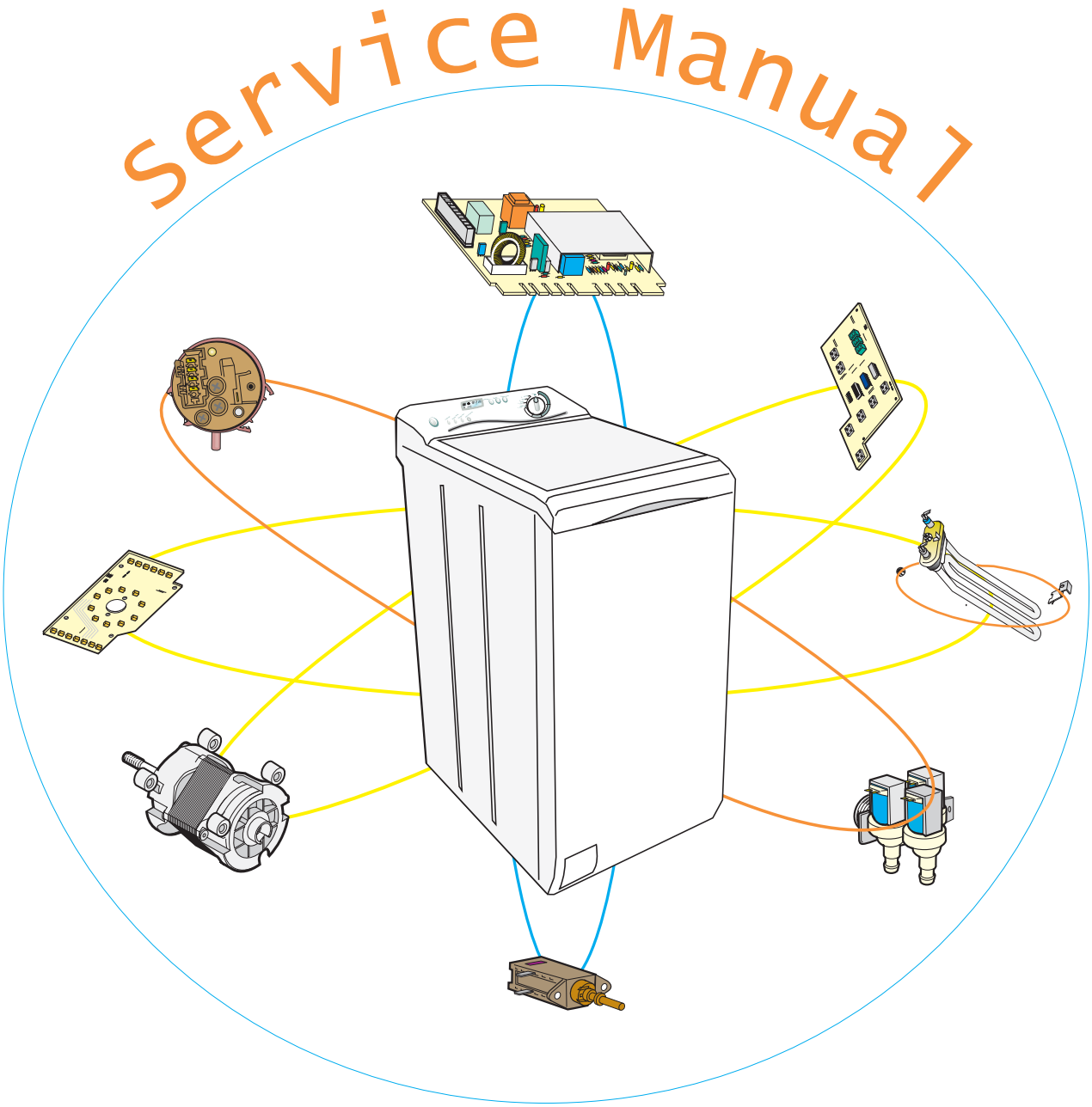
Technical Assistance Service **466000113**



For **Electronic** Top Loading **Washing Machines**

- with or without display,
- water feed through a 3-way solenoid valve.

1st EDITION - July 2006

IMPORTANT

Remove the plug from the mains power supply when carrying out any operations on the machine.

INTRODUCTION

This manual has been written taking into consideration most of the electronic washing machines in our production range and possessing various construction technologies and aesthetics (with or without LCD display). Consequently, this Manual must be used together with all the other technical documents appertaining to the product in question (exploded views, wiring diagrams, technical information sheets, etc.).

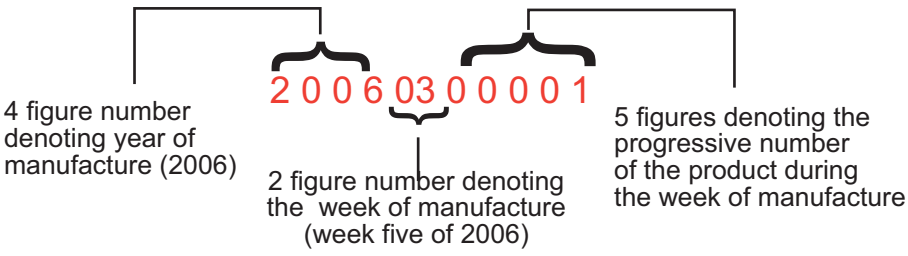
WATER SUPPLY

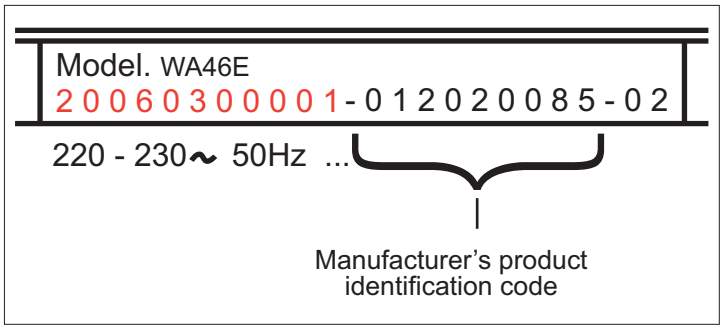
This manual provides instructions for connecting the appliance to the mains water supply, with explanations for washing machines with cold water feed only and those with both a hot and cold water feeds.
The water pressure must be between 0.05 and 1 Mpa.

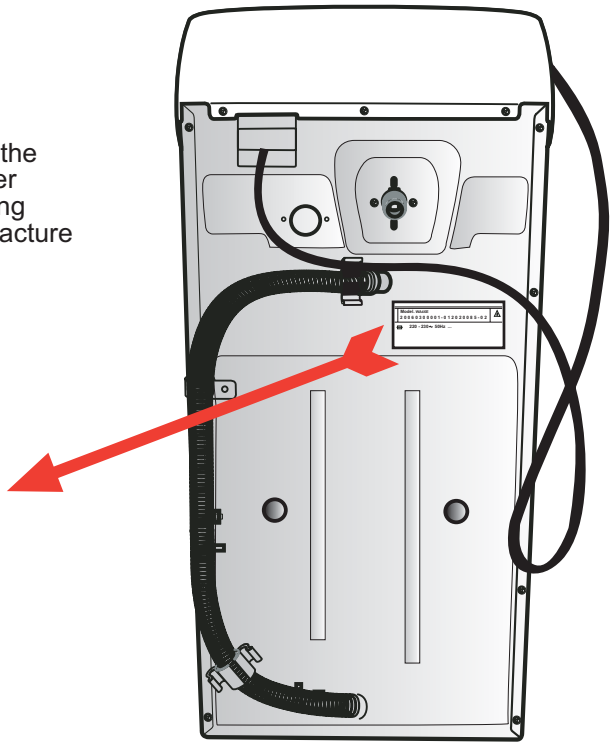
RATING PLATE

The rating plate is located on the rear panel of the washing machine.
If the casing needs to be replaced, remove the rating plate and attach it to the new casing.
The rating plate reports all the nominal data required by current standards (power supply voltage, total absorbed power, etc...).

The serial number consists of 11 characters that indicate the date of manufacture and serial number:
For example:

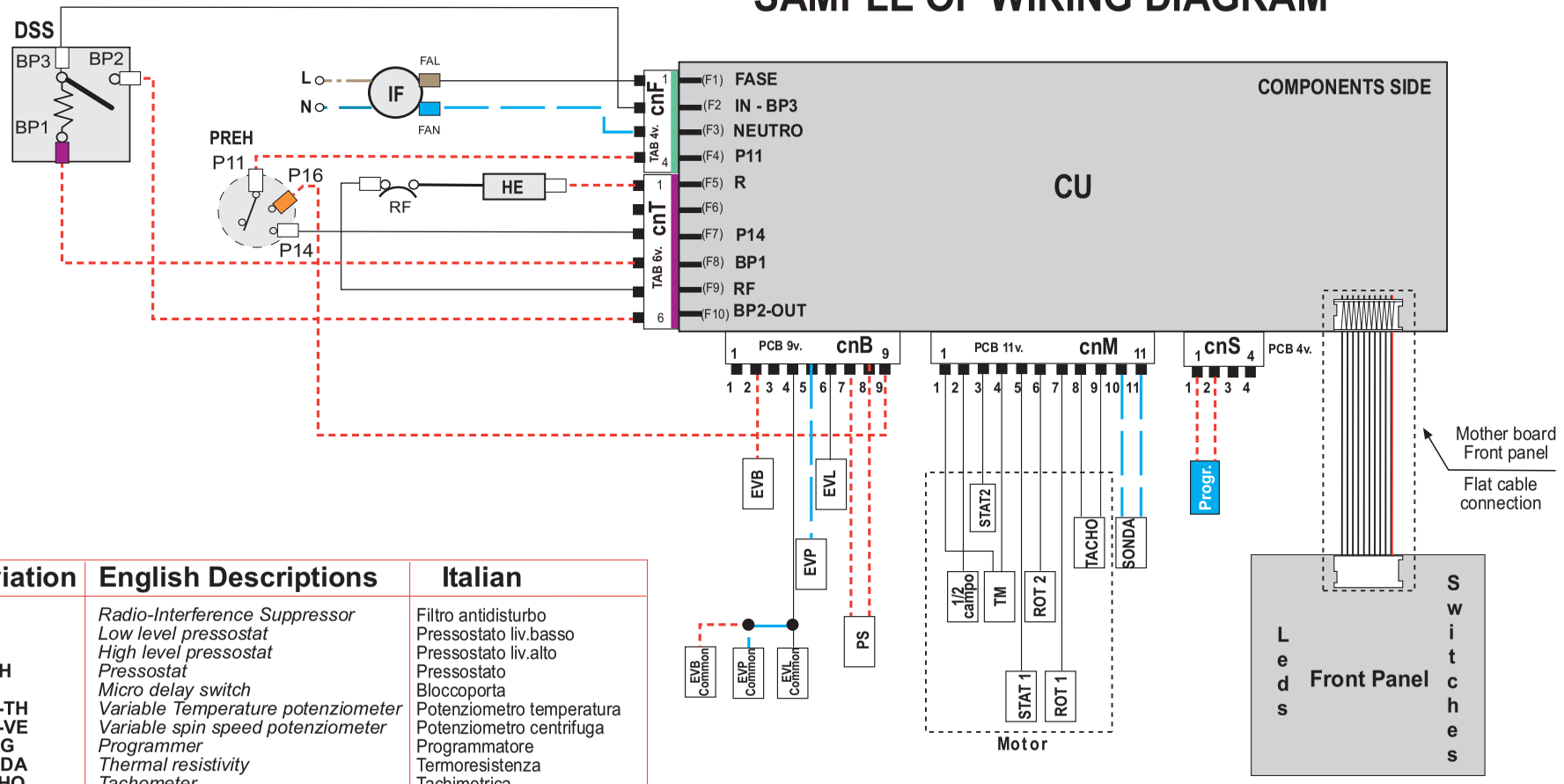






Should any problems occur with the washer drier, the Main Technical Assistance Office in your country must be informed of the serial number and the model in question in order to help the manufacturer identify the product.

SAMPLE OF WIRING DIAGRAM

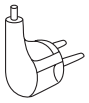


Abreviation	English Descriptions	Italian
IF	*Radio-Interference Suppressor*	Filtro antidisturbo
PRL	*Low level pressostat*	Pressostato liv.basso
PRH	*High level pressostat*	Pressostato liv.alto
PREH	*Pressostat*	Pressostato
DSS	*Micro delay switch*	Bloccoporta
POT-TH	*Variable Temperature potenziometer*	Potenziometro temperatura
POT-VE	*Variable spin speed potenziometer*	Potenziometro centrifuga
PROG	*Programmer*	Programmatore
SONDA	*Thermal resistivity*	Termoresistenza
TACHO	*Tachometer*	Tachimetrica
PS	*Drain pump*	Pompa scarico
EVL	*Washing Water Valve*	Elettrovalvola Lavaggio
EVP	*Pre-Washing Water Valve*	Elettrovalvola Pre-Lavaggio
EVB	*Bleaching Water Valve*	Elettrovalvola Candeggina
EVH	*Hot Water valve*	Elettrovalvola calda
EVC	*Cold Water valve*	Elettrovalvola fredda
Att-A	*Washing actuator*	Attuatore lavaggio
Att-B	*Prewashing actuator*	Attuatore prelavaggio
HE	*Washing Heating element*	Resistenza lavaggio
AS	*ON - OFF button*	Pulsante On - Off
TH	*Fixed thermostat*	Termostato fisso
CU	*Control unit*	Modulo elettronico
M	*Main washing motor*	Motore lavaggio
TM	*Thermal cut-off*	Protettore Termico Motore
RF	*Heating Fuse Protector*	Fusibile resistenza
BC	*Stoppage Drum Sensor*	Sensore Blocco Cestello

BLACK BROWN BLUE LIGHT BLUE RED

WHITE GREY VIOLET PINK

1. General specifications

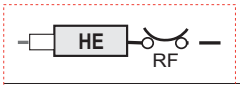


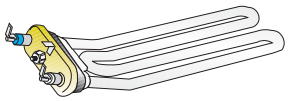
Voltage (according to the model)	230V /240V± 10% / 50 Hz
Max. absorption	2200 W
Fuse	10 A

2. Drum speed

Slow spin	550 rpm
High speed spin	according to the model

3. Tubular wash heater element with internal fuse

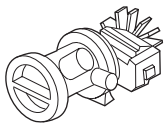




Power rating	1900 W	/	1900 W
Voltage (according to the model)	230 V		240 V

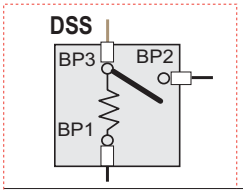
Warning: the Blue terminal indicates the internal thermofuse (RF)

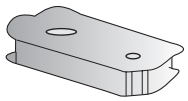
4. Synchronous drain pump



Power rating	approx. 34	W
Voltage	230-240V AC	50Hz
Flow rate	20	l/min.
Height of drain hose	max. 0,90	m
	min. 0,60	m

5. Safety door catch

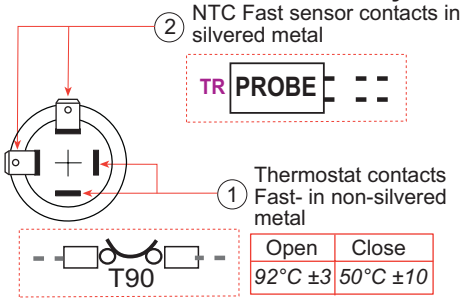




When a wash program is in progress, a safety device prevents the top lid from being opened. To open it while a wash program is running, switch off the washing machine using the On/Off button (if present) or position the programmer knob on "Stop". The lid can then be opened after a time lapse of approximately 2 minutes.

At the end of the cycle, wait for the END indicator to light up before opening the top lid.

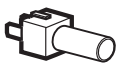
6.A Version with fixed safety thermostat with incorporated thermistor (water in tub temperature sensor)



Open	Close
92°C ±3	*50°C ±10*

Fixed safety thermostat 92°C ±3 with automatic reset and Normally Closed Contact.
The NTC sensor allows precise control of the temperature (+/- 2°C). As the temperature of the water increases, the ohmic resistance of the sensor decreases.
To check the operation of the component, heat the water to 25°C, then use a tester to check that the ohmic resistance is around 5 kOhm.

6.B Version with fixed safety thermostat and separate thermistor (water in tub temperature sensor)

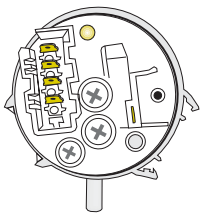


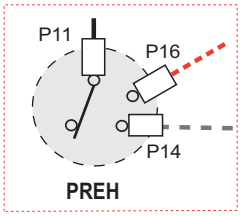
Open	Close
90°C ±3	*> 75°C*

The NTC sensor allows precise control of the temperature (+/- 2°C).
As the temperature of the water increases, the ohmic resistance of the sensor decreases.
To check the operation of the component, heat the water to 25°C, then use a tester to check that the ohmic resistance is around 5 kOhm.

Fixed safety thermostat 92°C ±3 with automatic reset and Normally Closed Contact.

7. Pressure Switch





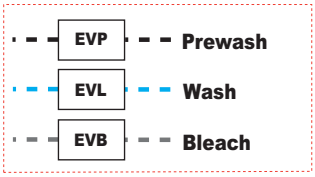
A single level pressure switch is used with the following functions:

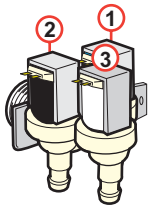
P11-P14
- Signals the electronic control unit (open/closed) that the low water level has been reached.
- heater element safety switch.

Contact P16 functions as an overflow safety device and trips when there is too much water in the tub.

Washing machine fill levels.
The washing machine levels are calculated by the electronic control unit according to the type and quantity of washing placed in the tub and the set program, and adds a safety margin which is pre-programmed in the module software.

8. Version with 3-way cold water solenoid valve.



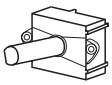


3) Prewash
2) Wash
1) Bleach

White coil Flow rate:	MAX.	10 ±15%	l / min
Working pressure:	MIN.	0,05 - 1	MPa
Black coil Flow rate:	MAX.	10 ±15%	l / min
Working pressure:	MIN.	0,05 - 1	MPa
Grey coil Flow rate:	MAX.	7 ±25%	l / min
Working pressure:	MIN.	0,05 - 1	MPa

Voltage (according to the model) 230/240V 50-60Hz

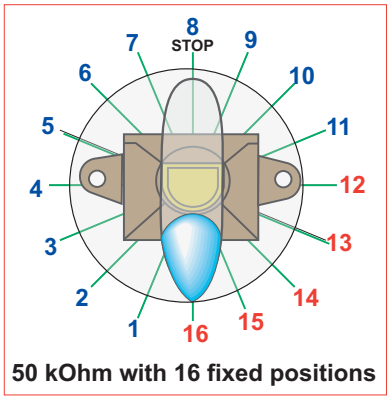
9. Wash program selection potentiometer.



The electronic washing machines can be fitted with one of two types of positive logarithmic potentiometer:
- 50 kOhm with 16 fixed positions
- 63 kOhm with 20 fixed positions

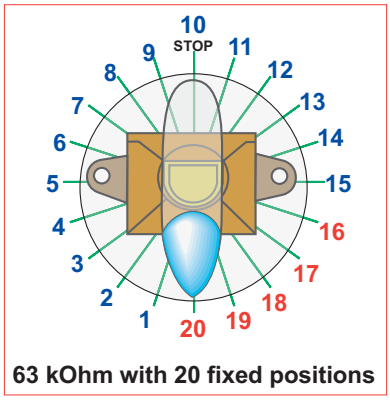
Their use depends purely on the number of programs for which the appliance has been designed.
The maximum Ohmic resistance is the reference value used to start the Autotest procedure.

Wiring diagram symbols



50 kOhm with 16 fixed positions

Important:
The positions in **red** are those used for the various phases of the **autotest.**



63 kOhm with 20 fixed positions

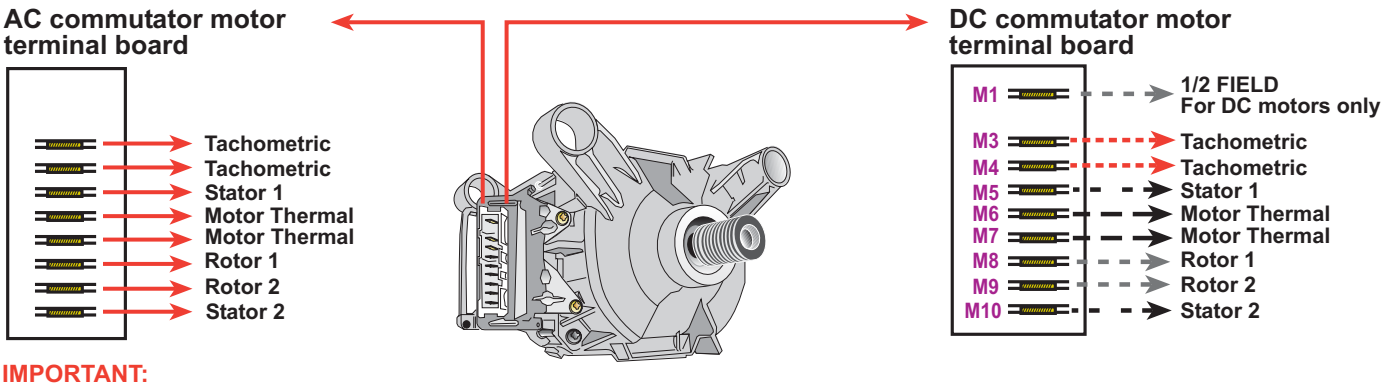
Program selector.

The start of a particular program is commanded by a wash code sent by the program selector (potentiometer) to the control unit.
The process also depends on the pressure switch signal: An **OPEN P11 - P14** contact enables the water feed or spin, while a **CLOSED P11 - P14** contact enables the motor to run during the wash and the heating phase.
The thermistor, tachometric and optional button signals are important for enabling the control unit microprocessor to run the required program. Note that each wash code of the program selector corresponds to a number of operations managed by the microprocessor.

10. Commutator motor 220-240V 50-60 Hz.

The commutator motor can be powered by: direct current (**DC**), **recognisable by the 1/2 FIELD contact on the terminal board**, or by alternating current (**AC**).

Appliances with 42 litre drum volume:
- AC motor, spin speed 800 rpm -1100 rpm
- DC motor, spin speed 1200 rpm or higher.

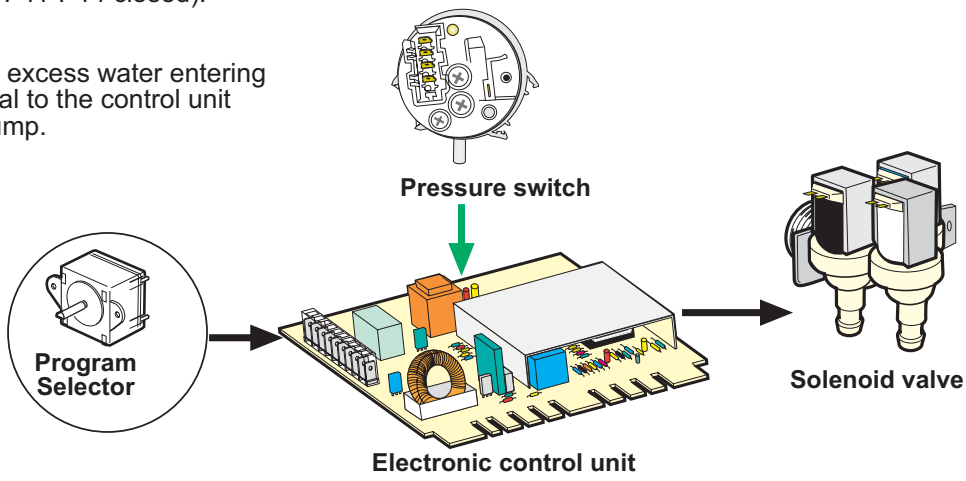


IMPORTANT:
- **It is not possible to replace just the tachometric on commutator motors.**
- **The motor brushes are not supplied as single spare parts.**
- **It is not technically possible to measure the ohmic resistance of this type of motor using a tester.**
- **The nominal data is reported on the motor itself.**

Water fill principle

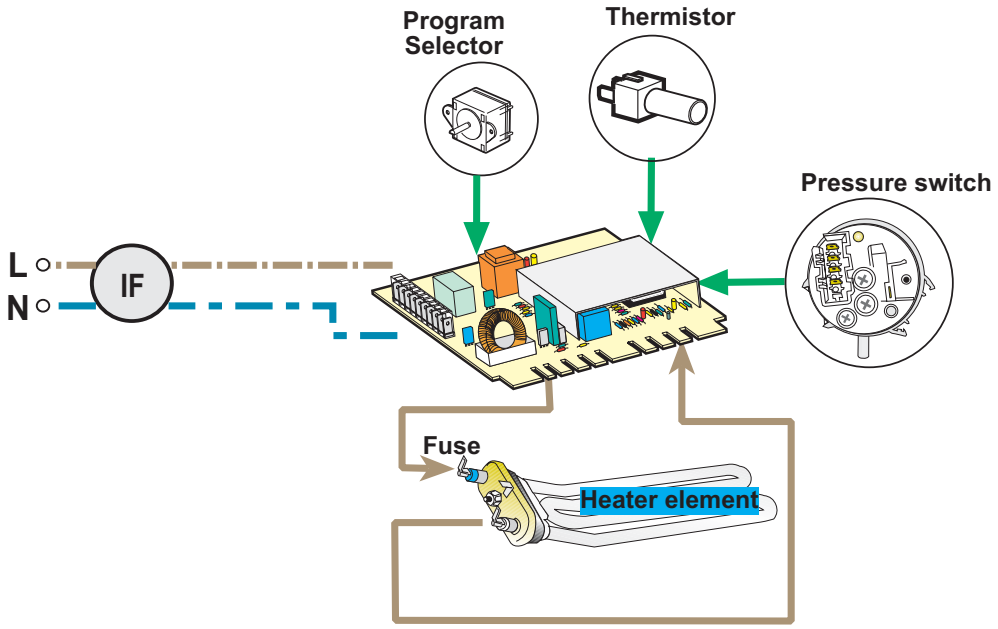
At the start of the wash program, the control unit, according to the program selected, commands the solenoid valve to feed water to the appliance providing the pressure switch authorises the action (the pressure switch must be OFF i.e. with contact P11-P14 open). When the required water level has been reached, the control unit closes the solenoid valve. (pressure switch with contact P11-P14 closed).

SAFETY:
If the pressure switch detects excess water entering the appliance, it sends a signal to the control unit which then starts the drain pump.



Heating phase principle

The heater element switches on when pressure switch contact P11-P14 is closed (water in the tub). A traditional thermostat to interrupt the power supply to the heater element is not provided.
The control unit receives the Ohmic value of the resistance and switches off the heater element when the correct temperature has been reached.



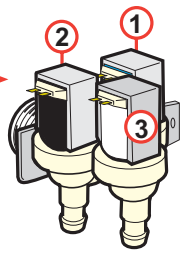
Cooling

The cooling phase is necessary in order to ensure that the water pumped to the domestic drainage system is not too hot.
This is always carried out for the **COTTON** program if the temperature is higher than 70°C. The water is gradually cooled down by allowing cold water to enter after the last wash cycle and before draining. The control unit feeds the cold water for one minute, pauses one minute then drains.
During **DELICATE** and **SYNTHETIC** programs, the cooling is always carried out before draining by activating the solenoid valve for 10 seconds.

Wash load balance control

The washing machines are fitted with an electronic balance control which is active in all the spinning phases.
At the start of the spin cycle, the load balance is checked by the control unit. If the load in the drum is unbalanced, the washing machine attempts to start the spin a number of times. If the control unit detects that the load is very unbalanced, the entire spin cycle may last as long as 20 minutes (even if the display still shows 12' (minutes).

Electronic washing machine version with water feed through 3-way solenoid valve.



FUNCTIONS OF THE CONTACTS

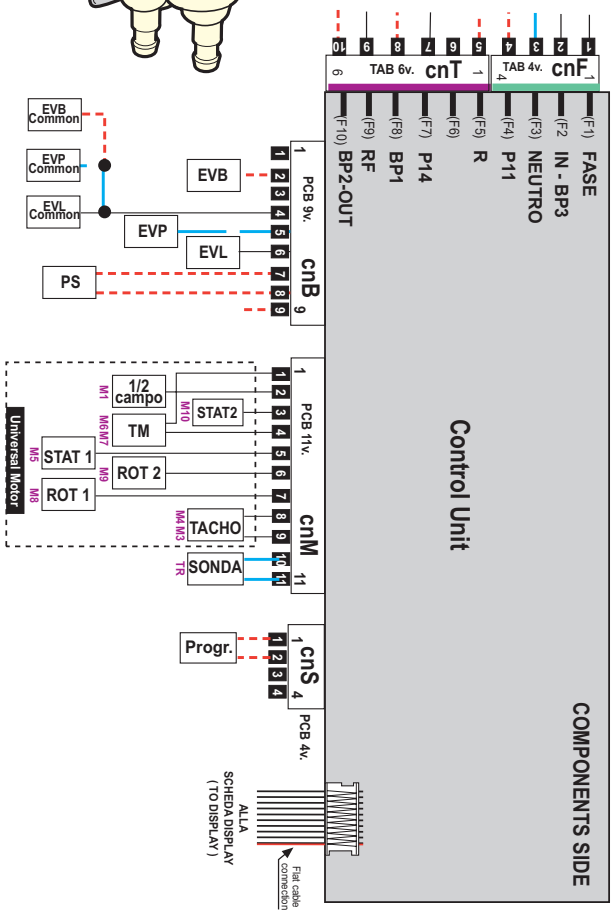
cnF1 receives power from the mains supply (Phase)
cnF2 feeds door catch contact **BP3**
cnF3 current output to mains supply (Neutral)
cnF4 feeds pressure switch contact **P11**
cnT1 feeds the **heater element**
cnT2 ----------
cnT3 receives the pressure switch level reached signal from contact **P14**
cnT4 feeds door catch contact **BP1**
cnT5 receives the return signal from the heater element through **safety thermostat**
cnT6 feeds door catch contact **BP2**

cnB1 ----------
cnB2 feeds Fabric Conditioner Solenoid Valve **EVB**
cnB3 ----------
cnB4 common to Solenoid valves **EVP, EVL, EVB.**
cnB5 power supply **Prewash solenoid valve EVP** (Prewash)
cnB6 power supply **Prewash solenoid valve EVL** (Wash)
cnB7-8 power supply **Drain pump**
cnB9 return signal from **pressure switch overfill safety (P16)**, starts drain pump.

cM1 Motor (**Thermal**)
cM2 Motor (**1/2 field**)
cM3 Motor (**Stator 2**)
cM4 Motor (**Thermal**)
cM5 Motor (**Stator 1**)
cM6 Motor (**Rotor 2**)

cN1 Motor (**Rotor 1**)
cN2 Motor (**Tachometric**)
cN3 Motor (**Tachometric**)
cN4-5 **Thermistor** (temperature control sensor)

cnS1-2 Program selector **potentiometer**



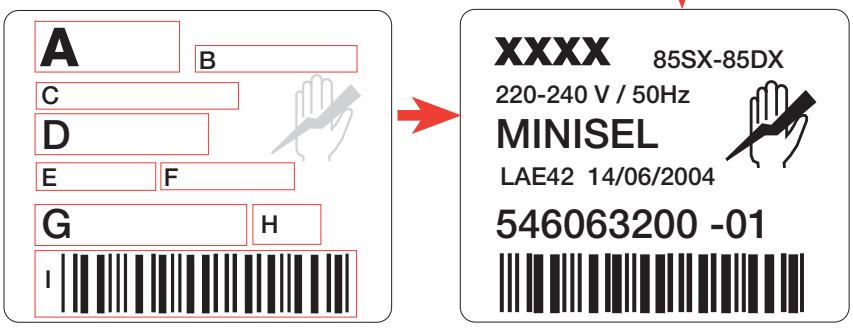
Flat cable receives information from the pushbutton circuit board (wash options) and sends information to the display (program status).

The use of different types of wiring means that the number of connectors may vary, though the control unit is always the same. Consequently, the wiring diagram shown above remains valid (providing the connectors have been wired correctly) in that it refers to the contacts on the control unit itself.
In the case of a fault, always check the control unit contacts (connectors). A false contact can compromise the correct execution of the program.

Explanation of the data reported on the electronic control unit label:

A = Maximum spin speed
B = Information for line testing
C = Voltage/Frequency
D = Control unit type
E = Appliance type
F = Control unit production date
G = Control unit code
H = Control unit/update version
I = Control unit barcode

Example:



IMPORTANT:
Before replacing an electronic control unit, use the autotest to make sure that all the electric components are working properly, that the contacts of the electronic control unit connections are sound and that the mains voltage is within the required limits.

Positions of the buttons on the various model styles:

General:
There are different types of electronic washing machines: **with or without LCD Display.** These types may be further subdivided according to their particular styling in terms of the positions of the wash option buttons. This, however, does not influence the operation of the appliance, in that the operation of the electronic control unit is the same in all cases, regardless of any extra functions that may be available on some models.

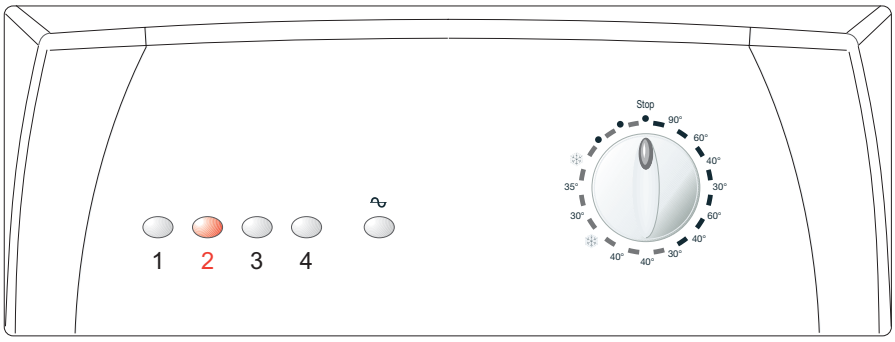
Example of an appliance with 1 knob and without display- Model style CM - 4 buttons

1 Prewash Selector

2 Energetic wash selector
2 Manual Autotest Selector

3 No-spin selector

4 Program start selector



Example of an appliance with 1 knob and without display- Model style CM - 7 buttons - 12 leds

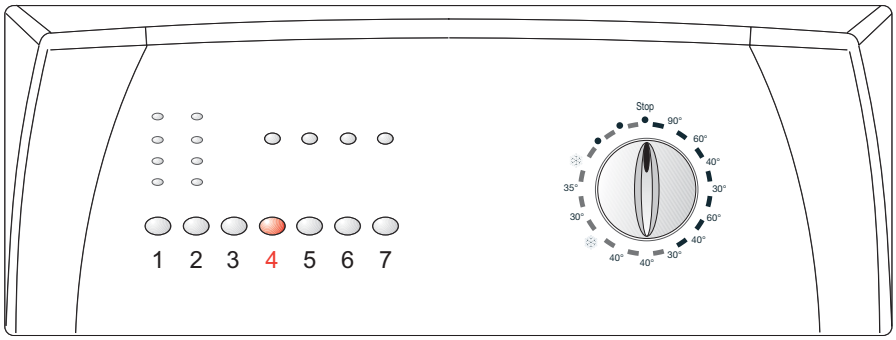
1 Delayed start selector
2 Spin speed selector
3 Prewash selector

4 Energetic wash selector
4 Manual Autotest Selector

5 Extra rinse selector

6 Depending on the model
6.1 Anti-crease selector
6.2 Spin delay selector
6.3 Drying selector
6.4 Stain removal selector.

7 Program start selector



Example of an appliance with 1 knob and with large display- Model style CM - 7 buttons - LCD

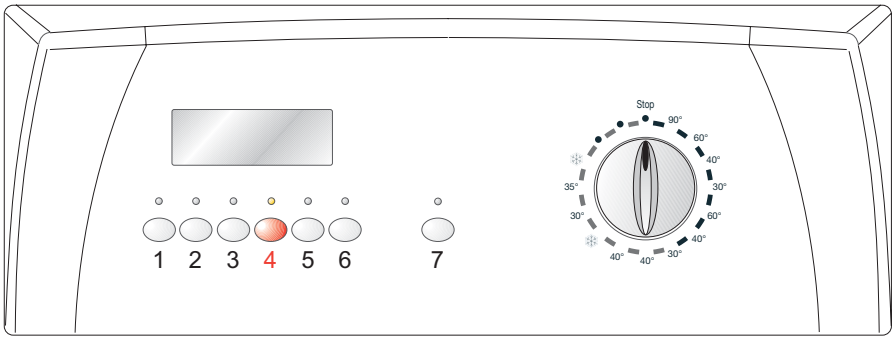
1 Delayed start selector
2 Spin speed selector
3 Prewash selector

4 Energetic wash selector
4 Manual Autotest Selector

5 Extra rinse selector

6 Depending on the model
6.1 Anti-crease selector
6.2 Spin delay selector
6.3 Stain removal selector.

7 Program start selector



Description of the functions of the selector buttons:

Delayed start button
This button allows a delayed start to be programmed for a selected wash program.
The set delay time is displayed by the timer LCD in hours:minutes (delays possible from 1 to 16 hours) or by the leds above the button (for models without display). The setting is confirmed by pressing the **Start** button, the **Delay** button will then light up to indicate that the function has been activated.
With the timer display at zero, the **Delay** button indicator light will switch off and the **Start** button will light up.
During the delay phase, the **Delay** button remains enabled to allow the delay setting to be modified.

Spin speed setting button (this button is not illuminated)
The button allows the maximum spin speed to be modified and/or reduced to zero. The set spin speed is displayed by the LCD or by the leds above the button (for models without display).
The initial speed setting displayed is the maximum allowed for the set program. The spin speed can also be modified during the wash cycle.
NB: Excluding the spin also excludes the DRYING function (in the case of Washer/driers).

No-spin button
This button allows the spin function to be included or excluded from the wash cycle.
The button is not normally lit but lights up when the function has been selected.

Prewash button
This button includes or excludes the prewash (see specifications) from the wash programs that accept the function (see program table in the instruction book).
The button is not normally lit but lights up when the function has been selected.

Energetic wash button
This button includes or excludes the energetic wash (see specifications) from the wash programs that accept the function (see program table in the instruction book).
The button is not normally lit but lights up when the function has been selected.

Extra rinse or extra rinses button (depending on the model)
This button includes or excludes the extra rinses (see specifications) from the wash programs that accept the function (see program table in the instruction book). The button is not normally lit but lights up when the function has been selected.

Anti-crease button
This button includes or excludes the anti-crease function from the wash programs that accept the function (see table in the instruction book).
The button is not normally lit but lights up when the function has been selected.

The anti-crease function limits the maximum spin speed to 800 or 1000 rpm (depending on the model), after which the drum rotates clockwise and anticlockwise at 35 rpm for 30 minutes with cycles of **7 seconds ON and 2 minutes OFF**.

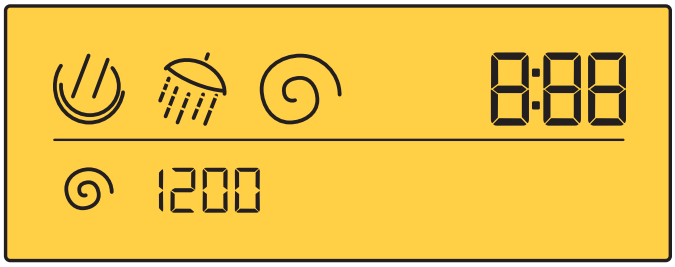
Spin delay
This button includes or excludes the spin delay function from the wash programs that accept the function (see table on the instruction book).
The button is not normally lit but lights up when the function has been selected.
The spin delay function stops the wash cycle at the last rinse and the button indicator light flashes.
The appliance will remain in this condition until the flashing button is pressed, after which the light will switch off and the cycle will restart to complete the program.

Stain removal button (if fitted to the appliance)
This button allows the stain removal function to be included or excluded from the **60°C COTTON** program.
The button is not normally lit but lights up when the function has been selected.
NB: When the stain removal function is activated, the prewash button is disabled

Stain removal program description
Place the usual detergent in the wash compartment and the special *stain removal* detergent in the prewash compartment.
After the first 10 minutes, the water is heated up to 40°C and the detergent is taken from the main wash compartment.
Once 40°C has been reached, water is fed through the prewash compartment for approximately 10 seconds *(taking with it the stain removal detergent).* The water is then further heated up to 60°C and remains at this temperature for approximately 10 minutes. The wash then continues for a further 40 minutes and then on to the rinses, etc. etc.

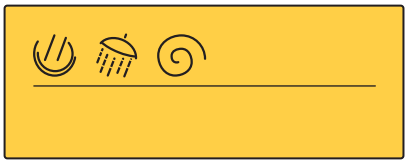
Start button
This button confirms the previously set functions and starts the program.
The button is not normally lit, but lights up to indicate the cycle is running only if the door catch is closed. In the version with the LCD, when the program selector is positioned on "**Stop**", the cycle is stopped and the button light switches off.
In the version without a display, when the program selector is positioned on "**Stop**", the cycle is stopped and the button light flashes.

DISPLAY version mod. B



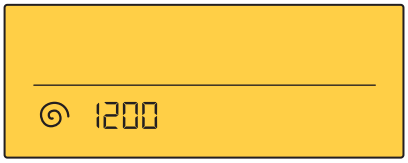
The wash symbols indicate the current phase of the program running:

= "**Wash"** phase
= "**Rinse**" phase
= "**Spin"** phase



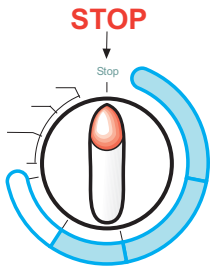
Timer display:
- wash time in hours:minutes
- delay time in hours:minutes (settable from 1 to 16 hours in steps of 1 hour)
- end of program indicated by the word **End**

Spin speed and No-spin function:
- The spin symbol is always lit.
- The spin speed can be set from the maximum allowed for the selected program down to **500 rpm** in steps of 100.
- The next press selects the No-spin function and is displayed by "**00**".



NB: When the program is reset, the display switches off.

“Program and Temperature” selector knob



This knob is used to select the type of wash and the most appropriate temperature for the items to be washed.
Positioning the knob at the "**STOP**" position will **reset** the programming of the appliance.
If, for any reason, you want to change the set wash program or add more washing to the load during the wash cycle, simply place the programmer knob on **“STOP”** (**the DISPLAY and the START button will switch off)** then re-position the knob on the new program and press the “**START**” button.

N.B. After carrying out this operation, check that there is detergent in the appropriate compartment and add if necessary.

Warning: Only use this function if strictly necessary and then only if the program to reset has been running for less than 3 minutes. Before opening the top lid after a reset, wait 2 minutes for the locking mechanism to release.

IMPORTANT:

The time reported on the display is **purely indicative** even though it is updated continuously during the wash cycle.
The wash time, in fact, can be influenced by a number of factors:

- Temperature and Pressure of the mains water supply system
- Voltage
- Quantity of washing and types of fabric in the drum.

These electronic appliances are fitted with an “EASY LOGIC” system that automatically recognises the quantity of washing placed in the drum. This function regulates the duration of the wash and quantity of water used, thus saving water, time and energy.
In the case where the amount of washing is less than the maximum recommended load (see washing machine instruction book), the quantity of water used for the wash will be reduced in proportion to the wash load.
In the case of a half-load or less, the machine will automatically carry out one rinse less than that programmed.

N.B. The “EASY LOGIC” function is only active for cotton programs.

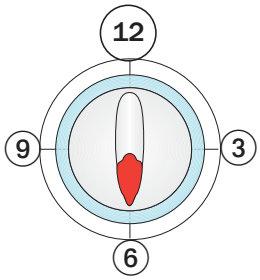
General:

Always start by checking the other components involved, and then check the electronic control unit last.
The following examples are provided assuming that all connections and connectors are in good working order, and that the voltage is within the required limits.
The electronic Control Unit has a self-diagnostics function that checks all the components connected to it, i.e. the so-called Autotest.

MANUAL AUTOTEST

To carry out the test, the following start conditions must be satisfied:

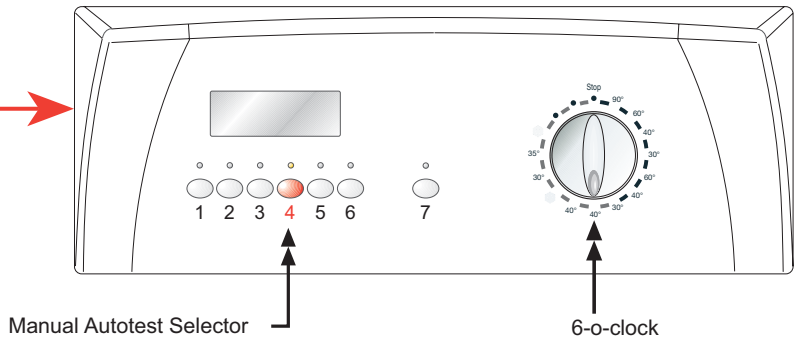
- The washing machine must be cold and empty. This is very important in that this phase tests both the thermistor and the pressure switch in OFF condition.



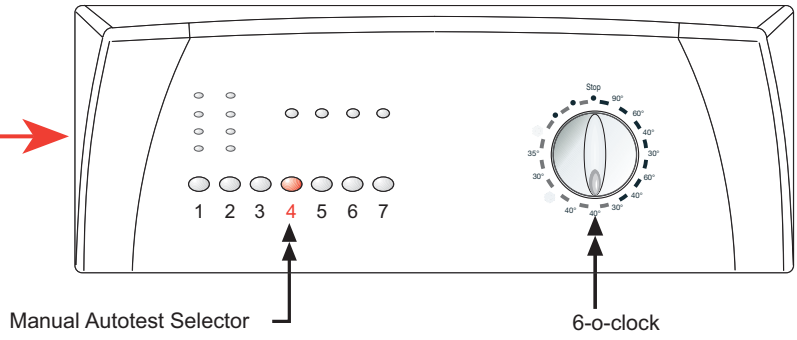
Procedure:

- Set the **wash program selector** knob with the index mark at **6-o-clock** (**Maximum Ohmic resistance value**).

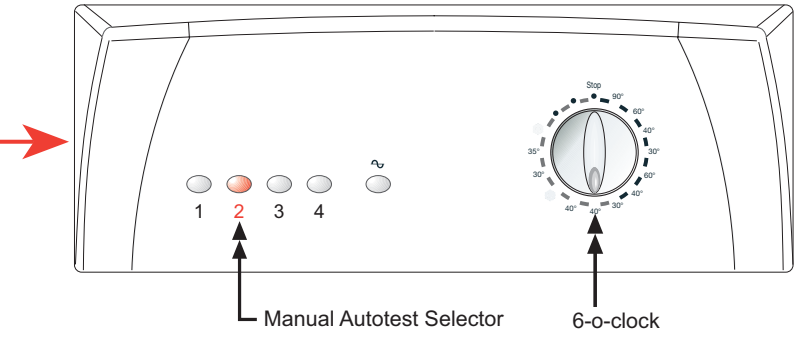
For appliances with 7 pushbuttons and LCD Display:
To start the appliance in autotest mode, press button **4**.



For appliances with 7 pushbuttons and no Display:
To start the appliance in autotest mode, press button **4**.



For appliances with 4 pushbuttons and no Display:
To start the appliance in autotest mode, press button 2.

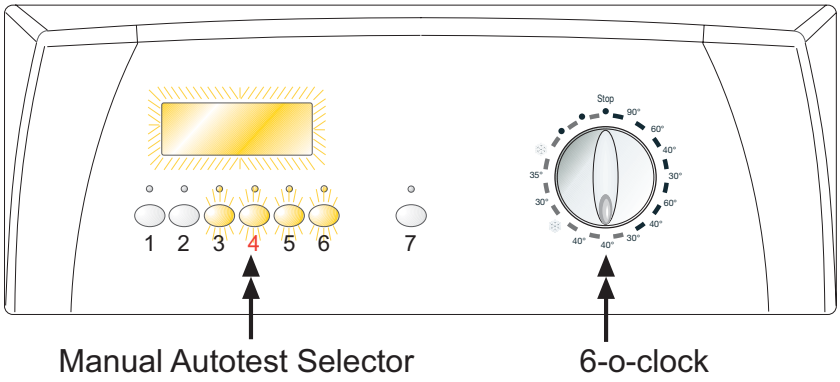


AUTOTEST for appliances with LCD display

The combination Knob (6-o-clock) and Autotest Selector button pressed for 5-6 seconds starts the Autotest.

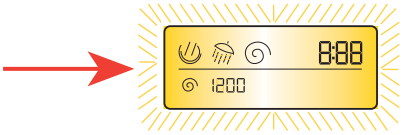
The display will light up fully for a few seconds together with some of the buttons.

NB:
The colour used for the display, the buttons and the knob has no significance.



This test will automatically check the following:
- That the **Thermistor** is not in short-circuit or disconnected.
- the **Pressure Switch OFF** condition (no water in tub)
- that the **Door catch** is working properly (contact closed)
- that the **Program selector** is connected properly

If the result of the test is positive, all the symbols on the display will light up.



Button illumination test:
- The **Spin speed selection** button is not luminous.
- The **Delayed start** button only lights up when pressed.
- The **Start** button only lights up when pressed.
- All the other buttons change their status from **On** to **Off**, or vice versa, each time they are pressed.

The **spin speed** selection button can change the set rpm at any time if pressed during the test.

N.B.: This button is not luminous.
On some models, the "No Spin" function is disabled during the Autotest phase.

The **Start** button switches the display wash/dry symbols on and off cyclically.

The programmer knob selects the various phases of the test, which are then displayed by the timer as described in **"Manual Test Selection"**.

INTRODUCTION:
The electronic control unit also allows individual components to be tested by varying the knob setting and maintaining the other conditions unchanged. Once the autotest function has been started, the required test can be selected by placing the knob in the appropriate position. Each position of the knob corresponds to a component test.
Starting from the start position (**6-o-clock**) and rotating the knob anticlockwise one position at a time there are **5** tests that can be carried out. Except for the first test, which is carried out by the control unit itself, in order to verify the result of the test, the behaviour of each tested component must be monitored.
The control unit takes a few seconds to pass from one test to the next. The acceptance of the test is signaled by the leds switching off or by a display code indicating the program corresponding to the position of the knob in autotest. From this point on, all the suspect components can be tested.
The correspondence between the reference position of the knob and a wash program is purely indicative, in that this is linked to the appliance model in question.

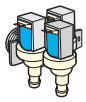
DIAGNOSTICS TABLE

Summary table of the tests that can be carried out on appliances with an **LCD Display** and fitted with a **3-way Solenoid valve**.

Possible displays according to the appliance model under test.

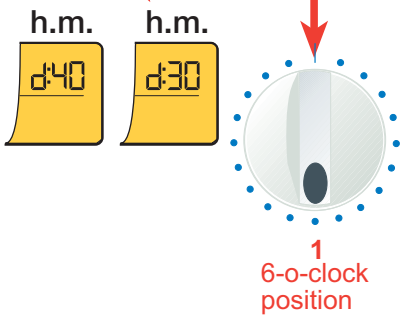
Position of knob index mark

Test N° 1

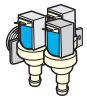


- Start position, all the functions are deactivated.

The control unit automatically tests the operation of the **thermistor**, the **pressure switch OFF** condition (no water in tub), the **program selector** and the **door catch** closed condition.

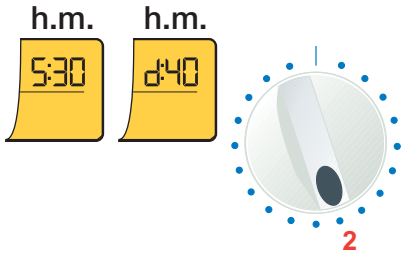


Test N° 2

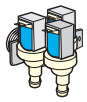


- Fills with water through the cold solenoid valve until the first pressure switch level is reached.

This procedure tests the operation of the **solenoid valves** and **pressure switch**.

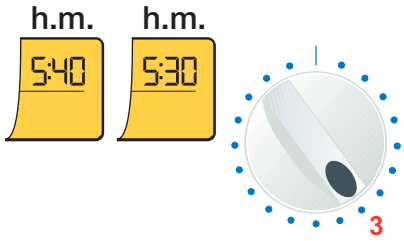


Test N° 3

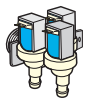


- The heater element is activated (only with water)
- The motor rotates alternately in both directions (clockwise and anticlockwise).

This procedure tests the operation of the **heater element**, the **motor** during washing.



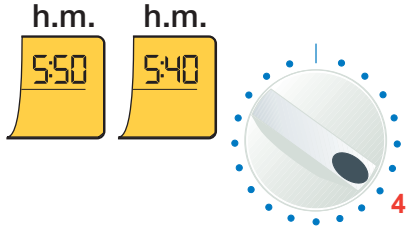
Test N° 4



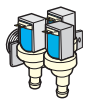
N.B.: In Autotest, on some models the "No Spin" function is disabled.

- The drain pump is activated and the spin runs at the preset speed.

This procedure tests the operation of the **drain pump**, the **motor** in spin mode.

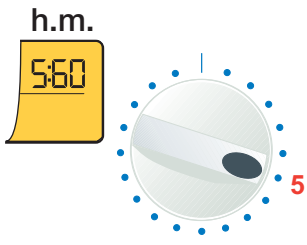


Test N° 5



- Fills with water for 10 seconds through the hot solenoid valve, where fitted (only with pressure switch off), wash motor operation at different rpm and direction according to the model of electronic circuit board fitted to the appliance. During this phase, for appliances fitted with a drum positioning sensor, the start led flashes if operation is correct otherwise it will remain lit.

This procedure tests the operation of the **hot water solenoid valve** (where fitted and only with pressure switch OFF) , the **motor** during washing and the drum positioning.

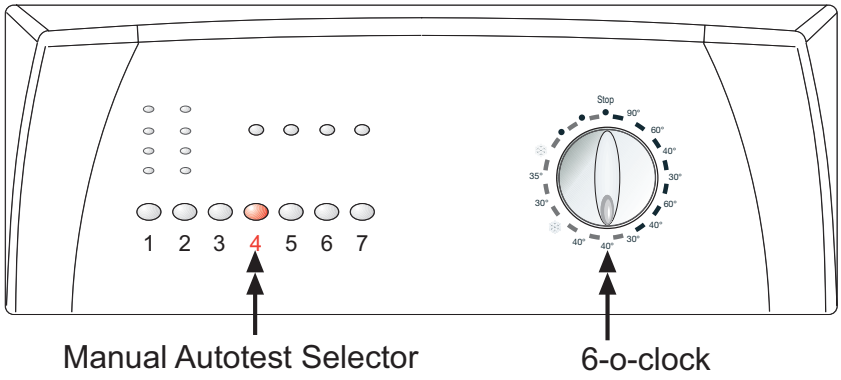


AUTOTEST for electronic appliances with 7 pushbuttons and no display

The combination Knob (6-o-clock) and Autotest Selector button pressed for 5-6 seconds starts the Autotest.

When the washing machine is powered up, the test begins.
The power led and the pushbuttons light up.

NB:
The colour used for the buttons and the knob has no significance.



This test will automatically check the following:
- That the **Thermistor** is not in short-circuit or disconnected.
- the **Pressure Switch OFF** condition (no water in tub)
- that the **Door catch** is working properly (contact closed)
- that the **Program selector/Spin speed selector** is connected properly

If the result of the test is positive, the 4 (washing phases) leds are in "**Test 1**" condition (see next page), the pushbuttons switch off and all the functions of the washing machine can be tested through the programmer knob.

Button illumination test:
- The **Spin speed selection** button is not luminous.
- The **Delayed start** button only lights up when pressed.
- The **Start** button only lights up when pressed.
- All the other buttons change their status from **On** to **Off**, or vice versa, each time they are pressed.

N.B.: On some models, the Delayed start button is not luminous.

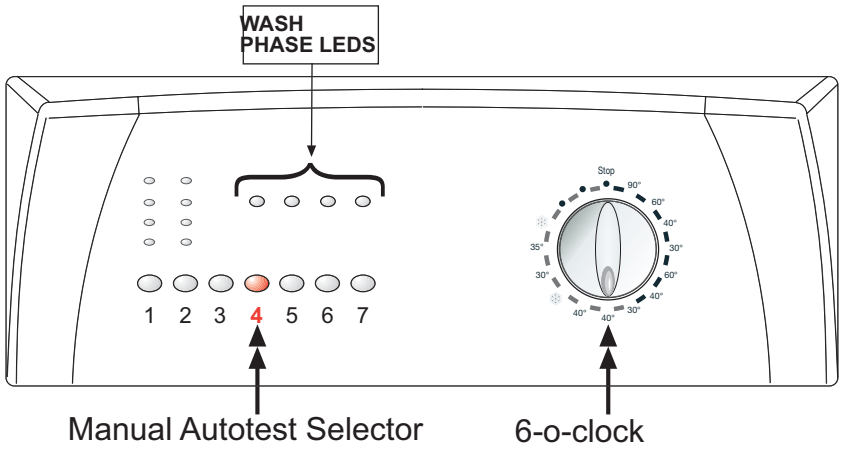
The **spin speed** selection button can change the set rpm at any time if pressed during the test.
N.B.: This button is not luminous.
On some models, the "No Spin" function is disabled during the Autotest phase.

The **Start** button switches the display washing symbols on and off cyclically.

The programmer knob selects the various phases of the test, which are then displayed by the timer as described in **"Manual Test Selection"**.

INTRODUCTION:
The electronic control unit also allows individual components to be tested by varying the knob setting and maintaining the other conditions unchanged.
Once the autotest function has been started, the required test can be selected by placing the knob in the appropriate position. Each position of the knob corresponds to a component test.
Starting from the start position (**6-o-clock**) and rotating the knob anticlockwise one position at a time there are **5** tests that can be carried out. Except for the first test, which is carried out by the control unit itself, in order to verify the result of the test, the behaviour of each tested component must be monitored.
The control unit takes a few seconds to pass from one test to the next. the acceptance of the test is signaled by the switching off of the leds indicating the program corresponding to the position of the knob in autotest. From this point on, all the suspect components can be tested.
The correspondence between the reference position of the knob and a wash program is purely indicative, in that this is linked to the appliance model in question.

MANUAL AUTOTEST - For model styling with 7 pushbutton control panel and no display



Setting the programmer knob at the positions described below will test the electric components and functions of the washing machine.

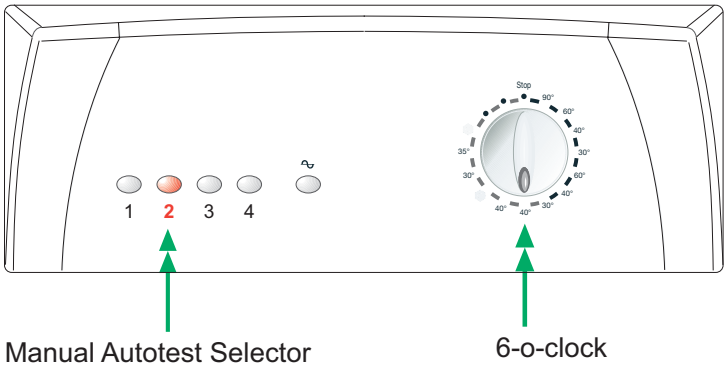
		Position of knob index mark at 6-o-clock	Status of the wash phase leds
Test N° 1	- Start position, all the functions are deactivated. **The control unit automatically tests** the operation of the **thermistor**, the **pressure switch OFF** condition (no water in tub), the **program selector** and the **door catch** closed condition.		1
Test N° 2	- Fills with water through the cold solenoid valve until the first pressure switch level is reached. This procedure tests the operation of the **solenoid valves** and **pressure switch**.		2
Test N° 3	- The heater element is activated (only with water) - The motor rotates alternately in both directions (clockwise and anticlockwise). This procedure tests the operation of the **heater element**, the **motor** during washing.		3
Test N° 4	**N.B.: In Autotest, on some models the "No Spin" function is disabled.** - The drain pump is activated and the spin runs at the preset speed. This procedure tests the operation of the **drain pump**, the **motor** in spin mode.		4
Test N° 5	- Fills with water for 10 seconds through the hot solenoid valve, where fitted (only with pressure switch off), wash motor operation at different rpm and direction according to the model of electronic circuit board fitted to the appliance. During this phase, for appliances fitted with a drum positioning sensor, the start led flashes if operation is correct otherwise it will remain lit. This procedure tests the operation of the **hot water solenoid valve** (where fitted and only with pressure switch OFF) , the **motor** during washing and the drum positioning.		5

AUTOTEST for low speed electronic appliances with 4 pushbuttons

The combination Knob (6-o-clock) and Autotest Selector button pressed for 5-6 seconds starts the Autotest.

When the washing machine is powered up, the test begins.
The power led and the pushbuttons light up.

NB:
The colour used for the buttons and the knob has no significance.



This test will automatically check the following:

- That the **Thermistor** is not in short-circuit or disconnected.
- the **Pressure Switch OFF** condition (no water in tub)
- that the **Door catch** is working properly (contact closed)
- that the **Program selector** is connected properly

If the result of the test is positive, the power led lights up, the pushbuttons switch off and all the functions on the appliance can be tested through the programmer knob.

Button illumination test:

- The **Spin speed selection** button is not luminous.
- All the other buttons change their status from **On** to **Off**, or vice versa, each time they are pressed.

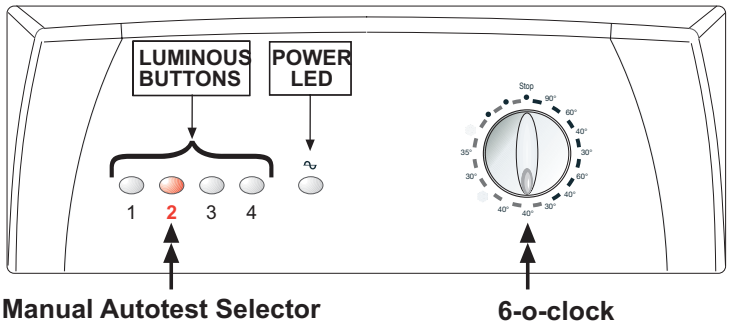
The programmer knob selects the various phases of the test, which are then displayed by the timer as described in **"Manual Test Selection"**.

INTRODUCTION:

The electronic control unit also allows individual components to be tested by varying the knob setting and maintaining the other conditions unchanged. Once the autotest function has been started, the required test can be selected by placing the knob in the appropriate position. Each position of the knob corresponds to a component test.
Starting from the start position **(6-o-clock)** and rotating the knob anticlockwise one position at a time there are **5** tests that can be carried out. Except for the first test, which is carried out by the control unit itself, **in order to verify the result of the test, the behaviour of each tested component must be monitored.**
The control unit takes a few seconds to pass from one test to the next. The acceptance of the test is signaled by the power led which changes its status from "flashing" to "ON". From this point on, all the suspect components can be tested. The correspondence between the reference position of the knob and a wash program is purely indicative, in that this is linked to the appliance model in question.

MANUAL AUTOTEST - For model styling with 1 knob and 4 pushbuttons

Setting the programmer knob at the positions described below will test the electric components and functions of the washing machine.

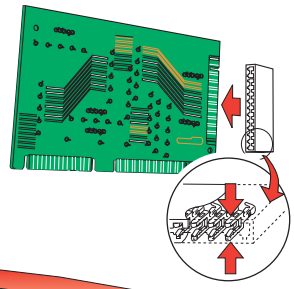


N.B.: Passing from one test to another takes a few seconds; during this time the Power LED flashes.

		Power led	Knob Index Position 6-o-clock
Test N° 1	- Start position, all the functions are deactivated. **The control unit automatically tests** the operation of the **thermistor**, the **pressure switch OFF** condition (no water in tub), the **program selector** and the **door catch** closed condition.		1
Test N° 2	- Fills with water through the cold solenoid valve until the first pressure switch level is reached. This procedure tests the operation of the **solenoid valves** and **pressure switch**.		2
Test N° 3	- The heater element is activated (only with water) - The motor rotates alternately in both directions (clockwise and anticlockwise). This procedure tests the operation of the **heater element**, the **motor** during washing.		3
Test N° 4	**N.B.: In Autotest, on some models the "No Spin" function is disabled.** - The drain pump is activated and the spin runs at the preset speed. This procedure tests the operation of the **drain pump**, the **motor** in spin mode.		4
Test N° 5	- Fills with water for 10 seconds through the hot solenoid valve, where fitted (only with pressure switch off), wash motor operation at different rpm and direction according to the model of electronic circuit board fitted to the appliance. This procedure tests the operation of the **hot water solenoid valve** (where fitted and only with pressure switch OFF) and the **motor** during washing.		5

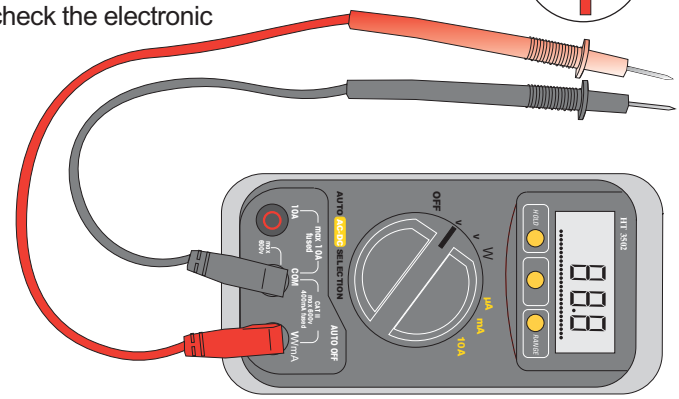
TROUBLESHOOTING GUIDE

Before carrying out any operations on a component check the quality of the electrical connections to the electronic control unit.



Check the condition of the wiring harness (for wear, twists, breakages) and the connections.

Always start by checking the other components involved, and then check the electronic control unit last.



The program will not start.

Try the Manual Autotest

A) If the appliance **DOES NOT** enter autotest mode, recognisable by the following components **not lighting up**:
- **Leds** (for appliances with a small display and 1 knob or 2 knobs without display.
- **Large LCD display** for appliances fitted with same.

Then the following checks must be carried out:

- Check that the electrical connections of the Potentiometer are correct and according to the wiring diagram, that the component is undamaged and in working order, otherwise replace the component.
- Check that the electrical connections of the pushbutton circuit board are inserted correctly. If so, and the problem persists, replace the pushbutton circuit board. Finally, if this doesn't solve the problem, replace the main electronic control unit.

B) If the appliance **ENTERS** autotest mode, depending on the type of appliance, the following components will light up:

1) For appliances with no display, **the wash phase leds will all remain lit**.
2) For appliances with an LCD display, **the display illumination will be minus graphics**.

If this occurs, it means that the control unit has discovered a malfunction in one of the three components that it is testing:

- the **thermistor**.
- the **pressure switch**
- the **door catch**

To check the operation of the thermistor:
- Disconnect the wiring from the thermistor and use a multimeter (Tester) to check the ohmic resistance, which should be approximately 5 kOhm at an ambient temperature of 25°C,
  - if the result is positive, check the Pressure switch.
  - if the result is negative, replace the Thermistor.

To check the operation of the Pressure switch:
- Disconnect the electrical wiring from the Pressure switch and check that contact P11-P14 is open,
  - if the result is positive, check the Door catch.
  - If the result is negative, check that the pressure switch pipe and the compression chamber are not blocked. if these are OK, replace the Pressure switch.

To check the operation of the Door catch:
- Check that connections **BP1**, **BP2** and **BP3** have been properly made.
- Use a Tester to check the voltage between contact **BP3** and **BP1.**
  - if the test result is positive, replace the component
  - If there is no voltage, replace the electronic control unit.

Once this procedure has been completed, the problem should have been resolved and the appliance should work properly.

DIAGNOSTICS TABLE

Water does not enter the tub.

Check that the water feed valve to the washing machine is open.

Start the manual Autotest procedure, then carry out **Test N° 2**. If water still does not enter the tub, use a Tester to carry out the following checks:

- check that there is Ohmic resistance (Ohms) between the two terminals of the solenoid valve, if the circuit is open replace the component.

- check that there is voltage at the ends of the wires connecting the solenoid valve to the control unit. If there is no voltage, replace the electronic control unit.

The washing machine does not heat the water in the tub.

Start the manual Autotest procedure, then carry out **Test N° 2** to fill the tub with water (this is necessary in order to allow the heater element to work). On completion of this operation, carry out **Test N° 3.** If the water is still not heated, use a Tester to carry out the following checks:

- check that there is Ohmic resistance (Ohms). If the circuit is open, replace the component.

- check that there is continuity between the two contacts of the T90° safety thermostat (if fitted), if the circuit is open replace the component.

- check that there is voltage at the ends of the wires connecting the heater element to the control unit. If there is no voltage, replace the electronic control unit.

The motor does not turn properly during a wash and/or spin

Start the manual Autotest procedure and then carry out **Test N° 3**.

- Check that he motor rotates alternately in both directions (clockwise and anticlockwise) at approximately 45 rpm.
  If the result is positive, carry out **Test N° 4**.
  If the test is negative, disconnect the motor from the wiring terminal board, then use a Tester to check that there is continuity at the ends of the wires connecting the wiring terminal board to the control unit. Then check that the connectors are not damaged or disconnected.

- Replace the motor with one known to be in working order. If the result of the test is positive, replace the motor. If the result is negative, replace the electronic control unit and refit the original motor.

The appliance does not drain

Check that the washing machine filter or the user's drains are not blocked.
Start the appliance in manual Autotest mode and move the programmer knob to the **Test N° 2** position. Wait for the pressure switch to trip and then carry out **Test N° 4**.

If the result is negative, disconnect the pump wiring and check that the circuit is no broken by verifying the ohmic resistance (Ohms). If the circuit is open, replace the electric pump.

- if the circuit is closed, remove the pump from the washing machine and use a screwdriver to check for any foreign bodies in the scroll.

- use a tester to check the continuity in the pump power supply wires. If all the tests carried out prove positive replace the control unit.

Water flows into the tub continuously.

- Check that the **solenoid valve** is not damaged (water should not enter the tub when the appliance is switched off).
- Check that the **pressure switch** is working by carrying out **Test N° 2**.
- Check that **Pressure switch** contact **P11- P14** is closed, allow this phase of the test to continue for a few minutes, then make sure that there are no air leaks.
- Check that there are no leaks from the gaskets, rubber couplings or tub unit.
- Check that the pressure switch pipe is not holed or bent.
- If all the above tests are positive, replace the electronic control unit.

SAFETY measures adopted in the electronic control unit software.

- Motor rotor jammed or Tachometric open.
After eight failed attempts to start the motor (either in wash or spin mode), the control unit passes to the end of the cycle and the **End** led flashes on appliances without a display or the word **End** appears on appliances with a display.

- Drain Pump blocked.
If the control unit does not detect the pressure switch empty condition after twenty minutes of pump running time, it passes to the next step and continues the cycle until the end of the program, stopping with water still in the tub.

- Thermistor or thermostat malfunction
If, after fifty minutes of heater element operation the set temperature has not been reached, the control unit advances and continues the cycle as normal, though with cold water.