK FREEZE button
- M. alarm pilot lamp
- N. alarm deactivation button

#### 5.1.1.1.1 Electronic boards

The electronic board of the appliance consists of:

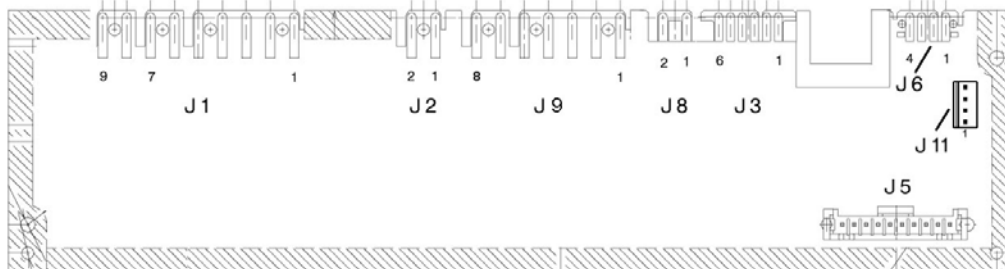
1. ERF2050 power board
2. ERF2000 DIGITS display board



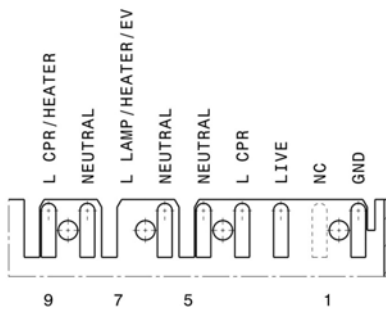
The two electronic boards are connected by means of a flat cable with a connector; therefore, the two boards are available singularly as spare part.

### 5.1.1.1.2 ERF2050 Power board

- View of the electronic board (side of components):



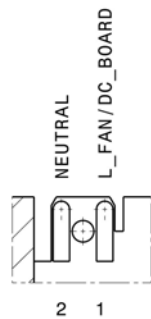
cd001621



J1

cd001656

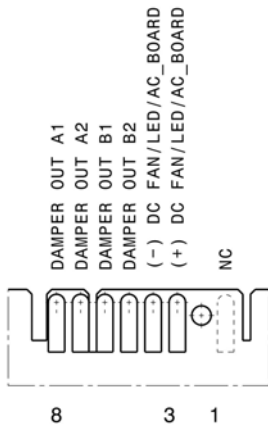
1. earth contact
2. free
3. line
4. compressor
5. neutral
6. lamp neutral
7. lamp
8. defrosting heater neutral
9. defrosting heater



J2

cd001658

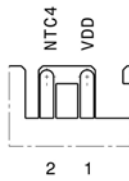
1. fan line
2. fan neutral



**J9**

cd001660

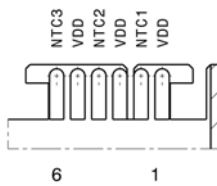
1. free
2. free
3. free
4. free
5. damper
6. damper
7. damper
8. damper



**J8**

cd001661

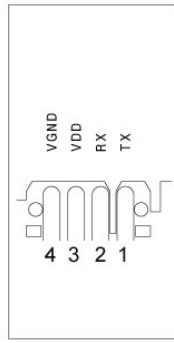
1. free
2. free



**J3**

cd001662

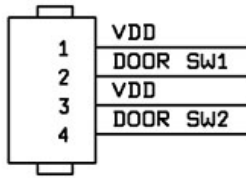
1. wine cellar air temperature sensor
2. wine cellar air temperature sensor
3. free
4. free
5. freezer air temperature sensor
6. freezer air temperature sensor



**J6**

cd001176

- 1. free
- 2. free
- 3. free
- 4. free

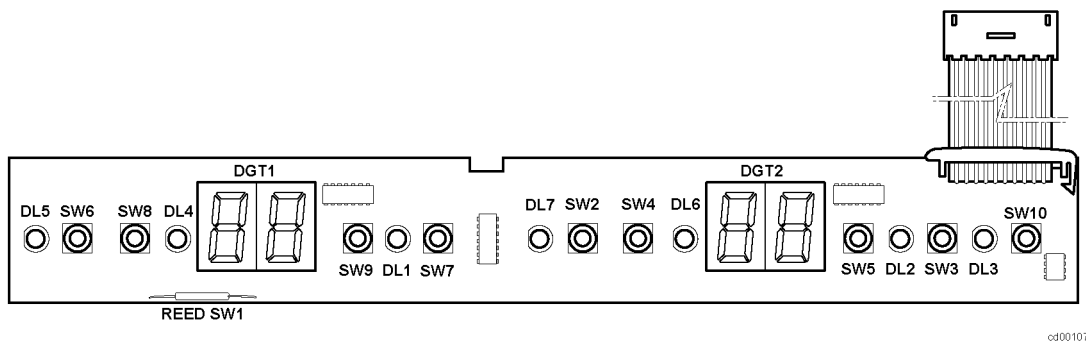


**J11**

cd001622

- 1. free
- 2. free
- 3. freezer door switch
- 4. freezer door switch

### 5.1.1.1.3 ERF2000 DIGITS display board



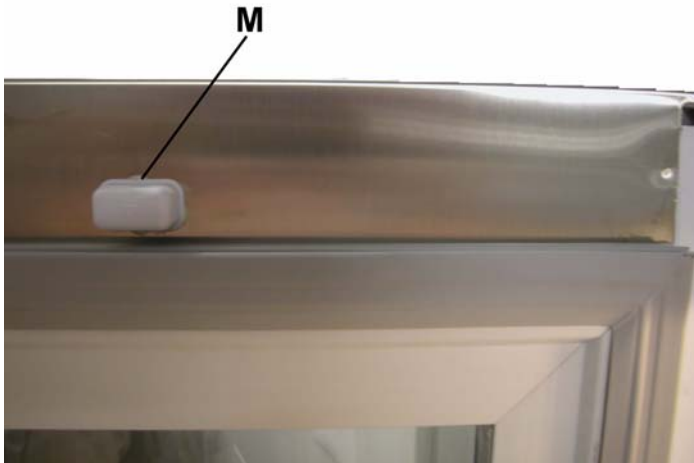
Key:

- SW1 = reed element
- SW2 = ON/OFF button for wine cellar + freezer
- SW3 = QUICK FREEZE button
- SW4 = freezer temperature increase button (+)
- SW5 = freezer temperature decrease button (-)
- SW6 = wine cellar ON/OFF button
- SW7 = button not used for this appliance (hidden under the programme plate)
- SW8 = wine cellar temperature increase button (+)
- SW9 = wine cellar temperature decrease button (-)
- SW10 = alarm deactivation button
- DGT1 = wine cellar display
- DGT2 = freezer display
- DL1 = LED not used for this appliance (LED hidden under the programme plate)
- DL2 = QUICK FREEZE LED
- DL3 = alarm pilot lamp LED
- DL4 = LED sign + wine cellar
- DL5 = ON/OFF indicator LED wine cellar
- DL6 = LED sign - freezer
- DL7 = ON/OFF indicator LED wine cellar + freezer

### 5.1.1.2 Magnet for wine cellar door switch

The control of the cooler door opening is carried out by using the magnetic switch located on the display board. The magnetic switch is activated by a magnet M located on the door.

The check of the door opening is used to switch on the lamp of the wine cellar, then after 5 minutes the lamp switches off automatically.



### 5.1.1.3 Wine cellar air temperature sensor

1 NTC sensor detects the temperature of the wine cellar:

- wine cellar air temperature sensor (placed inside the air vent grid)



The wine cellar air temperature sensor is used to control the appliance by means of the air flow regulator (damper) and also to display the wine cellar temperature.

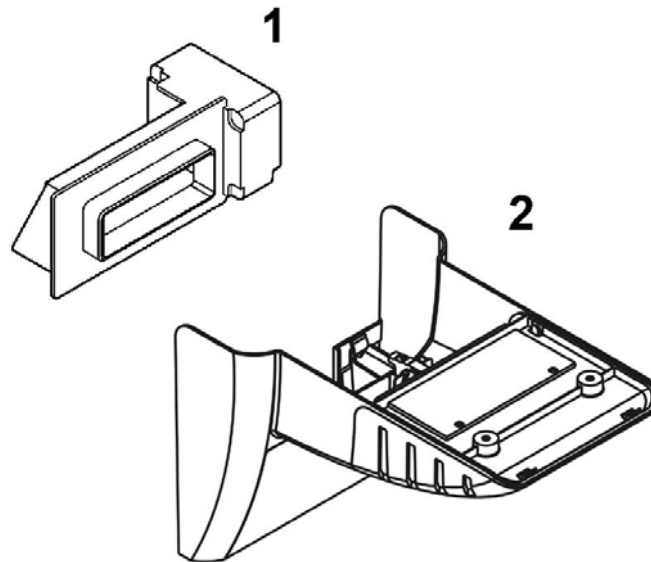
The sensor C has the foamed cable inside the cabinet, therefore it is not replaceable (for further information please see Service Bulletin 599374122).



#### 5.1.1.4 Air flow regulator (damper)

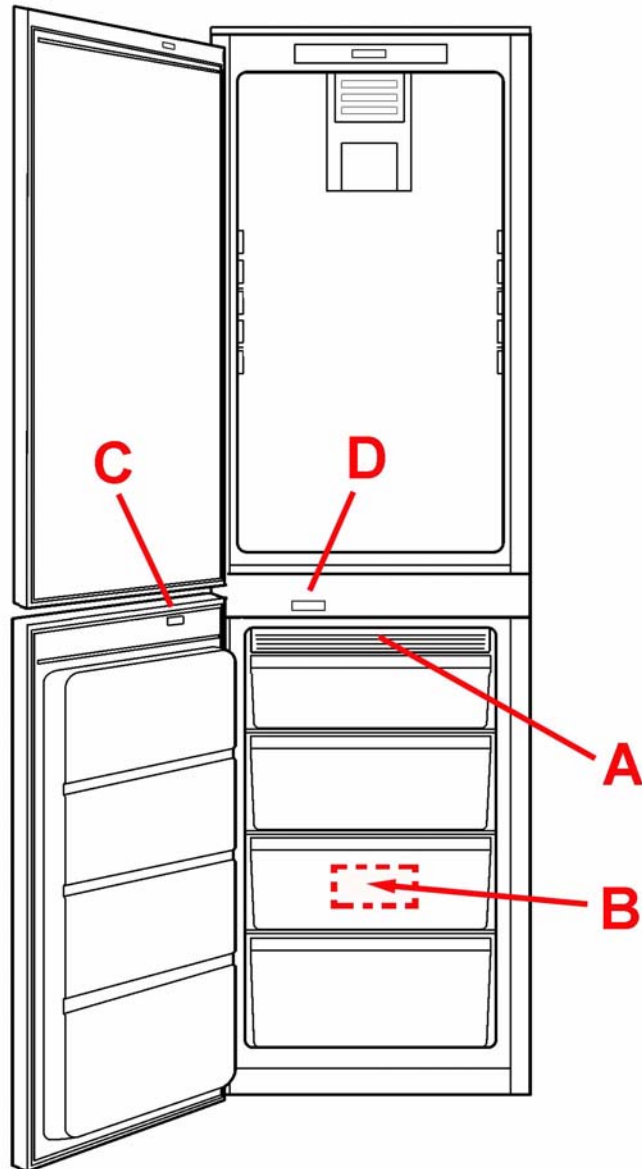
The temperature regulation of the cooler compartment occurs by means of the passage or not of cold air from the damper, which can have only 2 fixed positions, opened or closed.

The air flow regulator (damper) 1 is located inside the diffuser lamp holder 2.



The damper consists of a door and a stepping motor and it is connected to the electric wiring by means of a 4-pole connector.

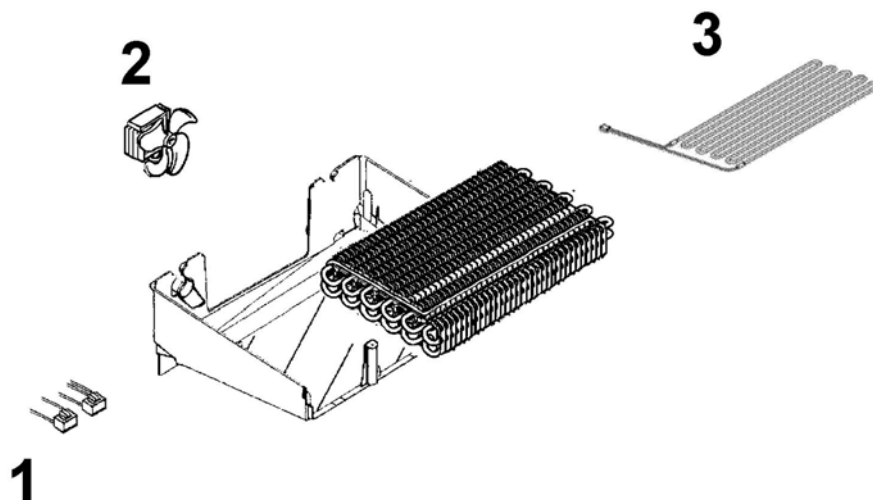
## 5.1.2 Freezer compartment



Key:

- A. cold module
- B. freezer temperature sensor (foamed inside the liner)
- C. magnet for freezer door switch
- D. magnetic sensor for freezer door switch

### 5.1.2.1 Cold module



Key:

- 1. defrosting cut-out and safety thermal switches
- 2. cold module fan
- 3. defrosting heater

Note:

The defrosting cut-out switches ( +8 / +40 °C ) are connected together; therefore, they are not available as single spare parts.

#### 5.1.2.1.1 Thermal switches

The thermal cut-outs are positioned in direct contact with the battery evaporator.

They switch off the defrosting heater respectively at:

- +8 °C cut-out defrosting switch (wire colour: brown)
- +40°C cut-out safety switch (wire colour: blue)

TYPE OF THERMAL OVERLOAD CUT-OUT	CUT-IN TEMPERATURE	
	OPENING	CLOSING
DEFROSTING	+ 8 °C	- 5 °C
SAFETY	+ 40 °C	+ 30 °C

Note:

The defrosting cut-out switches ( +8 / +40 °C ) are connected together; therefore, they are not available as single spare parts.

### 5.1.2.1.2 Cold module fan

The fan is located behind the cold module.

The air is intaken by the fan, therefore, in case of its replacement, ensure that the air is forced towards the cell bottom.

The fan has the following characteristics:

- voltage 240 V
- power 3,1 W
- speed 2000 rpm



The fan stops in case of opening of the freezer door or of the cooler door.  
To simulate the door closed, use a magnet and put it next to the magnetic sensor located on the intermediate crossbar or the magnetic sensor located on the electronic board.

### 5.1.2.1.3 Defrosting heater

The defrosting heater is used to defrost the ice that has accumulated on the battery evaporator.

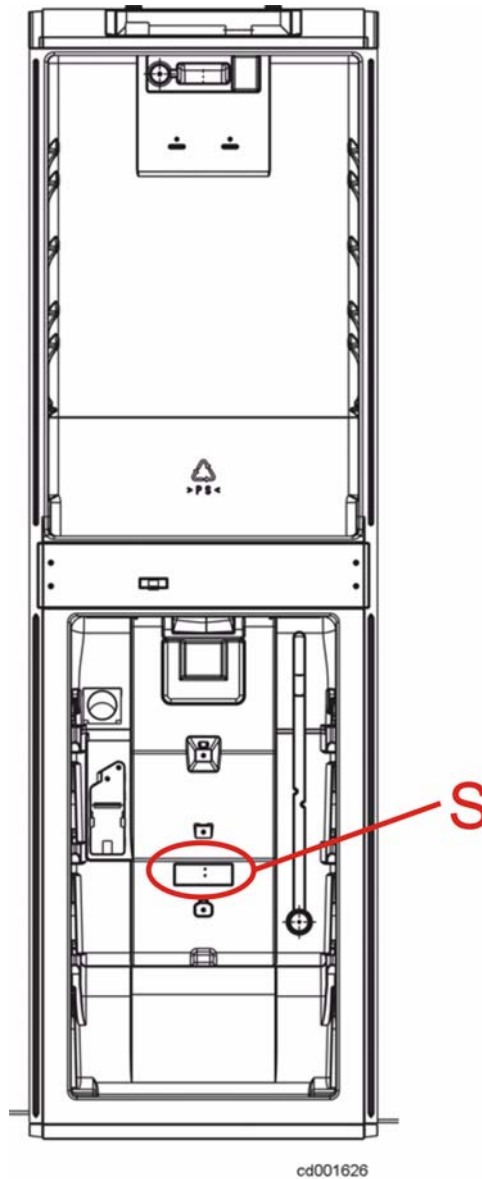
The balancing heater has the following values:

- voltage 240 V
- power 274 W
- resistance 210 Ohm

### 5.1.2.2 Freezer temperature sensor

1 NTC sensor detects the temperature of the freezer compartment:

- freezer air temperature sensor (located inside the freezer liner)



The freezer air temperature sensor is used to control the appliance by means of the fan and the compressor and also to display the freezer compartment temperature.

The sensor S has the foamed cable inside the cabinet, therefore it is not replaceable (for further information please see Service Bulletin 599374122).

### 5.1.2.3 Magnet for freezer door switch

The control of the cooler door opening is carried out by using the magnetic switch located inside the intermediate crossbar.

The magnetic switch is activated by a magnet M located on the door.

The check of the door opening is used to stop the fan when the door is opened and it is also used to manage the defrosting cycles of the cold module.

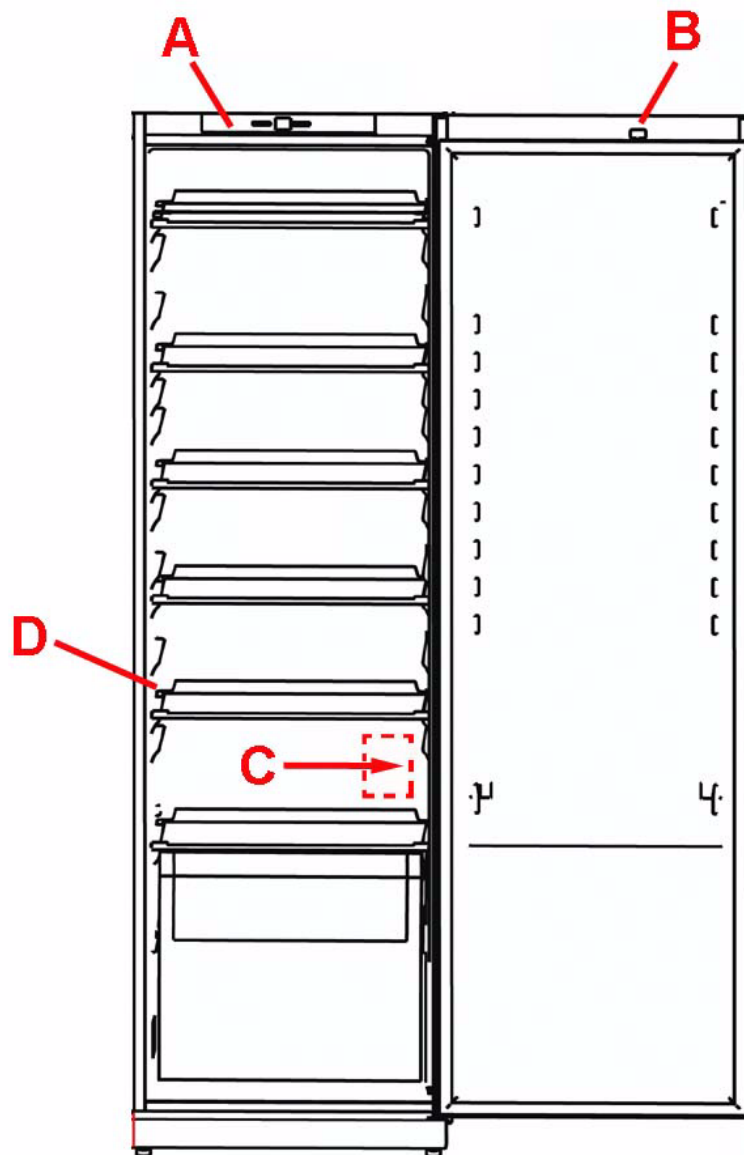


### 5.1.2.4 Magnetic sensor for freezer door switch

The check of the freezer door opening is activated by a magnetic switch located inside the intermediate crossbar.



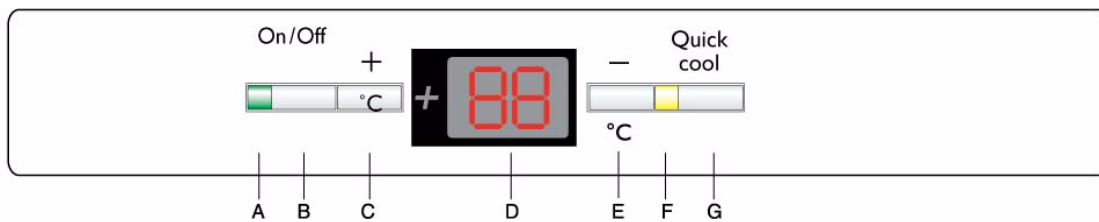
## 5.2 REFRIGERATOR



Key:

- A. control panel
- B. magnet for cooler door switch
- C. evaporator temperature sensor (foamed inside the liner)
- D. cooler air temperature sensor (foamed inside the liner)

## 5.2.1 Control panel



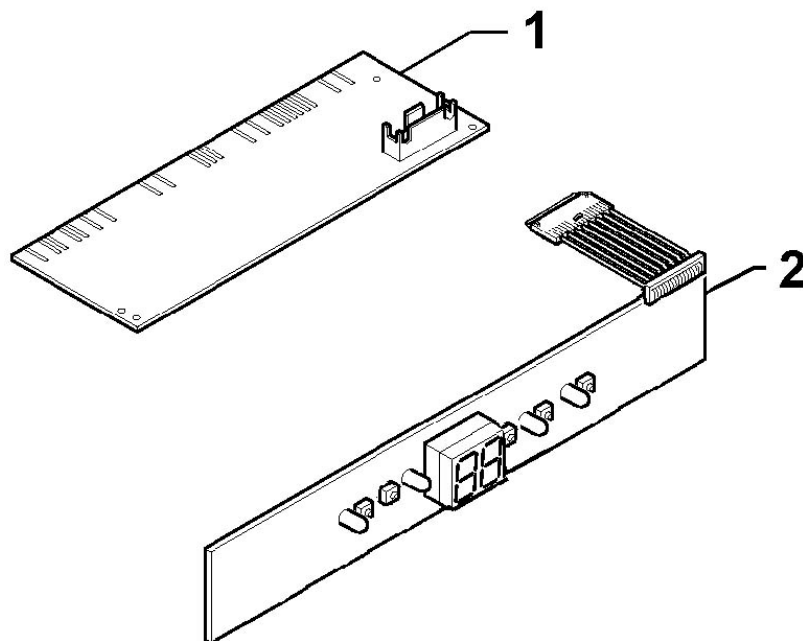
Key:

- A. ON/OFF pilot lamp
- B. ON/OFF button
- C. temperature increase button (+)
- D. temperature displaying
- E. temperature decrease button (-)
- F. QUICK COOL pilot lamp
- G. QUICK COOL button

### 5.2.1.1 Electronic boards

The electronic board of the appliance consists of:

1. ERF2000 power board
2. ERF2000 DIGITS display board

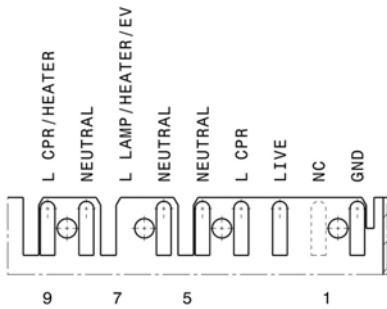
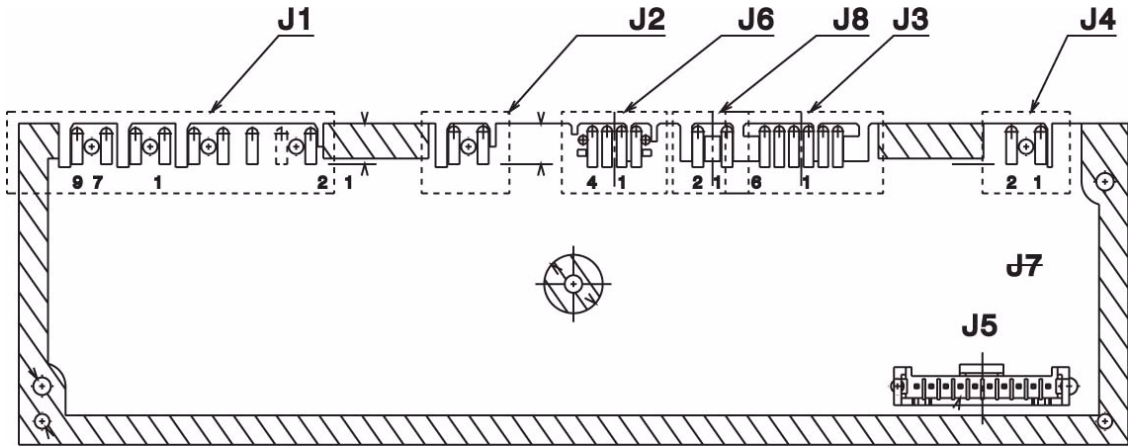


The two electronic boards are connected by means of a flat cable with a connector; therefore, the two boards are available singularly as spare part.



### 5.2.1.2 ERF2000 Power board

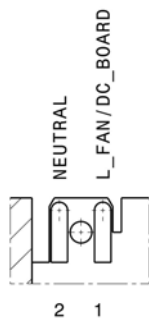
- View of the electronic board (side of components):



J1

cd00165E

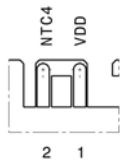
1. earth contact
2. free
3. line
4. compressor
5. neutral
6. lamp neutral
7. lamp
8. free
9. free



J2

cd00165F

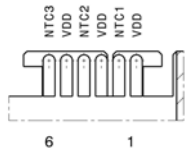
1. DAC 1.1 fan line
2. DAC 1.1 fan neutral



**J8**

cd001551

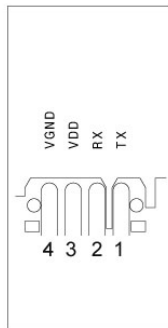
1. free
2. free



**J3**

cd001562

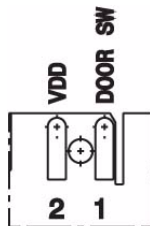
1. cooler air temperature sensor
2. cooler air temperature sensor
3. evaporator temperature sensor
4. evaporator temperature sensor
5. free
6. free



**J6**

cd001176

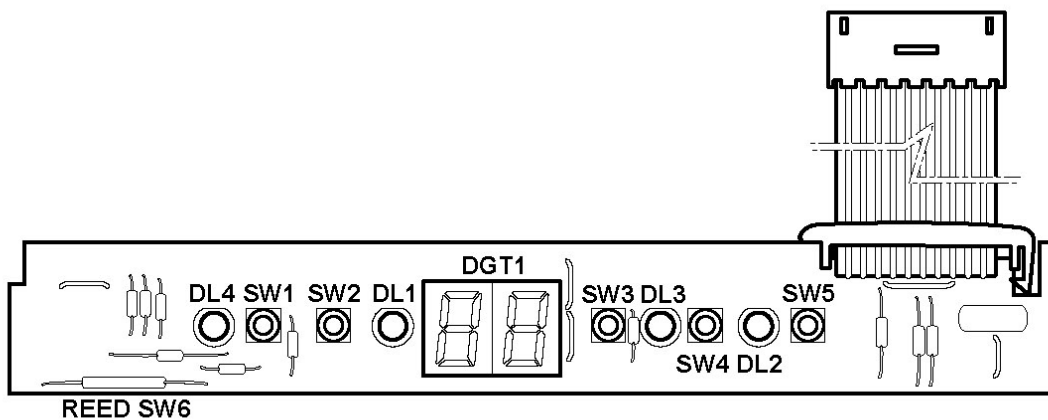
1. free
2. free
3. free
4. free



**J4**

1. free
2. free

### 5.2.1.3 ERF2000 DIGITS display board



cd001075

Key:

- SW1 = ON/OFF button
- SW2 = temperature increase button (+)
- SW3 = temperature decrease button (-)
- SW4 = QUICK COOL button
- SW5 = button not used for this appliance (hidden under the programme plate)
- SW6 = reed element
- DGT1 = temperature displaying
- DL1 = LED -
- DL2 = LED not used for this appliance (LED hidden under the programme plate)
- DL3 = QUICK COOL LED
- DL4 = ON/OFF indicator LED

## 5.2.2 Magnet for cooler door switch

The control of the cooler door opening is carried out by using the magnetic switch located on the display board.

The magnetic switch is activated by a magnet M located on the door.

The control of the door opening is used to light up the lamp of the cooler compartment.



### 5.2.3 Temperature sensors

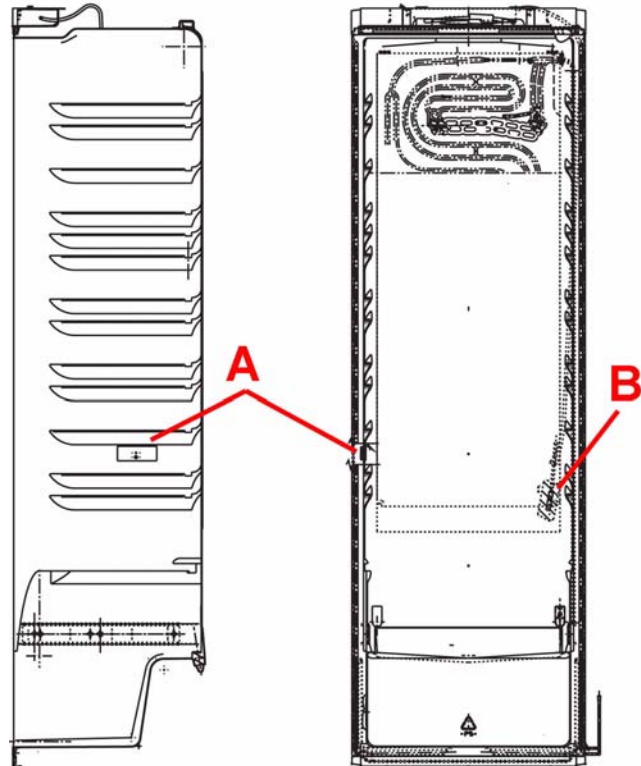
2 NTC sensors are used to detect the temperatures of the cooler compartment:

- evaporator temperature sensor (located inside the freezer liner)
- cooler air temperature sensor (located inside the freezer liner)

Key:

A = cooler temperature sensor

B = evaporator temperature sensor



The sensors A and B feature the foamed cable inside the cabinet, therefore they are not replaceable (for further information, please see Service Bulletin 599374122).

## 6 MAIN FUNCTIONS

### 6.1 COMBI FIFTY TOTAL NO FROST

#### 6.1.1 Normal



Warning: Unplug the appliance before operating.

In case of first switching on with a freezer compartment temperature higher than 10 °C, the appliance operates with a test cycle (for the factory) for a maximum time of about 1,5 hours.

In this period do not check the correct functioning of the appliance, since the loads are activated only for internal check (compressor, fan and defrosting heater).

When the appliance is off then:

- the compressor is off
- the displays are off

Pushing the ON/OFF button, the displays switch on with the following displaying:

- + symbol on the freezer display
- flashing digits of the freezer compartment
- freezer compartment temperature alarm (buzzer active)

Push the alarm deactivation button to deactivate the buzzer.

Regulate the temperatures of the compartments so as to set the following values:

- about +10 °C in the cooler
- about -18 °C in the freezer

In NOFROST coolers, the humidity inside the freezer compartment accumulates on the evaporator battery thanks to the air circulation, thus preventing the formation of frost on food.

During the normal operation time, the electronic board powers the compressor and the fan circuits.

The fan is activated or deactivated with a 2-minute delay compared to the compressor.

The operation time which corresponds to the interval between the following defrosting lasts about 14 hours with normal opening of the door (it can last up to 72 hours if the doors are never opened!).

#### 6.1.2 Normal with first switching on or power failure

In case of fault when the appliance is switched on for the first time or in case of a power failure, one of the two conditions described below occurs:

1. If the internal temperature is higher or the same as the sensor cut-in temperature (CUT-IN), when the power is restored, the electronic board activates the compressor and the fan till the set temperature is reached and after 5 hours the electronic board activates the defrosting procedure (after the compressor cut-out)
2. If the internal temperature is lower than the sensor cut-in temperature (CUT-IN), when the power is restored, the compressor functions in thermostatic conditions and after 5 hours the electronic board activates the defrosting procedure (after the compressor cut-out)

The electronic board activates, in any case, the defrosting procedure 5 hours after the first switching on and after a power failure.

### 6.1.3 Defrosting

All the humidity of the compartment accumulates on the evaporator, which is the coldest part of the compartment; periodically, about every 14 hours with normal door opening (up to 72 hours if the doors are never open!), it is then necessary to defrost the ice on the battery.

The defrosting starts after the compressor cut-out or if the compressor is on after max. 2,5 hours.

The electronic board disconnects immediately the circuit which powers the compressor, after 2 minutes the fan circuit, waits 3 minutes and then it powers the circuit of the defrosting heater for a minimum time of about 20 minutes.

The heat generated by the defrosting heater does not affect the freezer compartment temperature or the food packages temperature, because the thermal energy is consumed in the defrosting process of the evaporator ice.

After 20 minutes, the electronic board checks the state of the thermal switch every minute to detect the cut-out.

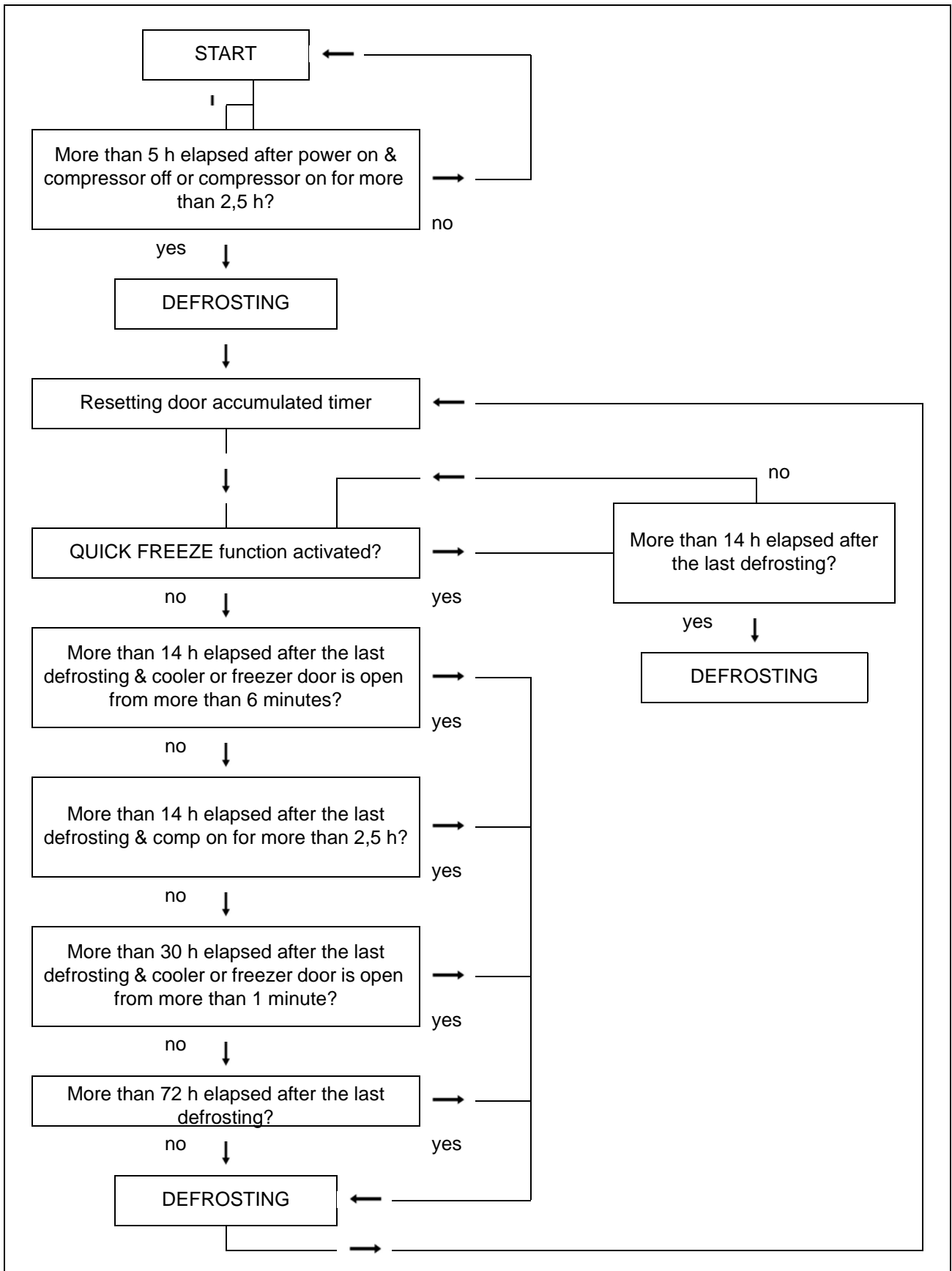
When the defrosting switch cuts-out, and anyway after 20 minutes, the electronic board switches the compressor on with a 5 minute delay.

After a 3-minute delay, when the air is already cold, the fan switches on too.

If for any reason, the defrosting cut-out switch does not switch on and the battery temperature rises up to 40 °C, the defrosting heater will be switched off by the safety thermal switch.

If 1 hour after the starting of the defrosting, the thermal switches did not cut out, the electronic board switches the defrosting heater off and continues its operation.

### 6.1.4 Flow chart for the defrosting management





### **6.1.5 QUICK FREEZE Function**

The QUICK FREEZE function is activated by pushing the relative button, therefore:

- the pilot lamp relative to the QUICK FREEZE function lights up;
- the compressor operates in thermostatic conditions and not continuously (like the temperature knob was on max. position) for a duration of about 52 hours, and then it deactivates automatically.

To deactivate the QUICK FREEZE function push the relative button.

With the QUICK FREEZE function the fixed defrosting can occur anyway, depending on how much time is elapsed after the last defrosting.

### **6.1.6 Switching off of wine cellar**

The wine cellar can be switched off by pushing the corresponding ON/OFF button.

The temperature display is switched off.

The air flow regulator (damper) is switched off and the lamp remains off even if the door is open.

Note:

In order to avoid the formation of bad odours inside the wine cellar, the damper is opened and closed immediately at intervals of about 20 minutes.

## 6.1.7 Malfunctioning of wine cellar temperature sensor

If during the normal operation a failure occurs to the cooler NTC temperature sensor (the signal coming from the sensor is out of range), then:

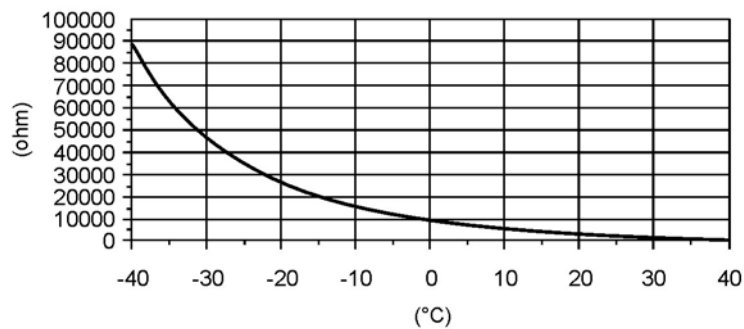
- The display shows cooler temperature sensor faulty
- The air flow regulator (damper) operates as follows:
  - open when the compressor is on
  - closed when the compressor is off
- The defrosting procedure is activated every about 10 hours



When the sensor operates again normally, the above described conditions terminate.

Characteristics of the NTC sensor:

T (°C)	ΔT (±°C)	Rn (Ω)
10	±0.6	5337
9	±0.6	5600
8	±0.5	5877
7	±0.5	6171
6	±0.5	6481
5	±0.5	6809
4	±0.5	7156
3	±0.5	7523
2	±0.4	7911
1	±0.4	8322
0	±0.4	8758
-1	±0.4	9218
-2	±0.4	9705
-3	±0.4	10222
-4	±0.5	10770
-5	±0.5	11352
-6	±0.5	11969
-7	±0.5	12624
-8	±0.5	13320
-9	±0.5	14059
-10	±0.5	14845
-11	±0.5	15678
-12	±0.6	16564
-13	±0.6	17506
-14	±0.6	18509
-15	±0.6	19577
-16	±0.6	20715
-17	±0.6	21928
-18	±0.6	23221
-19	±0.6	24600
-20	±0.6	26072
-21	±0.7	27637
-22	±0.7	29307
-23	±0.7	31092
-24	±0.7	32999
-25	±0.7	35039
-26	±0.7	37221
-27	±0.7	39556
-28	±0.7	42056
-29	±0.8	44735
-30	±0.8	47606
-31	±0.8	50668
-32	±0.8	53952
-33	±0.8	57475
-34	±0.8	61258
-35	±0.8	65320
-36	±0.8	69686
-37	±0.8	74381
-38	±0.8	79431
-39	±0.9	84867
-40	±0.9	90721



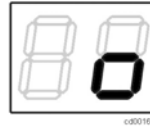
cd001199

cd001050

## 6.1.8 Malfunctioning of freezer temperature sensor

If during the normal operation a failure occurs to the freezer NTC temperature sensor (the signal coming from the sensor is out of range), then:

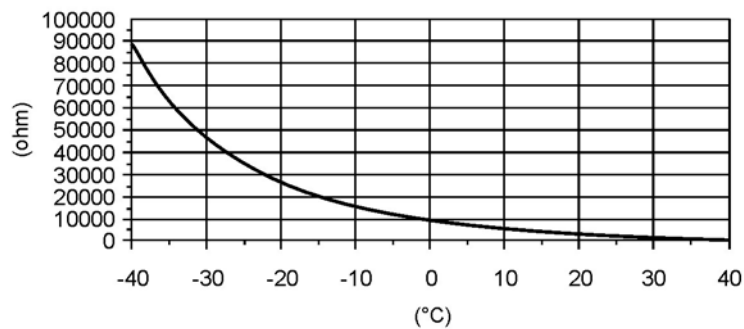
- The display shows freezer temperature sensor faulty



- The appliance operates with preset cycle when the compressor is powered for 40 minutes and remains off for 40 minutes alternatively
- The defrosting procedure is activated every about 10 hours

Characteristics of the NTC sensor:

T (°C)	ΔT (±°C)	Rn (Ω)
10	±0.6	5337
9	±0.6	5600
8	±0.5	5877
7	±0.5	6171
6	±0.5	6481
5	±0.5	6809
4	±0.5	7156
3	±0.5	7523
2	±0.4	7911
1	±0.4	8322
0	±0.4	8758
-1	±0.4	9218
-2	±0.4	9705
-3	±0.4	10222
-4	±0.5	10770
-5	±0.5	11352
-6	±0.5	11969
-7	±0.5	12624
-8	±0.5	13320
-9	±0.5	14059
-10	±0.5	14845
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-12	±0.6	16564
-13	±0.6	17506
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-16	±0.6	20715
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-18	±0.6	23221
-19	±0.6	24600
-20	±0.6	26072
-21	±0.7	27637
-22	±0.7	29307
-23	±0.7	31092
-24	±0.7	32999
-25	±0.7	35039
-26	±0.7	37221
-27	±0.7	39556
-28	±0.7	42056
-29	±0.8	44735
-30	±0.8	47606
-31	±0.8	50668
-32	±0.8	53952
-33	±0.8	57475
-34	±0.8	61258
-35	±0.8	65320
-36	±0.8	69686
-37	±0.8	74381
-38	±0.8	79431
-39	±0.9	84867
-40	±0.9	90721



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## 6.2 REFRIGERATOR

### 6.2.1 Normal



Warning: Unplug the appliance before operating.

In case of first switching on with a freezer compartment temperature higher than 10 °C, the appliance operates with a test cycle (for the factory) for a maximum time of about 1,5 hours.

In this period do not perform tests for the correct operation of the appliance, since the loads of the appliance are activated only for internal check (compressor).

When the appliance is off then:

- the compressor is off
- the display is off

Pushing the ON/OFF button, the display switches on with the following displaying:

- + symbol on display
- flashing digits

Regulate the temperature of the compartment so as to set the following values:

- about +5 °C in the cooler

### 6.2.2 QUICK COOL Function

The QUICK COOL function is activated by pushing the relative button, therefore:

- the pilot lamp relative to the QUICK COOL function lights up;
- The compressor operates in thermostatic conditions and not continuously (like the temperature knob was on max. position) for a duration of about 6 hours, and then it deactivates automatically.

To deactivate the QUICK COOL function push the relative button.

### 6.2.3 HOLIDAY Function (valid only for the cooler)

The HOLIDAY function is activated when the customer does not want to use the cooler temporary.

In this case it is not necessary to leave the cooler door open, because a +15 °C temperature is automatically set to avoid the formation of bad odours inside.

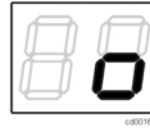
To activate the HOLIDAY function push button + (temperature increase) till letter H is shown in the cooler display.

Obviously the cooler must be empty because the +15 °C temperature does not allow the preservation of the most common food.

## 6.2.4 Malfunctioning of cooler temperature sensor

If during the normal operation a failure occurs to the cooler NTC temperature sensor (the signal coming from the sensor is out of range), then:

- The display shows cooler temperature sensor faulty

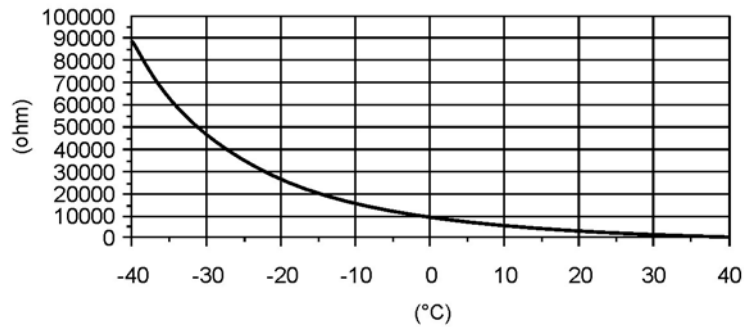


- The appliance operates with a preset cycle when the compressor is powered for 40 minutes and remains off for 40 minutes alternatively.

When the sensor operates again normally, the above described conditions terminate.

Characteristics of the NTC sensor:

T (°C)	ΔT (±°C)	Rn (Ω)
10	±0.6	5337
9	±0.6	5600
8	±0.5	5877
7	±0.5	6171
6	±0.5	6481
5	±0.5	6809
4	±0.5	7156
3	±0.5	7523
2	±0.4	7911
1	±0.4	8322
0	±0.4	8758
-1	±0.4	9218
-2	±0.4	9705
-3	±0.4	10222
-4	±0.5	10770
-5	±0.5	11352
-6	±0.5	11969
-7	±0.5	12624
-8	±0.5	13320
-9	±0.5	14059
-10	±0.5	14845
-11	±0.5	15678
-12	±0.6	16564
-13	±0.6	17506
-14	±0.6	18509
-15	±0.6	19577
-16	±0.6	20715
-17	±0.6	21928
-18	±0.6	23221
-19	±0.6	24600
-20	±0.6	26072
-21	±0.7	27637
-22	±0.7	29307
-23	±0.7	31092
-24	±0.7	32999
-25	±0.7	35039
-26	±0.7	37221
-27	±0.7	39556
-28	±0.7	42056
-29	±0.8	44735
-30	±0.8	47606
-31	±0.8	50668
-32	±0.8	53952
-33	±0.8	57475
-34	±0.8	61258
-35	±0.8	65320
-36	±0.8	69686
-37	±0.8	74381
-38	±0.8	79431
-39	±0.9	84867
-40	±0.9	90721



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## 7 ALARMS

### 7.1 Freezer compartment temperature alarm

When the freezer compartment reaches  $-11\text{ }^{\circ}\text{C}$ , the temperature alarm activates:

- The display digits flash
- The temperature alarm pilot lamp light up
- The buzzer sounds

Push the alarm deactivation button to deactivate the buzzer.

When normal conditions are reset (after a power failure):

- The acoustic signal deactivates
- The temperature alarm pilot lamp remains on
- The display digits still flash

Pushing the alarm deactivation button:

- The highest temperature reached in the freezer compartment is displayed for 5 minutes
- The alarm pilot lamp switches off
- The display digits do not flash anymore

## 8 ACCESSIBILITY

### 8.1 COMBI FIFTY TOTAL NO FROST

#### 8.1.1 Wine cellar compartment



Warning: Unplug the appliance before operating.

##### 8.1.1.1 Air flow regulator (damper)

To access the air diffuser and its components (damper and lamp holder) perform the following operations in sequence:



a) Remove the lamp protection by releasing the hook



b) Remove the filter support pushing it downwards



c) Unscrew the 2 upper fixing screws



d) Unscrew the 2 front fixing screws



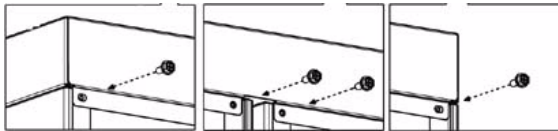
e) View of the lamp holder



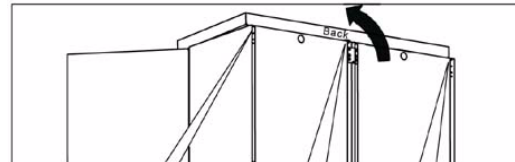
f) The damper is fitted with 2 screws and is connected to the electric wiring by means of a 4-pole connector

### 8.1.1.2 Control support

To access to the control support and its components (power and display boards), it is necessary to remove the steel plate cover of the mounting kit positioned above the 2 appliances as indicated in the following operations:



a) Unscrew the fixing screws of steel plate cover positioned on the back of the appliance



b) Rise the steel plate cover upwards as indicated by the arrow

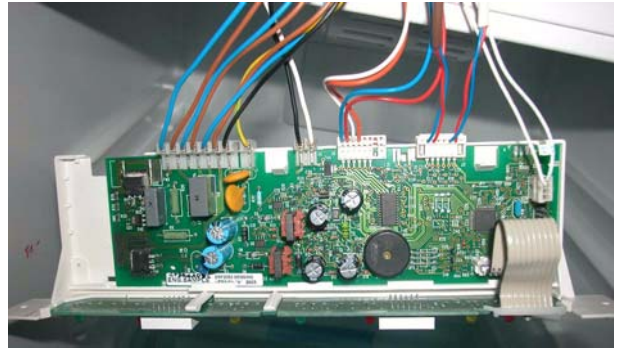


c) Remove the steel plate cover from the hinges as indicated by the arrow





d) Unscrew the 2 fixing screws of the control support and extract it pulling it backwards



e) Now it is possible to access to the power and display boards

## 8.1.2 Freezer compartment

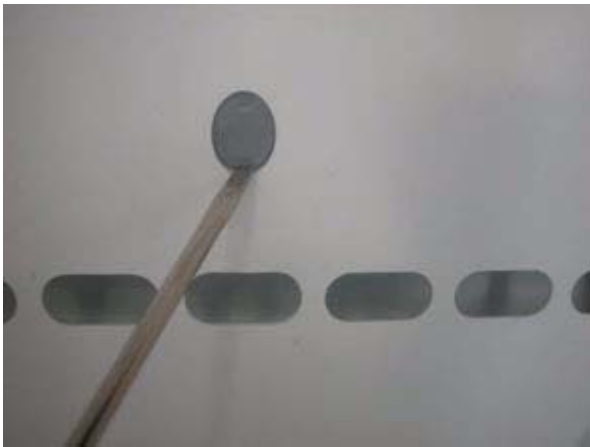


Warning: Unplug the appliance before operating.

### 8.1.2.1 Battery evaporator

To access the battery evaporator and its components (fan, defrosting heater and thermal switches), perform the following operations in sequence:

a) Remove the drawers and the grids



b) Remove the 3 screw covers



c) Remove the 3 fixing screws of the evaporator shield



d) Remove the connection box lid



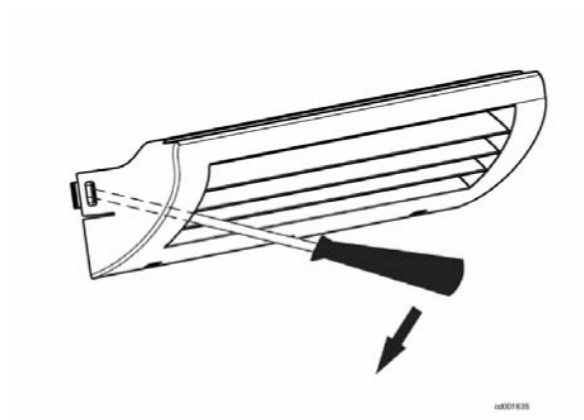
e) Detach the 2 fan and defrosting heater connectors



f) Release the 3 lower hooks of the air vent grid



g) Insert a screwdriver into the indicated slot



h) Insert the screwdriver end into the hook and rotate the screwdriver towards the direction of the arrow



i) Extract the cold module



j) Thermal switches connector



k) Thermal switches

Note:

The defrosting cut-out switches ( +8 / +40 °C ) are connected together; therefore, they are not available as single spare parts.



I) The fan is fitted to the support that is extracted from the cold module



Warning: In case of replacement of the fan, it is necessary to ensure that the fan operates with suction.

Note:

If the hoses are too short to extract the cold module, it is necessary to release and rotate the condenser and the compressor as indicated in figure:



## 9 TROUBLESHOOTING



Warning: Unplug the appliance before operating.

### 9.1 Excessive ice formation on the battery :

If the rubber valve remains open, the humid air outside the freezer compartment is ducted inside and it accumulates too much ice on the battery.

The valve remains open if there are foreign bodies or if it loses elasticity; therefore, in the first case the foreign bodies must be removed, while in the latter the rubber valve must be replaced.

### 9.2 Failed defrosting:

In case of failed defrosting, the possible causes are:

Sequence no	POSSIBLE CAUSES	HOW TO CONTROL	SOLUTION
1.	The defrosting heater is interrupted	Unplug the appliance, remove the connector of the heater and verify with the tester the correct resistance value to the connector clamps	If the resistance value does not correspond to the technical data, replace the heater
2.	One or both switches of the thermal protectors are open	Frost the battery, then detach the power plug of the appliance, remove the connector of the thermal switches and verify with the tester the correct resistance value to the connector clamps	If the resistance value does not correspond to 0 (zero Ohm) replace the thermal switches assembly

## 10 SPECIAL FUNCTIONS

### 10.1 COMBI FIFTY TOTAL NO FROST

#### 10.1.1 Service Mode

##### 10.1.1.1 Starting Service Mode

To start the procedure, perform the following operations:

1. Connect the plug to the socket
2. Switch on the appliance with the ON/OFF button
3. Open the doors of the appliance
4. Switch the appliance off with the ON/OFF button
5. Within the first 10 seconds hold down the two buttons "QUICK FREEZE function" and "alarm deactivation" simultaneously.

The confirmation of the procedure start occurs with the acoustic signalling of the buzzer which emits a long beep and with the lighting up of all segments of the display.

##### 10.1.1.2 Exiting Service Mode

The procedure terminates when one of the following operations is carried out:

- a. The plug is detached from the socket and reconnected
- b. 40 minutes have elapsed and no button has been pushed
- c. The last phase of the procedure has been reached.

##### 10.1.1.3 Functions of the Service Mode

Press the "QUICK FREEZE function" or "alarm deactivation" button to skip to the following phase of the procedure.

Press the "ON/OFF" button to activate/deactivate the loads (compressor, defrosting heater, lamp, fan and air flow regulator damper).

List of the phases of the SERVICE MODE:

1. All segments of the display are on.
2. All segments of the displays are off.
3. The number 0 is shown on the display and the load controlled by ACS TH1 [compressor] is checked.  
To activate/deactivate the load press the button "ON/OFF" (the load is activated when the QUICK FREEZE function pilot lamp and the alarm pilot lamp light up).
4. The number 1 is shown on the display and the load controlled by ACS TH2 [defrosting heater] is checked.  
To activate/deactivate the load press the button "ON/OFF" (the load is activated when the QUICK FREEZE function pilot lamp and the alarm pilot lamp light up).
5. The number 2 is shown on the display and the load controlled by ACS TH3 [lamp] is checked.  
To activate/deactivate the load press the button "ON/OFF" (the load is activated when the QUICK FREEZE function pilot lamp and the alarm pilot lamp light up).
6. The number 3 is shown on the display and the load controlled by ACS TH4 [fan] is checked.  
To activate/deactivate the load press the button "ON/OFF" (the load is activated when the QUICK FREEZE function pilot lamp and the alarm pilot lamp light up).

Note:

When the procedure skips to the following phase pressing the button "QUICK FREEZE function" or "alarm deactivation", the load keeps its status (for example, if the compressor had been activated, it will remain on also in the subsequent phases); in this way, it is possible to check the loads simultaneously.

7. The number 00 (= damper closed) or 0F (= damper open) is shown on the display and the air flow regulator (damper) is checked.  
To activate/deactivate the load press the button "ON/OFF".
8. Check of the doors.

The display digits correspond to the doors: the unit digits correspond to the cooler door, while the ten digits correspond to the freezer door.

If the relative door is closed, the displayed digit is 0 otherwise is 1.

9. Check of the counter.

The display shows an increasing number at intervals of 1 second.

This is a counter used by the board for its internal management.

10. Check of the temperature sensors.

The display shows one of the following codes:

Code	Description
E0	no error
E1	evaporator sensor damaged
E2	room temperature sensor damaged (installed on the display board)
E4	room temperature sensor damaged (installed on the power board)
E5	0 degree compartment sensor damaged

Note:

The errors regarding the cooler and freezer air sensors are already displayed during the normal operation.

At this point all the phases necessary to check the loads have been displayed, therefore it is advisable to interrupt the procedure of the SERVICE MODE unplugging and replugging the appliance.

Note:





If you do not want to interrupt the SERVICE MODE, the procedure continues with some phases dedicated exclusively to the factory, therefore they must not be considered.

Also in this case the exit from the SERVICE MODE is carried out unplugging and replugging the appliance.

## 11 DISPLAY SYMBOLS





### 11.1 COMBI FIFTY TOTAL NO FROST

#### 11.1.1 Wine cellar compartment

DISPLAY	DIGITS	DESCRIPTION
 <small>cd001650</small>	NOT FLASHING	It indicates the wine cellar temperature with normal operation [from +5 to +16].
 <small>cd001651</small>	NOT FLASHING	It indicates the malfunctioning of the wine cellar air temperature sensor.
 <small>cd001652</small>	NOT FLASHING	It indicates incompatibility between the electronic boards. Remedy: Check the spare part nos. of the electronic boards.
 <small>cd001653</small>	NOT FLASHING	It indicates an Eeprom parameter writing/reading error. Remedy: Replace both electronic boards (power and display).








## 11.1.2 Freezer compartment

DISPLAY	DIGITS	DESCRIPTION
 <small>cd001650</small>	NOT FLASHING	It indicates the freezer temperature with normal operation [from -15 to -24].
 <small>cd001651</small>	NOT FLASHING	It indicates the malfunctioning of freezer air temperature sensor.
 <small>cd001652</small>	NOT FLASHING	It indicates incompatibility between the electronic boards. Remedy: Check the spare part nos. of the electronic boards.
 <small>cd001653</small>	NOT FLASHING	It indicates an Eeprom parameter writing/reading error. Remedy: Replace both electronic boards (power and display).

## 11.2 REFRIGERATOR

### 11.2.1 Cooler compartment

DISPLAY	DIGITS	DESCRIPTION
 <small>cd001650</small>	NOT FLASHING	It indicates the cooler temperature with normal operation [from +2 to +8].
 <small>cd001654</small>	NOT FLASHING	It indicates the HOLIDAY function of the cooler compartment [15 °C].
 <small>cd001651</small>	NOT FLASHING	It indicates the malfunctioning of cooler air temperature sensor.
 <small>cd001652</small>	NOT FLASHING	It indicates incompatibility between the electronic boards. Remedy: Check the spare part nos. of the electronic boards.
 <small>cd001653</small>	NOT FLASHING	It indicates an Eeprom parameter writing/reading error. Remedy: Replace both electronic boards (power and display).

## 12 Revisions

Revision	Date	Description
00	02/2007	Document release
01	03/2008	Updated Chap.1: added reference S.M. 599706047 for electronic compressor and added PNC to table