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**Washing machines with  
EWM 1000 PLUS  
electronic control system  
and  
“AEG Nexxt”  
display board**

**With sensor  
ARCHED cabinet**



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# 1 Purpose of this manual

The purpose of this manual is to provide service engineers who are already familiar with the repair procedures for traditional washing machines with information regarding appliances fitted with the EWM 1000 plus electronic control system.

The electronic control system plus EWM1000 plus consists of a main electronic board and one control/display board, "Aeg Nexxt" version.

The following are described:

- General characteristics
- Control panel and washing programmes
- Technical characteristics
- Guide to the diagnostics

For detailed information concerning hydraulic circuit, structural characteristics of the appliances and accessibility, please refer to Service Manual of washing machines with ARCHED cabinet (publication no. 599 376782).

## 2 PRECAUTIONS



- **Electrical appliances must be serviced only by qualified Service Engineers.**
- **Always remove the plug from the power socket before touching internal components.**

## 3 GENERAL CHARACTERISTICS

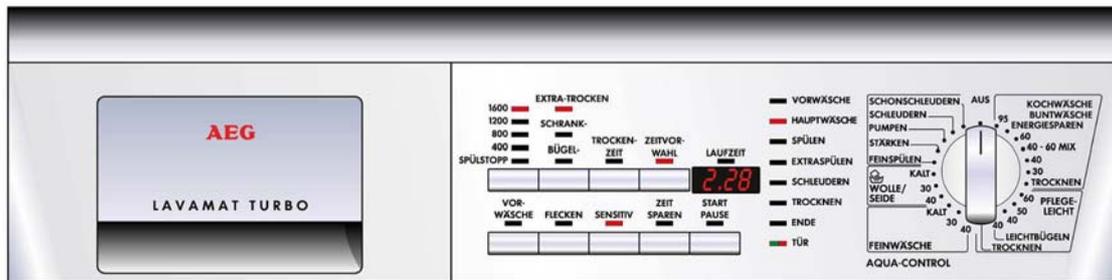
<b>Programme selector</b>	▪ 24-position with incorporated general switch
<b>Serial port</b>	▪ DAAS-EAP communications protocol up to 38400 baud
<b>Power supply</b>	▪ 220/240V ▪ 50/60 Hz (configurable)
<b>Type of washing</b>	▪ Traditional ▪ with "eco-ball" sphere
<b>Rinsing system</b>	▪ Traditional
<b>Motor</b>	▪ Collector, with tachometric generator
<b>Spin speed</b>	▪ 850 ÷ 1600 rpm
<b>Anti-unbalancing system</b>	▪ FUCS
<b>Water fill</b>	▪ 1 solenoid valve with 1 inlet – 2 or 3 outlets
<b>Detergent drawer</b>	▪ 3 compartments: prewash/stains, wash, conditioners ▪ 4 compartments: prewash/stains, wash, conditioners, bleach
<b>Control of water level in the tub</b>	▪ two-level pressure switch: 1st level and anti-boiling safety level (the other levels refer to fixed-time fills) ▪ possibility of three-level pressure switch: 1st level, anti-boiling and anti-flooding safety levels
<b>Door safety device</b>	▪ Traditional (with PTC) ▪ Instantaneous
<b>Power of heating element</b>	▪ Up to 1950W
<b>Temperature control</b>	▪ NTC sensor
<b>Sensors</b>	▪ Water Control

## 4 CONTROL PANEL

The configuration of the control panel depends on the following:

- ↪ Type of control/display board
- ↪ Programme selector
- ↪ Design of the control panel (no. of buttons, LEDs)
- ↪ Different configuration of the buttons

**Example of control panel:**



**Buttons:**

- max. 9, horizontally

**LEDs:**

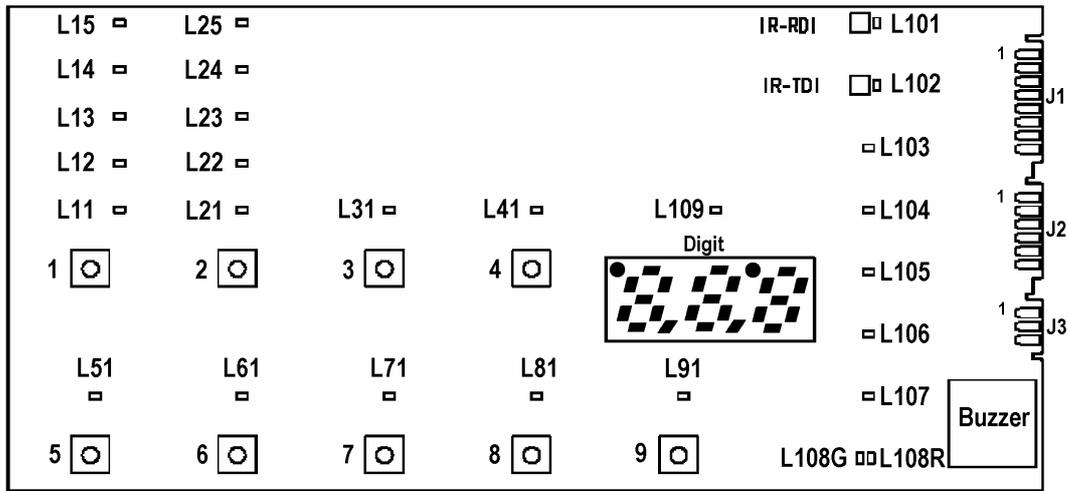
- max. 27

**Display:**

- 3 digits with 24 red LEDs

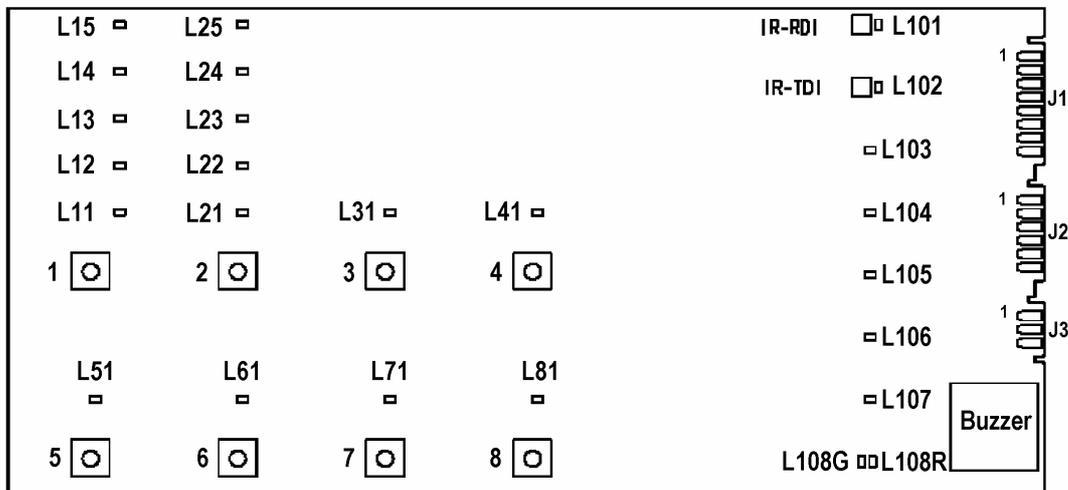
## 4.1 Control/display board

### 4.1.1 Version with display:



- ⇒ 3 digits
- ⇒ 27 LEDs: 26 red, one bicolour (red and green)
- ⇒ 9 buttons

### Version without display:



- ⇒ 26 LEDs: 25 red, one bicolour (red and green)
- ⇒ 8 buttons

## 4.2 Washing programmes

### 4.2.1 Configuration of the programmes

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

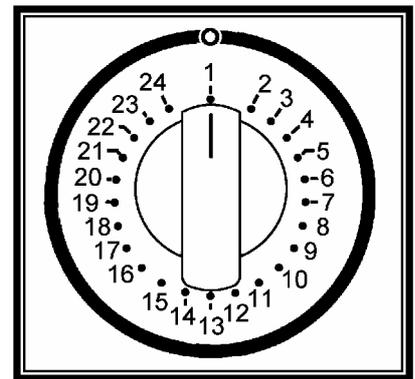
<b>Types of fabrics</b>	Cotton/linen, Synthetics, Delicates, Wool, Hand-wash
<b>Special programmes</b>	Soak, Rinses, Spin, Drain, Conditioner
<b>Temperature</b>	Normal, Maximum: the initial temperature is the maximum that can be selected for a specific washing programme
<b>Spin</b>	Normal, Minimum, Maximum
<b>Options (Normal/Possible)</b>	Bleach, Economy (energy label), Stains, Short, Very short, Reduced spin speed, Night-time cycle, Half-load, Easy-Iron, Rinse Hold, Extra rinse, Pre-wash, Soak and Sensitive
<b>Programme phases</b>	Pre-wash, Wash, Rinses, Spin, Economy, Delayed start

### 4.3 Programme selector

The programme selector defines the type of washing cycle (ex: water level, drum movement, no of rinses) and washing temperature to be selected according to the type of wash.

The programme selector can be rotated both clockwise and anti-clockwise.

The first position is used to cancel the current programme and to switch the appliance off, if the main switch is incorporated in the selector.



### 4.4 Start/Pause

**Start:** after selecting the programme and the desired options, press this button to start. If the delay time has been selected, the countdown will begin and the display will indicate it. The LED stops flashing and remains lit for the whole duration of the programme.

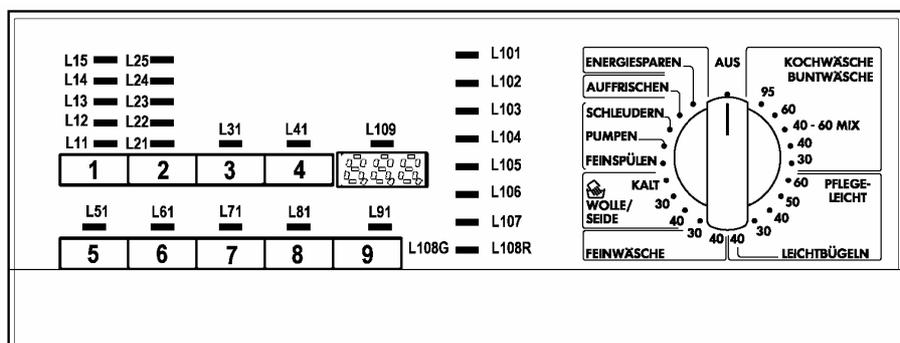
**Pause:** by pressing the button again, the current programme is interrupted and the display or the corresponding LED starts flashing. During the pause phase it is possible to open the door only if the machine is not during the heating phase, the water level is not high and the drum is not moving.

**During the pause** it is possible to modify the programme as follows:

- the OPTIONS of the cycle can be modified before the phase by which they have to be performed
- the SPIN can be modified before the final spin

**To re-start the programme** press the START/PAUSE button again.

### 4.5 Functions of the buttons



*The washing programmes and the functions of the single buttons vary for the different models, since they are determined by the configuration operation of the appliance.*

## 5 WASHING PROGRAMMES AND OPTIONS

### 5.1 Programmes

The washing programmes can be configured. The basic programmes are listed in the table below.

Programme	Temperature (°C)	Number of rinses	Final spin (rpm)	
<b>Cotton</b>	<b>90</b>	87	450/650/850/1000/1200/ 1300/1400/1600	
	<b>90E</b>	67		
	<b>60</b>	60		
	<b>60E</b>	50 (*)(**)		
	<b>50</b>	50		
	<b>50/40E</b>	44 (*)		
	<b>40</b>	40		
	<b>30</b>	30		
<b>cold</b>	20			
<b>Synthetic fabrics</b>	<b>60</b>	60	3	Max. 900
	<b>60/50E</b>	42 (*)		
	<b>50</b>	50		
	<b>40</b>	40		
	<b>30</b>	30		
<b>Delicates</b>	<b>cold</b>	20	3	450/700
	<b>40</b>	40		
	<b>30</b>	30		
<b>Wool</b>	<b>40</b>	40	3	Max. 1000
	<b>30</b>	35		
	<b>cold</b>	20		
<b>Hand-wash</b>	<b>40</b>	40	3	Max. 1000
	<b>30</b>	35		
	<b>cold</b>	20		
<b>Soak</b>	30/20	----	----	
<b>Rinses</b>	----	3	Max. 1600	
<b>Delicate rinses</b>	----	3	Max. 700	
<b>Conditioner</b>	----	1	Max. 1600	
<b>Drain</b>	----	----	----	
<b>Spin</b>	----	----	Max. 1600	
<b>Delicate spin</b>	----	----	Max. 700	
<b>Mini</b>	30	2	Max. 1000	

(\*) "Energy label" programmes

(\*\*)

Programme	Group	Temperature (°C)
<b>COTTON 60 E</b>	G18	50
	G19	53
	G20	45
	G22	47

## 5.2 Options of the washing cycle

The selection of the options is to be carried out after switching on the appliance and setting the desired programme with the selector and before pressing the start/pause button.

When the button is pressed, the corresponding LED lights; by pressing it again the LED switches off.

### Possible options according the selected programme

			OPTIONS														
			Rinse-hold	Night cycle	Pre-wash	Soak	Stains	Daily	Short	Economy	Sensitive	Extra rinse	Bleach	Half-load	Easy iron	Reduced spin speed	No spin
Compatibility with PROGRAMMES	COTTON	90°C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		60°C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		50°C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		40°C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		30°C	X	X	X	X		X	X		X	X	X	X	X	X	X
		Cold	X	X	X	X		X	X		X	X	X	X	X	X	X
	SYNTHETIC FABRICS	60°C	X	X	X	X	X	X	X	X	X	X			X	X	X
		50°C	X	X	X	X	X	X	X	X	X			X	X	X	
		40°C	X	X	X	X	X	X	X		X	X			X	X	X
		30°C	X	X	X	X		X	X		X	X			X	X	X
		Cold	X	X	X	X		X	X		X	X			X	X	X
	MINI PROGRAMME	30°C	X	X												X	X
		Cold	X	X												X	X
	DELICATES	40°C	X	X	X	X			X			X				X	X
		30°C	X	X	X	X			X			X				X	X
		Cold	X	X	X	X			X			X				X	X
	WOOL - HAND-WASH	40°C	X	X												X	X
		30°C	X	X												X	X
		Cold	X	X												X	X
	SOAK																
RINSES		X	X							X	X	X		X	X	X	
CONDITIONER		X	X											X	X	X	
DRAIN																	
SPIN															X		
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				
	PRE-WASH	X	X				X	X	X	X	X		X	X	X	X	
	SOAK	X	X				X	X	X	X	X		X	X	X	X	
	STAINS	X	X				X	X	X	X	X		X	X	X	X	
	DAILY	X	X	X	X	X				X	X	X	X	X	X	X	
	SHORT	X	X	X	X	X				X	X	X	X	X	X	X	
	ECONOMY	X	X	X	X	X				X	X	X	X	X	X	X	
	SENSITIVE	X	X	X	X	X	X	X	X		X	X	X		X	X	
	EXTRA RINSE	X	X	X	X	X	X	X	X	X		X	X	X	X	X	
	BLEACH	X	X				X	X	X	X	X		X	X	X	X	
	HALF LOAD	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	
	REDUCED SPIN SPEED	X		X	X	X	X	X	X	X	X	X	X				
	NO SPIN	X		X	X	X	X	X	X	X	X	X	X	X			
Phases in which selection is possible	PRE-SELECTION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	PRE-WASH	X	X			X	X	X	X	X	X	X	X	X	X	X	
	WASH	X	X			X	X	X	X	X	X	X	X	X	X	X	
	RINSES	X													X	X	
	SPIN														X	X	

## 5.3 Description of options

### 5.3.1 Night cycle

- ↖ Eliminates all spin phases and adds **three** rinses in COTTON cycles and **two** rinses in SYNTHETICS cycles.
- ↖ Stops the appliance with water in the tub before the final rinse.
- ↖ Switches off the buzzer (if configured)
- ↖ To drain the water select a drain or spin cycle.

### 5.3.2 Rinse-hold

- ↖ Stops the appliance with water in the tub before the final spin cycle.
- ↖ Switches off the buzzer (if configured)
- ↖ To drain the water select a drain or spin cycle.

### 5.3.3 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 to the washing phase.
- ↖ This option cannot be selected for WOOL and HAND-WASH cycles.

### 5.3.4 Soak

- ↖ Adds a pre-wash phase (30' duration with wool cycle movement) at the start of the cycle with water heating at 30°C (or cold, if selected).
- ↖ In COTTON and SYNTHETICS cycles, performs a short spin (impulse) before passing to the washing phase.
- ↖ Together with the delayed start option it is possible to select a soak time from 30 minutes up to 10 hours.
- ↖ This option cannot be selected for WOOL and HAND-WASH cycles.

### 5.3.5 Stains

- ↖ Adds a 5-minute motor movement phase after heating to 40°C.
- ↖ Ducts water to the pre-wash/stains compartment in order to introduce the special stain-removal product.
- ↖ This option cannot be selected for DELICATES, WOOL and HAND-WASH cycles.
- ↖ The movements during the washing phase change from vigorous to normal.

### 5.3.6 Short (daily)

- ↖ Modifies the structure of the washes in the COTTON and SYNTHETICS programmes in order to obtain good washing performance with a very short cycle (optimization for small loads).

### 5.3.7 Very short

- ↖ Modifies the structure of the COTTON, SYNTHETICS and DELICATES programmes in order to obtain short washing times (optimization for small or lightly-soiled loads).
- ↖ Reduces the number of rinse cycles (one less).
- ↖ Increases the water level in the remaining two rinse cycles.

### 5.3.8 Economy / Energy label

- ↖ Modifies the structure of the COTTON 40°/50°/60°/90° - SYNTHETIC FABRICS 50°/60° programmes in order to reduce energy consumption.
- ↖ Reduces the washing temperature in 90°/60°/50° programmes, while for the 40° programme the temperature is increased by 4°.
- ↖ Increases the duration of the wash phase.

### 5.3.9 Sensitive

- ↵ Adds a rinse in the COTTON – SYNTHETIC FABRICS.
- ↵ During the cotton cycles the movements pass from vigorous to normal.
- ↵ Eliminates the intermediate spins except from the last two which are reduced.

### 5.3.10 Extra rinse

Adds two rinses in the COTTON, SYNTHETICS and DELICATES cycles.  
Eliminates the intermediate spin cycles, with the exception of the last rinse, which is reduced to 450 rpm.  
If the appliance features this button press it and then the corresponding LED lights.

### 5.3.11 “Half load” button

- ↵ Eliminates a rinse in the COTTON programmes.

### 5.3.12 Easy-Iron

- **In COTTON programmes:**
  - ↵ Adds three rinses.
  - ↵ Eliminates the intermediate spins.
  - ↵ Performs an impulse spin phase.
  - ↵ Adds an “untangling” phase after the spin cycle.
- **In SYNTHETICS cycles:**
  - ↵ Reduces the heating temperature in 50/60° cycles to 40°C.
  - ↵ Increases the washing time.
  - ↵ Prolongs the cooling phase at the end of the washing phase.
  - ↵ Adds one rinse without spin cycle.
  - ↵ Adds an “untangling” phase after the impulse spin cycle.

### 5.3.13 Reduced spin speed

- ↵ Reduces the speed of **all** spins as shown in the table.

<b>Maximum spin speed (rpm)</b>	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
<b>Reduction for COTTON (rpm)</b>	450	450	450	450	500	550	600	650	700	750	800
<b>Reduction for ALL OTHER CYCLES (rpm)</b>	450	450	450	450	450	450	450	450	450	450	450

### 5.3.14 No spin

- ↵ Eliminates **all** the spin phases.
- ↵ If selected, three rinses are added in the COTTON cycle and one in the SYNTHETICS cycle.

### 5.3.15 Modifying the spin speed

- ↵ Reduces the speed of **all** spin cycles.
- ↵ The last position can be used for NO SPIN, RINSE-HOLD.
- ↵ If the NO-SPIN option is selected, three rinses are added in the COTTON cycle, and one in the SYNTHETICS cycle.

### 5.3.16 Time reduction (Quick)

- ↵ Modifies the structure of the COTTON - SYNTHETICS– DELICATES programmes to obtain washing time very short (optimization for small or lightly-soiled loads).
- ↵ Reduces the no. of rinses (one rinse less).
- ↵ Increases the water level of the other two rinses.
- ↵ Corresponds to the SHORT- VERY SHORT cycles on the basis of the configuration of the appliance.

### 5.3.17 Temperature adjustment

- ↵ Used to select the washing temperature compatibly with the limit temperature for the cycle.
- ↵ Can be used during the cycle selection phase: the temperature can be modified only if the heating phase has not started (in pause mode).

### 5.3.18 “Exclusion of the buzzer”

In models with the buzzer it is possible to exclude the acoustic signal during the selection or at the end of the cycle, but the alarm remains on. The key combination is described in the user manual attached with the appliance.

### 5.3.19 Delayed-start time

- **Models with digit**

↵ It is possible to select, during the programme selection phase, a delayed start from 30 minutes up to 23 hours (↵ 30' ↵ 60' ↵ 90' ↵ 2h ↵ 3h... ↵ 23h ↵ 0h).

↵ During the delay phase, the time decreases every hour up to 2h, then by 30minutes.

↵ To start the cycle immediately, after the delay time began: press the Start/Pause button, cancel the delay time by pressing the relative button and press Start/Pause again.

- **Models with led**

↵ Insert a pause before the start of the programme, the delay time is indicated by the corresponding LEDs.

↵ To start the cycle immediately, after the delay time began: press the Start/Pause button, cancel the delay time by pressing the relative button and press Start/Pause again.

## 5.4 Variation of the rinses according to the options

		No of rinses with the options											
		Normal	Half load	Super rinse	Night cycle	Easy-ironing	Exclusion of spin	Super rinse and half load	Super rinse and night cycle	Night cycle and half load	Night cycle, super rinse and half load	Sensitive	
PROGRAMMES	COTTON	Normal	3	2	5	6	6	6	4	8	5	7	4
		Eco – Energy label	3	2	5	6	6	6	4	8	5	7	4
		Very short	2	2	4	5	5	5	4	7	5	7	3
	SYNTHETIC FABRICS	Normal	3	-	5	4	4	4	-	6	-	-	4
		Eco – Energy label	3	-	5	4	4	4	-	6	-	-	4
		Very short	2	-	4	3	3	3	-	6	-	-	3
	DELICATES	Normal	3	-	5	3	-	3	-	5	-	-	4
		Eco – Energy label	-	-	-	-	-	-	-	-	-	-	-
		Very short	2	-	4	2	-	2	-	4	-	-	3

## 5.5 Display (some models)

The display shows the following information:

- ⇒ **three flashing digits**, when the appliance is switched on.
- ⇒ **the duration of the washing programme**, which appears after selecting it. This time corresponds to that necessary for the maximum load for every type of programme. After starting the programme, the time diminishes (and updates) by every minute.
- ⇒ **the end of the programme** indicated by a "0" (when it is possible to open the door).
- ⇒ **the delayed start**, selected by the relative button. After pressing the START/PAUSE button, the countdown starts and the delayed time diminishes by every hour. In the last 2 hours diminishes by 30min.
- ⇒ **an alarm code**, indicating anomalies in the functioning of the machine.

## 5.6 LEDs

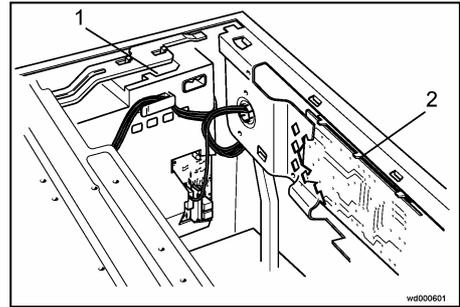
The LEDs indicate different information according to the type of configuration; the End-of-cycle Led is featured in all models.

Type of Led	Functions
<b>Pre-wash</b>	Lights during selection mode if the programme includes the pre-wash phase, and during the execution of the pre-wash.
<b>Wash</b>	Lights during selection mode if the programme includes the wash phase, and during the execution of the wash.
<b>Pre-wash/Wash</b>	Lights during selection mode if the programme includes the pre-wash or wash phases, and during the execution of these phases.
<b>Rinse</b>	Lights during selection mode if the programme includes rinse phases, and during the execution of the rinse.
<b>Spin</b>	Lights during selection mode if the programme includes the spin phase, and during the execution of the spin.
<b>Drain</b>	Lights during selection mode if the programme includes the drain phase, and during the execution of the drain
<b>Extra rinse</b>	Lights when this option has been memorized (if included in the cycle) during the execution of the rinse.
<b>Rinse hold</b>	Lights if the programme includes the rinse-hold option and at the end of the cycle, when the appliance stops with water in the tub.
<b>Current cycle</b>	Lights during execution of the cycle
<b>End of cycle</b>	Lights when the programme has been completed; also used to display alarm conditions
<b>Blocked filter</b>	Lights at the end of the cycle if the drain filter is blocked.
<b>Overdosing</b>	Lights at the end of the cycle if an overdosing alarm of detergent occurs.
<b>ON/OFF</b>	Lights when the appliance is switched on
<b>Door</b>	<ul style="list-style-type: none"> <li>⇒ Lights when the door is locked by the interlock.</li> <li>⇒ Switches off when the door is locked.</li> <li>⇒ Flashes when the door is about to unlock (it is clear above all in models with safety device with PTC)</li> </ul>
<b>Time-to-end</b>	Lights when the display shows the time-to-end

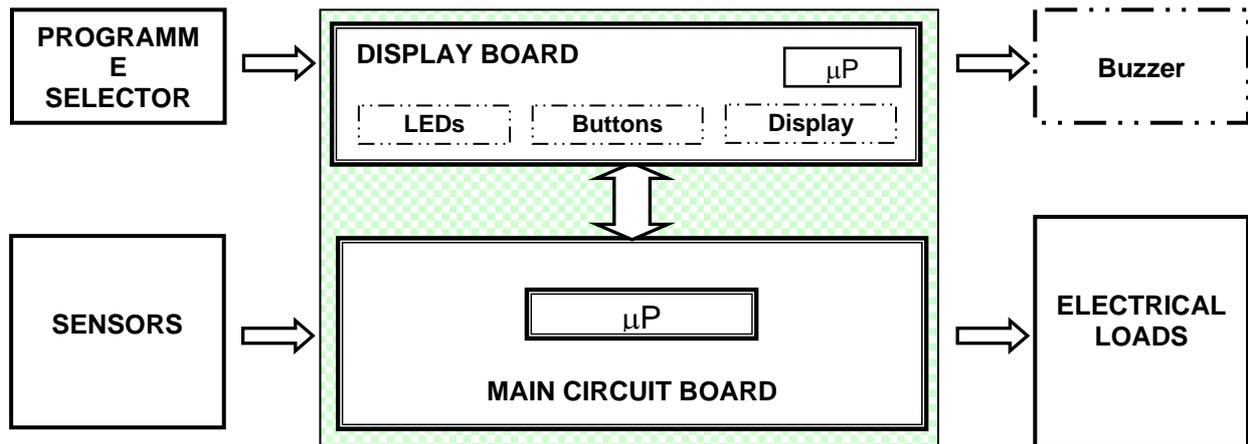
## 6 TECHNICAL CHARACTERISTICS

### 6.1 EWM1000 Plus Electronic control

The EWM1000 Plus electronic control consists of a main PCB (1) and a control/display board (2).

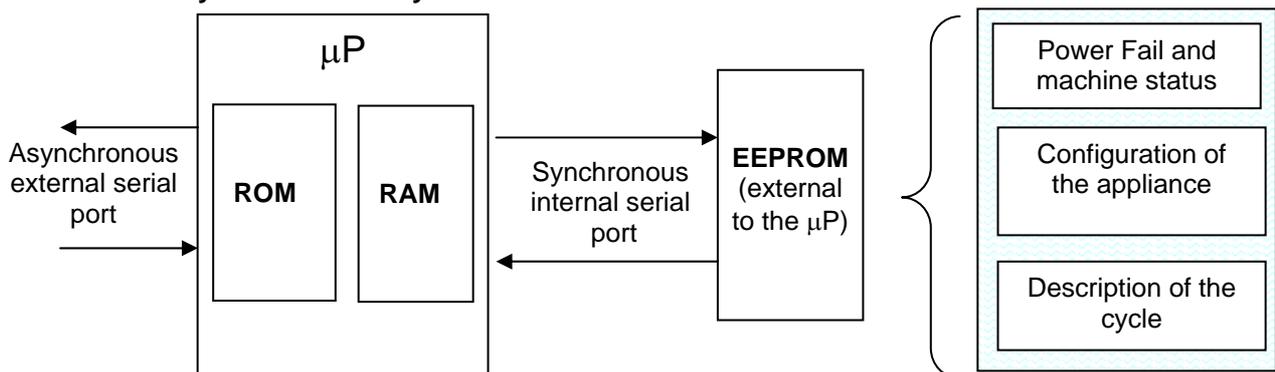


#### 6.1.1 Functions of the circuit board



- ⇒ The circuit board receives signals relative to the cycle settings via the control/display board. The buttons, the LEDs and the display are also mounted on this board which is connected to the programme selector.
- ⇒ The board also powers all the electrical components (solenoid valves, washing motor, drain pump, heating element, door interlock).
- ⇒ The board controls the temperature of the washing water via an NTC sensor, as well as the speed of rotation of the washing pump according to the signal received from the tachometric generator.
- ⇒ It checks the water level in tub via the level pressure switch and the safety one.

#### 6.1.2 Memory in the control system



The main circuit board features an EEPROM memory (external to the microprocessor) which stores in memory data relative to the configuration, description of the cycle, cycle status in case of a power failure, and any alarm conditions.

The configuration data (entered in the factory using a computer with a DAAS interface) determine the functionalities of the appliance (number and type of programmes, options, LEDs etc).

The overall structure of the microprocessor memory on the main PCB is subdivided into three sections:

**ROM** This area of memory contains the software with the general instructions that control the operation of the appliance, such as those of the electrical components and alarms. The ROM is set up by the manufacturer of the microprocessor, and cannot be modified.

**RAM** This part of memory contains all the variables used during the execution of the wash programme, which are written in dynamic format. The RAM can be read using a DAAS interface.

**EEPROM** This area of memory contains:

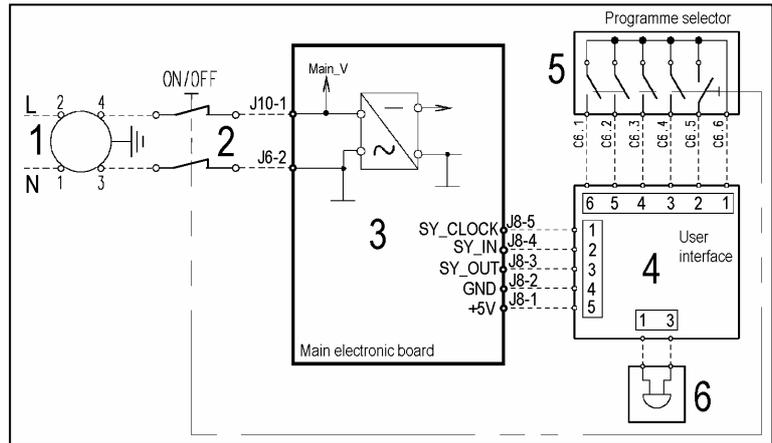
- the data necessary to restart the appliance in case of a power failure;
- the parameters for the wash cycle, such as water fill level, speed and type of motor movement, and the temperature during the various phases of the wash cycle. Once written, this data is protected and, normally, can be read only using a DAAS interface;
- data relative to the configuration of the appliance, such as the speed of the final spin phase, the volume of the tub, the type of washing system, etc. This data may be entered either via a DAAS interface or via the control/display board.

## 6.2 Power supply and programme selection

The main board (3) is powered by the interference suppressor (1) and by the closure of the contacts of the main switch (2). The affected connectors are J6-2 (neutral) and J10-1 (line).

The control/display board (4) is powered at 5V by the main board: through the programme selector (5) it is possible to select the programme. The selection of the options / start is performed through the board buttons (4).

The buzzer (if featured) (6) is powered by the display board.



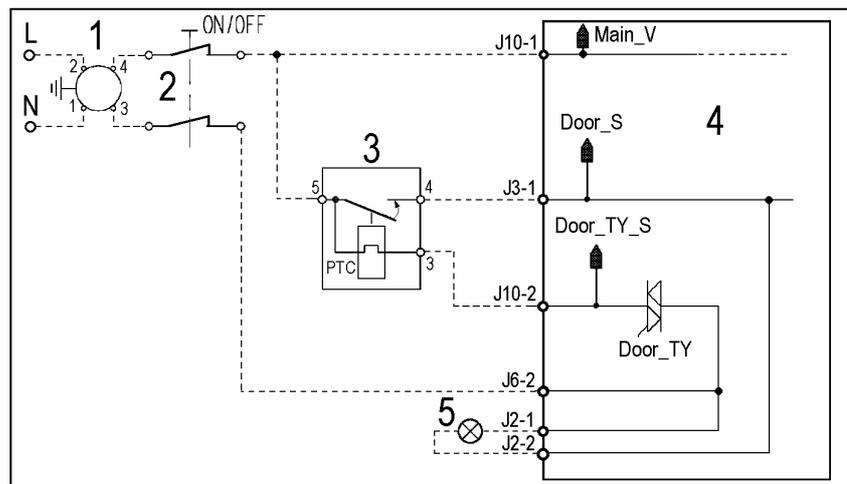
## 6.3 Door interlock

There are two types of door interlock:

- voltmetric with PTC: it is always necessary to wait from 1 to 3 minutes before opening the door.
- instantaneous: the door can be opened as soon as the cycle ends.

### 6.3.1 Voltmetric interlock with PTC

1. Suppressor
2. Main switch (button or programme selector)
3. Door interlock
4. Main PCB
5. Door pilot lamp closed



#### • Operating principle

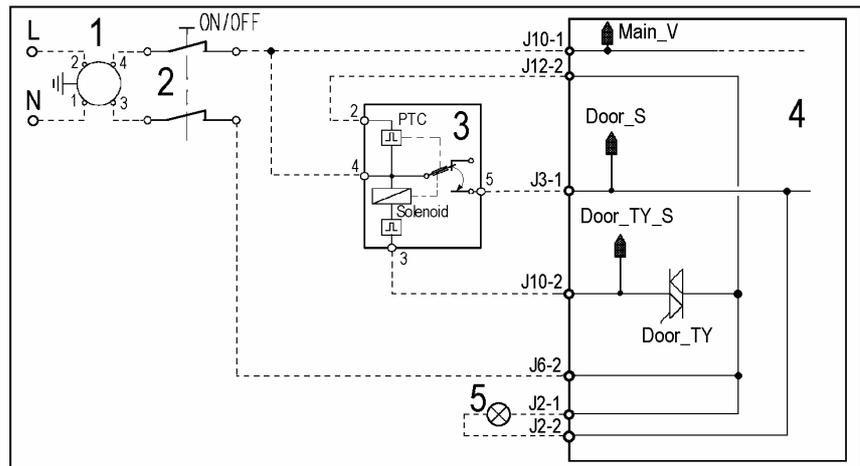
- ↪ When the washing programme is started by pressing the START/PAUSE button, the bi-metal PTC (contacts 3-5) is powered by the triac on the PCB (J6-2 connector): after 2 – 4 seconds, this closes the switch (5-4) which powers the electrical components of the appliance (only if the door is closed).
- ↪ The door interlock prevents aperture of the door while the appliance is in operation.
- ↪ At the end of the washing programme, the PCB disconnects the interlock from the power supply, but the door remains locked for 1 to 2 minutes (PTC cooling time).

#### Door locked” pilot lamp

- ↪ Certain models feature a pilot lamp which lights to indicate that the door is locked. This pilot lamp switches off when the door can be opened.

### 6.3.2 Instantaneous door interlock

1. Suppressor
2. Main switch (button or programme selector)
3. Door interlock
4. Main PCB
5. Door pilot lamp off

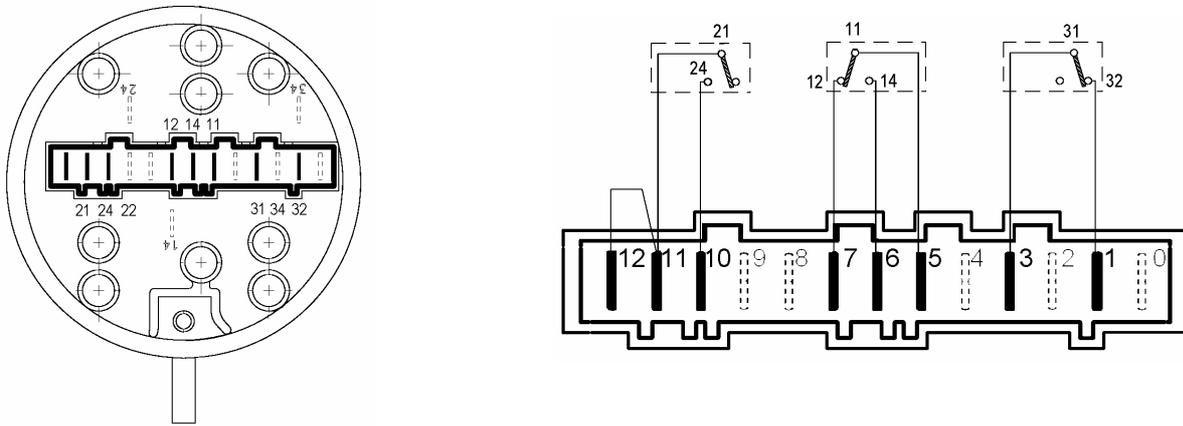


- **Operating principle**
  - ↪ When the appliance is switched on, the ON/OFF switch closes and the bi-metal PTC (contact 4-2) is powered; the door, however, is not locked.
  - ↪ When the programme starts (START/PAUSE button), the PCB transmits a 20 msec voltage signal to contacts 4-3 of the solenoid valve (J10-2 connector of the board) (at least 6 seconds must elapse after switching on); this signal locks the door and, at the same time, closes the main switch (contacts 4-5) which powers all the components in the appliance.
- At the end of the programme, the PCB transmits two 20 msec signals (at an interval of 200 msec).
  - the first signal does not release the door.
  - the second signal (which is transmitted only if the system functions correctly) releases the door interlock and at the same time the contacts of the main switch are opened.
- **Conditions necessary for door release**
  - ↪ Before transmitting the door release signals, the main 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 exceed 40°C.
- **Automatic release device**
  - ↪ In the event of a power failure, if the appliance is switched off, or if the solenoid should malfunction, the bi-metal PTC cools over a period of 1 to 4 minutes, and then releases the door.
- **“Door locked” pilot lamp**
  - ↪ Certain models feature a pilot lamp which lights to indicate that the door is locked. This pilot lamp switches off when the door can be opened.

## 6.4 Control pressure switch for water level in the tub

Control of the water level is performed by a two or three-level pressure switch which functions as follows:

- contact 11-14: anti-boiling safety level
- contact 21-24: first level
- contact 31-32: anti-overflow safety level (*not all models*)



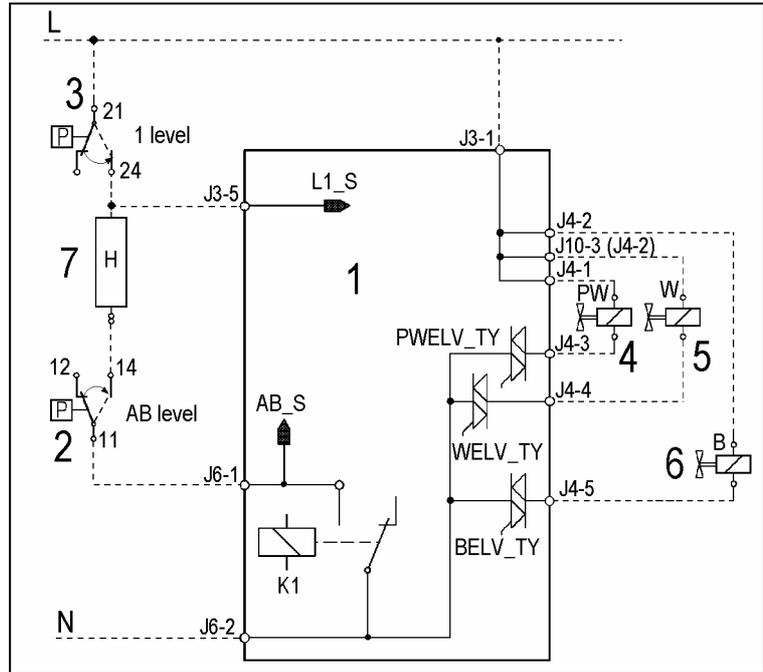
### 6.4.1 Pressure switch settings

	Full (mm)	Refill (mm)	Full (mm)	Refill (mm)
<b>Anti-boiling level</b>	60± 3	35± 3	55± 3	35± 3
<b>1st level</b>	95± 3	65± 3	80± 3	55± 3
<b>Anti- overflow level</b>	390± 15	240±50	390± 15	240±50

## 6.5 Water fill system

The solenoid valves are powered by the PCB via two or three triacs. The status of the pressure switch (empty/full) is detected by two "sensing" lines".

1. PCB
  2. Anti-boiling level
  3. 1st level
  4. Pre-wash solenoid
  5. Wash solenoid
  6. Bleach solenoid (some models)
  7. Heating element
- AB\_S Anti-boiling level sensor  
L1\_S 1st level sensor



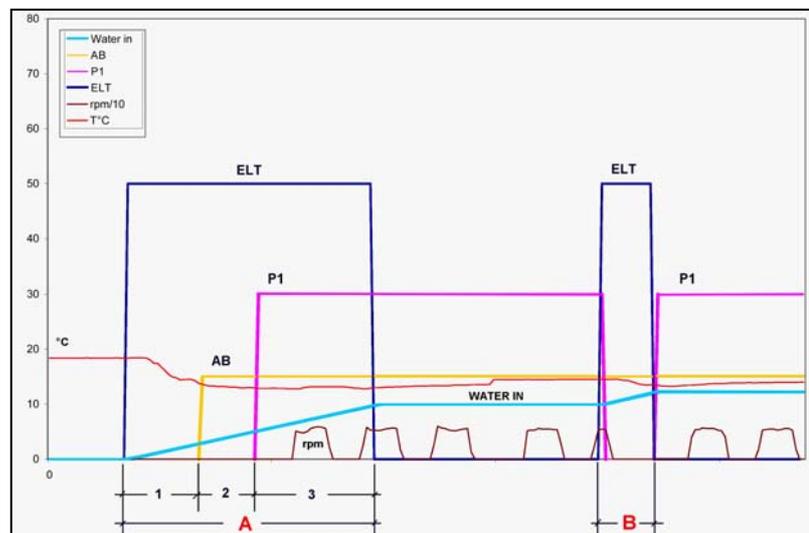
### 6.5.1 Calculation of flow rate

Calculation of the capacity – necessary to determine the time for the supplementary fill – is performed by measuring the time that elapses between the closure of the anti-boiling contact on FULL and the closure of the 1st level contact.

$\text{Flow rate} = \frac{\text{Volume}}{\text{Time (T1-T2)}}$	<p><b>Volume</b> = Volume of the tub between the two levels (anti-boiling and 1st level)  <b>T1 – T2</b> = The time that elapses between the closure of the anti-boiling and 1st level contacts on FULL</p>
--	---

### • Water fill diagram

- ELT** = solenoid valve  
**P1** = 1st level  
**AB** = anti-boiling level  
**rpm** = drum rotation speed  
**Water in** = water fill

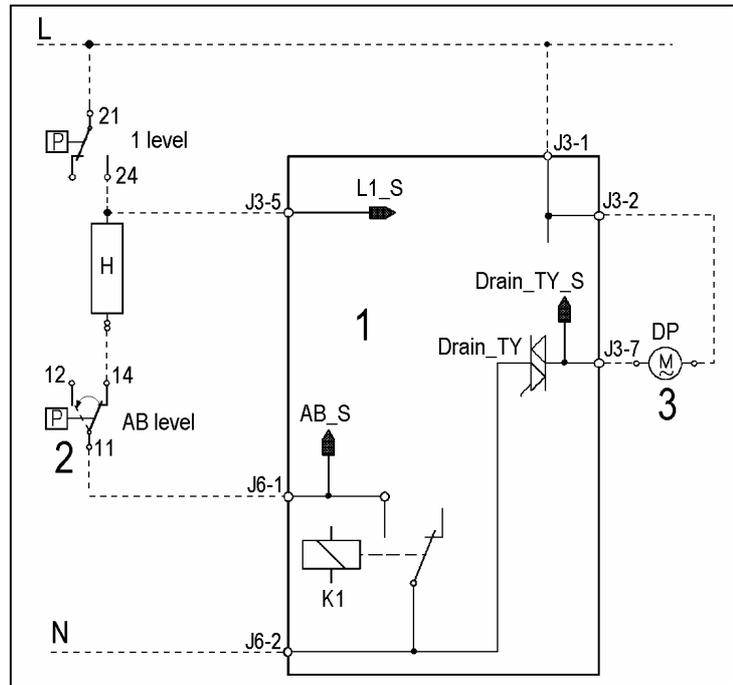


- Phase A:** The phase during which the initial fill takes place:
1. Water fill until the anti-boiling pressure switch closes on FULL.
  2. Water fill until the 1st level pressure switch closes on FULL: the delivery of the solenoid is calculated during this phase.
  3. Water fill for time **Q**, which varies according to delivery and cycle phase.
- Phase B:** If the 1st level pressure switch returns to EMPTY, a supplementary fill is performed until the pressure switch returns to close on FULL. This phase may be followed by a further timer-controlled fill.

## 6.6 Drain pump

1. PCB
2. Anti-boiling pressure switch
8. Drain pump

AB\_S Anti-boiling level sensor



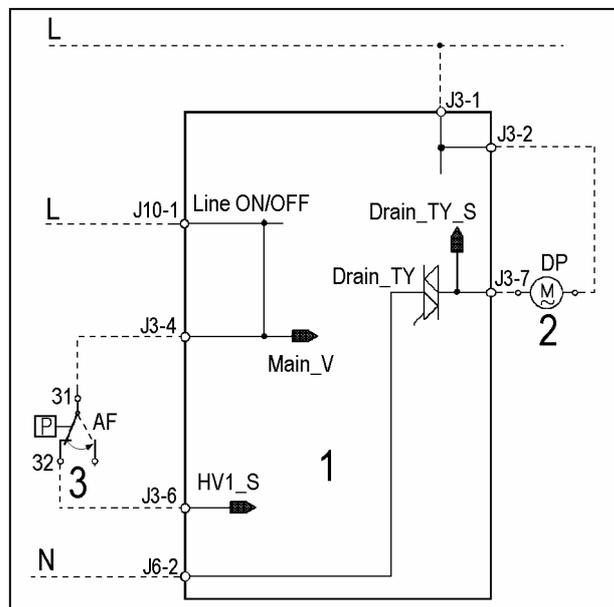
The PCB powers the drain pump via a triac as follows:

- ↻ for a pre-determined period.
- ↻ until the anti-boiling pressure switch closes on EMPTY, after which the pump is actioned for a brief period or passes to the subsequent phase.

## 6.7 Anti-flooding device

1. PCB
8. Drain pump
9. Anti-overflow pressure switch

HV1\_S Anti-overflow level sensor

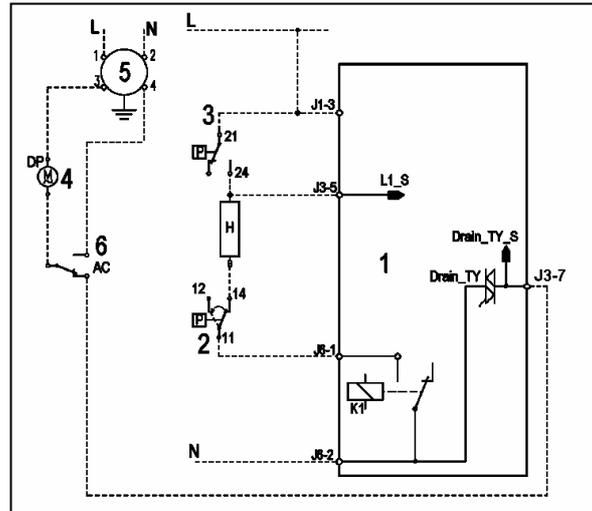


The third pressure switch level (if featured) is used as an anti-overflow safety device: if the pressure switch contact should open in the FULL position, the PCB actions the drain pump until the pressure switch returns to the EMPTY position.

## 6.8 Water Control (not in all models)

The Water Control system is a sensor located in contact with the base frame. The sensor detects water leaks inside the machine (not only during normal operation, but also when the unit is off and plugged in) and starts the drain pump.

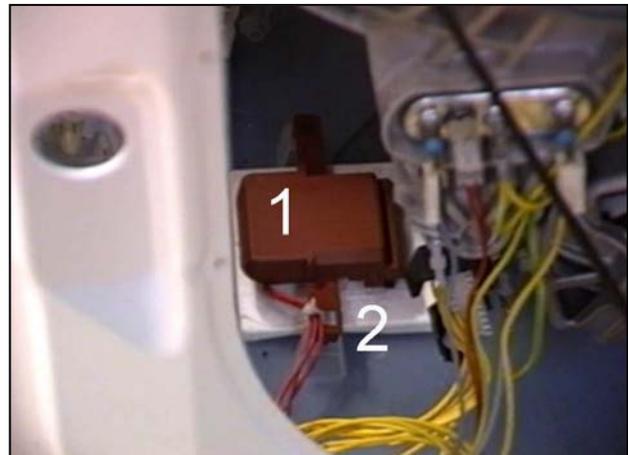
1. Main board
2. 1st LEV. Pressure switch
3. Anti-boiling pressure switch AE
4. Drain pump
5. Anti-interference filter
6. Water Control



Besides supporting the various components on the appliance (drain pump, recirculation pump, shock absorbers, etc.), the base frame is designed to be a container that collects any water leaks that may occur (from the tub, from a tube or pipe, etc.). These leaks are directed into an area where a float is installed. When this float is raised by water, it actuates a microswitch that starts the drain pump. When the switch is tripped, an alarm is also signalled (if the machine is switched on).

**Important:** When replacing the drain pump or tube, arrange the tube so that it doesn't interfere with the float.

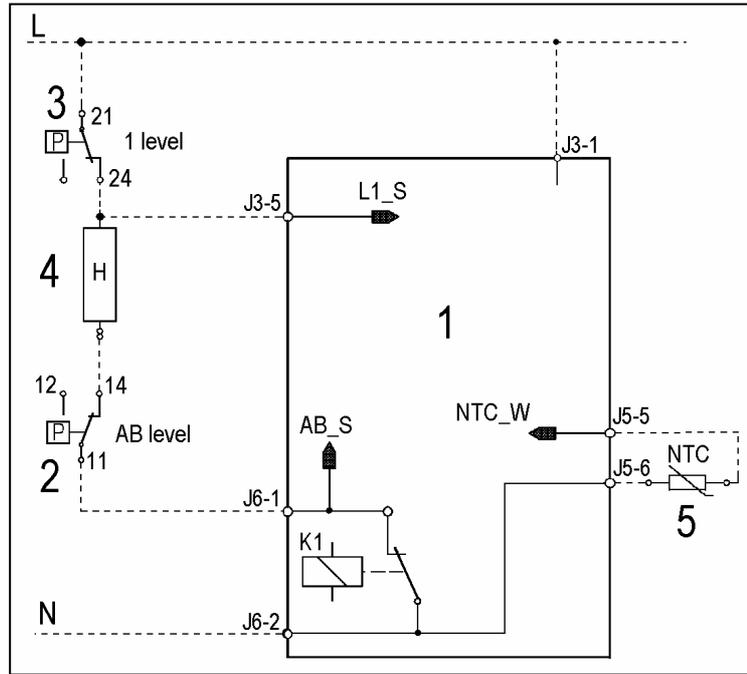
1. microswitch
2. float



## 6.9 Heating

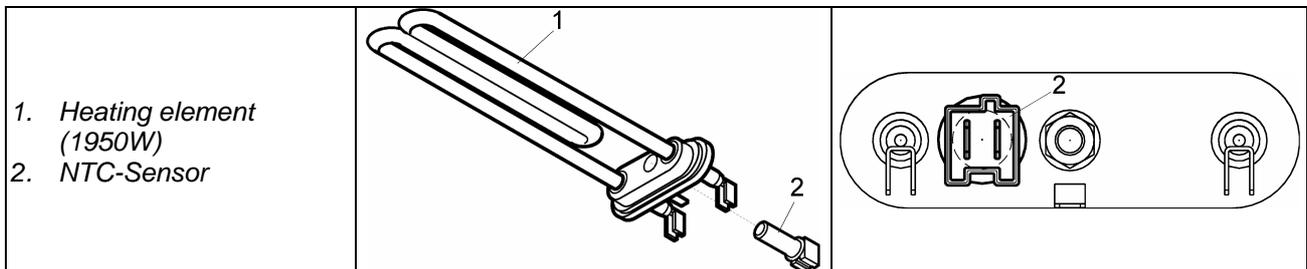
- 1. PCB
- 2. Anti-boiling pressure switch
- 3. 1st level pressure switch
- 4. Heating element
- 5. NTC temperature sensor

- K1 Relay
- AB\_S Anti-boiling level sensor
- L1\_S 1st level sensor



The heating element is powered by a relay on the PCB via the contacts of the pressure switch when closed on FULL.

### 6.9.1 Heating element



- 1. Heating element (1950W)
- 2. NTC-Sensor

### 6.9.2 Temperature sensor

The temperature is controlled by the PCB by means of a NTC temperature sensor.

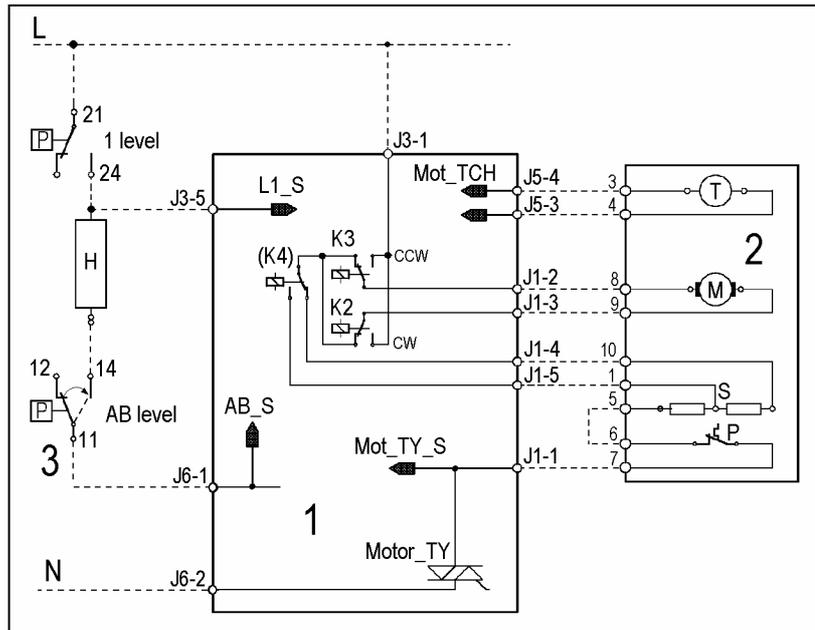
TEMPERATURE (°C)	RESISTANCE(Ω)		
	Nominal value	Maximum value	Minimum value
20	6050	6335	5765
60	1250	1278	1222
80	640	620	660

## 6.10 Motor

1. PCB
2. Motor
3. Anti-boiling/anti-foam pressure switch

M = rotor  
P = motor safety cut-out  
S = stator  
T = tachometric generator

AB\_S Anti-boiling/anti-foam level sensor



## 6.11 Power supply to motor

The PCB powers the motor via a triac. The direction of rotation is reversed by switching of the contacts on the two relays (K2-K3), which modify the connection between the rotor and the stator.

In certain models (1200-1600rpm), a third relay (K4) is used to power the stator (full or half field) according to the spin speed

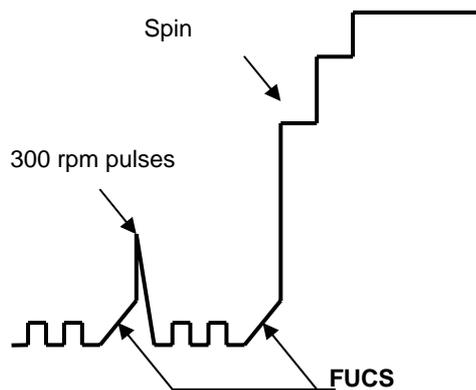
The speed of rotation of the motor is determined by the signal received from the tachometric generator.

During the spin phases, the microprocessor, depending on the software configuration, may perform the anti-foam control procedure (if featured) and the anti-unbalancing control procedure.

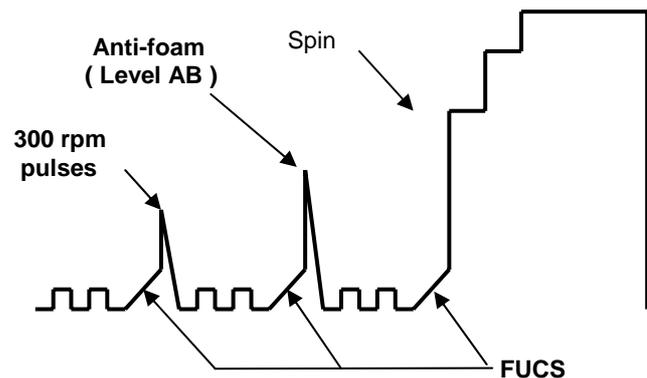
## 6.12 Anti-foam control system

The anti-foam control procedure (if featured) is performed via the anti-boiling pressure switch (AB).

### Spin phase without foam



### Spin phase with little foam

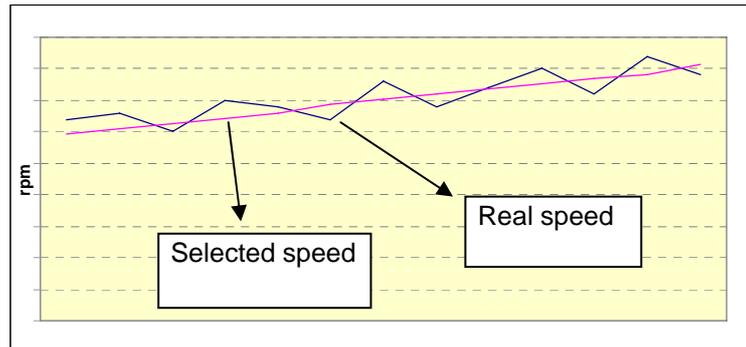


- **Spin with little foam:** if the contact of pressure switch AB closes on FULL, the spin phase is interrupted; the drain pump continues to operate and, when the contact returns to EMPTY, the spin phase is resumed.
- **Spin with excessive foam in the tub (critical situation):** The control system detects whether the pressure switch commutates 5 times to FULL. In this case, the spin phase is skipped, and a one-minute drain cycle is performed with the motor switched off; in the case of a washing phase, a supplementary rinse is added.

### 6.13 "FUCS" (Fast Unbalance Control System)

The control procedure for unbalanced loads is performed dynamically, before each spin cycle, as follows:

- ↻ The phase begins at a speed of 55 rpm; the speed can never fall below this threshold, otherwise the check is repeated.
- ↻ At intervals of 300 ms, the balance is calculated and compared with predetermined limits. If the value is less than the lower limit, the speed of the drum is increased by a certain value depending on the transmission relation between motor pulley/drum; if the unbalancing is higher, it is decreased by the same value. The reduction in the speed of the drum distributes the washing correctly; this procedure is repeated until the wash load is completely balanced.
- ↻ Correct balancing of the wash load is achieved at a speed of 115 rpm, after which the spin cycle begins.



The Unbalancing Control function takes place in different phases: each phase is characterized by:

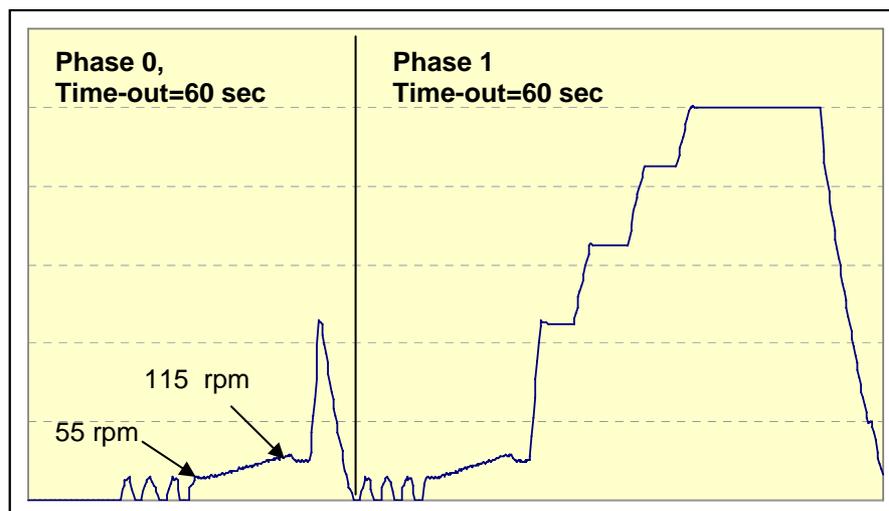
- ↻ an unbalancing index (0-1-2-3)
- ↻ an unbalancing threshold value (ex: 350, 650, 850, 1200rpm)
- ↻ a time out (max. time)

- **Ending of the FUCS balancing phase**

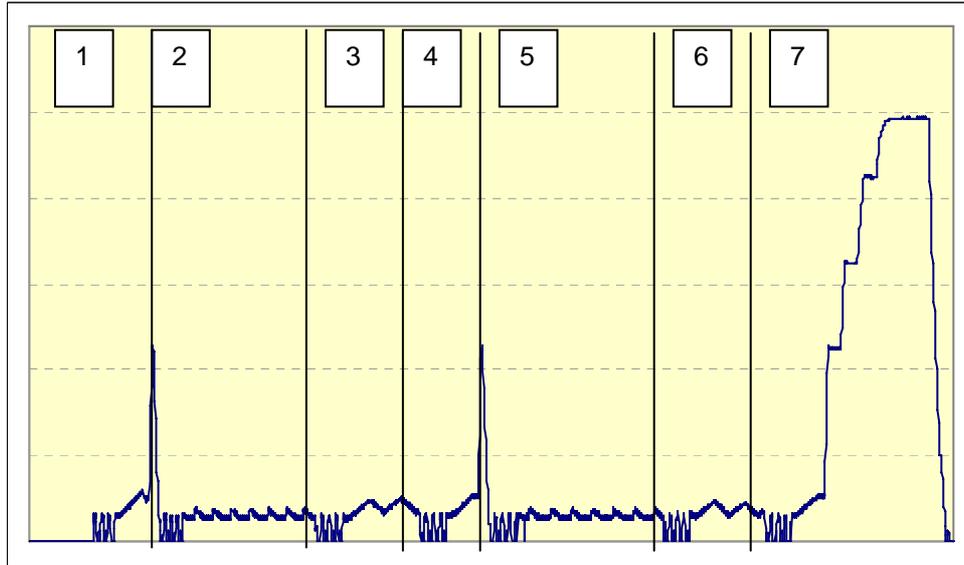
The phase is ended when:

- ↻ The drum rotation speed is 115 rpm (or 85rpm in some cases of unbalancing index). In this case the spin is performed.
- ↻ In some cases the optimal balancing value is not reached: a reduced spin is performed depending on the unbalancing.
- ↻ In the worst case, in which all phases are not sufficient to reach a minimum balancing value, the spin is not performed.

- **Example of perfect balancing**



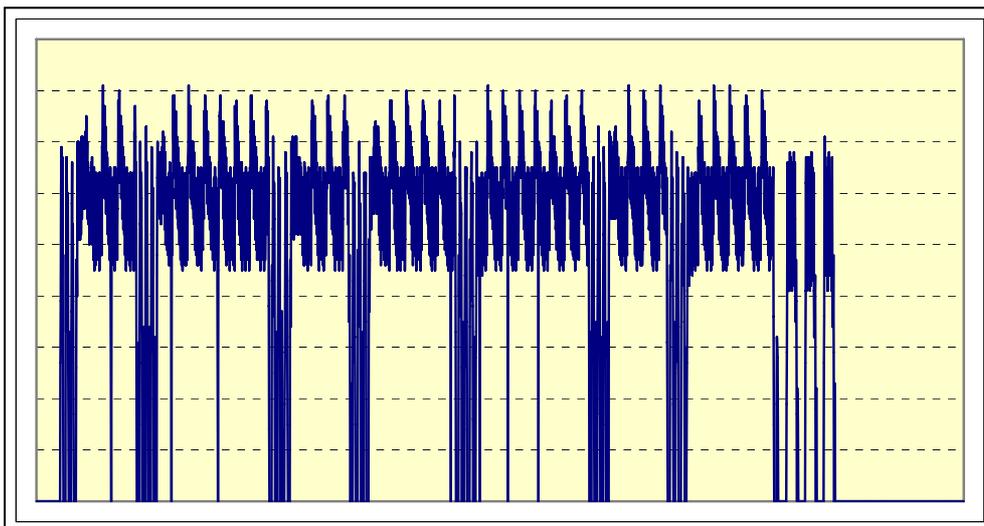
- **Balancing in the available longer interval**



Phase	Unbalancing index	Time-out (sec)
1	0	60
2	1	120
3	2	60
4	3	90
5	1	120
6	2	90
7	3	90

- **Unbalancing after all phases**

In this case the spin (or impulse) is not performed.



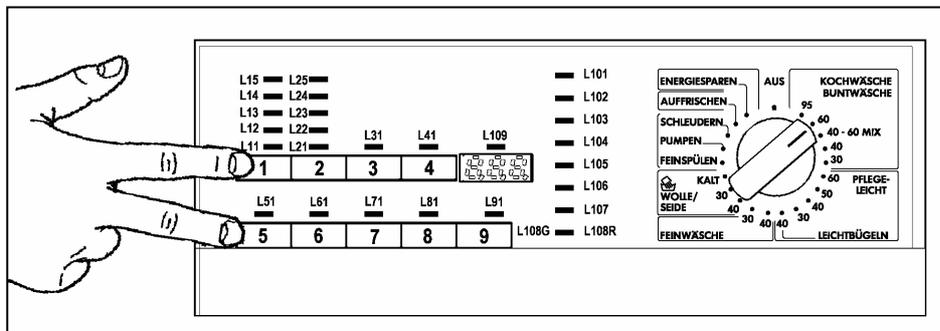
## 7 DEMO Mode

A special cycle has been created for demonstration of the operation of these appliances in retail outlets without connecting the appliance to the water supply. In this way, the salesman can select any programme; after starting the cycle by pressing START, the appliance will perform certain phases only, and will skip those which cannot be performed (water fill, drain, heating).

The cycle takes place as follows:

- ↪ the door locking device is actioned in the normal way (i.e. the door remains locked while the appliance is in operation, and can be opened at the end of the cycle or in pause mode)
- ↪ motor: all low-speed movements are enabled, while the pulse signals and the spin cycle are excluded
- ↪ the water fill solenoids and the drain pump are disabled
- ↪ display: since the phases of the cycle take place in rapid succession (1 second of the demo cycle is equivalent to 1 minute of the actual cycle), the time-to-elapsed decreases by 1 unit per second. Remember that the time-to-elapsed does not always correspond to the actual cycle time
- ↪ alarms: for reasons of safety, the following groups of alarms remain enabled: E40 (door closed), E50 and E90 (communication between the boards/configuration).

### 7.1 Demo mode setting



- ↪ Switch the appliance off
- ↪ Press buttons **1** and **5** simultaneously and then, holding them down, switch the appliance on by rotating the programme selector of **two positions clockwise**
- ↪ Hold buttons **1** and **5** down until the LEDs start flashing (about 5 seconds).

### 7.2 Exiting demo mode

- ↪ To exit demo mode, switch the appliance off.

## 8 DIAGNOSTICS SYSTEM

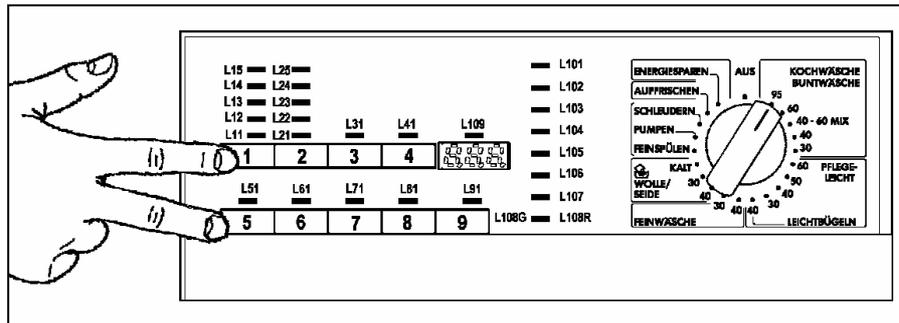
### 8.1 Access to diagnostics system

Using a single procedure, it is possible to access to the diagnostics system. After accessing this function, the following operations can be performed:

- control of the operation of each of the components in the appliance
- read / cancel the alarms

The diagnostics cycles are available only if the communication between the main PCB and the display board is correct; moreover there should not be configuration errors of the appliance.

**To access:**



1. Cancel the set programme and switch the appliance off.
2. Press buttons **1** and **2** simultaneously and then, holding them down, switch the appliance on by rotating the programme selector of **one position clockwise**.

In the first position the function test of the buttons and the corresponding LEDs is performed; by rotating the programme selector **clockwise** the operation diagnostics of each component and the reading of the alarms is carried out.

### 8.2 Exiting diagnostics system

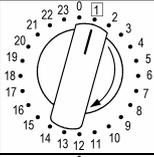
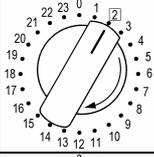
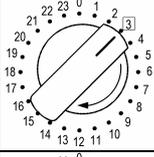
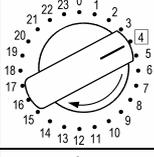
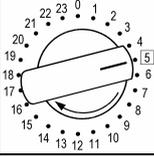
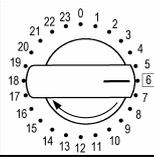
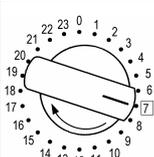
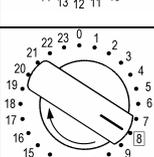
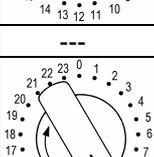
↩ To exit the diagnostics system switch the appliance off, on and then off again.

### 8.3 Phases of the diagnostics test

Independently of the type of selector, after activating the diagnostics system, the operation diagnostics of the different components and the reading of the alarms can be performed, by rotating the selector **clockwise**.

In models with digit the code of the selector position is displayed for a second.

In the diagnostics cycle all alarms are activated. If during the cycle operation an alarm occurs, the appliance blocks and the LEDs (and the display) flash indicating the relative code.

Diagnostics phases			
Selector position	Components actioned	Operating conditions	Function checked
1 	All the LEDs light in sequence. When a button is pressed, the corresponding LED lights (and the buzzer, if featured, sounds)	Always activated	Operation of the user interface
2 	Door interlock Washing solenoid	Door locked Water level below anti-flooding level Maximum time 5 minutes	Water ducted through washing compartment
3 	Door interlock Pre-wash solenoid	Door locked Water level below anti-flooding level Maximum time 5 minutes	Water ducted through pre-wash compartment (bleach)
4 	Door interlock Pre-wash and wash solenoids	Door locked Water level below anti-flooding level Maximum time 5 minutes	Water ducted through conditioner compartment
5 	Door interlock. Bleach/stains solenoid.	Door locked Water level below anti-flooding level Maximum time 5 minutes	Water ducted through bleach/stains compartment
6 	Door interlock Washing solenoid if the level of water in the tub is below 1st level Heating element.	Door locked. Water at 1st level. Maximum time 10 min. or up to 90°C. (*)	Heating
7 	Door interlock. (Washing solenoid if the level of water in the tub is below 1st level). Motor (55 rpm clockwise, 55 rpm counter-clockwise, 250 rpm impulse)	Door locked Water level at 1st level.	Check for leaks from the tub
8 	Door interlock Drain pump Motor up to 650 rpm then at maximum spin speed	Door locked Water level lower than anti-boiling level for spinning	Drain and spin; control of congruence in closure of level pressure switches
9 ---	---	---	---
10 	Reading/cancelling last alarm	---	---
11, 12 ...24	All LEDs light in sequence. Pressing a button the corresponding LED lights (and the Buzzer sounds, if featured)		

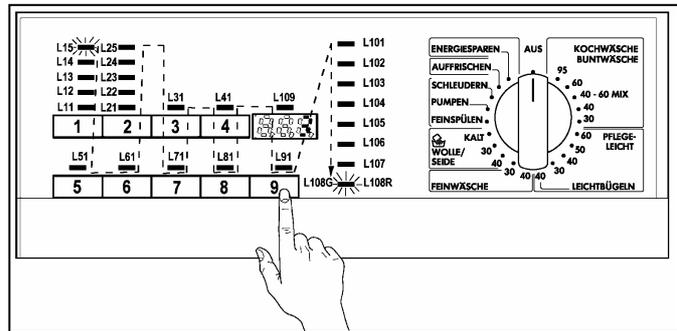
(\*) In most cases, this time is sufficient to check the heating. However, the time can be increased by repeating the phase without draining the water: for a moment to a different phase of the diagnostics cycle and then back to the heating control phase (if the temperature is higher than 80°C, heating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

(\*\*) See table page 39, "Display code".

### 8.3.1 Display board diagnostics

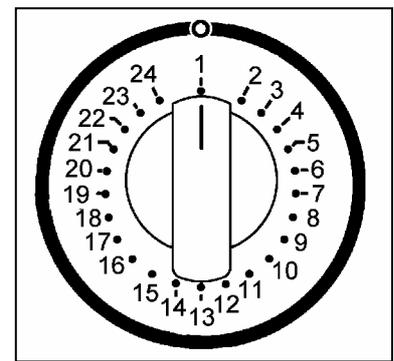
After entering the diagnostics system, the display board is checked: all LEDs and the display light in sequence (if featured).

Pressing all buttons, the corresponding LEDs switch on or those closer; the display shows the hexadecimal code corresponding to the button codification.



### 8.3.2 Programme selector

In the table are indicated the closures between the contact C6 (common) and the other contacts (C1–C5) of the programme selector in the different positions and the corresponding codification. The code is displayed only in the appliances with display.



Selector position	Closure of selector contacts (C6 is the common)				
	C1	C2	C3	C4	C5
Type 24 positions					
1 - Cancel	0	1	1	1	1
2	0	1	0	0	1
3	0	1	1	0	0
4	0	1	0	1	0
5	0	1	1	1	0
6	0	0	0	1	1
7	1	0	0	0	0
8	1	0	0	0	1
9	1	0	0	1	0
10	0	1	0	1	1
11	0	0	1	0	1
12	1	0	0	1	1
13	1	0	1	0	0
14	0	0	1	1	0
15	1	0	1	0	1
16	0	0	1	1	1
17	1	0	1	1	0
18	1	0	1	1	1
19	1	1	0	0	0
20	0	1	1	0	1
21	0	0	0	0	1
22	0	1	0	0	0
23	0	0	0	1	0
24	0	0	1	0	0

## 9 ALARMS

### 9.1 Displaying the alarms to the user

Control of the alarm system can be configured; according to the model, therefore, some or all of the alarms may be displayed to the user.

Normally all the alarms are displayed to the user except for:

- E10 – water fill
- E20 – drain water
- E40 – door closure
- E90 – configuration

**The alarms are active during the execution of the washing programme; except for the alarms relative to the configuration and power/frequency supply which are displayed also in the selection phase.**

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

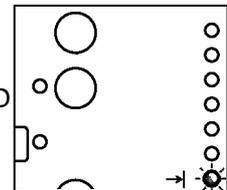
- The level of the water in the tub is below 1st level
- The temperature of the water is lower than 55°C

Certain alarm conditions require that a drain phase be performed before the door can be opened:

- Cooling water fill if the temperature is in excess of 65°C
- Drain until closure of both pressure switch contacts (1st level and anti-boiling safety system) on EMPTY within a maximum of 3 minutes.

#### 9.1.1 Alarms displayed during normal operation

The type of alarm condition is displayed to the user by the repeated flashing of the END OF CYCLE LED (0.4 seconds lit, 0.4 seconds off, with an interval of 2.5 seconds between sequences). This LED is featured on ALL MODELS, though configured in different positions.



If, for example, the user should forget to close the door, the control system will detect alarm E41 about 15 seconds after the start of the cycle; the cycle remains in PAUSE mode and the display, if featured, would display E40.

Simultaneously the LED end-of-cycle flashes repeating the sequence indicated in the table. The four flashing indicate the first of the two digits of the alarm **E41** (the alarms relative to a same function are grouped by families).

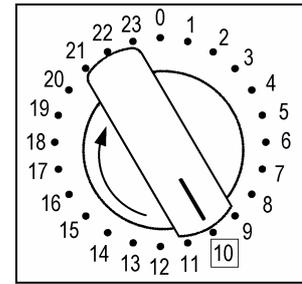
In this case, once the door has been closed, it is sufficient to press the start button to start the programme.

LED end of cycle		→
On/Off	Time (Sec.)	Value
	0.4	1
	0.4	
	0.4	2
	0.4	
	0.4	3
	0.4	
	0.4	<b>4</b>
	0.4	
	2.5	Pause between sequences

## 9.2 Reading the alarm codes

In order to read the last alarm code memorized in the EEPROM on the PCB:

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

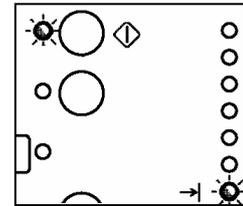


### 9.2.1 Displaying the alarm

The alarm is displayed by a repeated flashing sequence of the two LEDs (0.4 seconds lit, 0.4 seconds off, with an interval of 2.5 seconds between sequences). *The buzzer (if featured) will sound "bips" in synchronization with the flashing of the LEDs.*

- **END OF CYCLE LED** → indicates the first digit of the alarm code (family)
- **START/PAUSE** → indicates the second digit of the alarm code (number within the family)

These two LEDs are featured on all models (though they are **configured differently**), and flash simultaneously.



Notes:

- The first letter of the alarm code "**E**" (Error) is not displayed, since this letter is common to all alarm codes.
- The alarm code "families" are shown in hexadecimal; in other words:
  - **A** is represented by 10 flashes
  - **B** is represented by 11 flashes
  - ...
  - **F** is represented by 15 flashes
- Configuration errors are shown by the flashing of a series of LEDs.

### 9.2.2 Examples of alarm displays

Example: Alarm E43 will display the following:

- On the display, if featured, **E43**
- The sequence of **four** flashes of the **End-of-cycle LED** indicates the first number E**4**3;
- The sequence of **three** flashes of the **Start/Pause LED** indicates the second number E4**3**;

END-OF-CYCLE LED →			START/PAUSE LED ↕		
On/Off	Time (Sec.)	Value	On/Off	Time (Sec.)	Value
	0.4	1		0.4	1
	0.4			0.4	
	0.4	2		0.4	2
	0.4			0.4	
	0.4	3		0.4	<b>3</b>
	0.4			0.4	
	0.4	<b>4</b>		3,3	Pause
	0.4				
	2.5	Pause			

### 9.2.3 Operation of alarms during diagnostics

All alarms are enabled during the components diagnostics phase. Moving the selector to pass from one control phase to the other, the appliance exits the alarm condition and performs the selected phase (if the alarm does not occur again).

### 9.3 Notes about some alarms

- **Configuration alarms**
  - ↗ **E91:** the error is indicated by the flashing of all the LEDs, E90 is displayed on the display, if featured
  - ↗ **E92:** the error is indicated by the flashing of the LEDs placed over the buttons, E90 is displayed on the display, if featured
  - ↗ **E93:** the error is indicated by the flashing of the phase/warning LEDs, E90 is displayed on the display, if featured
- ↗ **EB1-EB2-EB3 alarms:** in case of problems with the power supply, the machine remains in alarm condition till the frequency or the power supply voltage returns to correct values or the appliance is switched off. "EB0" alarm family is displayed and it is not possible to enter the diagnostics or to use "alarm fast display" mode: the alarm complete can be read only when the abnormal situation terminated.
- **E51- E52 alarms:** during the diagnostics test all alarms are displayed: normally, moving the selector to pass from one control phase to the other, the appliance exits the alarm condition and performs the selected phase. This does not happen for the E51 alarms (motor power triac short-circuited) and E52 (no signal of motor tachometric generator): the only possibility to exit from the alarm condition is to switch the appliance off.

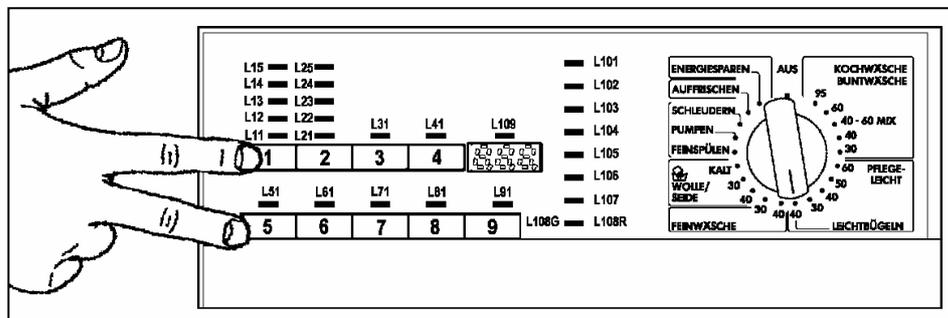
### 9.4 Rapid reading of alarm codes

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

- ↗ Press buttons **1** and **5** simultaneously for at least 2 seconds: the LED switch off and then display the sequence of flashes indicating the alarm.
- ↗ The alarm sequence is displayed for the time in which the buttons are hold down
- ↗ The reading system is the same as that indicated in paragraph. 10.2
- ↗ During the time the alarm is displayed, the appliance continues to perform the cycle or, if it is in the selection phase, it keeps in memory the options previously chosen.

### 9.5 Cancelling the last alarm

It is good practice to cancel the last alarm, after reading the alarm code to check whether the alarm re-occurs during the diagnostics control after the reparation of the appliance.



1. Select diagnostics mode and turn the programme selector to the **tenth** position (reading of alarm)
2. Press buttons **1** and **5** simultaneously.
3. Hold buttons **1** and **5** down (about 2 seconds).

## 9.6 Table of alarm codes

Alarm	Description	Possible fault	Action/machine status	Reset
E11	Difficulties in water fill for washing	Tap closed or mains pressure insufficient; drain hose incorrectly positioned; water fill solenoid faulty; leaks from the hydraulic circuit of the pressure switch; pressure switch faulty; wiring faulty; PCB faulty.	Cycle paused with door closed	Start
E13	Water leakage	Drain hose incorrectly positioned; mains pressure insufficient; water fill solenoid faulty; leakage/blockage of pressure switch hydraulic circuit; pressure switch faulty.	Cycle paused with door closed	Start
E21	Difficulties in draining	Drain hose kinked/blocked/incorrectly positioned; drain filter blocked/dirty; drain pump faulty; wiring faulty; PCB faulty; current leakage from heating element to ground.	Cycle paused	Start
E23	Drain pump triac faulty	Drain pump faulty; wiring faulty; PCB faulty.	Safety drain cycle – Cycle stopped with door open	OFF
E24	Fault in “sensing” circuit of drain pump triac	PCB faulty.	Safety drain cycle – Cycle stopped with door released	OFF
E33	Incongruence between closure of anti-boiling and 1st level pressure switch contacts	Pressure switch faulty; current leakage from heating element to ground; heating element; wiring faulty; PCB faulty.	Safety drain cycle – Cycle stopped with door open	OFF/reset
E35	Water overflow (flooding)	Water fill solenoid faulty; leakage from pressure switch hydraulic circuit; pressure switch faulty; wiring faulty; PCB faulty.	Cycle blocked. Safety drain cycle. Drain pump always in operation (5 minutes on, 5 minutes off etc.)	OFF/reset
E36	Fault in “sensing” circuit of anti-boiling pressure switch	PCB faulty.	Cycle blocked, door locked.	OFF/reset
E37	1st level sensing circuit faulty	PCB faulty.	Cycle blocked, door locked.	OFF/reset
E39	“HV” sensor of anti-overflow level faulty	PCB faulty.	Cycle blocked, door locked.	OFF/reset
E41	Door open	Door interlock faulty; wiring faulty; PCB faulty.	Cycle paused	Start
E42	Problems of door closure	Door interlock faulty; wiring faulty; PCB faulty.	Cycle paused	Start
E43	Interlock power supply triac faulty	Door interlock faulty; wiring faulty; PCB faulty.	(Safety drain cycle) Cycle blocked	OFF
E44	Door interlock sensor faulty	PCB faulty.	(Safety drain cycle) Cycle blocked	OFF
E45	Door interlock sensing circuit triac faulty	PCB faulty	(Safety drain cycle) Cycle blocked	OFF
E51	Motor power supply triac short-circuited	PCB faulty; current leakage from motor or from wiring.	Cycle blocked, door locked (after 5 attempts)	OFF/reset
E52	No signal from motor tachometric generator	Motor faulty; wiring faulty; PCB faulty	Cycle blocked, door locked (after 5 attempts)	OFF/reset
E53	Motor triac sensing circuit faulty	PCB faulty.	Cycle blocked, door locked	OFF
E54	Motor relay contacts sticking	PCB faulty; current leakage from motor or from wiring	Cycle blocked, door locked (after 5 attempts)	OFF
E61	Insufficient heating during washing	NTC sensor faulty; heating element faulty; wiring faulty; PCB faulty.	The heating phase is skipped	---

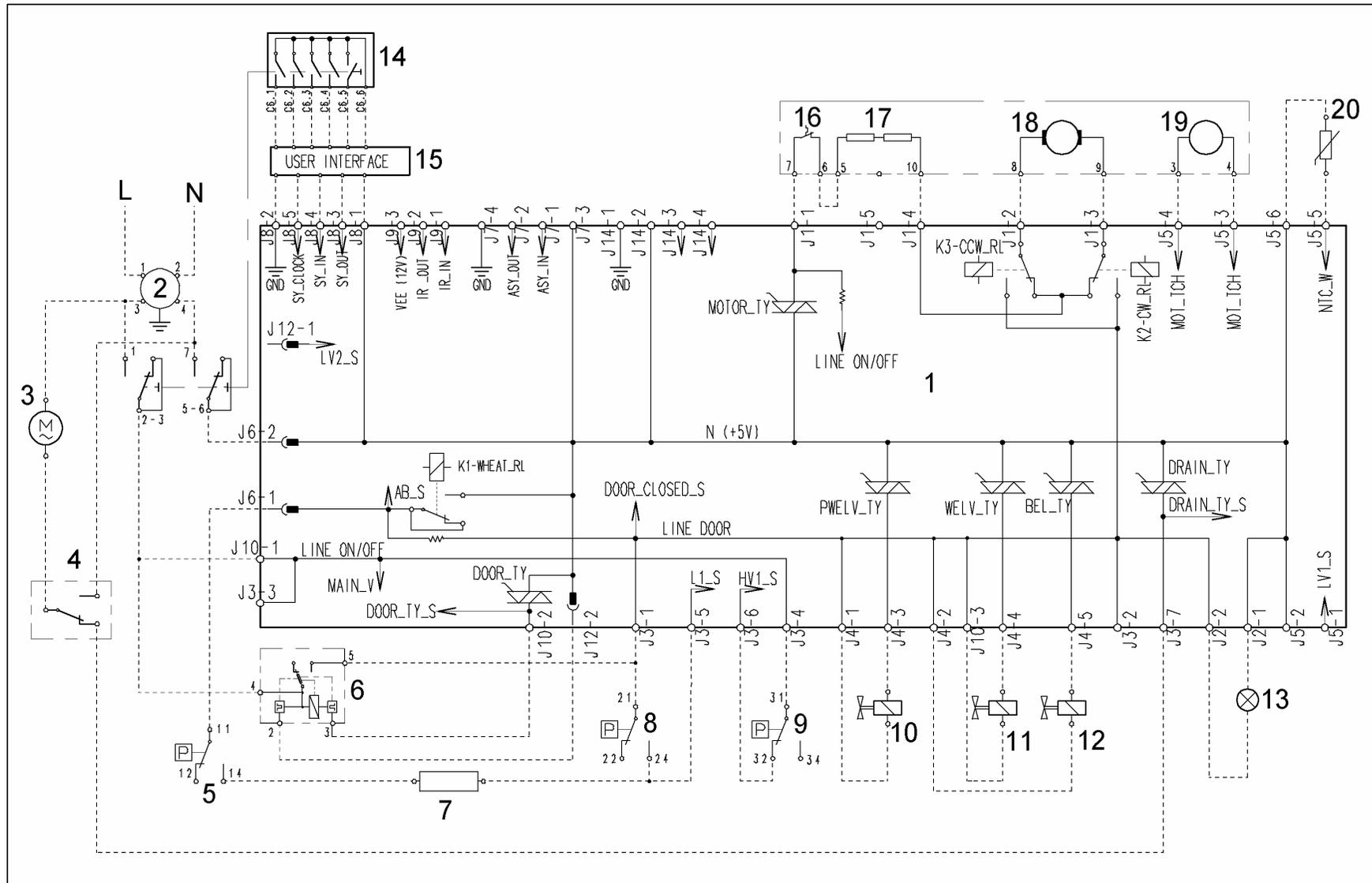
Alarm	Description	Possible fault	Action/machine status	Reset
E62	Overheating during washing	NTC sensor faulty; heating element faulty; wiring faulty; PCB faulty.	Safety drain cycle – Cycle stopped with door open	OFF
E66	Heating element power relay faulty	PCB faulty; current leakage from heating element to ground.	Safety drain cycle – Cycle stopped with door open	OFF
E71	Washing NTC sensor faulty	NTC sensor faulty; wiring faulty; PCB faulty.	The heating phase is skipped	Start
E74	Washing NTC-sensor badly positioned	NTC sensor badly positioned; NTC sensor faulty; wiring faulty; PCB faulty.	The heating phase is skipped	Start
E82	Error in selector reset position	PCB faulty (Wrong configuration data). Selector, wiring	---	OFF/reset
E83	Error in reading selector	PCB faulty (Wrong configuration data). Selector, wiring	Cycle cancelled	---
E91	Communication incongruence between main PCB- display board (versions not compatible)	Wiring faulty; Faulty control/display board Main PCB faulty.	Cycle interrupted	---
E92	Communication incongruence between main PCB- display board (versions not compatible)	Wrong control/display board; Wrong PCB (do not correspond to the model).	Cycle interrupted	---
E93	Incorrect configuration of appliance	Incorrect configuration data; PCB faulty.	Cycle interrupted	OFF/reset
E94	Incorrect configuration of washing cycle	Incorrect configuration data; PCB faulty.	Cycle interrupted	OFF/reset
E95	Communication error between microprocessor and EEPROM	PCB faulty.	Cycle interrupted	OFF/reset
E97	Incongruence between programme selector and cycle configuration	Faulty PCB (Wrong configuration data).	Cycle interrupted	OFF/reset
EB1	Frequency of appliance incorrect	Power supply problems (incorrect / disturbance); PCB faulty.	Cycle interrupted	---
EB2	Voltage too high	Power supply problems (incorrect / disturbance); PCB faulty.	Cycle interrupted	---
EB3	Voltage too low	Power supply problems (incorrect / disturbance); PCB faulty.	Cycle interrupted	---
EF1	Drain filter blocked (too long drain phase)	Drain tube blocked/kinked/too high; Drain filter dirty/blocked.	Warning displayed at the end of cycle (specific LED)	---
EF2	Overdosing of detergent (too much foam during drain phases)	Excessive detergent dosing; drain tube kinked/blocked; Drain filter dirty/blocked.	(specific LED)	---
EF3	Control water intervention	Water leakage on the base; faulty water control device.	Water drain and cycle blocked	OFF/reset
E00	No alarm	---	---	---



### 10.1.1 Key to circuit diagram

Components in the appliance	Components of the PCB	
<ol style="list-style-type: none"> <li>1. Electronic board</li> <li>2. Suppressor</li> <li>3. ON/OFF switch</li> <li>4. ON/OFF pilot lamp</li> <li>5. Door interlock</li> <li>6. Anti-boiling pressure switch</li> <li>7. Heating element</li> <li>8. 1st level pressure switch</li> <li>9. Anti-overflow pressure switch (<i>not all models</i>)</li> <li>10. Pre-wash solenoid valve</li> <li>11. Wash solenoid valve</li> <li>12. Bleach solenoid valve (<i>not all models</i>)</li> <li>13. Drain pump</li> <li>14. Closed door lamp (<i>not all models</i>)</li> <li>15. Control/display board</li> <li>16. Thermal cut-out (motor)</li> <li>17. Stator (motor)</li> <li>18. Rotor (motor)</li> <li>19. Tachometric generator (motor)</li> <li>20. NTC temperature sensor</li> </ol>	<p>BELV_TY DOOR_TY DRAIN_TY K1 K2 K3 K4  MOTOR_TY PWELW_TY Serial interface WELV_TY</p>	<p>Bleach solenoid Triac Door interlock Triac Drain pump Triac Heating element relay Motor relay: clockwise rotation Motor relay: anti-clockwise rotation Motor relay: half field power supply (<i>models with higher spin at 1200 rpm</i>) Motor Triac Pre-wash solenoid Triac Asynchronous serial interface Wash solenoid Triac</p>

## 10.2 Diagram (with Water Control)



### 10.2.1 Key to circuit diagram

Components in the appliance	Components of the PCB	
<ol style="list-style-type: none"> <li>1. Electronic board</li> <li>2. Suppressor</li> <li>3. Drain pump</li> <li>4. Water control</li> <li>5. Anti-boiling pressure switch</li> <li>6. Door interlock</li> <li>7. Heating element</li> <li>8. 1st level pressure switch</li> <li>9. Anti-overflow pressure switch (<i>not all models</i>)</li> <li>10. Pre-wash solenoid valve</li> <li>11. Wash solenoid valve</li> <li>12. Bleach solenoid valve (<i>not all models</i>)</li> <li>13. Closed door lamp (<i>not all models</i>)</li> <li>14. Selector</li> <li>15. Control/display board</li> <li>16. Thermal cut-out (motor)</li> <li>17. Stator (motor)</li> <li>18. Rotor (motor)</li> <li>19. Tachometric generator (motor)</li> <li>20. NTC temperature sensor</li> </ol>	BELV_TY DOOR_TY DRAIN_TY K1 K2 K3 K4  MOTOR_TY PWELW_TY Serial interface WELV_TY	Bleach solenoid Triac Door interlock Triac Drain pump Triac Heating element relay Motor relay: clockwise rotation Motor relay: anti-clockwise rotation Motor relay: half field power supply ( <i>models with higher spin at 1200 rpm</i> )  Motor Triac Pre-wash solenoid Triac Asynchronous serial interface Wash solenoid Triac