

Refrigerator
KE 680-1-3T

Service Manual: H8-74-07

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1. Safety Instructions



Danger!

***Repairs may only be carried out by a qualified electrician!
Improper repairs can be extremely dangerous for the user.***

It is essential that you observe the following instructions in order to prevent electric shocks:

- The casing and the frame may be live in the event of faults!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Disconnect the appliance from the mains prior to carrying out any repair work!
- When inspecting live parts, a residual current circuit breaker must always be used!
- Always ensure that an earthed conductor is properly connected! The ground wire resistance must not exceed that specified in the standard! It is of vital importance for ensuring the safety of people and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or the corresponding regulations for your country!
- Do not touch any of the components in the appliance. The modules are also live!
- Observe instructions on electrostatic hazards!
- Wear safety goggles and protective gloves when handling refrigerants. Rinse your eyes with a lot of water if refrigerant splashes into them.



Attention!

Make sure you observe the following instructions:

- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current operated device.



Sharp edges: Use protective gloves.



Components may be electrostatic!
Observe handling precautions!

2. Repair Instructions

- Never attempt to carry out repairs by “randomly replacing” components!
- Always proceed systematically and observe the technical documentation that goes with the appliance!
- Electronic circuit boards are generally not repaired; instead they are completely replaced with original spare parts. Exceptions are documented separately.
- Pipe connections in cooling circuits are not to be soldered. Lokring connections are to be used.
- Carry out a leak test and a functional test on the cooling circuit.
- The dehumidifier is to be replaced before evacuation and filling during any intervention in the cooling circuit.
- It is essential to replace the compressor and the dehumidifier when repair work resulting from suction leaks in the cooling circuit is carried out. Humidity which gets into the cooling circuit will cause irreparable damage to the oil in the compressor.

3. Introduction

This manual is for BEST model SIDE BY SIDE refrigerators with a number display.

The models comprise two stand-alone appliances (FIFTY TOTAL NO FROST combination appliance + refrigerator) which are linked with an assembly set.

The manual is for appliances with the following PNCs:

Full appliance	925807511		
Full appliance model	KE680-1-3T		
Individual PNC appliances	923807505	KE680-1-2T	Refrigerator
	925807510	KE680-1-2T	Combination appliance
	925989649	KE680-1-2T	Assembly set



Caution!

The two appliances (COMBI FIFTY and REFRIGERATOR) must be connected to the power supply with the corresponding mains cables. The two mains cables may not be changed.

3.1 FIFTY TOTAL NO FROST combination appliance

FIFTY TOTAL NO FROST combination appliance features:

- No Frost (No Frost freezer, No Frost wine cooler)
- Free-standing installation
- Electronic control elements (controls type ERF2050)
- Air volume control (damper)
- The controls of the FIFTY TOTAL NO FROST combination appliance have been installed in the

top part of the wine cooler.

- Electronic power unit type ERF2050.
- Electronic display type ERF2000 (display with numbers).
- The appliance has only one traditional or electronic compressor, but it is possible to switch on only the wine cooler with the ON/OFF key.
- The temperature has been set as follows:
 - from +16 to +5°C in the wine cooler
 - from –15 to –24°C in the freezer
- The number display (DIGITS) shows the temperatures in both the cooling zones.
- The appliance performs the following functions:
 - quick freezing
 - freezer temperature alarm
- The appliance has the following cooling zones:
 - freezer
 - wine cooler
- The evaporator circuit comprises a finned-type evaporator (freezer).

3.2 Refrigerator

The refrigerator is type:

- Static
- Free-standing installation
- Single compressor technology
- Electronic control elements (controls type ERF2000)
- Display with numbers (DIGITS)

Refrigerator features:

- The refrigerator controls have been installed in the top part of the refrigerator.
- Electronic power unit type ERF2000.
- Electronic display type ERF2000 (display with numbers).
- The appliance has a single compressor.
- The temperature has been set as follows:
 - from +8 to +2°C in the refrigerator
- The number display (DIGITS) shows the refrigerator temperature.
- The evaporator circuit comprises a hidden evaporator.

The appliance performs the following functions:

- rapid cooling (QUICK COOL)
- holiday function

3.3 Assembly set

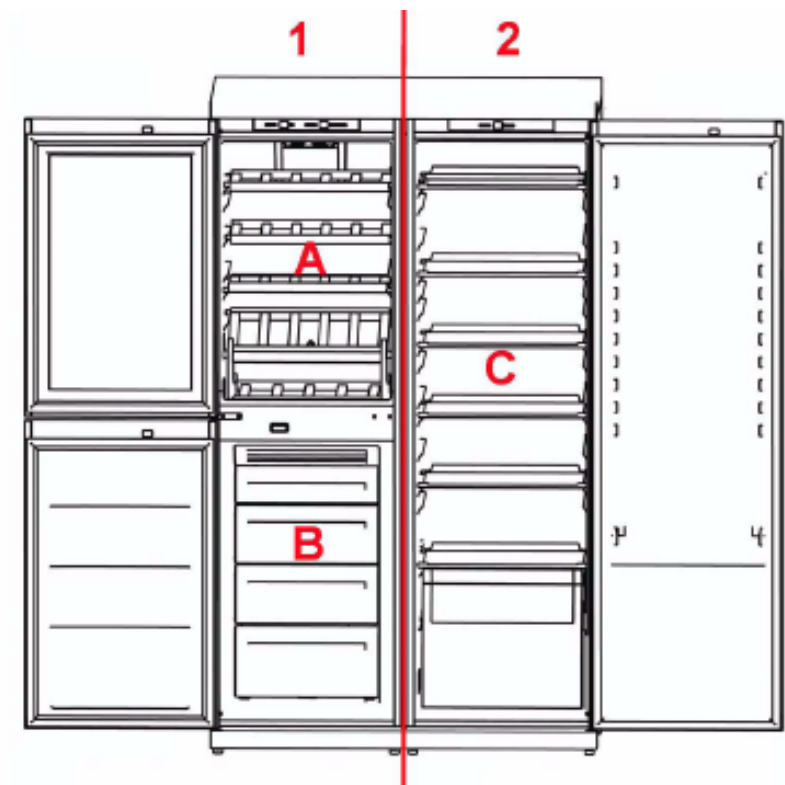
The assembly set contains the following components:

- Head section
- Base
- Side base
- Handles
- Clamps
- Screws
- Adjusting feet

4. The combination appliance at a glance

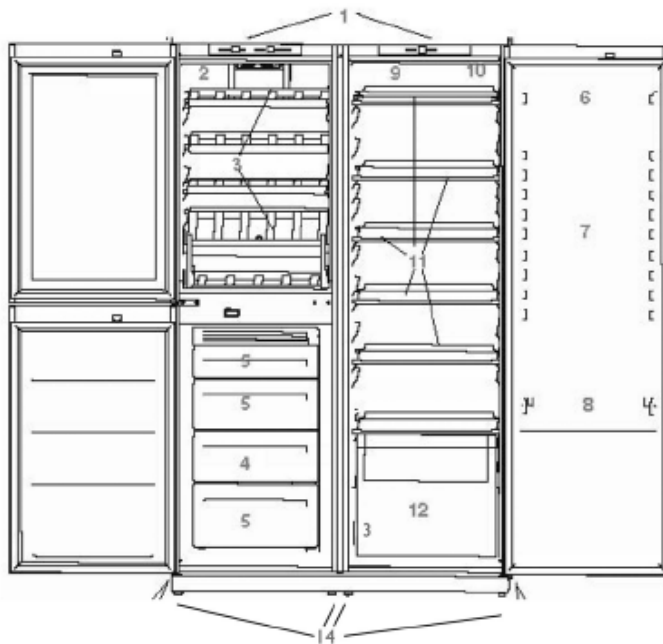
4.1 General partitioning

- 1 A Wine cooler
- 1 B Freezer
- 2 C Refrigerator



4.2 Internal partitioning

- 1 Appliance controls
- 2 Illumination lamp
- 3 Bottle shelves
- 4 Freezer section for fresh food
- 5 Section for frozen food
- 6 Butter section
- 7 Jug shelf
- 8 Bottle rack
- 9 DAC 1.1
- 10 Illumination lamp
- 11 Glass shelves
- 12 Vegetable tray
- 13 Rating plate
- 14 Adjusting feet



4.3 Features

An NTC probe is used to determine the temperature in the wine cooler:

- refrigerator temperature probe (located in the ventilation screen)

A probe recognises the temperature in the freezer:

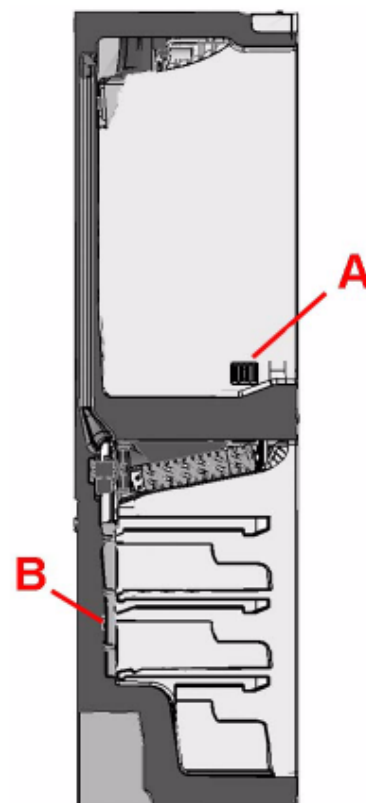
- freezer temperature probe (in the freezer)

The defrosting of the finned-type evaporator is regulated by the electronic system by recognizing the temperature of the probes; it depends on how often the doors are opened.

A Wine cooler temperature probe

B Freezer temperature probe

The cables for probes A and B are foamed into the interior of the casing so they cannot be replaced (for more information see the H8-74-05 Service Manual).



Refrigerator features

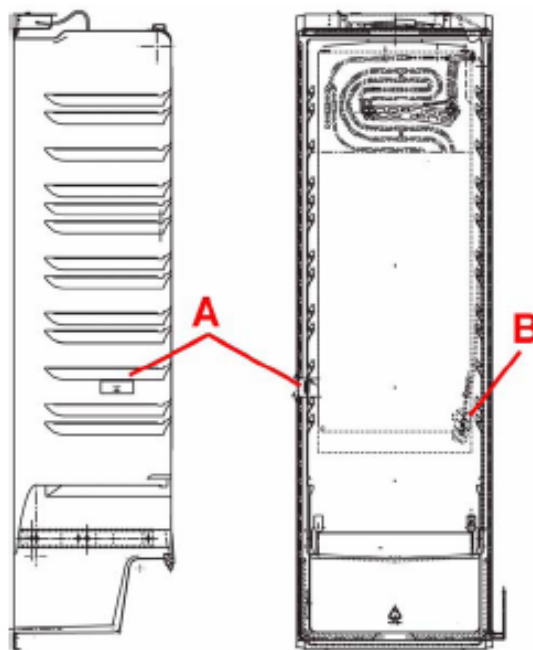
Two probes are used to determine the temperature in the refrigerator:

- Refrigerator air temperature probe (in the left of the refrigerator)
- Evaporator temperature probe (in contact with the hidden evaporator in the inner housing)

The cables for probes A and B have been foamed in the inside of the casing, so they cannot be replaced.

A Refrigerator temperature probe

B Evaporator temperature probe



5. Air flow

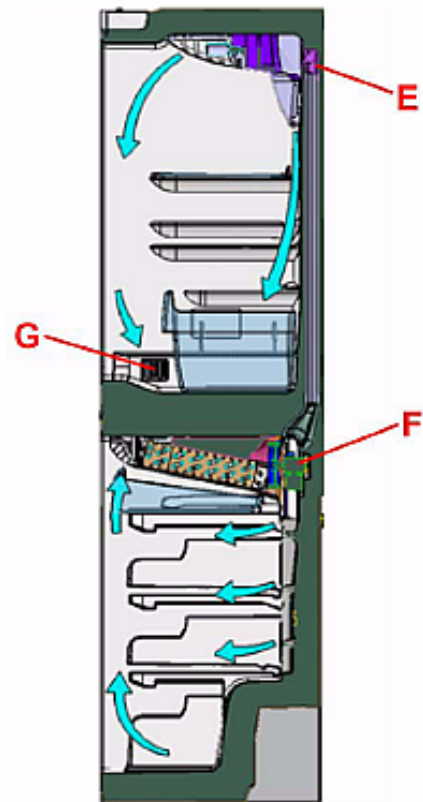
Unlike for the PARTLY NO FROST refrigerator, the TOTAL NO FROST appliance refrigerator and freezer share; the finned-type evaporator cools both cooling zones.

The cold generated by the battery-driven evaporator located in the freezer is distributed by the fan F mounted behind the evaporator module.

Refrigerator air volume: the cold air is guided from the fan to the foamed channel and comes out from the air volume control (damper) E, which is located in the back of the diffuser lamp mounting.

The air comes back into the freezer through the foamed channels and enters the ventilation screen G.

Freezer air volume: the cold air is guided into the room by the air umbrella and gets back into the evaporator module through the front ventilation screen.



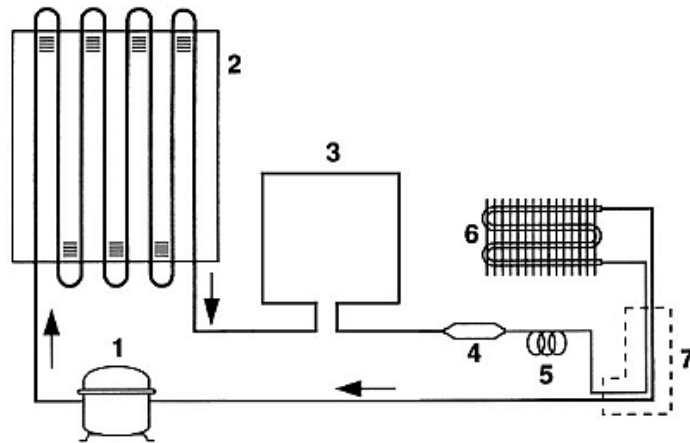
Caution!

If the door of the freezer or refrigerator is opened, the fan will come to a standstill.

To simulate a closed door, use a magnet which you insert near the Reed element located in the middle cross bar or the Reed element located in the electronic unit.

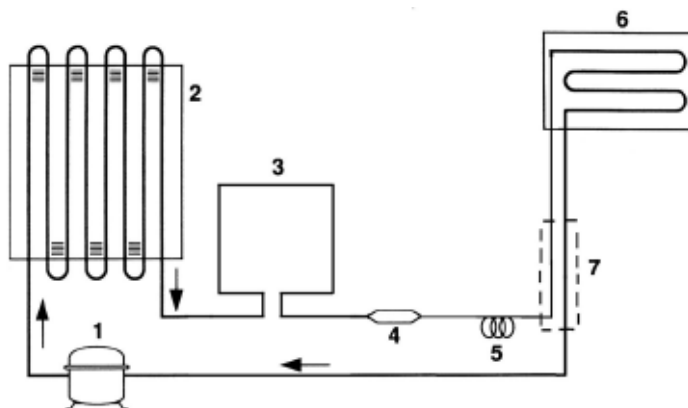
6. Cooling circuit

6.1 FIFTY TOTAL NO FROST combination appliance



- | | | | |
|---|------------------------|---|----------------------------------|
| 1 | Compressor | 2 | Capacitor |
| 3 | Anti-condensation coil | 4 | Drainage filter |
| 5 | Capillaries | 6 | Finned-type evaporator (freezer) |
| 7 | Heat exchanger | | |

6.2 Refrigerator

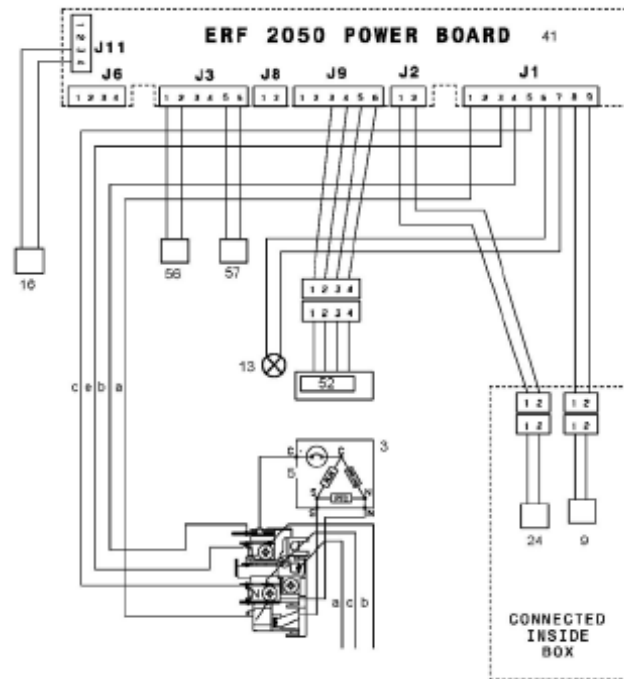


- | | | | |
|---|------------------------|---|----------------------------------|
| 1 | Compressor | 2 | Capacitor |
| 3 | Anti-condensation coil | 4 | Drainage filter |
| 5 | Capillaries | 6 | Hidden evaporator (refrigerator) |
| 7 | Heat exchanger | | |

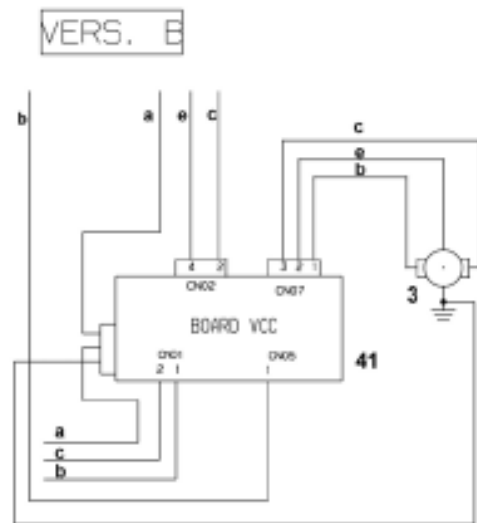
7. Electric system

7.1 FIFTY TOTAL NO FROST combination appliance

(Observe the circuit diagrams for each model!)



- | | |
|-----------------|---------|
| a. Yellow-green | b Brown |
| c Blue | d White |
| e Black | f Grey |
| g Red | |



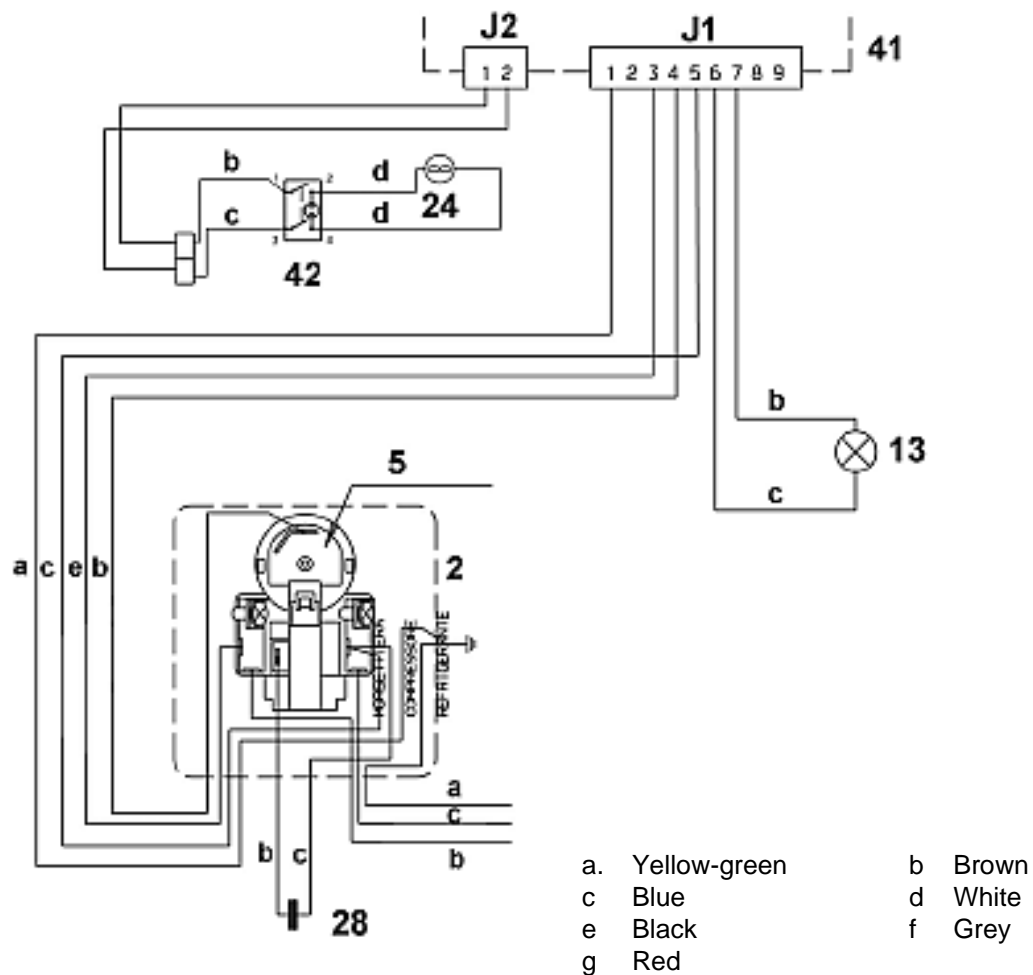
VERS. B = for the electronic compressor:

- | | |
|-------------------------|-------------------------------|
| 3 Electronic compressor | 41 Compressor electronic unit |
|-------------------------|-------------------------------|

For traditional compressors:

- | | |
|---------------------------------------|----------------------------------|
| 3 Compressor | 5 Motor protection |
| 9 Defrost resistor | 13 Illumination lamp |
| 16 Freezer door switch | 24 Finned-type evaporator fan |
| 41 Electronic unit ERF 2050 | 52 Air volume control (damper) |
| 56 Refrigerator air temperature probe | 57 Freezer air temperature probe |

7.2 Refrigerator

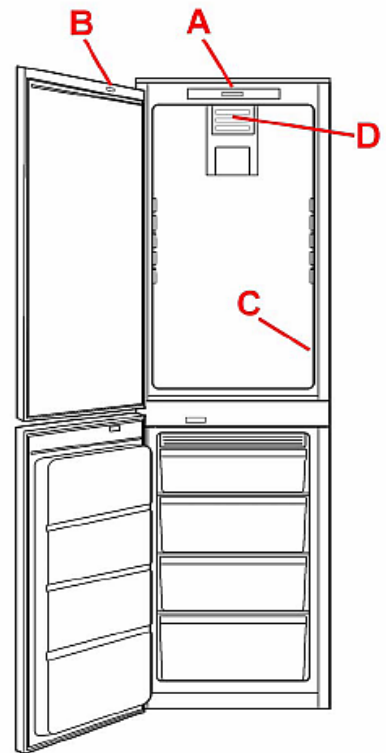


2	Compressor	5	Motor protection
13	Illumination lamp	24	D.A.C. fan 1.1
28	Operating capacitor (only for models for which this has been provided)		
41	Electronic unit ERF 2000	42	D.A.C. fan Switch 1.1

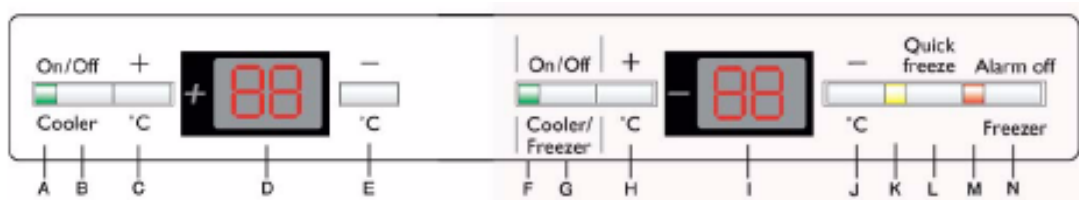
8. FIFTY TOTAL NO FROST combination appliance

8.1 Wine cooler

- A Control panel
- B Magnet for wine cooler door switch
- C Wine cooler air temperature probe
- D Air volume control (damper)



A Control panel



Wine cooler

- A Wine cooler ON/OFF indicator light
- B Wine cooler ON/OFF key
- C Key for increasing the temperature in the wine cooler (+)
- D Display for showing temperatures in the wine cooler
- E Key for reducing the temperature in the wine cooler (-)

Freezer

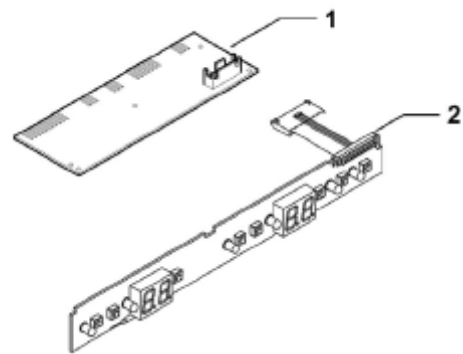
- F Wine cooler + freezer ON/OFF indicator light
- G Wine cooler + freezer ON/OFF key
- H Key for increasing the temperature in the freezer (+)
- I Display for showing temperatures in the freezer
- J Key for reducing the temperature in the freezer (-)
- K QUICK FREEZE function control lamp (quick-freeze)
- L ACTION FREEZE function key (quick-freeze)
- M Alarm control lamp
- N Alarm switch-off key

Electronic units

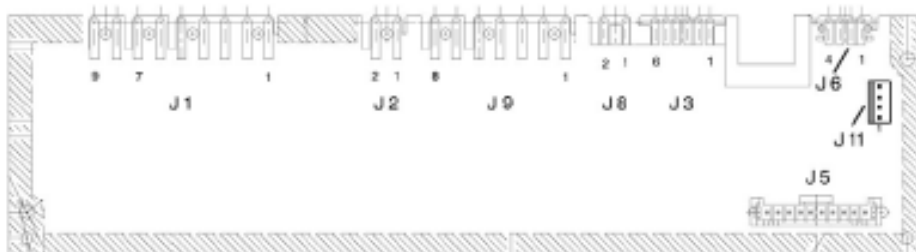
The appliance electronic system comprises:

- Electronic power unit type ERF2050
- Display electronic unit type ERF2000 DIGITS

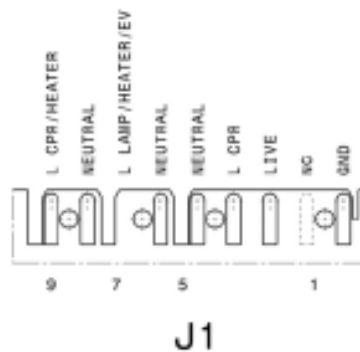
The two electronic units are connected to one another with a connecting flat cable so they are available as individual spare parts.



Electronic power unit ERF 2050



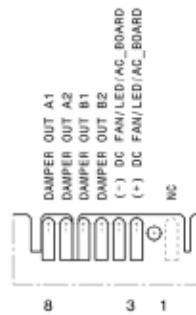
1. Earthing contact
2. Free
3. Cable
4. Compressor
5. Neutral wire
6. Illumination lamp neutral wire
7. Illumination lamp
8. Defrost resistor neutral wire
9. Defrost resistor



1. Fan cable
2. Fan neutral wire

**J2**

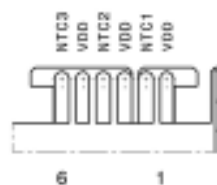
1. Free
2. Free
3. Free
4. Free
5. Damper
6. Damper
7. Damper
8. Damper

**J9**

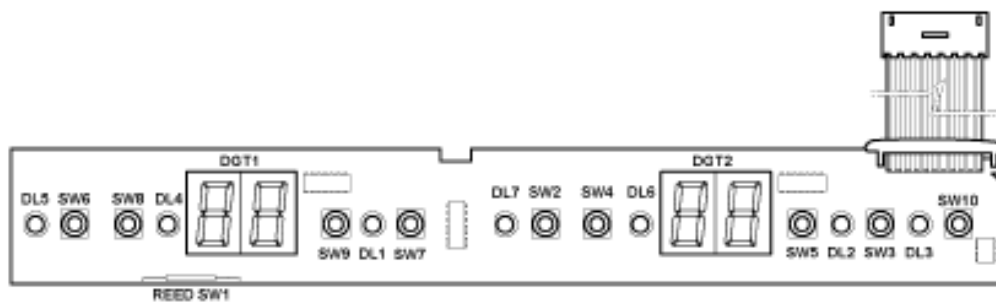
1. Free
2. Free

**J8**

1. Wine cooler air temperature probe
2. Wine cooler air temperature probe
3. Free
4. Free
5. Freezer air temperature probe
6. Freezer air temperature probe

**J3**

Display electronic unit ERF2000 DIGITS



SW1 = Reed element

SW2 = Wine cooler + freezer ON/OFF key

SW3 = ACTION FREEZE function key (quick-freeze)

SW4 = Key for raising the temperature in the freezer (+)

SW5 = Key for reducing the temperature in the freezer (-)

SW6 = Wine cooler ON/OFF key

SW7 = Key not used (concealed under the programme panel)

SW8 = Key for increasing the temperature in the refrigerator (+)

SW9 = Key for reducing the temperature in the wine cooler (-)

SW10 = Alarm switch-off key

DGT1 = Wine cooler display

DGT2 = Freezer display

DL1 = LED not used (concealed under the programme panel)

DL2 = ACTION FREEZE function LED (quick-freeze)

DL3 = Alarm signal lamp LED

DL4 = LED sign + wine cooler

DL5 = Wine cooler ON/OFF display LED

DL6 = LED sign - freezer

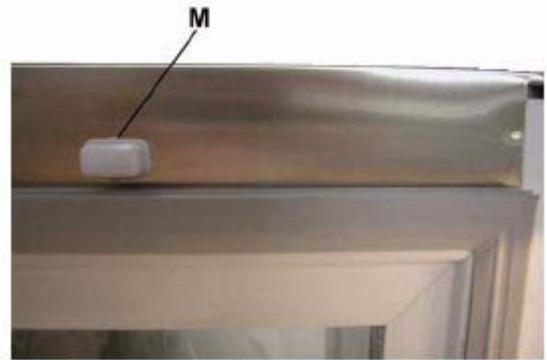
DL7 = Wine cooler + freezer ON/OFF display LED

B Magnet for wine cooler door switch

The solenoid switch for monitoring the wine cooler door is located in the display electronic unit.

The solenoid switch is operated by a magnet M in the door.

Monitoring the opening of the door is used for switching on the illumination lamp of the wine cooler; the illumination lamp is automatically switched off again after 5 minutes.

**C Wine cooler air temperature probe**

An NTC probe is used to detect the temperature in the wine cooler:

The air temperature probe for the wine cooler (located in the right-hand ventilation screen) is not only used for regulating the appliance with the air volume control (damper); it is also used for showing the temperature in the wine cooler.

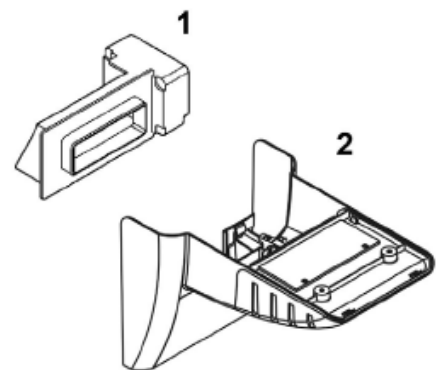
Probe C has a cable foamed inside the housing, so it cannot be replaced.

**D Air volume control (damper)**

The temperature setting in the refrigerator falls through the flow (or absence of the flow) of cold air from the damper. It has only 2 fixed positions, open or closed.

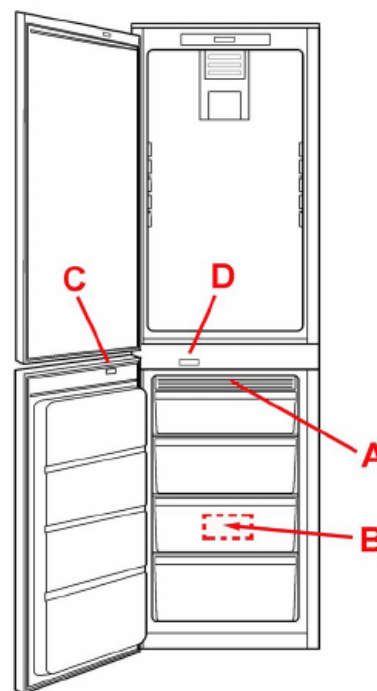
The air volume control (damper) (1) is located in the diffuser lamp mounting (2).

The damper comprises a flap with a stepper motor; it is connected to the electric wiring with a 4-pole connector.



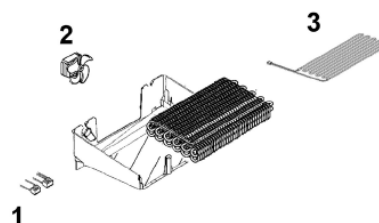
8.2 Freezer

- A Evaporator module (cold module)
- B Freezer temperature probe (foamed in the room)
- C Magnet for the freezer door switch
- D Magnetic sensor for the freezer door switch



A *Evaporator module (cold module)*

- 1. Thermal switch and defrost termination switch
- 2. Evaporator module fan
- 3. Defrost resistor



Please note! The defrost termination thermal switch and the thermal circuit breaker (+8/+40°C) are connected to one another and are thus not available as separate spare parts.

Thermal switch

The thermal switches are in direct contact with the finned-type evaporator.

They take voltage from the defrost element in the case of:

- +8°C defrost termination switch (brown cable)
- +40°C circuit breaker (blue cable)

Type of thermal switch	Cut-in temperature	
	Open	Close
Defrost termination	+8°C	-5°C
Circuit breaker	+40°C	+30°C

B **Evaporator module fan**

The fan is located behind the evaporator module.

The fan exerts a suction force on the air. For this reason, when the fan needs to be replaced, it must be ensured that the air is blown towards the bottom of the refrigerator.

The fan has the following characteristics:

- Voltage: 240 V
- Output: 3.1 W
- Speed: 2000 rpm



Caution!

If the door of the freezer or refrigerator is opened, the fan will come to a standstill. To simulate a closed door, use a magnet which you insert near the Reed element located in the middle cross bar or the Reed element located in the electronic unit.

C **Defrost resistor**

The defrost resistor is used to melt the ice that has built up on the battery-operated evaporator.

The defrost resistor data is as follows:

- Voltage: 240 V
- Output: 274 W
- Resistance: 210 ohm

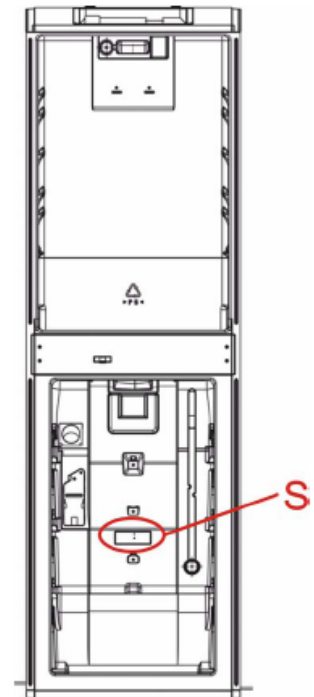
8.2.1 Freezer temperature probe

An NTC probe recognises the temperature in the freezer:

The temperature probe for the freezer is not only used for regulating the appliance with the fan and the compressor; it is also used for showing the temperature in the freezer.

The probe S has a cable foamed inside the housing and cannot be replaced.

S Freezer air temperature probe (located in the freezer)



8.2.2 Magnet for the freezer door switch

The solenoid switch for monitoring the freezer door is located in the middle cross bar.

The solenoid switch is operated by a magnet M in the door.

Monitoring the opening of the door is used for switching off the fan when the door is opened and for defrosting the evaporator module.

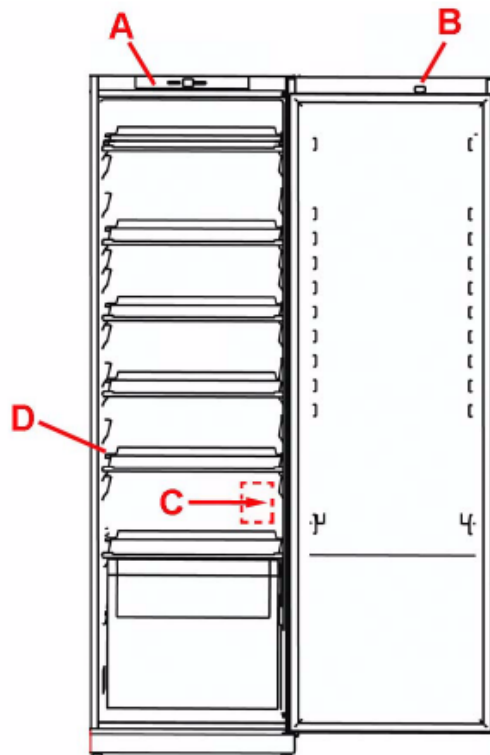
Magnetic sensor for the freezer door switch

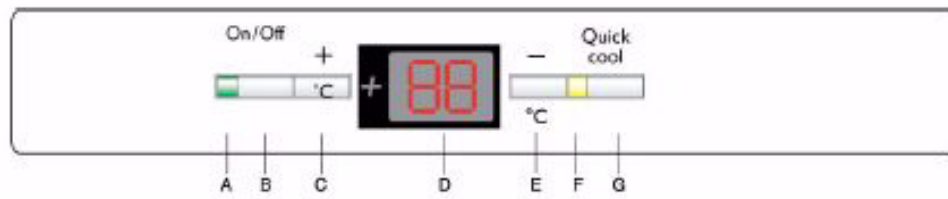
The solenoid switch for monitoring the freezer door is activated by a magnet located in the middle cross bar.



8.3 Refrigerator

- A Control panel
- B Magnet for refrigerator door switch
- C Evaporator temperature probe (foamed in the refrigerator)
- D Evaporator air temperature probe (foamed in the refrigerator)



A Control panel

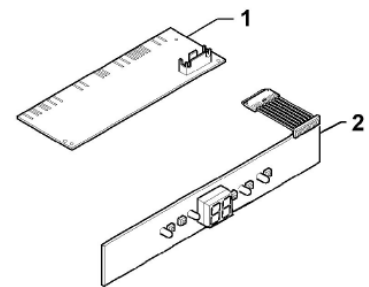
- A ON/OFF indicator light
- B ON/OFF key
- C Key to raise the temperature (+)
- D Display for showing temperatures
- E Key to lower the temperature (-)
- F QUICK COOL function control lamp (rapid cooling)
- G QUICK COOL function key (rapid cooling)

8.3.1 Electronic units

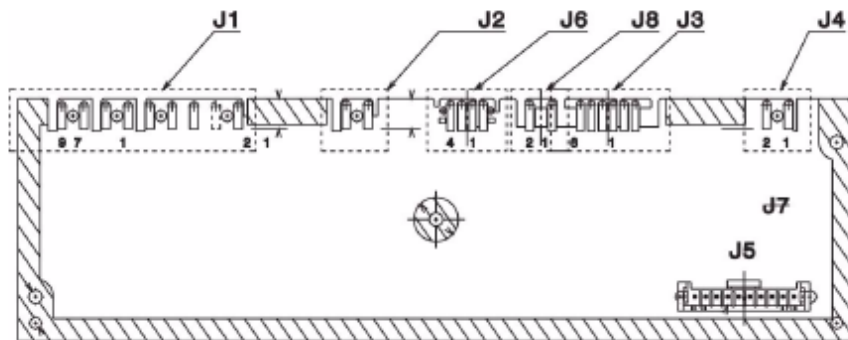
The appliance electronic system comprises:

- Electronic power unit type ERF2000.
- Display electronic unit type ERF2000 DIGITS

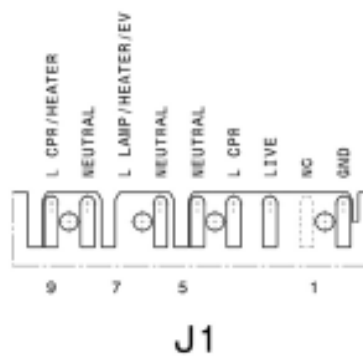
The two electronic units are connected to one another with a connecting flat cable and are thus available as individual spare parts.



Electronic power unit type ERF2000



1. Earthing contact
2. Free
3. Cable
4. Compressor
5. Neutral wire
6. Illumination lamp neutral wire
7. Illumination lamp
8. Free
9. Free



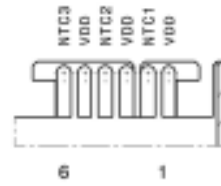
1. Cable for fan DAC 1.1
2. Neutral wire for fan DAC 1.1



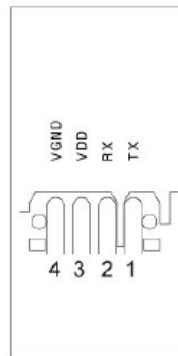
1. Free
2. Free



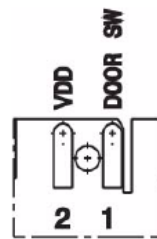
1. Refrigerator air temperature probe
2. Refrigerator air temperature probe
3. Evaporator temperature probe
4. Evaporator temperature probe
5. Free
6. Free

**J3**

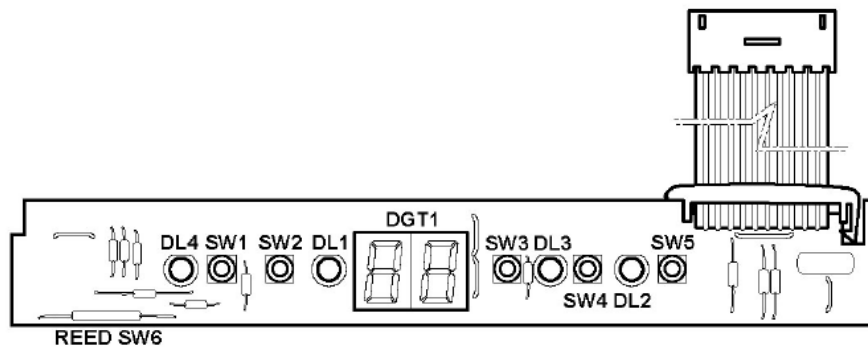
1. Free
2. Free
3. Free
4. Free

**J6**

1. Free
2. Free

**J4**

Display electronic unit ERF2000 DIGITS



SW1 = Reed element

SW2 = Key to raise the temperature (+)

SW3 = Key to lower the temperature (-)

SW4 = Key for QUICK COOL function (rapid cooling)

SW5 = Key not used (concealed under the programme panel)

SW6 = Reed element

DFT1 = Display for showing temperatures

DL1 = LED sign +

DL2 = LED not used (concealed under the programme panel)

DL3 = LED for QUICK COOL function (rapid cooling)

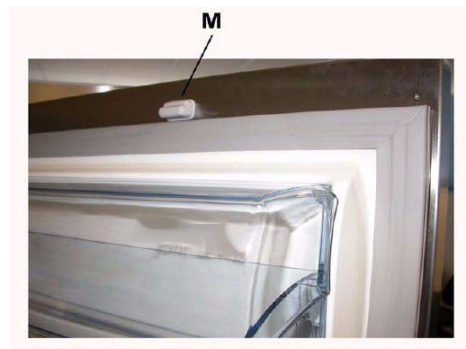
DL4 = ON/OFF display LED

B Magnet for refrigerator door switch

The solenoid switch for monitoring the refrigerator door is located in the display electronic unit.

The solenoid switch is operated by a magnet (M) in the door.

The control is used for switching on the illumination lamp of the refrigerator.



C + D Temperature probes

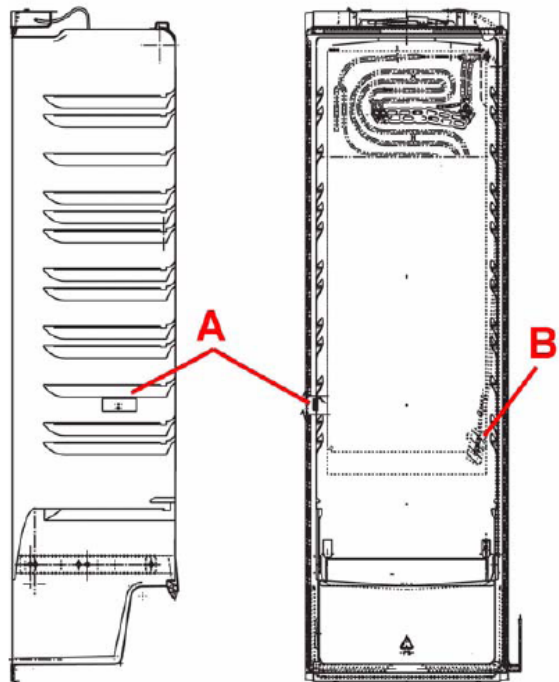
Temperatures in the refrigerator are measured by two NTC probes:

- Evaporator temperature probe (foamed within the refrigerator)
- Freezer air temperature probe (located in the freezer)

The cables for probes A and B are foamed into the interior of the casing so they cannot be replaced (for more information see the H8-74-05 Service Manual).

A = Refrigerator temperature probe

B = Evaporator temperature probe



9. Main functions

9.1 FIFTY TOTAL NO FROST combination appliance

9.1.1 Normal function

When the appliance is switched on for the first time and there is a temperature of more than 10°C in the freezer, the appliance will carry out a test programme (factory setting) for up to 1.5 hours.

No function tests may be carried out during this time, since the appliance loads are only activated for internal controls (compressor, fan and defrost resistor).

When the appliance is switched OFF:

- The compressor will be switched off.
- The displays will be switched off.

If the ON/OFF key is pressed, the display will switch on and show the following:

- Symbol “+” on the freezer display.
- The freezer numbers will blink.
- Freezer temperature alarm (buzzer activated).

Switch off the acoustic signal with the buzzer OFF key.

Regulate the refrigerator and freezer temperatures so that the following settings result:

- approx. +10°C in the refrigerator
- approx. –18°C in the freezer

Thanks to air circulation, the moisture present in the freezer evaporates on the evaporator battery of NO FROST refrigerators. This prevents ice from building up on the food.

During normal operating times, the electronic system powers the electric circuit of the compressor and fan.

The fan is switched off with a delay of 2 minutes after the compressor.

The operating time equivalent to the time span between the defrost phases operated in sequence is approx. 14 hours when the doors are opened normally (this time may be up to 72 hours when a door is never opened!).

9.1.2 Normal function when first switched on or after a power cut

If the appliance power supply is disrupted when the appliance is first switched on or when there is a power cut, one of the following circumstances will occur:

1. When, upon resumption of the power supply, the temperature inside the appliance is equal to or higher than the cut-in temperature of the air temperature probe in the refrigerator, the electronic system will switch on the compressor and the fan until the temperature that has been set is reached and it will activate the defrosting procedure after five hours (after the compressor has been switched off).

2. When, upon resumption of the power supply, the temperature inside the appliance is lower than the cut-in temperature of the air temperature probe in the refrigerator, the compressor will operate in the thermostatic operating status and the electronic system will activate the defrosting procedure after five hours (after the compressor has been switched off).

The electronic system will always activate the defrosting procedure after five hours, unless the appliance has been switched on for the first time or unless a power failure has occurred.

9.1.3 Defrosting

The moisture inside the appliance will all be deposited on the evaporator, which is the coldest part of the refrigerator; this is why the ice present on the battery needs to be defrosted at regular intervals, at least every 14 hours when the door is opened normally (if the door is never opened, defrosting will only need to be carried out after 72 hours).

Defrosting is commenced when the compressor is switched off or, when the compressor is in operation, after 2.5 hours at the most.

The electronic system will immediately switch off the electric circuit which feeds the compressor and after two minutes it will switch off the electric circuit feeding the fan. After another three minutes the electronic system will feed the electric circuit of the defrost resistor for at least around 20 minutes.

The heat generated by the defrost resistor will not have any effect on the temperature in the freezer or on the temperature of food, since all the thermal energy is used for defrosting the ice present on the evaporator.

After 20 minutes the electronic system will record the status of the defrost termination thermal switch to determine when it switches off.

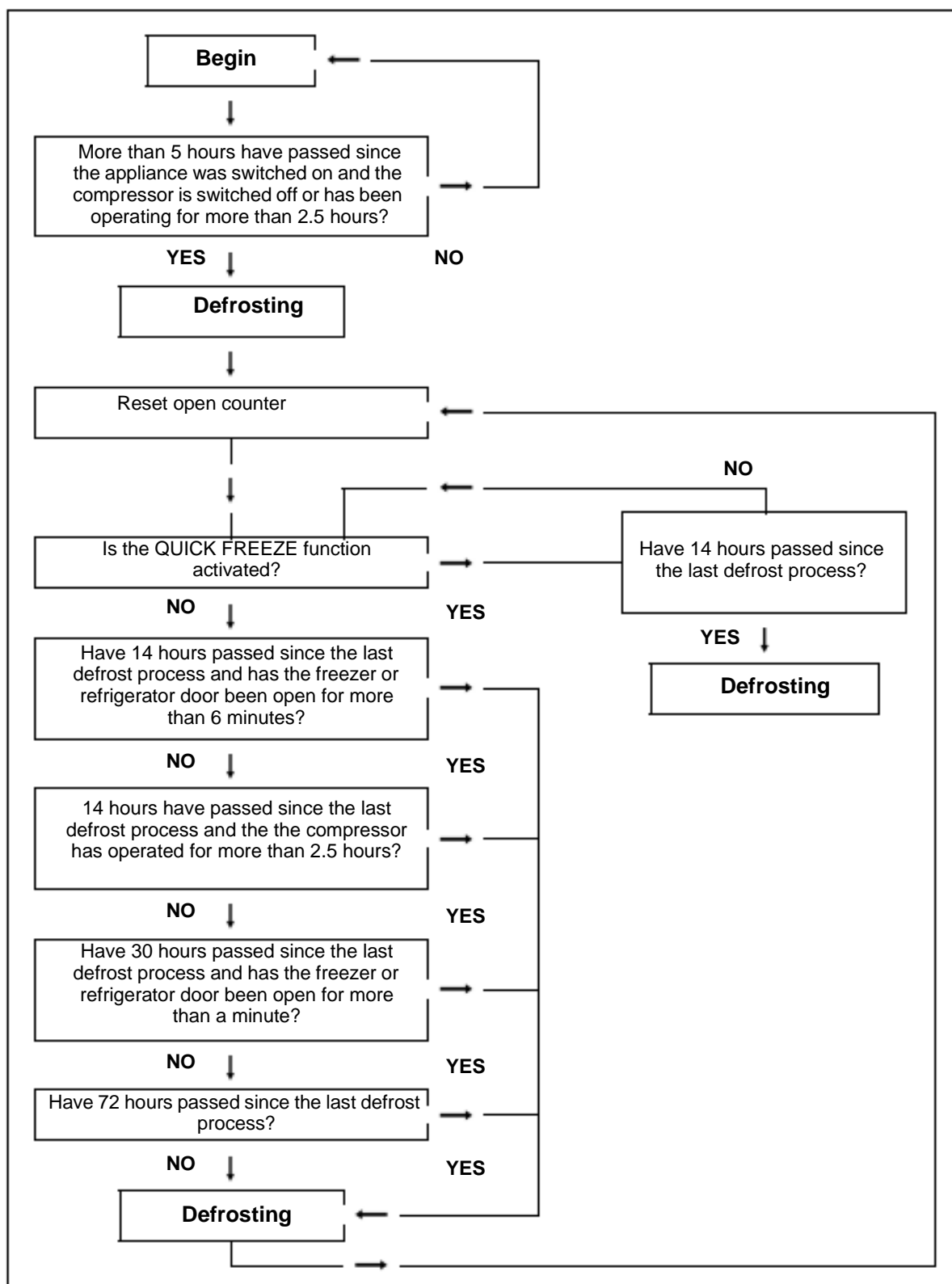
After the defrost termination switch has switched off and definitely after 20 minutes, the electronic system will switch the compressor on again with a delay of five minutes.

The fan will also be switched on again following a further delay of three minutes, if the air has in the meantime already become cold.

If for any reason whatsoever the defrost termination switch is not activated, so that the battery temperature rises to +40°C, the defrost resistor will be switched off by the thermal circuit breaker.

If the thermal switch has not switched the defrost resistor off one hour after commencement of defrosting, the electronic system will always deactivate the defrost resistor and will allow normal operation to continue.

9.1.4 Flow diagram for controlling the defrosting procedure



9.1.5 QUICK FREEZE function

The QUICK FREEZE function is activated with the relevant key, after which:

- the QUICK FREEZE function control lamp will be switched on;
- the compressor will operate in the thermostatic operating mode for about 52 hours instead of in continuous operation (as if the temperature key had been set at Max.) and will then be switched off automatically.

Press the relevant key to deactivate the QUICK FREEZE function.

While the QUICK FREEZE function is in operation, defined defrost processes may nevertheless be carried out, irrespective of how much time has passed since the last defrost process.

9.1.6 Switching off the wine cooler

The wine cooler can be switched off with the relevant ON/OFF key.

The temperature display is switched off.

The air volume control (damper) is switched off and the illumination lamp remains switched off even if the door is open.

Please note! In order to prevent unpleasant odours from developing inside the wine cooler, the air volume control is opened and then closed again immediately in intervals of approx. 20 minutes.

9.1.7 Wine cooler temperature probe fault

If the NTC temperature probe in the refrigerator develops a fault during normal operation (the signal emitted by the probe is not within the limits):

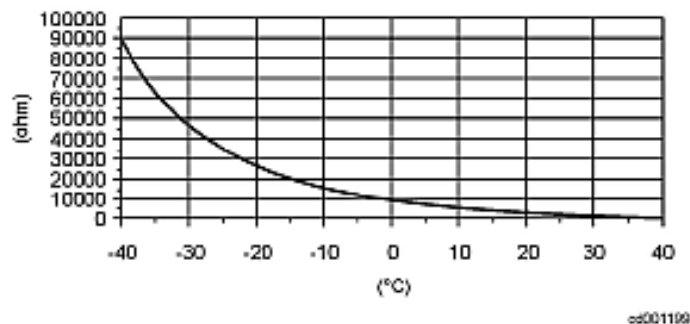
- the display will show that the refrigerator temperature control has developed a fault;
- the air volume control (damper) functions as follows:
 - open when the compressor is switched on,
 - closed when the compressor is switched off;
- defrosting will be activated approx. every 10 hours.



When the probe functions properly again, the three operating conditions defined above will be discontinued.

NTC probe features:

T(°C)	ΔT(±°C)	Rn (Ω)
10	±0.6	5337
9	±0.6	5600
8	±0.5	5817
7	±0.5	6111
6	±0.5	6461
5	±0.5	6809
4	±0.5	7156
3	±0.5	7521
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	11959
-7	±0.5	12624
-8	±0.5	13320
-9	±0.5	14059
-10	±0.5	14845
-11	±0.5	15678
-12	±0.6	16554
-13	±0.6	17526
-14	±0.6	18529
-15	±0.6	19572
-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	29302
-23	±0.7	31052
-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	47626
-31	±0.8	50658
-32	±0.8	53952
-33	±0.8	57415
-34	±0.8	61258
-35	±0.8	65320
-36	±0.8	69646
-37	±0.8	74351
-38	±0.8	79431
-39	±0.9	84867
-40	±0.9	90721

**9.1.8 Freezer temperature probe fault**

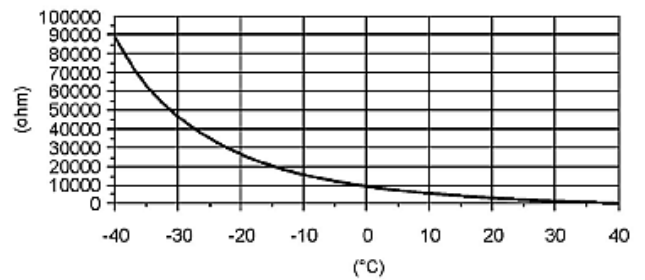
If the NTC temperature probe in the freezer develops a fault during normal operation (the signal emitted by the probe is not within the limits), the following will occur:

- The display will show that the freezer temperature probe has developed a fault.
- The appliance will carry out a pre-determined programme run during which the compressor will alternately be powered for 40 minutes and switched off for 40 minutes.
- Defrosting will be activated approx. every 10 hours.



NTC probe features:

T (°C)	ΔT (±°C)	Rn (Ω)
10	±0.5	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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9.2 Refrigerator

9.2.1 Normal

When the appliance is switched on for the first time and there is a temperature of more than 10°C in the freezer, the appliance will have a test programme carried out (factory setting) for up to 1.5 hours.

No function tests may be carried out during this time, since the appliance loads are only activated for internal controls (compressor).

When the appliance is switched OFF:

- The compressor will be switched off.
- The display will be off.

If the ON/OFF key is pressed, the display will switch on and show the following:

- Symbol + on the display
- Blinking numbers

Set a temperature of approx. +5°C in the refrigerator.

9.2.2 QUICK COOL function

The QUICK COOL function is activated with the relevant key, after which:

- the QUICK COOL function control lamp will be switched on;
- the compressor will operate in the thermostatic operating mode for about 6 hours instead of in continuous operation (as if the temperature key had been set at Max.) and will then be switched off automatically.

Press the relevant key to deactivate the QUICK COOL function.

9.2.3 HOLIDAY function (only for the refrigerator)

The HOLIDAY function is switched on when the user temporarily does not wish to use the refrigerator.

In this case the refrigerator door will not need to be left open because a temperature of +15°C is set automatically to prevent a bad odour from developing inside the refrigerator.

To activate the HOLIDAY function, press the + key (to raise the temperature) until the letter *H* is shown in the refrigerator display.

The refrigerator will naturally need to be emptied, as food cannot be stored at a temperature of +15°C.

9.2.4 Refrigerator temperature probe fault

If the NTC temperature probe in the refrigerator develops a fault during normal operation (the signal emitted by the probe is not within the limits), the following will occur:

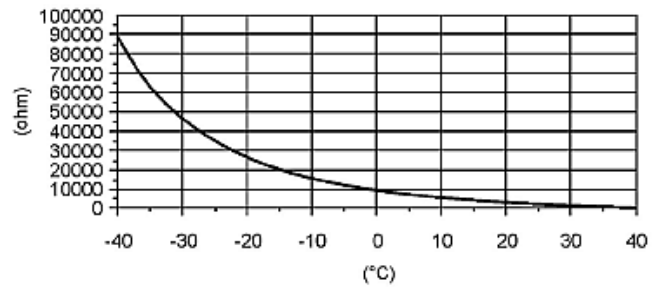
- The display will show that the refrigerator temperature probe has developed a fault.
- The appliance will carry out a pre-determined programme run during which the compressor will alternately be powered for 40 minutes and switched off for 40 minutes.



When the probe functions properly again, the two operating conditions defined above will be discontinued.

NTC probe features:

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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10. Alarms

10.1 Freezer temperature alarm

The temperature alarm is activated when the temperature in the freezer reaches -11°C :

- The numbers in the display will blink.
- The temperature alarm control lamp will switch on.
- The buzzer will sound.
To switch off the buzzer sound, press the key to deactivate the buzzer.

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

- The acoustic signal will be deactivated.
- The temperature alarm control lamp will remain switched on.
- The numbers in the display will continue to blink.

When the key for deactivating the alarm is pressed:

- The highest temperature reached in the freezer is displayed for 5 seconds.
- The alarm control lamp will switch off.
- The numbers in the display will not blink.

11. Accessibility



Caution!

Always pull the mains plug out before working on the appliance.

11.1 FIFTY TOTAL NO FROST combination appliance

11.1.1 Wine cooler

A Air volume control (damper)

Proceed as follows to access the air diffusor and its components (air volume control and lamp mounting):



1. Unhook the ratchet brace and remove the lamp mounting.



2. Remove the filter holder downwards.



3. Remove the 2 top fastening screws.



4. Remove the 2 front fastening screws.



5. View of the lamp mounting

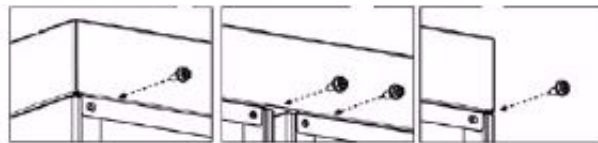


6. The damper is fastened with 2 screws; it is connected to the electric wiring with a 4-pole connector.

B Control holder

To access the control holder and its components (electronic power unit and electronic display unit), the metal cover of the assembly set, located on top of the two appliances, will need to be removed.

1. Remove the two fastening screws from the metal cover.



2. Lift the metal cover up.



3. Pull the metal cover out of the hinges.



4. Loosen the two fastening screws for the control panel and remove them.



5. This will give you access to the electronic power unit and the electronic display unit.



11.2 Freezer

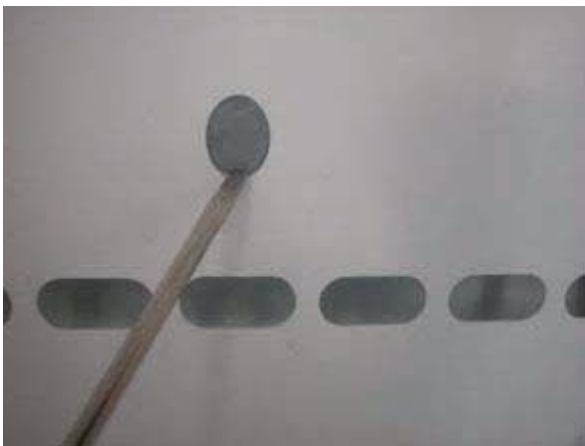


Caution!

Always pull the mains plug out before working on the appliance.

11.2.1 Finned-type evaporator

Proceed as follows to access the finned-type evaporator and its components (fan, defroster heating element and thermal switch):



1. Remove the drawers and grid and then the 3 screw covers.
2. Remove the 3 fastening screws from the evaporator cover.



3. Remove the cover of the terminal board.



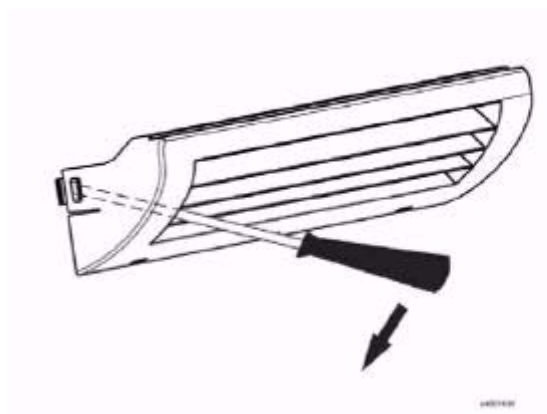
4. Disconnect the 2 fan connectors and the defroster heating element



5. Unhook the 3 bottom ratchet braces on the ventilation screen.



6. Put a screwdriver in the slot shown.



7. Put the tip of the screwdriver into the ratchet braces and turn the screwdriver in the direction of the arrow.



8. Pull out the evaporator module.



9. Thermal switch connector



10. Thermal switch

Please note!

The defrost termination thermal switch and the thermal circuit breaker (+8/+40°C) are connected to one another and are thus not available as separate spare parts.



11. The fan is fastened to the holder which pulls out of the evaporator module.

Attention!

Should the fan be replaced, make sure that the fan suction functions.

**Please note!**

If the hoses are too short to pull out the evaporator module, the condenser and the compressor will need to be unhooked and turned.

12. Fault finding



Caution!

Always pull the mains plug out before working on the appliance.

12.1 Layer of ice on the battery too thick

When the rubber valve stays open, the humidified air outside the freezer gets inside and too much ice is deposited on the battery.

The valve stays open when foreign bodies are present or when it loses its elastic properties. In the first case the foreign body will need to be removed and in the latter case the rubber valve will need to be replaced.

12.2 Appliance does not defrost

The following may cause the defrost phase to fail:

No.	Possible causes	Check	Remedy
13	The defrost resistor has been interrupted.	Pull out the mains plug of the appliance, remove the defrost resistor connector and use the tester to check for the correct resistance value on the connector terminals.	Replace the resistor if the resistance value does not comply with the technical data.
	One or both thermal cut-off device switches are open.	Allow frost to build up on the battery, then pull out the mains plug of the appliance, disconnect the thermal switch and use the tester to check for the correct resistance value on the connector terminals.	Replace the thermal switch of the unit if the resistance value is not 0 (zero ohm).

13. Special functions

FIFTY TOTAL NO FROST combination appliance

13.0.1 Customer service programme

Starting the customer service programme

1. Put the plug into the socket.
2. Switch on the appliance with the ON/OFF key.
3. Open the appliance doors.
4. Switch off the appliance with the ON/OFF key.

Press the two QUICK FREEZE and alarm OFF keys simultaneously within 10 seconds.

The customer service programme start will be confirmed when a long acoustic signal sounds and the display segments are all switched on.

End of the customer service programme

The customer service programme can only be ended when one of the following conditions has been met:

- The plug is pulled out of the socket and then put in again.
- 40 minutes have passed since the last time a key was pressed.
- The final phase has been reached.

Functions of the customer service programme

Press the QUICK FREEZE key or the alarm OFF key to skip the following phases of the customer service programme.

Press the ON/OFF key to activate/deactivate the loads (compressor, defrost resistor, illumination lamp, fan and air volume control damper).

List of the customer service programme phases:

1. The display segments are all switched on.
2. The display segments are all switched off.
3. The displays shows 0 and the load regulated by the acs TH1 [compressor] is checked.
Press the ON/OFF key to activate/deactivate the load (the load is activated when the QUICK FREEZE function control lamp and the alarm control lamp switch on).
4. The display shows 1 and the load regulated by the acs TH2 [defrost resistor] is checked.
Press the ON/OFF key to activate/deactivate the load (the load is activated when the QUICK FREEZE function control lamp and the alarm control lamp switch on).

5. The display shows 2 and the load regulated by the acs TH3 [illumination lamp] is checked.
Press the ON/OFF key to activate/deactivate the load (the load is activated when the QUICK FREEZE function control lamp and the alarm control lamp switch on).
6. The display shows 3 and the load regulated by the acs TH4 [fan] is checked.
To activate/deactivate the load, press the "ON/OFF" key (the load is activated when the QUICK FREEZE function control lamp and the alarm control lamp switch on).

Please note! If the procedure goes to the following phase when the QUICK FREEZE function or alarm OFF key is pressed, the load state will be maintained (e.g. when the compressor has been activated it will be active in the following phases). This makes it possible to check the loads at the same time.

7. The number 00 (= damper closed) or 0F (= damper open) is shown on the display and the air volume control (damper) is checked.
To activate/deactivate the load press the "ON/OFF" key.
8. Checking the doors
The numbers on the display are compatible with the doors: the unit number is equivalent to refrigerator door, while the number for the tens is for the freezer door.

When the corresponding door is closed, the number display will be 0, otherwise it is 1.

9. Checking the counter
The display shows a rising number in one-second cycles.
This counter is used by the electronic system for its internal control.
10. Checking the temperature probes.
The display will show one of the following codes:

Code	Description
E0	No error
E1	Evaporator probe defect
E2	Room temperature probe defect (mounted on the electronic display unit)
E4	Room temperature probe defect (mounted on the electronic power unit)
E5	0° section probe defect

Please note! Errors in the air temperature probes for the refrigerator and the freezer are already shown during normal operation.

The customer service programme should be discontinued after all the phases in the load test have been shown. To discontinue the programme switch the appliance off and then on again.





Please note! If the customer service programme is not discontinued, other phases will run which are only of interest to the factory and should be ignored.

In this case too, the customer service programme will end when the appliance is switched off and then on again.





14. Display symbols

14.1 FIFTY TOTAL NO FROST combination appliance






14.1.1 Wine cooler

Display	Figures	Description
	Not blinking	The temperature for normal operation in the wine cooler is shown [from +5°C to +16°C]
	Not blinking	A fault in the air temperature probe in the wine cooler is shown
	Not blinking	Shown when the electronic systems are not compatible. Remedy: Check the electronic unit spare-part numbers.
	Not blinking	Shown when there is a writing/reading error in the EEPROM data. Remedy: Change both electronic units (electronic power and electronic display units).

14.1.2 Freezer

Display	Figures	Description
	Not blinking	The temperature for normal operation in the freezer is shown [from –15°C to –24°C].
	Not blinking	A fault in the air temperature probe in the freezer is shown.
	Not blinking	Shown when the electronic systems are not compatible. Remedy: Check the electronic unit spare-part numbers.
	Not blinking	Shown when there is a writing/reading error in the EEPROM data. Remedy: Change both electronic units (electronic power and electronic display units).

14.2 Refrigerator

Display	Figures	Description
	Not blinking	The temperature for normal operation in the freezer is shown [from +2°C to +8°C].
	Not blinking	The HOLIDAY function in the refrigerator is shown [15°C].
	Not blinking	A fault in the air temperature probe in the refrigerator is shown.
	Not blinking	Shown when the electronic systems are not compatible. Remedy: Check the electronic unit spare-part numbers.
	Not blinking	Shown when there is a writing/reading error in the EEPROM data. Remedy: Change both electronic units (electronic power and electronic display units).