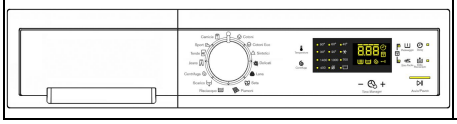
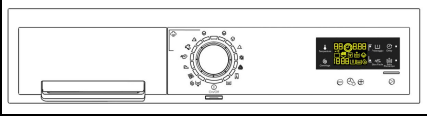
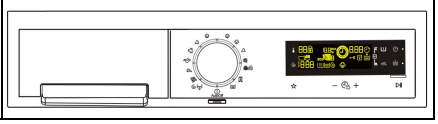
SERVICE MANUAL

WASHING

TC 4	TC 3	TC 2
		

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Front-Loading Washing Machines with electronic control system

EWM09312
EWM10931

Technical and functional characteristics

THE INSPIRATION RANGE

TC 4 - TC 3 - TC 2

G29

INDEX

1 PURPOSE OF THIS MANUAL

The purpose of this manual is to provide service engineers who are already familiar with the repair procedures for traditional washing machines with information regarding washing machines fitted with the EWM0 9312 (TC4-TC3) and EWM10931 (TC2) electronic control system.

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

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

The manual deals with the following topics:

- General characteristics
- Control panel and compatibility between washing programmes and options
- Settings: Demo, Diagnostics
- Alarms
- Technical and functional characteristics
- Accessibility

1.1 Low consumption mode

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

1.1.1 TC4 TC3 with universal motor (EWM09312)

“Stand-Off” mode

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

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

“Auto-off” mode

If, after 5 minutes, during the programme selecting phase or after the end of the cycle, the appliance receives no further instructions, it is automatically turned off (for energy savings in conformity with the standards on energy consumption).
All the settings are stored so that when the appliance is turned back on, the programme is ready or if the auto-off mode was triggered after the end of the cycle, the user can see that the cycle ended normally, and can restart it if necessary.

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

If an alarm occurs during a washing programme, the auto off function is disabled, and an alarm is displayed.

1.1.2 TC2 with three-phase motor and Inverter (EWM10931)

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

a.) When you press the ON/OFF button to turn off the appliance, the Zero Watt circuit is triggered and cuts off the supply voltage after a few seconds, just long enough to secure the washing machine (motor off, door locked, etc…), the cycle and any options selected are reset, so that the next time the appliance is turned on, it is ready to perform the programme.
(To open the door, you will have to wait one or two minutes for the door safety lock to be released).

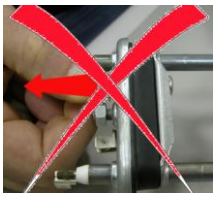
b. If, after 5 minutes, during the programme selecting phase or after the end of the cycle, the appliance receives no further instructions, it is automatically turned off and the Zero Watt circuit which cuts off the supply voltage is triggered (for energy savings in conformity with the standards on energy consumption). All the settings are stored so that when the appliance is turned back on, the programme is ready or if the auto-off mode was triggered after the end of the cycle, the user can see that the cycle ended normally, and can restart it if necessary.

If an alarm occurs during a washing programme, the auto off function is disabled, and an alarm is displayed.

The appliances which are not equipped with the Zero Watt (0 Watt) circuit in: **"Stand-Off"** or **"Auto-off"** mode, see para. 1.1.1.

2 WARNINGS

- **Any work on electrical appliances must only be carried out by qualified personnel.**
- **Before servicing an appliance, check the efficiency of the electrical system in the home using appropriate instruments. For example: refer to the indications provided/illustrated in the <<metratester>> course at the address (http://electrolux.edvantage.net) on the Electrolux Learning Gateway portal.**
- **When the work is finished check that the equipment's safety conditions have been reinstated, as though it were straight off the assembly line.**
- **If the circuit board has to be handled/replaced, use the ESD kit (Cod. 405 50 63-95/4) to avoid static electricity from damaging the circuit board, see S.B. No. 599 72 08-09 or consult the course <<Electrostatic charges>> at the address (http://electrolux.edvantage.net) on the Electrolux Learning Gateway portal.**
- **This platform is not fitted with an ON/OFF switch. Before you access internal components, take the plug out of the socket to cut the power supply.**
- **Make resistance measurements, rather than direct voltage and current measurements**
- **Warning the sensors located in the display board could be at a potential of 220 Volts.**
- **When replacing the heating element, replace it with one that has the same characteristics (2 thermal fuses) in order not to compromise the safety of the appliance. Do not remove/switch the NTC sensors between heating elements.**



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

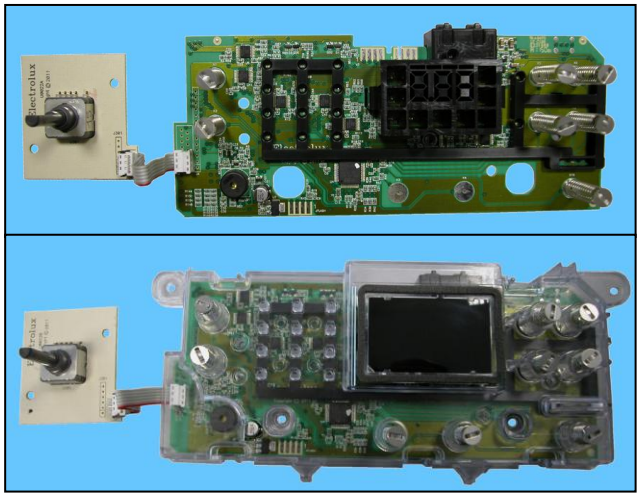
3 TC 4

3.1 General characteristics

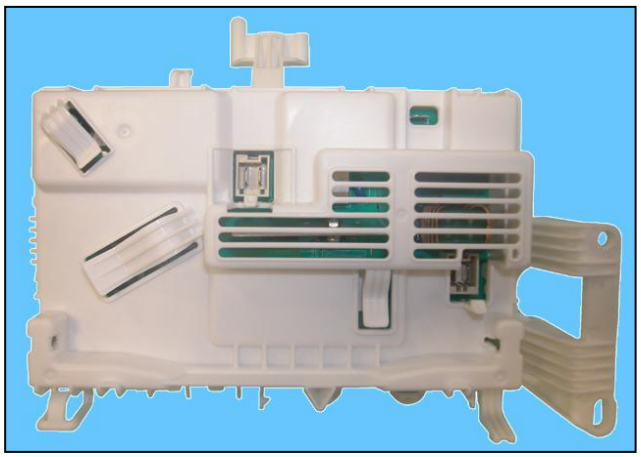
The EWM09312 electronic control system consists of two circuit boards.

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

- The control/display circuit board, inserted in a plastic box, secured to the control panel (the figure illustrates: the display circuit board with the side support plate onto which the selector is secured, connected to one another by a flat cable and the display circuit board assembly).



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

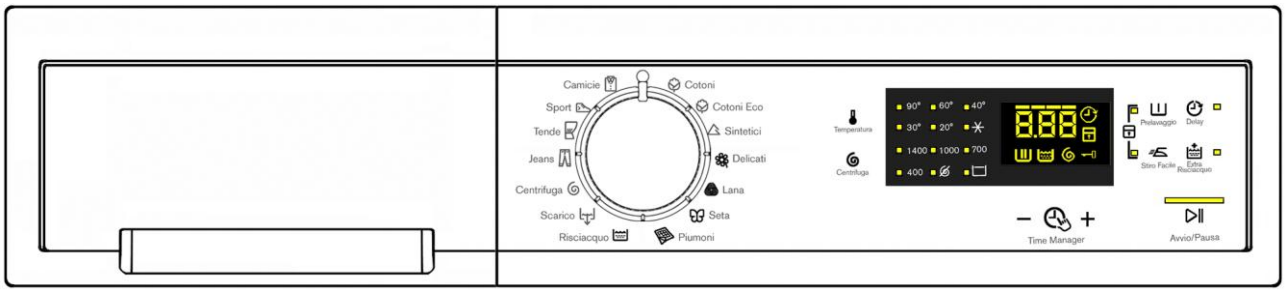


No. of touch-sensitive keys	▪ maximum 9 (8 options + start/pause)
No. LEDs	• maximum 27 yellow + 1 red LED + Digit (made up of 22 LEDs)
Programme selector	▪ 15 positions (incorporated in the circuit board)
Power supply voltage	▪ 220/240V ▪ 50/60 Hz (configurable)
Washing type	▪ Traditional with “Eco-ball”
Rinsing system	▪ Traditional with “Eco-ball”
Motor	▪ Collector, with tachometric generator (Universal)
Spin speed	▪ 1000 ÷ 1,600 rpm
Anti-unbalancing system	▪ AGS
Cold water fill	▪ 1 solenoid valve with 1 inlet – 2 outlets
Detergent dispenser	▪ 2 compartments: wash, conditioners
Control of water level in the tub	▪ Electronic/analogue pressure switch
Door safety interlock	▪ Traditional (with PTC)
Heating element heat output	▪ 1,750W with thermal fuses incorporated
Temperature check	▪ NTC probe incorporated in the heating element
Buzzer	▪ Traditional incorporated in the PCB

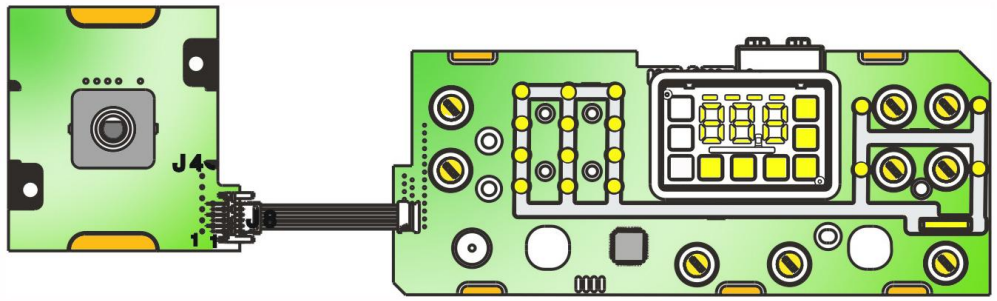
3.2 Control panels

3.2.1 Styling

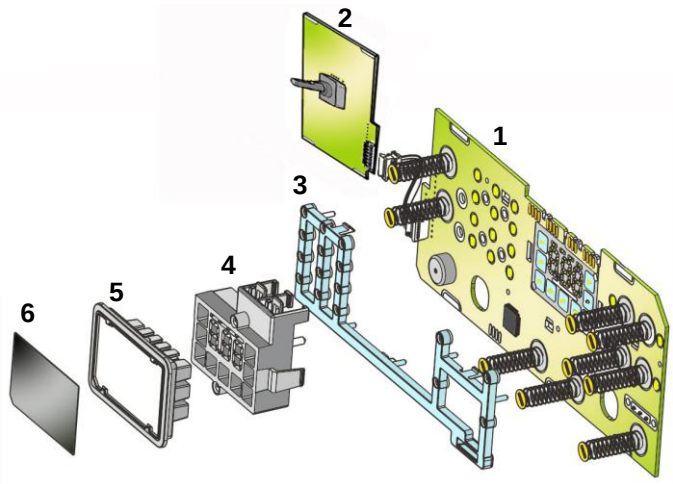
- Max. 9 touch push buttons
- 15 position programme selector
- 27 yellow LEDs + 1 red LED
- Digits made up of 22 LEDs



3.2.2 Display board

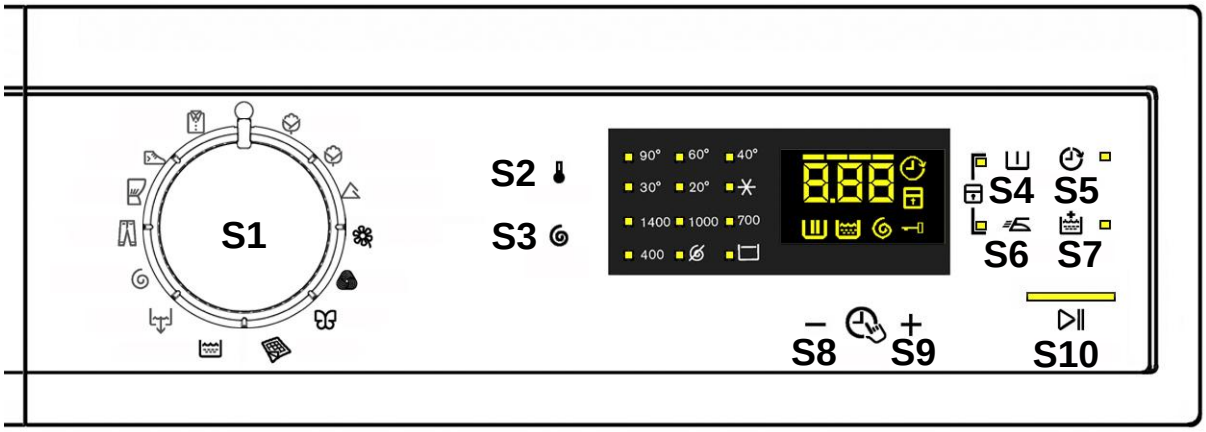


- Display board assembly, exploded view



1. Display board
2. Selector card with knob
3. Ligt divider
4. Digits light conveyor
5. Digits light diffuser
6. Silk-screen printed digital filter

3.2.3 Control panel configuration



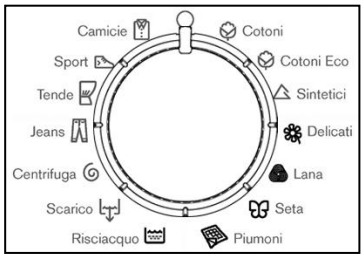
The washing programmes, the functions of the selector knob and the various buttons vary according to the model, since these are determined by the configuration of the appliance.

3.2.3.1 Programme selector (S1)

The knob has 15 non configurable positions.
There is no ON/OFF switch.
The 0 (zero) position is reserved for resetting the programme that is running and turn off all the LEDs on the display board.

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

The various positions of the selector may be configured in order to perform the various washing programmes (e.g. water level, drum movement, No. of rinses and the washing temperature to be selected according to the type of laundry).



The selector can be turned both clockwise and anti-clockwise.
For each programme, the compatible options and other parameters are defined.
The programme temperature is selected using the relevant sensor.

3.2.3.2 Programme configuration

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

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

3.2.3.3 Sensor – LEDs and Display

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

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

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

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

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

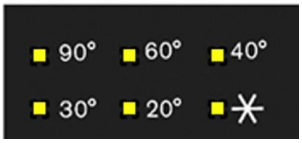
Every time you touch a sensor, you need to lift your finger up by a centimetre and half a second needs to elapse before touching it again, otherwise the electronic system does not recognise that the sensor has been touched for a second time.

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

- **Sensor no. 2**: TEMPERATURE (configurable)

The temperature is always associated with the first sensor, in combination with the six LEDs located in the top left hand corner of the display.

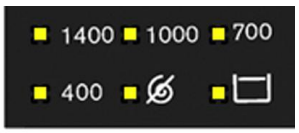
The initial temperature displayed is that set for the chosen programme.
By touching the sensor you can lower the temperature. Once this has been reached the selection starts again from the highest available one for the selected programme.
The selected temperature is shown by turning on the LEDs near the silk-screen printed value on the control panel.



The temperatures available (displayed in °C) are: **90°C, 60°C, 40°C, 30°C, 20°C cold cycle.**

The cold cycle is indicated by the symbol 
The initial temperature set for each programme is configurable.
The temperature of 50°C is not envisaged.

- **Sensor no. 3**: SPIN SPEED (configurable)



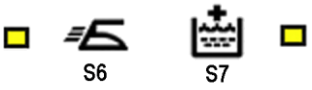
The spin speed is always associated with the second sensor, in combination with the six LEDs located in the bottom left hand corner of the display.
The initial spin speed displayed is that set for the chosen programme.
Touching the sensor you can reduce the spin speed, indicated by the LED near the silk-screen printed value on the control panel coming on. Once the lowest speed has been reached you can, if you wish, select “No spin”, “Stop water in tub” lighting up the relative symbol, or “Night cycle” (if compatible with the selected programme).
The next selection will be the highest speed available for the selected programme.

The speeds that can be combined with the six LEDs are shown in the following table.

Max spin speed (rpm)	800	1000	1000	1200	1200÷1400	1200÷1400	1400-1600	1400-1600	1400-1600	1400-1600
Intermediate	600	800	800	800	1000	1000	1200	1200	1200	1200
Intermediate	400	400	600	400	800	800	800	800	1000	1000
Intermediate	No speed	No speed	400	No speed	400	400	400	400	800	800
Intermediate	Rinse hold	Rinse hold	No speed	Rinse hold	Rinse hold	No speed	Rinse hold	No speed	Rinse hold	No speed
Last selection	Night Cycle	Night Cycle	Rinse hold	Night Cycle	Night Cycle	Rinse hold	Night Cycle	Rinse hold	Night Cycle	Rinse hold

- **Sensor no. 4-5-6-7** (configurable)

Each of the sensors located on the right hand side of the display can be combined with a LED and are used to choose one of the following four selected options:
- Delayed Start
- Extra-rinse
- Easy Iron
- Pre-wash



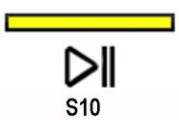
Depending on the option/choices, the programme duration time is updated (via the three digits).

- **Sensor no. 8-9**

These two sensors are positioned under the display and act as:
- Time manager

Allowing the end user to lengthen or shorten the washing cycle duration, this adjustment should be done after setting the temperature value and the spin speed.

- **Sensor no. 10**



This sensor has the START/PAUSE function, used to start up a washing programme, after selecting the washing cycle and required options; it can also pause a cycle that has already started: to allow you to change selected option or open the door (if the temperature conditions or water level allow for this).
The cycle re-starts if you touch the sensor again.
The Led combined with this sensor flashes slowly: in the selection phase, during the pause and at the end of a cycle with water in the tub. It stays lit when a cycle is running and turns off when the cycle has ended and the door is unlocked.

While other sensors when touched immediately change from selected to de-selected, in the case of this sensor, more time is needed to avoid unwanted cycle start ups or pauses.

Display

The display is produced by a black film with transparent, silk-screen printed symbols, that are lit by yellow LEDs when activated.

The display shows the following information.

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

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

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

- **Delayed start**:
selected using the relative sensor, every time the delayed time is pressed, it increases and is simultaneously shown on the display.
- Up to 90 minutes the increases are of 30 minutes (☞ 30 mins ☞ 60 mins☞ 90 mins)
- From 2 ÷ 20 hours the increases are of 1 hour (2hrs.☞ 3hrs...☞ 20hrs.☞ 0hrs.).
In order to reset the delay time, reach the maximum delay time (20 hours) and the next time the sensor is pressed the delay time is cancelled.
Once the delay time has been set, after 3'' of no sensor being touched, the display will once again show the programme's duration time. Press the sensor once to view the set delay time. After starting the cycle the display shows the delay time count down.

The icon  and LED near the silk-screen printed symbol stay on, for the entire selection and delay phase, to show that the function is active.
During the last hour, the time decreases minute by minute

To cancel the delayed start time, after the cycle has started, pause the washing machine using the related sensor and cancel the option.

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

- **Incorrect choice:**
displayed by the message “**Err**”, when a function that is not compatible with the chosen programme is selected.
the display duration is two seconds.

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

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

- **Time manager:**
Represented by four segments positioned above the digits.
(See par. 3.3 page 15)

- **Wash phase:**
It lights up during the washing phase

- **Rinse phase:**
It lights up during the rinse phase

- **Spin phase:**
It lights up during the drainage phase before and during the final spin.

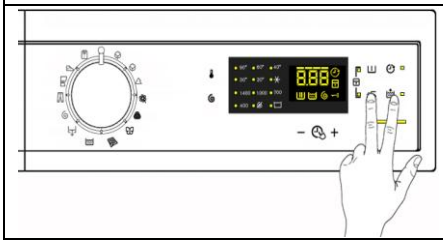
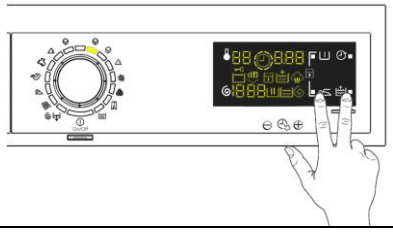
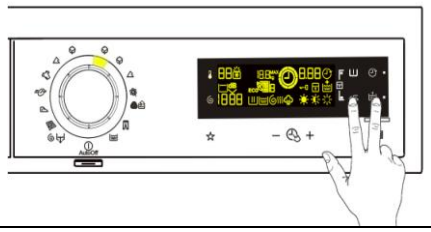
3.2.3.4 Buzzer

This comprises a multi-tone buzzer and sounds in the following cases:
- When the appliance is turned on and off, it plays two different musical tunes.
- When a sensor is pressed it emits a short “**Click**”.
- When the cycle ends this is indicated by a special sequence of “**three long beeps**” repeated at intervals of 15” for a total of 2 minutes. The sequence can only be stopped by opening the door in appliances where the instant door safety device with micro-switch is fitted.
- In the event of a malfunction in the machine this is indicated by a special sequence of “**three short beeps**” repeated 3 times at intervals of 15” for a total of 5 minutes.

All appliances are fitted with the buzzer, and leave the factory with the option enabled. To disable it use the combination of sensors.
The volume has a factory setting which cannot be adjusted by the user.

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

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

TC 4	TC 3	TC 2
		

To enable it, touch the sensors simultaneously for 3 seconds. A short beep will confirm that it has been enabled, whereas two short beeps will confirm that it has been disabled.

3.3 Time manager

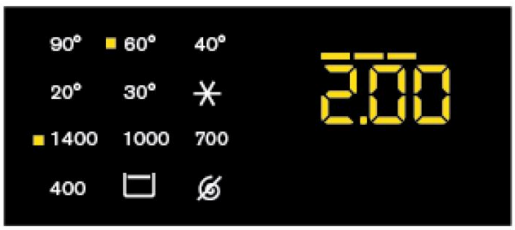
The time manager is an option available in programmes for Cotton, Synthetics, Delicates and Jeans.

During the selection of the washing cycle, four segments above the digits light up which show that the programme manages the “Time Manager” option.

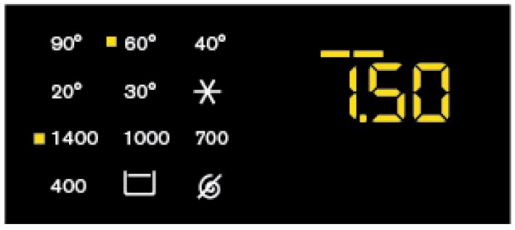
The final user can reduce the three level washing cycle duration, simultaneously with each selection: the display updates the washing cycle time and turns off a segment.

When a programme with “Time manager” is selected the four segments light up that correspond to the maximum duration time of the selected programme.
Touching the sensor with the “+” sign there is no variation.
The four segments stay lit and the time shown by the digits does not vary.

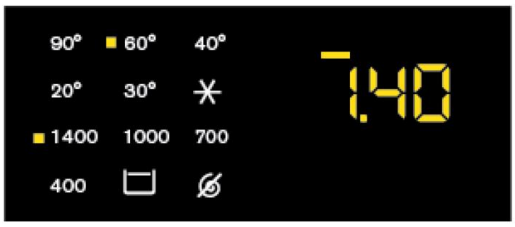
Touching the sensor with the “–” sign once, one segment turns off and simultaneously the washing time shown by the digits decreases.



Touching the sensor with the “–” sign twice, two segments turn off and simultaneously the washing time shown by the digits decreases further.



Touching the sensor with the “–” sign three times, three segments turn off and simultaneously the washing time shown by the digits decreases further.
Only one segment that indicates the minimum level of the “Time manager” is still lit.



Continuing to touch the sensor with the “–” sign no other segment turns off and the time does not decrease any further.
Once the minimum level has been reached to obtain a variation, you need to touch the sensor with the “+” sign. An increase in time shown by the digits will be obtained with the respective increase in the number of segments lit, until they are all lit and the maximum time shown will be that of the programme.

There is no “Time manager” in the “Cotton Eco” programme, however the segments are lit. By pressing the “Time manager” sensor once to reduce the time two segments are deselected.

4 TC3 STYLING

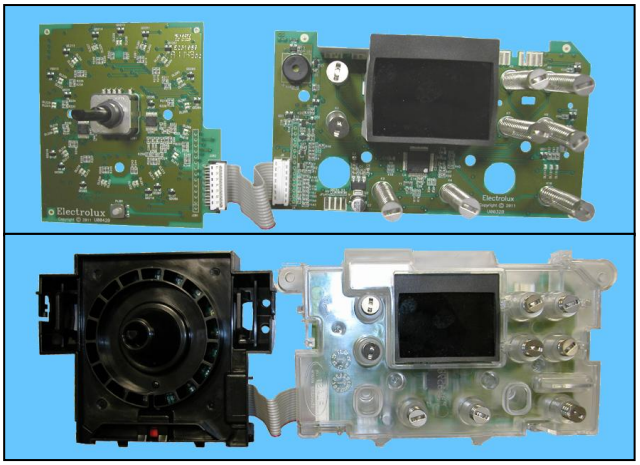
4.1 General characteristics

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

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

The EWM09312 electronic control system consists of two circuit boards plus the motor control (Inverter) for washing machines, whereas a further board is used in washer dryers for the part dedicated to drying.

- The control/display circuit board, inserted in a plastic box, secured to the control panel (the figure illustrates: the display circuit board with the side support plate onto which the selector is secured, connected to one another by a flat cable and the display circuit board assembly).



- The main circuit board is positioned at the rear of the appliance, receives commands from the display board, powers the electrical components as well as communicating with the motor control board (Inverter) in washing machines, while it also communicates with the board which controls the drying phase in washer dryers.

4.1.1 General WM characteristics

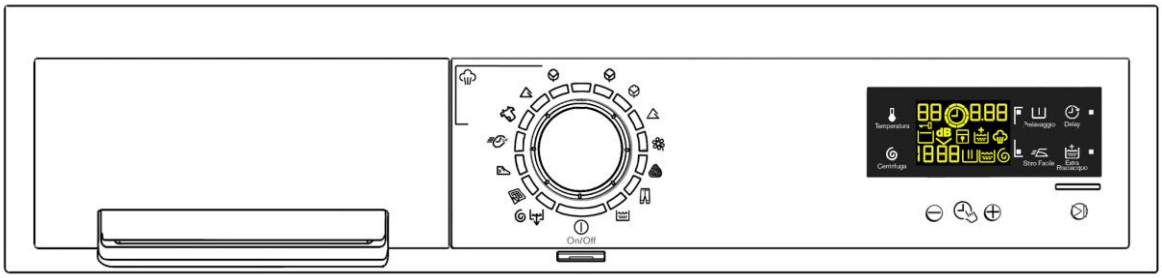
No. of buttons	▪ max 1 (ON/OFF)
No. of sensors	▪ maximum 9 (8 options + 1 start/pause)
No. LEDs	▪ maximum 22 + LCD
Programme selector	▪ 14 positions (incorporated in the circuit board)
Serial port	▪ DAAS-EAP communication protocol up to 115,200 baud
Power supply voltage	▪ 220/240V ▪ 50/60 Hz (configurable)
Washing type	▪ Traditional with “Eco-ball” ▪ Jet-System
Rinsing system	▪ Traditional with “Eco-ball” ▪ Jet-System
Motor	▪ Collector, with tachometric generator (Universal)
Spin speed	▪ 400 ÷ 1,600 rpm
Anti-unbalancing system	▪ AGS
Cold water fill	▪ 1 solenoid valve with 1 inlet – 2 outlets
Detergent dispenser	▪ 3 compartments: prewash, wash, conditioners.
Control of water level in the tub	▪ Electronic/analogue pressure switch
Door safety interlock	▪ Instantaneous
Heating element heat output	▪ 1,950W with thermal fuses incorporated
Temperature check	▪ NTC probe incorporated in the heating element
Buzzer	▪ Traditional incorporated in the PCB
Sensors	▪ Water fill gauge (2÷12 l/m flowmeter) ▪ Water control

4.2 Control panels

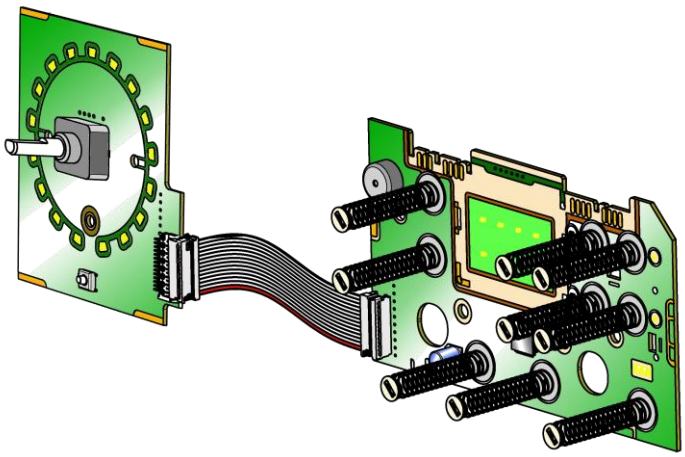
4.2.1 Styling

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

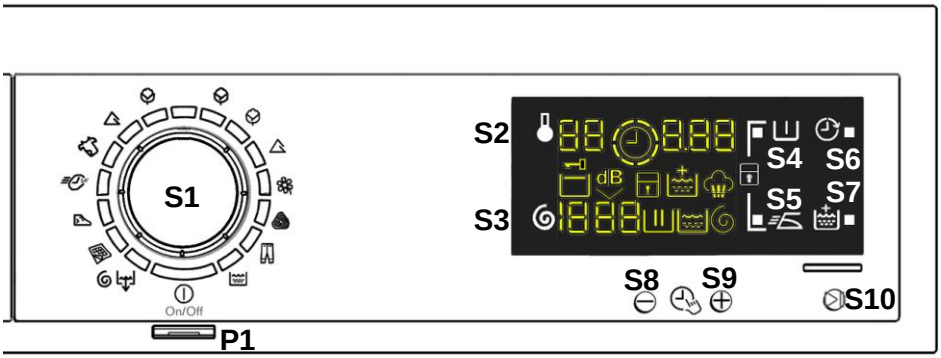
Version WM



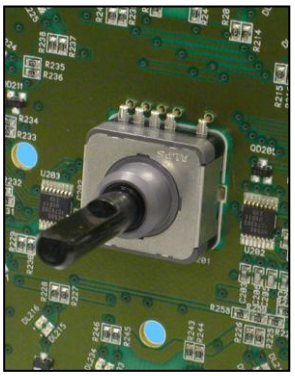
- Positioning of LEDs and sensors



4.2.2 Control panel configuration

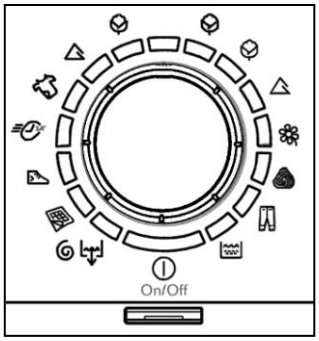


The washing programmes, the functions of the selector knob (where featured) and the various sensors vary according to the model, since these are determined by the configuration of the appliance.



4.2.2.1 Programme selector (S1)

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



4.2.2.2 Programme configuration

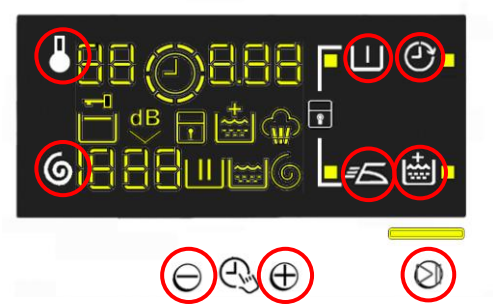
The table below lists the parameters that can be used to define the washing programmes.

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

4.2.2.3 Sensori

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

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



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

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

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

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

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

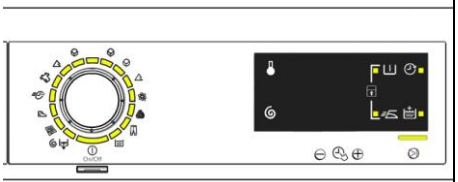
4.2.2.4 Sensors – LEDs and LCD

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

- **Button no. 1**: ON/OFF - ON

  Press it to turn the appliance on, at the same time the buzzer will sound a tone (if enabled), all the LEDS around the selector dial will light up for an instant and the LCD display stays off (figure above). When the initial phase has ended, only one LED remains lit and the LCD display shows the basic settings of a programme (figure below).

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.
Press the ON/OFF button to cancel the chosen programme.

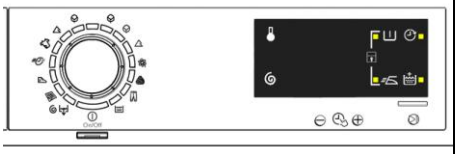


P1

- **Button no. 1**: ON/OFF - OFF

  To turn the appliance off, press this button and hold it down for approximately 1 second, after this time the buzzer will sound a tone (if enabled), all the LEDS around the selector dial will light up for an instant (figure above), the LCD display shows the programme settings, then the following switch off: the LEDS around the selector dial, the Start/Pause LED, the LCD display (figure below).

P1

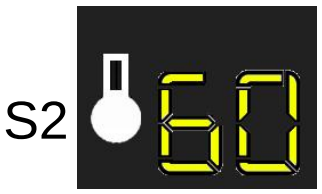


- **Sensor no. 2**: TEMPERATURE

  This is related to the part of the LCD display in which the washing cycle temperature is shown.
  The starting temperature shown on the LCD display is the one set for the programme selected.
  Touch the sensor (represented by the thermometer symbol) in sequence to lower the temperature. Once the lowest temperature has been reached, the selection starts off again from the highest one available for that particular programme.

The temperatures available (displayed in °C) are:
90°C, 60°C, 50°C, 40°C, 30°C, 20°C, cold cycle.

the cold cycle is displayed by two dashes. 



- **Sensor no. 3**: SPIN SPEED
  This is related to the part of the LCD display in which the washing cycle spin speed is shown.
  The starting speed shown on the LCD display is the one set for the programme selected.
  Touch the sensor (represented by the spin cycle symbol) in sequence to lower the speed; once the lowest speed has been reached, the next selections are:
  - "Rinse hold" and the related symbol lights up where compatible with the chosen programme, and it also lights up during the "Extra silent" programme in the washer-dryer).
  - "Night cycle" and the related symbol lights up (not available in the washer-dryer)

  The next selection will be the highest speed available for the programme.

The spin speeds are: 1600–1400–1200–1000–800–600–400– 0 "No Spin", "Rinse Hold" and "Night Cycle"
When no speed is selected, or one of the following cycles is selected: "No Spin", "Rinse Hold" and "Night Cycle", the LCD display shows three dashes

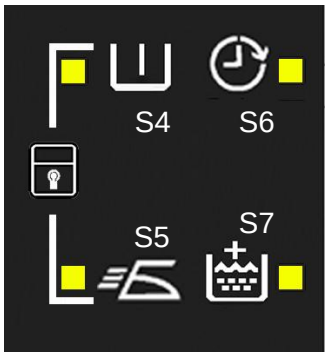
S3

- **Sensor nos. 4-5-6-7**: OPTION (configurable)

Each of the sensors located on the right hand side of the LCD display can be combined with a LED and are used to choose one of the following options:

- Delayed Start
- Super rinse
- Easy Iron
- Pre-wash
- Hot and cold water (only TC3 WM where featured)
- Automatic drying (washer-dryer only) (see options)
- Time-controlled drying (washer-dryer only) (see options)

Depending on the option/choices, the programme duration time is updated (via the three digits).



- **Sensor nos. 8-9**

These two sensors are positioned under the display and act as:
- Time manager

Allowing the end user to lengthen or shorten the washing cycle duration, this adjustment should be done after setting the temperature value and the spin speed.

S8 **S9**

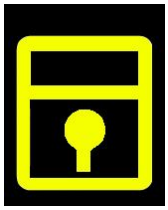
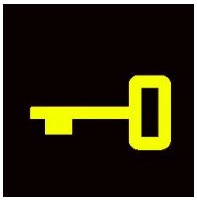
- **Sensor no. 10**

This sensor has the START/PAUSE function, used to start up a washing programme, after selecting the washing cycle and required options; it can also pause a cycle that has already started: to allow you to change selected option or open the door (if the temperature conditions or water level allow for this).
The cycle re-starts if you touch the sensor again.
The LED combined with this sensor flashes slowly: in the selection phase, during the pause and at the end of a cycle with water in the tub.
It stays lit when a cycle is running and turns off when the cycle has ended and the door is unlocked.
While other sensors when touched immediately change from selected to de-selected, in the case of this sensor, more time is needed to avoid unwanted cycle start ups or pauses.

S10

LCD

The information described below also appears on the LCD:

• **Programme phases** The three icons shown have the following meanings, respectively: – Wash  – Risciacquo  – Spin  They are lit during the selecting phase to display which phases the programme includes. During the programme the icon for the phase in progress flashes, and when the phase has ended it remains lit continuously. The same applies when the machine is in pause during the cycle.	
• **Padlock**: The icon lights up when the “child lock” is on. To indicate that all the sensors are disabled to prevent children from modifying, starting or pausing the cycle. Touch any sensor or turn the selector dial during its activation and the icon will flash. A sensor combination needs to be pressed to activate/deactivate it. It may be silk-screen printed on the control panel or described in the instruction manual.	
• **Door closed sensor**: Lights up when the safety device stops door opening and switches off when the door can be opened. It flashes when the device is about to unlock the door (it is noticed with PTC delaying devices, which need one or two minutes to open).	
• **Washing programme time** This appears after a washing programme has been selected. This time corresponds to the time required for the maximum wash load for each type of programme. After the programme has started, the time decreases (and is updated) minute by minute.	
• **Delayed Start** Selected on the related sensor. After the START/PAUSE sensor has been touched, the countdown starts and the delay time decreases hour by hour, from a delay of 2 hours up to 20 hours (☞ 30’☞ 60’☞ 90’☞ 2h☞ 3h...☞ 20hrs.☞ 0hrs.). During the last 2 hours, it decreases by 30 mins at a time. During the delayed start, the LED beside the silk-screen printed symbol on the front panel  remains permanently lit.	
• **Selection incorrect** Displays the flashing message “**Err**”, for one 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** **End of the programme** is indicated by **a permanently lit zero** (when the door can be opened). • **Appliance stopping with water in the tub**, at the end of Programmes with the RINSE HOLD option, this is displayed by **a permanently lit zero.** The LED indicating the door remains on and the LED of the START/PAUSE sensor is turned off. The washing machine continues to operate, rotating the drum once every 2 minutes.	
• **Alarm code** Indicates an anomaly during operation of the machine. Simultaneously to the displaying of the code on the LCD display, the LED above the START/PAUSE sensor flashes.	
• **Calculate amount of washing** Only for appliances with PROPORTIONAL programmes. After the washing programme has started, the dot starts to flash. The washing machine is now calculating the laundry load inside the drum. When this phase is completed, the dot is lit continuously and the three digits display the programme time.	
• **Extra-rinse** Appliances which do not feature the button and related LED for the Extra rinse option can enable/disable this option by pressing a sensor combination (which may be silk-screen printed on the control panel or described in the instruction manual). This option is enabled/disabled during programme selection and is confirmed by the related symbol being turned on/off. The option remains enabled even after the appliance has been turned off (for subsequent programmes).	

4.2.2.5 Buzzer

Description: see para. 3.2.3.4. page 16

5 TC2 STYLING

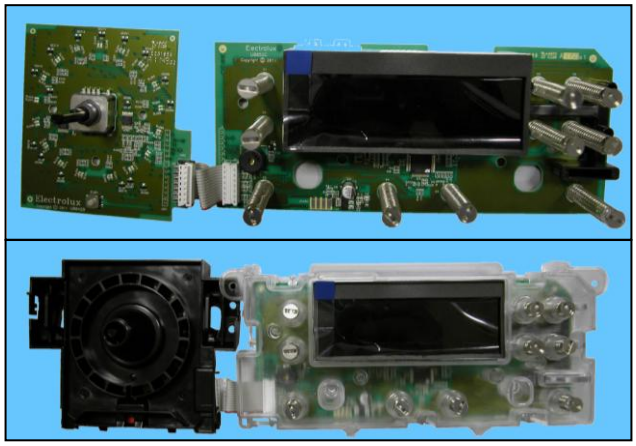
5.1 General characteristics

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

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

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

- The control/display circuit board, inserted in a plastic box, secured to the control panel (the figure illustrates: the display circuit board with the side support plate onto which the selector is secured, connected to one another by a flat cable and the display circuit board assembly).



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

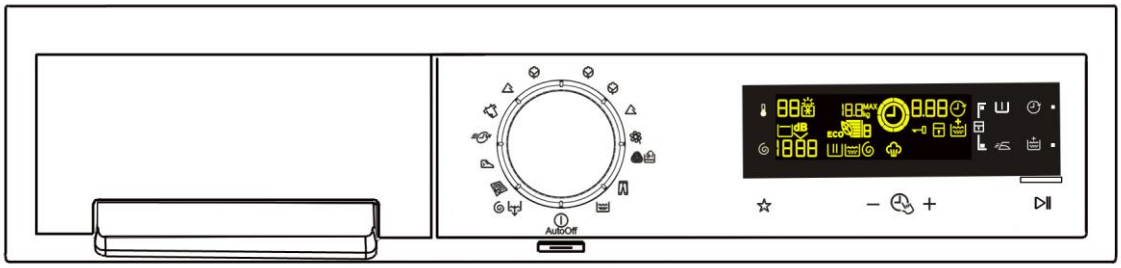
No. of buttons	▪ max 1 (ON/OFF)
No. of touch sensors	▪ maximum 10 (9 options + 1 start/pause)
No. LEDs	▪ maximum 22 + LCD
Programme selector	▪ 14 positions (incorporated in the circuit board)
Serial port	▪ DAAS-EAP communication protocol up to 115,200 baud
Power supply voltage	▪ 220/240V ▪ 50/60 Hz (configurable)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

5.2 Control panels

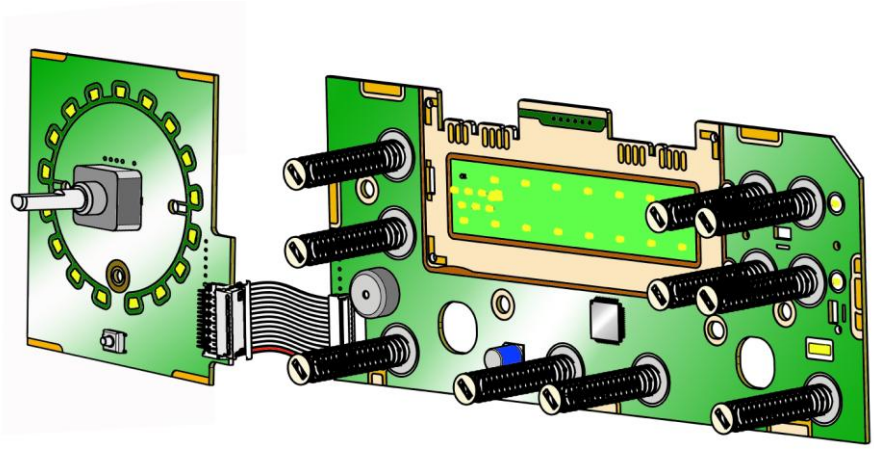
5.2.1 Styling

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

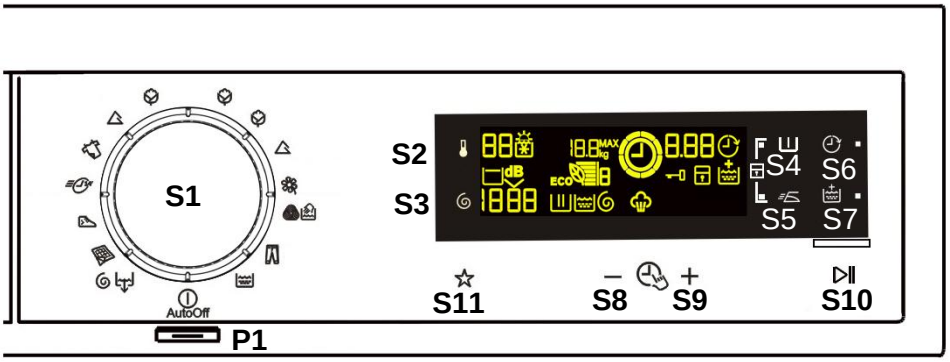
5.2.1.1 Version WM



- Positioning of LEDs and sensors



5.2.1.2 Control panel configuration



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

5.2.1.3 Programme selector (S1)

Description: see para. 3.2.3.1 pag. 11

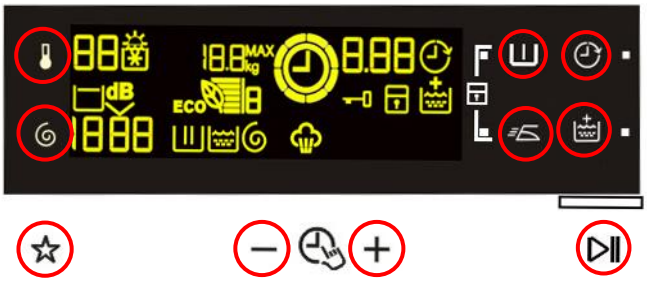
5.2.1.4 Programme configuration

Description: see para. 3.2.3.2 pag. 11

5.2.1.5 Sensors

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

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



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

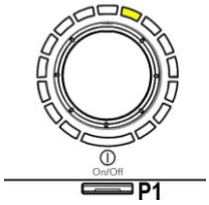
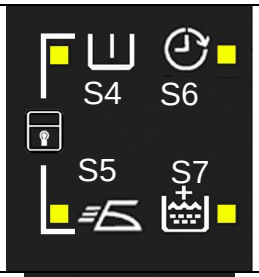
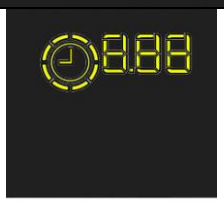
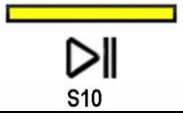
Simultaneously to the enabling/disabling of the options, the cycle duration time is updated via the digits.

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

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

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

Sensors – LEDs and LCD
The function of each button is defined by the configuration of the appliance.

• **Button no. 1**: ON/OFF Description: see **Button no. 1** on page 22	
• **Sensor no. 2**: TEMPERATURE See description on page 14 The only difference from the TC3 version is the representation of the cold cycle, which is represented by the cold symbol and by two dashes to replace the Digits.	**S2** 
• **Sensor no. 3**: SPIN SPEED This is related to the part of the LCD display in which the washing cycle spin speed is shown. The spin speed displayed initially is that configured for the chosen programme. Touch the sensor (represented by the spin cycle symbol) in sequence to lower the speed; once the lowest speed has been reached, the next selections are: ➢ "Rinse Hold" and the related symbol lights up (where compatible with the chosen programme) ➢ "Night cycle" and the related symbol lights up dB The next selection will be the highest speed available for the programme. The spin speeds are: 1600–1400–1200–1000–800–600–400– 0 "No Spin", "Rinse Hold" and "Night Cycle" When no speed is selected, or one of the following cycles is selected: "No Spin", "Rinse Hold" and "Night Cycle", the LCD display shows three dashes	**S3** 
• **Sensor nos. 4-5-6-7**: OPTION (configurable) See Sensor nos. 4-5-6-7: page 23	
• **Sensor nos. 8-9**: (configurable) See Sensor nos. 8-9: page 23	
• **Sensor no. 10**: START/PAUSE See Sensor no. 10: page 23	

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

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

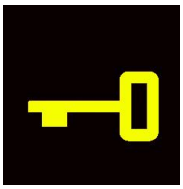
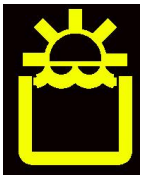
  When the selected programme has been optimised with the desired options, it can be stored in the memory, by touching the related sensor for approximately 3 seconds. The buzzer “beeps” once, and simultaneously the LCD display shows  flashing, to confirm the saving. This operation must be performed before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

  To recall the stored programme, simply touch the sensor, simultaneously the LCD display shows the stored programme with the chosen options; if no programme was stored in the memory, the LCD display does not show any change.
  To make changes to the stored programme, simply: recall the programme, make the changes and touch the sensor for three seconds, as described previously to store the changes.

S11

- **LCD**

The information described below also appears on the LCD:

• **Programme phases**: Description: see page 24	
• **Padlock**: Description: see page 24	
• **Door closed sensor**: Description: see page 24	
• **Hot Water**: It lights up when the possibility of filling water through the related solenoid valve is enabled.	
• **Weight:** Represented by a group of icons that light up during the programme selection phase when the door is open, to inform the user of the maximum laundry load to place inside the drum, with an accuracy of approximately ½ kg.	
• **Washing programme time:** Description: see page 24	
• **Delayed Start** Selected on the related sensor. After the START/PAUSE or sensor has been touched, the countdown starts and the delay time decreases hour by hour, from a delay of 2 hours up to 20 hours (☞ 30'☞ 60'☞ 90'☞ 2h☞ 3h...☞ 20hrs.☞ 0hrs.). During the last 2 hours, it decreases by 30 mins at a time. Touch the sensor in sequence to increase the delay by 30' up to 2 hours, whereas from 2 hours to 20 hours, the increase is of 1 (one) hour. During the programme selection phase, a delayed start is possible of between 30' and 20 hours (30' ☞ 60' ☞ 90' ☞ 10h ☞11h… ☞20h ☞0h) and the time is shown on the LCD display; during the last hour, the time decreases minute by minute. To cancel the delayed start time, after the cycle has started, pause the washing machine using the related sensor and cancel the option.	

• **Selection incorrect** Description: see page 24	
• **End of cycle** Description: see page 25	
• **Alarm code** Description: see page 25	
• **Extra-rinse** Appliances which do not feature the sensor and related LED for the Extra rinse option can enable/disable this option by pressing a sensor combination (which may be silk-screen printed on the control panel or described in the instruction manual). This option is enabled/disabled during programme selection and is confirmed by the related symbol being turned on/off. The option remains enabled even after the appliance has been turned off (for subsequent programmes).	
• **Eco Manager** Displays how economical the wash cycle is according to the Time Manager level. Displaying the value through the number of horizontal bars lit, in an interval of between 2÷6, where 6 is the maximum and 2 is the minimum economy.	

5.2.1.6 Buzzer

Description: see para. 3.2.3.4. page 16

5.2.2 Time Manager and Eco Manager

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

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

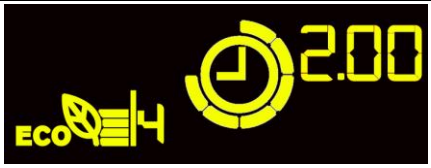
The Time Manager is represented on the right-hand side of the LCD display, and it consists of: eight segments surrounding the clock and three digits, which indicate the duration of the washing cycle.

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

For the Cotton and Synthetics programmes, there are 8 Time Manager levels; level 6 is set by default by the appliance, so the end user can reduce it by 5 levels to achieve a shorter cycle or increase it by 2 levels to achieve a more economical but longer cycle.
There are 4 Time Manager levels for the Delicates programmes too, but the end user can only reduce it by 3 levels.

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

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

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

5.2.2.1 Time Manager summary table

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

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

Cooling
Default Level
Eco Level

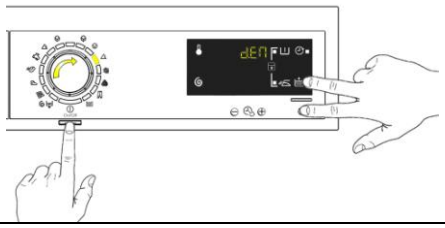
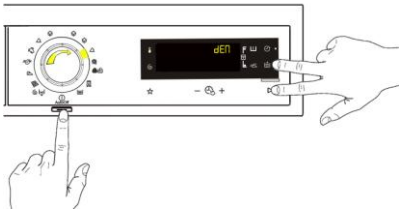
6 “DEMO” MODE

A special cycle is designed to demonstrate the operation of these appliances in shops, without connecting them to the water mains. This way, any one of the programmes can be selected and, once the start button/sensor has been pressed/touched (START/PAUSE), the appliance will only perform some of the phases of the programme, skipping those which cannot be performed (water fill, drain, heating).
The cycle takes place as follows:

- The door lock is enabled regularly (door locked during operation, possibility of opening it at the end of the cycle or when paused).
- Motor: all low speed movements are enabled, the pulses and spin are disabled.
- The water fill solenoid valves and the drain pump are disabled.
- Display: as the cycle phases are very fast (one second in the demo cycle corresponds to approximately one minute in the actual cycle) the end time decreases by 1 unit per second. Bear in mind that the end time does not always correspond to the actual cycle time.

6.1 Access to DEMO settings for TC3 and TC2 stylings

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

TC 3	TC 2
	

Do not start the procedure with your fingers over the combination sensors

1. Switch on the appliance using the ON/OFF button.
2. Turn the selector clockwise until the third LED lights up.
3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram).
4. Hold your fingers over the sensors (approximately three or five seconds) until “dEM” flashes for a short time.

6.2 Access the DEMO setting for TC4 stylings

TC4


Do not start the procedure with your fingers over the combination sensors

1. Set the selector dial to position 0 (zero).
2. Turn the three position switch **clockwise.**
3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram).
4. Keep your finger above the sensors until the flashing wording “DEM” appears on the screen.

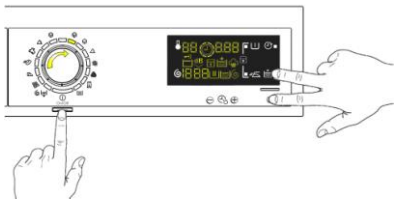
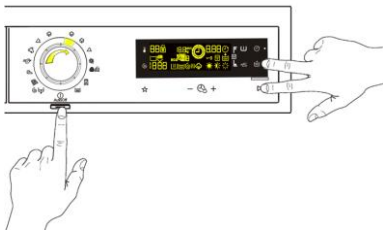
6.3 Exiting DEMO mode

To exit the demo mode, disconnect the plug from the power supply, because the ON/OFF pushbutton in the TC3/TC2 stylings and the rotation of the selector knob to position 0 (zero) for the TC4 styling have no function.

7 DIAGNOSTICS SYSTEM

7.1 Access to diagnostics for TC3 and TC2 stylings

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

TC 3	TC 2
	

Do not start the procedure with your fingers over the combination sensors

1. Switch on the appliance using the ON/OFF button. The first LED lights up.
2. Touch the **START/PAUSE** and the nearest **option sensor** simultaneously (as shown in the figure).
3. Hold your fingers over the sensors until the LEDs and symbols begin to flash in sequence (approximately 3 seconds).

In the first position, the operation of the sensors, the LEDs and the groups of symbols shown on the LCD display is checked;

For the TC3 and TC2 styling:
When the programme selector is turned in a **clockwise direction,** operation of the various components is diagnosed and the alarms are read (see diagnostic test on the next page).

7.2 Access to diagnostics for TC 4 styling

TC4


Do not start the procedure with your fingers over the combination sensors

1. Set the selector dial to position 0 (zero).
2. Rotate the programme selector by **one position clockwise.**
3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram).
4. Keep your fingers above the sensors until the LEDs and display symbols start flashing.

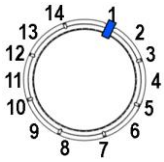
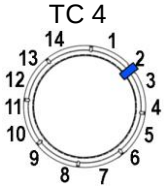
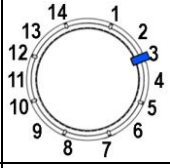
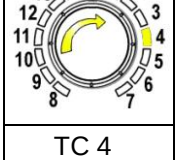
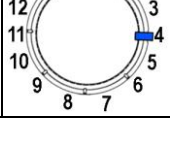
In the first position, the operation of the buttons and the related LEDs is checked; turning the programme selector dial **clockwise** runs the diagnostic cycle for the operation of the various components and reads any alarms.

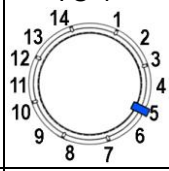
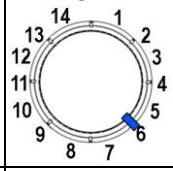
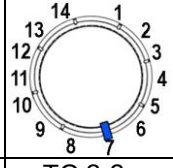
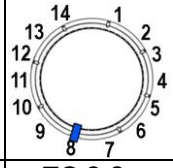
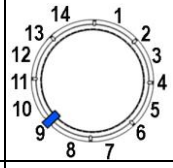
7.3 Quitting the diagnostics system

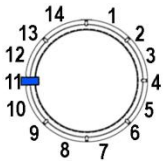
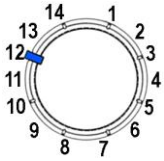
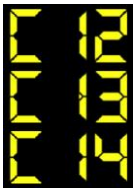
→ To exit the diagnostic cycle, switch the appliance off then back on:
for TC3/TC2 styling press the ON/OFF push button, while for TC4 styling rotate the knob to 0 (zero)
If “electricity trials” appears on the screen when you turn the appliance on, repeat the operation of turning it off and on.

7.4 Phases of the diagnostics test

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

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

Selector position		Components activated	Working conditions	Function tested	LCD display
5	TC 3-2  TC 4 	- Door safety interlock - Third solenoid valve	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to third solenoid valve compartment	 Water level in the tub is displayed (mm)
6	TC 3-2  TC 4 	- Door safety interlock - Fourth solenoid valve (hot water where featured)	Door closed Water level below anti-flooding level Maximum time 5 mins.	Water fill to fourth solenoid valve compartment	 Water level in the tub is displayed (mm)
7	TC 3-2  TC 4 	- Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Heating element - Weight sensor (if there is one, an extra litre of water is loaded) - Circulation pump	Door closed Water level above the heating element. Maximum time of 10 mins or up to 90°C. **(*)**	Reheating Circulation	 Temperature in °C measured using the NTC probe.
8	TC 3-2  TC 4 	- Door safety interlock - Wash solenoid valve, if the water in the tub is not enough to cover the heating element - Motor (55 rpm clockwise, 55 rpm anti-clockwise, 250 rpm pulse)	Door closed Water level above the heating element	Check for leaks from the tub	 Drum speed in rpm/10
9	TC 3-2  TC 4 	- Door safety interlock - Drain pump - Motor up to 650 rpm then at maximum spin speed (**)	Door closed Water level lower than anti-boiling level for spinning.	Drain, calibration of analogue pressure switch and spin	 Drum speed in rpm/10
10	-----	-----	-----	-----	-----

Selector position		Components activated	Working conditions	Function tested	LCD display
11	TC 3-2  TC 4 	- Reading/Deleting the last alarm	-----	----	
12 ÷ 14	TC 3-2  TC 4 	- The LEDs, groups of symbols in the LCD screen and the backlight of the display are turned on in sequence. - Touch a sensor to turn on the group of icons in the LCD screen or the corresponding LED and the buzzer sounds at the same time.	Always active	User interface functioning	

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

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

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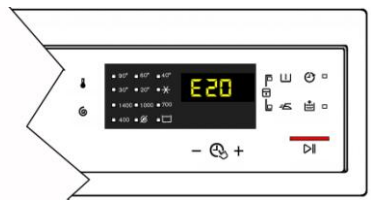
8 ALARMS

8.1 Displaying the alarms to the user

When a problem arises with the appliance, “WARNING” appears on the LCD screen, represented by a code (three digits, indicating the time required for the cycle to end). At the same time the buzzer gives off three short “beeps” every 20” for a period of 5 minutes.
Once the fault has been repaired the buzzer does not give off any “beeps” and the selected programme appears on the LCD screen.
This does not occur for alarm EH0

TC 4	TC 3	TC 2
		

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

TC4 / TC3 / TC2
E10 – Water fill difficulty (tap closed)
E20 – Drain difficulty (filter dirty)
E40 – Door open
EF0 – Excessive detergent
EH0 – Voltage or frequency outside normal values

While the alarm listed below:

TC4 / TC3 / TC2
EF0 – Water leakage (Aqua Control System)

The intervention of a service engineer is required

The other alarms are displayed by a code

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

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

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

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

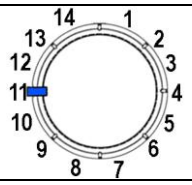
- Cooling water fill if the temperature is greater than 65°C.
- Drain until the analogue pressure switch is on empty, during a max. 3 minute interval.

8.2 Reading the alarms

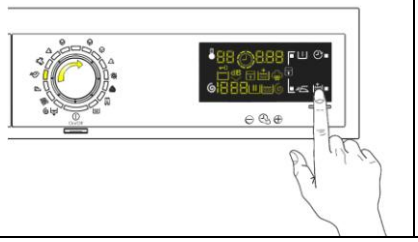
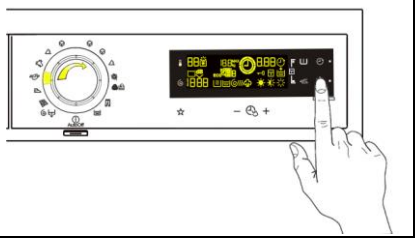
The last three alarms stored in the FLASH memory of the PCB can be displayed:

- Enter the diagnostic mode (para. 7.1 or parag. 7.2)
- Irrespective of the type of PCB and configuration, turn the programme selector knob **clockwise** to the **eleventh position** and the last alarm is displayed.
- To display previous alarms, touch the sensor closest to the START/PAUSE sensor in sequence (as shown in the figure).
- To return to the last alarm, touch the START/PAUSE sensor.

TC4



TC3 - TC2

TC 4	TC 3	TC 2
		

8.3 Rapid reading of alarms

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

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

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

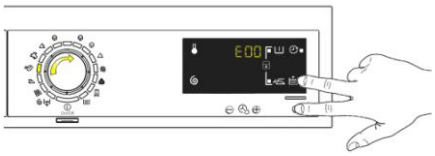
→ The alarm reading system is as described in para. 8.2

→ While the alarm is being displayed, the appliance continues to perform the cycle or, if in the programme selection phase, it stores the previously selected options.

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

TC 4	TC 3	TC 2
		

1. Enter the diagnostic mode (para. 7.1 or parag. 7.2)
2. Turn the selector clockwise until the **eleventh** LED lights up.
3. Simultaneously press the **START/PAUSE** sensor and the nearest **option sensor** (as shown in the diagram).
4. Keep your fingers over the sensors until the LCD display shows “E00” (at least 5 seconds).

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

9 OPERATING TIME COUNTER

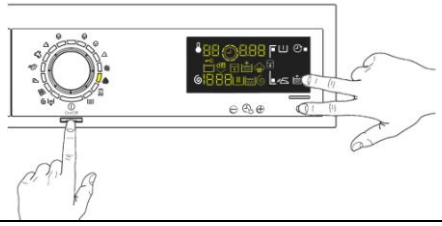
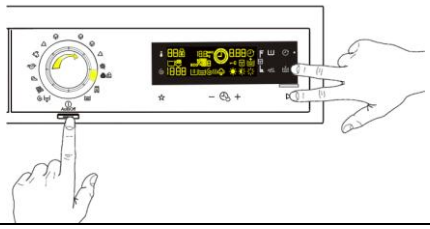
Using a specific procedure, the operator can display the total operating time for the appliance, which is counted from the moment it is first switched on.
The unit can count up to a maximum of **6,550** hours of operating time.

- 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

9.1.1 TC3 – TC2 stylings

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

TC 3	TC 2
	

Do not start the procedure with your fingers over the combination sensors

1. Switch on the appliance using the ON/OFF button
2. Turn the selector clockwise until the **fifth** LED lights up.
3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram).
4. Keep your fingers over the sensors until the hours of operation appear on the display (at least 5 seconds).

9.1.2 TC 4 Styling

TC4


Do not start the procedure with your fingers over the combination sensors

1. Set the selector dial to position 0 (zero).
2. Rotate the programmes know **clockwise as far as position five**.
3. Simultaneously press the **START/PAUSE** button and the nearest **option sensor** (as shown in the diagram).
4. Keep your fingers above the sensors until the LEDs and display symbols start flashing.

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 the TC4-3-2.
For example, if the operating time is **6,550** hours, the display will show the following sequence:

	Step 1	**Step 2**	**Step 3**
	For two seconds, the following is displayed: Hr	For two seconds, the following digits are displayed: ↳ thousands (**6**) ↳ hundreds (**5**)	For the next two seconds the following digits are displayed: ↳ tens (**5**) ↳ units (**0**)
TC 4/3/2			

At the end of phase three (after the tens and units are displayed), the cycle is repeated.
To return to normal mode, either: switch the appliance off or press a button or turn the selector knob.

10 OPTIONS

10.1 Compatibility between options

		OPTIONS														
		Rinse hold	Night cycle	Pre-wash	Stains	Extra-rinse	Easy-iron	Economy	TM 8	TM 7	TM 6	TM 5	TM 4	TM 3	TM 2	TM 1
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	x
	Pre-wash	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
	Super rinse	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
	Economy	x	x	x	x	x	x	■					x			
	TM 8	x	x	x	x	x	x		■							
	TM 7	x	x	x	x	x	x			■						
	TM 6	x	x	x	x	x	x				■					
	TM 5	x	x	x	x	x	x					■				
	TM 4	x	x	x	x	x	x	x					■			
	TM 3	x	x	x	x	x	x							■		
	TM 2	x	x	x	x	x	x								■	
	TM 1	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									
	Wash	x	x			x	x									
	Rinses	x														
	Spin															

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

10.2 Description of options

- **Rinse hold**

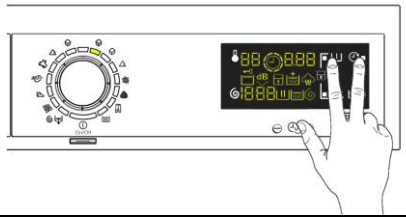
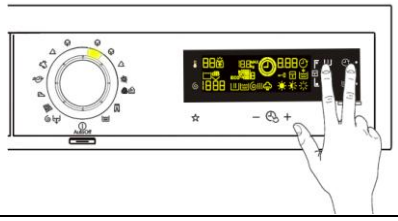
→ During the cycle the intermediate rinses and spins are performed.
→ Stops the appliance with water in the tub before the final spin cycle.
→ To drain the water, simply press the START/PAUSE button to perform the drain phase and the spin cycle.

- **Pre-wash**

→ Adds a pre-wash phase at the start of the cycle with water heating to 30°C (or cold, if selected).
→ In COTTON and SYNTHETICS cycles, performs a short spin before passing on to the washing phase.
→ This option cannot be selected for WOOL and HAND WASH cycles.

- **EXTRA-rinse**

→ Add **two** rinses to the cycles where featured.
→ Eliminates the spin at the end of washing.

ENABLING/DISABLING EXTRA RINSE USING A COMBINATION OF SENSORS		
Appliances which do not envisage the SUPER RINSE option combined with a button can enable it through a sensor combination.		
TC 4	**TC 3**	**TC 2**
		
During the selecting phase, touch the two sensors shown in the figure simultaneously for a few seconds until the related icon lights up. This option also remains enabled during subsequent cycles. To disable it, repeat the same operation until the related icon is turned off.		

- **No spin**

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

- **TM5-6-7-8**

→ Modifies the structure of the COTTON - SYNTHETIC FABRICS - DELICATES cycles to obtain good washing performance in a variable amount of time.

- **TM2-3-4**

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

- **TM1**

→ Modifies the structure of the wash phase of the COTTONS - SYNTHETICS - DELICATES cycles by 1kg of laundry.

- **Delayed start time**

→ Adds a pause before the start of the programme. The delay time is displayed on the three digits.
→ During the programme selection phase, a delayed start can be selected, from 30' to 20 hours (30' ☞ 60' ☞ 90' ☞ 2h ☞3h… ☞20h ☞0h) and the time is shown on the display. During the last hour the time decreases minute by minute.
→ To start the cycle immediately after the countdown to the delayed start has already begun: press the Start/Pause button, cancel the delay time by pressing the relevant button, then press Start/Pause again.

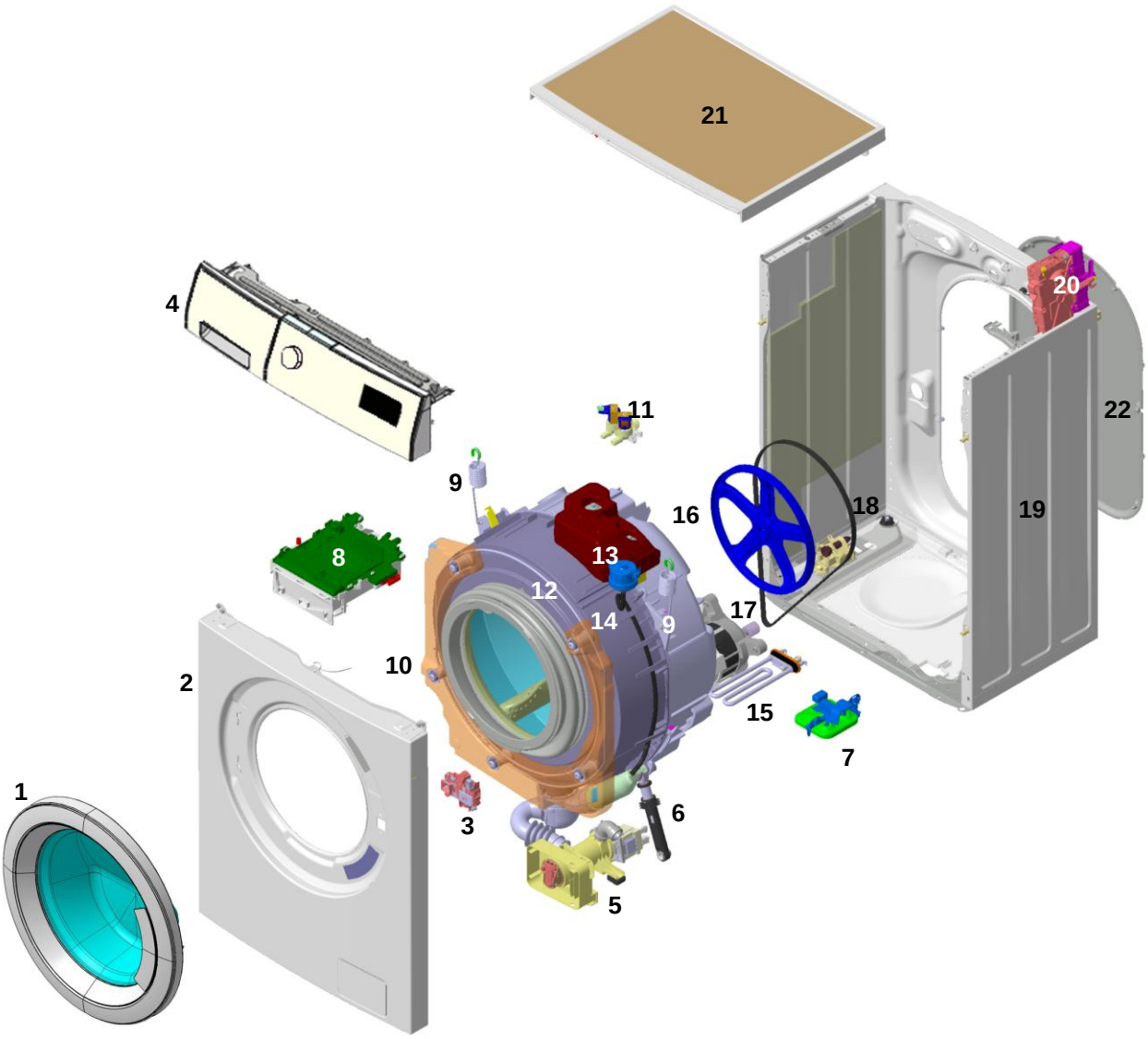
- **Easy-iron**

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

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

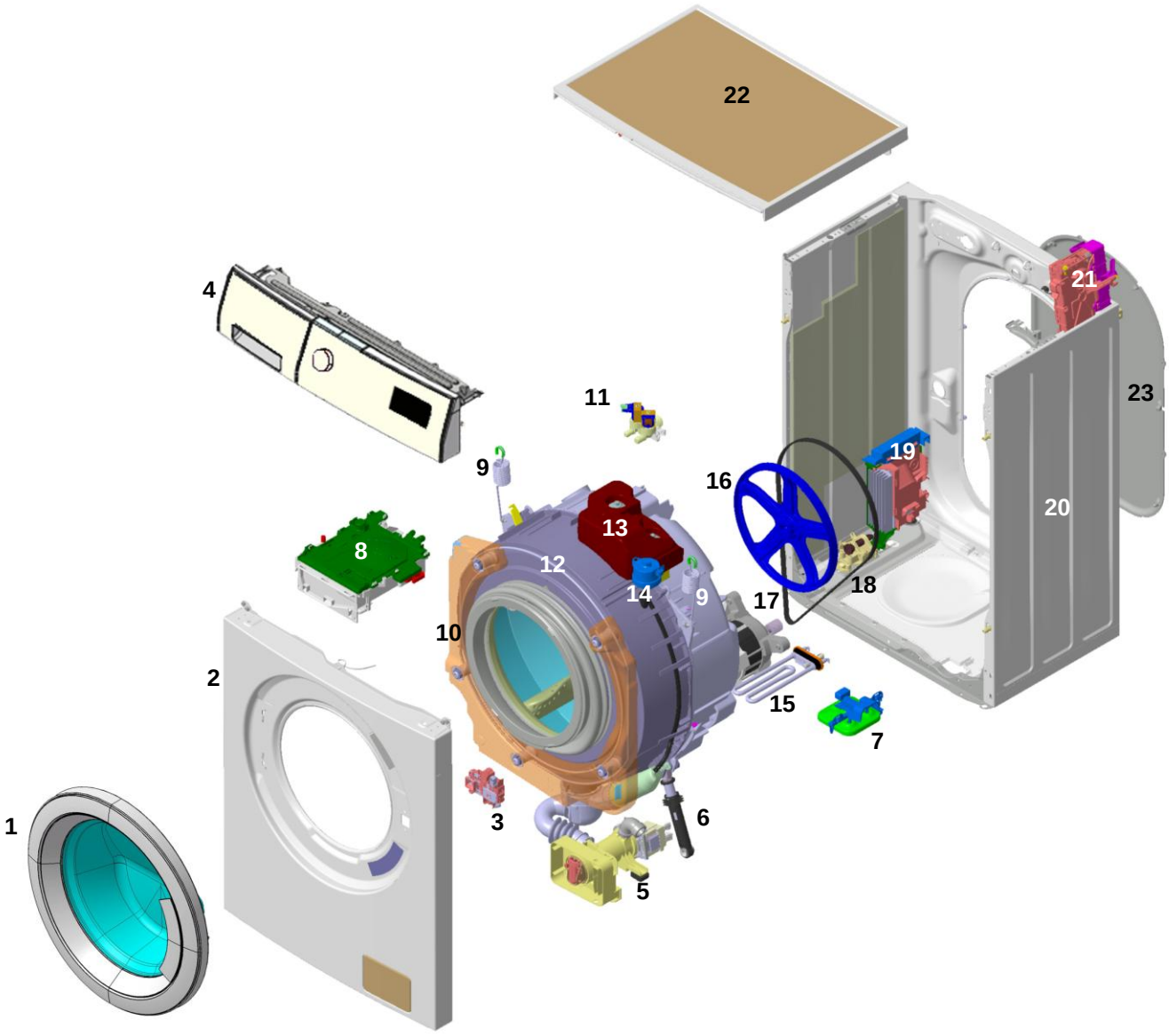
11 TECHNICAL CHARACTERISTICS

11.1 TC4 TC3 constructive characteristics (universal motor)



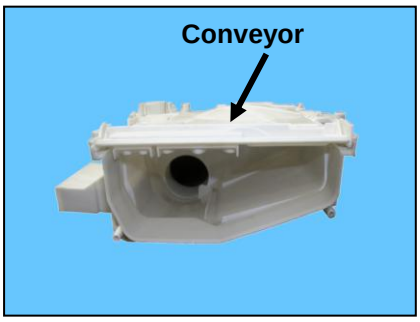
1. Door
2. Front panel
3. Door Lock
4. Control panels
5. Drain pump and filter unit
6. Shock absorbers
7. Water control
8. Detergent dispenser
9. Washing unit suspension springs
10. Front counterweight
11. Solenoid valves
12. Washing unit
13. Top counterweight
14. Analogue pressure switch
15. Resistance
16. Pulley
17. Motor
18. Belt
19. Back unit casing
20. Main circuit board
21. Worktop
22. Back panel

11.2 Construction characteristics TC2 (three-phase motor, Inverter)

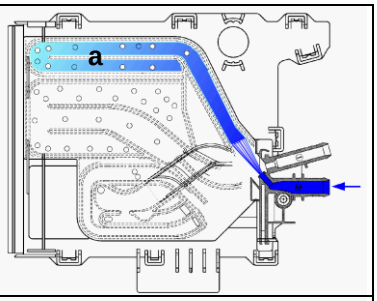
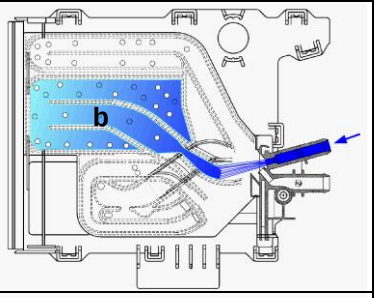
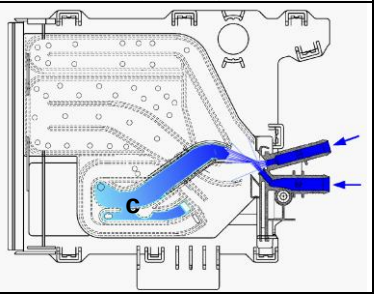


1. Door
2. Front panel
3. Door Lock
4. Control panels
5. Drain pump and filter unit
6. Shock absorbers
7. Water control
8. Detergent dispenser
9. Washing unit suspension springs
10. Front counterweight
11. Solenoid valves
12. Washing unit
13. Top counterweight
14. Analogue pressure switch
15. Resistance
16. Pulley
17. Motor
18. Belt
19. Inverter motor control board
20. Back unit casing
21. Main circuit board
22. Worktop
23. Back panel

11.3 Detergent dispenser



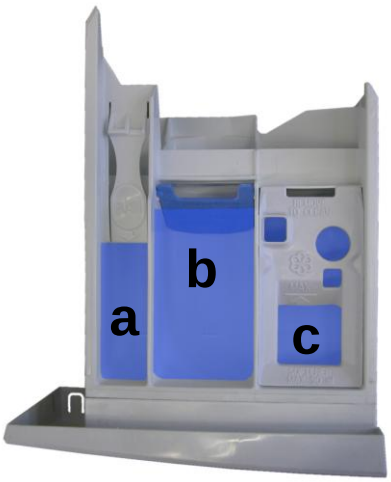
Operating principle.

Water fill to pre-wash compartment (pre-wash solenoid) • This solution is used with the three compartment tray: the detergent in compartment “a” is loaded at the start of the pre-wash phase. • Alternatively, in some models with the “stains” option, compartment “a” can be used for the stain remover, which is loaded during the wash phase.	
Water fill to wash compartment (wash solenoid) • In all models: compartment “b” is used to contain the detergent, which is loaded at the start of the wash cycle.	
Water fill to conditioner compartment (pre-wash and wash solenoid valves) • In all models: compartment “c” is used for the conditioner, which is loaded at the start of the final rinse: the pre-wash and wash solenoids are activated simultaneously.	

11.4 Detergent drawer

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

A flap has been fitted inside compartment “**b**” where the detergent is introduced, which can be flipped up or down.



Flip it up to use powder detergent.

Position of the flap when the appliance leaves the factory (see figure).

To modify the position of the flap, pull the detergent dispenser out (see page 84).

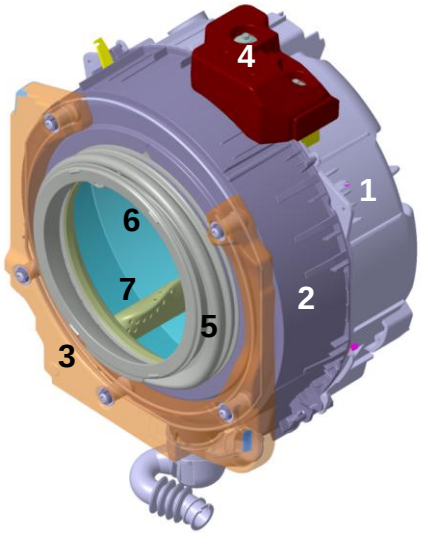
Flip the flap down to use liquid detergent.

For further details, read the instruction manual.

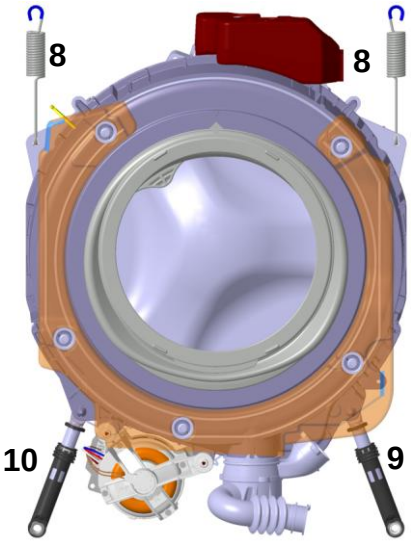
11.5 Washing unit

WASHING UNIT		
Type	Load capacity (cottons) max.	Drum volume
G29	6 / 6.5 kg	45 litres

The washing unit is made up of:
A back casing (1) and a front casing (2), welded together to form the welded tub. Inside, it contains the drum (6) (made of stainless steel) with three blades (7) clicked in place (made of carboran).
To balance the unit during the washing movements and during the spin phases, the two counterweights are secured in place with screws: one at the front (3) and one at the top (4).
The bellow seal (5) is fixed at the front.



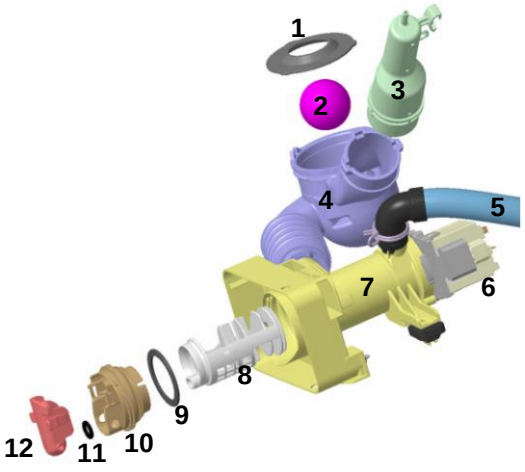
The washing unit is suspended by two coil springs (8) attached to the top crossbar, and the oscillations are dampened by two shock absorbers, one on the right (9) and one on the left (10) (looking straight at the front of the appliance).



11.6 Water circuit

11.6.1 OKO version drain circuit

1. Ball lock ring
2. Ball
3. Pressure chamber
4. Filter body tub tube
5. Drain pipe
6. Drain pump
7. Filter body
8. Filter or needle trap
9. Filter dial seal
10. Filter dial
11. Locking lever seal
12. Locking lever



11.6.2 New Filter dial

Until now, the loading circuit was drained as described below:

- For some appliances, the drain hose needs to be detached from the back panel and positioned as low down as possible to drain the water left inside the drain circuit.
- In other appliances, at the bottom of the front panel, there is a flap granting access to the filter knob. Beside it, there is a small tube to drain the water once the plug has been removed.
- For machines manufactured with the new filter dial: open the hatch at the bottom of the front panel, and the filter dial will appear as shown in fig. 1.

  To drain the water, simply:
  - press the two tabs that lock the plug closing lever, fig. 2.
  - simultaneously remove the top part of the lever as indicated by the yellow arrow fig. 3
  - position the closing lever as shown in fig. 4.

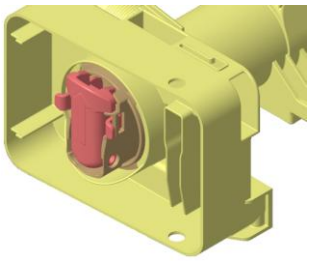


Fig. 1

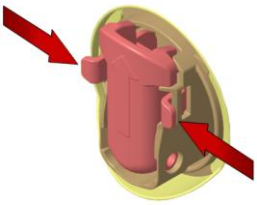


Fig. 2

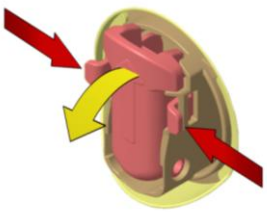


Fig. 3

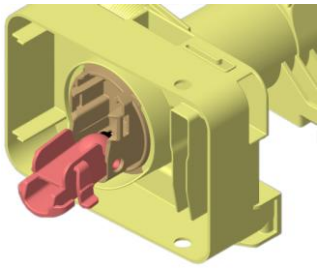
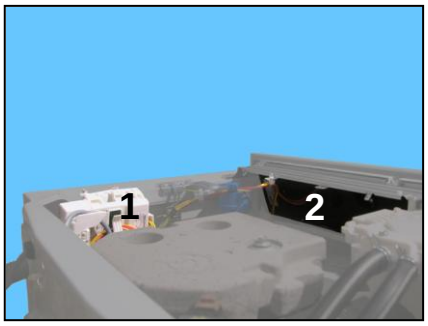


Fig. 4

11.7 Electronic control



The electronic control is made up of:

1. Main circuit board
2. Control/display circuit board
3. INVERTER motor control board (TC2) where featured (not shown in the figure).

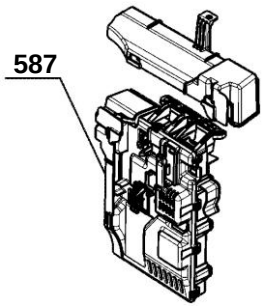
The control/display PCB contains: the selector used to select the washing programme, the LCD display to show information on the programme, but buttons used to adjust the temperature, the spin speed and optionally to select an option, the START/PAUSE button and finally the ON/OFF button.
The commands acquired by the display board (by turning the selector, selecting an option, etc...) are sent to the main circuit board, which powers all the electrical components (cold water solenoid valve, drain pump, heating element, door safety interlock, etc.) and:

It controls the level of water via the analogue pressure switch.
It controls the state 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 flow of water through the solenoid valve via the flowmeter.

At the same time it controls their operation to guarantee proper performance of the washing cycle.

11.7.1 Programming/Updating the main circuit board

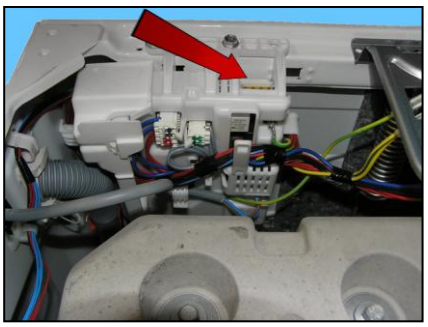
In the Service Notes the main circuit board (587) is identified with two spare parts codes:



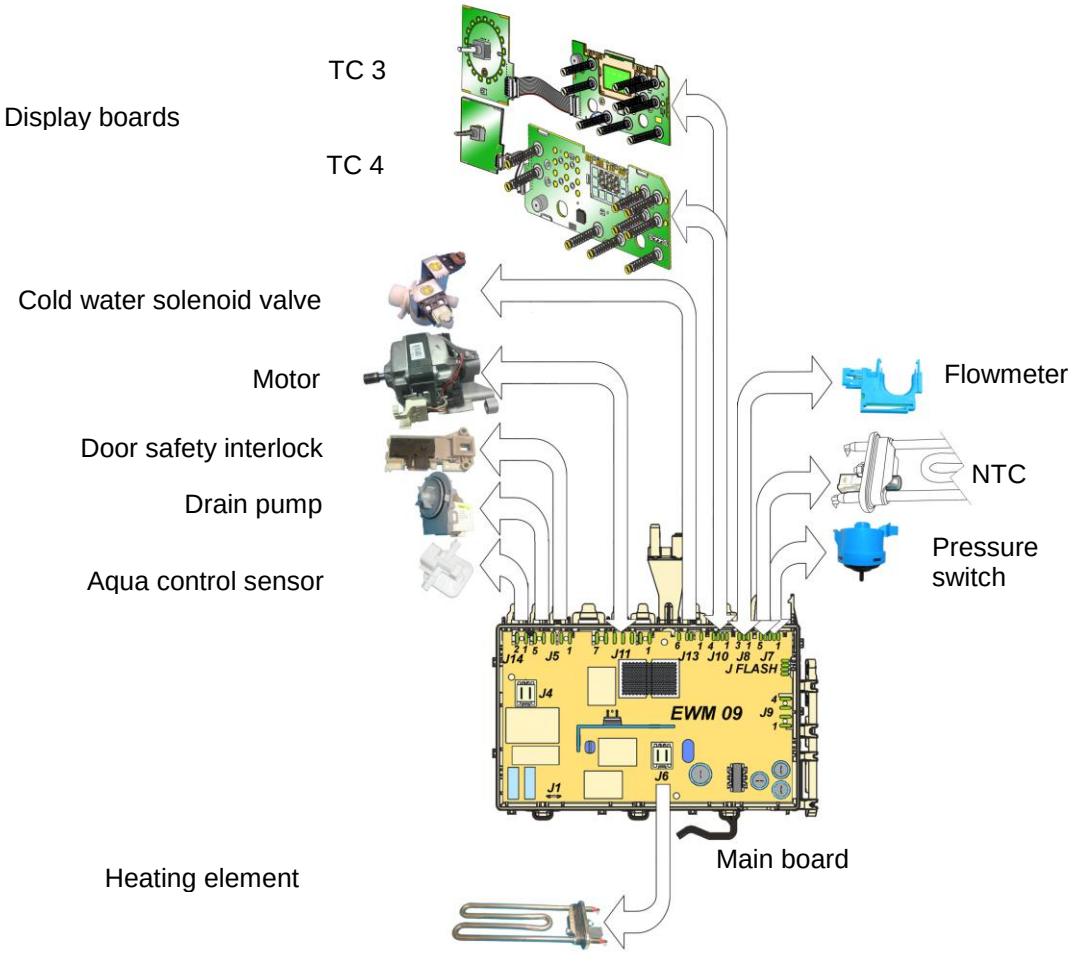
- Code 973 914… identifies the pre-programmed board.
- Code 132… identifies the unprogrammed board.

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

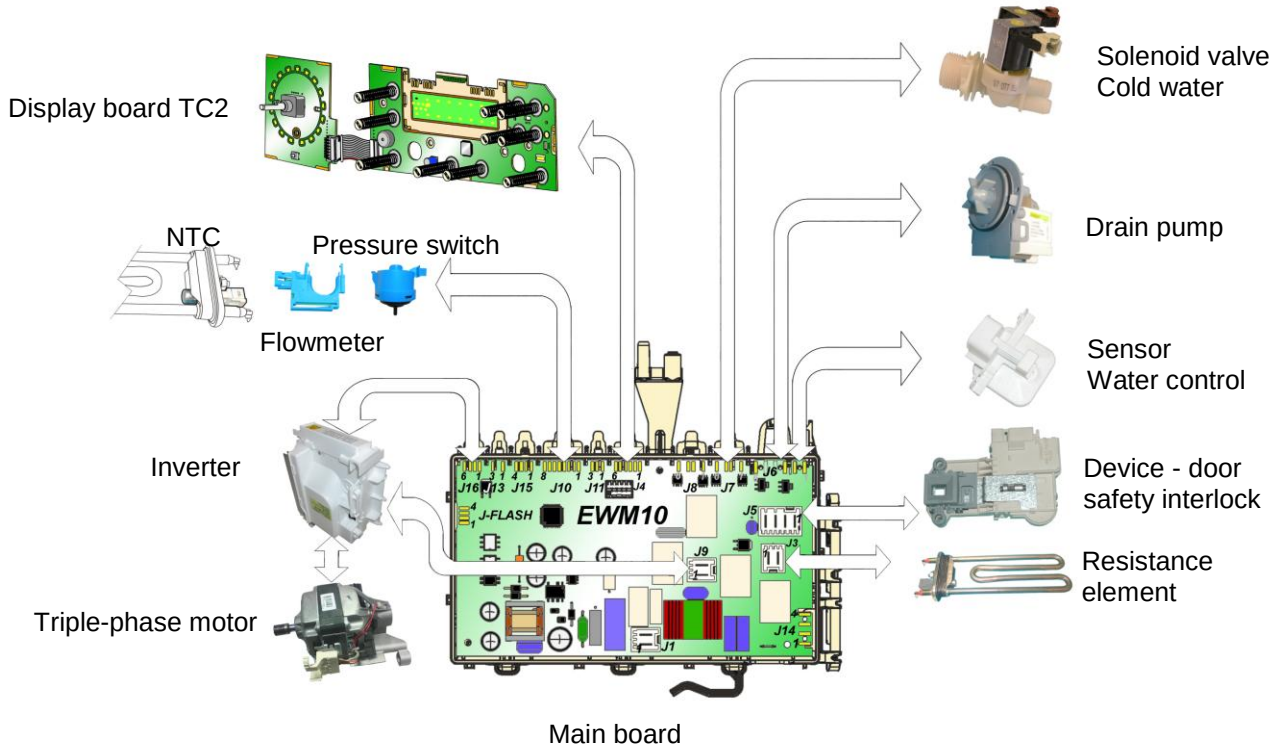
To update/program the main board, insert the **Sidekick** connector in the position shown by the red arrow:



TC4-TC3 electronic control with universal motor



11.7.2 TC2 electronic control with three-phase motor and Inverter



12 ELECTRICAL COMPONENTS

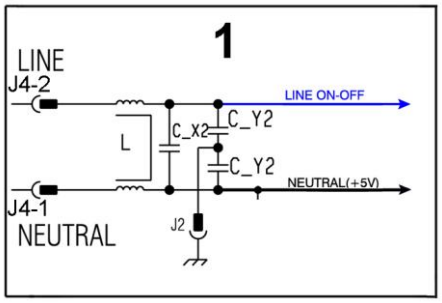
- **When replacing any of the components, please refer to the code shown in the list of spare parts relating to the appliance being repaired.**

12.1 Noise filter

12.1.1 General characteristics

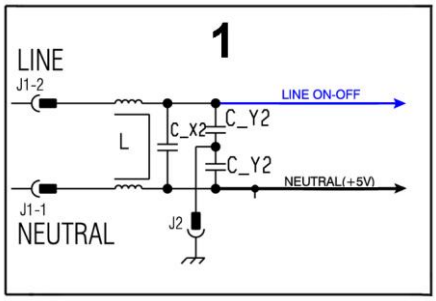
This device is connected to the electricity power line input of the appliance and avoids the emission of radio frequency disturbance in the electricity mains. It is incorporated into the main board.

Diagram with universal Motor



1. Main circuit board

Diagram with Inverter



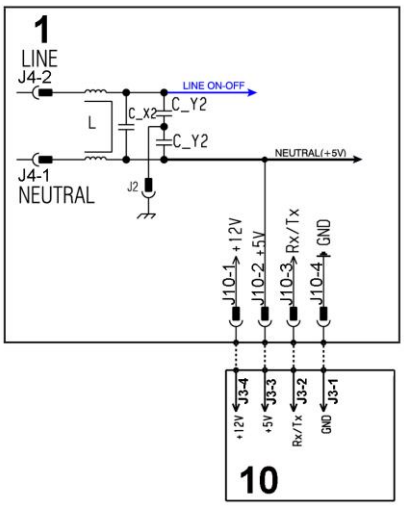
1. Main circuit board

12.2 Display board

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

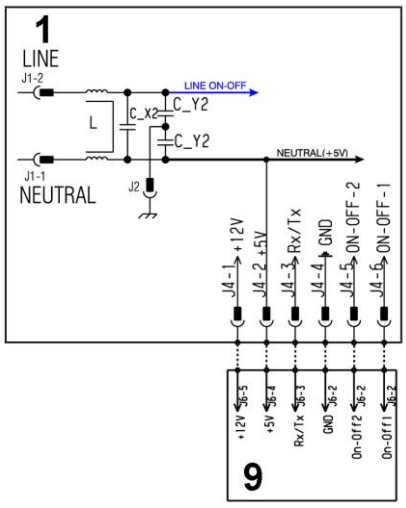
The main circuit board (1) supplies the power supply voltage to the control/display board (9/10).
Turn the selector dial to select the programmes, press the buttons to choose the options and press the START/PAUSE button to start or pause the appliance.
The buzzer - where featured - is powered by the display board.

Diagram with universal Motor



1. Main circuit board
10. Display board

Diagram with Inverter

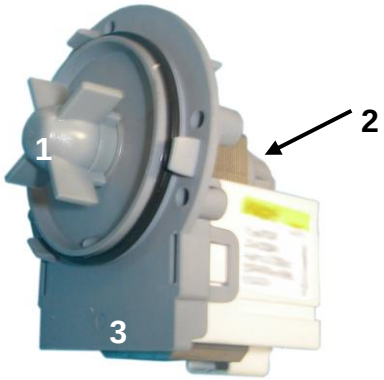


1. Main circuit board
9. Display board

12.3 Drain pump

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

12.3.1 General characteristics



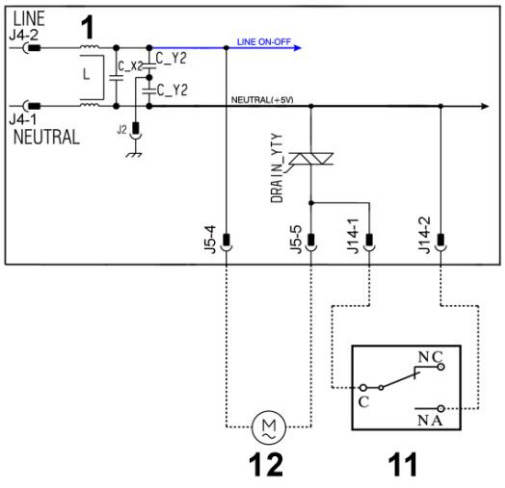
1. *Wheel*
2. *Rotor*
3. *Stator*

The pump, which drains the water at the end of the various washing cycle phases, is centrifugal and is activated by a synchronous motor.
The rotor consists of a permanent magnet and the direction of rotation can be either clockwise or anticlockwise. It 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 above ground level. Fitted with overload cut-out.

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

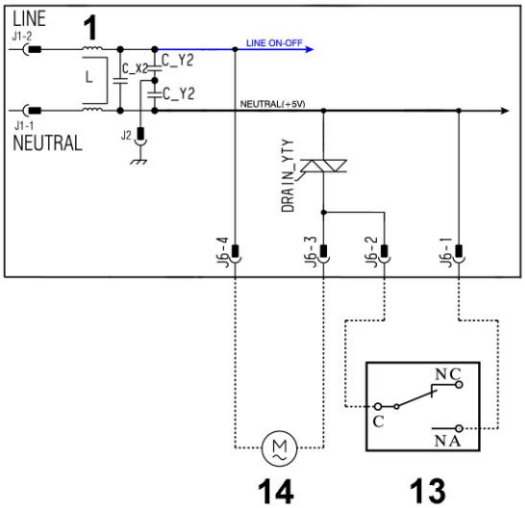
The drain pump is powered by the main circuit board through a triac, as follows:
- For a pre-determined period (and an alarm might be displayed - see table of alarms).
- Until the electronic pressure switch closes on empty, after which the pump is activated for a brief period or moves on to the next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

Diagram with universal Motor



1. *Main circuit board*
11. *Aquacontrol sensor*
12. *Drain pump*

Diagram with Inverter



1. *Main circuit board*
13. *Aquacontrol sensor*
14. *Drain pump*

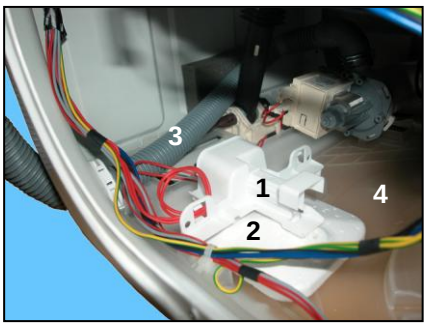
12.4 Aqua control (where featured)

12.4.1 General characteristics

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).

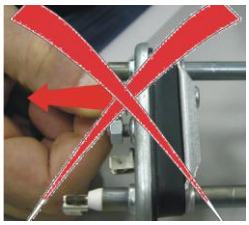
In the bottom of the washing machine there is a plastic bottom that forms a container. This collects any water leakage (from the tub, from the pipes, etc.), which flows into the area in which the float is positioned (made of polystyrene). In the presence of water this lifts up and triggers the microswitch, which powers the drain pump. When it is triggered, the LCD display shows an ALARM (if the machine is on). See table of alarms.

1. *Micro-switch*
2. *Float*
3. *Drain pipe*
4. *Aqua control bottom*



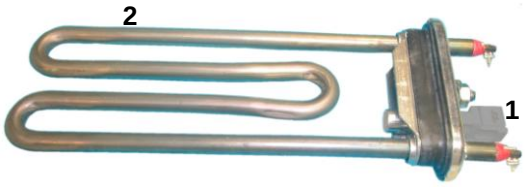
12.5 Heating element

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



12.5.1 General characteristics

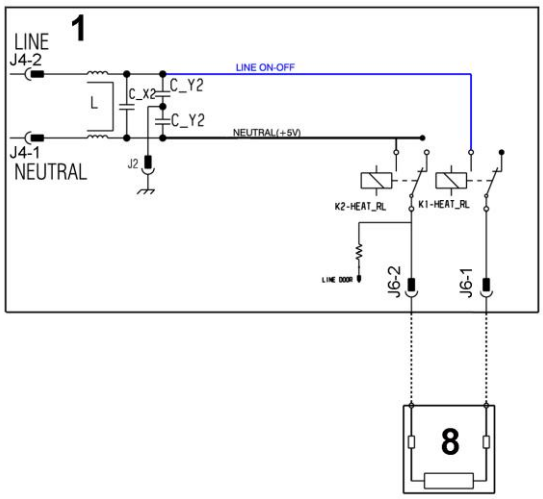
1. *NTC probe*
2. *Heating element*



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

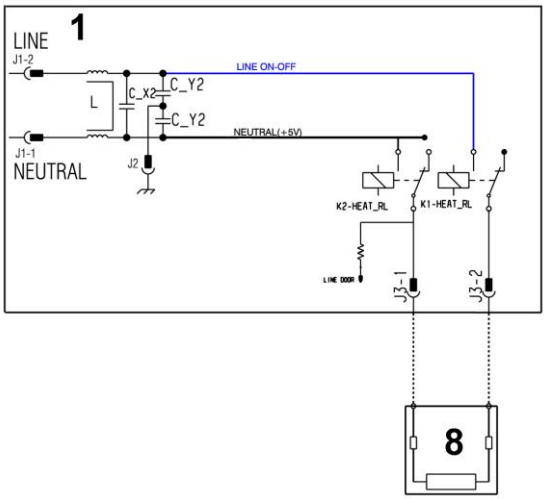
It is powered by two relays (K1, K2) situated in the circuit board. It is fitted with two thermal fuses which trip if the temperature of the heating element exceeds the values for which they were calibrated.
(In the event of a fault an alarm will be displayed - see table of alarms).

Diagram with universal Motor



1. *Main circuit board*
8. *Heating element*

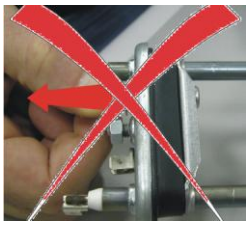
Diagram with Inverter



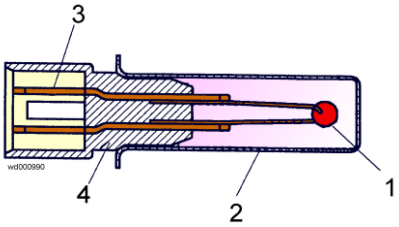
1. *Main circuit board*
8. *Heating element*

12.6 Temperature probe

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



12.6.1 General characteristics

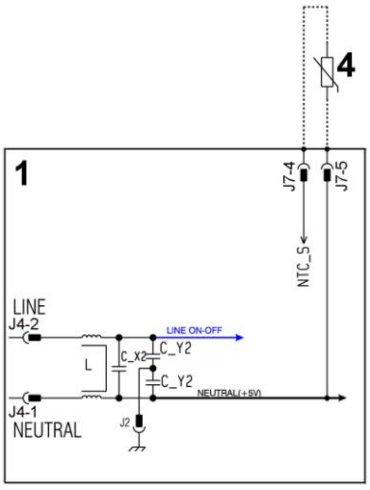


1. *NTC heating element*
2. *Metal capsule*
3. *Terminals*
4. *Plastic casing*

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.

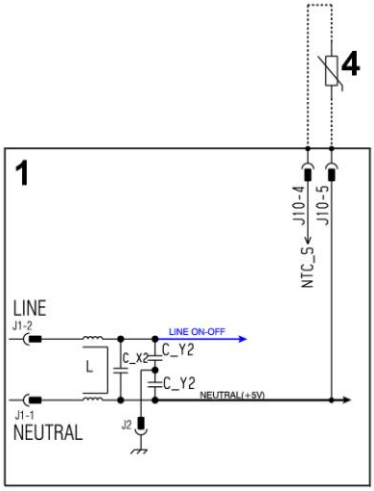
The temperature of the water is controlled by the circuit board by means of an NTC temperature probe incorporated in the heating element.

Diagram with universal Motor



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

Diagram with Inverter



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

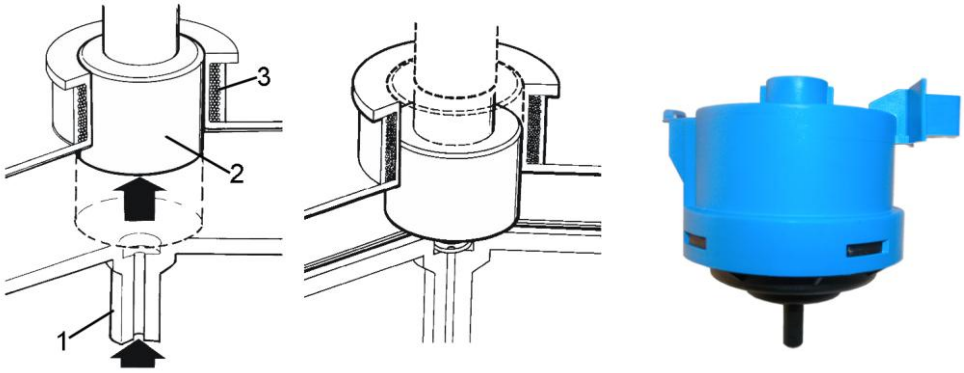
In the event of a fault (short-circuit or stoppage) an alarm will be displayed - see table of alarms.

12.7 Analogue pressure switch

12.7.1 General characteristics

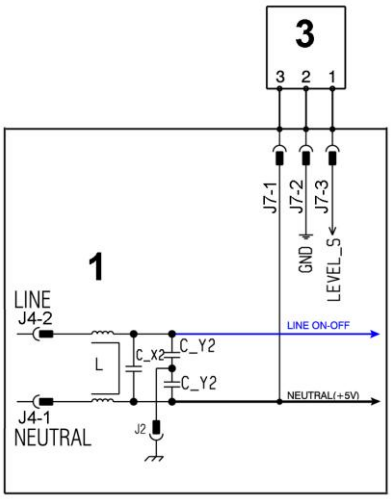
The electronic pressure switch is an analogue device that controls the water level in the tub, used in models with electronic control system, and it is directly connected to the main PCB.

1. *small pipe*
2. *core*
3. *oscillating coil*



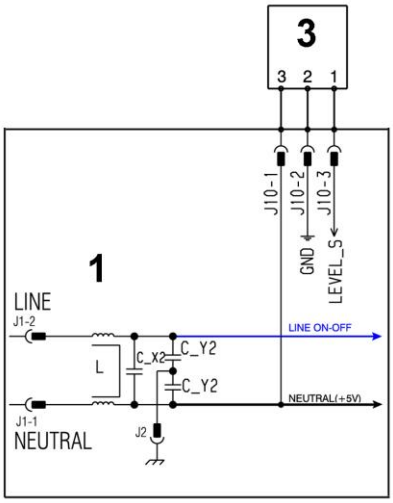
The pressure switch is connected via a pipe to the pressure chamber.
When water is introduced into the tub, this creates a pressure inside the hydraulic circuit that causes the membrane to change position. This in turn modifies the position of the core inside the coil, thus changing the inductance and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

Diagram with universal Motor



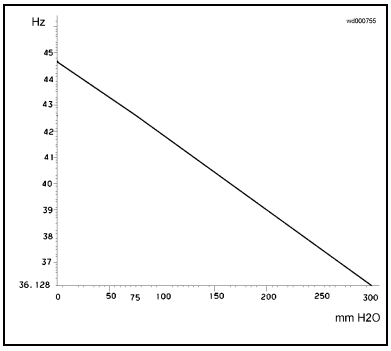
1. *Main circuit board*
3. *Analogue pressure switch*

Diagram with Inverter



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

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

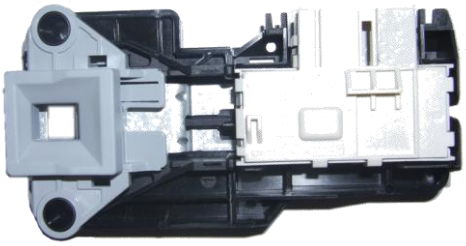


In the event of a fault an alarm will be displayed - see table of alarms.

12.8 Door safety interlock

12.8.1 Traditional door interlock (where featured)

12.8.1.1 General characteristics



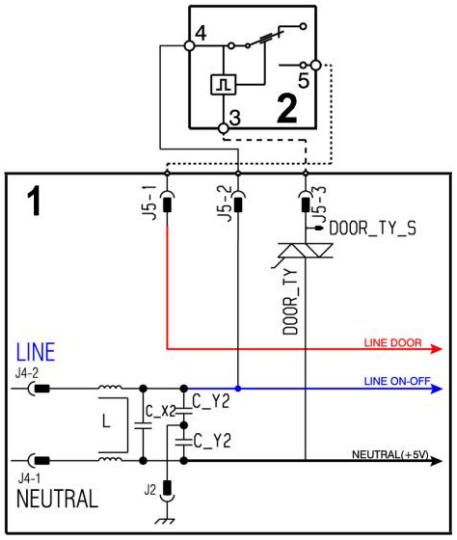
An electromechanical device is used as the door safety interlock, having the following functions:

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

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

- **Operating principle**

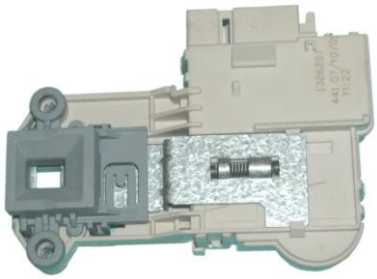
⇘ Once the wash programme is started by pressing the start/pause button, the bi-metal PTC (contact 3) is powered by the triac on the circuit board (J5-3): after 2-4 seconds, the switch (4-5) powering the electrical components of the washing machine is closed.



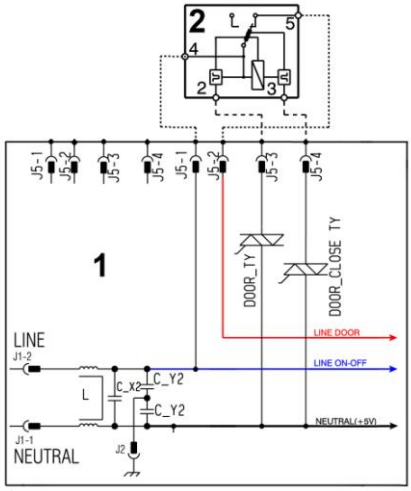
1. *Main circuit board*
2. *Door safety device - Traditional*

12.8.2 Instantaneous door interlock (where featured)

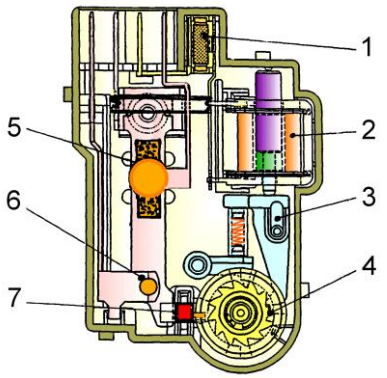
12.8.2.1 General characteristics



The instantaneous door interlock allows the door to be opened as soon as the drum stops.
If the conditions described further are met.



1. Main circuit board
2. Instantaneous door interlock



- **Operating principle**

1. Solenoid protection PTC
2. Solenoid
3. Lifting assembly
4. Cam
5. PTC - bi-metal
6. Electrical contacts (main switch)
7. Ratchet

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

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

- the drum must be stationary (no signal from the tachometric generator).
- the water level must not be higher than the lower edge of the door.
- the temperature of the water must not be higher than 40ºC.

– Automatic release device

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

– Solenoid protection

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

→ main circuit board triac short circuit

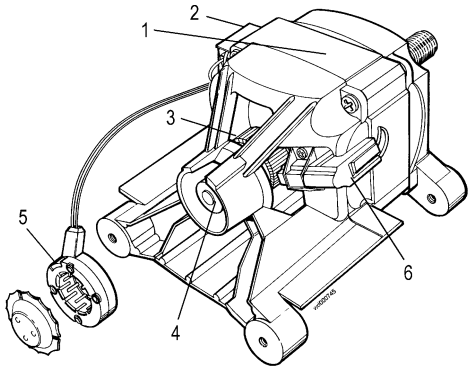
→ many consecutive pressings of the start/pause button (more than 10 times)

12.9 Universal motor

12.9.1 General characteristics

Collector motors are fitted on appliances with a spin speed of between 600 and 1600 rpm.

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

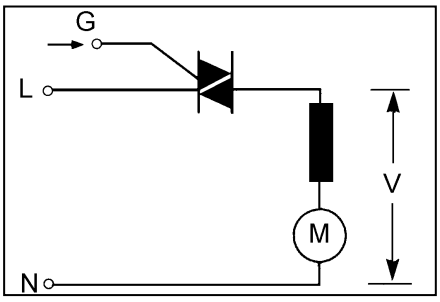


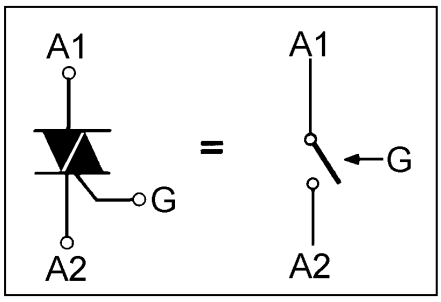
12.9.2 Operating principle

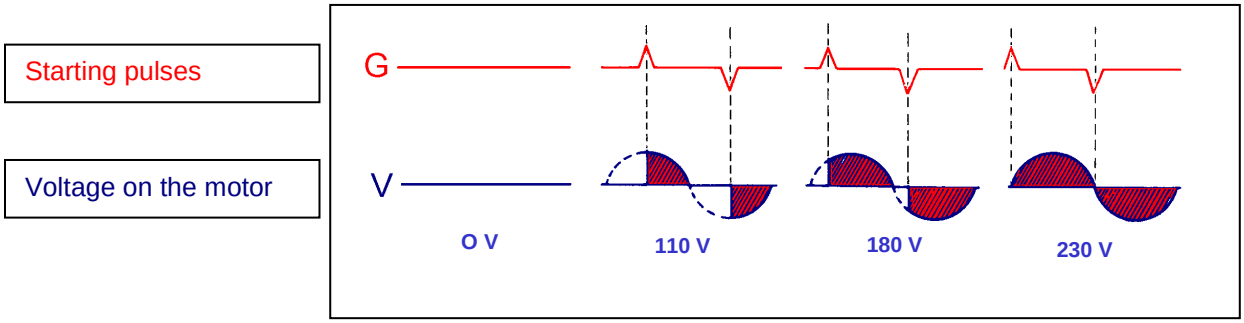
The stator winding is connected in series to the rotor winding (serial excitation).
Every section of the rotor winding is connected to a pair of collector blades (also referred to as a switching device). The electrical contact between the collector and the fixed circuit is made by two static brushes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

12.9.2.1 Motor speed control

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



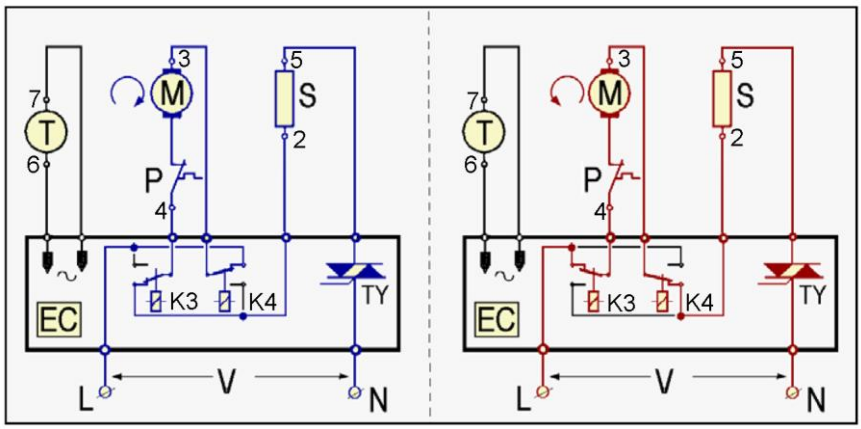




12.9.2.2 Direction of rotation of the motor

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

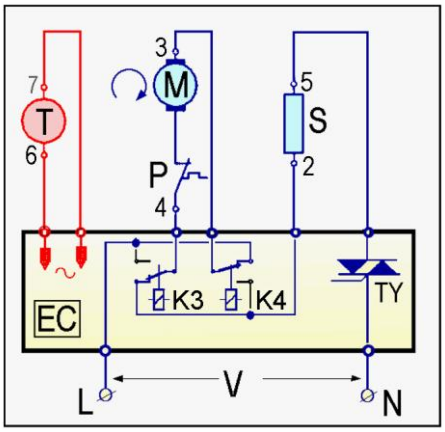
EC Electronic control
P Overheating cut-out (motor)
S Stator
M Rotor
T Tachometric generator
TY Triac
K3,4 Inversion relay



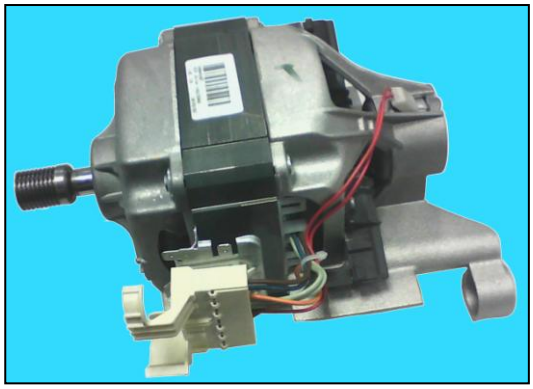
12.9.2.3 Tachometric generator

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

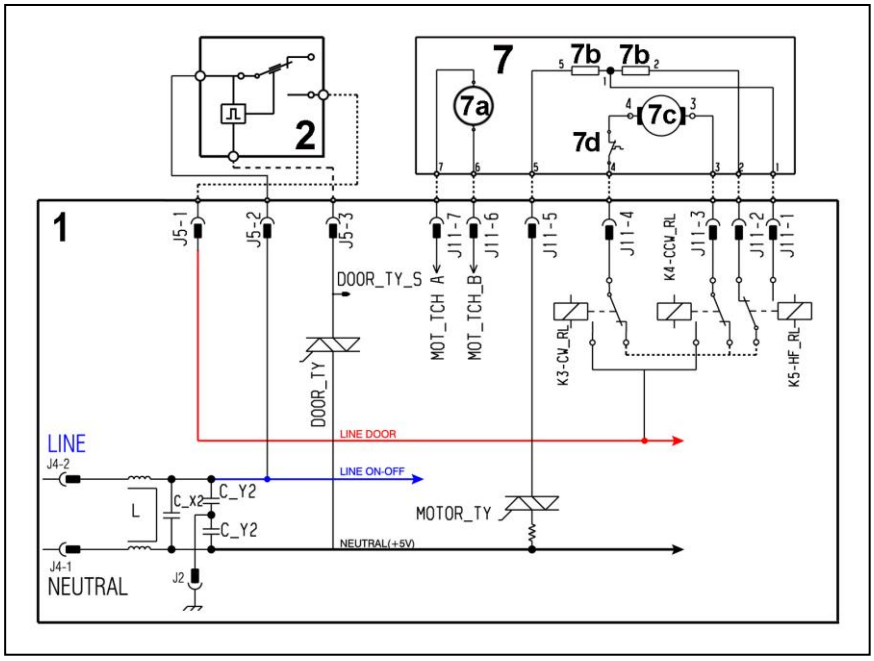
EC Electronic control
P Overheating cut-out (motor)
S Stator
M Rotor
T Tachometric generator
TY Triac
K3,4 Inversion relay



12.9.3 Power supply to motor



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



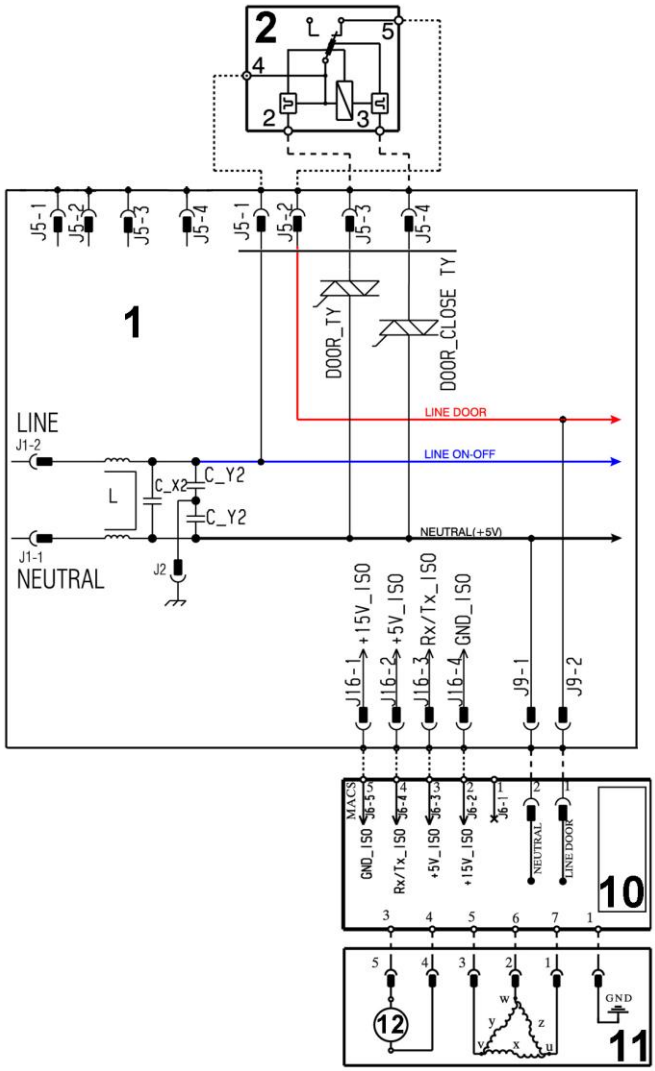
1. Main circuit board
2. Door safety interlock
7. Universal motor
7a. Tachometric generator (motor)
7b. Stator (motor)
7c. Rotor (motor)
7d. Thermal cut-out (motor)

12.10 Three-phase asynchronous motor (where featured)

12.10.1 General characteristics

1. Main circuit board
2. Door safety interlock
10. Inverter
11. Motor
12. Tachometric generator

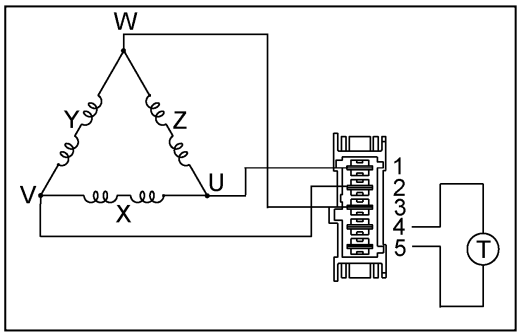
X-Y-X = Motor windings



12.10.2 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 310V.

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



Coil y ohm 5.8 ~ ±7% (contacts 2-3)

Coil x ohm 5.8 ~ ±7% (contacts 1-2)

Coil z ohm 5.8 ~ ±7% (contacts 1-3)

Coil T (tachometric) ohm 181.5 ~±7% (4-5 contacts).

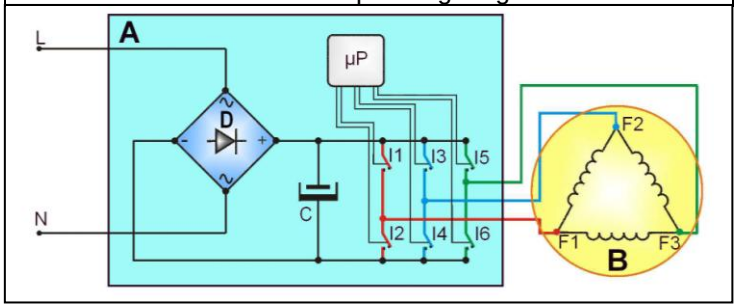
12.11 Inverter (where featured)

12.11.1 General characteristics

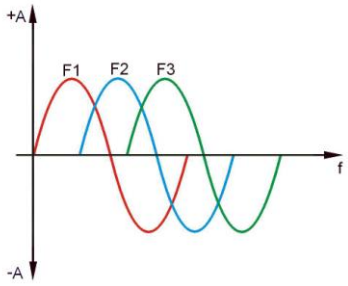
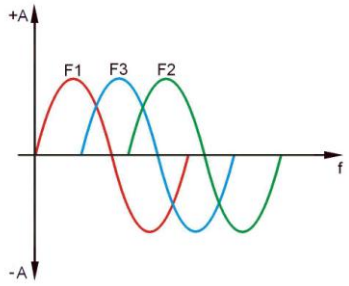
The EWM10931 electronics use a new asynchronous motor, with 2 poles, three-phase, with high performance and low noise levels.

L = Phase
N = Neutral
T IT = “INVERTER” board
B = Motor
CR = Capacitor
D = Diodes
I1÷6 = Switches
F1÷3 = Motor connectors
µP = Micro Processor

“INVERTER” operating diagram



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 310V at the ends of capacitor 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.

Clockwise rotation of the motor	Anti-clockwise rotation 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.

- **Any work on electrical appliances must only be carried out by qualified personnel.**
- **Unplug the appliance before accessing internal components.**
- **When replacing the “INVERTER” board, do not open the plastic casing, because some parts are subject to high voltage values and some condensers remain loaded for a long time at dangerous voltage levels even after being unplugged.**
- **Accidental physical contact may cause electric shocks.**

12.11.2 Anti-foam control system

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

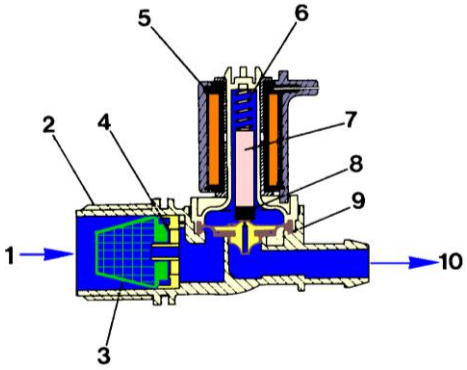
- **Spin with little foam:** if the pressure switch senses a “full” level, the spin phase is interrupted, the drain pump continues to operate and, when the pressure switch senses “empty”, the spin phase is resumed.
- **Spin with excess foam in the tub (critical situation):** this is recognised if the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

12.12 Solenoid valves

12.12.1 General characteristics

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

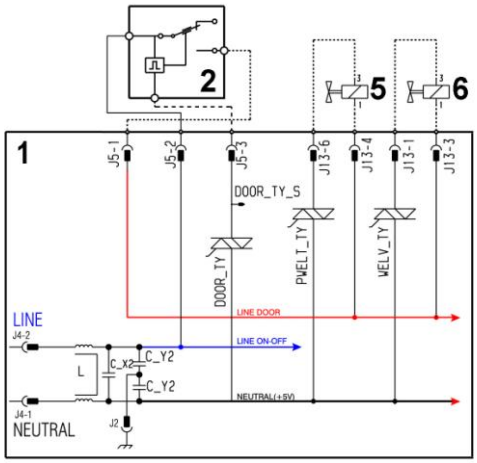
1. *Water inlet*
2. *Solenoid valve body*
3. *Filter or needle trap*
4. *Flow reducer*
5. *Coil*
6. *Spring*
7. *Moving core*
8. *Rubber*
9. *Membrane*
10. *Water outlet*



12.12.1.1 Operating principle

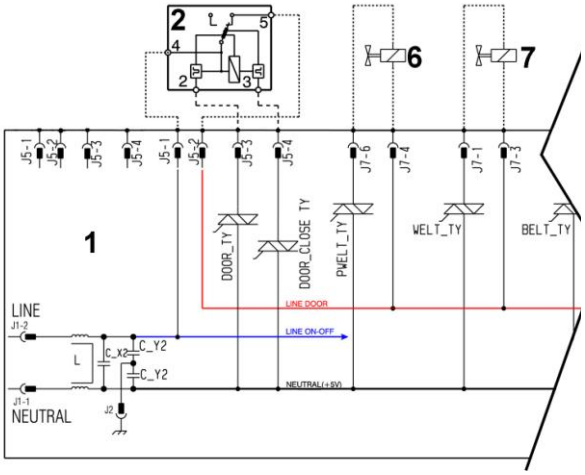
When idle, the core, pushed by a spring, keeps the central hole of the membrane closed and so the latter hermetically seals access to the water inlet duct.
When the coil is powered, the core is attracted, releasing the central hole of the membrane. Consequently the valve opens.

Diagram with universal Motor



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

Diagram with Inverter



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

Mechanical jamming of the solenoid valve

The solenoid valve may jam open without receiving power supply (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) will lock the door, start the drain pump and display an ALARM simultaneously.

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 signaled.

12.13 Flowmeter (where featured)

12.13.1 General characteristics

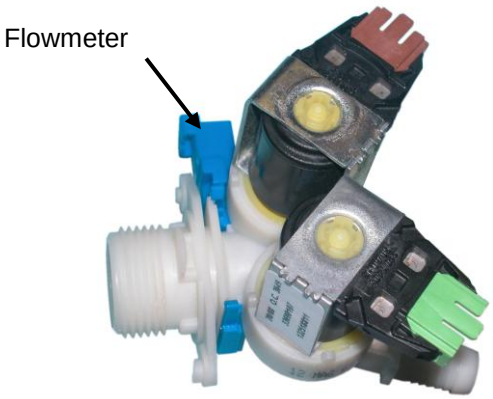
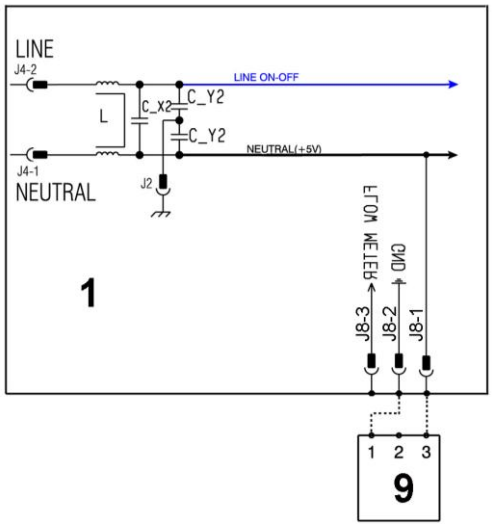
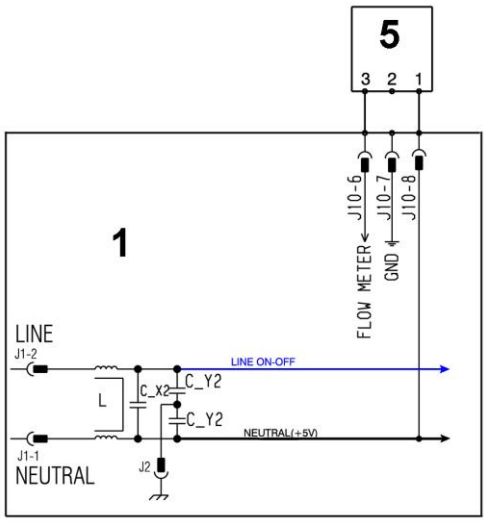


Diagram with universal Motor



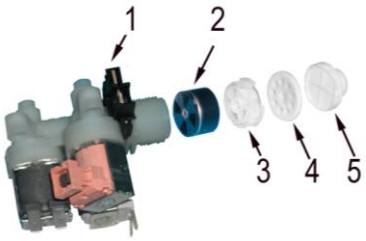
1.Main circuit board
9.Flow sensor

Diagram with Inverter



1.Main circuit board
5.Flow sensor

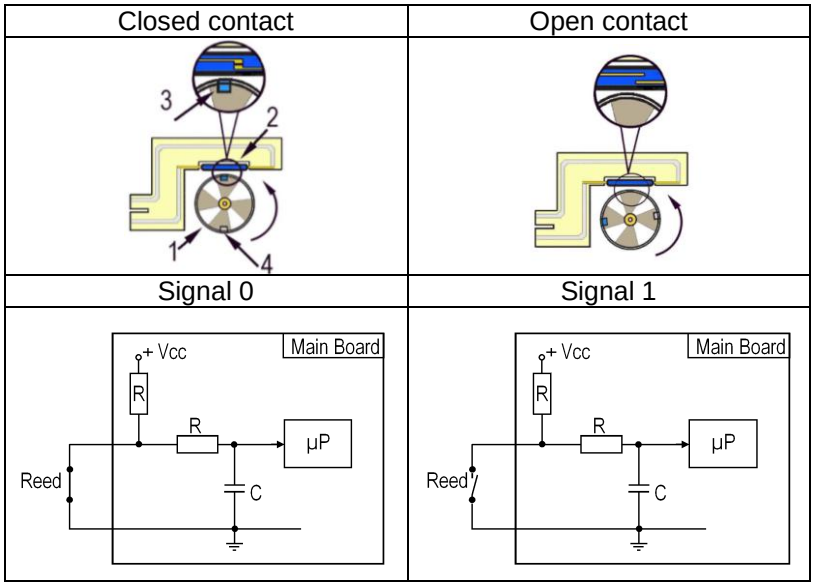
Some models of solenoid valves have a built-in flow sensor, which measures the quantity of water in litres that is loaded into the appliance.
In the event of a sensor failure, the water level is controlled by the analogue pressure switch.

Electronically controlled valve, exploded view	PCB	Turbine
		
1-PCB 2-Turbine 3-Deflector 4-Diffuser 5-Double filter	6-Reed contact	7-Magnet

12.13.2 Operating principle of the flowmeter

The main components of the flowmeter are:

1. *Turbine (with magnet and counterweight mounted on the outside)*
3. *Reed contact (normally open)*
4. *Magnet*
5. *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.

13 ALARM SUMMARY TABLE

Alarm	Description	Possible fault	Machine status/action	Reset
E00	No alarm			
E11	**Water fill difficulty during washing**	Tap closed or water pressure too low; drain pipe improperly positioned; water fill solenoid valve faulty; leaks from water circuit on pressure switch; pressure switch faulty; wiring faulty; main PCB faulty.	Cycle is paused with door locked	START/RESET
E13	**Water leaks**	Drain pipe improperly positioned; water pressure too low Water fill solenoid valve faulty; water circuit on pressure switch is leaking/clogged; pressure switch faulty.	Cycle is paused with door locked	START/RESET
E21	**Drain difficulty during washing**	Drain pipe kinked/clogged/improperly positioned; drain filter clogged/dirty; wiring faulty; pressure switch faulty; drain pump rotor blocked; drain pump faulty; main PCB faulty.	Cycle is paused (after 2 attempts)	START ON/OFF RESET
E23	**Faulty triac for drain pump**	Wiring faulty; drain pump faulty; main PCB faulty.	Safety drain cycle - Cycle stops with door open	RESET
E24	**Drain pump triac "sensing" circuit faulty**	Main circuit board faulty.	Safety drain cycle - Cycle stops with door unlocked	RESET
E31	**Malfunction in electronic pressure switch circuit**	Wiring; Electronic pressure switch; Main PCB;	Cycle stops with door locked	RESET
E32	**Calibration error of the electronic pressure switch**	Drain pipe kinked/clogged/improperly positioned; solenoid valve faulty; drain filter clogged/dirty; drain pump faulty; leaks from pressure switch hydraulic circuit; pressure switch faulty; Wiring; main PCB;	Cycle is paused	START/RESET
E35	**Overflow**	Water fill solenoid valve faulty; leaks from water circuit on pressure switch; wiring faulty; pressure switch faulty; main PCB faulty.	Cycle interrupted. Safety drain cycle. Drain pump continues to operate (5 min. on, then 5 min. off. etc.)	RESET
E38	**Internal pressure chamber is clogged (water level does not change for at least 30 sec. of drum rotation)**	Motor belt broken; water circuit on pressure switch clogged.	Heating phase is skipped	RESET
E41	**Door open**	Check whether the door is closed properly; Wiring faulty; door safety interlock faulty; Main circuit board faulty.	Cycle is paused	START/RESET
E42	**Problems with door lock**	Wiring faulty; door safety interlock faulty; Electrical current leak between heating element and ground; main PCB faulty.	Cycle is paused	START/RESET
E43	**Faulty triac supplying power to door delay system**	Wiring faulty; door safety interlock faulty; Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET
E44	**Faulty sensing by door delay system**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET
E45	**Faulty sensing by door delay system triac**	Main circuit board faulty.	(Safety drain cycle) Cycle blocked	RESET

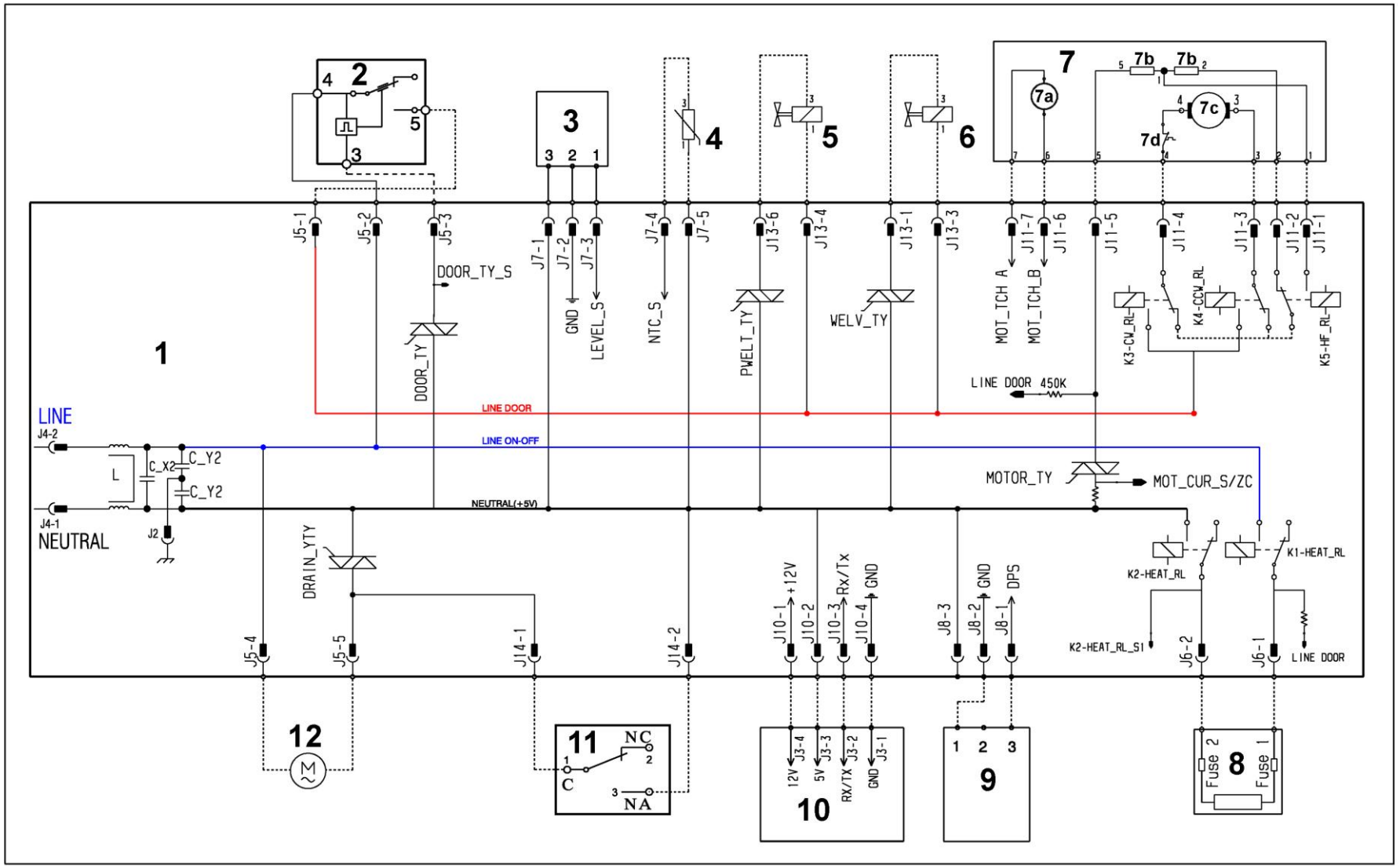
Alarm	Description	Possible fault	Machine status/action	Reset
E51	**Motor power triac short-circuited**	Current leakage from motor or from wiring; Main PCB faulty;	Cycle stops with door open (after 5 attempts)	ON/OFF
E52	**No signal from motor tachometric generator**	Wiring faulty; Motor faulty; Inverter board faulty;	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E53	**"Sensing" faulty triac motor**	Main circuit board faulty.	Cycle blocked	RESET
E54	**Motor relay contacts sticking**	Current leakage from motor or from wiring; Main PCB faulty;	Cycle blocked (after 5 attempts)	RESET
E57	**Inverter is drawing too much current (>15°)**	Wiring faulty on inverter for motor; inverter PCB faulty; motor faulty.	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E58	**Inverter is drawing too much current (>4.5°)**	Motor malfunction (overload); Wiring faulty on inverter faulty; motor faulty; inverter PCB faulty	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E59	**No signal from tachometric generator for 3 seconds**	Wiring faulty on inverter for motor; inverter PCB faulty; motor faulty;	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E5A	**Overheating on heat dissipator for Inverter**	Overheating caused by continuous operation or ambient conditions (let appliance cool down); Inverter PCB faulty. NTC open (on the Inverter PCB)	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E5C	**Input voltage is too high**	Input voltage is too high (measure the grid voltage); inverter PCB faulty.	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E5d	**Data transfer error between Inverter and main PCB**	Line interference; wiring faulty; faulty main PCB or inverter PCB.	----------	ON/OFF RESET
E5E	**Communication error between Inverter and main PCB**	Faulty wiring between main PCB and inverter PCB; Inverter PCB faulty; Main PCB faulty;	Cycle blocked (after 5 attempts)	ON/OFF RESET
E5F	**Inverter PCB fails to start the motor**	Wiring faulty; Inverter PCB faulty; Main PCB faulty;	Cycle stops with door open (after 5 attempts)	ON/OFF RESET
E5H	**Input voltage is lower than 175V**	Wiring faulty; Inverter PCB faulty;	Cycle stops with door locked (after 5 attempts)	ON/OFF RESET
E61	**Insufficient heating during washing**	Wiring faulty; NTC probe for wash cycle faulty; Heating element faulty; Main PCB faulty.	The heating phase is skipped	START/RESET
E62	**Overheating during washing (temperature higher than 88°C for more than 5 min.)**	Wiring faulty; NTC probe for wash cycle faulty; Heating element faulty; Main PCB faulty.	Safety drain cycle Cycle stops with door open	RESET
E66	**Heating element power relay faulty (inconsistency between sensing and K2 relay status)**	Current leakage between heating element and ground. Main PCB faulty;	Safety water fill Cycle stops with door closed.	ON/OFF RESET
E68	**Current leak to the ground**	Current leakage between heating element and ground.	The heating phase is skipped	START/RESET
E69	**Heating element interrupted**	Wiring faulty; Heating element for washing interrupted (thermal fuse open); Main PCB faulty.	----------	START ON/OFF RESET
E6A	**Heating relay sensing faulty**	Main circuit board faulty.	Cycle stops with door locked	RESET
E6H	**Heating element power relay faulty (inconsistency between sensing and K1 relay status)**	Wiring faulty; Earth-leakage between heating element and earth; Main PCB faulty.	Safety water fill Cycle stops with door closed	ON/OFF RESET

Alarm	Description	Possible fault	Machine status/action	Reset
E71	**NTC probe for wash cycle faulty (short-circuited or open)**	Wiring faulty; NTC probe for wash cycle faulty Main circuit board faulty.	The heating phase is skipped	START/RESET
E74	**NTC probe for wash cycle improperly positioned**	Wiring faulty; NTC probe for wash cycle improperly positioned; NTC probe faulty; Main PCB faulty.	The heating phase is skipped	RESET
E83	**Error in reading selector**	Main PCB faulty (Incorrect configuration data).	Cycle cancelled	START/RESET
E86	**Selector configuration error**	Display board	----------	START ON/OFF RESET
E87	**Display board microprocessor faulty**	If this continues, replace the display board	No action to be taken	START ON/OFF RESET
E91	**Communication error between main PCB and display**	Wiring faulty; control/display circuit board faulty, Inverter Board faulty, Main circuit board faulty.	----------	RESET
E92	**Communication inconsistency between main PCB and display (incompatible versions)**	Incorrect control/display PCB Incorrect PCB (does not correspond to the model).	Cycle blocked	ON/OFF
E93	**Appliance configuration error**	Main PCB faulty (incorrect configuration data);	Cycle blocked	ON/OFF
E94	**Incorrect configuration of washing cycle**	Main PCB faulty (incorrect configuration data);	Cycle blocked	ON/OFF
E97	**Inconsistency between programme selector and cycle configuration**	Main PCB faulty (incorrect configuration data).	Cycle blocked	RESET
E98	**Communication error between main PCB - Inverter**	Incompatibility between main PCB and Inverter	Cycle blocked	ON/OFF
E9C	**Display board configuration error**	Display board faulty	----------	START ON/OFF RESET
E9E	**Display board sensor/touch key faulty**	Display board faulty	----------	ON/OFF
EC1	**Electronically controlled valve blocked with operating flowmeter**	Faulty wiring; Faulty/blocked solenoid, PCB faulty,	Cycle stops with door locked Drain pump continues to operate (5 mins. on, then 5 mins. off, and so on)	RESET
EC2	**Data transfer error between Weight sensor and main PCB.**	Wiring faulty; Weight sensor faulty, PCB faulty,	No action to be taken	START/RESET
EC3	**Problems with the weight sensor (communication error with the weight sensor, no signal or outside the limits)**	Wiring faulty; Weight sensor faulty; Main PCB faulty;	----------	START/RESET
EC4	**AGS current sensor faulty.**	Main board faulty.	Spin speed reduced to safety speed of 150 rpm	RESET
EF1	**Drain filter clogged (drain phase too long)**	Drain filter clogged/dirty. Drain hose blocked/kinked/too high.	Warning displayed at the end of cycle.	START/RESET

Alarm	Description	Possible fault	Machine status/action	Reset
EF2	**Overdosing of detergent (too much foam during drain phases)**	Excessive detergent dosing; Drain hose kinked/blocked; Drain filter clogged/dirty.	Warning displayed after 5 attempts or by the specific LED.	RESET
EF3	**Aqua control system intervention**	Water leaks onto base frame; Aqua control system faulty; Drain pump winding interruption/overheating.	Appliance drains	ON/OFF RESET
EF4	**Water fill pressure too low, no signal from flowmeter and electronically controlled valve is open**	Tap closed, water fill pressure too low	----------	RESET
EF5	**Unbalanced load**	Final spin phases skipped.	----------	START/RESET
EF6	**Reset**	If it continues, replace the main board.	No action to be taken	----------
EH1	**Supply frequency of appliance outside the limits**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal frequency conditions	ON/OFF
EH2	**Supply voltage too high**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal voltage conditions	ON/OFF
EH3	**Supply voltage too low**	Problem with the power supply network (incorrect/disturbed); Main PCB faulty.	Wait for nominal voltage conditions	ON/OFF
EH4	**0Watt relay malfunction**	Main circuit board faulty.	----------	ON/OFF RESET
EHE	**Inconsistency between FCV relay (in the main board) and safety "sensing" circuit**	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)**	Main circuit board faulty.	Safety drain cycle Cycle stops with door open	RESET

14 DIAGRAMS

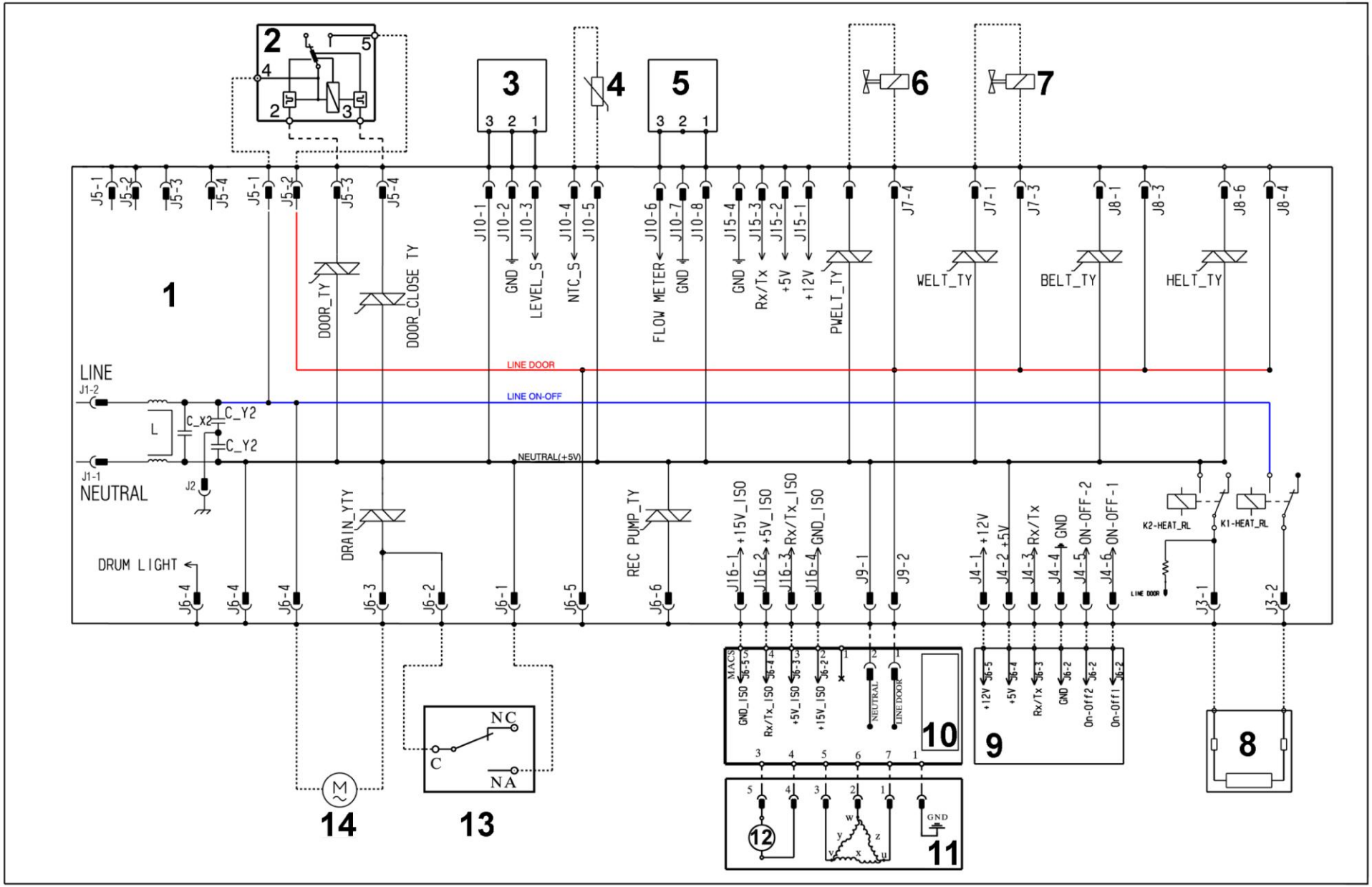
14.1 Operating Circuit Diagram EWM09312 (with universal motor)



14.2 Key to operating circuit diagram EWM09312 (with universal motor)

Appliance electrical components		PCB components	
1.	Main circuit board	DRAIN_YTY	Drain pump Triac
2.	Door safety interlock	DOOR_TY	Door interlock Triac
3.	Electronic pressure switch	PWELT_TY	Pre-wash solenoid Triac
4.	NTC	WELV_TY	Wash solenoid Triac
5.	Pre-wash solenoid valve	K1	Heating element relay
6.	Wash solenoid valve	K2	Heating element relay
7.	Universal motor		
7a.	Tachometric (motor)		
7b.	Stator (motor)		
7c.	Rotor (motor)		
7d.	Thermal cut-out (motor)		
8.	Heating element		
9.	Flowmeter		
10.	Display board		
11.	Aquacontrol sensor		
12.	Drain pump		

14.3 Operating circuit diagram EWM10931 WM (with three-phase motor)



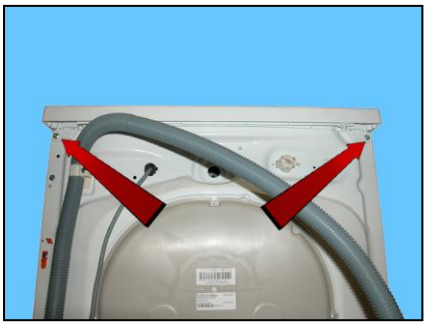
14.4 Key to operating circuit diagram EWM10931 (with three-phase motor)

Appliance electrical components	PCB components
1. Main circuit board 2 Door safety interlock (instantaneous) 3. Electronic pressure switch 4. NTC (washing) 5. Flow sensor 6. Pre-wash solenoid valve 7. Wash solenoid valve 8. Heating element 9. Display board 10. Motor control board (Inverter) 11. Triple-phase motor 12. Tachometric generator (motor) 13. Aqua control sensor 14. Drain pump	DRAIN_YTY Drain pump Triac DOOR_TY Door interlock Triac DOOR_CLOSE_TY Door interlock Triac PWELT_TY Pre-wash solenoid Triac WELV_TY Wash solenoid Triac K1 Heating element relay K2 Heating element relay

15 MANUAL FOR

15.1 Worktop

Remove the screws that secure it to the back panel.



Pull it out from the back

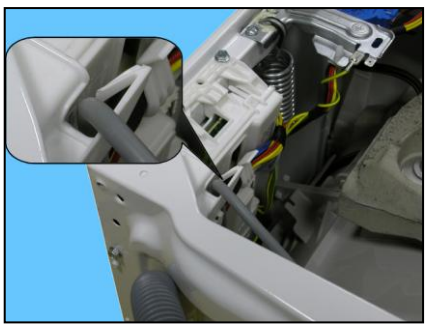
15.2 From the worktop, you can access

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

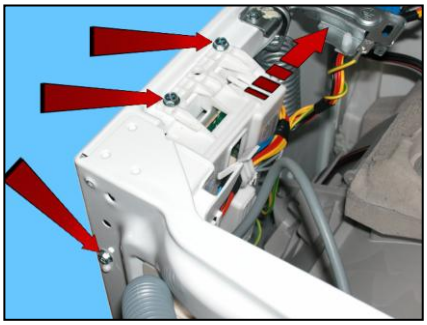
15.2.1 Main board

Remove the worktop (see relevant paragraph).

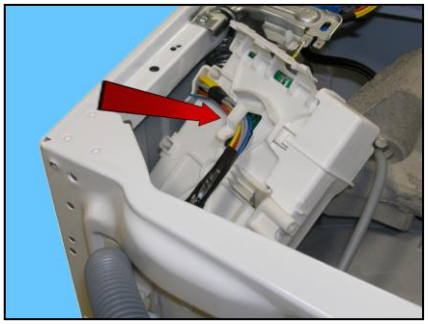
Remove the power cable from the hook that holds it close to the board.



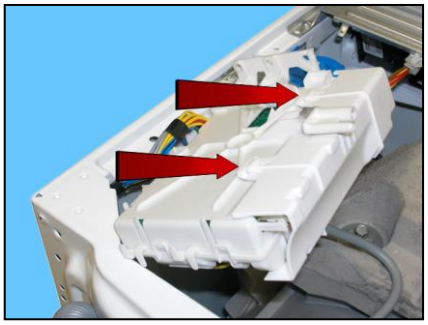
Unfasten the three screws securing it to the unit.
Move it in the direction of the dotted arrow.



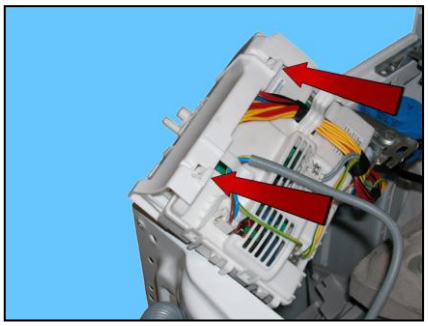
Turn the board anti-clockwise, release the wiring from the hook indicated by the arrow.



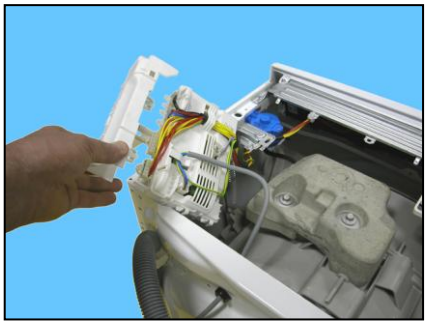
Pull out the board assembly and position it as shown in the figure.
Release the hooks securing the connectors protection on one side.



on the other

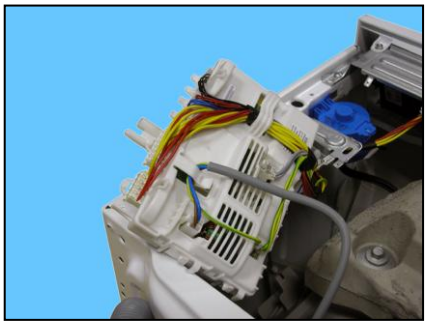


Remove the connector protection.



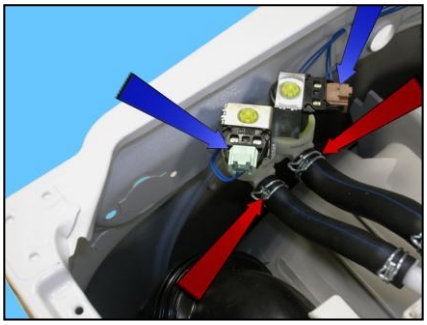
Remove the connectors.

Beware: some are held in place by hooks.

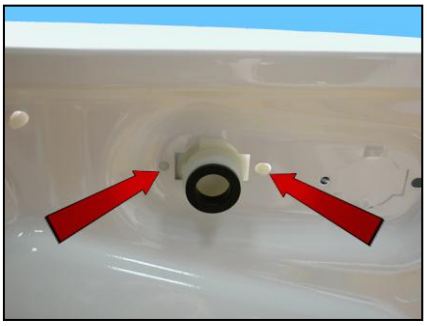


15.2.2 Solenoid valve

Remove the worktop (see relevant paragraph).



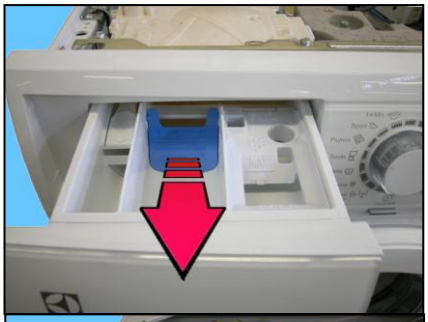
Detach the connectors indicated by the blue arrows.
Pull out the pipes indicated by the red arrows, which connect the solenoid valve to the detergent dispenser.



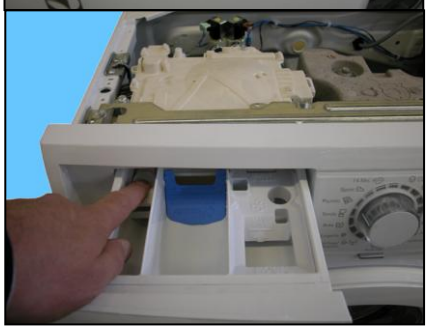
Unscrew the water fill pipe from the solenoid valve.
Push the two retainers indicated by the arrows towards the inside of the appliance.
At the same time, turn the solenoid valve to remove it.

15.2.3 Control panel

Remove the worktop (see relevant paragraph).

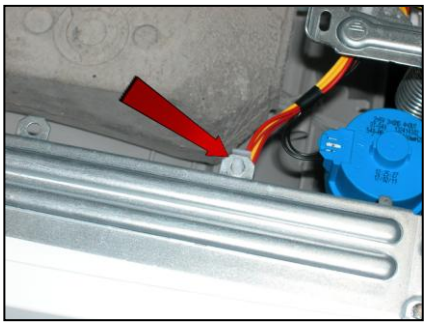


Pull the detergent dispenser out and at the same time press the stop locking it in place.

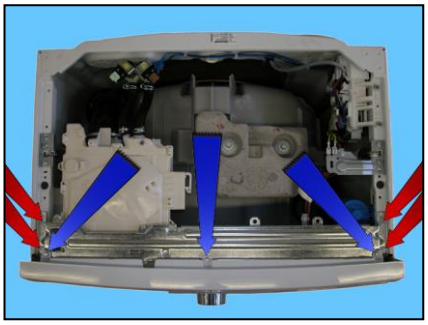


Loosen the screws that attach the control panel to the detergent tray.

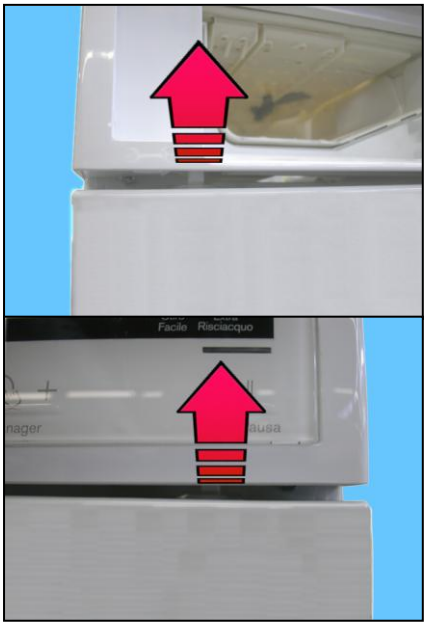
Remove the clamp from the crosspiece.



Slacken the four screws which secure the crosspiece to the cabinet (red arrows).
Remove the three screws securing the control panel to the crossbar
(blue arrows).

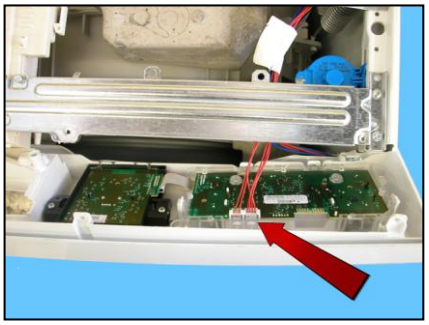


Raise both sides of the control panel so as to pull out the hooks which secure it to the front panel.



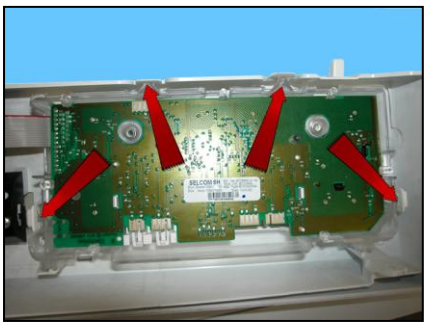
Take out the control panel and position it as shown in the figure taking care not to scratch it.

Remove the connector which connects the display board to the main circuit board (red arrow).



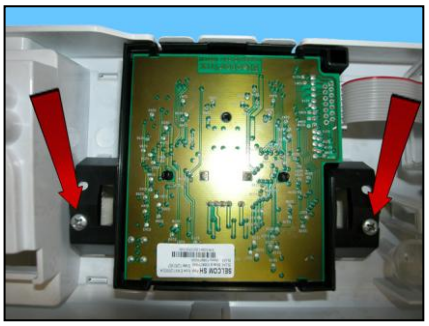
15.2.4 Display board/selector assembly

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



Release the tabs which secure the board assembly to the control panel.
When re-assembling the display board, position it parallel to the control panel and check that the sensor springs are positioned in their slots.
Push the board so that the tabs block it.

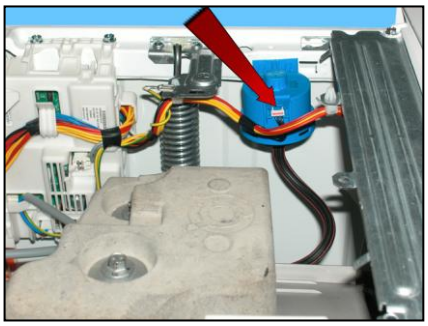
Selector control



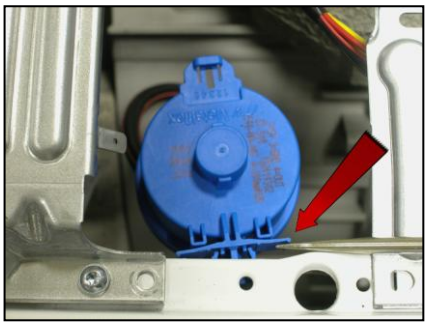
Slacken the two screws and unhook the four tabs that hold it to the control panel

15.2.5 Analogue pressure switch

Remove the worktop (see relevant paragraph).



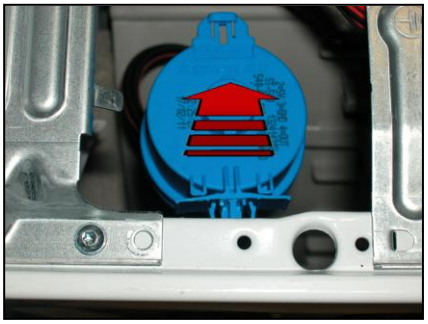
Remove the connector (red arrow)

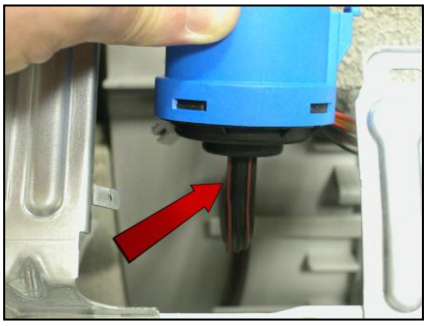


Tighten the tabs which secure it to the cabinet, first on one side.

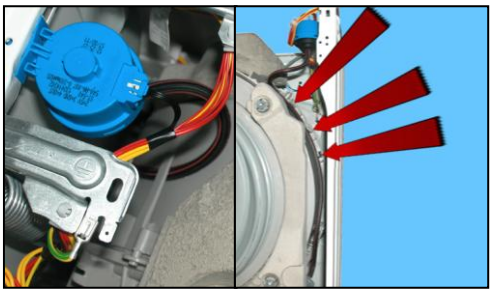
Then on the other.

Take it out





Pull out the small tube which connects it to the pressure chamber.

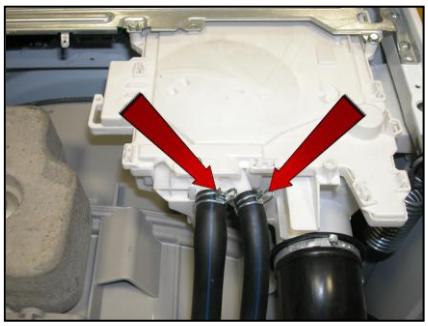


When reassembling the pressure switch, repeat these steps in the reverse order and,

arrange the pipe as shown in the figures, taking care that it does not touch the counterweight and position it in the purpose-provided seats incorporated into the welded tub (indicated by the arrows). To prevent the pipe from coming into contact with the unit while the appliance is in operation.

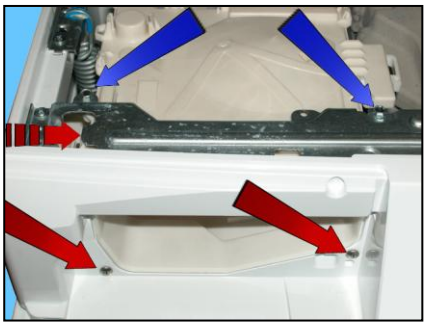
15.2.6 Detergent dispenser

Remove the worktop (see relevant paragraph).



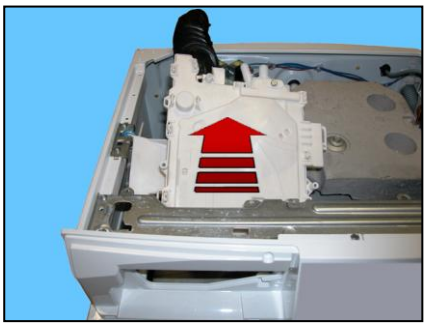
Remove the pipes that connect it to the solenoid valve.

Unfasten the screw in the clamp that fixes the detergent loading pipe to the tray, and remove it from its housing.



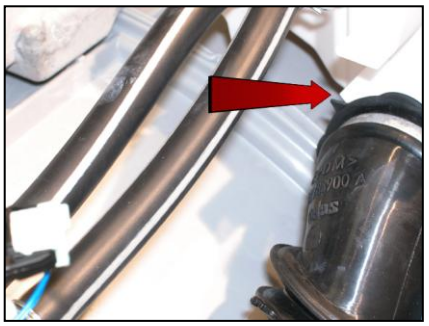
Remove the two screws securing it to the control panel (red arrows).
Remove the the two screws securing it to the controls crossbar (light blue arrows)
Release the anchor tab which secures the detergent dispenser to the crosspiece (dotted arrow).

Remove the detergent dispenser.



15.2.7 Detergent fill pipe

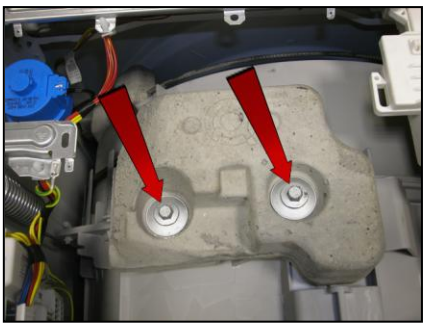
Remove the worktop (see relevant paragraph).
Remove the detergent tray (see relevant paragraph).



Pull out the pipe from the detergent dispenser after breaking/loosening the clamp between the detergent dispenser and the detergent loading pipe.
When reassembling, use a new clamp with the same characteristics.
The size of the clamp to use is 65.5 mm.
When introducing the pipe into the dispenser, make sure the two references are aligned.

15.2.8 Top counterweight

Remove the worktop (see relevant paragraph)



Remove the two screws that secure it to the welded tub

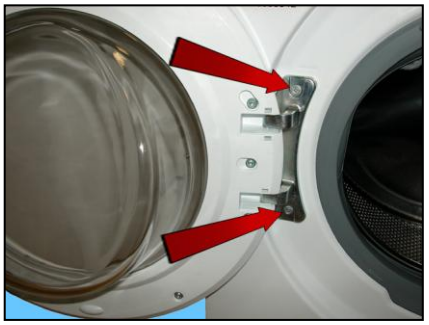
When reassembling:
If the tub assembly is new, tighten the screws at a torque of 20 Nm.
If the tub assembly is not new, tighten the screws at a torque of 15 Nm.

15.3 Accessing the front part

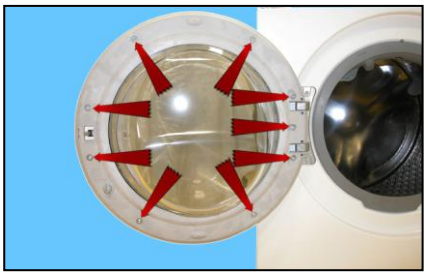
1. Door and Door Hinge
2. Door safety interlock
3. Bellow seal
4. Blade
5. Front panel

15.3.1 Door hinge - Door

To replace the hinge, loosen the screws securing it to the cabinet.



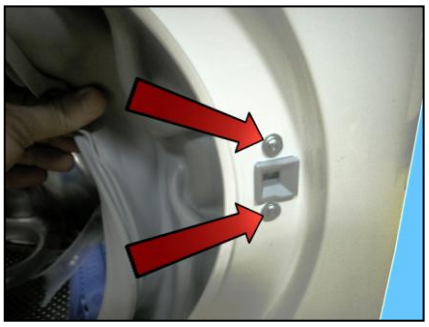
To access the door, loosen the screws joining the two front and rear door frames together.



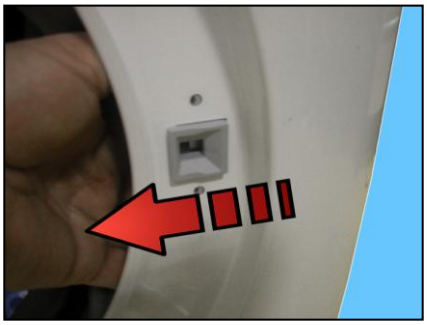
15.3.2 Door safety interlock

Remove the iron ring securing the bellow seal to the cabinet.
Remove the part of the bellow seal concerned from the unit.

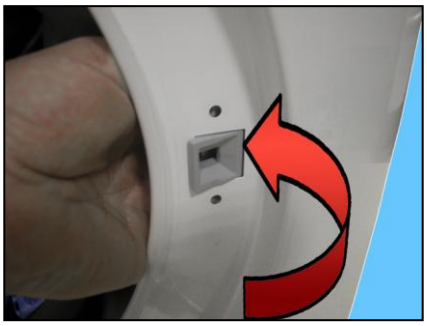
Unfasten the two screws securing the door safety interlock to the front panel.



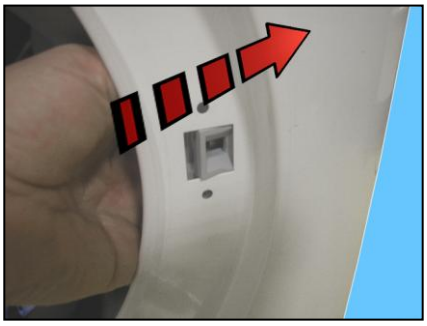
Take the device and move it to the left.



Turn it towards the inside (right-hand side of the flange).



Pull it out towards the right and remove it.

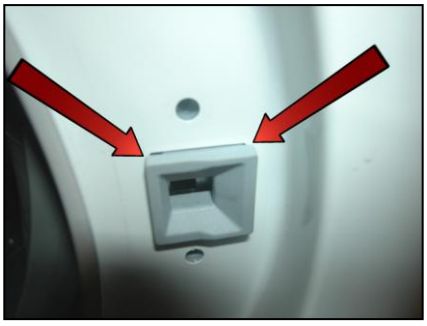


Pull out the wiring protection from the door safety interlock.
Disconnect the connector.

To reassemble the door safety interlock, repeat the same tasks in reverse order.

Before tightening the screws to secure the door safety interlock to the front panel, make sure the flange is positioned properly on the outside as indicated by the arrows.

Tighten the screws at a torque of 2.5 Nm.

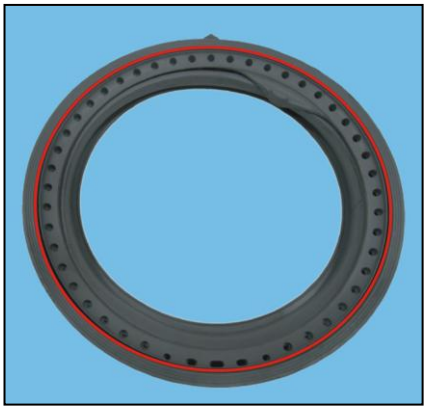


15.3.3 Bellow seal

Remove the iron ring securing the bellow seal to the cabinet.
Release the bellows seal from the front panel.

Take the seal out of the welded tub.
(take care as the seal is held in position by a snap ring)

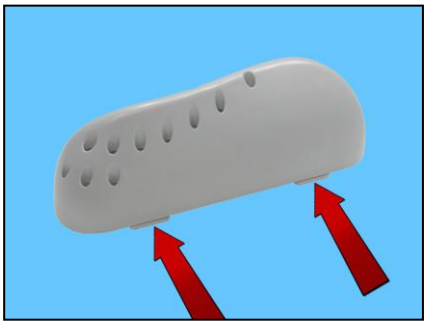
When reassembling the seal
Use liquid soap to lubricate the part where the tub is inserted (indicated by the red circle).
Make sure the references are aligned.
Reassemble the snap ring between the door bellow seal and the tub.
Reassemble the iron ring between the door bellow seal and the cabinet.



15.3.4 Blade

The blade is secured to the drum with slides and secured with blades carved into the drum.

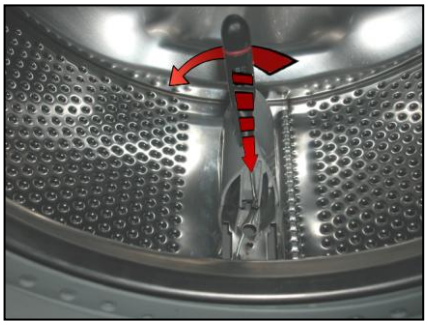
The blades are secured in place by four slides (indicated by the arrows) which fit into purpose-provided runners in the drum strip.



To release the blade from the drum:

Insert a flat-tip screwdriver into the hole (as shown in the figure)

With the screwdriver tilted towards the left
Push the right-hand tab downwards.

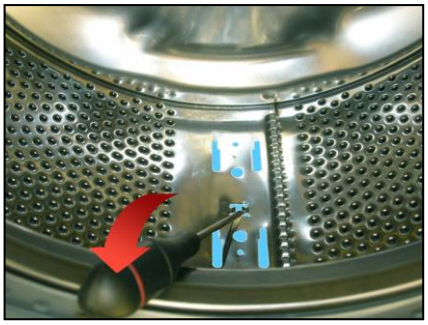


With the screwdriver tilted towards the right
Push the left-hand tab downwards.

When the two tabs are down
Concurrently, tighten the blade near the slides.
Push the blade towards the front of the drum

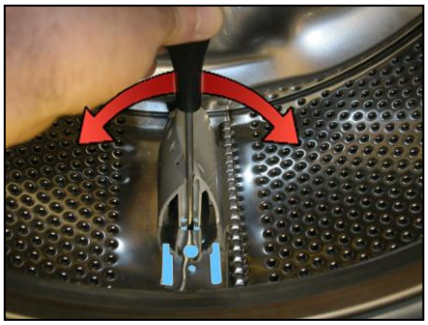
Reassembling the blade onto the drum

Before securing the new blade
Insert a screwdriver beneath the lock tabs and raise them a little.

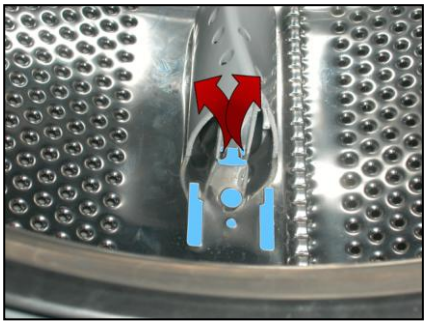


Position the new blade inside the drum guides.
Push it towards the back.

Insert the screwdriver (in the fourth slot) at a right angle to the blade,
so as to position it at the centre of the two lock tabs.
Move to the left and right.



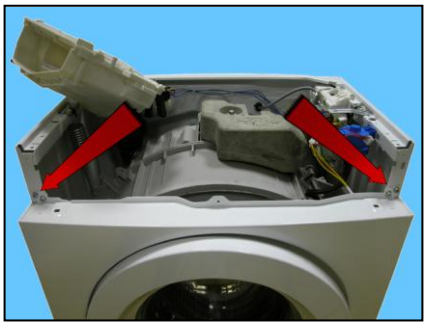
to move the tabs up (as indicated by the arrows) and insert them inside the blade, securing it to the drum (as shown in the figure).



15.3.5 Front panel

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring, remove the door bellow seal from the front panel.
Unfasten the screws securing the door safety interlock.

Tilt the washing machine towards the back.
Unfasten the three screws securing the front panel at the bottom.



Remove the four screws which secure the front panel to the sides.

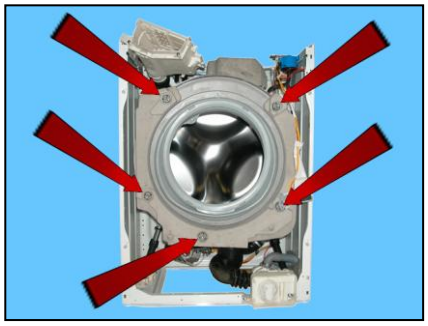
Remove the front panel

15.4 From the front panel, you can access

1. The front counterweight
2. The shock absorbers
3. The drain water circuit
4. The pressure chamber
5. The welded tub assembly
6. The tub suspension springs

15.4.1 Front counterweight

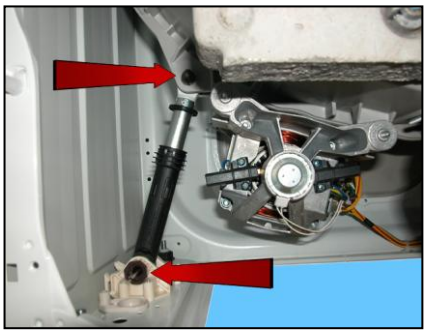
Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring securing the bellow seal to the front panel.
Unfasten the screws securing the door safety interlock (see related paragraph).
Remove the front panel (see relevant paragraph).
Unfasten the five screws securing the front counterweight to the welded tub assembly.

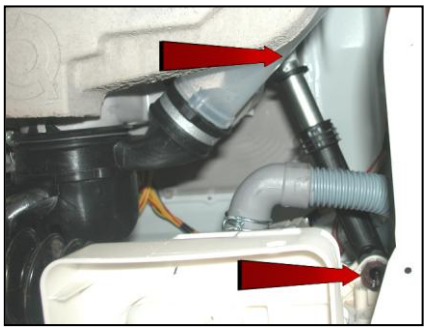


Not all appliances are fitted with the aqua control bottom. Consequently, certain operations can be carried out directly from the bottom of the appliance.

15.4.2 Shock absorbers

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring securing the bellow seal to the front panel.
Unfasten the screws securing the door safety interlock (see related paragraph).
Remove the front panel (see relevant paragraph).
Pull out the pins securing it to the tub and lower crosspiece.





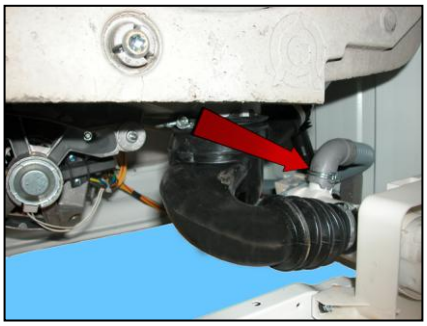
To reposition the pins, see para. 15.5 page 98

15.4.3 Drain water circuit

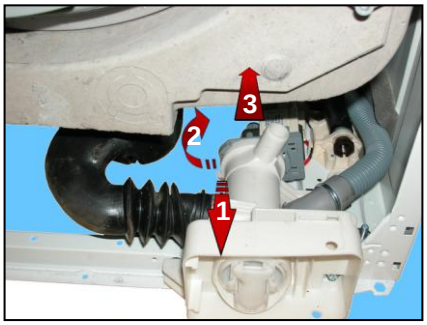
15.4.3.1 Drain pump

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring securing the bellow seal to the front panel.
Unfasten the screws securing the door safety interlock (see related paragraph).
Remove the front panel (see relevant paragraph).

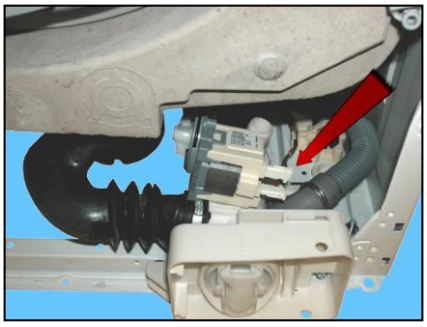
Pull out the main drain pipe



Move tooth 1 (take care not to break it)
Turn pump 2 in a clockwise direction and simultaneously extract it from the filter body 3.



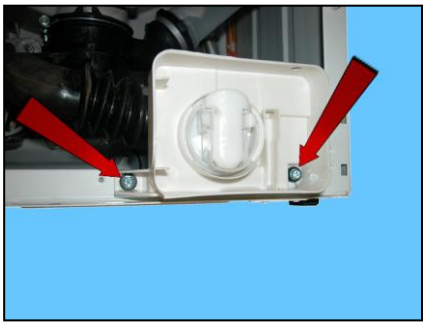
Remove the connectors from the pump.



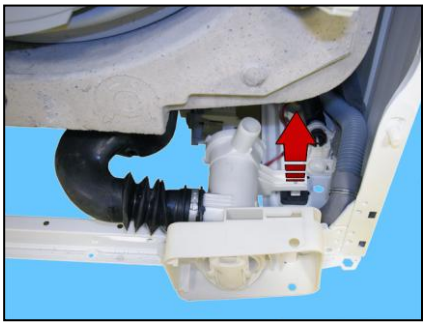
15.4.3.2 Filter body

Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring securing the bellow seal to the front panel.
Unfasten the screws securing the door safety interlock (see related paragraph).
Remove the front panel (see relevant paragraph).
Remove the drain pump.

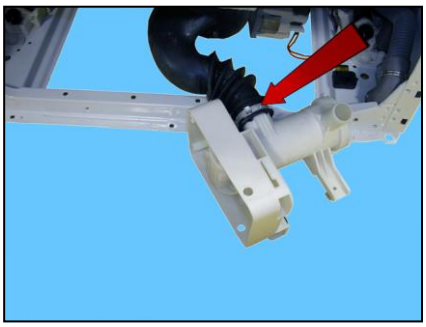
Loosen the screws securing it to the front crossbar.



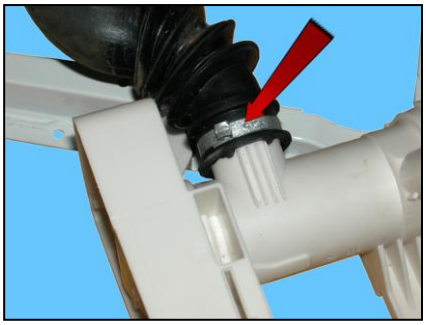
Lift the filter body to extract the support inserted on the side crossbar.



Remove the filter body and break/loosen the clamp (indicated by the arrow).



When refitting the filter body, pay attention to the reference points of the drain pipe and filter body.
Use a clamp with the same characteristics (measuring 40.5 mm)



15.4.3.3 Tub drain pipe and pressure chamber

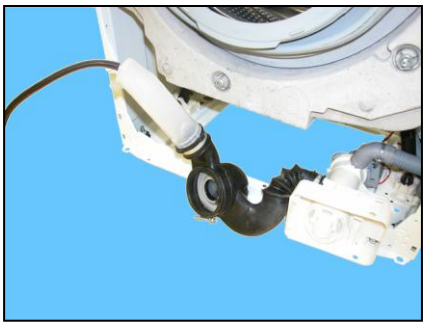
Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the iron ring securing the bellow seal to the front panel.
Unfasten the screws securing the door safety interlock (see related paragraph).
Remove the front panel (see relevant paragraph).
Remove the rear back panel (see relevant paragraph).

Pull out the pipe which connects the pressure switch to the pressure chamber (from one side or from the other).

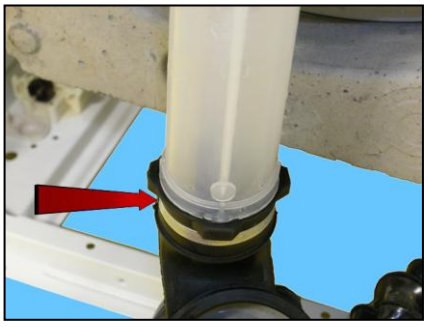
From the rear (back panel)
Unfasten the screw that secures the chamber to the welded tub Push the hook (1) while at the same time lifting the chamber (2) off the support which secures it to the tub.

From the front (front panel)
Loosen the screw of the clamp securing the tub drain pipe to the welded tub.

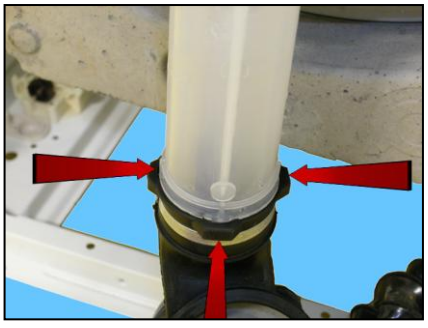
Remove it from its position, pull it out together with the pressure chamber



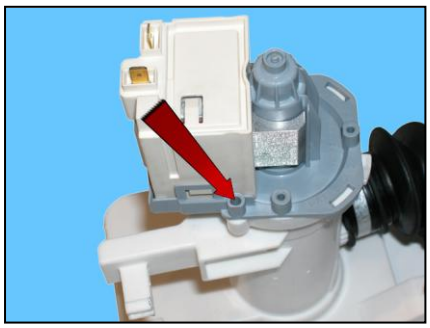
To remove the pressure chamber from the tub drain pipe Loosen/break the clamp indicated by the arrow.



When repositioning the pressure chamber, pay attention to the correct position of the three references.
Use a clamp with the same characteristics as the one you removed.
The clamp measures 52.5 mm.



Reference between drain pipe and welded tub.

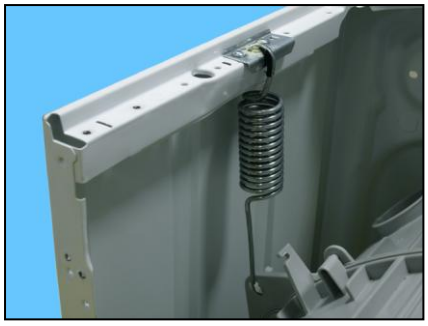


If the lock catch securing the pump to the filter body breaks.
Use a screw size 3.5x19 Code 5024 79 51- 00/2.
Screw it into the slot indicated by the arrow.

15.4.4 Welded tub assembly

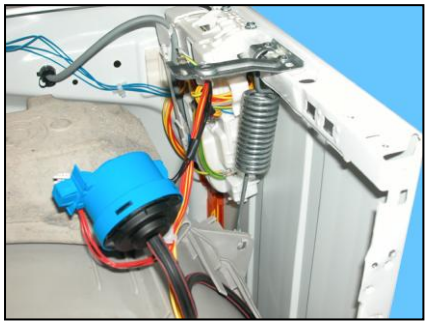
Remove the worktop (see relevant paragraph).
Remove the control panel (see relevant paragraph).
Remove the front panel (see relevant paragraph).
Remove the detergent tray (see relevant paragraph).
Remove the upper counterweight (see relevant paragraph).
Remove the front counterweight (see relevant paragraph).
Remove the back panel (see relevant paragraph).
To remove the washing unit assembly, disconnect:
All the tub pipes, the wiring connectors that connect the heating element, the NTC probe, remove the belt and the motor (to lighten the tub).
Lay the appliance on its back (making sure you place a polystyrene or cardboard layer on the floor to prevent damaging the cabinet).
Take the tub out of the washing machine

15.4.5 Tub suspension springs



- Left spring

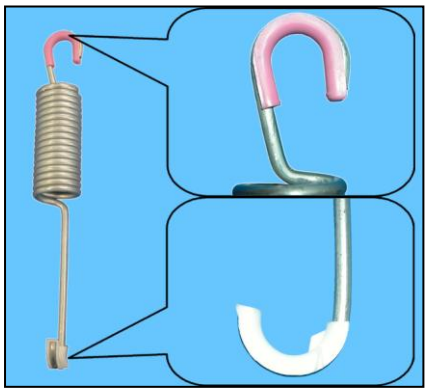
Attach the spring as shown in the figure: the shortest leg faces towards the side, whereas the longest leg faces towards the welded tub.



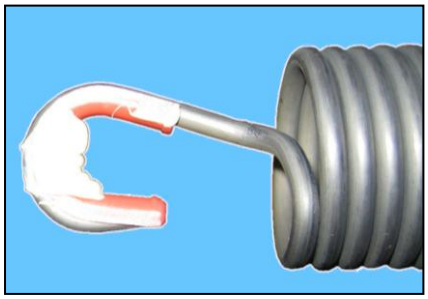
- Right spring

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

When reattaching the springs (after repair work which required their removal), make sure that the bushings shown in the figure are featured on both ends (the colour of the bushings in the photos below may vary).
Pay attention to the differences between the bushings (see enlarged details).
Spare bushings are available, under the following codes:



Upper bushing Code 405 50 62-51/9
Lower bushing Code 405 50 62-52/7

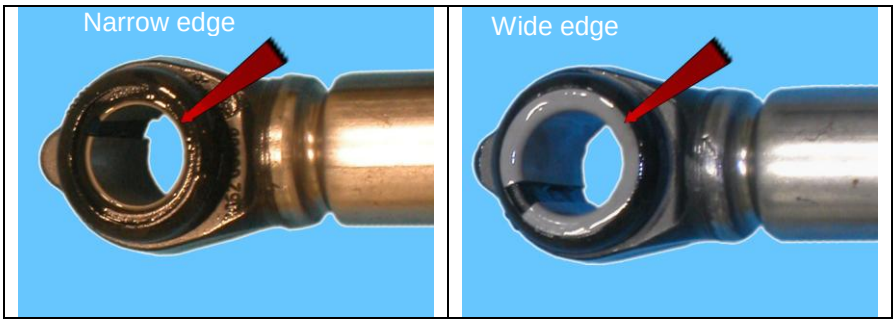


Apply some grease on either end of the spring. Use grease Cod. 5026 24 16-00/6

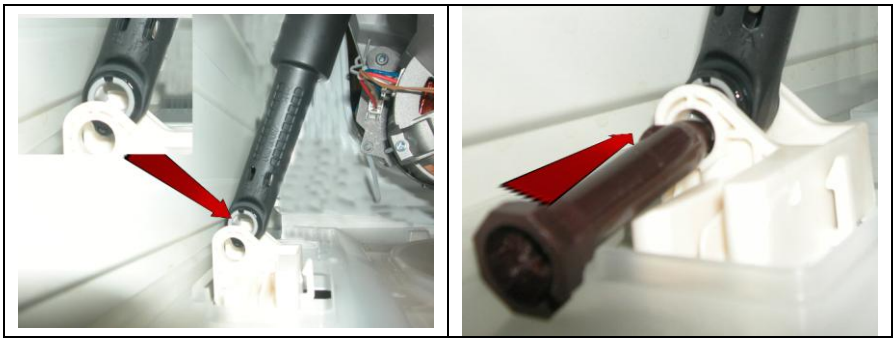
Position in which the springs are hooked to the sides.

15.5 Shock absorber pin

There is a bushing on either end of the shock absorber. It has a wider profile on one end to avoid it becoming dislodged when the pin is inserted (see the two figures below).



When positioning the shock absorber inside the fastening (situated at the bottom of the cabinet or in the tub), take care when positioning the bushing, so as to insert the pin from the part of the bushing with the widest profile.
The spare bushing is supplied under Code 344 91 25-30/5



If you are having difficulty inserting the pin, grease it a little (code 5026 24 16-00/6).

15.6 Accessing the rear part

15.6.1 Back panel

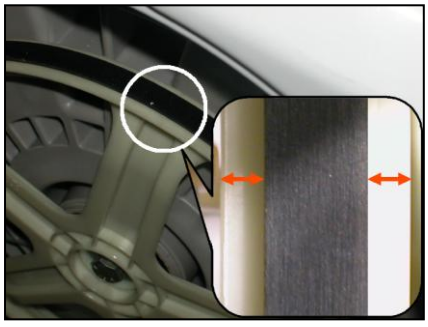
Loosen the screws that fix it to the cabinet

15.7 From the back panel, you can access

1. Belt
2. Plastic pulley (∅ 273 mm)
3. Motor
4. Resistance
5. Shock absorber

15.7.1 Belt

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



When reassembling:
Position the belt, and align it with the centre of the pulley (∅ 273 mm) as shown in the figure.

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

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

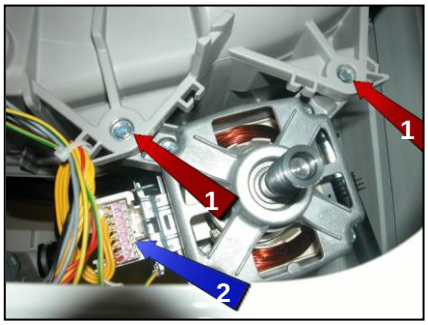
15.7.2 Plastic pulley (∅ 273 mm)

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

Tighten the screw at a torque of 60 Nm.

15.7.3 Motor

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



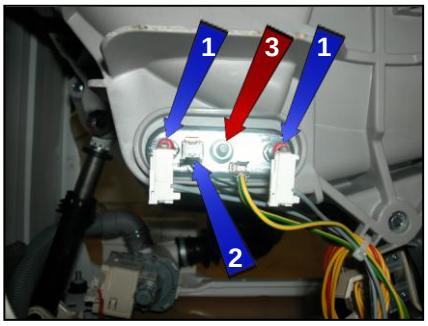
Loosen the two front fastening screws (1) and the rear ones (not visible in the figure).
Disconnect the connectors (2): for the power supply and earthing

When reassembling, restore the connections.

If the clamp securing the wiring to the motor breaks, replace it with a new one.

Tighten the screws at a torque of 5 Nm.

15.7.4 Resistance

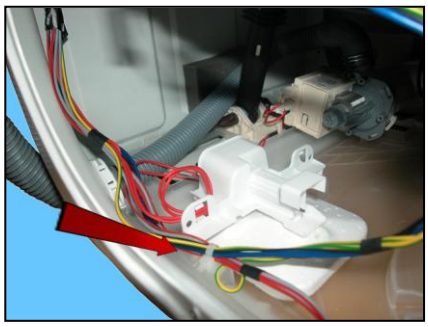


Remove the back panel (see relevant chapter).

Disconnect the connectors of the heating element (1) and NTC probe (2).
Loosen the nut (3) and pull it out.

Tighten the nut at a torque of 4 Nm.

15.7.5 Aqua control (where featured)



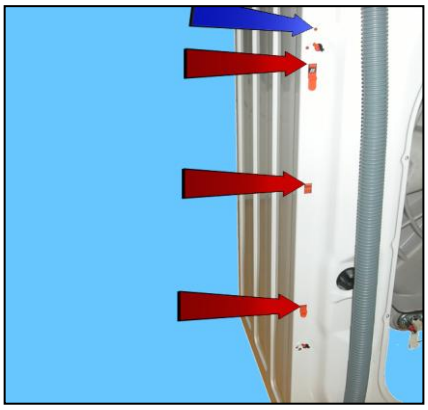
Remove the back panel (see relevant chapter).

Release the hooks securing it to the bottom and disconnect the connector.

15.7.6 Wiring support

When fixing the wiring support make sure that the two stops (indicated by the red arrows) fit into their housings, locking the support to the unit.

If the fixing is not stable and there is a risk of it coming out of its position, fasten the support to the unit with a screw (6.5 x 3.5 mm) screwed into the hole indicated by the blue arrow.



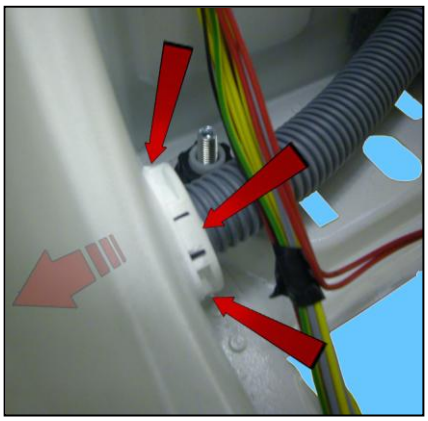
15.7.7 Main drain pipe

Unfasten the screw (Torx with pawl in the middle) which fastens the pipe fastener at the top of the appliance
Straighten out the pipe to drain the water into a container.

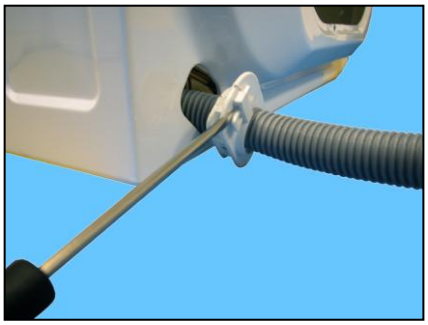
Remove the back panel (see relevant chapter).

Remove the clamp (indicated by the arrow) which secures the drain pipe to the drain pump

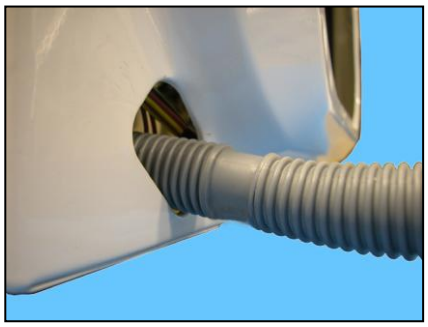
Remove the pipe fastener fixing it to the cabinet by pressing the three hooks (indicated by the arrows) and pulling it outwards at the same time.



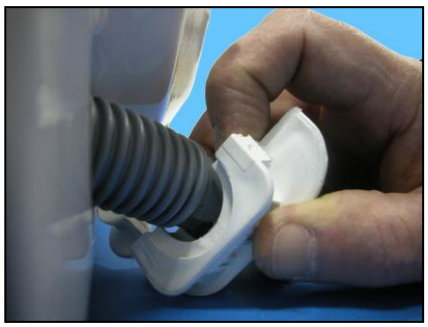
Insert a screwdriver to open up the cabinet pipe fastener.



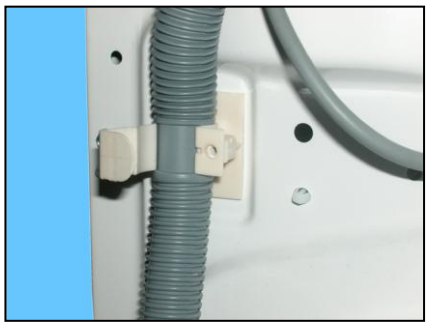
When refitting the pipe, make sure that the non-corrugated part.



is inserted inside the pipe fastener seating.

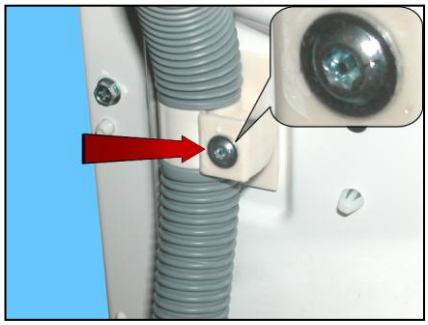


The other non-corrugated section of the pipe must be positioned in the pipe fastener located in the upper area of the appliance.



Close the pipe fastener, tighten the safety Torx screw (with the pawl in the middle of the head).

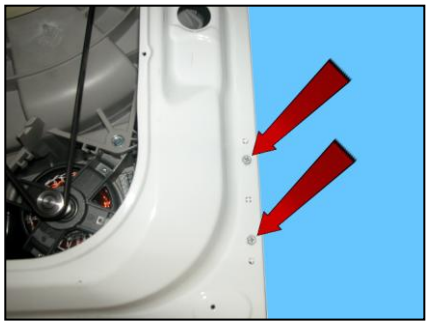
DO NOT USE OTHER SCREWS



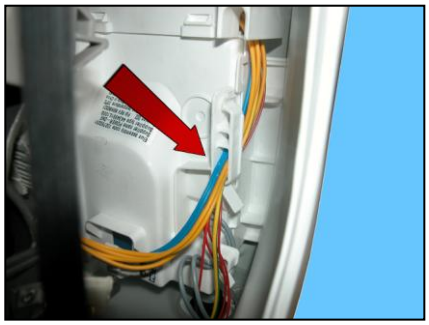
15.7.8 Inverter (in appliances where featured)

Remove the back panel (see relevant chapter).

Loosen the two screws that fix it to the cabinet



Remove the wiring from the hook of the inverter casing.

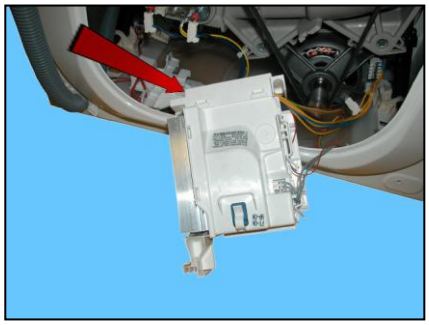


Move the inverter towards the inside of the appliance and lift it up.
To pull out the hook that secures it to the crossbar

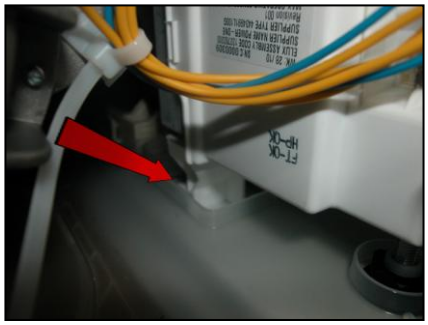
Pushing the washing unit towards the inside, turn and position the inverter as shown in the figure.

Turn it

Open the wiring protection and disconnect the connectors.



When repositioning the inverter in its seat, pay attention that the hook is inserted in its position in the crosspiece



REVISION:

Revision	Date	Description	Author	Approved by:
00	05/2012	Document creation	DMM	XX – 0X/201X