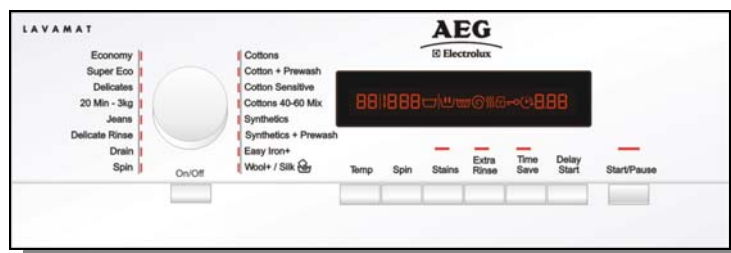




Series 7



Series 8



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

Publication
number

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EN

**Top loading
washing machines
with electronic
control system**

EWM10931

**Technical and functional
characteristics**

**NEW
COLLECTION**

SERIES 7 / 8

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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 (SERIES 7/8).

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

Consumption reduction mode

In order to reduce electricity waste when the cycle is not running, the equipment on this platform has two ways of entering consumption reduction mode:

1. Stand-off

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 buttons are disabled, although the main circuit board and certain electrical components are electrically powered.

There are two options for removing the power supply: the first is to unplug the socket or integrate a small electronic circuit, known as Zero Watt (0 Watt) in the main electronic board which automatically turns the equipment off.

The auto off function combined with the Zero Watt (actual consumption ~ 50 mW) works in two ways:

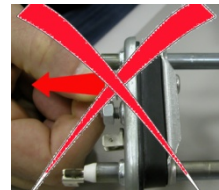
- a.) When you press the ON/OFF button to turn off the appliance, the supply voltage is cut off and the washing machine is secured (motor off, door locked, etc...), the cycle and any options selected are reset, so that the next time the appliance is turned on, it is ready to perform the programme. (To 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 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).
 - If this occurs during the selecting phase, the programme and the options selected are cancelled and the basic programme appears when the appliance is turned back on.
 - If the cycle has ended, all the settings are stored so that when the appliance is turned back on, 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 of is deactivated showing the alarm.

2 WARNINGS



- **Before starting work on a piece of equipment, check that the earth in the lodgings is working properly by using an appropriate tool and follow the instructions described/illustrated on the Electrolux Learning Gateway portal.**
- <http://electrolux.edvantage.net>
- **When the work is finished check that the equipment's safety conditions have been reinstated, as though it were straight off the assembly line.**
- **In the event of handling/replacing the electronic circuit board, use the ESD (Cod. 405 50 63-95/4) kit to avoid electrostatic discharges damaging the electronic circuit board see S.B. Nr. 599 72 08-09.**
- **Any work on electrical appliances must only be carried out by qualified technicians.**
- **This platform is not fitted with an ON/OFF switch. Before you access internal components, take the plug out of the socket to disconnect the power supply.**
- **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.**
- **It is strictly forbidden to extract/exchange the NTC probes between one element and another.**
- **Always empty the appliance of all the water before laying it on its side.**
- **When replacing components, please refer to the code shown in the list of spare parts relating to the appliance.**



3 SERIES 7

3.1 General characteristics

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

The control/display circuit board, inserted in a plastic box, secured to the control panel.

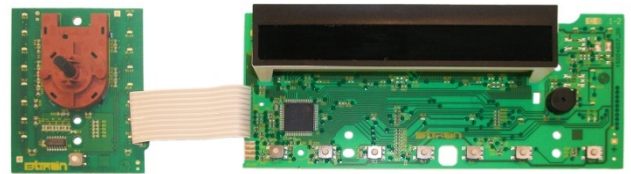
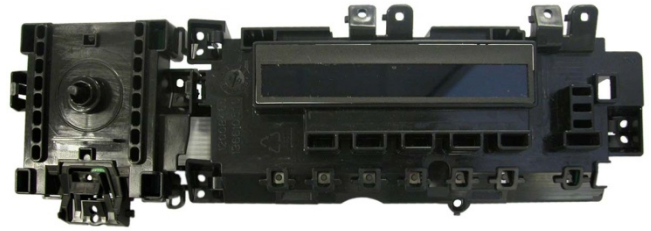
The figure shows:

The control/display circuit board and plastic container already assembled.

The display board.

The side header that the selector is fitted to.

The flat cable that connects the 2 circuit boards to one another.



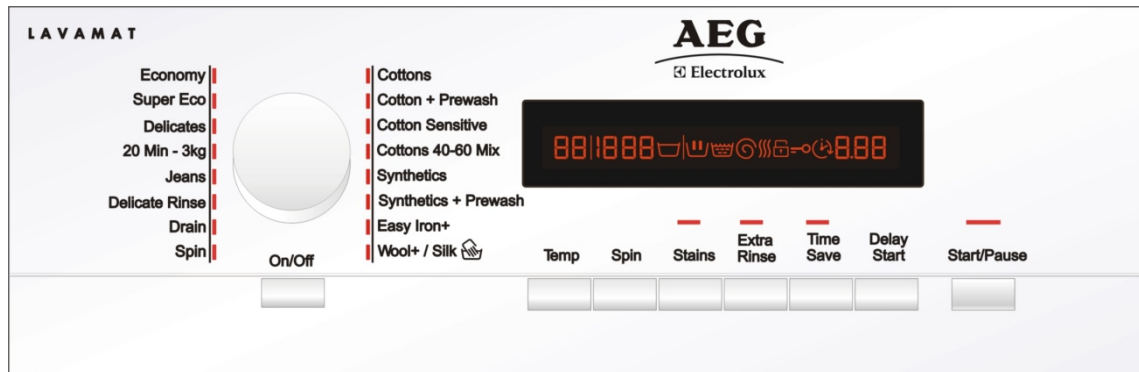
The main board is positioned to the rear of the equipment, receives commands from the display board and signals from various sensors located in the washing machine, powers the electric parts and communicates with the motor control board (Inverter).

No. buttons	<ul style="list-style-type: none"> ▪ Maximum 8 (6 options + start/pause + ON/OFF)
No. LEDs	<ul style="list-style-type: none"> ▪ Maximum 20 + LCD
Programme selector	<ul style="list-style-type: none"> ▪ 16 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
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 filling	<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, fabric softeners ▪ 4 compartments: pre-wash, 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"> ▪ Traditional (with PTC) ▪ Instantaneous
Heating element heat output	<ul style="list-style-type: none"> ▪ 1,950 W with thermal fuses incorporated
Temperature control	<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 (flow meter from 2÷12 l/m) ▪ Water control
Drum light	<ul style="list-style-type: none"> ▪ LED

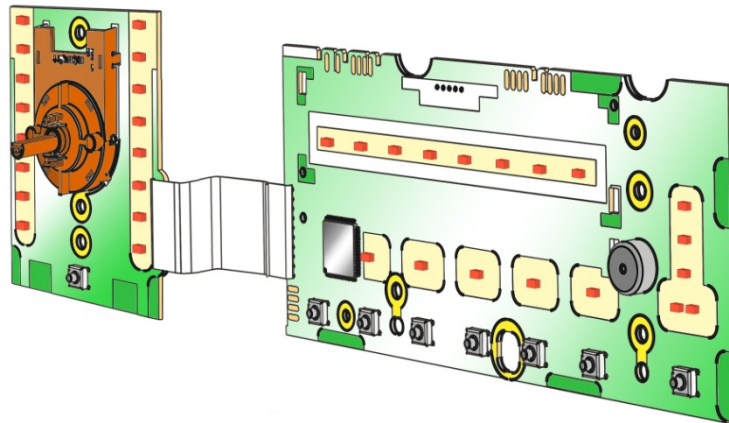
3.2 Control panel

3.2.1 Styling

- Max. 8 buttons
- Programme switch with 16 positions without the 0 position
- 20 LEDs
- LCD

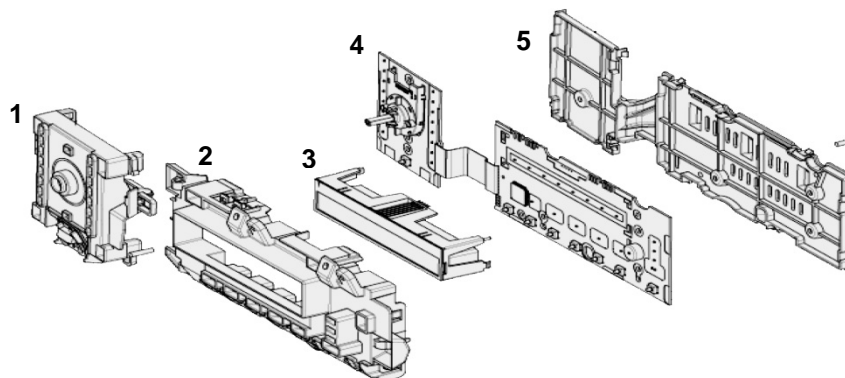


- Positioning of LEDs and buttons



- Display board assembly, exploded view

1. Selector board protection
2. Display board protection
3. LCD display
4. Display board and selector board
5. Rear protection



3.2.2 Control panel configuration



The washing programmes, the functions of the selector knob and the various buttons vary according to the model, since these are determined by the configuration of the appliance.

3.2.3 Programme selector (S1)

The selector used is a HI-FI type, that is, the knob has non index and no reset position, the programme selected is indicated by the lighting of the corresponding LED.

The number of positions cannot be configured. There are always 16 (in all stylings) and they are bound to the number of LEDs that indicate the washing programmes.

The programmes can be configured to perform the 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.



3.2.4 Programme configuration

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

Types of fabric	Cottons/linen, Synthetics, Delicates, Wool, Hand-wash, Shoes, Jeans, Duvet, Silk.
Special programmes	Soak, Miniprogramme, Easy-Iron, Conditioner, Rinses, Delicate rinses, Drain, Delicate spin, Spin.
Temperature	Normal, Maximum: the initial temperature is the one configured by the chosen washing programme.
Spin	Normal, Minimum, Maximum.
Possible options	Rinse Hold, Pre-wash, Stains, Extra Rinse, Normal, Daily, Super quick, Spin reduction, No spin.
Programme phases	Pre-wash, Wash, Rinses, Spin, Delayed start.

3.2.5 Pushbuttons – LEDs and LCD

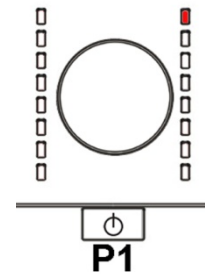
The functions of each button are defined by the configuration of the appliance.

• Button no. 1: ON/OFF

This button is always included in all stylings.

- Press it to turn the appliance on. The buzzer concurrently plays a melody (where enabled), the LCD display lights up (the illuminated symbols are those of the programme).
- To turn the appliance off, press the button and hold it down for approximately 1 second, after which time the buzzer plays a melody (where enabled), the LCD display and LEDs are turned off, all the options selected and any programme in operation are cancelled.

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.



• Button no. 2: TEMPERATURE

This button is related to the part of the LCD display where the temperature of the washing cycle is shown.

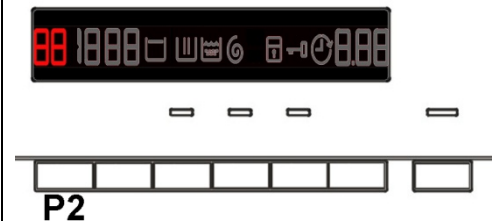
The initial temperature shown on the LCD display is that set for the selected programme.

Press the button 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.

The temperatures available (displayed in °C) are:

95°C, 60°C, 50°C, 40°C, 30°C, 20°C, cold cycle.


The cold cycle is displayed by three dashes " - - - ".



• Button no. 3: SPIN SPEED

This button is related to the part of the LCD display where the spin speed of the washing cycle is shown.

The initial speed shown on the LCD display is that set for the selected programme.

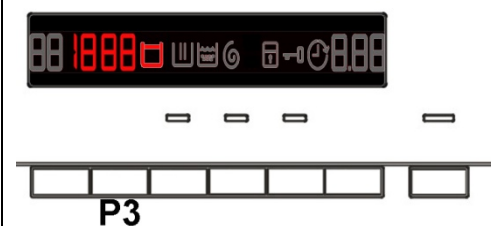
Pressing the button in sequence will reduce the speed and once the lowest selection has been reached, the next one is "Rinse hold" and the relative symbol  lights up (if compatible with the selected programme), this is lit even during the "Extra silent" programme.

Pressing this button again will take you back to the highest speed available for the selected programme.

The spin speeds are:

1,600–1,400–1,200–1,000–800–600–400–"Rinse hold".

When no speed is selected, or the "Rinse Hold" cycle is selected, the LCD display shows three dashes - - -

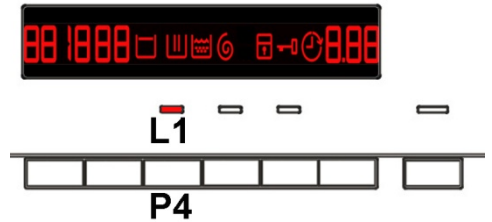


• **Button no. 4: OPTION**

This button is configurable and is related to LED (L1). Depending on the configuration of the appliance, it can perform the option of:

- Stains
- HOT & COLD water filling

Press this button to enable/disable the option related to it, with the respective lighting/turning off of LED L1. At the same time, the programme time is updated (via the three digits).

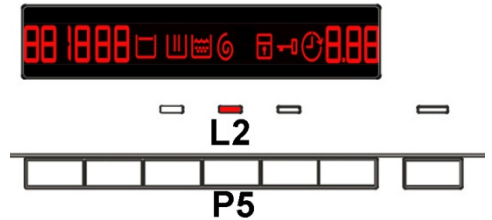


• **Button no. 5: OPTION**

This button is related to LED (L2), and performs the option of:

- Extra-rinse

Press this button to enable/disable the option related to it, with the respective lighting/turning off of the LED. At the same time, the programme time is updated (via the three digits).

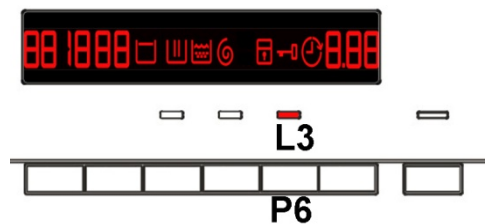


• **Button no. 6: OPTION**

This button is related to LED (L3), and performs the option of:

- Time Save

Press this button to enable/disable the option related to it, with the respective lighting/turning off of the LED. At the same time, the programme time is updated (via the three digits).



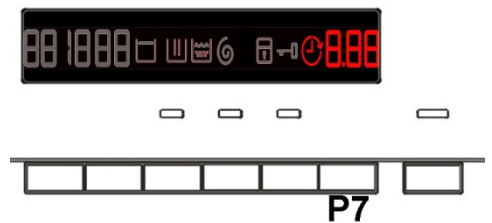
The following options can also be configured in appliances:

- Time Save: with two levels, corresponding to: Daily and Super Quick. Press it once to perform the Daily function. The related LED lights. Press it twice to perform the Super Quick function. The related LED stays on and the three digits simultaneously vary the cycle time.
- Stains and HOT and COLD Water are alternative options of the same button.
- When a solenoid valve for hot water is fitted, the related option is also configured.

• **Button no. 7: DELAYED START**

This button is configurable and has the DELAYED START function. During the programme selection phase, a delayed start can be selected, from 30' to 20 hours (30' ↻ 60' ↻ 90' ↻ 2h ↻ 3h... ↻ 20h ↻ 0h) and the time is shown on the display screen, during the last hour the time decreases minute by minute.

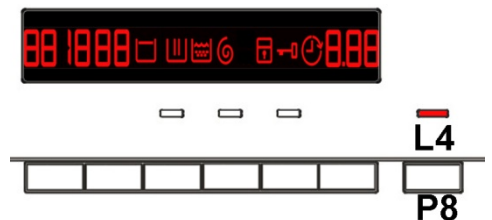
To cancel the delayed start time, after the cycle has started, pause the washing machine using the START/PAUSE button and cancel the option.



• **Button no. 8: START/PAUSE**








This button is used to START the appliance or PAUSE it.

It is related to LED L4, which flashes when the appliance is on pause, whereas it is lit continuously when the appliance is performing a washing cycle.



3.2.6 LCD series 7

The information described below is also displayed on the LCD:

<p>• Programme phases:</p> <p>The three icons represented respectively mean:</p> <ul style="list-style-type: none"> – Wash/Pre-wash – Rinse – Spin <p>They are lit during the selecting phase to display which phases the programme includes.</p> <p>During the programme, the icon of the phase in progress flashes, and once the phase has been completed, it remains lit continuously. The same applies when the appliance is paused during the cycle.</p>	
<p>• Padlock:</p> <p>The icon lights up when the “child lock” is on.</p> <p>To indicate that all the buttons are disabled to prevent children from modifying, starting or pausing the cycle. If a button is pressed when it is on, the icons flash.</p> <p>A key 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>	
<p>• Door lock:</p> <p>Lights up when the safety device stops door opening and switches off when the door can be opened.</p> <p>Flashes when the device is about to unlock the door.</p>	
<p>• Washing programme time</p> <p>It is displayed after a washing programme has been selected. This corresponds to the time required for the maximum wash load for each type of programme.</p> <p>After the programme has started, the time decreases (and is updated) minute by minute.</p>	
<p>• Delayed Start</p> <p>Selected on the related button. After the START/PAUSE button is pressed, the countdown starts and the delay time decreases hour by hour, from a delay of 20 hours down to 2 hours</p> <p>(🕒 30' 🕒 60' 🕒 90' 🕒 2h 🕒 3h... 🕒 20h 🕒 0h).</p> <p>during the last 2 hours, it decreases by 30 min. at a time;</p> <p>During the delayed start, the icon  remains permanently lit.</p>	
<p>• Wrong selection</p> <p>Display of the flashing writing “Err” for a second.</p> <p>When a function not compatible with the chosen programme is selected, or if the selector is turned when a cycle is in progress.</p>	

• **End of cycle**

When the cycle ends and you can open the door, the display shows a permanently lit 0.

Stopping the machine with water in the tub, at the end of programmes with the RINSE HOLD option, is displayed by a permanently lit zero.

The LED indicating the door remains on and the LED of the START/PAUSE button is turned off. The washing machine continues to operate even though the cycle has finished, rotating the drum once every 2 minutes.



• **Alarm code**

Indicates an error in the appliance operation. Simultaneously to the displaying of the code, the START/PAUSE button flashes.



• **Laundry load calculation**

After the washing programme has started, the dot starts to flash. The washing machine is now calculating the laundry load inside the drum thus establishing the amount of water to be loaded. When this phase is completed, the dot is lit continuously and the three digits display the programme time.



4 SERIES 8

4.1 General characteristics

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

The control/display circuit board, inserted in a plastic box, secured to the control panel.

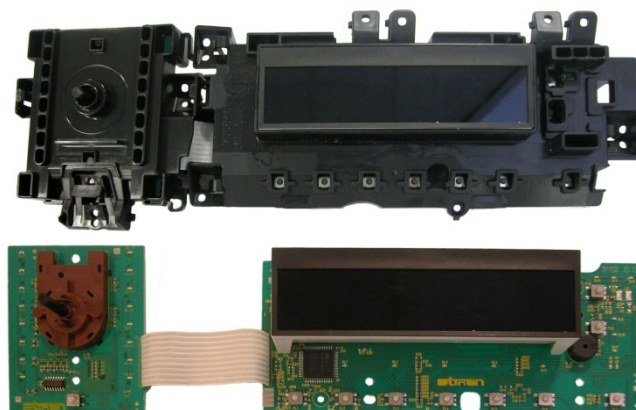
The figure shows:

The control/display circuit board and plastic container already assembled.

The display board.

The side header that the selector is fitted to.

The flat cable that connects the 2 circuit boards to one another.



The main board is positioned to the rear of the equipment and receives commands from the display board and signals from various sensors located in the washing machine, powers the electric parts and communicates with the motor control board (Inverter).

No. buttons	<ul style="list-style-type: none"> ▪ Maximum 9 (6 options + start/pause + ON/OFF)
No. LEDs	<ul style="list-style-type: none"> ▪ Maximum 20 + LCD
Programme selector	<ul style="list-style-type: none"> ▪ 16 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
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 filling	<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, fabric softeners ▪ 4 compartments: pre-wash, 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"> ▪ Traditional (with PTC) ▪ Instantaneous
Heating element heat output	<ul style="list-style-type: none"> ▪ 1,950 W with thermal fuses incorporated
Temperature control	<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 (flow meter from 2÷12 l/m) ▪ Water control
Drum light	<ul style="list-style-type: none"> ▪ LED

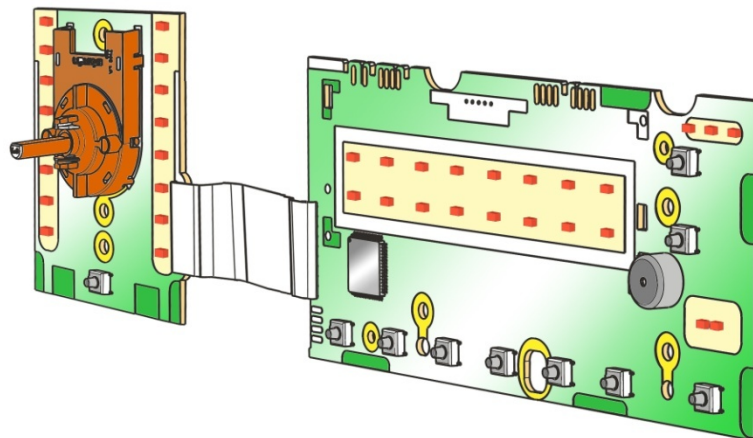
4.2 Control panel

4.2.1 Styling

- Max. 9 buttons
- 16-position programme selector
- 20 LEDs
- LCD

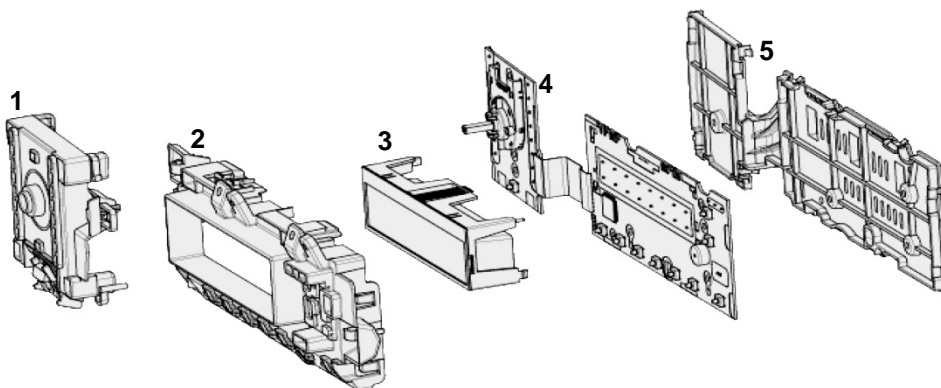


- Positioning of LEDs and buttons



- Display board assembly, exploded view

1. Selector board protection
2. Display board protection
3. LCD display
4. Display board and selector board
5. Rear protection



4.2.2 Control panel configuration



The washing programmes, the functions of the selector knob and the various buttons vary according to the model, since these are determined by the configuration of the appliance.

4.2.3 Programme selector (S1)

The selector used is a HI-FI type, that is, the knob has non index and no reset position, the programme selected is indicated by the lighting of the corresponding LED.

The number of positions cannot be configured. There are always 16 (in all stylings) and they are bound to the number of LEDs that indicate the washing programmes.

The programmes can be configured to perform the 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.



4.2.4 Programme configuration

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

Types of fabric	Cottons/linen, Synthetics, Delicates, Wool, Hand-wash, Shoes, Jeans, Duvet, Silk.
Special programmes	Soak, Miniprogramme, Easy-Iron, Conditioner, Rinses, Delicate rinses, Drain, Delicate spin, Spin.
Temperature	Normal, Maximum: the initial temperature is the one configured by the chosen washing programme.
Spin	Normal, Minimum, Maximum.
Possible Options	Rinse Hold, Pre-wash, Stains, Extra Rinse, Normal, Daily, Super quick, Spin reduction, No spin.
Programme phases	Pre-wash, Wash, Rinses, Spin, Delayed start.

4.2.5 Pushbuttons – LEDs and LCD

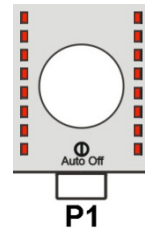
The functions of each button are defined by the configuration of the appliance.

• Button no. 1: ON/OFF

This button is always included in all stylings.

- Press it to turn the appliance on. The buzzer concurrently plays a melody (where enabled), the LCD display lights up (the illuminated symbols are those of the programme).
- To turn the appliance off, press the button and hold it down for approximately 1 second, after which time the buzzer plays a melody (where enabled), the LCD display and LEDs are turned off, all the options selected and any programme in operation are cancelled.

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.





P1

• Button no. 2: TEMPERATURE

This button is related to the part of the LCD display where the temperature of the washing cycle is shown.

The initial temperature shown on the LCD display is that set for the selected programme.

By pressing the button sequentially you can lower the temperature to the extent that you can carry out a cold cycle indicated by the cold symbol  and two dashes .

Once you have reached the lowest temperature the selection starts again from the highest one available for the programme.

The temperatures available (displayed in °C) are:

95°C, 60°C, 50°C, 40°C, 30°C, 20°C and cold cycle.




P2

• Button no. 3: SPIN SPEED

This button is related to the part of the LCD display where the spin speed of the washing cycle is shown.

The initial speed shown on the LCD display is that set for the selected programme.

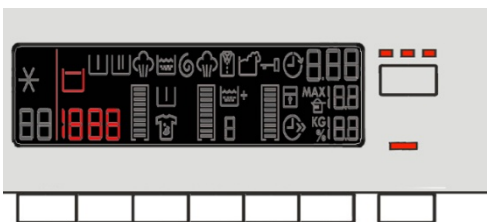
Pressing the button in sequence will reduce the speed and once the lowest selection has been reached, the next one is “Rinse hold” and the relative symbol  lights up (if compatible with the selected programme), this is also lit during the “Extra silent” programme.

Pressing this button again will take you back to the highest speed available for the selected programme.

The spin speeds are:

1,600–1,400–1,200–1,000–800–600–400–“Rinse Hold” cycle.

When no speed is selected, or the “Rinse Hold” cycle is selected, the LCD display shows three dashes - - -



P3

The settings described below not only have symbols, but they are also accompanied by a graphic bar within a frame. If it is illuminated, this indicates that the option is enabled for the chosen programme, otherwise it is off.

When all its segments are lit, it will start from scratch again the next time it is pressed.

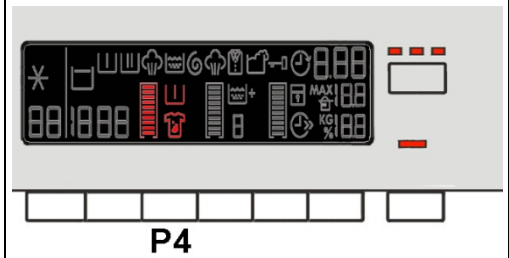
• **Button no. 4: OPTION**

It is related to the part of the LCD display (see figure) where the graphic bar and the symbols relating to the options are displayed, depending on the chosen programme.

Press the button to light the graduated scale and the Stains symbol lights simultaneously. If you continue to press it, the Pre-wash symbol also lights up.

The selection order is as follows:

- Stains.
- Pre-wash.
- Stains + Pre-wash.



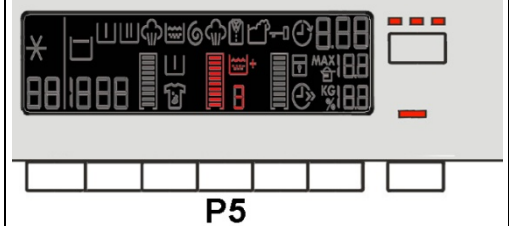
P4

• **Button no. 5: OPTION**

It is related to the part of the LCD display (see figure) showing: the graphic bar, a digit and the “Extra rinse” symbol.

Press the button to light the graduated scale. The symbol for the “Extra rinse” lights simultaneously, and the digit shows the number of additional rinses to combine with the programme.

The number of rinses depends on the programme configuration.



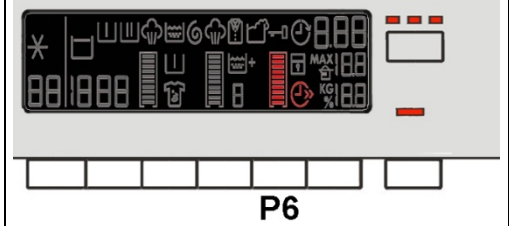
P5

• **Button no. 6: OPTION**

It is related to the part of the LCD display (see figure) showing: the graphic bar and the “Time save” option.

Press the button and half or all of the graduated scale may light up, depending on the configuration of the button. The related symbol also lights up simultaneously.

- Press the button once and the chosen option is “Daily”.
- Press the button twice and the chosen option is “Super Quick”.



P6

• **Button no. 7: DELAYED START**

It is related to the part of the LCD display (see figure) showing the related symbol and the three digits.

Press the button 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 every time the button is pressed.

The symbol lights and stays on for the entire delay phase.

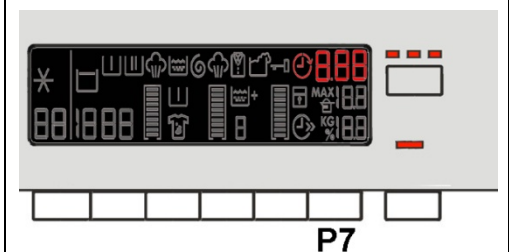
During the programme setting phase, you can select a start delay spanning from 30' to 20 hours.

30' ⏪ 60' ⏪ 90' ⏪ 2h ⏪ 3h... ⏪ 20h ⏪ 0h

and the time is displayed on the LCD screen.

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 button and cancel the option.



P7

• **Button no. 8:** START/PAUSE

This button is used to START the appliance or PAUSE it.

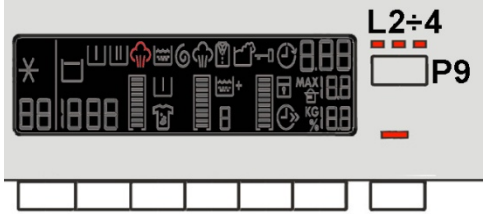
It is related to LED L1, which flashes when the appliance is on pause, whereas it is lit continuously during a washing cycle.



• **Button no. 9:** STEAM (where featured)

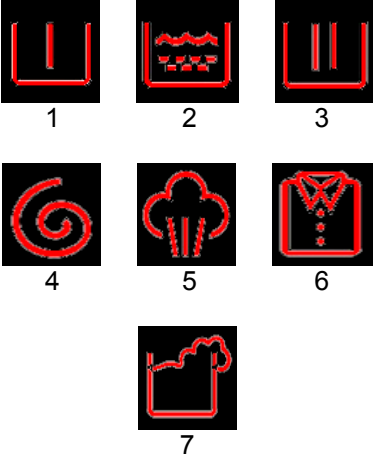

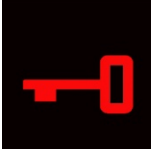


Press this button in sequence to select from three different steam intensity levels.

These are highlighted by the lighting of LEDs L2/L3/L4 and the related symbol lighting on the LCD display.



4.2.6 LCD series 8

The following information is also displayed on the LCD:

<p>• Programme phases:</p> <p>The icons represented respectively mean:</p> <ol style="list-style-type: none">1. Pre-wash2. Wash3. Rinse4. Spin5. Steam combined with the programme (where featured)6. Rinse Hold7. Detergent overdose <p>They light up during the programme setting where featured and during their performance.</p> <p>The icon representing the Overdose lights up at the end of the cycle if during the performance of the programme an excess production of foam was detected.</p>	
<p>• Padlock:</p> <p>The icon lights up when the “child lock” is on.</p> <p>To indicate that all the buttons are disabled to prevent children from modifying, starting or pausing the cycle.</p> <p>A key 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>	
<p>• Door lock:</p> <p>Lights up when the safety device stops door opening and switches off when the door can be opened.</p> <p>Flashes when the device is about to unlock the door.</p>	
<p>• Washing programme time</p> <p>It is displayed after a washing programme has been selected. This corresponds to the time required for the maximum wash load for each type of programme.</p> <p>After the programme has started, the time decreases (and is updated) minute by minute.</p>	
<p>• Delayed Start</p> <p>Selected on the related button. After the START/PAUSE button is pressed, the countdown starts and the delay time decreases hour by hour until it reaches 2 hours.</p> <p>In the last 2 hours the time varies in stages of 30 minutes until it reaches the last hour, after which the time decreases minute by minute.</p> <p>To cancel the delayed start time, after the cycle has started, pause the washing machine using the related button and cancel the option.</p>	

• **Wrong selection**

Display of the flashing writing “Err” for a second.

When a function not compatible with the chosen programme is selected, or if the selector is turned when a cycle is in progress.



• **End of cycle**

When the cycle ends and you can open the door, the display shows a permanently lit zero.

Stopping the machine with water in the tub, at the end of programmes with the RINSE HOLD option, is displayed by a permanently lit zero.

The LED indicating the door remains on and the LED of the START/PAUSE button is turned off. The washing machine continues to operate even though the cycle has finished, rotating the drum once every 2 minutes.



• **Alarm code**

Indicates an error in the appliance operation. Simultaneously to the displaying of the code, the START/PAUSE button flashes.



• **Laundry load calculation**

After the washing programme has started, the dot starts to flash. The washing machine is now calculating the laundry load inside the drum thus establishing the amount of water to be loaded. When this phase is completed, the dot is lit continuously and the three digits display the programme time.



5 BUZZER

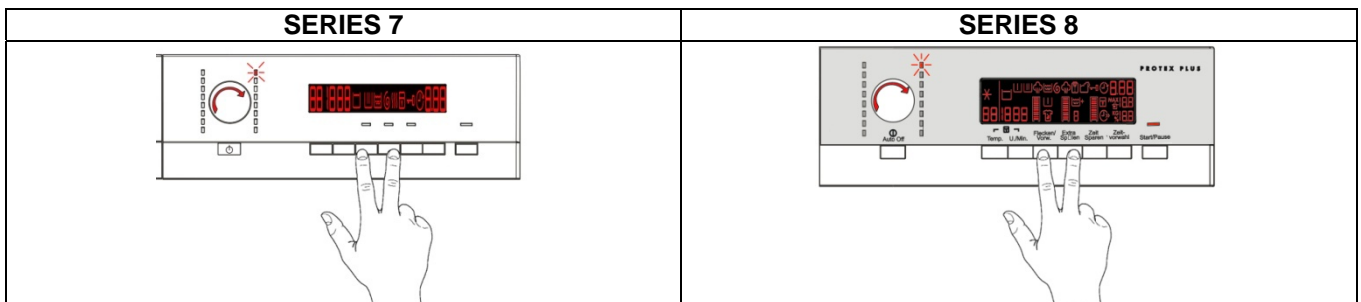
This consists of a multi-tone beeper and starts working in the following cases:

- When the appliance is turned on and off, it plays two different musical tunes.
- If a button is pressed, it emits a short **“Click”**
- When the cycle has ended, this is indicated by a special sequence of **“three long beeps”** repeated at 15" intervals for two minutes.
- In the event of an appliance malfunction, this is indicated by a special sequence of **“three short beeps”** repeated 3 times at 15" intervals for 5 minutes.

All the appliances are fitted with the buzzer. They leave the factory with the option enabled. Use the key combination shown below to disable it.

The volume has a factory setting which cannot be adjusted by the user.

When the buzzer is disabled (using the key combination), it only emits a short **“Click”** and the sequence of **“three short beeps”** if an alarm rings.



In order to activate or disable the buzzer simultaneously press the push buttons shown in the figure for 5 seconds, a brief acoustic signal confirms whether it has been activated or disabled.

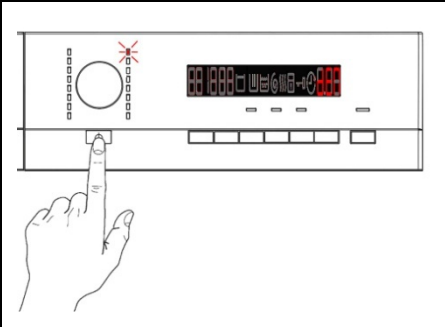
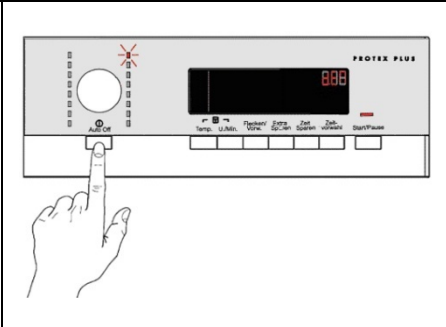
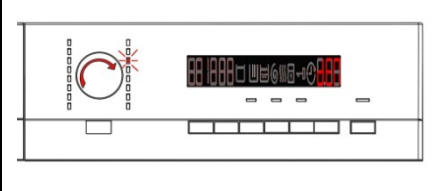
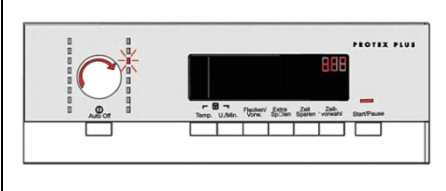
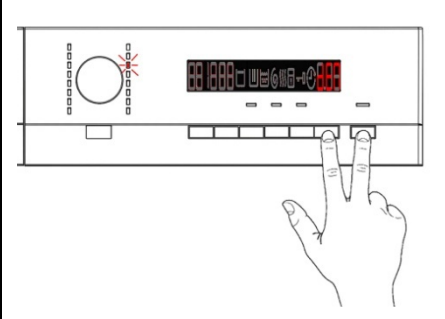
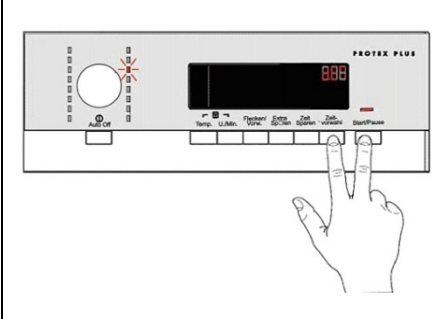
6 DEMO MODE

A special cycle is designed to demonstrate the operation of these appliances in shops, without connecting them to the water mains:

- The door closure device is activated normally.
- All motor's low speed movements, the pulses and spin are disabled.
- The water fill solenoid valves and the drain pump are disabled.
- The display only shows set-up stage.
- (START/PAUSE is disabled), because without the door the movement cannot be seen and is, therefore, useless.

6.1 Demo mode settings

Do not start the procedure with the combination buttons pressed

	Series 7	Series 8
Turn the appliance on at the ON/OFF switch.		
Turn the selector dial until the third LED in the right-hand row is on.		
Press the START/PAUSE button and the nearest option button simultaneously (as shown in the figure). Hold the buttons down (approximately three or five seconds) until "dEM" flashes for a short time.		

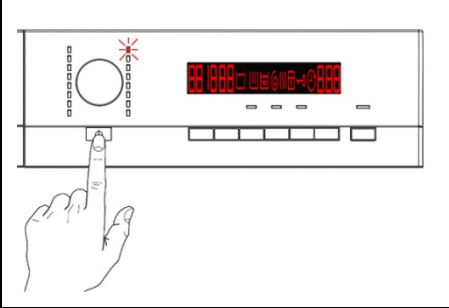
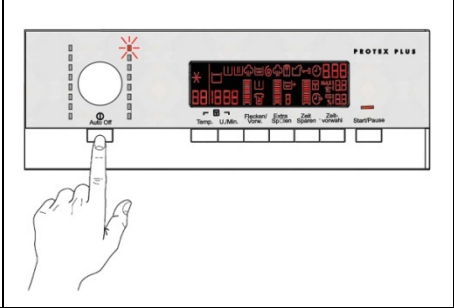
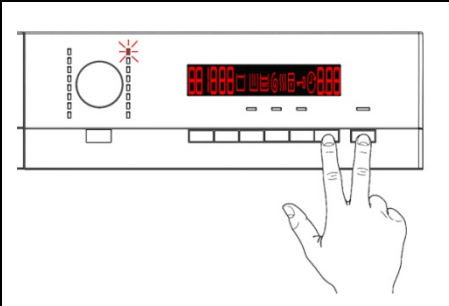
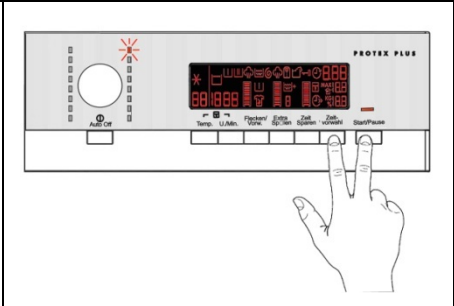
6.2 Exiting DEMO mode

To quit the demo mode, unplug the appliance at the socket, because the ON/OFF button does not function.

7 DIAGNOSTIC SYSTEM

7.1 Accessing diagnostics

Do not start the procedure with the combination buttons pressed

	Series 7	Series 8
Turn the appliance on at the ON/OFF switch and the first LED in the right-hand row turns on.		
Press the START/PAUSE button and the nearest option button simultaneously (as shown in the figure). Hold the buttons/sensors down/pressed until the LEDs and symbols begin to flash in sequence (approximately 3 seconds).		

In the first position, the operation of the buttons, of the related LEDs and of the groups of symbols shown on the LCD screen is checked; turn the programme selector dial **clockwise** to run the diagnostic cycle for the operation of the various components and to read any alarms (see diagnostic test).

During this phase, if any key combination is pressed (except for the one relating to diagnostics), all the combinations of options stored are deleted (Extra rinse, No buzzer, etc..) whereas for SERIES 9, the memories with the customised programmes are also deleted.

7.2 Quitting the diagnostics system

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

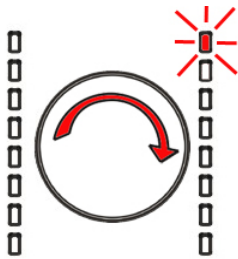

7.3 Diagnostic test phases

Irrespective of the type of circuit board and the configuration of the 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.

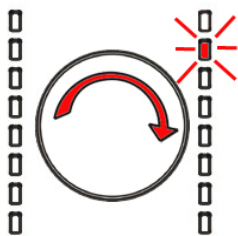

Concurrently, a selector control code is shown on the LCD display, which indicates for two seconds the description in the last column of the table below.

(all alarms are enabled in the diagnostic cycle).

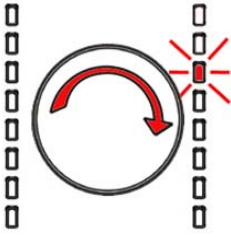

Position 1

User interface test	Purpose of the test:	To test operation of all the LEDs and switches.
	Components activated:	<ul style="list-style-type: none"> The LEDs are turned on in sequence, as are the symbol groups of the LCD display and its backlight.
	Behaviour:	<ul style="list-style-type: none"> All LEDs turn on in sequence. By pressing a key the corresponding icon unit lights up. The code is shown on the LCD and a beep sounds. All the icons on the LCD flash.
	Working conditions:	There is a control to run the test (always active).
	LCD display:	

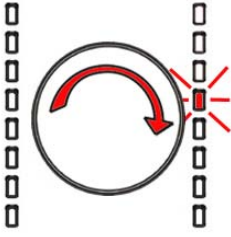

Position 2

Water fill to wash compartment	Purpose of the test:	To check the correct operation of the wash compartment water route.
	Components activated:	<ul style="list-style-type: none"> Door safety interlock. Wash solenoid.
	Working conditions:	<ul style="list-style-type: none"> Door closed. Water level below anti-flooding level. Maximum time 5 min.
	LCD display:	 Water level in the tub is displayed (mm).

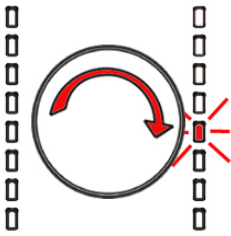

Position 3

Water fill to pre-wash compartment	Purpose of the test:	To check the correct operation of the pre-wash compartment water route.
	Components activated:	<ul style="list-style-type: none"> • Door safety interlock. • Pre-wash solenoid.
	Working conditions:	<ul style="list-style-type: none"> • Door closed. • Water level below anti-flooding level. • Maximum time 5 min.
	LCD display:	 Water level in the tub is displayed (mm).

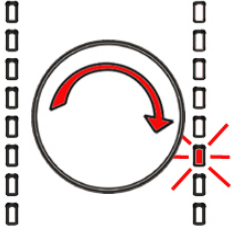

Position 4

Water fill to conditioner compartment	Purpose of the test:	To check the correct operation of the conditioner compartment water route.
	Components activated:	<ul style="list-style-type: none"> • Door safety interlock. • Pre-wash and wash solenoid valves.
	Working conditions:	<ul style="list-style-type: none"> • Door closed. • Water level below anti-flooding level. • Maximum time 5 min.
	LCD display:	 Water level in the tub is displayed (mm).

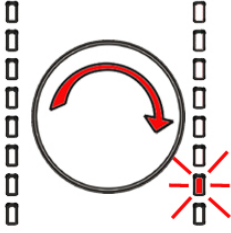

Position 5

Water filling to produce steam (only in some models)	Purpose of the test:	To check the correct operation of the steam production water fill solenoid valve (only in certain models).
	Components activated:	<ul style="list-style-type: none"> • Door fastening device. • Third solenoid valve.
	Working conditions:	<ul style="list-style-type: none"> • Door closed. • Water level below anti-flooding level. • Maximum time 5 min.
	LCD display:	 Water level in the tub is displayed (mm).

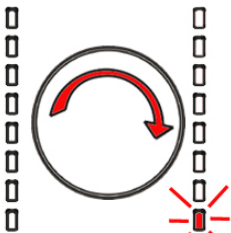

Position 6

Hot water fill (only in certain models)	Purpose of the test:	To check the correct operation of the hot water fill fourth solenoid valve (only in certain models).
	Components activated:	<ul style="list-style-type: none"> • Door safety interlock. • Fourth solenoid valve (where featured).
	Working conditions:	<ul style="list-style-type: none"> • Door closed • Water level below anti-flooding level. • Maximum time 5 min.
	LCD display	 Water level in the tub is displayed (mm).

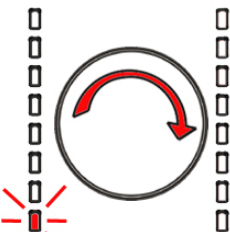

Position 7

Heating	Purpose of the test:	To check the correct operation of the heater unit.
	Components activated:	<ul style="list-style-type: none"> • Door fastening device. • Wash solenoid, if the water in the tub is not enough to cover the heating element. • Heating element.
	Working conditions:	<ul style="list-style-type: none"> • Door closed • Water level high enough to cover the heating element. • Maximum time 10 min. or up to 90°C. (*).
	LCD display:	 Temperature in °C measured using the NTC probe.

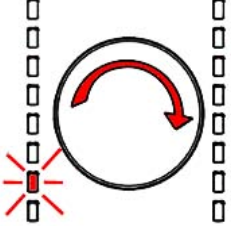

Position 8

Leaks from the tub	Purpose of the test:	To check for any water leaks from the tub during operation.
	Components activated:	<ul style="list-style-type: none"> • Door fastening device. • Wash solenoid, if the water in the tub is not enough to cover the heating element. • Motor (anticlockwise rpm, pulse at 250 rpm).
	Working conditions:	<ul style="list-style-type: none"> • Door closed. • Water level above. • The heating element.
	LCD display:	 Drum speed in rpm/10.

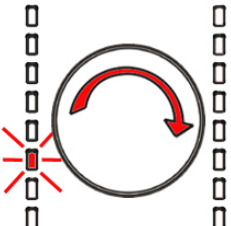

Position 9

Drain, calibration of analogue pressure switch and spin	Purpose of the test:	To check the correct operation of the spin cycle drain pump and calibrate the analogue pressure switch.
	Components activated:	<ul style="list-style-type: none"> • Door safety interlock. • Drain pump. • Motor up to 650 rpm then at maximum spin speed (**).
	Working conditions:	<ul style="list-style-type: none"> • Door closed • Water level lower than anti-boiling level for spinning.
	LCD display:	 Drum speed in rpm/10.

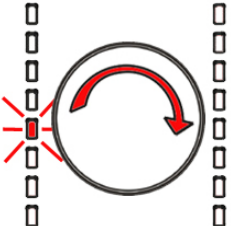

Position 10

Drum position	Purpose of the test:	To check the correct position of the drum via DSP.
	Components activated:	<ul style="list-style-type: none"> • Drum rotation motor. • Door fastening device. • Drum position sensor DSP.
	Working conditions:	<ul style="list-style-type: none"> • Door closed.
	LCD display:	

Position 11

Reading/Deleting the last alarm	Purpose of the test:	Reading/Deleting the last alarm.
	Components activated:	-----
	Working conditions:	-----
	LCD display:	 Displays any alarms present or stored.

Position 12÷16

User interface test	Purpose of the test:	To test operation of all the LEDs and switches.
	Components activated:	<ul style="list-style-type: none"> • The LEDs are turned on in sequence, as are the symbol groups of the LCD display and its backlight.
	Behaviour:	<ul style="list-style-type: none"> • All LEDs turn on in sequence. • By pressing a key the corresponding icon unit lights up. • The code is shown on the LCD and a beep sounds. • All the icons on the LCD flash.
	Working conditions:	There is a control to run the test (always active).
	LCD display:	

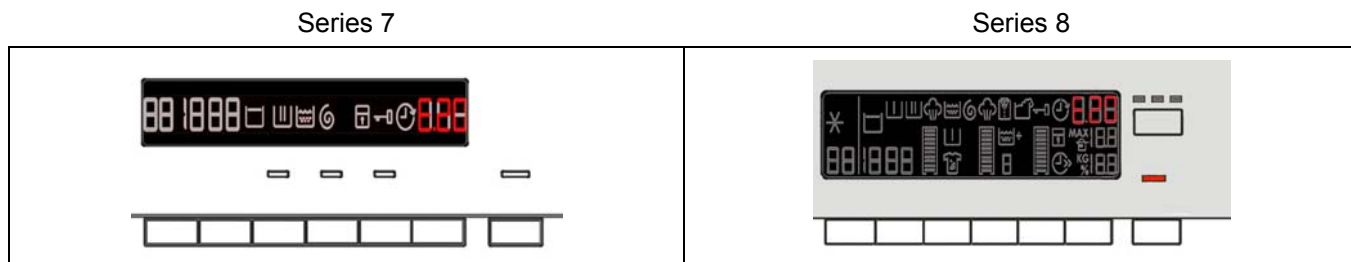
(*) In most cases, the established time is sufficient to check the heating. However, the time can be increased by repeating the phase without draining the water: pass for a moment to a different phase of the diagnostic cycle and then back to the heating control phase (if the temperature is higher than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

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

8 ALARMS

8.1 Displaying the alarms to the user

When a problem arises in the appliance, which generates a “WARNING” or an “ALARM”, this is displayed with three digits, where the time until the end of the cycle is represented.



The alarms displayed to the user are listed below:

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

The alarms listed below:

- EF0 - Water leakage (Aqua Control System)

For its solution, the intervention of a Service engineer is required.

While for the alarm:

- EH0 - Voltage or frequency outside normal values

It is necessary to wait for power supply voltage and/or frequency to restore normal conditions.

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

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

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

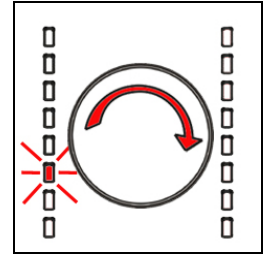
Certain alarm conditions require a drain phase to be performed before the door can be opened for safety reasons:

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

8.2 Reading the alarms

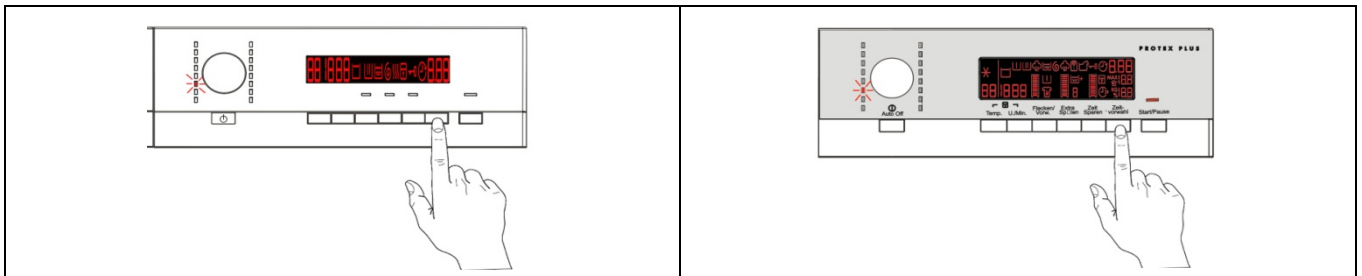
The last three alarms stored in the FLASH memory of the PCB can be displayed:

- Enter the diagnostic mode.
- Irrespective of the type of circuit board and configuration, turn the programme selector knob **clockwise** to the **eleventh position** and the last alarm is displayed.
- To display previous alarms, press the button to the left of the START/PAUSE button in sequence (as shown in the figure).
- To return to the last alarm, press the START/PAUSE button.



SERIES 7

SERIES 8



8.3 Rapid reading of alarms

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

- Press the **START/PAUSE** button and the nearest **option button** simultaneously (as if you were entering DIAGNOSTIC mode) for at least 2 seconds: the LCD display shows the last alarm.
- The alarm is displayed until another key is pressed.
- While the alarm is being displayed, the appliance continues to perform the cycle or, if in the programme selection phase, it maintains the previously selected options in memory.

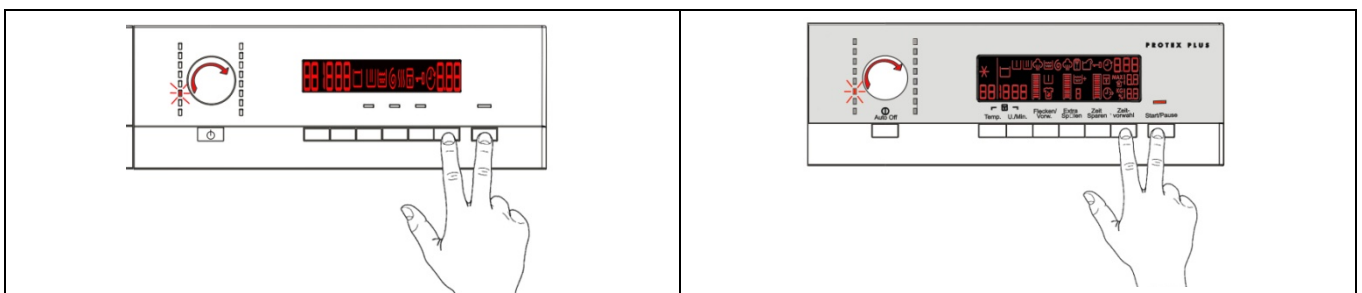
8.4 Deleting the last alarm

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

Series 7

Series 8



1. Enter the diagnostic mode.
2. Turn the selector dial clockwise until the eleventh LED is turned on (in the left-hand alarm reading row).
3. Press the **START/PAUSE** button and the nearest **option button** simultaneously (as shown in the figure).
4. Hold down the buttons until the LCD display shows "E00" (at least 5 seconds).

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

8.5 Alarm Summary Table

ALARM CODE	Description	Possible fault	Action/machine status	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 tube 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	Malfunction in sensing circuit on triac for drain pump	<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 defective. • Wiring; main circuit board. 	Cycle 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 min. on, then 5 min. off etc.).	RESET
E38	Internal pressure chamber is clogged (water level does not change for at least 30 sec. of drum rotation)	<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 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 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 cooling dissipator for Inverter (>88°C)	<ul style="list-style-type: none"> Overheating caused by continuous operation or ambient conditions. Inverter board faulty. NTC open (on the Inverter board). 	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
E5C	Input voltage is too high - greater than 430 V	<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. 	-----	
E5E	Communication error between Inverter and main PCB	<ul style="list-style-type: none"> Faulty wiring between main board and Inverter. Inverter board faulty. Main 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 open 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"> Earth leakage between heating element and earth. 	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. Earth leakage between heating element and earth. 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

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

ALARM CODE	Description	Possible fault	Action/machine status	Reset
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
EC1	Electronically controlled valve blocked with operating flow meter	<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 min. on, then 5 min. off etc.).	RESET
EC3	Problems with weight sensor (no signal or outside the limits)	<ul style="list-style-type: none"> • Faulty wiring. • Weight sensor faulty. • Main board faulty. 	-----	START/ 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. 	Water drain.	ON/OFF RESET
EF4	Water fill pressure too low, no signal from flow meter 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	Supply frequency of appliance outside the 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
EH4	0 Watt relay malfunction	<ul style="list-style-type: none"> • Main circuit board faulty. 	-----	ON/OFF RESET
EHE	Inconsistency between FCV relay (in the main board) and safety "sensing" circuit	<ul style="list-style-type: none"> • Faulty wiring. • Main circuit board faulty. 	Safety drain cycle. Cycle stops with door open.	RESET
EHF	Safety sensing circuit faulty (wrong input voltage to microprocessor)	<ul style="list-style-type: none"> • Main circuit board faulty. 	Safety drain cycle. Cycle stops with door open.	RESET

9 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.

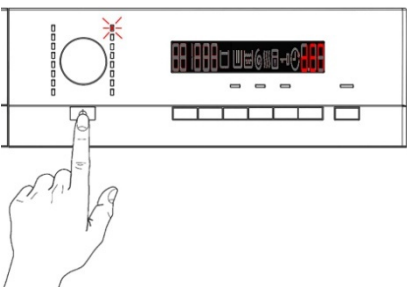
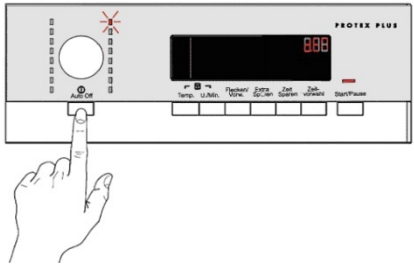

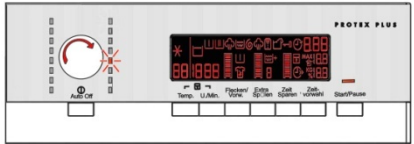
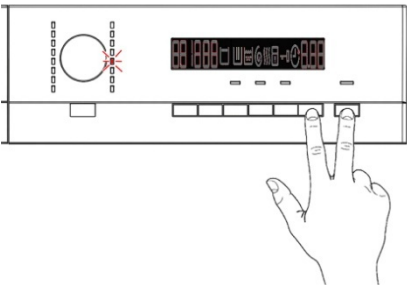
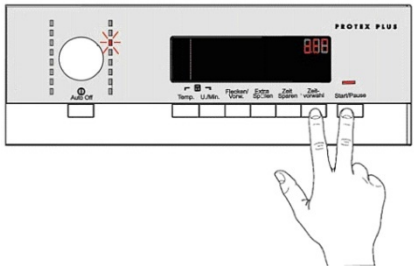
- Only the operating time of normal programmes (and not diagnostic cycles) is counted.
- The actual operating time for the cycle is counted (which does not include pauses, delayed start time, rinse hold time and soaking phases).
- The precision of the counter is 30 seconds per programme.
- Only whole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

9.1 Reading the operating time

Do not start the procedure with the combination buttons pressed

Series 7

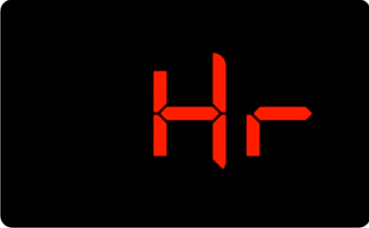


Series 8

<p>Turn the appliance on at the ON/OFF switch.</p>		
<p>Turn the selector dial clockwise until the fifth LED in the right-hand row is on.</p>		
<p>Press the START/PAUSE button and the nearest option button simultaneously (as shown in the figure). Hold the buttons down (approximately three or five seconds) until "dEM" flashes for a short time.</p>		

9.2 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)
		

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.

9.2.1 Compatibility between options

		OPTIONS																
		Rinse hold	Night cycle	Pre-wash/Soak (*)	Stains	Extra-rinse	Easy-iron	Economy (*)	Normal	Daily	Super Quick	Sensitive	Reduced spin speed	No spin	Aquasol	Max steam	Medium steam	Min steam
Compatibility with OPTIONS	Rinse hold			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
	Pre-wash/Soak (*)	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
	Super rinse	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
	Economy	X	X	X	X	X	X				X	X	X	X		X	X	X
	Normal	X	X	X	X	X	X					X	X	X	X	X	X	X
	Daily	X	X	X	X	X	X					X	X	X	X	X	X	X
	Super Quick	X	X	X	X	X	X	X					X	X	X	X	X	X
	Sensitive	X		X	X			X	X	X			X	X	X	X	X	X
	Reduced spin speed			X	X	X	X	X	X	X	X	X			X	X	X	X
	No spin			X	X	X	X	X	X	X	X	X			X	X	X	X
	Aquasol	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				
	Medium steam	X	X	X	X	X	X	X	X	X	X	X	X	X				
Min steam	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	
	Pre-wash	X	X			X	X					X	X	X	X	X	X	
	Wash	X	X			X	X					X	X	X	X	X	X	
	Rinses	X																
	Spin																	

(*) Pre-wash and Soak cancel each other out.

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. The maximum delay is of 20 hours.
- The selection of the spin cycle is available for all programmes, except for Drain/Soak/Extra Silent.

9.3 Description of options

9.3.1 Rinse hold

- During the cycle, performs the rinses and the intermediate spins.
- Stops the appliance with water in the tub before the final spin cycle.
- To drain the water, simply press the START/PAUSE button to perform the drain phase and the spin cycle.

9.3.2 Pre-wash

- Adds a pre-wash phase at the start of the cycle with water heating to 30°C (or cold, if selected).
- In COTTONS 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.

9.3.3 Pre-wash

- Adds a pre-wash phase with heating to 30°C (or cold, if selected) plus 30' hold with HAND WASH movement.
- Complete Cycle.

9.3.4 Stains

- Adds a 5-minute motor movement phase after heating to 40°C.
- Water flow to the pre-wash/stains compartment to introduce the special stain-removal product.
- This option cannot be selected for WOOL and HAND WASH cycles.

9.3.5 Super rinse (SERIES 7)

- Adds **two** rinses to the COTTONS cycle, one to the SYNTHETICS – DELICATES cycles.
- Eliminates the spins at the end of the washing.

9.3.6 Super rinse (SERIES 8 key combination).

- Adds two rinses to the COTTON cycle, one to the SYNTHETIC FABRICS – DELICATES cycles.
- Eliminates the spins at the end of the washing.

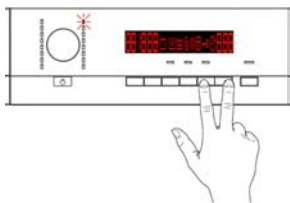
9.3.7 EXTRA rinse (SERIES 8)

- Adds up to five rinses in the COTTONS – SYNTHETICS – DELICATES cycles.
- When the rinses are five or more, it eliminates the spins at the end of the washing.
- Maximum of 8 rinses in total.

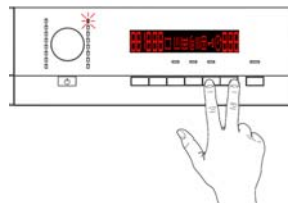
ENABLING/DISABLING SUPER RINSE KEY COMBINATION

Appliances which do not envisage the SUPER RINSE option combined with a button can enable it through a key combination.

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During the selecting phase, press the two buttons shown in the figure simultaneously for a few seconds until the related icon lights up. This option also remains enabled for subsequent cycles. To disable it, repeat the same procedure until the related icon is turned off.

9.3.8 No spin

- It eliminates all the spin phases.
- It adds three rinses to the COTTONS cycle and one to the SYNTHETICS cycle.

9.3.9 Daily

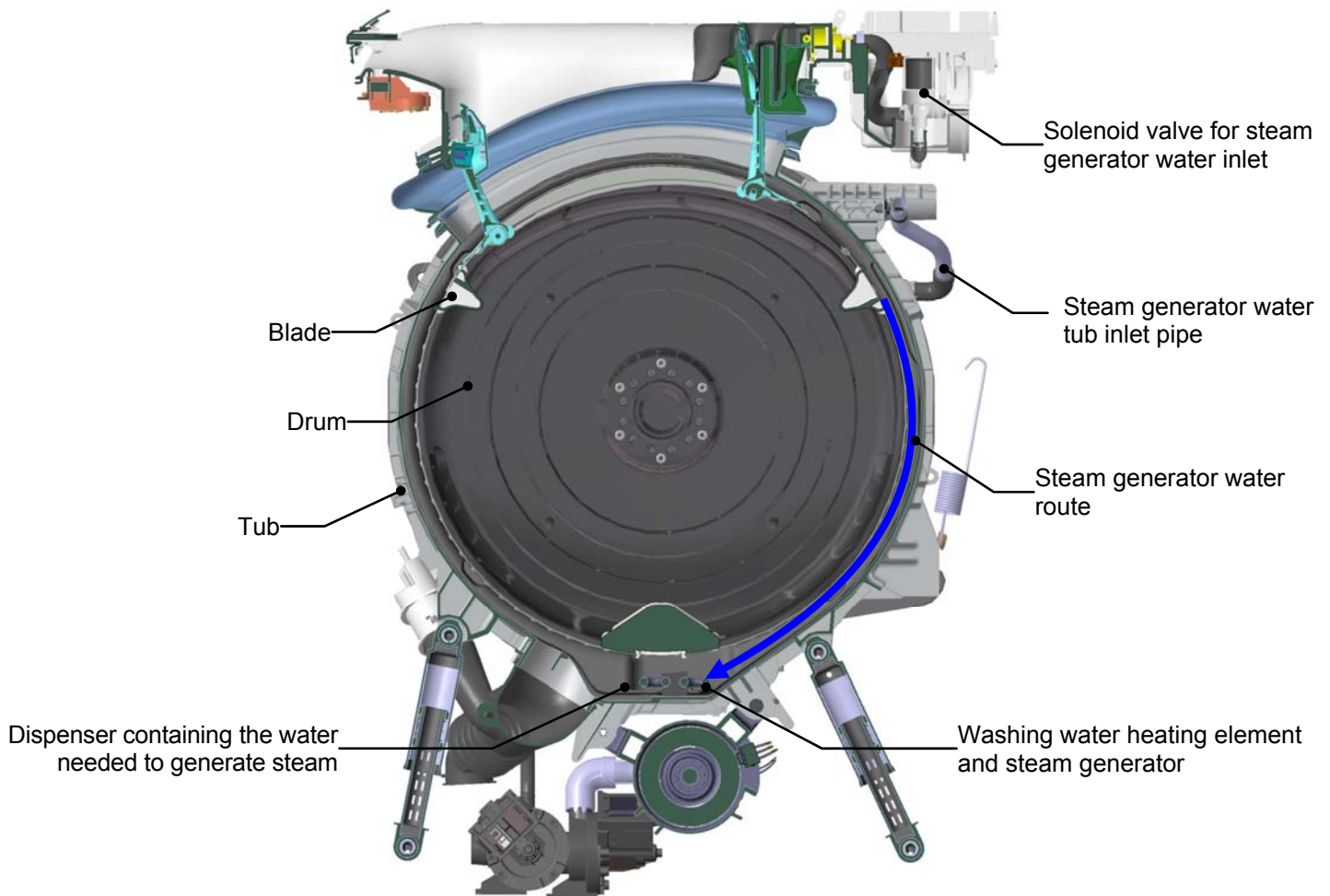
- Modifies the structure of the COTTONS – SYNTHETICS – DELICATES cycles to obtain good washing performance in a short space of time.
- **Super quick**
 - Modifies the structure of the wash phase of the COTTON – SYNTHETIC FABRICS – DELICATES cycles by half a load.
- **Delayed start time**
 - Adds a pause before the start of the programme. The delay time is displayed on the three digits.
 - See page 12 series 7, page 20 series 8, page 28 series 9.
 - 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.

9.3.10 Generating STEAM

In SERIES 8 certain programmes can be configured to generate steam, which is used to refresh the laundry or remove some creases and make ironing easier.

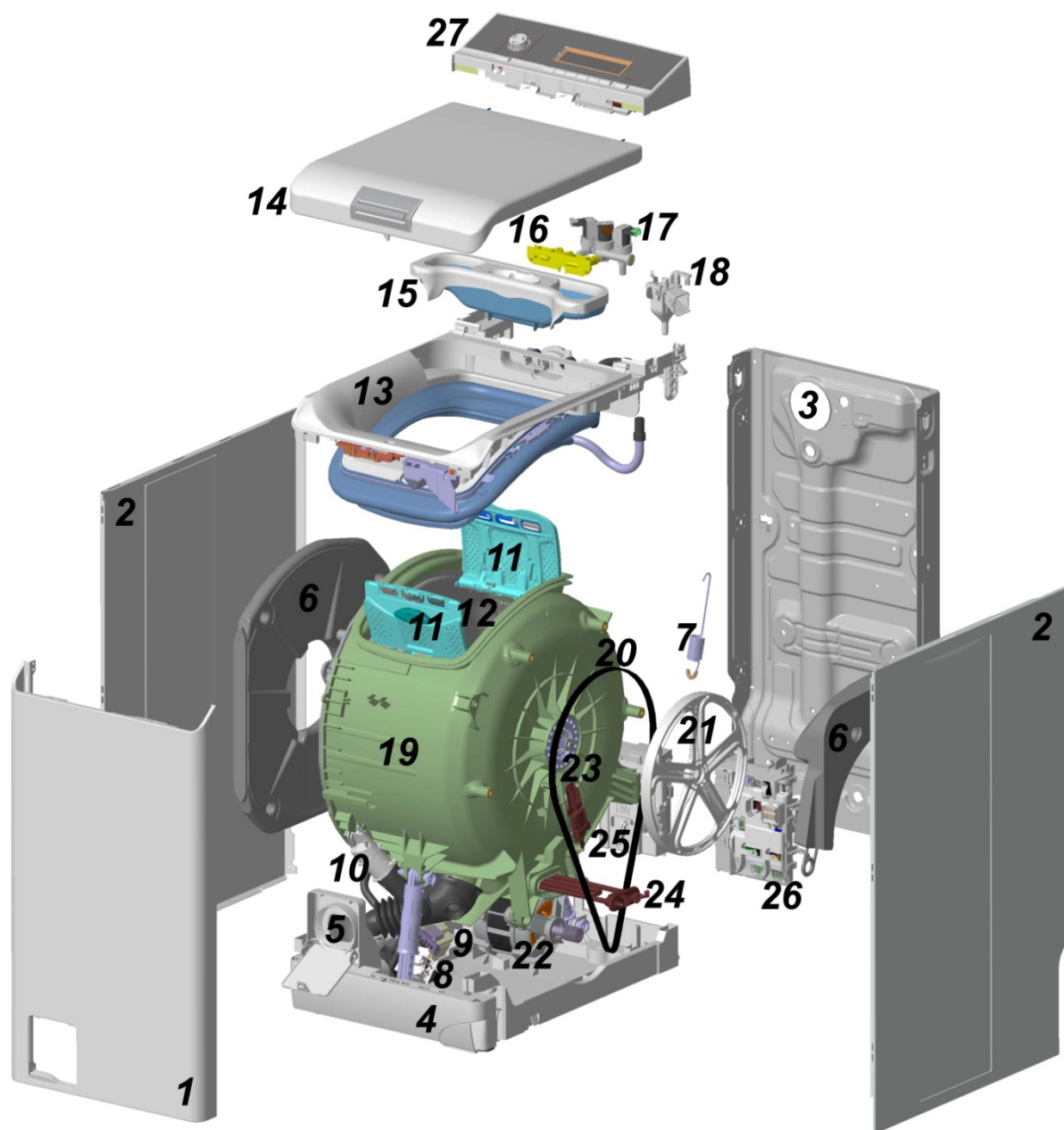
To obtain steam, during these programmes, the quantity of water filled in the tub must be enough to cover the heating element and the maximum temperature to reach is 60°C/75°C.

During the water filling and the movement of the drum, the laundry must not get wet.



10 TECHNICAL CHARACTERISTICS

10.1 Manufacturing characteristics

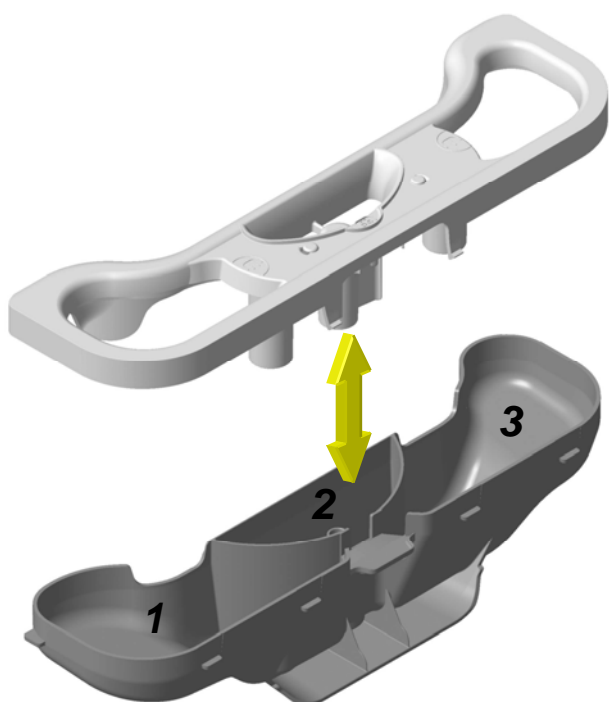
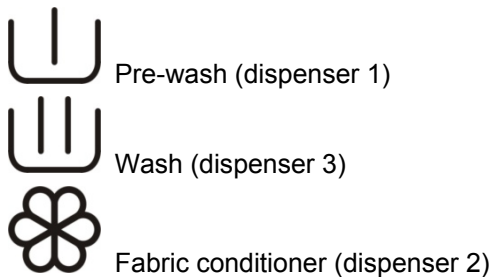


- | | | |
|-------------------------------------|--------------------------|------------------------------------|
| 1. Frontal piece. | 10. Pressure chamber. | 19. Washing unit. |
| 2. Sides. | 11. Lids. | 20. Transmission belt. |
| 3. Back panel. | 12. Drum. | 21. Pulley. |
| 4. Base. | 13. Inlet. | 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. |

10.2 Detergent dispenser

10.2.1 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:

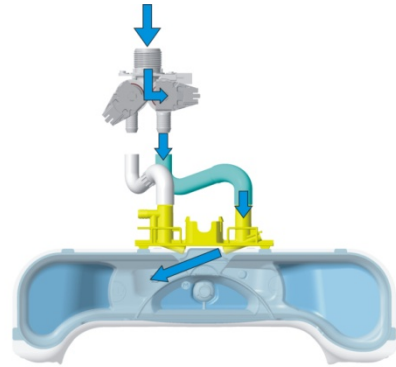


1. Detergent dispenser.
2. Fabric softener dispenser.
3. Pre-wash detergent dispenser.

10.2.2 Working principle of water dispenser.

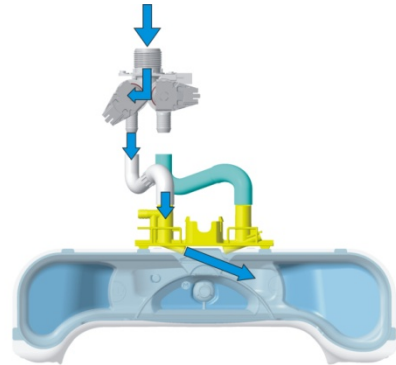
– Pre-wash

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

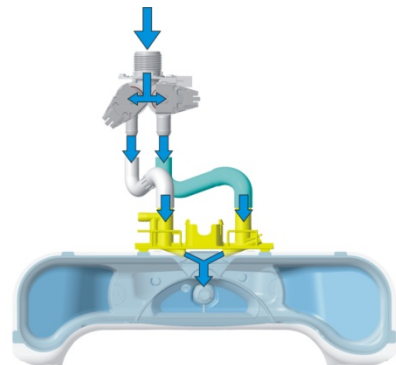
During the washing phase the left solenoid valve is activated, the water coming from the load pipe passes through the pressure reducer and then to the water dispenser, which then sends the water into the right dispenser picking up the detergent needed for washing.



– 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.



10.3 Washing unit

WASHING UNIT		
Type	Load capacity (cottons)	Drum volume
	max.	
C4	6 kg	42 litres

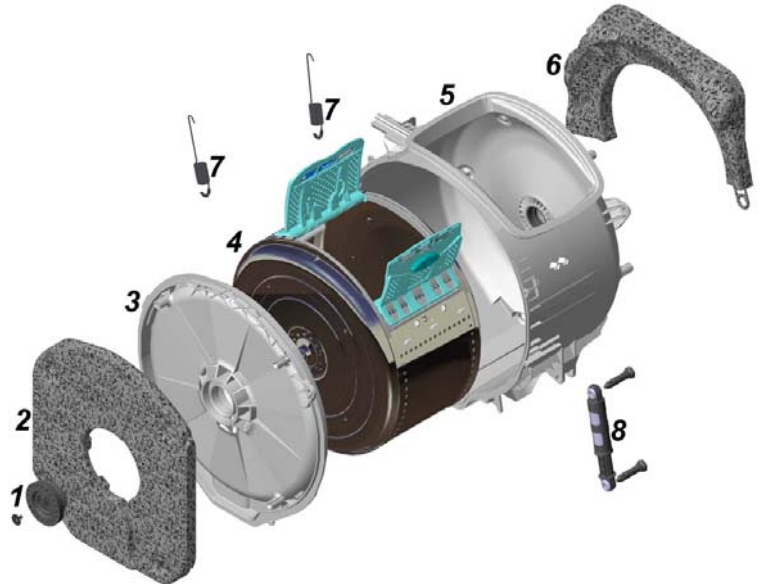
The washing unit is made up of:

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.

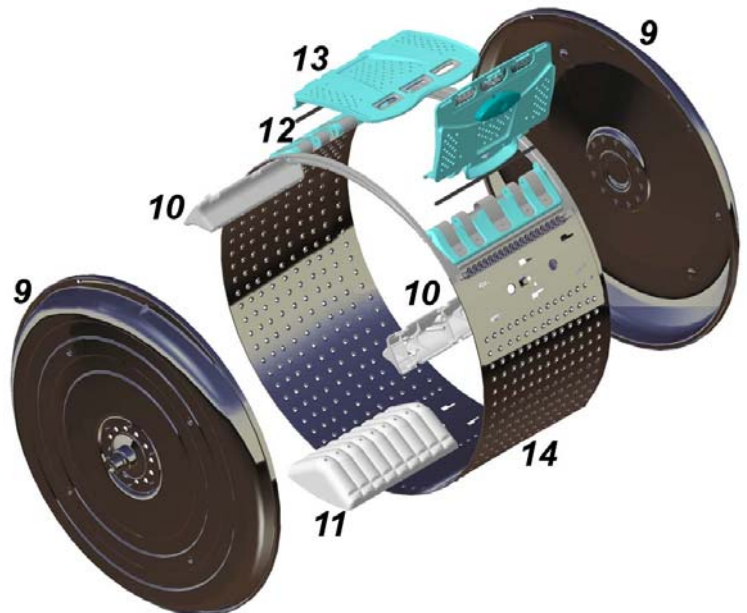
The drum is held in position by 4 bearings fitted to the tub and held by a support (1).

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).

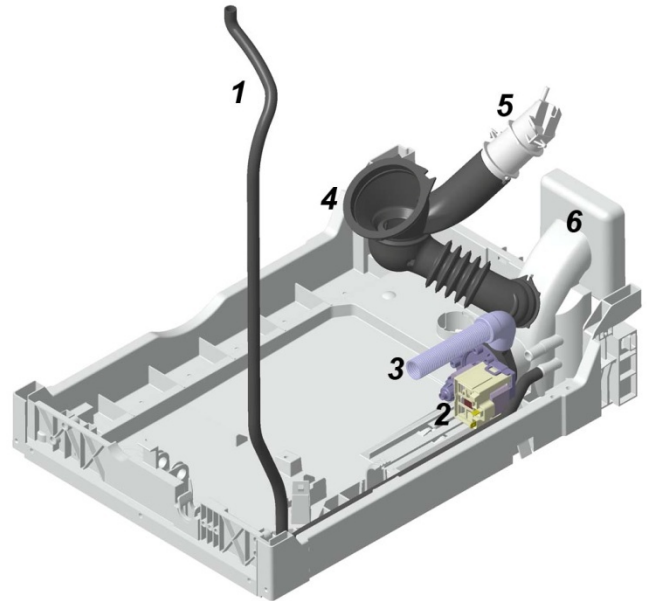
Inside the drum we can find 3 spokes 2 the same (10) and one bigger and heavier (11) positioned at 180° from the inlet, the latter serving to compensate the weight of the 2 lids.



10.4 Water circuit

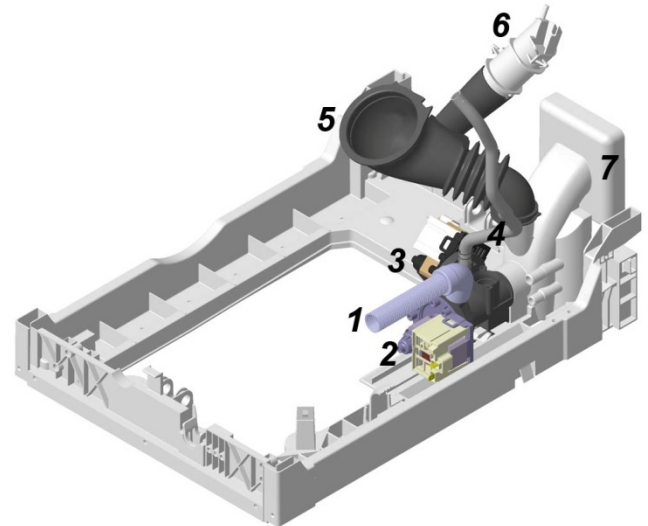
10.4.1 OKO version drain circuit

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.



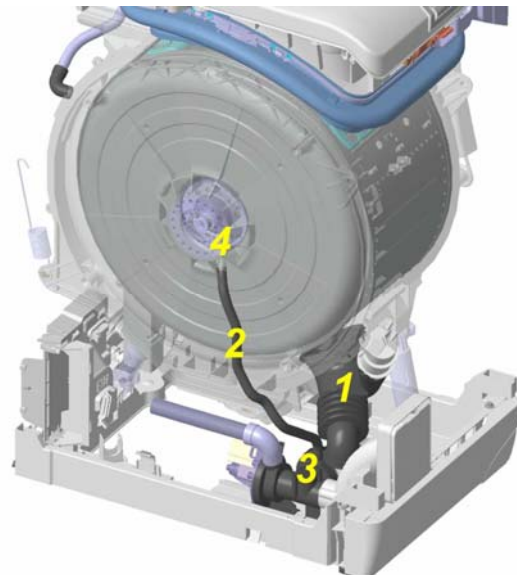
10.4.2 JET version drain circuit

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.



10.4.3 JET circuit

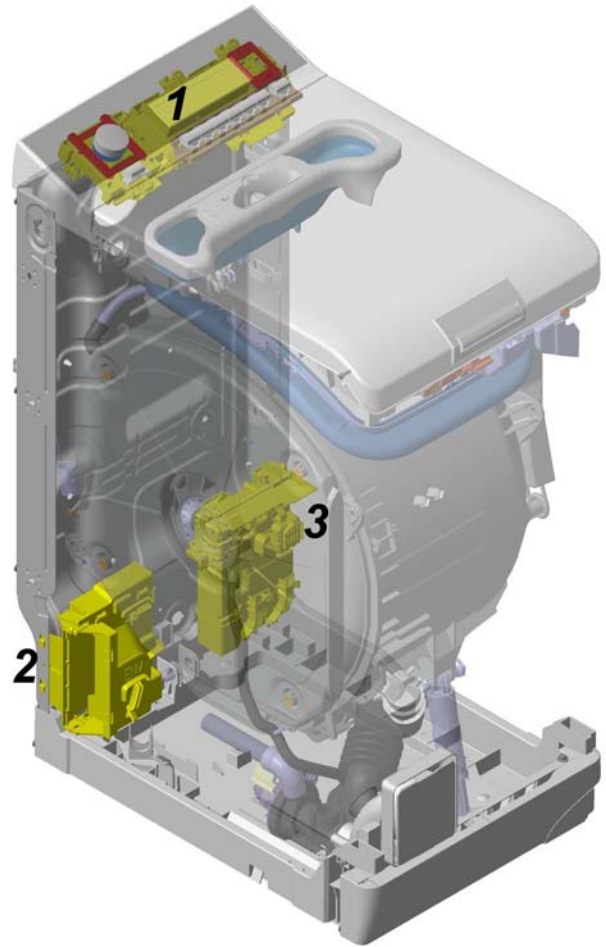
The water that circulates in the drain circuit (1) during washing through the pump (3) is put under pressure and going back up the pipe (2) and the nozzle (4) is once again pumped into the drum creating a continuous recycle of water.



10.5 Electronic control

The electronic control is made up of:

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



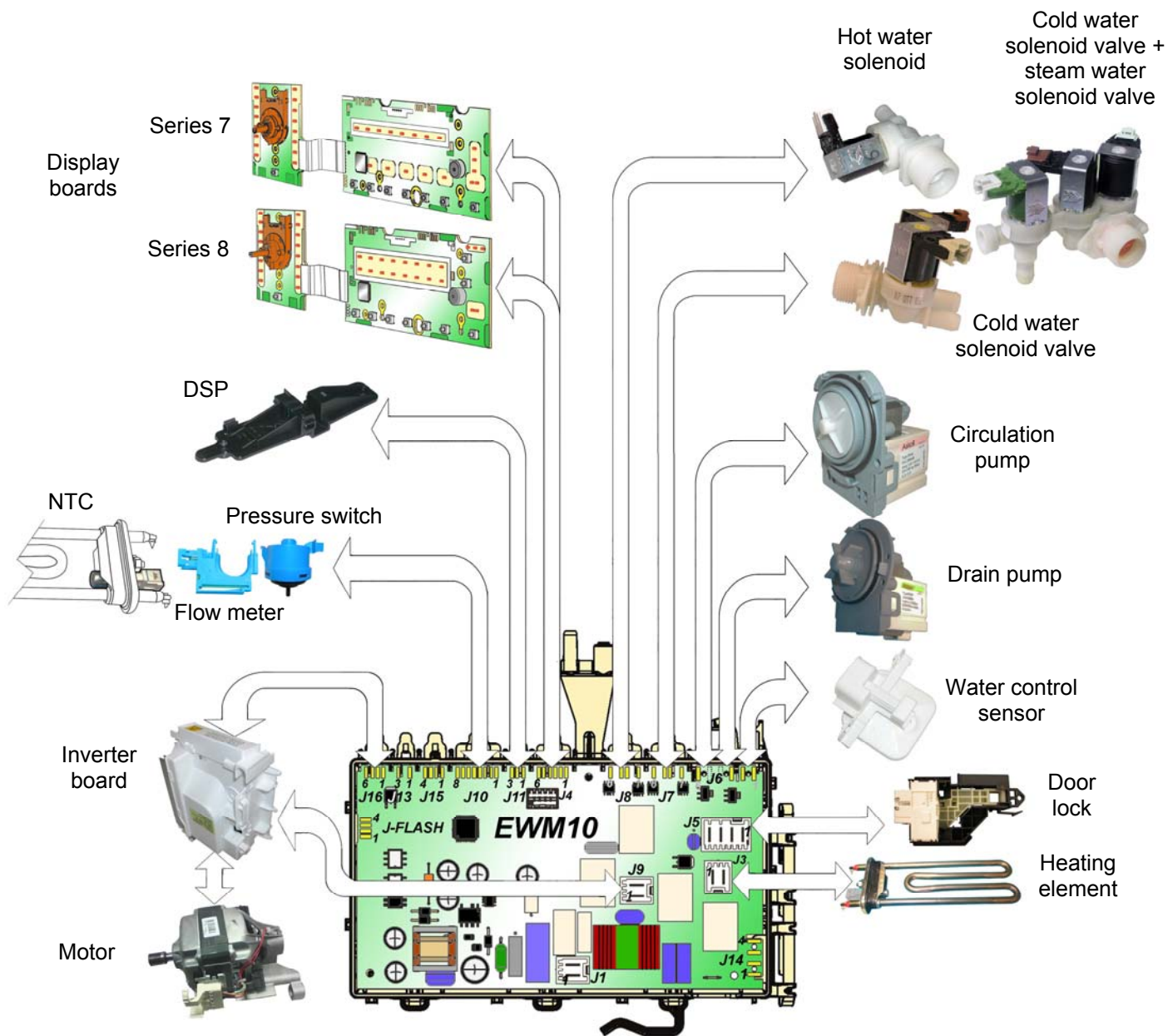
The control/display circuit board contains: the selector, to select the wash programme, the LCD screen to view information relating to the programme; the buttons to adjust the temperature, the spin speed and if necessary select an option, the Start/PAUSE button and lastly the ON/OFF button.

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.

10.5.1 Connecting electric parts



11 ELECTRICAL COMPONENTS

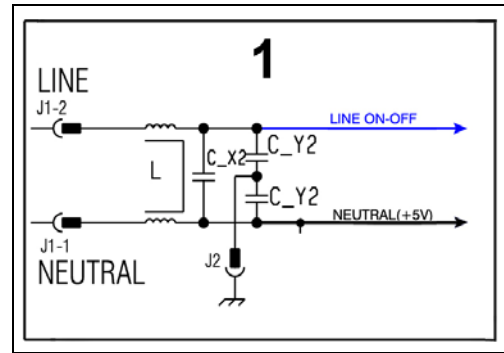


When replacing any of the components, please refer to the code shown in the list of spare parts relating to the appliance being repaired.

11.1 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



11.2 Display board

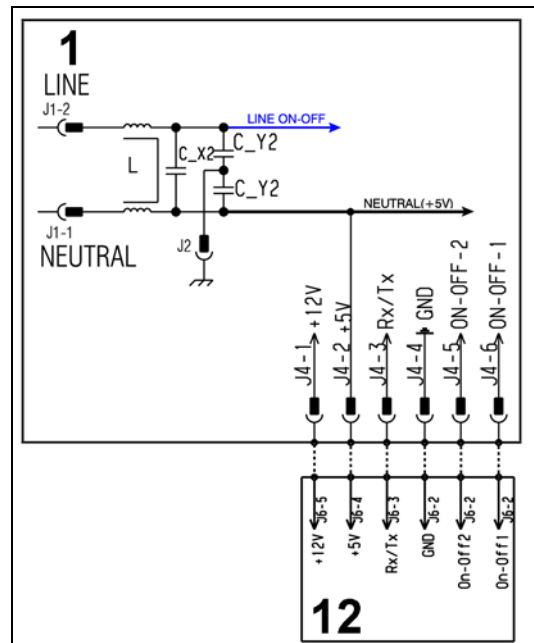
The main circuit board (1) supplies the power supply voltage to the control/display board (12).

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



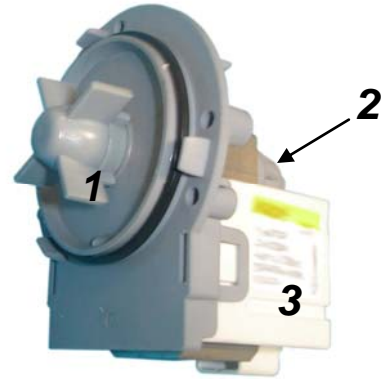
11.3 Drain pump



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

11.3.1 General characteristics

1. Wheel
2. Rotor
3. Stator




The pump, which drains the water at the end of the various washing cycle phases, is centrifugal and is actuated by a synchronous motor.

The rotor consists of a permanent magnet and the direction of rotation can be either clockwise or anticlockwise.

The rotor can turn by approximately a quarter of a revolution without turning the wheel. Consequently, if a foreign body is stuck in the wheel, the rotor can perform small movements clockwise and anticlockwise until the foreign body is released.

The flow rate of these pumps is approximately 18÷20 l/min, and the maximum head is 90 cm.

Fitted with thermal cut-out.



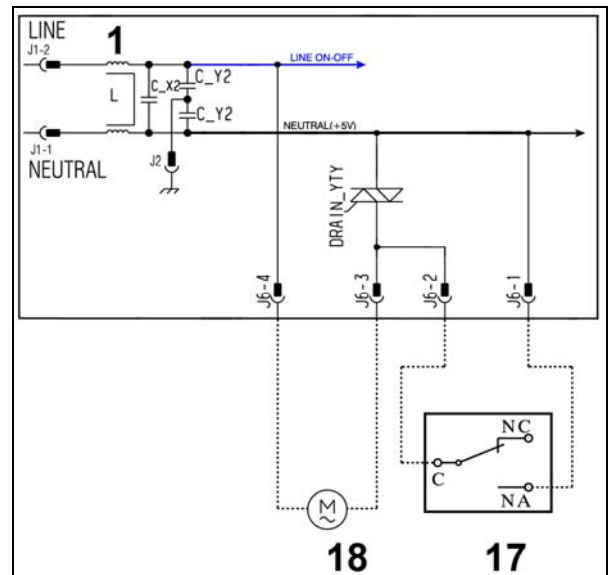
Synchronous pumps, when powered on empty (disconnected from the water circuit), may not start in some cases because their very construction makes them need an antagonist torque on the wheel to allow the rotor to move in one of the two directions.

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

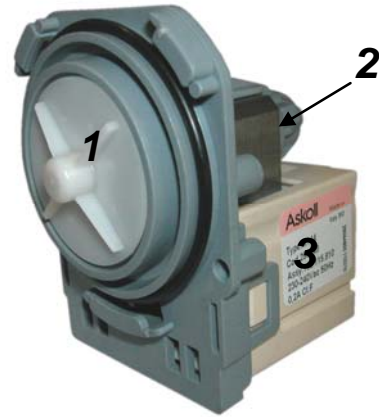


11.4 Circulation pump (where featured)

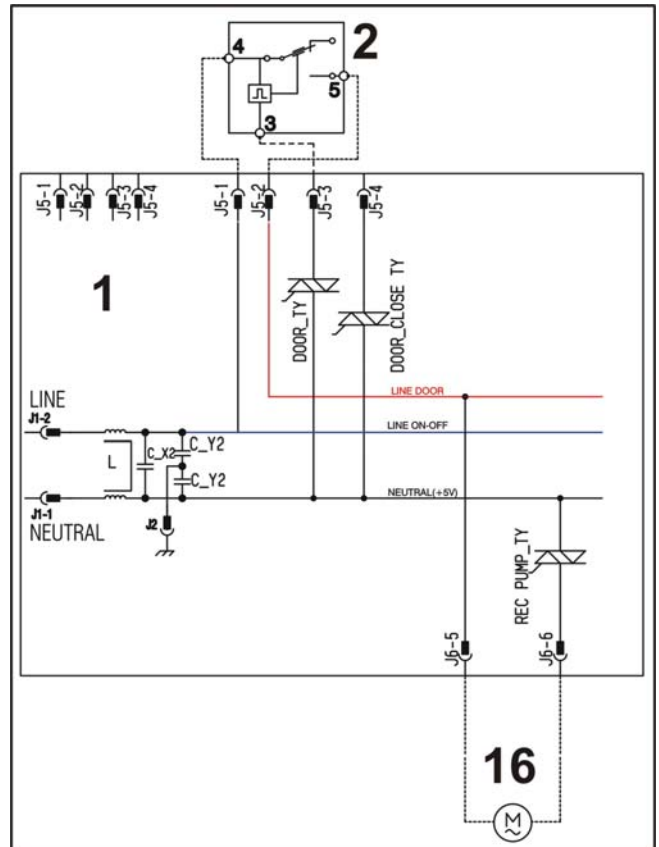
In models with Jetsystem washing, a synchronous circulation pump is fitted, which is designed to circulate water continuously, withdrawing it from the filter body and introducing it into the tub through the bellow seal.

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..

11.5 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.



11.6 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

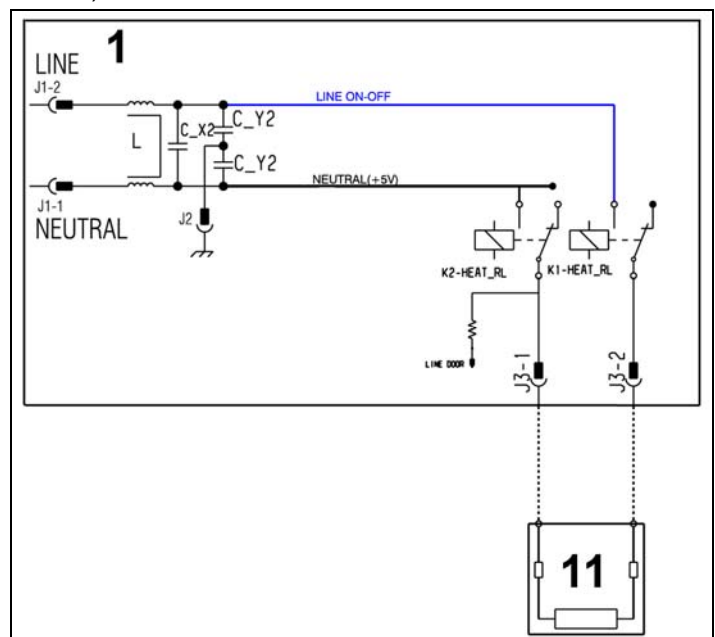


The heating element is hardened, that is, inserted into a stainless steel water proof tubular case.

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).

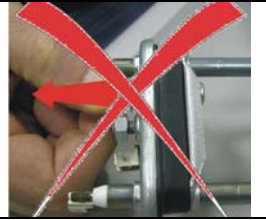
1. Main electronic circuit board
11. Heating element



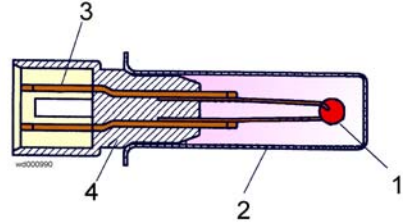
11.7 Temperature sensor



- 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...).



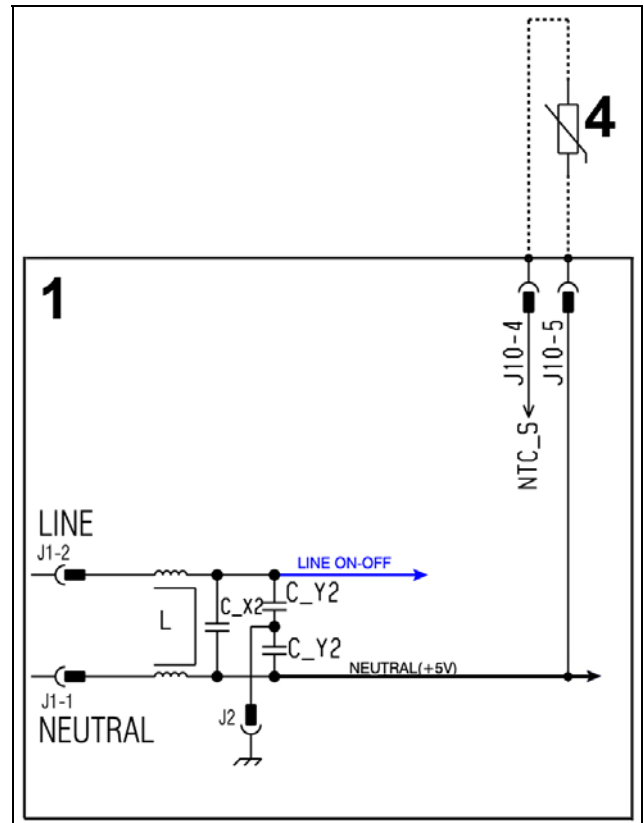
1. NTC heating element
2. Metal capsule
3. Terminals
4. Plastic casing



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



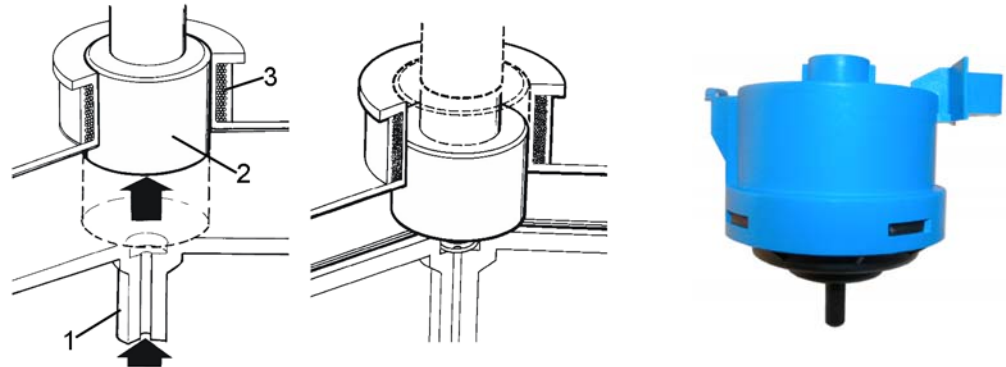
In the event of a fault (short-circuit or failure), an alarm is displayed – see table of alarms.

11.8 Analogue pressure switch

11.8.1 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

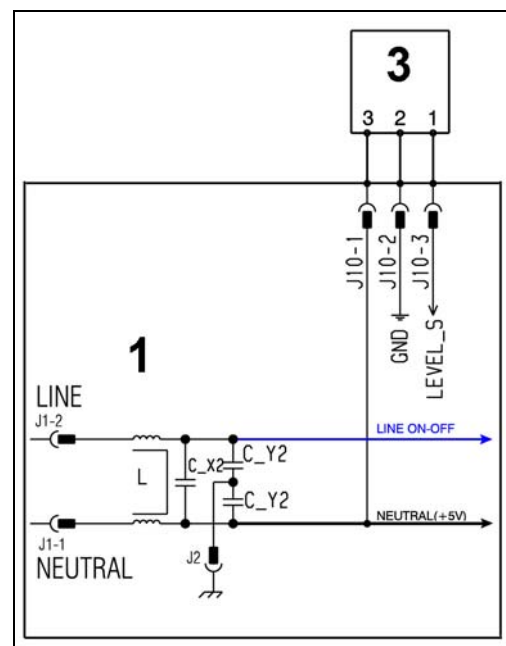


The pressure switch is connected via a pipe to the pressure chamber.

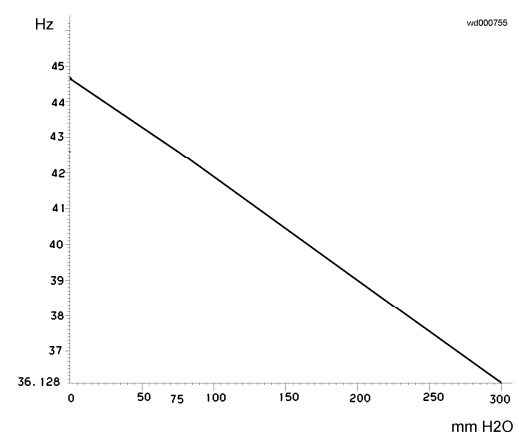
When water is introduced into the tub, this creates a pressure inside the hydraulic circuit that causes the membrane to change position. This in turn modifies the position of the core inside the coil, thus changing the inductance and the frequency of the oscillating circuit.

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.

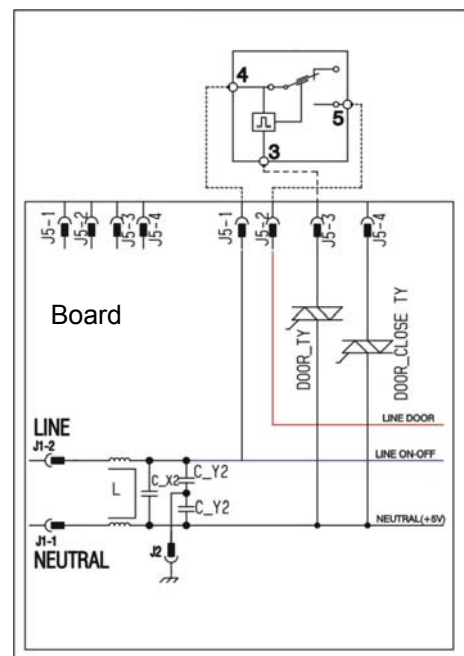
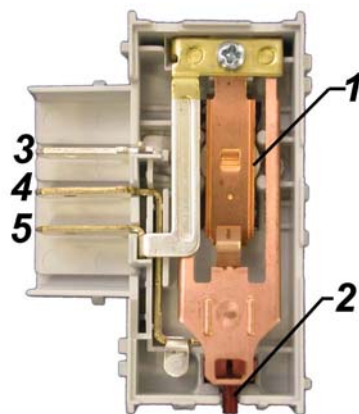
11.9 Door safety interlock

11.9.1 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

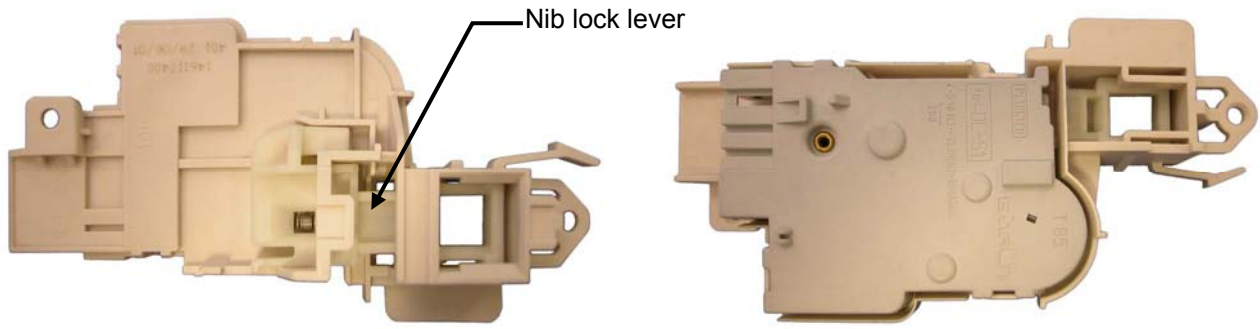


After pressing the START/PAUSE key a pre-established current passes through the bimetallic PTC (1) which becoming misshapen causes the lock lever (2) to move, stopping the nib lock runner from moving.

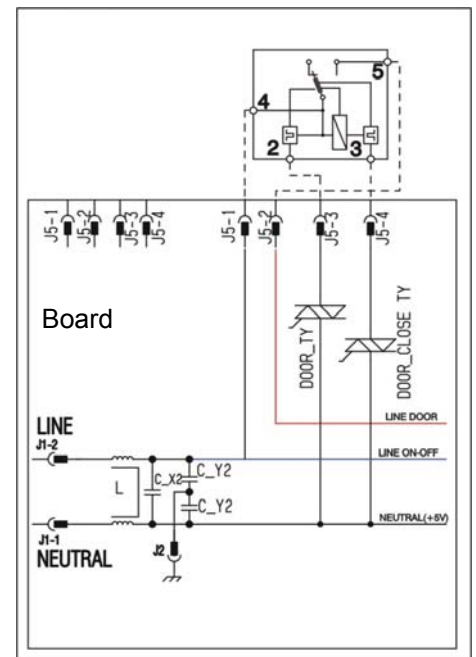
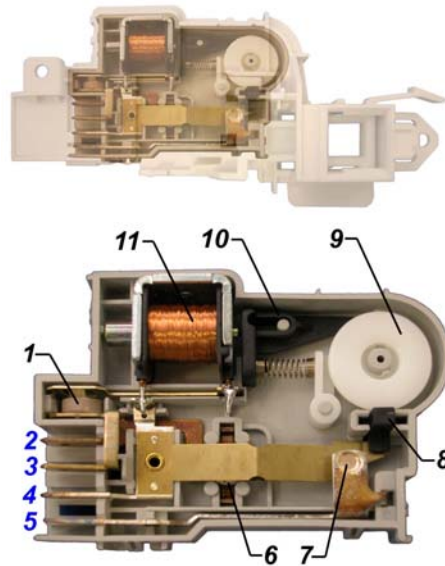
At the end of the programme when the power supply to the bimetallic PTC (1) is disconnected a certain amount of time is needed to allow it, previously misshapen, to return to its initial rest position thus unlocking the nib lock runner.

11.9.2 Immediate opening safety device.

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



When the programme starts up the door lock receives 3 pulses from the board via the contact.

The pulse applies voltage to the solenoid via the PTC element. This way the lever is moved and the dividing head disc moves one cog with an audible click.

The locking device (8) is unlocked allowing the bimetallic to activate the device (8), and the equipment lid is thus closed.

Via the START/PAUSE key or at the end of the programme, the door lock receives two electronic pulses and the dividing head disc is moved twice.

Only with the second pulse can the equipment cover be opened immediately, in fact the second pulse moves the blocking device thus allowing the nib lock lever to move.

Why two pulses? The door lock is driven by a triac on the main electronics.

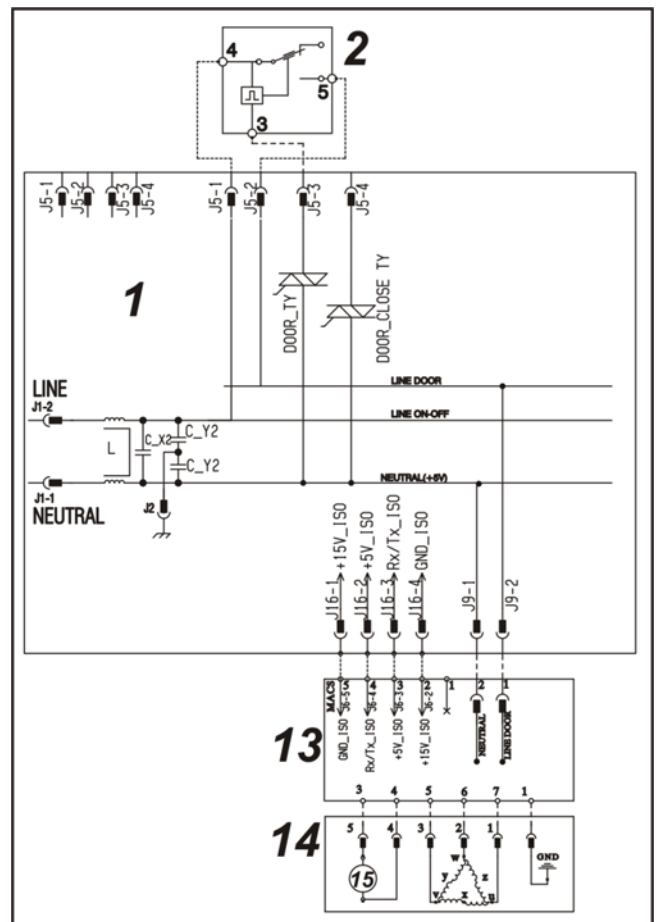
In the event of a short circuit on the triac, the electronics send a door lock pulse so for safety reasons a second impulse is required.

If there is a power cut during washing the door lock needs approximately 2 minutes before the equipment cover can be opened. During this time, the PTC bimetallic cools down and the locking device opens.

11.10 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



11.10.1 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.

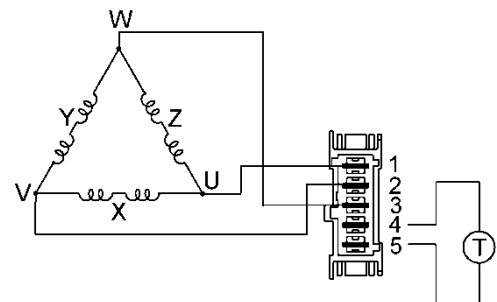
It is possible to get an idea of the efficiency of the motor by measuring the resistance of the coils:

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).



11.11 Inverter board

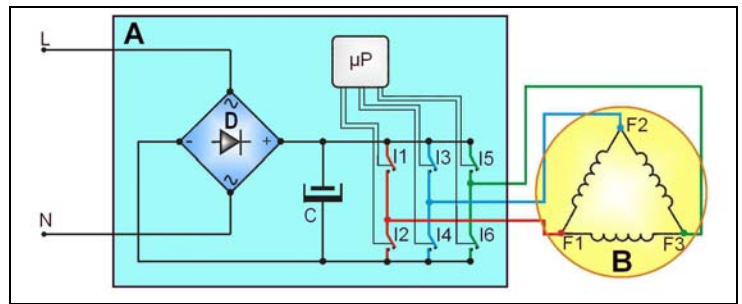
The EWM10931 electronics use a new asynchronous motor, with 2 poles, three-phase, with high performance and low noise levels.

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



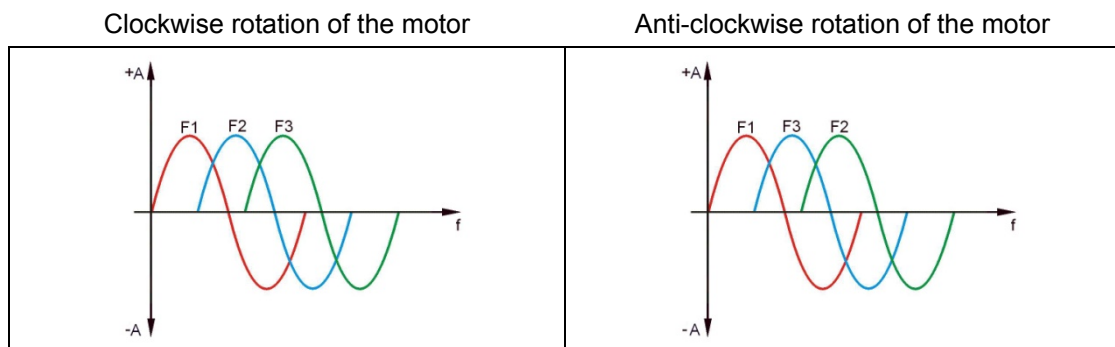
“INVERTER” main diagram

- 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.

11.11.1 AGS

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

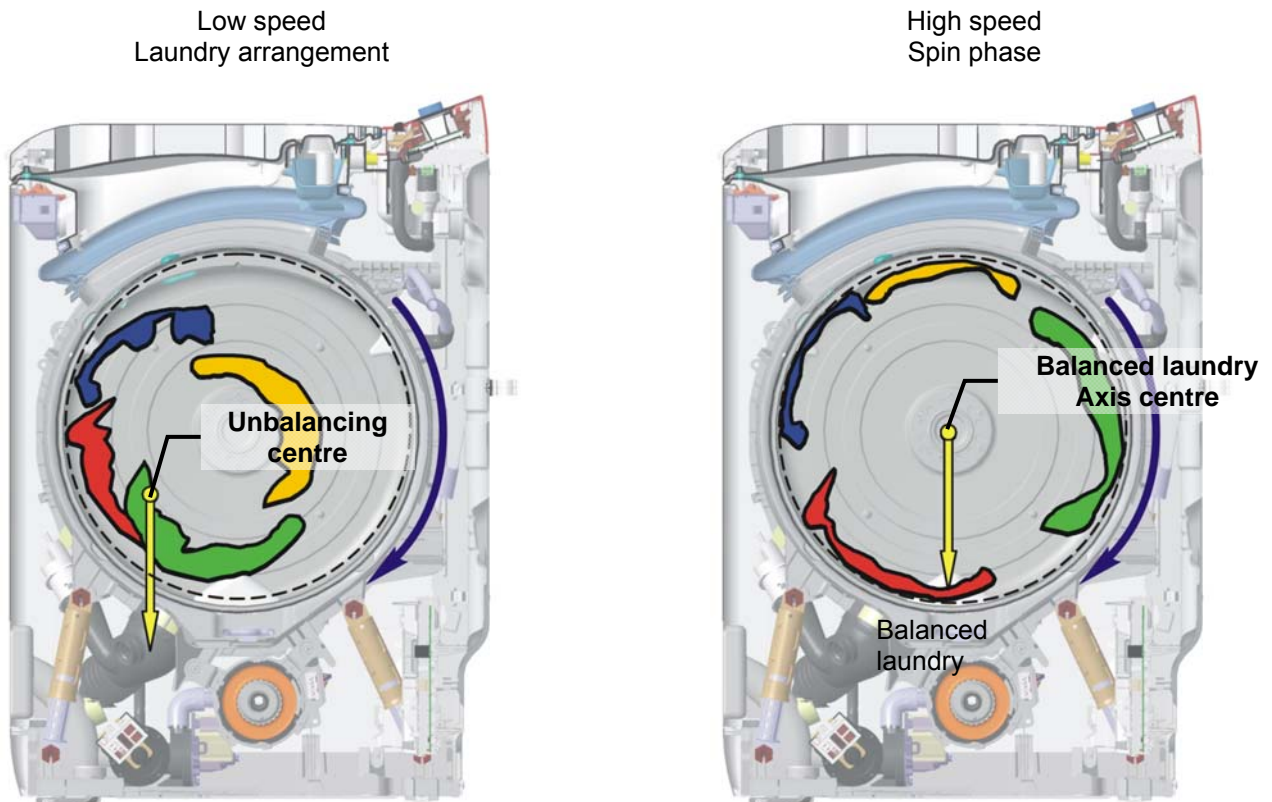
It is a complete procedure for the distribution of the laundry in the drum, limiting the static residual unbalance and guaranteeing an effective spin phase in an axis subsequently avoiding excessive vibrations in the washing machine.

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:



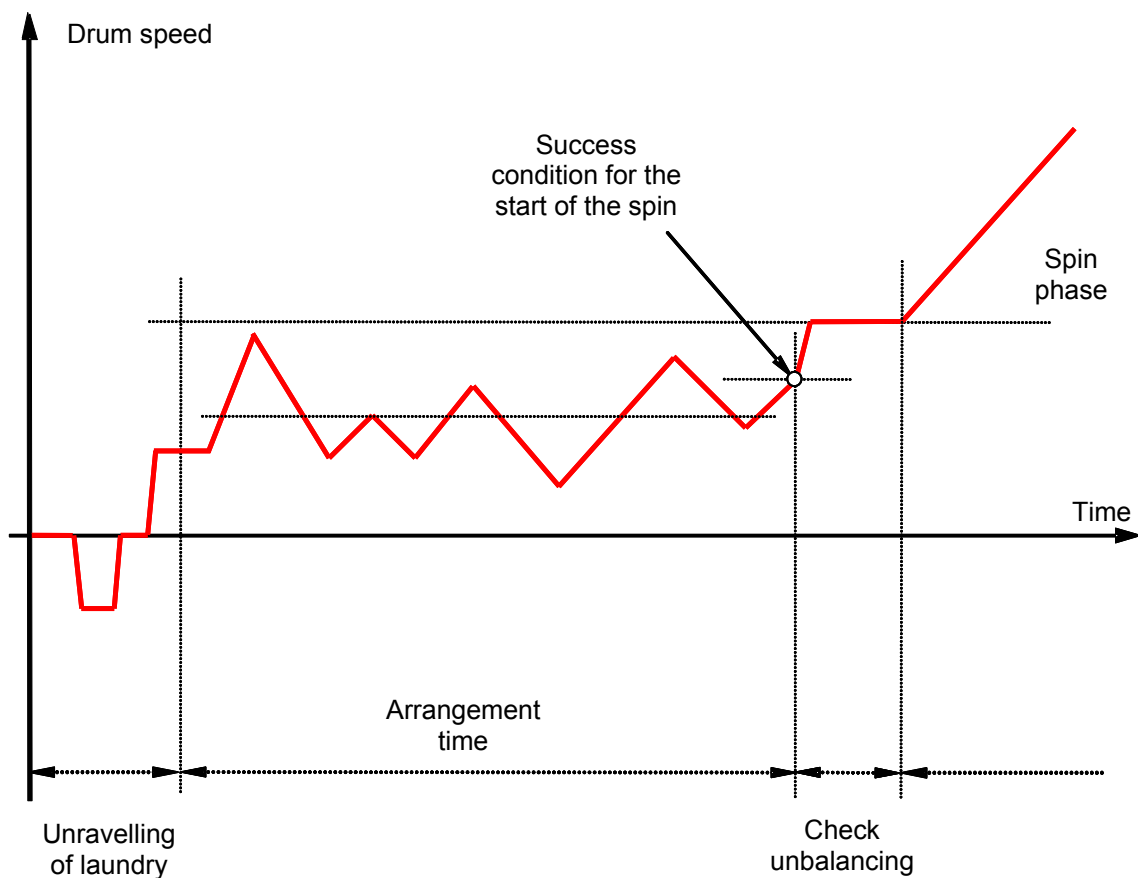
The AGS control is carried out before each spin and it aims to achieve the following:

- 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.

In this graph we can see that after a short unravelling phase we move immediately on to a phase where the drum spins at a variable high speed in order to place the laundry uniformly across the surfaces of the drum.

Once this phase is complete we have the ideal condition for starting the spin; firstly however before moving on to the maximum spin speed required by the kind of pre-selected programme, we still have one small phase where the unbalancing is once again checked.

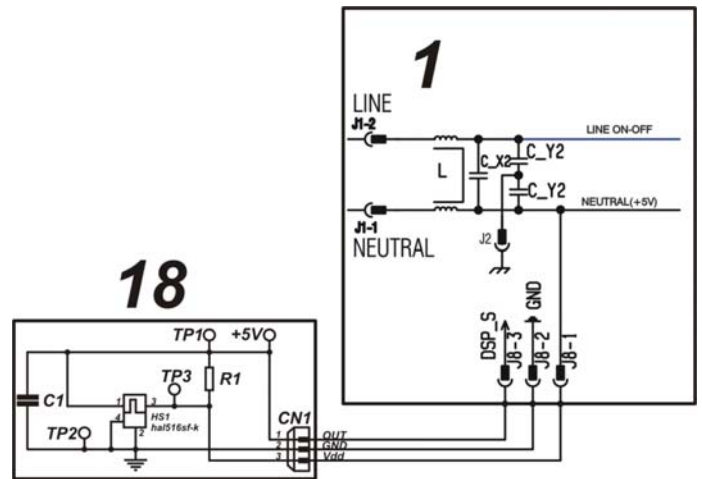


11.12 DSP drum positioning device (Drum – Self – Position)

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.

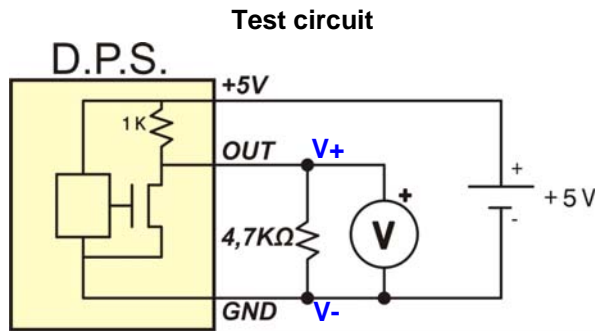
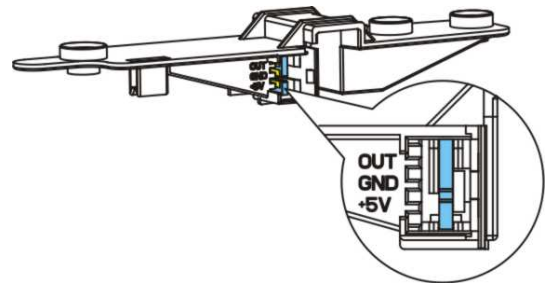


- 1. Main electronic circuit board
- 18. DSP internal circuit
- R1 1 KΩ 5%
- C1 4.7 μF 50 V 10%

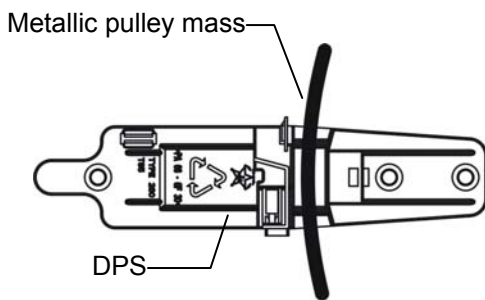


11.12.1 DPS operating control

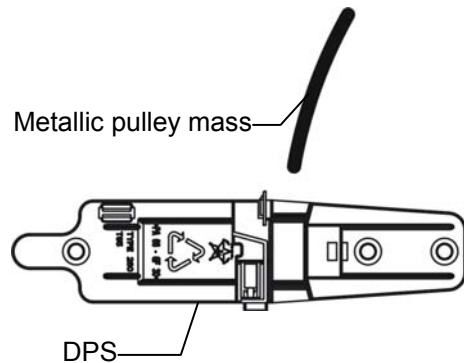
- Power the DPS circuit between the points +5 V and Mass (GND) with a voltage of 5 V.
- Position a 4.7 KΩ element between the OUT points and the mass (GND).
- Use the voltmeter to measure the voltage in the element ends (V+ V- points).



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



11.13 Solenoid valves

SOLENOID VALVE
HOT WATER

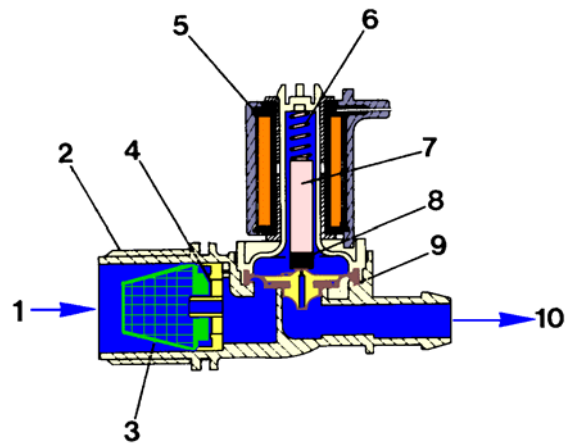
SOLENOID VALVE
TWO WAYS

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

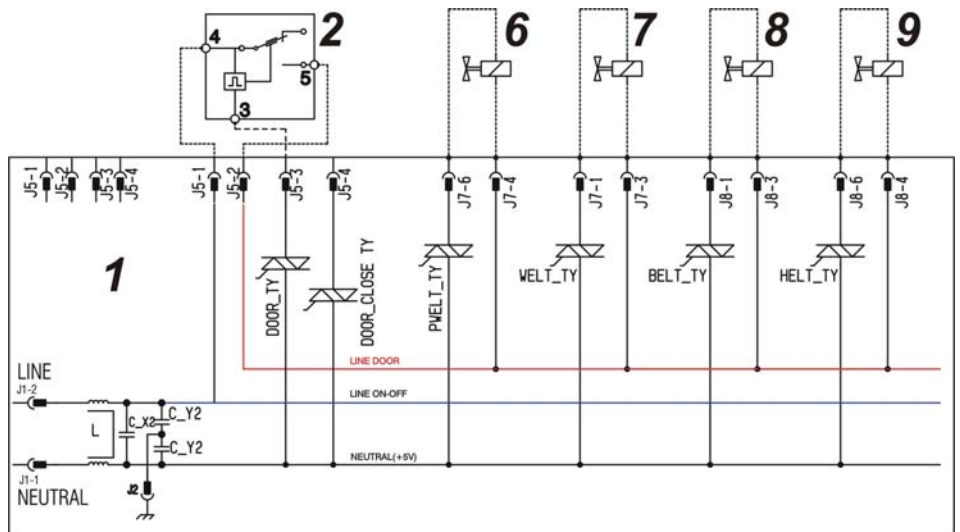


11.13.1 Operating principle

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



11.13.2 Problems relating to the solenoid valves

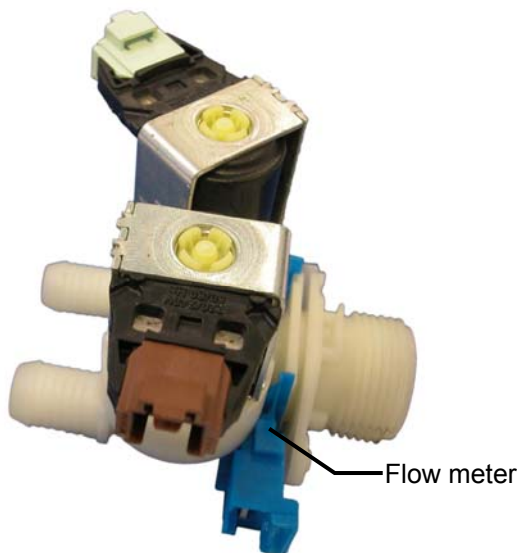
- **Mechanical jamming of the solenoid valve**

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.

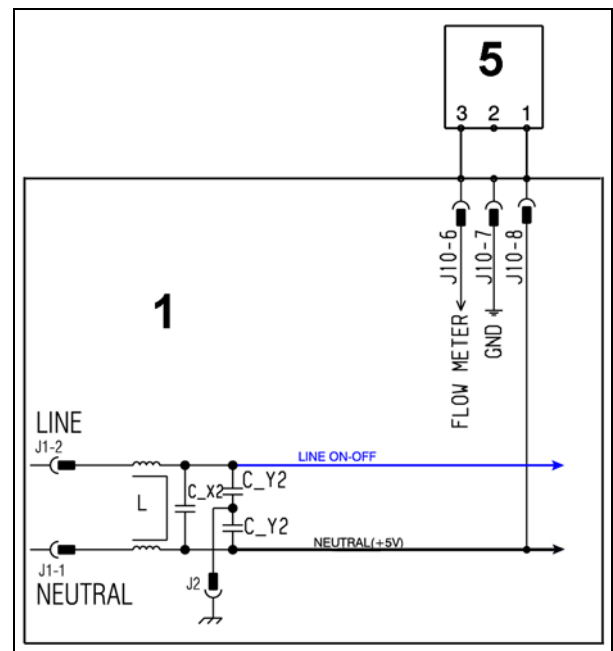
- **Low water pressure**

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.

11.14 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.

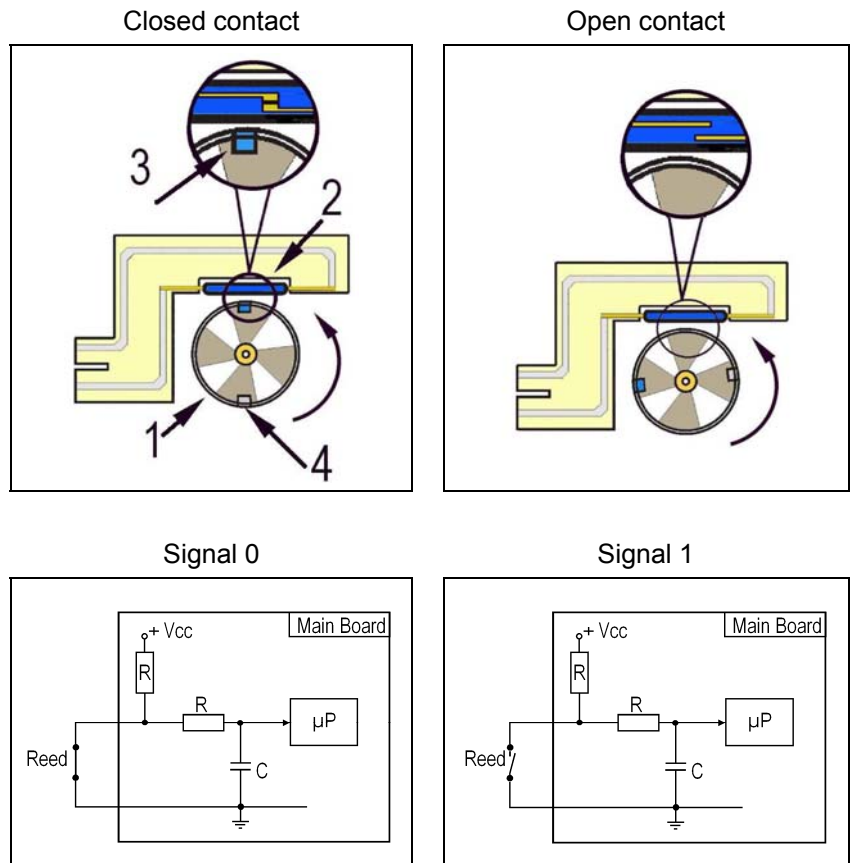
In the event of a sensor failure, the water level is controlled by the analogue pressure switch.

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

11.14.1 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



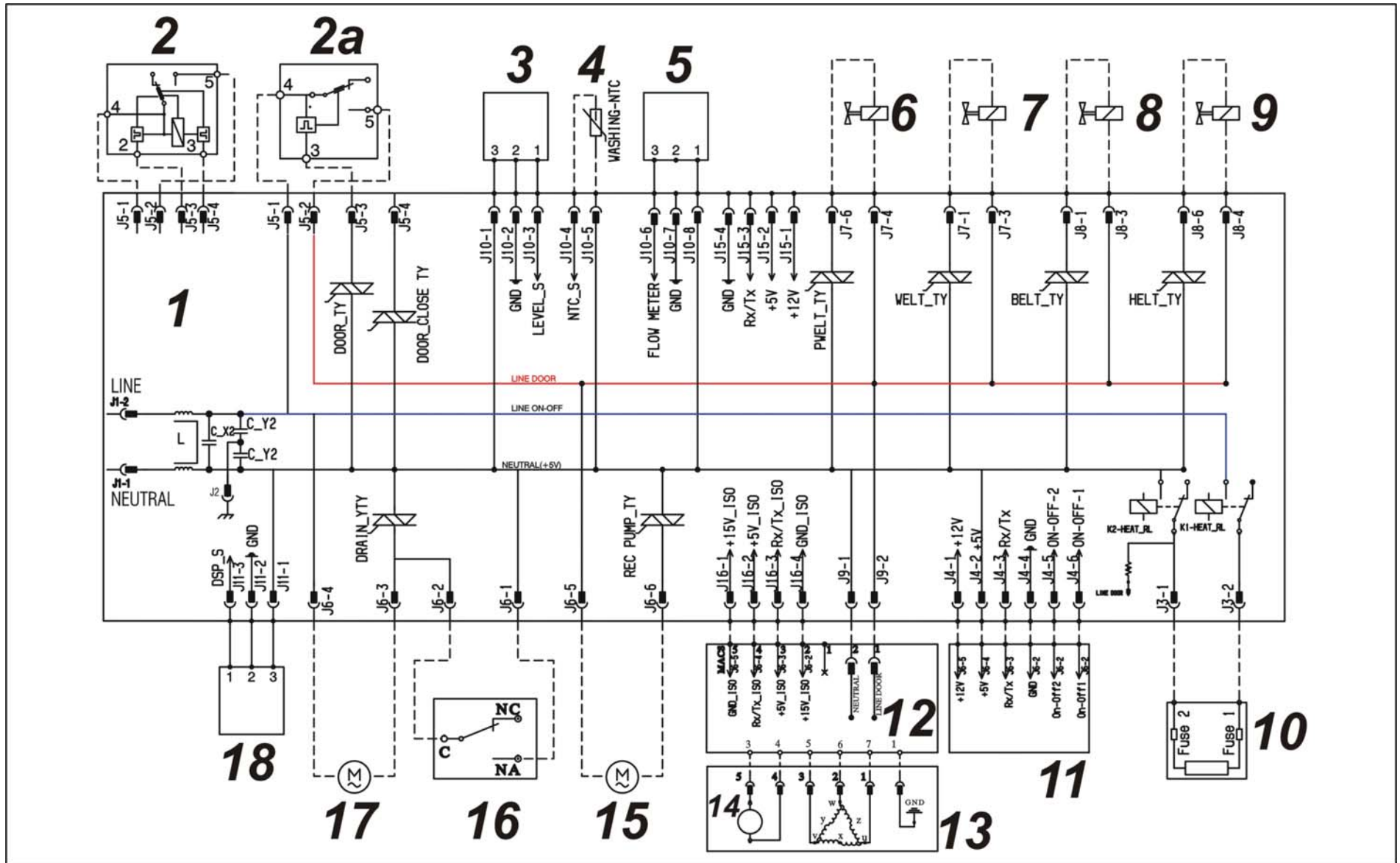
Water entering the solenoid valve rotates the turbine (1) and magnet (3), which passes in front of the Reed contact (2), thus closing it. As this contact opens and closes, it generates pulses at a frequency that depends on the water flow rate).

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 DIAGRAMS

12.1 WM diagram with THREE-PHASE ASYNCHRONOUS MOTOR



12.2 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		

13 ACCESSIBILITY



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

13.1 Control panel

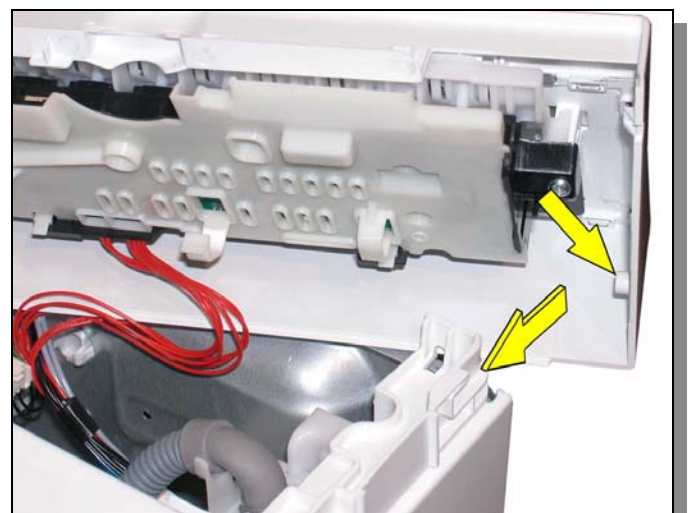
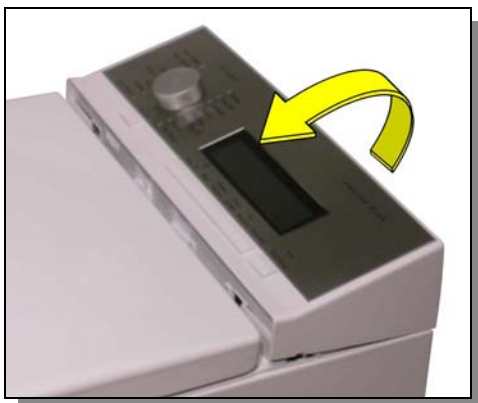
13.1.1 Dismantling

- Insert from one side then another, a screwdriver into the side slits 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.



13.1.2 Assembly

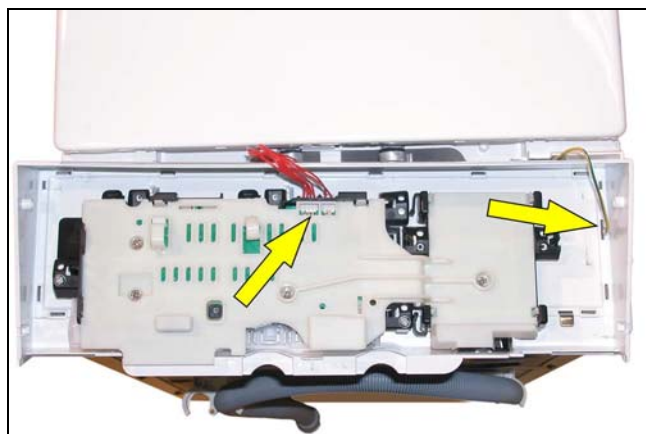
- Introduce the runner pivots located on the control panel into the rails found on the sides of the washing machine.
- Rotate it forwards.
- Press the control panel forwards until it is completely hooked on.



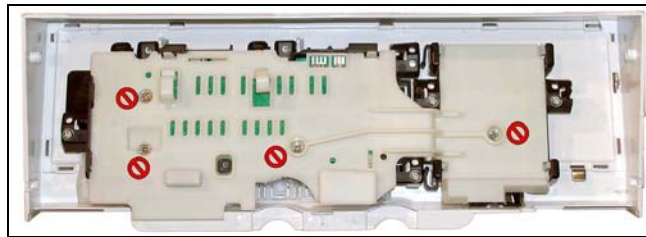
13.2 Control circuit

After opening the control panel, we can remove the control circuit board.

- Disconnect the connectors that link the control circuit board to the main board.
- In the models with stainless steel decorative panel we can also find a mass connection.



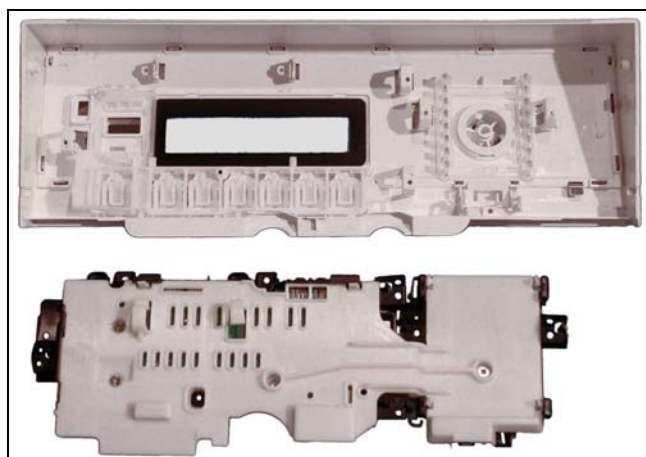
- Unscrew the screws holding on the control panel board.
- You do not need to remove the screws marked with a red circle with a diagonal slash that hold the cover on the board.



13.3 Key spring and light diffuser

Once the board has been removed we can reach the key spring and led light diffusers.

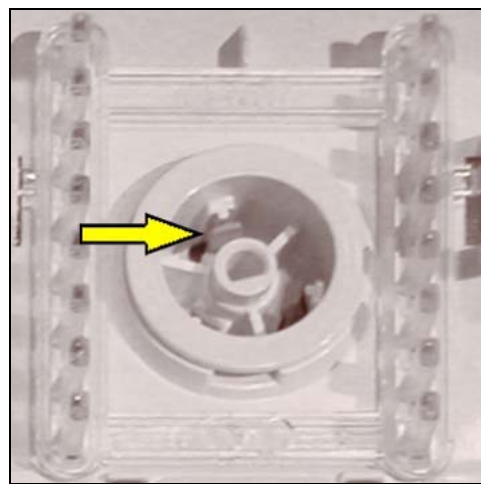
- Remove the key spring and led light diffuser releasing them from the clips that lock them on.



13.4 Programme selector knob

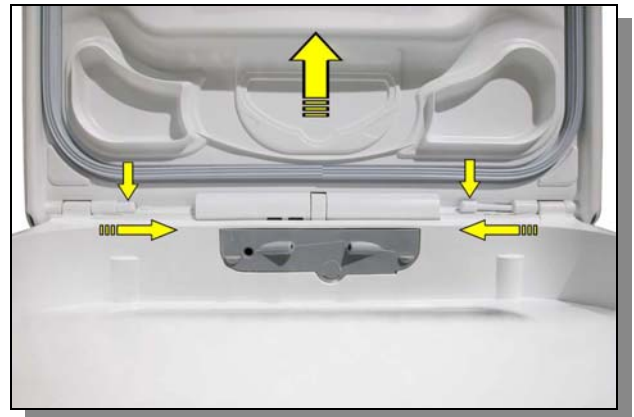
Before refitting the board we recommend you remove the knob to make it easier to insert the pivot.

- With the aid of a screwdriver press the three locking clips on the knob cover inwards.
- Simultaneously pull the knob cover until it is completely removed.



13.5 Cover

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



13.6 Water dispenser

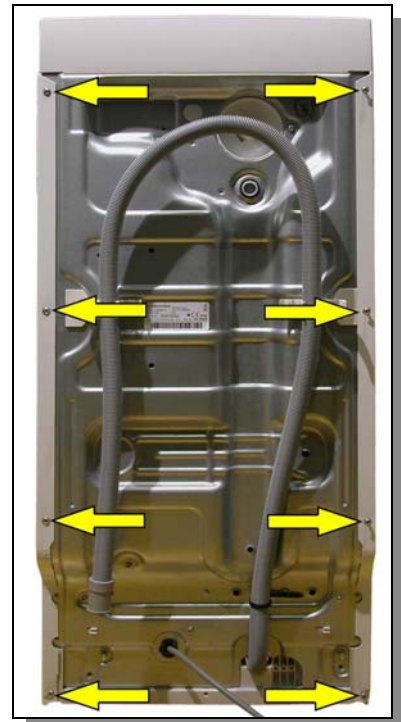
- Remove the detergent dispenser.
- Remove the control panel.
- Open the two clamps using a screwdriver, that block the pipes carrying water from the solenoid valves to the water dispenser.
- Disconnect the pipes that carry the water from the solenoid valves to the water dispenser and the small service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



13.7 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.

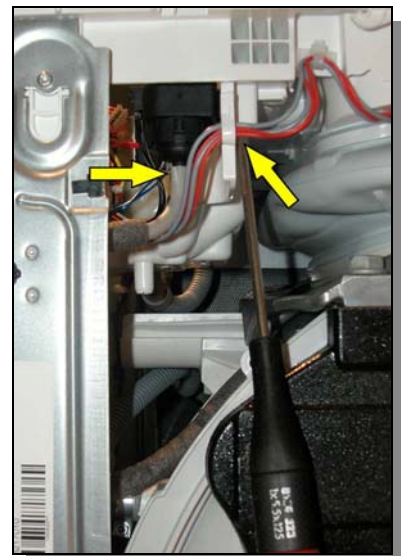


13.8 Electronic pressure switch

- 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.

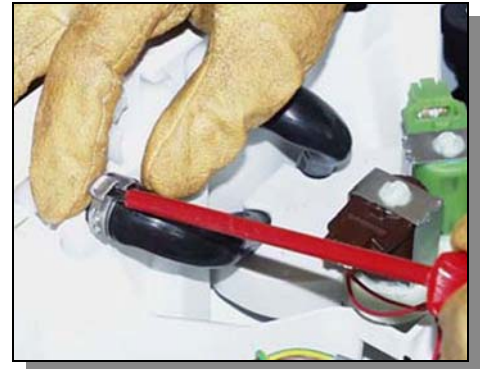


When replacing anything, please refer to the code shown in the list of spare parts relating to the appliance being repaired.

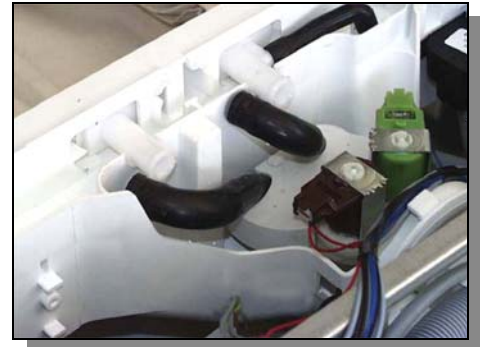


13.9 Solenoid valves

- 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.

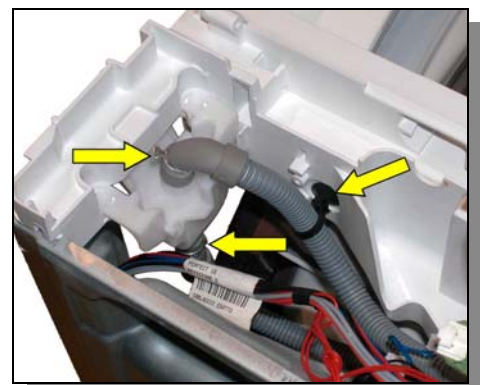


- Press the stop tabs with a screwdriver.
- Rotate the whole solenoid valve unit until it has been disconnected.



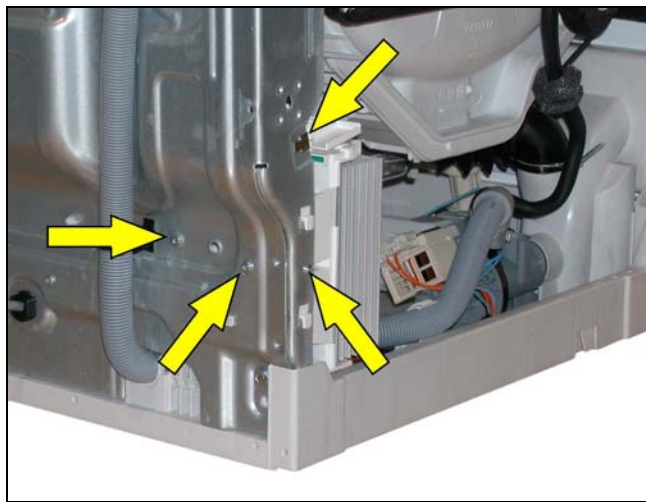
13.10 Air break

- 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.



13.11 Motor control board

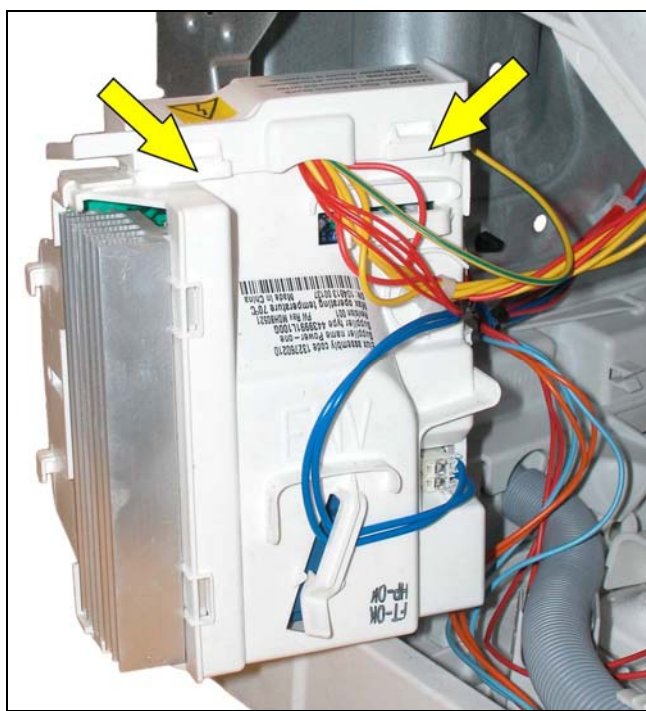
- Remove the left side panel.
- Unscrew the two screws on the back part of the equipment and the side screws that lock the board support to the back panel.
- Disconnect the mass connections located on the frames to make it easier to remove the board.



- 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.

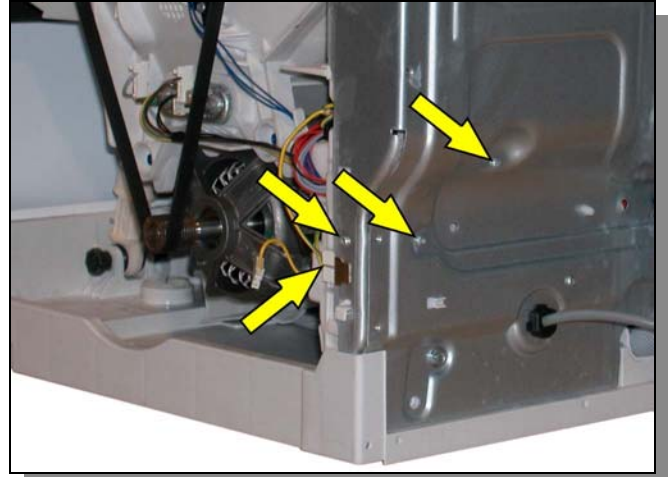


When replacing the board, please refer to the code shown in the list of spare parts relating to the appliance.



13.12 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.

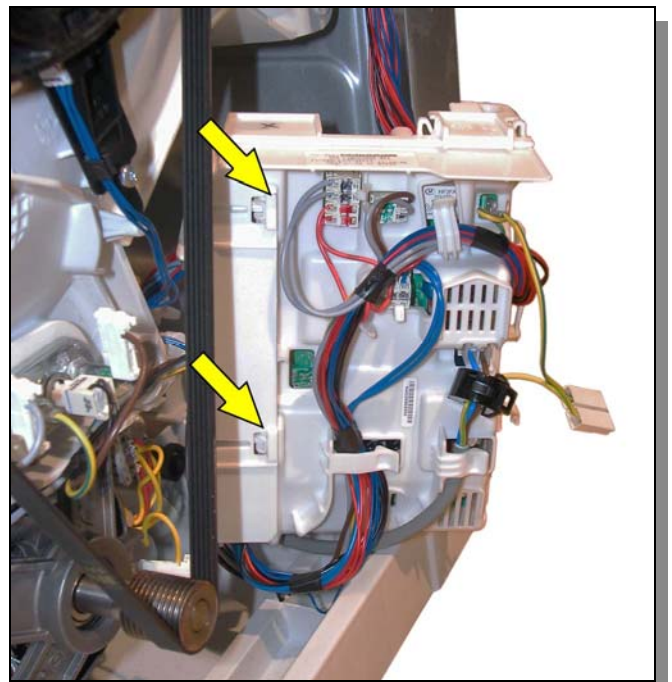


- Gently lift the whole board unit in order to release it and remove it.
- Unfasten the clips using a screwdriver and open the connector protection cover.
- Disconnect all the connectors and remove the board.



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.

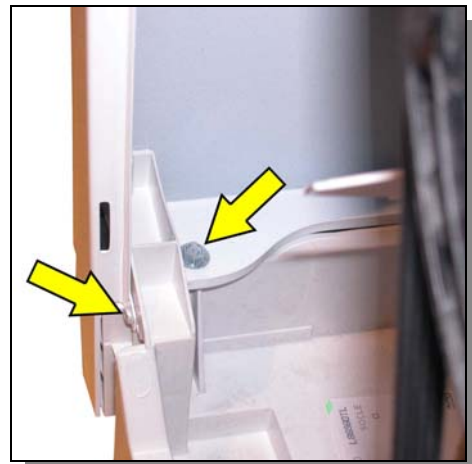
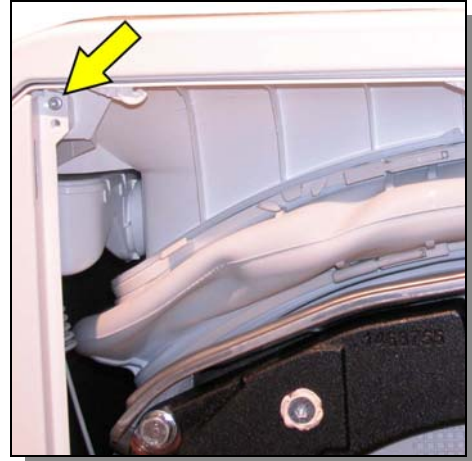


13.13 Frontal piece



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

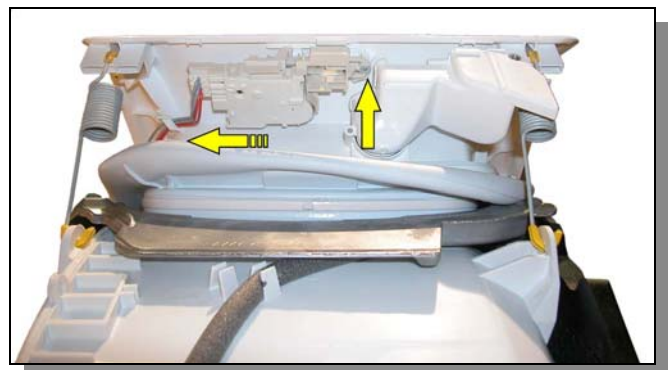
- Remove the two side screws that hold the frontal piece on to the inlet.
- Remove the two side screws that hold the frontal piece to the base frame.
- Remove the two internal screws that hold the frontal piece to the base frame.
- Gently lift the inlet and remove the frontal piece.



13.14 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.

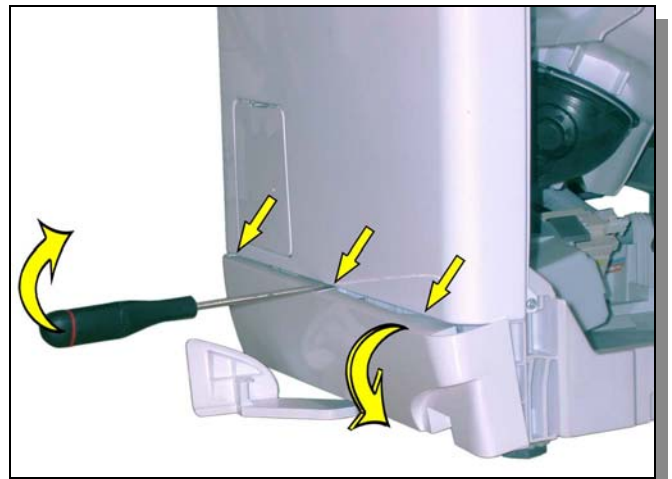


13.15 Base board

- 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.



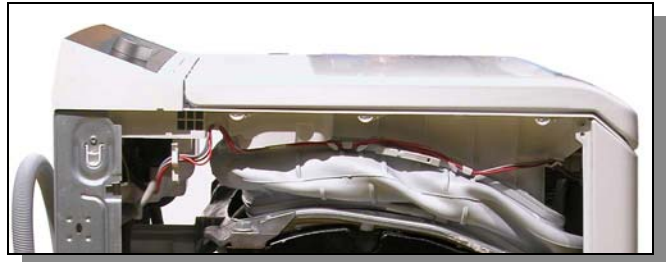
13.16 Transport roll

- 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.



13.17 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.

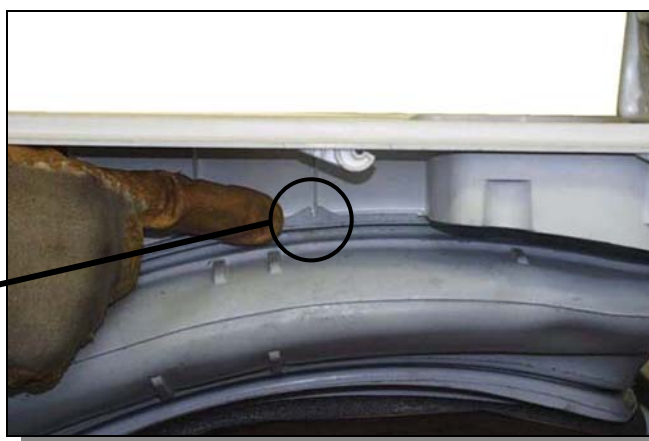


- Then insert the upper part.

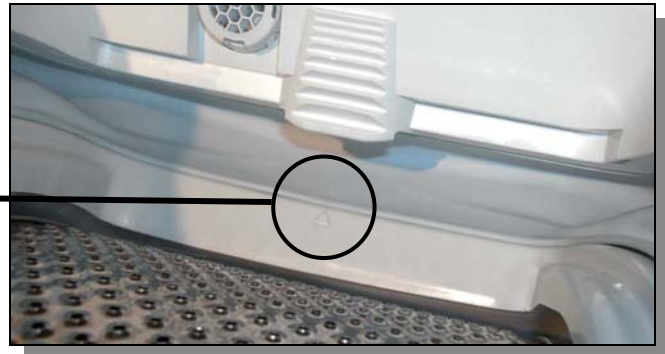
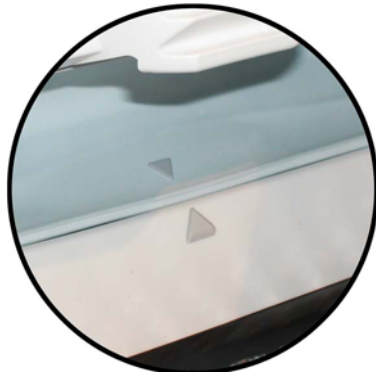


- Check that the bellow is inserted properly by checking that the reference notches are positioned properly.

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.

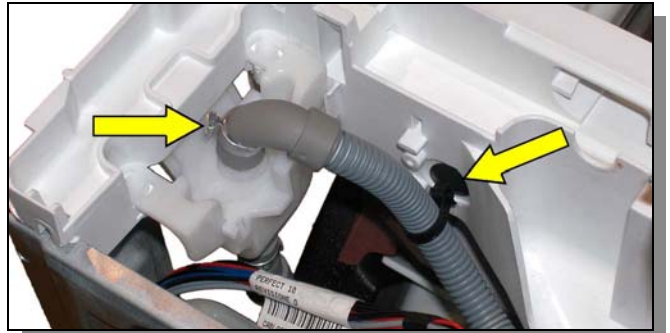


13.18 Inlet

- 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.

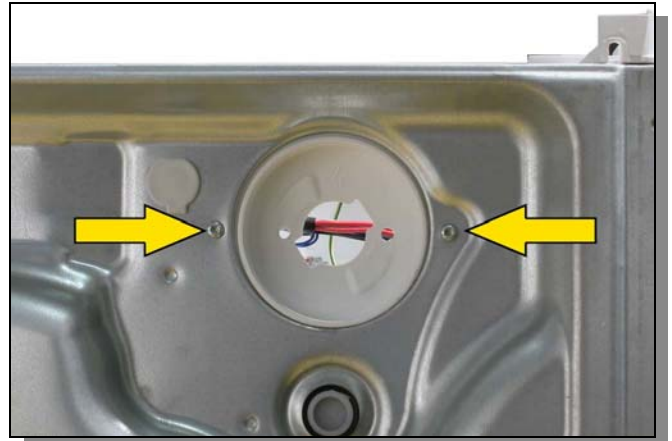
- Release the front right and left springs.



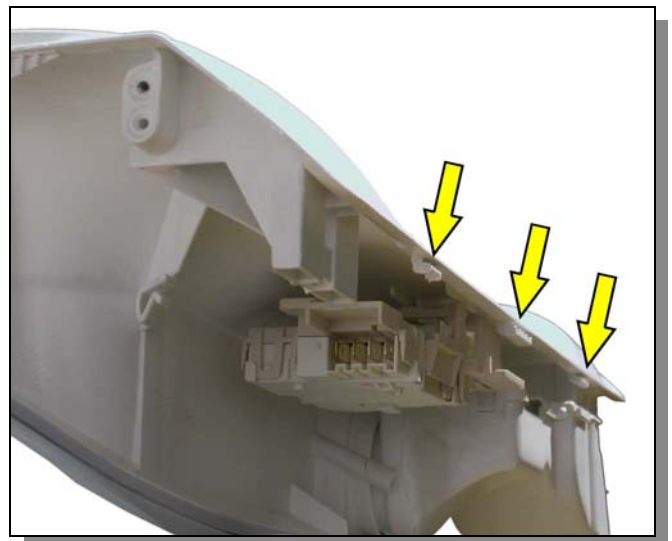
- Remove the 2 right screws and the 2 left screws that fasten the outlet to the column and back panel.



- 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.



13.19 Counterweights

13.19.1 Right counterweight



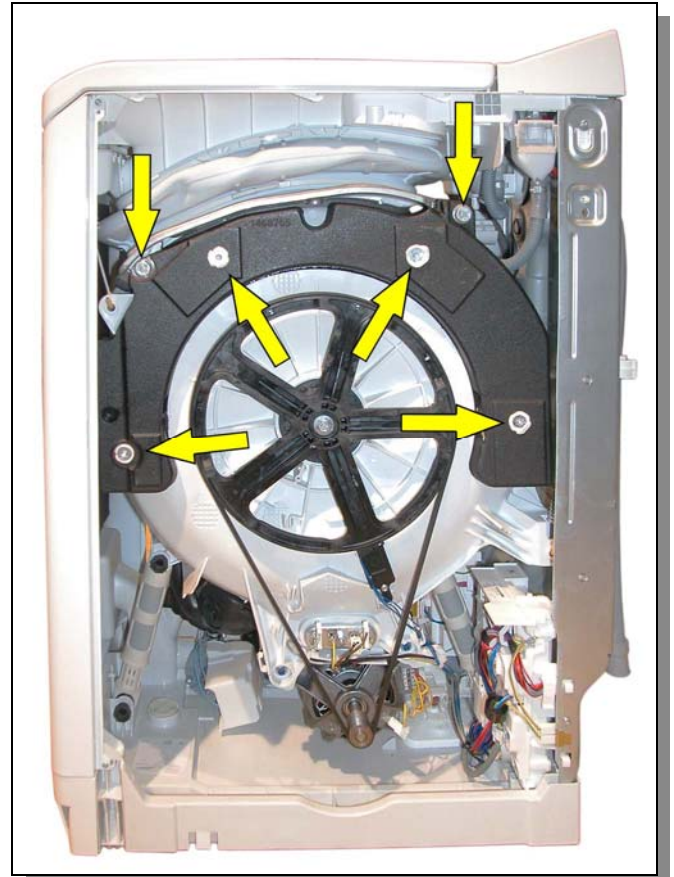
The right counterweight weighs around 10 kg so take care when removing it.

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.



13.19.2 Left counterweight



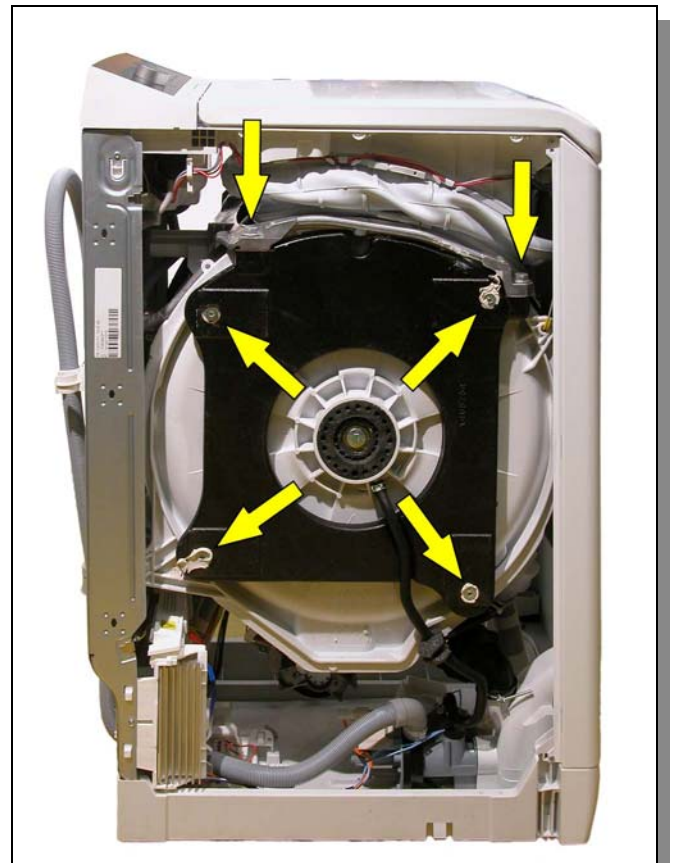
The left counterweight weighs around 13 kg so take care when removing it.

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.



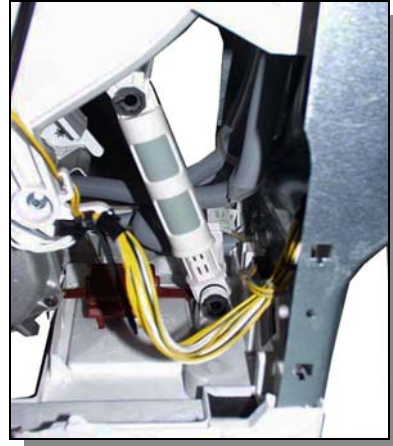
13.20 Shock absorbers

- Remove the left and right sides.

Front shock absorber



Rear shock absorber

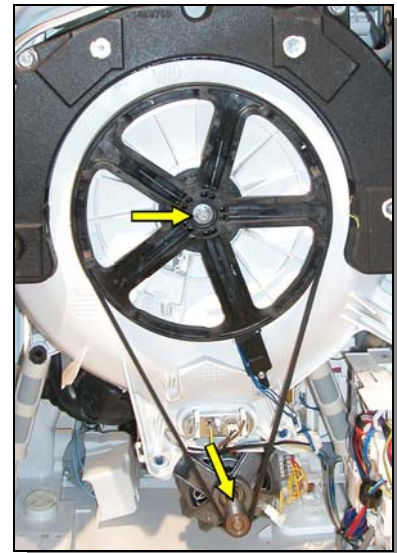


- Release the brass stop plugs positioned above and under each shock absorber.
- Remove the shock absorbers.



13.21 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.

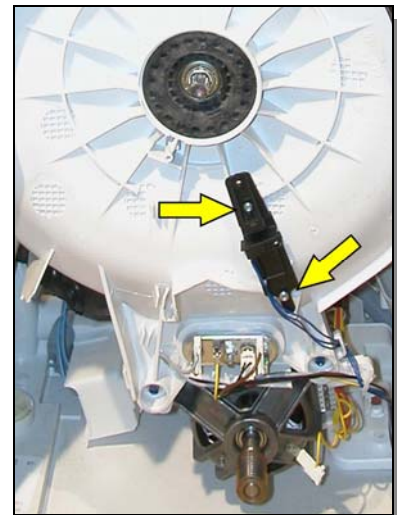


- When refitting the pulley make sure that the notch on the pulley coincides with the part with no cogs on the drum axis.



13.22 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.



13.23 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*).



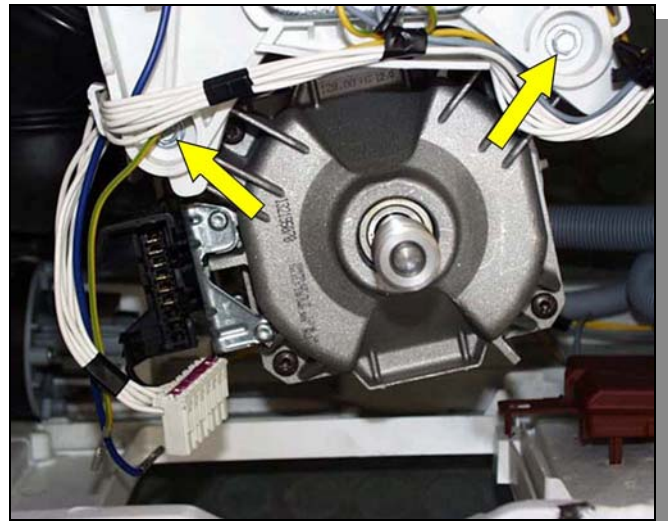
Residual water could overflow wetting the motor.

- Extract the heating element by pulling it outwards.



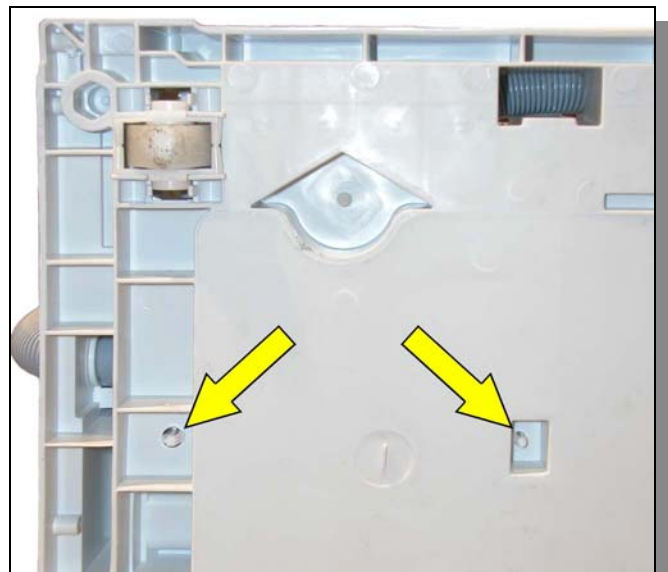
13.24 Drum rotation motor

- 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.



13.25 Water control sensor

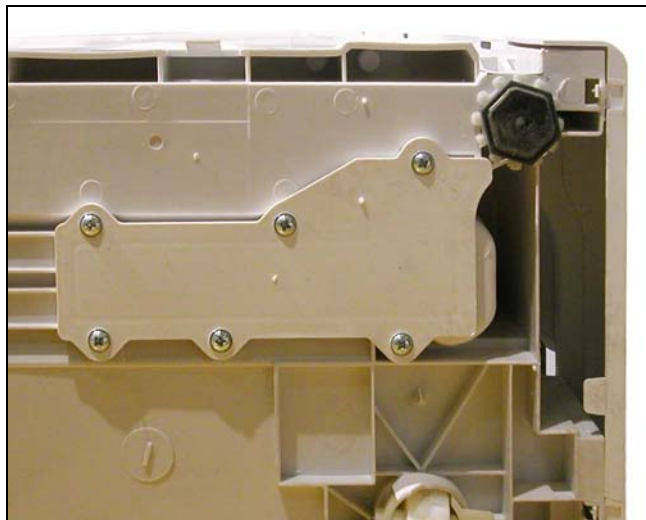
- Remove the left side panel.
- Lay the equipment on its right side.
- Remove the two sensor fastening hooks using a pair of pliers.
- Disconnect the sensor and remove it.



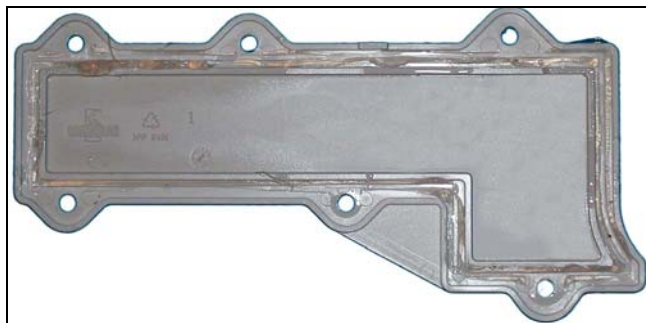
13.26 Drain pump and circulation pump

13.26.1 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.

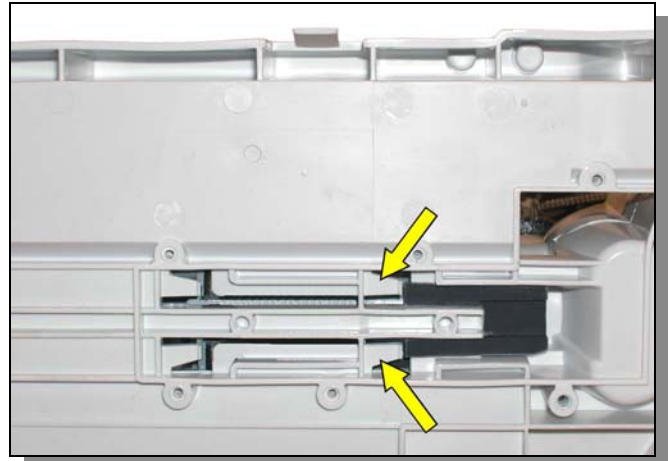


13.26.2 Drain pump

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

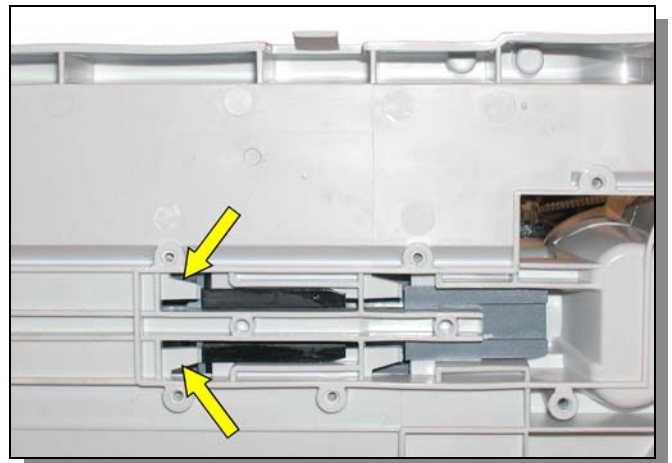
If the washing machine doesn't have a circulation system the drain pump will be directly inserted into the filter unit.

- 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.

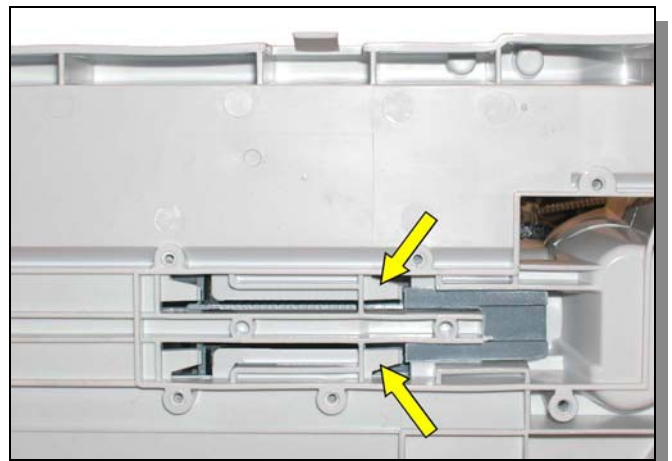
- Disconnect the pump connectors.
- Open the clamp that holds the pipe onto the pump outlet and remove it.
- Use a screwdriver to lower the clips that hold the pump.
- Move the pump towards the back of the machine and remove it.



13.26.3 Circulation pump

The circulation pump is inserted in a specific duct where the drain pump is also fastened and it 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.



13.27 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

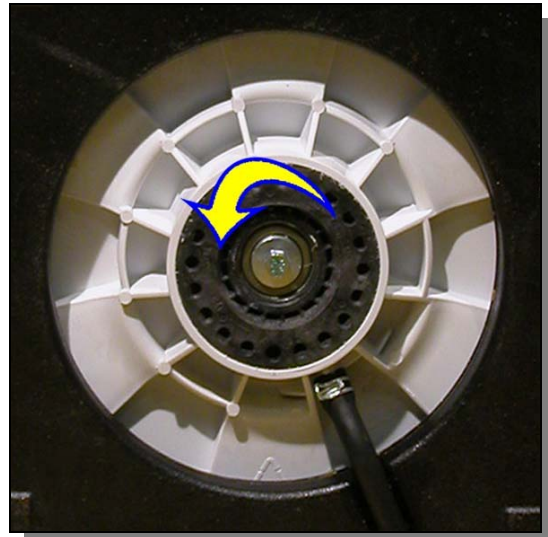
- Unscrew the bearing support paying attention to the threading direction and remove it.



Pay attention to the threading direction

Right side (pulley side) unscrew in a clockwise direction

Left side unscrew in an anti-clockwise direction



13.27.1 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

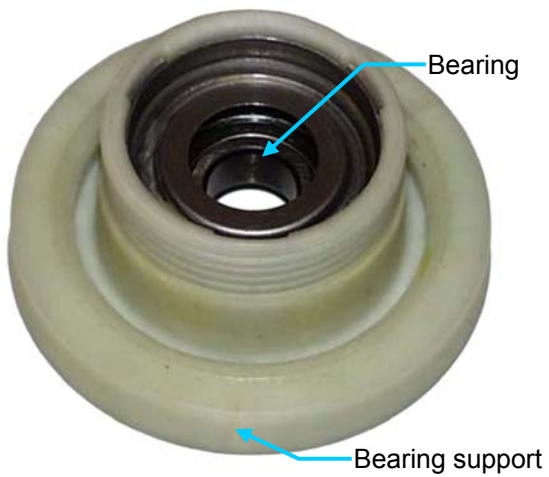


13.27.2 Bearing support unit with no seal ring

- 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.

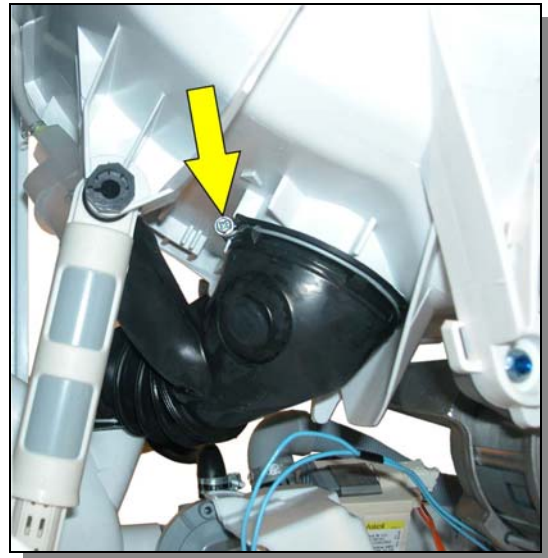


The bearing unit is self-locking so do not tighten it excessively



13.28 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.

