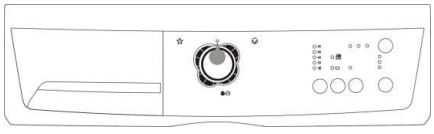
Electrolux
Distriparts

SERVICE MANUAL

WASHING

Z3	Z6
	

Washing machines

with electronic control system

EWM09311

Technical and functional characteristics

Z3/Z6

Customer Care - EMEA
Training and Operations Support
Technical Support

Publication number

599 75 54-20

EN

Edition: 06-2014 – Rev. 02

Index

1 Purpose of this manual

The purpose of this manual is to provide service engineers who are already familiar with the repair procedures for household washing machines with information regarding washing machines fitted with the EWM09311 electronic control system.

The current electronic appliances manufactured use a heating element with thermal fuses (inside its branches) as safety, which interrupt if the water level drops below the minimum level permitted.
The incorporated NTC probe contacts have a 2.5 mm pitch.

The manual deals with the following topics:

- General characteristics
- Control panel and compatibility between washing programmes and options
- Setting: Demo, Diagnostics
- Alarms
- Technical and functional characteristics
- Accessing the various components

Please note:
The selector on this platform is not fitted with an ON/OFF switch; to cut off the power supply to the appliance, the plug must be removed from the power socket.

Low consumption mode

In order to minimise electricity wastage when the cycle is not under way, appliances in this platform offer two ways of enabling a low consumption mode:

- Stand-By
- Stand-Off

Stand-By – triggered after five minutes, during the programme selecting phase (since the washing machine does not receive any commands from the buttons or the selector dial) and at the end of the washing cycle. All LEDs are turned off (including the Display, if present), with the exception of the green LED on the START/PAUSE button, which flashes at a very low rate to signal that the appliance is powered, but is in low power consumption mode. The appliance exits Stand-By mode when any one of the buttons is pressed. The control panel lights up and displays the status of the appliance (last programme selected or end of programme) before Stand-By mode was entered.

Stand- Off – The appliance is in “Stand – Off” (virtual off) status when the selector dial is set to “OFF” or “0” (zero). Indeed this position leads to the cancelling of any programme that might have been selected, the LEDs being turned off, along with the Display, where featured.
While the main board and the components upstream of the door safety interlock remain powered.

The plug must be removed from the mains socket to cut the power to the appliance.

To ensure the appliance is always **safe to operate**, even when you turn the selector dial to the OFF position (to cancel a programme in progress), with a high water level and the motor in motion, this will only translate to the user interface (control panel) being turned off, while the main board remains powered to keep the door safety interlock locked until the safety conditions are achieved.

2 WARNINGS

- **Any work on electrical appliances must only be carried out by qualified personnel.**
- **Before servicing an appliance, check the efficiency of the electrical system in the home using appropriate instruments. For instance, please refer to the instructions provided/illustrated in the Electrolux Learning Gateway portal (http://electrolux.edvantage.net).**

  When the work is finished check that the equipment's safety conditions have been reinstated, as though it were straight 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**
- **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.**

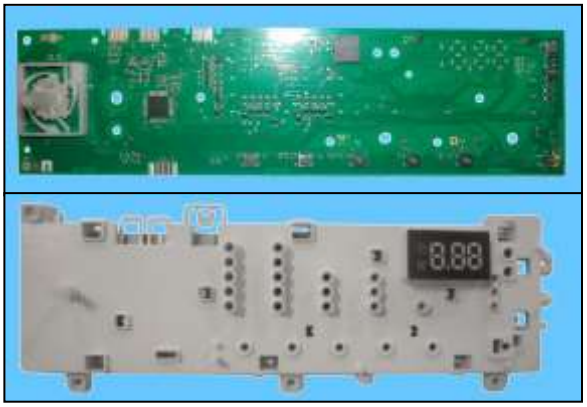
- **Always empty the appliance of all the water before laying it on its side.**
- **Never place the appliance on its right side (electronic control system side): some of the water in the detergent dispenser could leak onto the electrical/electronic components and cause these to burn.**
- **Take care because some of the appliance parts may have sharp edges**
- **When replacing components, please refer to the code shown in the list of spare parts relating to the appliance.**

3 STYLING Z3

3.1 General characteristics

The EWM09311 electronic control system consists of two circuit boards:

- Control/display board in a plastic casing fitted to the control panel (the figure illustrates the individual board and the board assembly consisting of board, casing and diffuser).

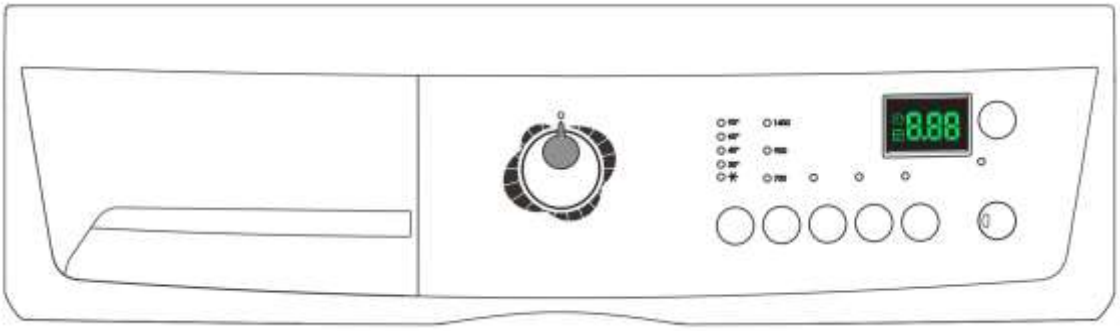


- Main board, positioned in the bottom rear of the appliance. It powers the electrical components and receives commands from the display board.

Programme selector	▪ 15 positions without main switch (incorporated in the circuit board)
No. buttons	▪ maximum 7 (3 options + 1 start/pause + 1 delayed start + 1 Spin + 1 Temperature)
No. LEDs	▪ maximum 14 (13 green LEDs + 1 red LED)+ 1 display
Serial port	▪ DAAS-EAP communication protocol up to 230400 baud
Power supply voltage	▪ 220/240V ▪ 50/60 Hz (configurable)
Washing type	▪ Traditional
Rinsing system	▪ Traditional
Motor	▪ Collector, with tachometric generator (Universal)
spin speed	▪ 600 ÷ 1,400 rpm
Anti-unbalancing system	▪ AGS
Water fill	▪ 1 solenoid valve with 1 inlet – 2 outlets
Detergent dispenser	▪ 2 compartments: wash, conditioners
Control of water level in the tub	▪ Electronic/analogue pressure switch
Door safety interlock	▪ Traditional (with PTC)
Heating element heat output	▪ 1750W with thermal fuses incorporated
Temperature check	▪ NTC probe incorporated in the heating element
Buzzer	▪ Traditional incorporated in the PCB

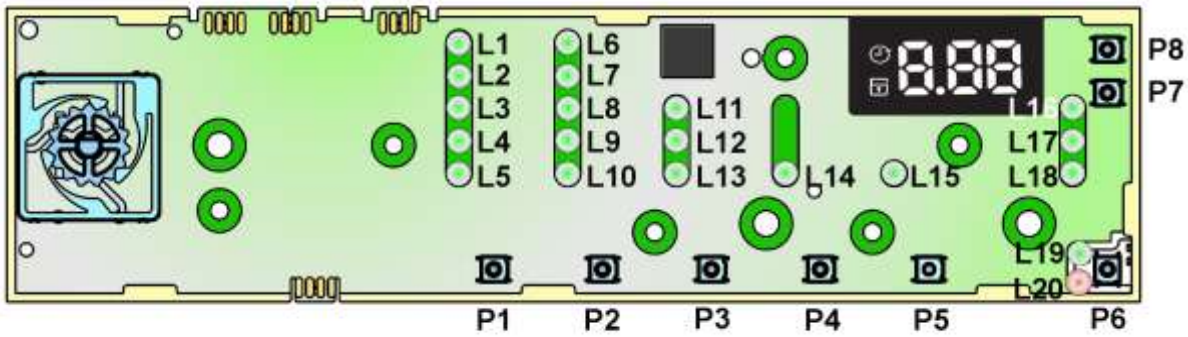
3.2 Control panels

3.2.1 Z3 Styling

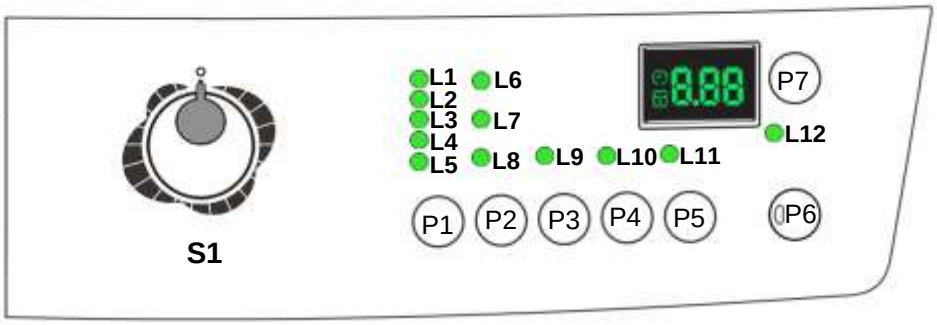


3.2.2 Display board

- Positioning of LEDs and buttons

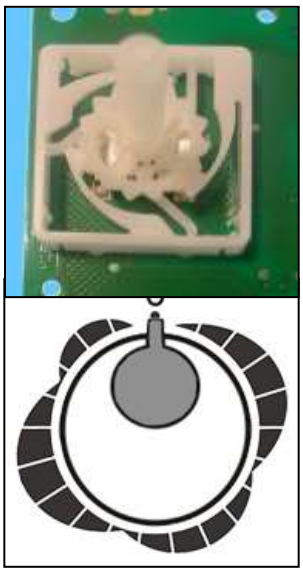


3.3 Configuration of control panel Z3



The wash programmes, the functions of the selector dial (where featured) and the individual buttons vary according to the model, since these are determined by the configuration of the appliance.

3.3.1 Programme selector (S1)



The selector is formed by a linear potentiometer. The fifteen positions are determined by a plastic structure that is secured around the potentiometer.
There is no ON/OFF switch.
The first position is for the OFF function, where the current programme is cancelled and all the LEDs on the display board are turned off.
The plug must be removed from the mains socket to cut the power to the appliance.

The various positions of the selector may be configured in order to perform the various washing programmes (e.g. water level, drum movement, No. of rinses and the washing temperature to be selected according to the type of laundry).
The selector can be turned both clockwise and anti-clockwise.
For each programme, the compatible options and other parameters are defined.
The programme temperature is selected using the relevant button.

3.3.2 Programme configuration

The table below lists the parameters that can be used to define the washing programmes.

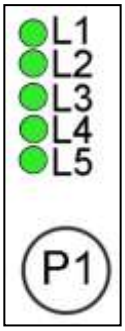
Types of fabric	Cotton/linen, Synthetic fabrics, Delicates, Wool, Hand-wash, Shoes, Jeans, Duvet, Silk.
Special programmes	Cotton/linen + pre-wash, Soak, Miniprogramme, Easy-Iron, Conditioner, Rinse, Drain, Spin, Economy.
Temperature	Normal, Minimum, Maximum: the initial temperature is the one proposed for the washing programme.
Spin	Normal, Minimum, Maximum.
Options (Normal/Possible)	Rinse Hold, Pre-wash, Extra rinse, Easy-Iron, Economy (energy label), Normal, Super quick, Reduced spin speed, No spin.
Programme phases	Pre-wash, Wash, Rinses, Spin, Delayed start.

3.3.3 Buttons and LEDs

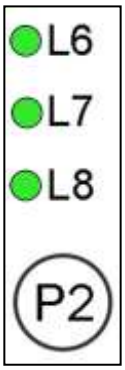
The function of each button is defined by the configuration of the appliance.

- **Button no. 1**: TEMPERATURE CONTROL
  this button is configurable and is related to LEDs (L1÷L5).
  Press it in sequence to choose the washing temperature among the values listed below: 90°C, 60°C, 40°C, 30°C, 20°C and Cold cycle.

  The initial temperature set for each programme is configurable.
  The temperature of 50°C is not envisaged.



- **Button no. 2**: SPIN SPEED SETTING
  this button is configurable and is related to LEDs (L6÷L8).
  By pressing it in sequence it is possible to select the desired spin speed or exclude it with the rinse hold option.

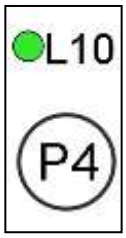


- **Button no. 3**: this button is configurable and is related to LED (L9). Depending on the configuration of the appliance, it can perform the function of:

  super quick, easy-iron, super rinse, rinse hold.

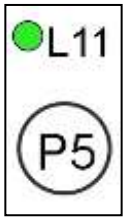
- **Button no. 4**: this button is configurable and is related to LED (L10); depending on the configuration of the appliance, it can perform the function of:

  super quick, easy-iron, super rinse, rinse hold.

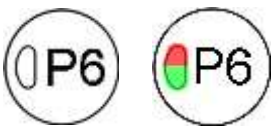


- **Button no. 5**: this button is configurable and is related to LED (L11); depending on the configuration of the appliance, it can perform the function of:

  super quick, easy-iron, super rinse, rinse hold.



- **Button no. 6**: this button is configurable and has the function of START/PAUSE.
  Pressing this button starts a washing cycle, or can pause a washing cycle already under way (there are two LEDs inside:
  - a **green** one which flashes when the appliance is in set-up, pause; it stays on when the cycle is under way and turns off when the cycle has ended;
  - a **red** one that flashes (150 ms off, 150 ms on) in the event of an alarm or incorrect selection, such as: an incompatible option, an incorrect temperature for the chosen programme or the rotation of the programme selector dial or the selection of an option while a washing cycle is under way.



- **L12 Door closed:** It lights up when the safety device prevents the door from opening and switches off when it can be opened. It flashes when the device is about to unlock the door (it should be noted with PTC delaying devices, which need one or two minutes to open).

- **Button no. 7**: this button is configurable and has the DELAYED START function. During the programme selection phase, a delayed start can be selected, from 30' to 20 hours (30' ☞ 60' ☞ 90' ☞ 2h ☞3h… ☞20h ☞0h) and the time is shown on the Display. During the last hour, the time decreases minute by minute.

3.3.4 Display

The display shows the following information.

- **- Duration of the washing programme**, which appears after it has been selected. This time corresponds to the time required for the maximum wash load for each type of programme. If an option is selected/deselected, the time is automatically updated. After the programme has started, the time decreases (and is updated) minute by minute.

- **- End of the programme** is indicated by **a permanently lit zero** (when the door can be opened).

- **- Appliance stopped with water in the tub**, after programmes with the RINSE HOLD option. This is displayed by **a permanently lit zero.** The LED indicating the door remains on and the LED on the START/PAUSE button is turned off. The washing machine continues to operate, rotating the drum once every 2 minutes.

- **- Delayed start**, selected on the related button. After the START/PAUSE button is pressed, the countdown starts and the delay time decreases hour by hour, from a delay of 2 hours up to 20 hours (☞ 30'☞ 60'☞ 90'☞ 2h☞ 3h...☞ 20hrs.☞ 0hrs.).

During the last 2 hours, it decreases by 30 mins at a time.

During delayed start, the icon  remains permanently lit.

- **- Padlock:** when lit, it indicates that all the buttons are disabled to prevent children from altering, starting or pausing the cycle;
To disable this function, a key combination needs to be pressed, which can be printed on the control panel or described in the instruction manual.

- **- Wrong choice of an option:** displayed by the message "**Err**", when a function that is not compatible with the chosen programme is selected. the display duration is two seconds.

- **Alarm code** indicates an error in the appliance operation; the START/PAUSE button flashes when the code is displayed.

- **Buzzer**

The buzzer emits:

→ One “**beep**” when: selecting programmes, selecting an option, when the START/PAUSE button is pressed to start or pause the cycle.

→ Three “**beeps**” when: an option incompatible with the selected programme is chosen, or when a button is pressed or a dial is turned during a cycle.

→ A particular sequence of “**beeps**” for a two-minute duration when the cycle has terminated.

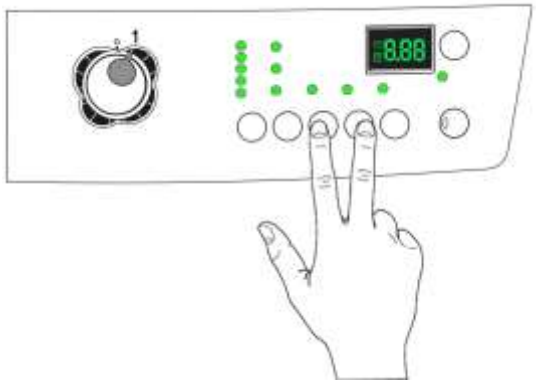
→ A particular sequence of three “**beeps**” to signal an appliance malfunction.

The Buzzer may be configured to sound:

- as in the aforementioned cases.
- only at the end of the cycle.
- only in the event of an alarm.

The volume has a factory preset level and cannot be changed by the user.

In models fitted with a buzzer, the buzzer can be enabled / disabled during programme selection, but alarm signalling remains enabled.



To enable/disable it, press the buttons simultaneously for 5 seconds. A short beep confirms that it has been enabled/disabled.

4 Z6 STYLING

4.1 General characteristics

The EWM09311 electronic control system consists of two circuit boards:

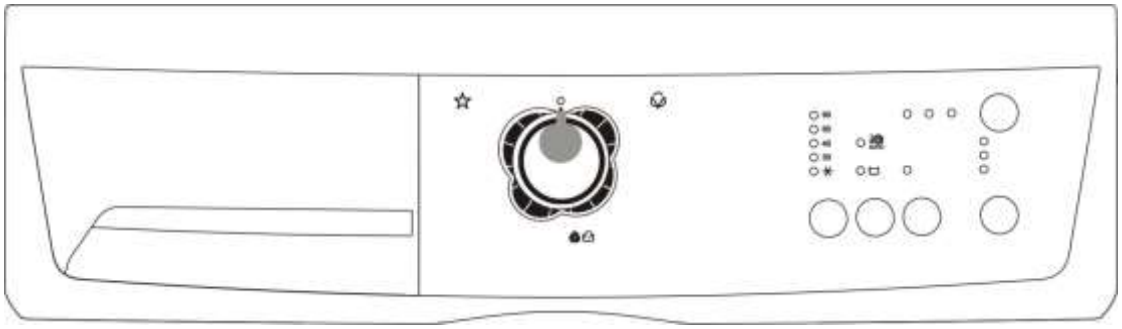
- Control/display board in a plastic casing fitted to the control panel (the figure illustrates the individual board and the board assembly consisting of board, casing and diffuser).

- Main board, located at the rear of the appliance. It powers the electrical components and receives commands from the display board.

- Main board, positioned at the rear of the appliance. It powers the electrical components and receives commands from the display board.

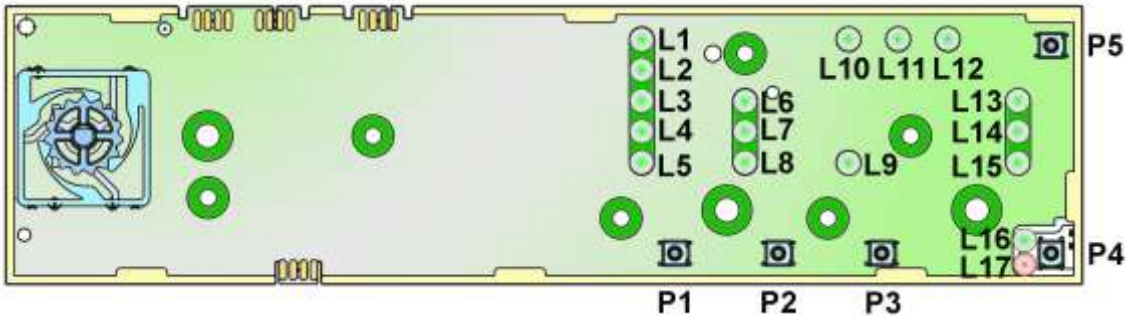
Programme selector	▪ 15 positions without main switch (incorporated in the circuit board)
Secondary selector	▪ 6 positions, only for version Z 5 (incorporated into the circuit board)
No. buttons	▪ maximum 5 (1 Spin/Temperature + 2 options + 1 start/pause + 1 delayed start)
No. LEDs	▪ Z5 Styling maximum 12 (11 green LEDs + 1 red LED). ▪ Z6 Styling maximum 16 (15 green LEDs + 1 red LED)
Serial port	▪ DAAS-EAP communications protocol up to 230400 baud
Power supply voltage	▪ 220/240V ▪ 50/60 Hz (configurable)
Washing type	▪ traditional
Rinsing system	▪ traditional
Motor	▪ Collector, with tachometric generator (Universal)
spin speed	▪ 600 ÷1,400 rpm
Anti-unbalancing system	▪ AGS
Water fill	▪ 1 solenoid valve with 1 inlet – 2 outlets
Detergent dispenser	▪ 2 compartments: wash, conditioners
Control of water level in the tub	▪ Electronic/analogue pressure switch
Door safety interlock	▪ Traditional (with PTC)
Heating element heat output	▪ 1750W with thermal fuse incorporated
Temperature check	▪ NTC probe incorporated in the heating element

4.2 Control panels



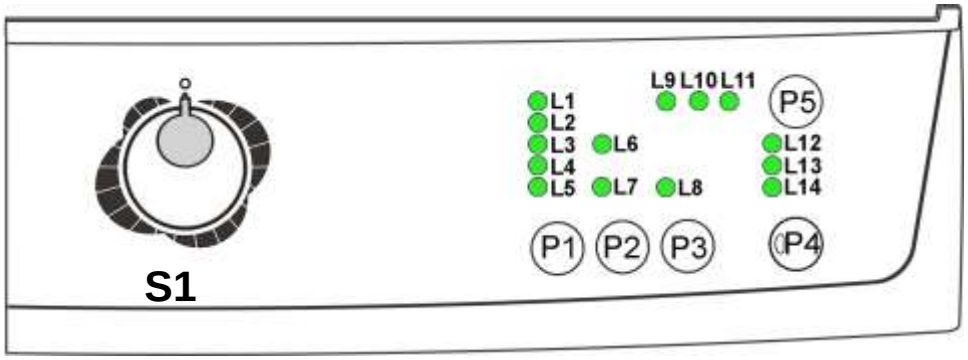
4.2.1 Display board

- Positioning of LEDs and buttons



4.2.2 Control panel configuration

Only one styling will be taken into consideration: the most complete one, since they are identical: both in terms of functions and button layout.



The wash programmes, the functions of the selector dial (where featured) and the individual buttons vary according to the model, since these are determined by the configuration of the appliance.

4.2.3 Programme selector (S1)

See sect. 3.3.1 page 9

4.2.4 Programme configuration

See sect. 3.3.2 page 9

4.2.5 Buttons and LEDs

The function of each button is defined by the configuration of the appliance.

- **Button no. 1**: this button is related to LEDs (L1-L5).

  pressing the button in sequence alters the temperature of the washing cycle from 90°C to cold cycle.

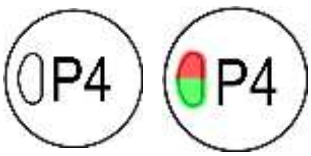
- **Button no. 2**: this button is configurable and is related to LEDs (L6 and L7). Depending on the configuration of the appliance, it can perform the function of:

  super quick, easy-iron, super rinse, rinse hold, spin speed regulation.

- **Button no. 3**: this button is configurable and is related to LED (L8). Depending on the configuration of the appliance, it can perform the function of:

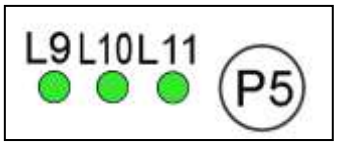
  super quick, easy-iron, super rinse, rinse hold.

- **Button no. 4**: this button is configurable and has the function of START/PAUSE.
  See sect. 3.3.3 Button 6 START/PAUSE on page 10



- **Button no. 5**:

  this button is configurable and is related to LEDs (L9÷L11).
  It performs the delayed start function.
  Press it in sequence to choose from one of the three delayed start options: 3h-6h-9h with the related LED coming on.



- **Wash phase indicator LEDs**:

LEDs L12 L13 L14 are configurable and are used as wash phase indicators.

Three combinations are envisaged.

First combination: The phases of the washing cycle are displayed and the “Extra Rinse” option can be selected by pressing a button;

Second combination: The phases of the washing cycle are displayed along with the status of the “Extra Rinse” option, when the latter can be selected by a key combination;

Third combination: The washing cycle phases are displayed, along with the status of the door and the “Extra Rinse” option can be selected by pressing a button.

Summary table of the three combinations

LED position	First combination	Second combination	Third combination
L12	Wash	Cycle in Progress	Cycle in Progress
L13	Rinses / Spin	Extra Rinse	Carriage door
L14	End of Cycle	End of Cycle	End of Cycle

The meaning of each LED function is described in the following table.

Possible indications	
Wash	Lights up in selection mode if the programme includes the wash phase and during the wash cycle.
Rinses / Spin	Lights up in selection mode if the programme includes rinses and spin and during the execution of these phases.
Extra Rinse	Lights up when this option has been memorised (if included in the cycle) and during rinses.
Cycle in progress	Lights up during execution of the cycle.
End of cycle	Lights up when the programme has completed and after the door has been unlocked.
Door closed	Lights up when the safety device prevents the door opening and switches off when the door can be opened. It flashes when the device is about to unlock the door (it is noticed with PTC delaying devices, which need one or two minutes to open).

5 COMPATIBILITY BETWEEN WASH PROGRAMMES AND OPTIONS

Programme	Temperature	Delayed Start	Super Quick	Extra-rinse	Easy Iron	Reduced spin speed	No Spin	Rinse hold
Cotton	95°÷ 0° (40°)	√	√	√	√	√	√	√
Cotton + pre-wash	95°÷ 0° (40°)	√	√	√	√	√	√	√
Cotton + economy	60°, 40° (60°)	√		√	√	√	√	√
Synthetic fabrics	60°, 0° (40°)	√	√	√	√	√	√	√
Delicates	40°÷ 0° (40°)	√	√	√		√	√	√
Wool/Hand Wash	40°, 0° (30°)	√				√	√	√
Jeans	60°, 0° (40°)	√			√	√	√	√
Mini/Teddy Bear/Sport Light	30°	√				√	√	
Child	30°, 0° (30°)	√				√	√	
Shoes	30°, 0° (30°)	√				√	√	
Blanket	40°, 0° (40°)	√				√		
5 Shirts	30°	√				√	√	√
Mix. 40°	40°	√		√	√	√	√	√
Mix. 20° Oko	20°	√		√		√	√	√
Prewash	30°	√						
Rinses / Conditioner		√		√	√	√	√	√
Spin		√				√		
Scarico								
Phases during which an option can be selected								
Selection	√	√	√	√	√	√	√	√
Wash cycle pause				√	√	√	√	√
Rinse cycle pause								√

The information is purely indicative.
(T°) the default temperature (in parentheses) is displayed by the cycle temperature LED, when selected (Z6 Styling).
(*) the default set speed when a cycle is selected, limited to that declared for the specific model.

5.1 Description of options

- **Rinse hold**

→ Stops the appliance with water in the tub before the final spin cycle.
→ To drain the water, reset the programme and then select a drain or spin cycle.

- **Pre-wash**

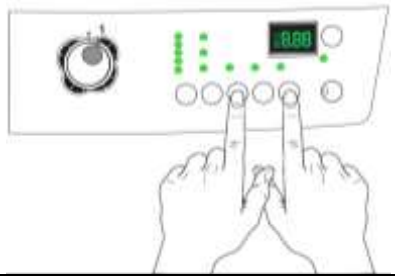
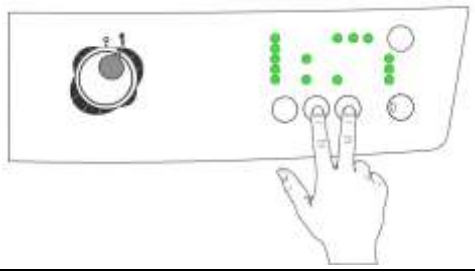
→ Adds a pre-wash phase at the start of the cycle with water heating to 30°C (or cold, if selected).
→ Available in COTTON cycles, performs a short spin before advancing to the wash phase.

- **Economy / Energy label**

→ Modifies the structure of the COTTON 40÷90 - SYNTHETIC FABRICS 50/60 programmes to reduce energy consumption, guaranteeing washing performance levels.
→ Reduces the washing temperature
→ Increases the duration of the wash phase

- **Super rinse**

→ Adds **two** rinses in the COTTON cycle, adds **one** rinse in the SYNTHETIC FABRICS - DELICATES cycles
→ Cancels the end of wash spin and the first two intermediate spins.
→ The other intermediate spins are limited to 450 rpm with the final spin at maximum speed.

ENABLING SUPER RINSE	
Appliances that do not envisage this option associated with a button can enable it through a key combination (see instruction manual).	
Z3 Styling	Z6 Styling
	
During the selection phase, press the two buttons shown in the figure simultaneously for at least 5 seconds until the related LED comes on. This option also remains enabled during subsequent cycles. To disable it, press the two buttons simultaneously for at least 5 seconds until the related LED is turned off.	

- **Easy-iron**

→ In COTTON programmes:
  - adds **three** rinse cycles
  - eliminates intermediate spin cycles
  - performs a pulse spin phase before the final spin
  - adds an “untangling” phase after the spin cycle

→ In SYNTHETIC FABRICS programmes:
  - it reduces the heating temperature in 50/60°C cycles to 40°C
  - increases the wash time
  - prolongs the cooling phase at the end of the wash phase
  - adds **one** rinse cycle
  - adds an “untangling” phase after the pulse spin cycle

- **No spin**

→ It eliminates <u>all</u> the spin phases
→ It adds **three** rinses to the COTTON cycle and **one** to the SYNTHETIC FABRICS cycle.

- **Super quick**

→ Modifies the structure of the wash phase of the COTTON - SYNTHETIC FABRICS - DELICATES cycles by half a load.

- **Delayed Start**

→ Adds a pause before the start of the programme. The delay time is indicated by LEDs or the Display (see page 12 or page 24 button 7/5, for Display or LED display, respectively).

→ To start the cycle immediately after the countdown to the delayed start has already begun: press the Start/Pause button, cancel the delay time by pressing the relevant button, then press Start/Pause again.

- **Reduced spin speed**

Z6 Styling

It can be linked to buttons with 2-5 LEDs, (the possible combinations are shown below):

- Maximum - Maximum declared spin speed.
- Reduction 1 - Reduction of the spin speed to between the maximum speed and the minimum speed (400 rpm).
- Reduction 2 - Reduction of the spin speed to between the speed of reduction 1 and the minimum speed (400 rpm).
- Automatic reduction – reduces the maximum speed for the programme by half, but not less than 400 rpm.
- No spin - excludes all spin cycles.
- Rinse hold - excludes only the final spin, but not the intermediate spins and ends the cycle with water in the tub.

A further spin reduction can be obtained by selecting the “Easy-Iron” option in cotton programmes when the selected programme envisages a spin speed of more than 900 rpm.

The following tables contain the possible configurations of the “Spin” button depending on the combination of LEDs.

Button with 5 LEDs						
Maximum spin speed (rpm)	600/700	800/900	1000÷1400	1000÷1400	1300÷1400	1400
Intermediate 1	500	700	900	900	1100	1200
Intermediate 2	400	500	700	700	900	900
Intermediate 3	No speed	No speed	No speed	500	700	700
Last selection	Rinse hold	Rinse hold	Rinse hold	No spin or Rinse hold	No spin or Rinse hold	No spin or Rinse hold

Button with 4 LEDs			
Maximum spin speed (rpm)	600/700	800/900	1000÷1400
Intermediate 1	500	700	900
Intermediate 2	400	500	700
Last selection	No spin or Rinse hold	No spin or Rinse hold	No spin or Rinse hold

Button with 3 LEDs			
Maximum spin speed (rpm)	600/700	800/900	1000÷1400
Intermediate 1	500	700	900
Intermediate 2	400	500	700

Button with 2 LEDs	
Intermediate 1	Automatic reduction
Intermediate 2	No spin or Rinse hold

Z3 Styling
It can be combined with buttons with 3 LEDs. The combination is the same as that described for the previous version.
The following tables contain the possible configurations of the “Spin” button depending on the combination of LEDs:

button with 3 LEDs and “Rinse hold” option combined with this button				
Maximum spin speed (rpm)	600	700	800	900÷1400
Intermediate 1	400	500	600	700
Intermediate 2	No spin or Rinse hold	No spin or Rinse hold	No spin or Rinse hold	No spin or Rinse hold

Button with 3 LEDs and “Rinse hold” option not combined with this button					
Maximum spin speed (rpm)	600/700	800	900÷1000	1000÷1400	1300÷1400
Intermediate 1	500	600	700	900	1100
Intermediate 2	400	400	500	700	700

When a programme is selected, the LED corresponding to the configured spin speed comes on.
If the “Rinse hold” option is combined with another button and it is selected, all the LEDs will be turned off.

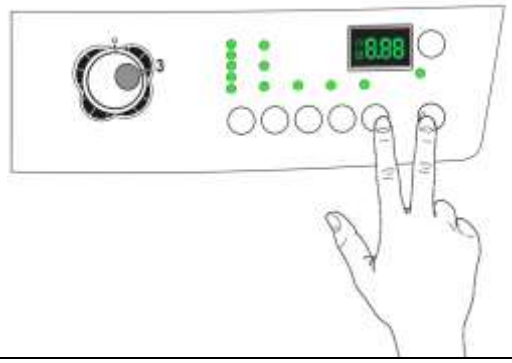
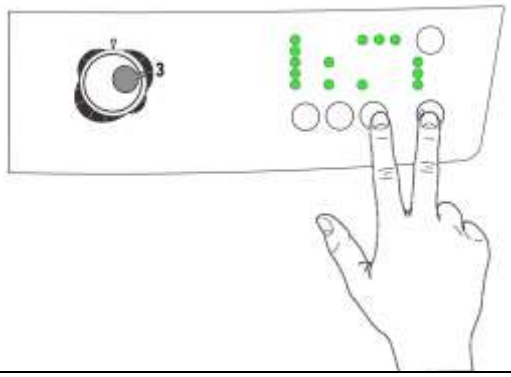
6 DEMO MODE SETTING

A special cycle allows demonstration of the operation of these appliances in shops, in a user interactive manner, without connecting them to the water mains:

- The interactive mode consists of selecting one of the programmes, adding any options and, once the start button has been pressed, the appliance will only perform certain of the phases of the programme, skipping those that cannot be performed (water fill, drain, heating).

The cycle takes place as follows:

- the door lock is enabled as usual (door locked during operation, possibility of opening it at the end of the cycle or when paused).
- Motor: all low speed movements are enabled, the pulses and spin are disabled,
- the water fill solenoid valves and the drain pump are disabled.
- Display: displays all the phases of the programme very quickly.
- Alarms: for safety reasons, the E40 (door closed), E50 (motor) and E90 (communication between boards/configuration) families of alarms are enabled.

Z 3	Z 6
	

1. Set the selector dial to position 0 (zero).
2. Press the **START/PAUSE** button and the nearest **option button** simultaneously (as shown in the figure).
3. Holding down the buttons, switch the appliance on by turning the programme selector **three positions clockwise**.
4. Hold the buttons down until the LEDs start to flash (at least 3 seconds).

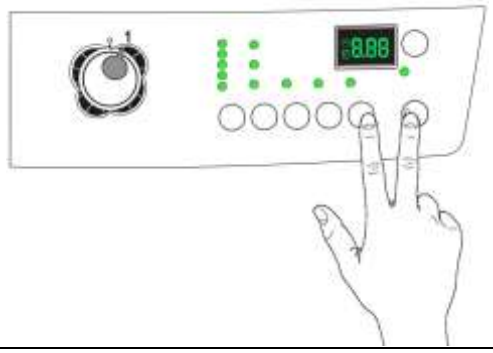
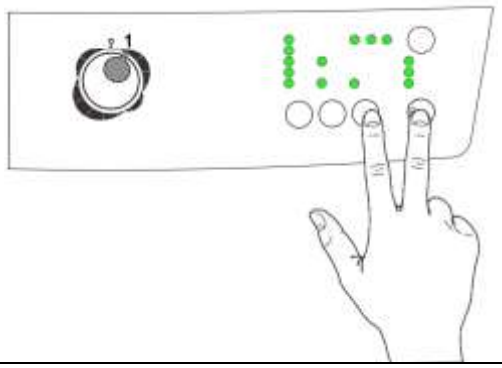
   Where a display is fitted, the message “DEM” is shown for 2 seconds.

6.1 Exiting DEMO mode

Unplug the appliance from the mains socket.

7 DIAGNOSTICS SYSTEM

7.1 Accessing diagnostics

Z3	Z6
	

1. Set the selector dial to position 0 (zero).
2. Press the **START/PAUSE** button and the nearest **option button** simultaneously (as shown in the figure).
3. Holding down the buttons, switch the appliance on by turning the programme selector **one position clockwise**.
4. Hold the buttons down until the LEDs start to flash (at least 2 seconds).

In the first position, the operation of the buttons and the related LEDs is checked; turning the programme selector dial **clockwise** runs the diagnostic cycle for the operation of the various components and reads any alarms.

7.2 Quitting the diagnostics system

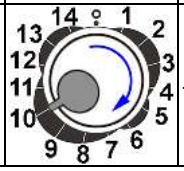
→ To exit the diagnostics system, turn the selector dial to position 0, turn the appliance back on and return the dial to position 0.

→ If *"ELE"* (electricity trials) appears on the screen when you turn the appliance on, repeat the operation of turning it on and off.

7.3 Phases of the diagnostics test

Irrespective of the type of electronic board and of the selector configuration, once the diagnostics system has been activated, turn the selector dial **clockwise** to run a check of the various components and read the alarms (as described in table 1)**.**
Concurrently, a control code of the selector (or of the second selector, where envisaged) is shown: in Z3 stylings on the display for **two** seconds, before displaying the contents of the last column in the table below, whereas in Z6 stylings the code is displayed by the LEDs coming on for **three** seconds (see table 2).
All alarms are enabled in the diagnostic cycle.

TABLE 1

Selector position		Components activated	Working conditions	Function tested	When a Display is present
1		- All the LEDs come on in sequence. - Pressing a button turns on the corresponding group or LED.	Always active	User interface functioning	
2		- 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		- Door safety interlock - Pre-wash solenoid valve	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill directly to tub	 Water level in the tub (mm)
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)
6		- Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Heating element	Door closed Water level above the heating element. Maximum time 10 mins up to 90°C. **(*)**	Reheating	 Temperature in °C measured using the NTC probe.
7		- Door safety interlock - Wash solenoid valve if the water level in the tub does not cover the heating element - Motor (55 rpm clockwise, 55 rpm anticlockwise, pulse at 250 rpm)	Door closed Water level above the heating element	Check for leaks from the tub.	 Drum speed in rpm/10
8		- 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
9	----	----	----	----	
10		- Reading/Deleting the last alarm	-----	----	

(*) 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 AGS (anti-unbalancing system) and no garments must be inside the appliance.

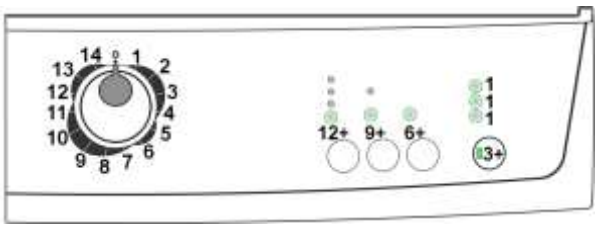
7.4 Selector efficiency check

Diagnostic testing also provides the opportunity to check the efficiency of the selectors.

7.4.1 Programme selector

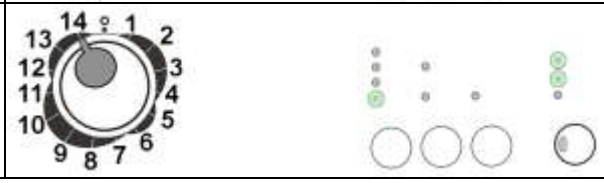
In the control panel illustrated below, the LEDs (lit) are linked to values.

By turning the dial, some of the LEDs come on, and summing the values with which they are linked gives the position of the dial (if the selector dial is efficient).



The table below includes all the possible selector control combinations:

TABLE 2

0		**1**	
2		**3**	
4		**5**	
6		**7**	
8		**9**	
10		**11**	
12		**13**	
14			

8 ALARMS

8.1 Displaying the alarms to the user

8.1.1 Z3 Styling

The alarms are displayed by the flashing red LED of the START/PAUSE button and simultaneously through the Display.

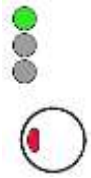
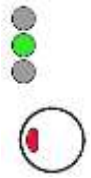
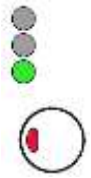
The alarms displayed to the user are listed below:

- **E10 - Water fill difficulty (tap closed)**
- **E20 - Drain difficulty (filter dirty)**
- **E40 - Door open**

8.1.2 Z6 Styling

Alarms are displayed by the red LED on the START/PAUSE button flashing along with one of the three LEDs above the START/PAUSE button.

The table below illustrates the various combinations of LED lightings.

E10		E20		E40	
Water fill difficulty (tap closed)		**Drain difficulty (filter fouled)**		**Door open**	

The aforementioned alarms (for both versions) can be remedied directly by the end user.

While the alarms listed below (for both versions):

- **EF0 – Water leakage (Aqua Control System)**
  It is displayed to the user, but technical assistance is required to repair it.

- **EH0 – Voltage or frequency outside normal values**
  It is necessary to wait for power supply voltage and/or frequency to restore nominal conditions.

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.

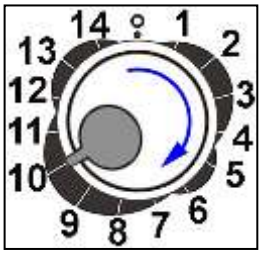
Certain alarm conditions require a drain phase to be performed before the door can be opened for safety reasons:

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

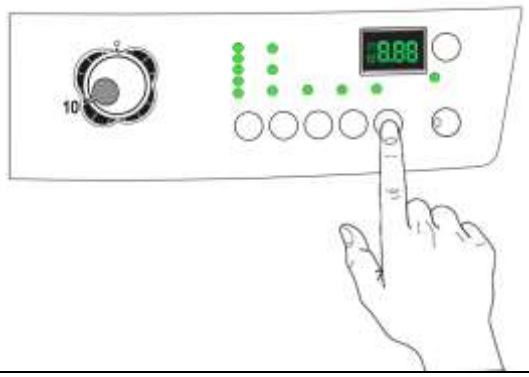
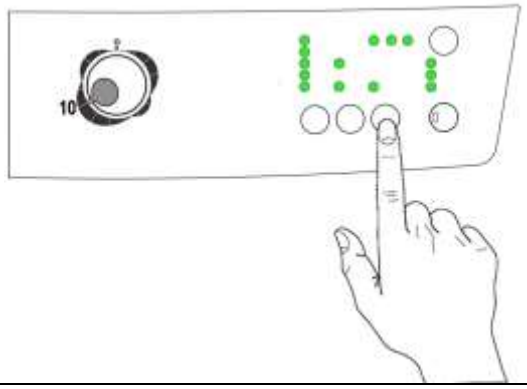
8.2 Reading the alarms

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

- Enter the diagnostic mode.
- Irrespective of the type of PCB and the configuration, turn the programme selector dial **clockwise** to the **tenth position.**



- The last alarm is displayed.
- To display the previous alarms, press the button to the left of the START/PAUSE button in sequence (as shown in the figure).

Z 3	Z 6
	

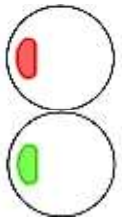
- To return to the last alarm, press the START/PAUSE button

8.2.1 Displaying the alarm

The alarm is displayed by a repeated flashing sequence of the START / PAUSE button red and green lights (0.5 seconds on, 0.5 seconds off with a 2.5 second pause between sequences).

- START / PAUSE button indicator with a red light → indicates the first digit of the alarm code (family)
- START / PAUSE button indicator with a green light → indicates the second digit of the alarm code (family internal number)

These two LEDs are present in all models.



Notes:

- The first letter of the alarm code "**E**" (Error) is not displayed, since this letter is common to all alarm codes.
- Alarm code families are expressed in hexadecimals; and therefore the letters:

→ **A** is represented by **10** flashes
→ **B** is represented by **11** flashes
→ ...
→ **F** is represented by **15** flashes

- Configuration errors are displayed by all LEDs flashing (user interface not configured).

8.2.2 Example of alarm display

Let us take alarm E43 (problem with the door safety TRIAC) as an example; the following will be displayed:

- a sequence of four flashes of the START / PAUSE button red light indicates the first number E**4**3;
- a sequence of three flashes of the START / PAUSE button green light indicates the second number E4**3**.

START / PAUSE button red light			START / PAUSE button green light		
On/off	**Time (Sec.)**	**Value**	**On/off**	**Time (Sec.)**	**Value**
	0.5	1		0.5	1
	0.5			0.5	
	0.5	2		0.5	2
	0.5			0.5	
	0.5	3		0.5	**3**
	0.5			0.5	
	0.5	**4**			
	0.5			2.5	Pause
	1.5	Pause			

8.2.3 Behaviour of the alarms during diagnostic testing

All alarms are enabled during diagnostic testing of the components.

8.2.4 Rapid reading of alarms

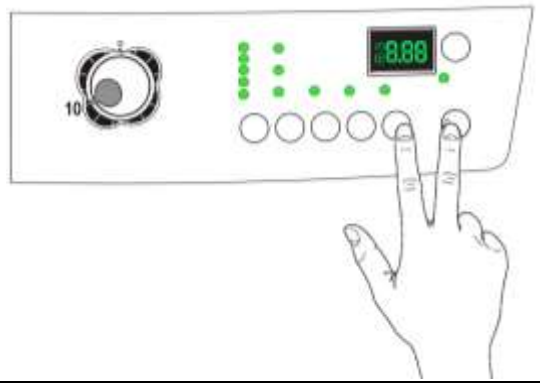
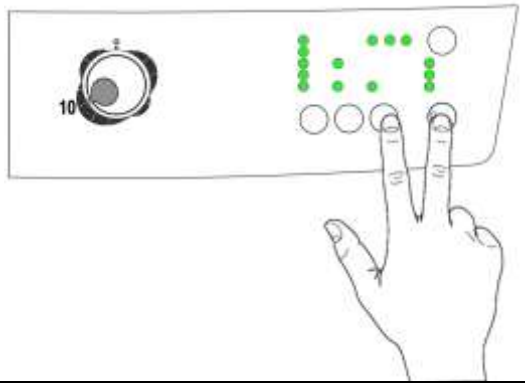
The last alarm can be displayed even if the programme selector is not in the tenth position (diagnostics) or if the appliance is in normal operating mode (e.g. during the execution of the washing programme):

→ Press the **START/PAUSE** button and the nearest **option button** simultaneously (as if you were entering DIAGNOSTIC mode) for at least 2 seconds: the LEDs initially switch off, and then display the flashing sequence indicating the last alarm.
→ The alarm continues to be displayed for the amount of time required, and then the display returns to its normal operation.
→ The alarm reading system is as described in sect. 8.2.
→ While the alarm is being displayed, the appliance continues to perform the cycle or, if in the programme selection phase, it maintains the previously selected options in memory.

8.2.5 Deleting the last alarms

Before deleting any alarms, make a note of the last alarm on the “Service Order” form.

- Delete them after reading them, to check whether the alarms re-occur during the diagnostic cycle.
- Delete them after repairing the appliance, to check whether they re-occur during testing.

Z 3	Z 6
	

1. Select diagnostics mode, turn the programme selector to the **tenth** position (alarm reading).
2. Press the **START/PAUSE** button and the nearest **option button** simultaneously (as shown in the figure).
3. Hold down the buttons until the LEDs stop flashing and the LCD display shows “E00” (at least 5 seconds).

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

9 ALARM SUMMARY TABLE

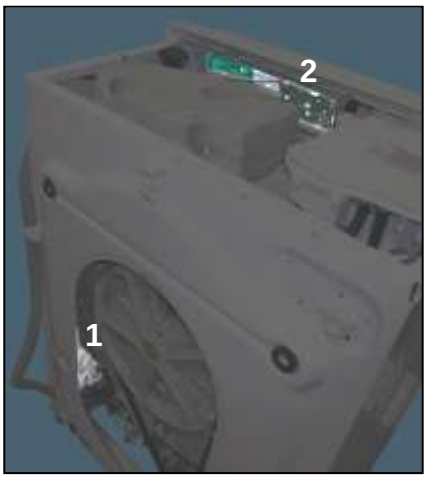
Alarm	Description	Possible fault	Machine status/action	Reset
E00	**No alarm**			
E11	**Water fill difficulty during washing**	Tap closed or water pressure too low; drain pipe improperly positioned; water fill solenoid valve faulty; leaks from water circuit on pressure switch; pressure switch faulty; wiring faulty; main PCB faulty.	Cycle is paused with door locked	START/RESET
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
E21	**Drain difficulty during washing**	Drain pipe kinked/fouled/improperly positioned; Drain filter clogged/fouled; Wiring faulty; Drain pump faulty; Pressure switch faulty; Main PCB faulty.	Cycle is paused (after 2 attempts)	START/RESET
E23	**Faulty triac for drain pump**	Wiring faulty; drain pump faulty; main PCB faulty.	Safety drain cycle - Cycle stops with door open.	RESET
E24	**Malfunction in drain pump triac "sensing" circuit (incorrect microprocessor voltage input)**	Main circuit board faulty.	Safety drain cycle - Cycle stops with door unlocked	RESET
E31	**Malfunction in electronic pressure switch circuit (pressure switch signal frequency out of limits)**	Wiring; Electronic pressure switch; Main PCB;	Cycle stops with door locked	RESET
E32	**Calibration error of the electronic pressure switch (The electronic pressure switch generates a signal with unstable frequency during the drain phase)**	Drain pipe kinked/clogged/improperly positioned; Solenoid valve faulty; Drain filter clogged/fouled; Drain pump faulty; pressure chamber; Pressure switch water circuit leaks; pressure switch; Wiring; main PCB;	Cycle is paused	START/RESET
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
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	ON/OFF RESET
E41	**Door open (after 20 sec.)**	Check whether the door is closed properly; Wiring faulty; door safety interlock faulty; Main circuit board faulty.	Cycle is paused	START/RESET
E42	**Problems with door lock Door still locked after 4' 25".**	Wiring faulty; door safety interlock faulty; Electrical current leak between heating element and ground; main PCB faulty.	Cycle is paused	START/RESET
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
E44	**Faulty "sensing" by door delay system**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET

Alarm	Description	Possible fault	Machine status/action	Reset
E45	**Faulty "sensing" by triac on door delay system (wrong microprocessor input voltage)**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET
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
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
E53	**Motor triac "sensing" circuit faulty (incorrect microprocessor input voltage)**	Main circuit board faulty.	Cycle blocked	RESET
E54	**Motor relay contacts sticking (voltage level high when the relay switches to OFF)**	Current leakage from motor or from wiring; Main PCB faulty;	Cycle blocked (after 5 attempts)	RESET
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
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
E68	**Current leakage to ground (value of mains voltage different from main value)**	Current leakage between heating element and ground.	The heating phase is skipped	START/RESET
E69	**Heating element interrupted**	Wiring faulty; Heating element for washing interrupted (thermal fuse open); Main PCB faulty.	----------	START ON/OFF RESET
E6A	**Heating relay sensing faulty**	Main circuit board faulty.	Cycle stops with door locked	RESET
E6H	**Heating element power relay faulty (inconsistency between sensing and K1 relay status)**	Current leakage between heating element and ground. Main circuit board 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
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	START/RESET
E83	**Error in reading selector**	Main PCB faulty (Incorrect configuration data).	Cycle cancelled	START/RESET
E86	**Selector configuration error**	Display board	----------	START ON/OFF RESET
E91	**Communication error between main PCB and display**	Wiring faulty; Control/display PCB faulty Main circuit board faulty.	----------	RESET
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
E93	**Appliance configuration error**	Main PCB faulty (incorrect configuration data)	Cycle blocked	ON/OFF

Alarm	Description	Possible fault	Machine status/action	Reset
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
E9C	**Display board configuration error**	Display board	----------	START ON/OFF RESET
EC4	**AGS current sensor faulty.**	Main board faulty.	Spin speed reduced to safety speed of 150 rpm	RESET
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
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.	Appliance drains	ON/OFF RESET
EF5	**Unbalanced load**	Final spin phases skipped.	----------	START/RESET
EF6	**Reset**	If it continues, replace the main board.	No action to be taken	----------
EH1	**Supply frequency of appliance outside the limits**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal frequency	ON/OFF
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

10 TECHNICAL CHARACTERISTICS

10.1 Electronic control



The electronic control is made up of:

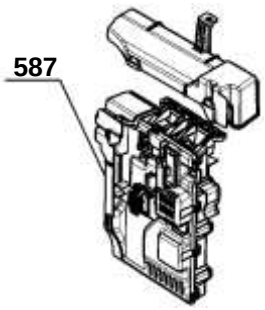
1. Main circuit board
2. Control/display circuit board

The control/display circuit board acquires the commands for cycle set-up. This board includes:
Buttons, LEDs, Display (where featured), programme selector and temperature control (where featured).
The commands acquired by the display board are sent to the main circuit board, which powers all the electrical components (solenoid valve, wash motor, drain pump, heating element and door safety device).

- It controls the temperature of the washing water via the NTC probe inserted in the heating element.
- It controls the motor rotation speed using the signal from the tachometric generator.
- It controls the level of water via the analogue pressure switch.

10.1.1 Programming/Updating the main circuit board

In the Service Notes the main circuit board (587) is identified with two spare parts codes:

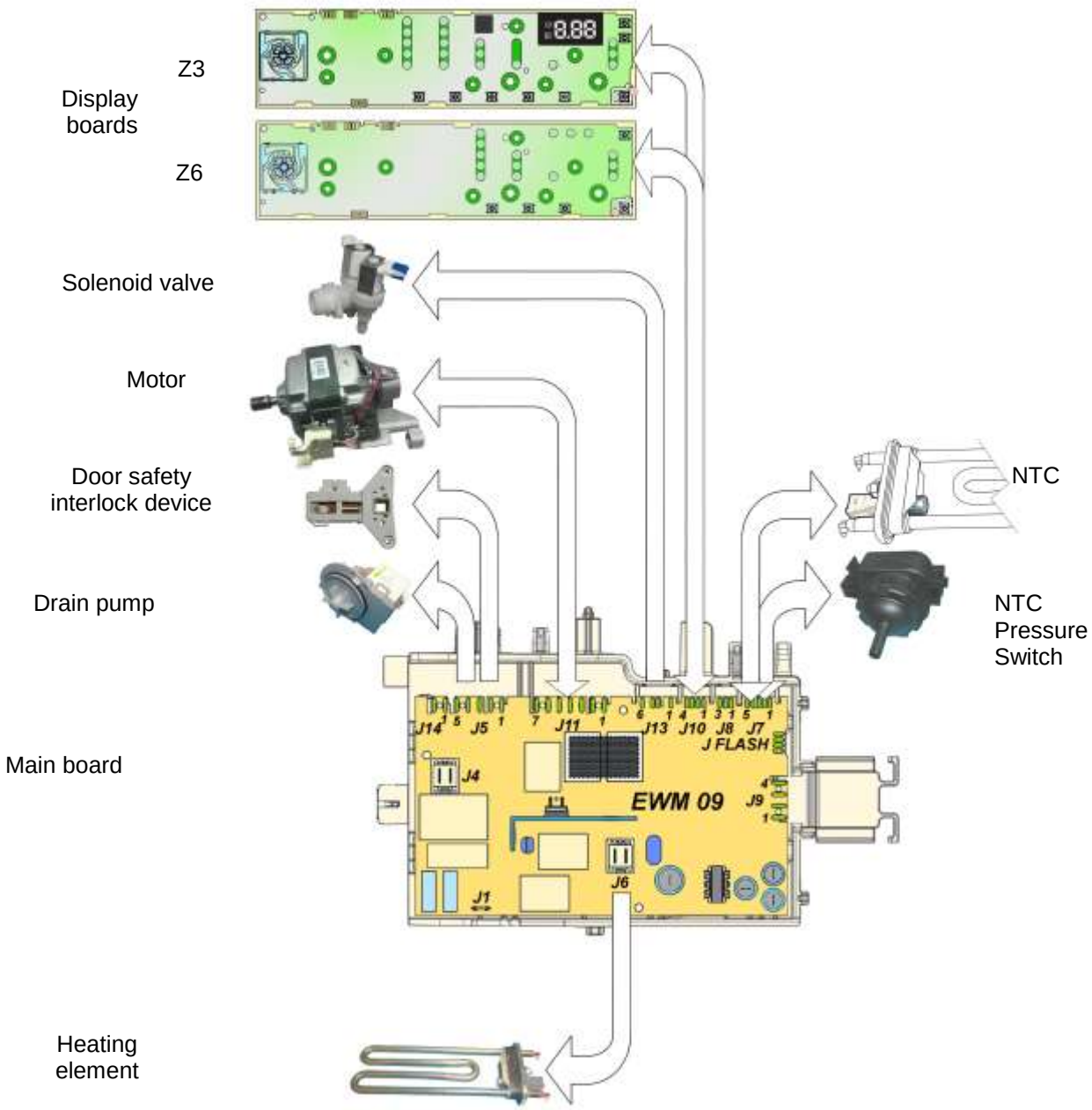


- Code 973 914… identifies the pre-programmed board.
- Code 132… identifies the unprogrammed board.

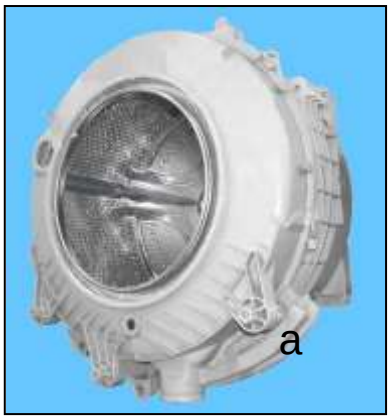
The circuit board can be programmed/updated using the **Sidekick** application.
For further information, please refer to the instructions provided/illustrated in the course entitled << **Guide to Sidekick** >> at the address (http://electrolux.edvantage.net) on the Electrolux Learning Gateway portal.

In order to update / programme the main board, insert the **Sidekick** connector in the position indicated by the red arrow:

10.2 Electrical features



10.3 Welded tub assembly



The welded tub consists of:
- a rear casing assembly
- a front casing

welded together.

The pressure chamber (a) is integrated into the tub assembly.
The supports to attach the respective counterweights can be found in the upper and frontal part.

The tub interior contains the drum assembly consisting of a STAINLESS steel casing to which the two flanges are seamed.

There are three built-in blades inside the drum and blocked to the drum with fins:

In the Super Slim and Slim unit

The blade is small (fig. a)

In the Full size unit

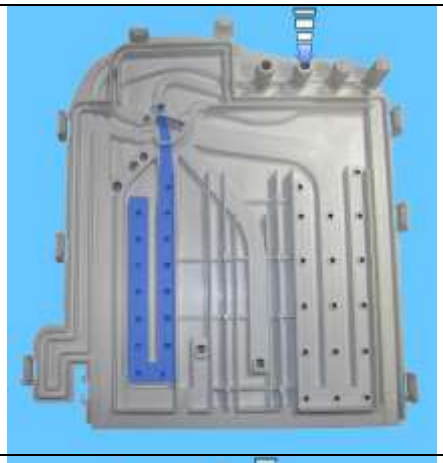
The blade is large (fig. b)

(For further information see par. 13.3.4 pag. 58)

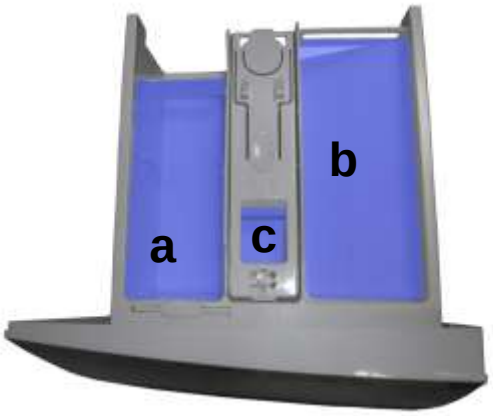
10.4 Detergent dispenser

New detergent drawer assembly, with a dispenser assembly incorporated at the front, which is inserted into the detergent inlet pocket of the porthole bellows seal.

Operating principle of the conveyor.

Water fill to pre-wash compartment (pre-wash solenoid) • This solution is used with the three compartment tray models: the detergent in compartment “b” is loaded at the start of the pre-wash phase.	
Water fill to wash compartment (wash solenoid) • In all models: compartment “a” is used to hold the detergent loaded at the start of washing. • In the event of stains, mix stain removers with the washing detergent (for powder detergent).	
Water fill to conditioner compartment (pre-wash and wash solenoid valves) • In all models: compartment “c” is used to contain the conditioner, which is removed with the water of the last rinse.	

10.5 Detergent drawer



10.5.1 Arranging the flap in the detergent dispenser

The detergent dispenser is designed for use with: powder detergent or liquid detergent.

The figure shows the detergent dispenser drawer for the use of powder detergent (and how it leaves the factory).

The arrow indicates the position in which the flap is inserted, which is used when using liquid detergent.

For the use of liquid detergent

Take the flap out of its seat

Insert it in the two rails at the centre of the washing tray.

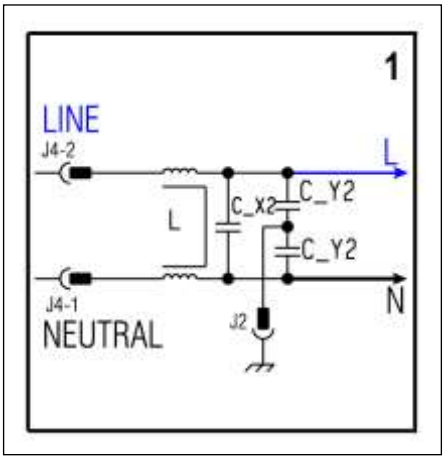
11 ELECTRICAL COMPONENTS

- **When replacing any of the components, please refer to the code shown in the list of spare parts relating to the appliance.**

11.1 Noise filter

General characteristics
This is a device that is connected to the electricity power line input of the appliance and prevents the emission of radio frequency noise. It is incorporated into the main board.

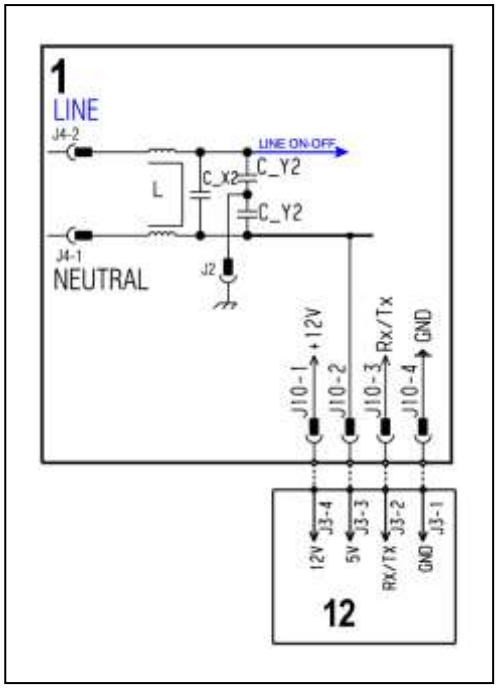
1. Main circuit board



11.2 Display board

The main circuit board (1) supplies the power supply voltage to the control and display board (12). The selector dial is used to select programmes. Selection of the options or start/pause is achieved using the buttons on the board (12). The buzzer - where featured - is powered by the display board.

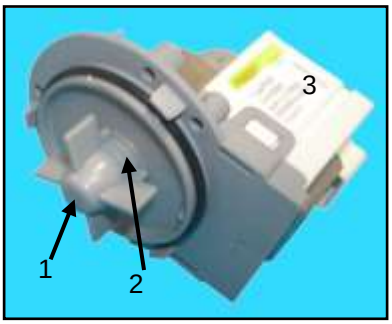
1. Main circuit board
12. Display board



11.3 Drain pump

- **When replacing the pump, please refer to the code shown in the list of spare parts relating to the appliance.**

11.3.1 General characteristics

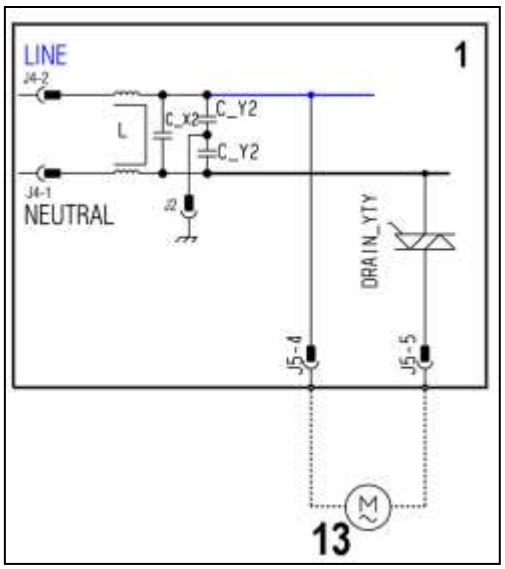


1. *Wheel*
2. *Rotor*
3. *Stator*

The pump, which drains the water at the end of the various washing cycle phases, is centrifugal and is actuated by a synchronous motor.
The rotor consists of a permanent magnet and the direction of rotation can be either clockwise or anticlockwise.
The rotor can turn by approximately a quarter of a revolution without turning the wheel. Consequently, if a foreign body is stuck in the wheel, the rotor can perform small movements clockwise and anticlockwise until the foreign body is released.
The flow rate of these pumps is approximately 22-25 l/min, and the maximum head is 90 cm.

Important!
Synchronous pumps, when powered on empty (disconnected from the water circuit), may not start in some cases because their very construction makes them need an antagonist torque on the wheel to allow the rotor to move in one of the two directions.
The pumps should therefore only be tested once fitted to the appliance, after a little water has been filled.

The drain pump is powered by the main circuit board through a triac, as follows:
- For a maximum pre-determined period (and an alarm might be displayed).
- Until the electronic pressure switch closes on empty, after which the pump is activated for a brief period or moves on to the next phase.

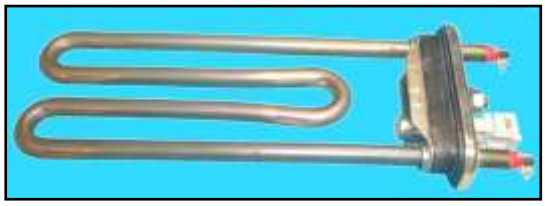


1. *PCB*
13. *Drain pump*

11.4 Heating element

	• **When replacing the heating element, please refer to the code shown in the list of spare parts relating to the appliance.** • **It is strictly forbidden to tamper with the heating element in any way!!! (e.g. replace the NTC probe, etc...)**

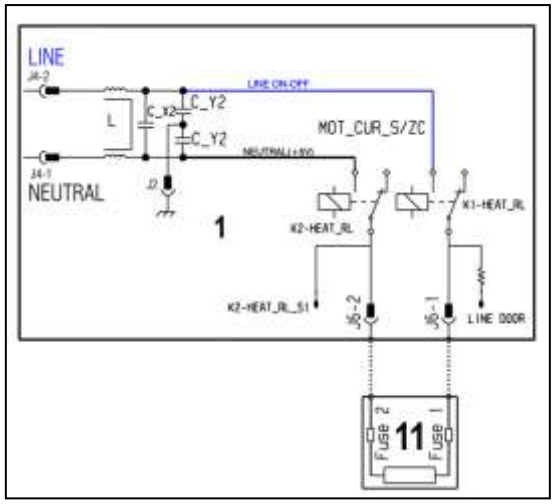
11.4.1 General characteristics



The heating element of the washing water is armoured, i.e. it is inserted in sealed tubular stainless steel casing.

It is powered by two relays (K1, K2) located on the circuit board. It is fitted with two thermal fuses which trip if the temperature of the heating element exceeds the values for which they were calibrated.

1. Main circuit board
11. Heating element

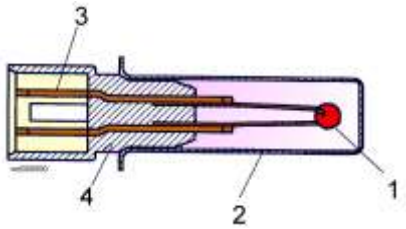


11.5 Temperature probe

	• **When replacing the heating element, please refer to the code shown in the list of spare parts relating to the appliance.** • **It is strictly forbidden to tamper with the heating element in any way!!! (e.g. replace the NTC probe, etc...)**

11.5.1 General characteristics

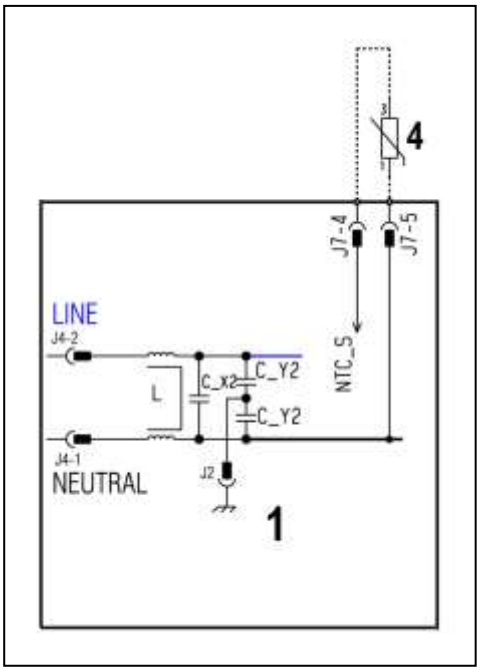
1. *NTC heating element*
2. *Metal capsule*
3. *Terminals*
4. *Plastic casing*



An NTC type probe is used to control the wash temperature: it is built in such a way that its internal resistance decreases as the temperature rises. This drop in resistance is detected by the electronic control which, when the desired temperature is reached, disconnects the heating element.

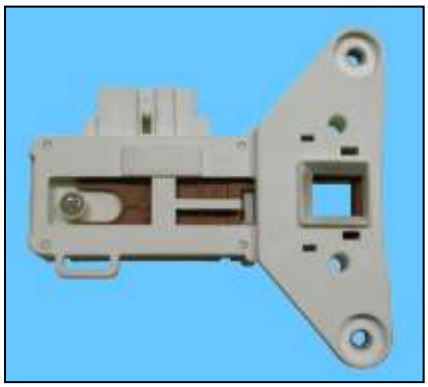
The temperature of the water is controlled by the circuit board by means of an NTC temperature probe incorporated in the heating element.

1. *Main circuit board*
4. *NTC probe*



11.6 Voltmetric door safety device with PTC

11.6.1 General characteristics



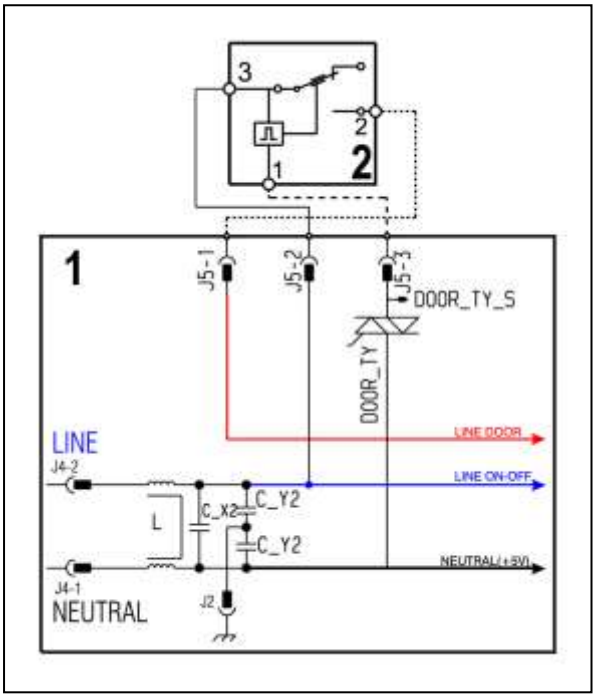
An electromechanical device is used as the door safety interlock, having the following functions:

- When powered, the voltmetric device closes the main switch which powers certain electrical components of the washing machine (only if the door is closed).
- During operation, the cursor remains mechanically blocked, preventing the door from opening when the appliance is running. Once the power supply is cut off, the door remains locked for 1-2 minutes to ensure that the drum has stopped before opening it.

In the applications analysed to this point, the door safety device was positioned after the anti-noise filter. Consequently, it powered all the electrical components of the appliance; in this platform, it only powered the solenoid valves and the motor.

- **Operating principle**

↳ Once the wash programme is started by pressing the start/pause button, the bi-metal PTC (contact 1) is powered by the triac on the circuit board (J5-3): after 2-4 seconds, the switch (3-2) powering the electrical components of the washing machine is closed.



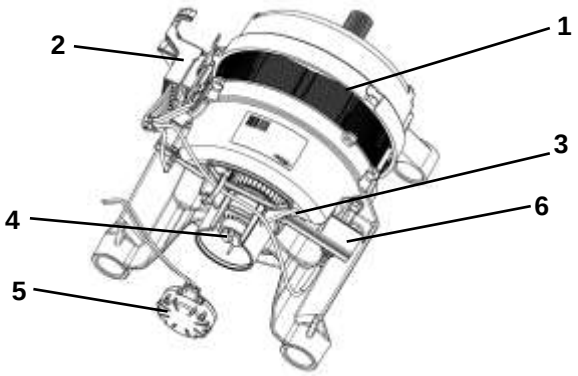
1. *Main circuit board*
2. *Door safety device - Traditional*

11.7 Motor

11.7.1 General characteristics

Collector motors are fitted on appliances with a spin speed of between 600 and 1400 rpm.

1. *Stator*
2. *Terminal board*
3. *Collector*
4. *Tachometric generator magnet*
5. *Tachometric generator coil*
6. *Brush*

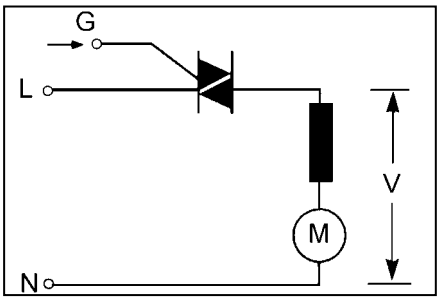


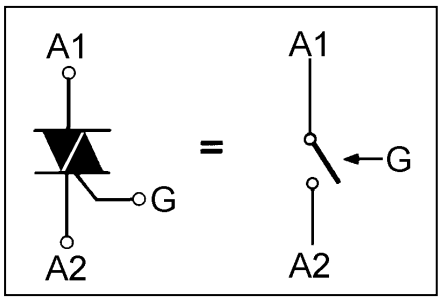
11.7.2 Operating principle

The stator winding is connected in series to the rotor winding (serial excitation).
Every section of the rotor winding is connected to a pair of collector blades (also referred to as a switching device). The electrical contact between the collector and the fixed circuit is made by two static brushes on the collector blades.
The motor rotation speed is in proportion to the supply voltage, supplied by an electronic control.
This type of motor is also referred to as “universal” because it can be powered by either alternating or direct current.

11.7.2.1 Motor speed control

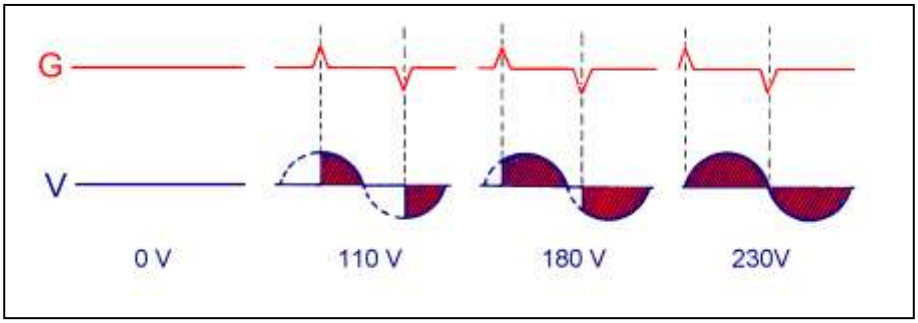
- This is achieved by an electronic control varying the voltage (V) applied to the motor.
- The method adopted is the “phase partialization” command of the TRIAC. The TRIAC is an electronic bidirectional switch. Closing of the circuit between A1-A2 (anodes) occurs when there are appropriate starting pulses on gate (G).





Starting pulses

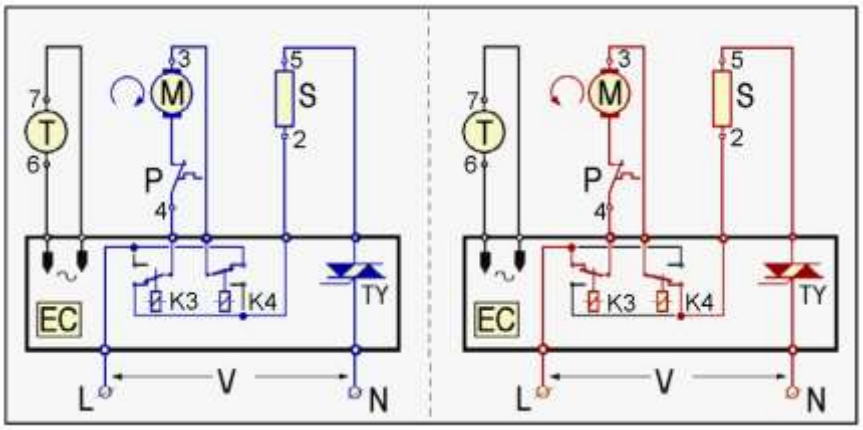
Voltage on the motor



11.7.2.2 Direction of rotation of the motor

The direction of rotation of the motor depends on how the windings of the stator and rotor are connected to one another. This connection is made by the circuit board relay contacts.

EC Electronic control
P Overheating cut-out (motor)
S Stator
M Rotor
T Tachometric generator
TY Triac
K3.4 Inversion relay

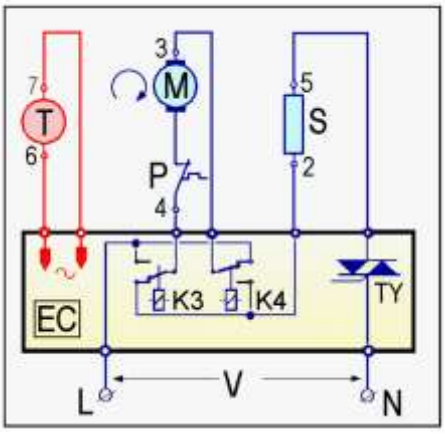


The drum rotates clockwise when spinning (seen through the door).

11.7.2.3 Tachometric generator

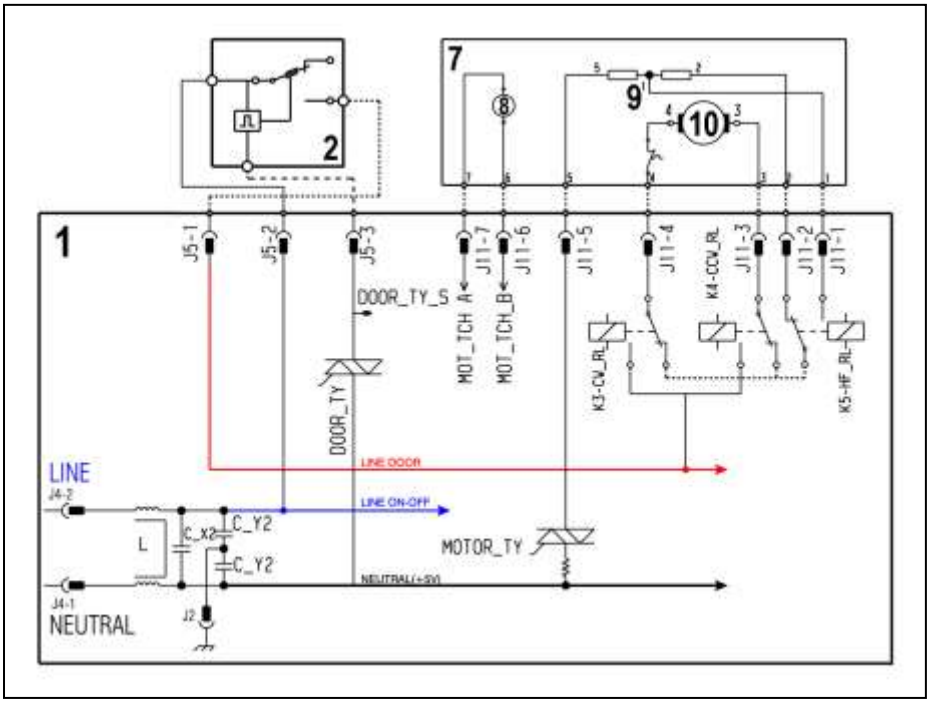
The speed of the collector motor, like all motors with serial excitation, depends on the load; so the speed decreases as the load increases. This makes it necessary for the power supply voltage to the motor, and therefore its speed, to be constantly controlled by an electronic speed control.
A tachometric generator, consisting of a magnet secured to the shaft and a coil, generates a voltage depending on the speed of the rotor, which is sent to the electronic control.
All the electronic controls have a protection system, which is more or less sophisticated, to avoid the operation of the motor in the event of a failure in the tachometric generator.

EC Electronic control
P Overheating cut-out (motor)
S Stator
M Rotor
T Tachometric generator
TY Triac
K3.4 Inversion relay



11.7.3 Power supply to motor

The PCB powers the motor via a triac; changes in the direction of rotation are achieved by switching the contacts on the two relays (K3-K4), which change the connection between the rotor and the stator.
In certain models, a third relay (K5) is used to power the stator (full or half field) according to the spin speed.
The motor speed is controlled by the signal from the tachometric generator.
During the spin phases, the micro-processor performs the anti-foam and the anti-balancing check procedure.



1. *Main circuit board*
2. *Door safety interlock*
7. *Universal motor*
8. *Tachometric generator*
9. *Stator*
10. *Rotor*

11.7.4 Anti-foam control system

The anti-foam control procedure is performed using the electronic pressure switch.

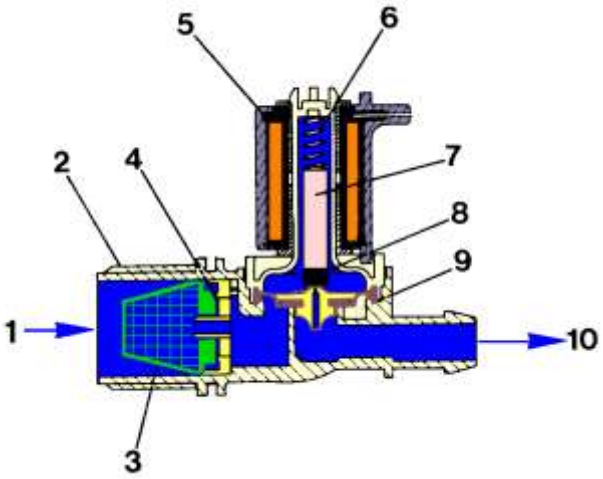
- **Spin with little foam:** if the pressure switch senses a “full” level, the spin phase is interrupted, the drain pump continues to operate and, when the pressure switch senses “empty”, the spin phase is resumed.
- **Spin with excess foam in the tub (critical situation):** this is recognised if the pressure switch senses full level on 5 occasions (five spin interruptions). If this occurs, the spin phase is skipped, and a one-minute drain cycle is performed with the motor stationary and, in the case of a washing phase, a supplementary rinse is added.

11.8 Solenoid valves

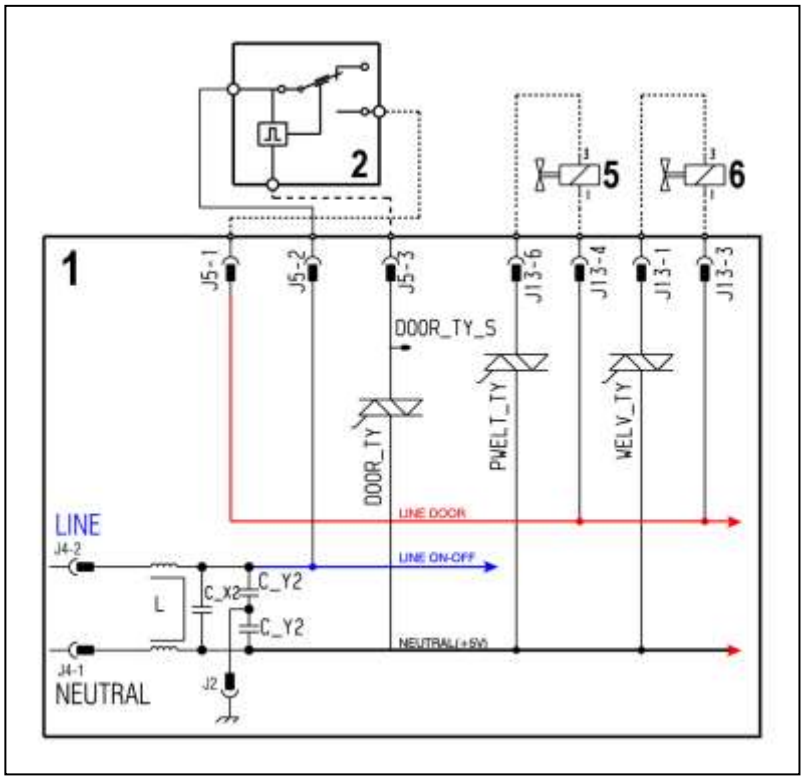
11.8.1 General characteristics

This component introduces water into the detergent dispenser and is controlled electrically by the main circuit board via Triac. The level of water in the tub is controlled by the analogue pressure switch.

1. *Water inlet*
2. *Solenoid valve body*
3. *Filter or needle trap*
4. *Flow reducer*
5. *Coil*
6. *Spring*
7. *Moving core*
8. *Rubber*
9. *Membrane*
10. *Water outlet*



When idle, the core, pushed by a spring, keeps the central hole of the membrane closed and so the latter hermetically seals access to the water inlet duct.
When the coil is powered, the core is attracted, releasing the central hole of the membrane. Consequently the valve opens.



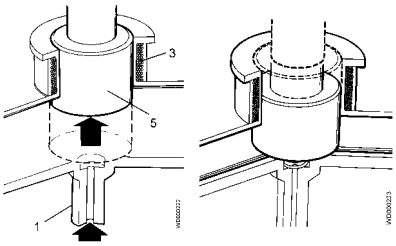
1. *Main circuit board*
2. *Door safety interlock*
5. *Pre-wash solenoid valve*
6. *Wash solenoid valve*

11.9 Tub water level control analogue pressure switch

11.9.1 General characteristics

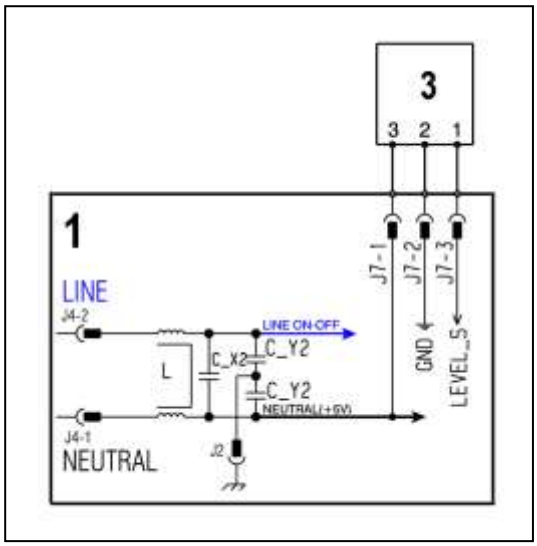
The electronic pressure switch is an analogue device that controls the water level in the tub, used in models with the electronic control system, and is connected directly to the main PCB.

1 pipe
3 oscillating coil
5 core

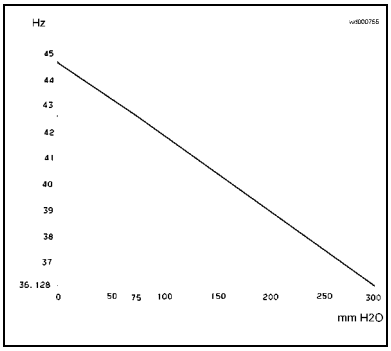


The pressure switch is connected via a pipe to the pressure chamber.
When water is introduced into the tub, this creates a pressure inside the hydraulic circuit that causes the membrane to change position. This in turn modifies the position of the core inside the coil, thus changing the inductance and the frequency of the oscillating circuit.
The PCB recognises how much water has been introduced into the tub according to the frequency.

1. *Main circuit board*
3. *Analogue pressure switch*

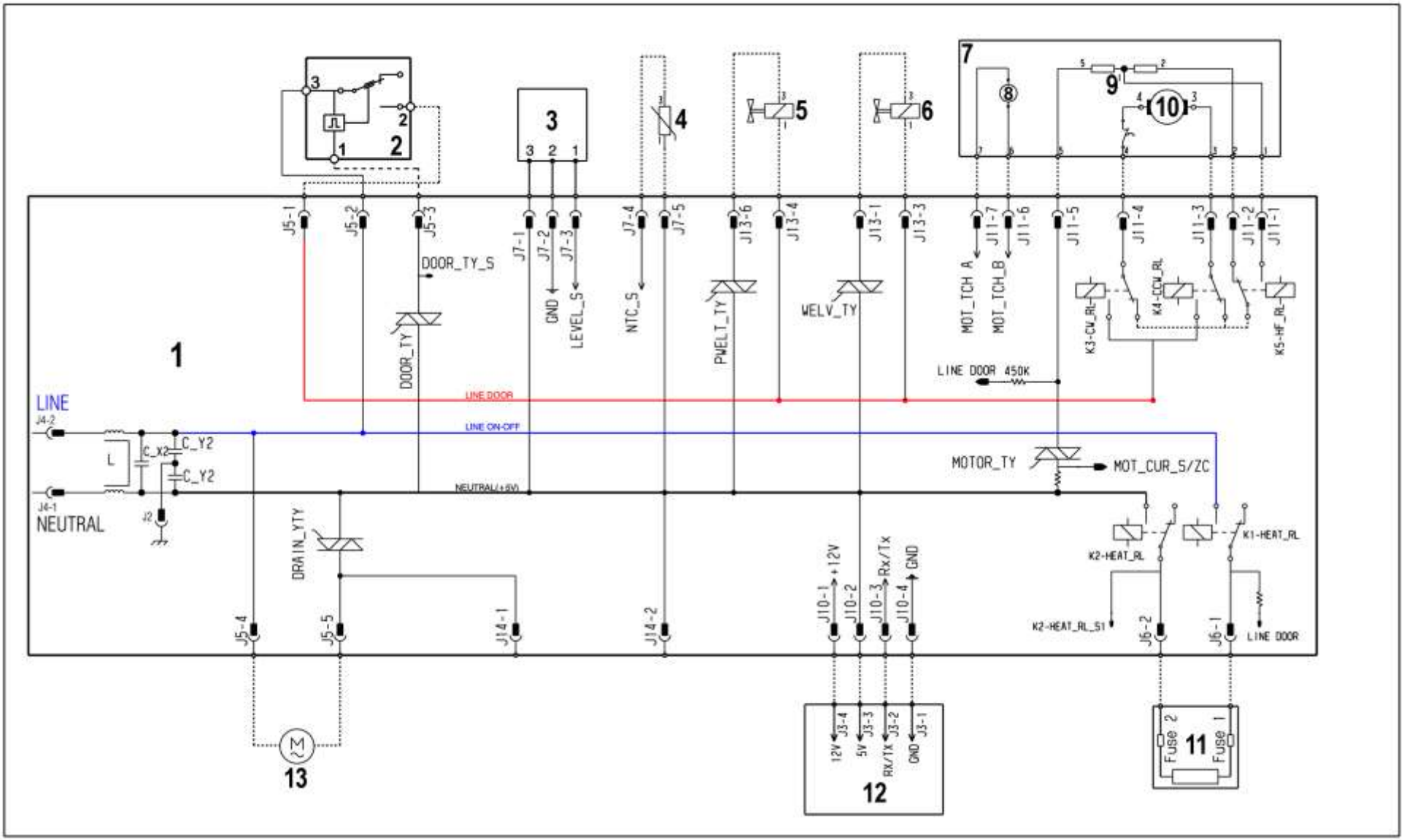


Operating frequency variation according to the quantity of water in the tub



12 MAIN ELECTRICAL CIRCUIT DIAGRAM

12.1 Diagram



12.2 Key to diagram

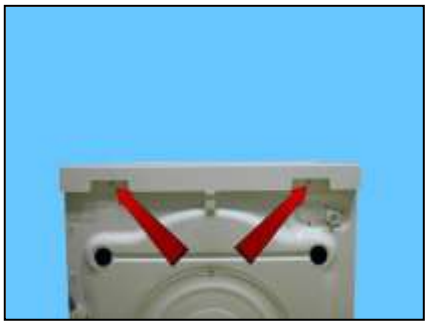
Appliance electrical components	PCB components	
1. Main circuit board	DRAIN_YTY	Drain pump Triac
2. Door safety interlock	DOOR_TY	Door interlock Triac
3. Electronic pressure switch	PWELT_TY	Pre-wash solenoid Triac
4. NTC	WELV_TY	Wash solenoid Triac
5. Pre-wash solenoid valve	MOTOR_TY	Motor Triac
6. Wash solenoid valve	K1	Heating element relay
7. Universal motor	K2	Heating element relay
8. Tachometric (motor)	K3	Motor relay: clockwise rotation
9. Stator (motor)	K4	Motor relay: anti-clockwise rotation
10. Rotor (motor)	K5	Motor relay: half-field power supply
11. Heating element		
12. Display board		
13. Drain pump		

13 ACCESSIBILITY

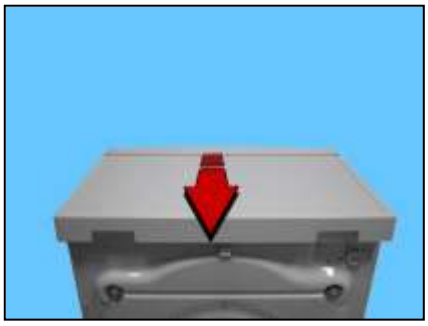
	**Take care because some of the appliance parts may have sharp edges**

13.1 Worktop

Remove the screws that secure it to the back panel

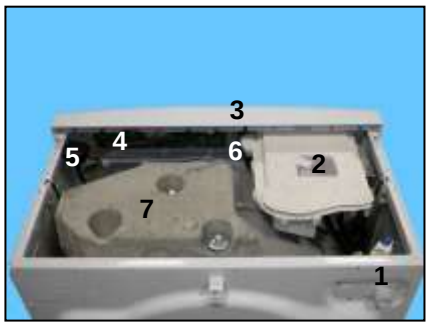


Pull it out from the back



13.2 From the worktop, you can access

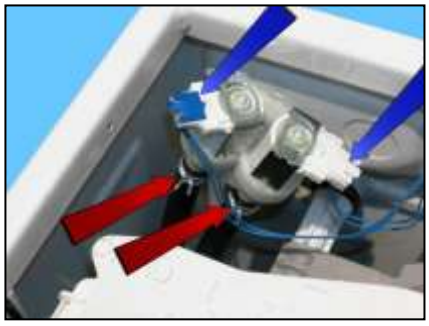
1. Solenoid valve
2. Detergent dispenser and conveyor
3. Control panel
4. Display board / light diffuser / buttons / buttons springs assembly.
5. Electronic pressure switch
6. Detergent/steam vent fill pipe
7. Top counterweight



13.2.1 Solenoid valve

Remove the worktop (see relevant paragraph).

Detach the connectors indicated by the blue arrows.
Pull out the pipes indicated by the red arrows, which connect the solenoid valve to the detergent dispenser.



Unscrew the water fill pipe from the solenoid valve.
Push the two retainers indicated by the arrows towards the inside of the appliance.
At the same time, turn the solenoid valve clockwise to remove it.

13.2.2 Control panel

Remove the worktop (see relevant paragraph).

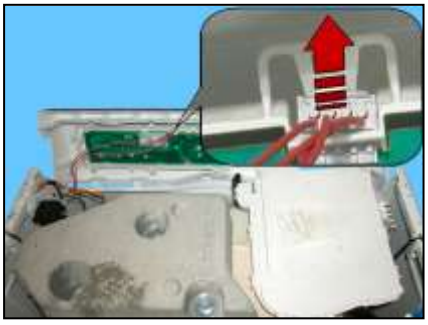
Pull the detergent dispenser out and at the same time press the stop locking it in place.

Loosen the screws that attach the control panel to the detergent tray.

Unscrew the two screws that hold the control panel to the unit, blue arrows, left side (seen from behind).

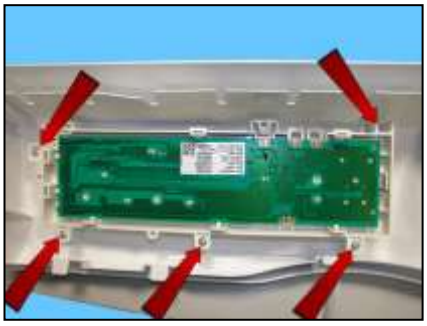
Unscrew the two screws that hold the control panel to the unit, blue arrows, right side (seen from behind).

Move the control panel forwards and remove the connector

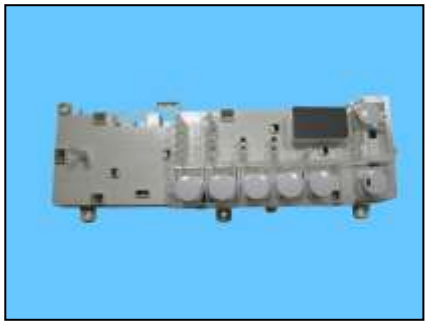


13.2.3 Display board/spring and button assembly

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).

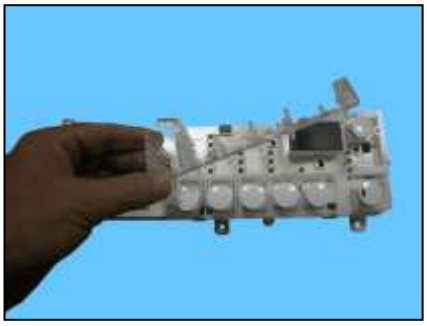


Remove the screws which secure the board assembly to the control panel.



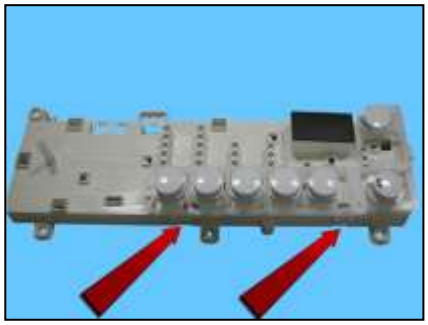
Display board with pushbuttons and light diffuser

- LED Light Diffuser

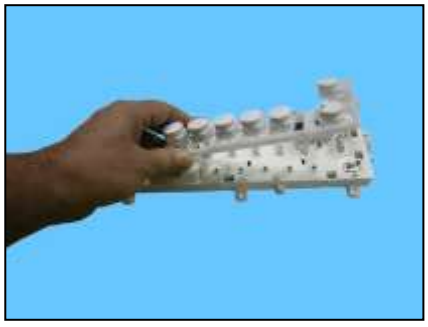


Remove it from its position

- Pushbutton support and Pushbuttons



Release the pushbutton support from the card casing



Remove the pushbutton support from its seat

13.2.4 Analogue pressure switch

Remove the worktop (see relevant paragraph).

Remove the connector (blue arrow)
Pull out the small pipe which connects it to the pressure chamber (red arrow)

Tighten the two tabs which secure it to the cabinet and remove it

Pressure switch

When re-assembling the pressure switch, position the pipe in the appropriate stops around the tub as shown in the figure to the side.

13.2.5 Detergent dispenser

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).

Remove the pipes that connect it to the solenoid valve.

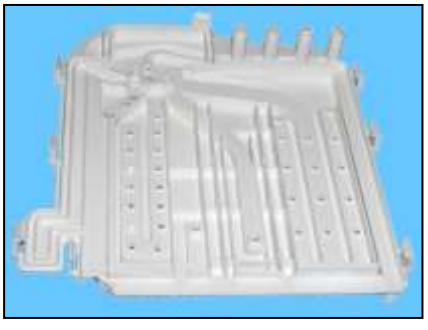
Lift the hook upwards that holds the steam vent pipe to the detergent dispenser and remove the pipe.

Lift the detergent dispenser upwards.
Use pliers to slacken the clamp that holds the detergent loading pipe.
Remove the detergent loading pipe.

- Conveyor

Unhook all the hooks (shown by the arrows) that attach it to the detergent dispenser.

Conveyor

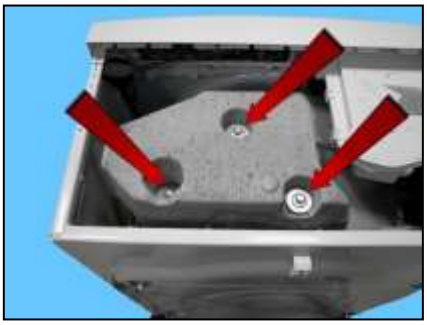


13.2.6 Detergent/steam vent and fill pipe

Remove the worktop (see relevant paragraph).
Remove the control panel
Remove the detergent dispenser (see relevant paragraph).

Remove the sleeve from the tub

When re-assembling the pipe to the dispenser apply a sealant like Bostik and make sure the reference points found on the dispenser and sleeve, correspond.



13.2.7 Top counterweight

Remove the worktop (see relevant paragraph).

Remove the three screws that secure it to the welded tub

Re-assembly: tighten the screws at a torque of 25÷28 N.

13.3 Accessing the front part

1. Bellow seal
2. Door hinge
3. Door
4. Door safety interlock

13.3.1 Bellow seal

Remove the iron ring securing the bellow seal to the cabinet.
Remove the bellow seal from the welded tub.
(take care as the seal is held in position by a snap ring).
Remove the small outlet pipe located in the lower part (fitted to the tub with Bostik that is resistant to water and high temperatures).

When reassembling the seal
Clean away the hardened sealant from the small outlet pipe's fixing hole of the bellow seal, before putting on new sealant.

Use liquid soap to lubricate the part traced in red where the tub is inserted.

13.3.2 Door hinge

13.3.2.1 Door hinge secured to cabinet with rivets

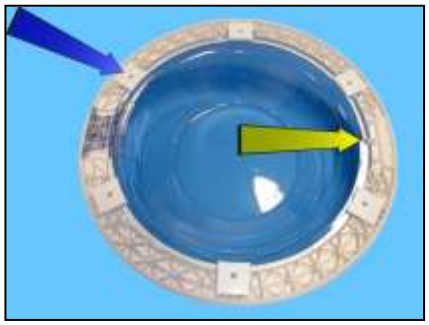
Loosen the three screws that hold the hinge to the frame of the washing machine door (red arrows).

Use a drill with a 4mm Ø point to drill four rivets (blue arrows) that hold the hinge to the unit.
Take care not to damage the bellow seal.

13.3.2.2 Door

Angle out the two frames, taking care not to break or scratch them.

Before intervening on the handle unit, make a careful note of the position of its various parts.



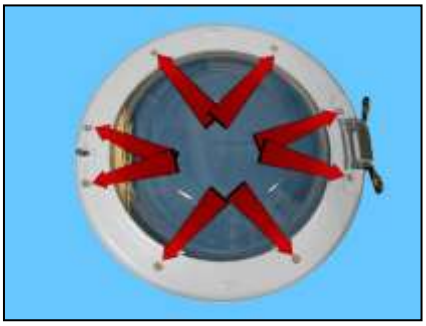
In order to remove the door glass, loosen the six screws and remove the respective plates (blue arrow) that hold it to the frame.

When repositioning the door pay attention to its right position by referring to the index indicated by the yellow arrow.

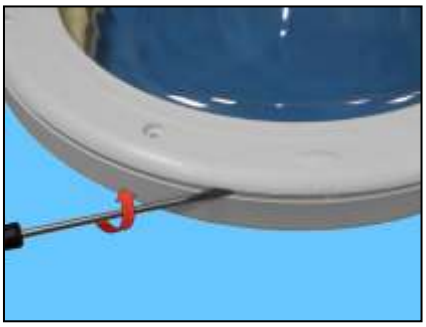
13.3.2.3 Door hinge secured to cabinet with screws

Loosen the two screws securing it to the cabinet

To access the door, loosen the screws joining the two front and rear door frames together



Insert the flat-tip screwdriver blade between the two frames to angle them out, taking care not to damage them.



Turn the door upside down and lift up the front frame

To remove the hinge, simply slide off the pin that secures it to the back frame

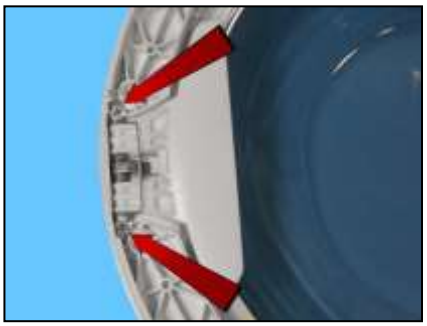
13.3.2.4 Door

In order to remove the door, release it from all the hooks that secure it to the back frame

When repositioning the door pay attention to its right position by referring to the index indicated by the red arrow

Before intervening on the handle unit, make a careful note of the position of its various parts.

Loosen the screws that secure it to the back frame

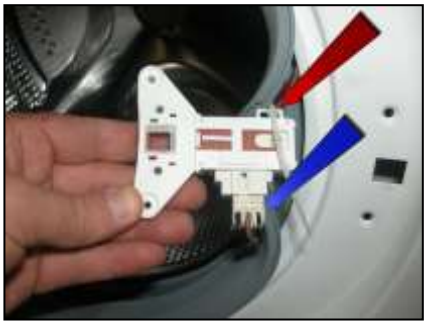


13.3.3 Door safety interlock

Remove the iron ring securing the bellow seal to the cabinet.

Remove the part of the bellow seal concerned from the unit.
Unfasten the two screws securing the door safety interlock to the front panel.

Cut the clamp (red arrow)
Remove the connector (blue arrow)

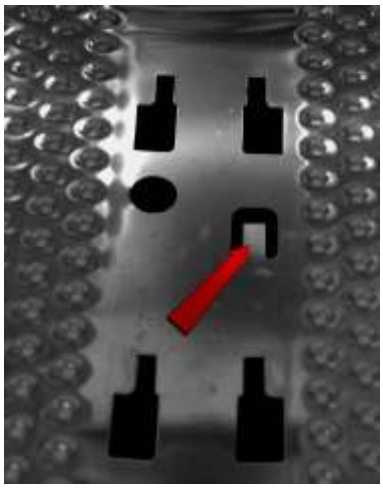
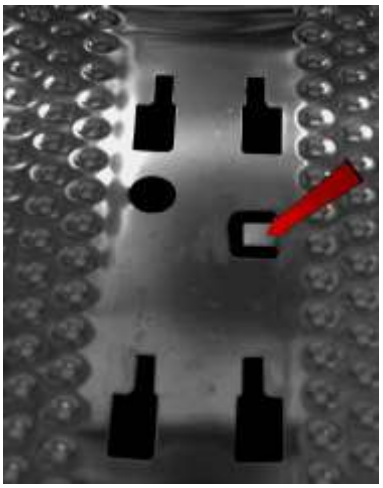


Recreate the initial conditions when re-assembling.

13.3.4 Blade

This blade is secured to the drum with slides and secured with a blade.

The appliances produced:

before Serial Number 420xxxxx	After Serial Number 421xxxxx
	
Are fitted with a tab which secures the blade in place, fitted at a right angle to the drum (see figure)	Are fitted with a tab which secures the blade in place, fitted in line with the drum (see figure)

To remove it from the drum:

Insert a flat-tip screwdriver (with a thin blade) into the blade hole as shown below:

For the small sized blade (hole 3)

For the normal sized blade (hole 5)

Same procedure for both blades (whether small or normal sized).

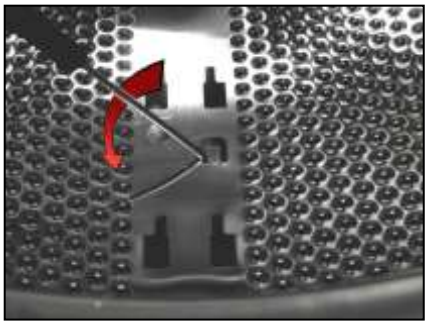
- Blades securing up to Serial Number 420xxxxx

To do that

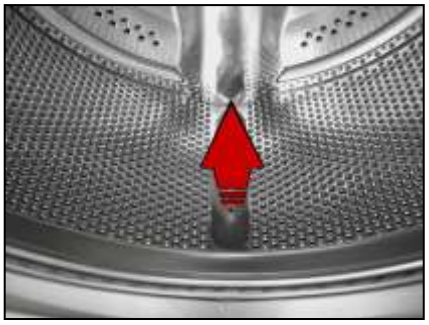
After inserting the screwdriver in the relevant hole

Tilt the screwdriver handle to the left.
Push the tab that secures the blade downwards.

When the fin has been lowered.
Slide the blade towards the front flange of the drum



Before securing the new blade
Lift up the fin in order to block the blade.



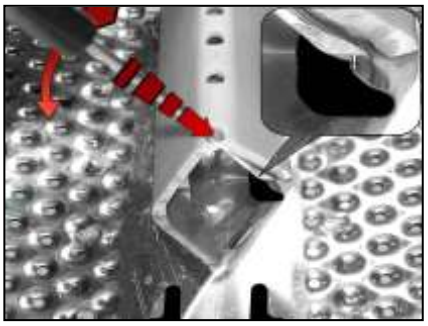
Position the new blade inside the drum guides.
Push it towards the back flange of the drum and check that it is blocked.
If it does not block, repeat the previous operation of lifting up the fin.

- Blades securing from Serial Number 421xxxxx

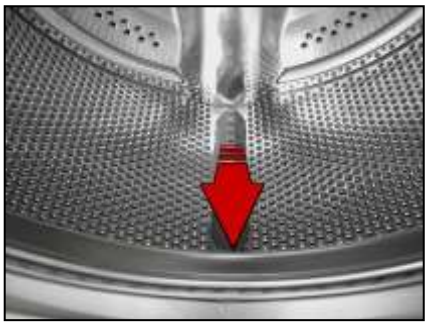
To do that

After inserting the screwdriver in the relevant hole

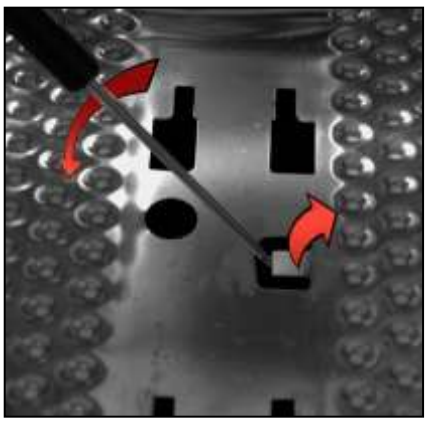
Tilt the screwdriver handle to the left.
Push the tab that secures the blade downwards.



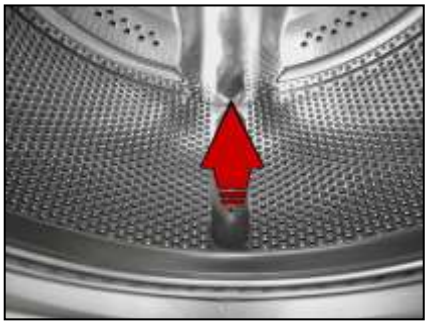
When the fin has been lowered.
Slide the blade towards the front flange of the drum



Before securing the new blade
Lift up the fin in order to block the blade.



Position the new blade inside the drum guides.
Push it towards the back flange of the drum and check that it is blocked.
If it does not block, repeat the previous operation of lifting up the fin.



13.4 Accessing the rear part

13.4.1 Back panel

Loosen the screws that fix the back panel to the unit.

13.5 From the back panel, you can access

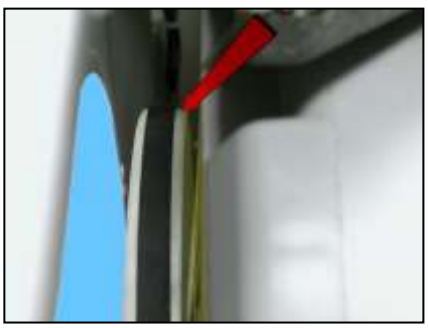
1. Belt
2. Pulley
3. Motor
4. Resistance
5. Main circuit board

13.5.1 Belt

Remove the back panel (see relevant chapter).
Hold the belt, and by turning the pulley, remove it.

When reassembling:
position the belt and align it with the centre of the pulley as shown in the figure.

Turning the pulley, check that the belt positions itself and remains in the central part of the pulley.



If necessary, adjust the position of the belt on the drive pulley, so that it is correctly positioned.

13.5.2 Pulley

Remove the back panel (see relevant chapter).
Remove the belt (see relevant chapter).
Insert a retainer to secure the pulley in place.
Unfasten the screw securing the pulley to the drum shaft.

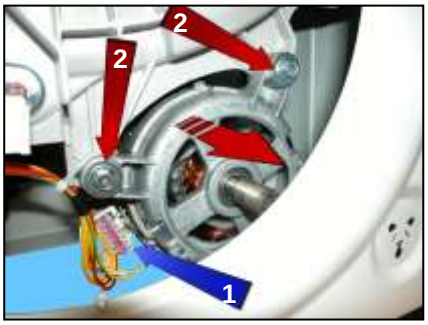
Tighten the screw at a torque of 25÷30 N.

13.5.3 Motor

Remove the back panel (see relevant chapter).
Remove the belt (see relevant chapter).

Disconnect the connectors (1): for the power supply and earthing.
Loosen the two front fixing screws (2)
Remove the motor in the direction of the traced arrow

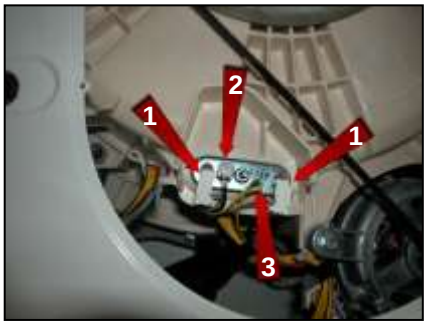
When reassembling, restore the connections.



13.5.4 Resistance

Remove the back panel (see relevant chapter).

Disconnect the connectors of the heating element (1), NTC probe (2) and earth (3).

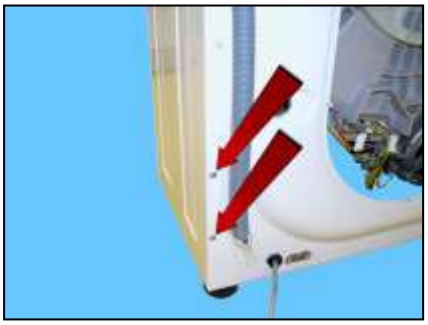


Unscrew the bolt to remove the heating element.

13.5.5 Main circuit board

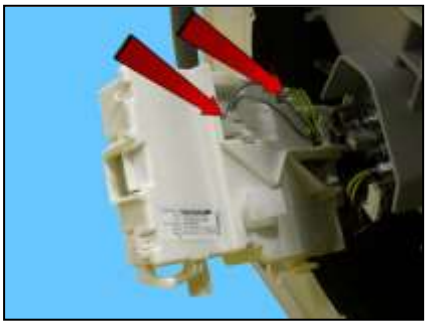
Remove the back panel (see relevant chapter).

Pull out the power supply cable connector
Pull out the wiring from the fixing hook.



Remove the two screws which secure the main board assembly to the back.

Pull out the connector of the branch of the heating element.



By pushing the washing unit of the appliance inwards, remove the main board assembly.
Detach the connectors indicated by the arrows.
Disconnect the drain pump power supply connectors.

	When handling/replacing the electronic board, 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.

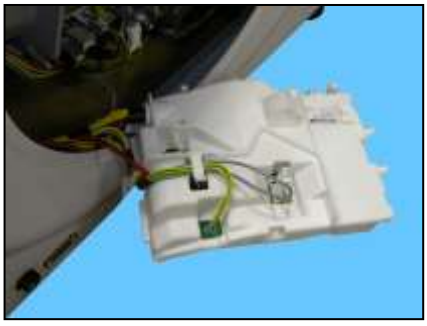
Open the main board assembly to remove the board and make note of the cabling layout

Main board

When re-assembling the main board, fit the connectors into their proper slots and arrange the cabling as shown in the figure ensuring that the various hooks block the board to the wrapping.

Close the lid.

Reconnect the various connectors, in particular, the drain pump and heating element ones.



Repeat the previous operations backwards in order to re-position the board in its place.

13.6 Bottom of the appliance

Always empty the water out of the drain circuit

Remove the fasteners that block the bottom of the unit

13.6.1 From the bottom of the appliance, you can access

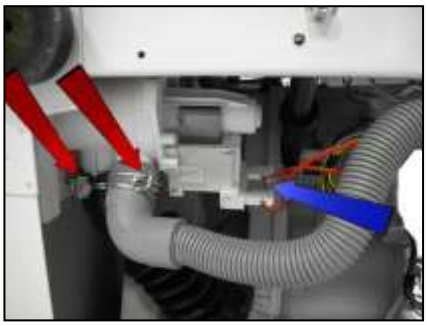
1. Drain circuit
2. Drain pump
3. Tub drain pipe
4. Shock absorbers

Set down the appliance in a horizontal position on a protected surface in order not to damage the unit.

13.6.2 Drain circuit

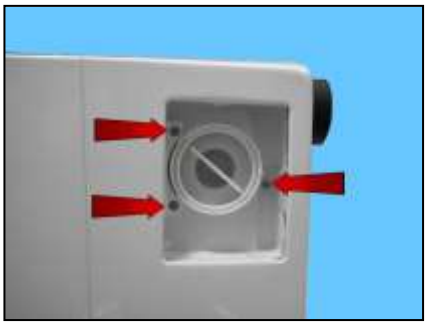
Filter body

Remove the panel



Disconnect the connectors from the discharge pump (blue arrow). Slacken the clamps that hold the main drain pipe and drain pipe that connects the welded tub (red arrows).

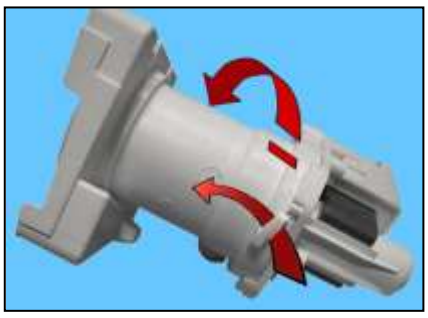
Loosen the three screws that fix it to the front.



Move it downwards.
Remove it towards the inside of the appliace

Filter unit and drain pump.

13.6.2.1 Drain pump



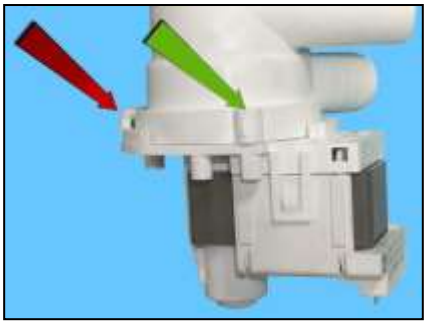
Remove the filter unit (see relevant paragraph)

In order to remove the pump from the filter unit:

Press the anti-rotation clip
Rotate the filter body (as shown by the arrows in the figure).

Drain pump

If the lock catch securing the pump to the filter body breaks (indicated by the red arrow).
Attach the pump to the filter body, securing it in place using a screw, screwing the latter in the slot (indicated by the green arrow)



Size of the screw 3.5x19 Code 5024 79 51-00/2

13.6.2.2 Tub drain pipe

Set down the appliance in a horizontal position on a protected surface in order not to damage the unit.

Loosen the screws to slacken the two clamps and remove the pipe.

Tub drain pipe

13.6.3 Shock absorbers

Set down the appliance in a horizontal position on a protected surface in order not to damage the unit.

The operations described here are valid for both shock absorbers.

Remove the pin that holds the shock absorber to the welded tub.

Loosen the screw that fixes it to the crosspiece.

13.6.4 Tub suspension springs

- Left spring (seen from the back part)

Attach the spring as shown in the figure:
the shortest leg faces towards the tub, whereas the longest leg faces towards the side.

- Right spring (seen from the back part)

The instructions provided for the left spring also apply to the right spring.

13.6.5 Welded tub assembly

Remove the back panel (see relevant paragraph).
Remove the worktop (see relevant paragraph).
Remove the detergent dispenser (see relevant paragraph).
Remove the whole control panel (see relevant paragraph).
Remove the bellow seal (see relevant paragraph).
Remove the solenoid valve (see relevant paragraph).
Remove the pressure switch including the small pipe (see relevant paragraph).
Disconnect the heating element cabling from the NTC probe and motor.
Set down the appliance in a horizontal position on a protected surface in order not to damage the unit.
Remove the shock absorbers (see relevant paragraph).
Remove the suspension springs
Slacken the clamp that holds the tub drain pipe to the filter unit assembly.
Slide out the tub

During re-assembly, take care when re-positioning the Bostik sealant in the right place and re-position the dot in the drain pipe.

13.6.6 Front counterweight

Follow the same steps described previously for the welded tub assembly, except the last paragraph where it talks about the sealant.

Screw in the retaining screws when re-assembling the counterweight onto the tub.

Revision	Date	Description	Author	Approved by:
00	07/2012	Document creation	DMM	XX – 0X/2012
01	07/2013	Page 34 Deleted table Page 54 Added “upper counterweight” photo Page 55 Changed paragraph 13.3.2 Added paragraphs 13.3.2.1 ÷13.3.2.4 and photo	DMM	XX – 0X/201X
02	06/2014	Page 34 Corrected last line from para. 13.3.5 to 13.3.4 Page 58 Amended/added disassembling blades and photos	DMM	XX – 0X/201X