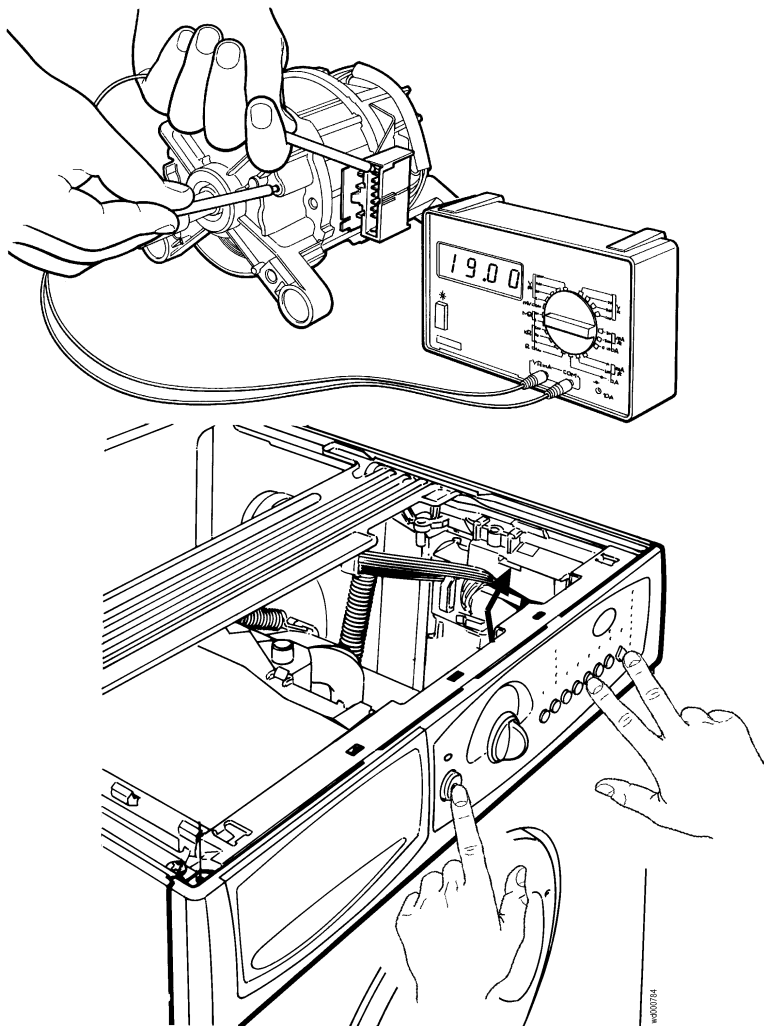




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**WASHING MACHINES
WITH EWM2000
ELECTRONIC CONTROL
SYSTEM**

**DIAGNOSTICS AND
CONFIGURATION**

**Stylings:
Ellipse, Alpha,
New Multipanel**

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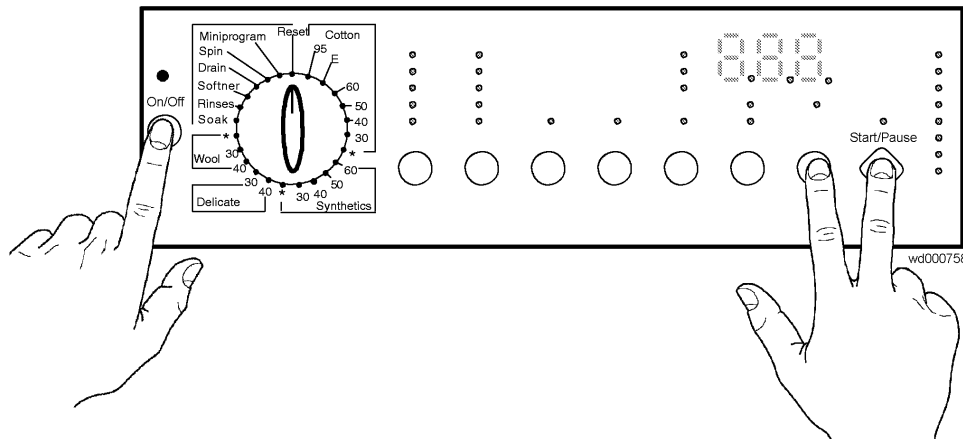
ACCESS TO THE DIAGNOSTICS / CONFIGURATION SYSTEM

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:

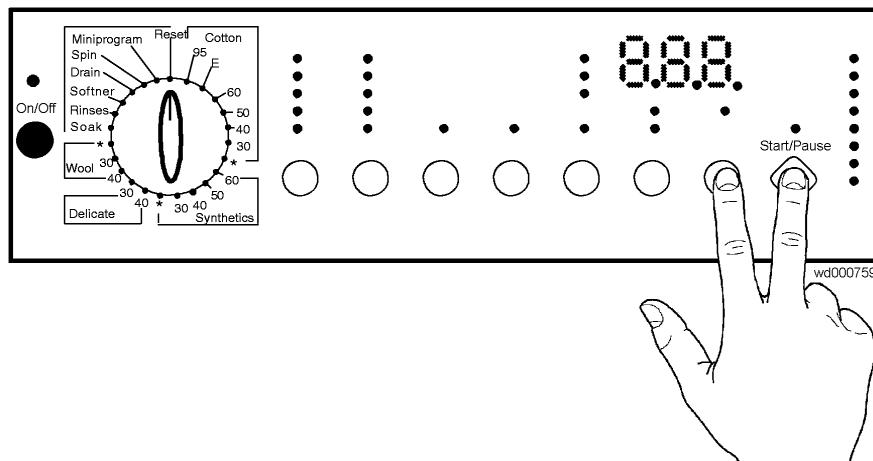
- configuration of the main PCB
- analysis of alarm conditions
- control of the operation of each of the components in the appliance.

To access the system:

- switch off the appliance and turn the programme selector knob to RESET.
- press the START/PAUSE button together with one of the other buttons and then, holding down both buttons, press the ON/OFF button to switch on the appliance.



- hold both buttons down until the buzzer (if featured) 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.

EXITING THE DIAGNOSTICS CYCLE

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

CONFIGURATION OF THE MAIN PCB

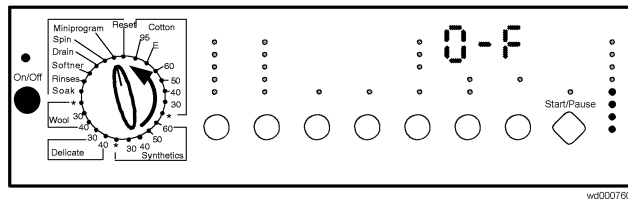
A standard main PCB is available as a spare part. This PCB contains only data relative to the wash cycle.

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

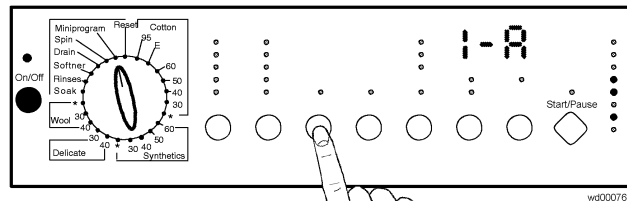
Configuration of the board consists of entering a 16-digit code which contains information which varies from model to model (type of washing system, type of tub, type of appliance, spin speed, etc.).

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

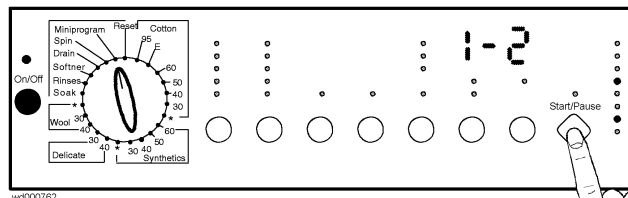
- turn the programme selector one position counter-clockwise; the display window shows the code relative to the position of the programme selector and, after two seconds, the code relative to the first of the 16 digits of the configuration code (i.e. position 0).



- when one of the option buttons is pressed (with the exception of the START/PAUSE button), all the digits which make up the configuration code are displayed in sequence.



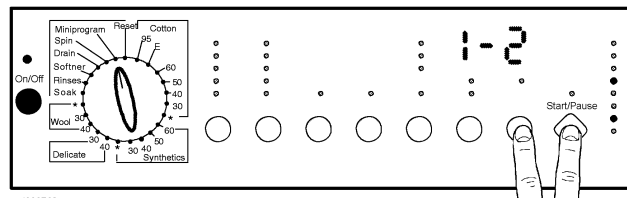
- press the START/PAUSE button to modify the configuration code (digit by digit).



- when all 16 digits have been entered, check that the code is correct, then memorize the code by pressing the START/PAUSE button and one of the option buttons at the same time; these buttons should be held down until the buzzer (if featured) sounds.

If the configuration is not entered correctly, the wash cycle will not start when the START button is pressed.

*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**.*

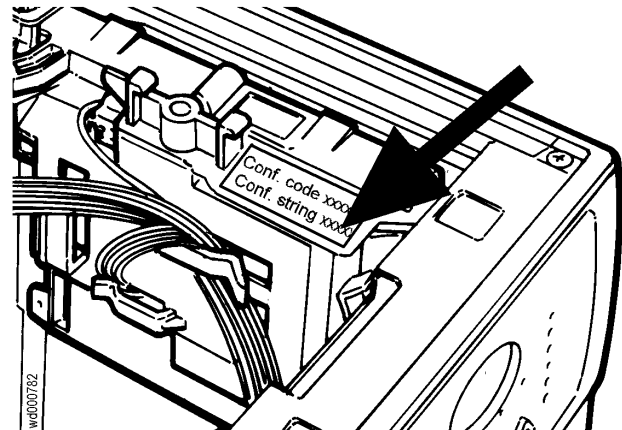


To exit the diagnostics system, switch the appliance off, on, and then off again.

CONFIGURATION CODE

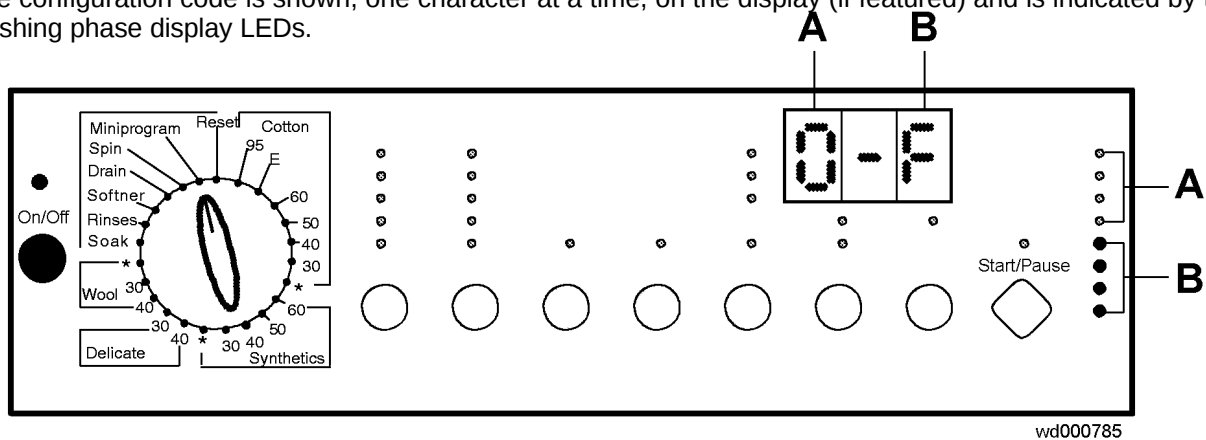
The configuration code (16 alphanumeric digits) is shown on a label affixed to the casing of the main PCB and in the Service Notes describing the various models.

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) and is indicated by the washing phase display LEDs.



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A = The first digit shown on the display (if featured) indicates the **position** of the value to be entered. The same information is also displayed in binary format on the first four washing phase LEDs. To **read** the various positions, press one of the wash cycle option buttons (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. The same information is also 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.

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

EXAMPLES OF CONFIGURATION

Configuration code: **A2A7808080E691F2**

TABLE OF CYCLE PHASE LEDS

By converting the characters into binary code, it is possible to create a table of the values to be entered (the positions are not modified):

POSITION:

VALUE:

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

○ LED OFF

● LED ON

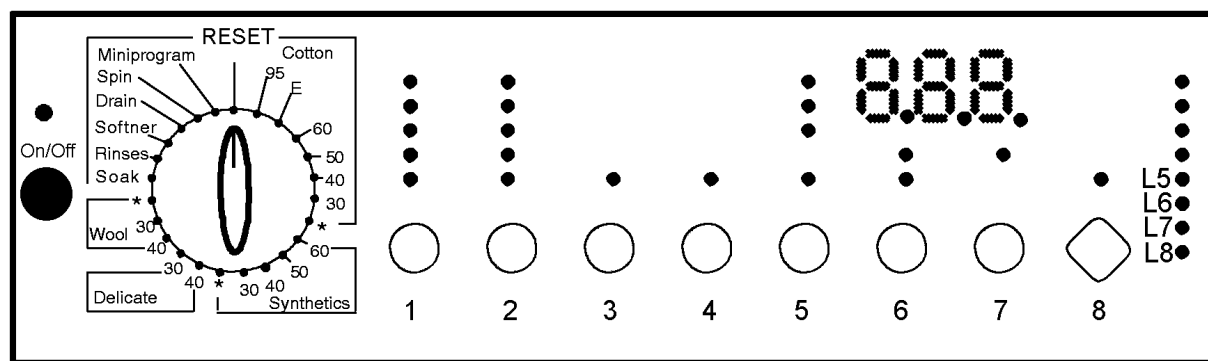
CONFIGURATION

1. Access the diagnostics system.
2. Turn the programme selector counter-clockwise by one position.
3. Press the START/PAUSE button 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 one of the option buttons (with the exception of START/PAUSE) to pass to the second position, and enter **2** by pressing START/PAUSE. 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 one of the option buttons (with the exception of START/PAUSE) to check that the configuration code is correct.
6. Memorize the configuration code by pressing START/PAUSE and one of the option buttons at the same time for at least 4 seconds, so that the configuration code is memorized by the main PCB.

DIAGNOSTICS SYSTEM

The diagnostics system is used to check the operation of all the components of the washing machine. After accessing the diagnostics routine (see "Access to the diagnostics / configuration system"), the correct operation of each component can be checked by turning the programme selector knob clockwise.

CHECKING THE DISPLAY BOARD



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When the knob is in the first position (RESET) (after accessing the diagnostics system), the system checks the display board.

The programme selector code is displayed for the first two seconds on the wash phase indicator LEDs, after which all the LEDs light in sequence (as well as the display, if featured).

When each button is pressed, the corresponding LED lights; the wash phase LEDs (and the display) show the binary code corresponding to the code relative to the button pressed.

Table of button codes

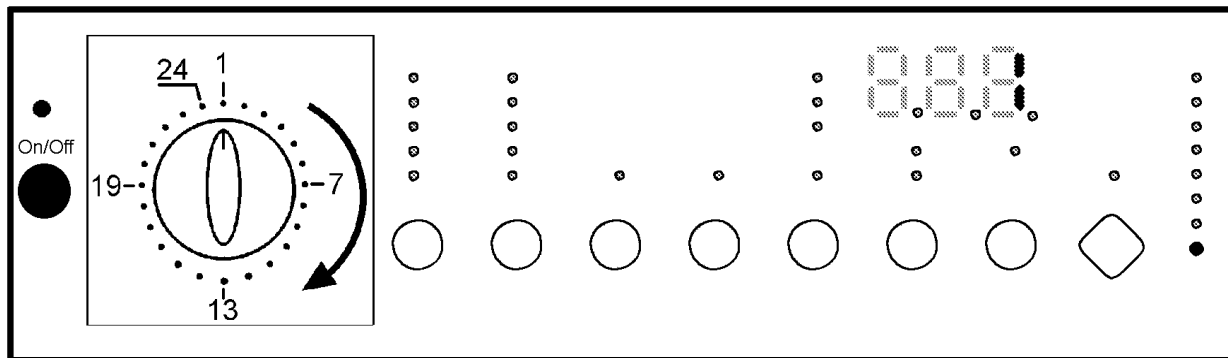
BUTTON NO.		1	2	3	4	5	6	7	8
LED	L5	☐	☐	☐	☐	☐	☐	☐	☒
	L6	☐	☐	☐	☒	☒	☒	☒	☐
	L7	☐	☒	☒	☐	☐	☒	☒	☐
	L8	☒	☐	☒	☐	☒	☐	☒	☐

☐ 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:

DIAGNOSTICS CYCLE



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Correct operation of all the components in the appliance can be checked by turning the programme selector knob clockwise.

The diagnostics cycles can be performed only if there is correct communication (connection) between the main PCB and the display board; also, the configuration of the appliance must be correct.

The wash phase LEDs (and the display, if featured) show the binary code representing the closure of the programme selector contacts for two seconds.

After two seconds, all the LEDs switch off and the diagnostics cycle corresponding to the position of the knob is performed.

If an alarm condition occurs during the diagnostics cycle, operation of the appliance is interrupted, and the LEDs (and display) show the corresponding alarm code (flashing).

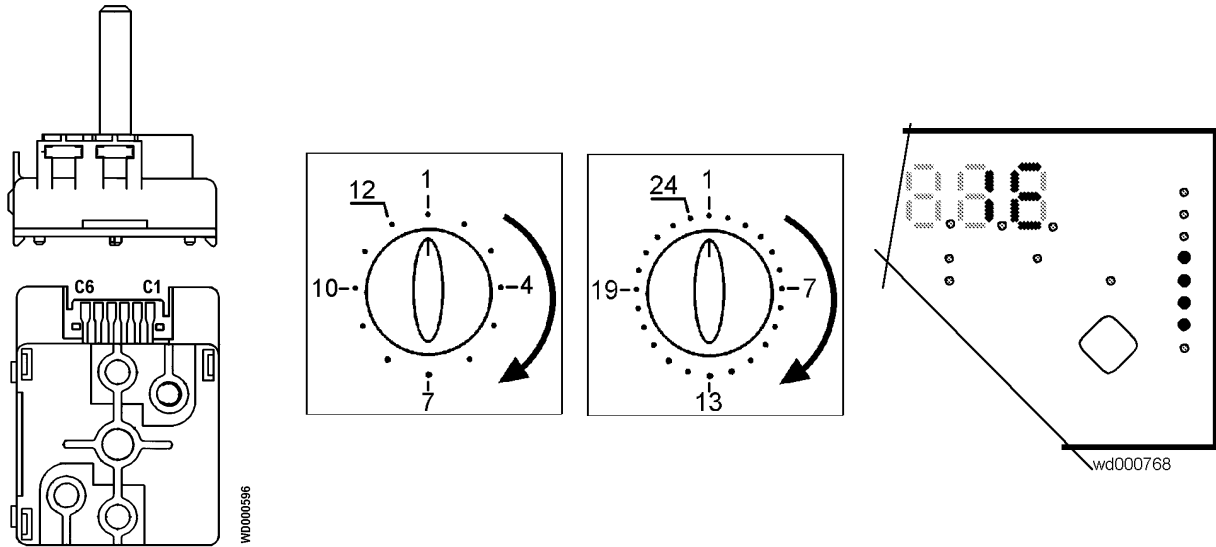
To exit the diagnostics cycle, switch the appliance off, on, and then off again.

DIAGNOSTICS CYCLE PHASES

Selector position	Function checked	Components actioned	Operating conditions
1	Operation of the display board	All the LEDs light in sequence. When a button is pressed, the corresponding LED lights and the code is displayed.	Always operative.
2	Water fill to wash compartment of dispenser	- door delay interlock - wash solenoid	Door closed, water fill to anti-overflow level for a maximum of 10 minutes.
3	Water fill to pre-wash compartment of dispenser	- door delay interlock - pre-wash solenoid	Door closed, water fill to anti-overflow level for a maximum of 10 minutes.
4	Water fill to conditioner compartment of dispenser	- door delay interlock - pre-wash solenoid - wash solenoid	Door closed, water fill to anti-overflow level for a maximum of 10 minutes.
5	Hot water fill or water fill to bleach compartment of dispenser	- door delay interlock - hot water solenoid or bleach solenoid (if featured)	Door closed, water fill to anti-overflow level for a maximum of 10 minutes.
6	Heating and circulation (Jetsystem models only)	- door delay interlock - (wash solenoid if the level is lower than the anti-boiling level) - circulation pump - heating element	Door closed, water fill higher than anti-boiling level if not reached, heating for a maximum of 10 minutes or to a temperature of 90°C.
7	Leakage from tub	- door delay interlock - (wash solenoid if level is lower than 150 mm) - motor	Door closed, water fill above 150 mm if not reached, motor up to drum rotation speed of 250 rpm.
8	Drain and spin, pressure switch check	- door delay interlock - drain pump - motor	Door closed, water drain, motor in movement (from lower level to anti-foam) until maximum spin speed is reached.

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

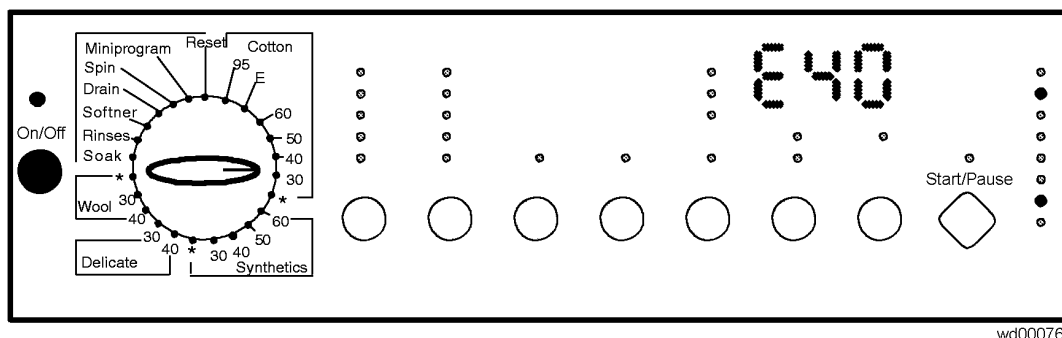
PROGRAMME SELECTOR



The table below shows the closure sequence of contact C6 (common) and the other contacts (C1 - C5) of the programme selector in the various positions, as well as the light-up sequence of the wash phase LEDs.

24-position selector knob	12-position selector knob (C1 not present)	Closure of selector contacts (C6 = common)					Display code
		C1	C2	C3	C4	C5	
1 - Reset	1 - Reset	0	1	1	1	1	1 E
2	2	0	1	0	0	1	0 6
3	-	0	1	1	0	0	1 4
4	3	0	1	0	1	0	0 C
5	-	0	1	1	1	0	1 C
6	4	0	0	0	1	1	0 A
7	-	1	0	0	0	0	0 1
8	-	1	0	0	0	1	0 3
9	-	1	0	0	1	0	0 9
10	5	0	1	0	1	1	0 E
11	-	0	0	1	0	1	1 2
12	-	1	0	0	1	1	0 b
13	-	1	0	1	0	0	1 1
14	-	0	0	1	1	0	1 8
15	6	1	0	1	0	1	1 3
16	-	0	0	1	1	1	1 A
17	7	1	0	1	1	0	1 9
18	8	1	0	1	1	1	1 b
19	-	1	1	0	0	0	0 5
20	9	0	1	1	0	1	1 6
21	-	0	0	0	0	1	0 2
22	10	0	1	0	0	0	0 4
23	11	0	0	0	1	0	0 8
24	12	0	0	1	0	0	1 0

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 pause
- cycle blocked
- current phase skipped

Only three alarm conditions are displayed to the user:

- problems with water fill
- problems with drain
- door open

In these cases, the cycle is paused so that the user can, if possible, solve the problem.

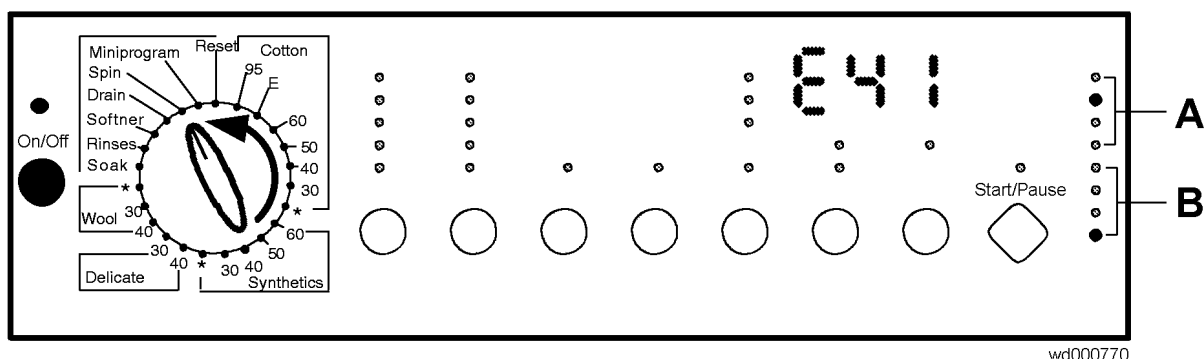
The seventh wash phase LED (alarm) flashes; the code relative to the type of alarm flashes on the first four LEDs (and on the display).

For example, in the case of alarm **E41** (door open), the display will show **E40** and, at the same time, the second LED will flash, indicating **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

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), **turn the programme selector knob two positions counter-clockwise** from the RESET position.



The alarm condition is displayed; the corresponding binary code flashes on the wash phase LEDs (and on the display).

A: The first four LEDs indicate the first digit of the alarm code

B: 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** and, at the same time, the second LED in group **A** (equivalent to **4** in binary code) and the fourth LED (equivalent to **1** in binary code) will also flash.

*If no alarm conditions have occurred, the display shows **E00**.*

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 (and 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
○	○	○	○	○	○	○	○	●	●
○	○	○	○	●	●	●	●	○	○
○	○	●	●	○	○	●	●	○	○
○	●	○	●	○	●	○	●	○	●

○ LED OFF

● LED ON

To exit the alarm condition, press START/PAUSE if the cycle is paused (this enables the appliance to attempt to complete the operation under the control of the user) or, if the cycle has been interrupted, switch off the appliance.

ALARM CODES

0: LED off

1: LED flashing

Alarm code	LED "A"	LED "B"	Fault description	User code	Result of alarm condition	Possible causes of fault
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
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; 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 0-66mm 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	Incongruency 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; anti-boiling pressure switch 1; wiring; main PCB
E34	0 0 1 1	0 1 0 0	Incongruency 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; anti-boiling pressure switch 2; 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
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
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 with door closed	Main PCB
E45	0 1 0 0	0 1 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)	Main PCB
E51	0 1 0 1	0 0 0 1	No signal from tachymetric generator on motor (no signal after maximum time)	---	Cycle blocked with door closed (after 5 attempts)	Main PCB
E52	0 1 0 1	0 0 1 0	No signal from tachymetric generator on motor (no signal after maximum time)	---	Cycle blocked with door closed (after 5 attempts)	Motor; tachymetric generator; wiring; main PCB
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

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 and cycle blocked	Heating element (earthed); NTC sensor faulty; 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 and 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
E83	1 0 0 0	0 0 1 1	Programme selector faulty (code not recognized)	---	---	Programme selector; wiring; main PCB
E84	1 0 0 0	0 1 0 0	"Sensing" circuit on circulation pump triac faulty	---	Cycle blocked with door closed	Main PCB
E85	1 0 0 0	0 1 0 1	Circulation pump faulty	---	Drain and cycle blocked	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
E93	1 0 0 1	0 0 1 1	Configuration error (incongruency between configuration values when appliance is switched on)	E90	Cycle blocked	Incorrect configuration; main PCB

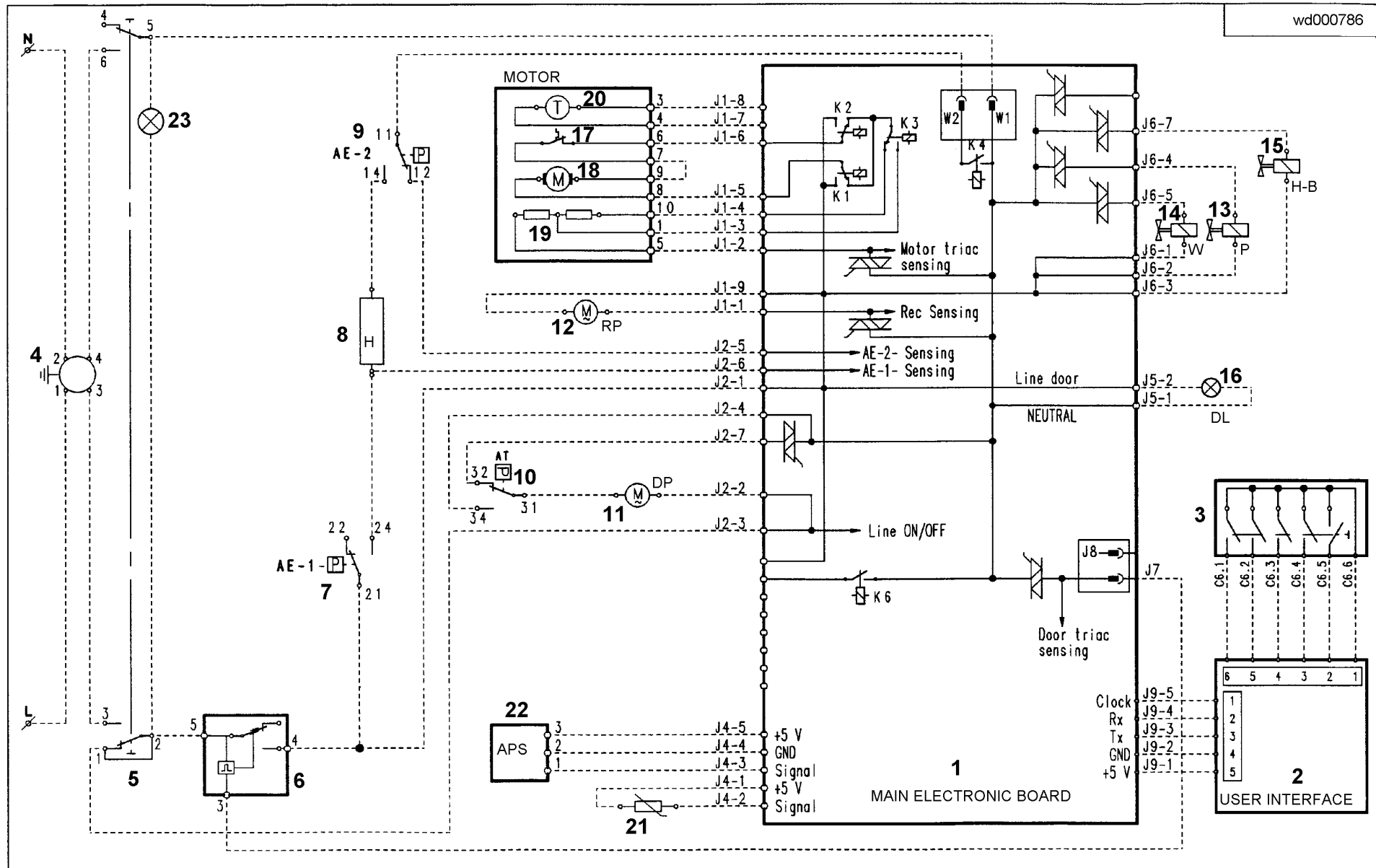
E94	1	0	Incorrect configuration of washing cycle	E90	Cycle blocked	Error in cycle software; main PCB
	0	1				
	0	0				
	1	0				

0:LED off

1: LED flashing

BASIC CIRCUIT DIAGRAM

wd000786



Key to circuit diagram

1. Main PCB
2. Control/Display board
3. Programme selector
4. Suppressor
5. Main switch
6. Door delay interlock
7. Anti-boiling pressure switch 1
8. Heating element
9. Anti-boiling pressure switch 2
10. Anti-overflow pressure switch
11. Drain pump
12. Circulation pump (Jetsystem models only)
13. Wash solenoid
14. Pre-wash solenoid
15. Bleach solenoid or hot water solenoid
16. Door aperture lamp
17. Motor cut-out
18. Rotor
19. Stator
20. Tachymetric generator
21. Temperature sensor (washing)
22. Electronic pressure switch
23. Pilot lamp

Connectors on main PCB

