

Technical Manual

FULL NO FROST COMBINED UNIT (2003)

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1 PRODUCT RANGE

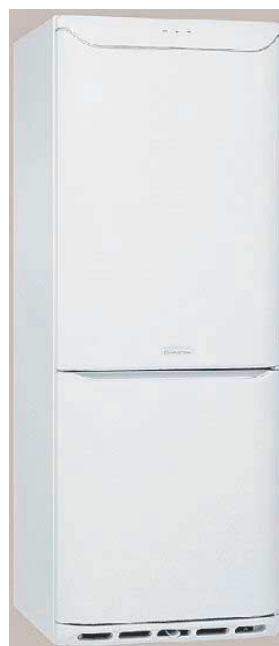
1.1 Full No Frost Combined Models



Ariston width 60



Ariston width 60



Ariston width 70



Ariston width 70



Indesit width 60



Indesit width 60



Indesit width 70



Indesit width 70

1.2 Control panels / User interface



**INDESIT
LED**

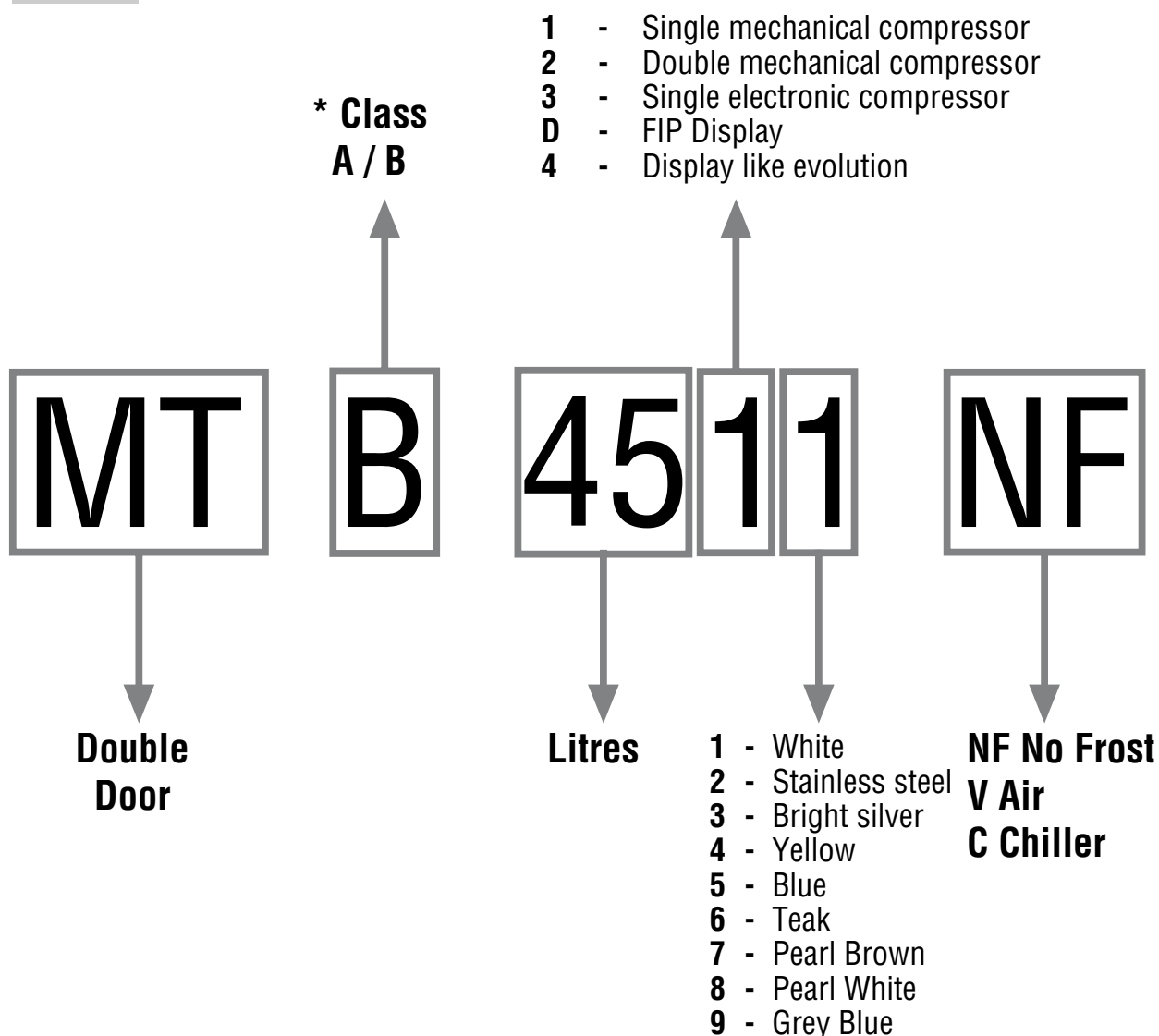


**ARISTON
LED**



**ARISTON
DISPLAY**

LEGENDS



* If the class is lower than B, the class is not written in the description (MT 4511 NF TK).

LEGEND - ARISTON NEW STYLING MODELS L = 60 cm

- **MT** Double door
- **MB** Combined
- **MS** Single-door
- **MU** Vertical freezers
- **MH** Horizontal freezers
- **FIRST TWO NUMBERS**
structure litres (same as old ones)

- **3rd NUMBER**

1	1 Compressor
2	2 Compressors
3	1 Compressor + Solenoid valve
4	1 Compressor + Solenoid valve + Display + Air
D	Display

- **4th NUMBER**

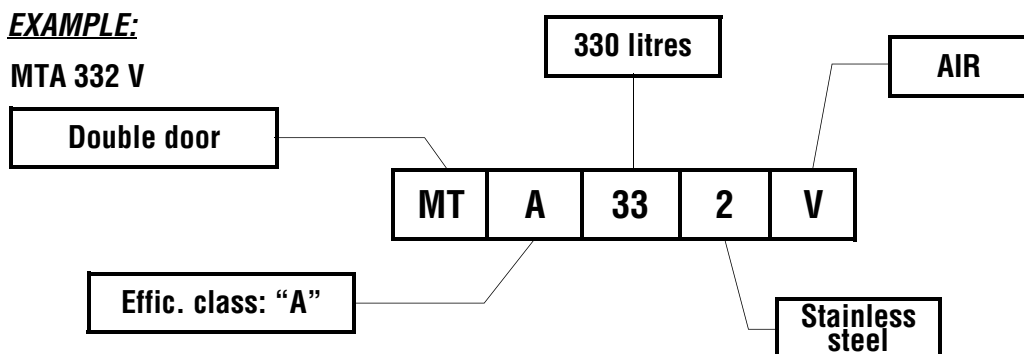
1	White
2	Stainless steel
3	Bright silver
4	Yellow
5	Blue
6	Teak
8	White (French market only)
9	S/steel (French market only)

- **Other letters indicate performances**

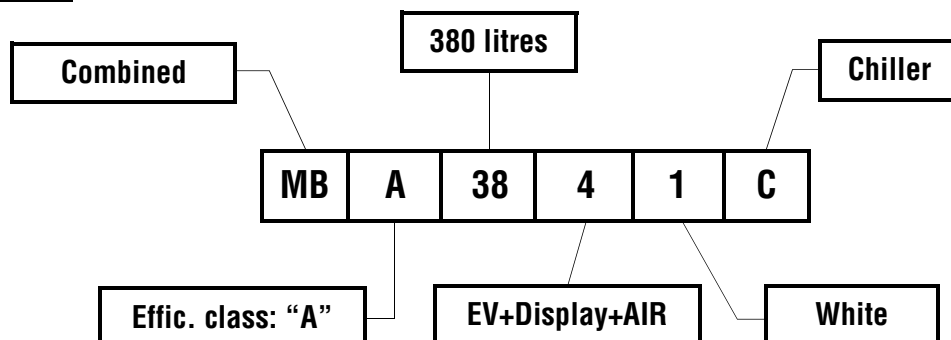
C	Chiller
V	Air
E	Ever Fresh (Vacuum Kit)
BS	Bacteria stop (Cell with Antimicrobial film)
NF	Full No-Frost

EXAMPLE:

MTA 332 V



MBA 3841 C

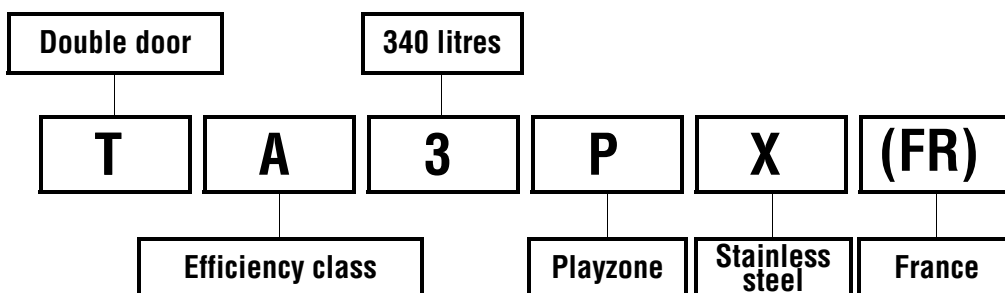


LEGEND INDESIT NEW STYLING 2003 REFRIGERATORS / COMBINED MODELS

Double door

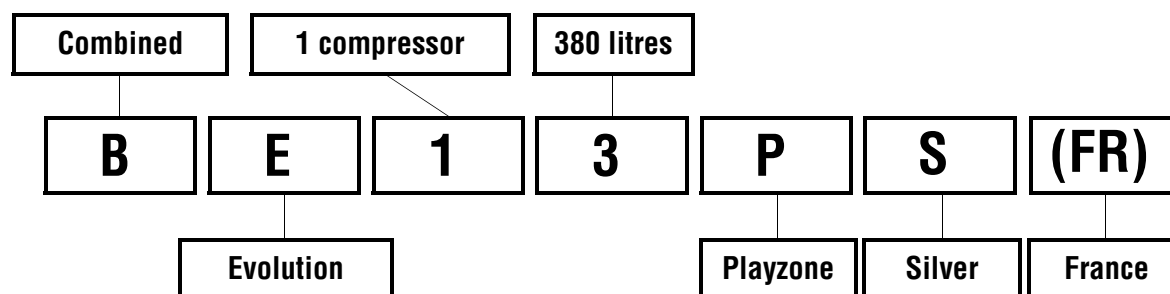
T	Top freezer
A / A+	Efficiency class A
E	Evolution
1st number	2 = 290 litres
	3 = 340 litres
	4 = 400 litres

Colour	T = Teak
	B = Blue
	Y = Yellow
	S = Silver
	X = S/steel
Refrigerant gas	I = Isobutane
Intended markets	(FR) = France
	(SP) = Spain
	Etc.
Accessories / Operation type	P = Playzone
	C = Chiller
	L = De luxe / Lock
	E = External Handle
	V = Ventilated
	H = External Handle + Playzone
	NF = Partial No Frost
	FNF = Full No Frost
	G = Glass (Glass refrigerator shelves)



Combined units

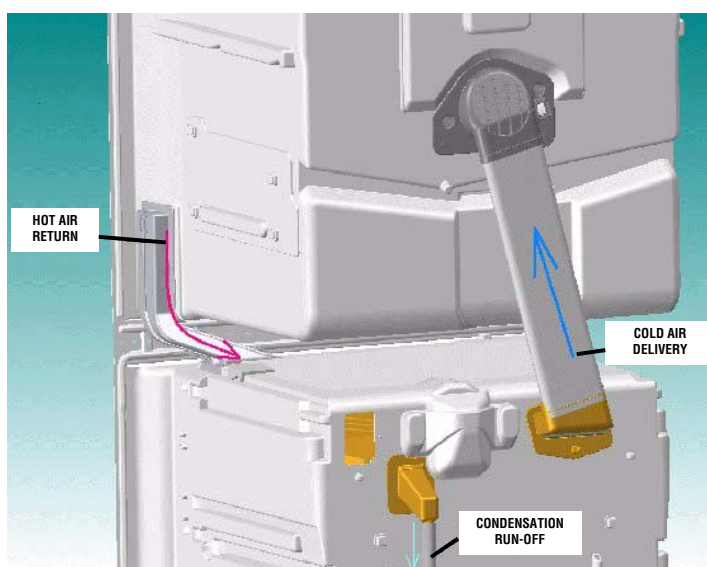
B	Bottom freezer
A / A+	Efficiency class A
E	Evolution
1st number	1 = 1 compressor
	3 = 1 compressor + EV or 1 compressor + electronic control
2nd number (3rd not compulsory)	2 = 330 litres
	3 = 380 litres
	39 = 390 litres
	4 = 400 litres



Exception FNF SP:
Play Zone and Chiller are implied (therefore in the description, "PC" are not given).

2 FUNCTIONING LOGICS

The refrigeration system consists of a compressor, a condenser on the rear wall of the appliance and an evaporator coil located in the freezer compartment. The cold produced by the evaporator coil reaches the freezer compartment by means of the freezer fan, and reaches the refrigerator compartment by the delivery ducting and the refrigerator fan and is distributed in the various shelves through the multiflow.



The refrigerator compartment temperature can be adjusted separately from that of the freezer, and vice versa. It is not possible to switch off just one of the two compartments; the only action possible is to switch off the entire appliance (refrigerator and freezer) by means of the **ON/OFF key on appliances with display, and using the freezer knob for appliances with knobs.**

The freezer compartment temperature adjustment is managed by the electronic board which receives the temperature values measured by the freezer air sensor. The freezer fan is fed, or not fed, according to these values. The temperatures used to manage demands for refrigeration from the freezer compartment and subsequent switching on of the compressor depend on the settings fixed by means of the user interface and which determine a compressor switching on/off threshold.

Also the refrigerator temperature adjustment is managed by the electronic board which switches the compressor and the refrigerator and freezer fans on/off according to the temperatures measured by the refrigerator air sensor. The temperatures used to manage demands for refrigeration from the refrigerator compartment and subsequent switching on of the compressor and the two fans depend on the settings fixed by means of the user interface.

Set temperature	Freezer switching on temperature	Freezer switching off temperature
-18 °C	-18 °C	-22 °C
-18 °C	-19 °C	-22 °C
-19 °C	-22 °C	-23 °C
-20 °C	-22 °C	-25 °C
-21 °C	-23 °C	-26 °C
-22 °C	-24 °C	-27 °C
-23 °C	-25 °C	-28 °C
-24 °C	-26 °C	-29 °C
-25 °C	-27 °C	-30 °C
-26 °C	-27 °C	-31 °C

Set temperature	Refrigerator switching on temperature	Refrigerator switching off temperature
8	14 °C	12 °C
7	10 °C	8 °C
6	8 °C	7.5 °C
5	7 °C	6 °C
4	5 °C	4 °C
3	4 °C	3.5 °C
2	2 °C	1 °C

Particular situations

Optimizing consumption

Temperature adjustment follows different rules if the following conditions occur:

- ECO function On
- Temperature (ambient) measured by the sensor on the electronic board of between **25 and 35 °C**
- Time elapsed from last door opening more than **22 hours**
- Duration of last compressor On cycle less than **45 min**

The previous conditions are tested whenever the compressor is switched off. If all these conditions have occurred, with every demand for refrigeration by one compartment, also the other compartment is forced to demand refrigeration (thus offering energy saving, as the compressor is switched on less often), considering as switching Off thresholds those set by the user.

This particular situation can be exited if at least one of the previous conditions has not occurred again on switching off of the compressor, or if the situation continues for more than **255 days**.

After a defrost

After every defrost, a refrigeration demand from the freezer compartment is forced, without waiting for the freezer air sensor to detect a **hotter value than the switching on temperature relevant to the adjustment set by the user**. The end of the demand is managed following the classic rules of thermostating.

3 CHARACTERISTICS OF THE APPLIANCE

	No Frost with display	Standard No Frost
User interface Input-Output	 On FR door: 6 Keys: (1) ON/OFF for switching the appliance on and off; (2) ECO for activation/deactivation of the ECO function; (3) RESET ALARM for resetting alarm conditions; (4) MODE, (5) ADJUST SELECT + and (6) ADJUST SELECT - for shifting on the display 1 Display: for adjusting the freezer (FZ) and fridge (FR), setting the various functions and signalling for the user 1 Buzzer: on electronic board housed in the control panel	 On appliance instrument panel: 1 FZ Knob: (1) ON/OFF for switching the appliance on and off and for freezer (FZ) adjustment 1 FR Knob: for adjusting the fridge (FR) and activation/deactivation of HOLIDAY function 1 Key SUPER FREEZE: for switching on the SUPER FREEZE function 1 Key SUPER FRIDGE: for switching on the SUPER FRIDGE function 3 LEDs: green for line, right yellow for SUPER FREEZE function, left yellow for SUPER COOL function 1 Buzzer: on electronic board housed in the control panel
Loads	1 COMPRESSOR 2 FR LAMPS (on Multiflow shell) 4 DEFROST HEATING ELEMENTS in parallel (evaporator, drip tray, chamber division, elbow) 1 FZ NF FAN (in FZ cell) 1 FR FAN (in FR cell) 2 THERMAL FUSES	1 COMPRESSOR 2 FR LAMPS (on Multiflow shell) 4 DEFROST HEATING ELEMENTS in parallel (evaporator, drip tray, chamber division, elbow) 1 FZ FAN (in FZ cell) 1 FR FAN (in FR cell) 2 THERMAL FUSES
Sensors	1 FZ EV SENSOR (in contact with FZ evaporator) 1 FZ AIR SENSOR (inside FZ compartment) 1 FR AIR SENSOR (inside FR compartment) 1 FR DOOR SWITCH (magnetic reed on board behind control panel)	1 FZ EV SENSOR (in contact with FZ evaporator) 1 FZ AIR SENSOR (inside FZ compartment) 1 FR AIR SENSOR (inside FR compartment) 1 FR DOOR SWITCH (magnetic reed on board behind control panel)
Internal serial line	Between the two boards: passage on FR door hinge	Not Available
External serial line	Output in the compressor bay	Output in the compressor bay
Memory EEPROM	On electronic board	On electronic board

4 ANALYZING THE LOADS

1. Compressor

The compressor, managed by the electronic board, is normally on when at least one of the two compartments demands refrigeration, i.e., when the temperatures of the freezer and/or refrigerator air sensor are such as to activate at least one refrigeration demand. When both compartments no longer need refrigeration, the refrigeration demands are deactivated and the compressor is switched off.

There are particular situations when, despite demands for refrigeration by the appliance's compartments, the compressor remains switched off.

- **Compressor protection:** in particular the compressor switches on **8 minutes** after it has been switched off. This allows the gas pressures inside the thermodynamic circuit to equalize without risk of the compressor becoming blocked due to too high pressures inside the thermodynamic circuit.
- **Long periods of activity:** if the compressor remains on for more than **4 hours** it is switched off, even if the compartments demand refrigeration.
- **Pause after defrost:** at the end of every defrost, the compressor observes **10 minutes** of protection so that the water formed can completely run off before the evaporator starts to cool again.

POSSIBLE CAUSE OF MALFUNCTION:

Electronic board management
Compressor control circuit on the board
Connection on the board
Wiring harness
Connection on the compressor
Breakages/anomalies inside the compressor
Temperature sensors open or short-circuited

TESTING:

General on appliance: force the compressor to switch on by activating the 24h SUPER FREEZE function and check that the compressor switches on. (Remember the 8 minutes of compressor protection).

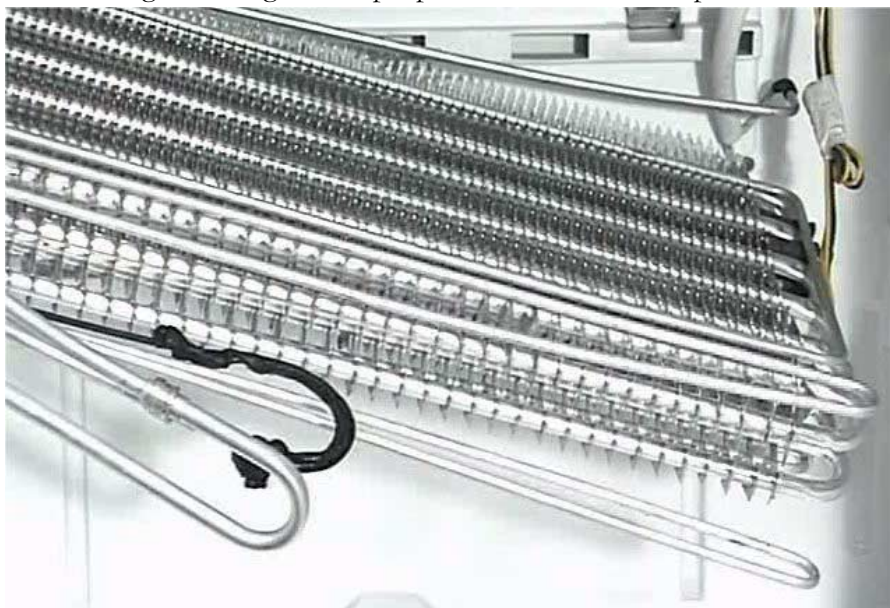
Wiring: check for continuity and short circuits; check the connections (connectors and terminals); check whether voltage is available.

Component: check that the component is fed; direct check of the compressor (powered directly).

Electronic board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

2. Defrost Heating Elements

The purpose of the **evaporator heating element** is to melt any ice on the evaporating coil. The presence of ice is due to the condensation of moist air in the two compartments, when it comes into contact with the low temperatures on the evaporator. This ice compromises the heat exchange between the evaporator and the air, reducing the refrigeration properties in the two compartments of the appliance.



The **drip tray heating element** melts any bits of ice coming off the evaporator and falling onto the drip tray, and also prevents blockage of the pipe that takes the water from the drip tray to the drain pipe.



The **elbow and chamber division heating elements** allow the elimination of ice formed on those elements; such places are subjected to direct flows of cold air, that can produce ice which prevents correct air circulation.

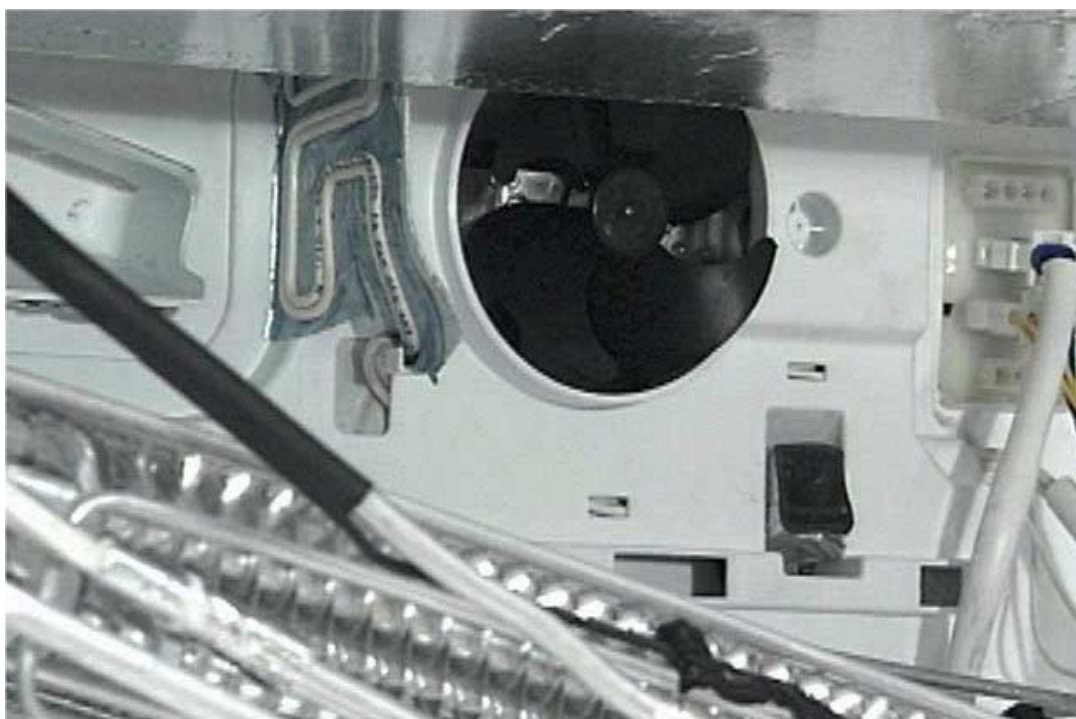
The four heating elements are connected in parallel and the electronic board controls them at the same time during the defrost phase. When these heating elements are switched on, the compressor is kept switched off by the board, even in case of demands for refrigeration by at least one of the two compartments.



Inside view



Rear view



The start and end of the defrost phase are controlled by the electronic board, taking into account:

Start of defrost

- total compressor On time from last defrost (on average 11 hours). In any case the period between two defrosts will be: max. 30 hours, min. 8 hours.
- duration of last defrost
- number of door openings

End of defrost

- reaching the temperature of approx. **15 °C** on the evaporator and in any case approx. **40 minutes** after the start of defrost.

POSSIBLE CAUSE OF MALFUNCTION:

Board management

Heating elements control circuit on the board

Connection on the board

Wiring harness

Thermal fuses

Connection on heating elements

Heating elements

Drain hole blocked

TESTING:

General on appliance: carry out the check using the Autotest procedure.

Wiring: check for continuity and short circuits; check the connections (connectors and terminals); check whether voltage is available; check non-opening of thermal fuses;

Component: check that the component is fed; directly check the heating elements (fed directly).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by means of replacement.

3. Freezer fan

The purpose of the freezer fan is to distribute the cold air, produced by the evaporator coil, inside the freezer compartment; the fan is located behind the evaporator coil.



Particular situations

- with **Refrigerator Door open** the freezer fan is not operated, even if the compressor is working, and is switched on again only when the refrigerator door is closed.
- **after defrost**, even if the compressor is on, in addition to the **5 minute** delay the fan will wait until the temperature (measured by the freezer sensor) on the evaporator is **-17 °C before switching on**.

POSSIBLE CAUSE OF MALFUNCTION:

Board management
Fan control circuit on the board
Connection on the board
Wiring harness
Fan connections
Freezer fan

TESTING:

General on appliance: carry out the check using the Autotest procedure.

Wiring: check for continuity and short circuits; check the connections (connectors and terminals); check whether voltage is available.

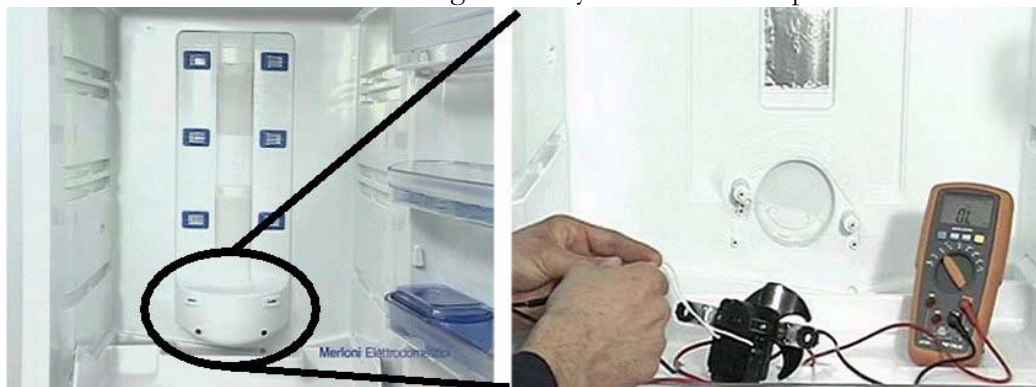
Component: check that the component is fed; directly check the freezer fan (fed directly with special wiring).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

4. Fridge fan

The purpose of the fridge fan is to take the cold from freezer compartment to the inside of the refrigerator compartment. By means of special ducting it draws the cold air from the freezer and distributes it in the refrigerator compartment through openings on the multiflow. The fridge fan, located on the bottom of the compartment, is managed by the board.

When the refrigerator compartment demands refrigeration, the compressor is fed and the fridge fan is switched on after **1 minute**. When the refrigerator compartment demands more refrigeration, the fan is switched off, even if the compressor could remain on due to a demand for refrigeration by the freezer compartment.



Particular situations

- with **Refrigerator Door open** the fridge fan is not fed, even if the compressor is working, and will be switched on again only when the refrigerator door is closed. The fridge fan can be on even if there is no demand for refrigeration by the refrigerator compartment. In fact, if the refrigerator door has just been closed the fan is switched on for **3 seconds** to prevent the hot and moist air that just has entered the refrigerator compartment from descending through the delivery ducting and freezing on the evaporator.
- **after defrost:** at the first switching on of the compressor after a defrost, in addition to the **5 minute** time delay for fan switching on, there is also a wait for the evaporator coil to reach **-17 °C**.

POSSIBLE CAUSE OF MALFUNCTION:

Board management
Fan control circuit on the board
Connection on the board
Wiring harness
Fan connections

TESTING:

General on appliance: carry out the check using the Autotest procedure.

Wiring: check for continuity and short circuits; check the connections (connectors and terminals); check whether voltage is available.

Component: check that the component is fed; directly check the fridge fan (fed directly with special wiring).

Electronic board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

5. Fridge Lamps

Inside the multiflow there are two lamps used to illuminate the refrigerator compartment. The lamps are connected in parallel, therefore the electronic board controls them at the same time.

The lamps stay on when the refrigerator door is kept open in appliance On conditions, i.e., as well as being connected to the electric grid, the appliance must have been switched on by means of the ON/OFF key on the user interface **for models with display, or a position other than stop on the freezer knob for models with knobs**. The lamps are switched off when the door is closed.



Particular situations

- **Refrigerator Door:** if the door is kept open for more than **2 minutes**, the lamp is not kept on continuously, but is switched on and off at regular intervals; if the door remains open for **7 minutes** or more, the frequency of flashing increases.

POSSIBLE CAUSE OF MALFUNCTION:

Board management
Refrigerator door circuit on the board
Lamp control circuit on the board
Connection on the board
Wiring harness
Lamp connections
Lamp
Presence of magnet on the refrigerator door

TESTING:

General on appliance: switch the appliance on, open the refrigerator door and visually check that the lamps come on.

Wiring: check for continuity and short circuits; check the connections (connectors and terminals); check whether voltage is available.

Component: visually check the lamp; direct check of the lamp (powered directly). A possible cause of incorrect lamp functioning can be the absence or wrong position of the magnet on the refrigerator door.

Electronic board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

6. Thermal fuses

Their function is to protect the combined unit from temperature increases caused by anomalous functioning of the heating elements, during the defrost phase. They are placed in contact with evaporator.

If the temperature on the evaporator reaches **72 °C**, the thermal fuses **open**, cutting off the feed to all the heating elements. They must be replaced in order to restore normal operation.



POSSIBLE CAUSE OF MALFUNCTION:

Thermal fuse connections

Wiring harness

Thermal fuses

TESTING:

General on appliance: force the defrost, drip tray, chamber division, and elbow heating elements to switch on (by means of the Autotest procedure) and check their correct operation (a malfunction is not necessarily due exclusively to the thermal fuses: see the paragraph relevant to these heating elements).

Wiring and component: check for continuity and short circuits; check the connections (connectors and terminals).

7. Probes

These are temperature sensors able to associate measurements in degrees centigrade with resistive values that are easily read and managed by the microprocessor on the board.

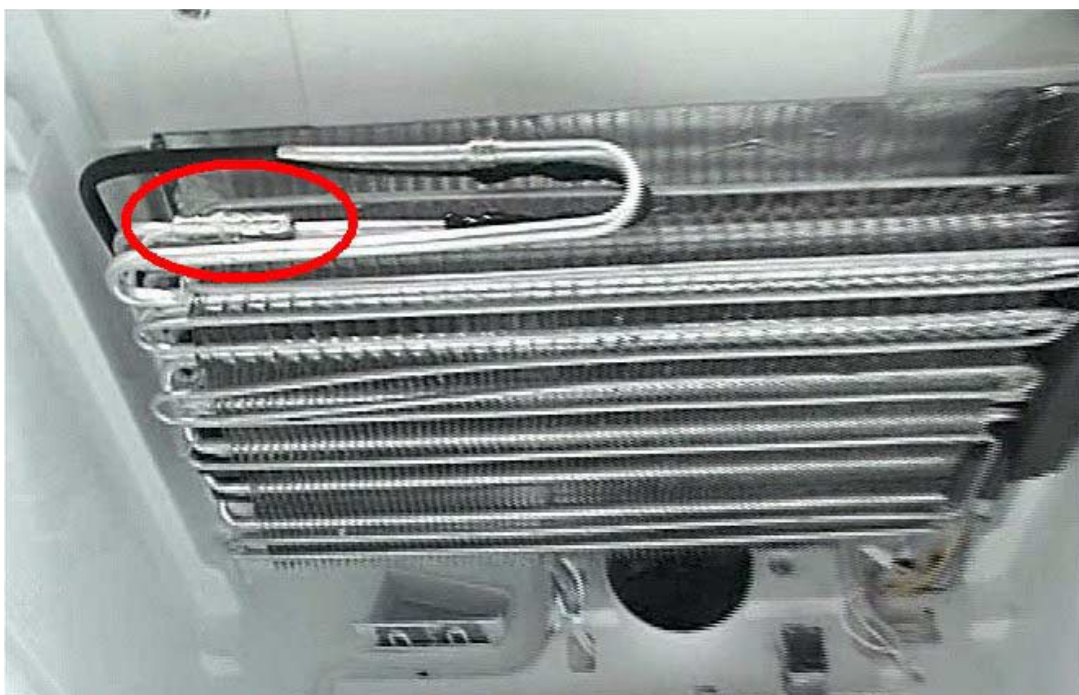
- The **Refrigerator Air Sensor**, located inside the compartment, allows the temperature set by the user to be adjusted. It is managed by the electronic board and the user controls its adjustment. The appliance continues to function in the event of a thermostat malfunction or short-circuit thanks to a timed thermostat run mode managed by the electronic board. The sensor cannot be replaced. The “Autotest” function will confirm a malfunction.



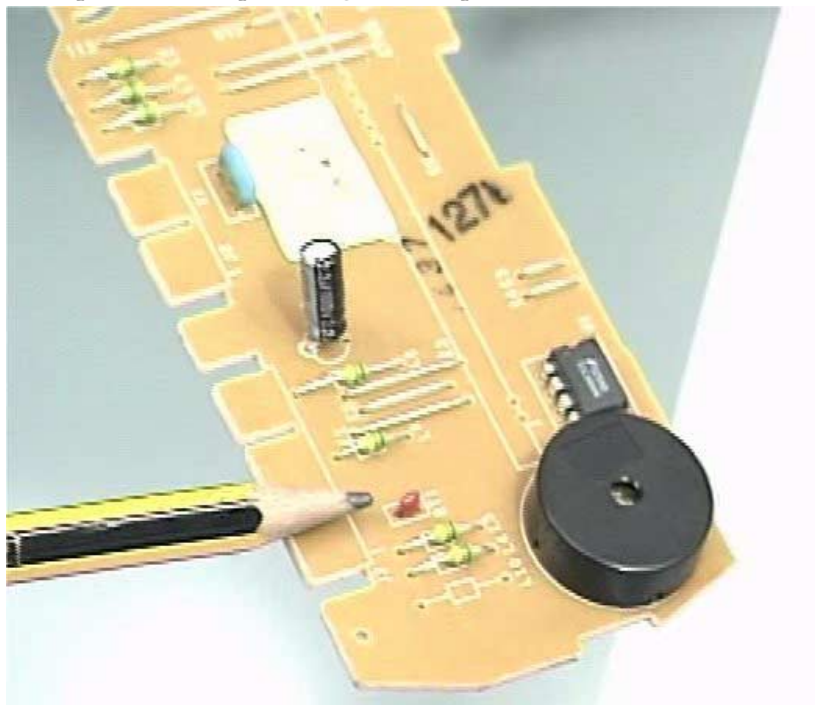
- The **Freezer Air Sensor**, located inside the compartment allows the temperature to be adjusted, signalling critical temperature thresholds to the board. It is managed by the electronic board and the user controls its adjustment. In the event of a freezer probe malfunction or short-circuit, freezer compartment alarms will not be signalled to the electronic board. The freezer will continue to ensure efficient freezing thanks to a timer run thermostat. Also this sensor cannot be replaced. The “Autotest” function will confirm the malfunction.



- The **Evaporator Sensor** in contact with the evaporator is all-important for the duration and conclusion of the defrost phase. The electronic board processes the signal. If the sensor is cut off or short-circuited, defrosting is carried out in any case, though not according to the temperature but the times imposed by the electronic board. Like the other sensors, the evaporator sensor cannot be replaced. The “Autotest” function will confirm the malfunction.



- The **Ambient Temperature Sensor**, located on the electronic board, measures the temperature of the room where the combined unit is working. This parameter is important for optimizing consumption.



Temperature °C	Resistance Ohm
50	973
45	1181
40	1493
35	1765
30	2176
25	2700
20	3360
15	4225
10	5348
9	5611
8	5888
7	6182
6	6491
5	6818
4	7164
3	7529
2	7916
1	8325
0	8758
-1	9216
-2	9701
-3	10215
-4	10759
-5	11337
-6	11949
-7	12598
-8	13288
-9	14019
-10	14795
-11	15620

Temperature °C	Resistance Ohm
-12	16497
-13	17429
-14	18420
-15	19475
-16	20596
-17	21791
-18	23063
-19	24418
-20	25862
-21	27402
-22	29045
-23	30797
-24	32668
-25	34666
-26	36800
-27	39082
-28	41521
-29	44131
-30	46921
-31	49910
-32	53111
-33	56541
-34	60218
-35	64161
-36	68393
-37	72932
-38	77808
-39	83046
-40	88577

POSSIBLE CAUSE OF MALFUNCTION:

Board management

Monitoring circuit on the board

Connection on the board

Sensor wiring

TESTING:

General on appliance: carry out the check using the “Autotest” procedure;

Wiring and component: check for continuity and short circuits; check the connections (connectors and terminals); check that the resistive values correspond to the values given by the manufacturer (heat the probe touching it with your hand where possible and check the variation in the resistive value).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

8. Eeprom memory

All the appliance functioning parameters are stored inside the Eeprom; incorrect communication between microprocessor and memory can seriously affect appliance operation and the user's adjustments.

The Eeprom is located on the electronic board.



POSSIBLE CAUSE OF MALFUNCTION:

Microprocessor management
Interchange circuit on the board
Memory

TESTING:

General on appliance: carry out the check using the Autotest procedure;

Board: carry out a quick visual check of the board (breakages or burnouts, etc.);
check by using a replacement.

9. Buzzer

Buzzer operation is closely tied to the signalling and alarm functions.
The buzzer is soldered onto the power board on the instrument panel.



POSSIBLE CAUSE OF MALFUNCTION:

Microprocessor management
Control circuit on the board
Buzzer

TESTING:

General on the appliance and component: a quick check can be that (with the appliance ON) of keeping the refrigerator door open for more than three to four minutes in order to force the door open alarm condition; checking that the buzzer starts to sound and goes off simply by closing the door (its failure to activate could also be due to a malfunction of the magnetic reed on the board).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

10. Display (when present)

The display allows the user to check the status of the appliance and to receive this information: the display is soldered onto the Display board on the refrigerator door.



POSSIBLE CAUSE OF MALFUNCTION:

Microprocessor management

Control circuit on the board

Display

Main board and Display board connection cable

TESTING:

General on appliance and component: with the appliance ON, check that the display is switched on correctly according to specifications. Press the MODE key repeatedly and check that different functions are selected each time (refrigerator temperature setting, freezer temperature setting; SUPER COOL; SUPER FREEZE; HOLIDAY; ICE PARTY; setting time, date, language in order); verify that the text scrolls properly in the dedicated area.

Wiring: (between the two boards) check for continuity and short circuits; check the connections (connectors and terminals).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement. It is recommended to also check the Power board.

11. LEDs (when present)

The LEDs allows the user to check status of the appliance and to receive this information: the LEDs are soldered onto the Power board on the control panel.



POSSIBLE CAUSE OF MALFUNCTION:

Microprocessor management
Control circuit on the board
LEDs

TESTING:

General on appliance and component: the green power LED must always be On when the appliance is fed; the right yellow SUPER FREEZE LED must come on when the relevant function is activated; the left yellow SUPER COOL LED must come on when the relevant function is activated. Force the events that light up the LEDs and verify they light up.

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

12. Analysis of keys (models with display only)

The keys allow the user to manage the appliance: they are soldered onto the Display board on the freezer door.



POSSIBLE CAUSE OF MALFUNCTION:

Wiring between the two boards
Microcontroller management
Control circuit on the board
Keys

TESTING:

General on the appliance and component:

ON/OFF key: with the appliance ON, press and hold down the key for about two to three seconds, checking that appliance goes OFF (indications on the display); Press and hold down the key again, checking that the appliance switches ON and that the display indicates this).

ECO key: with the appliance ON, press the key and check that the ECO icon is activated on the display. Press the key again and the icon must be deactivated.

RESET ALARM RESET key: with the appliance ON, hold the refrigerator door open for more than three to four minutes in order to force the door open alarm condition, (indications on the display and buzzer sounding); check that alarm signalling stops on pressing the key.

MODE key: (display models only) with the appliance ON, press the key repeatedly and check that different functions are selected each time (SUPER COOL; SUPER FREEZE; HOLIDAY; ICE PARTY; setting time, date, language in order).

ADJUST SELECT + and ADJUST SELECT - keys: with the appliance ON, press the MODE key once to activate the refrigerator temperature setting condition; check that the flashing temperature value on the display increases by 1 degree each time ADJUST SELECT + is pressed and decreases by 1 degree each time ADJUST SELECT - is pressed.

Wiring: (between the two boards) check for continuity and short circuits; check the connections (connectors and terminals).

Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

13. Analysis of knobs and keys (STANDARD models only)

The keys and knobs allow the user to manage the appliance; they are soldered onto the board on the appliance control panel.

POSSIBLE CAUSE OF MALFUNCTION:

Microcontroller management

Control circuit on the board

Keys

Knobs

TESTING:

General on the appliance and component:

FREEZER knob: turn the knob all the way anticlockwise and check that the appliance is OFF, opening the refrigerator door and checking that the lamps do not come on.

REFRIGERATOR knob: after switching the appliance on, turning the freezer knob clockwise, check that on turning the refrigerator knob all the way anticlockwise the buzzer beeps twice, confirming activation of the HOLIDAY function. Starting from this latter position, turn the refrigerator knob clockwise, checking that the buzzer beeps only once, confirming deactivation of the HOLIDAY function.

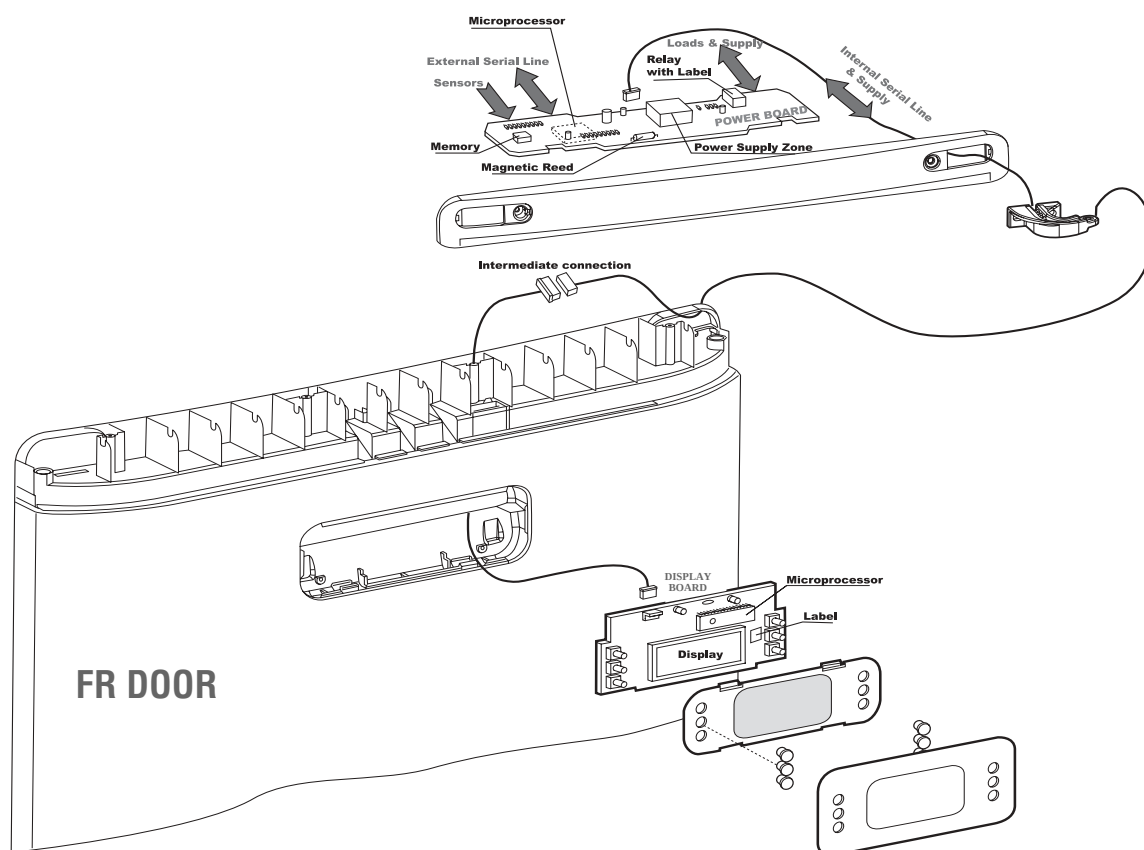
SUPER FREEZE key: with the appliance ON and the HOLIDAY function not active, press the key and check that the SUPER FREEZE function is activated (left yellow LED comes on).

SUPER FRIDGE key: with the appliance ON and the HOLIDAY function not active, press the key and check that the SUPER COOL function is activated (right yellow LED comes on).

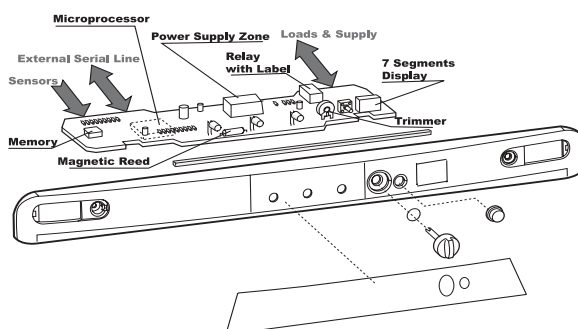
Board: carry out a quick visual check of the board (breakages or burnouts, etc.); check by using a replacement.

5 ELECTRONIC BOARDS

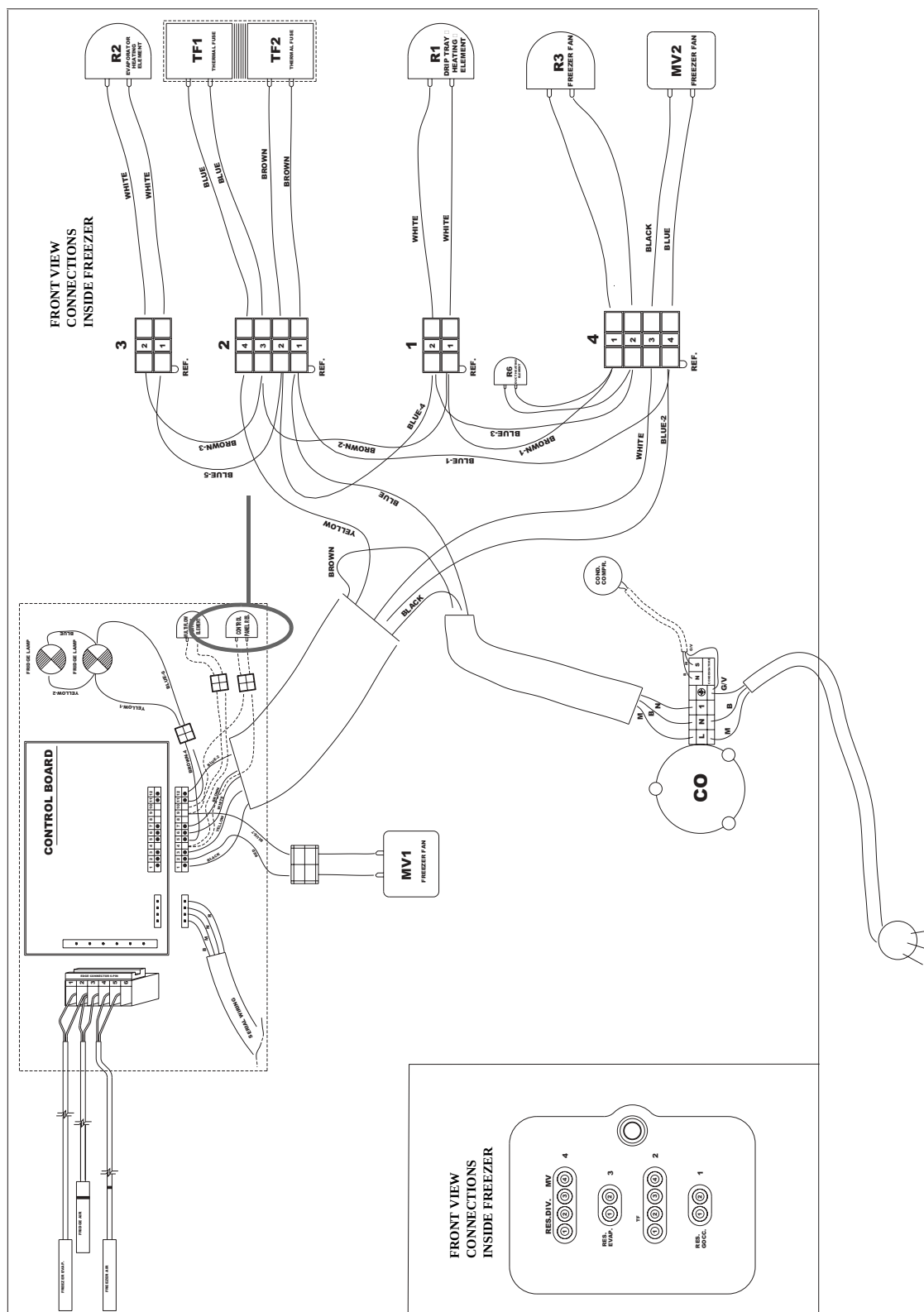
NF COMBINED UNITS WITH DISPLAY



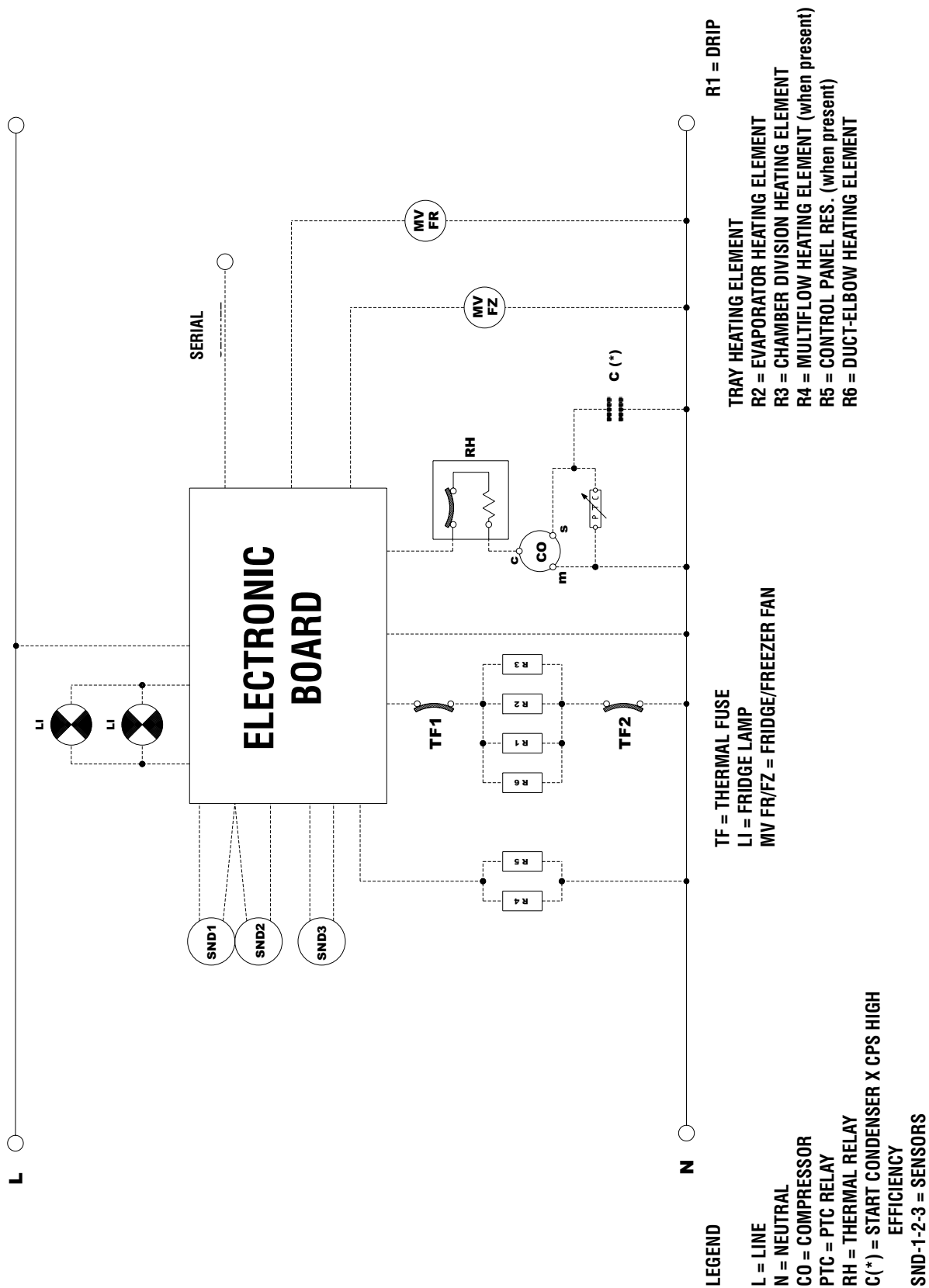
STANDARD NF COMBINED UNITS



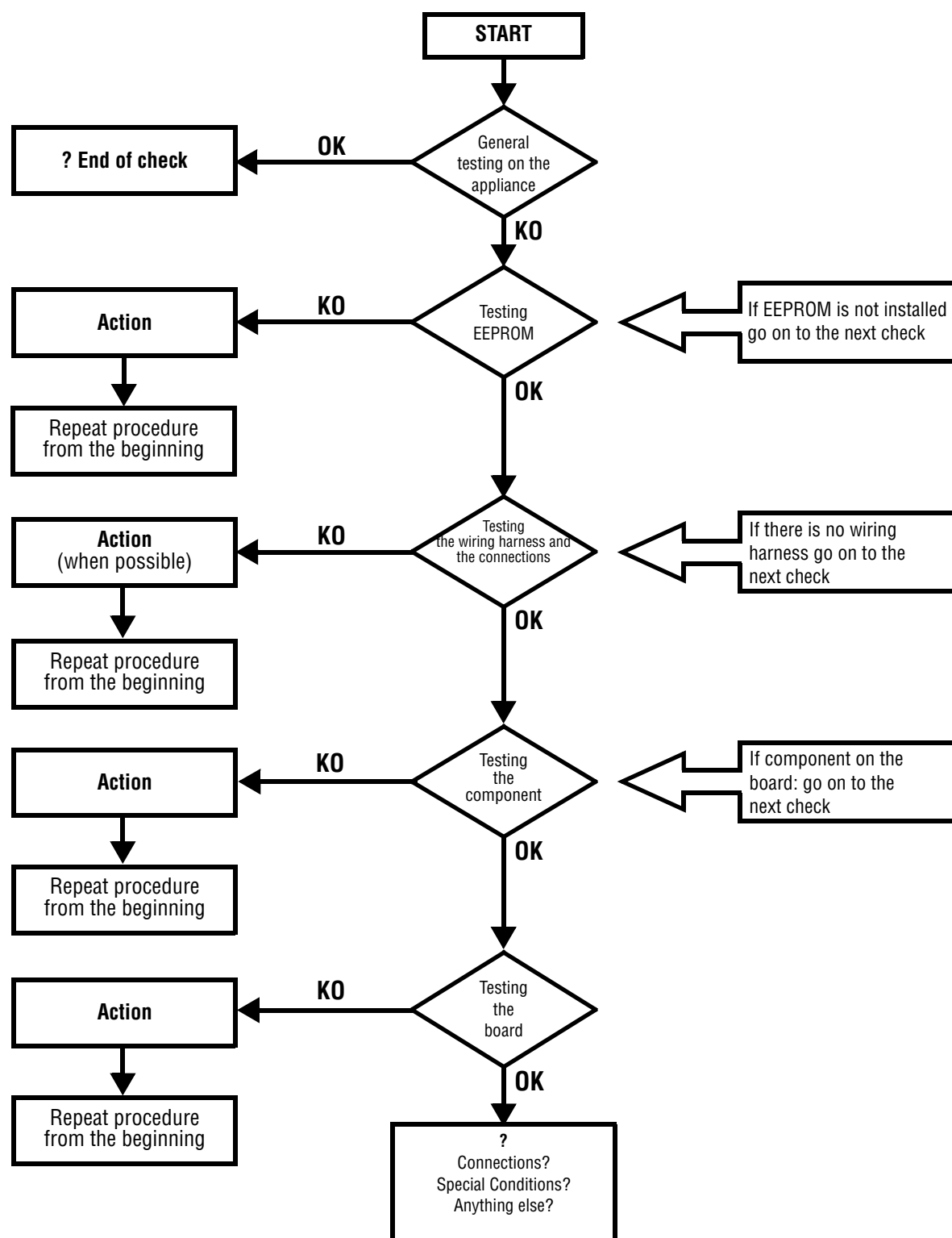
6 CONNECTION DIAGRAM



7 MAIN WIRING DIAGRAM



8 RECOMMENDED PROCEDURE FOR TESTING THE ELECTRONIC APPLIANCES



9 AUTOTEST

This helps with a quick check of the loads, which otherwise are difficult to activate, as well as of the probes and the EEPROM memory.

N.B.: before using the Autotest it is advisable to check the correct operation of the refrigerator lamps and the buzzer which are used for signalling possible malfunctions.

MODEL	ACTIVATION	DEACTIVATION	CHECK	RESPONSE
No Frost DISPLAY	Appliance OFF by ON/OFF key Press the ECO key for more than 3s	- 255s after activation - When the appliance is switched on again by means of the ON/OFF key - Switching off the power supply	FR lamps	Visual check by operator (the lamp comes on when the door is opened)
			FR fan	Check by operator
			FZ fan	Check by operator
			Evaporator, drip tray, chamber division, elbow heating elements	Check by operator
			Probes (active after 20s)	FR lamp flashes if KO (short or open) + messages ● FR air sensor = SND AIR FR ● FZ air sensor = SND AIR FZ ● FZ evaporator sensor = SND EVA FZ ● PCB sensor (ambient) = SND PCB If no anomaly sensors and EEPROM message "TEST OK"
			EEPROM	Buzzer sounds if KO + message EEPROM memory = EEPROM If no anomaly sensors and EEPROM message " TEST OK "
No Frost STANDAR D	Appliance OFF by FZ knob Press the SUPER FREEZE key for more than 3s	- 255s after activation - When the appliance is switched on again by means of the FZ knob - Switching off the power supply	FR lamps	Visual check by operator (the lamp comes on when the door is opened)
			FR fan	Operator's visual check
			FZ fan	Operator's visual check
			Defrost, drip tray, chamber division, elbow heating elements	Operator's visual check
			Probes (active after 20s)	FR lamp flashes if: KO (short or open) + LEDs flash ● FR air sensor = SUPER COOL LED ● FZ air sensor = SUPER FREEZE LED ● FZ evaporator sensor = SUPER FREEZE LED ● PCB sensor (ambient) = LINE LED
			EEPROM	Buzzer sounds if KO + LINE LED flashes

10 ALARMS

The appliance can provide the user with information on operational malfunctions:

- **Refrigerator door open too long**
- **High temperature inside Freezer compartment**

The indications and procedures for exiting refrigerator door open alarm situations are given in the table:

Conditions	DISPLAY MODELS		STANDARD MODELS	
	Signalling	Exiting the alarm condition	Signalling	Exiting the alarm condition
Door open > 2 minutes	Buzzer, red alarm triangle, "door open" scrolling text	Close door, "RESET ALARM" key	Buzzer	Close door
Door open > 4 minutes	Buzzer, red alarm triangle, "door open" scrolling text, REFRIGERATOR lamp flashes	Close door, "RESET ALARM" key	Buzzer, Refrigerator lamp flashes	Close door
Door open > 6 minutes	Buzzer, red alarm triangle, "door open" scrolling text, REFRIGERATOR lamp flashes faster	Close door, "RESET ALARM" key	Buzzer, Refrigerator lamp flashes faster	Close door

The indications and procedures for exiting freezer compartment temperature alarm situations are given in the table:

Conditions	DISPLAY MODELS		STANDARD MODELS	
	Signalling	Exiting the alarm condition	Signalling	Exiting the alarm condition
If the temperature measured by the FZ air sensor is HIGHER THAN -6 °C and after 150 minutes the temperature is above +1 °C, alarm A1 occurs (if the temperature is above +8° A2 occurs). If it remains between +1 °C and -6 °C for 24 hours A1 occurs	Buzzer, red alarm triangle, scrolling text on display	- Pressing the "RESET ALARM" key once switches off the buzzer, but does not exit the alarm situation. - Press the "RESET ALARM" key twice to exit the alarm situation.	Buzzer, SUPER FREEZE LED (yellow) and SUPER COOL LED (yellow) flash	Operating the freezer knob, switch the appliance off (OFF position) and on again
If the temperature measured by the FZ air sensor is HIGHER THAN -6 °C and after 150 minutes the temperature is above +8 °C, alarm A2 occurs. After 2 hours of A1 without "RESET ALARM" being pressed A2 occurs.	Buzzer, red alarm triangle, scrolling text on display	- Press the "RESET ALARM" key once to switch the buzzer off, but the alarm situation is not exited. - Press the "RESET ALARM" key twice to exit the alarm situation.	Buzzer, SUPER FREEZE LED (yellow) flashes and SUPER COOL LED (yellow) and LINE LED (green)	Operate the freezer knob to switch the appliance off (OFF position) and on again

11 “DEMO MODE” FUNCTION (DISPLAY MODELS ONLY)

The DEMO MODE can be activated by keeping the MODE, ADJUST SELECT + and ADJUST SELECT - buttons pressed at the same time for more than 3 seconds, starting from an initial appliance OFF condition.

Activating this function makes the user interface (display and keys) completely accessible without controlling any load (compressor, refrigerator, freezer fan, heating elements), irrespective of the status of the appliance. The lamp status is controlled according to refrigerator door opening. DEMO MODE activated is shown by the wording DEMO MODE ON appearing every 30 seconds. The DEMO MODE can be deactivated by keeping the MODE, ADJUST SELECT + and ADJUST SELECT - buttons pressed at the same time for more than 3 seconds, starting from the appliance OFF condition, and is signalled by the words DEMO MODE OFF.

12 “ECO” FUNCTION

This function offers temperatures optimized for preserving foods with the lowest permissible consumption.

This function is activated to set a programmed cycle for keeping the refrigerator and freezer compartments at a given temperature.

This function cannot be activated with the appliance on logic OFF, if one of the two possible alarms conditions (A1 or A2) is active and if the Holiday function is active.

For display models the function is activated by means of the button on the refrigerator door display with its relevant signalling, and for the standard models by turning **both knobs** to “e”; normally, the adjustment for ECO function corresponds to that used for calculating consumption according to European regulations. The function can be deactivated by pressing the ECO or ON/OFF keys on the door display. Upon deactivation, the signalling on the display stops and the user adjustment prior to activation of the ECO function which is also shown on the display in the area relevant to the freezer compartment and fridge, becomes active again.

If one of the two alarms conditions exists with the ECO function active, the latter function is not deactivated, however the alarm status prevails, performing particular cycles in the freezer; when the alarm is deactivated, the ECO function operates normally again. The ECO function cannot be activated in the alarm condition.

The SUPER FREEZE, SUPER COOL, HOLIDAY and ICE PARTY functions can be activated, and thus acquire priority with respect to the ECO function: ECO is reactivated when these functions are deactivated. In case of sensor (freezer air sensor) breakage, the function is time managed. In case of a power failure while the ECO function is activated, when the power comes on again it will reactivate automatically with the same settings as before.

13 “HOLIDAY” FUNCTION

This function offers temperatures optimized for preserving foods with the lowest permissible consumption in case of minimum use of the refrigerator compartment: particularly in the case of medium-long holidays when the freezer can remain full and with the refrigerator empty.

This function is activated to set a cycle (refrigerator switching On threshold **15 °C**, refrigerator switching Off threshold **13 °C**; freezer switching On threshold **-16 °C**, freezer switching Off threshold **-20 °C**) programmed for keeping the refrigerator and freezer compartments at given temperatures that will also be shown on the display (when present) in the area relevant to the freezer compartment and fridge.

The function cannot be activated with the appliance on logic OFF and if one of the two possible alarm conditions (A1 or A2) is active.

For display models the function is activated by means of the refrigerator door display with its relevant signalling; for standard models, by turning the refrigerator knob all the way anticlockwise - this event is signalled by the buzzer beeping twice. The function is deactivated by means of the refrigerator door display or when the appliance is switched off (ON/OFF key on the display). For standard model the function is deactivated by positioning the refrigerator knob outside the relevant limit area. Upon deactivation, the buzzer beeps once, confirming the exiting of that function, and the adjustment set by the user by means of the knobs is reactivated.

If one of the two alarm conditions (A1 or A2) exists with the HOLIDAY function active, the HOLIDAY function is not deactivated, however the alarm status prevails, performing particular cycles in the freezer; when the alarm is deactivated the HOLIDAY function operates normally again. The HOLIDAY function cannot be activated in the alarm condition.

If the HOLIDAY function is active, the SUPER FREEZE and SUPER COOL functions cannot be activated. If SUPER FREEZE or SUPER COOL are already active and the HOLIDAY function is activated, SUPER FREEZE or SUPER COOL will be regularly completed and then the HOLIDAY function will start operating. If the HOLIDAY function is active, the ICE PARTY function cannot be activated. If ICE PARTY is already active and the HOLIDAY function is activated, ICE PARTY will be terminated immediately and the message to remove the bottle will be signalled to the user.

In case of freezer or refrigerator air sensor breakage, the function is time managed. In case of a power failure while the HOLIDAY function is activated, when the power comes on again it will reactivate automatically.

14 “SUPER FREEZE” FUNCTION

This function allows all foods placed in the freezer to be frozen in the best possible way (also for best preserving the qualities of the frozen foods).

Activating this function forces the compressor to stay on continuously in order to have maximum freezing power for the freezer compartment. Two activation procedures are possible for this function: the SUPER FREEZE 24h for freezing small quantities of food with activation possible just before or even at the time of placing the food in the compartment; the SUPER FREEZE 48h for freezing large quantities of food with activation recommended 24h before placing the food in the compartment for already having lots of cold available and to be able to complete the freezing with the second 24 hours of operation activated;

In the first case the function is ended after the 24h, or if the freezer air sensor measures a temperature below 0 °C for **254 minutes**. In the second case the function is ended after the 48h.

If the SUPER FREEZE function is activated, there may be an immediate defrost if the cumulated “compressor On” hours are **more than 1 hour**, otherwise the function proceeds as specified.

Defrosts can occur during execution of the SUPER FREEZE function. In particular, after the compressor has been on for **11 hours**, it is switched off and a defrost is done, which ends with the conditions already seen for normal operation; at the end of this defrost, the compressor is switched on again to complete the remaining hours of SUPER FREEZE function.

The SUPER FREEZE function can be activated in the appliance ON condition, whereas it is never possible in that of appliance OFF. The SUPER FREEZE cannot be activated if one of the two alarm conditions (A1 or A2) exists, or if the HOLIDAY function is active.

If the SUPER FREEZE 24h function is activated by means of the refrigerator door display (when present), the icon on the display remains on (fixed), whereas for the SUPER FREEZE 48h function the same icon comes on flashing, indicating activation and execution of the first 24h; after the first 24h of activation the icon remains on (fixed), indicating the start of the second 24h. The area on the display relevant to the freezer compartment continues to show the temperature set by means of the user adjustment, which will become active again only at the end of the SUPER FREEZE function (irrespective of 24h or 48h).

For the standard models, on activating the function by means of the special key on the appliance control panel, the relevant LED remains on (fixed), whereas for the SUPER FREEZE 48h function the same LED comes on flashing, indicating activation and execution of the first 24h; after the first 24h of activation the LED remains on (fixed), indicating the start of the second 24h.

Switching the appliance off (ON/OFF key on the display) automatically involves deactivation of the function. Activation of one of the two alarm modes (see paragraph “Alarm Management”) automatically involves deactivation of the function, if the alarm condition is reset, the function is not reactivated.

The SUPER FREEZE function (irrespective of 24h or 48h) can be deactivated by a further action on the display (or the special key, for standard models); another exit mode is also reaching of the max. activation temperature appraised for the function: 24h or 48h according to the mode activated. For the SUPER FREEZE 24h function only, exiting is also provided for when a given temperature is reached in the freezer (0 °C for 254 minutes). The latter exit mode is not considered in the event of freezer air sensor breakage. Upon deactivation the signalling on the display stops and the user adjustment prior to activation of the SUPER FREEZE function (irrespective of 24h or 48h) is reactivated. If one of the alarm conditions exists, this prevails, interrupting normal SUPER FREEZE operation and deactivating the function.

The ECO and HOLIDAY functions can be activated, but these start operating as soon as the SUPER FREEZE function is deactivated (for any reason). The ICE PARTY can be activated, which thus gains priority over the SUPER FREEZE function (overlapping it): SUPER FREEZE reactivates (continuing the previously reached condition) when the ICE PARTY function is deactivated. In the event of a power failure while the SUPER FREEZE 24h or 48h function is activated, when the power comes back on the SUPER FREEZE 24h or 48h function is automatically reactivated, completing the remaining hours, unless a temperature alarm has not immediately occurred.

15 “SUPER COOL” FUNCTION

This function allows large quantities of food placed in the refrigerator to be chilled in the best possible way.

Activation of this function changes the switching on and off thresholds for the refrigerator compartment (switching off at **4 °C** switching on at **6 °C**) with an average temperature of **2 °C**; these new thermostating thresholds are maintained for **3 cycles**.

The SUPER COOL function can be activated in the appliance ON condition, whereas it is never possible in that of appliance OFF. The SUPER COOL function cannot be activated if one of the two alarm conditions exists (A1 or A2) or if the HOLIDAY function is active.

If the SUPER COOL function is activated by means of the refrigerator door display (when present), the icon on the display remains on (fixed) for the entire time required by the refrigerator to perform the cycles with the new thresholds. The area on the display relevant to the refrigerator compartment continues to show the temperature set by means of the user adjustment.

For standard models, activation occurs by means of a special key on the control panel, the relevant LED remains on (fixed) for the entire time required by the refrigerator to perform the cycles with the new thresholds.

Switching the appliance off (ON/OFF key on the display) automatically involves deactivation of the function. Entering one of the two alarms modes automatically involves deactivation of the function, if the alarm is reset, the function is not reactivated.

The SUPER COOL function can be deactivated by a further action on the display, or by means of the special key in standard models; another exit mode is also the completion of the number of cycles with the new thermostatting thresholds.

At the moment of deactivation the signalling on the display stops and the user adjustment prior to activation of the SUPER COOL function is reactivated. If one of the two alarms conditions exists it prevails, interrupting the normal SUPER COOL operation and deactivating the function.

The ECO and HOLIDAY functions can be activated, but these start operating as soon as the SUPER COOL function is deactivated (for any reason). The ICE PARTY function can be activated, which thus gains presence over the SUPER COOL function (overlapping it).

In the event of a power failure while the SUPER COOL function is activated, when the power comes back on, the SUPER COOL function is automatically reactivated, completing the remaining cycles, unless a temperature alarm has not immediately occurred.

16 “ICE PARTY” FUNCTION (DISPLAY MODELS ONLY)

This function allows a bottle (champagne, wine, etc.) to be chilled in the shortest possible time in the freezer compartment, with a signal from the appliance at the end of the operation, thus avoiding breakage of the bottle due to freezing of the liquid inside it.

Activating this function forces the compressor to stay on continuously in order to have maximum freezing power for the freezer compartment and thus quickly chilling the bottle. At the end of a given period, which is about 30' (considered optimum for chilling the bottle), the appliance continues operating as it did before activation of the function and the display and buzzer alert the user to remove the bottle (now suitably cold) from the freezer. **A further intermediate time, of approx. 20', has been identified, after which a signal indicates that the bottle is “cellar cool” + beep: the user can decide to remove or continue chilling it).**

The ICE PARTY function can always be activated in the appliance ON condition, whereas it is never possible in that of appliance OFF. The ICE PARTY function cannot be activated if one of the two alarm conditions exists (A1 or A2) or if the HOLIDAY function is active.

The function is activated by means of the refrigerator door display with its relevant signalling. The area on the display relevant to the freezer compartment continues to show the temperature set by means of the user adjustment, which will become active again only at the end of the ICE PARTY function.

Switching off the appliance (ON/OFF key on the display) automatically involves deactivation of the function.

Entering one of two alarms modes automatically involves deactivation of the function; the signalling (display and buzzer) for removing the bottle from the freezer compartment is in any case activated.

Activation of the HOLIDAY function deactivates the ICE PARTY function, activating the relevant message to remove bottle, on the display.

The ICE PARTY function can be deactivated by a further action on the display; another exit mode is also reaching of the given time for the function. (**On reaching half time** the appliance activates an alert on the display with relevant sounding of the buzzer, **“cellar cool” + beep**, for about 15 seconds; if the user wishes to remove the bottle and force function deactivation by pressing the RESET ALARM key, the function ends then, whereas if the user does not perform any action the operation continues until the maximum preset temperature is reached). At the moment of deactivation the signalling on the display by means of the icon stops and the user adjustment prior to activation of the ICE PARTY function is reactivated; the display and buzzer signal that the bottle is suitably cold and that it should be removed from the freezer compartment so as not to damage it with additional cold; this signalling stops when the RESET ALARM is pressed. If one of the two alarms conditions exists it prevails, interrupting the normal ICE PARTY operation and deactivating the function; the signalling (display and buzzer) for removing the bottle from the freezer compartment is in any case activated.

The ECO and SUPER FREEZE functions can be activated, but these start operating as soon as the ICE PARTY function is deactivated (for any reason).

In the event of a power failure while the ICE PARTY function is activated, when the power comes back on the function is not automatically reactivated, whereas the signalling (display and buzzer) to remove the bottle from the freezer compartment is immediately activated.

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