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**Washing machines  
&  
Washer-Dryers  
with EWM2000  
Electronic Control**

**Styling: Delta 3**

**Production: Porcia (IT)  
(SW: W2C0145x)**

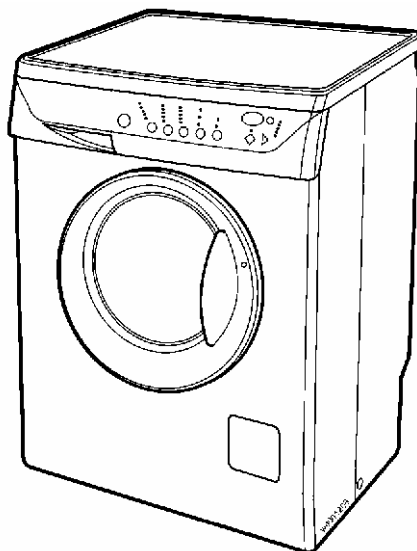


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# 1 General characteristics



## **Washing machines with EWM2000 electronic control system:**

- analog (electronic) pressure switch
- anti-foam control function
- unbalance control system FUCS
- jetsystem or traditional washing system (with Eco-Ball)
- "Total exchange" jetsystem or traditional rinse system
- spin speeds up to 1600 rpm
- commutator motor AC or DC with separate converter
- heating element in the tub, 1950W
- "Handwash" programme
- rinse hold/night cycle

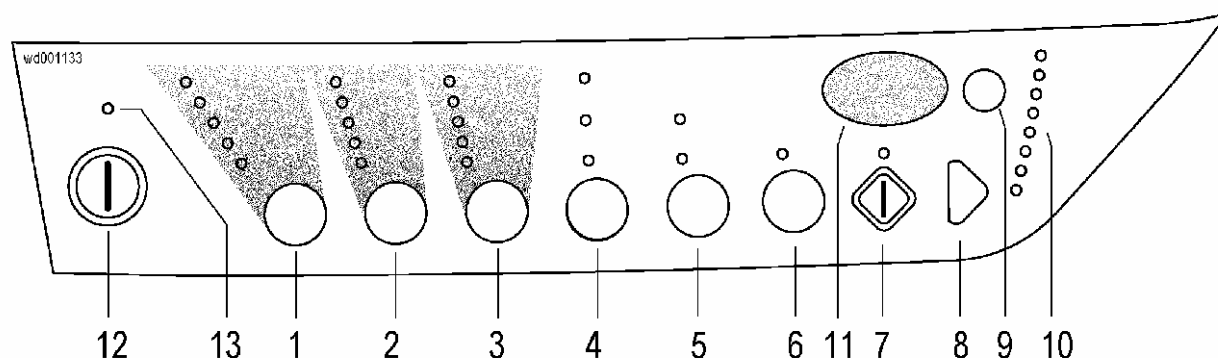
## **Washer-dryers:**

- water condensation drying system
- automatic or time-controlled drying cycles
- drying heater: 700 + 700 W

## 2 Control panel

The control panel fitted to the appliance may be different depending on:

- ⇒ the control/display board
- ⇒ different design of the panel (on the number of buttons, LEDs)
- ⇒ the different configuration of the buttons

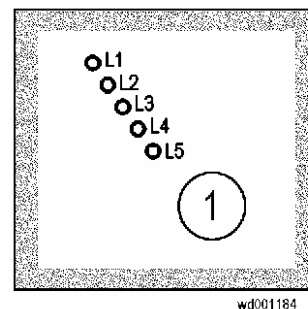


WASHING MACHINES	WASHER DRYERS
1. “FABRICS” button	1. “FABRICS” button
2. “TEMPERATURE” button	2. “TEMPERATURE” button
3. “SPIN” button	3. “SPIN” button
4. “OPTIONS” button	4. “OPTIONS” button
5. “OPTIONS” button	5. “AUTOMATIC DRYING” button
6. “OPTIONS” button	6. “DRYING TIME” button
7. “START/PAUSE” button	7. “START/PAUSE” button
8. “SKIP/RESET” button	8. “SKIP/RESET” button
9. “DELAYED START” button	9. “DELAYED START” button
10. Programme phase indicator LEDs	10. Programme phase indicator LEDs
11. Display window	11. Display window
12. ON/OFF button	12. ON/OFF button
13. Pilot lamp	13. Pilot lamp

## 2.1 “FABRICS” button

Press this button to select the washing programme suitable for the fabrics to be washed.

The LED corresponding to the selected washing programme lights. The machine proposes the standard programme for the type of fabric selected; a temperature and the maximum spin speed for the selected programme are displayed, as well as the normal soiling level. However, these parameters can be modified by pressing the corresponding buttons. The display will also show the duration of the selected programme, which is calculated according to the maximum load for each type of fabric, and the START/PAUSE LED begins to flash.



The type of fabric can be modified at any time during the washing cycle; in this case, the phase currently being performed will restart from the beginning.

The table below shows the options that the user can select for the configuration of each model.

LED	Configuration type A	Configuration type B	Configuration type C
L1	Cotton	Cotton	Cotton
L2	Synthetics	Synthetics	Synthetics
L3	Delicate fabrics	Delicate fabrics	Delicate fabrics
L4	Wool	Hand wash	Wool
L5	Hand wash	Mini	-----

### Hand wash

If this programme is selected (certain models only), the washing cycle will be especially delicate, and can be used for fabrics labelled “Hand Wash”.

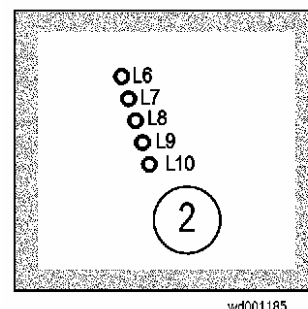
## 2.2 “TEMPERATURE” button

If a temperature different from the standard temperature proposed by the appliance is desired, press this button repeatedly to increase or decrease the temperature. The corresponding LED will light.

The maximum temperature is 90°C for cotton, 60°C for synthetics, 40°C for delicate fabrics, wool and hand washing.

The temperature button is effective only after the type of fabric has been selected.

The temperature can be modified at any time during the washing cycle (“PAUSE”); in this case, the phase will restart from the beginning.

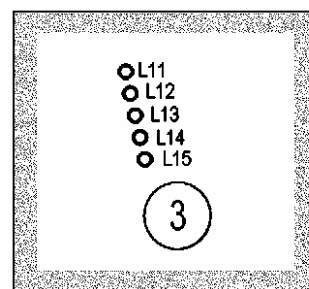


LED	Configuration type A	Configuration type B	Configuration type C
L6	90° C	90° C	90° C
L7	60° C	60° C	60° C
L8	40° C	50° C	50° C
L9	30° C	30° C	40° C
L10	Cold wash	Cold wash	30° C

## 2.3 “SPIN” button

Press this button to reduce the speed of the intermediate and final spin cycles as shown in the table below. This button is effective only after the type of fabric has been selected; the spin speed can be modified until the end of the rinses.

If automatic drying has already been selected (washer-dryers only), the minimum spin speed is 900 rpm for COTTON and 700 rpm for SYNTHETICS.



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Button	LED	Function 1	Function 2	Function 3	Function 4	Function 5	Function 6
<b>3</b>	L11	Max speed	Max speed	900 g/	Max speed	Max speed	900 g/
	L12	1200 g/	900 g/	700 g/	1200 g/	900 g/	700 g/
	L13	900 g/	700 g/	600 g/	900 g/	700 g/	600 g/
	L14	700 g/	500 g/	500 g/	700 g/	500 g/	500 g/
	L15	Rinse hold / Night cycle	Rinse hold / Night cycle	Rinse hold / Night cycle	No spin	No spin	No spin

### COTTON cycles rinses

In COTTON cycles, this option also modifies the structure of the rinsing phases according to the speed of the intermediate spin:

Intermediate spin (rpm)	Traditional washing			Jetsystem washing		
	1 <sup>st</sup> rinse	2 <sup>nd</sup> rinse	Last rinse	1 <sup>st</sup> rinse	2 <sup>nd</sup> rinse	Last rinse
<850	TR2	TR2	TR2	TR2	TR2	TR2
850-950	TR1	TR2	TR2	TE	TR2	TR2
1000-1150	TR1	TR1	TR2	TE	TE	TR2
>1150	TR1	TR1	TR1	TE	TE	TE

**TR2** Traditional rinse at second level

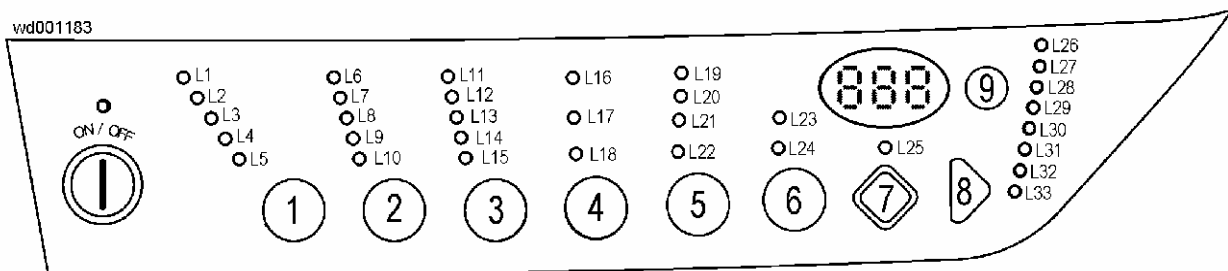
**TR1** Traditional rinse at first level

**TE** "total exchange" (virtual tank) jetsystem rinse



## 2.4 "OPTION / DRYING" buttons

The number and type of OPTIONS buttons vary according to the model.



**Matrix of the functions of the different buttons:**

Button	4			5				6	
	L16	L17	L18	L19	L20	L21	L22	L23	L24
Function 1	Prewash	Soak	Short / Very short	Extra Dry	Store Dry	Iron Dry	Synthetics Dry	Drying time (cotton)	Drying time (synthetics)
Function 2	Prewash	Extra/Super Rinse	Short / Very short			Prewash	Soak		Extra/Super Rinse
Function 3	Prewash	Half Load	Short / Very short			Prewash	Extra/Super Rinse		Half Load
Function 4	Prewash	Rinse hold/Night cycle	Short / Very short			Prewash	Half Load		Stain
Function 5	Prewash	Economy	Short / Very short			Prewash	Stain		Economy
Function 6	Intensive	Normal	Short / Very short			Extra/Super Rinse	Economy		Short / Very short
Function 7		Prewash	Soak			Extra/Super Rinse	Short / Very short		Bio
Function 8		Prewash	Extra/Super Rinse			Extra/Super Rinse	Bio		Rinse hold/Night cycle
Function 9		Prewash	Half Load				Extra/Super Rinse		
Function 10		Prewash	Stain				Half Load		
Function 11		Prewash	Economy				Stain		
Function 12		Prewash	Short / Very short				Economy		
Function 13		Prewash	Bio				Short / Very short		
Function 14							Bio		
Function 15							Rinse hold/Night cycle		

### 2.4.1 "PREWASH" button

This option selects an additional prewash phase at 30° C at the beginning of the cycle. It can be selected only during the programme selection phase and is not available in WOOL cycles. Moreover this option cannot be selected together with the STAINS or SOAK options.

### 2.4.2 “RINSE HOLD” button or “NIGHT CYCLE”

This function is available for COTTON, SYNTHETICS, DELICATES and WOOL cycles; in certain models, it is combined with the SPIN button.

When this option is selected, the appliance will not drain the tub at the end of the final rinse and at the end of the cycle, the LED corresponding to the START/PAUSE button (and, where applicable, the phase indicator LED) will begin to flash to indicate to the user that the water in the tub must be drained.

- ⇒ In COTTON cycles it adds three rinses and eliminates all spin cycles
- ⇒ In SYNTHETICS cycles it adds a rinse and eliminates all spin cycles
- ⇒ In all OTHER cycles it eliminates all spin cycles

The following options can be selected to complete the programme:

- **drain and spin:** Press START/PAUSE. The appliance will drain the tub and then perform a spin cycle at the maximum speed for the programme previously selected;
- **select a spin speed** using the SPIN button and then press START/PAUSE;
- **drain only:** Press SKIP/RESET **once**, until the DRAIN LED lights, then press START/PAUSE.

*In the case of WASHER-DRYERS, this option can not be selected, if the drying phase at the end of the cycle has already been selected.*

### 2.4.3 “SOAK” button

This option can be selected in COTTON, SYNTHETICS and DELICATE FABRICS cycles (but only in the programme selection phase), and adds a pre-wash at the beginning of the cycle which consists of the following phases:

- ⇒ water fill and heating at 30° C
- ⇒ a soak phase of about 30 minutes. The DELAYED START button (if featured) can be used to select a SOAK time from 1 hour to 24 hours. The delay time will be shown in hours in the display window during the selection phase; after the cycle has been started, the delayed-start countdown will be shown in hours until it falls below 10 hours, after which the time will be shown in hours and minutes.
- ⇒ the water is drained and the appliance passes to the subsequent phase.

The SOAK option cannot be selected together with the STAINS and PRE-WASH options.

### 2.4.4 “STAINS” button

The STAINS option can be selected in COTTON, SYNTHETICS and DELICATE FABRICS cycles with temperatures of 40°C or higher, and can also be selected during the washing phase.

This option adds the STAINS phase, in which special additives are introduced into the tub from the pre-wash compartment after the BIO phase with heating to 40°C, and an additional 10 minutes of motor movement. The STAINS option cannot be selected together with the PRE-WASH/SOAK, INTENSIVE and QUICK /DAILY options.

### 2.4.5 “ECONOMY” button

This option is available only in cycles for COTTON and SYNTHETICS with temperatures of 30°C or higher. The ECONOMY option reduces the temperature of the programme and increases the drum movement phases after the heating phases.

The ECONOMY option cannot be selected together with the INTENSIVE / HEAVY / LIGHT SOILING and QUICK CYCLE / DAILY options.

#### 2.4.6 “INTENSIVE” / “HEAVY SOIL” button

This option can be selected during the entire duration of the washing programme, and is available only in cycles for COTTON and SYNTHETICS.

This option increases the phases of drum movement after the heating phases.

The INTENSIVE / HEAVY SOIL option cannot be selected together with the STAINS, QUICK and ECONOMY options.

#### 2.4.7 “SHORT or VERY SHORT CYCLE - LIGHT SOIL” / “DAILY” button

This option can be selected during the entire duration of the wash programme, and is available in cycles for COTTON, SYNTHETICS and DELICATE FABRICS: it reduces the duration of the cycle.

When this option is selected in COTTON and SYNTHETICS cycles, it modifies the rinse sequence as well as reducing the times: one rinse is eliminated, and the water fill level in the remaining rinses is increased. It cannot be selected together with STAINS, INTENSIVE and ECONOMY options.

#### 2.4.8 “LEVEL OF SOILING” button

This option can be selected during the entire duration of the washing programme.

The standard programme is set for NORMAL soiling. By pressing this button, the level of soiling can be modified:

⇒ HEAVY / INTENSIVE (this option can be selected only in cycles for COTTON and SYNTHETICS)

⇒ LIGHT - SHORT CYCLE (this option can be selected only in cycles for COTTON, SYNTHETICS and DELICATE FABRICS)

The functions of these options are as described for the corresponding individual buttons.

#### 2.4.9 "BIO" button

This option can be selected only after selecting the type of fabric, and can also be selected during the washing phase. The BIO option can be selected only in cycles for COTTON and SYNTHETICS with temperatures of 40°C or higher.

The BIO option adds a 10-minute phase of motor movement after heating to 40°C, and is designed to activate the enzymes contained in the detergent.

#### 2.4.10 “HALF LOAD” button

This option can be selected in the COTTON cycles on traditional (i.e. non-Jetsystem) washing machines, and reduces the number of rinse cycles by one.

#### 2.4.11 “EXTRA RINSE” or “SUPER RINSE” button

Can be used with all programmes **except the wool programme**. The machine performs 4 rinses instead of 3.

This option is recommended for people who are allergic to detergents and in areas where the water is very soft.

## 2.5 Buttons for washer-dryers

### 2.5.1 "ELECTRONIC DRYING"

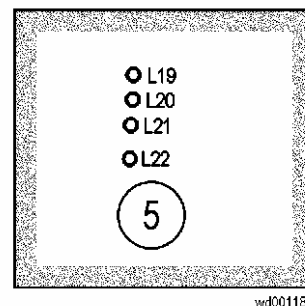
It is possible to select three different electronic levels of dryness: one for COTTON and one for SYNTHETICS cycles:

**L19** ⇒ Extra dry (cotton)

**L20** ⇒ Store dry (cotton)

**L21** ⇒ Iron dry (cotton)

**L22** ⇒ Store dry (synthetics)



The drying time is automatically calculated by the "Fuzzy" logic.

**The drying phase can be performed either as automatic drying phase (non stop programme), if previously selected together with the washing programme, as well as a separate drying phase.**

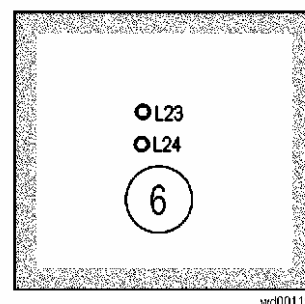
### 2.5.2 DRYING TIME"

When this button is pressed it is possible to select (5 minutes a time) from 10 to 130 minutes drying for COTTON cycles and from 10 to 100 minutes for SYNTHETICS cycles.

The drying cycle can be selected both as automatic drying and as separate drying cycle.

**L23** ⇒ drying (full power)

**L24** ⇒ synthetic drying (half-power)



## 2.6 "START/PAUSE" button

- ♦ **START:** After selecting the programme and the desired options, press the START button to start the programme. The LED positioned above the button will cease flashing and remain lit. If a delayed start time has been selected, the countdown will commence; the countdown will be shown on the display.
- ♦ **PAUSE:** When the button is pressed again, the programme currently being performed is interrupted.

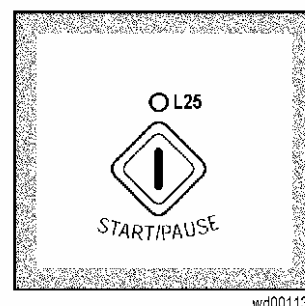
The LED above the button will start to flash. When the cycle is paused, the door LED switches off and the door can be opened on condition that:

- the machine is not performing a heating phase
- the water level is not high
- the drum is not in movement

When the appliance is paused, the programmes can be modified as follows:

- The structure can be changed or the programme cancelled (SKIP/RESET button). In this case, the water (and detergent) will not be drained and the new cycle will begin with water in the tub. If it is preferred to restart the new cycle without saving water and detergent, it is necessary first to select a drain phase and then the new programme.
- The FABRICS and the TEMPERATURES can be modified only during the washing phase; in this case, the cycle will be restarted from the beginning.
- The SPIN can be modified before the start of the final spin cycle.
- All the cycle OPTIONS can be modified before the commencement of the phase to be modified.
- DRYING selections can be modified before the starting of the drying phase.

To re-start the cycle, press the START/PAUSE button again.



- ♦ **Water drain and spin cycle:** after the "rinse hold" phase press this button to start the cycle with the drain and final spin again.

## 2.7 “SKIP/RESET” button

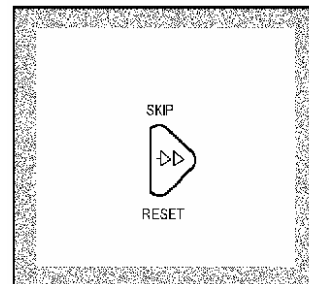
Thus button performs two functions:

- ◆ **Cancels the programme:** Press the button until the cycle LEDs switch off. The display will show three flashing hyphens.
- ◆ **Selects special programmes:** In the programme **selection** and **execution** phases, this button can be used to cancel certain phases of the programme so that the appliance effectively performs a special cycle. In the programme execution phase, the appliance must be paused.

The cycle **normally** performed by the appliance consists of the following phases:

**Wash » Rinses » Spin (drying for washer-dryers)**

- ⇒ When the button is pressed **once**:  
**Rinses » Spin (drying for washer-dryers)**
- ⇒ When the button is pressed **twice**:  
**Spin (drying for washer-dryers)**
- ⇒ When the button is pressed **three** times:  
**Drain**
- ⇒ When the button is pressed **four** times:  
**Cancel programme**



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If the **PRE-WASH** option is selected, it can be cancelled by pressing this button, so that the appliance performs the wash only.

## 2.8 “DELAYED START” button

This button can be used to delay the start of the programme for up to 24 hours. The selected delay time is shown on the display for approximately 5 seconds, after which the duration of the programme is displayed.

The DELAYED START option must be selected **after** selecting the programme and **before** pressing START/PAUSE.

The delay countdown is decremented at intervals of one hour, and is shown on the display.

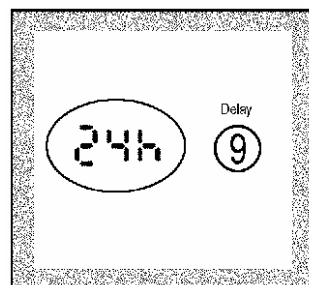
To modify or cancel the delayed-start time:

- press START/PAUSE to set the appliance to PAUSE.
- press the DELAYED START button until the display shows the new delay time or **0h**.
- press START/PAUSE again.

The porthole door remains locked during the entire delayed-start period (the door pilot lamp lights).

If it is necessary to open the porthole door, set the appliance to PAUSE mode. After re-closing the door, press START/PAUSE.

If the SOAK option has been selected, the delay time becomes the soak time.

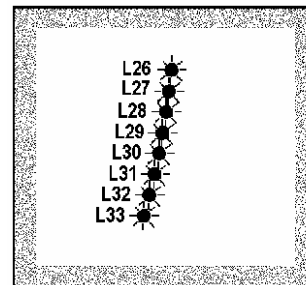


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## 2.9 Programme phase LEDs

When the programme has been selected, the LEDs corresponding to the various phases in the programme light.

When the programme starts, only the LED corresponding to the current phase remains lit.



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LED	Colour	Models with Display		Models without Display	
L26	Green	--	Door	Prewash	Door
L27	Green	Prewash	Prewash	Wash	Wash
L28	Green	Wash	Wash	Rinses	Wash
L29	Green	Rinses	Rinses	Rinse hold	Rinses
L30	Green	Spin	Spin	Spin	Spin
L31	Green	Drain	Drain	Drain	Drain
L32	Orange	Drying (only for washer-dryers)	Drying (only for washer-dryers)	Filter Clogged	Filter Clogged
L33	Green	--	--	End	End

### Door LED

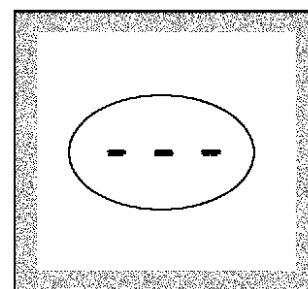
The following table shows the door LED the function:

Led Status	Meaning
On	While the cycle is performing with the possibility to open the door (in pause mode)
Flashing	Cycle in pause mode without the possibility to open the door (closed door)
Off	While the cycle is performing without the possibility to open the door (in pause mode) or door open

## 2.10 Display

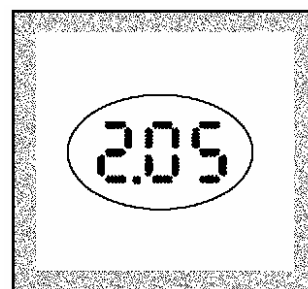
The display shows the following information:

- ⇒ **Three flashing hyphens:** when a programme is cancelled by pressing the SKIP/RESET button. The hyphens will also be displayed when the ON/OFF button is pressed to switch the appliance on, but only if the cycle selected previously has been cancelled.



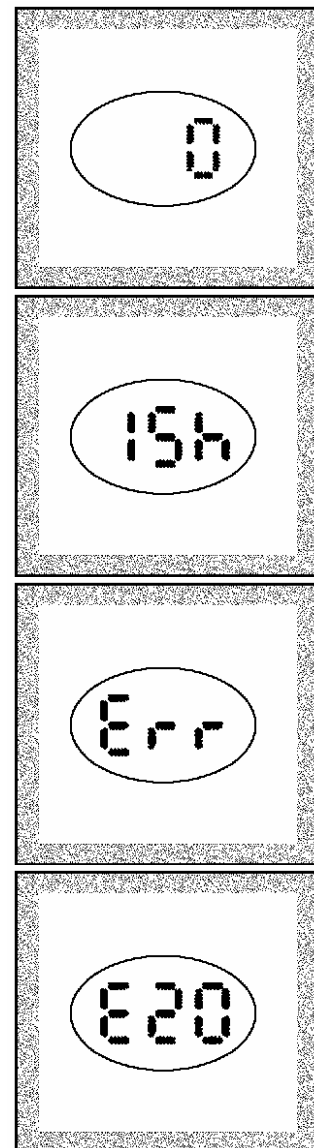
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- ⇒ **The duration of the washing programme** is displayed when the programme has been selected. This time corresponds to the time necessary for the maximum wash load. When the programme is started (i.e. after pressing START/PAUSE), the time is decremented at intervals of one minute.
- ⇒ **The drying programme duration (washer-dryers)**, which is displayed during the phase of selection of the drying time. After two seconds the total time corresponding to half wash load is shown up. In non-stop cycles the time results from the wash plus drying time.



wd001143

- ⇒ **Rinse hold:** the appliance stops with water in the tub at the end of programmes for which the RINSE HOLD option has been selected; the display shows a **zero** (fixed, not flashing)
- ⇒ **End of cycle:** indicated by a **zero (flashing)** and, at the same time, the door pilot lamp switches off. The zero re-appears when the appliance is switched on again, if the previous programme has not been cancelled. It may occur, when the appliance is switched on for the first time, that a flashing zero is shown on the display and the acoustic signals are activated. This is due to the fact that the machine has performed a washing cycle during testing in the factory which has not been cancelled on completion.
- ⇒ **Delayed start,** which is selected using the DELAYED START button. The countdown starts when the START/PAUSE button is pressed, and is decremented at intervals of one hour.
- ⇒ **An incorrect option selection** is signalled by **Err** on the display if the function selected is not compatible with the programme. The buzzer also sounds when an incorrect option is selected
- ⇒ **An alarm code** indicates a machine malfunction

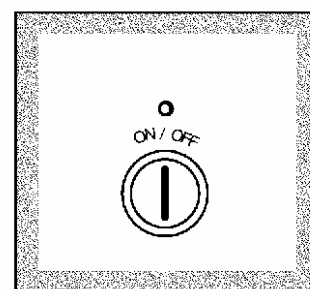


wd001146

## 2.11 ON/OFF button

Press the ON/OFF button to switch the appliance ON. The display shows three flashing hyphens or a flashing zero. Press the same button to switch the appliance OFF.

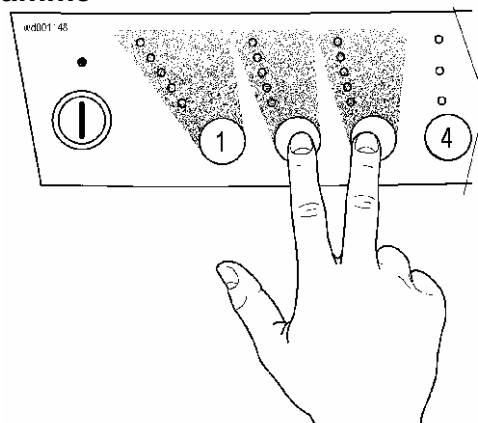
*The ON/OFF button is an bipolar switch button, and is not part of the display board*



wd001192

## 2.12 Exclusion of the buzzer at the end of the programme

By pressing the "TEMPERATURE (2)" and "SPIN (3)" buttons at the same time (or the temperature button with button 4) it is possible to deactivate the buzzer sound which indicates the end of the programme; by repeating this operation the buzzer will be activated again. This function is always available and is memorized until it is modified.



### 3 Washing programmes

Programme	Temperature (°C)	No. of rinses	Spin *
COTTON	Cold ÷ 90°	3	IMPCF_01
SYNTHETICS	Cold ÷ 60°	3	IMP5
DELICATES	Cold ÷ 40°	3	IMP7
WOOL	Cold ÷ 40°	3	IMP4
HAND WASH	Cold ÷ 40°	3	IMP4
PROGRAMME MINI, 30° / 30 min.	Cold ÷ 60°	2	IMP7

- see spin cycle chapter

#### 3.1 Possible options for each programme

Options	Cotton	Synthetics	Delicates	Wool	Mini
90°C	X				
60°C	X	X			X
50°C / 60 Eco	X	X			X
40°C	⊗	⊗	X	X	X
30°C	X	X	⊗	⊗	⊗
Cold	X	X	X	X	X
Drying	3 levels	1 level			
Drying time	Full power	Half power			
>900 g'	⊗				
900 g'	X	⊗		⊗	
700 g'	X	X	⊗	X	⊗
500 g'	X	X	X	X	X
No spin		X	X	X	X
Rinse hold / night cycle	X	X	X	X	X
Prewash	X	X	X		
Stains	X	X	X		
Intensive/ Heavy soil	X	X			
Daily	X	X			
Short/light	X	X	X		
Economy	X	X			
Bio	X	X			
Extra Rinse / Super rinse	X	X	X		
Delayed Start	X	X	X	X	X

⊗ standard functions      X options

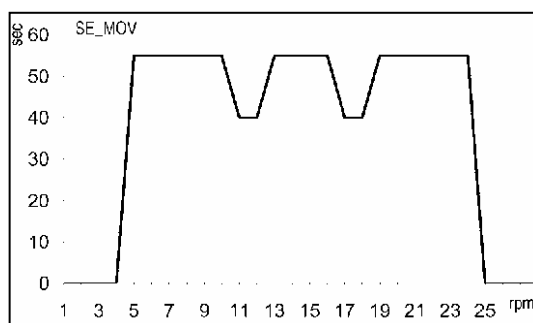


## 4 Washing programmes charts

Key to programmes	
Description	
<b>Calibration</b>	Drain sub-phase for calibration of the electronic pressure switch
Levels	
<b>mm H<sub>2</sub>O</b>	Level expressed in water mm (full/empty)
Pumps	
<b>OFF</b>	Pump off
<b>ON</b>	Pump on
<b>LEV</b>	Pump on from one level of pressure switch
Water inlet valves	
<b>ELV2</b>	Prewash
<b>ELV3</b>	Wash
<b>ELV2 ELV3</b>	Prewash + wash = softener
Refilling	
<b>NR</b>	Normal refilling
<b>VT</b>	"Total exchange" refilling (virtual tank)
<b>Dis</b>	Refilling disabled
Time	
<b>'</b>	Minutes
<b>"</b>	Seconds
<b>Tout</b>	Max. time (timeout)
Drying	
<b>TMP</b>	It is active up to the selected temperature

Motor movement			
Code	Pause(sec)	Movement(sec)	Speed (rpm.)
<b>D_MOV</b>	12	4	55
<b>E_MOV</b>	5	8	55
<b>E1_MOV</b>	4	12	75
<b>SE_MOV</b>	4	21	55/40
<b>N_MOV</b>	8	8	55
<b>PWL1_MOV</b>	40	1	35
<b>PWL3_MOV</b>	12	1	35
<b>PWL4_MOV</b>	57	1	35
<b>COLD_MOV</b>	4	12	40
<b>DRY_MOV</b>	57	3	55
<b>CR3_MOV</b>	Unidirectional movement		80
<b>DLD_MOV</b>	Unidirectional movement		40
<b>OFF</b>	No movement		0

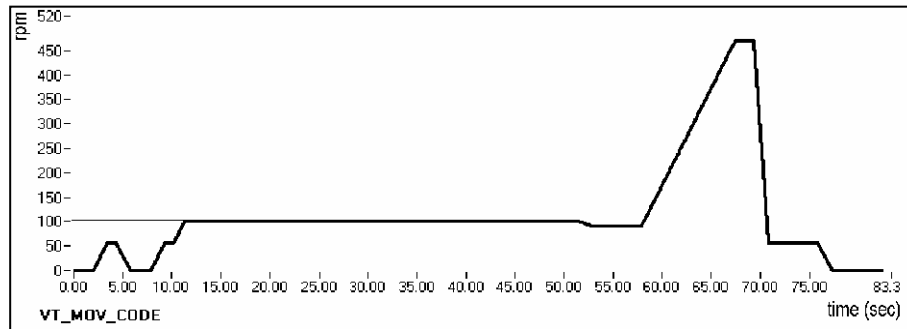
**SE\_MOV Mov:**



**VT movement during rinses in "jetsystem total exchange" COTTON programmes – Only for models with circulation pump (jetsystem):**

During these phases, in which the motor rotates at high speed, if the electronic pressure switch detects that the water in the tub falls below a certain level, the following operations are performed:

- ⇒ spin at 470 rpm (VT\_MOV\_CODE) to remove the water from the fabrics and therefore to increase the level in the tub



- ⇒ 5 seconds pause, during which the level is again checked and, if necessary, the solenoid valve is activated in order to load water until the level is correct
- ⇒ energetic movement (E) (with the circulation pump in operation)

These operations may be repeated up to a maximum of three times for each rinse.

***The parameters of the different programmes (levels, movements) vary according to the wash system of the different models:***

⇒ ***jetsystem (with circulation pump)***

⇒ ***traditional / eco-ball***

⇒ ***tub G20 (46 litres)***

⇒ ***tub G21 (54 litres)***

## 4.1 Cotton 60°C (Jetsystem)

(W2C01450) Cotton 60 JETSYSTEM Intermediate spin 850-1000											
N.	Phase	Description	Levels (mm H <sub>2</sub> O)		Rec. pump	Drain pump	Elv / Det comp.	Movement	Re- filling	Temp. °C	Time
			G20	G21							
0		CALIBRATION	35/15	35/15	OFF	ON		OFF	Dis		Tout 10'
1	Washing	WATER FILL	40/15	40/15	OFF	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	40/15	OFF	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	85/55	85/45	OFF	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	85/55	85/45	OFF	OFF	ELV3	COLD_MOV	NR		5'
5		MOVEMENT			ON	OFF		E_MOV	Dis	40	1'
6		MOVEMENT			OFF	OFF		E_MOV	Dis	54	22"
7		MOVEMENT	70/55	70/55	OFF	OFF	ELV3	E_MOV	NR		2'
8		MOVEMENT			ON	OFF		E_MOV	Dis		2'
9		HEATING+MOV.			ON	OFF		E_MOV	Dis	40	2'
10		HEATING	35/15	35/15	ON	OFF	ELV3	E_MOV	NR	40	Tout 40'
11		HEATING+MOV.			ON	OFF		E_MOV	Dis	54	2'
12		HEATING	35/15	35/15	OFF	OFF	ELV3	E_MOV	NR	54	Tout 40'
13		MOVEMENT			ON	OFF		E_MOV	Dis		2'
14		HEATING+MOV.			OFF	OFF		E_MOV	Dis	54	2'
15		HEATING	35/15	35/15	OFF	OFF	ELV3	E_MOV	NR	54	Tout 40'
16		MOVEMENT			ON	OFF		SE_MOV	Dis		12'
17		MOVEMENT			ON	OFF		N_MOV	Dis		4'
18		MOVEMENT			ON	OFF		SE_MOV	Dis		14'
19		WATER DRAIN			OFF	Lev		OFF	Dis		Tout 10'
20		TIME WATER DRAIN			OFF	ON		OFF	Dis		30"
21		SPINNING			OFF	ON		INP6_INP_SECT	Dis		Tout 20'
22		SPINNING			OFF	ON		INP6_SP_SECT	Dis		Tout 20'
23	1 <sup>st</sup> Rinse	MOVEMENT			OFF	OFF		CR3_MOV	Dis		5"
24		WATER FILL	75/20	95/20	LEV	OFF	ELV3	CR3_MOV	VT		Tout 15'
25		MOVEMENT	35/25	35/25	ON	OFF	ELV3	E_MOV	NR		5'
26		MOVEMENT			ON	OFF		E1_MOV	Dis		3'
27		WATER DRAIN			OFF	Lev		D_MOV	Dis		Tout 10'
28		SPINNING			OFF	ON		IMP6_RINSE	Dis		Tout 20'
29	2 <sup>nd</sup> Rinse	MOVEMENT			OFF	OFF		CR3_MOV	Dis		5"
30		WATER FILL	75/20	95/20	LEV	OFF	ELV3	CR3_MOV	NR		Tout 15'
31		MOVEMENT	35/25	35/25	ON	OFF		E_MOV	VT		5'
32		MOVEMENT			ON	OFF		E1_MOV	Dis		3'
33		WATER DRAIN			OFF	Lev		D_MOV	Dis		Tout 10'
34		SPINNING			OFF	ON		IMP6_RINSE	Dis		Tout 20'
35	3 <sup>rd</sup> Rinse (softener)	MOVEMENT			OFF	OFF		CR3_MOV	Dis		5"
36		WATER FILL	75/20	95/20	LEV	OFF	ELV2 ELV3	OFF	NR		Tout 15'
37		MOVEMENT	75/20	95/20	LEV	OFF	ELV2 ELV3	N_MOV	NR		30"
38		MOVEMENT	75/20	95/20	LEV	OFF	ELV2 ELV3	OFF	NR		5"
39		WATER FILL	95/20	100/65	LEV	OFF	ELV2 ELV3	N_MOV	NR		Tout 15'
40		MOVEMENT	95/20	100/65	LEV	OFF	ELV2 ELV3	N_MOV	NR		11'
41	Spinning	WATER DRAIN			OFF	Lev		OFF	Dis		Tout 10'
42		TIME WATER DRAIN			OFF	ON		OFF	Dis		15"
43		SPINNING			OFF	ON		IMPCF_01_(AC- DC)	Dis		Tout 20'
44		MOVEMENT			OFF	OFF		N_MOV	Dis		2'

## 4.2 Cotton 60°C (Traditional/Eco-ball)

(W2C01450) Cotton 60 TRADITIONAL/ECO-BALL Intermediate spin 850 1000									
N.	Phase	Description	Levels (mm H <sub>2</sub> O)	Drain pump	Elv / Det comp.	Movement	Refilling	Temp. °C	Time
0		CALIBRATION	40/15	ON		OFF	Dis		Tout 10'
1	Washing	WATER FILL	40/15	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	95/57	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	75/55	OFF	ELV3	COLD_MOV	NR		5'
5		MOVEMENT	75/55	OFF	ELV3	E_MOV	NR		2'
6		HEATING	75/55	OFF	ELV3	E_MOV	NR	40	Tout 40'
7		HEATING	75/55	OFF	ELV3	E_MOV	NR	54	Tout 40'
8		MOVEMENT		OFF		E_MOV	Dis		2'
9		HEATING	75/55	OFF	ELV3	E_MOV	NR	54	Tout 40'
10		MOVEMENT		OFF		E_MOV	Dis		10'
11		MOVEMENT		OFF		N_MOV	Dis		4'
12		MOVEMENT		OFF		E_MOV	Dis		24'
13		WATER DRAIN		Lev		OFF	Dis		Tout 10'
14		TIME WATER DRAIN		ON		OFF	Dis		30"
15		SPINNING		ON		INP6_INP_SECT	Dis		Tout 20'
16		SPINNING		ON		INP6_SP_SECT	Dis		Tout 20'
17	1 <sup>st</sup> Rinse	MOVEMENT		OFF		OFF	Dis		5"
18		WATER FILL	100/65	OFF	ELV3	OFF	NR		Tout 15'
19		MOVEMENT	100/65	OFF	ELV3	E_MOV	NR		6'
20		WATER DRAIN		Lev		D_MOV	Dis		Tout 10'
21		SPINNING		ON		IMP6_RINSE	Dis		Tout 20'
22	2 <sup>nd</sup> Rinse	MOVEMENT		OFF		OFF	Dis		5"
23		WATER FILL	100/65	OFF	ELV3	OFF	NR		Tout 15'
24		MOVEMENT		OFF	ELV3	E_MOV	NR		6'
25		WATER DRAIN		Lev		D_MOV	Dis		Tout 10'
26		SPINNING		ON		IMP6_RINSE	Dis		Tout 20'
27	3 <sup>rd</sup> Rinse (softener)	MOVEMENT		OFF		OFF	Dis		5"
28		WATER FILL	100/65	OFF	ELV2 ELV3	OFF	NR		Tout 15'
29		MOVEMENT	100/65	OFF	ELV2 ELV3	N_MOV	NR		30"
30		MOVEMENT	100/65	OFF	ELV2 ELV3	OFF	NR		5"
31		WATER FILL	140/95	OFF	ELV2 ELV3	OFF	NR		Tout 15'
32		MOVEMENT		OFF	ELV2 ELV3	E_MOV	NR		7'
33	Spinning	WATER DRAIN		Lev		OFF	Dis		Tout 10'
34		TIME WATER DRAIN		ON		OFF	Dis		15"
35		SPINNING		ON		IMPCF_01 (AC-DC)	Dis		Tout 20'
36		MOVEMENT		OFF		N_MOV	Dis		2'

### 4.3 Synthetics 40°C (Jetsystem)

(W2C01450) Synthetics 40 JETSYSTEM										
N.	Phase	Description	Levels (mm H <sub>2</sub> O)	Rec. pump	Drain pump	Elv / Det comp.	Movement	Refilling	Temp. °C	Time
0		CALIBRATION	35/15	OFF	ON		OFF	Dis		Tout 10'
1	Washing	WATER FILL	40/15	OFF	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	OFF	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	100/65	LEV	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	100/65	LEV	OFF	ELV3	N_MOV	NR		7'
5		HEATING	100/65	ON	OFF	ELV3	N_MOV	NR	38	Tout 40'
6		MOVEMENT	100/65	LEV	OFF	ELV3	N_MOV	NR		8'
7		HEATING	100/65	ON	OFF	ELV3	E_MOV	NR	40	Tout 40'
8		MOVEMENT	100/65	LEV	OFF	ELV3	D_MOV	NR		3'
9		MOVEMENT	100/65	LEV	OFF	ELV3	E_MOV	NR		7'
10		HEAT+MOV	100/65	ON	OFF	ELV3	D_MOV	NR	40	3'
11		MOVEMENT	100/65	LEV	OFF	ELV3	E_MOV	NR		6'
12		WATER FILL	160/80	LEV	OFF	ELV3	N_MOV	NR		Tout 1'
13		MOVEMENT		LEV	OFF		N_MOV	Dis		1'
14		MOVEMENT		LEV	OFF		N_MOV	Dis		1'
15		WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
16		TIME WATER DRAIN		OFF	ON		OFF	Dis		30"
17		TIME WATER DRAIN		OFF	ON		E_MOV	Dis		30"
18		TIME WATER DRAIN		OFF	ON		E_MOV	Dis		1'
19	1 <sup>st</sup> Rinse	MOVEMENT		OFF	OFF		OFF	Dis		5"
20		WATER FILL	160/80	LEV	OFF	ELV3	OFF	NR		Tout 15'
21		MOVEMENT	160/80	LEV	OFF	ELV3	N_MOV	NR		2'
22		WATER DRAIN		LEV	Lev		E_MOV	Dis		Tout 10'
23		TIME WATER DRAIN		LEV	ON		E_MOV	Dis		2'
24	2 <sup>nd</sup> Rinse	MOVEMENT		LEV	OFF		OFF	Dis		5"
25		WATER FILL	160/80	LEV	OFF	ELV3	OFF	NR		Tout 15'
26		MOVEMENT	160/80	LEV	OFF	ELV3	N_MOV	NR		2'
27		WATER DRAIN		OFF	Lev		E_MOV	Dis		Tout 10'
28		SPINNING		OFF	ON		IMP_C0_INP_SECT	Dis		Tout 20'
29		SPINNING		OFF	ON		IMP_C0_SP_SECT	Dis		Tout 20'
30	3 <sup>rd</sup> Rinse	MOVEMENT		OFF	OFF		OFF	Dis		5"
31		(softener) WATER FILL	100/65	OFF	OFF	ELV2 ELV3	OFF	NR		Tout 15'
32		MOVEMENT		OFF	OFF	ELV2 ELV3	N_MOV	NR		30"
33		MOVEMENT		OFF	OFF	ELV2 ELV3	OFF	NR		5"
34		WATER FILL	160/80	LEV	OFF	ELV2 ELV3	OFF	NR		Tout 15'
35		MOVEMENT	160/80	LEV	OFF	ELV2 ELV3	N_MOV	NR		2'
36		MOVEMENT	160/80	LEV	OFF	ELV2 ELV3	N_MOV	NR		3'
37	Spinning	WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
38		TIME WATER DRAIN		OFF	ON		OFF	Dis		15"
39		SPINNING		OFF	OFF		IMP5	Dis		Tout 20'
40		MOVEMENT		OFF	OFF		N_MOV	Dis		1'

#### 4.4 Synthetics 40°C (Traditional/Eco-ball)

(W2C01450) Synthetics 40 ECOBALL-TRADITIONAL										
N.	Phase	Description	Levels (mm H <sub>2</sub> O)		Drain pump	Elv / Det comp.	Movement	Refilling	Temp. °C	Time
			Eco- ball	Tradit.						
0		CALIBRATION	40/15	40/15	ON		OFF	Dis		Tout 10'
1	Spinning	WATER FILL	40/15	40/15	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	40/15	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	105/80	120/90	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	105/80	120/90	OFF	ELV3	N_MOV	NR		7'
5		HEATING	105/80	120/90	OFF	ELV3	N_MOV	NR	40	Tout 40'
6		MOVEMENT	105/80	120/90	OFF	ELV3	N_MOV	NR		8'
7		HEATING	105/80	120/90	OFF	ELV3	E_MOV	NR	40	Tout 40'
8		MOVEMENT	105/80	120/90	OFF	ELV3	D_MOV	NR		3'
9		MOVEMENT	105/80	120/90	OFF	ELV3	E_MOV	NR		7'
10		HEAT+MOV	105/80	120/90	OFF	ELV3	D_MOV	NR	40	3'
11		MOVEMENT	105/80	120/90	OFF	ELV3	E_MOV	NR		6'
12		WATER FILL	135/85	155/10	OFF	ELV3	N_MOV	NR		Tout 1'
13		MOVEMENT			OFF		N_MOV	Dis		1'
14		MOVEMENT			OFF		N_MOV	Dis		1'
15		WATER DRAIN			Lev		OFF	Dis		Tout 10'
16		TIME WATER DRAIN			ON		OFF	Dis		30"
17		TIME WATER DRAIN			ON		E_MOV	Dis		30"
18		TIME WATER DRAIN			ON		E_MOV	Dis		1'
19	1 <sup>st</sup> Rinse	MOVEMENT			OFF		OFF	Dis		5"
20		WATER FILL	135/85	155/10	OFF	ELV3	OFF	NR		Tout 15'
21		MOVEMENT	135/85	155/10	OFF	ELV3	N_MOV	NR		2'
22		WATER DRAIN			Lev		E_MOV	Dis		Tout 10'
23		TIME WATER DRAIN			ON		E_MOV	Dis		2'
24	2 <sup>nd</sup> Rinse	MOVEMENT			OFF		OFF	Dis		5"
25		WATER FILL	135/85	155/10	OFF	ELV3	OFF	NR		Tout 15'
26		MOVEMENT	135/85	155/10	OFF	ELV3	N_MOV	NR		2'
27		WATER DRAIN			Lev		E_MOV	Dis		Tout 10'
28		SPINNING			ON		IMP_C0_INP_ SECT	Dis		Tout 20'
29		SPINNING			ON		IMP_C0_SP_ SECT	Dis		Tout 20'
30	3 <sup>rd</sup> Rinse	MOVEMENT			OFF		OFF	Dis		5"
31	(softener)	WATER FILL	105/80	120/90	OFF	ELV2 ELV3	OFF	NR		Tout 15'
32		MOVEMENT	105/80	120/90	OFF	ELV2 ELV3	N_MOV	NR		30"
33		MOVEMENT	105/80	120/90	OFF	ELV2 ELV3	OFF	NR		5"
34		WATER FILL	135/85	155/10	OFF	ELV2 ELV3	OFF	NR		Tout 15'
35		MOVEMENT	135/85	155/10	OFF	ELV2 ELV3	N_MOV	NR		2'
36		MOVEMENT	135/85	155/10	OFF	ELV2 ELV3	N_MOV	NR		3'
37	Spinning	WATER DRAIN			Lev		OFF	Dis		Tout 10'
38		TIME WATER DRAIN			ON		OFF	Dis		15"
39		SPINNING			ON		IMP5	Dis		Tout 20'
40		MOVEMENT			OFF		N_MOV	Dis		1'

## 4.5 Hand wash 30° (Jetsystem)

(W2C01450) Handwash 30 JETSYSTEM										
N.	Phase	Description	Levels (mm H <sub>2</sub> O)	Rec. pump	Drain pump	Elv / Det comp.	Movement	Refillin g	Temp. °C	Time
0		CALIBRATION	35/15	OFF	ON		OFF	Dis		Tout 10'
1	Washing	WATER FILL	40/15	OFF	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	OFF	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	115/50	LEV	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	115/50	LEV	OFF	ELV3	PWL4_MOV	NR		4'
5		HEATING	115/50	ON	OFF	ELV3	PWL4_MOV	NR	30	Tout 40'
6		MOVEMENT	115/50	LEV	OFF	ELV3	PWL4_MOV	NR		2'
7		HEAT+MOV	115/50	LEV	OFF	ELV3	PWL4_MOV	NR	30	14'
8		WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
9		TIME WATER DRAIN		OFF	ON		OFF	Dis		1'
10	1 <sup>st</sup> Rinse	MOVEMENT		OFF	OFF		OFF	Dis		5"
11		WATER FILL	160/80	LEV	OFF	ELV3	OFF	NR		Tout 15'
12		MOVEMENT	160/80	LEV	OFF	ELV3	PWL4_MOV	NR		3'
13		WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
14		TIME WATER DRAIN		OFF	ON		OFF	Dis		1'
15	2 <sup>nd</sup> Rinse	MOVEMENT		OFF	OFF		OFF	Dis		5"
16		WATER FILL	160/80	LEV	OFF	ELV3	OFF	NR		Tout 15'
17		MOVEMENT	160/80	LEV	OFF	ELV3	PWL4_MOV	NR		3'
18		WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
19		TIME WATER DRAIN		OFF	ON		OFF	Dis		1'
20	3 <sup>rd</sup> Rinse (softener)	MOVEMENT		OFF	OFF		OFF	Dis		5"
21		WATER FILL	115/50	OFF	OFF	ELV2 ELV3	OFF	NR		Tout 15'
22		MOVEMENT	115/50	OFF	OFF	ELV2 ELV3	N_MOV	NR		30"
23		WATER FILL	160/80	LEV	OFF	ELV2 ELV3	OFF	NR		Tout 15'
24		MOVEMENT	160/80	LEV	OFF	ELV2 ELV3	PWL4_MOV	NR		5'
25	Spinning	WATER DRAIN		OFF	Lev		OFF	Dis		Tout 10'
26		SPINNING		OFF	ON		IMP4	Dis		Tout 20'
27		MOVEMENT		OFF	OFF		N_MOV	Dis		1'

## 4.6 30° Hand wash (Traditional/Eco-ball)

(W2C01450) Handwash 30 TRADITIONAL										
N.	Phase	Description	Levels (mm H <sub>2</sub> O)		Drain pump	Elv / Det comp.	Movement	Refilling	Temp. °C	Time
			Ecoball	Tradit.						
0		CALIBRATION	40/15	40/15	ON		OFF	Dis		Tout 10'
1	Washing	WATER FILL	40/15	40/15	OFF	ELV2	OFF	NR		Tout 15'
2		MOVEMENT	40/15	40/15	OFF	ELV2	PWL3_MOV	NR		1'
3		WATER FILL	140/90	150/80	OFF	ELV3	OFF	NR		Tout 15'
4		MOVEMENT	140/90	150/80	OFF	ELV3	PWL4_MOV	NR		4'
5		HEATING	140/90	150/80	OFF	ELV3	PWL4_MOV	NR	30	Tout 40'
6		MOVEMENT	140/90	150/80	OFF	ELV3	PWL4_MOV	NR		2'
7		HEAT+MOV	140/90	150/80	OFF	ELV3	PWL4_MOV	NR	30	14'
8		WATER DRAIN			Lev		OFF	Dis		Tout 10'
9		TIME WATER DRAIN			ON		OFF	Dis		1'
10	1 <sup>st</sup> Rinse	MOVEMENT			OFF		OFF	Dis		5"
11		WATER FILL	135/85	155/110	OFF	ELV3	OFF	NR		Tout 15'
12		MOVEMENT	135/85	155/110	OFF	ELV3	PWL4_MOV	NR		3'
13		WATER DRAIN			Lev		OFF	Dis		Tout 10'
14		TIME WATER DRAIN			ON		OFF	Dis		1'
15	2 <sup>nd</sup> Rinse	MOVEMENT			OFF		OFF	Dis		5"
16		WATER FILL	135/85	155/110	OFF	ELV3	OFF	NR		Tout 15'
17		MOVEMENT	135/85	155/110	OFF	ELV3	PWL4_MOV	NR		3'
18		WATER DRAIN			Lev		OFF	Dis		Tout 10'
19		TIME WATER DRAIN			ON		OFF	Dis		1'
20	3 <sup>rd</sup> Rinse (softener)	MOVEMENT			OFF		OFF	Dis		5"
21		WATER FILL	140/90	150/80	OFF	ELV2 ELV3	OFF	En		Tout 15'
22		MOVEMENT	140/90	150/80	OFF	ELV2 ELV3	N_MOV	En		30"
23		WATER FILL	135/85	155/110	OFF	ELV2 ELV3	OFF	En		Tout 15'
24		MOVEMENT	135/85	155/110	OFF	ELV2 ELV3	PWL4_MOV	En		5'
25	Spinning	WATER DRAIN			Lev		OFF	Dis		Tout 10'
26		SPINNING			ON		IMP4	Dis		Tout 20'
27		MOVEMENT			OFF		N_MOV	Dis		1'

#### 4.7 Drying Cotton (Jetsystem - Traditional - Eco-ball)

(W2C01450) Cotton CUPBOARD DRYING								
N.	Phase	Description	Levels (mm H <sub>2</sub> O)	Power	Drain pump	Fan	Movement	Time
0		CALIBRATION			ON	OFF		Tout 10'
1	DRYING	TAP_TEST	10/0		OFF	OFF	N_MOV	Tout 10'
2		FIRST COOL DOWN			ON	TMP	N_MOV	Tout 20'
3		DRY_ACQ		FULL	ON	ON	DRY_MOV	Tout 20'
4		TIME DRY		FULL	ON	ON	DRY_MOV	Tout 84'
5		COOL DOWN		OFF	ON	ON	DRY_MOV	Tout 10'

#### 4.8 Drying Synthetics (Jetsystem - Traditional - Eco-ball)

(W2C01450) Synthetics CUPBOARD DRYING								
N.	Phase	Description	Levels (mm H <sub>2</sub> O)	Power	Drain pump	Fan	Movement	Time
0		CALIBRATION		OFF	ON	OFF		Tout 10'
1	DRYING	TAP_TEST	10/0	OFF	OFF	OFF	N_MOV	Tout 10'
2		FIRST COOL DOWN		OFF	ON	TMP	N_MOV	Tout 20'
3		DRY_ACQ		HALF	ON	ON	DRY_MOV	Tout 20'
4		TIME DRY		HALF	ON	ON	DRY_MOV	Tout 84'
5		COOL DOWN		OFF	ON	ON	DRY_MOV	Tout 10'



## 4.9 “FUCS” (Fast Unbalance Control System)

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

- The phase starts with the inversion rotation of the drum at a speed of 55 rpm.
- 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 400 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 2 rpm; if the value is higher, the speed of the drum is reduced by 2 rpm. 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 four steps: each phase is characterised by a *value of unbalancing threshold* and by a *time out* (max. time)

**Step 0:** The zero phase has a preset unbalancing threshold; if correct balancing is achieved, the appliance performs a spin pulse at 470 rpm, preceded by 5 sec at 100 rpm and followed by phase 1; otherwise, after a maximum of 60 seconds the function passes to step 1.

**Step 1:** The first phase has a different preset unbalancing threshold; if correct balancing is achieved, the appliance performs the spin cycle, preceded by 5 sec at 100 rpm. Otherwise, after a maximum of 120 seconds, the function passes to step 2.

**Step 2:** The second phase is characterised by a different unbalancing threshold: if correct balancing is not achieved within 60 seconds, the function passes to step 3.

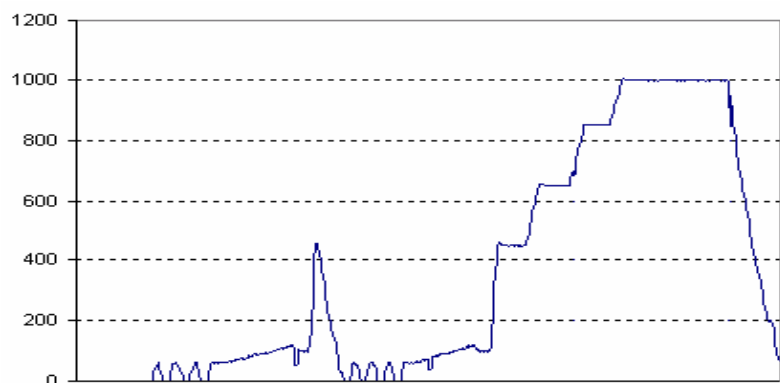
**Step 3:** The third phase has a preset unbalancing threshold: if correct balancing is achieved within 90 seconds a spin pulse is performed, preceded by 5 sec at 100 rpm and followed by a new step 1; otherwise, after a maximum of 90 seconds, the function passes to a new step 1. If the unbalancing value remains excessive at the second attempt during step 3, the spin cycle is skipped; if the balancing is not correct a reduced spin is performed.

### 4.9.1 Examples of operation of the unbalancing control function

The following examples refer to an appliance with a final spin speed at 1000 rpm.

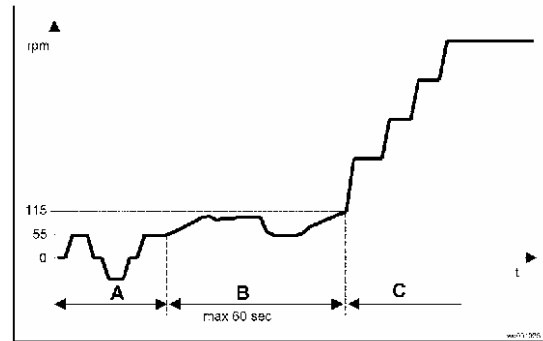
#### Load correctly balanced

- Low speed
- FUCS phase 0 and pulse
- Low speed
- FUCS phase 1
- Normal spin



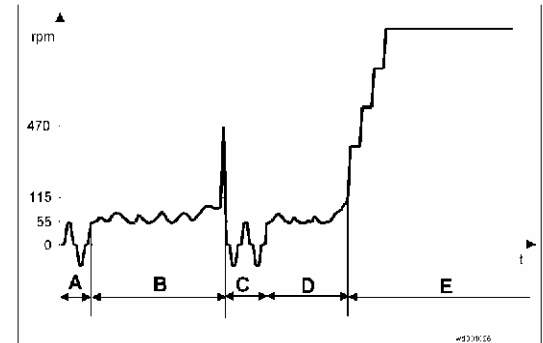
### Load balanced after few attempts:

- A: Low speed
- B: FUCS phase 1
- C: Normal spin



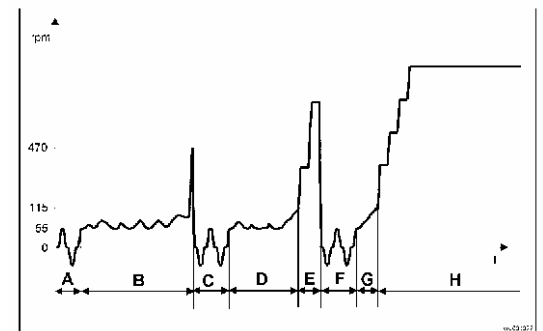
### Load balanced after second phase:

- A: Low speed
- B: FUCS phase 1 with pulse at 470 rpm
- C: Low speed
- D: FUCS phase 2
- E: Normal spin



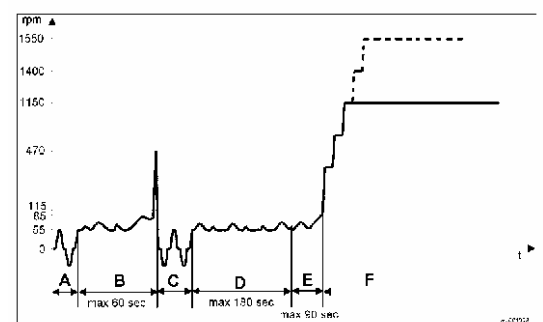
### Load balanced after second phase and anti-foam control function:

- A: Low speed
- B: FUCS phase 1 with pulse at 470 rpm
- C: Low speed
- D: FUCS phase 2
- E: Spin with anti-foam function
- F: Low speed
- G: FUCS phase 3
- H: Normal spin



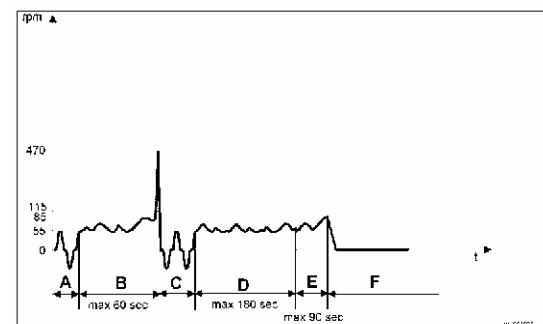
### Load slightly unbalanced after third phase:

- A: Low speed
- B: FUCS phase 1 with pulse at 470 rpm
- C: Low speed
- D: FUCS phase 2
- E: FUCS phase 3
- F: Reduced spin



### Load unbalanced after third phase:

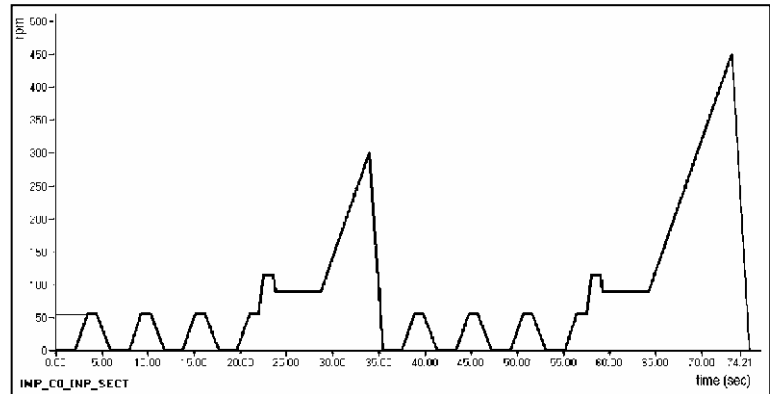
- A: Low speed
- B: FUCS phase 1 with pulse at 470 rpm
- C: Low speed
- D: FUCS phase 2
- E: FUCS phase 3
- F: the spin phase is skipped and the appliance passes to the subsequent phase



## 4.10 Spin cycles

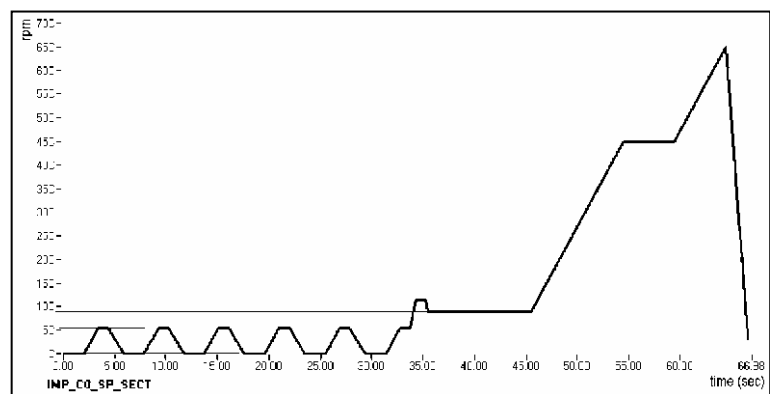
### 4.10.1 SPIN MP\_C0\_INP\_SECT

- prewash cotton and synthetics, penultimate synthetics rinse (1<sup>st</sup> part)



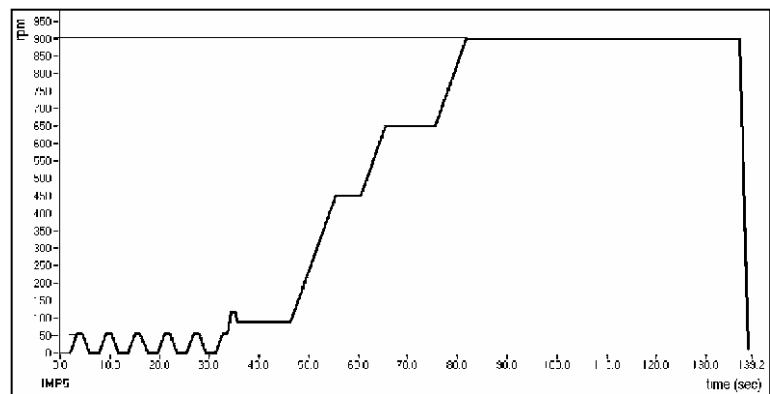
### 4.10.2 SPIN IMP\_C0\_SP\_SECT

- prewash cotton and synthetics, penultimate synthetics rinse (2<sup>nd</sup> part)



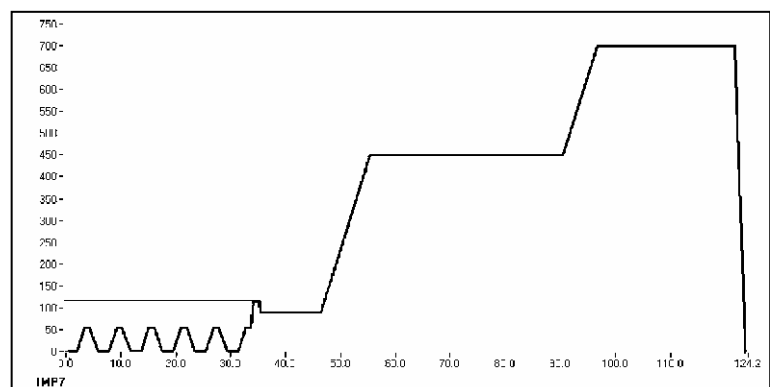
### 4.10.3 SPIN IMP5

- final synthetics



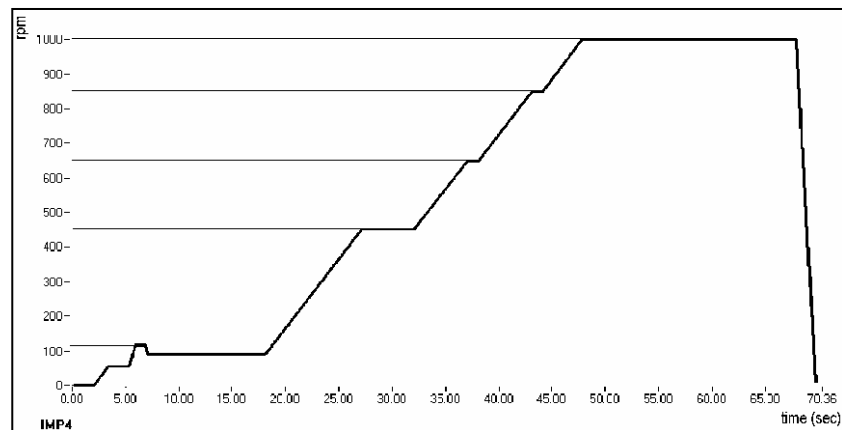
### 4.10.4 SPIN IMP7

- final delicates



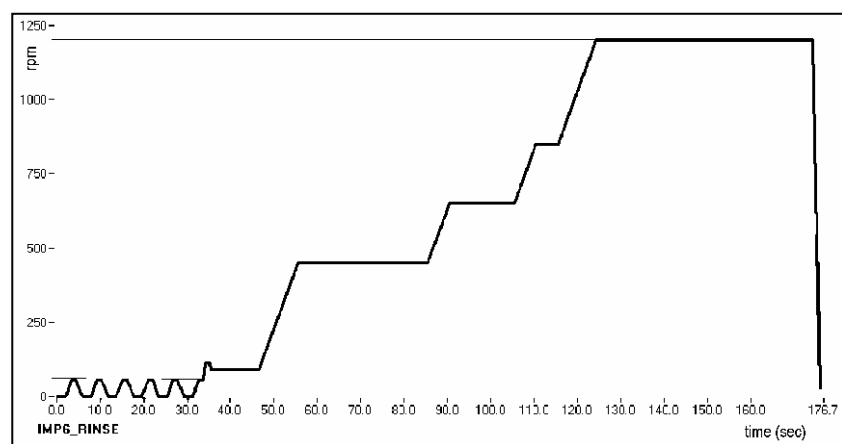
#### 4.10.5 SPIN IMP4

- final wool



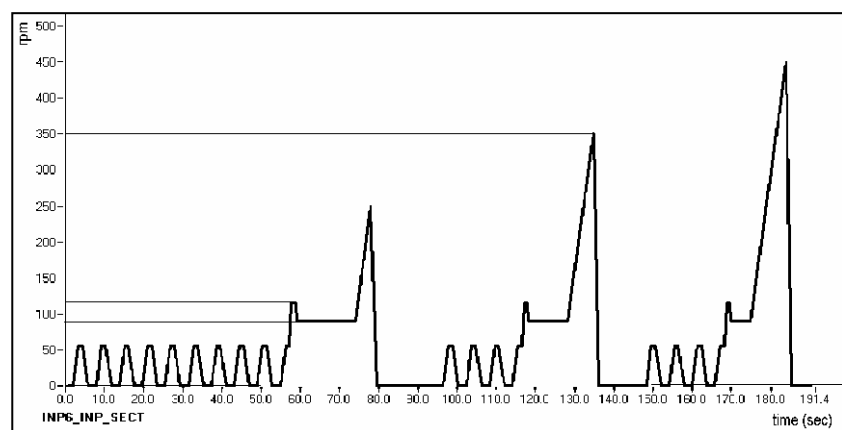
#### 4.10.6 SPIN IMP6-RINSE

- intermediate cotton rinses (the speed can be configured)



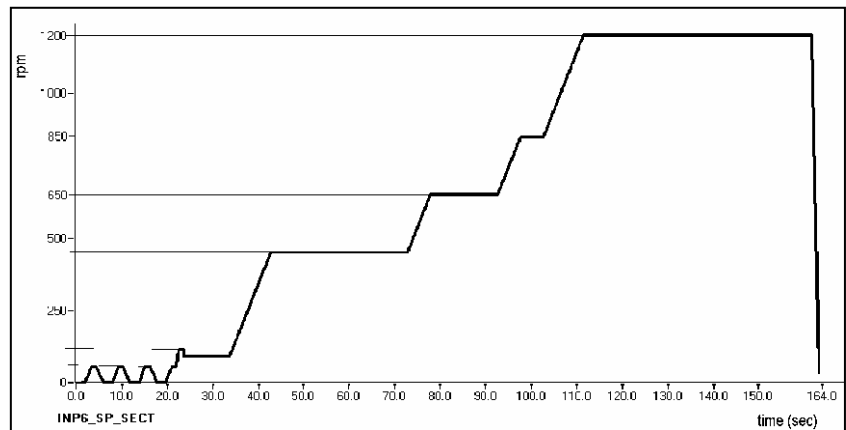
#### 4.10.7 SPIN IMP6\_INP\_SECT

- cotton final wash phase (1<sup>st</sup> part)



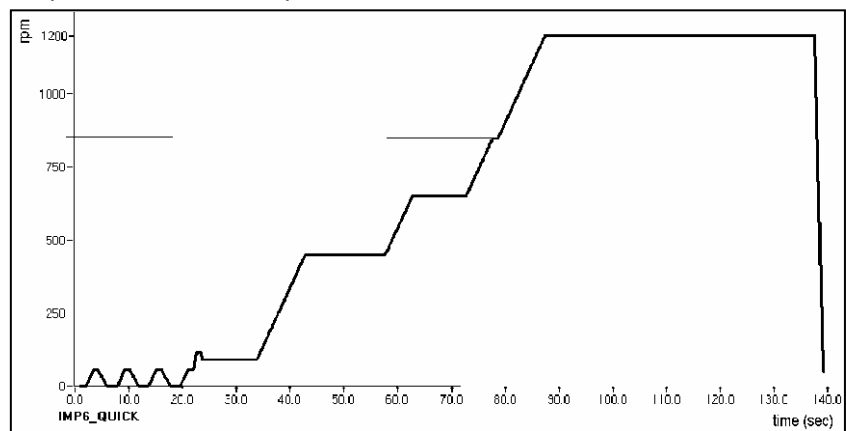
#### 4.10.8 SPIN IMP6\_SP\_SECT

- cotton final wash phase (2<sup>nd</sup> part)



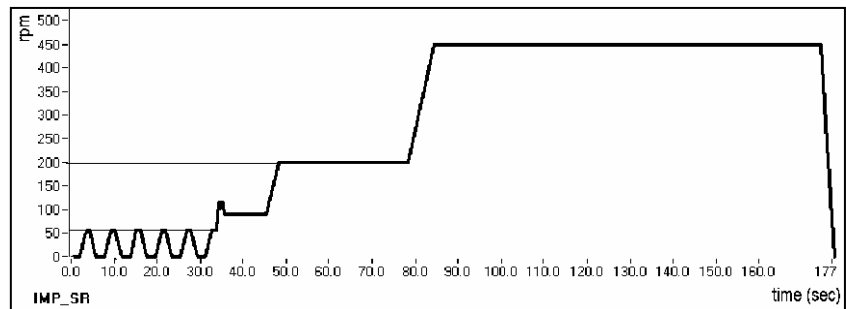
#### 4.10.9 SPIN IMP6\_QUICK

- cotton final and intermediate wash phase with “short” option



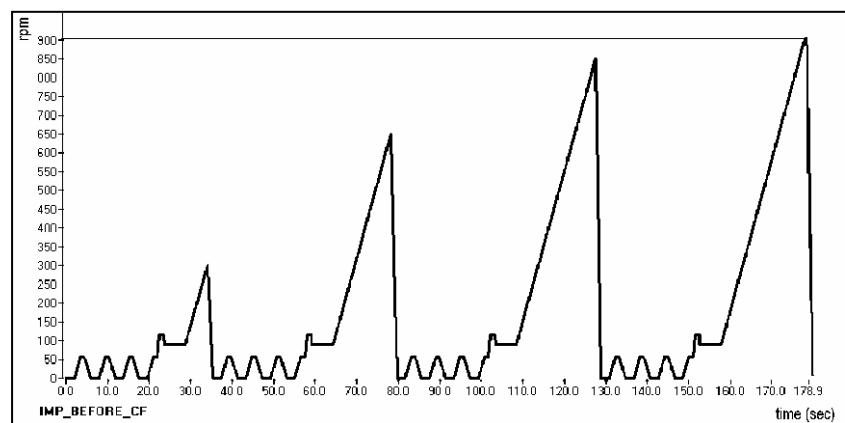
#### 4.10.10 SPIN IMP\_SR

- intermediate with “super-rinse” option



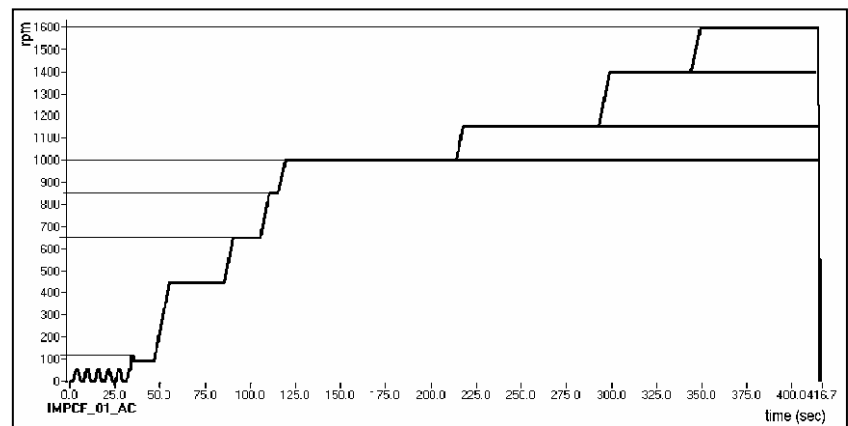
#### 4.10.11 SPIN IMP\_BEFORE\_CF

- precedes the cotton final spin if the drying is selected at the end of the washing cycle (washer driers)



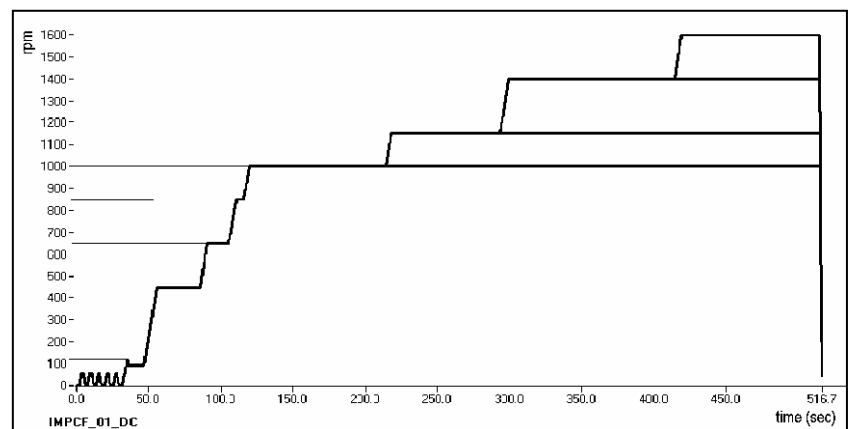
#### 4.10.12 SPIN IMPCF\_01\_AC

- cotton final with AC motors



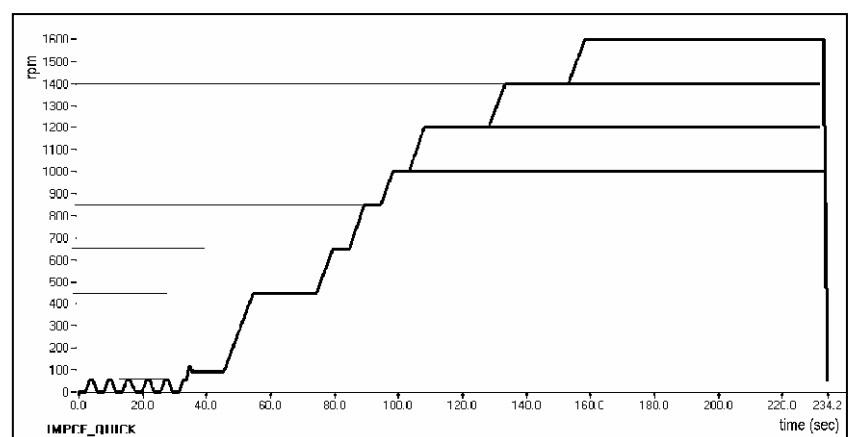
#### 4.10.13 SPIN IMPCF\_01\_DC

- cotton final with DC motors



#### 4.10.14 SPIN IMPCF\_QUICK

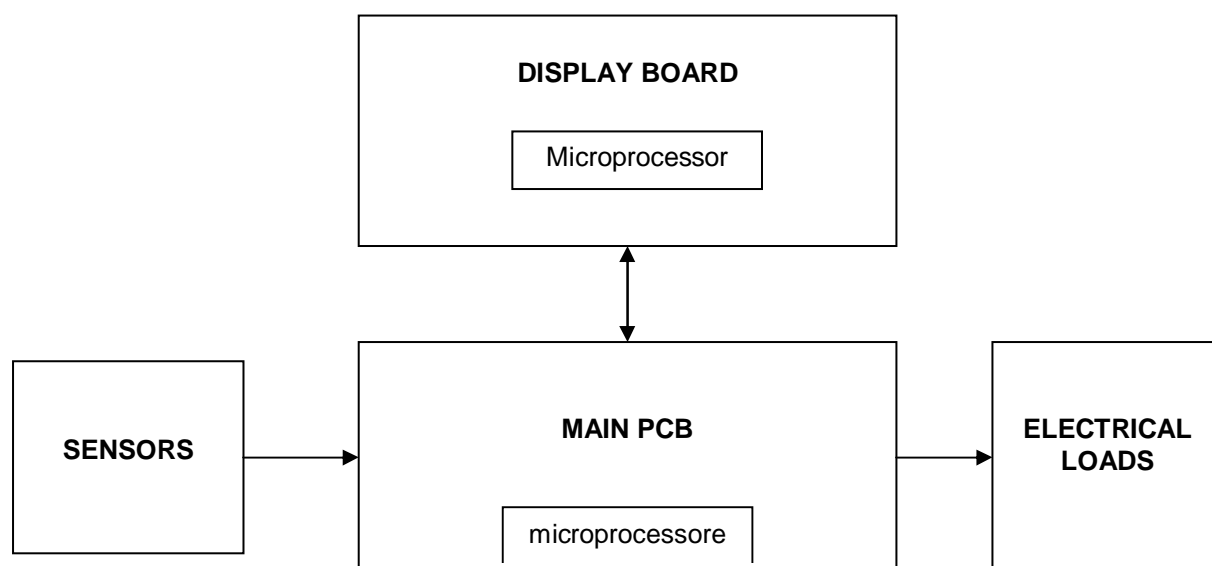
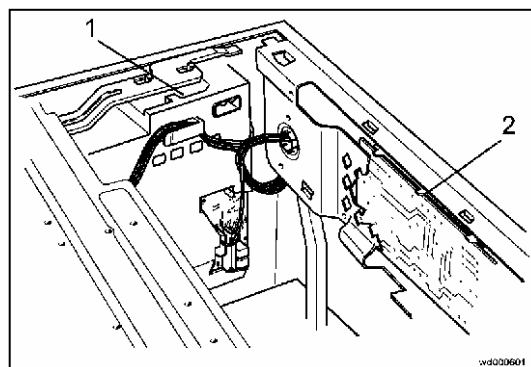
- cotton final with "short" option



## 5 Technical characteristics

### 5.1 EWM2000 Electronic control unit

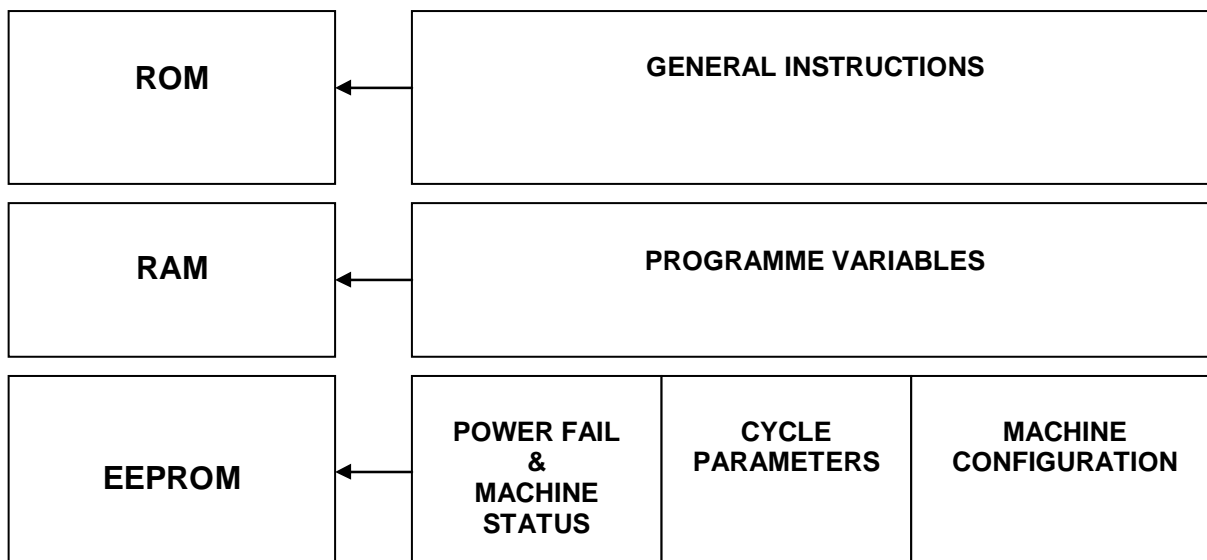
1. Main PCB  
2. Control/Display Board



The main PCB performs the following functions:

- acquisition of the wash cycle settings via the control/display board.
- control of the water level in the tub via the electronic pressure switch and the safety pressure switch.
- control of the temperature of the washing solution via an NTC sensor.
- control of the speed of rotation of the motor via a signal from the tachometric generator.
- powering of all the electrical components in the washing machine and control of the wash cycle

### 5.1.1 Microprocessor memories (main PCB)



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.

### ENTERING DATA INTO THE EEPROM

All the data is entered into the EEPROM on the production line of the washing machines using a computer with a DAAS interface.

In the field, the configuration only can be modified using a combination of buttons on the control/display board.



## 5.2 Analog pressure switch (electronic)

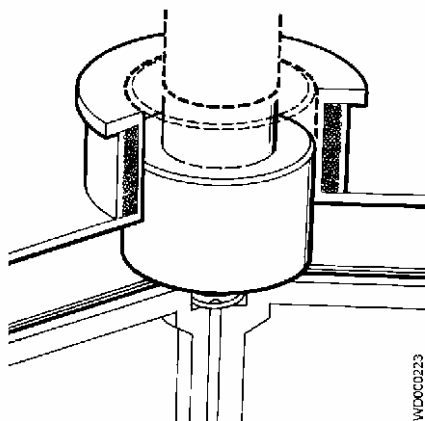
The electronic pressure switch is an analog device that controls the water level in the tub. It is directly connected to the main electronic PCB.

1. air inlet hose
2. diaphragm
3. coil
4. electronic circuit (oscillator)
5. core
6. spring
7. calibration screw
8. connector

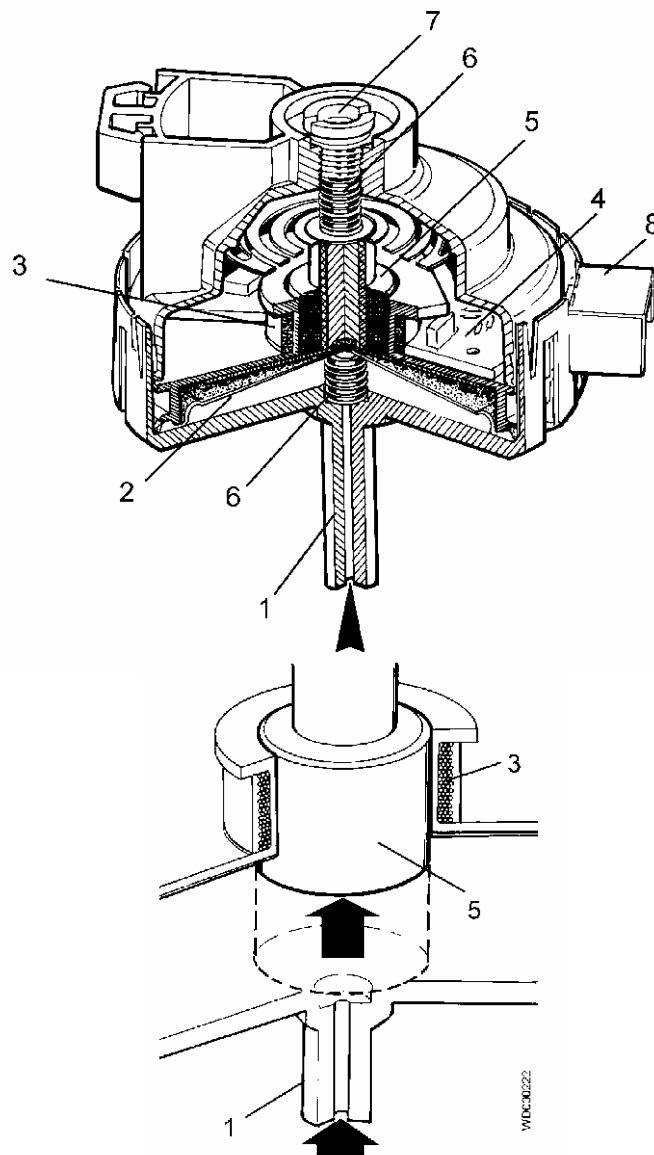
The pressure switch is connected by a hose to the pressure chamber.

When the tub is filled with water, the pressure created inside the hydraulic circuit expands the diaphragm. This in turn modifies the position of the core inside the coil, thus changing the inductance and the frequency of the oscillating circuit.

The electronic PCB, according to the frequency, recognizes the quantity of the water in the tub.



WD000223

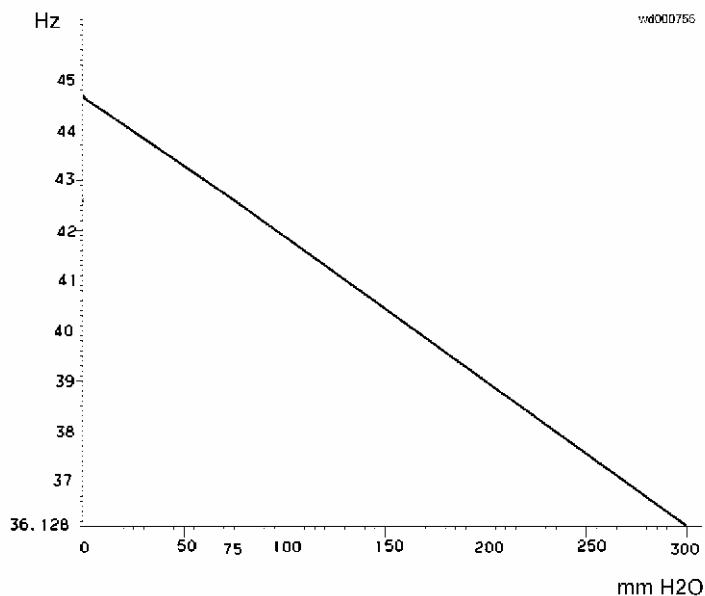


WD000220

WD000222

wd000755

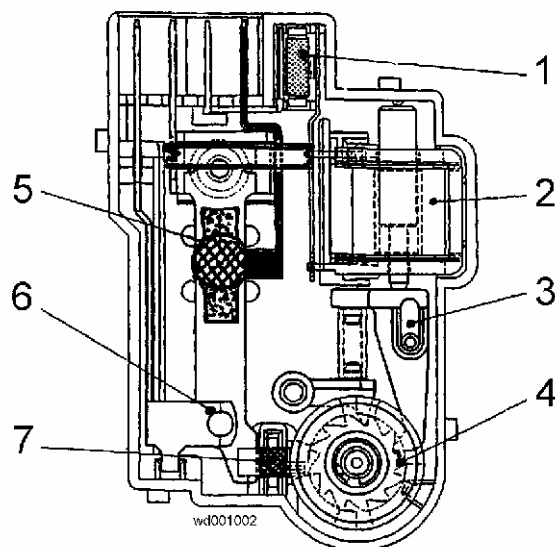
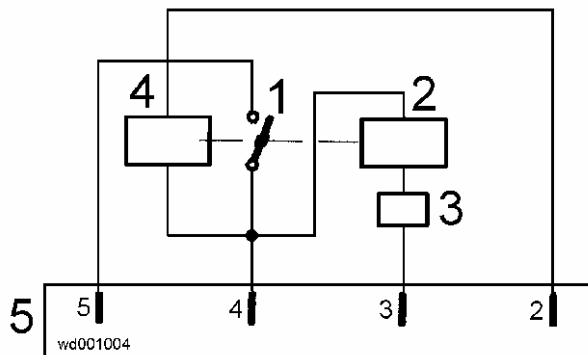
### Frequency variation according to pressure



### 5.3 Instantaneous door safety device

Certain models are fitted with an instantaneous door safety device; this means that the door can be opened as soon as the drum stops rotating.

1. PTC solenoid protector
2. Solenoid
3. Lever mechanism
4. Cam
5. PTC - bimetal
6. Electrical contacts (main switch)
7. Latch



1. Main switch
2. Solenoid
3. PTC solenoid protection
4. Bimetal PTC
5. Connector

#### Operation principle

When the ON/OFF button is pressed to switch the appliance on, the bimetal PTC is powered; the cam is in a position which prevents the latch from moving outwards.

When the START/PAUSE button is pressed to start the programme, the main PCB transmits a signal (duration 20 msec) to the solenoid (at least 6 seconds after the appliance is switched on). The solenoid causes the cams to rotate one position. This raises the latch which holds the cursor of the door safety device in position and, at the same time, closes the contacts of the main switch, which thus powers all the components in the appliance.

At the end of the programme, the board transmits two signals (at an interval of 200 msec and having the same 20 msec duration):

- the first signal moves the cams a further position, though without releasing the latch.
- the second signal (which is transmitted only if the system functions correctly) moves the cams another position, which causes the latch to retract, thus releasing the safety device. At the same time, the contacts of the main switch are opened.

#### Conditions of door opening

Before transmitting the door aperture signal, the main PCB checks that the following conditions are observed:

- the drum must be stationary (i.e. no signal received from the tachometric generator)
- the water must not be above the lower lip of the door
- the temperature of the water must be not more than 40°C.

#### Automatic release device

In case of a power failure, or if the appliance is switched off using the ON/OFF button, or if the solenoid should malfunction, the bimetal PTC cools over a period varying from 55 seconds to 4 minutes (at a temperature of 65°C), after which the door lock is released.

#### Solenoid protection

A PTC is connected in series with the solenoid with the purpose of limiting the current (and thus possible overheating) in the following cases:

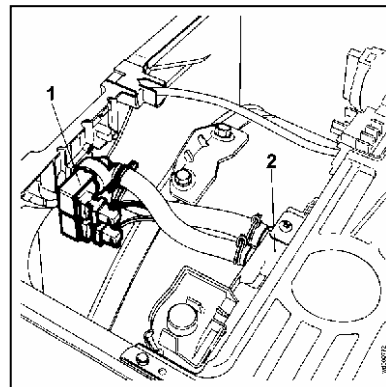
- TRIAC on the main PCB short-circuited
- Repeated actioning of the START/PAUSE button (more than 10 times)

## 5.4 Detergent dispenser

Water is ducted into the detergent dispenser by a solenoid valve with one inlet and two or three outlets. Some models are fitted with a second solenoid valve for hot water fill.

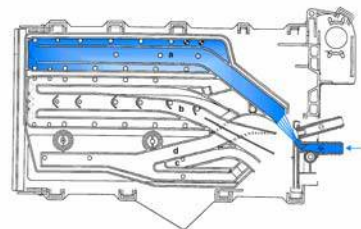
The same detergent dispenser is used in all models; the only difference lies in the water intake nozzle. The detergent dispenser may consist of three or four compartments.

1. Solenoid valve
2. Detergent dispenser



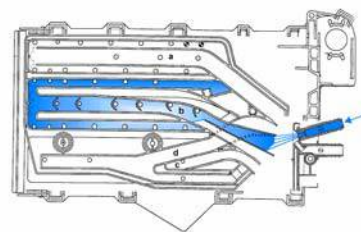
### Water fill to pre-wash compartment (pre-wash solenoid)

- The detergent contained in the “a” compartment filled at the start of the pre-wash.
- In some models, with “stains” option, the “a” compartment can be used alternatively to contain the stain remover, which is filled during the wash phase.



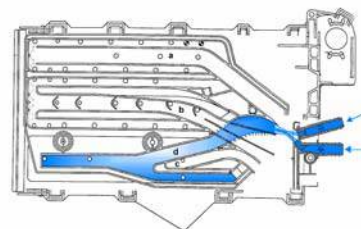
### Water fill to wash compartment (wash solenoid)

- The “b” compartment is used to contain the detergent that is filled at the start of the wash cycle.



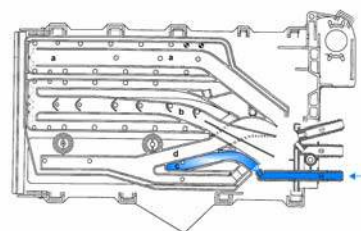
### Water fill to softener compartment (pre-wash and wash solenoids)

- The “d” compartment is used to contain the softener that is filled at the start of the last rinse



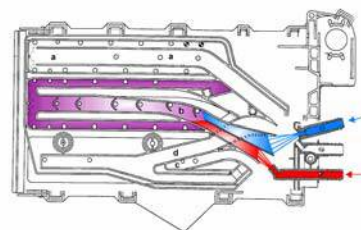
### Water fill to bleach compartment (bleach solenoid)

- In models with **4-compartment** dispenser water is filled into “c” compartment at the start of the last rinse.



### Hot water fill (hot water/wash solenoids)

- In models with hot water solenoid the hot water/wash solenoids are actioned simultaneously to fill water mixed in the wash compartment.



## 5.5 Power supply to the motor

The main PCB powers the motor directly via a TRIAC. Reversal of the direction of the motor is effected by two relays that vary the connection between the rotor and the stator.

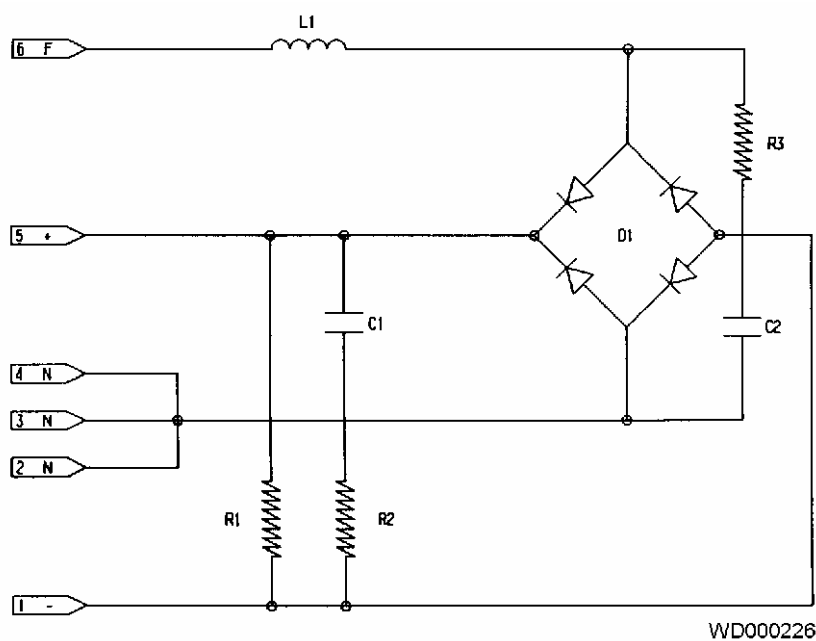
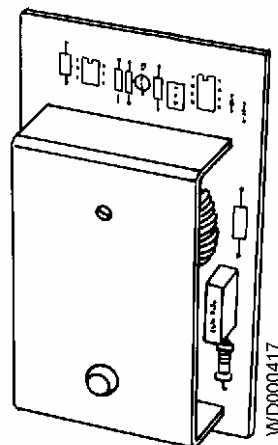
A third relay powers the stator in half- or full-range operation, depending on the spin speed.

The speed of the motor is controlled by a signal received from the tachometric generator.

During the spin cycles, the microprocessor checks for an unbalanced load and for excessive foam.

### 5.5.1 AC/DC Converter

This component, which is fitted to certain models only, serves to convert the alternating current generated by the TRIAC on the main PCB into a direct current to power the drum motor.



L1	1.2 mH	R1	68 K $\Omega$
D1	25A/600V	R2-R3	100 $\Omega$
C1-C2	47 $\mu$ F		

## 5.6 Circulation pump

In Jetsystem models, the circulation pump is powered directly by the main PCB via a TRIAC.

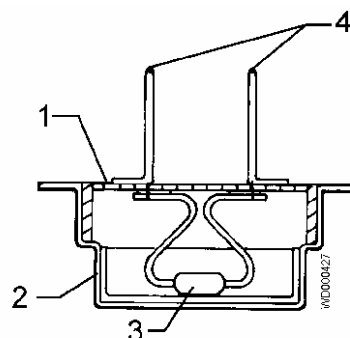
## 5.7 Heating

The heating element is powered directly by the main PCB via a relay.

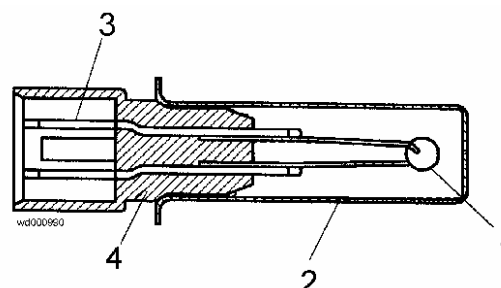
As a safety feature, a traditional dual-level pressure switch (anti-boiling 1 and anti-boiling 2) is connected in series to the heating element.

The temperature is controlled directly by the main PCB via an NTC temperature sensor. Two versions of the NTC sensor exist, depending on the type of tub; their shape is different, but their characteristics are identical.

1. Plastic casing
2. Metallic capsule
3. NTC resistor
4. Terminals



1. NTC resistor
2. Metallic capsule
3. Terminals
4. Plastic casing



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

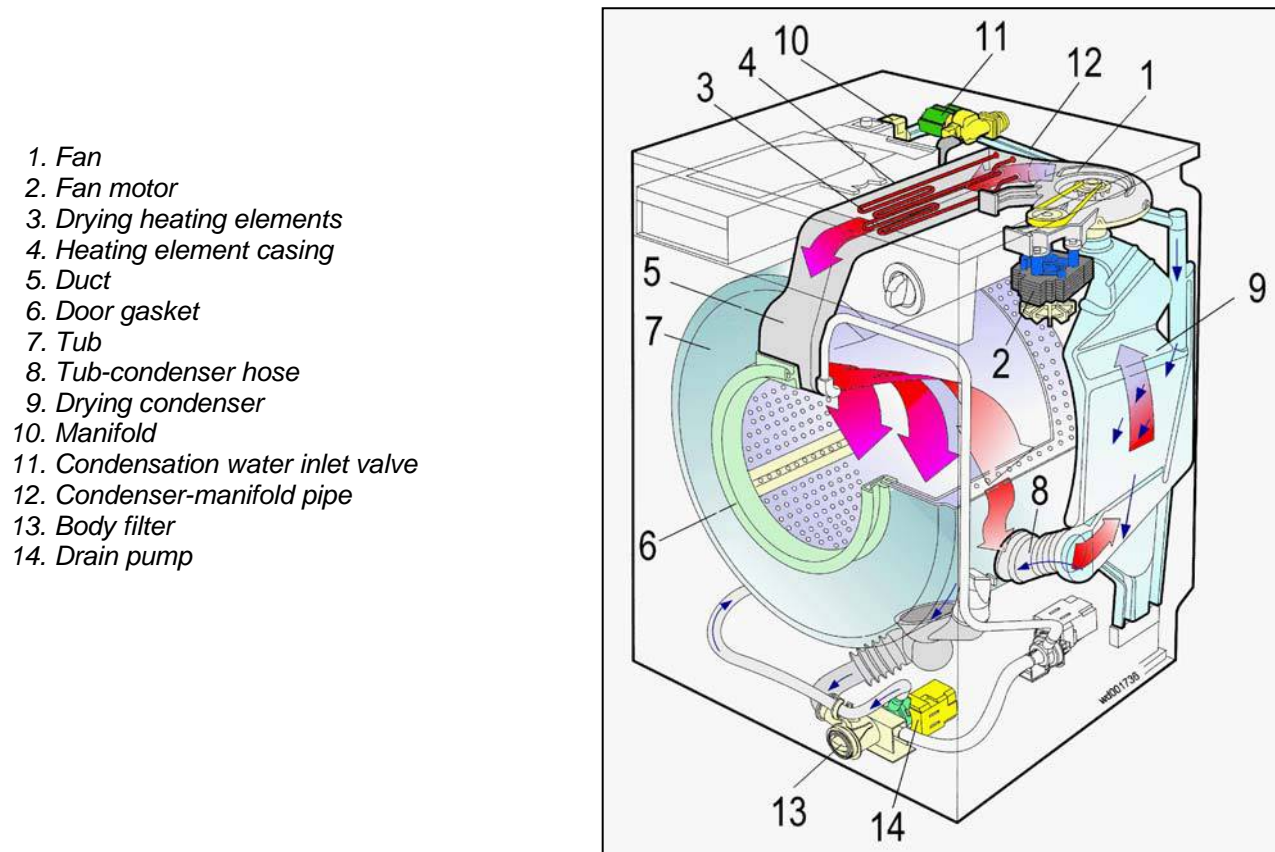
## 5.8 Drain cycle

The drain pump is powered directly by the main PCB via a TRIAC.

## 6 Drying circuit (washer-dryers)

The drying system is identical to that used for washer/dryers with traditional timers.  
There are 2 versions:

- “Standard” with drying heating elements of 700+700 W
- “High performance” with drying heating elements of 1000+1000 W



**Automatic drying cycles:** the drying time is controlled by the microprocessor to provide the desired level of humidity.

The drying cycle may be carried out at the end of the washing cycle or separately.

Three types of drying can be selected:

- Extra dry (for cotton only)
- Cupboard dry (cotton and synthetics)
- Iron dry (for cotton only)

**Time-controlled cycles:** the drying time is selected by the user (maximum 130 minutes for cottons, 100 minutes for synthetics).

**Cooling:** At the end of all drying cycles, a cooling phase takes place.

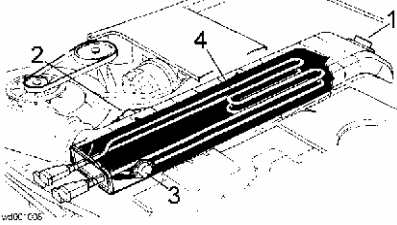
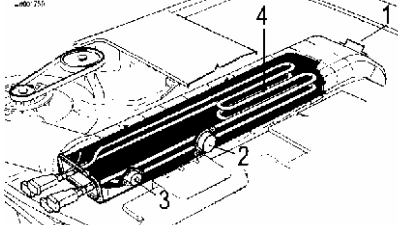
**The drying heater** is powered directly by the main PCB via two relays and the contacts of the safety pressure switch.

In cycles for synthetic fabrics, drying takes place with only one of the branches of the heating element in operation (half-power). For cotton cycles, both branches of the heating element are used (full power).

**The fan motor** is powered by a different relay; **the solenoid valve** is powered by a TRIAC.

### 6.1.1 Temperature control

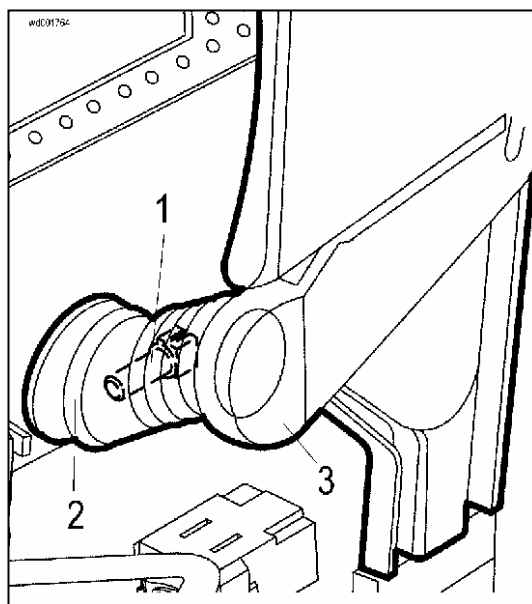
An NTC sensor fitted to the duct is used to control the drying temperature; two safety thermostats (one of which is a manual-reset type) are fitted to the casing of the heating element.

	"Standard" Version	"High performance" Version
<ol style="list-style-type: none"> <li>1. NTC sensor for control of drying temperature</li> <li>2. Automatic-reset safety thermostat</li> <li>3. Manual-reset safety thermostat (150°C)</li> <li>4. Drying heater</li> </ol>		
<b>NTC Sensor : resistance at 25°C</b>	5000Ω	
<b>Manual-reset safety thermostat</b>	Normally closed, opens at 150°C	
<b>Automatic-reset safety thermostat</b>	Normally closed, opens at 98°C	Normally closed, opens at 110°C
<b>Drying heater power</b>	700 + 700 W	1000+1000 W
<b>Fan rate</b>	about 55 m <sup>3</sup> – hour	about 80 m <sup>3</sup> – hour

### 6.1.2 Determining the drying time:

In automatic cycles, the NTC sensor fitted to the drying condenser is used to control the drying time.

1. NTC temperature sensor
2. Tub-condenser pipe
3. Drying condenser



## 7 Diagnostics and configuration system

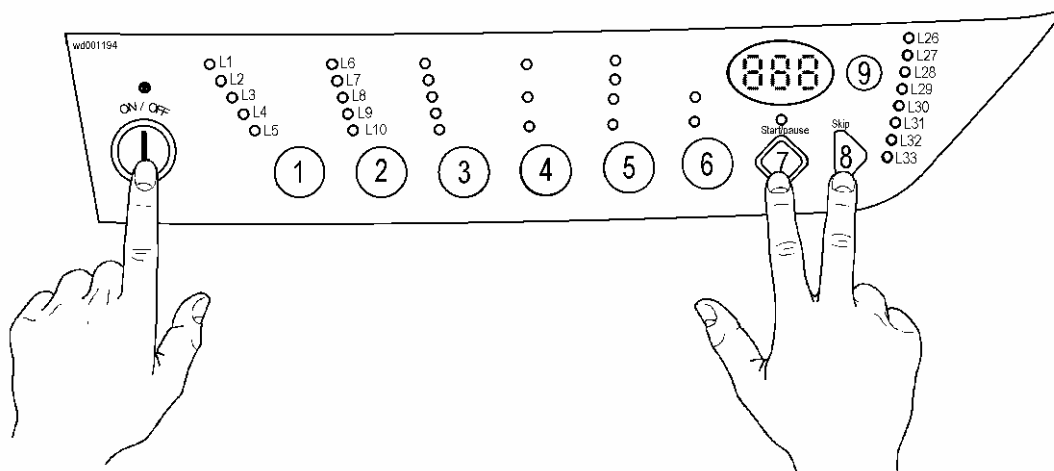
### 7.1 Access to the diagnostics and configuration system

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

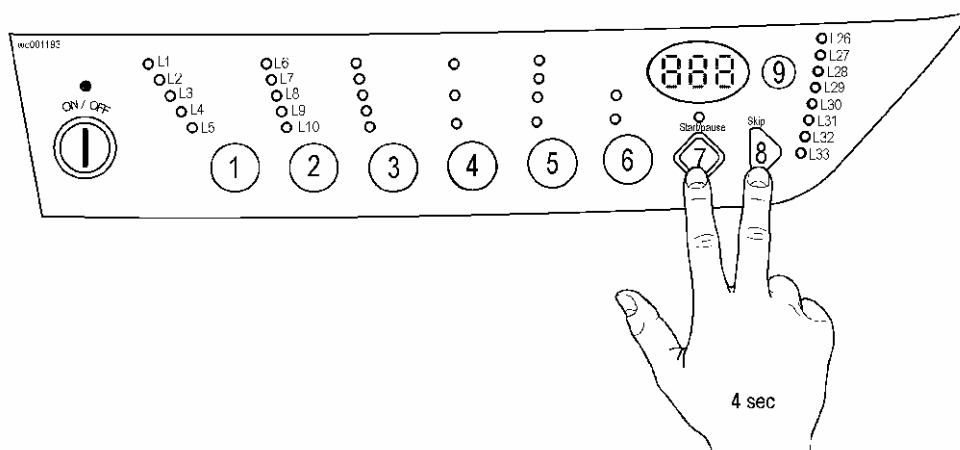
- control of the operation of each of the components in the appliance
- analysis of alarm conditions
- configuration of the main PCB

To access the system:

- ⇒ press the SKIP/RESET button to cancel the programme previously selected and switch off the appliance
- ⇒ press the START/PAUSE (7) button together with the SKIP/RESET (8) button and then, holding down both buttons, press the ON/OFF button to switch on the appliance



- ⇒ hold both buttons (START/PAUSE and SKIP/RESET) down until the buzzer sounds and the LEDs begin to flash (about 4 seconds).



At this point, the display board is checked and the LEDs (and, if featured, the display window) light in sequence.

If the main PCB has not been configured, it is possible only to perform the test on the display board and the configuration procedure.

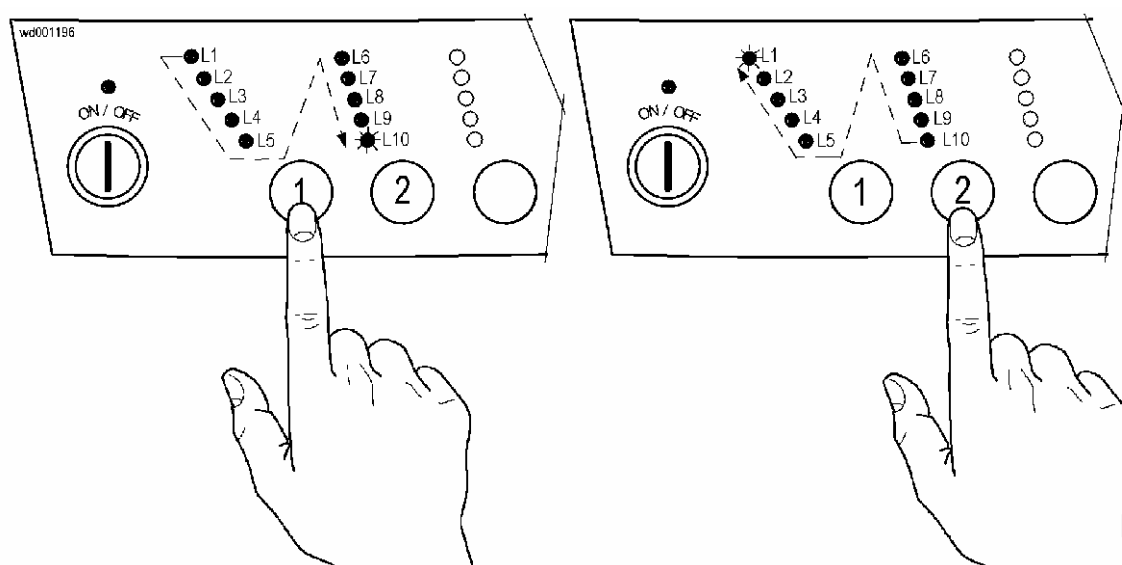


## 7.2 Diagnostics system

The diagnostics system can be used to check the correct operation of all the components in the washing machine.

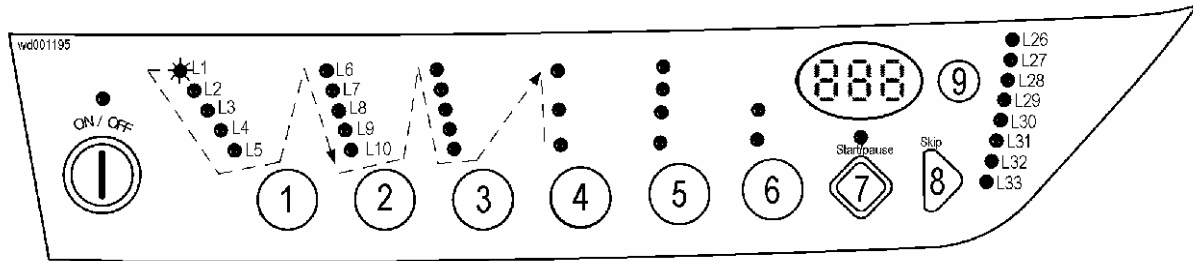
After accessing the diagnostics routine, the display board is checked for correct operation. All the LEDs (and, if featured, the display) light in sequence.

- Press the FABRICS button (1) to pass to the subsequent test phase (LED L1 lit).
- Press the FABRICS button again to increment the number of the phase controlled. After the last phase, the display returns to its normal condition. The LED corresponding to the phase being tested lights (L1 → L10).
- Press the TEMPERATURE button (2) to decrement the number of the phase controlled. After the last phase, the display returns to its normal condition (L10 → L1).



DIAGNOSTIC CONTROL SYSTEM		
PHASE	LED lit	Function tested
0	All (in sequence)	Tests the display board
1	L1	Water fill to wash compartment in the dispenser
2	L2	Water fill to pre-wash compartment in the dispenser
3	L3	Water fill to conditioner compartment in the dispenser
4	L4	Hot water fill or cold water fill to bleach compartment (certain models only)
5	L5	Heating (and, in Jetsystem models, circulation pump)
6	L6	Rotation of drum at 250 rpm with water in the tub (test for leaks from tub)
7	L7	Drain and spin at maximum speed; pressure switches.
8	L8	Drying (washer/dryers only)
9	L9	Displays the last alarm
10	L10	Configuration of the main electronic board

### 7.3 Display board diagnostics



After accessing the diagnostics system, the display board is checked for correct operation. All the LEDs (and, if featured, the display) light in sequence.

When the various buttons are pressed, the corresponding LEDs light. The display shows a binary code corresponding to the code of the button pressed and the buzzer sounds.

When the FABRICS or TEMPERATURE buttons are pressed, the corresponding LED lights for a moment and the binary code is displayed. On completion of the test, the buzzer sounds and the system passes to the previous or subsequent phase of the diagnostics cycle.

**Table of button codes (models without display)**

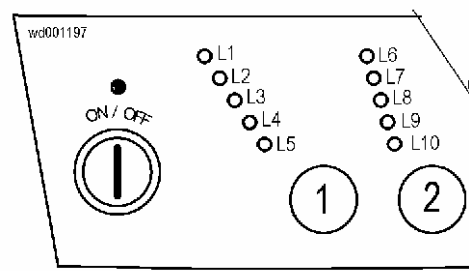
No. of button		0	1	2	3	4	5	6	7	8
LED	L30	○	○	○	○	○	○	○	○	●
	L31	○	○	○	○	●	●	●	●	○
	L32	○	○	●	●	○	○	●	●	○
	L33	○	●	○	●	○	●	○	●	○

○ LED OFF  
● LED ON

*The display board test is performed automatically even if the board is powered while not connected to the main PCB and the programme selector.*

## 7.4 Diagnostics cycle

When the FABRICS (1) or TEMPERATURE (2) buttons are pressed, the system passes to the previous or subsequent phase of the diagnostics cycle. The LED corresponding to the phase of the diagnostics cycle lights.



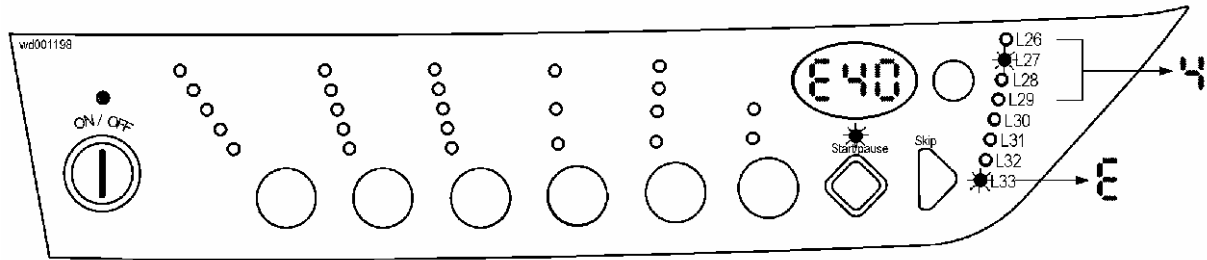
LED	Function tested	Components actioned	Operating conditions	Parameters displayed
3	Water fill to wash compartment	- door interlock - wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
4	Water fill to pre-wash compartment	- door interlock - pre-wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
5	Water fill to conditioner compartment	- door interlock - pre-wash solenoid - wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
6	Hot water fill or fill to bleach compartment (certain models only)	- door interlock - hot water or bleach solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
7	Heating (and, in Jetsystem models, recirculation)	- door interlock - (wash solenoid if level is lower than the antiboiling device) - recirculation pump (Jetsystem models) - heating element	Door closed, water fill to above anti-boiling level if not yet reached, heating for max. 5 min or to 55°C (*)	Water temperature in °C
8	Check for leaks from tub	- door interlock - (wash solenoid if level is <150mm) - motor	Door closed, water fill above 150mm level if not yet reached, motor until the drum reaches 250 rpm	Motor speed (rpm)
9	Drain and spin, check for pressure switch congruency	- door interlock - drain pump - motor	Door closed, water drain, motor movement, until maximum spin speed is reached	Motor speed (rpm ÷ 10)
10	Drying (washer/dryers only)	- door interlock - drain pump - drying heater (full power) - fan motor - condensation solenoid	Door closed, water drain to a level lower than the anti-boiling device, drying heater for max. 10 min or until the drying temperature sensor (fitted to the duct) detects a temperature of 150°C	NTC drying temperature sensor on duct and condenser (in °C, displayed alternately for 2 sec)

(\*) When the max. time is exceeded (timeout) error E61 is normally displayed (insufficient heating during wash) since, although the heating is performed with the drum still, not every appliance can reach the 55°C temperature in 5 minutes.

In most cases this time is sufficient to control the heating; to reach the pre-set temperature, repeat this phase without draining the water (skip for a while to another diagnostics phase and then go back to heating control phase again).

**If an alarm condition occurs during the course of the diagnostics cycle, the appliance stops and the display or LEDs flash to indicate the alarm code.**

## 7.5 Alarms



The electronic control unit detects and recognizes any malfunctions in the operation of the appliance, in which case an alarm condition is generated. Alarm conditions may be of three types:

- cycle paused
- cycle blocked
- current phase skipped

Only four alarm conditions are normally displayed to the user:

- ⇒ problems with water fill
- ⇒ problems with drain
- ⇒ door open
- ⇒ communication error between the electronic boards, or configuration error

In the first three cases, the cycle is paused so that the user can, if possible, solve the problem. The code showing the type of alarm flashes on the display.

In models without a display window, the last wash phase LED (end) flashes; the code relative to the type of alarm flashes on the first four LEDs (and on the display).

For example, in the case of alarm **E41** (door open), the display will show **E40**. In models not featuring a display window, as well as the end-of-cycle LED which indicates error "**E**", the second LED indicates **4** in binary code.

As can be seen from the general alarm code table, **E4..** alarm conditions include all alarms relative to door closure problems:

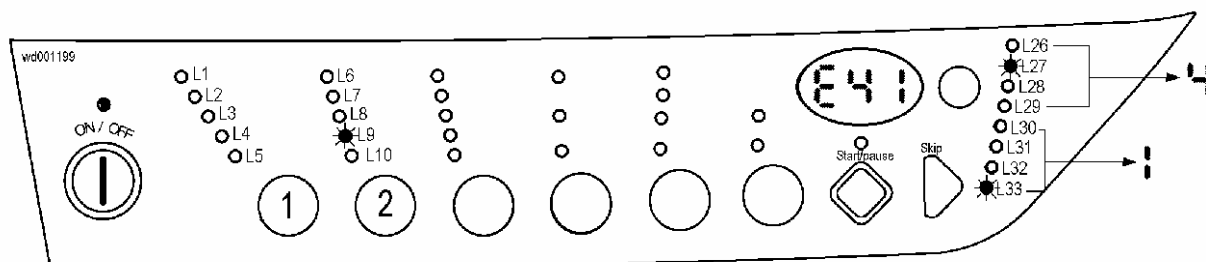
- **E41**: door open
- **E42**: door interlock malfunction
- **E43, E44, E45**: problems with main PCB or wiring

In the case of communication or configuration errors, the alarm is displayed immediately when the appliance is switched on; in the event of configuration errors, the only possible action is to access the diagnostics system.

The FILTER BLOCKED alarm is signalled by the corresponding LED (if featured) only at the end of the cycle; **EF0** flashes on the display.

## 7.6 Reading the last alarm condition

The diagnostics system makes it possible to identify the last alarm condition which occurred during the operation of the appliance. To read this alarm condition, after accessing the diagnostics system (see "Access to the diagnostics / configuration system"), press the FABRICS or TEMPERATURE buttons until LED **L9** lights.



The alarm condition is shown on the display, or the corresponding binary code flashes on the wash phase LEDs.

- ⇒ The first four LEDs indicate the first digit of the alarm code
- ⇒ The second four LEDs indicate the second digit of the alarm code

For example, if an **E41** alarm condition (door open) is generated, the display will show **E41** or (if the appliance does not feature the display window) the second LED in the first group (equivalent to **4** in binary code) and the fourth LED in the second group (equivalent to **1** in binary code) will flash.

*If no alarm condition has occurred, **E00** is displayed.*

### 7.6.1 Diagnostics cycle alarms

If a malfunction should occur during the course of the diagnostics cycle, the relative alarm codes are displayed. In this case, too, the wash phase LEDs (or the display) show the error code (flashing).

#### Binary codes

The table below shows how to convert the binary code displayed by the LEDs into the corresponding decimal number.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										A	b	C	d	E	F
○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●

- LED off
- LED on

## 7.7 Alarm codes

0: LED off

1: LED flashing

Alarm code	LED L26 -29	LED L30 - 33	Description of fault	User code	Effect	Possible causes
E11	0 0 0 1	0 0 0 1	Problems with water fill in wash phase (maximum 10 minutes for each fill phase)	E10	Cycle PAUSED	Tap closed or mains pressure insufficient; solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E12	0 0 0 1	0 0 1 0	Problems with water fill in drying phase (maximum 10 minutes for each fill phase during in the wash load untangling phase)	E10	Cycle PAUSED	Tap closed or mains pressure insufficient; solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E21	0 0 1 0	0 0 0 1	Problems with water drain in wash phase (maximum 10 minutes for each drain phase)	E20	Cycle PAUSED	Drain hose obstructed; filter blocked; drain pump; pressure switches; wiring; main PCB
E22	0 0 1 0	0 0 1 0	Problems with water drain during drying or drying condenser blocked (anti-boiling pressure switch closed on "full")	E20	Heating phase skipped	Drain hose obstructed; filter blocked; drying condenser blocked; drain pump; pressure switches; wiring; main PCB
E31	0 0 1 1	0 0 0 1	Electronic pressure switch circuit faulty (frequency of pressure switch signal out of limits)	---	Cycle blocked with door closed	Electronic pressure switch; wiring; main PCB
E32	0 0 1 1	0 0 1 0	Incorrect calibration of electronic pressure switch (electronic pressure switch level different from 0-66 mm after initial calibration drain and anti-boiling pressure switch on "empty")	---	Cycle PAUSED	Tap closed or mains pressure insufficient; solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E33	0 0 1 1	0 0 1 1	Incongruence between level of electronic pressure switch and level of anti-boiling pressure switch 1 (duration of fault at least 60 seconds)	---	Cycle blocked with door closed	Hydraulic circuit of pressure switches; electronic pressure switch; pressure switch; wiring; main PCB
E34	0 0 1 1	0 1 0 0	Incongruence between level of electronic pressure switch and level of anti-boiling pressure switch 2 (duration of fault at least 60 seconds)	---	Cycle blocked with door closed	Hydraulic circuit of pressure switches; electronic pressure switch; pressure switch; wiring; main PCB
E35	0 0 1 1	0 1 0 1	Water level too high (level of electronic pressure switch higher than 300mm for more than 15 seconds)	---	Cycle blocked with door closed and water drain to 120mm	Solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB

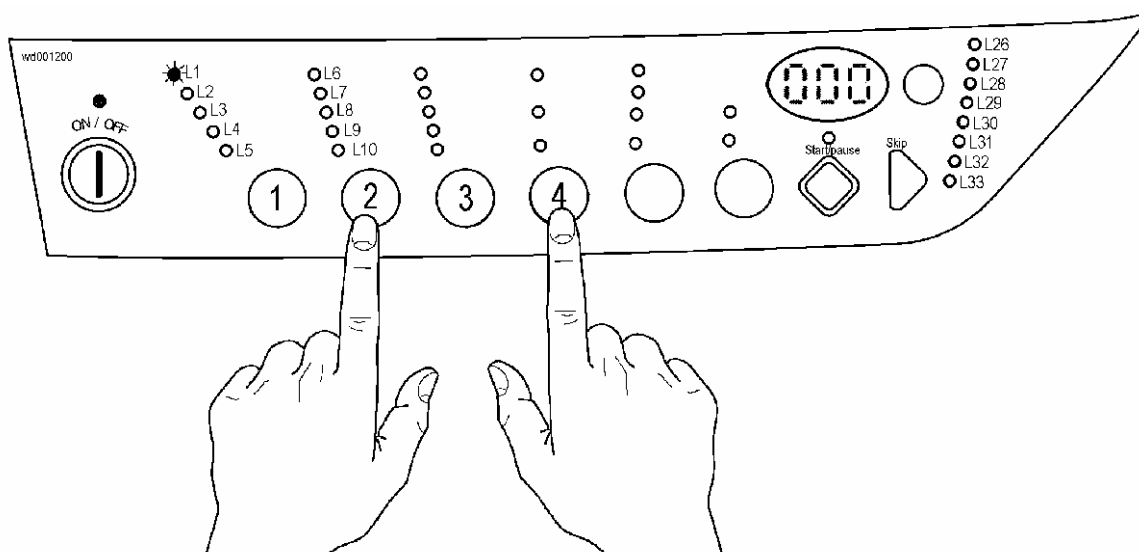
Alarm code	LED L26 -29	LED L30 - 33	Description of fault	User code	Effect	Possible causes
E36	0 0 1 1	0 1 1 0	"Sensing" circuit of anti-boiling pressure switch 1 faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E37	0 0 1 1	0 1 1 1	"Sensing" circuit of anti-boiling pressure switch 2 faulty (input signal to microprocessor always 0 - 5V)	---	Cycle blocked with door closed	Main PCB
E38	0 0 1 1	1 0 0 0	Pressure chamber blocked (water level does not vary for at least 30 sec. during drum rotation)	---	Heating phase skipped	Pressure switch hydraulic circuit; pressure switches, motor drive belt broken
E41	0 1 0 0	0 0 0 1	Door open (door delay interlock does not close after 15 seconds)	E40	Cycle paused	Door open; door delay interlock; wiring; main PCB
E42	0 1 0 0	0 0 1 0	Problems with door closure (door open during cycle for more than 15 sec. or door closed after cycle for more than 3 min.)	E40	Cycle paused	Door delay interlock; wiring; main PCB
E43	0 1 0 0	0 0 1 1	TRIAC which powers the door interlock faulty (incongruency between status of door interlock "sensing" circuit and status of TRIAC)	E40	Cycle paused	Wiring; main PCB
E44	0 1 0 0	0 1 0 0	"Sensing" circuit of door delay interlock faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked	Main PCB
E45	0 1 0 0	0 1 0 1	"Sensing" circuit of door delay interlock triac faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E51	0 1 0 1	0 0 0 1	TRIAC which powers the motor short-circuited (TRIAC short-circuit cut-out activated or motor speed more than maximum speed)	---	Cycle blocked with door closed (after 5 attempts)	Loss of insulation on motor winding/wiring; main PCB
E52	0 1 0 1	0 0 1 0	No signal from tachometric generator on motor (no signal after maximum time)	---	Cycle blocked with door closed (after 5 attempts, the last after 20 sec)	Motor; tachometric generator; wiring; main PCB

Alarm code	LED L26 -29	LED L30 - 33	Description of fault	User code	Effect	Possible causes
E53	0 1 0 1	0 0 1 1	"Sensing" circuit of motor TRIAC faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E54	0 1 0 1	0 1 0 0	Relays contacts sticking (voltage on "sensing" circuit when the relays should be open)	---	Cycle blocked with door closed (after 5 attempts)	Loss of insulation on motor windings/wiring; main PCB
E55	0 1 0 1	0 1 0 1	Motor circuit open	---	Cycle blocked with door closed (after 5 attempts)	Motor; wiring; main PCB
E56	0 1 0 1	0 1 1 0	Problems with motor tachimetric generator	---	Cycle blocked with door closed (after 5 attempts, last after 20')	Motor (tachimetric generator); wiring; main PCB
E61	0 1 1 0	0 0 0 1	Insufficient heating during washing (maximum heating time exceeded)	---	Heating phase skipped	NTC sensor incorrectly calibrated; heating element; wiring; main PCB
E62	0 1 1 0	0 0 1 0	Overheating during washing (temperature >88°C for more than 5 minutes)	---	Drain, cycle blocked	Heating element (earthed); NTC sensor faulty; wiring; main PCB
E64	0 1 1 0	0 1 0 0	Overheating during drying (drying temperature >180°C detected by NTC temperature sensor on duct)	---	Heating phase for drying skipped	Drying NTC sensor (duct); drying heater; wiring; main PCB
E66	0 1 1 0	0 1 1 0	Power relay to heating element faulty (incongruency between closure of anti-boiling pressure switch 2 and status of relay K3)	---	Drain, cycle blocked	Anti-boiling pressure switch 2; wiring; main PCB
E71	0 1 1 1	0 0 0 1	NTC wash sensor faulty (voltage not within limits = short-circuit or open)	---	Heating phase skipped	Wash NTC sensor; wiring; main PCB
E72	0 1 1 1	0 0 1 0	NTC sensor on drying condenser faulty (voltage out of limits = short-circuit or open)	---	Heating phase for drying skipped	Drying NTC sensor (condenser); wiring; main PCB



Alarm code	LED L26 -29	LED L30 - 33	Description of fault	User code	Effect	Possible causes
E73	0 1 1 1	0 0 1 1	NTC sensor on drying duct faulty (voltage out of limits = short-circuit or open)	---	Heating phase for drying skipped	Drying NTC sensor (duct); wiring; main PCB
E84	1 0 0 0	0 1 0 0	"Sensing" circuit on circulation pump triac faulty (input signal to microprocessor always 0V or 5V)	---	Drain, cycle blocked (door open)	Main PCB
E85	1 0 0 0	0 1 0 1	Circulation pump faulty (incongruency between status of "sensing" circuit on circulation pump and status of TRIAC)	---	Drain, cycle blocked (door open)	Circulation pump; wiring; main PCB
E91	1 0 0 1	0 0 0 1	Communications error between main PCB and display board	E90	---	Wiring; main PCB; display board
E92	1 0 0 1	0 0 1 0	Communications incongruency between main PCB and display board (versions not compatible)	E90	---	Main PCB; display board
E93	1 0 0 1	0 0 1 1	Configuration error (incongruency of configuration values when appliance is switched on)	E90	Cycle blocked	Configuration error; main PCB
E94	1 0 0 1	0 1 0 0	Incorrect configuration of washing cycle	E90	Cycle blocked	Cycle software error; main PCB
EF1	1 1 1 1	0 0 0 1	Drain filter blocked (drain phase too long)	Specific LED (EF0)	---	Drain hose obstructed/kinked; drain filter dirty/blocked
EF2	1 1 1 1	0 0 1 0	Excessive detergent (too much foam during drains)	Specific LED (EF0)	---	Excessive detergent introduced; drain hose obstructed/kinked; drain filter dirty
EF3	1 1 1 1	0 0 1 1	Water leakage: intervention of Aqua Control system	---	Water drain to 120mm, cycle blocked	Leaks from base; drain pump; wiring; main PCB

## 7.8 Canceling the last alarm condition



To cancel the last memorised alarm condition press button no. **2** (TEMPERATURES) and no. **4** at the same time during one of the 8 phases of the diagnostics cycle and not in the alarm or configuration reading positions.

To check for correct operation, go back to the alarm reading position (the L10 LED is on); the display should show **E00**.

The alarm is cancelled also when a new configuration is given to the main PCB.

## 7.9 Configuration of the main PCB

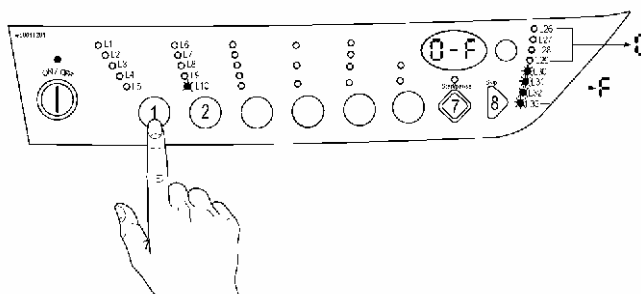
A standard main PCB is available as a spare part. This PCB contains only data relative to the wash cycle.

**After replacing the main PCB, it is necessary to perform the configuration procedure in order to operate the washing machine.**

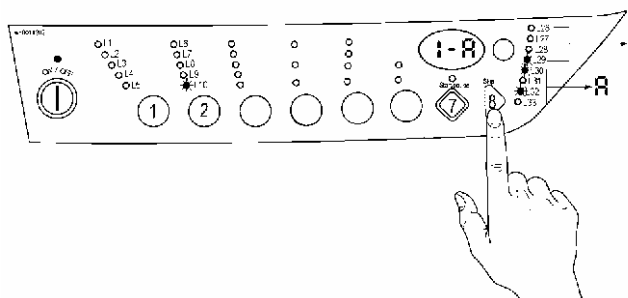
Configuration of the board consists of entering a 16-digit code which contains information which varies from model to model (type of washing system, type of tub, spin speed, etc.).

To access the machine configuration procedure, first enter the diagnostics system, and then:

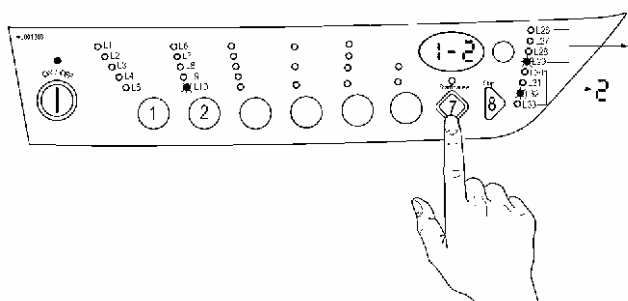
- ⇒ press the FABRICS (1) or TEMPERATURE (2) buttons until LED L10 lights; the code relative to the first of the 16 digits of the configuration code (position 0) is displayed



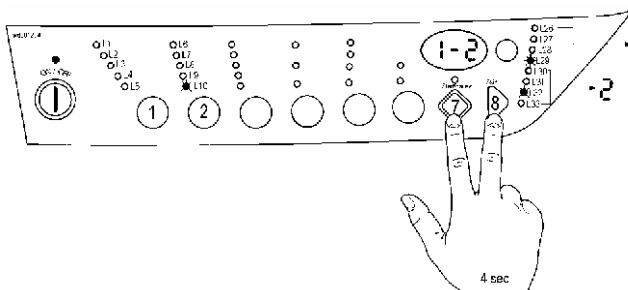
- ⇒ when the SKIP/RESET button (8) is pressed, all the digits which make up the configuration code are displayed in sequence



- ⇒ press the START/PAUSE button (7) to modify the configuration code (digit by digit)



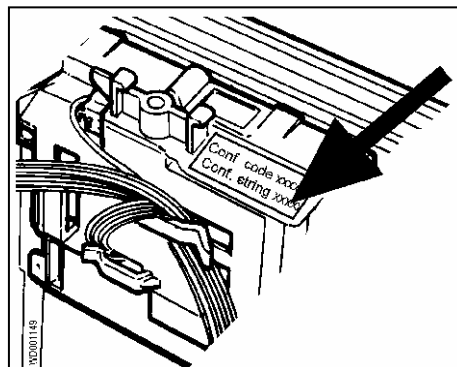
- ⇒ when all 16 digits have been entered, check that the code is correct, then memorize the code by pressing the START/PAUSE (7) and SKIP/RESET (8) buttons at the same time; these buttons should be held down for at least 4 seconds (i.e. until the buzzer sounds).



***When configuration has been completed, perform the diagnostics routine in order to check that the appliance functions correctly. In case of an error, the display window will show error code E93 and the machine stops.***

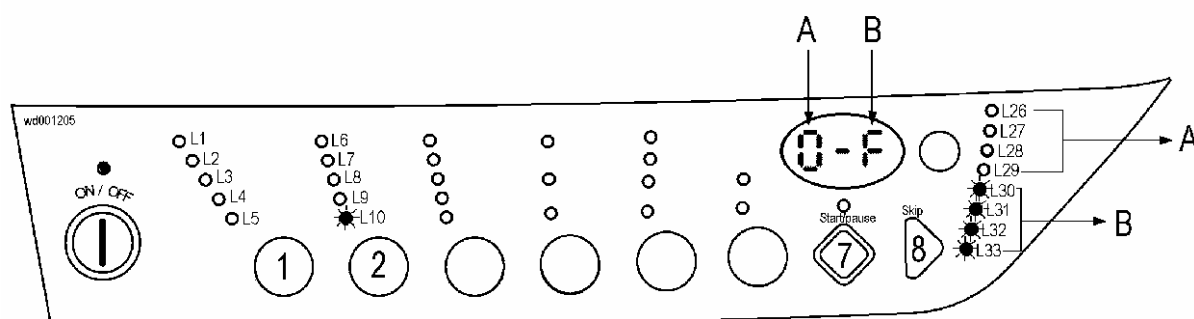
## 7.9.1 Configuration code

The configuration code (16 alphanumeric digits) is shown on a label affixed to the casing of the main PCB and in the Spare Parts Lists describing the various models. It is advisable to note the configuration code on the casing of the new PCB fitted to the washing machine



## READING THE CONFIGURATION CODE

The configuration code is shown, one character at a time, on the display (if featured) or on the washing phase display LEDs.



**A** = The first digit shown on the display (if featured) indicates the **position** of the value to be entered. On models not fitted with a display window, the same information is displayed in binary format on the first four washing phase LEDs. To **read** the various positions, press the SKIP/RESET button (8) repeatedly (the first position displayed is "0").

**B** = The last digit on the display (if featured) indicates the **value** of the configuration character to be entered in a given position. On models not fitted with a display window, the same information is displayed in binary format on the second set of four washing phase LEDs. To **modify** the value of the character displayed, press the START/PAUSE button (7) repeatedly as necessary.

## BINARY CODES

The table below can be used to convert the binary code shown by the LEDs into the corresponding letter or decimal number.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										A	b	C	d	E	F
○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●

○ LED off  
● LED on

## 7.9.2 Example of configuration

Configuration code: **A2A7808080E691F2**

<b>POSITION:</b>	0	1	2	3	4	5	6	7	8	9	10 (A)	11 (B)	12 (C)	13 (D)	14 (E)	15 (F)
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
<b>VALUE:</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>7</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>E</b>	<b>6</b>	<b>9</b>	<b>1</b>	<b>F</b>	<b>2</b>

### Table of cycle phases Leds

On models not featuring the display window, it is advisable, before beginning the configuration procedure, to convert the digits of the configuration code into binary format (the positions, indicated by the second group of 4 LEDs, are not modified).

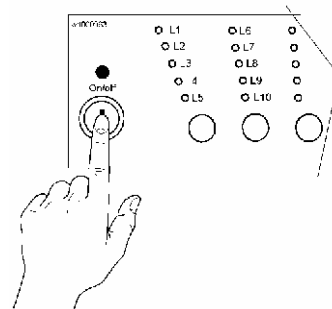
POSITION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
											A	b	C	d	E	F
	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
	○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
	○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●
VALUE	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
	○	○	○	●	○	○	○	○	○	○	●	●	○	○	●	○
	●	●	●	●	○	○	○	○	○	○	●	●	○	○	●	●
	○	○	○	●	○	○	○	○	○	○	○	○	●	●	●	○
	A	2	A	7	8	0	8	0	8	0	E	6	9	1	F	2

## CONFIGURATION

1. Access the diagnostics system.
2. Press the FABRICS (1) or TEMPERATURE (2) buttons until LED **L10** lights. The code relative to the first of the 16 characters of the configuration code is displayed (position zero).
3. Press the START/PAUSE button (7) sequentially to enter the letter **A** in position **0**. If the appliance features a display window, this will show **0-A**; if not, the wash cycle LEDs should light as shown in column 0 of the table (i.e. the fifth and seventh LEDs).
4. Press the SKIP/RESET button (8) to pass to the second position, and enter **2** by pressing START/PAUSE (7) as necessary. The display should now show **1-2**, and the LEDs should light as shown in column 1 of the table (fourth and seventh).
5. Repeat this procedure to enter the remaining configuration digits. When all the digits have been entered, press the SKIP/RESET button (8) to check that the configuration code is correct.
6. Memorize the configuration code by pressing the START/PAUSE (7) and SKIP/RESET (8) buttons at the same time for at least 4 seconds, so that the configuration code is memorized by the main PCB.
7. Perform the diagnostics cycle to check that the appliance operates correctly. In case of a configuration error, error **E93** is displayed and the operation of the appliance is interrupted).

## 7.10 Exiting the diagnostics cycle

To exit the diagnostics cycle, switch the appliance off, then on, then off again.



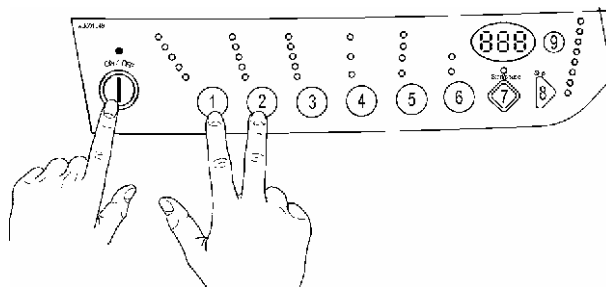
## 7.11 Operating time counter

A specific procedure can be used to display the total number of hours of operation of the appliance, which are counted as from the first time it is operated. This option is available on models with display only. The maximum value that can be stored in memory is **6,550** hours of operation.

- ⇒ only the time of the normal programmes is counted (cycle diagnostics are not included).
- ⇒ the effective time of the cycles is counted (i.e. not including pauses, delayed start times, rinse hold periods and the soak phases).
- ⇒ the accuracy of the counter is to within 30 seconds for each programme.
- ⇒ only whole hours of operation are displayed (1 hr 59 minutes is displayed as 1 hour)

### 7.11.1 Reading the operating time

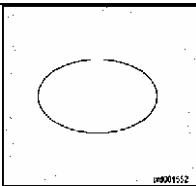
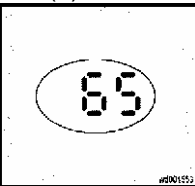
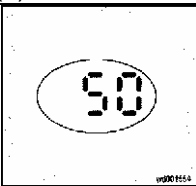
- ⇒ reset the running programme and switch the appliance off
- ⇒ press buttons FABRICS (1) and button TEMPERATURE (2) simultaneously and then, holding then down, switch the appliance on with button ON/OFF
- ⇒ hold down buttons for at least 4 seconds



### Displaying the operating time

The operating time is displayed two digits at a time. The first pair of digits shows the thousands and hundreds; the second pair shows tens and units.

For example, a total operating time of **6,550** hours will be displayed as follows:

1 →	2 →	3 →
Blank display for <u>two seconds</u>	The first pair of digits is displayed for <u>two seconds</u> : - thousands ( <b>6</b> ) - hundreds ( <b>5</b> )	The second pair of two digits is displayed for two seconds: - tens ( <b>5</b> ) - units ( <b>0</b> )
		

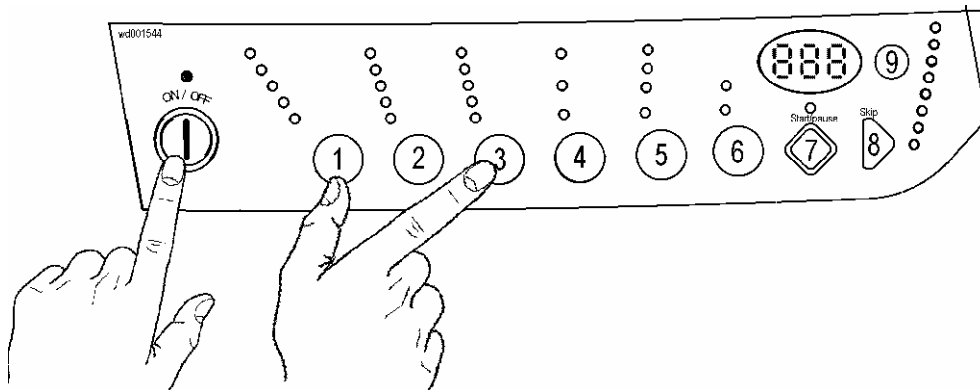
## 8 DEMO Mode

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
- circulation pump (certain models only): this pump is normally disabled, but functions if water is introduced manually until the anti-boiling safety level has been reached
- 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).

### 8.1 Setting demo mode



- ⇒ Reset the running programme and switch the appliance off
- ⇒ Press button FABRICS (1) and button SPIN (3) simultaneously and then, holding them down, switch the appliance on with button ON/OFF
- ⇒ Press and hold down the buttons for at least 4 seconds

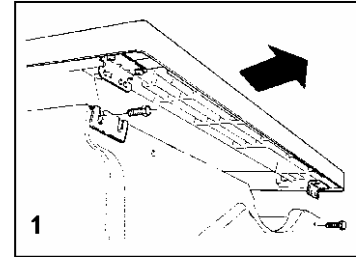
### 8.2 Exiting demo mode

Switch the appliance off to exit the demo mode.

## 9 Accessibility to electronic control

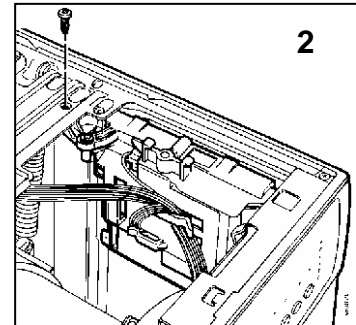
### 9.1 Cover

- a. Unscrew the two rear screws (1), push backwards and release it from the cabinet



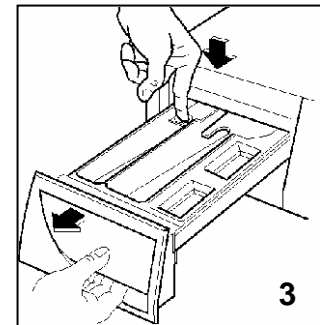
#### 9.1.1 Main PCB

- a. Remove the cover
- b. Unscrew the support fixing screw – board housing (2)
- c. Release the wiring from the supports
- d. Extract the electronic board housing
- e. Disconnect the connectors



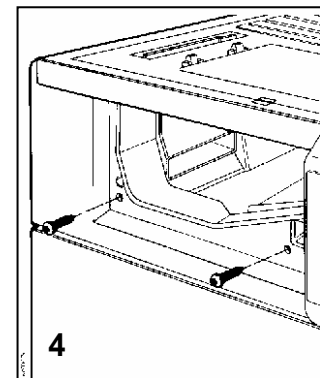
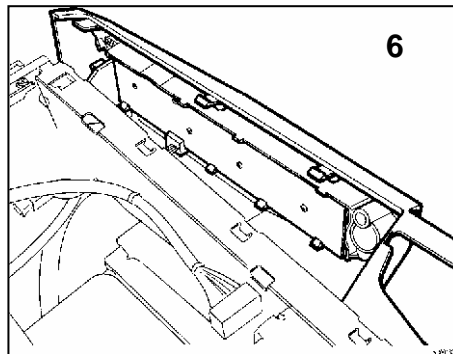
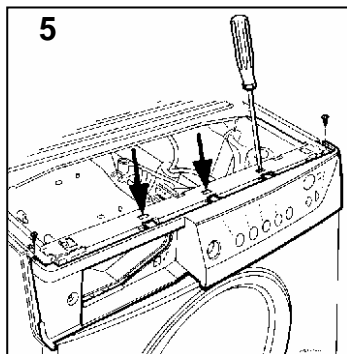
### 9.2 Control panel

- a. Remove the cover (1)
- b. Extract the detergent drawer (3)
- c. Unscrew the control panel screws to control support (4)
- d. Unscrew the support crossbar screws to control panel and release the fixing wings (5-6)
- e. Disconnect the wiring connector from the display board and remove the control panel



#### 9.2.1 Control/Display board

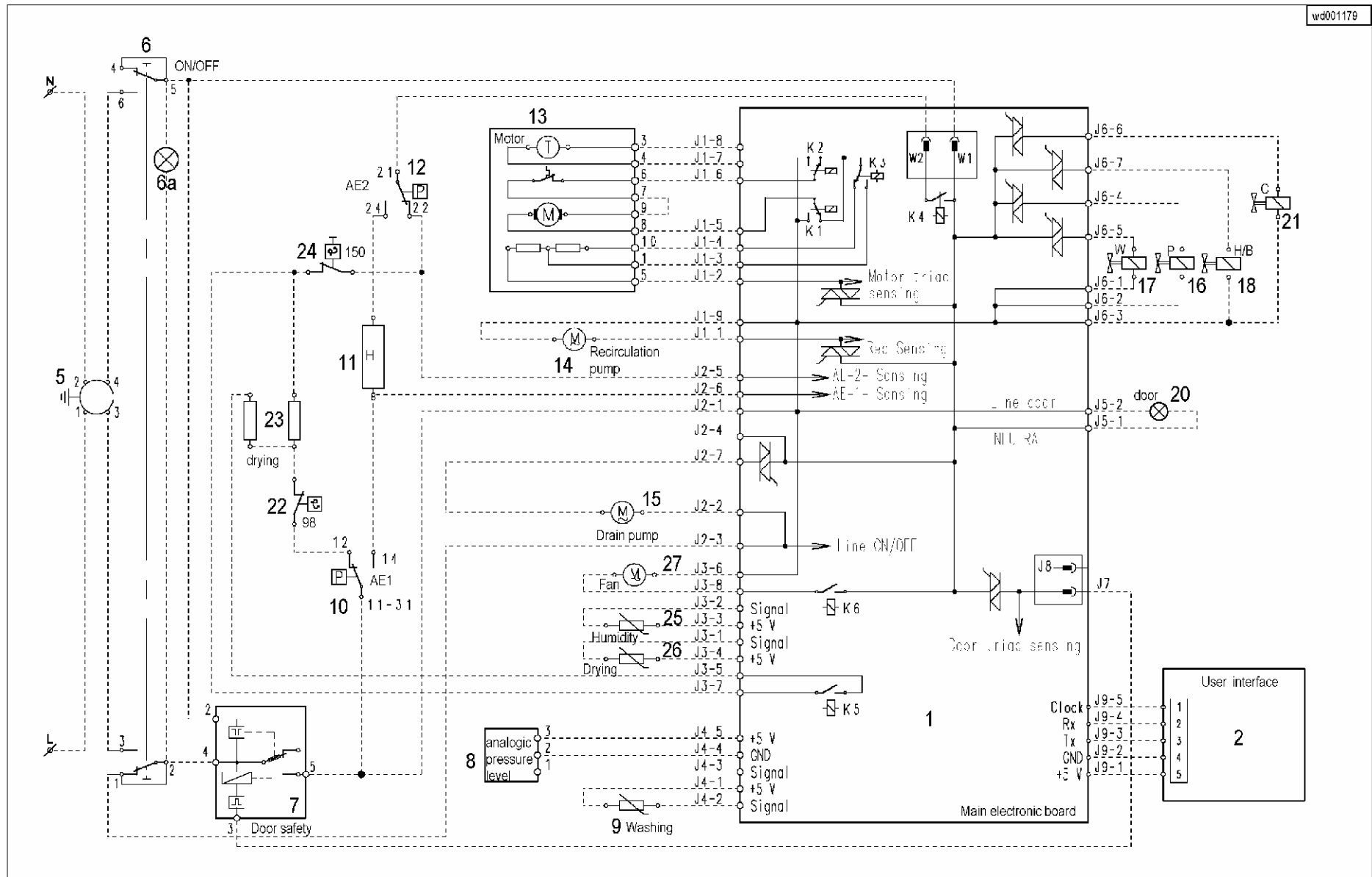
- a. Remove the control panel
- b. Disconnect the wiring from the board
- c. Unscrew the fixing screws to electronic board housing-control panel (7)
- d. Extract the board-housing assembly releasing it from the control panel



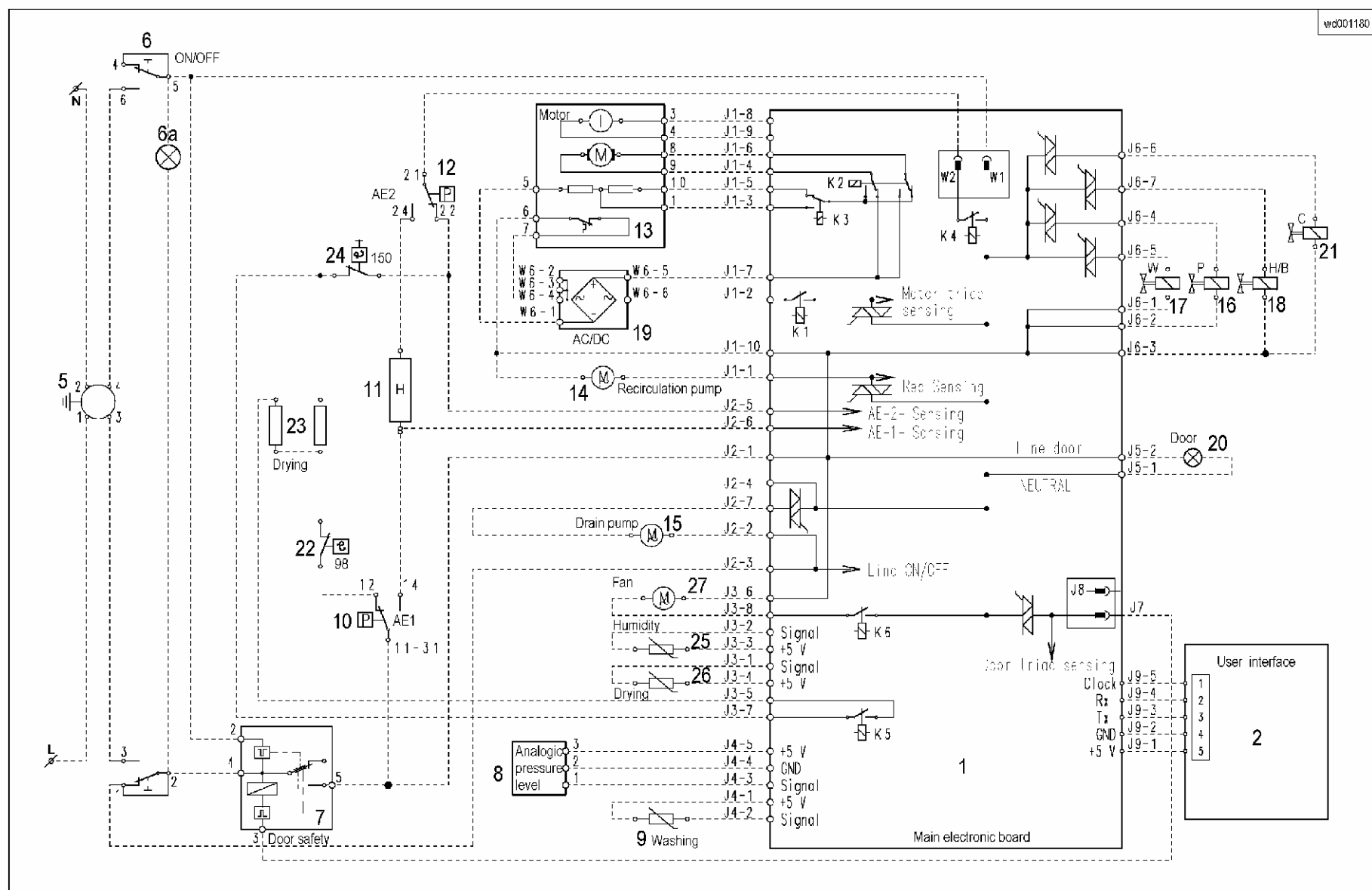


## 10 Basic circuit diagrams

### 10.1 Version with AC motor



## 10.2 Version with DC motor



### 10.3 Key to circuit diagram

1. Main PCB
2. Control/display board
5. Anti-interference filter
6. ON/OFF button
- 6a. Pilot lamp
7. Door interlock
8. Analog pressure switch (*electronic*)
9. NTC temperature sensor (*washing*)
10. Anti-boiling pressure switch 1
11. Heating element (*washing*)
13. Motor
12. Anti-boiling pressure switch 2
14. Recirculation pump (*jetsystem models*)
15. Drain pump
16. Pre-wash solenoid
17. Wash solenoid
18. Bleach solenoid or hot water solenoid (*certain models only*)
19. AC/DC converter (*certain models only*)
20. Door lamp

#### Washer/dryers only

21. Condensation solenoid
22. Safety thermostat
23. Heating element (drying)
24. Manual-reset safety thermostat
25. NTC temperature sensor (drying time)
26. NTC temperature sensor (drying)
27. Fan motor