





TC3	TC2
	

© ELECTROLUX HOME PRODUCTS
 Customer Care - EMEA
 Training and Operations Support
 Technical Support

Publication
 number

599 76 58-59

EN

Edition: 04/2013 - Rev. 00

**Washing machines
 with electronic control
 system**

EWM10931

Functional characteristics

INSPIRATION RANGE

TC3 TC2

INDEX

1	PURPOSE OF THIS MANUAL.....	5
2	WARNINGS.....	6
3	TC3 STYLING	7
3.1	General characteristics	7
3.1.1	General WM characteristics	7
3.1.2	Control panels	8
3.1.3	Styling.....	8
3.1.4	Control panel configuration	9
4	TC2 STYLING	16
4.1	General characteristics	16
4.1.1	General WM characteristics	16
4.2	Control panels	17
4.2.1	Styling.....	17
4.2.2	Time Manager and Eco Manager	23
5	DIAGNOSTICS SYSTEM.....	25
5.1	Access to DEMO settings for TC3 and TC2 stylings	25
6	DIAGNOSTICS SYSTEM.....	26
6.1	Accessing diagnostics.....	26
6.2	Quitting the diagnostics system	26
6.3	Phases of the diagnostics test	27
6.3.1	TC3 – TC2 styling	27
7	ALARMS.....	29
7.1	Displaying the alarms to the user.....	29
7.2	Reading the alarms	30
7.2.1	TC3 – TC2 styling	30
7.3	Rapid reading of alarms	30
7.4	Deleting the last alarm	31
8	OPERATING TIME COUNTER.....	32
8.1	Reading the operating time	32
8.1.1	TC3 – TC2 stylings.....	32
8.2	Display of total operating time.....	32
9	OPTIONS	33
9.1	Compatibility between options	33
9.2	Description of options.....	34
10	ALARM SUMMARY TABLE	36
10.1.1	Generating STEAM	45
11	TECHNICAL CHARACTERISTICS.....	46
11.1	Manufacturing characteristics	46
11.2	Detergent dispenser	47
11.2.1	Detergent dispenser.....	47
11.2.2	Detergent tray for Powder / Liquid detergents	47
11.2.3	Working principle of water dispenser	48
11.3	Washing unit	49
11.4	Water circuit	50
11.4.1	OKO version drain circuit	50
11.4.2	JET version drain circuit.....	50
11.4.3	JET circuit.....	50
11.4.4	ECO SPRAY Circuit.....	51
11.5	Electronic control.....	52
11.5.1	Connecting electric parts.....	53
12	ELECTRICAL COMPONENTS	54
12.1	Anti-disturbance filter	54
12.2	Display board	54
12.3	Drain pump.....	55
12.3.1	General characteristics	55
12.4	Circulation pump (where featured).....	56
12.5	Water control.....	57
12.6	Heating element	57
12.7	Temperature sensor.....	58
12.8	Analogue pressure switch.....	59
12.8.1	General characteristics	59
12.9	Door safety interlock	60
12.9.1	Delayed opening safety device	60

12.9.2	Safety device open lid (without micro)	61
12.9.3	Safety device open lid (with micro)	62
12.10	Three-phase asynchronous motor - Inverter.....	63
12.10.1	Power supply to motor	63
12.11	Inverter board.....	64
12.11.1	AGS.....	65
12.12	DSP drum positioning device (Drum – Self – Position)	67
12.12.1	DPS operating control	67
12.13	Solenoid valves	68
12.13.1	Operating principle	68
12.13.2	Problems relating to the solenoid valves	69
12.14	Flow meter.....	70
12.14.1	Operating principle of the flow meter	71
12.15	Drum light (where featured)	72
12.15.1	Internal drum lighting.....	72
13	DIAGRAMS	73
13.1	WM diagram with THREE-PHASE ASYNCHRONOUS MOTOR	73
13.2	Key to diagram	74
14	ACCESSIBILITY.....	75
14.1	Control panel.....	75
14.1.1	Dismantling.....	75
14.1.2	Assembly.....	76
14.2	Control circuit	76
14.3	Display/selector board assembly	77
14.4	Cover.....	77
14.5	Water dispenser	78
14.6	Sides	78
14.7	Electronic pressure switch	79
14.8	Solenoid valves	79
14.9	Air break.....	80
14.10	Motor control board	80
14.11	Main board	81
14.12	Frontal piece	82
14.13	Door Lock.....	82
14.14	Drum Light (where featured)	83
14.15	Eco Spray Circuit	84
14.16	Base board.....	84
14.17	Transport roll	85
14.18	Bellow seal	85
14.19	Inlet.....	88
14.20	Counterweights	90
14.20.1	Right counterweight	90
14.20.2	Left counterweight.....	90
14.21	Shock absorbers	91
14.22	Pulley.....	92
14.23	Drum position sensor DSP.....	92
14.24	Heating element	93
14.25	Drum rotation motor	93
14.26	Water control sensor	93
14.27	Drain pump and circulation pump	94
14.27.1	Bottom lid	94
14.27.2	Drain pump.....	95
14.27.3	Circulation pump	95
14.28	Bearings	96
14.28.1	Bearing support unit with seal ring	96
14.28.2	Bearing support unit with no seal ring.....	97
14.29	Remove the washing unit.....	98

1 PURPOSE OF THIS MANUAL

The purpose of this manual is to provide service engineers who are already familiar with the repair procedures for traditional washing machines with information regarding washing machines fitted with the EWM10931 electronic control system.

Previous platforms (electronic/mechanical) used a safety pressure switch which controlled the minimum water level in the tub, beneath which the supply to the heating element was interrupted.

The current electronic appliances manufactured (EWM10931 platform), use a heating element with thermal fuses (inside its branches) for safety, which interrupt in case of temperature overload caused by the water level dropping 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
- Settings: Demo, Diagnostics
- Alarms
- Technical and functional characteristics
- Accessibility

Low consumption mode

In order to reduce electricity waste when the cycle is not running, the appliances on this platform are designed to enter consumption reduction mode:

“Stand-Off” mode

When the appliance is switched off at the ON/OFF button, it is in the “Stand-Off” or “virtual” off status. The LEDs and the LCD screen are turned off and the sensors are disabled, although the main circuit board and certain electrical components are electrically powered.

“Auto-off” mode

If, after 5 minutes, during the programme selecting phase or after the end of the cycle, the appliance receives no further instructions, it is automatically turned off (for energy savings in conformity with the standards on energy consumption).

All the settings are stored so that when the appliance is turned back on, the programme is ready or if the auto-off mode was triggered after the end of the cycle, the user can see that the cycle ended normally, and can restart it if necessary.

You have to unplug the appliance to cut off the power supply

“Zero Watt” mode

Some appliances are fitted with a circuit (in the main circuit board) called Zero Watt (0 Watt with an actual consumption ~50 mW) which cuts off the power supply to the appliance:

- a. When you press the ON/OFF button to turn off the appliance, the Zero Watt circuit is triggered and cuts off the supply voltage after a few seconds, just long enough to secure the washing machine (motor off, door locked, etc.), the cycle and any options selected are reset, so that the next time the appliance is turned on, it is ready to perform the programme.
(To open the door, you will have to wait one or two minutes for the door safety lock to be released).
- b. If, after 5 minutes, during the programme selecting phase or after the end of the cycle, the appliance receives no further instructions, it is automatically turned off and the Zero Watt circuit which cuts off the supply voltage is triggered (for energy savings in conformity with the standards on energy consumption). All the settings are stored so that when the appliance is turned back on, the programme is ready or if the auto-off mode was triggered after the end of the cycle, the user can see that the cycle ended normally, and can restart it if necessary.

If an alarm goes off when a wash programme is running, the automatic turn off is disabled showing the alarm.

2 WARNINGS



- **Any work on electrical appliances must only be carried out by qualified technicians.**
- **Before servicing an appliance, check the efficiency of the electrical system in the home using appropriate instruments. For example: refer to the indications provided/illustrated in the <<metrater>> course at the address (<http://electrolux.edvantage.net>) on the Electrolux Learning Gateway portal.**
On completing operations, check that the appliance has been restored to the same state of safety as when it came off the assembly line.
- **If the circuit board has to be handled/replaced, use the ESD kit (Code 405 50 63-95/4) to avoid static electricity from damaging the circuit board, see S.B. No. 599 72 08-09 or consult the course <<Electrostatic charges>> at the address (<http://electrolux.edvantage.net>) on the Electrolux Learning Gateway portal.**
- **This platform is not fitted with an ON/OFF switch. Before you access internal components, take the plug out of the socket to cut the power supply.**
- **Make resistance measurements, rather than direct voltage and current measurements**
- **Warning the sensors located on the display board could be at a potential of 220 Volts.**
- **When replacing the heating element, replace it with one that has the same characteristics (2 thermal fuses) in order not to compromise the safety of the appliance. Do not remove/switch the NTC sensors between heating elements.**
- **Always empty the appliance of all the water before laying it on its side (see the relevant paragraph).**
- **Never place the appliance on its right side (electronic control system side): some of the water in the detergent dispenser could leak onto the electrical/electronic components and cause these to burn.**
- **When replacing components, please refer to the code shown in the list of spare parts relating to the appliance.**



3 TC3 STYLING

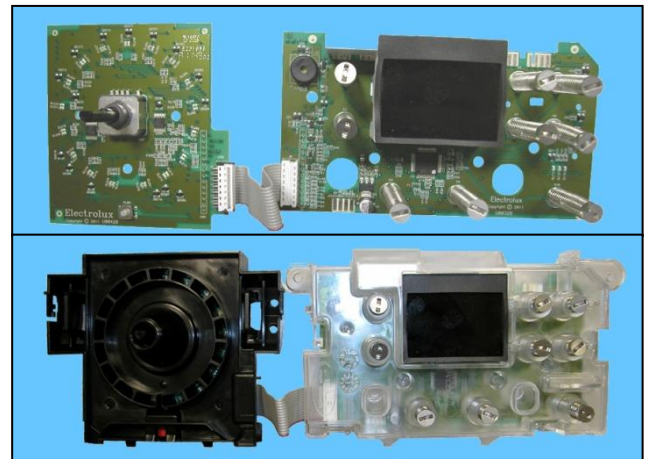
3.1 General characteristics

The TC3 styling has a single ON/OFF button, all the other choices/adjustments are made by skimming your finger over the touch sensors, which replace the buttons used so far.

In the event of problems with the touch sensors (difficulty selecting/adjusting them), clean and dry the display and do not wear gloves when setting the chosen programme.

The EWM10931 electronic control system consists of two circuit boards plus the motor control system (inverter) for washing machines.

↗ The control/display circuit board, inserted in a plastic box, secured to the control panel (the figure illustrates: the display board with the side socket in which the selector is fixed, connected together by a flat cable, and the display board assembly).



↗ The main circuit board is positioned at the rear of the appliance and receives commands from the display board, powers the electrical components as well as communicating with the motor control board (Inverter).

3.1.1 General WM characteristics

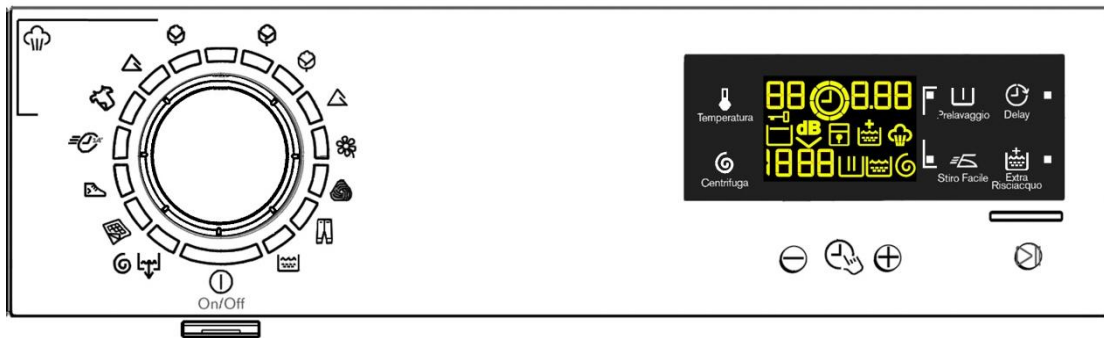
No. of buttons	<ul style="list-style-type: none"> ▪ Max 1 (ON/OFF)
No. of sensors	<ul style="list-style-type: none"> ▪ Maximum 9 (8 options + 1 start/pause)
No. LEDs	<ul style="list-style-type: none"> ▪ Maximum 22 + LCD
Programme selector	<ul style="list-style-type: none"> ▪ 14 positions (incorporated in the circuit board)
Serial port	<ul style="list-style-type: none"> ▪ DAAS-EAP communication protocol up to 115,200 baud
Power supply voltage	<ul style="list-style-type: none"> ▪ 220/240 V ▪ 50/60 Hz (configurable)
Washing type	<ul style="list-style-type: none"> ▪ Traditional with "Eco-ball" ▪ Jet-System
Rinsing system	<ul style="list-style-type: none"> ▪ Traditional with "Eco-ball" ▪ Jet-System ▪ Eco Spray
Motor	<ul style="list-style-type: none"> ▪ Two-pole asynchronous (three-phase), with tachometric generator
spin speed	<ul style="list-style-type: none"> ▪ 400÷1,600 rpm
Anti-unbalancing system	<ul style="list-style-type: none"> ▪ AGS
Cold water fill	<ul style="list-style-type: none"> ▪ 1 solenoid valve with 1 inlet – 2 or 3 outlets
Hot water filling	<ul style="list-style-type: none"> ▪ 1 solenoid valve with 1 inlet – 1 outlet
Detergent dispenser	<ul style="list-style-type: none"> ▪ 3 compartments: pre-wash/stains, wash, conditioner ▪ 4 compartments: prewash, wash, stain remover and conditioners
Control of water level in the tub	<ul style="list-style-type: none"> ▪ Electronic/analogue pressure switch
Door safety interlock	<ul style="list-style-type: none"> ▪ Instantaneous
Heating element heat output	<ul style="list-style-type: none"> ▪ 1,950 W with thermal fuses incorporated
Temperature check	<ul style="list-style-type: none"> ▪ NTC probe incorporated in the heating element
Buzzer	<ul style="list-style-type: none"> ▪ Traditional incorporated in the PCB
Sensors	<ul style="list-style-type: none"> ▪ Water fill gauge (2÷12 l/m flowmeter) ▪ Drum position ▪ Water control

3.1.2 Control panels

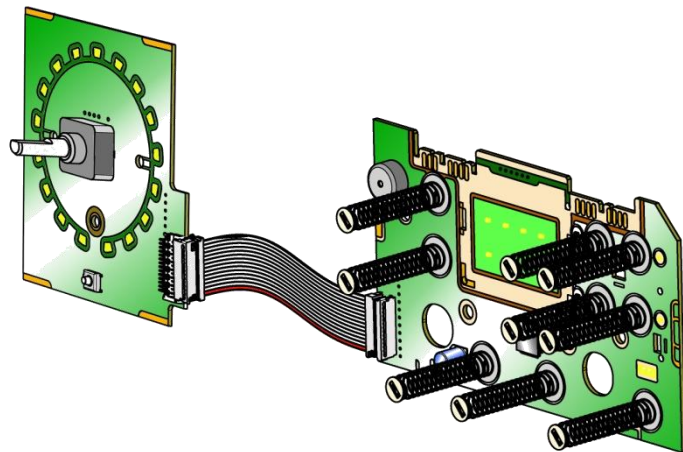
3.1.3 Styling

- Max. 1 Button
- Max. 9 sensors
- 14 position programme selector
- 22 LEDs
- 1 LCD

Version WM

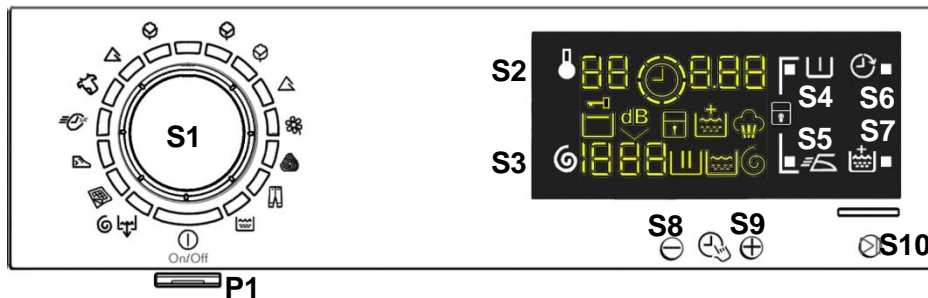


- Positioning of LEDs and sensors



3.1.4 Control panel configuration

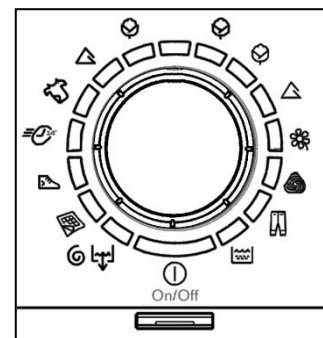
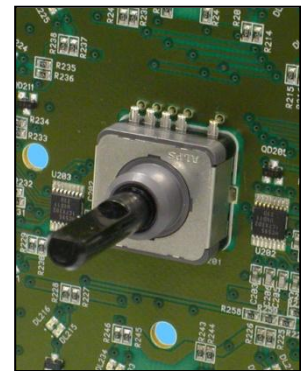
The description below applies to both versions (washing machines and washer dryers), unless specified with Washing machines or Washer Dryers.



The washing programmes, the functions of the selector knob (where featured) and the various sensors vary according to the model, since these are determined by the configuration of the appliance.

3.1.4.1 Programme selector (S1)

The selector used is of the HI-FI type (the dial has no index and no reset position, the programme selected is indicated by the fact that the corresponding LED lights up). The number of positions cannot be configured. There are always 14 (in all stylings) and they are bound to the number of LEDs that indicate the washing programmes. The programmes can be configured to perform different washing cycles (e.g.: water level, drum movement, no. of rinses and the washing temperature to be selected according to the type of garments). The selector can be turned both clockwise and anti-clockwise. For each programme, the compatible options and other parameters are defined.



3.1.4.2 Programme configuration

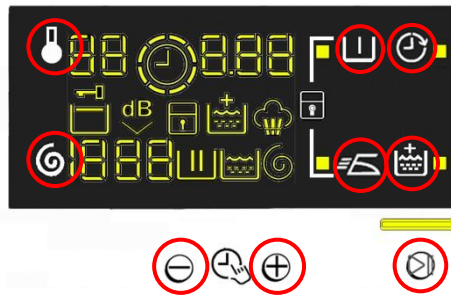
The table below lists the parameters that can be used to define the washing programmes.

Types of fabric	Cotton/linen, Synthetic fabrics, Delicates, Wool, Hand-wash, Shoes, Jeans, Duvet, Silk.
Special programmes	Soak, Miniprogramme, Easy-Iron, Conditioner, Rinse, Delicates Rinse, Drain, Delicates Spin, Spin.
Temperature	Normal, Maximum: the initial temperature is the one set for the washing programme selected.
Spin	Normal, Minimum, Maximum
Options (Normal/Possible)	Rinse Hold, Night Cycle, Pre-wash, Stains, Extra Rinse, Easy-Iron, Time Manager 1/2/3/4/5/6/7/8, Reduced Spin, No Spin, Steam.
Programme phases	Pre-wash, Wash, Rinse, Spin, Delayed Start.

3.1.4.3 Sensors

The function of each touch sensor is defined via the configuration of the appliance (the data and images are for guidance only).

The touch sensors are positioned under the silk-screen printed symbols on the control panel (circled here in red).



A light touch on the centre of the symbol is enough to activate/deactivate the function linked to the sensor with the switching on/off of the relative Led confirming that the enabling/disabling has taken place.

Simultaneously to the enabling/disabling of the options, the cycle duration time is updated via the digits.







You need to keep your finger pressed down for a longer period of time with the Start/Pause sensor to confirm both the cycle's start and pause, in order to avoid unwanted starts or accidental pauses.










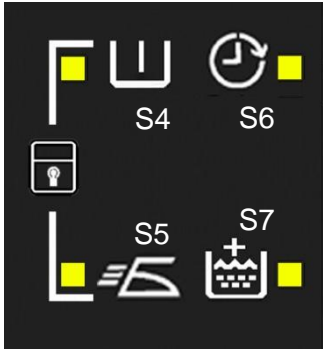

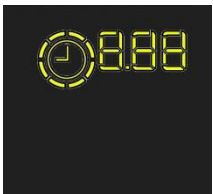




Every time you touch a sensor, you need to lift your finger up by a centimetre and half a second needs to elapse before touching it again, otherwise the electronic system does not recognise that the sensor has been touched for a second time.

The sensors used for adjusting the: Temperature, Spin, delayed Start and Time Manager have a continued variation of values as long as your finger is in contact with the sensor.

3.1.4.4 Sensors – LEDs and LCD

The functions of each button are defined by the configuration of the appliance.





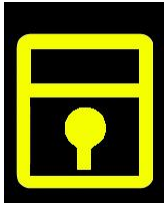
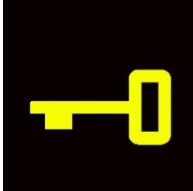




<ul style="list-style-type: none"> Button no. 1: ON/OFF – ON This button is always included in all three stylings. Press it to turn the appliance on, at the same time the buzzer will sound a tone (if enabled), all the LEDs around the selector dial will light up for an instant and the LCD display stays off (figure above). When the initial phase has ended, only one LED remains lit and the LCD display shows the basic settings of a programme (figure below). <p>The operation of the ON/OFF depends on the configuration of the main circuit board. It can cut the appliance off from the electricity mains completely (0 Watt circuit) or set the appliance to low energy consumption mode (without 0 Watt circuit) in which case you will need to take the plug out of the socket to cut off the electricity supply completely.</p> <p>Press the ON/OFF button to cancel the chosen programme.</p>	 <p style="text-align: center;">P1</p> 
<ul style="list-style-type: none"> Button no. 1: ON/OFF – OFF To turn the appliance off, press this button and hold it down for approximately 1 second, after this time the buzzer will sound a tone (if enabled), all the LEDs around the selector dial will light up for an instant (figure above), the LCD display shows the programme settings, then the following switch off: the LEDs around the selector dial, the Start/Pause LED, the LCD display (figure below). 	 <p style="text-align: center;">P1</p> 
<ul style="list-style-type: none"> Sensor no. 2: TEMPERATURE This is related to the part of the LCD display in which the washing cycle temperature is shown. The starting temperature shown on the LCD display is the one set for the programme selected. Touch the sensor (represented by the thermometer symbol) in sequence to lower the temperature. Once the lowest temperature has been reached, the selection starts off again from the highest one available for that particular programme. <p>The temperatures available (displayed in °C) are: 90°C, 60°C, 50°C, 40°C, 30°C, 20°C, cold cycle.</p> <p>The cold cycle is displayed by two dashes </p>	 <p style="text-align: center;">S2</p>





<ul style="list-style-type: none"> Sensor no. 3: SPIN SPEED This is related to the part of the LCD display in which the washing cycle spin speed is shown. The starting speed shown on the LCD display is the one set for the programme selected. Touch the sensor (represented by the spin cycle symbol) in sequence to lower the speed; once the lowest speed has been reached, the next selections are: <ul style="list-style-type: none"> ➤ "Rinse hold" and the related symbol lights up  (where compatible with the chosen programme, and it also lights up during the "Extra silent" programme in the washer-dryer). ➤ "Night cycle" and the related symbol lights up  (not available in the washer-dryer). <p>The next selection will be the highest speed available for the programme.</p> <p>The spin speeds are: 1,600–1,400–1,200–1,000–800–600–400–0 "No Spin", "Rinse Hold" and "Night Cycle". When no speed is selected, or one of the following cycles is selected: "No Spin", "Rinse Hold" and "Night Cycle", the LCD display shows three dashes </p>	
<ul style="list-style-type: none"> Sensor nos. 4-5-6-7: OPTION (configurable) Each of the sensors located on the right hand side of the LCD display can be combined with a LED and are used to choose one of the following options: <ul style="list-style-type: none">  Delayed Start  Super rinse  Easy Iron  Pre-wash  Hot and cold water (only TC3 WM where featured) <p>Depending on the option/choices, the programme duration time is updated (via the three digits).</p>	
<ul style="list-style-type: none"> Sensor nos. 8-9 These two sensors are positioned under the display and act as: <ul style="list-style-type: none">  Time manager Allowing the end user to lengthen or shorten the washing cycle duration, this adjustment should be done after setting the temperature value and the spin speed. 	 <p>S8    S9</p>
<ul style="list-style-type: none"> Sensor no. 10 This sensor has the START/PAUSE function, used to start up a washing programme, after selecting the washing cycle and required options; it can also pause a cycle that has already started: to allow you to change selected option or open the door (if the temperature conditions or water level allow for this). The cycle re-starts if you touch the sensor again. The LED combined with this sensor flashes slowly: in the selection phase, during the pause and at the end of a cycle with water in the tub. It stays lit when a cycle is running and turns off when the cycle has ended and the door is unlocked. While other sensors when touched immediately change from selected to de-selected, in the case of this sensor, more time is needed to avoid unwanted cycle start ups or pauses. 	 <p>S10</p>



LCD

The information described below also appears on the LCD:

<p>Washing Machine</p> <p>The three icons shown have the following meanings, respectively:</p> <ul style="list-style-type: none"> - Wash  - Rinse  - Spin  <p>They are lit during the setting phase to display which phases are included in the programme.</p> <p>During the programme the icon for the phase in progress flashes, and when the phase has ended it remains lit continuously. The same applies when the machine is in pause during the cycle.</p>	
<ul style="list-style-type: none"> • Padlock: The icon lights up when the “child lock” is on. To indicate that all the sensors are disabled to prevent children from modifying, starting or pausing the cycle. Touch any sensor or turn the selector dial during its activation and the icon will flash. <p>A sensor combination needs to be pressed to activate/deactivate it. It may be silk-screen printed on the control panel or described in the instruction manual.</p>	
<ul style="list-style-type: none"> • Door closed sensor: Lights up when the safety device stops door opening and switches off when the door can be opened. Flashes when the device is about to unlock the door (with door interlock with PTC, which needs one/two minutes to open). 	
<ul style="list-style-type: none"> • Washing programme time: This appears after a washing programme has been selected. This time corresponds to the time required for the maximum wash load for each type of programme. After the programme has started, the time decreases (and is updated) minute by minute. 	
<ul style="list-style-type: none"> • Delayed Start: Selected on the related sensor. After the START/PAUSE sensor is touched, the countdown starts and the delay time decreases hour by hour, from a minimum delay of 2 hours to a maximum of 20 hours (☞ 30' ☞ 60' ☞ 90' ☞ 2hrs ☞ 3hrs... ☞ 20h ☞ 0h). During the last 2 hours, it decreases by 30 min. at a time. During the delayed start, the LED beside the silk-screen printed symbol on the front panel  remains permanently lit. 	
<ul style="list-style-type: none"> • Selection incorrect: Displays the flashing message “Err”, for one second. Appears on selecting option that is incompatible with the programme selected, or when the selector is turned while a cycle is running. 	

<ul style="list-style-type: none"> • End of cycle: End of the programme is indicated by a permanently lit zero (when the door can be opened). • Appliance stopping with water in the tub, at the end of Programmes with the RINSE HOLD option, this is displayed by a permanently lit zero. The LED indicating the door remains on and the LED of the START/PAUSE sensor is turned off. The washing machine continues to operate, rotating the drum once every 2 minutes. 	
<ul style="list-style-type: none"> • Alarm code: Indicates an anomaly during operation of the machine. Simultaneously to the displaying of the code on the LCD display, the LED above the START/PAUSE sensor flashes. 	
<ul style="list-style-type: none"> • Calculate amount of washing: Only for appliances with PROPORTIONAL programmes After starting the washing programme the dot starts to flash. At this point the washing machine calculates the amount of washing inside the drum. When this phase ends the dot lights up fixed and the three digits display the programme time. 	
<ul style="list-style-type: none"> • Extra-rinse: Appliances which do not feature the button and related LED for the Extra rinse option can enable/disable this option by pressing a sensor combination (which may be silk-screen printed on the control panel or described in the instruction manual). This option is enabled/disabled during programme selection and is confirmed by the related symbol being turned on/off. The option remains enabled even after the appliance has been turned off (for subsequent programmes). 	

3.1.4.5 Buzzer

This comprises a multi-tone buzzer and sounds in the following cases:

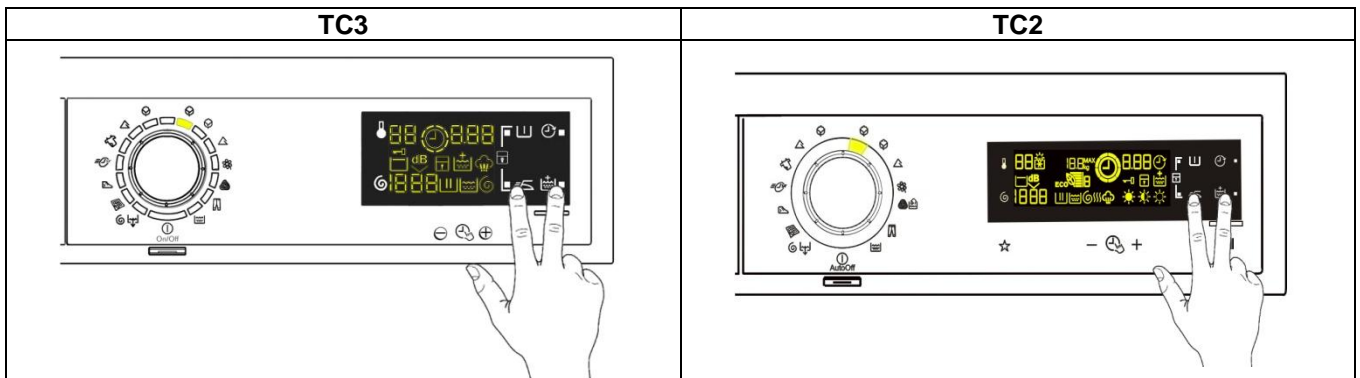
- When the machine is turned on and off it emits two different tunes.
- When a button is pressed it emits a short “**Click**”
- When the cycle ends, this is indicated by a special sequence of “**three long beeps**” repeated at intervals of 15” for a total of 2 minutes.
- In the event of an appliance malfunction, this is indicated by a special sequence of “**three short beeps**” repeated three times at 20” intervals for 5 minutes.

All appliances are fitted with the buzzer, and leave the factory with the option enabled. To disable it use the combination of sensors.

The volume level is set in the factory and cannot be adjusted by the user.

When the buzzer is disabled (using the combination of sensors) it only emits the short “**Click**” and the sequence of “three short beeps” **when an alarm is triggered**.

During the programme selection phase, the buzzer can be enabled/disabled with a sensor combination (which may be silk-screen printed on the control panel or described in the instruction manual), but the alarm signalling remains enabled.



To enable it, touch the sensors simultaneously for 5 seconds. A short beep will confirm that it has been enabled, whereas two short beeps will confirm that it has been disabled.

4 TC2 STYLING

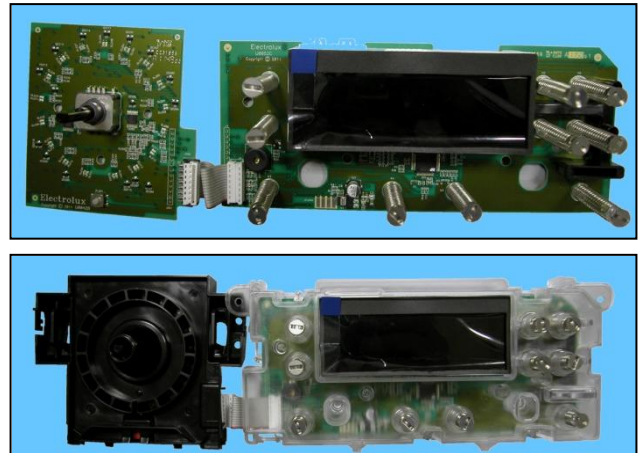
4.1 General characteristics

The TC2 styling has a single ON/OFF button, all the other choices/adjustments are made by skimming your finger over the touch sensors, which replace the buttons used so far.

In the event of problems with the touch sensors (difficulty selecting/adjusting them), clean and dry the display and do not wear gloves when setting the chosen programme.

The EWM10931 electronic control system consists of two circuit boards plus the motor control system (inverter) for washing machines.

↖ The control/display circuit board, inserted in a plastic box, secured to the control panel (the figure illustrates: the display board with the side socket in which the selector is fixed, connected together by a flat cable, and the display board assembly).



↖ The main circuit board is positioned at the rear of the appliance and receives commands from the display board, powers the electrical components as well as communicating with the motor control board (Inverter).

4.1.1 General WM characteristics

No. of buttons	▪ Max 1 (ON/OFF)
No. of touch sensors	▪ Maximum 10 (9 options + 1 start/pause)
No. LEDs	▪ Maximum 22 + LCD
Programme selector	▪ 14 positions (incorporated in the circuit board)
Serial port	▪ DAAS-EAP communication protocol up to 115,200 baud
Power supply voltage	▪ 220/240 V ▪ 50/60 Hz (configurable)
Washing type	▪ Traditional with "Eco-ball" ▪ Jet-System
Rinsing system	▪ Traditional with "Eco-ball" ▪ Jet-System ▪ Eco Spray
Motor	▪ Two-pole asynchronous (three-phase), with tachometric generator
spin speed	▪ 400÷1,600 rpm
Anti-unbalancing system	▪ AGS
Cold water fill	▪ 1 solenoid valve with 1 inlet – 2 or 3 outlets
Hot water filling	▪ 1 solenoid valve with 1 inlet – 1 outlet
Detergent dispenser	▪ 3 compartments: pre-wash/stains, wash, conditioner ▪ 4 compartments: prewash, wash, stain remover and conditioners.
Control of water level in the tub	▪ Electronic/analogue pressure switch
Door safety interlock	▪ Instantaneous
Heating element heat output	▪ 1,950 W with thermal fuses incorporated
Temperature check	▪ NTC probe incorporated in the heating element
Buzzer	▪ Traditional incorporated in the PCB
Sensors	▪ Water fill gauge (flowmeter from 2÷12 l/m) ▪ Water control ▪ Drum position
Drum Light	▪ LED light

4.2 Control panels

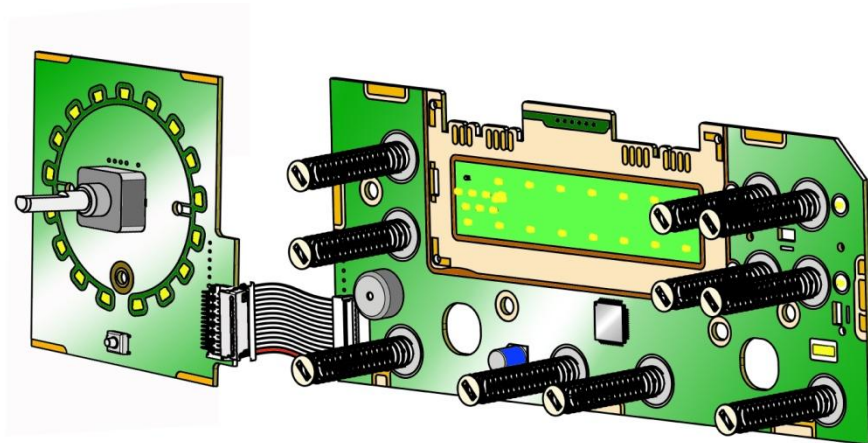
4.2.1 Styling

- Max. 1 Button
- Max. 10 sensors
- 14 position programme selector
- 22 LEDs
- 1 LCD

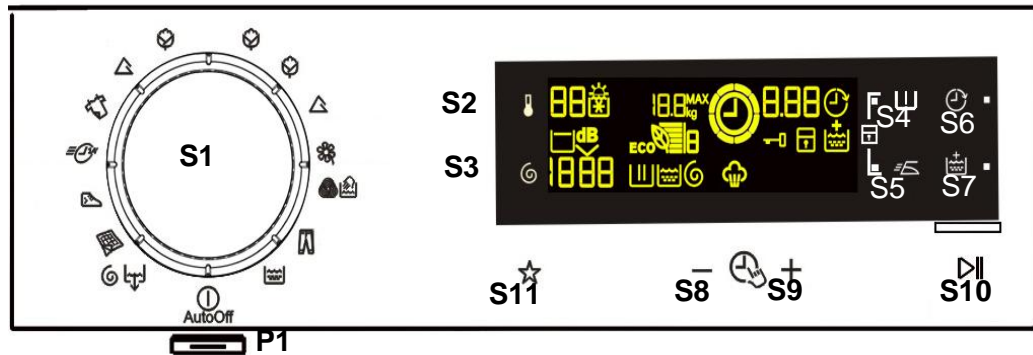
4.2.1.1 Version WM



- Positioning of LEDs and sensors



4.2.1.2 Control panel configuration



The washing programmes, the functions of the selector knob (where featured) and the various sensors vary according to the model, since these are determined by the configuration of the appliance.

4.2.1.3 Programme selector (S1)

Description: see para. 3.1.4.1

4.2.1.4 Programme configuration

Description: see para. 3.1.4.2

4.2.1.5 Sensors

The function of each touch sensor is defined via the configuration of the appliance (the data and images are for guidance only).

The touch sensors are positioned under the silk-screen printed symbols on the control panel (circled here in red).



A light touch on the centre of the symbol is enough to activate/deactivate the function linked to the sensor with the switching on/off of the relative Led confirming that the enabling/disabling has taken place.

Simultaneously to the enabling/disabling of the options, the cycle duration time is updated via the digits.

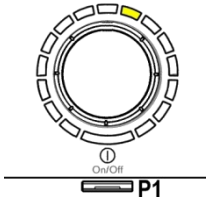







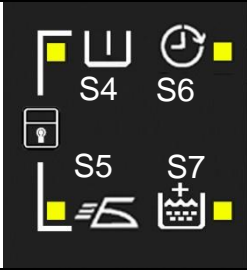


You need to keep your finger pressed down for a longer period of time with the Start/Pause sensor to confirm both the cycle's start and pause, in order to avoid unwanted starts or accidental pauses.

Every time you touch a sensor, you need to lift your finger up by a centimetre and half a second needs to elapse before touching it again, otherwise the electronic system does not recognise that the sensor has been touched for a second time.

The sensors used for adjusting the: Temperature, Spin, delayed Start and Time Manager have a continued variation of values as long as your finger is in contact with the sensor.

Sensors – LEDs and LCD

The functions of each button are defined by the configuration of the appliance.

<ul style="list-style-type: none"> • Button no. 1: ON/OFF <p>Description: see Button no. 1 on page 14</p>	
<ul style="list-style-type: none"> • Sensor no. 2: TEMPERATURE <p>See description on page 14 The only difference from the TC3 version is the representation of the cold cycle, which is represented by the cold symbol  and by two dashes  to replace the Digits.</p>	
<ul style="list-style-type: none"> • Sensor no. 3: SPIN SPEED <p>This is related to the part of the LCD display in which the washing cycle spin speed is shown. The spin speed displayed initially is that configured for the chosen programme. Touch the sensor (represented by the spin cycle symbol) in sequence to lower the speed; once the lowest speed has been reached, the next selections are:</p> <ul style="list-style-type: none"> ➤ "Rinse Hold" and the related symbol lights up  (where compatible with the chosen programme). ➤ "Night cycle" and the related symbol lights up . <p>The next selection will be the highest speed available for the programme.</p> <p>The spin speeds are: 1,600–1,400–1,200–1,000–800–600–400–0 "No Spin", "Rinse Hold" and "Night Cycle". When no speed is selected, or one of the following cycles is selected: "No Spin", "Rinse Hold" and "Night Cycle", the LCD display shows three dashes .</p>	
<ul style="list-style-type: none"> • Sensor nos. 4-5-6-7: OPTION (configurable) <p>See Sensor nos. 4-5-6-7, paragraph 3.1.4.4</p>	
<ul style="list-style-type: none"> • Sensor nos. 8-9: (configurable) <p>See Sensor nos. 8-9, paragraph 3.1.4.4</p>	
<ul style="list-style-type: none"> • Sensor no. 10: START/PAUSE <p>See Sensor no. 10, paragraph 3.1.4.4</p>	

- **Sensor no. 11: STORING A PROGRAMME**

This sensor is located beneath the sensor used to adjust the spin speed, allowing the user to store or recall a customised programme.

When the selected programme has been optimised with the desired options, it can be stored in the memory, by touching the related sensor for approximately 3 seconds. The buzzer “beeps” once, and simultaneously the LCD display shows **nen** flashing, to confirm the saving. This operation must be performed before you start the wash cycle.

To recall the stored programme, simply touch the sensor, simultaneously the LCD display shows the stored programme with the chosen options; if no programme was stored in the memory, the LCD display does not show any change.



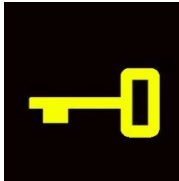






To make changes to the stored programme, simply: recall the programme, make the changes and touch the sensor for three seconds, as described previously to store the changes.






S11

- **LCD**

The information described below also appears on the LCD:

<ul style="list-style-type: none"> • Programme phases 	
<ul style="list-style-type: none"> • Padlock 	
<ul style="list-style-type: none"> • Door closed sensor 	
<ul style="list-style-type: none"> • Hot Water: It lights up when the possibility of filling water through the related solenoid valve is enabled. 	
<ul style="list-style-type: none"> • Washing programme time 	
<ul style="list-style-type: none"> • Delayed Start: Selected on the related sensor. After START/PAUSE or the sensor is touched, the countdown starts and the delay time decreases hour by hour, from a minimum delay of 2 hours to a maximum of 20 hours (☞ 30' ☞ 60' ☞ 90' ☞ 2hrs ☞ 3hrs... ☞ 20h ☞ 0h). During the last 2 hours, it decreases by 30 min. at a time. Touch the sensor in sequence to increase the delay by 30' up to 2 hours, whereas from 2 hours to 20 hours, the increase is of 1 (one) hour. During the programme selection phase, a delayed start is possible of between 30' and 20 hours (30' ☞ 60' ☞ 90' ☞ 10h ☞ 11h... ☞ 20h ☞ 0h) and the time is shown on the LCD display during the last hour, the time decreases minute by minute. To cancel the delayed start time, after the cycle has started, pause the washing machine using the related sensor and cancel the option. 	
<ul style="list-style-type: none"> • Selection incorrect 	
<ul style="list-style-type: none"> • End of cycle 	
<ul style="list-style-type: none"> • Alarm code 	

<ul style="list-style-type: none"> • Extra-rinse: Appliances which do not feature the sensor and related LED for the Extra rinse option can enable/disable this option by pressing a sensor combination (which may be silk-screen printed on the control panel or described in the instruction manual). This option is enabled/disabled during programme selection and is confirmed by the related symbol being turned on/off. The option remains enabled even after the appliance has been turned off (for subsequent programmes). 	
<ul style="list-style-type: none"> • Steam 	
<ul style="list-style-type: none"> • Eco Manager: Displays how economical the wash cycle is according to the Time Manager level. Displaying the value through the number of horizontal bars lit, in an interval of between 2÷6, where 6 is the maximum and 2 is the minimum economy. 	

4.2.1.6 Buzzer

Description: see para. 3.1.4.5

4.2.2 Time Manager and Eco Manager

The Time Manager is an option available in programmes for Cotton, Synthetics and Delicates and it is teamed with the Eco Manager.

During the washing programme selection phase, the icons shown below light up in the display, if the selected programme manages it.



The Time Manager is represented on the right-hand side of the LCD display, and it consists of: eight segments surrounding the clock and three digits, which indicate the duration of the washing cycle.

The Eco Manager is represented on the left-hand side of the display, and it consists of: a leaf, six horizontal bars and a number, which show the economy level of the chosen programme, depending on the Time Manager selection. The higher the number and the more bars displayed, the more economical the programme.

For the Cotton and Synthetics programmes, there are 8 Time Manager levels; level 6 is set by default by the appliance, so the end user can reduce it by 5 levels to achieve a shorter cycle or increase it by 2 levels to achieve a more economical but longer cycle.

There are 8 Time Manager levels for the Delicates programmes too, but the end user can only reduce it by 3 levels.






















There is no Time Manager in the “Cotton Eco” programme (Energy Label), however all 8 segments are displayed when this programme is selected; four are turned off when the Time Manager sensor is pressed just once to reduce the time.

This table shows the relationship between the Time Manager and the Eco Manager.

<p>Time Manager level 8 Maximum washing cycle time Maximum economy level</p>	
<p>Time Manager level 7 Increases the cycle time Increases the economy level</p>	
<p>Time Manager level 6 Default washing cycle Default economy cycle</p>	
<p>Time Manager level 1 Minimum washing cycle time The lowest economy level</p>	

4.2.2.1 Time Manager summary table

This table shows: the Time Manager levels and the corresponding icon shown on the LCD display depending on the fabrics.

	TM index	8 Levels		8 Levels		4 Levels		4 Levels	
		COTTON		SYNTHETICS		DELICATES		ECONOMY	
		Option	Segments	Option	Segments	Option	Segments	Option	Segments
Shortest cycle	TM1	TM1		TM1		-----	-----	-----	-----
	TM2	TM2		TM2		TM2		-----	-----
	TM3	TM3		TM3		-----	-----	-----	-----
	TM4	TM4		TM4		TM4		TM4	
	TM5	TM5		TM5		-----	-----	-----	-----
	TM6	TM6		TM6		TM6		-----	-----
	TM7	TM7		TM7		-----	-----	-----	-----
Longest cycle	TM8	TM8		TM8		TM8		-----	-----

Cooling
Default Level
Eco Level

5 DIAGNOSTICS SYSTEM

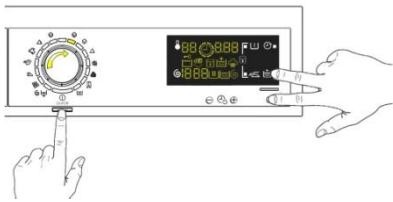
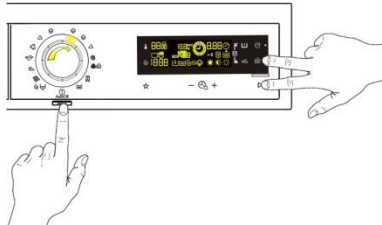
A special cycle is designed to demonstrate the operation of these appliances in shops, without connecting them to the water mains. In this way it is possible to select one of the programmes and, once the start button (START/PAUSE) has been pressed, the appliance will only perform some of the phases of the programme, skipping those which 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: as the cycle phases are very fast (one second in the demo cycle corresponds to approximately one minute in the actual cycle) the end time decreases by 1 unit per second. Bear in mind that the end time does not always correspond to the actual cycle time.

5.1 Access to DEMO settings for TC3 and TC2 stylings

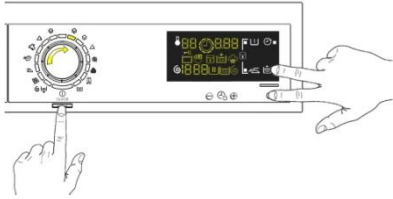
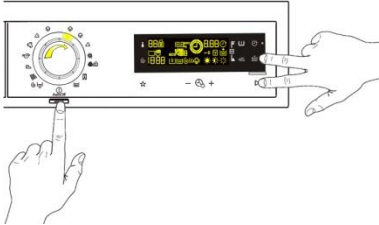
The operations listed below must be carried out within 7 seconds.

TC3	TC2
	
<p style="text-align: center;"><u>Do not start the procedure with your fingers over the combination sensors</u></p> <ol style="list-style-type: none">1. Switch on the appliance using the ON/OFF button.2. Turn the selector clockwise until the third LED lights up.3. Simultaneously press the START/PAUSE button and the nearest option sensor (as shown in the figure).4. Hold your fingers over the sensors (approximately three or five seconds) until "dEM" flashes for a short time.	

6 DIAGNOSTICS SYSTEM

6.1 Accessing diagnostics

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

TC3	TC2
	
<p style="text-align: center;"><u>Do not start the procedure with your fingers over the combination sensors</u></p> <ol style="list-style-type: none">5. Switch on the appliance using the ON/OFF button. The first LED lights up.6. Touch the START/PAUSE and the nearest option sensor simultaneously (as shown in the figure).7. Hold your fingers over the sensors until the LEDs and symbols begin to flash in sequence (approximately 3 seconds). <p>In the first position, the operation of the sensors, the LEDs and the groups of symbols shown on the LCD display is checked;</p> <p>For the TC3 and TC2 styling: When the programme selector is turned in a clockwise direction, operation of the various components is diagnosed and the alarms are read (see diagnostic test on the next page).</p>	

6.2 Quitting the diagnostics system

→ To exit the diagnostic cycle, switch the appliance off, then back on and then off again.











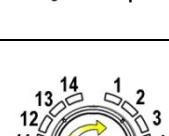
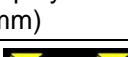
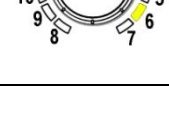
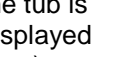
6.3 Phases of the diagnostics test



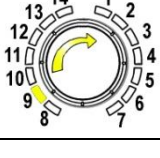

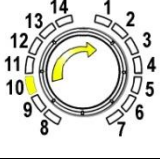

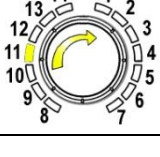


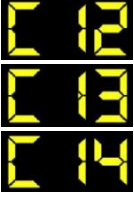
6.3.1 TC3 – TC2 styling

Irrespective of the type of PCB and the configuration of the programme selector, after entering the diagnostic mode, turn the programme selector dial **clockwise** to perform the diagnostic cycle for the operation of the various components and to read any alarms.

Concurrently, a selector control code is shown on the LCD display, which indicates for **two** seconds the description in the last column of the table below.

(All alarms are enabled in the diagnostic cycle.)

Selector position	Components activated	Working conditions	Function tested	LCD display
1 	<ul style="list-style-type: none"> The LEDs, groups of symbols in the LCD screen and the backlight of the display are turned on in sequence Touch a sensor to turn on the group of icons in the LCD screen or the corresponding LED and the buzzer sounds at the same time 	Always active	User interface functioning	
2 	<ul style="list-style-type: none"> Door safety interlock Wash solenoid valve 	Door closed Water level below anti-flooding level Maximum time 5 min.	Water fill to wash compartment	 Water level in the tub (mm)
3 	<ul style="list-style-type: none"> Door safety interlock Pre-wash solenoid valve 	Door closed Water level below anti-flooding level Maximum time 5 min.	Water fill to pre-wash compartment	 Water level in the tub (mm)
4 	<ul style="list-style-type: none"> Door safety interlock Solenoid valve pre-wash and wash 	Door closed Water level below anti-flooding level Maximum time 5 min.	Water fill to conditioner compartment	 Water level in the tub (mm)
5 	<ul style="list-style-type: none"> Door safety interlock Third solenoid valve 	Door closed Water level below anti-flooding level Maximum time 5 min.	Water fill to third solenoid valve compartment	 Water level in the tub is displayed (mm)
6 	<ul style="list-style-type: none"> Door safety interlock Fourth solenoid valve (hot water where featured) 	Door closed Water level below anti-flooding level Maximum time 5 min.	Water fill to fourth solenoid valve compartment	 Water level in the tub is displayed (mm)
7 	<ul style="list-style-type: none"> Door safety interlock Wash solenoid valve, if the water in the tub is not enough to cover the heating element Heating element Weight sensor (if there is one, an extra litre of water is loaded) Circulation pump 	Door closed Water level above the heating element. Maximum time 10 min. or up to 90°C (*)	Reheating Circulation	 Temperature in °C measured using the NTC probe

8		<ul style="list-style-type: none"> - Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Motor (55 rpm clockwise, 55 rpm anti-clockwise, 250 rpm pulse) 	<p>Door closed Water level above the heating element</p>	<p>Check for leaks from the tub</p>	 <p>Drum speed in rpm/10</p>
9		<ul style="list-style-type: none"> - Door safety interlock - Drain pump - Motor up to 650 rpm then at maximum spin speed (**) 	<p>Door closed Water level lower than anti-boiling level for spinning</p>	<p>Drain, calibration of analogue pressure switch and spin</p>	 <p>Drum speed in rpm/10</p>
10		<ul style="list-style-type: none"> - Drum rotation motor - door fastening device - Drum position sensor DSP 	<p>Door closed</p>	<p>Check the correct position of the drum via DSP</p>	
11		<ul style="list-style-type: none"> - Reading/deleting the last alarm 	<p>----</p>	<p>---</p>	
12 ÷ 14		<ul style="list-style-type: none"> - The LEDs, groups of symbols in the LCD screen and the backlight of the display are turned on in sequence - Touch a sensor to turn on the group of icons in the LCD screen or the corresponding LED and the buzzer sounds at the same time 	<p>Always active</p>	<p>User interface functioning</p>	

(*) In most cases, the established time is sufficient to check the heating. However, the time can be increased by repeating the phase without draining the water: pass for a moment to a different phase of the diagnostic cycle and then back to the heating control phase (if the temperature is higher than 80°C, heating does not take place).

(**) The check at the maximum speed occurs without control of the A.G.S. and no garments must be inside the appliance.

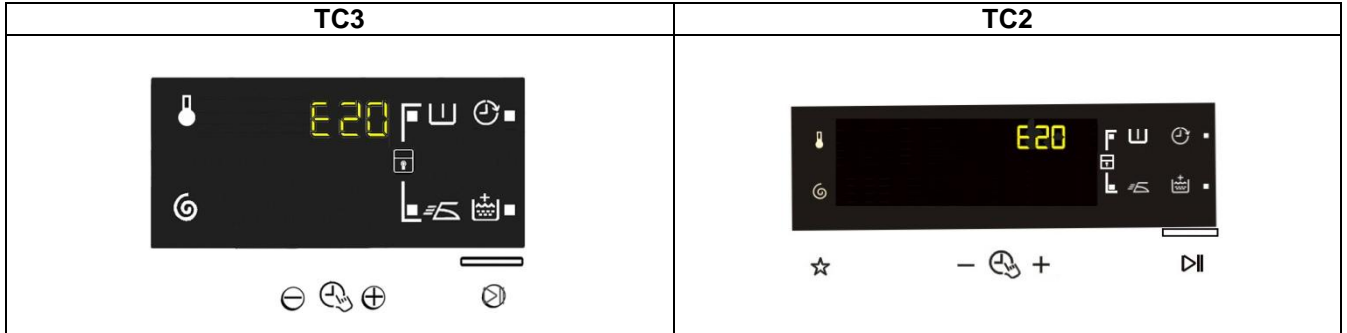
7 ALARMS

7.1 Displaying the alarms to the user

When a problem occurs in the appliance, the LCD display shows a “WARNING”:

- In stylings TC3 and TC2 with a code (in the three digits, where the time until the end of the cycle is represented).
- In styling TC1, a message is shown (in the text line).

This information ceases to be displayed when the problem is repaired/solved. The buzzer then emits a sound (three short “beeps” every 20” for 5 minutes). This does not occur for alarm EH0.



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

TC3/TC2	TC1
E10 – Water fill difficulty (tap closed)	Check the tap
E20 – Drain difficulty (filter dirty)	Check the drain filter
E40 – Door open	Check the door
EF0 – Excessive detergent	Excessive detergent
EH0 – Voltage or frequency outside normal values	Unstable frequency or voltage

While the alarm listed below:

TC3/TC2	TC1
EF0 – Water leakage (Aqua Control System)	Caution: water

The intervention of a service engineer is required to resolve this.

The other alarms are displayed by a code.

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

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

- The 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:

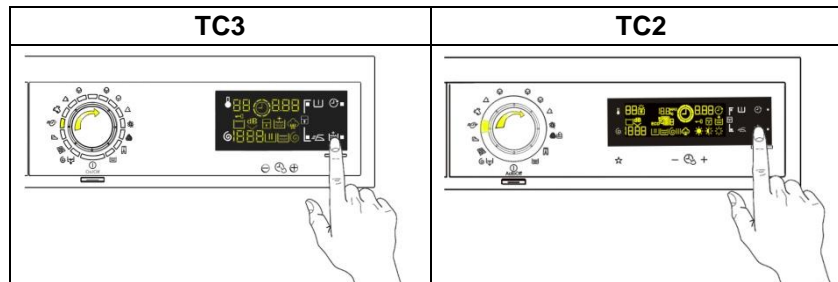
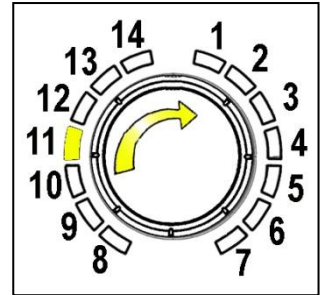
- Cooling water fill if the temperature is higher than 65°C.
- Drain until the analogue pressure switch is on “empty”, within a max. time of 3 minutes.

7.2 Reading the alarms

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

7.2.1 TC3 – TC2 styling

- Enter the diagnostic mode (para. 7.1).
- Irrespective of the type of PCB and configuration, turn the programme selector knob **clockwise** to the **eleventh position**, the last alarm will be displayed.
- To display previous alarms, touch the sensor closest to the START/PAUSE sensor in sequence (as shown in the figure).
- To return to the last alarm, touch the START/PAUSE sensor.



7.3 Rapid reading of alarms

It is possible to display the last alarm even if the selector is not in the eleventh diagnostics position or if the appliance is in normal operating mode (for example when performing a wash programme):

→ Touch the **START/PAUSE** sensor and the nearest **option sensor** simultaneously (as if you were entering DIAGNOSTIC mode) and hold for at least 2 seconds: the LCD display shows the last alarm.

→ The alarm will continue to be displayed until a sensor is touched.

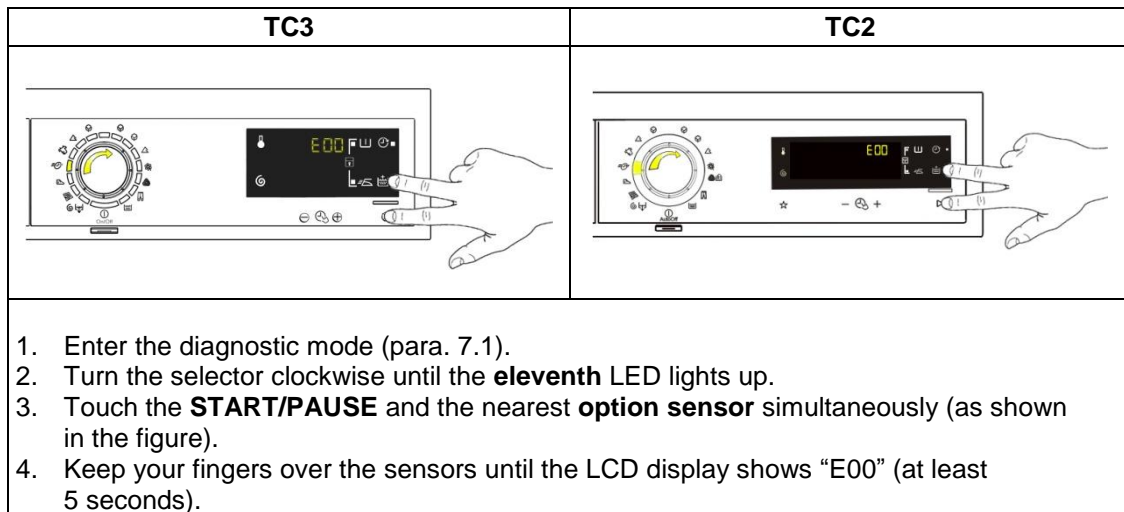
→ The alarm reading system is as described in para. 8.2.

→ While the alarm is displayed, the appliance continues to carry out the cycle, or if it is in the programme selection phase, it retains the options selected previously in memory.

7.4 Deleting the last alarm

It is good practice to cancel the alarms stored:

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



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

8 OPERATING TIME COUNTER

Using a specific procedure, the operator can display the total operating time for the appliance, which is counted from the moment it is first switched on.

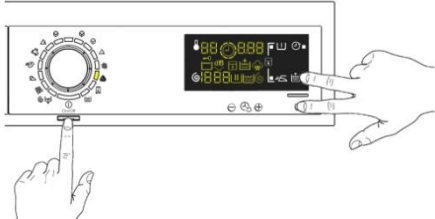
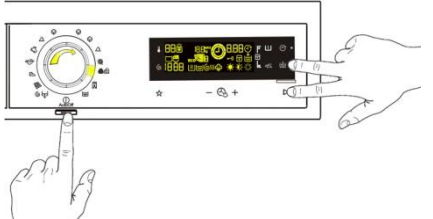
The unit can count up to a maximum of **6,550** hours of operating time.

- Only the operating time of normal programmes (and not diagnostic cycles) is counted.
- The actual operating time for the cycle is counted (which does not include pauses, delayed start time, rinse hold time and soaking phases).
- The precision of the counter is 30 seconds per programme.
- Only whole hours of operation are counted (1 hr and 59 min = 1 hr).

8.1 Reading the operating time

8.1.1 TC3 – TC2 stylings




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

TC3	TC2
	
<p style="text-align: center;"><u>Do not start the procedure with your fingers over the combination sensors</u></p> <ol style="list-style-type: none"> 1. Switch on the appliance using the ON/OFF button. 2. Turn the selector clockwise until the fifth LED lights up. 3. Touch the START/PAUSE and the nearest option sensor simultaneously (as shown in the figure). 4. Keep your fingers over the sensors until the hours of operation appear on the display (at least 5 seconds). 	

8.2 Display of total operating time

This time is displayed with a sequence of two digits at a time: the first two digits indicate thousands and hundreds, the second two digits indicate tens and units.

For example, if the operating time is **6,550** hours, the display will show the following sequence:

	Phase 1	Phase 2	Phase 3
	For <u>two seconds</u> , the following is displayed: Hr	For <u>two seconds</u> , the following digits are displayed: ↙ thousands (6) ↘ hundreds (5)	For the next <u>two seconds</u> the following digits are displayed: ↙ tens (5) ↘ units (0)
TC 3/2			

At the end of phase three (after the tens and units are displayed), the cycle is repeated.

To return to normal mode, either: switch the appliance off or press a button or turn the selector knob.

9 OPTIONS

9.1 Compatibility between options

		OPTIONS																			
		Rinse hold	Night cycle	Pre-wash/Soak (*)	Stains	Extra-rinse	Easy-iron	Economy	TM 8 (Intensive)	TM 7 (Normal)	TM 6 (Daily)	TM 5 (Light)	TM 4 (Quick)	TM 3 (Super Quick)	TM 2	TM1	Aquasol	Max steam	Medium steam	Minimum steam	Drying
Compatibility with OPTIONS	Rinse hold			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Night cycle			X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X
	Pre-wash/Soak (*)	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Stains	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Super rinse	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Easy-iron	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Economy	X	X	X	X	X	X						X				X	X	X	X	X
	TM 8 (Intensive)	X	X	X	X	X	X										X	X	X	X	X
	TM 7 (Normal)	X	X	X	X	X	X										X	X	X	X	X
	TM 6 (Daily)	X	X	X	X	X	X										X	X	X	X	X
	TM 5 (Light)	X	X	X	X	X	X										X	X	X	X	X
	TM 4 (Quick)	X	X	X	X	X	X	X									X	X	X	X	X
	TM 3 (Super Quick)	X	X	X	X	X	X										X	X	X	X	X
	TM 2	X	X	X	X	X	X										X	X	X	X	X
	TM1	X	X	X	X	X	X										X	X	X	X	X
	Aquasol	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	Max steam	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
	Medium steam	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
	Minimum steam	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
	Drying			X	X	X		X	X	X	X	X	X	X	X	X	X	X			
Phases where selection/ modification is possible	Selection	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Pre-wash	X	X			X	X										X	X	X	X	
	Wash	X	X			X	X										X	X	X	X	
	Rinse	X																			
	Spin																				

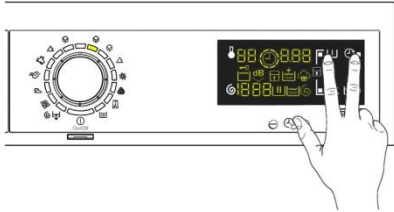
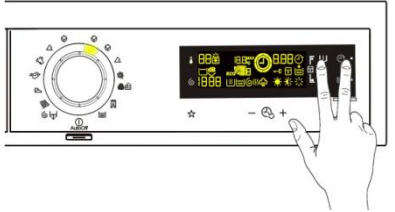
(*) Pre-wash and Soak exclude each other

Pre-wash+Stains and Soak+Stains are compatible with one another depending on the detergent dispenser used.

- The delayed start is compatible with all programmes except for Drain; the maximum time selectable is 20 hours.
- The selection of the spin cycle is available for all programmes, except for Drain/Soak/Extra Silent.

9.2 Description of options

- **Rinse hold**
 - During the cycle the intermediate rinses and spins are performed.
 - Stops the appliance with water in the tub before the final spin cycle.
 - To drain the water, simply press the START/PAUSE button to run the drain and spin cycles.
- **Pre-wash**
 - Adds a pre-wash phase at the start of the cycle with water heating to 30°C (or cold, if selected).
 - In COTTON and SYNTHETICS cycles, performs a short spin before passing on to the washing phase.
 - This option cannot be selected for WOOL and HAND WASH cycles.
- **Pre-wash**
 - Adds a pre-wash phase with heating to 30°C (or cold, if selected) plus 30' hold with HAND WASH movement.
 - Completes the cycle.
- **EXTRA-rinse**
 - Add **two** rinses to the cycles where featured.
 - Eliminates the spin at the end of washing.

ENABLING/DISABLING EXTRA RINSE USING A COMBINATION OF SENSORS	
Appliances which do not envisage the SUPER RINSE option combined with a button can enable it through a sensor combination.	
TC3	TC2
	
During the selecting phase, touch the two sensors shown in the figure simultaneously for a few seconds until the related icon lights up. This option also remains enabled during subsequent cycles. To disable it, repeat the same operation until the related icon is turned off.	

- **No spin**
 - It eliminates all the spin phases.
 - It adds three rinses to the COTTON CYCLE and one to the SYNTHETIC FABRICS cycle.
- **Daily**
 - Modifies the structure of the COTTON - SYNTHETIC FABRICS - DELICATES cycles to obtain good washing performance in a variable amount of time.
- **Super quick**
 - Modifies the structure of the wash phase of the COTTON - SYNTHETIC FABRICS - DELICATES cycles by half a load.
- **Delayed start time**
 - Adds a pause before the start of the programme. The delay time is shown on the three digit display
 - 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.
 - 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.

- **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

- **Hot & Cold Water** (only for TC3 styling with pre-set connection)

→ Touching this sensor activates / deactivates the hot water solenoid valve function.

When it is activated: as well as the cold water in the tub, hot water is added (provided by the solar panels, or another source), increasing the water temperature in the tub.

The heating element is powered to reach the temperature established by the programme.

→ The higher the temperature of the mixed hot water, the less electricity is used to reach the temperature requested by the selected programme.

10 ALARM SUMMARY TABLE

ALARM CODE	Description	Possible fault	Machine status/action	Reset
E11	Water fill difficulty during washing	<ul style="list-style-type: none"> ▪ Tap closed. ▪ Water pressure too low. ▪ Drain pipe improperly positioned. ▪ Water fill solenoid valve faulty. ▪ Leaks from pressure switch water circuit. ▪ Pressure switch faulty. ▪ Faulty wiring. ▪ Main circuit board faulty. 	Cycle is paused with door locked	START/RESET
E13	Water leaks	<ul style="list-style-type: none"> ▪ Drain pipe improperly positioned. ▪ Water pressure too low. ▪ Water fill solenoid valve faulty. ▪ Leaks/clogging of pressure switch water circuit. ▪ Pressure switch faulty. 	Cycle is paused with door locked	START/RESET
E21	Drain difficulty during washing	<ul style="list-style-type: none"> ▪ Drain pipe kinked/clogged/improperly positioned. ▪ Drain filter clogged/dirty. ▪ Faulty wiring. ▪ Pressure switch faulty. ▪ Drain pump rotor blocked. ▪ Drain pump faulty. ▪ Main circuit board faulty. 	Cycle is paused (after 2 attempts)	START ON/OFF RESET
E23	Faulty TRIAC for drain pump	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Drain pump faulty. ▪ Main circuit board faulty. 	Safety drain cycle - Cycle stops with door open	RESET
E24	Drain pump TRIAC "sensing" circuit faulty	<ul style="list-style-type: none"> ▪ Main circuit board faulty. 	Safety drain cycle - Cycle stops with door unlocked	RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E31	Malfunction in electronic pressure switch circuit	<ul style="list-style-type: none"> ▪ Wiring; Electronic pressure switch. ▪ Main electronic circuit board. 	Cycle stops with door locked	RESET
E32	Calibration error of the electronic pressure switch	<ul style="list-style-type: none"> ▪ Drain tube kinked/clogged/improperly positioned. ▪ Solenoid valve faulty. ▪ Drain filter clogged/dirty. ▪ Drain pump faulty. ▪ Leaks from pressure switch water circuit. ▪ Pressure switch faulty. ▪ Wiring; main circuit board. 	Cycle is paused	START/RESET
E35	Overflow	<ul style="list-style-type: none"> ▪ Water fill solenoid valve faulty. ▪ Leaks from pressure switch water circuit. ▪ Faulty wiring. ▪ Pressure switch faulty. ▪ Main circuit board faulty. 	Cycle interrupted Safety drain cycle Drain pump continues to operate (5 mins. on, then 5 mins. off, and so on)	RESET
E38	Internal pressure chamber is clogged (water level does not change for at least 30 sec. of drum rotation)	<ul style="list-style-type: none"> ▪ Motor belt broken. ▪ Pressure switch hydraulic circuit clogged. 	Heating phase is skipped	RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E41	Door open	<ul style="list-style-type: none"> ▪ Check whether the door is closed properly. ▪ Faulty wiring. ▪ Door safety interlock faulty. ▪ Main circuit board faulty. 	Cycle is paused	CLOSE THE DOOR
E42	Problems with door lock	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Door safety interlock faulty. ▪ Electrical current leak between heating element and ground. ▪ Main circuit board faulty. 	Cycle is paused	START/RESET
E43	Faulty triac supplying power to door delay system	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Door safety interlock faulty. ▪ Main circuit board faulty. 	Safety drain cycle Cycle blocked	RESET
E44	Faulty "sensing" of door delay system	<ul style="list-style-type: none"> ▪ Main circuit board faulty. 	Safety drain cycle Cycle blocked	RESET
E45	Faulty sensing by door delay system TRIAC	<ul style="list-style-type: none"> ▪ Main circuit board faulty. 	Safety drain cycle Cycle blocked	RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E52	No signal from motor tachometric generator	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Motor faulty. ▪ Inverter board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E57	Inverter is drawing too much current (>15 A)	<ul style="list-style-type: none"> ▪ Motor-inverter wiring faulty. ▪ Inverter board faulty. ▪ Motor faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E58	Inverter is drawing too much current (>4.5 A)	<ul style="list-style-type: none"> ▪ Abnormal motor operation (overload). ▪ Motor-inverter wiring faulty. ▪ Motor faulty. ▪ Inverter board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E59	No signal from tachometric generator for 3 seconds	<ul style="list-style-type: none"> ▪ Motor-inverter wiring faulty. ▪ Inverter board faulty. ▪ Motor faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E5A	Overheating on heat dissipater for inverter	<ul style="list-style-type: none"> ▪ Overheating caused by continuous operation or ambient conditions (let appliance cool down). ▪ Inverter board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E5C	Input voltage is too high	<ul style="list-style-type: none"> ▪ Input voltage is too high (measure the grid voltage). ▪ Inverter board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E5D	Data transfer error between inverter and main PCB	<ul style="list-style-type: none"> ▪ Line interference. ▪ Faulty wiring. ▪ Main board or Inverter board faulty. 	-----	ON/OFF RESET
E5E	Communication error between inverter and main PCB	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Control/display circuit board faulty. ▪ Inverter board faulty. ▪ Weight sensor board faulty. ▪ WD board faulty. ▪ Main circuit board faulty. 	Cycle blocked after 5 attempts	ON/OFF RESET
E5F	Inverter PCB fails to start the motor	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Inverter board faulty. ▪ Main board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET
E5H	Input voltage is lower than 175 V	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Inverter board faulty. 	Cycle blocked with door locked after 5 attempts	ON/OFF RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E61	Insufficient heating during the washing phase	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ NTC probe for wash cycle faulty. ▪ Heating element faulty. ▪ Main circuit board faulty. 	The heating phase is skipped	START/RESET
E62	Overheating during washing phase (temperature higher than 88°C for more than 5 min.)	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ NTC probe for wash cycle faulty. ▪ Heating element faulty. ▪ Main circuit board faulty. 	Safety drain cycle Cycle stops with door open	RESET
E66	Heating element power relay faulty (inconsistency between sensing and relay status)	<ul style="list-style-type: none"> ▪ Main circuit board faulty. 	Safety water fill Cycle stops with door closed	ON/OFF RESET
E68	Current leak to the ground	<ul style="list-style-type: none"> ▪ Current leakage between heating element and ground. 	The heating phase is skipped	START/RESET
E69	Heating element interrupted	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Heating element for washing interrupted (thermal fuse open). ▪ Main circuit board faulty. 	-----	START ON/OFF RESET
E6A	Heating relay sensing faulty	<ul style="list-style-type: none"> ▪ Main circuit board faulty. 	Cycle stops with door locked	RESET
E6H	Heating element power relay faulty (inconsistency between sensing and relay status)	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Current leakage between heating element and ground. ▪ Main circuit board faulty. 	Safety water fill Cycle stops with door closed	ON/OFF RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E71	NTC probe for wash cycle faulty (short-circuited or open)	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ 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	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ NTC probe for wash cycle improperly positioned. ▪ NTC probe faulty. ▪ Main circuit board faulty. 	The heating phase is skipped	RESET
E83	Error in reading selector	<ul style="list-style-type: none"> ▪ Main circuit board faulty. ▪ Incorrect configuration data. 	Cycle cancelled	START/RESET
E86	Selector configuration error	<ul style="list-style-type: none"> ▪ Incorrect configuration of display board. 	-----	START ON/OFF RESET
E87	Display board microprocessor faulty	<ul style="list-style-type: none"> ▪ If this continues, replace the display board. 	No action to be taken	START ON/OFF RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
E91	Communication error between main PCB and display board	<ul style="list-style-type: none"> ▪ Faulty wiring. ▪ Control/display circuit board faulty. ▪ Main circuit board faulty. 	-----	RESET
E92	Communication inconsistency between main PCB and display board (incompatible versions)	<ul style="list-style-type: none"> ▪ Incorrect control/display board. ▪ Incorrect PCB (does not correspond to the model). 	Cycle blocked	ON/OFF
E93	Appliance configuration error	<ul style="list-style-type: none"> ▪ Main circuit board faulty. ▪ Incorrect configuration data. 	Cycle blocked	ON/OFF
E94	Incorrect configuration of washing cycle	<ul style="list-style-type: none"> ▪ Main circuit board faulty. ▪ Incorrect configuration data. 	Cycle blocked	ON/OFF
E97	Inconsistency between programme selector and cycle configuration	<ul style="list-style-type: none"> ▪ Main circuit board faulty. ▪ Incorrect configuration data. 	Cycle blocked	RESET
E98	Communication error between main PCB – inverter	<ul style="list-style-type: none"> ▪ Incompatibility between main PCB and inverter. 	Cycle blocked	ON/OFF
E9C	Display board configuration error	<ul style="list-style-type: none"> ▪ Display board faulty. 	-----	START ON/OFF RESET
E9E	Display board touch sensor faulty	<ul style="list-style-type: none"> ▪ Display board faulty. 	-----	ON/OFF
EA1	No drum position signal made	<ul style="list-style-type: none"> ▪ DSP sensor faulty. ▪ Transmission belt broken. ▪ Main circuit board faulty. ▪ Faulty wiring. 	Drum positioning cycle cancelled	START/RESET
EA6	No signal from the DSP during motor activation	<ul style="list-style-type: none"> ▪ DSP sensor faulty. ▪ Transmission belt broken. ▪ Main circuit board faulty. ▪ Faulty wiring. 	Cycle paused	START RESET

ALARM CODE	Description	Possible fault	Action Machine status	Reset
EC1	Electronically controlled valve blocked with operating flowmeter	<ul style="list-style-type: none"> Faulty wiring. Solenoid valve faulty/blocked. Circuit board faulty. 	Cycle stops with door locked Drain pump continues to operate (5 mins. on, then 5 min. off, and so on)	RESET
EF1	Drain filter clogged (drain phase too long)	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Water leaks onto base frame. Aqua control device faulty. 	Appliance drains	ON/OFF RESET
EF4	Water fill pressure too low, no signal from flowmeter and electronically controlled valve is open	<ul style="list-style-type: none"> Tap closed. Water fill pressure too low. 	-----	RESET
EF5	Unbalanced load	<ul style="list-style-type: none"> Final spin phases skipped. 	-----	START/RESET
EF6	Reset	<ul style="list-style-type: none"> If it continues, replace the main board. 	-----	-----

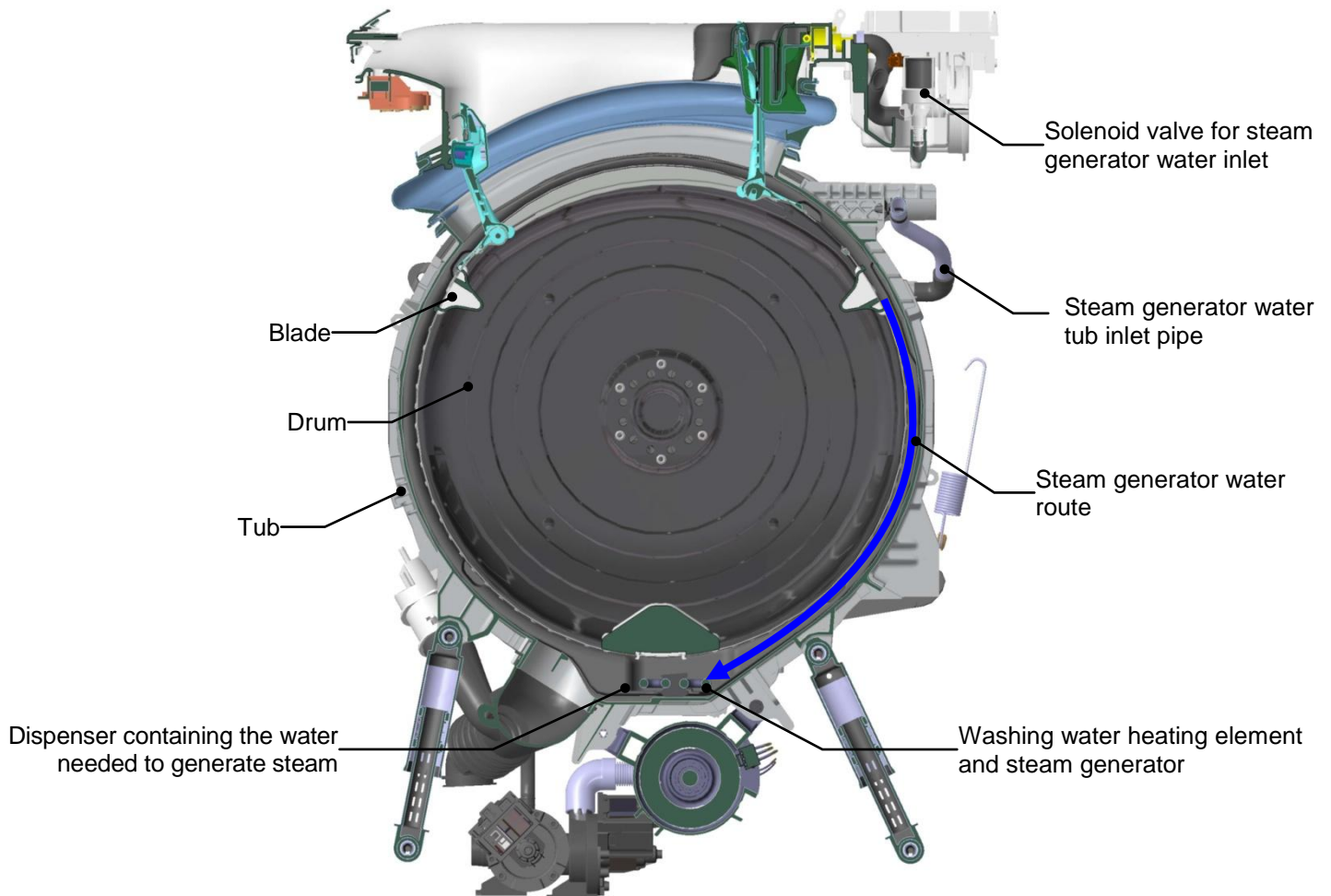
ALARM CODE	Description	Possible fault	Action Machine status	Reset
EH1	Appliance power supply frequency out of limits	<ul style="list-style-type: none"> ▪ Problem with the power supply network (incorrect/disturbed). ▪ Main circuit board faulty. 	Wait for nominal frequency conditions	ON/OFF
EH2	Supply voltage too high	<ul style="list-style-type: none"> ▪ Problem with the power supply network (incorrect/disturbed). ▪ Main circuit board faulty. 	Wait for nominal voltage conditions	ON/OFF
EH3	Supply voltage too low	<ul style="list-style-type: none"> ▪ Problem with the power supply network (incorrect/disturbed). ▪ Main circuit board faulty. 	Wait for nominal voltage conditions	ON/OFF

10.1.1 Generating STEAM

In the TC2 styling certain programmes can be configured to generate steam, which is used to refresh the laundry or remove some creases and make ironing easier.

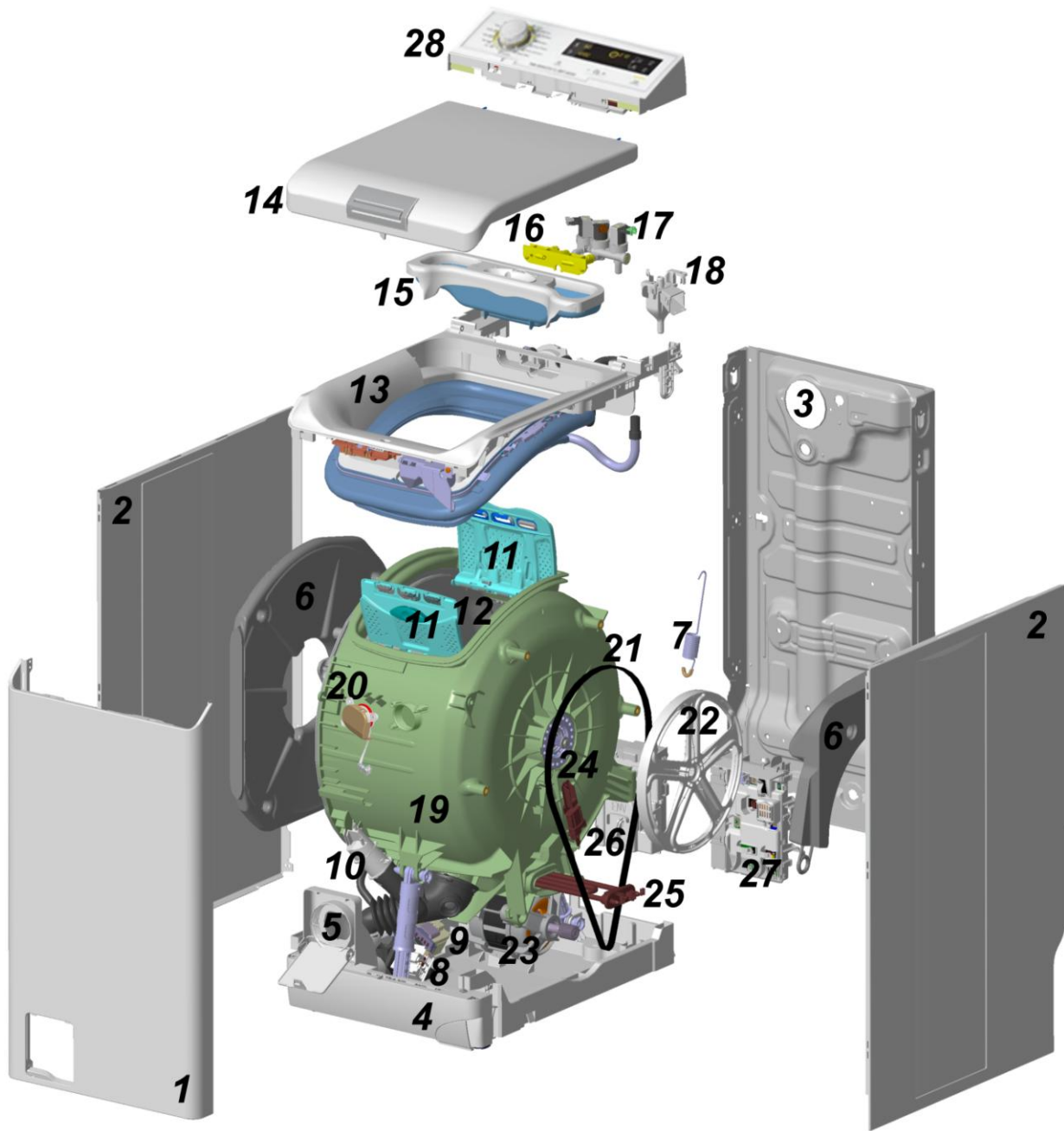
To obtain steam, during these programmes, the quantity of water filled in the tub must be enough to cover the heating element and the maximum temperature to reach is 60°C/75°C.

During the water filling and the movement of the drum, the laundry must not get wet. In order to achieve this, it is essential that during installation the appliance is perfectly level so that the water entering from the specific solenoid valve flows around the tub casing without wetting the drum and laundry.



11 TECHNICAL CHARACTERISTICS

11.1 Manufacturing characteristics






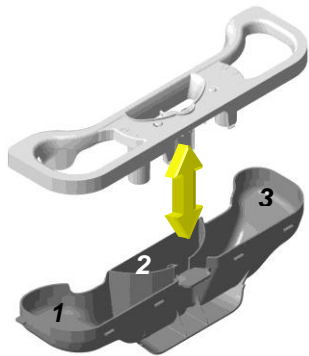
- | | | |
|-------------------------------------|--------------------------|------------------------------------|
| 1. Frontal piece. | 10. Pressure chamber. | 19. Washing unit. |
| 2. Sides. | 11. Lids. | 20. Drum light. |
| 3. Back panel. | 12. Drum. | 21. Pulley. |
| 4. Base. | 13. Inlet. | 22. Drum rotation motor. |
| 5. Filter. | 14. Upper cover. | 23. DSP. |
| 6. Right and Left counterweights. | 15. Detergent dispenser. | 24. Heating element. |
| 7. Washing unit suspension springs. | 16. Water dispenser. | 25. Motor inverter control board. |
| 8. Circulation pump. | 17. Solenoid valves. | 26. Main electronic circuit board. |
| 9. Drain pump. | 18. Air Break. | 27. Control panel. |

11.2 Detergent dispenser

11.2.1 Detergent dispenser

Before entering the tub, the cold water passes through the detergent dispenser picking up the detergent inside it. This dispenser is split into 3 compartments marked with the symbols:

-  Pre-wash (dispenser 1)
-  Wash (dispenser 3)
-  Fabric conditioner (dispenser 2)



1. Detergent dispenser.
2. Fabric softener dispenser.
3. Pre-wash detergent dispenser.

11.2.2 Detergent tray for Powder / Liquid detergents

In some washing machines the detergent tray configured to use both liquid and powder detergent can be used; the tray can be configured to the kind of detergent by moving the lever (1) in the centre of the tray.



Lever position when the appliance leaves the factory and for use with powder detergent.



Move the lever to the right to use liquid detergent

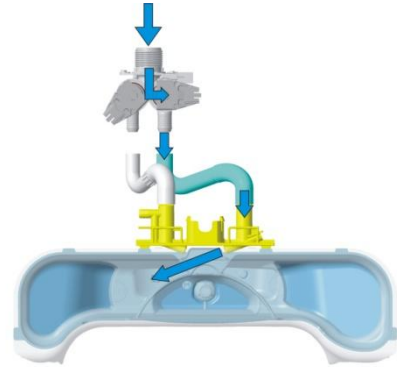


For further details, read the instruction manual.

11.2.3 Working principle of water dispenser.

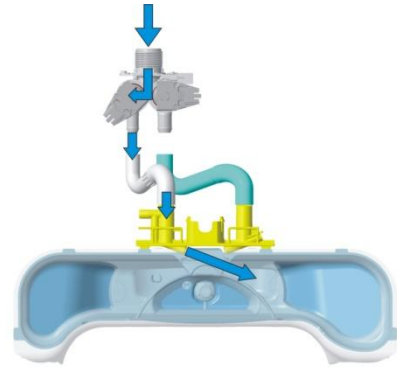
– Pre-wash

During the pre-wash phase the right solenoid valve is activated, the water coming from the load pipe passes through the pressure reducer and then to the water dispenser, which then sends the water into the left dispenser picking up, if there, the detergent needed for the pre-wash.



– Wash

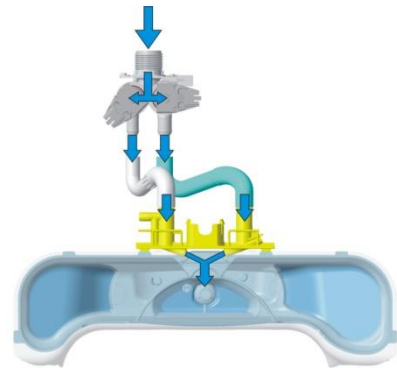
During the washing phase the left solenoid valve is activated, the water coming from the load pipe passes through the pressure reducer and then to the water dispenser, which then sends the water into the right dispenser picking up the detergent needed for washing.



– Fabric softener

In some programmes the fabric softener in the central dispenser is picked up.

In order to do this both solenoid valves are put into action, the water coming simultaneously out of the right and left side of the distributor is directed into the central dispenser containing the fabric softener.



11.3 Washing unit

WASHING UNIT		
Type	Load capacity (cottons)	Drum volume
C4	7 kg	42 litres

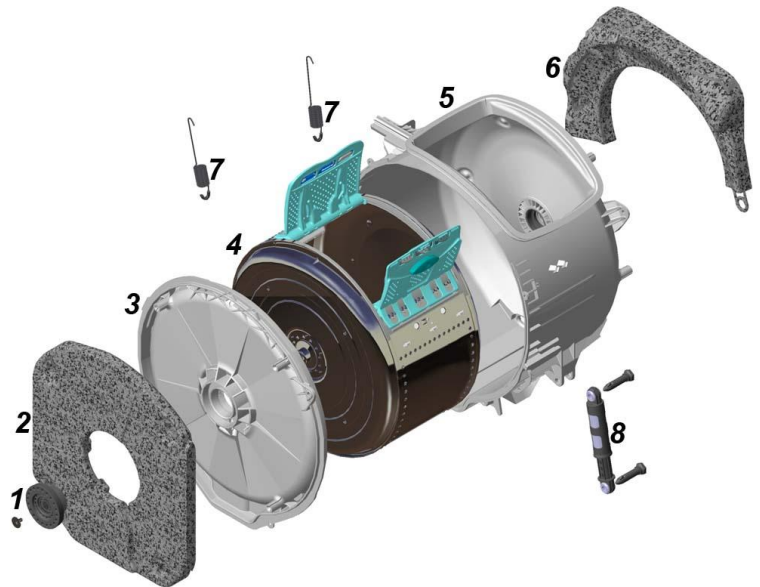
The washing unit is made up of:

A stainless steel drum (4) inserted inside a carboran tub (5) with a welded cover (3).

2 counterweights are positioned to the sides (2 and 6) needed to reduce the swinging caused by the clothes during washing.

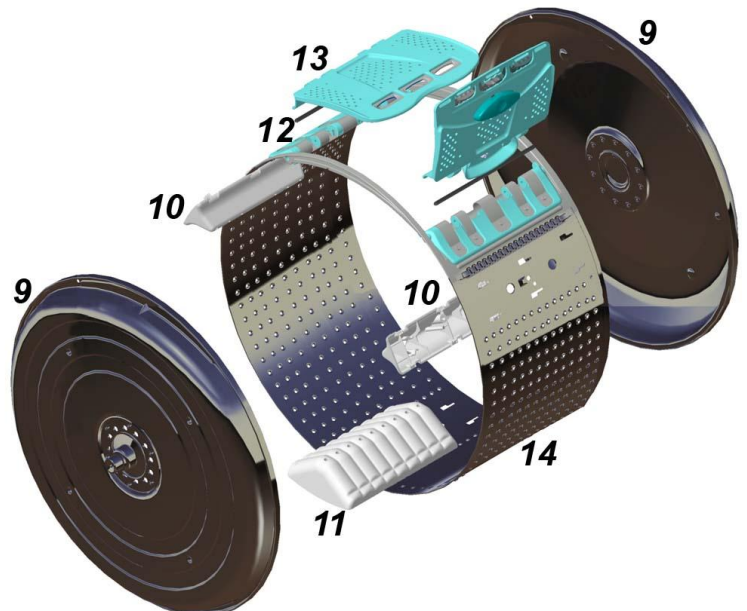
The drum is held in position by 4 bearings fitted to the tub and held by a support (1).

The washing unit is held suspended by two spiral springs (7) fitted to the back panel, the swinging is muffled by two shock absorbers (8) one to the front and one at the back of the tub and fitted to the base frame.



The drum inserted in the washing unit is made up of 2 flanges (9) clamped to a perforated cylinder (14) with an open part (inlet) and in correspondence with the inlet there are 2 tilted lids (13) fitted to this cylinder using 2 pivots (12).

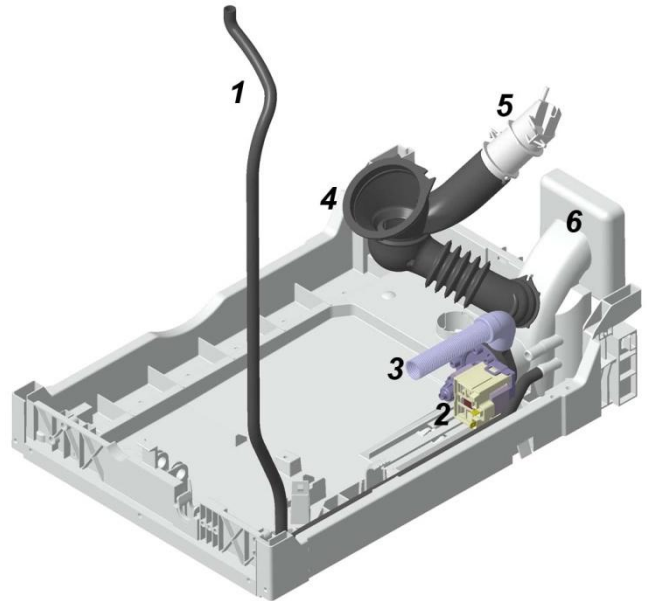
Inside the drum we can find 3 spokes 2 the same (10) and one bigger and heavier (11) positioned at 180° from the inlet, the latter serving to compensate the weight of the 2 lids.



11.4 Water circuit

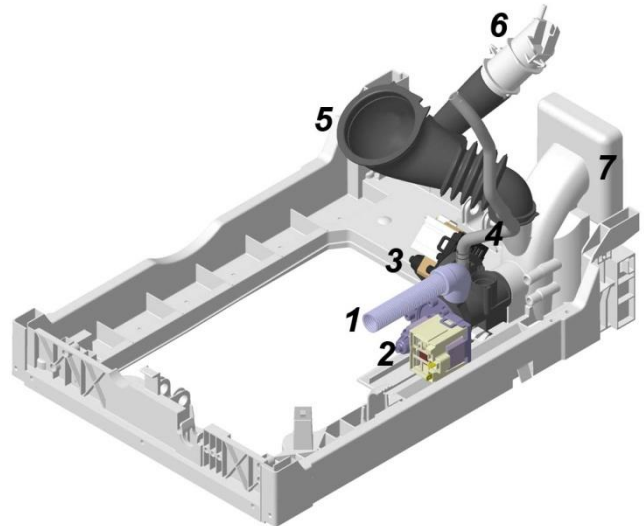
11.4.1 OKO version drain circuit

1. Prefilling pipe.
2. Drain pump.
3. Drain pipe.
4. Filter unit tub pipe containing the sphere.
5. Pressure chamber.
6. Filter unit amassed in the base frame.



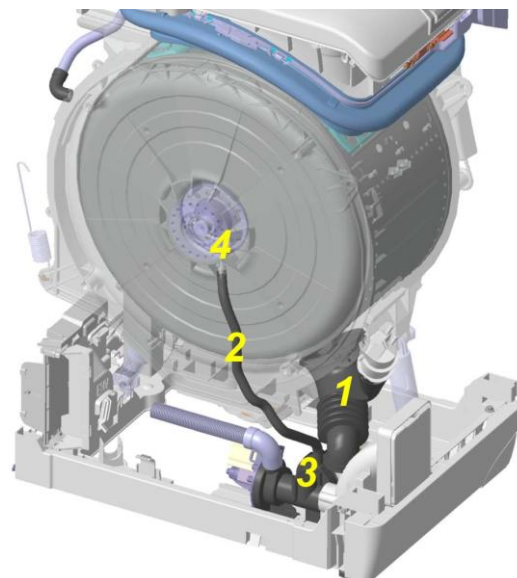
11.4.2 JET version drain circuit

1. Drain pipe.
2. Drain pump.
3. Circulation pump.
4. Jet pipe.
5. Filter body tub pipe.
6. Pressure chamber.
7. Filter unit amassed in the base frame.



11.4.3 JET circuit

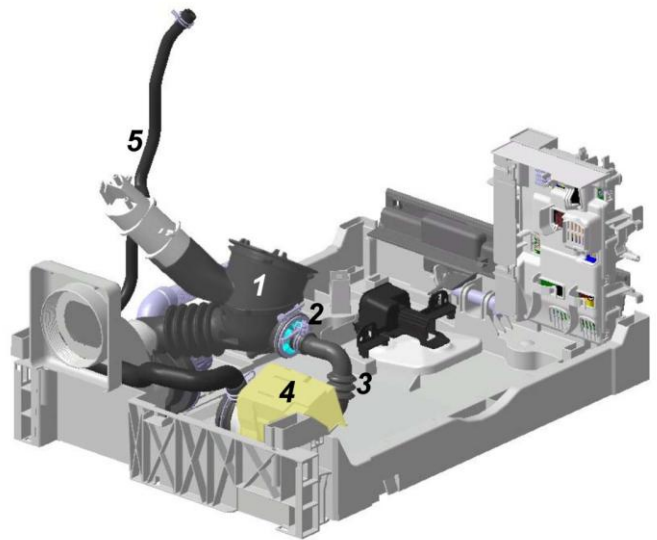
The water that circulates in the drain circuit (1) during washing through the pump (3) is put under pressure and going back up the pipe (2) and the nozzle (4) is once again pumped into the drum creating a continuous recycle of water.



11.4.4 ECO SPRAY Circuit

Complete Eco Spray Circuit

1. Tub drain pipe assembly
2. Filter
3. Re-circulation pump filter pipe
4. Re-circulation pump
5. Jet Pipe

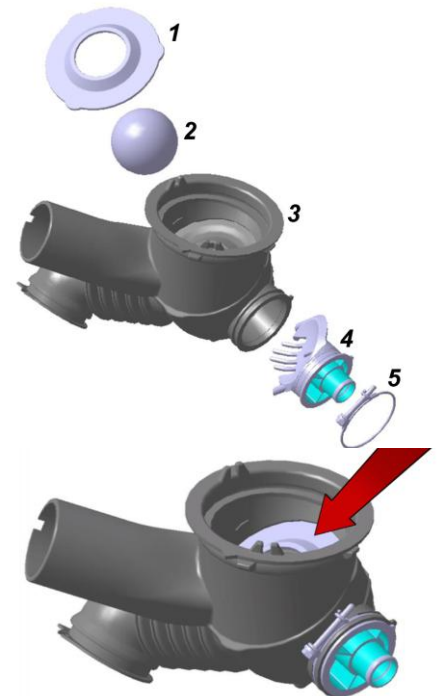


11.4.4.1 Tub drain pipe assembly



The tub drain pipe assembly is made up of:

1. Louver - stops the ball from getting in between the drum and tub.
2. Ball – as a result of the pressure from the drain circuit, it is pushed against the louver in order to separate the washing circuit from the drain circuit.
3. Pipe - Tub drain.
4. Filter - is an unusual shape and has two functions:
 - ↳ When the re-circulation pump is functioning, it acts as a filter and is cleaned automatically during the appliance's draining stage.
 - ↳ Thanks to its unusual shape, it keeps the ball in its exact position, because it does not block the drain pipe hole during drainage and even when the re-circulation pump is not powered.
5. Clamp



Operating principle

During the washing cycle the detergent is removed from: the prewash/wash/fabric softener trays. Unable to dissolve, a part of this deposits: on the bottom of the tub, above the ball and on the louver (shown by the arrow).

This part of the detergent would no longer be used and would end up in the drain the first time that the drain pipe starts functioning, at the expense of the washing cycle result.

A new hydraulic "Eco Spray" circuit is used to avoid this.

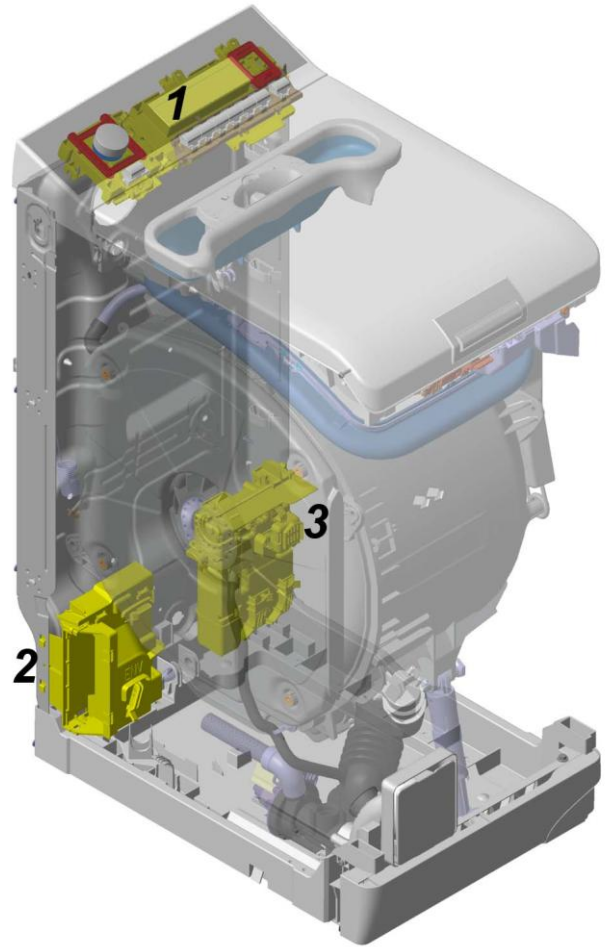
Its function is as follows:

During the washing cycle, the electronic control powers the re-circulation pump at set intervals (4); when this starts functioning, it causes a depression inside the drain pipe resulting in the ball dropping (2); at this point the deposited detergent enters the drain pipe and via the re-circulation pump and the Jet pipe (5) once again enters in circulation inside the drum.

11.5 Electronic control

The electronic control is made up of:

1. Control/display circuit board.
2. INVERTER motor control board.
3. Main electronic circuit board.



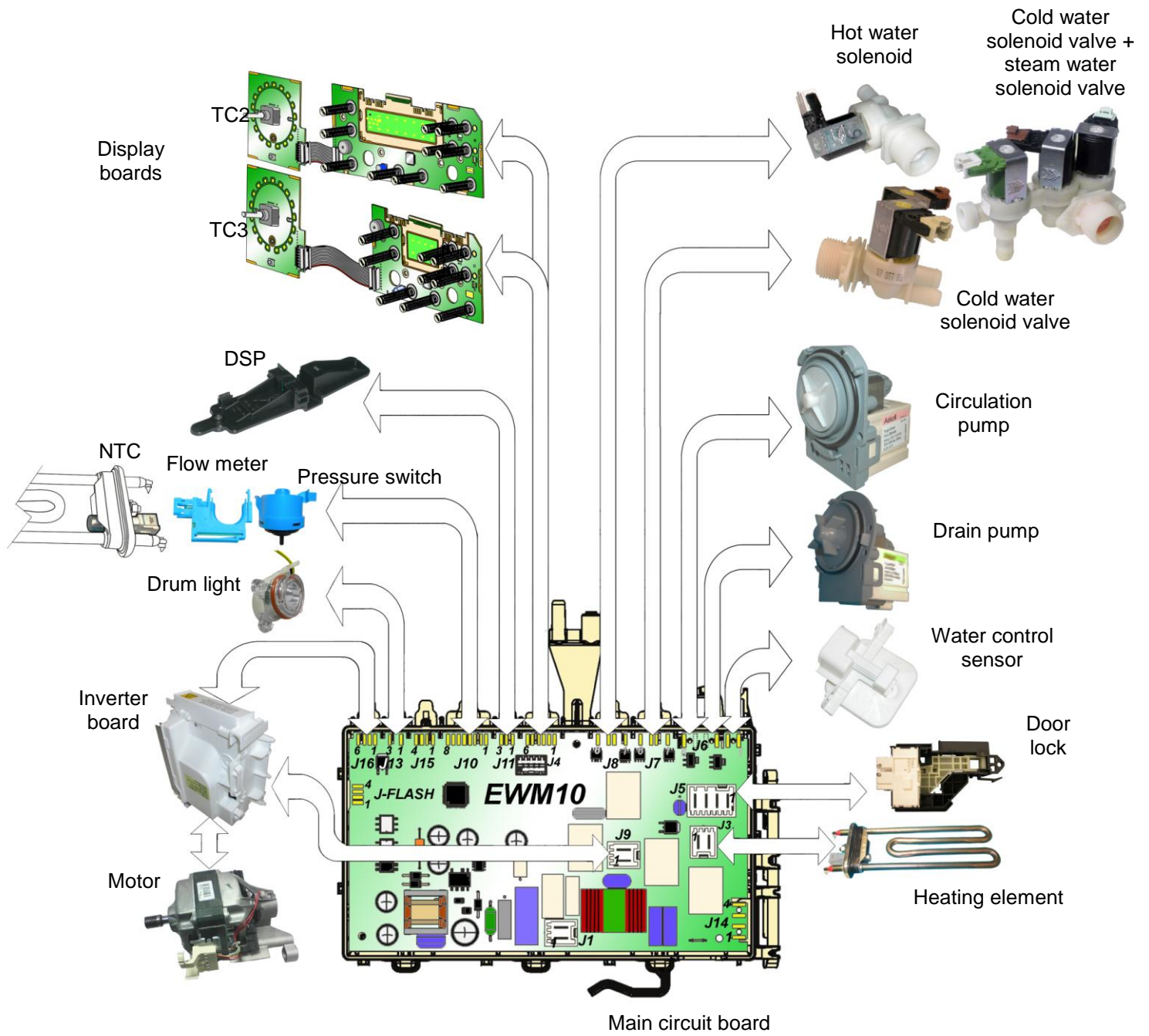
The control/display circuit board contains: the selector, to select the wash programme, the LCD screen to view information relating to the programme; the buttons to adjust the temperature, the spin speed and if necessary select an option, the Start/PAUSE button and lastly the ON/OFF button.

The commands received by the display board (by turning the selector dial, selecting an option, etc...) are sent to the main circuit board, which powers all the electrical components (cold and hot water solenoid valve – where featured, motor control board – Inverter, drain pump, circulation pump – where featured, heating element, door safety interlock, drum light).

- It controls the level of water via the analogue pressure switch.
- It controls the status of the door.
- It controls the speed of the motor.
- It controls the temperature of the washing water via the NTC probe inserted in the heating element.
- It controls the voltage and frequency of the electricity supply, making sure they are close to nominal values.
- It controls the position of the drum, via the DSP sensor.
- It controls the flow of water through the solenoid valve via the flow meter.

It simultaneously controls their functioning to guarantee the correct performance of the washing cycle.

11.5.1 Connecting electric parts



12 ELECTRICAL COMPONENTS

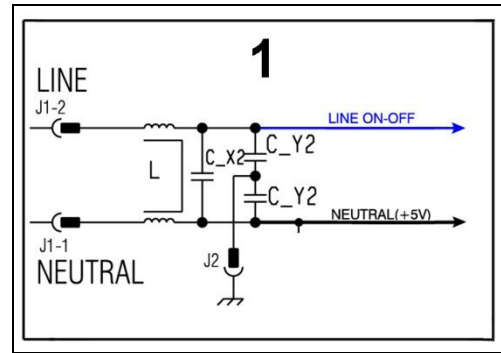


When replacing any of the components, please refer to the code shown in the list of spare parts relating to the appliance being repaired.

12.1 Anti-disturbance filter

This device is connected to the electricity power line input of the appliance and avoids the emission of radio frequency disturbance in the electricity mains. It is incorporated into the main board.

1. Main electronic circuit board



12.2 Display board

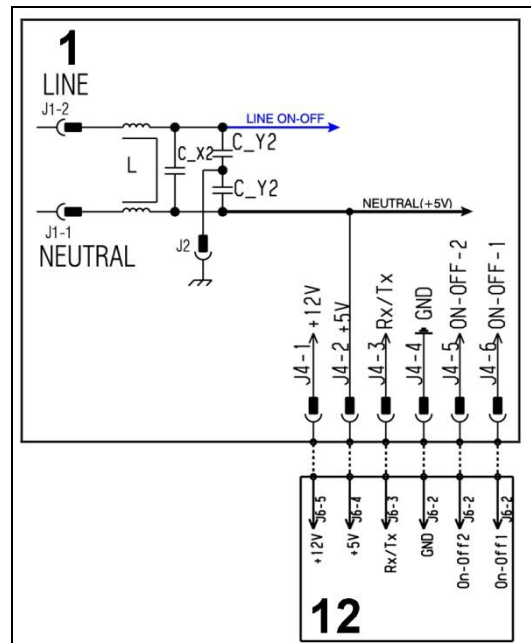
The main circuit board (1) supplies the power supply voltage to the control/display board (12).

Turn the selector dial to select the programmes, press the buttons to choose the options and press the START/PAUSE button to start or pause the appliance.

The buzzer - where featured - is powered by the display board.

1. Main electronic circuit board

12. Display board



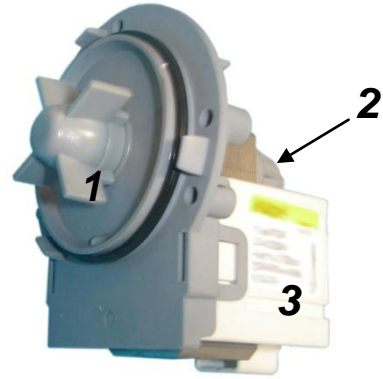
12.3 Drain pump



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

12.3.1 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 18÷20 l/min, and the maximum head is 90 cm.

Fitted with thermal cut-out.



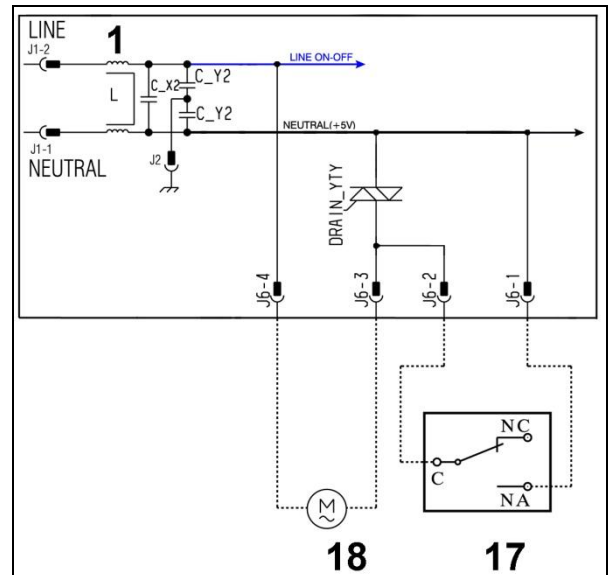
Synchronous pumps, when powered on empty (disconnected from the water circuit), may not start in some cases because their very construction makes them need an antagonist torque on the wheel to allow the rotor to move in one of the two directions.

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 pre-determined period (and an alarm might be displayed, see table of alarms).
- ↪ Until the electronic pressure switch closes on empty, after which the pump is actuated for a brief period or passes to the subsequent phase.

1. Main electronic circuit board
17. Water control sensor
18. Drain pump

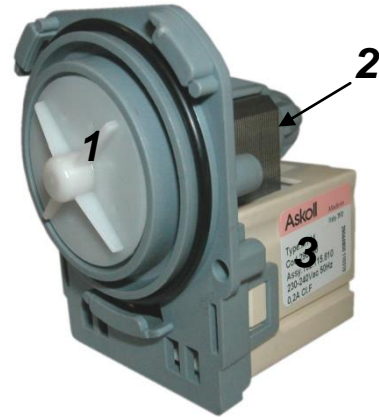


12.4 Circulation pump (where featured)

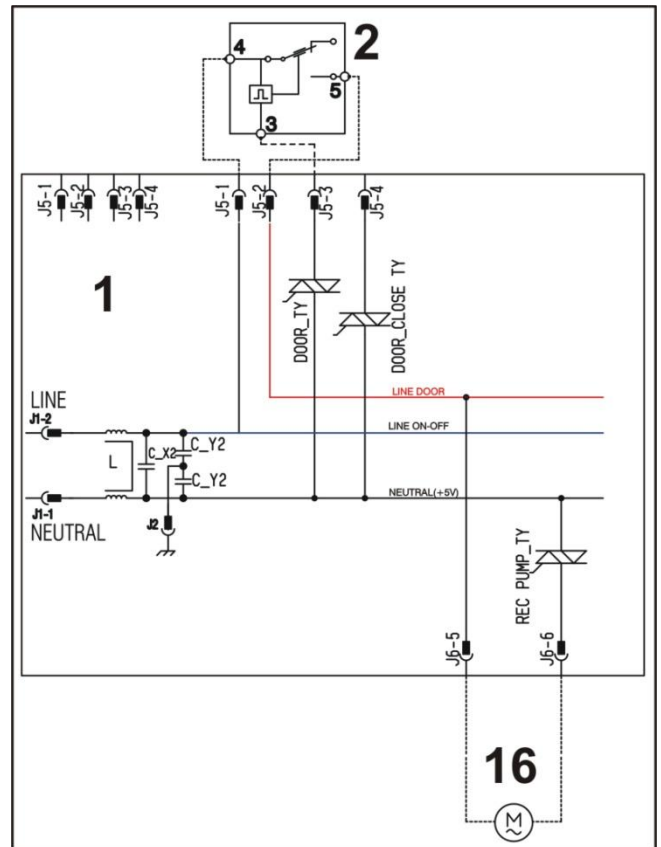
In models with Jetsystem washing, a synchronous circulation pump is fitted, which is designed to circulate water continuously, withdrawing it from the filter body and introducing it into the tub through the bellow seal.

It is powered directly by the main circuit board via a triac and is fitted with a thermal cut-out.

1. Wheel
2. Rotor
3. Stator



1. Main electronic circuit board
2. Door safety interlock
16. Circulation pump



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..

12.5 Water control

The Aqua control is a sensor placed touching the bottom of the appliance which detects any water leaks inside the washing machine and powers the drain pump (not only during normal operation but also when the appliance is turned off but plugged in).

In the lower part of the washing machine, there is a plastic bottom in the shape of a tray, which collects any water leaks (from the tub, from the pipes and hoses, etc.), that all collect in the area where the float is positioned (made of polystyrene), which in the presence of water is raised and triggers the micro-switch, which powers the drain pump.

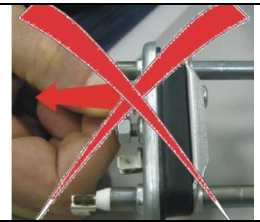
When it is triggered, the LCD displays an ALARM (if the appliance is on) – see table of alarms.



12.6 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. changing the NTC probe, etc...).**



1. NTC probe
2. Heating element

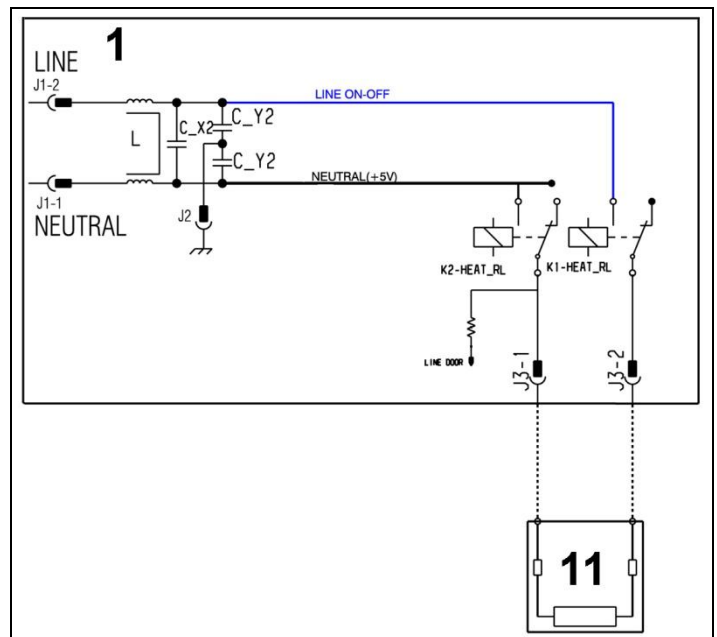


The heating element is hardened, that is, inserted into a stainless steel water proof tubular case.

It is powered by two relays (K1, K2) situated in 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.

(In the event of a fault, an alarm is displayed - see table of alarms).

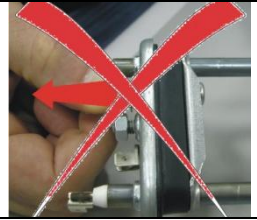
1. Main electronic circuit board
11. Heating element



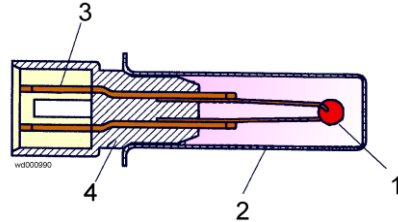
12.7 Temperature sensor



- **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. changing the NTC probe, etc...).**



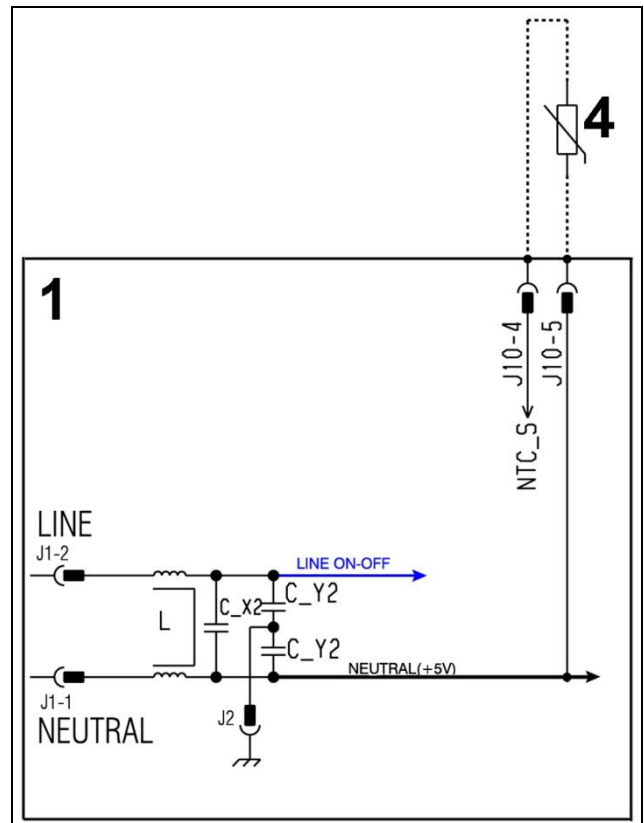
1. NTC heating element
2. Metal capsule
3. Terminals
4. Plastic casing



An NTC type probe is used to control the washing 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 probe incorporated in the heating element.

1. Main electronic circuit board
4. NTC probe



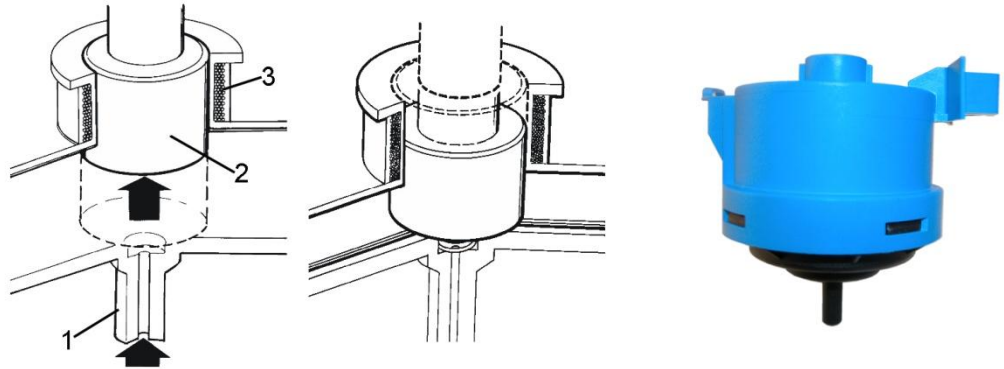
In the event of a fault (short-circuit or failure), an alarm is displayed – see table of alarms.

12.8 Analogue pressure switch

12.8.1 General characteristics

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

1. Small tube
2. Core
3. Oscillating coil

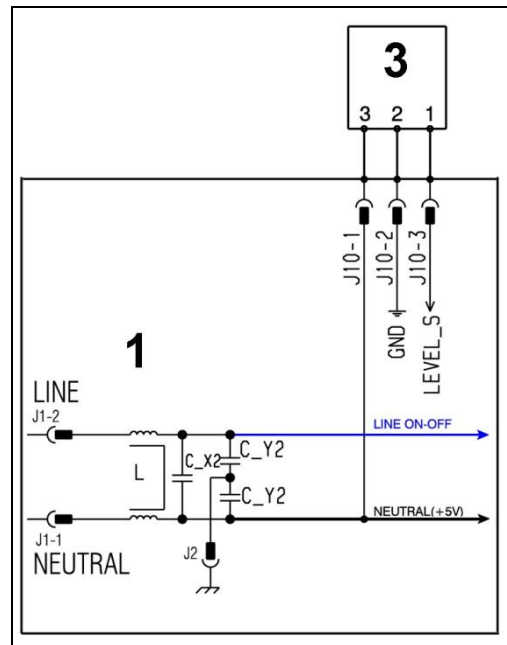


The pressure switch is connected via a pipe to the pressure chamber.

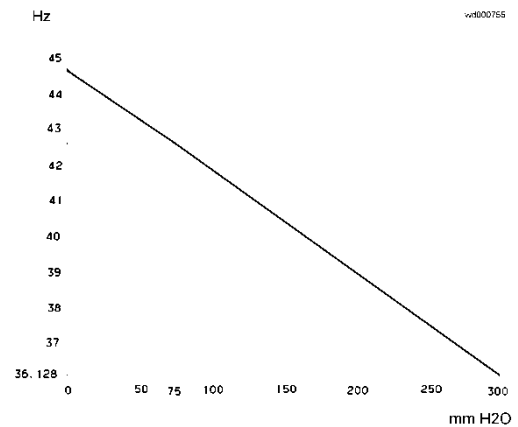
When water is introduced into the tub, this creates a pressure inside the hydraulic circuit that causes the membrane to change position. This in turn modifies the position of the core inside the coil, thus changing the inductance and the frequency of the oscillating circuit.

The PCB recognises how much water has been introduced into the tub according to the frequency.

1. Main electronic circuit board
3. Analogue pressure switch



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

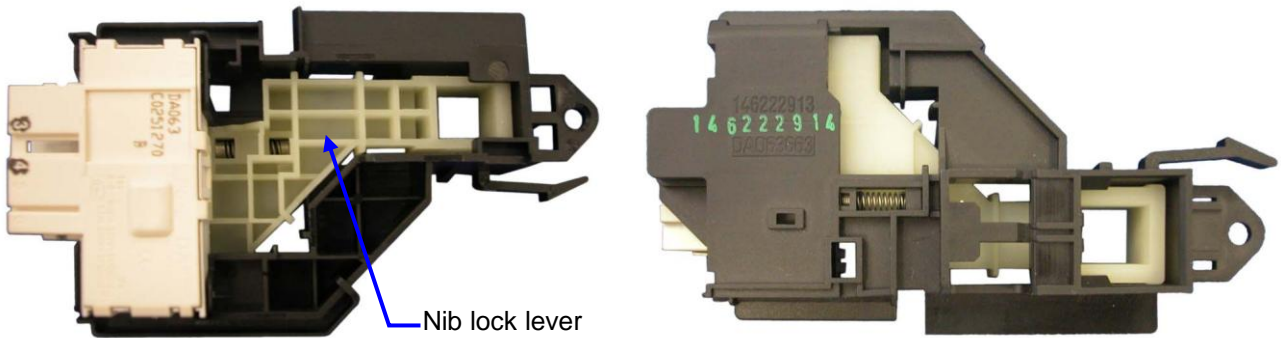


In the event of a fault, an alarm is displayed – see table of alarms.

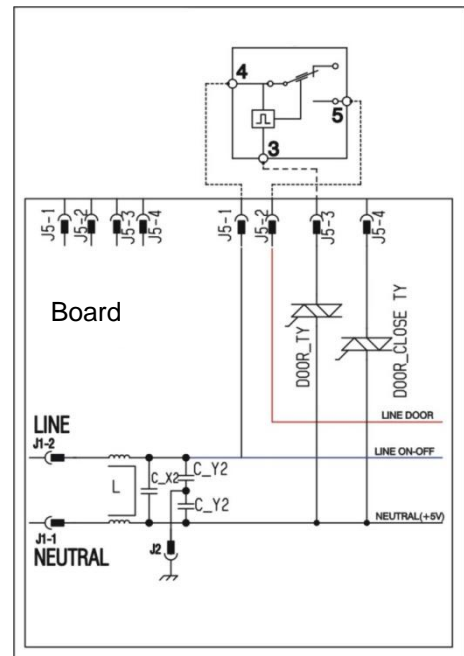
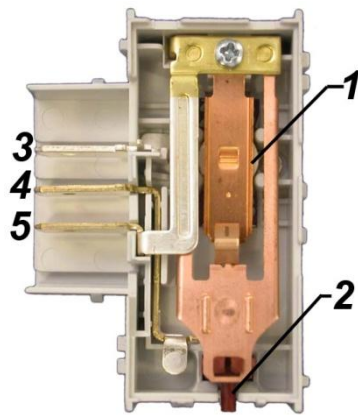
12.9 Door safety interlock

12.9.1 Delayed opening safety device

The door delay safety device ensures that while the tumble-dryer is working normally, it is impossible to open the door for safety reasons and ensures that at the end of the wash cycle the door can only be opened after a set time.



1. Bimetallic PTC
2. Lock lever

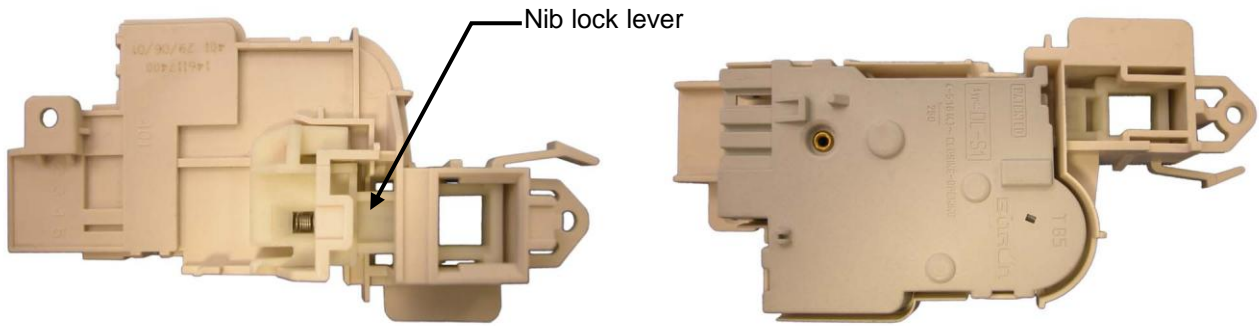


After pressing the START/PAUSE key a pre-established current passes through the bimetallic PTC (1) which becoming misshapen causes the lock lever (2) to move, stopping the nib lock runner from moving.

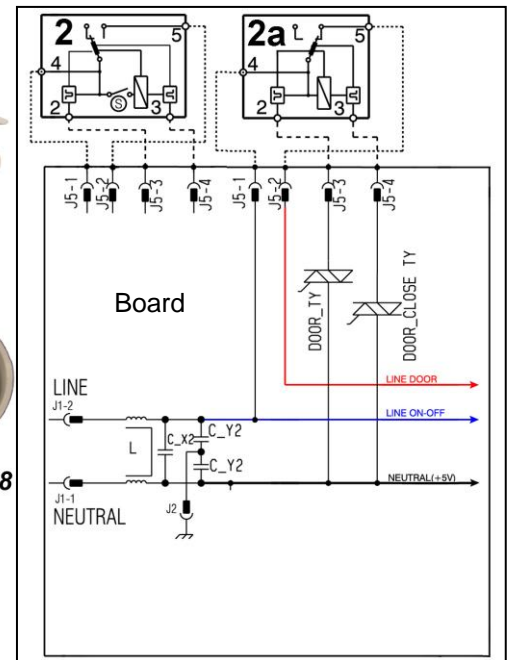
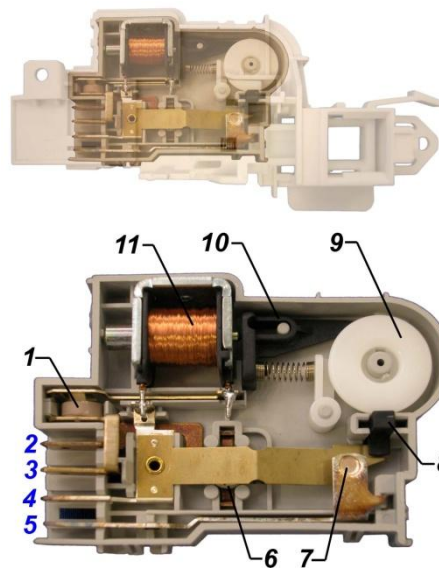
At the end of the programme when the power supply to the bimetallic PTC (1) is disconnected a certain amount of time is needed to allow it, previously misshapen, to return to its initial rest position thus unlocking the nib lock runner.

12.9.2 Safety device open lid (without micro)

The instantaneous door safety device blocks the opening of the door while the tumble-dryer is working normally but allows the door to be opened as soon as the drum stops.



1. Solenoid protection PTC
2. Connection to J5 pos. 3
3. Connection to J5 pos. 4
4. Connection to J5 pos. 1
5. Connection to J5 pos. 2
6. Bimetallic PTC
7. Changing contact
8. Blocking device
9. Cam
10. Cam activating lever
11. Solenoid



Main circuit board

2 Door safety interlock (with micro-switch)

2a Door safety interlock (without micro-switch)

Operating principle

- When the programme starts (start/pause button), the main circuit board sends a voltage pulse, lasting 20 msec, to the solenoid (at least 6 seconds must have passed since the appliance was turned on), which turns the position of the cam (9): the ratchet (8) which locks the cursor of the door safety interlock is raised and simultaneously closes the contacts of the main switch (7), which powers all the appliance components.
- When the programme ends, the circuit board sends two additional 20 msec pulses (200 msec apart):
 - the first pulse moves the cam by another position, without releasing the ratchet
 - the second pulse (which is only sent if everything is in working order) moves the cam to another position, which causes the ratchet to return to its position and therefore release the interlock; the contacts of the main switch are simultaneously opened.

Door open conditions

Before pulses are sent to open the door, the PCB checks for the following conditions:

- the drum must be stationary (no signal from the tachometric generator).
- the temperature of the water must not be higher than 40° C.

– Automatic release device

In the event of a power failure, turn the appliance off at the ON/OFF button, solenoid fault, the bi-metal PTC cools in between 55 seconds and about 4 minutes (with temperature of 65° C) and therefore releases the door.

– Solenoid protection

A PTC is connected in series to the solenoid to limit the current (and therefore any overheating) in the following cases:

→ main circuit board triac short-circuit

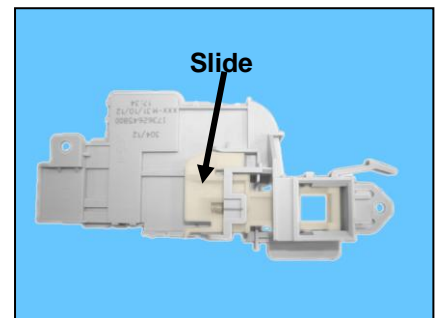
→ many consecutive pressings of the start/pause button (more than 10 times)

12.9.3 Safety device open lid (with micro)

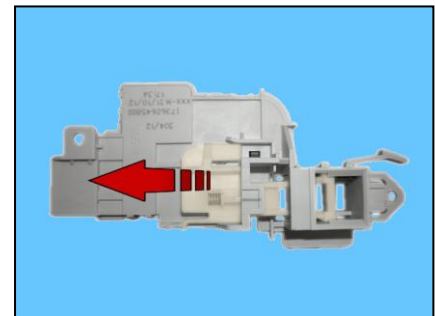
Its function is the same as the one described above.

Some appliances have a drum light which turns on / off depending on the position of the slide whose movement establishes the opening / closing of the two contacts

When the washing machine lid is open, the slide is in the position as shown here in the adjacent figure.



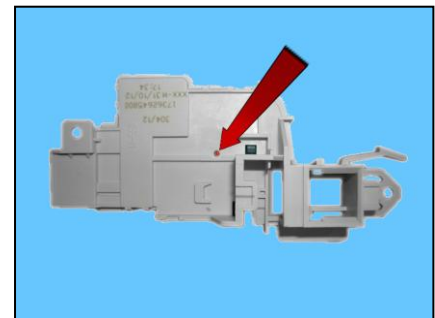
By closing the washing machine lid, the latch moves the slide in the direction indicated by the arrow.



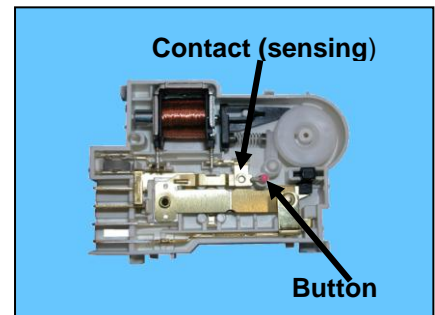
Safety device without slide

The slide movement described above causes the button to move as indicated by the arrow with the subsequent opening / closing of a contact inside the device.

When the washing machine lid is open, the information on the PCB will be to light the drum while, when it is shut, the information will be to not light it.



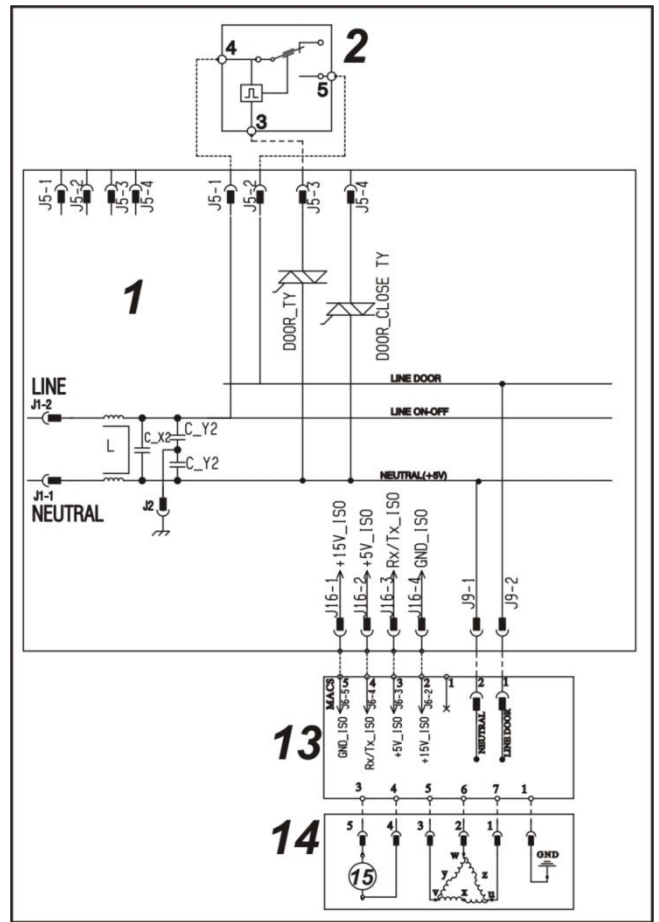
Inside the device



12.10 Three-phase asynchronous motor - Inverter

1. Main electronic circuit board
2. Door safety interlock
13. Inverter
14. Motor
15. Tachometric generator

X-Y-X = Motor windings



12.10.1 Power supply to motor

Three-phase power is fed by the inverter (13), which sends through the connectors 5-6-7 the three phases to connectors 1-2-3 on the motor (nodes U-W-V), where the windings (Y-X-Z-) are connected.

The phase shift between the phases is 120° and peak amplitude is 310 V.

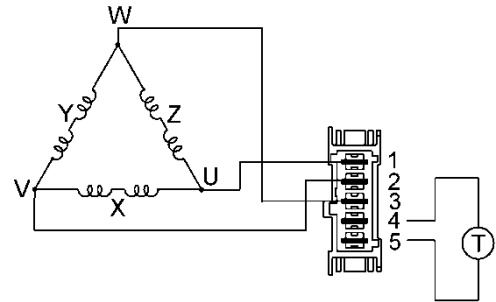
It is possible to get an idea of the efficiency of the motor by measuring the resistance of the coils:

Coil y ohm 5.46 $\sim \pm 7\%$ (contacts 2-3)

Coil x ohm 5.46 $\sim \pm 7\%$ (contacts 1-2)

Coil z ohm 5.46 $\sim \pm 7\%$ (contacts 1-3)

Coil T (tachometric) ohm 188 $\sim \pm 7\%$ (contacts 4-5).



12.11 Inverter board

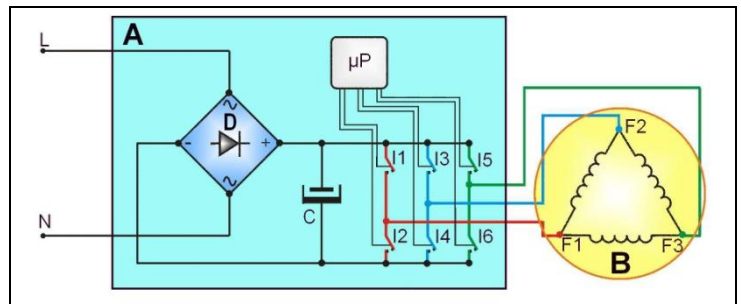
The EWM10931 electronics use a new asynchronous motor, with 2 poles, three-phase, with high performance and low noise levels.

This motor is piloted by an inverter board that transforms a single phase inlet into a modulated three-phase outlet.



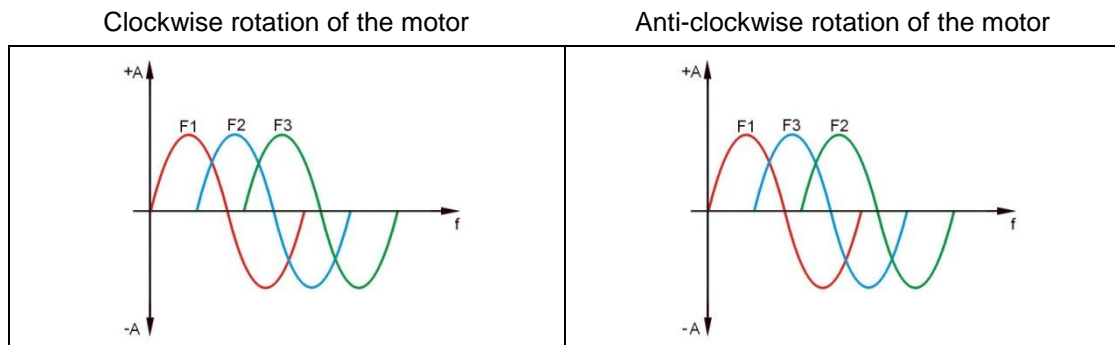
“INVERTER” main diagram

- L = Phase
- N = Neutral
- A = “INVERTER” board
- B = Motor
- C = Condenser
- D = Diodes
- I1÷6 = Switches
- F1÷3 = Motor connectors
- μP = Micro Processor



To transform the single-phase electricity (available in our homes) into three-phase electricity, a new circuit board is used (A) to transform the energy from single-phase to three-phase, which can be modulated in breadth and frequency respectively to adjust the power and number of revolutions of the motor.

Single-phase electricity (applied to connectors L-N), is rectified by the diode jumper (D), so there is a direct voltage of 310 V at the ends of condenser C, which through the combination of the opening and closing of switches I1÷I6 (piloted by the μprocessor) determines the piloting voltage and frequency of the motor.



The speed of rotation of the motor is determined by the signal received from the tachometric generator (T).

During the spin phases, the microprocessor can perform, depending on the software configuration, the anti-foam check, where featured and the anti-unbalancing check.

12.11.1 AGS

AGS is the abbreviation for the Italian words “**A**lgoritmo di **G**estione dello **S**bilanciamento” (Algorithm of Unbalance management).

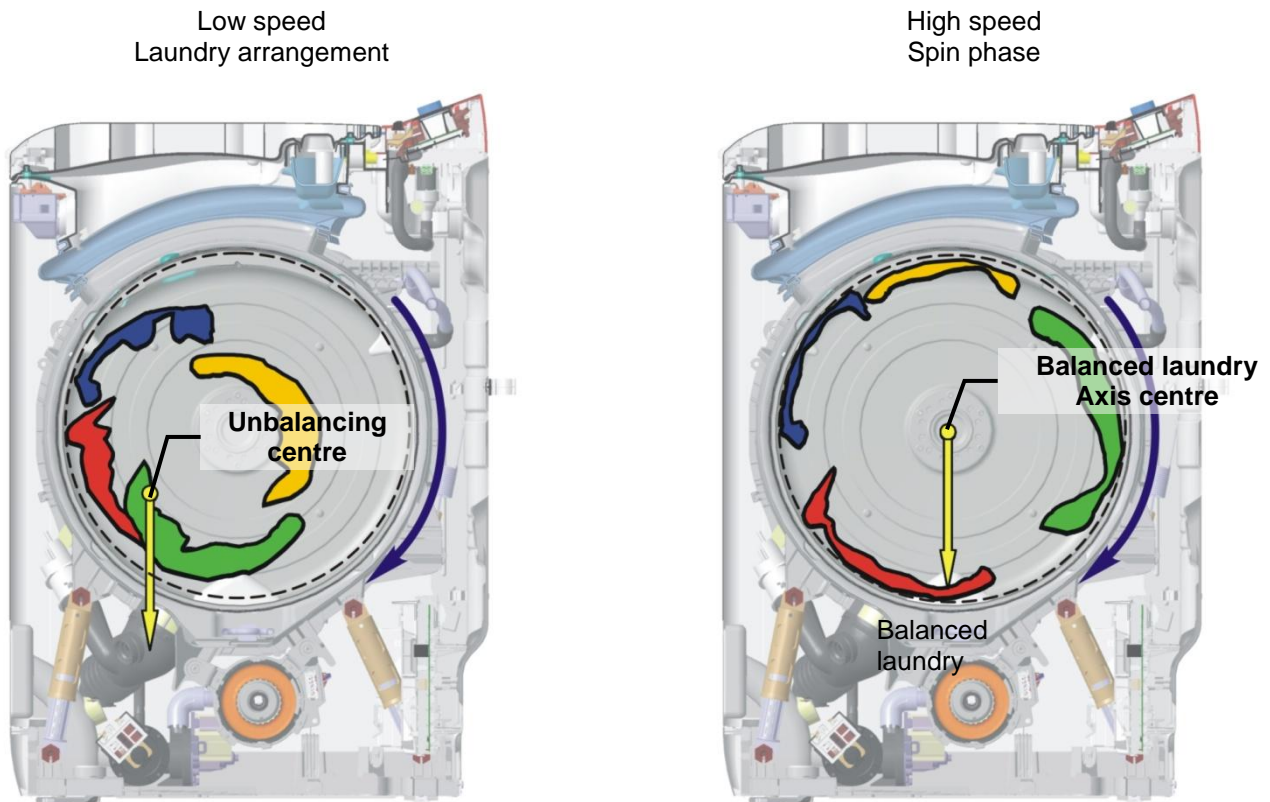
It is a complete procedure for the distribution of the laundry in the drum, limiting the static residual unbalance and guaranteeing an effective spin phase in an axis subsequently avoiding excessive vibrations in the washing machine.

AGS works properly in all washing machines fitted with a speed sensor and a torque sensor.

The tachometer fitted to the motor sends out the speed signal.

As far as the torque sensor is concerned on the Electronic EWM10 platforms, we have a motor voltage sensor integrated into the main board that allows us to have an electric power estimate.

Then, via the motor's efficiency (deducted from a motor load table), we can obtain the mechanical power and lastly the torque signal:



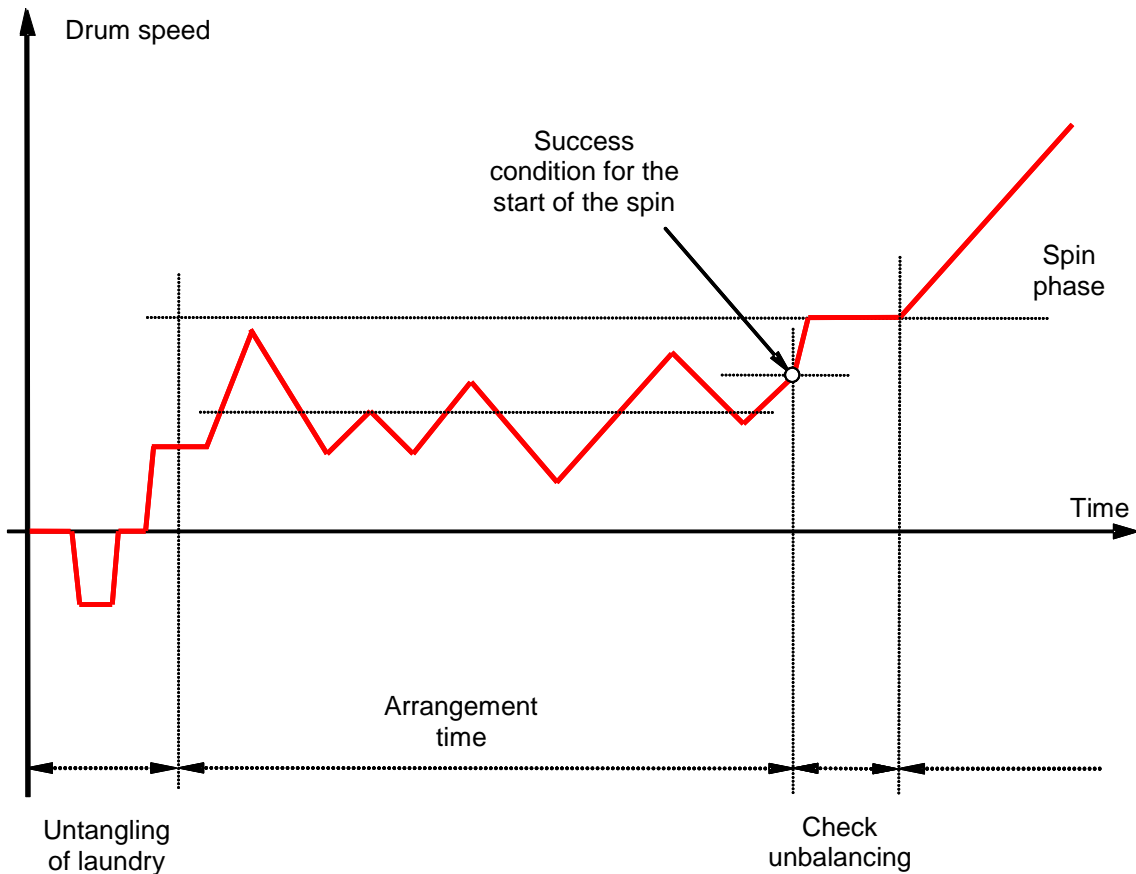
The AGS control is carried out before each spin and it aims to achieve the following:

- Measure the inertia moment.
- Measure the static unbalance.
- Control the distribution of the laundry load so that the level of static unbalance is below a specific threshold.
- The dynamics of the unbalance in order to limit the wash unit swings.
- The calculation of the maximum spin speed with the measured static unbalance.

When all the following conditions are in place, we have the right condition to ensure that the spin can start.

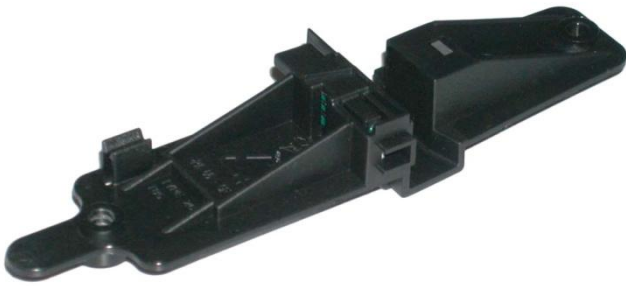
The graph below represents the various stages of the motor control, before reaching the top spin speed for the selected programme.

During the first phase, the drum rotates at a speed that untangles the laundry. Once this phase is complete, the drum starts rotating at a variable speed in order to arrange the laundry evenly over the whole surface. At this point the spin phase could start but the electronic control is set to carry out an unbalancing control and if this does not cause any problem, the spin phase starts, reaching the maximum speed required by the selected programme.

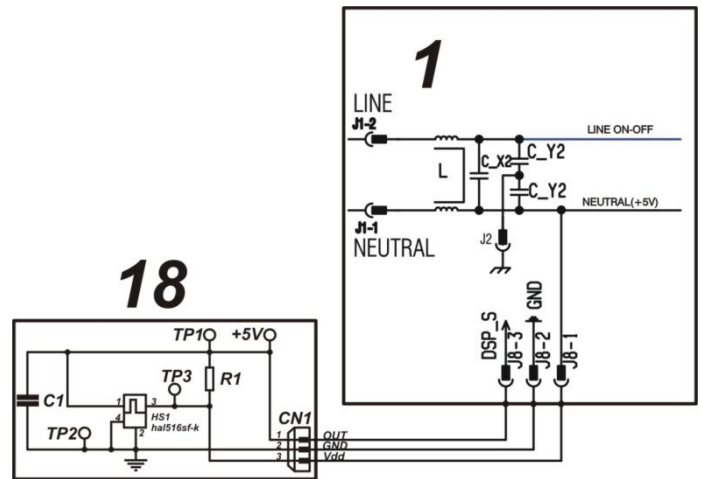


12.12 DSP drum positioning device (Drum – Self – Position)

The DSP or Drum Self Position is an electronic device for putting the drum in the right position so that once the wash cycle is finishes the 2 load lids are in the upper part of the washing machine so that the person operating it does not have to rotate the drum manually.

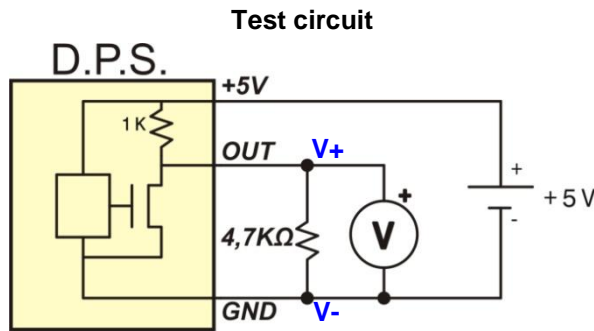
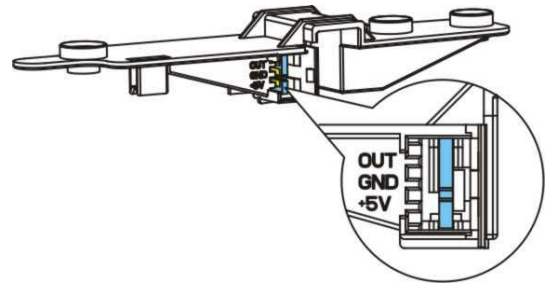


- 1. Main electronic circuit board
- 18. DSP internal circuit
- R1 1 K Ω 5%
- C1 4.7 μ F 50 V 10%

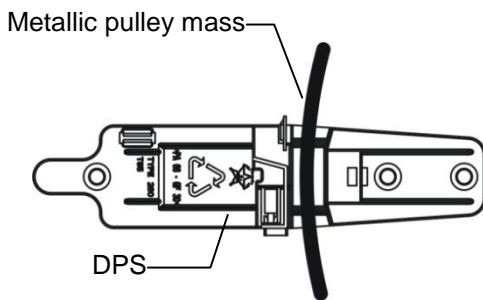


12.12.1 DPS operating control

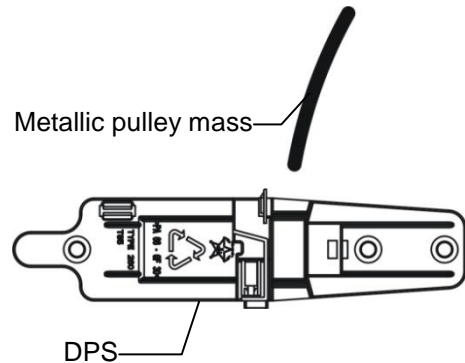
- Power the DPS circuit between the points +5 V and Mass (GND) with a voltage of 5 V.
- Position a 4.7 K Ω element between the OUT points and the mass (GND).
- Use the voltmeter to measure the voltage in the element ends (V+ V- points).



DPS sensor with metallic mass inserted.
Voltage measured at the V+ V- < 1.5 V ends



DPS sensor with no metallic mass inserted.
Voltage measured at the V+ V- > 3.8 V ends



12.13 Solenoid valves

SOLENOID VALVE
HOT WATER

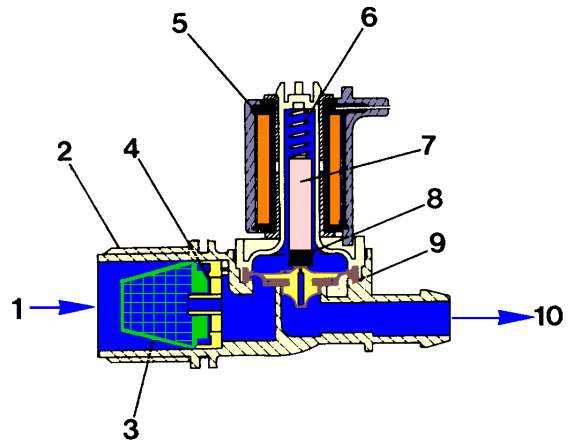
SOLENOID VALVE
TWO WAYS

SOLENOID VALVE
THREE WAYS



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
4. Flow reducer
5. Coil
6. Spring
7. Moving core
8. Rubber
9. Membrane
10. Water outlet

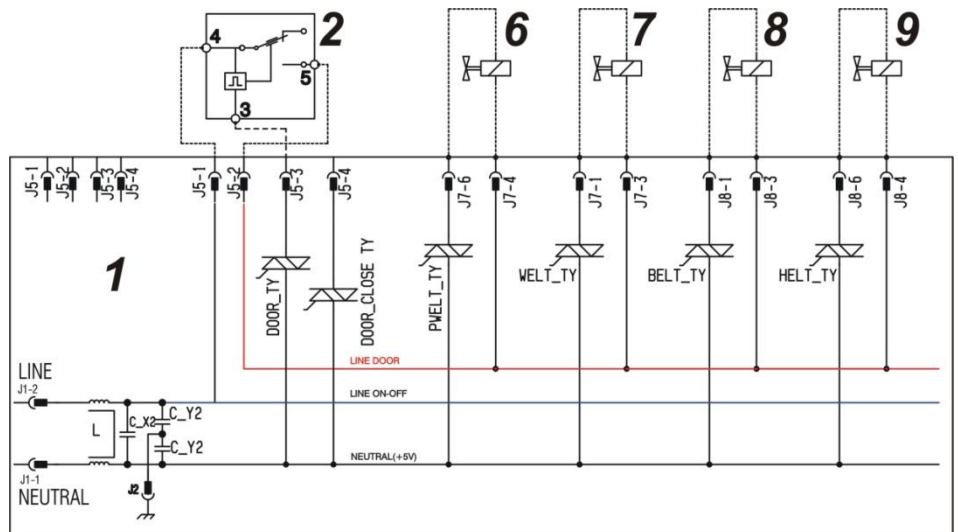


12.13.1 Operating principle

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 electronic circuit board
2. Door safety interlock
6. Pre-wash solenoid
7. Wash solenoid
8. Steam solenoid valve
9. Hot water solenoid



12.13.2 Problems relating to the solenoid valves

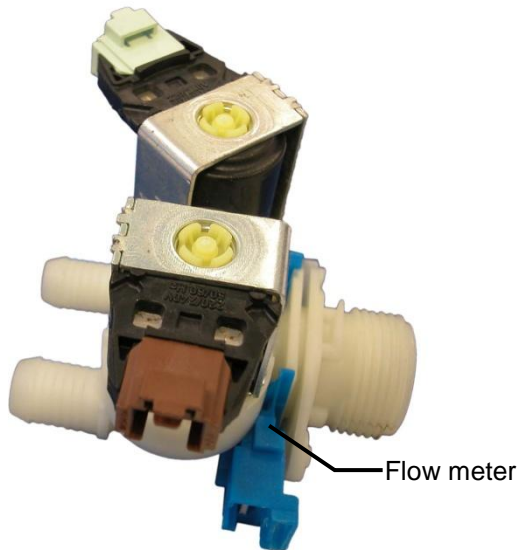
- **Mechanical jamming of the solenoid valve**

The solenoid valve may jam open without being actuated (which will cause flooding if the pressure switch controlling the water level does not trip). If this occurs, the electronic control system (which continuously monitors the flow sensor), starts the drain pump and simultaneously displays an ALARM.

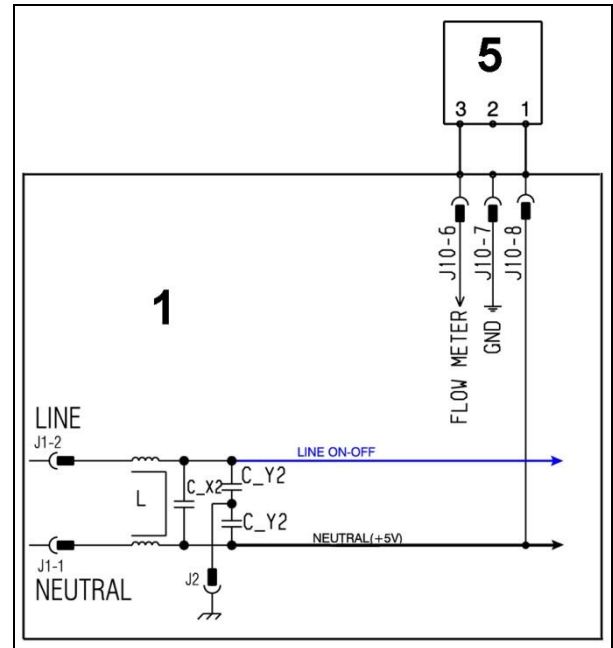
- **Low water pressure**

If the flow sensor does not generate a signal during the water fill phases, even though power is being supplied to the solenoid valve, the cause of this condition may be a closed water tap or clogged filter on the solenoid valve (with ensuing low water pressure). If this occurs, only a WARNING will be displayed and the cycle will continue for five minutes, after which time an ALARM will be signalled.

12.14 Flow meter



- 1. Main electronic circuit board
- 5. Flow meter



Some models of solenoid valves have a built-in flow sensor, which measures the quantity of water in litres that is loaded into the appliance.

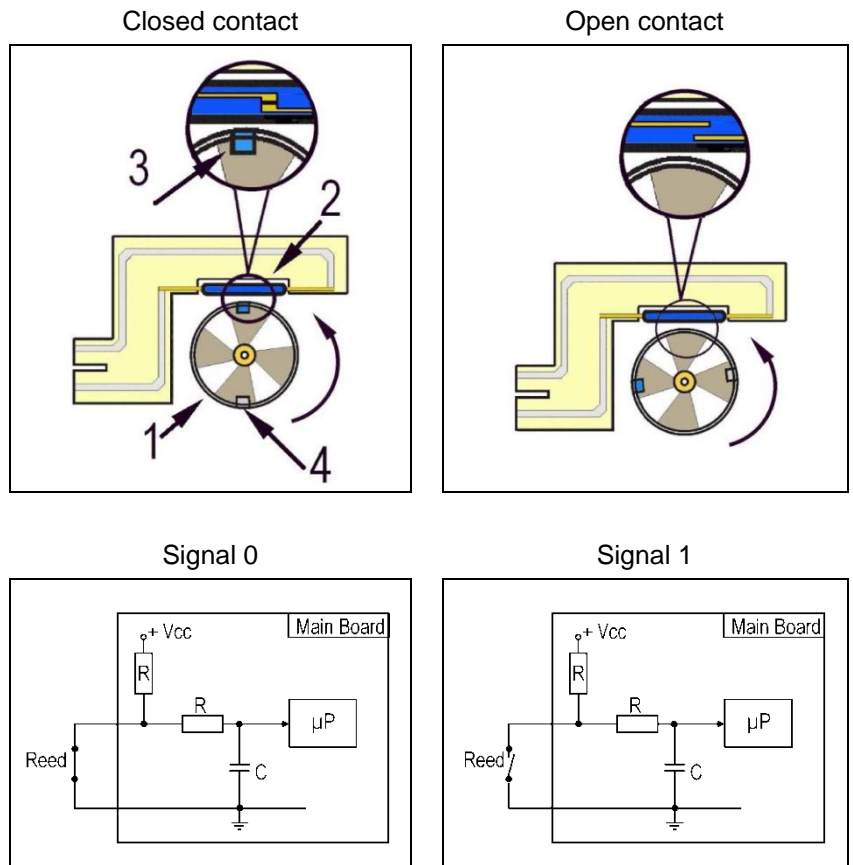
In the event of a sensor failure, the water level is controlled by the analogue pressure switch.

Electronically controlled valve, exploded view	PCB	Turbine
<ul style="list-style-type: none"> 1. PCB 2. Turbine 3. Deflector 4. Diffuser 5. Double filter 	<ul style="list-style-type: none"> 6. Reed Contact 	<ul style="list-style-type: none"> 7. Magnet 8. Counterweight

12.14.1 Operating principle of the flow meter

The main components of the flow meter are:

1. Turbine (with magnet and counterweight mounted on the outside)
2. Reed contact (normally open)
3. Magnet
4. Counterweight



Water entering the solenoid valve rotates the turbine (1) and magnet (3), which passes in front of the Reed contact (2), thus closing it. As this contact opens and closes, it generates pulses at a frequency that depends on the water flow rate).

The turbine completes 230 revolutions for each litre of water. The operating range of the flow sensor is 0.2÷10 bar.

Using the signal it receives, the micro-processor can calculate the number of litres of water passing through the solenoid valve.

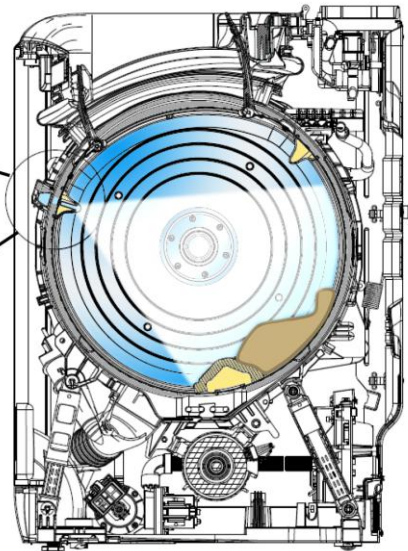
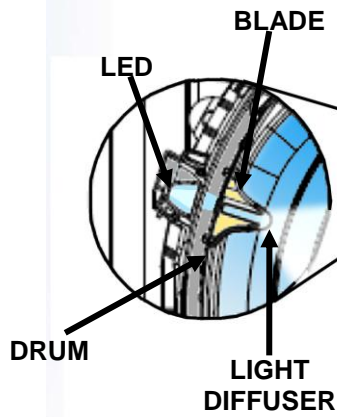
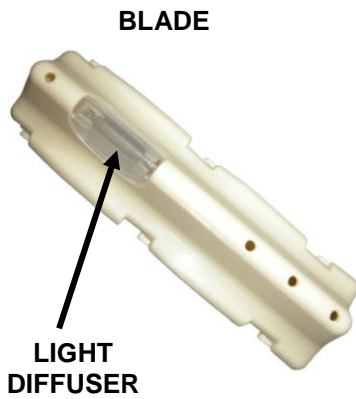
12.15 Drum light (where featured)

The drum light consists of a high luminosity LED. When the appliance is at the setting phase (START/PAUSE light flashing), on opening the laundry load lid the LED lamp comes on and lights the inside of the drum; vice versa on closing the laundry load lid, it turns off.



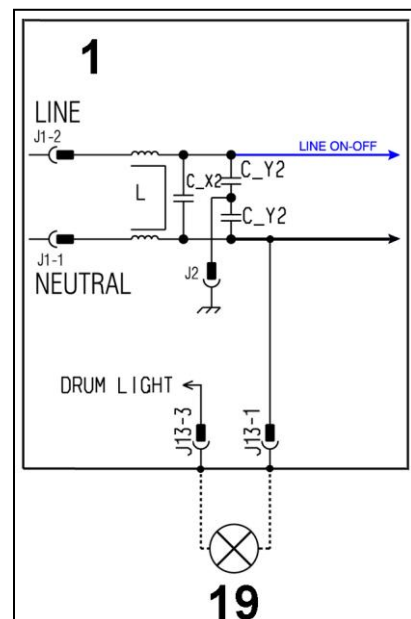
IMPORTANT: Do not look straight at the light beam emitted by the LED when it is on.

12.15.1 Internal drum lighting



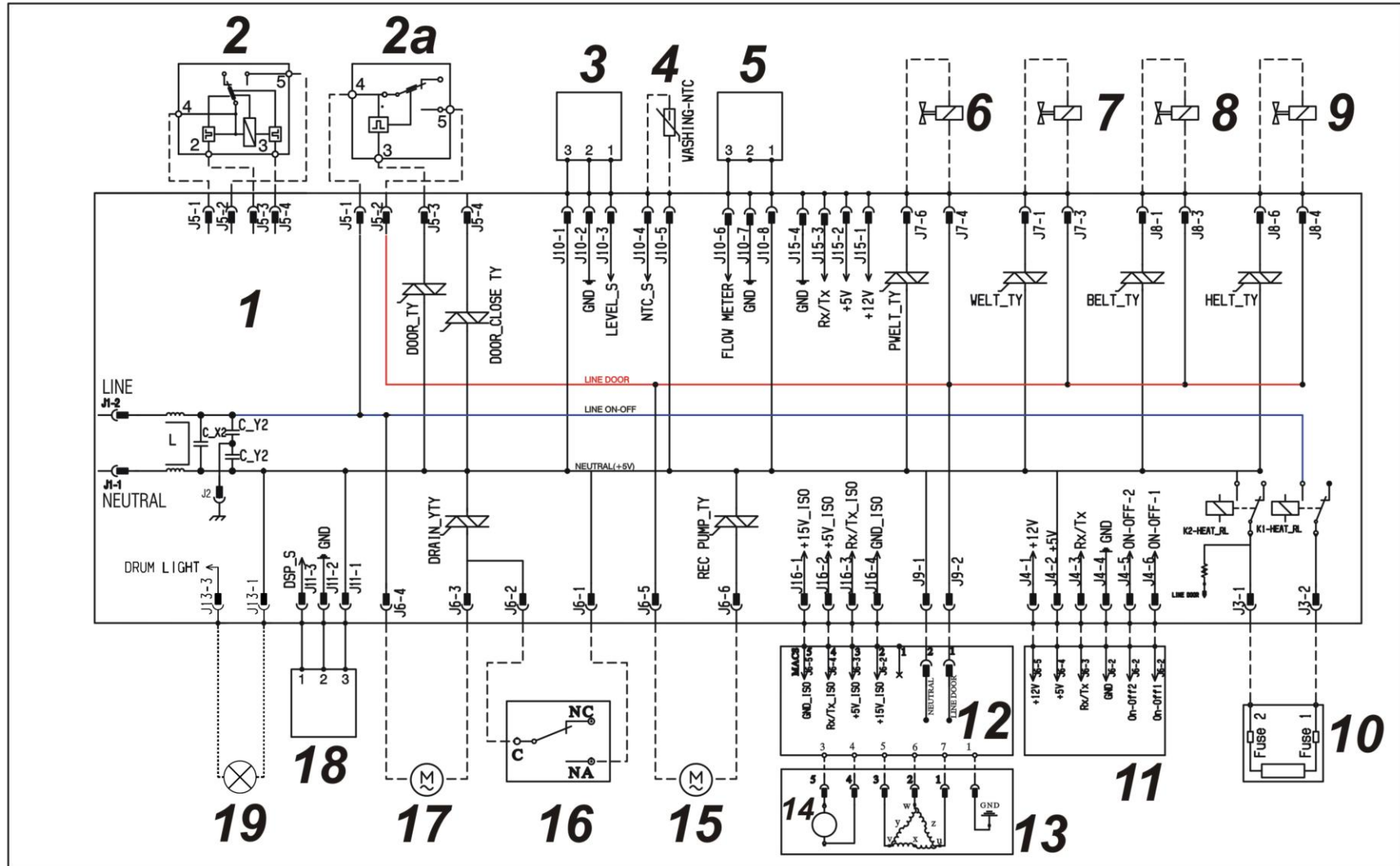
To check the efficiency of the LED, power it with constant direct current of 150mA and a voltage of 3.3V.

- 1. Main circuit board
- 19. Drum light



13 DIAGRAMS

13.1 WM diagram with THREE-PHASE ASYNCHRONOUS MOTOR



13.2 Key to diagram

Appliance electrical components	PCB components	
1. Main electronic circuit board	DRAIN_YTY	Drain pump Triac
2. Instantaneous door safety interlock	DOOR_TY	Door interlock Triac
2a. Delayed door safety interlock	DOOR_CLOSE_TY	Door interlock Triac
3. Electronic pressure switch	REC PUMP_TY	Circulation pump TRIAC switch
4. NTC (washing)	PWELT_TY	Pre-wash solenoid Triac
5. Flow sensor	WELV_TY	Wash solenoid Triac
6. Pre-wash solenoid	BELT_TY	Fabric softener solenoid valve Triac
7. Wash solenoid	HELT_TY	Hot water solenoid triac
8. Fabric softener solenoid valve	K1	Heating element relay
9. Hot water solenoid	K2	Heating element relay
10. Heating element		
11. Display board		
12. Motor control board (inverter)		
13. Triple-phase motor		
14. Tachometric generator (motor)		
15. Circulation pump		
16. Aqua control sensor		
17. Drain pump		
18. DSP		
19. Drum light		

14 ACCESSIBILITY



Before intervening on the equipment place a protection above the drum in order to prevent small parts falling inside the tub.

14.1 Control panel

Some appliances have the control panel attached with screws at the back

- Slacken the two screws (shown by the arrows)



14.1.1 Dismantling

- Insert a screwdriver into the side slits, first from one side then another, as shown in the figure.
- Taking care not to ruin the paint work, lever downwards in order to slightly widen the control panel until you unfasten the clips that hold it on.

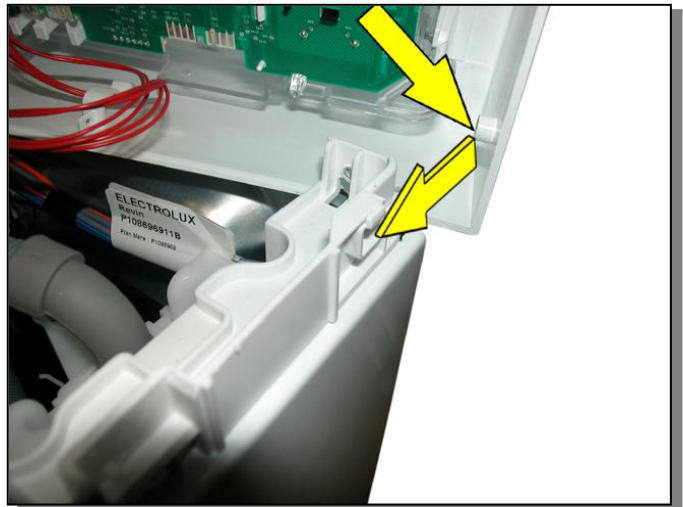


- Lift it up gently and move it towards the back.



14.1.2 Assembly

- Introduce the runner pivots located on the control panel into the rails found on the sides of the washing machine.
- Rotate it forwards.
- Press the control panel forwards until it is completely hooked on.



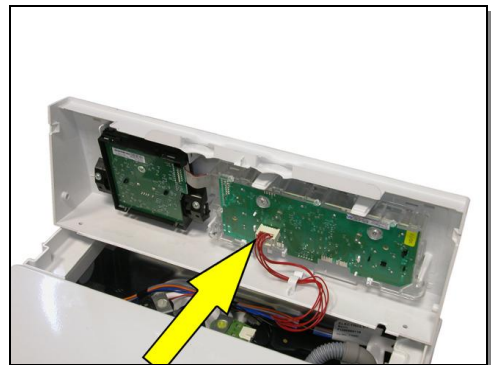
14.2 Control circuit



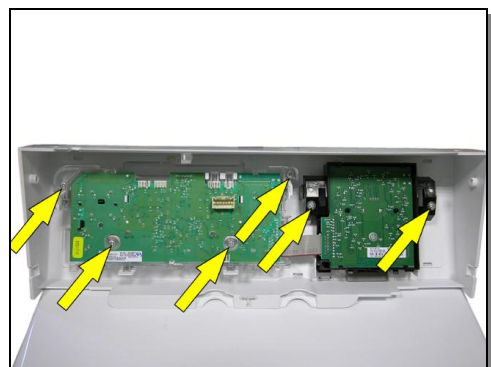
- **Warning: the sensors located in the display boards could be at a potential of 220 Volts.**

After opening the control panel, the control circuit board can be removed.

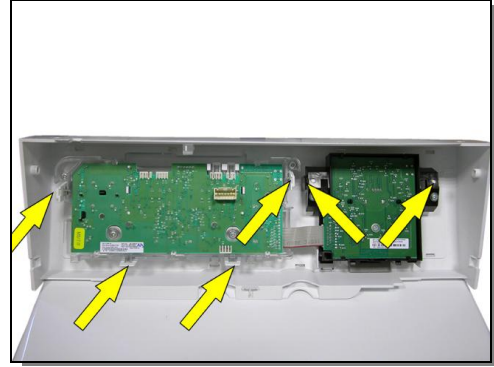
- Disconnect the connector that links the control circuit board to the main board.
- Remove the wiring from the hook that holds the wiring to the control panel



- Slacken the screws that hold the board to the control panel (shown by the yellow arrows).

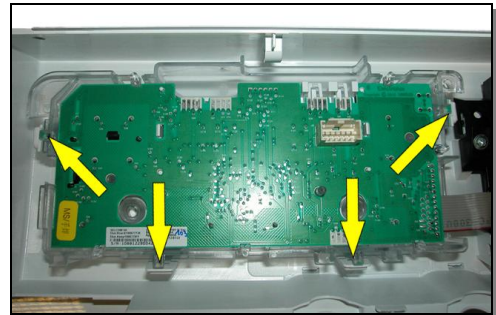
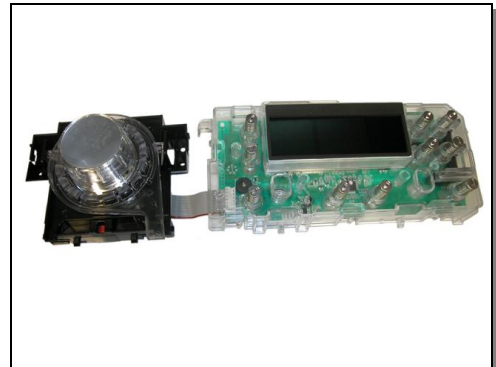


- Release the clips.



14.3 Display/selector board assembly

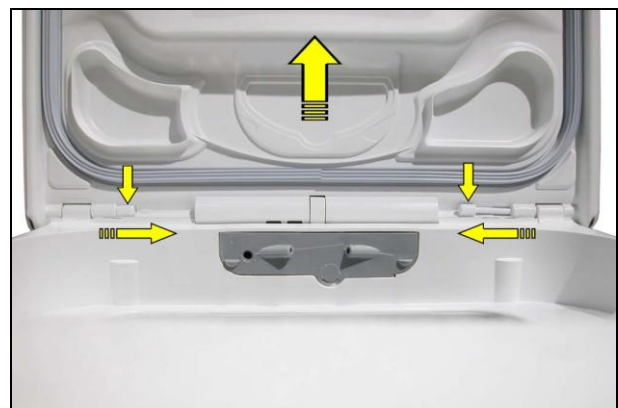
- Display/selector board assembly



When repositioning the display board, place it parallel with the control board, press the parts where the fastening hooks are so that the sensors are positioned correctly.

14.4 Cover

- Move the two hinge pivots inwards until they have been completely removed.
- Lift up the cover and remove.



14.5 Water dispenser

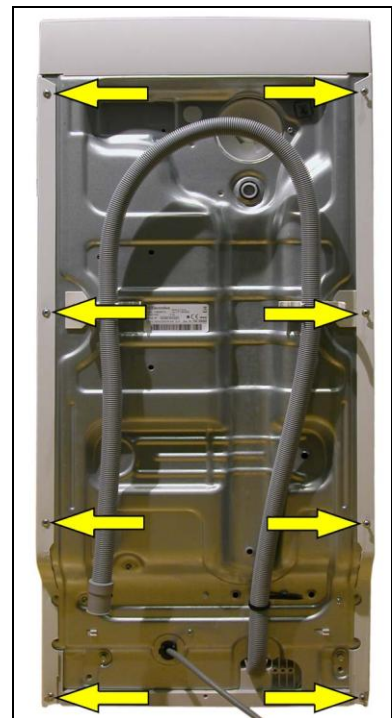
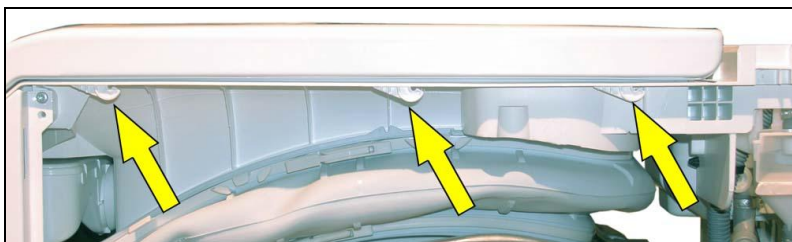
- Remove the detergent dispenser.
- Remove the control panel.
- Open the two clamps using a screwdriver, that block the pipes carrying water from the solenoid valves to the water dispenser.
- Disconnect the pipes that carry the water from the solenoid valves to the water dispenser and the small service pipe if relevant.
- Release the water dispenser and remove it.



14.6 Sides

Removing the sides you can access all various parts of the washing machine.

- Loosen the screws that secure the sides to the back panel.
- Move the panels to the back of the washing machine in order to release them from the upper rails shown in the figure.

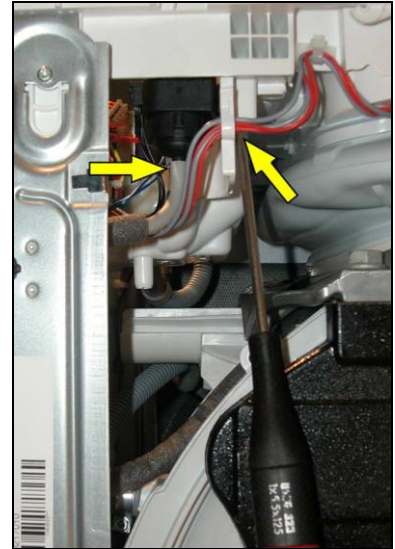


14.7 Electronic pressure switch

- Remove the left side panel.
- Release the pipe that connects the pressure chamber to the pressure switch.
- Use a screwdriver to release the pressure switch fastening clips and remove it.



When replacing anything, please refer to the code shown in the list of spare parts relating to the appliance being repaired.



14.8 Solenoid valves

- Remove the flexible water flow pipe making sure firstly that you have closed the water low tap.
- Remove the control panel.
- Open the two clamps using a screwdriver, that block the pipes carrying water from the solenoid valves to the water dispenser.



- Disconnect the pipes that carry water from the solenoid valves to the water dispenser.

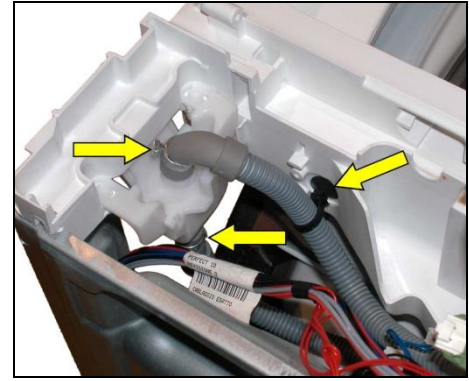


- Press the stop tabs with a screwdriver.
- Rotate the whole solenoid valve unit until it has been disconnected.



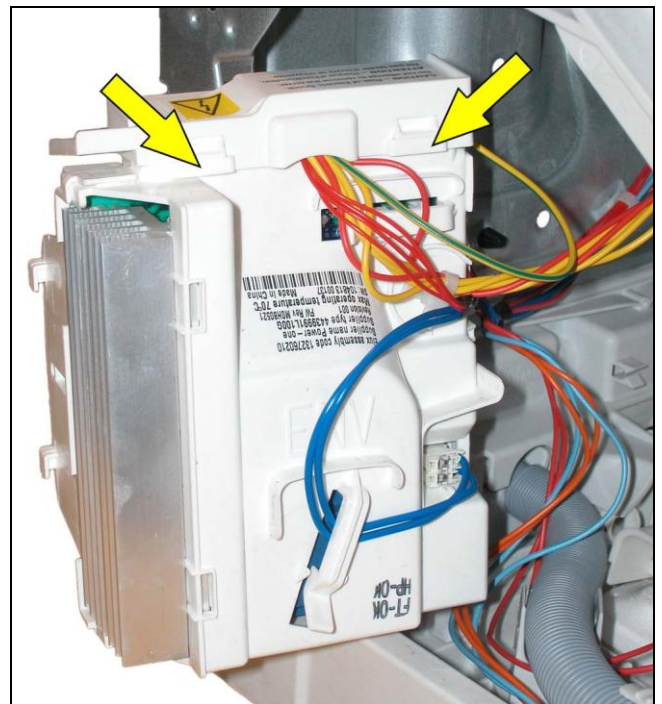
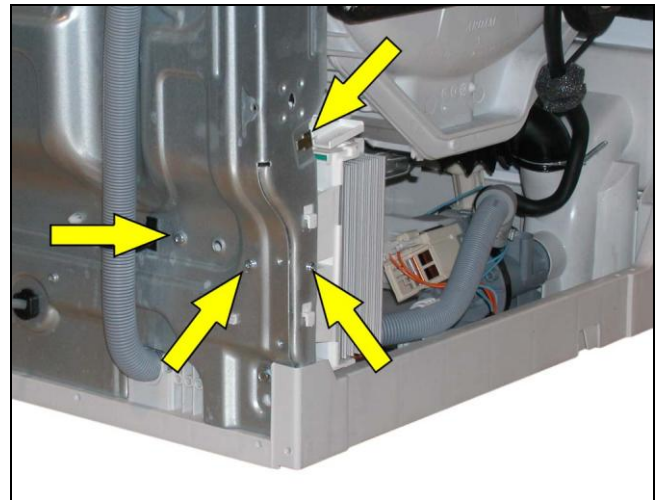
14.9 Air break

- With the help of a screwdriver, loosen the clamp locking the air break inlet pipe in position, and remove the pipe.
- Repeat the operation on the outlet pipe.
- Release the pipe fastening clamp from its base.
- Unfasten the pivots that fasten the air break to the structure.
- Remove the filter pulling it upwards.



14.10 Motor control board

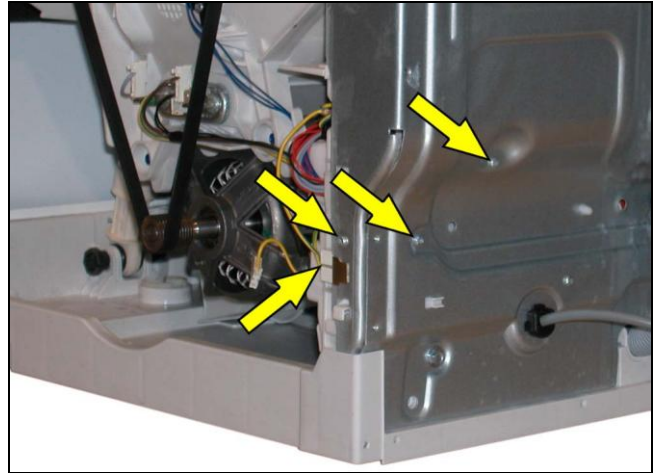
- Remove the left side panel.
 - Unscrew the two screws on the back part of the equipment and the side screws that lock the board support to the back panel.
 - Disconnect the mass connections located on the frames to make it easier to remove the board.
-
- Gently lift the whole board unit in order to release it and remove it.
 - Unfasten the clips using a screwdriver and open the connector protection cover.
 - Disconnect all the connectors and remove the board.



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

14.11 Main board

- Remove the right side panel.
- Unscrew the two screws on the back part of the equipment and the side screws that lock the board support to the back panel.
- Disconnect the mass connections located on the frames to make it easier to remove the board.

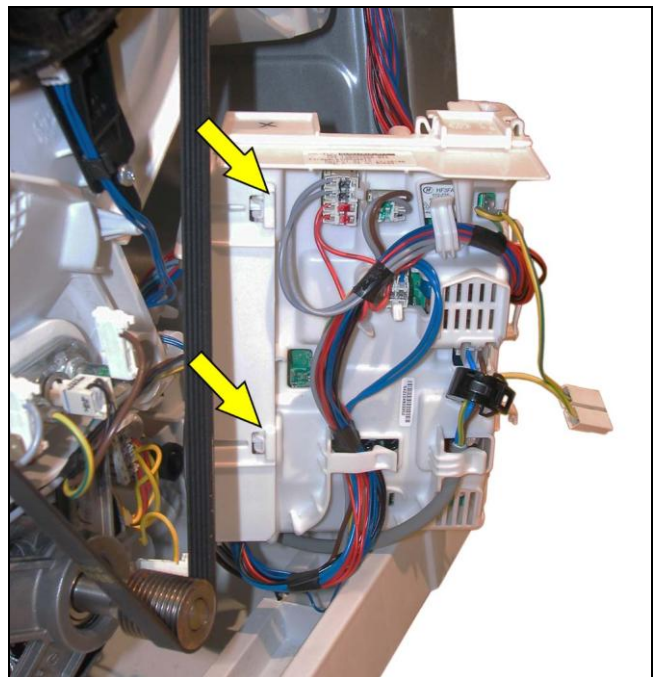


- Gently lift the whole board unit in order to release it and remove it.
- Unfasten the clips using a screwdriver and open the connector protection cover.
- Disconnect all the connectors and remove the board.



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

When reinserting the connector protection cover firstly insert the back part first.

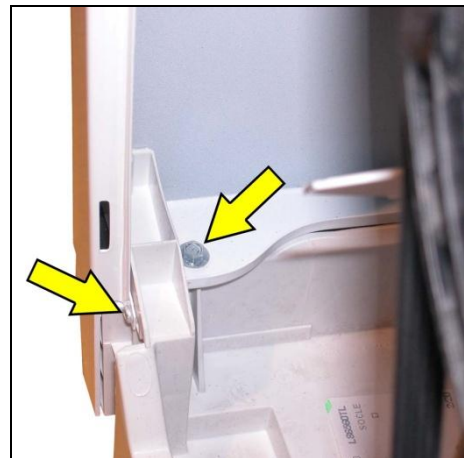
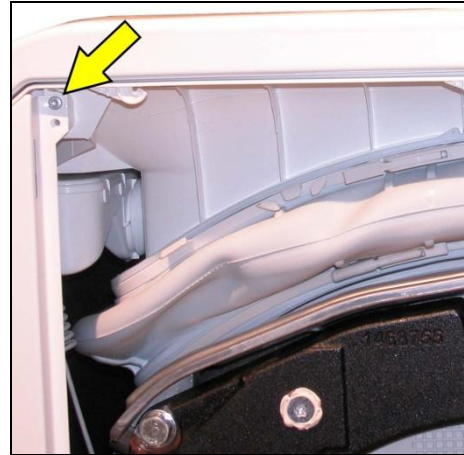


14.12 Frontal piece



Before removing the frontal piece place a support under the motor in order to make the operation easier.

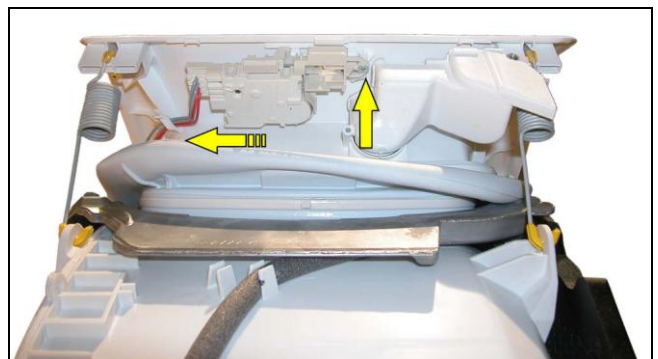
- Remove the two side screws that hold the frontal piece on to the inlet.
- Remove the two side screws that hold the frontal piece to the base frame.
- Remove the two internal screws that hold the frontal piece to the base frame.
- Gently lift the inlet and remove the frontal piece.



14.13 Door Lock

- Open the laundry loading cover.
- Remove the side panels.
- Remove the frontal piece.
- Release the wiring from the cable tray.
- Remove the door lock fastening screws.
- Move leftwards towards the door lock unit until it has been fully released.
- Disconnect the connector.

In order to re-assemble the door lock carry out the operations in reverse.



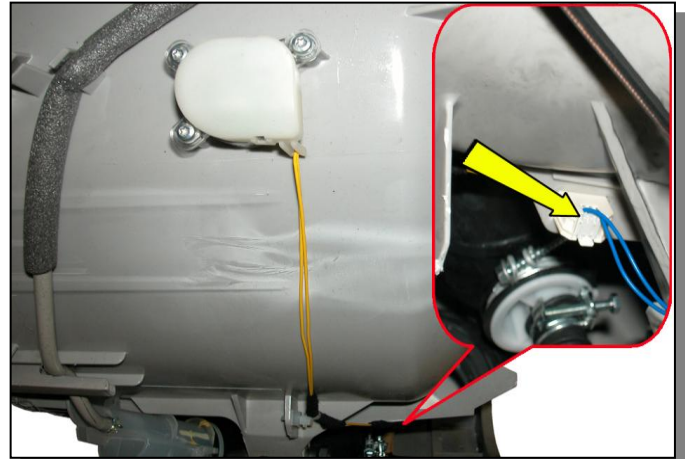
14.14 Drum Light (where featured)

- Open the laundry loading cover (optional).
- Remove the side panels.
- Remove the frontal piece.

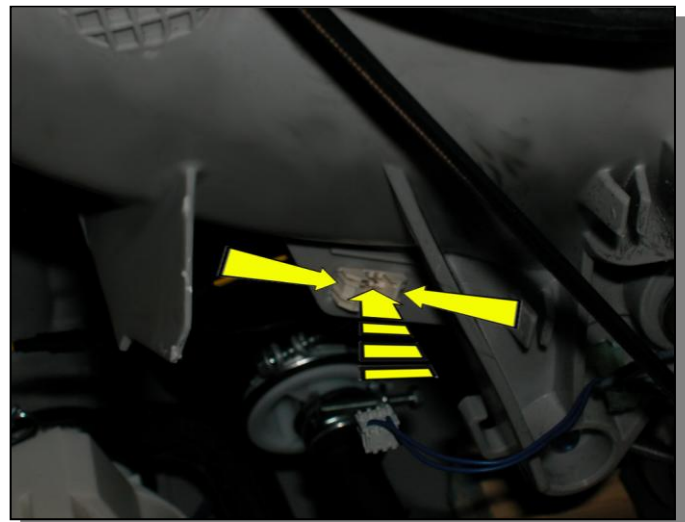


Before removing the frontal piece place a support under the motor in order to make the operation easier.

- Detach the connector (indicated by the arrow)



- Squeeze the tabs that hold the connector to the tub
- Push it towards the inside of the appliance to remove it from its hold.



- Slide the clip out of the support
- Unfasten the three screws that secure the light to the tub.
- Remove the light assembly.



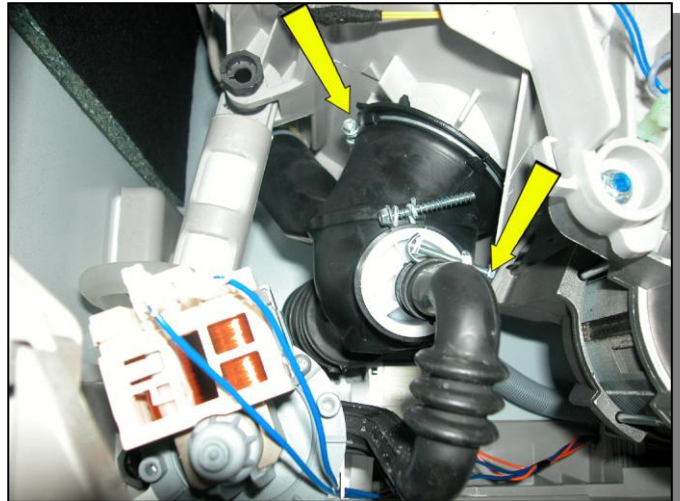
14.15 Eco Spray Circuit

- Drain off the water from the drain circuit
- Remove the side panels.
- Remove the frontal piece.

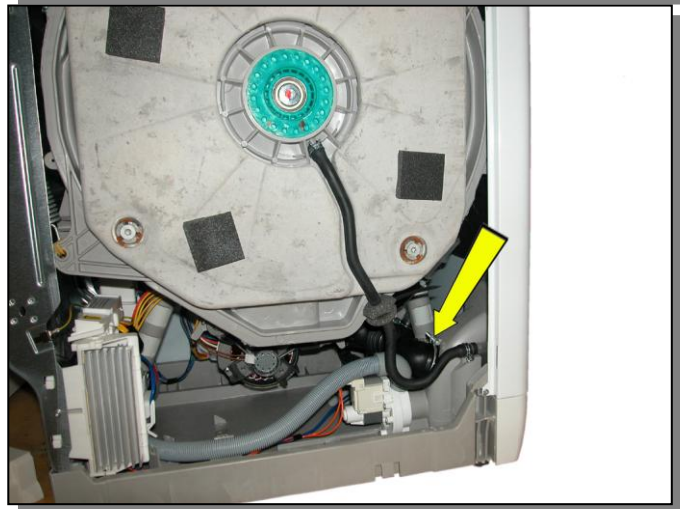


Before removing the frontal piece place a support under the motor in order to make the operation easier.

- From the right side (frontal view)
- Slacken the screws that hold the two clamps indicated by the yellow arrows.



- From the right side (frontal view)
- Remove the internal pressure chamber
- Slacken the screw that tightens the clamp indicated by the yellow arrow.

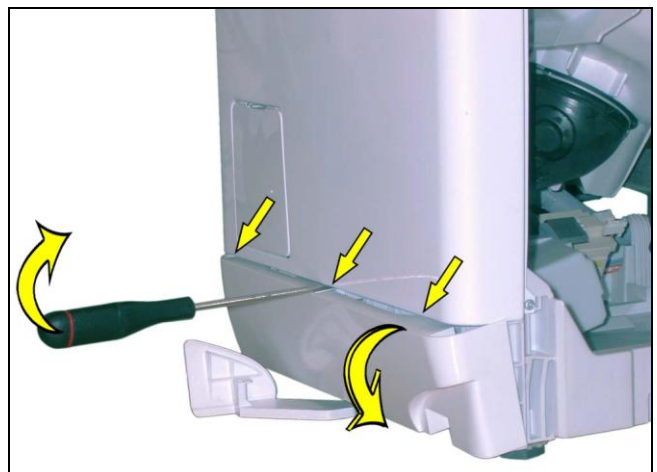


14.16 Base board

- Remove the left and right panels.
- Remove the transport roll.
- Insert a screwdriver into the points indicated by the arrows starting from a side one.
- Lever with the screwdriver and simultaneously rotate the base board downwards.
- Repeat this operation on all three points.

In order to refit the base board.

- Insert the base and rotate the base board in order to fully insert the three fastening clips.



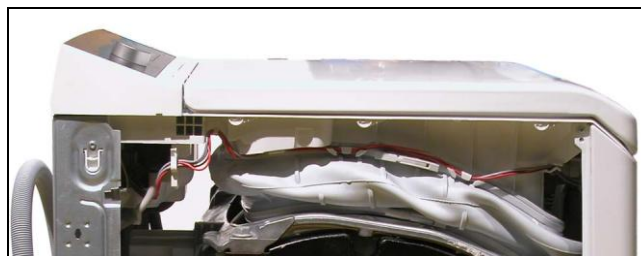
14.17 Transport roll

- Remove the right side.
- Slightly tilt the washing machine to the left.
- Release the transport roll using the screwdriver and remove it by pushing downwards.



14.18 Bellow seal

- Remove the left and right sides.
- Remove the support wiring.



- Cut the upper and lower cutting ring with a pair of pliers.



- Remove the bellow taking care not to ruin the 2 bases.
- Grease the bellow again in the fastening area to make assembly easier.



- Start re-assembling the bellow by inserting the lower part first.

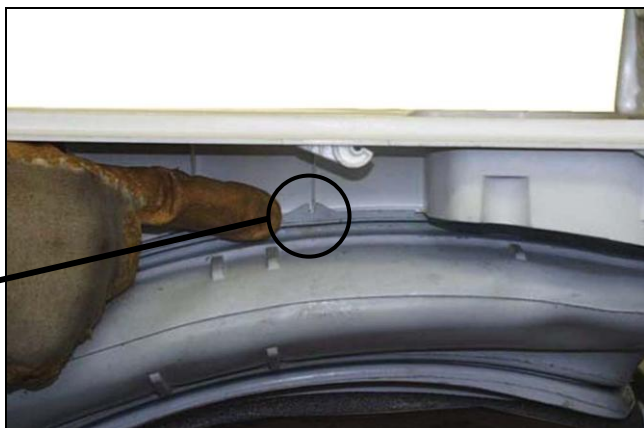


- Then insert the upper part.

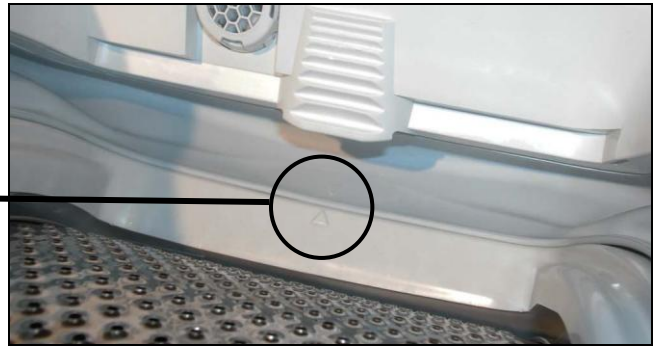
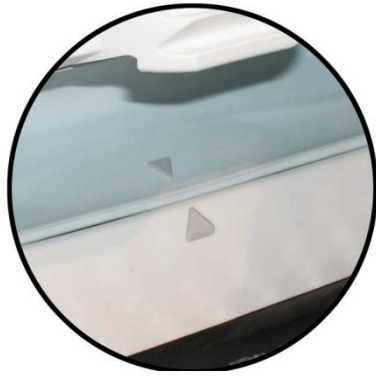


- Check that the bellow is inserted properly by checking that the reference notches are positioned properly.

External right and left sides.



Inside frontal zone.



- Insert the blocking rings.
- Tighten them initially with your hands then block them with the aid of a pair of pliers.

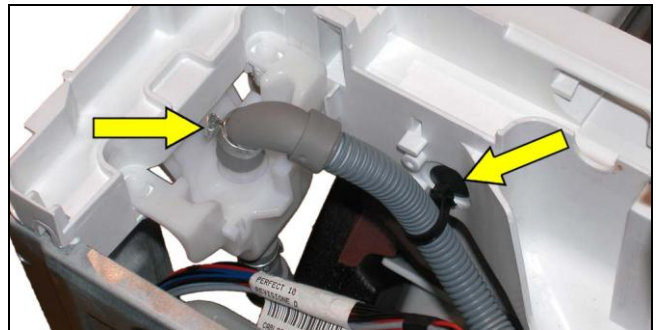


14.19 Inlet

- Removing the cover.
- Remove the detergent dispenser.
- Remove the control panel.
- Cut the upper cutting ring with a pair of pliers.
- Release the bellow from the upper side.



- Remove the water dispenser.
- Remove the electronic pressure switch.
- In the models with an air break, remove the pipe that connects it to the solenoid valves and the fastening clamp that holds the pipe to the outlet.
- Lift it up in order to release the air break unit with the output pipe connected.
- Remove the solenoid valve unit.



Before removing the front springs place a support under the motor to make the operation easier.

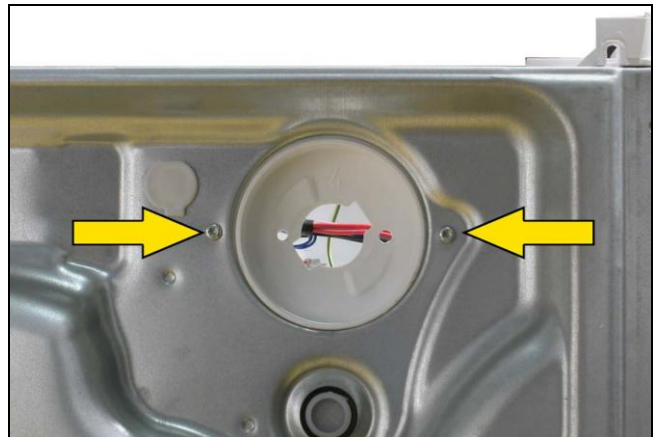
- Release the front right and left springs.



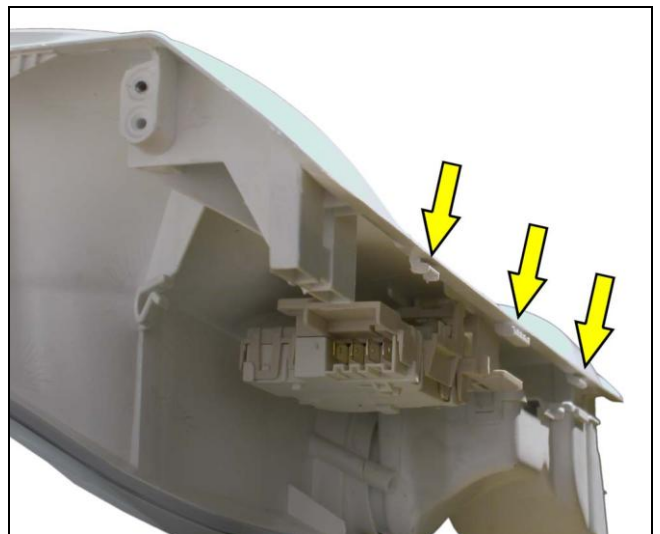
- Remove the 2 right screws and the 2 left screws that fasten the outlet to the column and back panel.



- Unscrew the 2 back screws.



- Gently lift the outlet from the back part.
- Push it towards the back panel to free the front part held to the base by the fasteners.
- Disconnect the door lock.



14.20 Counterweights

14.20.1 Right counterweight



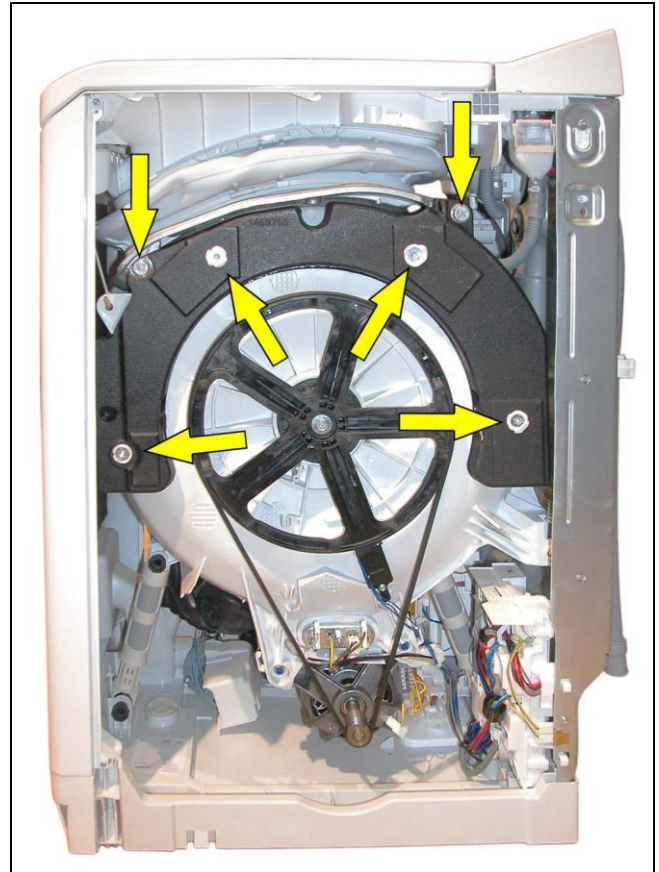
The right counterweight weighs around 10 kg so take care when removing it.

Dismantling.

- Remove the right side panel
- If there is an aluminium frame remove the 2 screws that hold the counterweight to it.
- Remove the 4 screws that hold the counterweight.

Re-fitting.

- Before re-fitting the counterweight clean out any old silicone from the screws and holes and reinsert the new silicone in the holes where the screws will be inserted.
- Place the counterweight and screw in the screws before the silicone has solidified.



14.20.2 Left counterweight



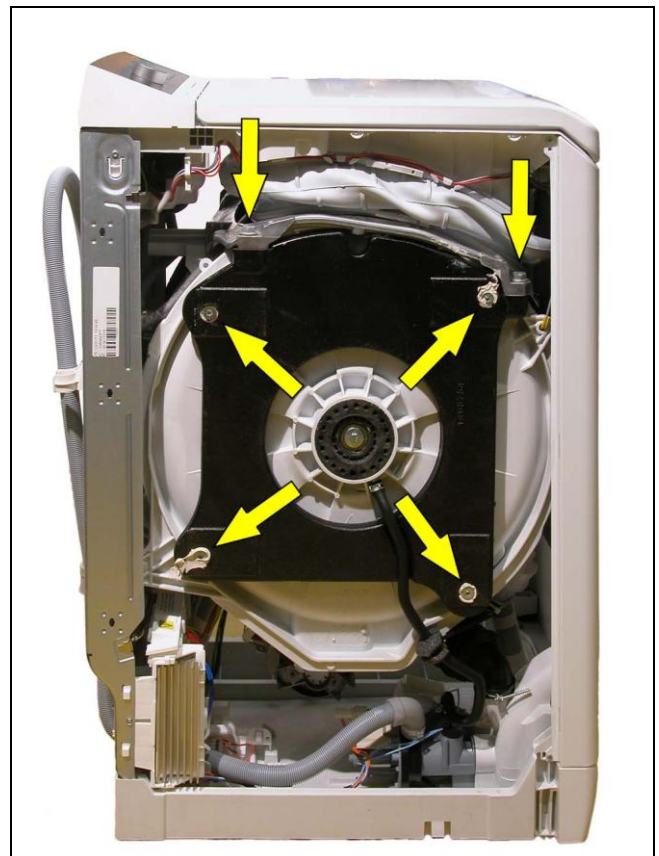
The left counterweight weighs around 13 kg so take care when removing it.

Dismantling.

- Remove the left side panel
- If there is a spray pipe, slacken the clamp and remove it.
- If there is an aluminium frame remove the 2 screws that hold the counterweight to it.
- Remove the 4 screws that hold the counterweight.

Re-fitting.

- Before re-fitting the counterweight clean out any old silicone from the screws and holes and reinsert the new silicone in the holes where the screws will be inserted.
- Place the counterweight and screw in the screws before the silicone has solidified.
- Reconnect the spray pipe if there is one.



14.21 Shock absorbers

- Remove the left and right sides.

Front shock absorber



Rear shock absorber



- Release the brass stop plugs positioned above and under each shock absorber.
- Remove the shock absorbers.

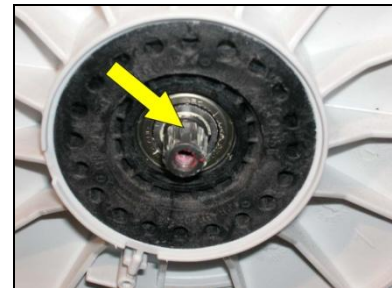
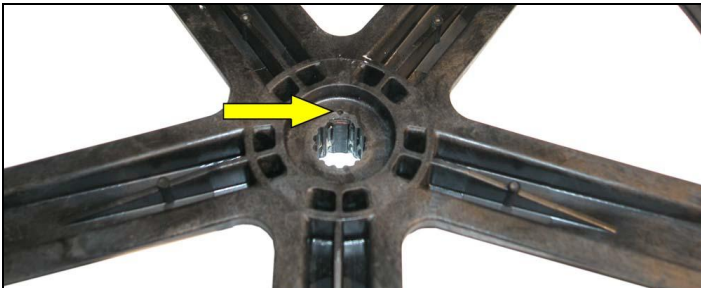


14.22 Pulley

- Remove the right side panel.
- before removing the belt check and make note of the belt's position on the motor axis.
- Remove the central screws that hold the pulley.
- Extract the pulley by pulling it outwards.

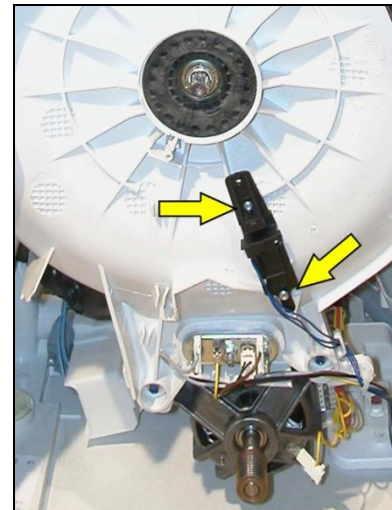


- When refitting the pulley make sure that the notch on the pulley coincides with the part with no cogs on the drum axis.



14.23 Drum position sensor DSP

- Remove the right side panel.
- before removing the belt check and make note of the belt's position on the motor axis.
- Remove the pulley.
- Unscrew the 2 screws that hold the DSP.



14.24 Heating element

- Remove the right side panel.
- Remove the electric connections.
- Slacken the central screws located on the heating element (*you don't have to remove the screw*).



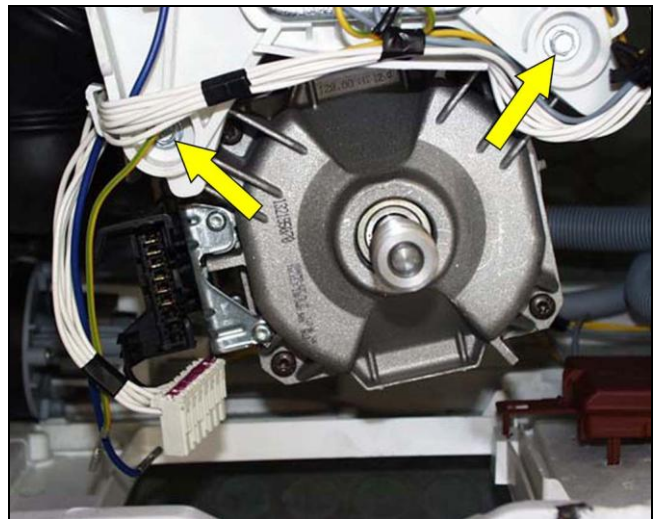
Residual water could overflow wetting the motor.

- Extract the heating element by pulling it outwards.



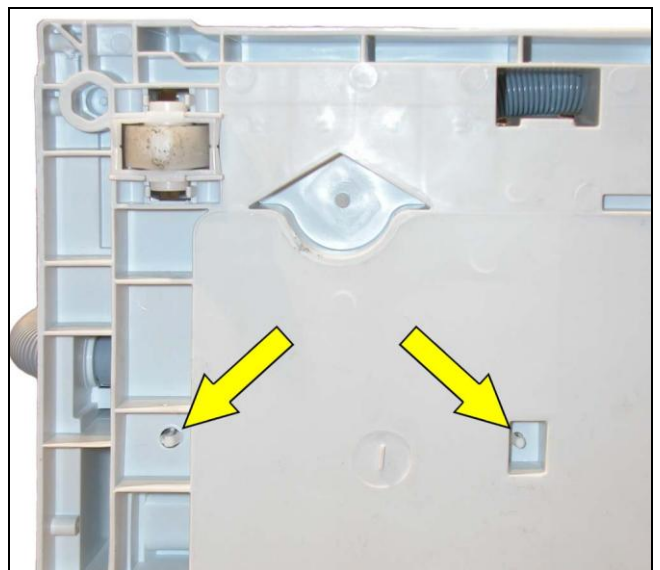
14.25 Drum rotation motor

- Remove the left and right panels.
- Remove the belt.
- Disconnect the mass connection and the motor power connector.
- Unscrew the screws that hold the motor.
- Remove the motor by extracting it from the left side of the equipment.



14.26 Water control sensor

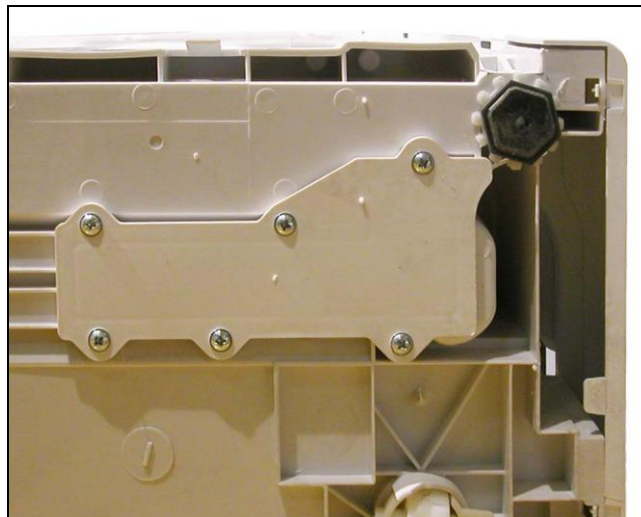
- Remove the left side panel.
- Lay the equipment on its right side.
- Remove the two sensor fastening hooks using a pair of pliers.
- Disconnect the sensor and remove it.



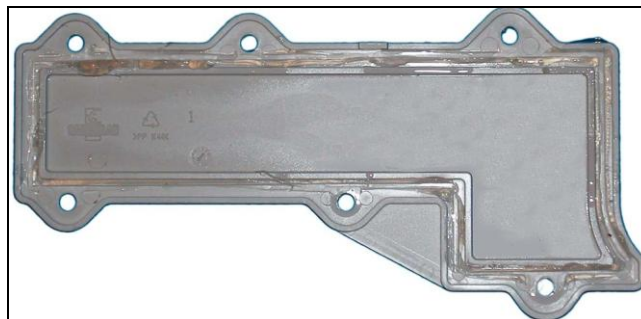
14.27 Drain pump and circulation pump

14.27.1 Bottom lid

- Remove the left side panel.
- Lay the equipment on its right side.
- Remove the 6 screws.
- Remove the bottom lid.



Before refitting the bottom lid clean the slot runner well on the bottom of the washing machine and the slot base of the lid and fill it with silicone in order to make it fully seal-proof again.

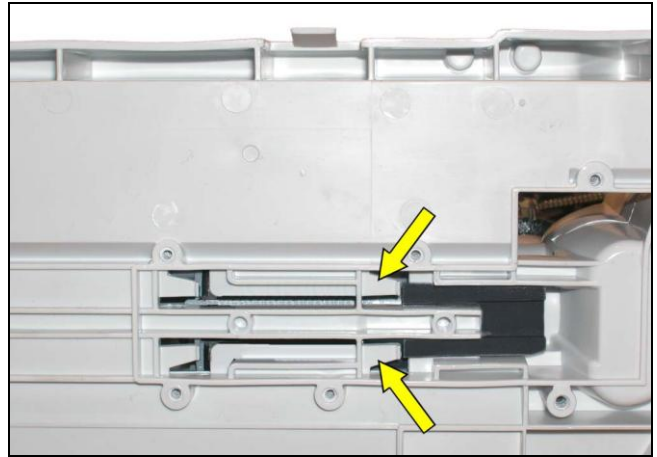


14.27.2 Drain pump

The drain pipe is held in place by two runners and 2 clips that prevent it from withdrawing.

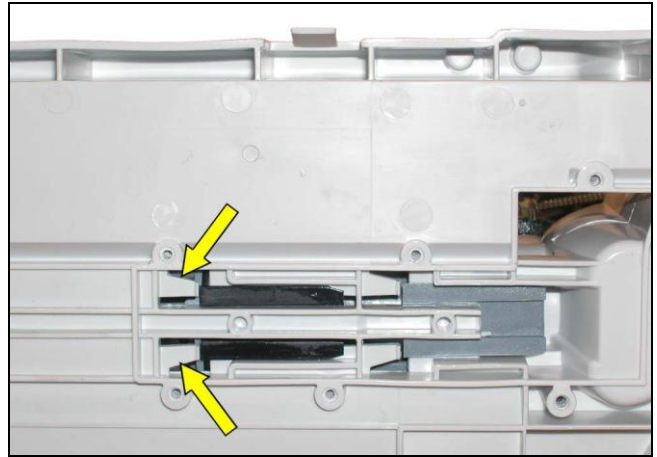
If the washing machine doesn't have a circulation system the drain pump will be directly inserted into the filter unit.

- Disconnect the pump connectors.
- Open the clamp that holds the pipe onto the pump outlet and remove it.
- Use a screwdriver to lower the clips that hold the pump.
- Move the pump towards the back of the machine and remove it.



If the washing machine has a circulation system the drain pump will be inserted in a specific duct where the circulation pump is also inserted.

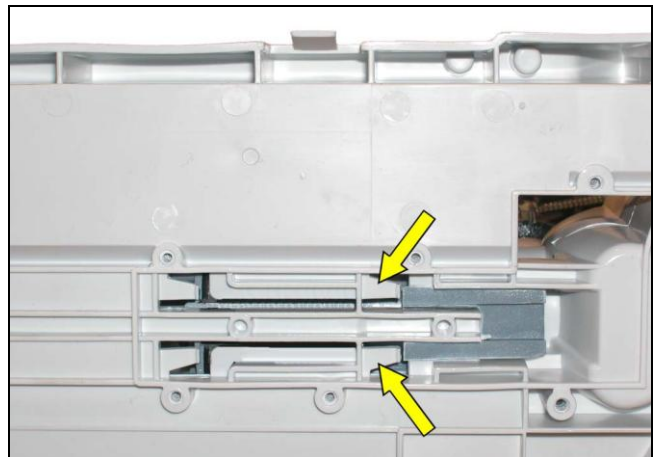
- Disconnect the pump connectors.
- Open the clamp that holds the pipe onto the pump outlet and remove it.
- Use a screwdriver to lower the clips that hold the pump.
- Move the pump towards the back of the machine and remove it.



14.27.3 Circulation pump

The circulation pump is inserted in a specific duct where the drain pump is also fastened and it is held in place by two runners and 2 clips that prevent it from withdrawing.

- Disconnect the pump connectors.
- Open the clamp that holds the pipe onto the pump outlet and remove it.
- Remove the drain pump, there is no need to disconnect it electrically nor remove the pipe connected to the outlet.
- Use a screwdriver to lower the clips that hold the pump.
- Move the pump with the whole duct towards the back of the machine and remove it.



14.28 Bearings

- Remove the right and left sides according to the bearing that you are planning on dismantling.
- Remove the central screw located in the pivot drum.
- Also remove the belt and pulley from the pulley side.
- Insert the specific tool as shown in the figure.

code 8992980018485

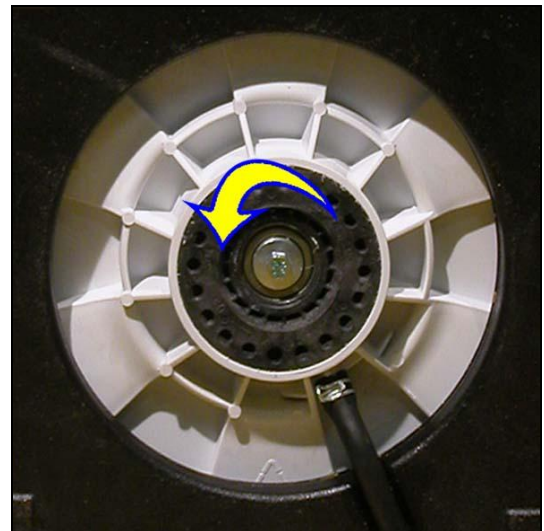
- Unscrew the bearing support paying attention to the threading direction and remove it.



Pay attention to the threading direction

Right side (pulley side) unscrew in a clockwise direction

Left side unscrew in an anti-clockwise direction



14.28.1 Bearing support unit with seal ring

Pay attention to the correct position of the seal ring during assembly.

Clean the axis and slightly grease the seal ring before inserting it in the bearing support.



The bearing unit is self-locking so do not tighten it excessively

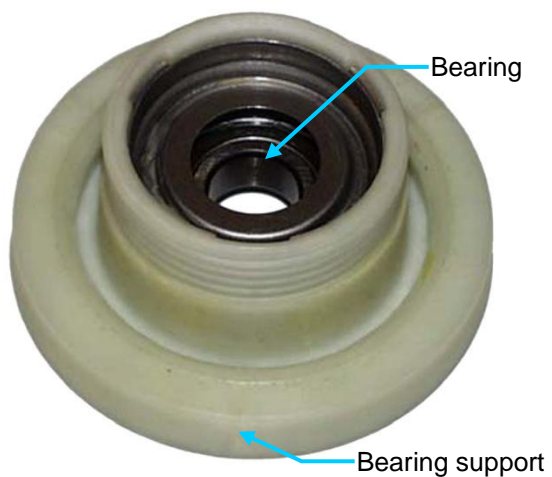


14.28.2 Bearing support unit with no seal ring

- Clean the axis and slightly grease the seal.
- Insert the seal making sure that the thin lip seal is positioned outwards.
- Push the seal as far as it can go.

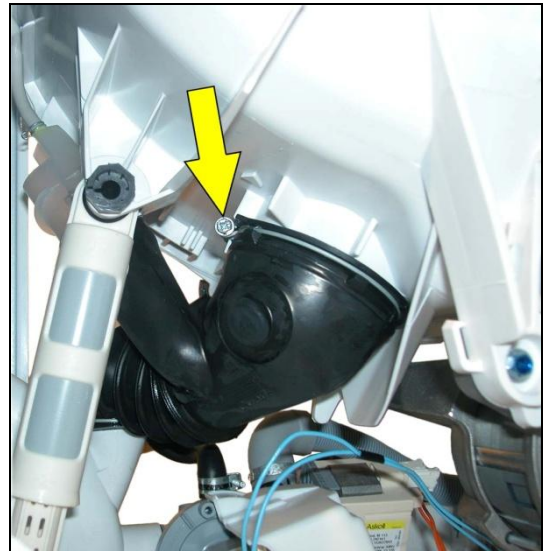


The bearing unit is self-locking so do not tighten it excessively



14.29 Remove the washing unit

- Remove the 2 left and right sides.
- Cut and remove the lower cutting ring on the bellow.
- Release the bellow from the lower side.
- If there is a spray pipe, slacken the clamp, release the clamp that holds it to the tub and remove it.
- Slide off the belt and remove the pulley.
- Remove the DSP drum positioning device.
- Remove the two left and right counterweights.
- Remove the heating element.
- Remove the drum rotating motor.
- Slacken the pipe tightening clamp in the flexible pipe and remove it.
- Disconnect the pressure switch and release the pipe on its entire route.



- Release the shock absorber pivots from the washing unit side.
- Release all the washing unit's support springs.



- Rotate the washing unit and remove it by pulling it to one side of the equipment.



REVISIONS:

Revision	Date	Description	Author	Approved by:
00	04/2013	Document creation	MDM	XX – 0X/201X