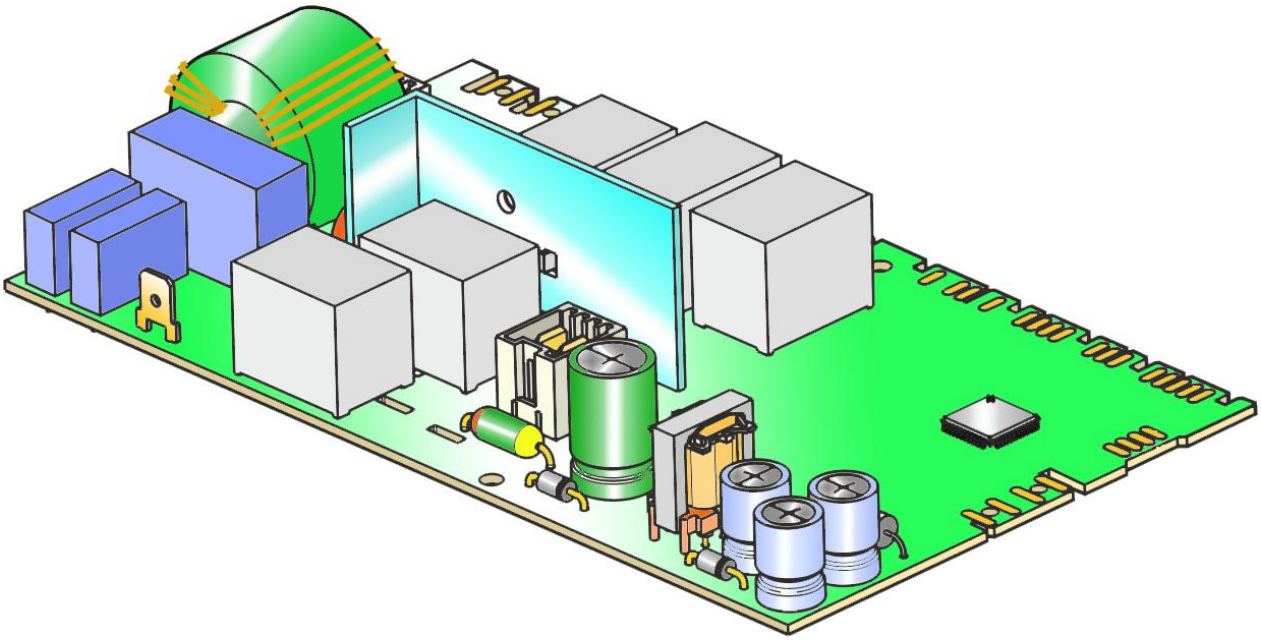
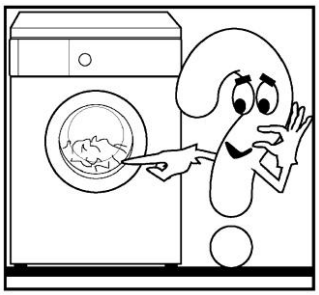
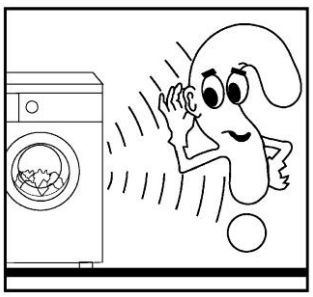
Electrolux

SERVICE MANUAL

WASHING







Publication number

599 75 38-69

EN

Edition: 05/2012 - Rev. 00

Front-Loading Washing Machines

guide to diagnostics of electronic controls

EWM09312

THE INSPIRATION RANGE

TC3 - TC4

G29

Index

1 INTRODUCTION

1.1 Purpose of this manual

The purpose of this manual is to explain, simply and schematically, the steps any Technician should take when faced with the problems indicated by the various alarm codes on appliances with electronic control in the EWM09312 series.

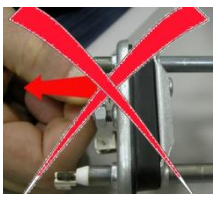
Depending on the appliance configuration, the alarms may be entirely or partially displayed to the user: the latter solution is usually adopted.
The diagnostics system is used by Service Technicians to:

- Read alarms
- Delete the alarm stored
- Test the appliance operation

1.2 Cautions

- **Any work on electrical appliances must only be carried out by qualified technicians.**
- **Before servicing an appliance, check the efficiency of the electrical system in the home using appropriate instruments. For example: refer to the indications provided/illustrated in the <<metratester>> course at the address (http://electrolux.edvantage.net) on the Electrolux Learning Gateway portal.**

  On completing operations, check that the appliance has been restored to the same state of safety as when it came off the assembly line.
- **If the circuit board has to be handled/replaced, use the ESD kit (Cod. 405 50 63-95/4) to avoid static electricity from damaging the circuit board, see S.B. No. 599 72 08-09 or consult the course "Electrostatic charges" at the address (http://electrolux.edvantage.net) on the Electrolux Learning Gateway portal.**
- **This platform is not fitted with an ON/OFF switch. Before you access internal components, take the plug out of the socket to cut the power supply.**
- **Make resistance measurements, rather than direct voltage and current measurements**
- **Warning the sensors located on the display board could be at a potential of 220 Volts.**
- **When replacing the heating element, replace it with one that has the same characteristics (2 thermal fuses) in order not to compromise the safety of the appliance. Do not remove/switch the NTC sensors between heating elements.**



- **Always empty the appliance of all the water before laying it on its side.**
- **Never place the appliance on its right side (electronic control system side): some of the water in the detergent dispenser could leak onto the electrical/electronic components and cause these to burn.**
- **When replacing components, please refer to the code shown in the list of spare parts relating to the appliance.**
- **The resistance values of the components shown in this S.M. are purely indicative (relating to a sample appliance with new components).**
  For the actual value of the component, please refer:
  to S.B. 599706597 for motors, and for the other components, please consult S.M. 599728903 "Component Characteristics".

1.3 How to proceed

1. Identify the type of control in question **(page 7)** and access the diagnostic cycle. **(See page 7).**

2. Read the alarm stored **(page 12)** and consult the instructions regarding the “alarm codes”, **(page 13÷16).**

3. Delete the alarms stored **(Page 12).**

4. If you are unable to access the diagnostic mode, consult the chapter entitled “The diagnostics system cannot be accessed”. **(page 17).**

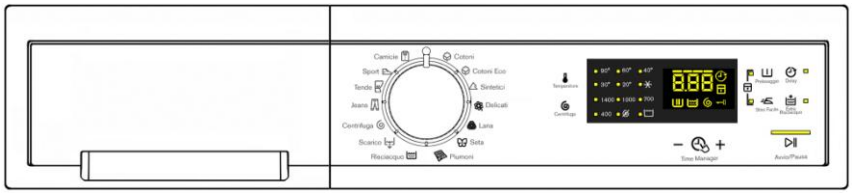
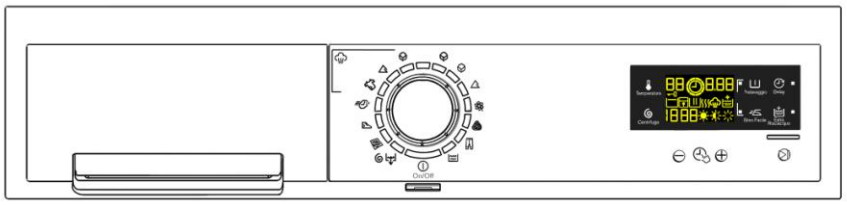
5. Should the main electronic circuit board need to be replaced, make sure there are no burns. **(See page 60).**

6. After all intervention, check the appliance is operating correctly using the diagnostic cycle **(page 8).**

7. Delete any alarm that may have been stored during the diagnostics operations **(page 12)**

2 WM APPLIANCE CONTROL PANELS

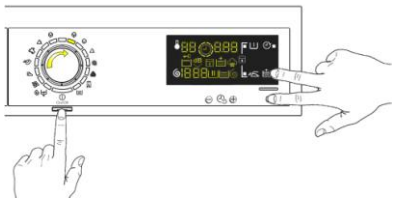
These are the stylings available at the time of printing of this Service Manual. Others may be developed in future.

THE INSPIRATION RANGE	TC4	
	TC3	

3 DIAGNOSTICS SYSTEM

3.1 Accessing diagnostics

The operations listed below must be carried out within 7 seconds.

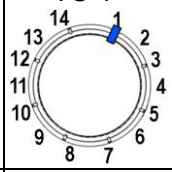
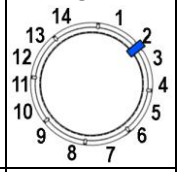
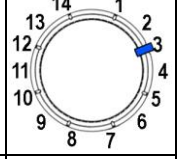
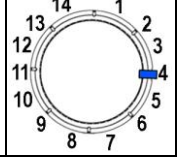
TC 3	TC4
	
Do not start the procedure with your fingers over the combination sensors	
1. Switch on the appliance using the ON/OFF button. The first LED lights up. 2. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram). 3. Hold your fingers over the sensors until the LEDs and symbols begin to flash in sequence (approximately 3 seconds). In the first position, the operation of the sensors, the LEDs and the groups of symbols shown on the LCD display is checked; When the programme selector is turned in a **clockwise direction**, the operation of the various components is diagnosed and the alarms are read (see diagnostic test on the next page).	1. Set the selector dial to position 0 (zero). 2. Rotate the programme selector by **one position clockwise.** 3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram). 4. Keep your fingers above the sensors until the LEDs and display symbols start flashing. In the first position, the operation of the buttons and the related LEDs is checked; turn the programme selector dial **clockwise** to run the diagnostic cycle for the operation of the various components and to read any alarms (see diagnostic test on the next page).

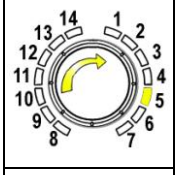
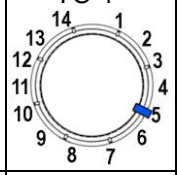
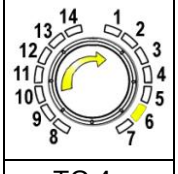
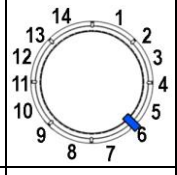
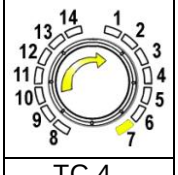
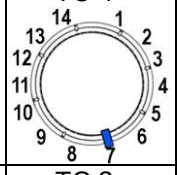
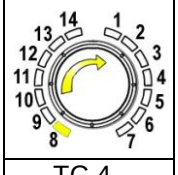
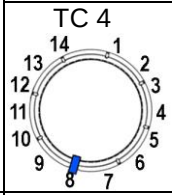
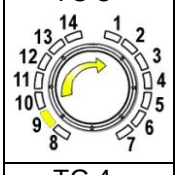
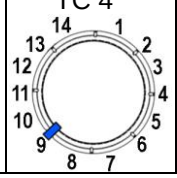
3.2 Quitting the diagnostics system

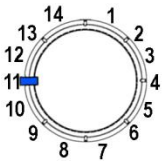
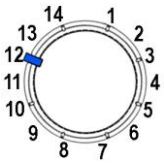
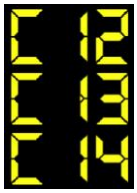
→ **Styling TC4**: To exit the diagnostics system, turn the selector dial to position 0 (zero).
→ **Styling TC3**: In order to exit the diagnostic system turn the appliance off using the ON/OFF push button.

Phases of the diagnostics test

Irrespective of the type of PCB and the configuration of the programme selector, after entering the diagnostic mode, turn the programme selector dial **clockwise** to perform the diagnostic cycle for the operation of the various components and to read any alarms.
Concurrently, a selector control code is shown on the LCD display, which indicates for **two** seconds the description in the last column of the table below.
(all alarms are enabled in the diagnostic cycle).

Selector position		Components activated	Working conditions	Function tested	LCD display
1	TC 3  TC 4 	- The LEDs, groups of symbols in the LCD screen and the backlight of the display are turned on in sequence. - Touch a sensor to turn on the group of icons in the LCD screen or the corresponding LED and the buzzer sounds at the same time.	Always active	User interface functioning	
2	TC 3  TC 4 	- Door safety interlock - Wash solenoid valve	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to wash compartment	 Water level in the tub (mm)
3	TC 3  TC 4 	- Door safety interlock - Pre-wash solenoid valve	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to pre-wash compartment	 Water level in the tub (mm)
4	TC 3  TC 4 	- Door safety interlock - Solenoid valve pre-wash and wash	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to conditioner compartment	 Water level in the tub (mm)

Selector position		Components activated	Working conditions	Function tested	LCD display
5	TC 3  TC 4 	- Door safety interlock - Third solenoid valve	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to third solenoid valve compartment	 Water level in the tub is displayed (mm)
6	TC 3  TC 4 	- Door safety interlock - Fourth solenoid valve (hot water where featured)	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to fourth solenoid valve compartment	 Water level in the tub is displayed (mm)
7	TC 3  TC 4 	- Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Heating element - Weight sensor (if there is one, an extra litre of water is loaded) - Circulation pump	Door closed Water level above the heating element. Maximum time 10 mins up to 90°C. **(*)**	Reheating Circulation	 Temperature in °C measured using the NTC probe.
8	TC 3  TC 4 	- Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Motor (55 rpm clockwise, 55 rpm anti-clockwise, 250 rpm pulse)	Door closed Water level above the heating element	Check for leaks from the tub.	 Drum speed in rpm/10
9	TC 3  TC 4 	- Door safety interlock - Drain pump - Motor up to 650 rpm then at maximum spin speed (**)	Door closed Water level lower than anti-boiling level for spinning.	Drain, calibration of analogue pressure switch and spin.	 Drum speed in rpm/10

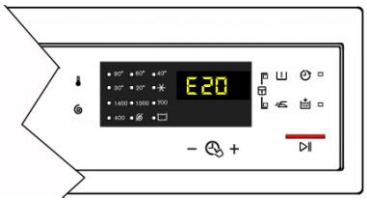
Selector position		Components activated	Working conditions	Function tested	LCD display
10	-----	-----	-----	-----	-----
11	TC 3  TC 4 	- Reading/Deleting the last alarm	-----	----	
12 ÷ 14	TC 3  TC 4 	- The LEDs, groups of symbols in the LCD screen and the backlight of the display are turned on in sequence. - Touch a sensor to turn on the group of icons in the LCD screen or the corresponding LED and the buzzer sounds at the same time.	Always active	User interface functioning	

(*) In most cases, this time is sufficient to check the heating. However, the time can be increased by repeating the phase without draining the water: pass for a moment to a different phase of the diagnostic cycle and then back to the heating control phase (if the temperature is higher than 80°C, heating does not take place).
(**) The check at the maximum speed occurs without control of the A.G.S. and no garments must be inside the appliance.

3.3 ALARMS

3.3.1 Displaying user alarms

When a problem occurs in the appliance, the LCD display shows a “WARNING”, represented by a code (in the three digits, where the remaining time for the cycle to finish is shown) and simultaneously the buzzer emits three short beeps every twenty seconds for five minutes.
Once the fault has been repaired/solved, the buzzer stops beeping and the LCD display shows the chosen programme.
This does not occur for alarm EH0.

TC 4	TC 3
	

The alarms displayed to the user are listed below and can also be eliminated by the user:

TC4 / TC3
E10 - Water fill difficulty (tap closed)
E20 - Drain difficulty (filter dirty)
E40 - Door open
EF0 – Excessive detergent
EH0 – Voltage or frequency outside normal values

While the alarm listed below:

TC4 / TC3
EF0 – Water leakage (Aqua Control System)

The intervention of a service engineer is required

The other alarms are displayed by a code

The alarms are enabled during the execution of the washing programme. With the exception of alarms associated with the configuration and the power supply voltage/frequency, which are also displayed during the programme selection phase.

The door can normally be opened (except where specified) when an alarm condition has occurred, on condition that:

- The level of the water in the tub is below a certain level.
- The water temperature is lower than 55°°C.
- The motor has stopped.

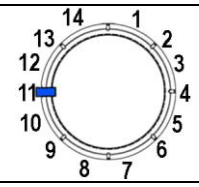
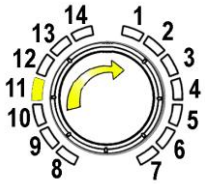
Certain alarm conditions require a drain phase to be performed before the door can be opened for safety reasons:

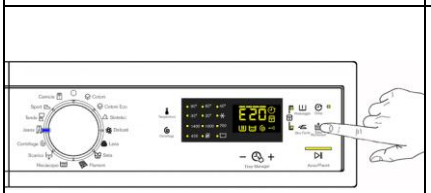
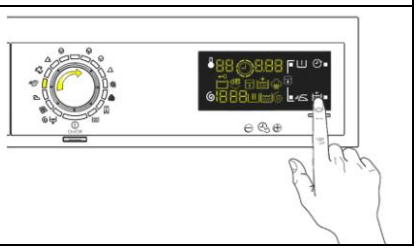
- Cooling water fill if the temperature is greater than 65°°C.
- Drain until the analogue pressure switch is on empty, during a max. 3 minute interval.

3.3.2 Reading the alarms

The last three alarms stored in the FLASH memory of the PCB can be displayed:

- enter the diagnostic mode (para. 3.1)
- Irrespective of the type of PCB and configuration, turn the programme selector knob **clockwise** to the **eleventh** position, the last alarm is displayed.
- to display previous alarms, touch the sensor closest to the START/PAUSE sensor in sequence (as shown in the figure)
- To return to the last alarm, touch the START/PAUSE sensor.

TC4

TC3 - TC2


TC 4	TC 3
	

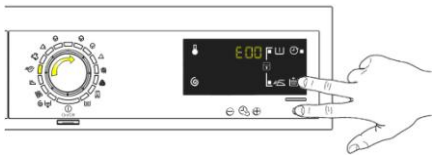
3.3.3 Rapid reading of alarms

The last alarm can be displayed even if the programme selector is not in the eleventh position (diagnostics) or if the appliance is in normal operating mode (e.g. during the execution of the washing programme):
→ Touch the **START/PAUSE** sensor and the nearest **option sensor** simultaneously (as if you were entering DIAGNOSTIC mode) and hold for at least 2 seconds: the LCD display shows the last alarm.
→ The alarm will continue to be displayed until a sensor is touched.
→ The alarm reading system is as described in para. 3.4.2
→ While the alarm is being displayed, the appliance continues to perform the cycle or, if in the programme selection phase, it stores the previously selected options.

3.3.4 Deleting the last alarm

It is good practice to cancel the alarms stored:

- after reading the alarm codes, to check whether the alarm re-occurs during the diagnostic cycle
- after repairing the appliance, to check whether it re-occurs during testing

TC 4	TC 3
	

1. enter the diagnostic mode (para. 3.1)
2. Turn the selector clockwise until the **eleventh** LED lights up.
3. Simultaneously press the **START/PAUSE** sensor and the nearest **option sensor** (as shown in the diagram).
4. Keep your fingers over the sensors until the LCD display shows “E00” (at least 5 seconds).

N.B. With this operation all the alarms stored are deleted.

3.4 Alarm Summary Table

alarm	Description	Possible fault	Machine status/action	Reset	Page
E00					
E11	**Water fill difficulty during washing**	Tap closed or water pressure too low; drain pipe improperly positioned; water fill solenoid valve faulty; leaks from water circuit on pressure switch; pressure switch faulty; wiring faulty; main PCB faulty.	Cycle is paused with door locked	START/RESET	18
E13	**Water leaks**	Drain pipe improperly positioned; water pressure too low Water fill solenoid valve faulty; water circuit on pressure switch is leaking/clogged; pressure switch faulty.	Cycle is paused with door locked	START/RESET	20
E21	**Drain difficulty during washing**	Drain pipe kinked/clogged/improperly positioned; drain filter clogged/dirty; wiring faulty; pressure switch faulty; drain pump rotor blocked; drain pump faulty; main PCB faulty.	Cycle is paused (after 2 attempts)	START ON/OFF RESET	22
E23	**Faulty triac for drain pump**	Wiring faulty; drain pump faulty; main PCB faulty.	Safety drain cycle - Cycle stops with door open.	RESET	24
E24	**Drain pump TRIAC "sensing" circuit faulty.**	Main circuit board faulty.	Safety drain cycle - Cycle stops with door unlocked	RESET	26
E31	**Malfunction in electronic pressure switch circuit**	Wiring; Electronic pressure switch; Main PCB;	Cycle stops with door locked	RESET	26
E32	**Calibration error of the electronic pressure switch**	Drain pipe kinked/clogged/improperly positioned; solenoid valve faulty; drain filter clogged/dirty; drain pump faulty; leaks from pressure switch hydraulic circuit; pressure switch faulty; Wiring; main PCB;	Cycle is paused	START/RESET	27
E35	**Overflow**	Water fill solenoid valve faulty; leaks from water circuit on pressure switch; wiring faulty; pressure switch faulty; main PCB faulty.	Cycle interrupted. Safety drain cycle. Drain pump continues to operate (5 min. on, then 5 min. off. etc.)	RESET	28
E38	**Internal pressure chamber is clogged (water level does not change for at least 30 sec. of drum rotation)**	Motor belt broken; water circuit on pressure switch clogged.	Heating phase is skipped	RESET	29
E41	**Door open**	Check whether the door is closed properly; Wiring faulty; door safety interlock faulty; Main circuit board faulty.	Cycle is paused	START/RESET	30
E42	**Problems with door lock**	Wiring faulty; door safety interlock faulty; Electrical current leak between heating element and ground; main PCB faulty.	Cycle is paused	START/RESET	32
E43	**Faulty triac supplying power to door delay system**	Wiring faulty; door safety interlock faulty; Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET	34
E44	**Faulty sensing by door delay system**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET	35
E45	**Faulty sensing by door delay system triac**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET	35

alarm	Description	Possible fault	Machine status/action	Reset	Page
E51	**Motor power triac short-circuited**	Current leakage from motor or from wiring; Main PCB faulty;	Cycle stops with door open (after 5 attempts)	ON/OFF	36
E52	**No signal from motor tachometric generator**	Wiring faulty; Motor faulty; Main circuit board faulty.	Cycle stops with door locked (after 5 attempts)	ON/OFF	37/39
E53	**"Sensing" faulty triac motor**	Main circuit board faulty.	Cycle blocked	RESET	41
E54	**Motor relay contacts sticking**	Current leakage from motor or from wiring; Main PCB faulty;	Cycle blocked (after 5 attempts)	RESET	42
E62	**Overheating during washing (temperature higher than 88°C for more than 5 min.)**	Wiring faulty; NTC probe for wash cycle faulty; Heating element faulty; Main PCB faulty.	Safety drain cycle Cycle stops with door open	RESET	43
E66	**Heating element power relay faulty (inconsistency between sensing and K2 relay status)**	Main PCB faulty;	Safety water fill Cycle stops with door closed.	ON/OFF RESET	44
E68	**Current leak to the ground**	Current leakage between heating element and ground.	The heating phase is skipped	START/RESET	45
E69	**Heating element interrupted**	Wiring faulty; Heating element for washing interrupted (thermal fuse open); Main PCB faulty.	----------	START ON/OFF RESET	46
E6A	**Heating relay sensing faulty**	Main circuit board faulty.	Cycle stops with door locked	RESET	47
E6H	**Heating element power relay faulty (inconsistency between sensing and K1 relay status)**	Wiring faulty; Earth-leakage between heating element and earth; Main PCB faulty.	Safety water fill Cycle stops with door closed.	ON/OFF RESET	
E71	**NTC probe for wash cycle faulty (short-circuited or open)**	Wiring faulty; NTC probe for wash cycle faulty Main circuit board faulty.	The heating phase is skipped	START/RESET	48
E74	**NTC probe for wash cycle improperly positioned**	Wiring faulty; NTC probe for wash cycle improperly positioned; NTC probe faulty; Main PCB faulty.	The heating phase is skipped	RESET	49
E83	**Error in reading selector**	Main PCB faulty (Incorrect configuration data).	Cycle cancelled	START/RESET	50
E86	**Selector configuration error**	Display board	----------	START ON/OFF RESET	
E87	**Display board microprocessor faulty**	If this continues, replace the display board	No action to be taken	START ON/OFF RESET	
E91	**Communication error between main PCB and display**	Wiring faulty; Control/display PCB faulty Main circuit board faulty.	----------	RESET	51
E92	**Communication inconsistency between main PCB and display (incompatible versions)**	Incorrect control/display PCB Incorrect PCB (does not correspond to the model).	Cycle blocked	ON/OFF	52
E93	**Appliance configuration error**	Main PCB faulty (incorrect configuration data)	Cycle blocked	ON/OFF	
E94	**Incorrect configuration of washing cycle**	Main PCB faulty (incorrect configuration data)	Cycle blocked	ON/OFF	
E97	**Inconsistency between programme selector and cycle configuration**	Main PCB faulty (incorrect configuration data).	Cycle blocked	RESET	

alarm	Description	Possible fault	Machine status/action	Reset	Page
E9C	**Display board configuration error**	Display board faulty	----------	START ON/OFF RESET	
E9E	**Display board sensor/touch key faulty**	Display board faulty	----------	ON/OFF	
EC1	**Electronically controlled valve blocked with operating flowmeter**	Faulty wiring; Faulty/blocked solenoid, PCB faulty,	Cycle stops with door locked Drain pump continues to operate (5 mins. on, then 5 mins. off, and so on)	RESET	53
EC4	**AGS current sensor faulty.**	Main board faulty.	Spin speed reduced to safety speed of 150 rpm	RESET	54
EF1	**Drain filter clogged (drain phase too long)**	Drain filter clogged/dirty. Drain hose blocked/kinked/too high.	Warning displayed at the end of cycle.	START/RESET	54
EF2	**Overdosing of detergent (too much foam during drain phases)**	Excessive detergent dosing; Drain hose kinked/blocked; Drain filter clogged/dirty.	Warning displayed after 5 attempts or by the specific LED.	RESET	
EF3	**Aqua control system intervention**	Water leaks onto base frame; Aqua control system faulty; Drain pump winding interruption/overheating.	Appliance drains	ON/OFF RESET	
EF4	**Water fill pressure too low, no signal from flowmeter and electronically controlled valve is open**	Tap closed, water fill pressure too low	----------	RESET	
EF5	**Unbalanced load**	Final spin phases skipped.	----------	START/RESET	55
EF6	**Reset**	If it continues, replace the main board.	No action to be taken	----------	
EH1	**Appliance power supply frequency out of limits**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal frequency conditions	ON/OFF	55
EH2	**Supply voltage too high**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal voltage conditions.	ON/OFF	
EH3	**Supply voltage too low**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal voltage conditions.	ON/OFF	

3.5 Notes on the behaviour of certain alarms

- **Configuration alarm E93:** when this alarm rings (when turned on) the machine blocks and the alarm code appears on the display provided the relevant configuration part is intact.
  It will not be possible to access diagnostics mode and the only available option is to turn the appliance off.
- **Configuration alarm E94:** The code can also be viewed from the display.
  The diagnostics mode cannot be accessed and the "quick alarm viewing" mode cannot be used.
- **Alarms EH1-EH2-EH3:** in the event of problems with the supply voltage, the appliance remains in alarm status until the mains frequency or voltage returns to acceptable values or the appliance is switched off. The display shows the **"H".** alarm family.
- **Alarms E51- E52:** all the alarms are displayed during diagnostic testing: normally, when shifting from one control phase to another, the appliance quits the alarm mode and executes the selected phase. This is not the case for alarms E51 (motor power supply TRIAC short-circuiting) and E52 (no signal from motor tachometric generator): the only possibility to get out of the alarm situation is to turn off the appliance then turn it on again with the ON/OFF button or disconnect the plug from the socket.

4 CANNOT ACCESS THE DIAGNOSTICS PROGRAMME

4.1 None of the LEDs on the circuit board light up

Are the power supply cable and the connection on the main board (connector **J4**) working properly?

NO → Replace/repair the power supply cable, check the connection

YES

Is the communication wiring between the main board (connector **J10**) and the display board (connector **J3**) working properly? (insert and remove)

NO → Replace/repair wiring

YES

Does the programme selector knob function mechanically?

NO → Replace/repair knob
Replace display board

YES

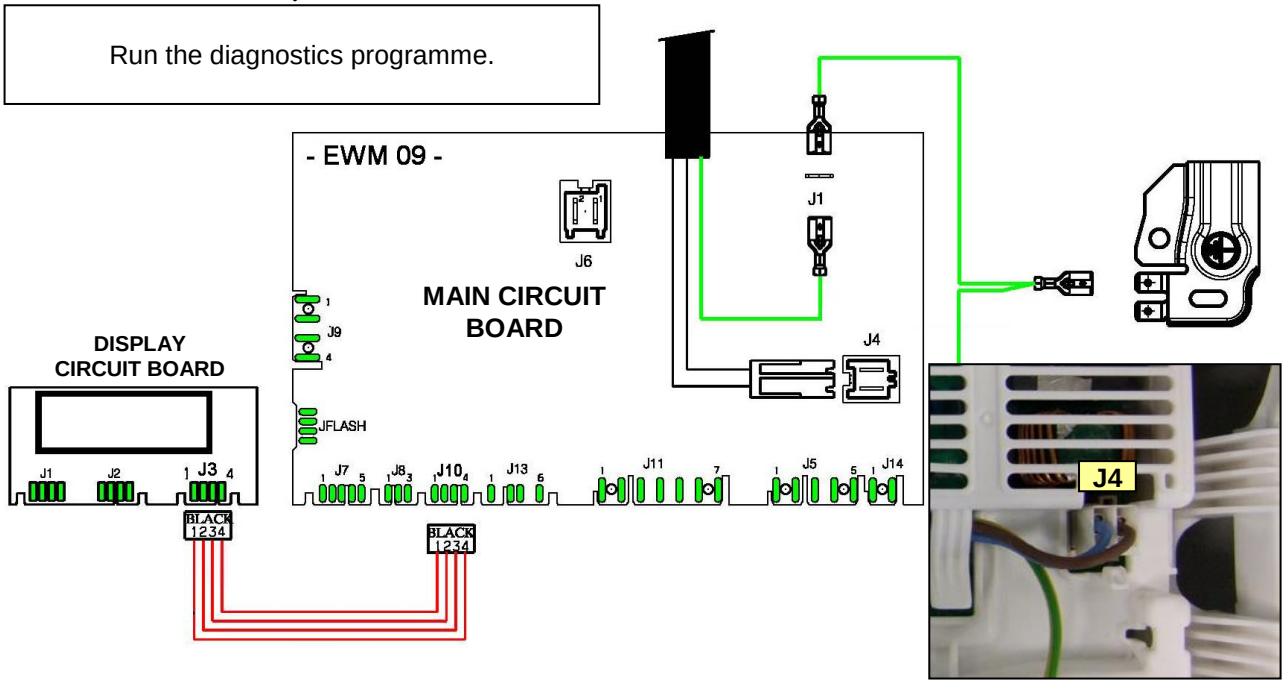
Change the main circuit board

Is the appliance working correctly?

NO → Replace display board

YES

Run the diagnostics programme.



5 TROUBLESHOOTING BASED ON ALARM CODES

E11	E11: Water fill difficulty during washing Maximum water fill time for every level of the pressure switch (the time is reset every time the level is achieved)	E11

! *check that all the connectors are correctly inserted*

Run the diagnostic cycle and fill all the trays with water**(phases 2,3,4)**
Are all the trays filling with water?

NO

YES

Is the drain pipe positioned correctly and not causing the siphon effect? **(fig.1)**

NO → Repair the drain circuit and repeat the diagnostic cycle to check for any further alarms.

YES

Is the washing machine's water circuit efficient (leaking)?

NO → Repair the water circuit and repeat the diagnostic cycle to check for any further alarms.

YES

Is the pressure switch's water circuit efficient (leaking/clogged)? **(fig. 2)**

NO → Repair the water circuit of the pressure switch and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

Is one or are all the solenoid valves not working?

NO → Check whether the tap is open, if the water pressure is too low and make sure the tubes are connected and not kinked

YES

Is the resistance measurement of the solenoid valve approximately 3.5÷4.5 KΩ? (Measure it directly on the solenoid valve without wiring) -(see **fig. 3)**-

NO → Replace the solenoid valve and repeat the diagnostic cycle to check for any further alarms.

YES

Reconnect the connector and measure approximately 3.5÷4.5 KΩ on the solenoid valve wiring connector on the circuit board side **(fig.4):**
Between J13-1 and J13-3 washing
Between J13-4 and J13-6 pre-wash
Is the solenoid valve wiring ok?

NO → Replace/repair the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board,* *see page 60*

E11

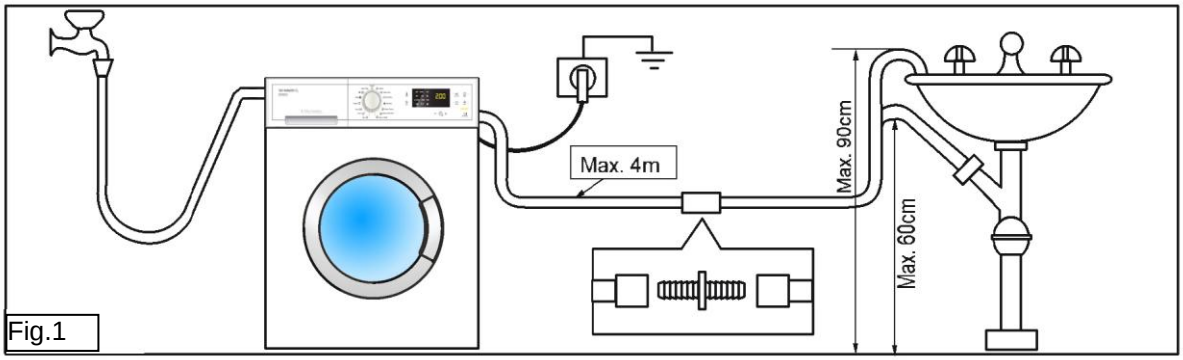


Fig.1

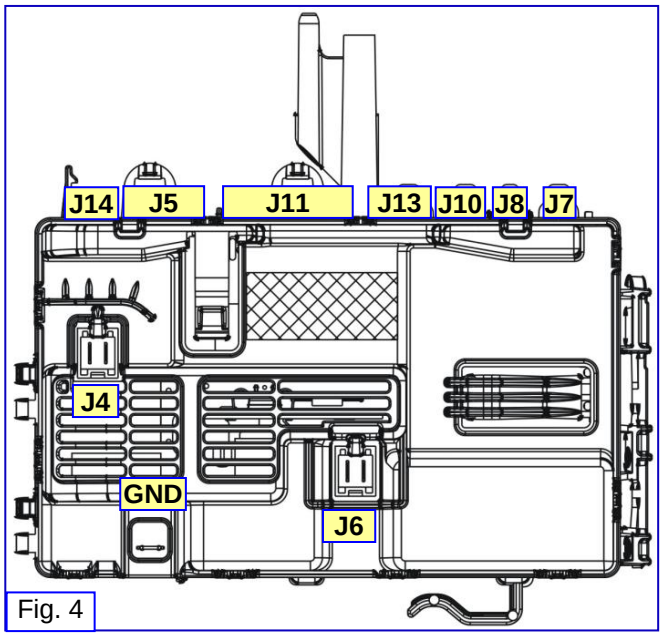


Fig. 4


Fig. 2

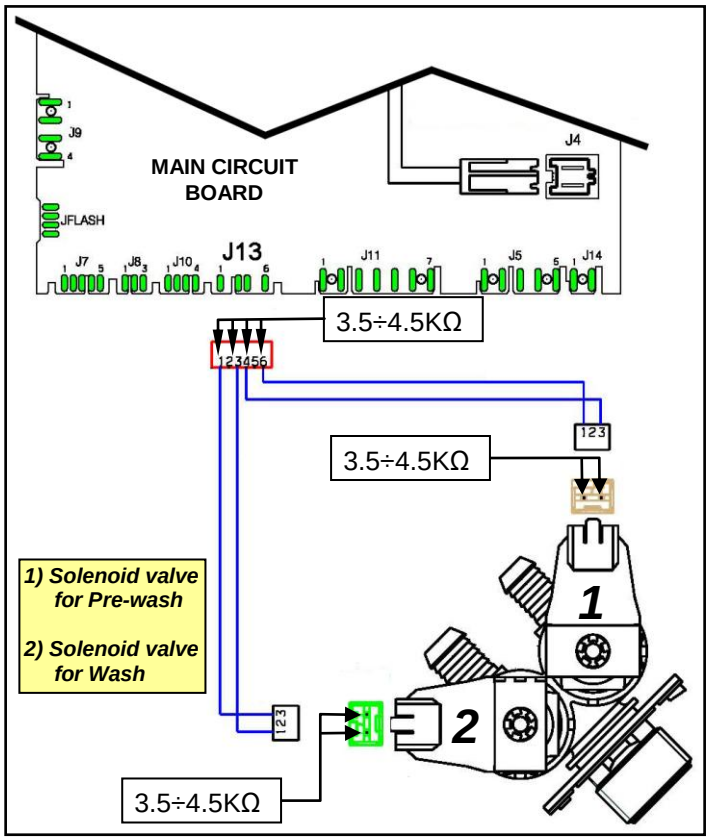


Fig.3

If there are burns on the circuit board, see page 60

E13	E13: Water leaks	E13
	Maximum overall water fill time exceeded (sum of all water fills between one drain phase and the next to avoid exceeding the maximum volume)	

Checks to perform:

! *check that all the connectors are correctly inserted*

Run the diagnostic cycle and fill all the trays with water **(phases 2,3,4)**
Are all the trays filling with water?

NO

YES

Is the drain pipe positioned correctly and not causing the siphon effect? **(fig.1)**

NO → Repair the drain circuit and repeat the diagnostic cycle to check for any further alarms.

YES

Is the washing machine's water circuit efficient (leaking)?

NO → Repair the water circuit and repeat the diagnostic cycle to check for any further alarms.

YES

Is the pressure switch's water circuit efficient (leaking/clogged)? **(fig.2)**

NO → Repair the water circuit of the pressure switch and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

Is one or are all the solenoid valves not working?

NO → Check whether the tap is open, if the water pressure is too low and make sure the tubes are connected and not kinked.

YES

Is the resistance measurement of the solenoid valve approximately 3.5÷4.5 KΩ? (Measure it directly on the solenoid valve without wiring) -(see **fig.3)**-

NO → Replace the solenoid valve and repeat the diagnostic cycle to check for any further alarms.

YES

Reconnect the connector and measure approximately 3.5÷4.5 KΩ on the solenoid valve wiring connector (on the circuit board side) – (**see fig. 4**) –
Between J13-1 and J13-3 washing
Between J13-4 and J13-6 pre-wash
Is the solenoid valve wiring ok?

NO → Replace/repair the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board, see page 60*

E13

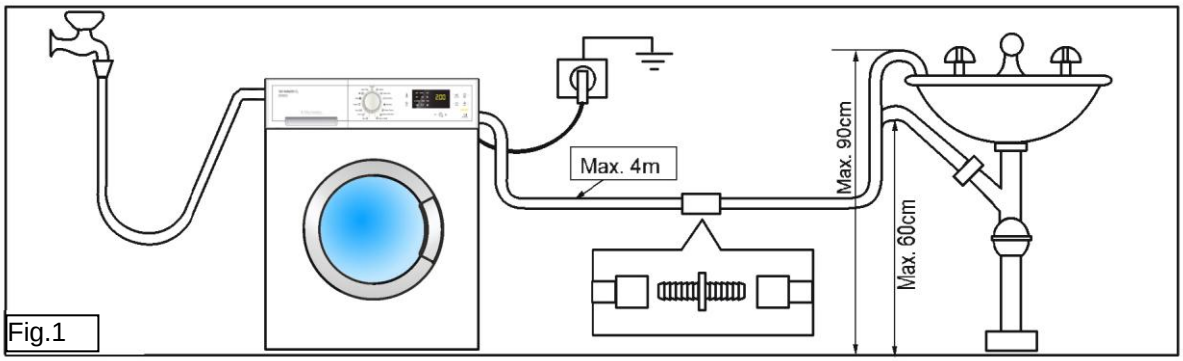


Fig.1

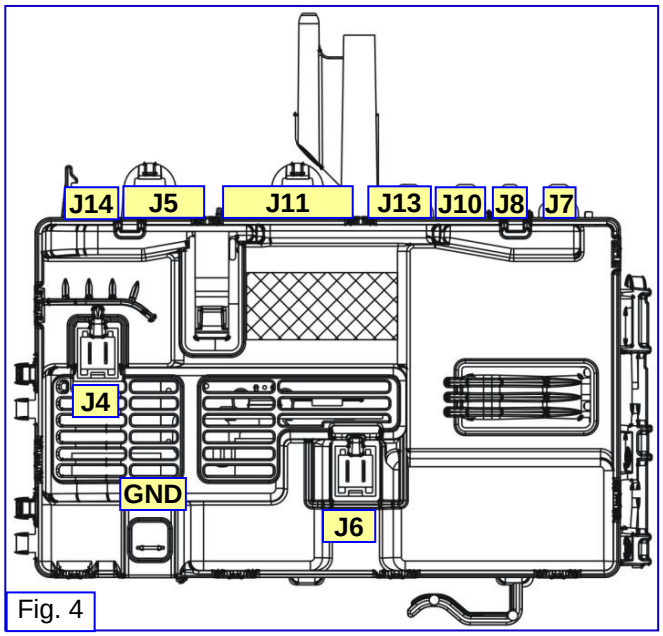


Fig. 4

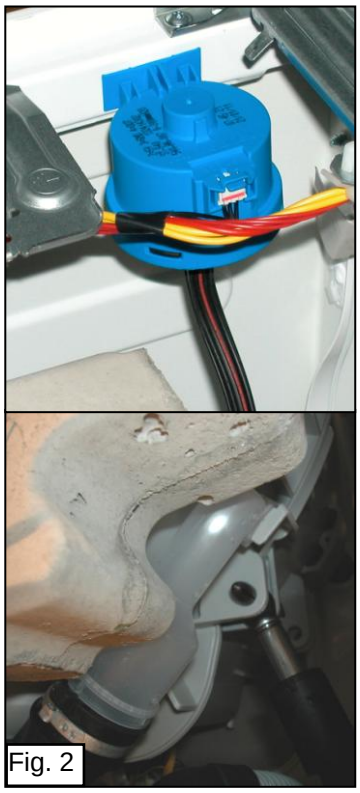


Fig. 2

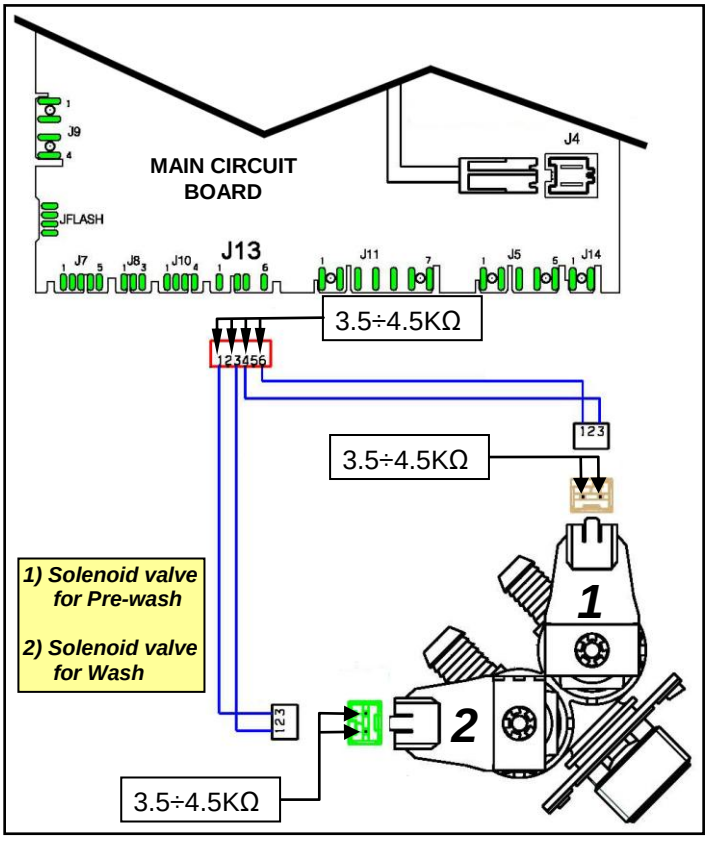


Fig.3

If there are burns on the circuit board, see page 60

E21	E21: Drain difficulty	E21
	Maximum drain time exceeded (measured for every cycle phase)	

Checks to perform:

check that all the connectors are correctly inserted

Is the drain filter clean?
- NO → Clean the filter and repeat the diagnostic cycle to check for any further alarms.
- YES ↓

Is the drain system ok? (drain pipe and water system of the home)- (**fig.1**)
- NO → Disconnect and check the drain system and repeat the diagnostic cycle to check for any further alarms.
- YES ↓

Is the drain pump working? (in the diagnostic cycle, select **phase 2** fill and **phase 8** drain) (noise from the pump)
- NO → Is the resistance measurement of the pump approximately 155÷182 Ω? (Measure it directly on the connector on the board side between J5-4 and J5-5) **–(fig. 4)-**
  - NO → Is the resistance measurement of the pump approximately 155÷182 Ω? (Measure it directly on the pump) -(see **fig.5)**-
    - NO → Replace the pump and repeat the diagnostic cycle to check for any further alarms.
    - YES ↓ Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms
  - YES ↓ Is the pump rotor mechanically blocked or broken?
    - NO → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.
    - YES ↓ Clean/replace the drain pump and repeat the diagnostic cycle to check for any further alarms.
- YES ↓

Is the pressure switch's water circuit efficient? (no clogging)
- NO → Repair the water circuit of the pressure switch and repeat the diagnostic cycle to check for any further alarms.
- YES ↓

Replace the pressure switch and repeat the diagnostic cycle to check for any further alarms.

If there are burns on the circuit board, see page 60

E21

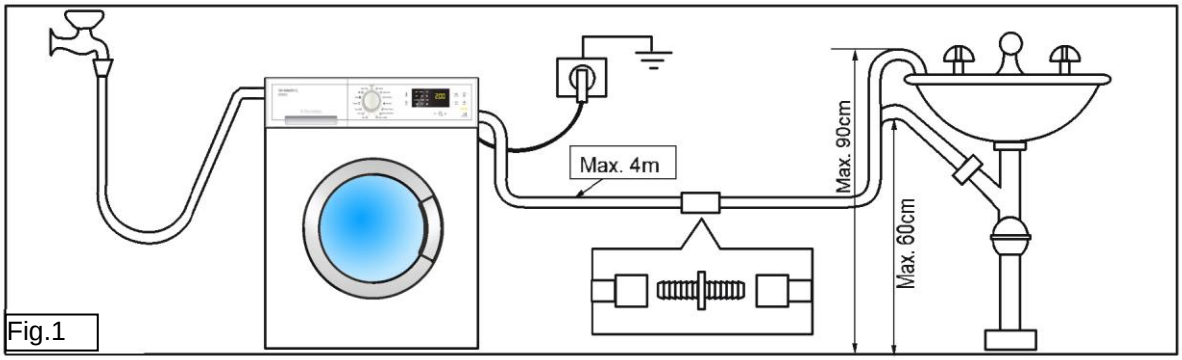


Fig.1

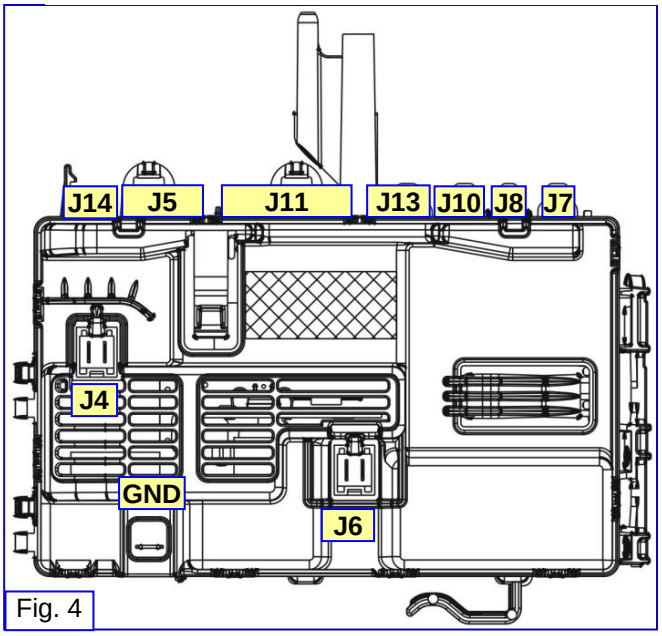


Fig. 4

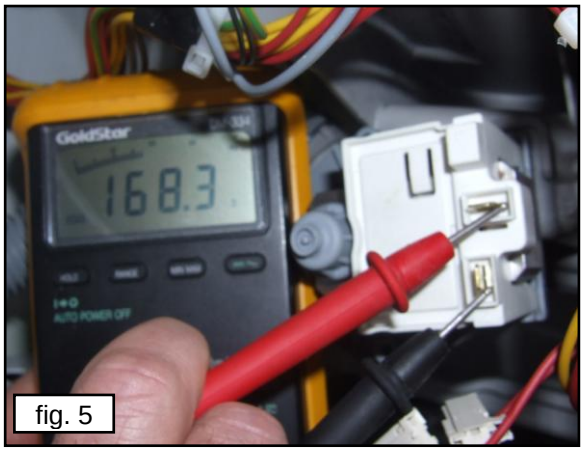
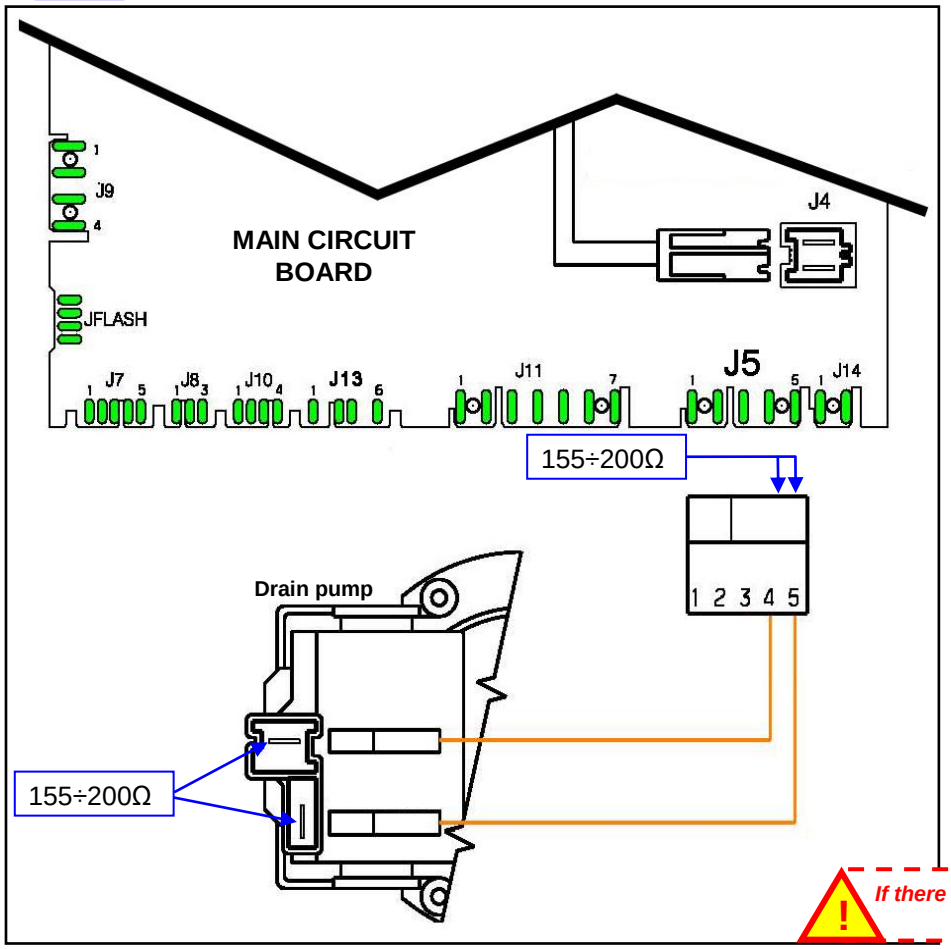


fig. 5



If there are burns on the circuit board, see page 60

E23	E23: Problems with the component (triac) controlling the drain pump	E23

Checks to perform:

check that all the connectors are correctly inserted

Is the resistance measurement of the pump approximately 155÷182 Ω? (Measure it between connectors J5-4 and J5-5 on the board side **–(fig.4)-**

NO

Is the resistance measurement of the pump approximately 155÷182 Ω? (Measure it directly on the pump) **–(see fig.5)-**

NO

Replace the pump and repeat the diagnostic cycle to check for any further alarms.

YES

Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Measure it between connectors J5-4 / J5-5 and the appliance body. **–(fig.6) -**
Is there any dispersion?

NO

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

If there are burns on the circuit board, see page 60

E23

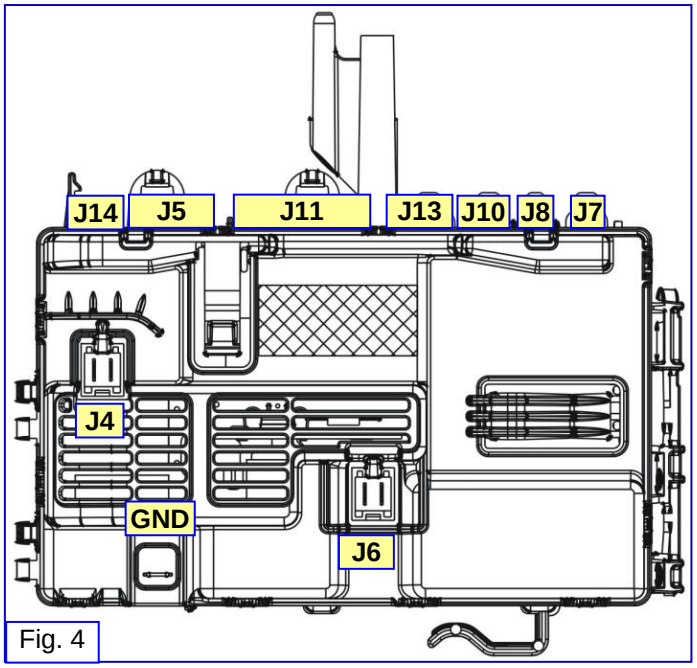


Fig. 4

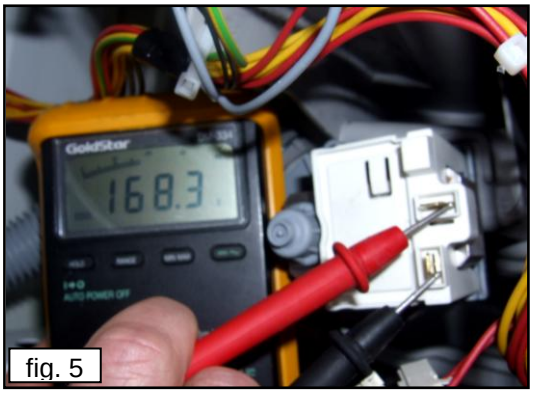


fig. 5

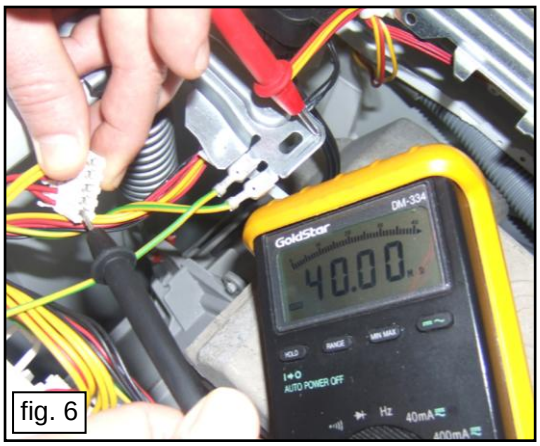
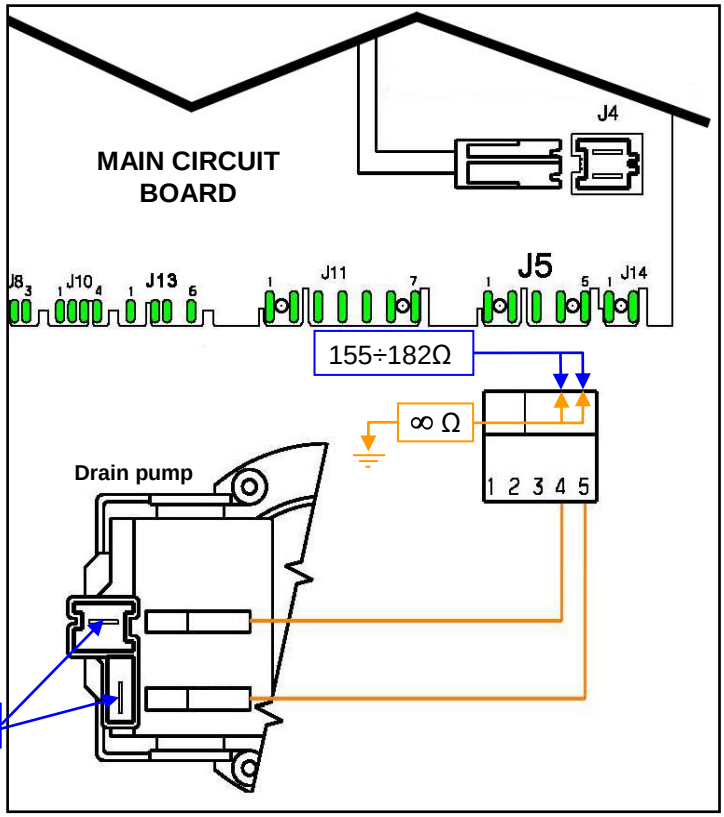


fig. 6



If there are burns on the circuit board, see page 60

E24	E24: Sensing circuit of the component (triac) controlling the drain pump faulty	E24

Checks to perform:

! check that all the connectors are correctly inserted

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

! If there are burns on the circuit board, see page 60

E31	E31: The analogue pressure switch provides the main circuit board with a signal outside the limits	E31

Checks to perform:

! check that all the connectors are correctly inserted

Measure that the circuit is closed between J7-1, J7-2, J7-3 and the connector of the analogue pressure switch (they are three independent wires (**see fig. 7)**.
is the wiring between the main circuit board and the analogue pressure switch ok and is it connected correctly on both sides?

NO → Reconnect and/or replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the analogue pressure switch and repeat the diagnostic cycle to check for any further alarm codes.
Is the appliance displaying the alarm code again?

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarm codes.

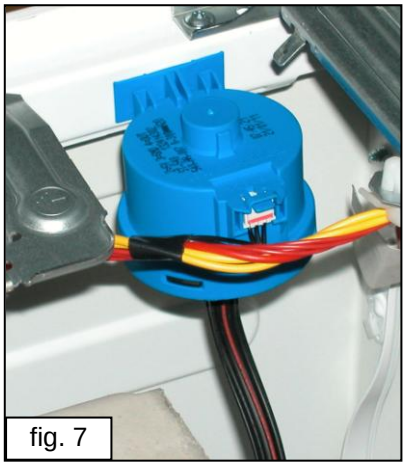
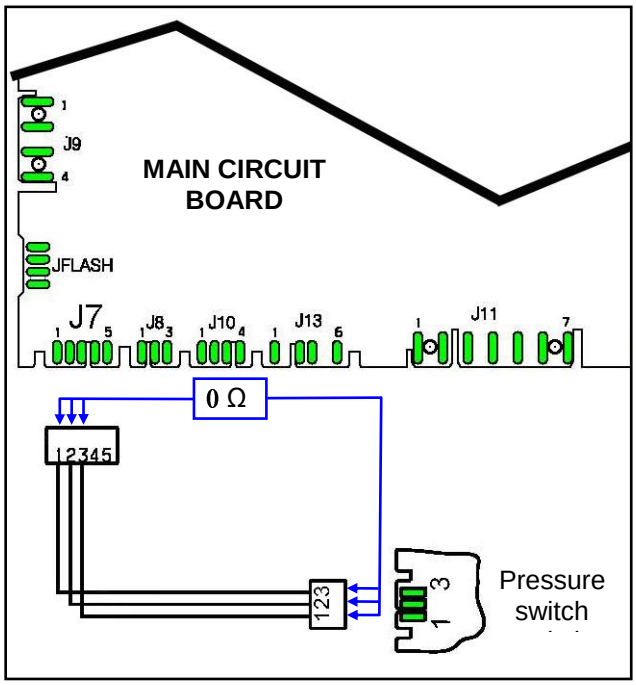


fig. 7



! If there are burns on the circuit board, see page 60

E32	**E32: The analogue pressure switch causes an error during calibration** (At the start of every cycle, the appliance drains to empty the tub and creates a level 0 to check the calibration of the analogue pressure switch	E32

Checks to perform:

check that all the connectors are correctly inserted

Drain the water from the tub. Are the pressure switch tube and pressure chamber unobstructed? (disconnect the tube and blow into it to make sure the system is unobstructed) **(fig. 2 and 8)**

NO → Clean/replace the tube and/or the pressure chamber and repeat the diagnostic cycle completely to check for any further alarms.

YES

Check the drain system (filter, drain pump, drain tube). Is the appliance draining correctly?

NO → Repair the drain circuit.

YES

YES

Select a washing cycle. After a few minutes, has the appliance filled with water and is the motor running?

NO → Replace the analogue pressure switch and repeat the diagnostic cycle to check for any further alarms.

YES

Appliance ok

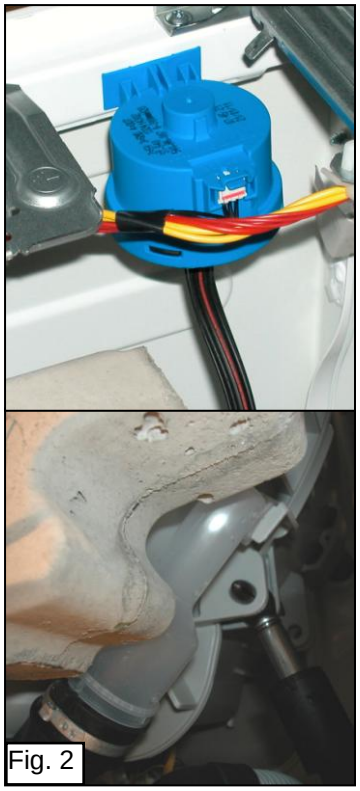


Fig. 2

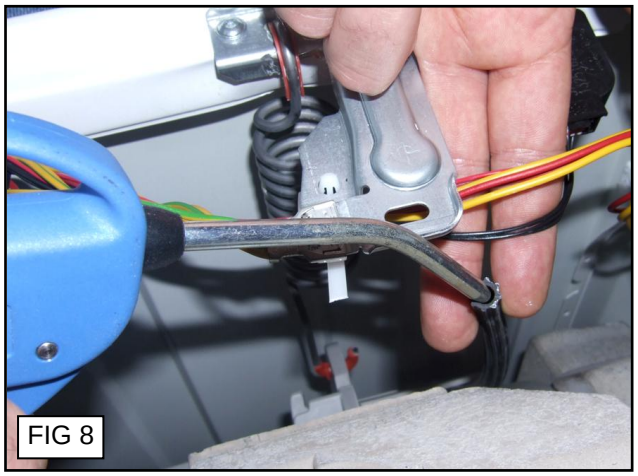


FIG 8

If there are burns on the circuit board, see page 60

E35	E35: Water level too high	E35
	The main circuit board measures a water level, using the electronic pressure switch, of more than 300 mm for longer than 15 secs.	

Checks to perform:

! ***check that all the connectors are correctly inserted***

Drain the water from the tub. Are the pressure switch tube and pressure chamber unobstructed? (disconnect the tube and blow into it to make sure the system is unobstructed**)** **–(see fig.2 and 8)-**

NO → Clean/change the tube and/or the pressure chamber and repeat the diagnostic cycle completely to check for any further alarms.

YES ↓

Does the appliance continue to fill with water even when it is switched off?

NO → Run the diagnostic cycle at **phase 8**. Once the door has locked, does the appliance start to fill with water?

NO → Is the wiring between the main circuit board and the analogue pressure switch connected correctly on both sides?

NO → Reconnect and/or replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Replace the water fill solenoid valve and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Replace the analogue pressure switch. Run a rinse cycle. Is alarm E35 shown again?

NO → Repeat the diagnostic cycle to check for any further alarms.

YES ↓

Replace the solenoid valve. Repeat the diagnostic cycle to check for any further alarms.

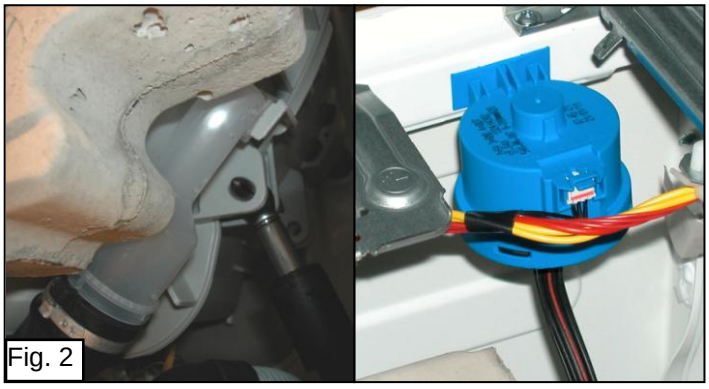


Fig. 2

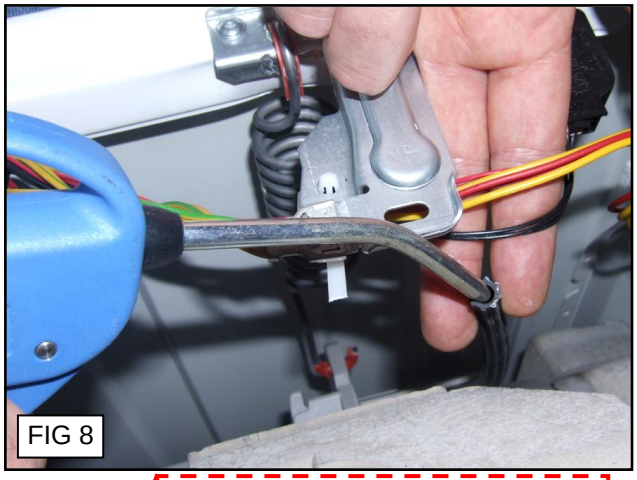


FIG 8

! ***If there are burns on the circuit board, see page 60***

E38	E38: Internal pressure chamber is clogged	E38
	The analogue pressure switch is not able to measure any variation in the water level for at least 30 secs during drum rotation.	

Checks to perform:

check that all the connectors are correctly inserted

Run the diagnostic cycle and set **phase 6**.
Is the motor running and the drum not moving?

NO

Drain the water from the tub and check the internal pressure chamber and the pressure switch tube.
Is the system unobstructed?
-(see fig.2)-

NO

Clean the internal pressure chamber and/or the pressure switch tube (disconnect the tube and blow into it to make sure the system is unobstructed**)**.
–(see fig. 8)-
Repeat the diagnostic cycle to check for any further alarms.

YES

Replace/reposition the belt and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the analogue pressure switch and repeat the diagnostic cycle to check for any further alarms.

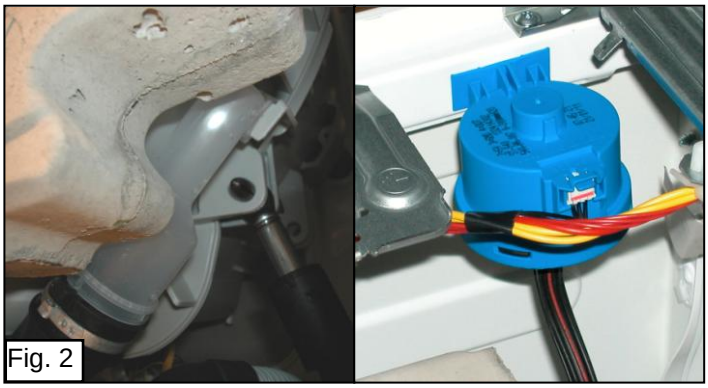


Fig. 2

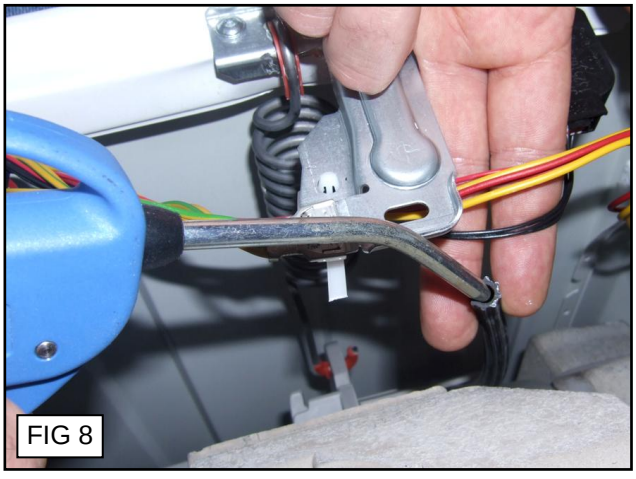


FIG 8

If there are burns on the circuit board, see page 60

E41	E41: Door open (device with 3 connections) Maximum time exceeded (PTC = 15 seconds)	E41

Checks to perform:

! check that all the connectors are correctly inserted

Is the door closed correctly?

NO → Close the door correctly and repeat the diagnostic cycle to check for any further alarms.

YES

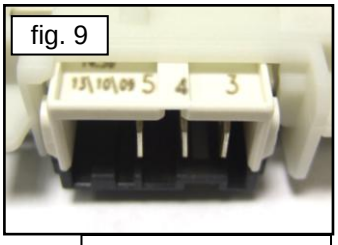
To check the wiring, with the door open, measure on the following wiring connectors:
- between wire J5-2 and J5-3, the circuit must NOT be open (measure the resistance value of the PTC).
- between wire J5-1 and J5-2, the circuit must be OPEN.

Is the system ok?

NO → Detach the connectors and measure on the component **(fig. 9):**
- between connectors 3 and 4, the circuit must not be open (measure the resistance value of the PTC).
- on the other hand, between connectors 4 and 5, the circuit must be open (the numbers are printed on the component).

Is the door interlock ok?

fig. 9



NO → Replace the door lock and repeat the diagnostic cycle to check for any further alarms.

YES

Measure the continuity between connector J5 (main circuit board) and the door lock connector.
Is the wiring ok?

NO → Replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Check the mechanical coupling between the door lock and the door latch. Is the system efficient?

NO → Replace the door latch/the door.

YES

Replace the door lock.
Is the appliance working correctly?

NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Repeat the diagnostic cycle to check for any further alarms.

! If there are burns on the circuit board, see page 60

E41 (device with 3 connections)

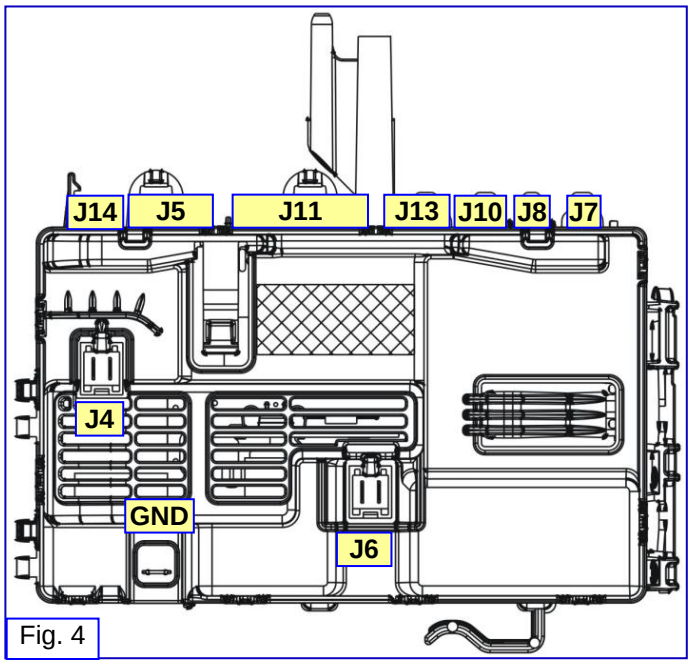
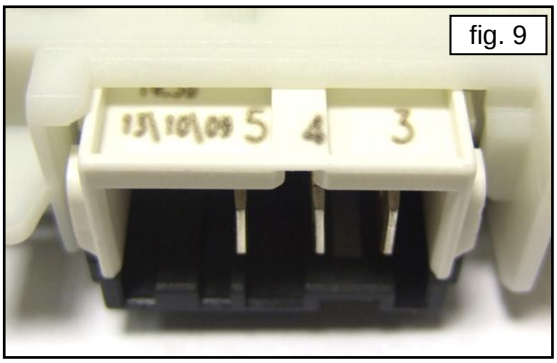
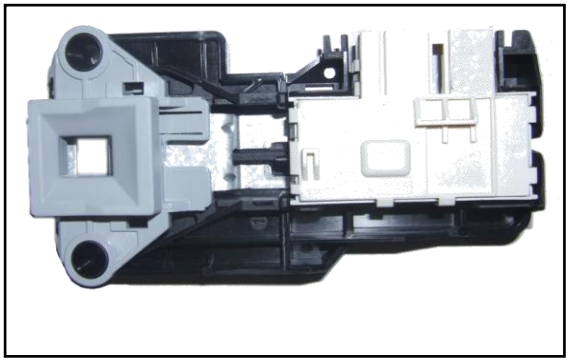
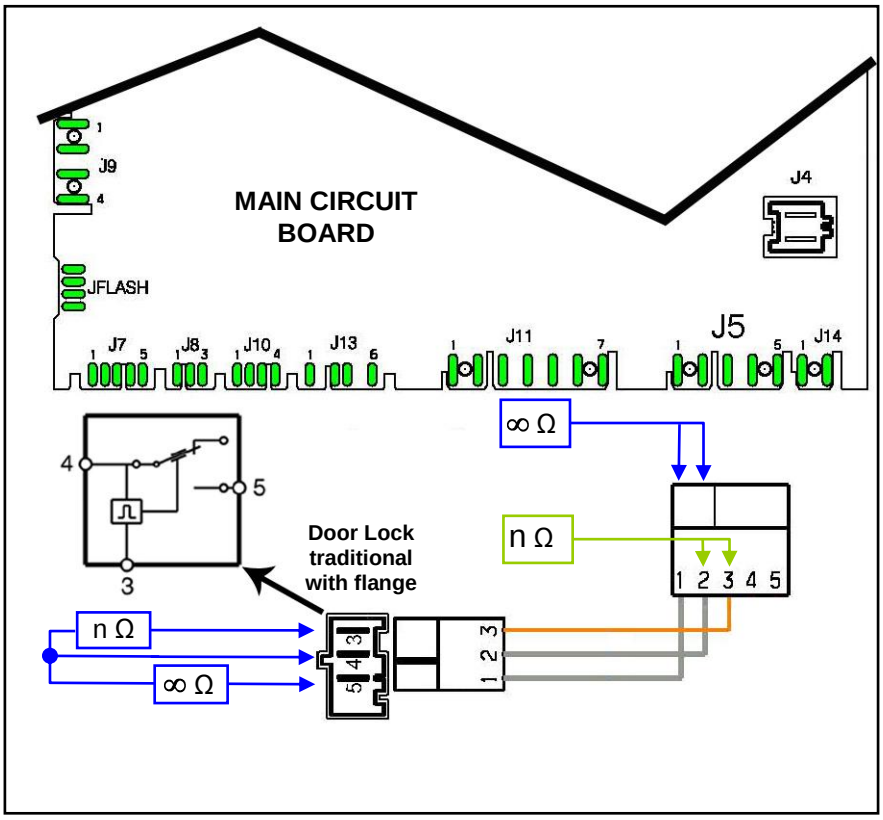


Fig. 4







If there are burns on the circuit board, see page 60

E42	E42: Problems opening door Maximum time exceeded (255 seconds)	E42

Checks to perform:

check that all the connectors are correctly inserted

Is the door closed correctly?

NO → Close the door correctly and repeat the diagnostic cycle to check for any further alarms.

YES

To check the wiring, with the door open, measure on the following wiring connectors:
- between wire J5-2 and J5-3, the circuit must NOT be open (measure the resistance value of the PTC).
- between wire J5-1 and J5-2, the circuit must be OPEN.

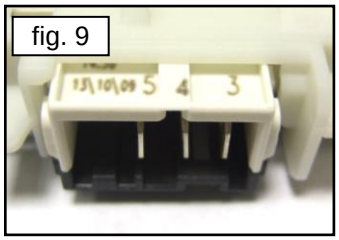
Is the system ok?

NO → Detach the connectors and measure on the component **(fig. 9):**
- between connectors 3 and 4, the circuit must not be open (measure the resistance value of the PTC).
- on the other hand, between connectors 4 and 5, the circuit must be open (the numbers are printed on the component).

Is the door interlock ok?

NO → Replace the door lock and repeat the diagnostic cycle to check for any further alarms.

fig. 9



YES

Measure the continuity between connector J5 (main circuit board) and the door lock connector.
Is the wiring ok?

NO → Replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Check the mechanical coupling between the door lock and the door latch. Is the system efficient?

NO → Replace the door latch/the door

YES

Replace the door lock.
Is the appliance working correctly?

NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Repeat the diagnostic cycle to check for anv further alarms

If there are burns on the circuit board, see page 60

E42 (device with 3 connections)

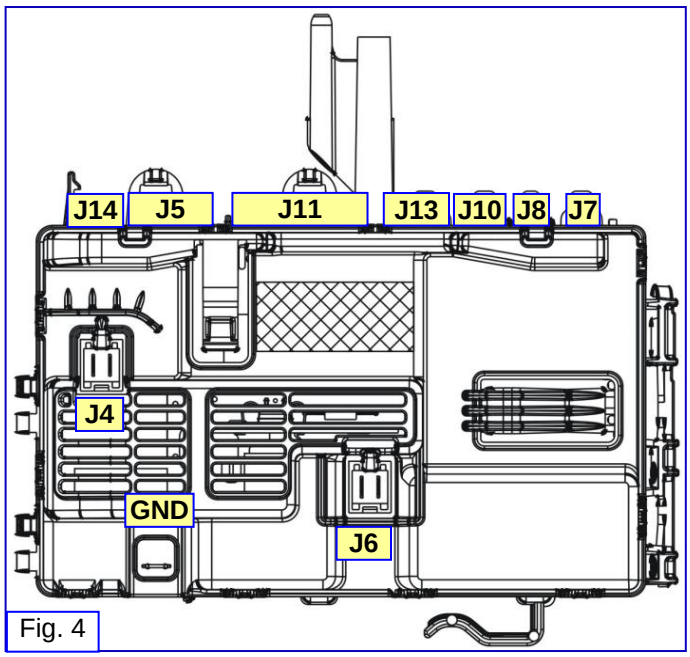
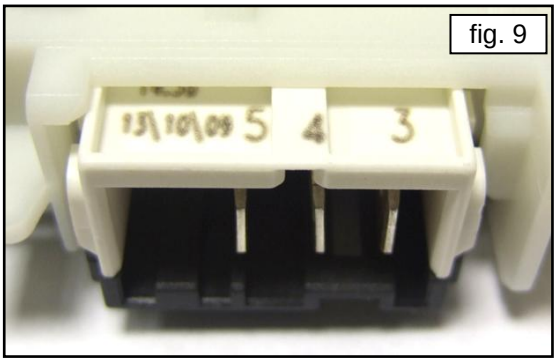
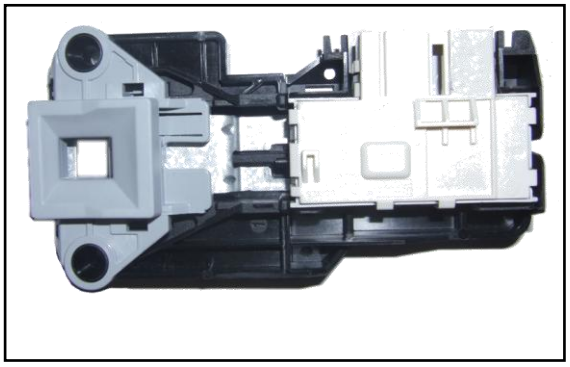
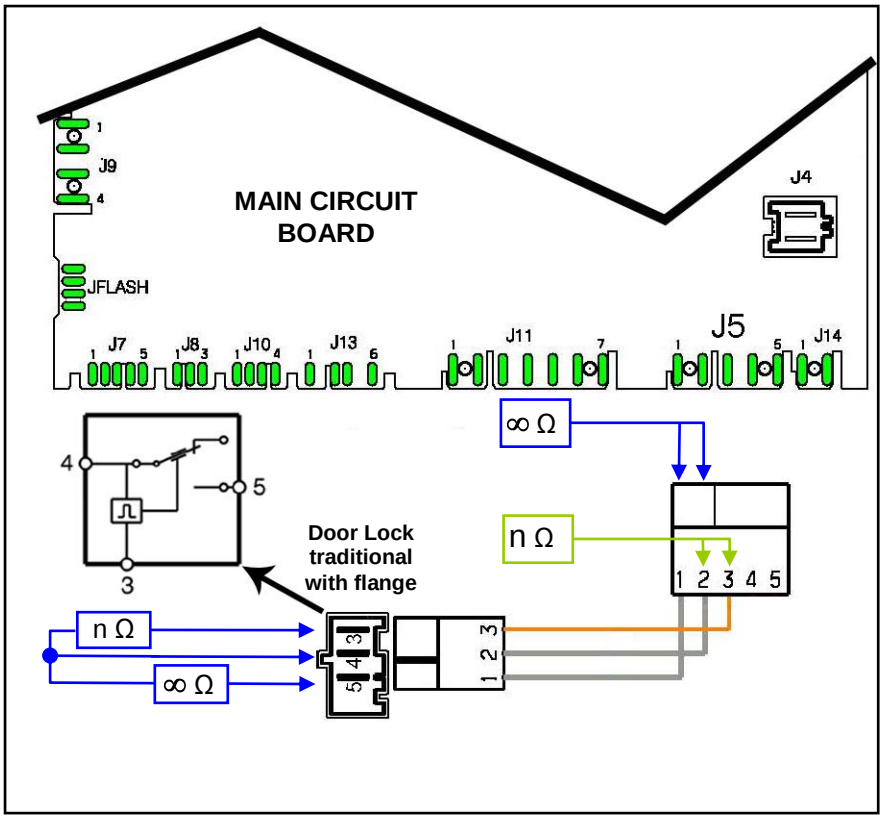


Fig. 4







If there are burns on the circuit board, see page 60

E43	E43: Problems with the component (Triac) controlling the door delay system (device with 3 connections)	E43

Checks to perform:

check that all the connectors are correctly inserted

To check the wiring, with the door open, measure on the following wiring connectors **(fig. 4)**:
- between wire J5-2 and J5-3, the circuit must NOT be open (measure the resistance value of the PTC).
- between wire J5-1 and J5-2, the circuit must be OPEN.
Is the system ok?

NO

Detach the connectors and measure on the component **(fig. 9):**
- between connectors 3 and 4, the circuit must not be open (measure the resistance value of the PTC).
- on the other hand, between connectors 4 and 5, the circuit must be open (the numbers are printed on the component).
Is the door interlock ok?

NO

Replace the door lock and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Measure the continuity between connector J5 (main circuit board) and the door lock connector
Is the wiring ok?

NO

Replace the wiring and repeat the diagnostic cycle to check for any further alarms

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

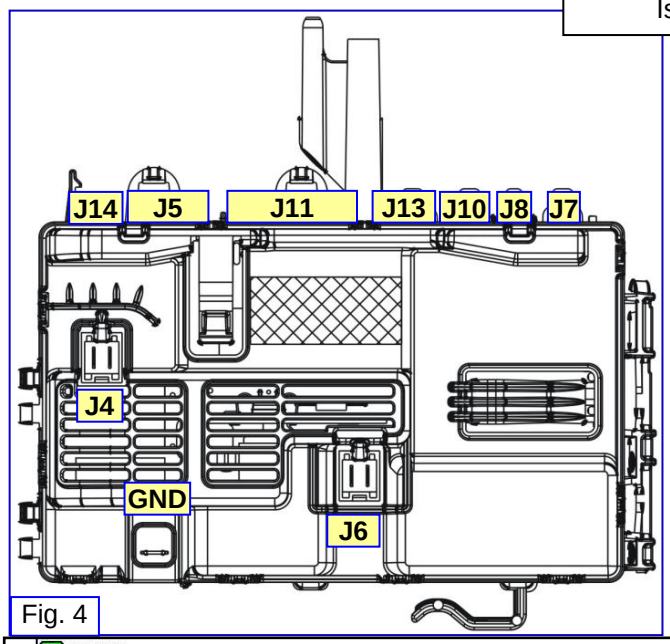


Fig. 4

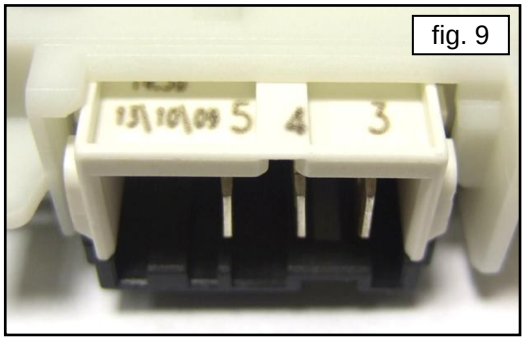
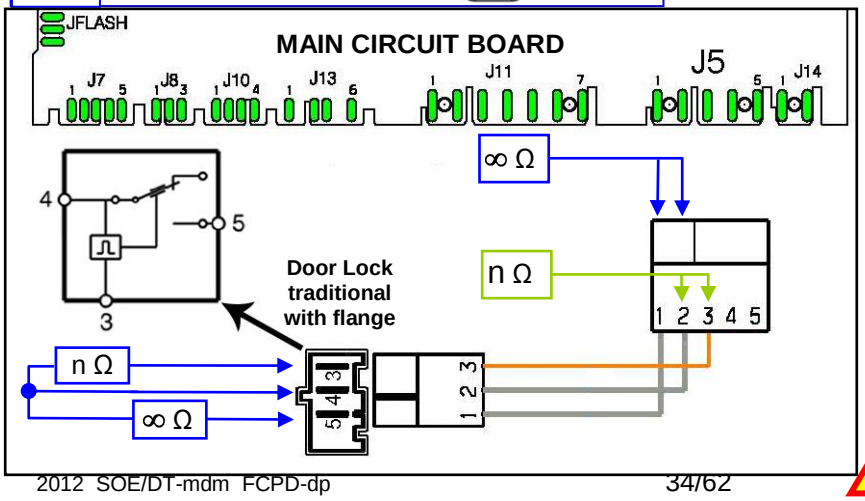


fig. 9



If there are burns on the circuit board, see page 60

E44	E44: Door closed "sensing" circuit faulty	E44

Checks to perform:

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E45	E45: Problems with the "sensing" circuit of the component (triac) controlling the door delay system	E45

Checks to perform:

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E51	E51: Motor power TRIAC short-circuited	E51
	Activation of the protection system for the Triac short-circuit (after 5 attempts separated by a 5-minute pause, during the cycle, immediately if recognised at the start of the cycle or during diagnostics)	

Checks to perform:

check that all the connectors are correctly inserted

Measure between all the terminals of the wiring connector J11-1÷J11-7 and the appliance body **(see fig. 6)** Is there any dispersion?

NO → Reconnect connector J11 to the main circuit board, detach the connector from the motor, and access **phase 8** of the diagnostic cycle. Is alarm E51 still shown?

NO → E52 is probably shown: replace the motor and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

YES → Detach the connector from the motor and measure between the terminals and the motor casing. **-(see fig.10)-** Is there any dispersion?

NO → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Check for any water residue on the motor/motor connector. Is there any water?

NO → Replace the motor and repeat the diagnostic cycle to check for any further alarms.

YES → Dry the motor/motor connector and repeat the diagnostic cycle to check for any further alarms.

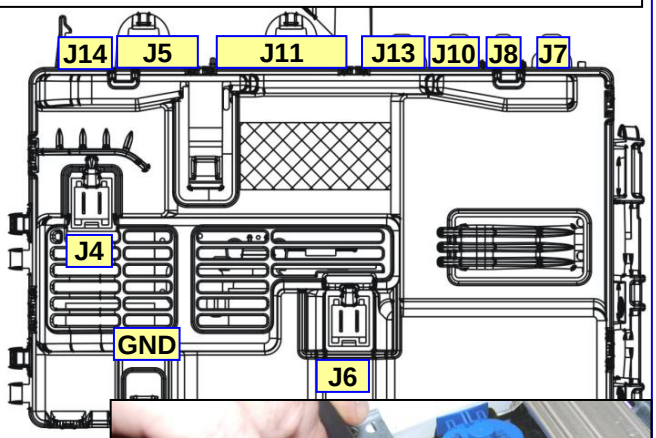


Fig. 4

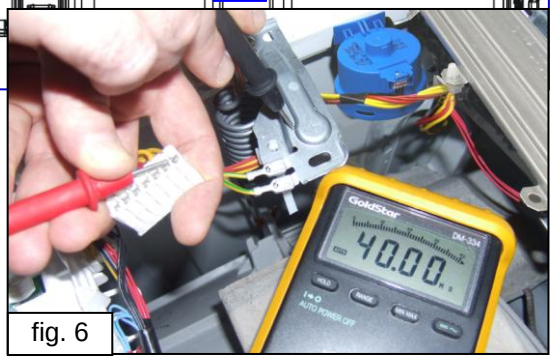
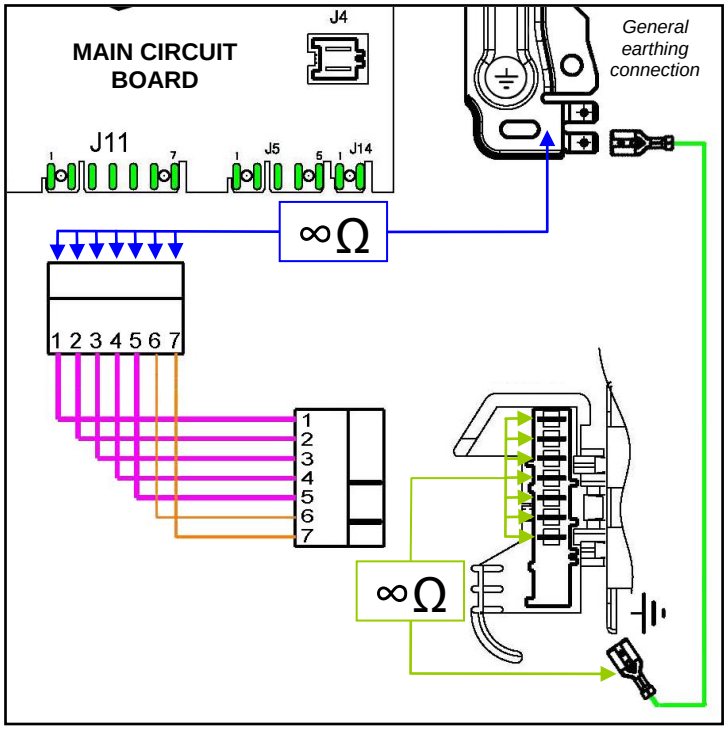


fig. 6



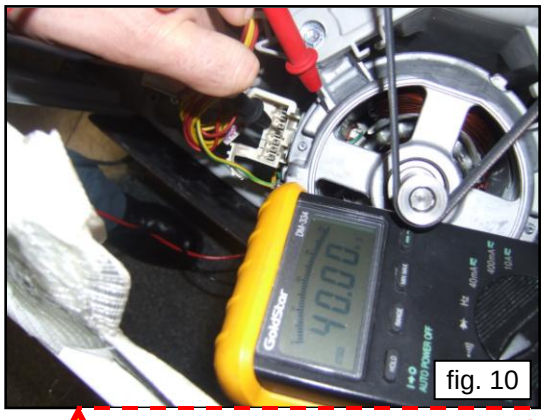


fig. 10

If there are burns on the circuit board, see page 60

E52	**E52: No signal from motor tachometric generator *(first part)***	E52
	Cycle interrupted after 5 attempts during the cycle, immediately if recognised at the start of the cycle or during diagnostics.	

Checks to perform:

check that all the connectors are correctly inserted

Access **phase 7** of the diagnostic cycle (The drum rotates at 55 rpm clockwise 55 rpm anticlockwise with pulse at 250 rpm). Is the motor running correctly?

NO → Does the motor run for a few moments then stop?

NO → **The motor never runs - see page 39 -**

YES → Measure between the terminals of the wiring connector J11-6 and J11-7. Are the values (Ω) of the tachometric generator correct? (as on **page 40** Point 4 - phase“A”)

NO → Detach the connector from the motor and measure (Ω) the tachometric generator coil, **-(see fig. 11)-** Is the value correct? (as on **page 40** Point 4 - phase “A”).

NO → Replace the motor or tachometric generator and repeat the diagnostic cycle to check for any further alarms.

YES → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Measure between the same terminals of the wiring connector (J11-6 and J11-7) and the appliance body. Is there any dispersion? -(**see fig.6)**-

NO → Check the positioning of the tachometric generator. Is it correct? **- (see fig. 12) -**

NO → Replace the motor/generator and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES → Detach the connector from the motor and measure between the terminals and the motor casing. **-(see fig. 10)-** Is there any dispersion?

NO → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the motor and repeat the diagnostic cycle to check for any further alarms.

If there are burns on the circuit board, see page 60

E52

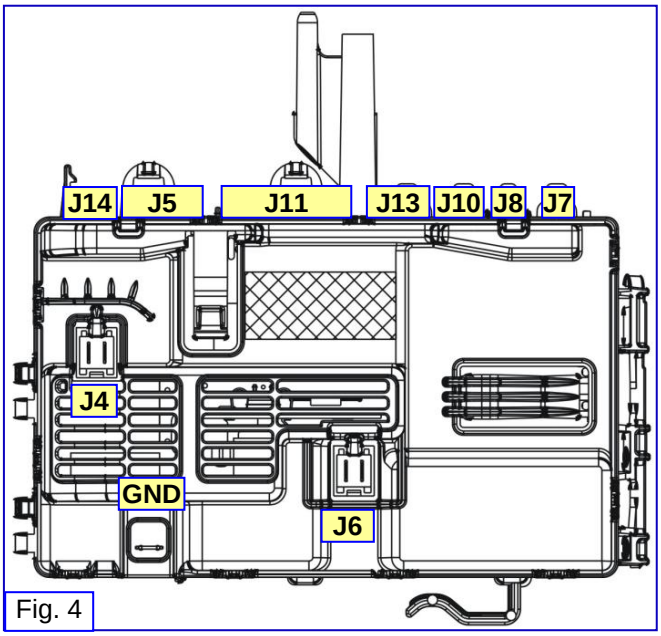


Fig. 4

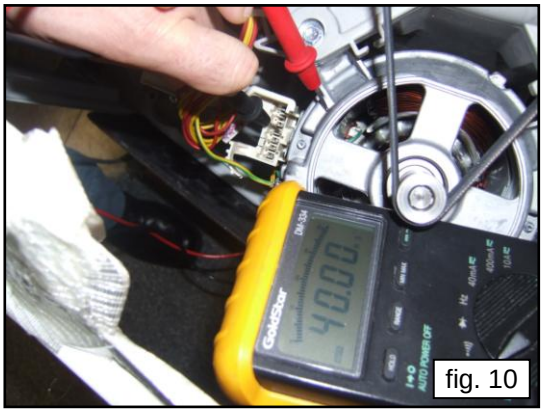


fig. 10

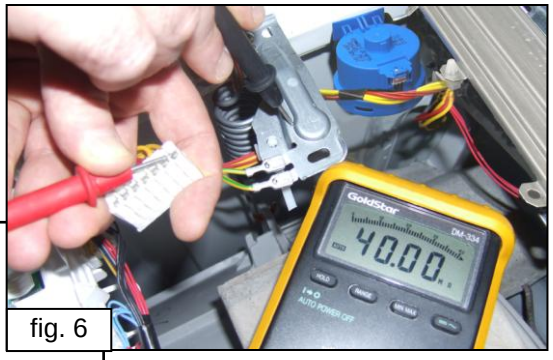
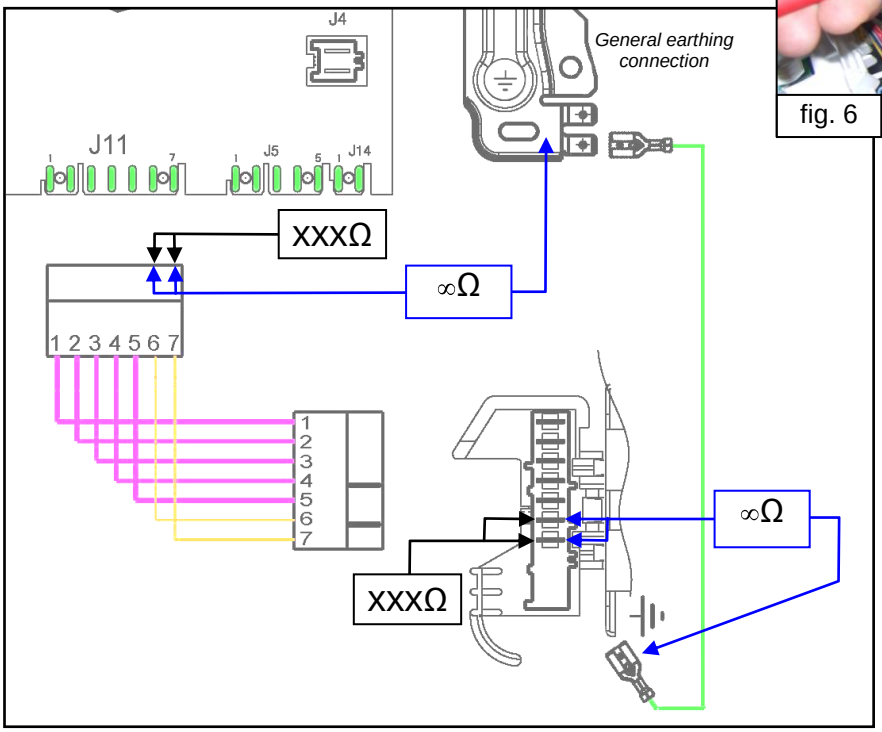


fig. 6



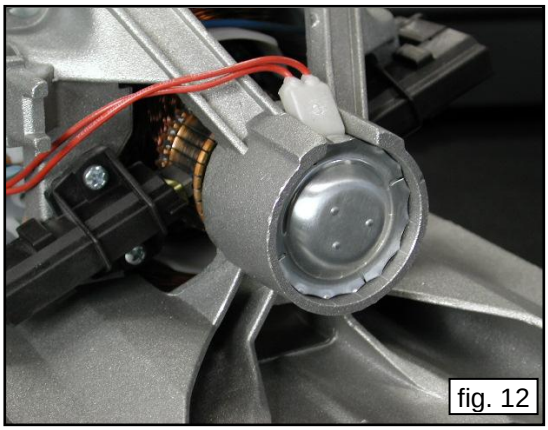


fig. 12

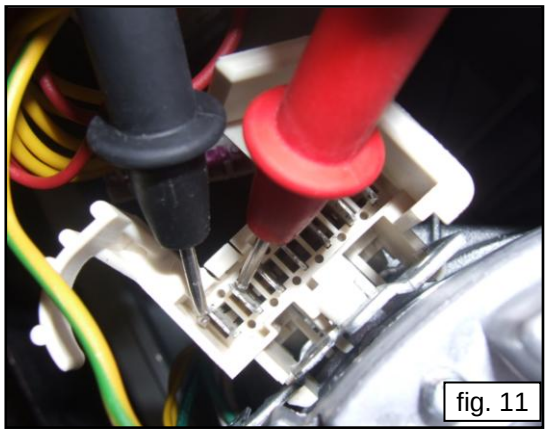


fig. 11

If there are burns on the circuit board, see page 60

E52	**E52: No signal from motor tachometric generator *(second part)***	E52
	Cycle interrupted after 5 attempts during the cycle, immediately if recognised at the start of the cycle or during diagnostics.	

Checks to perform:

check that all the connectors are correctly inserted

The motor never runs

To check the wiring, measure (Ω) between the following wiring connectors of the main circuit board **(fig.4)** and compare the values with the correct ones (**see page 40**: point 4 - motor parameters)
- between J11-2 and J11-5, a value as in point 4 - **B** (Stator) must be found
- between J11-1 and J11-5, where featured, a value as in point 4 – **D** must be found (half field stator).
- between J11-3 and J11-4, a value as in point 4- **C** (rotor) must be found.

Are the values correct?

NO → Check the motor as on **page 40**. Is the motor ok?

NO → Replace the motor and repeat the diagnostic cycle to check for any further alarms.

YES → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

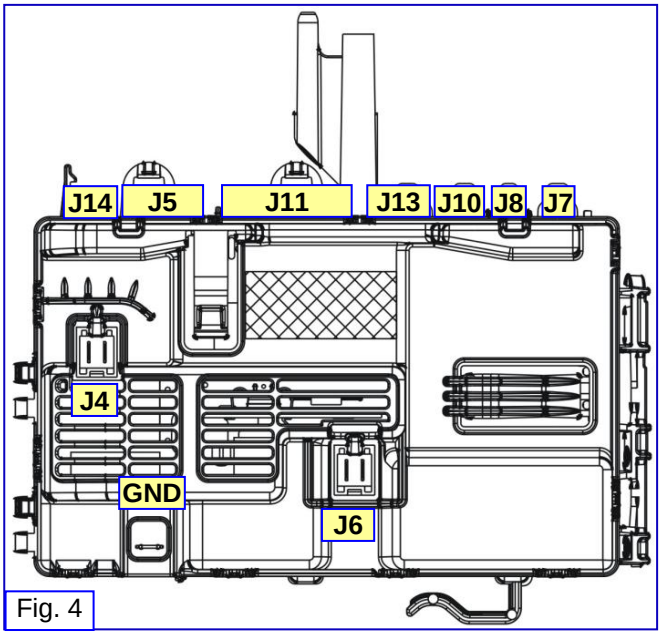
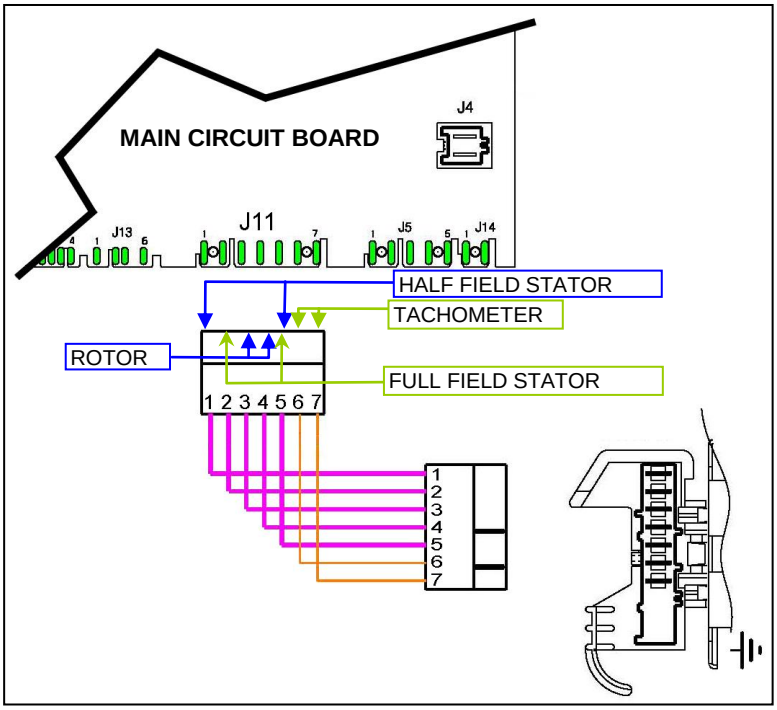


Fig. 4



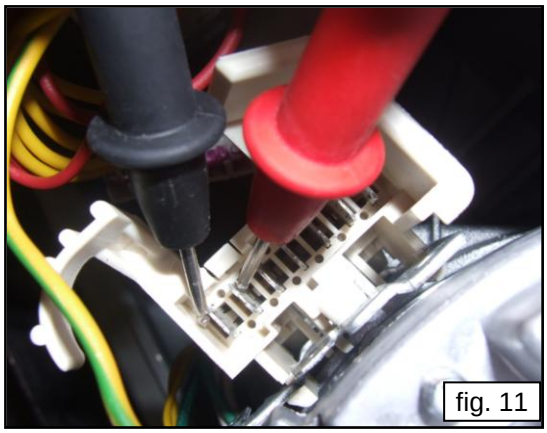


fig. 11

If there are burns on the circuit board, see page 60

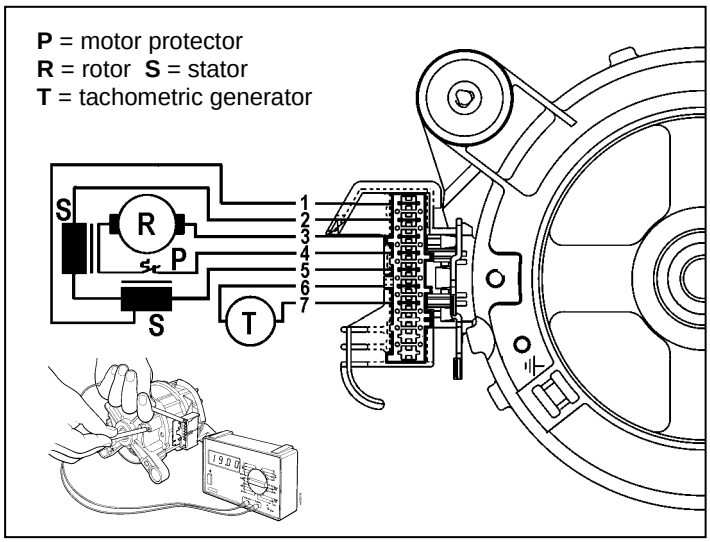
How to check collector motors

1) Check the connection blocks (wiring) and for the presence of any protruding/kinked terminals.

2) Check for the presence of any marks / residue / water or detergent deposits on the motor and where these come from.

3) Proceed by checking for any windings / earthed parts or parts with poor earthing insulation. Use a tester with a minimum capacity of 40 MΩ: between each individual terminal and the motor casing, read ∞ **(fig. 10)**

4) Proceed by checking each individual winding according to the following table **(fig. 11).**



	MOTOR TERMINAL BOARD TERMINALS	CHECK:	MOTORI NMSC	MOTORI AP&C	MOTORI ECM
A	6-7	Tachometric generator winding	184 Ω	68,7 Ω	91Ω
B	2-5	Stator winding (all fields)	1,1÷2,2 Ω	1,62÷2,12 Ω	1,46÷1,95 Ω
C	3-4	Rotor winding (plus thermal cutout)	1,6÷1,8 Ω	1,9÷2,42 Ω	2÷2,3 Ω
D	1-5	Stator winding (half field, terminal 1 present)	0,55÷0,56 Ω	0,67 Ω	0,68 Ω

The tolerance of the resistance of windings is ± 7%

Things to note: when checking the rotor winding, the measurement must be made along the entire profile, turning the shaft very slowly and checking for the presence of any short circuits between visible blades. Also check the condition of the brushes.

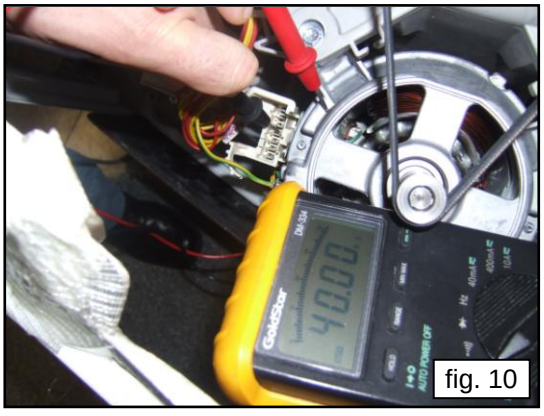


fig. 10

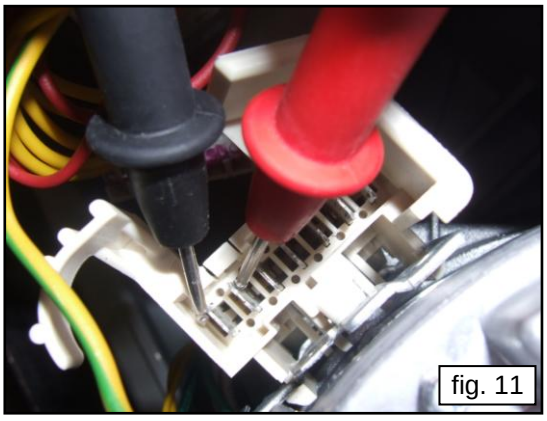


fig. 11

E53	E53: Problems with the "sensing" circuit of the component (Triac) powering the motor	E53

Checks to perform:

check that all the connectors are correctly inserted

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

If there are burns on the circuit board, see page 60

E54	E54: Motor relay contacts sticking	E54
	Voltage value on the motor circuit even when the same should not be operating	

Checks to perform:

check that all the connectors are correctly inserted

Measure between all the terminals of the wiring connector J11-1 ÷ J11-5 and the appliance body **- see page 40 -** point 3 Is there any dispersion?**- (see fig. 6) -**

NO → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Detach the connector from the motor and measure between the terminals and the motor casing.**-(see fig. 10) -** Is there any dispersion?

NO → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Replace the motor and repeat the diagnostic cycle to check for any further alarms.

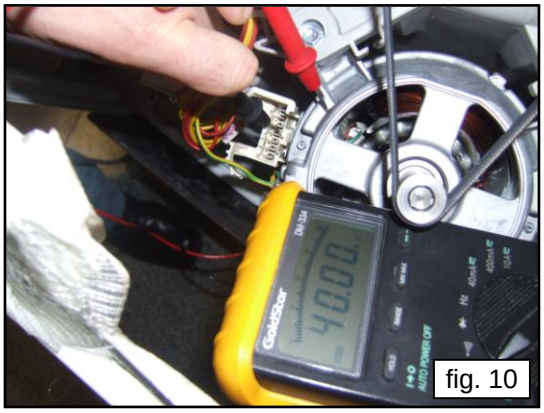


fig. 10

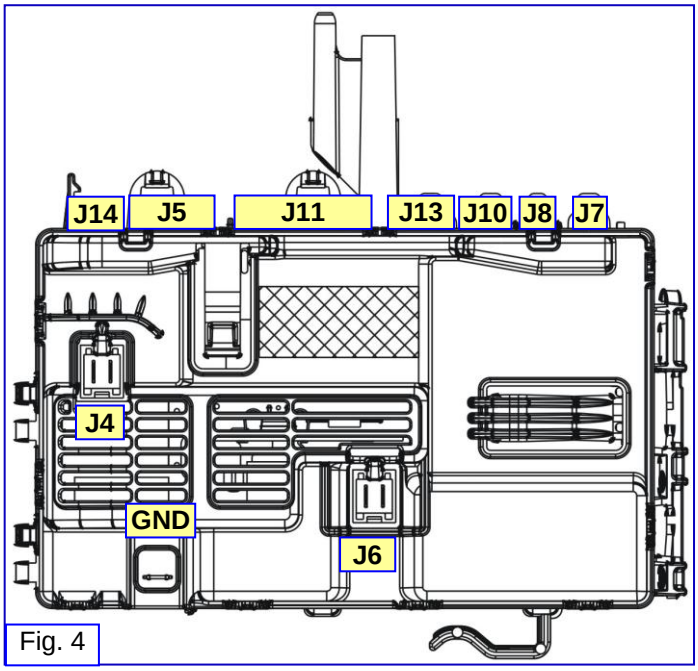
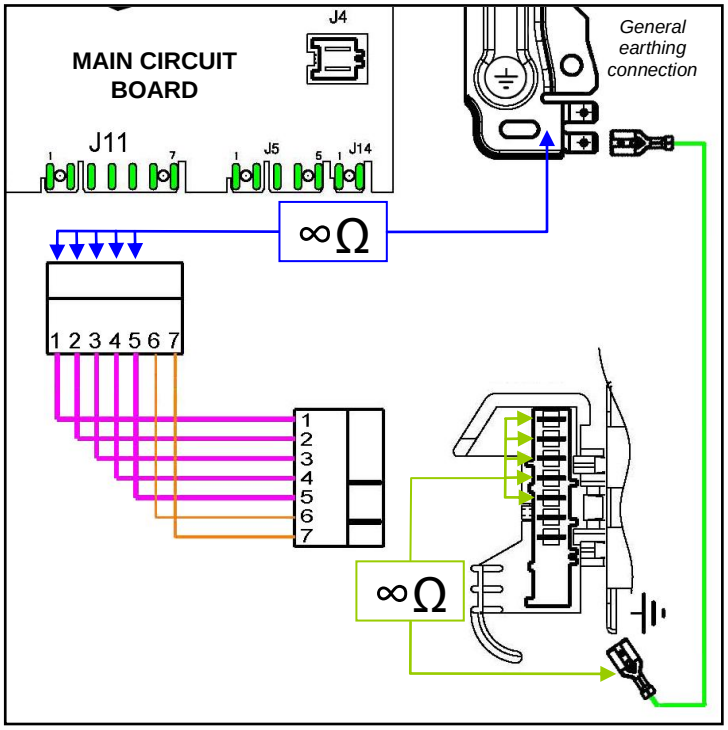


Fig. 4



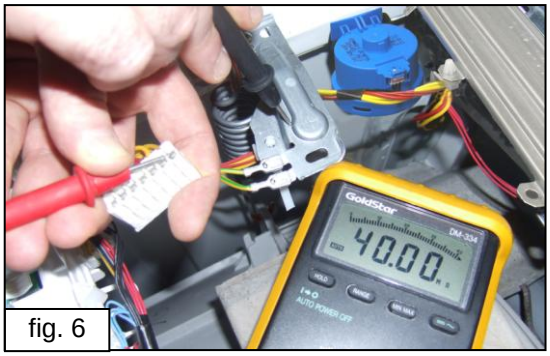


fig. 6

If there are burns on the circuit board, see page 60

E62	E62: Overheating during washing	E62
	The temperature of the NTC probe exceeds 88°C for more than 5 mins.	

Checks to perform:

check that all the connectors are correctly inserted

Run the diagnostic cycle and fill with water up to the door level to make sure the heating element is completely submerged. Measure between the wiring connector J6-1/J6-2 and the appliance body. **(See fig 6)** Is the circuit open?

NO → Detach the connector and measure between the heating element and the earth contact. **- (see fig. 15)-** Is the circuit open?

NO → Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Measure the NTC probe between terminals J7-4 and J7-5 of the main circuit board connector. Is the value correct? (between 5.7 and 6.3 KΩ at 20°C)

NO → Detach the connector and measure the value directly on the NTC probe. **- (see fig. 14)-** Is the value correct? (between 5.7 and 6.3 KΩ at 20°C)

NO → Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

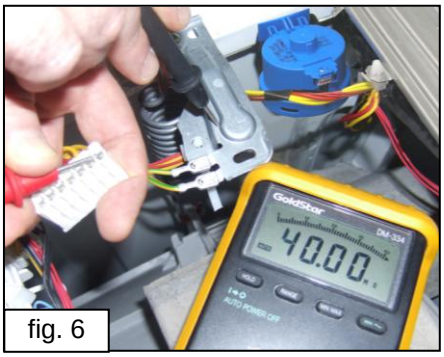


fig. 6

fig. 14

fig. 15

If there are burns on the circuit board, see page 60

E66	E66: Heating element power supply relay faulty (inconsistency between the sensing and the status of Relay K2)	E66

Checks to perform:

check that all the connectors are correctly inserted

Measure between the connector J6-1/J6-2 of the main circuit board and the appliance body. **(Fig. 6)** Is there any dispersion?

NO → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

YES

Detach the connector J6 and measure between the heating element and the earth contact. **- fig. 15-** Is the circuit open?

NO → Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES

Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

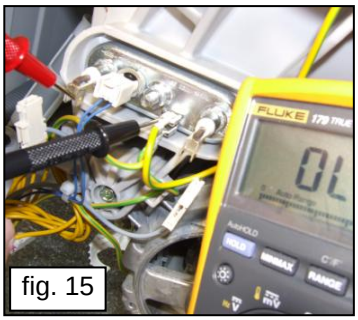


fig. 15

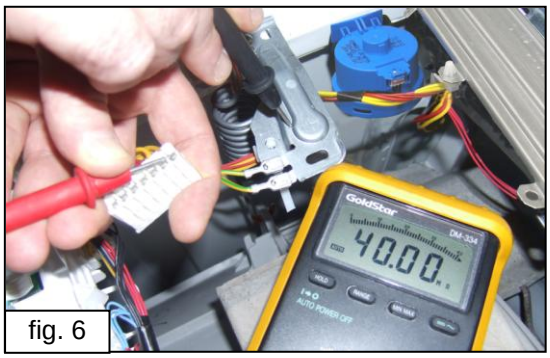


fig. 6

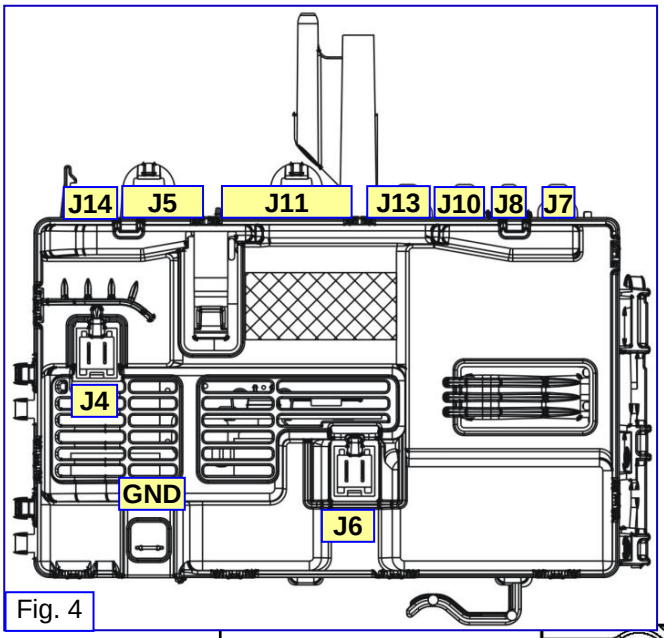
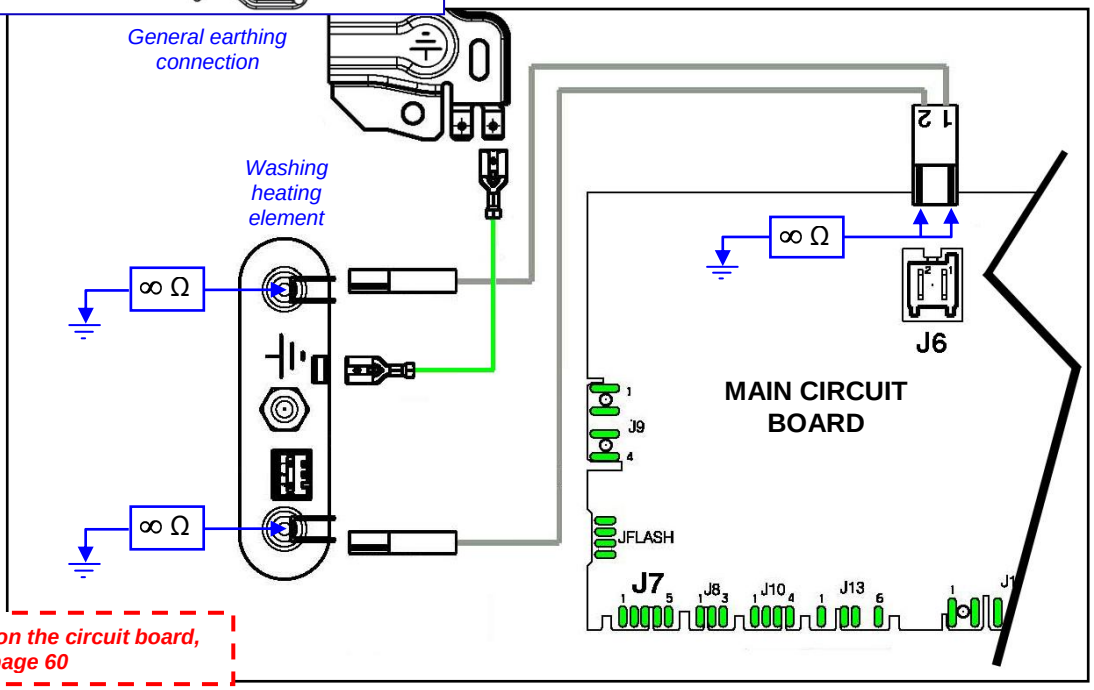


Fig. 4



If there are burns on the circuit board, see page 60

E68	E68: Washing heating element leakage	E68

Checks to perform:

check that all the connectors are correctly inserted

Run the diagnostic cycle and fill with water up to the door level to make sure the heating element is completely submerged. Measure between the wiring connector J6-1/J6-2 and the appliance body.
-(see fig. 6)-
Is the circuit open?

NO

Detach the connector and measure between the heating element and the earth contact.
- (see fig. 15)-
Is the circuit open?

NO

Run phase **8** of the diagnostic cycle, drain water from the tub. Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES

Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

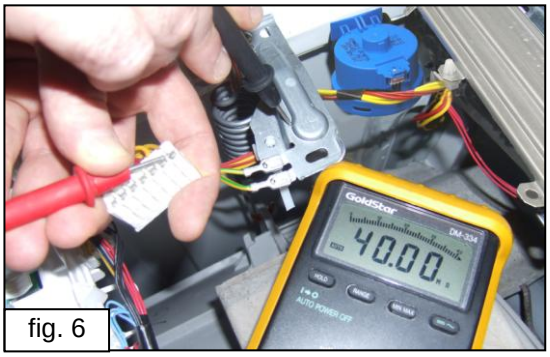


fig. 6

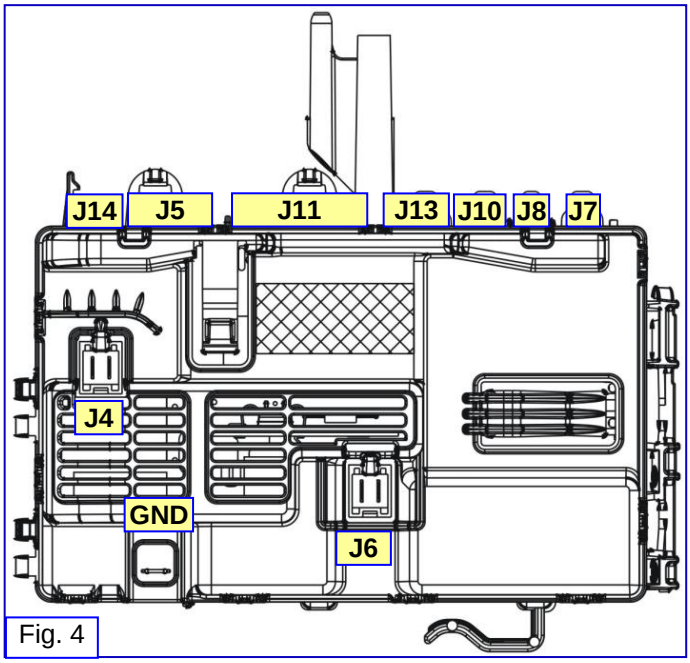


Fig. 4

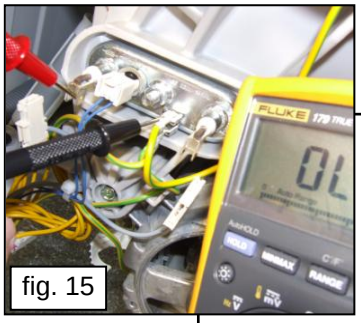
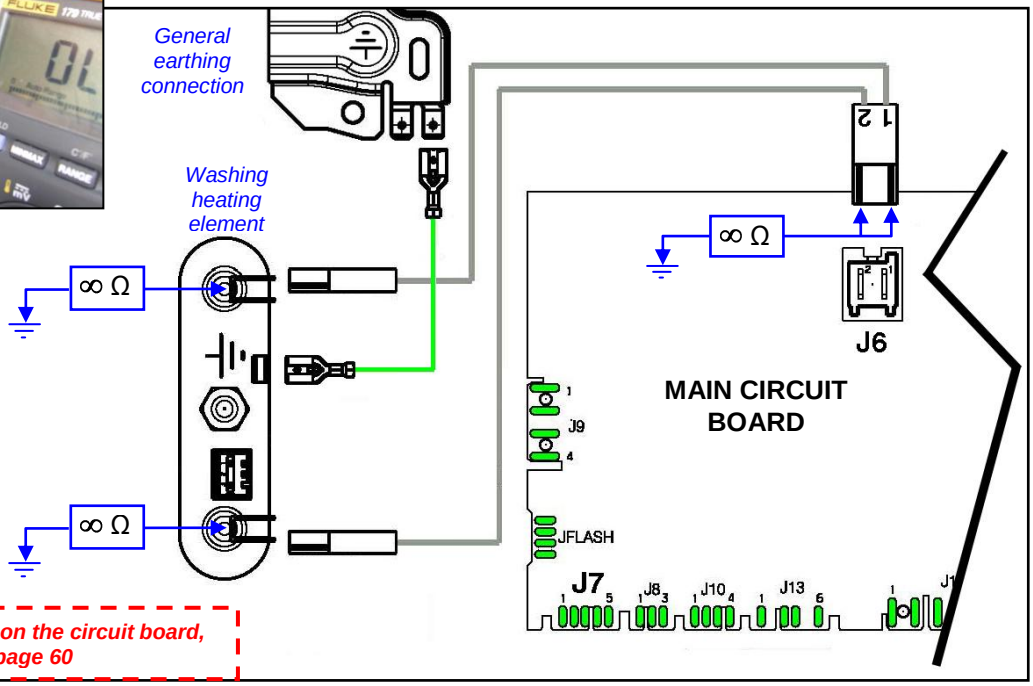


fig. 15



If there are burns on the circuit board, see page 60

E69	E69: Washing heating element damaged	E69

Checks to perform:

check that all the connectors are correctly inserted

Measure the resistance value of the heating element (⏜) between terminals J6-1 ÷ J6-2 of the wiring connector **-(see fig. 4)-** Is the value correct? (28÷31Ω for 230V/1750W)

NO

Measure the resistance value directly on the terminals of the heating element (detach the connectors) **(See fig 13)** Is the value correct? (28÷31Ω for 230V/1750W)

NO

Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES

Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

Fig.13

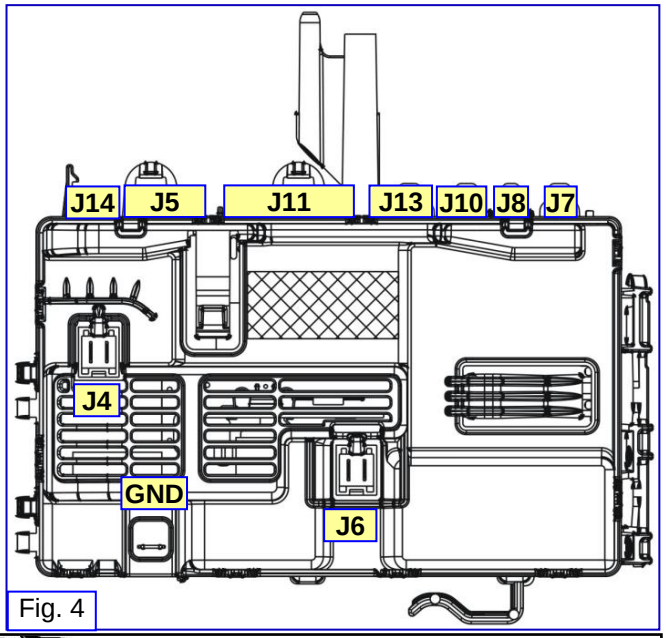
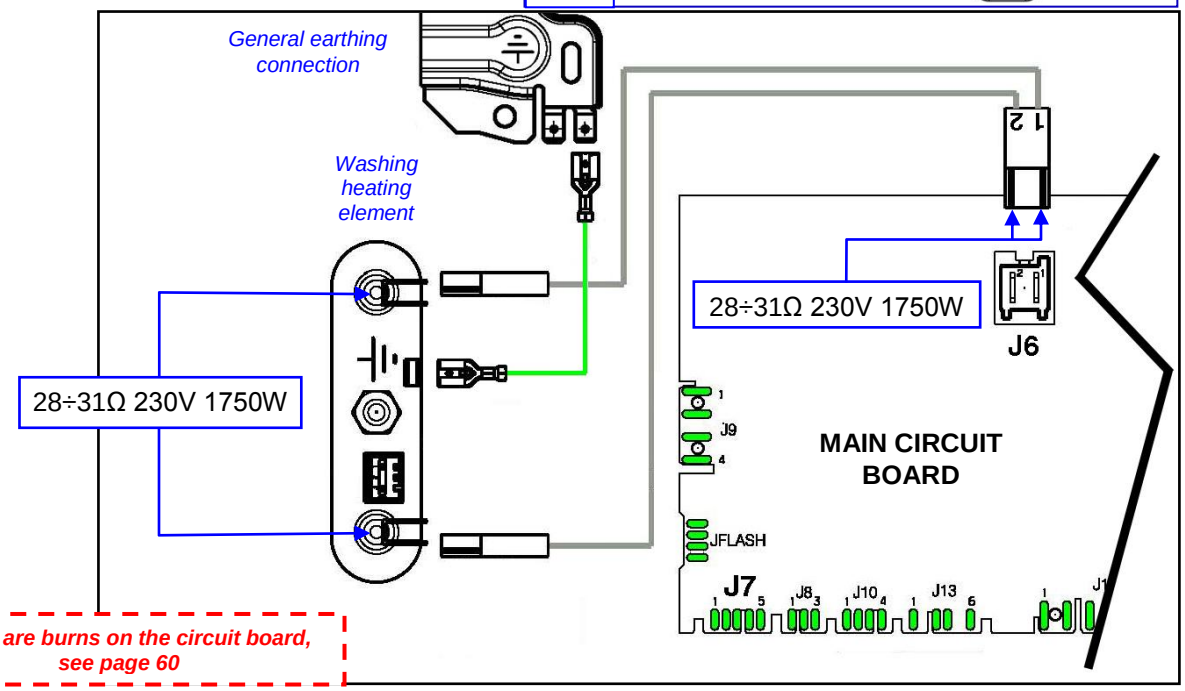


Fig. 4



If there are burns on the circuit board, see page 60

E6A	E6A: Heating relay sensing faulty	E6A

Checks to perform:

check that all the connectors are correctly inserted

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

If there are burns on the circuit board, see page 60

E6H	E6H: Heating element power supply relay faulty (inconsistency between the sensing and the status of Relay K1)	E6H

Checks to perform:

check that all the connectors are correctly inserted

Run the diagnostic cycle and fill with water up to the door level to make sure the heating element is completely submerged. Measure between the wiring connector J6-1/J6-2 and the appliance body.
-(see fig. 6)-
Is the circuit open?

NO

Detach the connector and measure between the heating element and the earth contact.
- (see fig. 15)-
Is the circuit open?

NO

Run phase **8** of the diagnostic cycle, drain water from the tub. Replace the heating element and repeat the diagnostic cycle to check for any further alarms.

YES

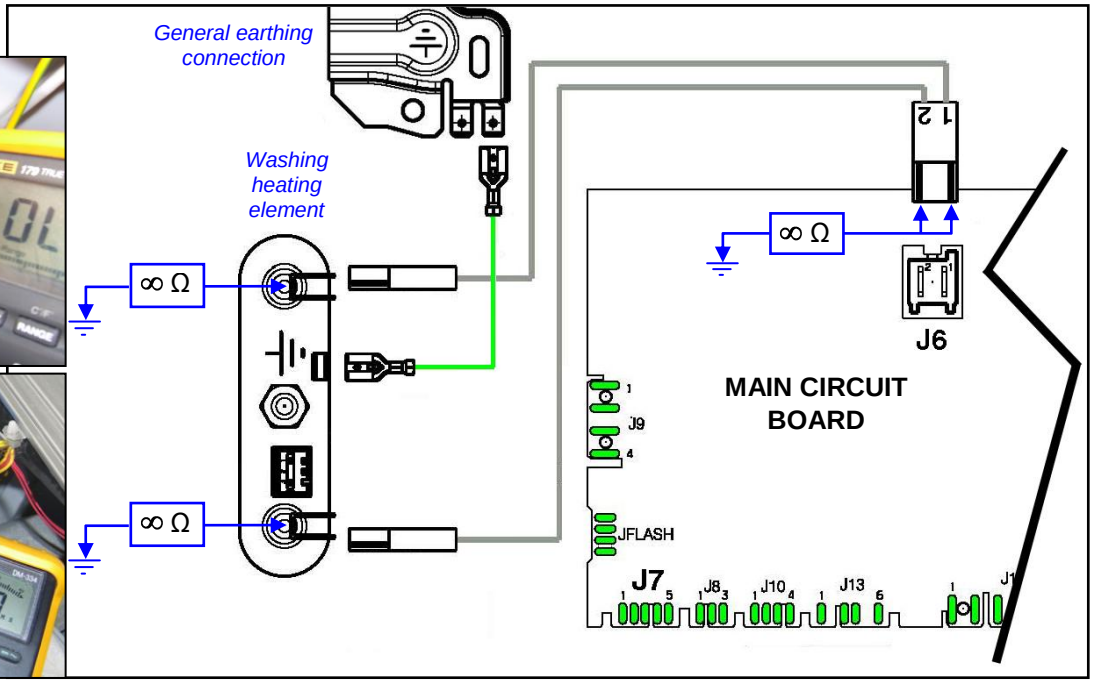
Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

fig. 15

fig. 6



If there are burns on the circuit board, see page 60

E71	E71: Washing NTC probe faulty	E71
	Voltage value out of range (short-circuit or open circuit)	

Checks to perform:

check that all the connectors are correctly inserted

Run **phase 6** of the diagnostic cycle and wait for the water to fill. Switch the appliance off and measure the value of the NTC probe between contacts J7-4 and J7-5 of the wiring connector **-see fig. 4-.** Is the value correct? (between 5.7 and 6.3 KΩ at 20°C)

NO → Detach the connector and measure directly on the NTC probe. **- (see fig. 14)-** Is the value correct? (5.7÷6.3 KΩ at 20°C)

NO → Run phase **8** of the diagnostic cycle, drain water from the tub. Replace the washing heating element and repeat the diagnostic cycle to check for any further alarms.

YES → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Measure between terminals J7-4, J7-5 of the NTC connector and the appliance body **– (see fig. 6) -** Is there any dispersion?

NO → Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

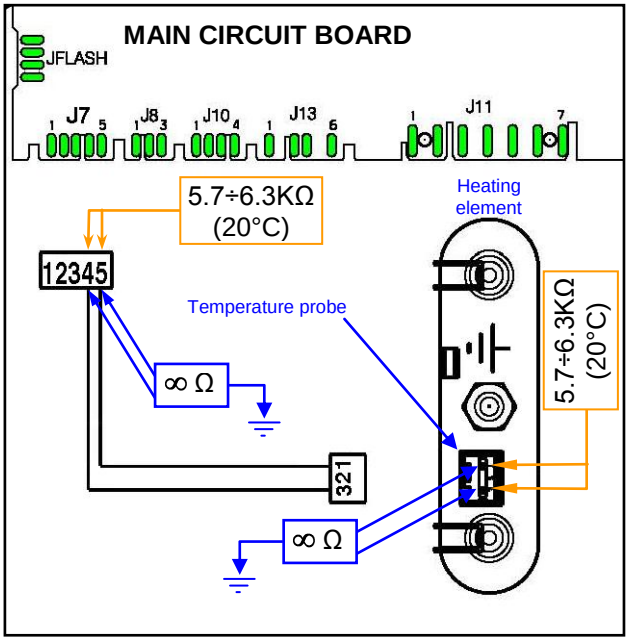
YES → Detach the connector and measure directly between the terminals of the NTC probe and the appliance body (there must be water in the tub. Has the dispersion been measured?

NO → Check/replace the wiring and repeat the diagnostic cycle to check for any further alarms.

YES → Run phase **8** of the diagnostic cycle, drain water from the tub. Replace the washing heating element and repeat the diagnostic cycle to check for any further alarms.

fig. 6

fig. 14



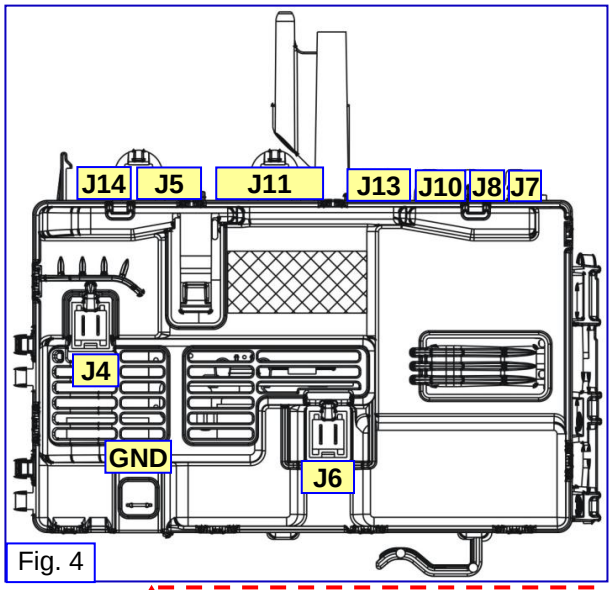


Fig. 4

If there are burns on the circuit board, see page 60

E74	E74: NTC probe improperly positioned	E74

Checks to perform:

check that all the connectors are correctly inserted

Is the probe visibly positioned correctly in its seat?
-See fig.17-

NO → Reposition the probe in its seat and repeat the diagnostic cycle to check for any further alarms.

YES

Measure the value of the NTC probe (5.7÷6.3K& at 20°C) between contacts J7-4 and J7-5 of the wiring connector **(fig. 4).**
Is the value correct?

NO → Replace the washing heating element and repeat the diagnostic cycle to check for anv further alarms.

YES

Run **phase 6** of the diagnostic cycle and wait for the water to fill. Wait in this phase for five minutes. Switch the appliance off and measure the value of the NTC probe between contacts J7-4 and J7-5 of the wiring connector **(fig. 4)**.
Is the value below 5 KΩ?

NO →

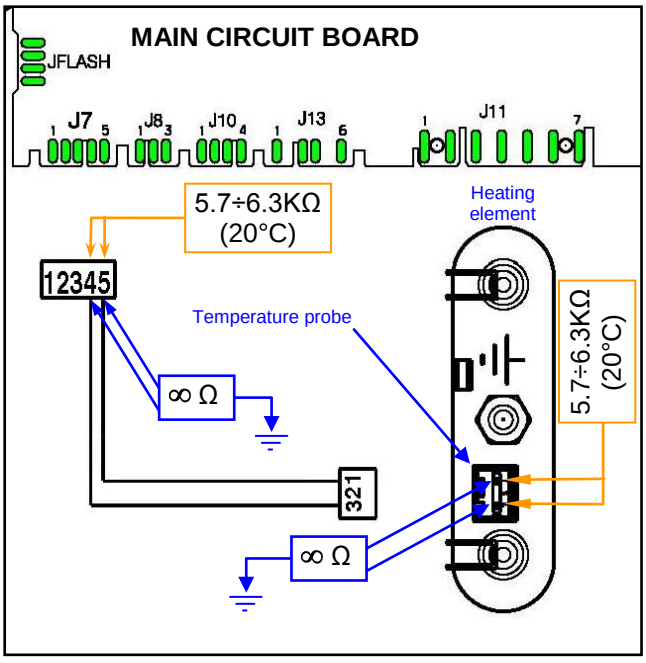
!!WARNING!!

DRAIN THE WATER FROM THE TUB BECAUSE IT IS BOILING HOT

Replace the washing heating element and repeat the diagnostic cycle to check for any further alarms.

YES

Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.



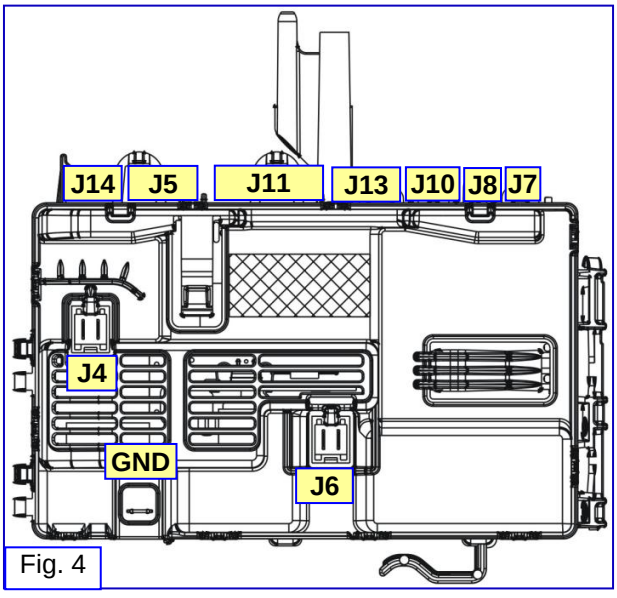


Fig. 4


Fig. 17

If there are burns on the circuit board, see page 60

E83	E83: Error reading the programme selector code	E83
	Selector position code not envisaged by the configuration data or configuration error	

Checks to perform:

! *check that all the connectors are correctly inserted*

Turn the appliance on, turn the programme selector to every setting: wait at least 10 seconds on each of the settings before moving on to the next one. Is alarm E83 shown again?

NO → Repeat the diagnostic cycle to check for any further alarms.

YES ↓

Check for any friction between the control panel and the knob. Is it difficult to turn the knob?

NO → Replace the display board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Repair the coupling between the control panel/selector knob. Repeat the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board,* *see page 60*

E86	E86: Programme selector configuration error	E86

Checks to perform:

! *check that all the connectors are correctly inserted*

Replace the display board and run the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board,* *see page 60*

E87	E87: Display board microprocessor faulty	E87

Checks to perform:

! *check that all the connectors are correctly inserted*

Replace the display board and run the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board,* *see page 60*

E91	E91: Communication error between the display board and the main circuit board	E91

Checks to perform:

check that all the connectors are correctly inserted

Check the wiring between the main circuit board and the display board:

► Detach and reconnect the connectors on both boards several times.

► Measure the continuity between connector J10 (main circuit board) and J3 (display board).
Is the wiring ok?

NO → Replace / repair the wiring and repeat the diagnostic cycle to check for any further alarms.

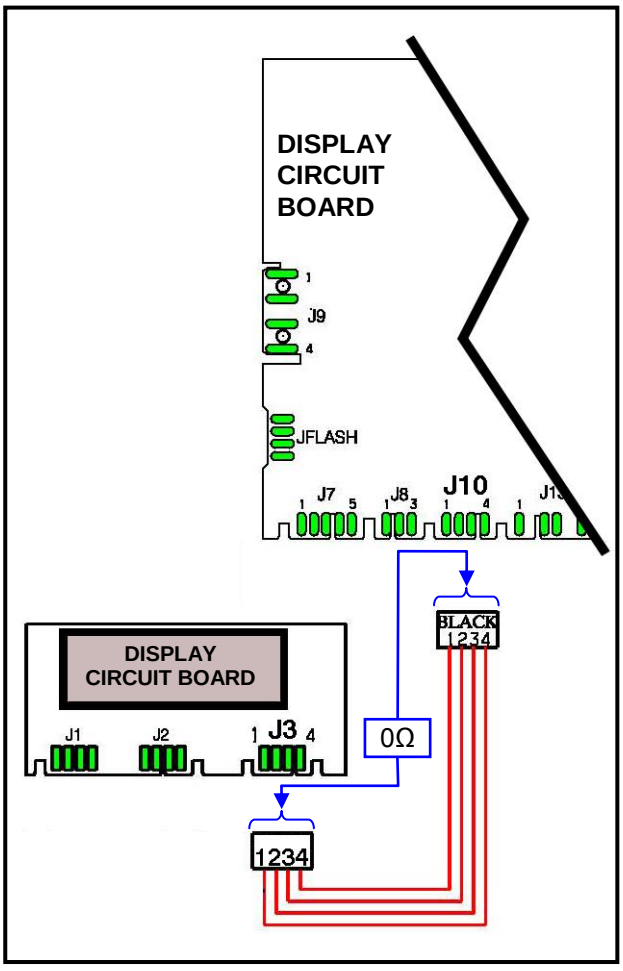
YES

Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.
Is the appliance still displaying E91?

NO → Appliance ok

YES

Replace the display board and repeat the diagnostic cycle to check for any further alarms.



If there are burns on the circuit board, see page 60

E92	E92: protocol incongruence	E92
	Inconsistency between configuration values on starting the appliance	

Checks to perform:

check that all the connectors are correctly inserted

Incorrect configuration possible.
Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E93	E93: Appliance configuration error	E93
	Inconsistency between configuration values on starting the appliance	

Checks to perform:

check that all the connectors are correctly inserted

Incorrect configuration possible.
Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E94	E94: Incorrect configuration of washing cycle	E94
	Inconsistency between configuration values on starting the appliance	

Checks to perform:

check that all the connectors are correctly inserted

Incorrect configuration possible.
Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E97	E97: Inconsistency between control selector version and configuration data	E97
	Discrepancy between programme configuration data and selector recognition data	

Checks to perform:

check that all the connectors are correctly inserted

Incorrect configuration possible.
Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E9C	E9C: Display board configuration error	E9C

Checks to perform:

check that all the connectors are correctly inserted

Incorrect configuration possible.
Replace the circuit board and repeat the diagnostic cycle to check for any further alarms.

E9E	E9E: Display board sensor/touch key faulty	E9E

Checks to perform:

check that all the connectors are correctly inserted

Display board faulty
Replace the display board and repeat the diagnostic cycle to check for any further alarms

If there are burns on the circuit board, see page 60

EC1	EC1: Water fill solenoid valves blocked The flowmeter has to fill water even with the solenoid valve not piloted	EC1

Checks to perform:

check that all the connectors are correctly inserted

Does the appliance fill with water even when it is turned off?

NO → Does the solenoid valve start filling with water as soon as the appliance is turned on?

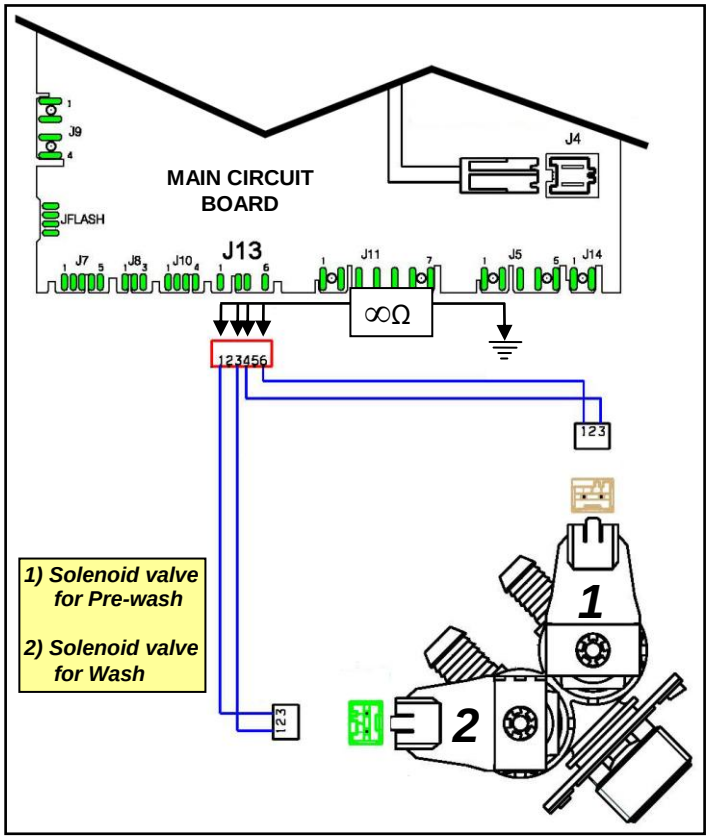
NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES → Open the drawer to check which solenoid valve is leaking and replace it. Repeat the diagnostic cycle to check for any further alarms.

YES → Open the drawer to check which solenoid valve is leaking and measure between the wiring connector of the respective solenoid valve and the appliance body to see if there is any dispersion **(fig.6 and table 1).** Is there any dispersion?

NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES → Replace the wiring and repeat the diagnostic cycle to check for any further alarms.



Tab. 1

Between J13-1 and J13-3 washing solenoid valve
Between J13-4 and J13-6 pre-wash solenoid valve

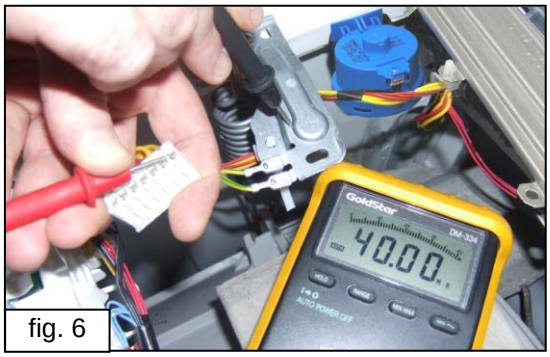


fig. 6

If there are burns on the circuit board, see page 60

EC4	EC4: AGS current sensor faulty error Spin speed reduced to safety speed of 150 rpm	EC4

Checks to perform:

! *check that all the connectors are correctly inserted*

Replace the main circuit board and run the diagnostic cycle to check for any further alarms.

! *If there are burns on the circuit board, see page 60*

EF1	EF1: Drain hose blocked/kinked/too high; drain filter clogged/dirty	EF1

Checks to perform:

! *check that all the connectors are correctly inserted*

This warning only appears at the end of the cycle. The appliance detected long drainage phases during the cycle. (E.g.: More than 20 seconds when draining after rinses). Check/clean the drain filter.

EF2	EF2: Excessive detergent dosing; drain hose kinked/blocked; drain filter dirty/clogged	EF2

Checks to perform:

! *check that all the connectors are correctly inserted*

This is an excessive detergent dosing warning. The system detected too much foam was forming during the drain phases. Advise the Customer to use the correct quantity of detergent and to make sure the filter and drain circuit are clean.

EF3	EF3: Aqua Control device triggered	EF3

Checks to perform:

! *check that all the connectors are correctly inserted*

This warns about the presence of water at the bottom of the appliance. Check for any water leaks and that the Aqua Control device float is positioned correctly.
Or caused by excessive overheating of the drain pump. Check for any items which may obstruct the normal operation of the rotor.

EF4	EF4: Water pressure too low, no signal from flowmeter, with electronically controlled valve open.	EF4

Checks to perform:

! *check that all the connectors are correctly inserted*

This warning is for the water pressure which is too low. Or the tap is closed.
If the water pressure is correct, check: the wiring of the flowmeter and the Flowmeter.

EF5	EF5: Unbalanced load, spin phases skipped.	EF5

Checks to perform:

check that all the connectors are correctly inserted

This is an unbalanced load warning. The appliance detected an extremely unbalanced load during the spin phases. Advise the customer to load more washing into the drum and not just individual garments.

EF6	EF6: Reset appliance.	EF6

Checks to perform:

check that all the connectors are correctly inserted

No action to be performed; if it continues, replace the main circuit board.

EH1	EH1: Mains frequency incorrect Power supply frequency out of configured range	EH1

Checks to perform:

check that all the connectors are correctly inserted

Important!

The appliance remains in alarm status until the mains frequency returns to the correct values or the appliance is switched off. Only the family of the alarm is displayed and the diagnostics mode cannot be accessed. The complete alarm can only be read when the situation has normalised.

Is the supply line disturbed or the mains frequency out of range?

NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Have the electrical system of the home checked / repaired by the proper Body.

If there are burns on the circuit board, see page 60

EH2	EH2: Supply voltage too high	EH2
	Supply voltage value higher than the one configured (for more than 10 seconds)	

Checks to perform:

check that all the connectors are correctly inserted

Important!

The appliance remains in alarm status until the mains voltage returns to the correct values or the appliance is switched off. Only the family of the alarm is displayed and the diagnostics mode cannot be accessed. The complete alarm can only be read when the situation has normalised.

Is the supply line disturbed or the mains voltage out of range?

NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Have the electrical system of the home checked / repaired by the proper Body.

If there are burns on the circuit board, see page 60

EH3	EH3: Supply voltage too low	EH3
	Supply voltage value higher than the one configured	

Checks to perform:

check that all the connectors are correctly inserted

Important!

The appliance remains in alarm status until the mains voltage returns to the correct values or the appliance is switched off. Only the family of the alarm is displayed and the diagnostics mode cannot be accessed. The complete alarm can only be read when the situation has normalised.

Is the supply line disturbed or the mains voltage out of range?

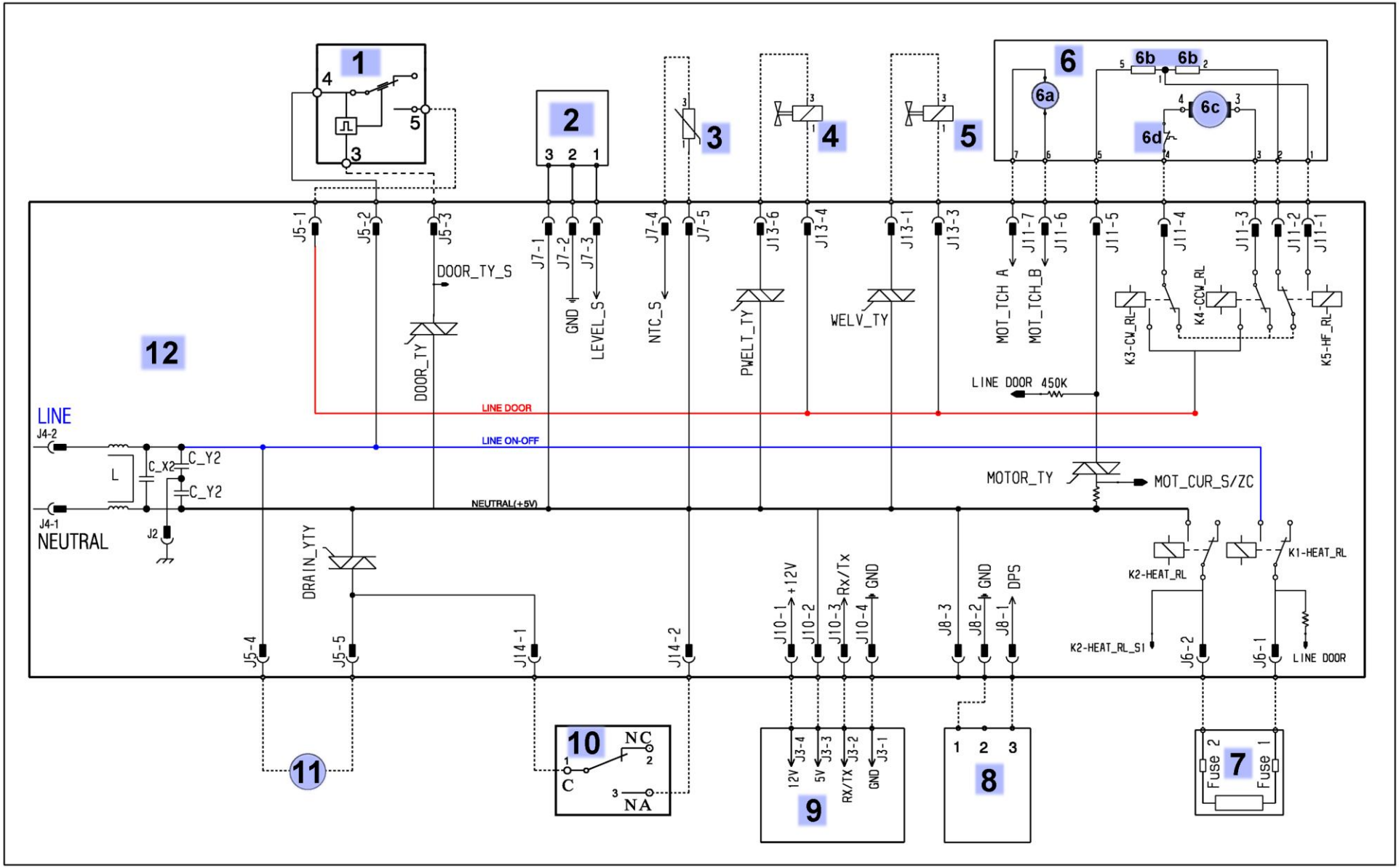
NO → Replace the main circuit board and repeat the diagnostic cycle to check for any further alarms.

YES ↓

Have the electrical system of the home checked / repaired by the proper Body.

If there are burns on the circuit board, see page 60

6 OPERATING CIRCUIT DIAGRAM WM WITH AQUA CONTROL

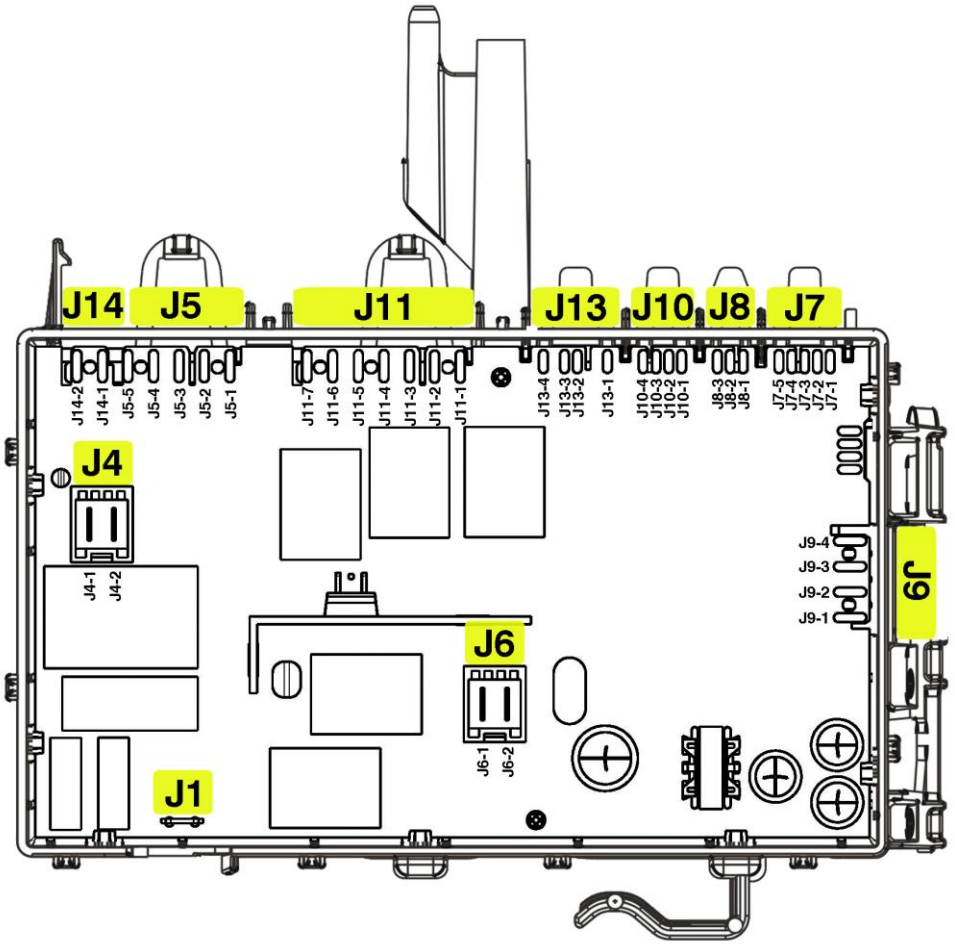


6.1 Key to circuit diagram WM

Appliance electrical components	PCB components	
1. Door safety interlock - Traditional		
2. Analogue pressure switch		
3. NTC temperature probe		
4. Pre-wash solenoid valve	DOOR_TY	Door interlock Triac
5. Wash solenoid valve	DRAIN_YTY	Drain pump Triac
6. Motor	PWELT_TY	Pre-wash solenoid Triac
6a. Tachometric generator (motor)	WELV_TY	Wash solenoid Triac
6b. Stator (motor)	K1	Heating element relay (Line)
6c. Rotor (motor)	K2	Heating element relay (Neutral)
6d. Thermal cut-out (motor)	K3	Motor relay: clockwise rotation
7. Heating element (with thermal fuses)	K4	Motor relay: anti-clockwise rotation
8. Flowmeter	K5	Motor relay: half-range power supply (some models)
9. Display board		
10. Water control		
11. Drain pump		
12. Main electronic circuit board		

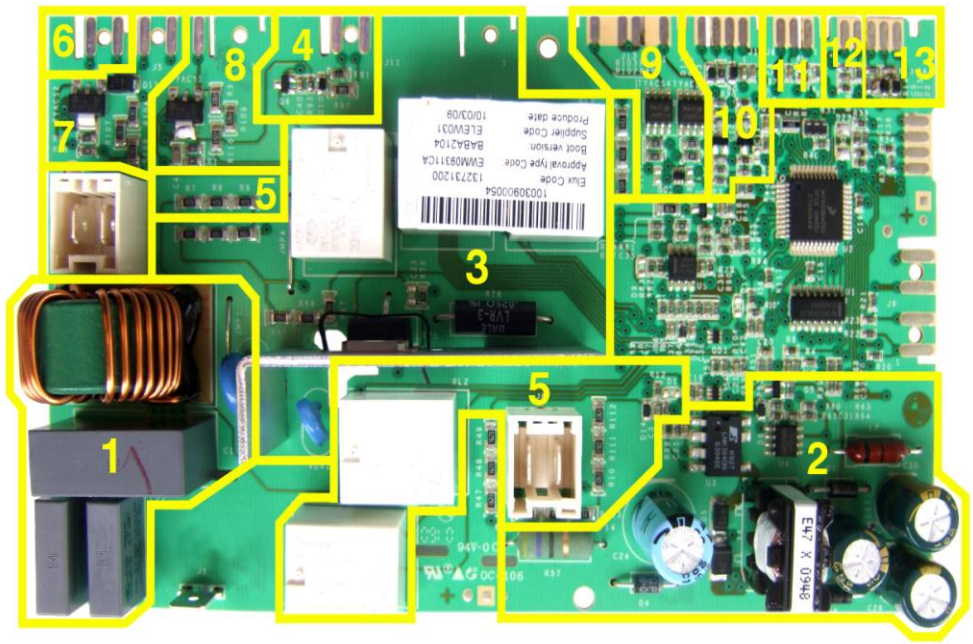
6.2 Main circuit board connectors

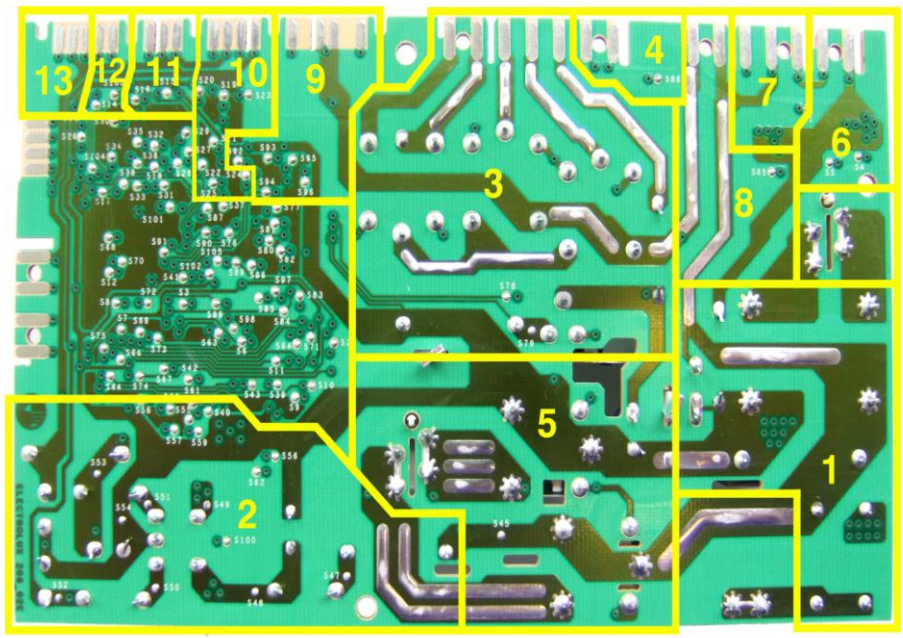
J9	J7
Serial Interface: **J9-1** ASY_IN **J9-2** ASY_OUT **J9-3** +5V **J9-4** GND	**J7-1** Analogue pressure switch (+5V) **J7-2** Analogue pressure switch (GND) **J7-3** Analogue pressure switch (signal) **J7-4** NTC temperature probe **J7-5** NTC temperature probe
J8	**J10**
J8-2 GND **J8-3 Flowmeter**	Communication with display board: **J10-1** Vee 12V **J10-2** 5V **J10-3** Rx/Tx **J10-4** GND
J13	**J11**
J13-1 Wash solenoid valve (Triac) **J13-3** Solenoid valves (line) **J13-4** Solenoid valves (line) **J13-6** Pre-wash solenoid valves (Triac)	**J11-1** Motor (stator - half range) **J11-2** Motor (stator full range) **J11-3** Motor (rotor) **J11-4** Motor (rotor) **J11-5** Motor (Triac) **J11-6** Motor (tachometric generator) **J11-7** Motor (tachometric generator)
J5	**J14**
J5-1 Door lock (Sensing Line) **J5-2** Door lock (Line) **J5-3** Door lock (Triac) **J5-4** Drain pump (Line) **J5-5** Drain pump (Triac)	**J14-1** Pump **J14-2** line (neutral)
J4	**J6**
J4-1 line (neutral) **J4-2** line	**J6-1** heating element (Line Relay) **J6-2** heating element (Neutral Relay)
J1	
J1 GND	



6.3 Burns on the main circuit board EWM09312

In the event of burns on the main circuit board, check whether the problem was caused by another electrical component (short-circuits, poor insulation, water leaks). Use the figures that follow to pinpoint the component which may have caused the problem, depending on the area of the burns.
The type of board illustrated is the one with the largest number of components; other boards do not feature some of these components.





1. Anti-disturbance filter area
2. Power supply area
3. Motor area
4. Tachometric generator (motor) area
5. Heating element area
6. Aqua control area
7. Drain pump area
8. Door lock area
9. Water fill solenoid valve area
10. Communication with display board area
11. Drum positioning area (top loading)
12. NTC temperature probe area
13. Analogue level sensor area

Remarks

REVISION:

Revisions	Date	Description	Author	Approved by - on
00	05/2012	Document Creation	DMM	XX – 0X/201X