Electrolux

Distriparts

SERVICE MANUAL

COOKING

Built-in ovens

GENERAL TROUBLESHOOTING PROCEDURE

KRONOS

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1 - PURPOSE OF THIS MANUAL

The purpose of this Manual is to provide a general outline of an efficient troubleshooting procedure for the new KRONOS system.
This Manual contains the general information necessary to perform the troubleshooting procedure.
In relation to the various applications / personalizations, a brief Service Note will be issued describing the differences between the various applications.

2 - INTRODUCTION

This troubleshooting procedure for the KRONOS system is intended to be used with reference to the basic information contained in the theoretical Service Manual (code 599 35 40 40), with the addition of flow charts, block diagrams and referring to any error codes that might be shown on the display.

3 - DIAGNOSTICS AND APPROACH TO THE SYSTEM

In view of the diversified nature and the flexibility of the system, it is necessary to adopt a method of approach to each specific type of fault.
In other words, it is important to identify in detail the phenomena that take place when a fault occurs by attempting to correctly interpret the user's complaint.
For example, if the user makes a service call because the "oven is off", this may be due to:

- The oven does not switch on.
- The oven switches on for a few moments and then switches off.
- The display is lit but the oven does not heat.

Even in an oven with a traditional programming system, these three phenomena require three different approaches to locating the fault.
In a more complex system such as Kronos, it is even more important to correctly interpret the phenomena that occur.
In order to facilitate the process of identification, it is necessary to subdivide the system into separate blocks and then to identify the block in which the fault has occurred.
A first classification may be as follows:

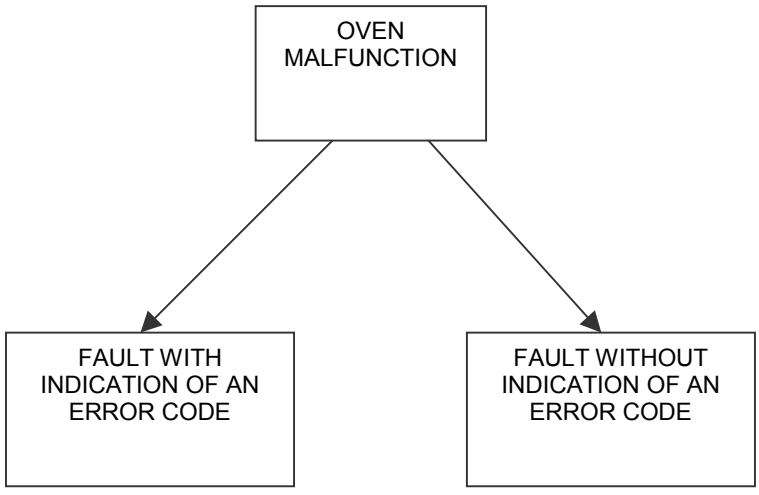

Fig. 1

If the fault is accompanied by an error code, it is easier to identify.
As explained in greater detail in sections 5 and 6, the appearance of an error code indicates a situation that has been detected by the system.

Error code display
The normal flow of information governed by the microcontroller is monitored by an internal programme; in the event of certain malfunctions, the relative information is shown on the display in the form of an error code.

Combinations of successive error codes
The data relative to the error code are memorized in one of the registers in the microcontroller.
If a second malfunction should occur, the relative error code is added to the code already stored in the register, and the display shows a third value, which is the sum (in hexadecimal format) of the various single codes.
In short, error codes may be shown on the display may be the sum (in hexadecimal format) of several error codes generated at different times.
In this case, in order to identify the current status and to display the code in a recognizable form, it is necessary to disconnect the appliance from the power supply and then switch it on again.

4 - GENERAL BLOCK DIAGRAM

In order to facilitate troubleshooting, especially when no error code is displayed, it may be useful to represent the system in the form of a block diagram:

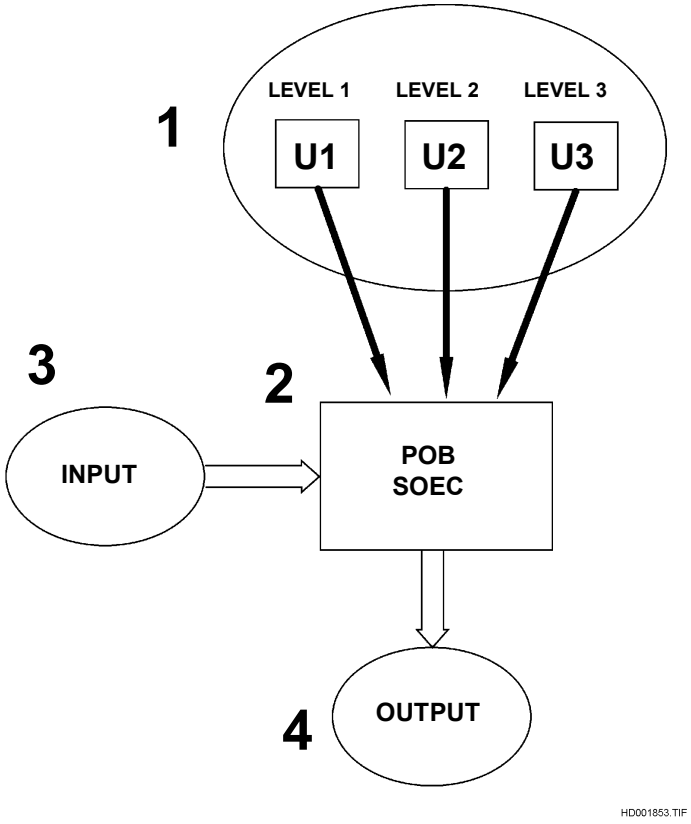

Fig. 2

1 - User interface (control units 1, 2 and 3)
2 - Power board
3 - Input devices (sensors)
4 - Output devices (power loads)

- The user interfaces (1) are the various control units including the control interfaces (if present).
- The power board receives information from the control units and signals from the input devices (3) in order to control the output devices (4).
- The input devices are sensors which transfer to the system any variations in temperature, as well as thermostats (in some models) which guarantee user safety in case of overheating.
- Out devices include the heating elements, the oven light and the various motors (oven fans, rotary spits).

5 - ERROR CODES

The KRONOS system performs an internal autodiagnostics routine and, when a malfunction is detected, displays the corresponding error code.

The error code is shown on the display as shown in the figures relative to the various levels (see figg. 3, 4 and 5).

The table below describes the various error codes.

ERROR CODE	DESCRIPTION OF THE CAUSE
08	Temperature sensor short-circuited
20	Temperature safety limit exceeded
40 (*)	Overheating detected
60	Overheating detected + temperature safety limit exceeded
65	Temperature sensor faulty
80	Failure to heat

Examples of the way in which error codes are displayed are shown below.:

Example of error code (65) on level 1 control unit:

Fig. 3

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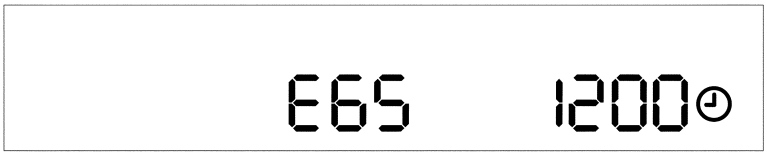
Example of error code (65) on level 2 control unit:

Fig. 4



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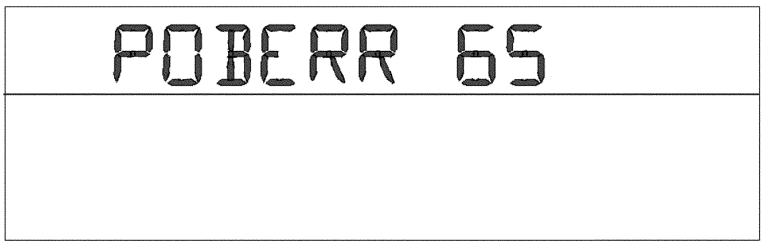
Example of error code (65) on level 3 control unit:

Fig. 5



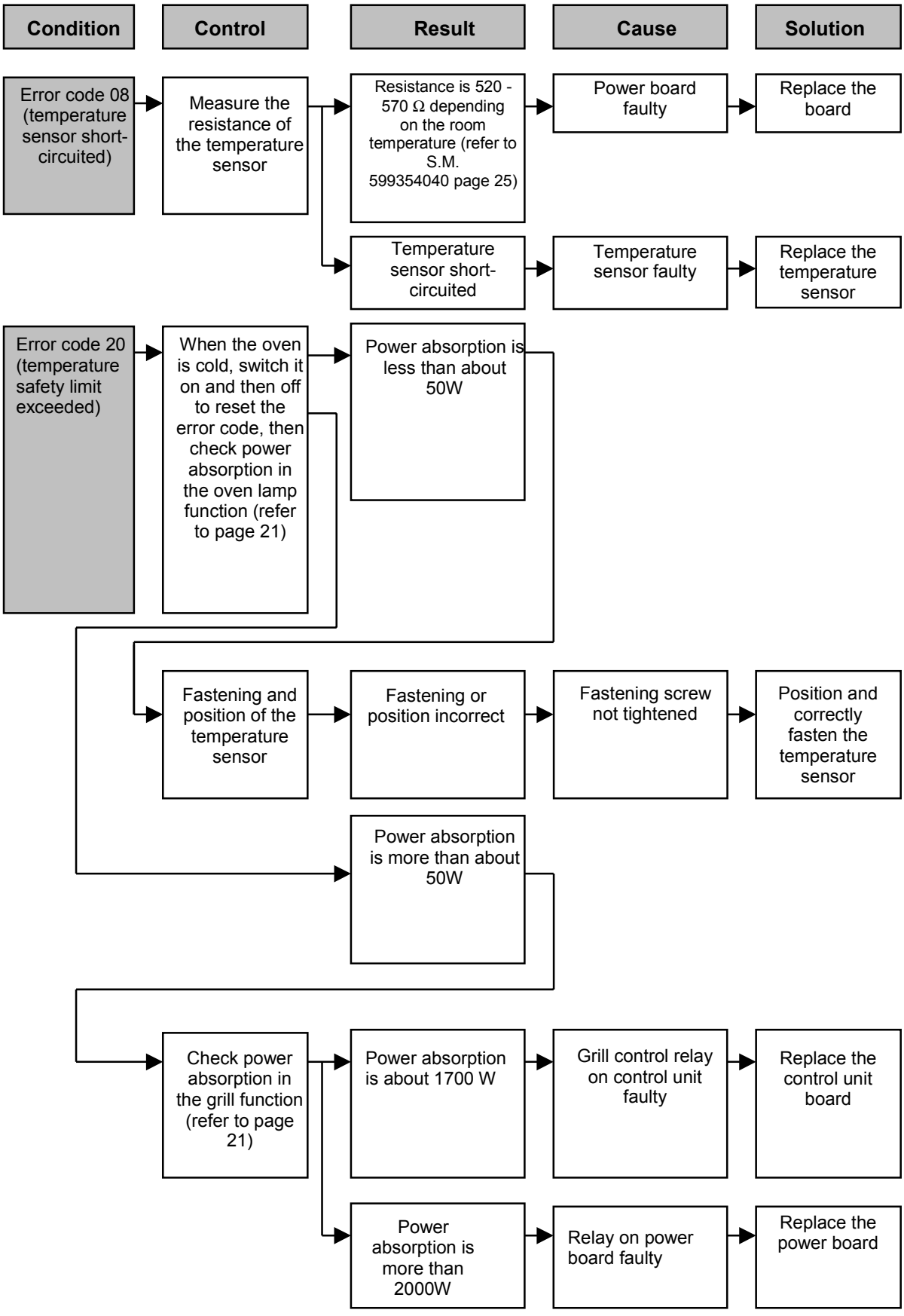
HD001906.TIF

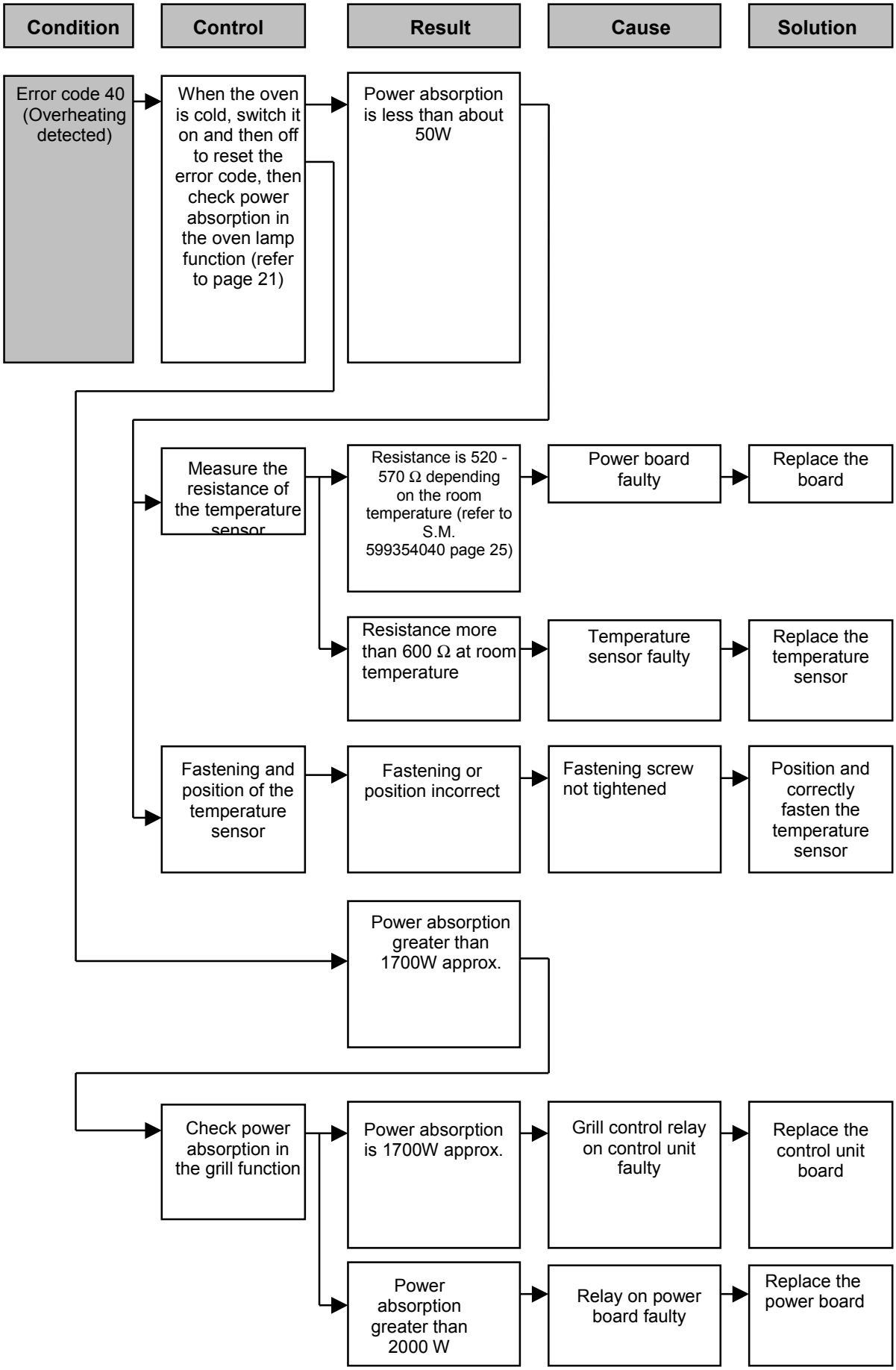
In the case of errors for which no error code is displayed, it is necessary to base the troubleshooting procedure on one of the block diagrams shown on the following pages.

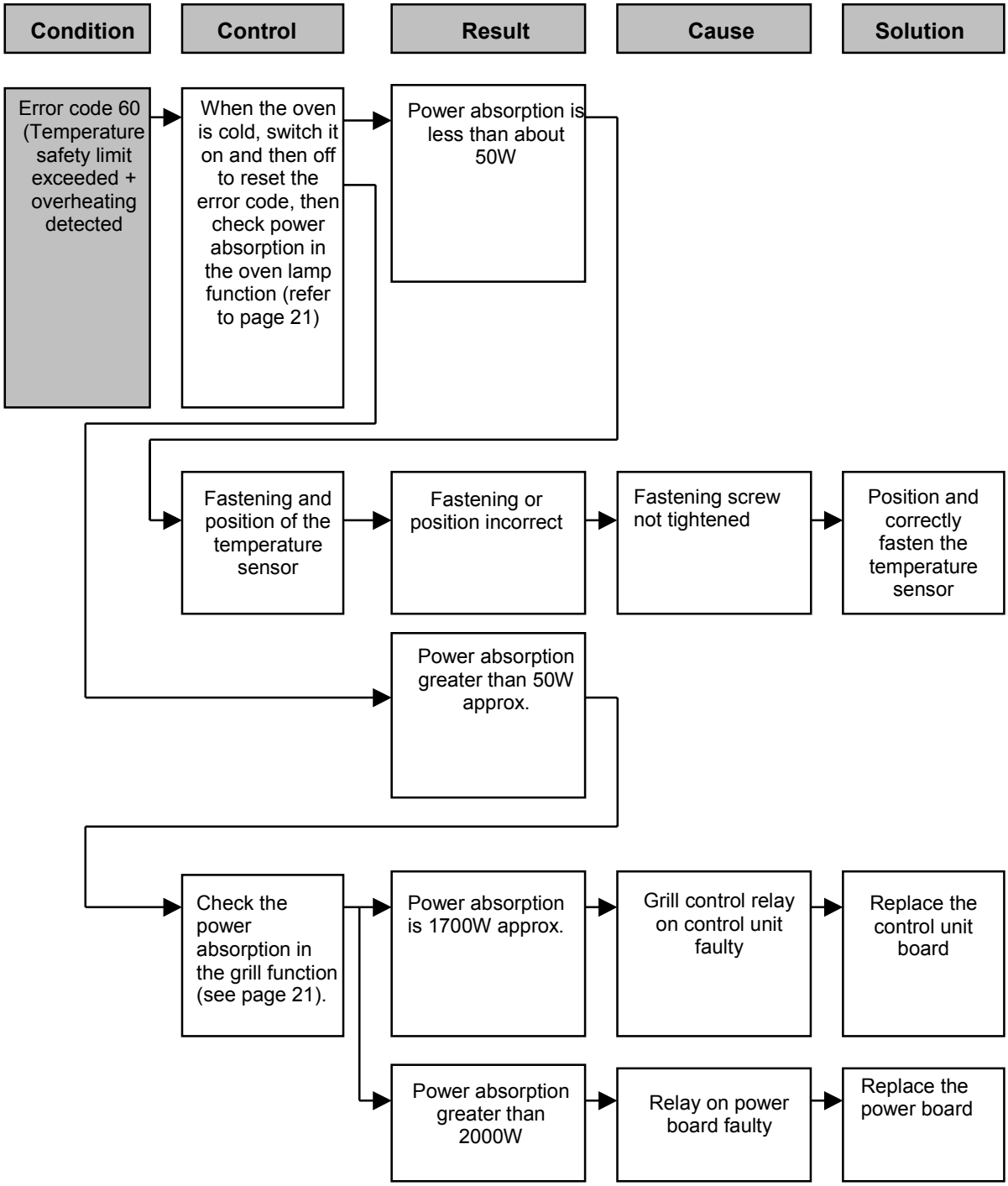
(*) IMPORTANT:
Error code 40 may appear if the oven is operated incorrectly (overheating of the oven in the oven light function). To restore the appliance to notmal operation, it is sufficient to allow the oven to cool, switch it off, then switch it on again.

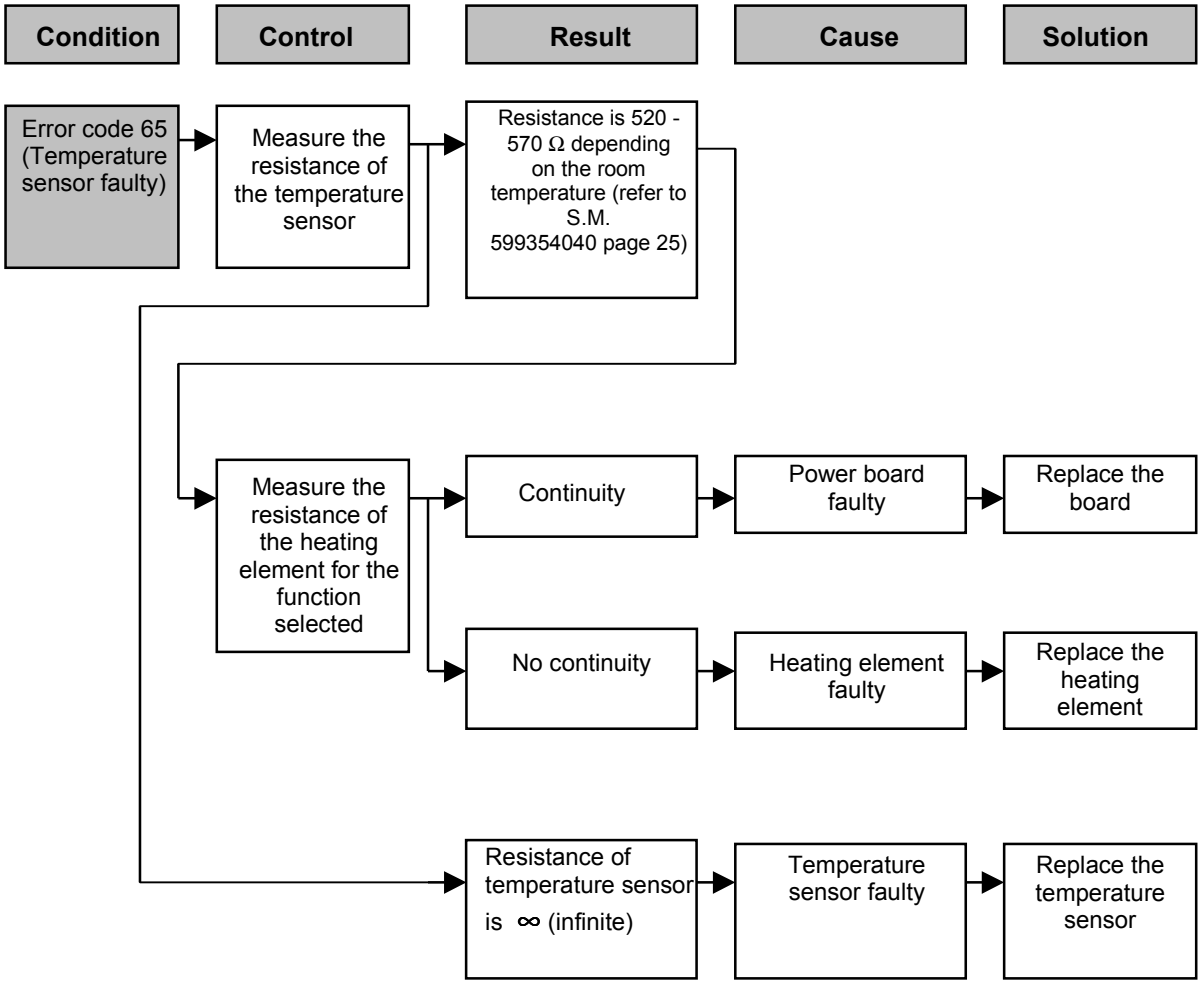
6 - TROUBLESHOOTING USING ERROR CODES

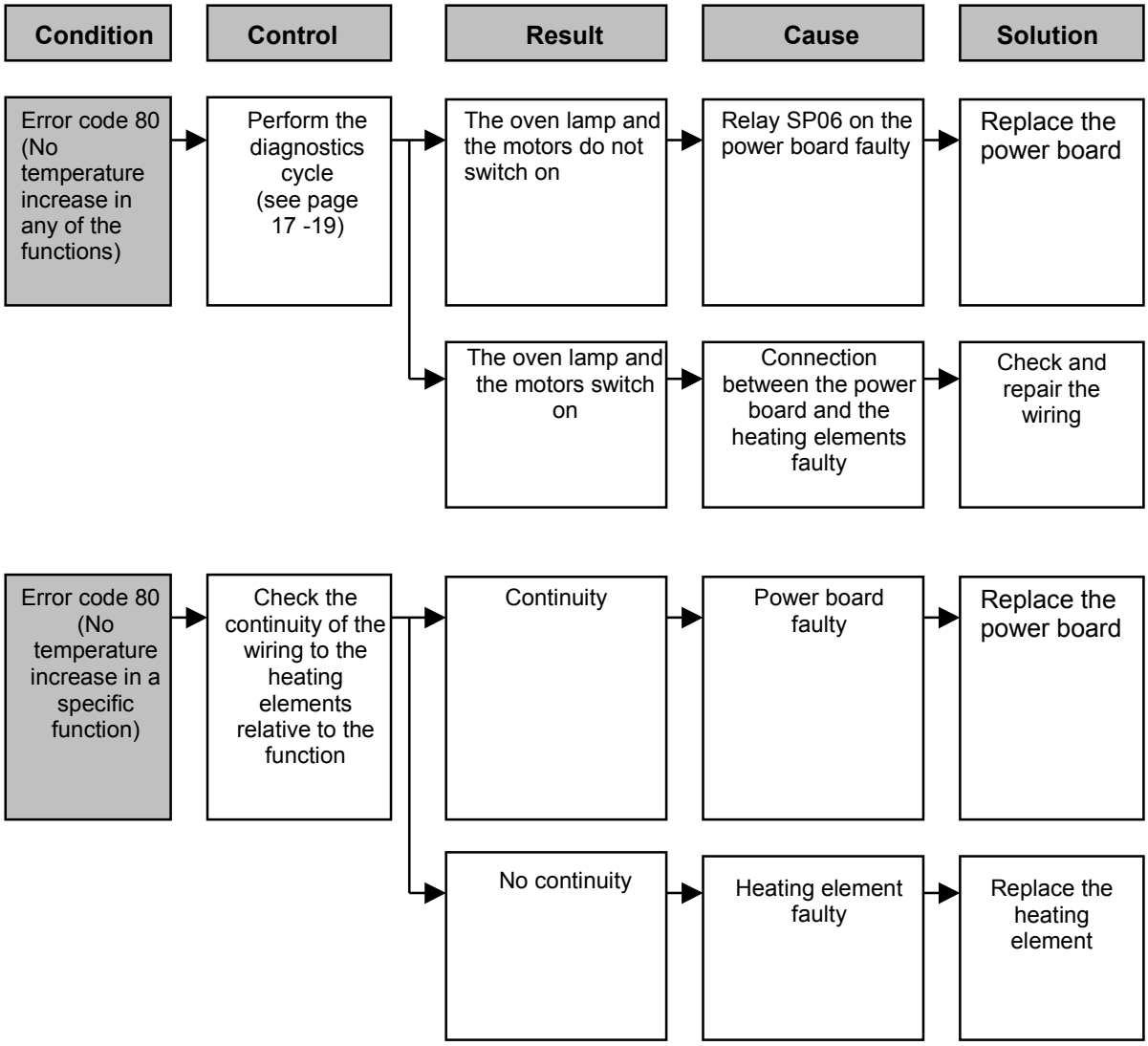
Troubleshooting based on error codes helps to identify the component or a specific section of the circuitry in the appliance.
When a malfunction is detected by the control circuit, the appliance shows the error code on the display and then switches off.



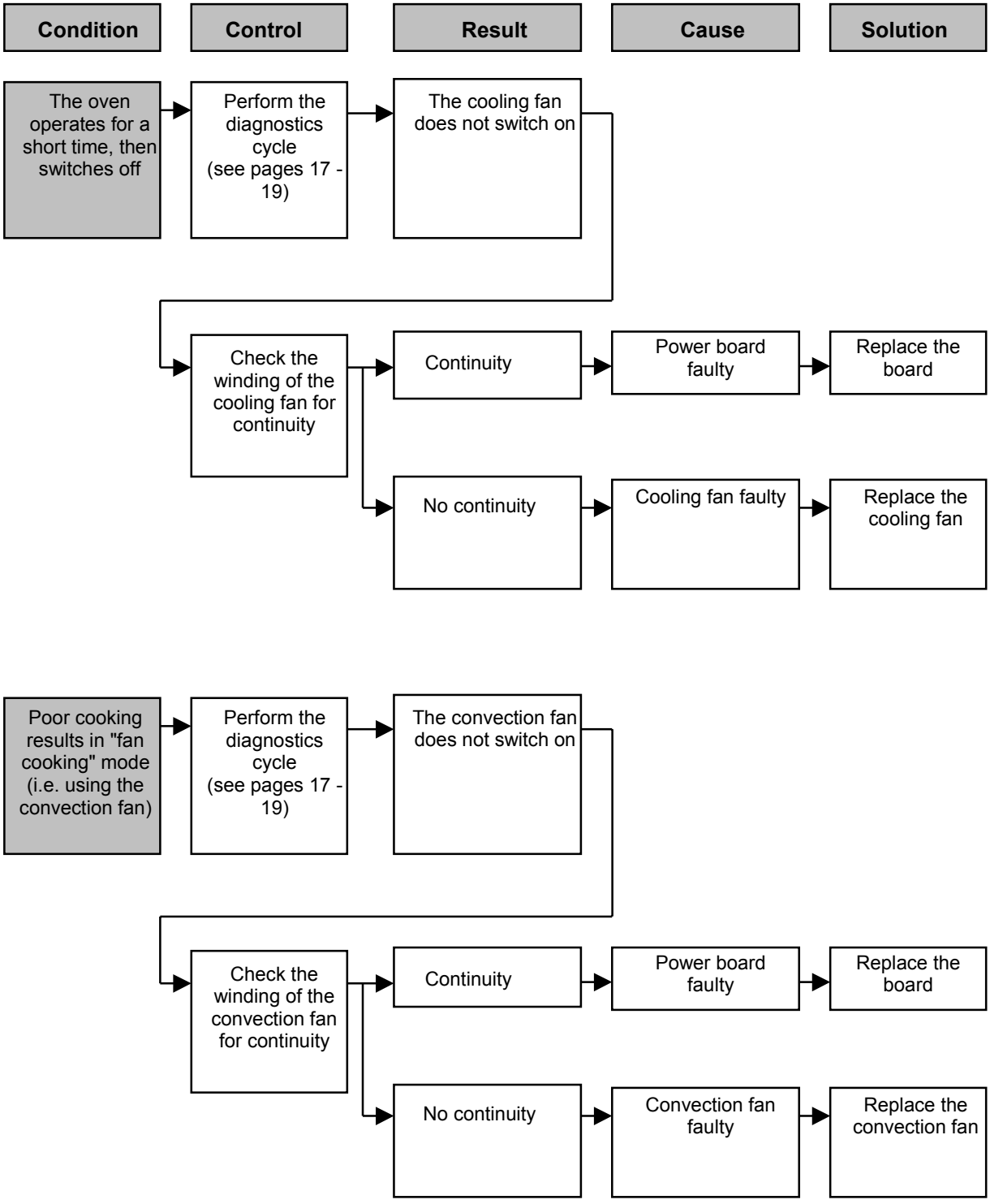

Condition
Control
Result
Cause
Solution
Error code 40 (Overheating detected)
When the oven is cold, switch it on and then off to reset the error code, then check power absorption in the oven lamp function (refer to page 21)
Power absorption is less than about 50W
Measure the resistance of the temperature sensor
Resistance is 520 - 570 Ω depending on the room temperature (refer to S.M. 599354040 page 25)
Power board faulty
Replace the board
Resistance more than 600 Ω at room temperature
Temperature sensor faulty
Replace the temperature sensor
Fastening and position of the temperature sensor
Fastening or position incorrect
Fastening screw not tightened
Position and correctly fasten the temperature sensor
Power absorption greater than 1700W approx.
Check power absorption in the grill function
Power absorption is 1700W approx.
Grill control relay on control unit faulty
Replace the control unit board
Power absorption greater than 2000 W
Relay on power board faulty
Replace the power board

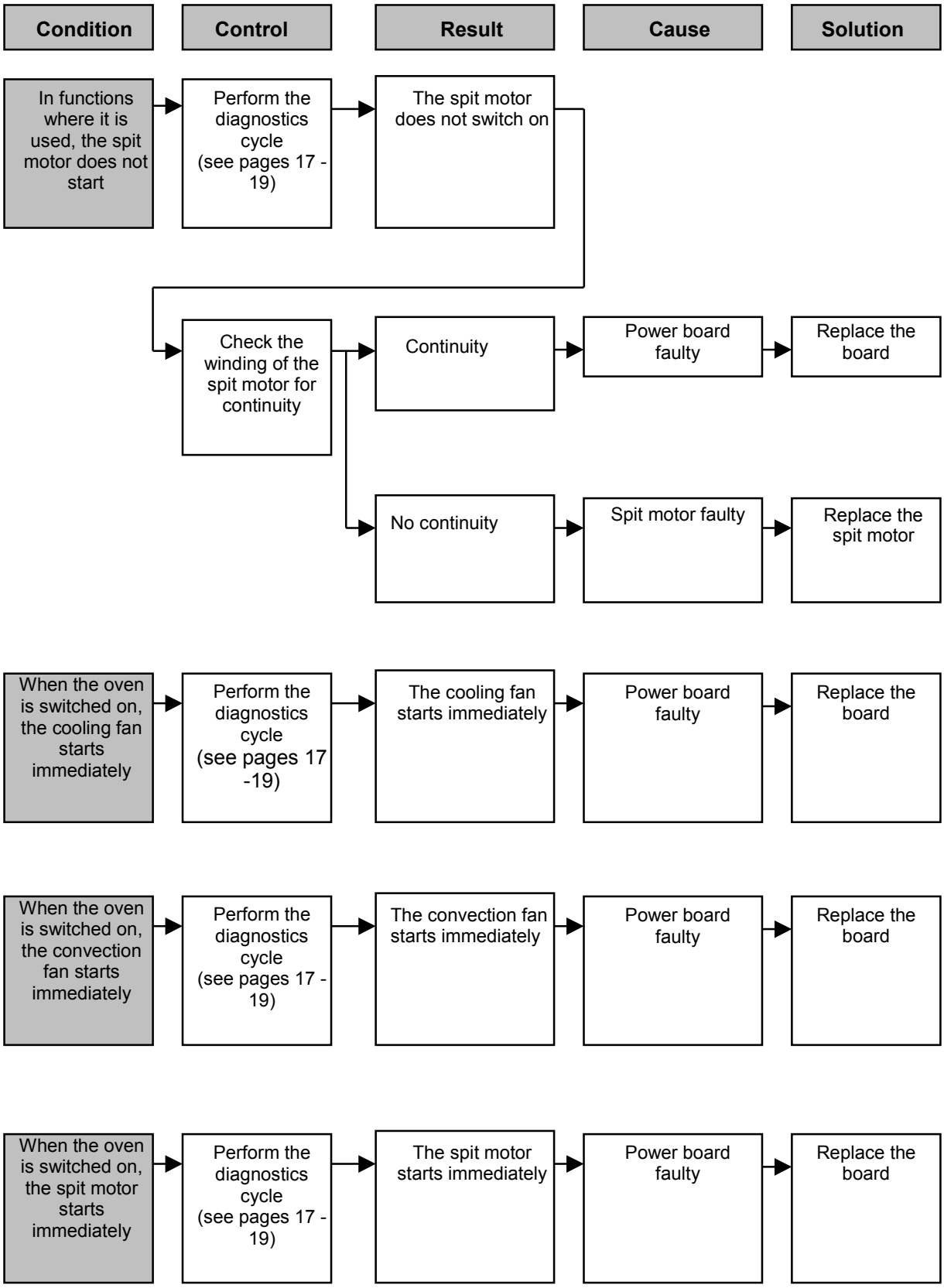

Condition
Control
Result
Cause
Solution
Error code 60 (Temperature safety limit exceeded + overheating detected
When the oven is cold, switch it on and then off to reset the error code, then check power absorption in the oven lamp function (refer to page 21)
Power absorption is less than about 50W
Fastening and position of the temperature sensor
Fastening or position incorrect
Fastening screw not tightened
Position and correctly fasten the temperature sensor
Power absorption greater than 50W approx.
Check the power absorption in the grill function (see page 21).
Power absorption is 1700W approx.
Grill control relay on control unit faulty
Replace the control unit board
Power absorption greater than 2000W
Relay on power board faulty
Replace the power board

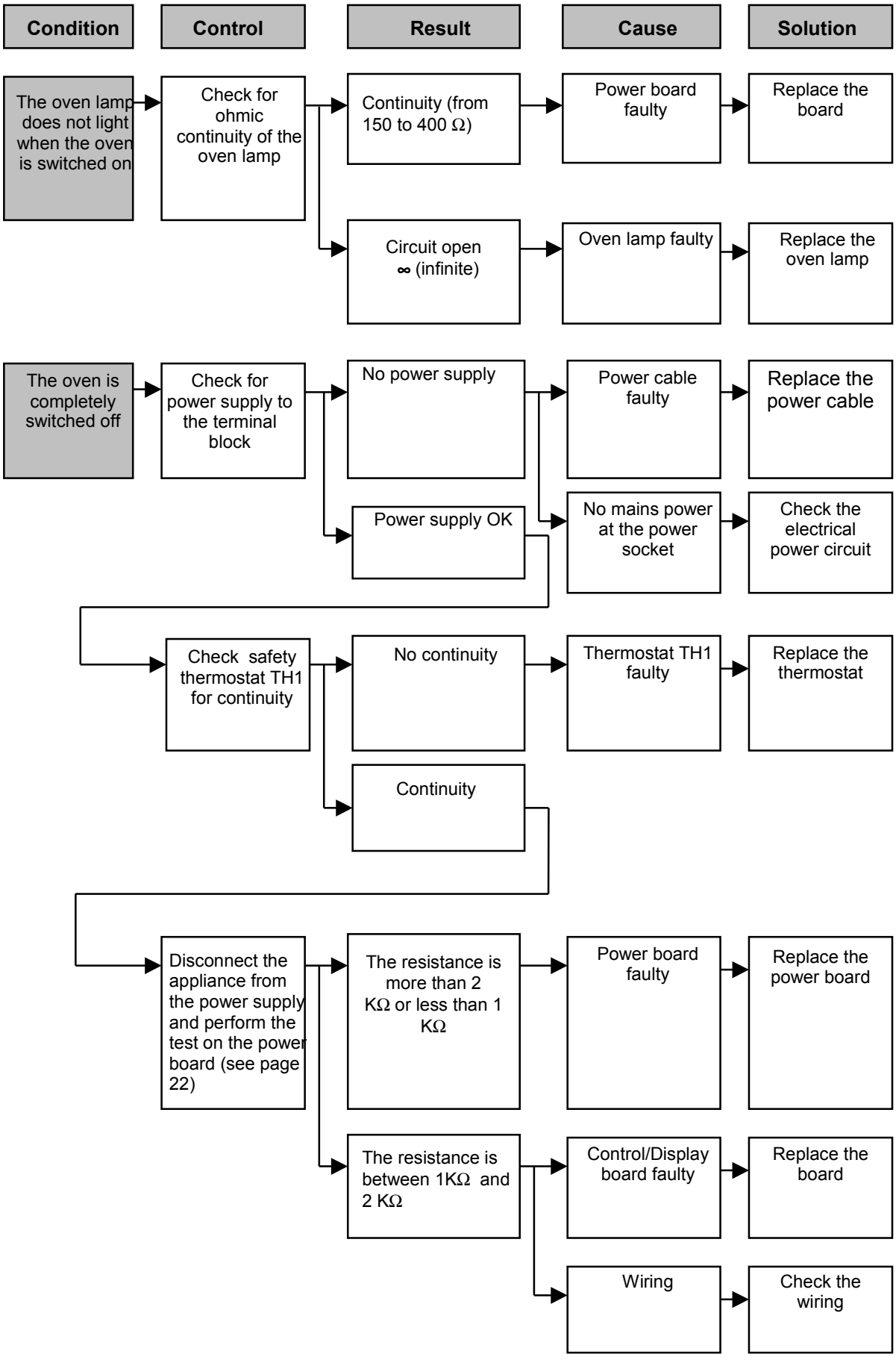

Condition
Control
Result
Cause
Solution
Error code 65 (Temperature sensor faulty)
Measure the resistance of the temperature sensor
Resistance is 520 - 570 Ω depending on the room temperature (refer to S.M. 599354040 page 25)
Measure the resistance of the heating element for the function selected
Continuity
Power board faulty
Replace the board
No continuity
Heating element faulty
Replace the heating element
Resistance of temperature sensor is ∞ (infinite)
Temperature sensor faulty
Replace the temperature sensor

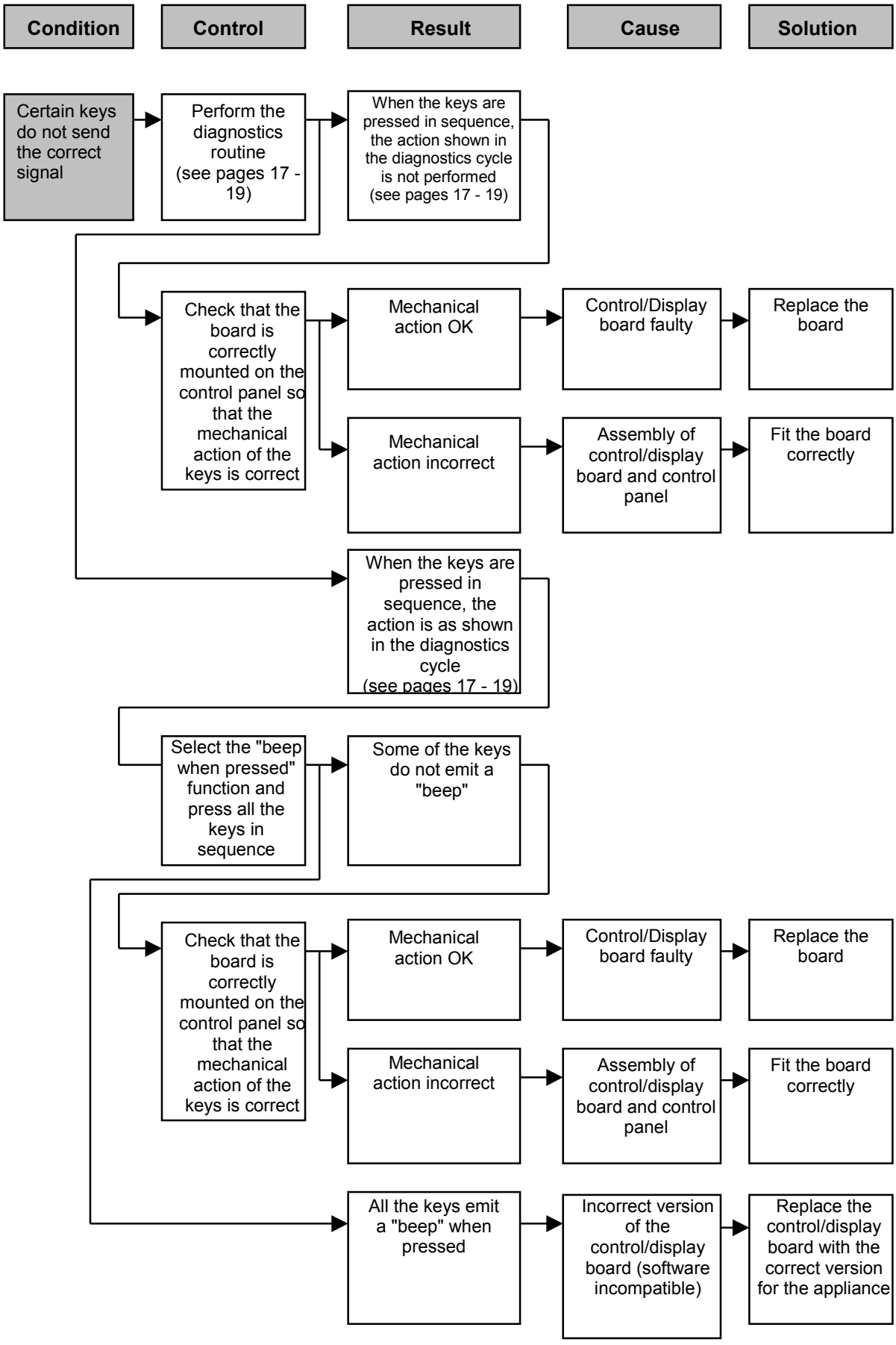

Condition
Control
Result
Cause
Solution
Error code 80 (No temperature increase in any of the functions)
Perform the diagnostics cycle (see page 17 -19)
The oven lamp and the motors do not switch on
Relay SP06 on the power board faulty
Replace the power board
The oven lamp and the motors switch on
Connection between the power board and the heating elements faulty
Check and repair the wiring
Error code 80 (No temperature increase in a specific function)
Check the continuity of the wiring to the heating elements relative to the function
Continuity
Power board faulty
Replace the power board
No continuity
Heating element faulty
Replace the heating element

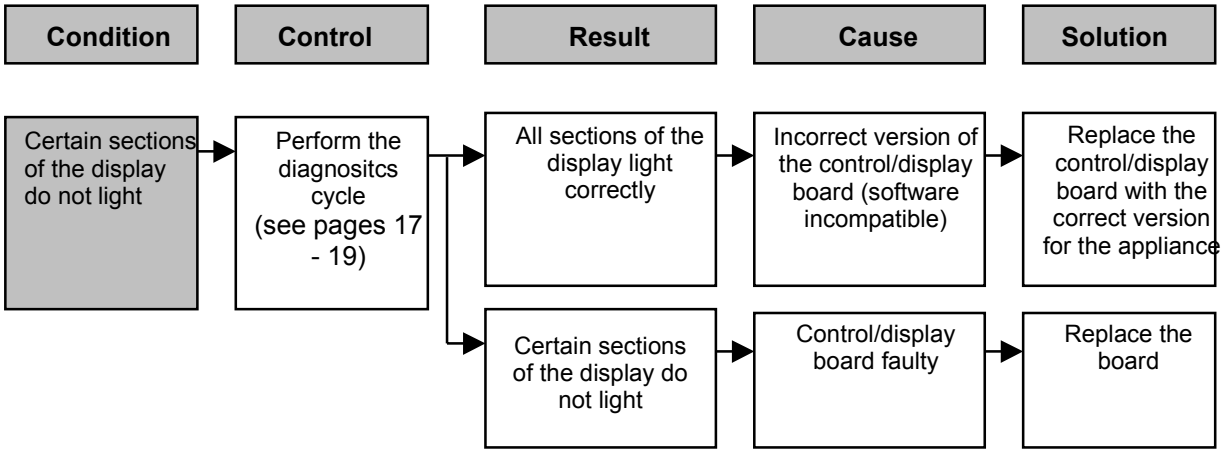
7 - TROUBLESHOOTING WITHOUT ERROR CODES




Condition
Control
Result
Cause
Solution
In functions where it is used, the spit motor does not start
Perform the diagnostics cycle (see pages 17 - 19)
The spit motor does not switch on
Check the winding of the spit motor for continuity
Continuity
Power board faulty
Replace the board
No continuity
Spit motor faulty
Replace the spit motor
When the oven is switched on, the cooling fan starts immediately
Perform the diagnostics cycle (see pages 17 -19)
The cooling fan starts immediately
Power board faulty
Replace the board
When the oven is switched on, the convection fan starts immediately
Perform the diagnostics cycle (see pages 17 - 19)
The convection fan starts immediately
Power board faulty
Replace the board
When the oven is switched on, the spit motor starts immediately
Perform the diagnostics cycle (see pages 17 - 19)
The spit motor starts immediately
Power board faulty
Replace the board


Condition
Control
Result
Cause
Solution
The oven lamp does not light when the oven is switched on
Check for ohmic continuity of the oven lamp
Continuity (from 150 to 400 Ω)
Power board faulty
Replace the board
Circuit open ∞ (infinite)
Oven lamp faulty
Replace the oven lamp
The oven is completely switched off
Check for power supply to the terminal block
No power supply
Power cable faulty
Replace the power cable
Power supply OK
No mains power at the power socket
Check the electrical power circuit
Check safety thermostat TH1 for continuity
No continuity
Thermostat TH1 faulty
Replace the thermostat
Continuity
Disconnect the appliance from the power supply and perform the test on the power board (see page 22)
The resistance is more than 2 KΩ or less than 1 KΩ
Power board faulty
Replace the power board
The resistance is between 1KΩ and 2 KΩ
Control/Display board faulty
Replace the board
Wiring
Check the wiring


Condition
Control
Result
Cause
Solution
Certain keys do not send the correct signal
Perform the diagnostics routine (see pages 17 - 19)
When the keys are pressed in sequence, the action shown in the diagnostics cycle is not performed (see pages 17 - 19)
Check that the board is correctly mounted on the control panel so that the mechanical action of the keys is correct
Mechanical action OK
Control/Display board faulty
Replace the board
Mechanical action incorrect
Assembly of control/display board and control panel
Fit the board correctly
When the keys are pressed in sequence, the action is as shown in the diagnostics cycle (see pages 17 - 19)
Select the "beep when pressed" function and press all the keys in sequence
Some of the keys do not emit a "beep"
Check that the board is correctly mounted on the control panel so that the mechanical action of the keys is correct
Mechanical action OK
Control/Display board faulty
Replace the board
Mechanical action incorrect
Assembly of control/display board and control panel
Fit the board correctly
All the keys emit a "beep" when pressed
Incorrect version of the control/display board (software incompatible)
Replace the control/display board with the correct version for the appliance


Condition
Control
Result
Cause
Solution
Certain sections of the display do not light
Perform the diagnositcs cycle (see pages 17 - 19)
All sections of the display light correctly
Incorrect version of the control/display board (software incompatible)
Replace the control/display board with the correct version for the appliance
Certain sections of the display do not light
Control/display board faulty
Replace the board

8 - DIAGNOSTICS CYCLE

It is possible to perform a diagnostics test in order to check the basic functions of the system.
The procedure for activating this test differs for each level of control unit.

8.1 - DIAGNOSTICS CYCLE FOR LEVEL 1 CONTROL UNIT

8.2 - DIAGNOSTICS CYCLE FOR LEVEL 2 CONTROL UNIT

To activate the diagnostics routine for the basic version, proceed as follows:

Press and hold down key "FHU" and connect the oven to the power supply.
The test takes place in the following sequence:

1 - A number is displayed indicating the initial status of the software (*).
2. All the segments of the display light.
3. The various control relays for the heating elements are activated in sequence and the display shows the software code (e.g. "**1 E 0020**").
4. The grill relay remains switched on for a certain time; at the same time, the four triacs are activated.

(*****) This number indicates the status of the internal memory, and changes according to the time that has elapsed since the appliance was last switched off and the data remaining in the system's memory (e.g. "**L 3004**" or "**S 3005**").

During this sequence, it is possible to obtain additional information by pressing certain keys:

Key no.	Symbol	Description
1		Displays the software code
2		Displays the temperature detected by the oven sensor
5		Indicates the presence of the meat probe, showing the temperature detected. If the meat probe is not featured, the display shows "**00**".
6		The buzzer sounds a "beep" to check for correct operation of the buzzer, and the system exits the test procedure.

8.3 - DIAGNOSTICS CYCLE FOR LEVEL 3 CONTROL UNIT

To activate the diagnostics routine for the basic version, proceed as follows:

Press and hold down key "1" and connect the oven to the power supply.
The test takes place in the following sequence:

1 - A number is displayed indicating the initial status of the software (*).
2. All the segments of the display light.
3. The various control relays for the heating elements are activated in sequence and the software code (e.g. "**BE 10 W0S48**") is shown in the upper section of the display.
4. The grill relay remains switched on for a certain time; at the same time, the four triacs are activated.

(*****) This number indicates the status of the internal memory, and changes according to the time that has elapsed since the appliance was last switched off and the data remaining in the system's memory (e.g. "**L 3004**" or "**S 3005**").

During this sequence, it is possible to obtain additional information by pressing certain keys:

Key no.	Symbol	Description
1		Displays the software code
2		Displays the temperature detected by the oven sensor
5		Indicates the presence of the meat probe, showing the temperature detected. If the meat probe is not featured, the display shows "**00**".
6		The buzzer sounds a "beep" to check for correct operation of the buzzer, and the system exits the test procedure.

9 - TESTING THE COMPONENTS

9.1 - TESTING THE OVEN TEMPERATURE SENSOR

In case of doubt regarding the correct operation of the oven temperature sensor, use an ohmmeter to measure its resistance as follows:

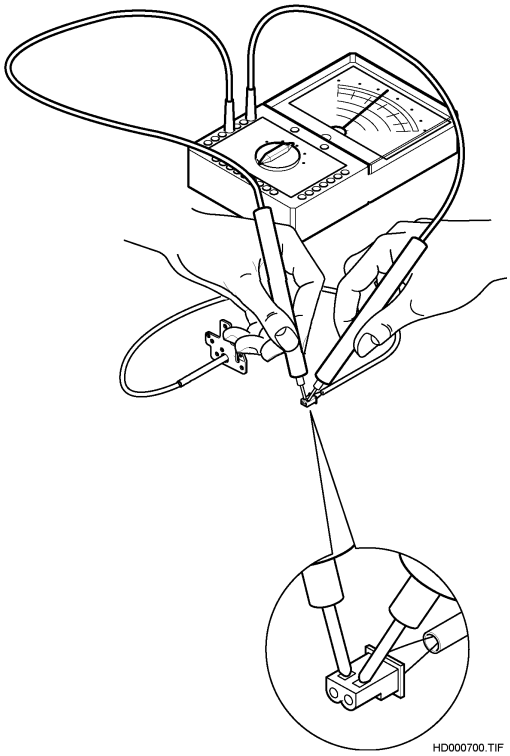


Fig. 6

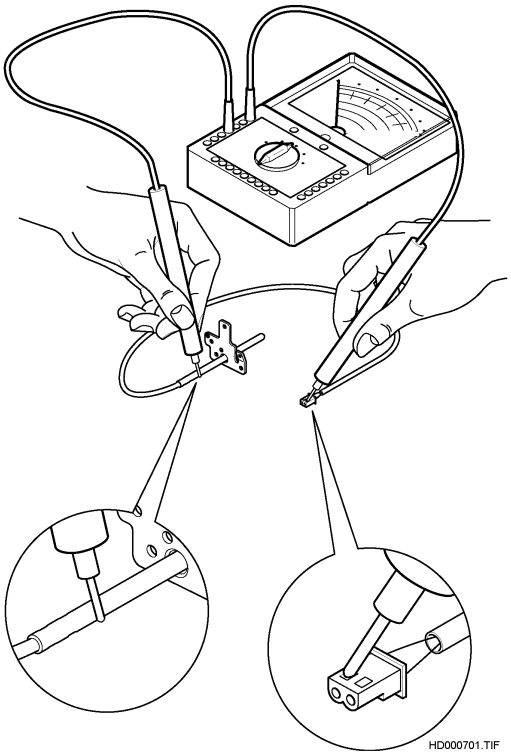


Fig. 7

The resistance should be approximately 500 - 600 ohm at room temperature.
It is important to measure the insulation resistance between the metal casing and each of the terminals, which must be greater than 2 Mohm.

9.2 - POWER ABSORPTION TESTS

The power absorption can be measured using the appropriate instrument (e.g. wattmeter), which should be applied between the power supply and the appliance.
The table below also shows indicative values for the relative current absorption in the event that an amperometric pincer is used for measurement.

POWER ABSORPTION (W)	CURRENT ABSORPTION (A)
50	0,20
1700	7,40
2000	8,70

N.B.: The values measured refer to a power supply voltage of 230 V.

9.3 - TESTING THE POWER BOARD

The continuity of the primary winding of the power transformer on the power board can be checked by measuring the ohmic resistance on the power supply terminal block. The test points for the various types of appliance are shown in fig. 8.

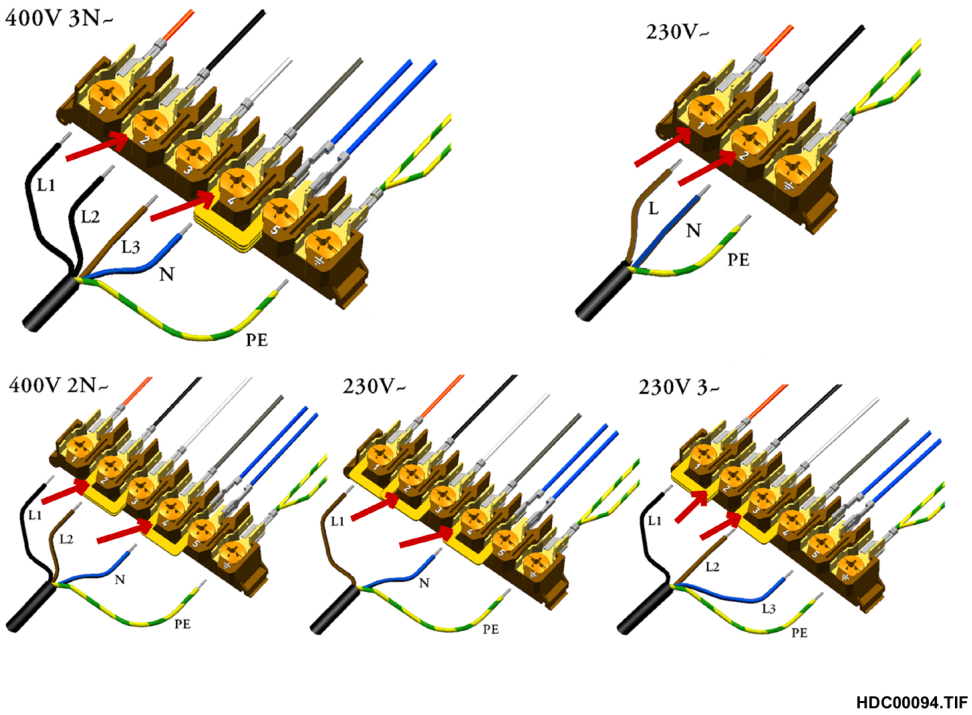
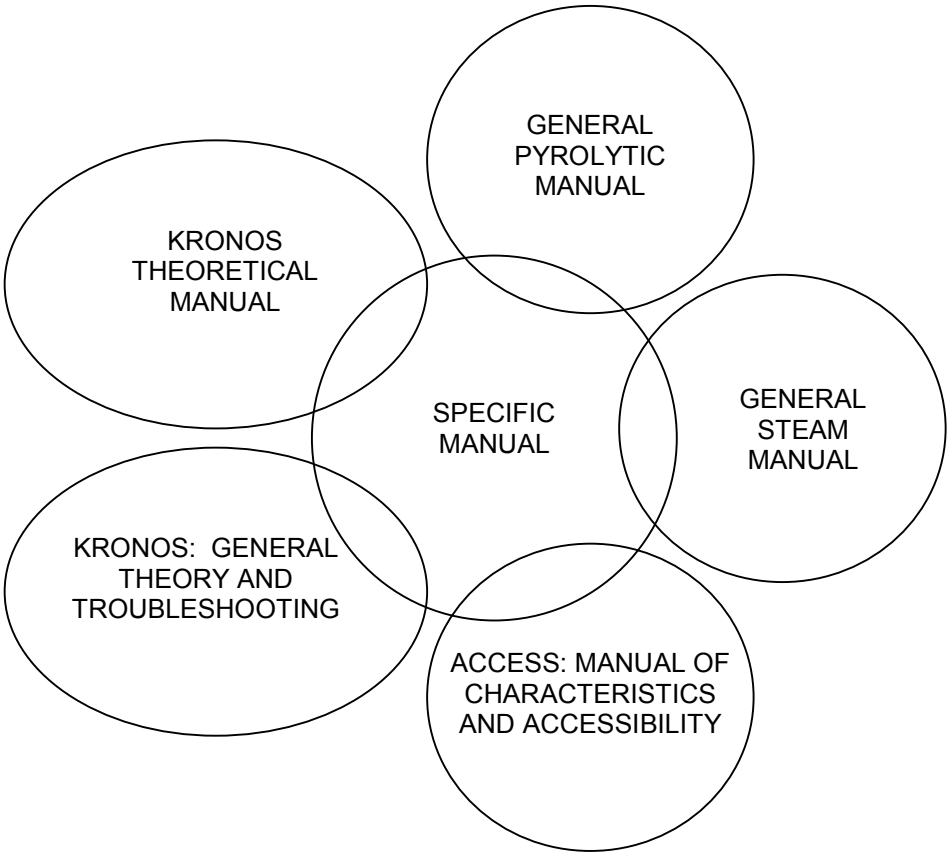


Fig. 8

N.B.: The faston for connection to point **L** of the power board is fitted with a faston cover to prevent detachment. If this is difficult to remove when replacing the board, it is advisable to cut the faston cover and fit a new faston cover (code **5022 59 95-00/5**).

10 - ACCESS/KRONOS: ORGANIZATION OF SERVICE MANUALS

In view of the quantity of theoretical, technical and practical information relative to the various combinations for the structure of the ACCESS/KRONOS system, this information has been subdivided into Service Manuals describing the general concepts, and separate Service Manuals containing specific information relative to each group of appliances.
Only the specific Service Manuals should be used for a specific appliance.

The various Service Manuals are as shown in the diagram below.