

Integrated Washer Dryer

IW 1209.0W

IWT 1259.0W

Küppersbusch

THE HEART OF A GOOD KITCHEN



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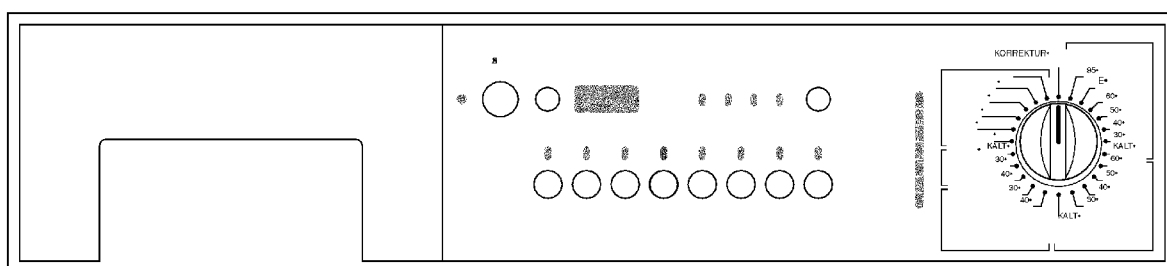
Washing Machine IW 1209.0 W

Part C

Washer Dryer IWT 1259.0 W

Part D

Fault Code Indicator and Test Programmes



Washing Programmes and Programme Functions

VF 92J - VP91J

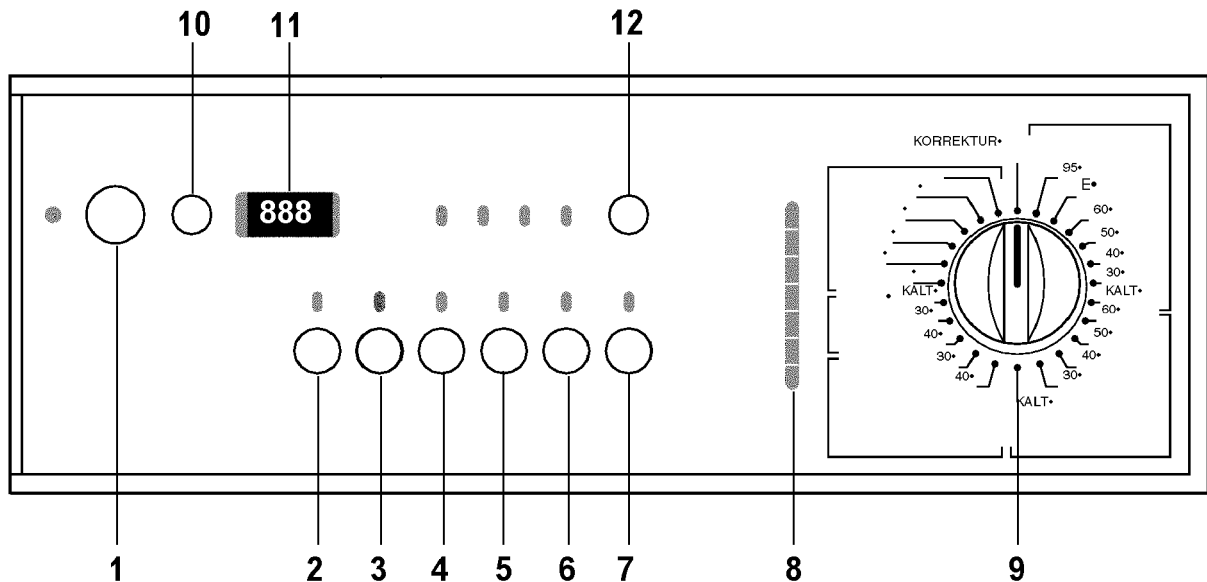
Multipanel Versions

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1. AUTOMATIC WASHING MACHINE CONTROL PANEL

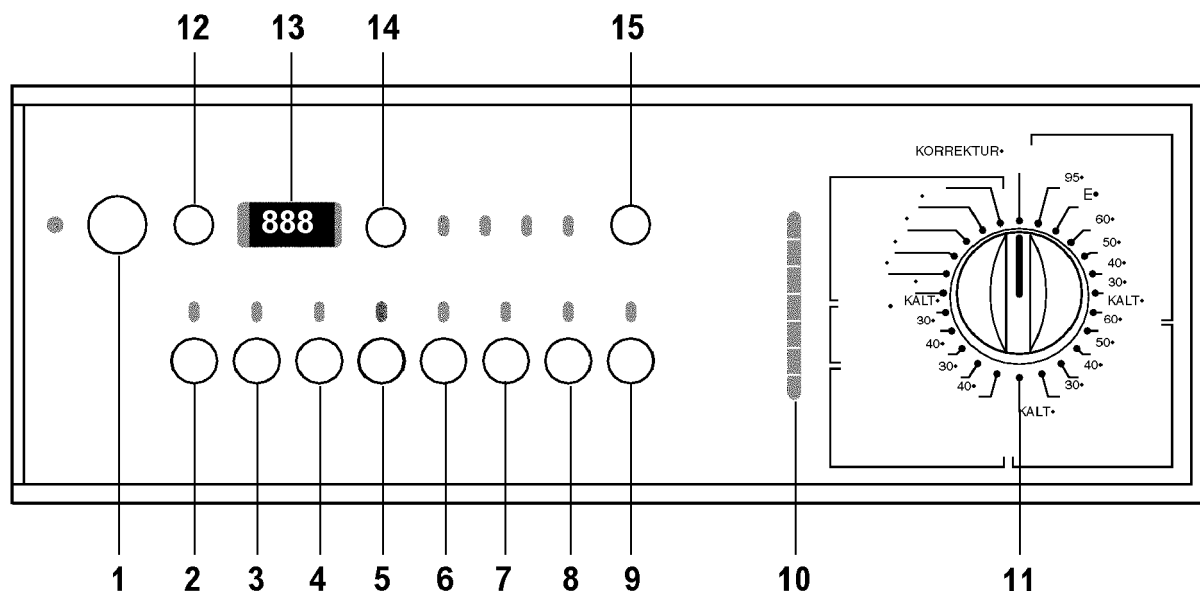
A common electronic control panel is used on models in the "MULTIPANEL" range. The functions of the buttons vary according to the way that the electronics have been configured for each particular model.



- 1 ON/OFF switch
- 2 Stain Programme button
- 3 Quick Wash Program button
- 4 Prewash button
- 5 Extra Rinse button
- 6 Rinse Hold button
- 7 Start/ Pause button
- 8 Programme Status Display LED
- 9 Programme Selector knob
- 10 Delay Timer button
- 11 Display
- 12 Spin Speed button

2. WASHER DRYER CONTROL PANEL

A common electronic control panel is used on models in the "MULTIPANEL" range. The functions of the buttons vary according to the way that the electronics have been configured for each particular model.



- 1 ON/OFF switch
- 2 Cupboard Dry button (available on certain models)
- 3 Easy Ironing button (available on certain models)
- 4 Stain Programme button
- 5 Quick Wash Programme button
- 6 Prewash button
- 7 Extra Rinse button
- 8 Rinse Hold button
- 9 Start/ Pause button
- 10 Programme Status Display LED
- 11 Programme selector knob
- 12 Delay Timer button
- 13 Display
- 14 Drying Time button
- 15 Spin Speed button

2.1 Buttons

ON/OFF button

For switching the machine on and off.

"Stain Programme" button

This button is used to specify that the "Stain Programme" should be run with the WHITES/COLOURED and WASH AND WEAR programmes. This involves heating the water to 40°C and adding a special detergent to the wash via the prewash dispenser. The programme time is extended by 10 minutes. The "Stain Programme" button will not work if INTENSIVE PREWASH is already selected.

"Quick Wash Programme" button

This button reduces the duration of the WHITES/COLOURED, WASH AND WEAR and DELICATES programmes. It also reduces the number of rinse cycles on the COLOURED programmes and increases the water level in the drum.

"Prewash" button

This button adds a pre-wash and extends the washing time by 10 minutes. The button will not work if the "QUICK WASH PROGRAMME" is already selected.

"Extra Rinse" button

Adds an extra rinsing cycles (from 3 to 4) on all WHITES/COLOURED, WASH AND WEAR and DELICATES programmes.

"Rinse Hold" button

When this key is pressed, the wash programme stops before the final spin cycle without draining the water. The machine then runs the "Creasecare Programme".

To proceed to final spin, press the "Start/ Pause" button or select a drain or spin programme.

The machine will automatically drain the water from the drum if it is still present 18 hours after activation of Rinse Hold.

This function can be used in combination with the WHITES/COLOURED, WASH AND WEAR and DELICATES programmes. Extra water is used on the last rinse cycle of the WHITES/COLOURED programmes.

When this function is selected on WOOL, final draining is carried out without spinning.

"Start/ Pause" button

This button starts the washing programme. The LED's on the display stop flashing and the status indicator appears.

This button can also be used to pause the machine in order to alter the programme or open the door. The "Start" LED begins to flash. The programme is resumed by pressing this button again.

The door can be opened only if the water temperature is below 40°C and the water level is below 180 mm. The door cannot be opened during the drying programme.

Program modification is only possible during the first 5-15 minutes (before the start of the heating phase).

The final spin cycle may be altered any time before it actually starts.

"Programme Status Display" LED

While the machine is being programmed, all LEDs light up showing the individual washing programme cycles. When the machine is running, only the LED showing the current cycle remains illuminated. When the machine is paused, an LED will flash to remind you of the programme phase in progress.

2.1.1 Programme Selector

Wash programmes are selected via a 24-position switch.

Selector Knob Position	Programme	Temperature
1	RESET/	
2	WHITES/COLOURED	95°C
3	WHITES/COLOURED	60°C
4	WHITES/COLOURED	60°C
5	WHITES/COLOURED	50°C
6	WHITES/COLOURED	40°C
7	WHITES/COLOURED	30°C
8	NON-FAST COLOURED (automatic washing machines) DRYING (washer dryers)	0°C
9	WASH AND WEAR	60°C
10	WASH AND WEAR	50°C
11	WASH AND WEAR	40°C
12	WASH AND WEAR	30°C
13	NON-FAST WASH AND WEAR (automatic washing machines) DRYING (washer dryers)	0°C
14	DELICATES	40°C
15	DELICATES	30°C
16	WOOL	40°C
17	WOOL	30°C
18	WOOL	0°C
19	SOAK	40°C
20	GENTLE RINSE	
21	FABRIC SOFTENER	
22	DRAIN	
23	SPIN	
24	GENTLE SPIN	

Turning the selector knob to the "RESET" position causes the machine to stop and cancels all existing programme settings. A new washing programme can then be set up from scratch.

2.1.2 "Delay Timer" button

This button can be used to delay the programme start by between 1 and 19 hours. The delay time is shown on the display. Pressing the "Start/ Pause" button starts the timer. The time remaining is updated every hour in the display.

2.1.3 Display

The display shows:

- ◆ In the RESET position: three flashing bars
- ◆ When programming the machine, the programme time in flashing numerals until the "Start/ Pause" button is pressed.
When setting the washing programmes, the programme time required for a full load appears in the display. As soon as the weight of the load has been calculated, the display changes to show the actual programme time.
When setting the drying programmes, the maximum drying time for a full load appears first. This is then replaced with the actual drying time, based on the amount of moisture in the wash.
- ◆ Once the programme has started, the time remaining figure is recalculated every 10 minutes. In the last 20 minutes the time is recalculated every 5 minutes.
- ◆ End of programme: three flashing "0"s show that the door can be opened.
- ◆ Programme start can be delayed by 1 to 19 hours.
After the "Start/ Pause" is pressed, the delay time remaining is recalculated every hour.
- ◆ Pre-heating phases are indicated by a dot that appears to the right of the digital display.
- ◆ Fault codes E00-E10-E20.

2.1.4 "Spin Speed" button

This button is used to select the desired spin speed. The appropriate LED lights up.

If the spin speed for WHITES/COLOUREDS programmes is set to 1200 rpm or higher (1000 rpm with the VP91J programme function), the intermediate spin cycles will run at 1200 rpm (1000 rpm with the VP91J programme function). If the speed is set lower than 1200 rpm, the final rinse cycle level 2 will be added, while the intermediate spin cycles run at the selected spin speed.

If a full wash/ dry programme has been selected, the spin speed can be reduced to a minimum of 900 rpm for WHITES/COLOUREDS and to a minimum of 700 rpm for WASH AND WEAR.

2.1.5 Buttons for "Automatic Drying" are available only on certain washer dryer models.

- ◆ "Cupboard Dry" button
- ◆ "Easy Ironing" button (for WHITES/COLOUREDS programmes only)

This button can be used to adjust the drying programme to suit the type of laundry being dried and the degree of drying required. The drying time is set and monitored using "Fuzzy Logic".

The drying programme can be set to follow on automatically from the wash programme or it can be used independently. If the spin speed has been set below 900 rpm for a WHITES/COLOUREDS wash programme, or under 700 rpm for WASH AND WEAR programmes, the final spin cycle automatically runs at the maximum selected speed.

2.1.6 "Drying Time" button - for washer dryers only

This button is used to set the drying time:

- ◆ from 10 to 100 minutes for WASH AND WEAR programmes
- ◆ from 10 to 130 minutes for WHITES/ COLOURED S programmes

The drying time can be set in increments of 10 minutes.

The drying programme can be set to follow on automatically from the wash programme or it can be used independently. If the spin speed has been set below 900 rpm for a WHITES/COLOURED S wash programme, or under 700 rpm for WASH AND WEAR programmes, the final spin cycle automatically runs at the maximum selected speed.

2.2 Programme Selection

The following tables show the options available for each wash programme.

Option/ Temperature	Programmes											
	1	2	3	4	5	6	7	8	9	10	11	12
95°C	○											
60°C Eco	●											
60°C	●	○										
40°C Eco	●	●										
40°C	●	●	○	○								
30°C	●	●	●	●								
Cold	●	●	●	●								
Auto drying	2 levels (full power)	1 level (full power)										
Timed drying	130 min. (full power)	100 min. (full power)										
Maximum spin speed	○						●	●	●			
900 rpm	●	○		○			●	●	●			
700 rpm	●	●	○	●			○	○	○			
500 rpm	●	●	●	●			●	●	●			
Rinse Hold	●	●	●	●			●	●				
Prewash	●	●	●									
Extra Rinse	●	●	●									
Quick Wash Programme	●	●	●									
Stain Programme	●	●										
Delay Timer	●	●	●	●	●	●	●	●			●	●

Programme Key

- | | |
|-------------------|---------------------|
| 1. Cotton | 7. Rinse |
| 2. Wash and Wear | 8. Fabric treatment |
| 3. Delicates | 9. Spin |
| 4. Wool | 10. Drain |
| 5. Mini-programme | 11. Auto Drying |
| 6. Soak | 12. Timed Drying |

● = Main Setting

○ = Options

The wash programme options are selected once the wash programme has been selected - before pressing the start button.

2.3 Programme Time

TYPE OF LAUNDRY	Temp. °C	Prewash (min.)	Normal (min.)	Short (min.)	Economy wash (min.)	Extra rinse (min.)
Cotton, white	90	172	149	109	//	15
Cotton, white	60	162	139	84	162	15
Cotton, white	40	140	117	77	128	15
Cotton, white	30	137	114	75	//	15
Cotton, white	0	113	100	63	//	15
Cotton, coloured	60	156	133	84	156	15
Cotton, coloured	40	131	108	69	119	15
Cotton, coloured	30	128	105	67	//	15
Cotton, coloured	0	104	91	55	//	15
Wash and wear	60	109	88	62	//	5
Wash and wear	40	95	74	49	79	5
Wash and wear	30	84	68	44	//	5
Wash and wear	0	70	61	37	//	5
Delicates	40	76	61	47	//	5
Delicates	30	66	54	40	//	5
Delicates	0	48	45	31	//	5
Wool: Hand wash	40	//	50	//	//	//
Wool: Hand wash	30	//	46	//	//	//
Wool: Hand wash	0	//	42	//	//	//
Soak		25	//	//	//	//
Fabric treatment		20	//	//	//	//
Rinse		50-25-20	//	//	//	//
Spin		10-5-5	//	//	//	//
Drain		5	//	//	//	//
Quick wash programme		30	//	//	//	//

3. WASHING PROGRAMME (FLOWCHART VF92J - VP91J)

WHITES/ COLOURED														
VF92J - VP91J														
Washprogrammes														
Functions														
Detergent reservoir														
Max. Duration														
Temperature °C														
Motor gear														
RPM														
Water Intake 2nd Level (220 mm)														
Water Intake Timed (22 secs.)														
Water Intake Timed (10 secs.)														
Water Intake 1st Level (115-150mm)														
Tub empty														
Programme Option														
90 °C														
60 °C														
Prewash														
Intensiv														
Short programme														
Stain programme														
Economy														
Spin Stop Button														
Rinse Hold														
Extra Rinse														
VP91J (Tub „G19“)														
Dry														
Extra Dry														

VF92J - VP91J	SINTHETICS																																							
Washprogrammes	U					W												E										P		S		T		R		S				
Functions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35					
Detergent reservoir	U					W					U																	P		S		T		R		S				
Max. Duration	P	7	T	V	10	P	7	T	8	0,2	T	8	T	8	1	2	V	P	2	V	P	2	V	10	P	2	V	P	5	18h	V	10	T	10	∞					
Temperature °C	37					40					60							60																						
Motor gear	N N E1 IM P0					N N E2					E1 E2 E2 E2							N E1							N E		N E		IM P0		N E1		N RH		D		IM P5		E3 E3	
RPM	55 55 55					55 55 55					55 55 55 55							55 55							55 55		55 55		55 55		55 55		55 55		55 55		55 55			
Water Intake 2nd Level (220 mm)																																								
Water Intake Timed (60 secs.)																																								
Water Intake Timed (10 secs.)																																								
Water Intake 1st Level (115-150mm)																																								
Tub empty																																								
Programme Option																																								
Normal	→ → → → →										→																	→ → → → →		→				→ → → → →						
Short programmes	→ → → → →										→ → → → →																	→ → → → →		→				→ → → → →						
Prewash						2'					→							18' 10'										→ → → → →		→				→ → → → →						
Intensiv						2'					→							18' 10'										→ → → → →		→				→ → → → →						
Stain programme	→ → → → →																											→ → → → →		→				→ → → → →						
Economy	→ → → → →										→							18' 10'										→ → → → →		→				→ → → → →						
Extra Rinse																														→ → → → →				→ → → → →						
Rinse Hold																																								
Dry																												→						CFS						

VF92J - VP91J	DELICATES																																						
Washprogrammes	U					W								T																									
Functions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28											
Detergent reservoir	U					W								T										⊗															
Max. Duration	P	7	P	T	V	P	7	P	T	14	0,2	10	V	P	2	V	P	2	V	P	2	V	P	2	18h	V	10	∞											
Temperature °C	37					37																																	
Motor gear	D					D					D					D					D					D					RH		D		IM P7				
RPM	55					55					55					55					55					55					55					55			
Water Intake Timed (10 secs.)																																							
Water Intake 2nd Level (220 mm)																																							
Water Intake 1st Level (170 mm)																																							
Tub empty																																							
Programme Option																																							
Normal	→→→→→													→→															→										
Prewash						2'								→→															→										
Intensiv						2'								→→															→										
Short programmes	→→→→→													→→→→															→										
Stain programme	→→→→→																							→→→→					→										
Extra Rinse																																							
Rinse Hold																																							

VF92J - VP91J		WOOL (MULTIPANEL)																			
Washprogrammes	U					T													P		∞
Functions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Detergent reservoir	U												T								
Max. Duration	P	2	5	T	5	V	P	3,5	V	P	3,5	V	P	3,5	P	1,5	0,3	4	V	10	∞
Temperature °C			40	40																	
Motor gear		D4	D4	D4	D4		D4			D4			D4		D4		D4		IM P4		
RPM		30	30	30	30		30			30			30		30		30				
Water Intake Timed (22 secs.)																					
Water Intake 2nd Level (220 mm)																					STOP
Water Intake Timed																					
Water Intake 1st Level (170 mm)																					
Tub empty																					⊙

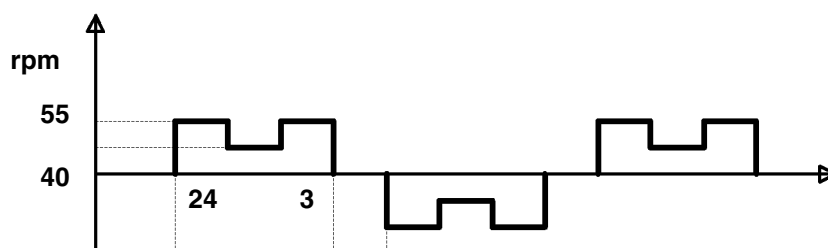
PROGRAMME KEY**P** = Filling time**T** = Heating time**V** = Drain time (to pressure switch reset point)**3.0.1 Agitation:**

	Action (s)	Pause (s)
N = NORMAL	8	8
SE = VIGOROUS	24	3
E1 = 70% AGITATION	9	4
E2 = 75% AGITATION	10	3
E3 = 95% AGITATION	57	3
D = GENTLE AGITATION	4	12
D1 = GENTLE AGITATION	3	35
D 2 = GENTLE AGITATION	3	28
D3 = GENTLE AGITATION	3	12
D4 = GENTLE AGITATION	3	57
RH = SOAK AGITATION	6	114

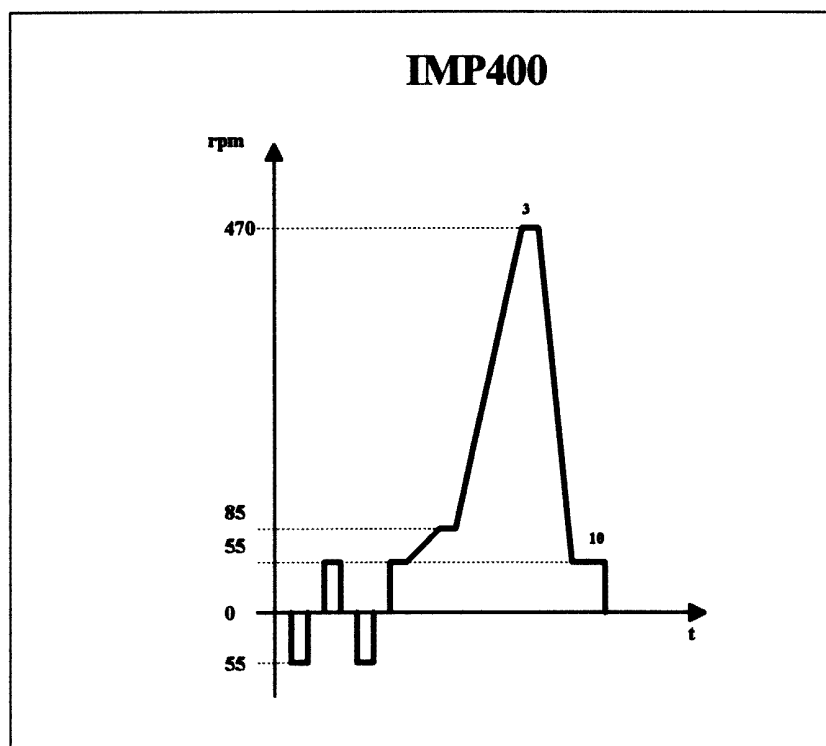
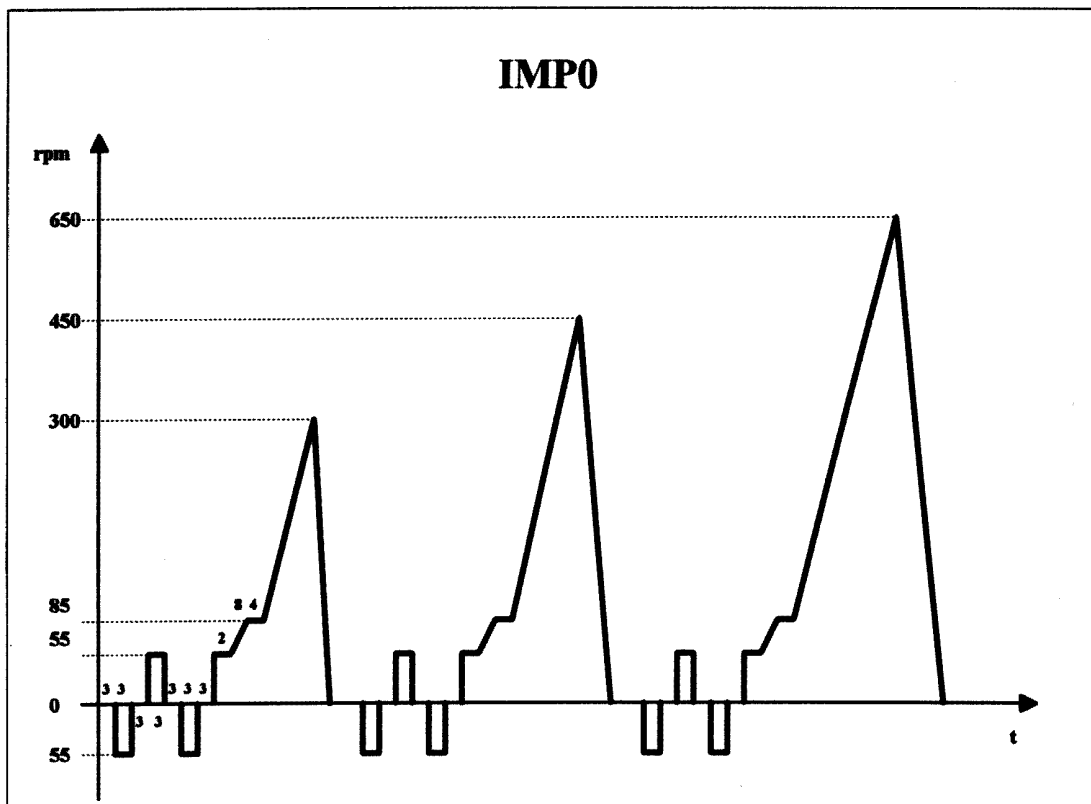
Rotation = continuously to the left

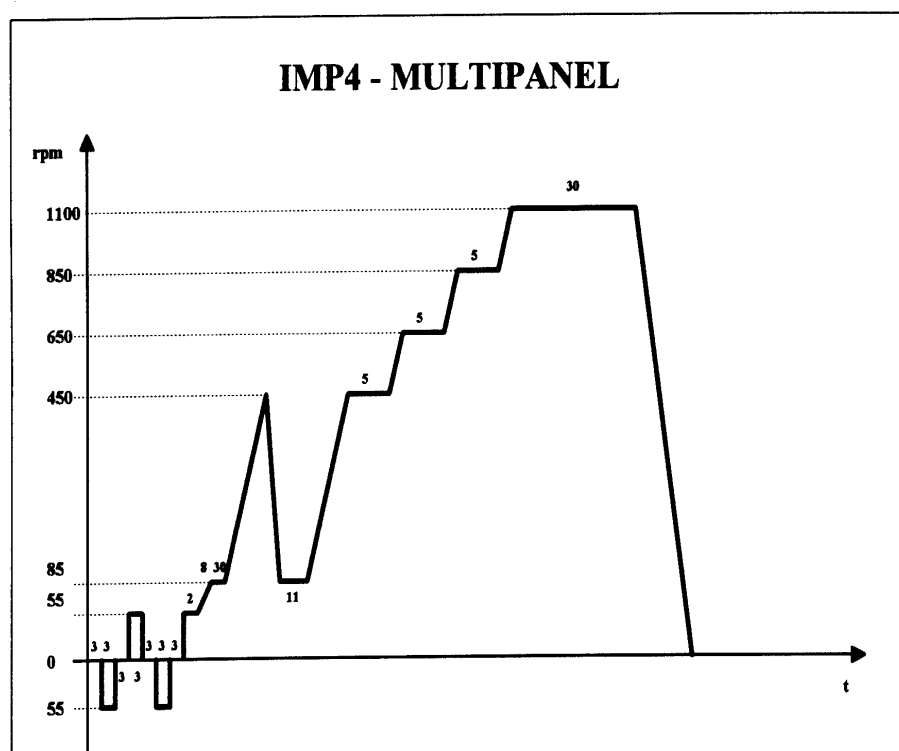
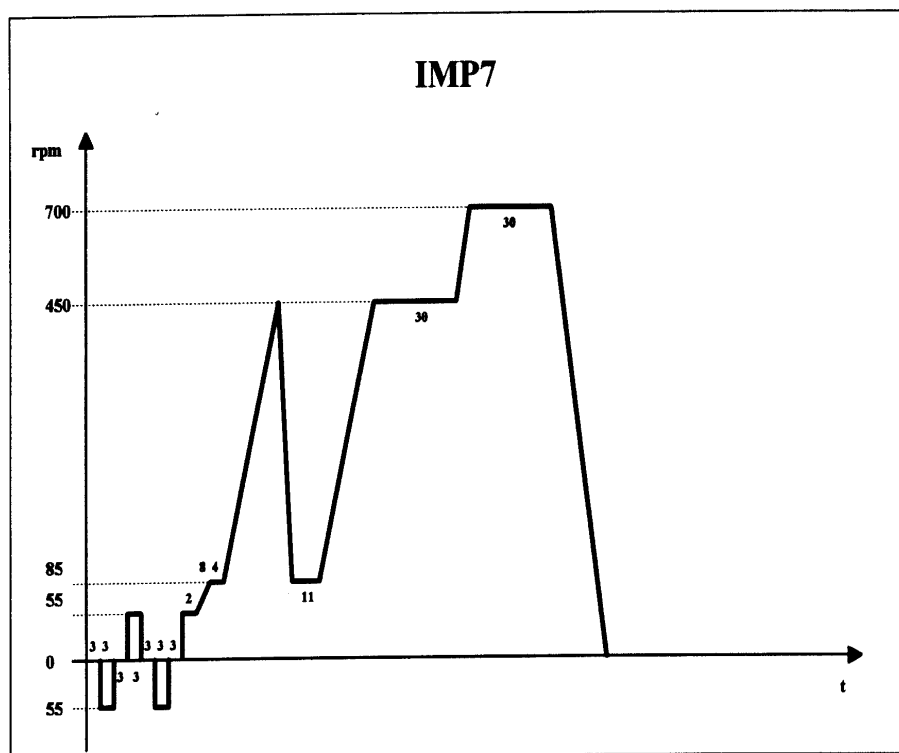
- ◆ In the steps with (24-30-40) E2 is run for 40 seconds with the circulation pump switched on. If the electronic pressure switch senses that the normal water level has not been reached, the following action is taken:
- ◆ Spin at 470 rpm (IMP 400)
- ◆ 5 seconds drum rotation in one direction at 55 rpm without circulation pump (no level monitoring)
- ◆ 5 seconds with circulation pump and level monitoring. If the pressure switch remains at the reset point, more water is added to raise the normal water level.

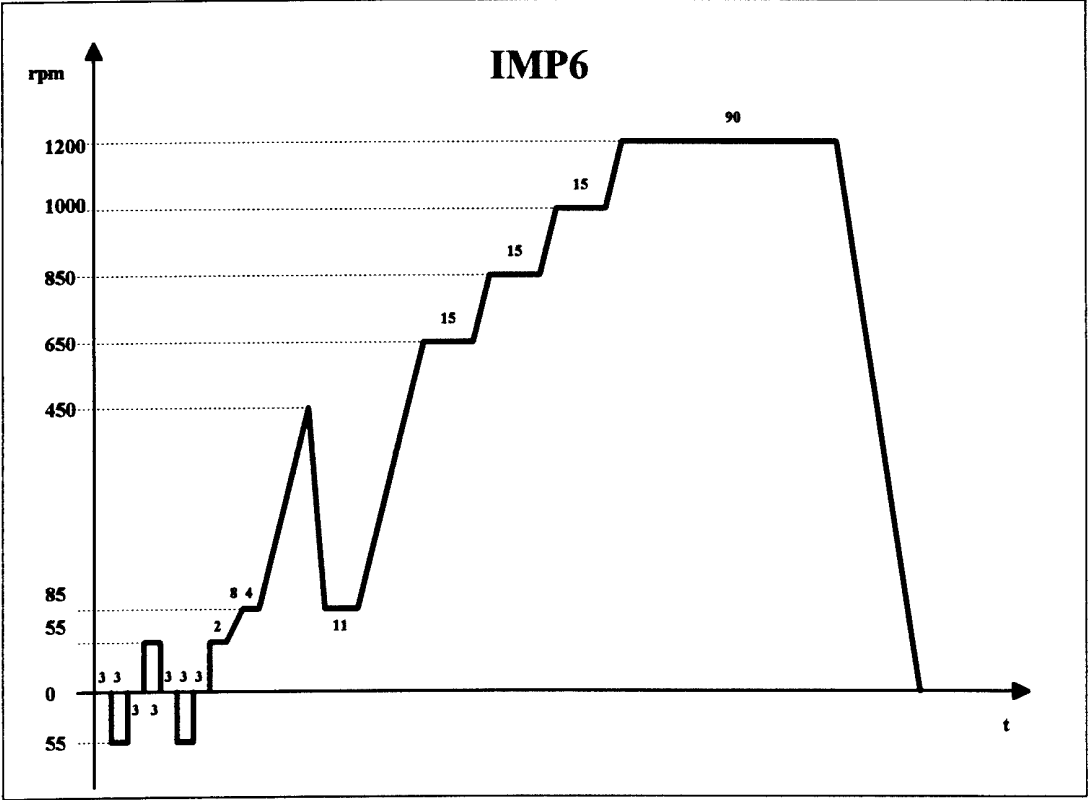
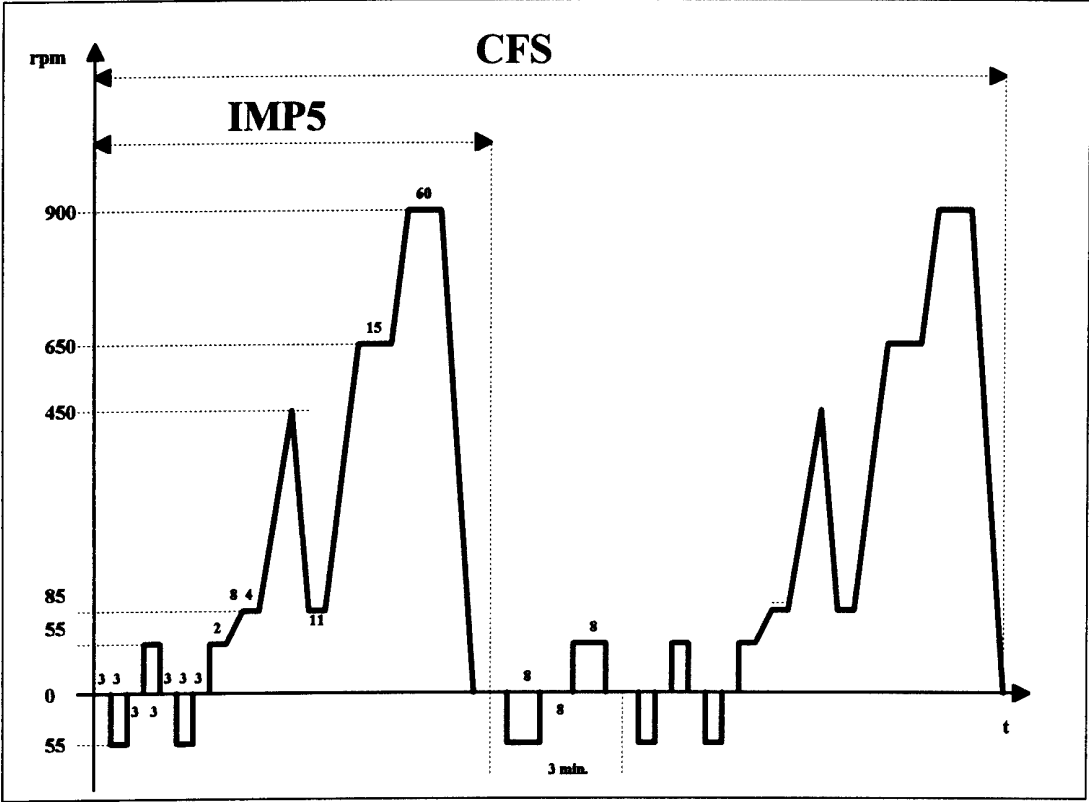
These three operations may be repeated no more than five times.

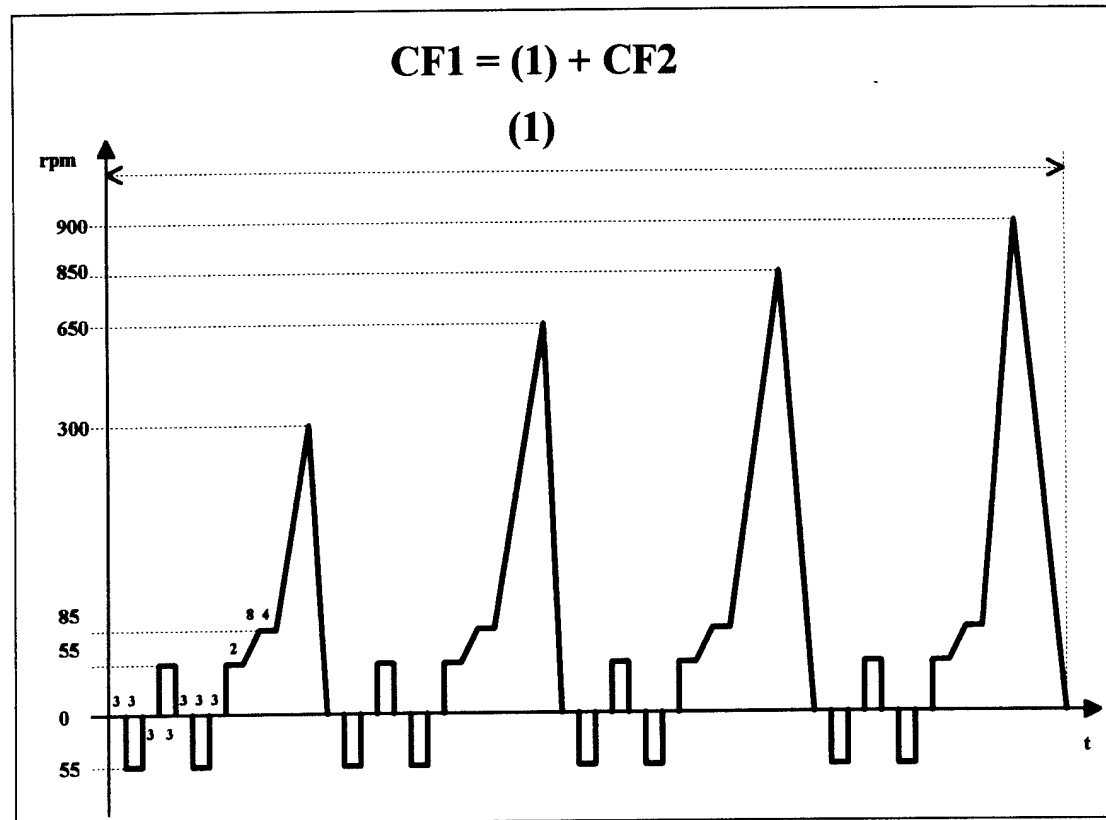
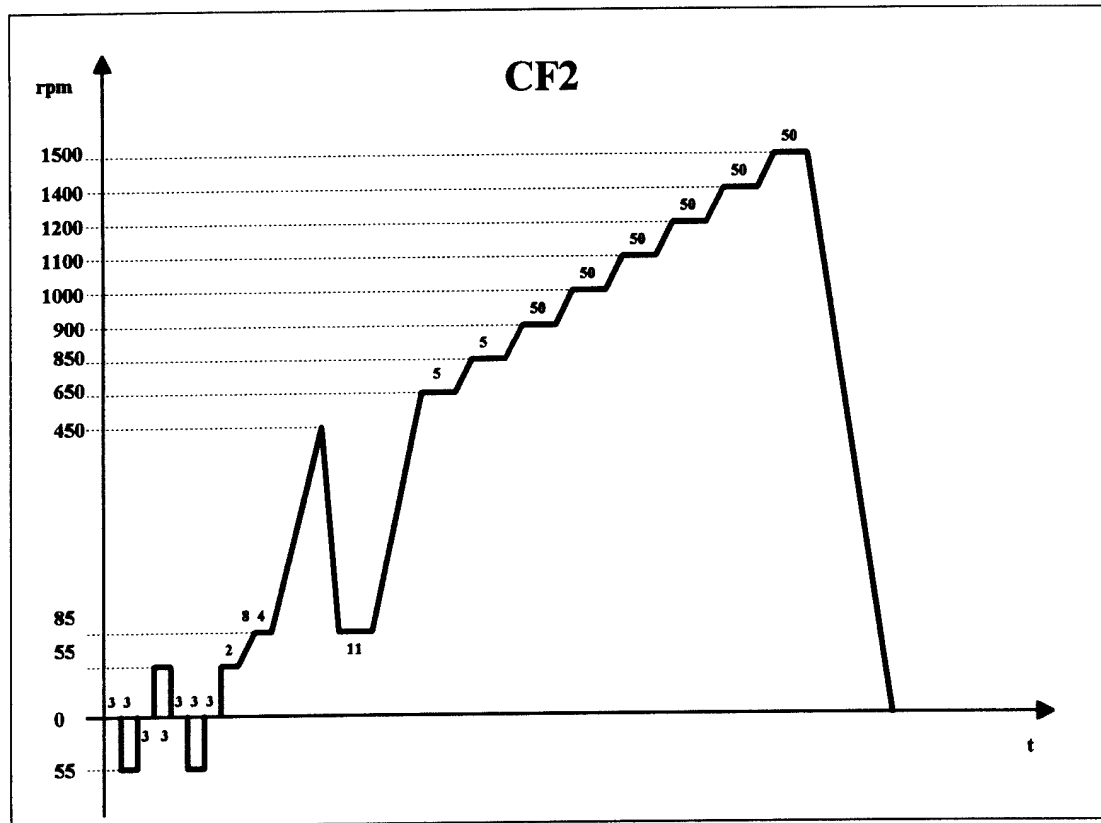
Vigorous agitation

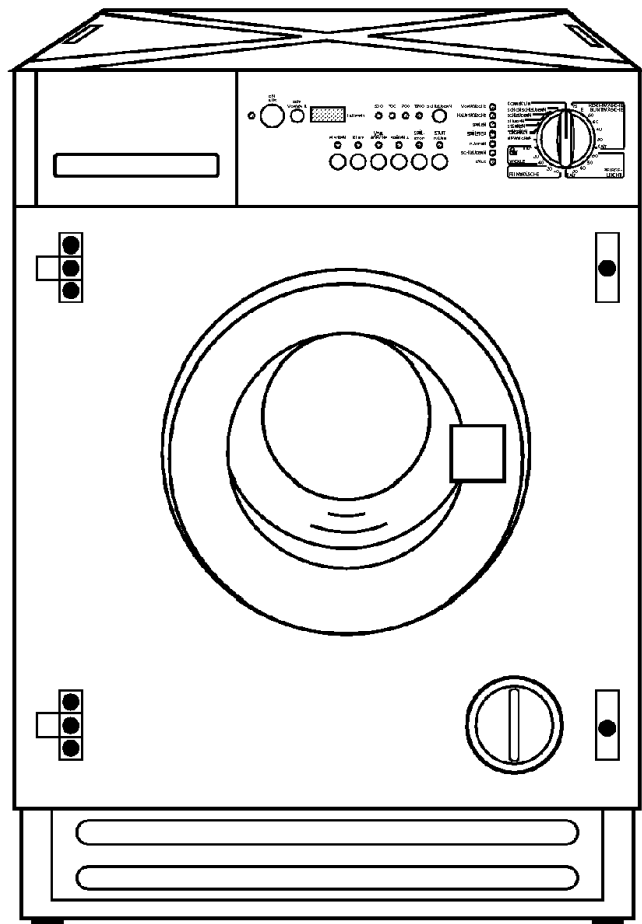
4. SPIN PROGRAMMES











Built-in Washing Machine

IW 1209.0W

Part B

Contents Part B

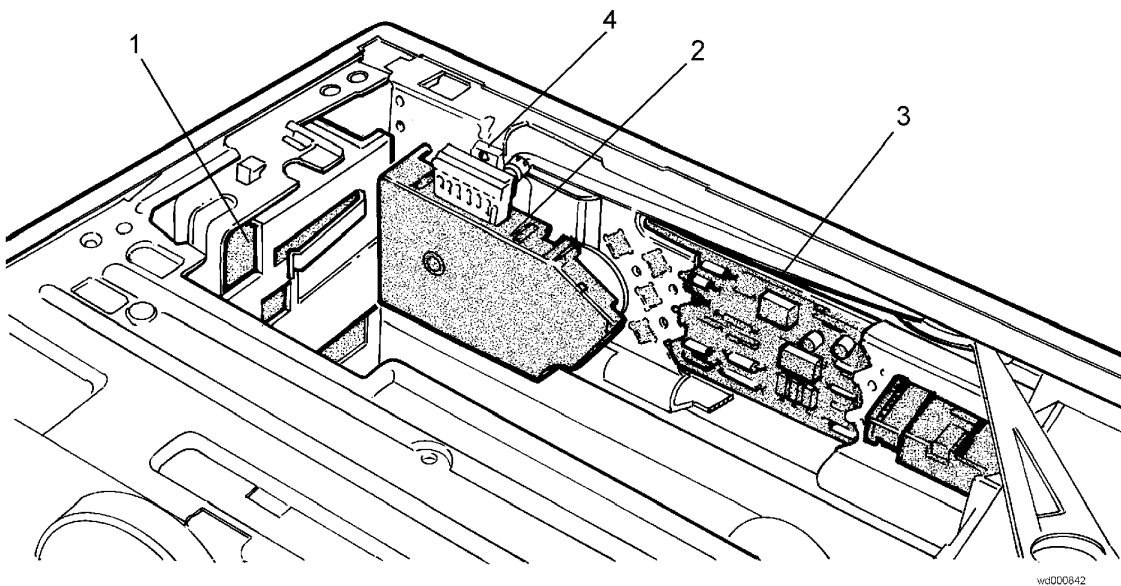
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5. ELECTRONIC CONTROL SYSTEM

The system, which is microprocessor-controlled, consists of a main module, a display module and a water inlet unit.

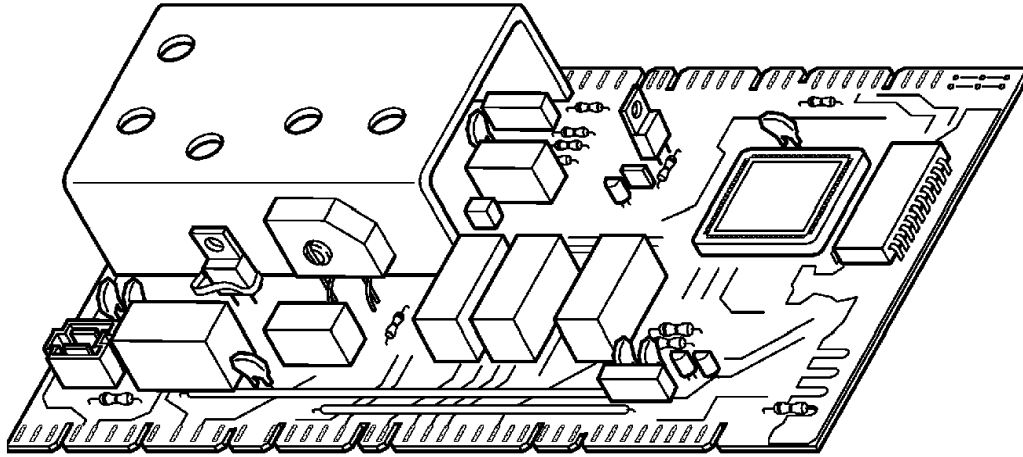
Known as MWM 1.5 (modular washing machine, version 1.5) this is a modular system; different models can be manufactured simply by substituting a few components.

The control system uses a number of plug-in cables to achieve the different functions required for each model.



1. Control unit
2. Water inlet valve
3. Display module
4. Programme selector

5.1 Control Unit

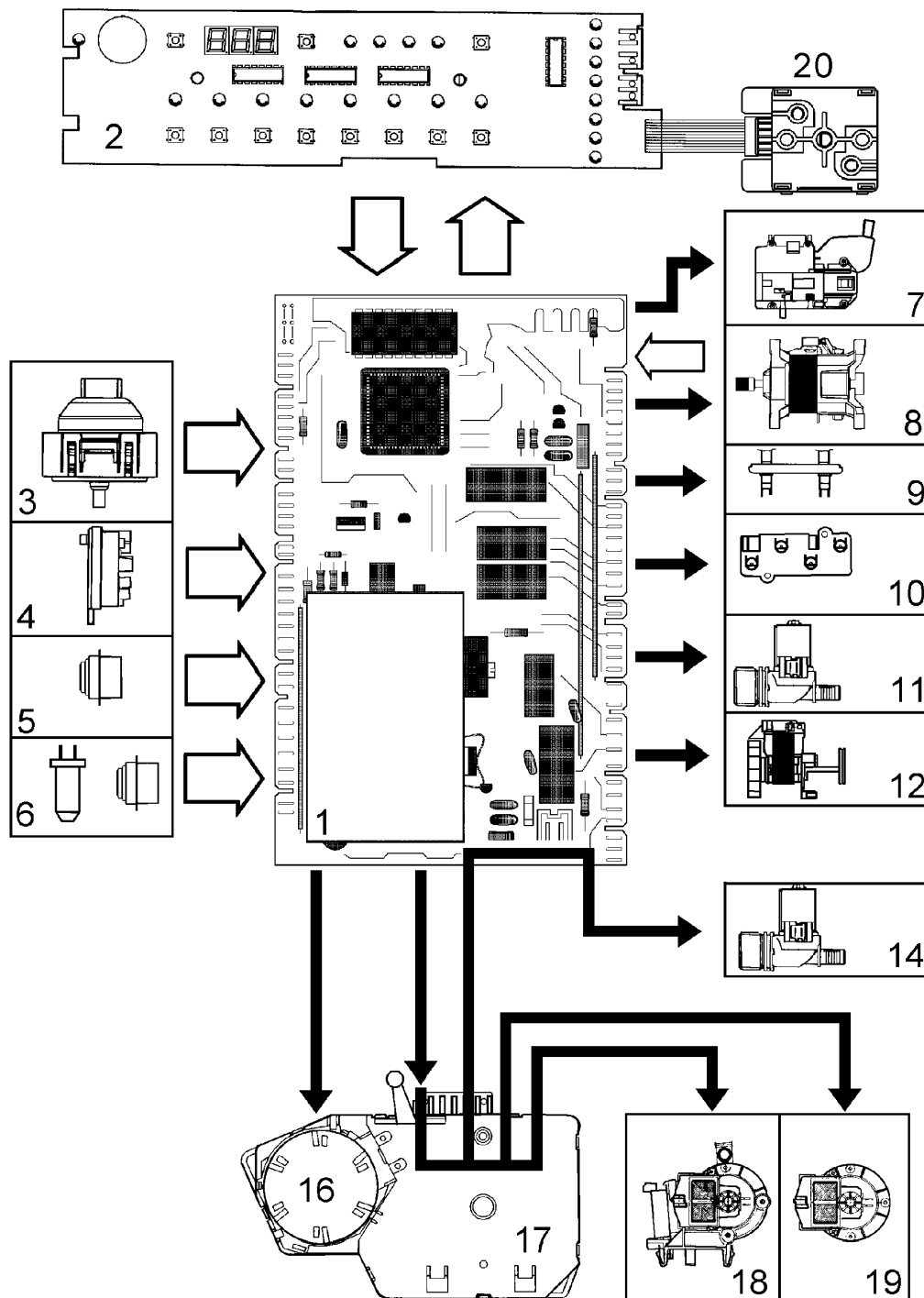


The main control unit, which is equipped with a microprocessor, monitors and controls the operation of the machine. It is enclosed in a plastic case attached to the control panel.

It performs the following functions:

- ◆ it stores the control signal data for each wash programme selected on the control panel
- ◆ it monitors the water level via an electronic and a safety pressure switch
- ◆ it monitors the temperature of the soapy water via an NTC thermistor
- ◆ it directs current to the door opening delay unit and the heater
- ◆ it supplies current to the main drive motor, regulating its speed in response to signals supplied from the tachogenerator. The control unit incorporates an AC/DC converter in order to provide DC for the motor
- ◆ it directs current to the inlet valve motor to switch it to the desired position
- ◆ it directs current via the inlet valve contacts to the drain pump, the circulation pump and the water inlet solenoid valve
- ◆ it supplies current directly to the drying heating element, the condenser's solenoid valve and the fan motor; it monitors drying time and temperature via two NTC thermistors

In the case of power failure, it stores the state of the current programme.
The machine will continue from the same point when power is re-connected.



1. Control unit
2. Display module
3. Electronic pressure switch
4. Safety pressure switch
5. NTC thermistor (washing)
6. NTC thermistor (drying)
7. Door opening delay unit
8. Motor
9. Heating element (washing)

10. Heating elements (drying)
11. Condenser solenoid valve
12. Fan motor
14. Water inlet solenoid valve (washing)
16. Water inlet valve motor
17. Water inlet valve
18. Circulation pump
19. Drain pump
20. Programme selector

5.2 Display Module

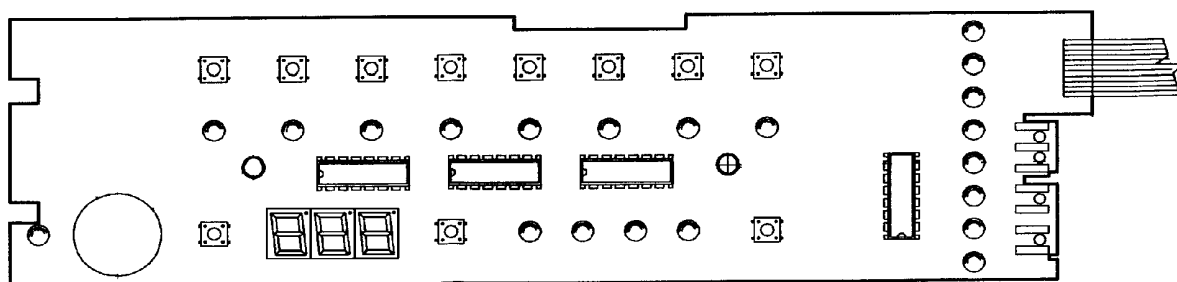
The display module is attached to the back of the control panel. It provides the user with information on all aspects of the machine's operation.

The button functions are determined by the type of control unit fitted and the design of the particular machine.

This module includes:

- ◆ buttons for selecting the wash programme, with the corresponding LED's
- ◆ the display, showing the programme time remaining
- ◆ the buzzer
- ◆ the ON/OFF button
- ◆ the Delay Timer button

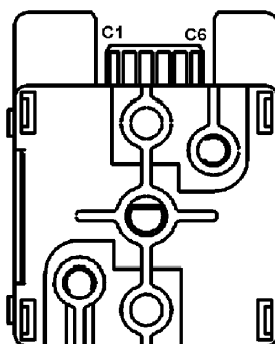
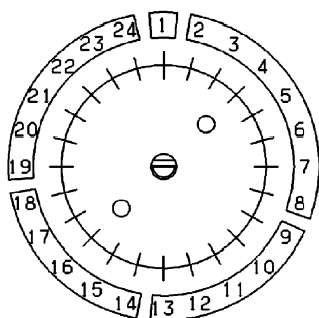
A cable connects the display module to the main control unit.



5.3 Programme selector switch

Wash programmes are selected via a 24-position selector switch.

The programme selector is connected to the display and switching module.



C6 (common)				
1	●	●	●	●
2		●		
3			●	
4	●		●	
5		●	●	
6	●	●	●	
7				●
8	●			●
9		●		●
10	●	●		●
11			●	●
12	●		●	●
13		●	●	●
14	●	●	●	
15				●
16	●			●
17		●		●
18	●	●		●
19			●	●
20	●		●	●
21		●	●	●
22	●	●	●	●
23			●	●
24	●			
C5	C4	C3	C2	C1

5.4 Water Inlet Valve

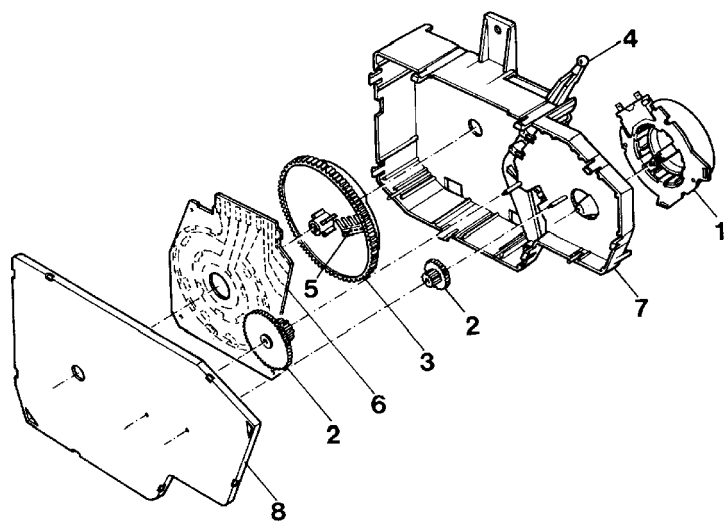
The water inlet valve is mounted on the control panel. It performs the following tasks:

- ◆ it moves the detergent dispenser lever mechanism, in order to direct water into the different compartments during the wash programme.
- ◆ It directs current to the following components:
 - Cold water solenoid valve
 - Tank drain pump
 - Circulation pump
 - Outlet pump

An electronic module supplies current to the stepper motor, which positions the inlet valve as required during the washing programme. The stepper motor remains in circuit only for as long as it takes to reposition the inlet valve.

If the stepper should continue to run, it is disconnected in order to reduce wear and tear on the contacts.

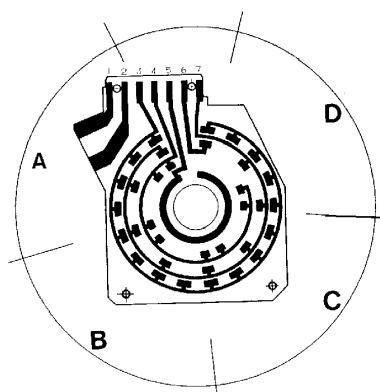
1. Stepper Motor
2. Gear wheels
3. Cam
4. Lever mechanism - lever
5. Brushes
6. Contact plate
7. Casing
8. Cover



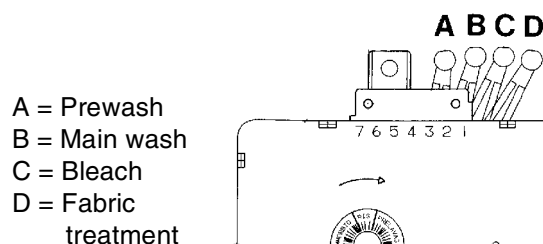
When the stepper motor (1) is switched on, the gear wheels (2) move the cam (3), which moves the lever on the lever mechanism.

Brushes (5) are attached to the cam. These slide along the copper rails of the contact plate (6). The contacts close at different times (see diagram), according to the position of the cam.

The cam follows a complete revolution in 15 seconds; as the contact plate is divided into 36 sectors, each step takes approx. 0.4 seconds.



Contact plate

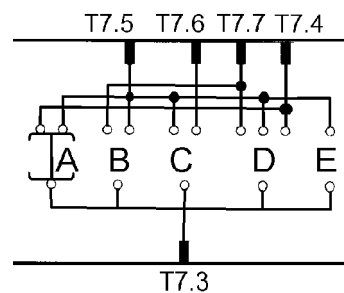


Lever position

Water Inlet Valve Contact Sequence

The microprocessor actuates and controls the water inlet valve.

The inlet valve motor (contacts T7-1/T7-2) is powered via a triac in the control unit.



In order to avoid wear on the contacts, the current supply to the loads is interrupted before the motor is energised.

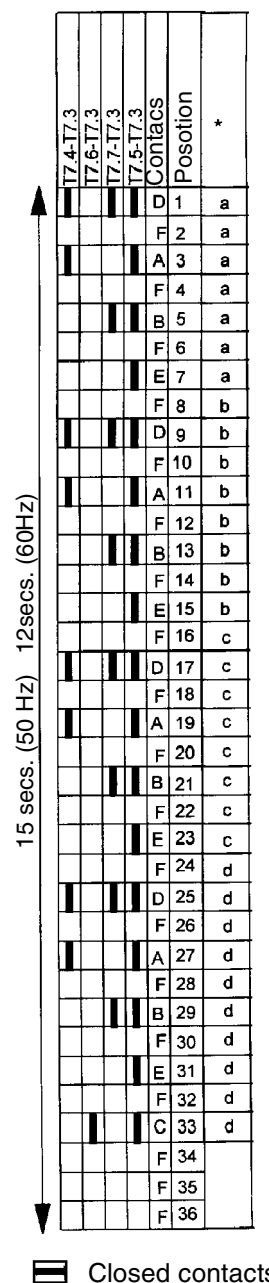
During the wash programme the water inlet valve can complete several turns before reaching the correct position.

The loads receive current via the control unit and are selected via the water inlet valve as follows:

- ◆ Drain pump: contacts T7-3/T7-6 closed.
The overflow protection pressure switch can be connected to the outlet pump; it switches on the outlet pump directly if there is a fault with the water inlet solenoid valve.
- ◆ Circulation pump: contacts T7-3/T7-7 closed.
- ◆ Cold water solenoid valve: contacts T7-3/T7-4 closed.
The above components are also selected via the two relays in the control unit.

* Detergent compartment:

a = Prewash
b = Main wash
c = (Bleach)
d = Fabric treatment

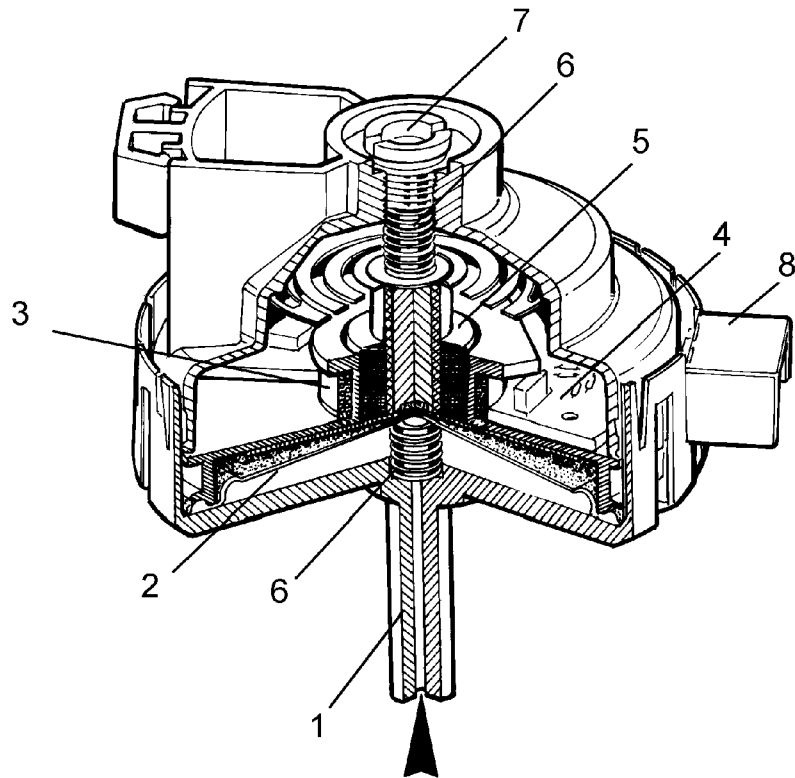


5.5 Electronic Pressure Switch

The electronic pressure switch is an analogue device for monitoring the water level in the tub. It is directly connected to the control unit.

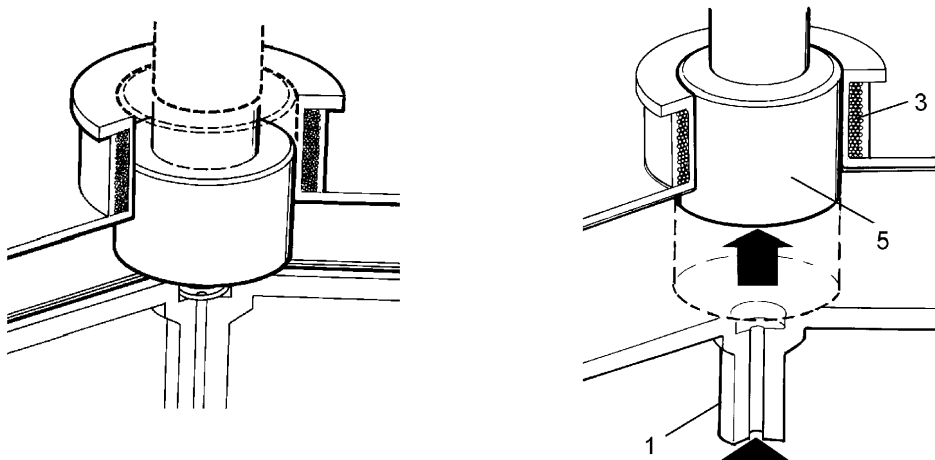
If the pressure switch should fail, the appliance will switch off immediately.

1. Air intake
2. Diaphragm
3. Coil
4. Oscillator circuit
5. Core
6. Spring
7. Calibration screw
8. Electrical connector



A hose connects the pressure switch to a pressure vessel fitted to the filter housing.

When water enters the tub, the pressure of the air in the pressure vessel increases. This causes the core to move within the coil, which alters the inductance of the coil and the oscillator circuit frequency. The control unit references this frequency and senses the water level in the tub.

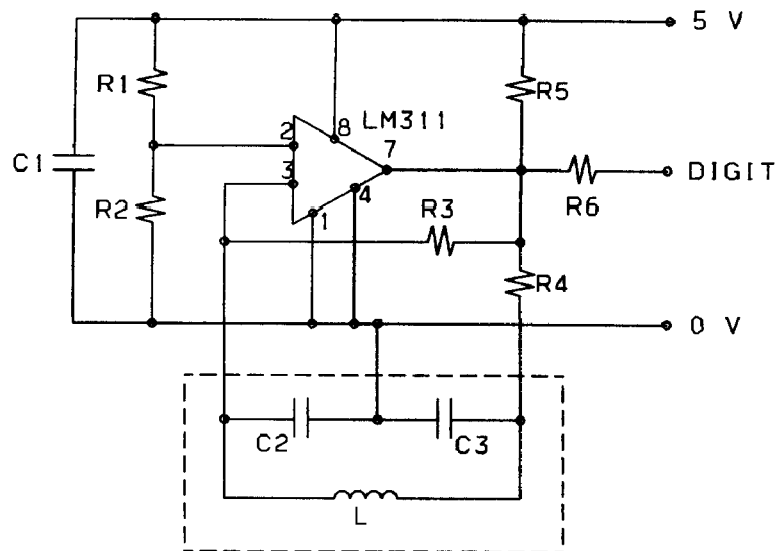
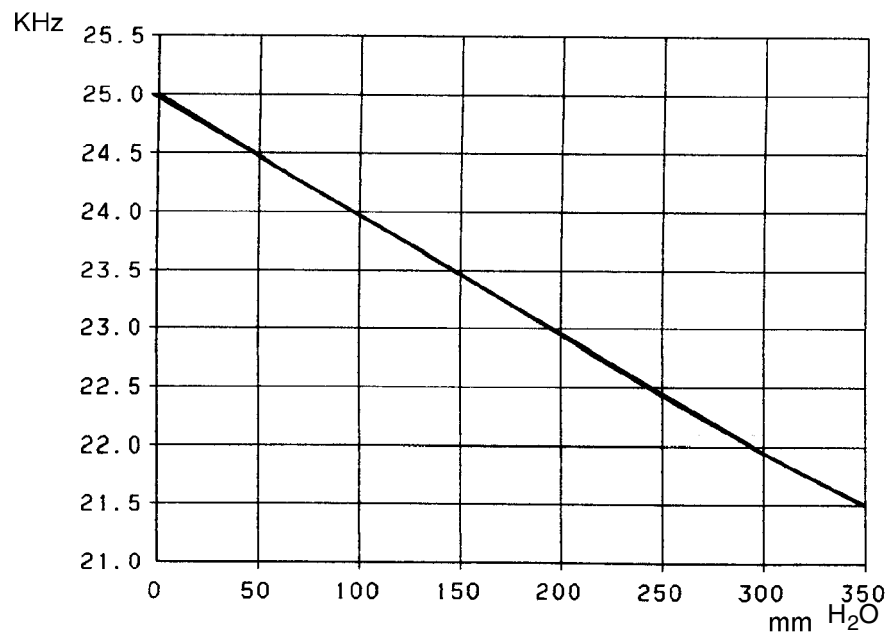


Circuit Diagram

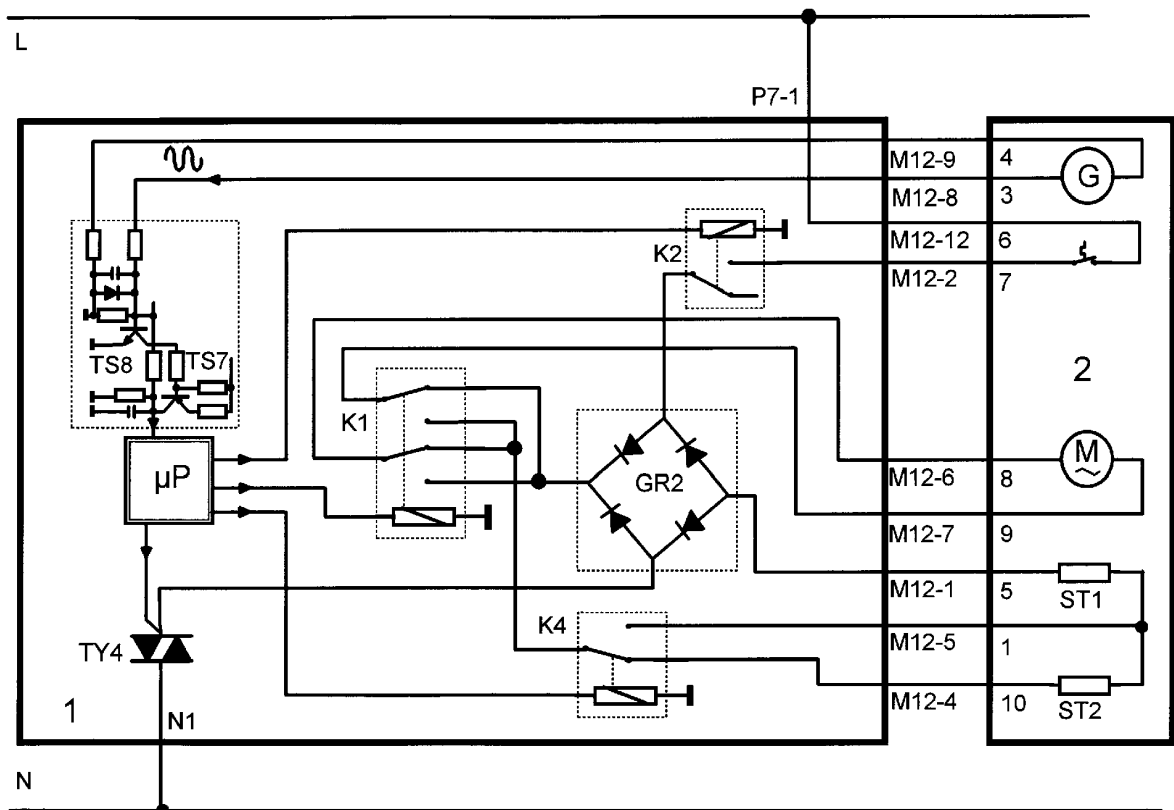
R1-R2 = 1KW
 R3 = 1MW
 R4 = 4.7KW
 R5 = 2.7KW
 R6 = 150W

 C1 = 10nF
 C2 = 33nF
 C3 = 15nF

IC1 = LM311
 L = 480 turns Ø 0.16 mm

Change of frequency relative to pressure (± 50 Hz)

5.6 Motor Speed Control



1. Control unit
2. Motor

Motor speed control is regenerative via a TY4 triac.

The rectifier (GR2) converts AC to DC to supply power to the motor.

The switching of the motor windings (M) and the stator (ST) needed to change the motor's rotational direction is performed using a relay (K1) located in the control unit.

If the motor exceeds 1000 rpm, a relay in the control unit removes power from half of the stator windings (ST1).

The speed of the motor is monitored at all times by a signal transmitted from the tachometer (G) to the microprocessor.

The control unit governs the duration and speed needed for each programme.

5.6.1 Foam Control

A pressure switch monitors foam build-up during the spin programmes. This improves the efficiency of the rinsing operation even when the water level is low.

If the pressure switch actuates when draining on spin, signifying the presence of foam in the tub, power is cut to the motor and the spin cycle is interrupted. The outlet pump will carry on working, however.

Power is restored to the motor once the foam has been removed. The pressure switch will activate if foam builds up again.

Spinning is limited to 10 minutes, after which the spin cycle is terminated. The following programme is be carried out.

5.6.2 Out of Balance Limitation System

The microprocessor uses the same signal to check that the load is evenly distributed in the drum before the machine starts a spin cycle.

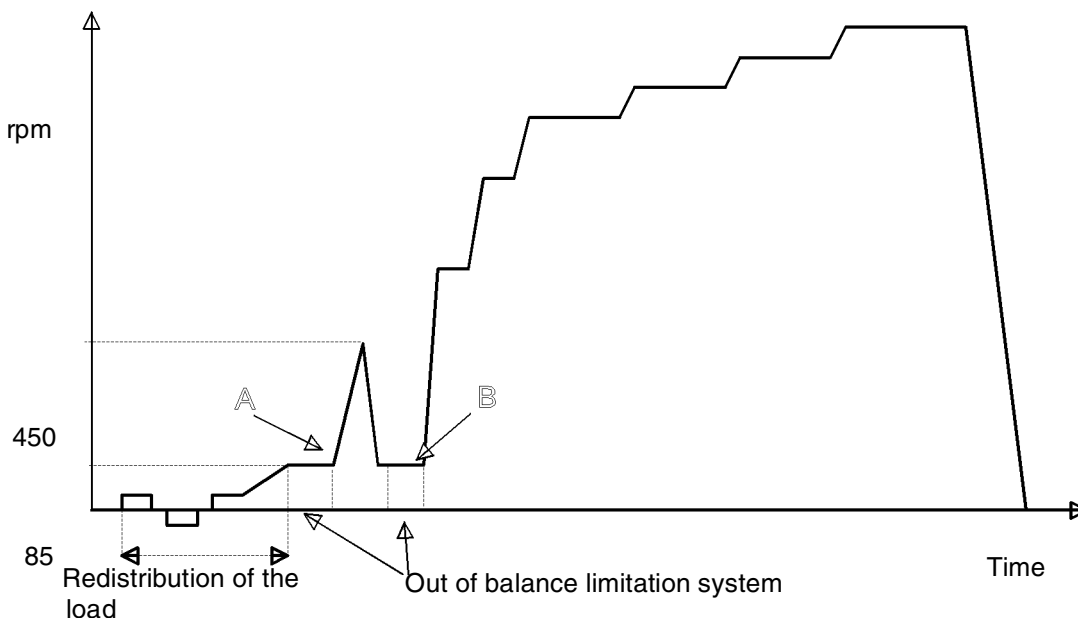
This check is carried out at 85 rpm, which is the distribute speed implemented prior to and after the spin phase. If the load remains unevenly distributed, the tachometer output voltage to the control unit will remain irregular and the control unit will interpret this accordingly.

The motor will not switch to the spin cycle but will automatically carry out further attempts to redistribute the load by reversing the direction of rotation.

The spin programme proceeds as soon as the load is correctly redistributed.

If the load still refuses to balance, the spin cycle runs as follows:

- ◆ If the load is slightly out of balance: spin speed will be reduced by approx. 200 rpm.
- ◆ If the load is seriously out of balance: spinning will take place at 650 rpm.



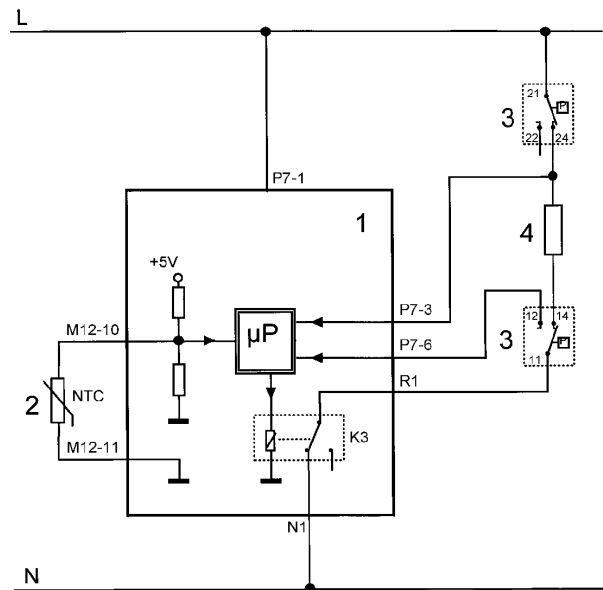
5.7 Wash water temperature control

1. Control module
2. Thermistor
3. Safety pressure switch
4. Heating element (washing)

The microprocessor sets the temperature of the soapy water needed for each programme.

In the "on" position, current flows to the heating element (4) through relay K3 via the contacts of the safety pressure switch (3).

Temperature is regulated by the microprocessor using an NTC thermistor (2). The internal resistance of the thermistor drops as its temperature increases. The drop in resistance of the thermistor is sensed by the microprocessor, which switches the heating element out of circuit as soon as the desired temperature is reached.

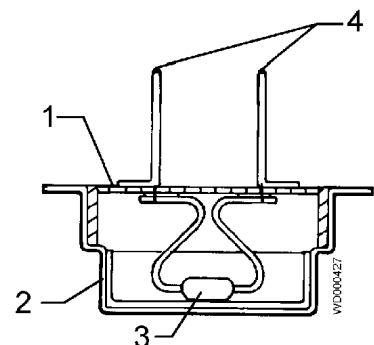


IMPORTANT

If the control unit detects a short-circuit or open-circuit in the NTC thermistor, it will skip the heating phase.

5.7.1 NTC thermistor

1. Plastic case
2. Metal container
3. NTC resistor
4. Contacts



Resistance values relative to temperature ($\pm 3\%$).

TEMPERATURE °C	RESISTANCE (ohms)
0	16325
15	7855
30	4028
40	2663
50	1801
60	1244
70	876
80	628
90	458
100	339
110	255
120	195

6. ACCESS TO THE COMPONENTS

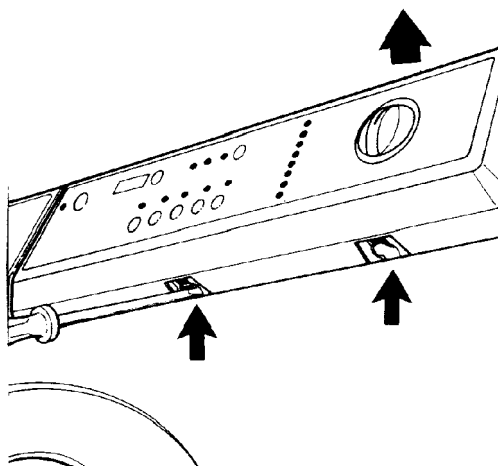
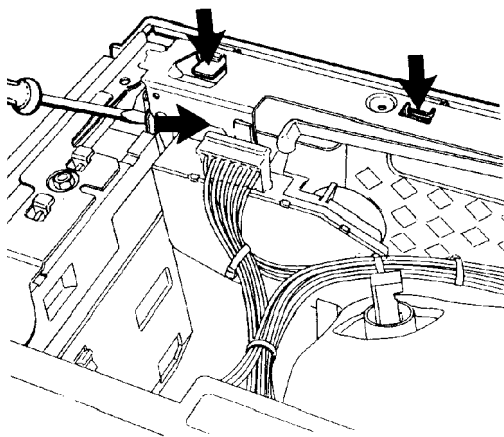
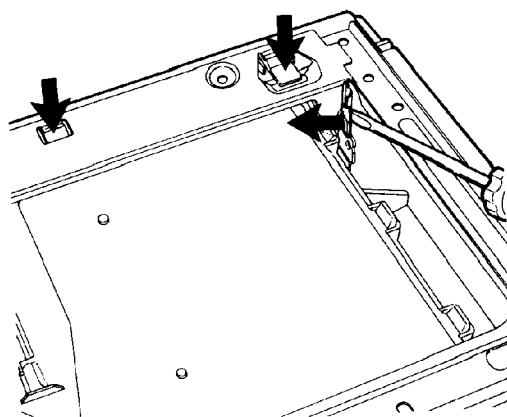
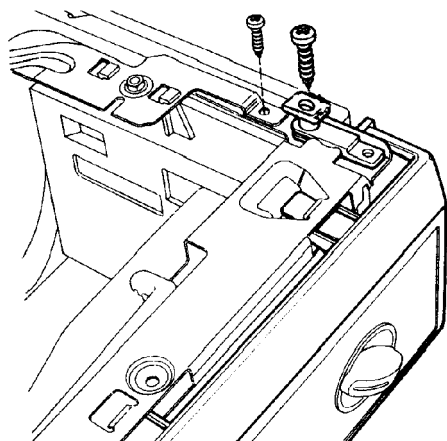
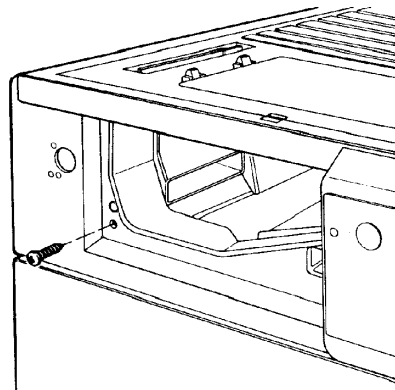
This section explains how to gain access to the various parts of the machine.

6.1 Fascia

- Remove the top panel.
- Take out the detergent dispenser and remove the fixing screws at the front of the fascia.
- Release the clips holding the fascia to its support and remove.

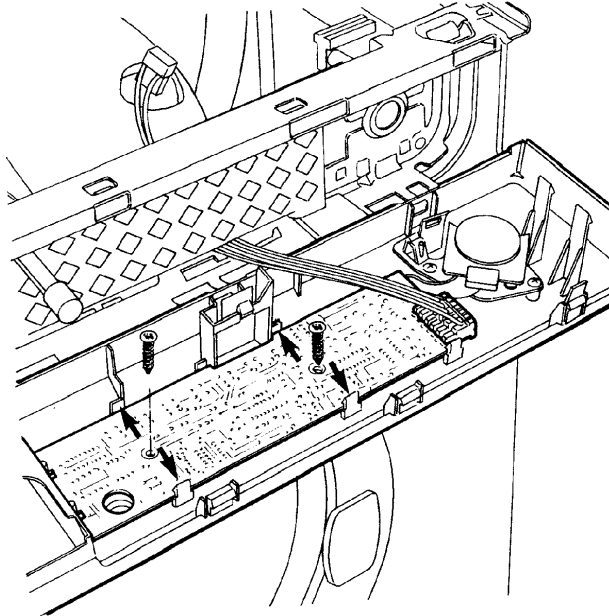
The above procedure is easier if you first undo the screws attaching the support to the shell. Then lift up the support and disengage the lower fascia clips.

- Disconnect the display module cable connector.



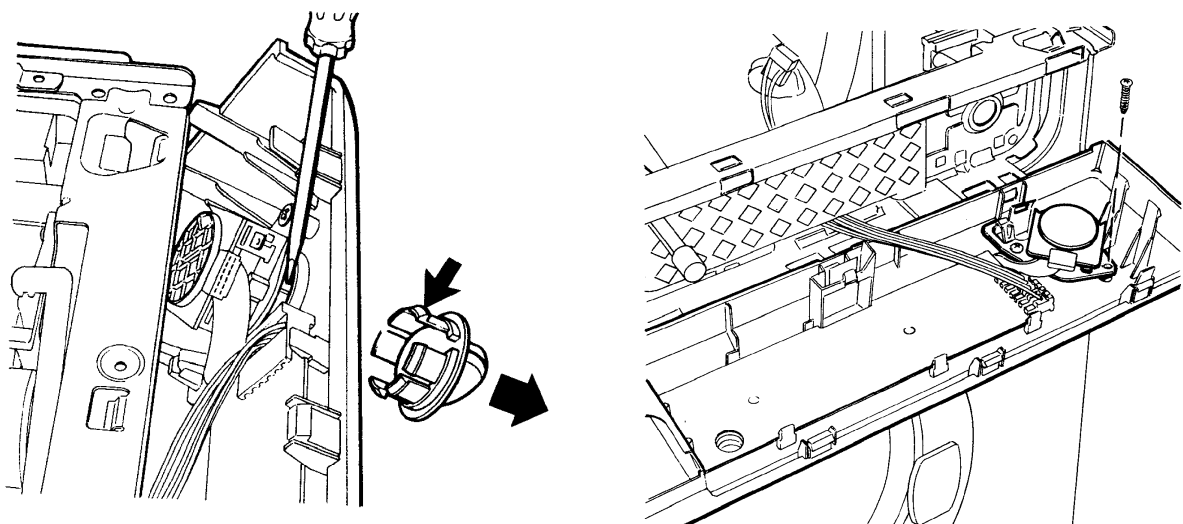
6.2 Display Module

- a) Remove the fascia panel
- b) Undo the screws
- c) Release the module



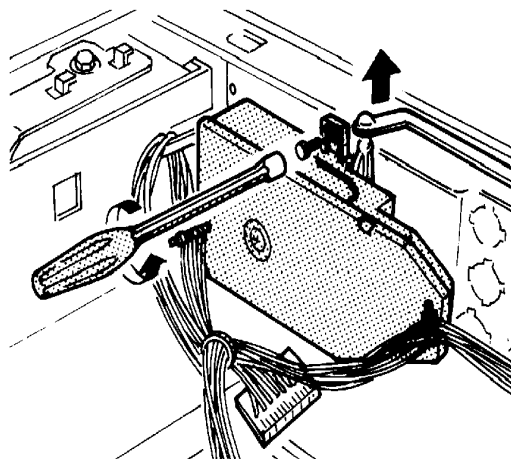
6.3 Programme selector switch

- a) Remove the fascia panel
- b) Take off the knob
- c) Undo the screws on the programme selector switch
- d) Separate the switch from the fascia panel and disconnect the cable



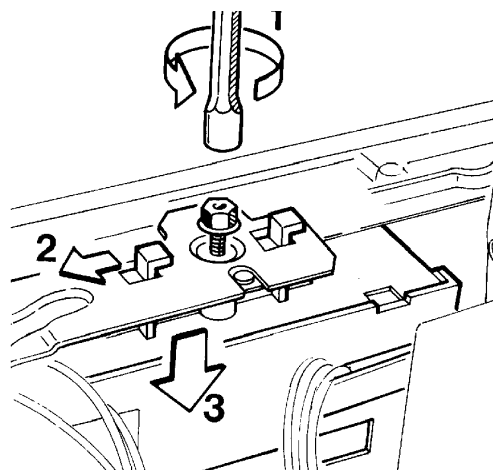
6.4 Water Inlet Valve

- a) Remove the top pane.
- b) Remove the cable connector
- c) Disengage the lever from the inlet unit
- b) Remove the screws and withdraw the inlet unit from its mounting



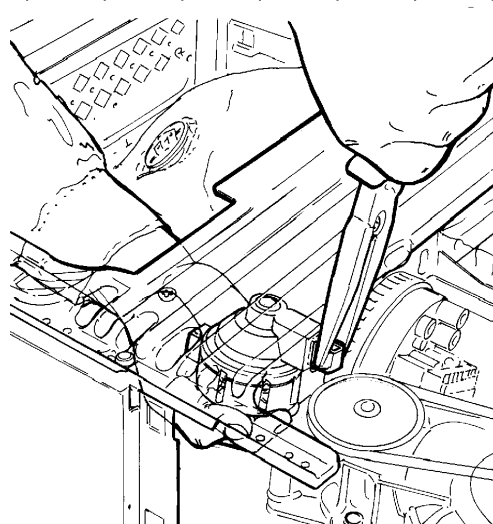
6.5 Control Unit

- a) Remove the top panel
- b) Remove the water inlet unit (see point 4)
- c) Remove the cable harness on the upper cross-member and cut off the cable tie
- b) Remove the screw and release the control box from its mounting
- e) Take out the control box
- f) Cut the cable ties on the box and unplug the connectors from the unit

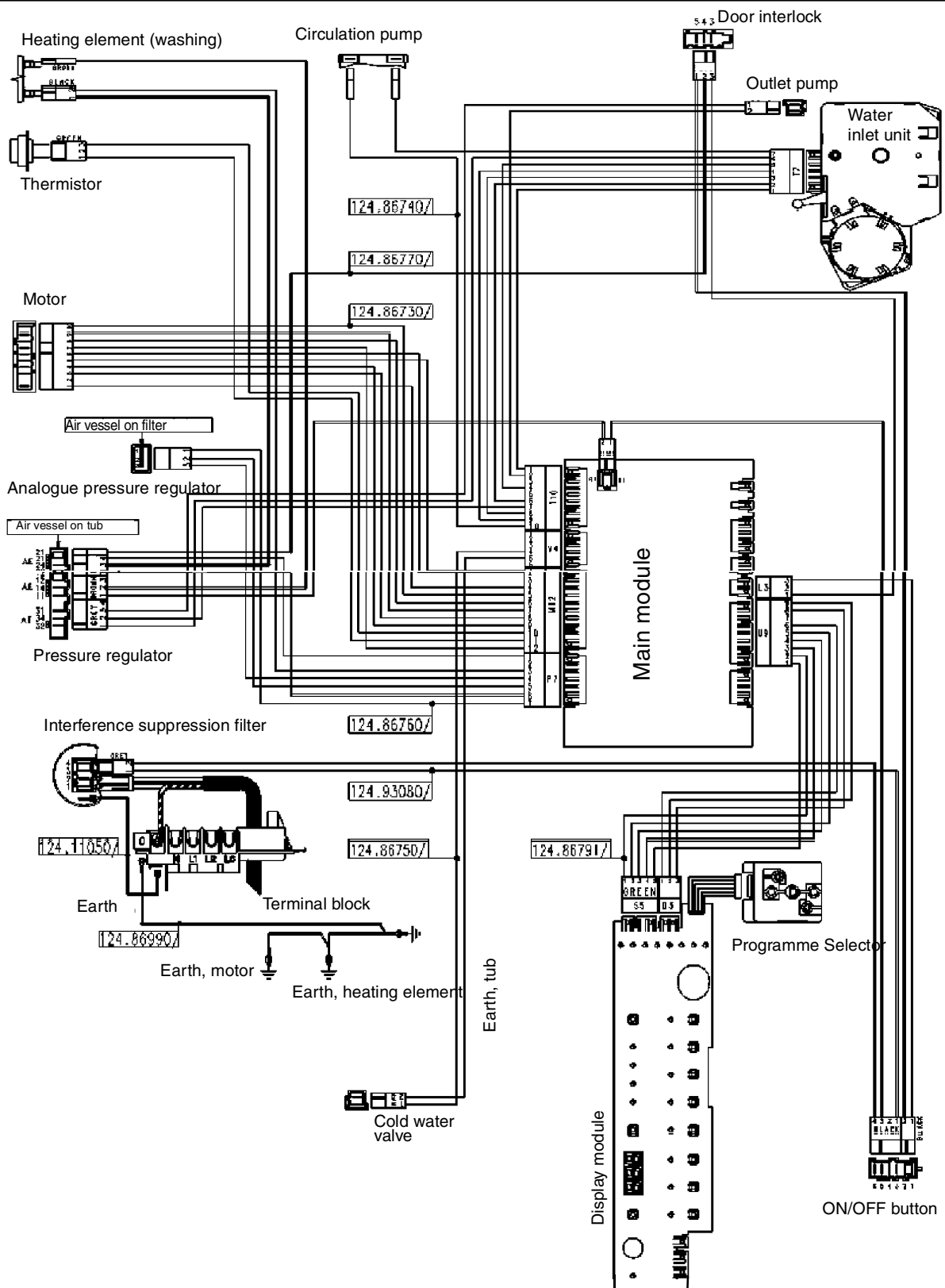


6.6 Electronic Pressure Switch

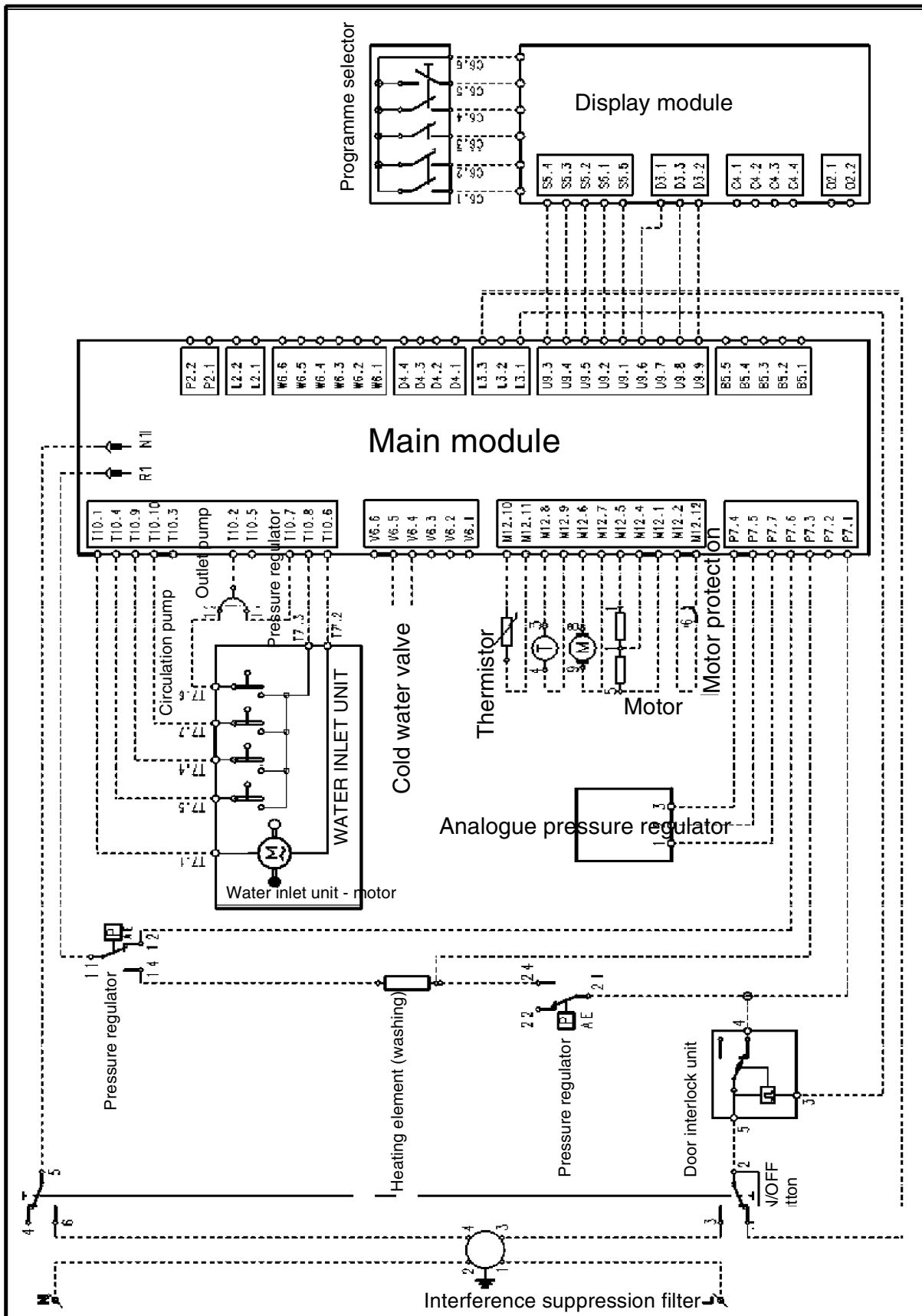
- a) Remove the top panel
- b) Push in the clips holding the switch, release it from its holder and take it out
- c) Unplug the connector
- d) Take off the hose

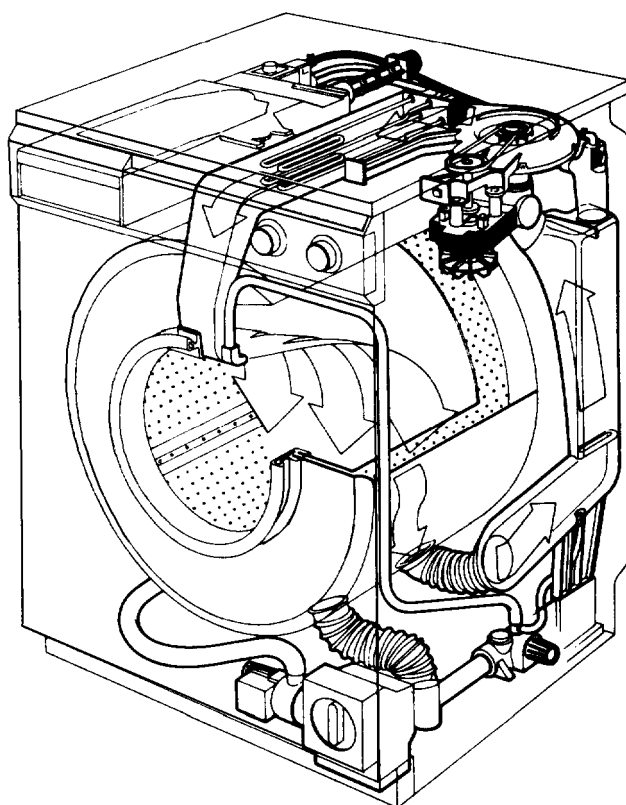


6.7 Wiring Diagram IW 1209.0 W



6.8 Wiring diagram IW 1209.0 W





Built-in Washer Dryer

IWT 1259.0 W

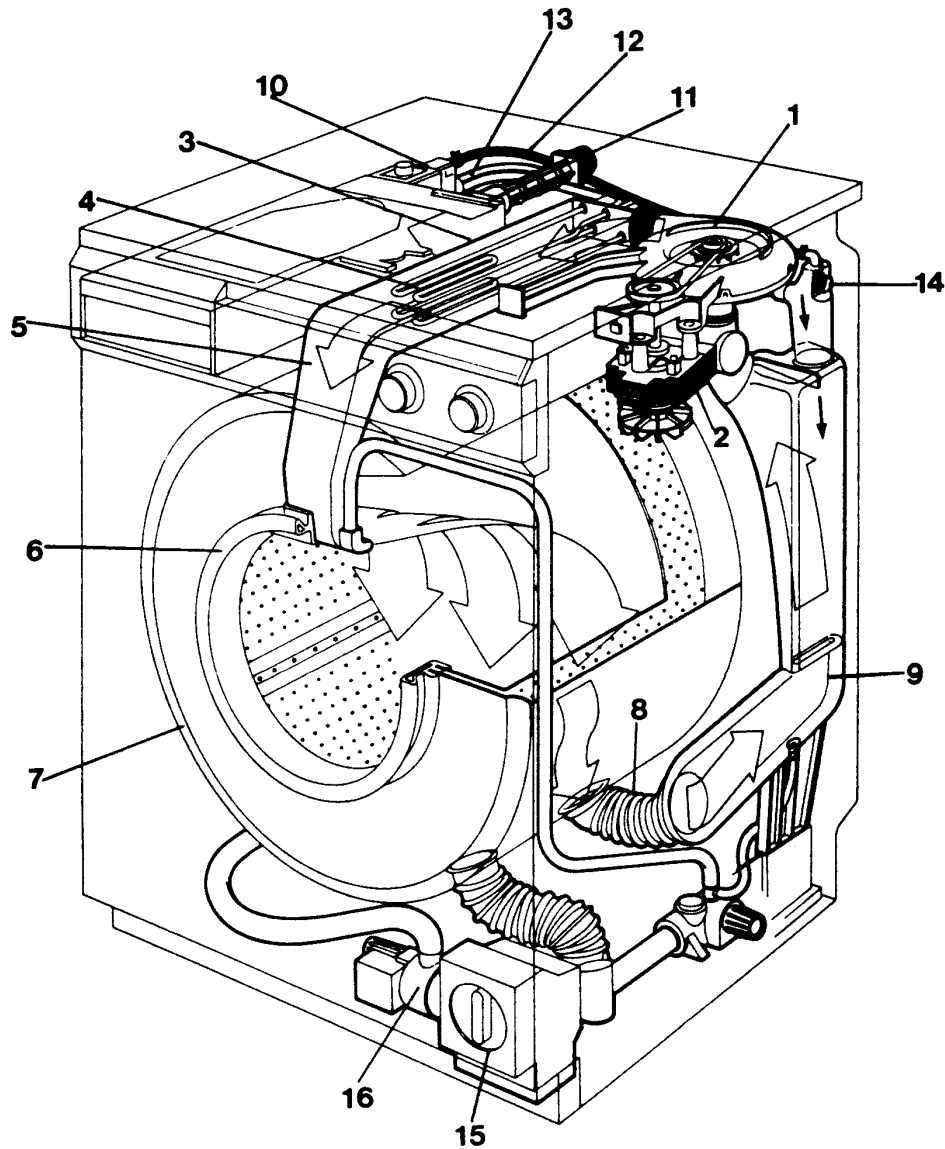
Part C

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7. DESIGN FEATURES AND FLOW DIAGRAMS

7.1 Dryer Components



- 1. Fan
- 2. Fan motor
- 3. Heater housing
- 4. Heater, drying
- 5. Heater duct
- 6. Door seal
- 7. Drum
- 8. Connecting hose
Sump - Condenser

- 9. Condenser (drying)
- 10. Connector
- 11. Solenoid valve
- 12. Connecting hose
Condenser connector
- 13. Steam vent outlet
- 14. Air break
- 16. Lint filter
- 17. Outlet pump

7.2 Drying System

There is a choice of two drying methods to change to:

Auto drying

The microprocessor determines the optimum drying time for the drying level required.

The drying cycle can be carried either at the end of the washing cycle, or independently.

There are three levels of dryness carried out either at the end:

- ◆ Easy iron
- ◆ Cupboard dry
- ◆ Extra dry

Timed Drying

The drying time is set by the user.

Because the drying time is pre-set on the timed programme, the NT2-C thermistor remains inactive.

7.2.1 Automatic Drying Cycles

The drying system is the same as is used on washer dryers with normal timers. The drying capacity is equal to half the maximum wash load capacity. Two separate drying cycles must be carried out to dry a full wash load. If only half a load is washed, the drying cycle can follow automatically at the end of the wash programme.

Only one heating element is switched on during the Wash and Wear drying cycle (half power). Both elements are switched on to dry Cotton/Linen (full power).

The dryer uses an airflow system with a water spray condensing system.

During drying, the drum turns at slow speed in alternate directions. The fan forces air across the heater elements and into the drum. The warm air dries the washing. When the moisture laden air comes into contact with the cold water spray, the moisture in the air condenses. The cool, dehumidified air is re-circulated over the heating elements and back into the drum. The cooling water and condensate are then discharged by the outlet pump.

The heater elements switch off for the last few minutes of the drying programme, although the fan keeps running to cool the laundry down.

The dryer uses an airflow system combined with a water spray condensing process.

The drying capacity of the washer dryer is equal to half the maximum (dry) wash load capacity of the machine. Drying has to be carried out twice to dry the equivalent of a full load of washing. If there is only half a load in the machine, drying can follow automatically at the end of the wash cycle.

During drying, the drum turns at slow speed in alternate directions.

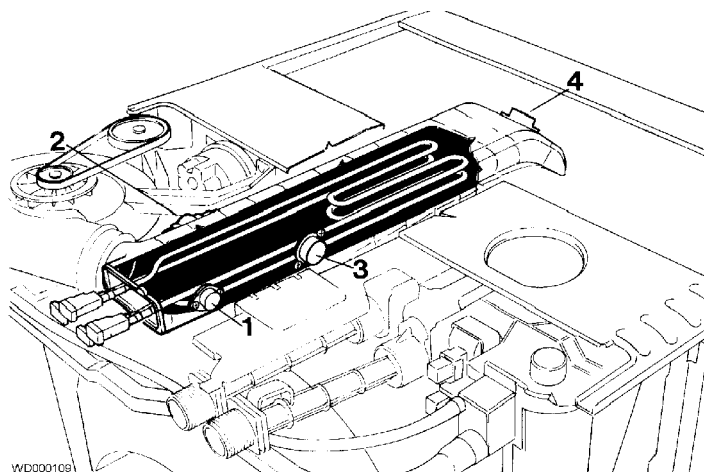
The fan forces air across the heater elements and into the drum. The warm air dries the washing. When the warm air comes into contact with the cold air, a heat exchange process takes place, which causes the moisture in the air to condense. The cool, dehumidified air is then drawn by the fan over the heating elements and forced back into the drum.

The cooling water and condensate is then discharged by the outlet pump.

The heater elements switch off for the last few minutes of the drying cycle, although the fan keeps running to cool the laundry down.

Thermostats and NTC Thermistor for Monitoring the Drying Temperature

1. Overheat thermostat with manual reset (150°C)
2. Overheat thermostat (98°C)
3. Extra dry thermostat (85°C)
4. NTC1 thermistor for monitoring the drying temperature



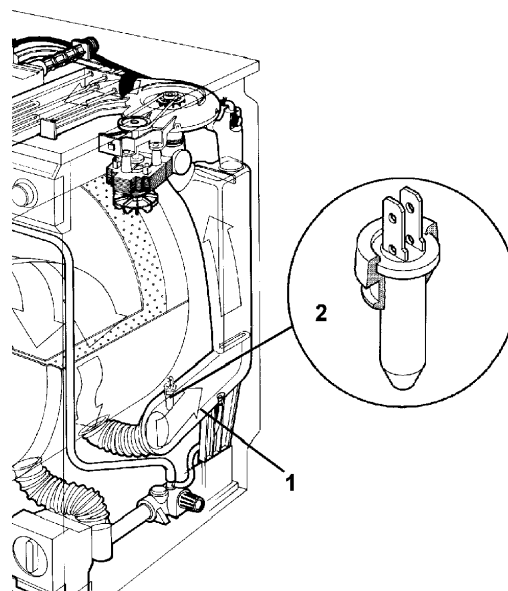
There are two overheat thermostats in the housing. One of these is normally open and is used to switch on the second heating element for the fast drying cycle. The NTC thermistor which monitors the drying temperature is located in the outlet duct. It is also used to monitor the temperature during washing.

NTC thermistor for Controlling the Drying Time

An NTC thermistor is used to control the drying time. It is mounted on the condenser.

Changes in NTC resistance in relation to temperature ($\pm 3\%$)

TEMPERATURE °C	RESISTANCE (ohms)
0	16325
15	7855
30	4028
40	2663
50	1801
60	1244
70	876
80	628
90	458
100	339
110	255
120	195



- 1 Drying condenser
- 2 NTC2 thermistor

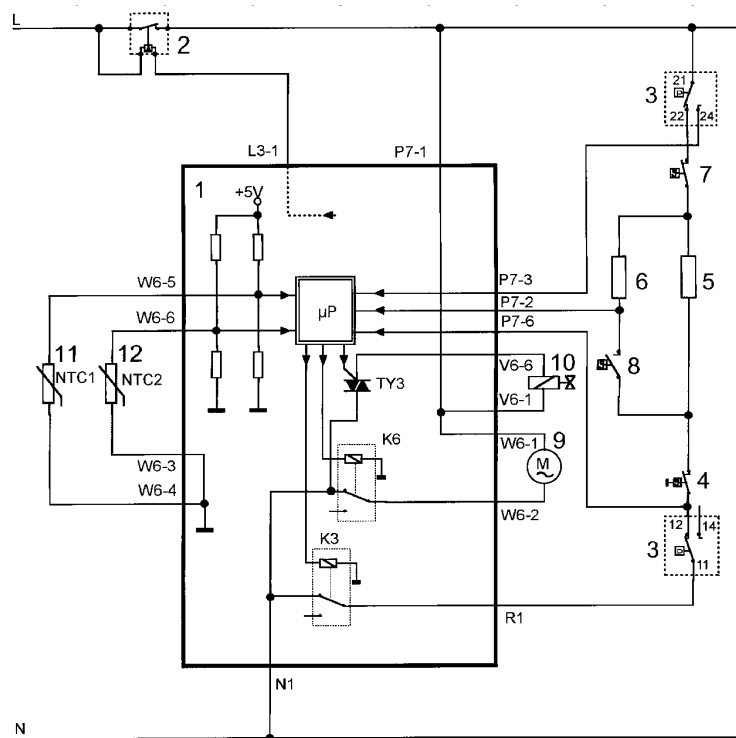


IMPORTANT

The control unit will detect a **short-circuit or open-circuit in the NTC thermistor**. If it does, the drying phase will be skipped.

DRYING SYSTEM (auto)

1. Control unit
2. Door opening delay unit
3. Safety pressure switch
4. Thermostat with manual reset (150°C)
5. Gentle dry heating element
6. Fast dry heating element
7. Overheat thermostat (98°C)
8. Fast dry thermostat (85°C)
9. Fan motor
10. Condenser solenoid valve
11. NTC thermistor
12. NTC2 thermistor



Current reaches the heating element (5) via relay K3 in the control unit (1). This is the same relay that controls the current supply to the heating element during the washing cycle. The safety pressure switches (3) (which are closed in the "off" position), the manual-reset thermostat (4) and the automatic-reset thermostat (7) are all connected in series with the heating element.

The condenser solenoid valve (10) is energised via the TY3 triac and the fan motor (9) is energised via the K6 relay.

During the Wash and Wear drying programme, the control unit simultaneously directs current to the heating element (5), the fan motor (9) and the drying solenoid valve (10).

It is therefore not possible for the Extra Dry thermostat (8) to reach 85 °C and the heating element (6) will not receive any power. As a result, drying is carried out at half power.

At the beginning of the programme for drying Whites, the control unit switches on the heating element (5) but not the fan motor (10). Within a short time, the thermostat (9) reaches a temperature of 85°C, which causes the second heating element (6) to activate.

The control unit initiates closing of the thermostat via the P7-2 contact and then directs current to the fan motor (9) and to the condenser solenoid valve (10).

Drying then takes place at full power.

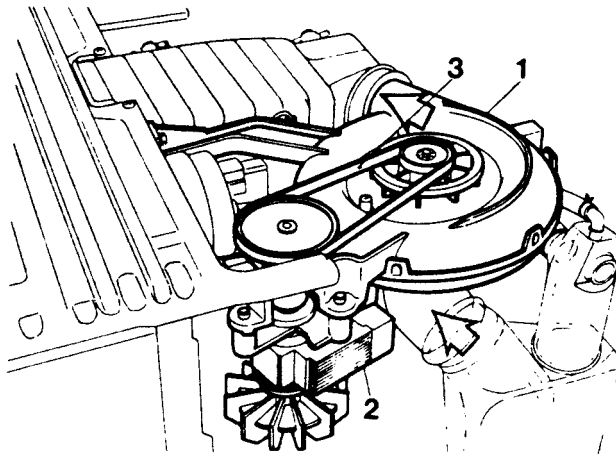
The microprocessor monitors the drying temperature via the NTC1 thermistor (11) and the NTC2 thermistor (12). The temperature levels of the damp air passing through the condenser are measured. When the desired drying level (easy iron, cupboard dry, extra dry) is reached, the current supply to the heating element is interrupted.

The fan motor and the condenser solenoid valve remain operational for another 10 minutes during the cool-down phase.

7.2.2 Timed programme

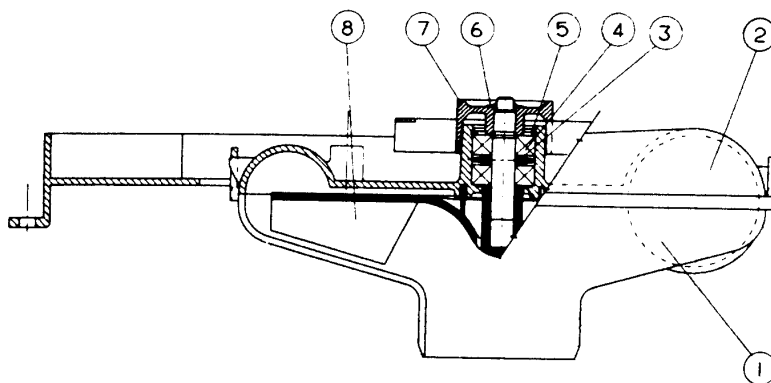
For further details see Chapter 9, section 9.1 under 'Timer'.

7.3 Fan



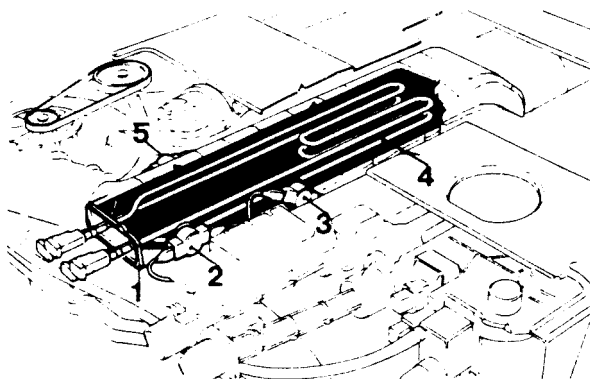
- 1. Fan unit
- 2. Fan motor
- 3. Drive belt

The fan blows air from the condenser to the heater housing unit.
The fan motor drives the impeller via a V-belt.



- 1. Cover
- 2. Fan spiral path
- 3. Bolts
- 4. Ball bearing
- 5. Retaining ring
- 6. Bolt mounting
- 7. Belt pulley
- 8. Fan impeller

7.4 Heater housing unit

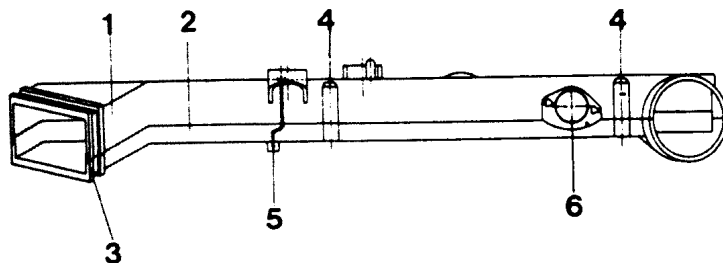


1. Housing
2. Thermostat with manual reset
3. Drying thermostat
4. Heating element, drying
5. Overheat thermostat

The heater housing consists of two aluminium alloy sections, bolted together and sealed with silicone sealant. Two layers of aluminium foil cover the housing. Insulation is provided by two mineral wool shells fastened on with clips.

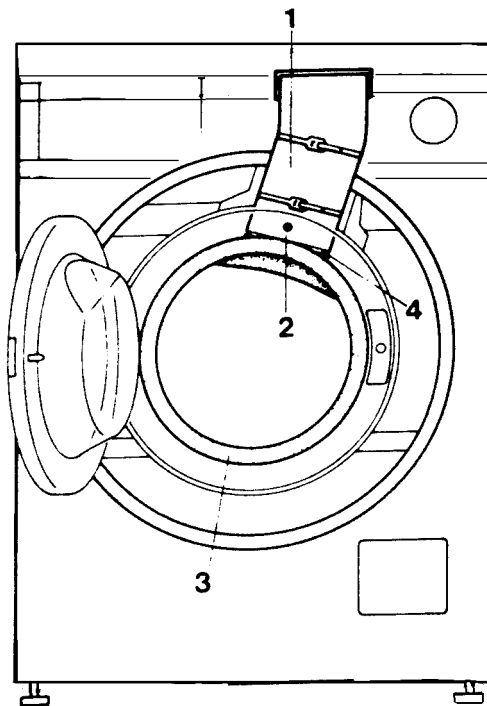
The air is heated by two heating elements. On the "gentle dry" programme, one element is switched off.

The unit is fitted with three thermostats: a system thermostat and two overhear thermostats.



1. Upper section
2. Bottom section
3. Silicon sealant
4. Bolts
5. Heating element rod
6. Thermostat position

7.5 Heater Duct



1. Heater duct
2. Fixing screws
3. Door seal
4. Wire band plate

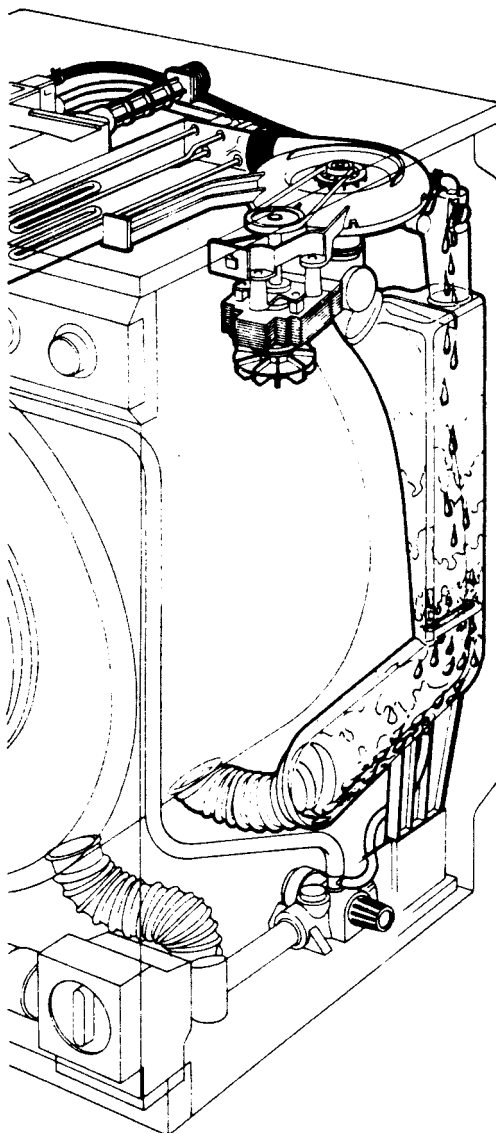
Warm air is directed from the heater unit along the duct, through the seal and directly into the drum.

The heater duct consists of two aluminium alloy tubular sections, bolted together and sealed with silicone sealant.

Two layers of aluminium foil cover the duct. Insulation is provided by mineral wool shells fastened on with clips.

The heater duct is bolted on to the front of outer tub. A steel wire clamp provides a reliable fit to the door seal.

7.6 Condenser (drying)



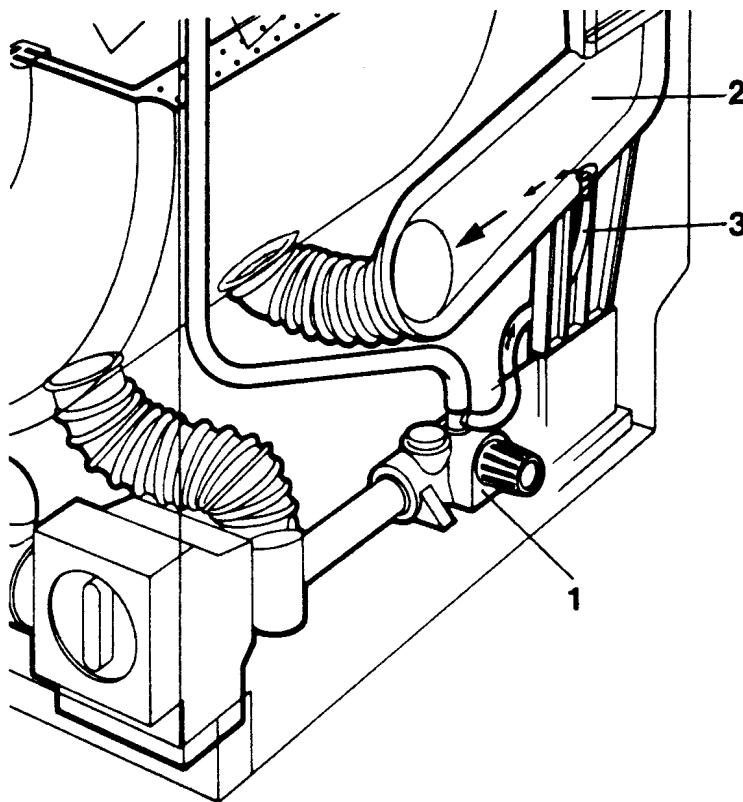
The drying condenser is attached to the frame. It consists of a plastic moulding with a hose connection to the sump at the bottom and a gasket connection to the fan housing unit at the top.

The moist air enters the condenser from the bottom and the cold water spray from the top.

The condenser is designed to produce a reaction when the moisture laden air comes into contact with the cold water spray.

This leads to condensation of the moisture in the air. The fan then draws in cold, dry air, which is re-circulated and reheated. The cooling water and condensate flow into the sump and are discharged by the outlet pump.

7.7 Condenser (self-cleaning)



1. Circulation pump
 2. Condenser
 3. Tube
- Pump - Condenser

During drying, lint that has been fed in with the water may collect on the bottom of the condenser.

The Jetsystem automatic washers are fitted with a pipe that connects the circulation pump to the condenser.

During the wash programme there is a constant flow of water between the condenser and the tub, which flushes the lint through the condenser. The lint is then trapped in the lint filter when the water is drained.

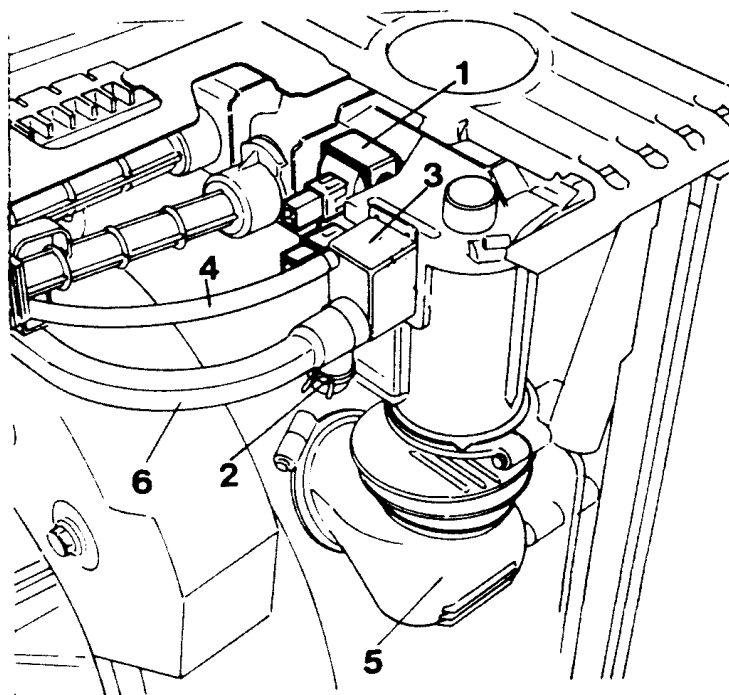
The machine therefore cleans away any lint that may gather during drying.

In automatic washers with normal wash systems, water automatically flows through the condenser, as the water level is higher during washing.

In this case, the lint is held in suspension and pumped away with the water.

It is therefore important to regularly clean the lint filter.

8. WATER CIRCULATION (DRYING)



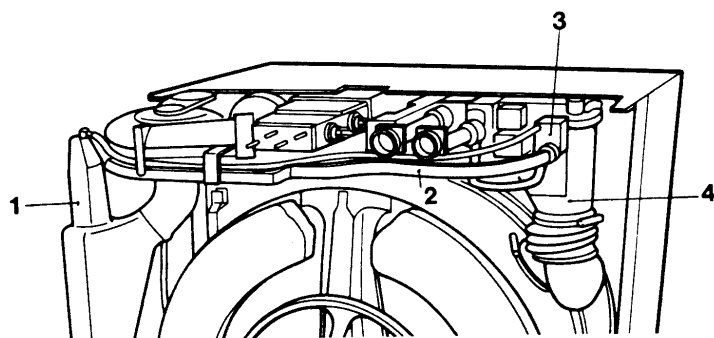
- 1. Solenoid valve
- 2. Tube to solenoid valve connector
- 3. Adapter
- 4. Tube adapter - condenser
- 5. Tube, detergent reservoir - tub
- 6. Moisture vent tube

The condensate enters a sub-chamber of the cold water solenoid valve at a rate of 0.4 litres per minute. The solenoid valve is joined to an adapter by a tube. The water flows from the adapter through a narrow tube into the top of the condenser. Inside the adapter there is a small hole, through which a small amount of water is released into the detergent reservoir.

This ensures that there is always water present inside the siphon of the tube that connects the detergent reservoir to the tub. This prevents steam from escaping from the tub and emerging from the detergent dispenser.

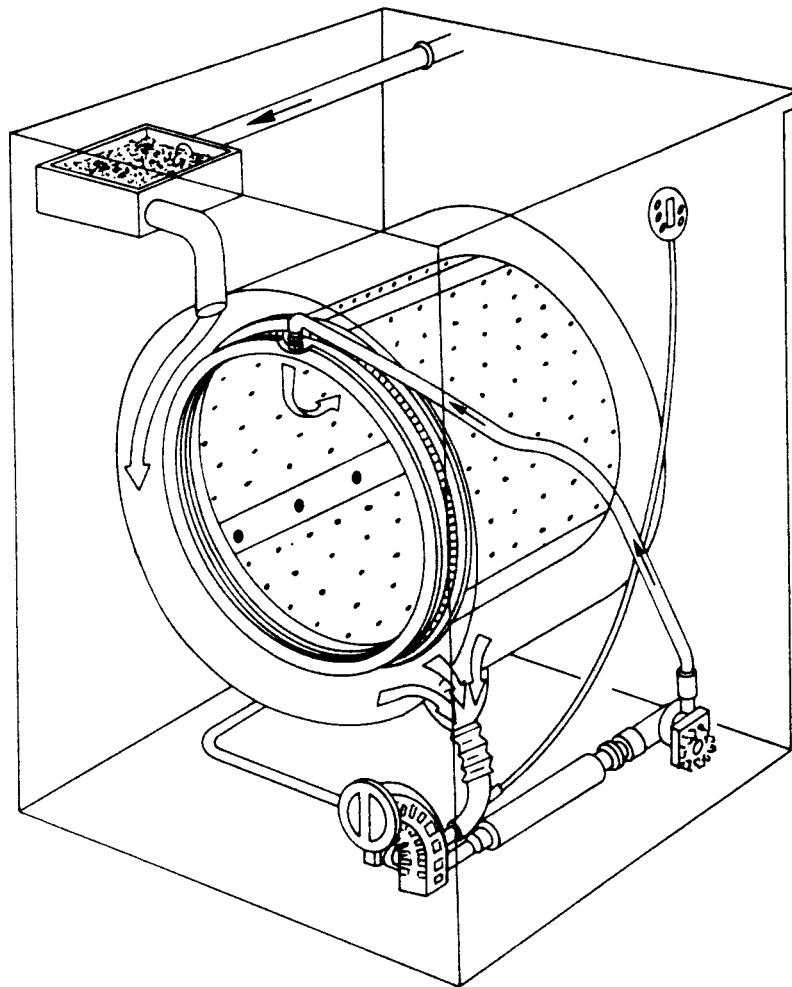
8.1 Steam vent tube

The condenser is connected to the adapter with a plastic tube. Steam which is formed as a result of the heat of the washing process is drawn off through this tube into the detergent reservoir. The steam condenses as soon as it comes into contact with the sides of the detergent reservoir



- 1. Condenser
- 2. Outlet tube
- 3. Adapter
- 4. Detergent reservoir

8.2 Washing with the Direct Spray Jetsystem



Washer dryers fitted with the Jetsystem use the Direct Spray system for washing.

With this system, water is sprayed directly into the drum through a feed fitted at the top of the door seal.

The water is thus sprayed straight into the wash, without having to pass through holes in the drum, as is the case with ordinary Jetsystems. The operating principle remains the same, however.

Water and heat losses are minimised by this system.

9. ELECTRICAL COMPONENTS - DRYING CYCLE

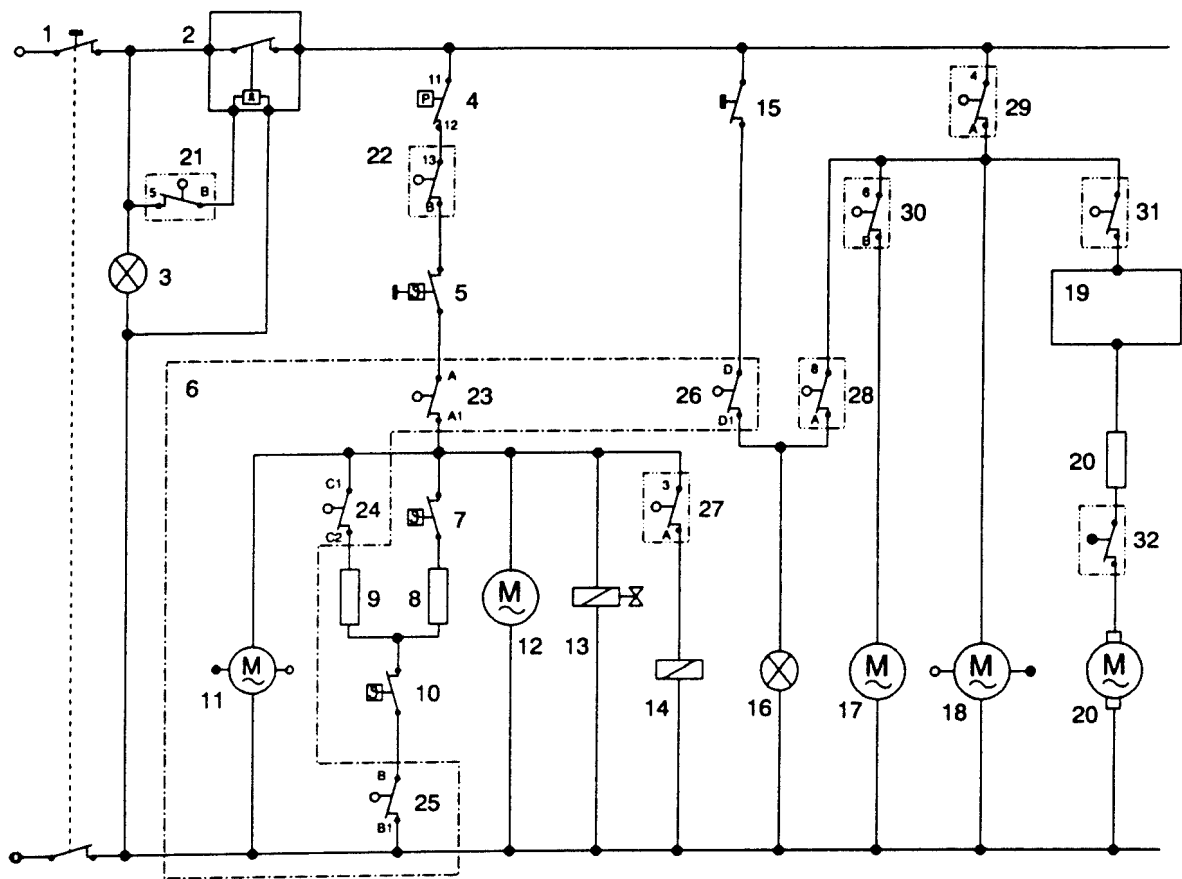
9.1 Timer

The washer dryers are fitted with two different types of timer.

1. A standard-type timer fitted with an interval timer for monitoring the drying time.
The interval timer controls the timer's thermostop solenoid during drying.
2. A timer with a built-in interval timer. The timer is fitted with two rotary knobs - one for selecting the drying programme and one for setting the drying time.

The diagrams on the following pages illustrate the way these timers work during the drying programmes.

9.2 Wiring Diagram for Timer with Interval Timer (drying cycle)



1. Main switch
2. Door delay unit
3. Control lamp
4. Pressure switch
5. Thermostat with manual reset
6. Interval timer
7. Drying thermostat
8. Heating element
9. Heating element, drying
10. Overheat thermostat
11. Interval timer motor
12. Fan motor
13. Condensate solenoid valve
14. Thermostop solenoid
15. Auto dry button
16. Dryer control lamp
17. Outlet pump
18. Timer motor
19. Electr. speed regulator
20. Motor commutator

Timer and Interval Timer Contacts

21. Door opening delay
22. Drying
23. Interval timer feed
24. Fast heat
25. Heating
26. Automatic drying
27. Thermostop drying
28. Automatic drying
29. Timer direct feed
30. Outlet pump
31. Motor regulation - monitoring
32. Changeover switch

Once the drying programme and time have been selected, pressing the main switch (1) will cause current to flow via contacts (21) first to the door delay unit (2) and then to all other system components. The main control lamp (3) and the dryer control lamp (16) which is connected to the timer contact (28) will come on straight away.

Current reaches the dryer circuit and interval timer motor (11) via the pressure switch (in its "off" position), the timer contact (22) and the interval timer contact (23). Monitoring is via manual-reset thermostat (5).

Current is directed to the heating element (9) by interval timer contact (24). The second element (8) is regulated by the drying thermostat (7).

The safety thermostat (10) and interval timer contact (25) complete the dryer circuit.

The fan motor (12), condensate solenoid valve (13), thermostop solenoid (14) and interval timer motor (11) are all supplied with current at the same time as the drying heating elements. Contact (29) directs current to the timer motor and to the motor's electronic speed regulator (20). The operation of the motor is governed by the various contacts on the speed regulator and the changeover switch (31-32).

Current is directed to the outlet pump by timer contact (30).

The timer stays in the drying position, as it remains blocked by the thermostop coil (14).

Both heating elements are switched on for fast drying. For gentle drying, one heating element (9) is switched out of circuit by open contact (24) of the interval timer. The power consumption of each heating element is 700W.

The NC drying thermostat (7) is set to open at 106°C and close at 90°C. Its purpose is to control the heat level during drying, particularly if excessively long drying times have been set by the user or in the event of over-voltage.

The safety thermostat (10) is normally closed. It switches on at 98°C and off at 75°C. It is mounted further away from the heating element than the drying thermostat. It triggers in the event of a malfunction of a fan motor components, a defective drive belt, failure of the drying thermostat (7), blocked water supply etc.

The interval timer opens contact (25) 8-10 minutes before the end of the drying programme, interrupting the current supply to the heating elements. The fan still operates during the cool-down period.

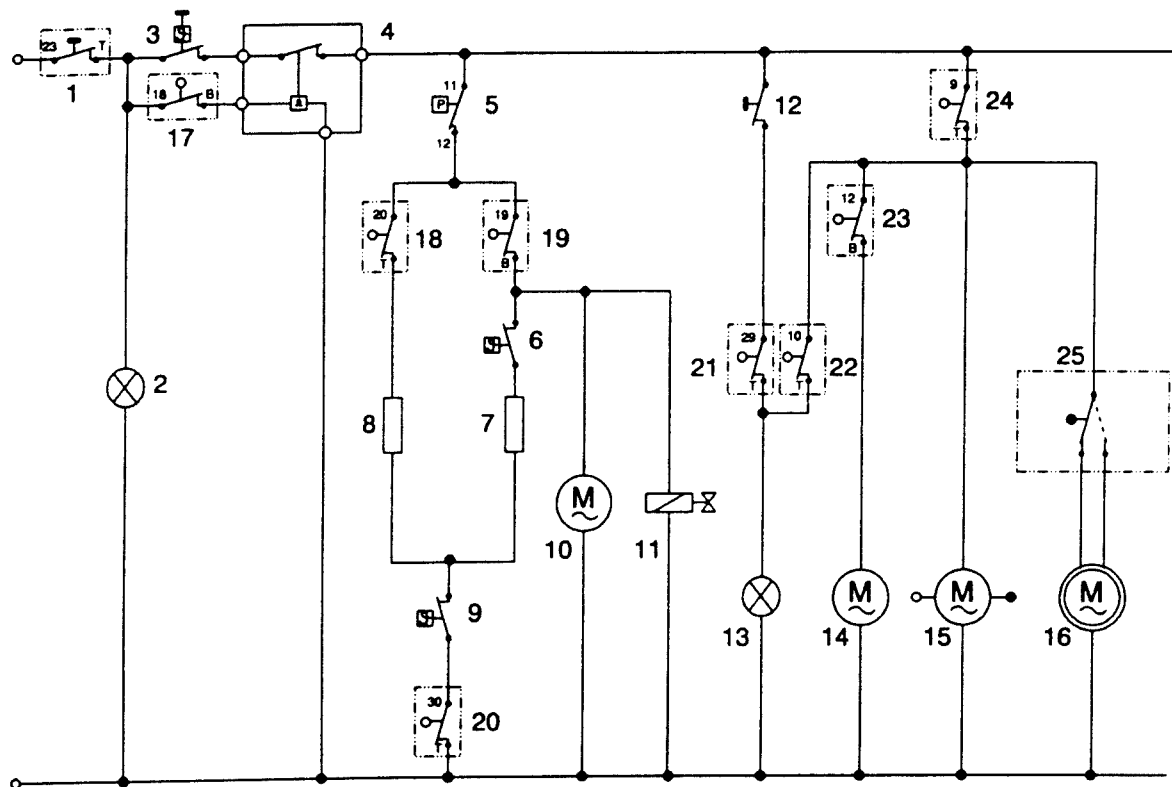
Contacts (23) open when the interval timer reaches the end of the programme (stop), interrupting the current supply to the thermostop coil. The timer is then advanced to the stop position within 2 minutes.

The manual reset thermostat (5) only activates in the event of a problem with the safety thermostat (10) or with one of the fan components.

The NC thermostat opens at 150°C, interrupting the current supply to the drying circuit and to the timer's thermostop solenoid, which switches to the stop position.

The "auto dry" button should be pressed for automatic drying after the wash programme. This button works with the interval timer contact (26) and the timer contact (28) to ensure that the end of programme stage is skipped and that drying proceeds automatically.

9.3 Wiring diagram for timer with two switches (drying cycle)



1. Main switch
2. Control lamp
3. Thermostat with manual reset
4. Door delay unit
5. Pressure switch
6. Drying thermostat
7. Heating element, drying
8. Heating element, drying
9. Safety thermostat
10. Fan motor
11. Condensate solenoid valve
12. Auto dry button
13. Dryer control lamp
14. Outlet pump
15. Timer motor
16. Motor

Timer contacts

17. Door opening delay
18. Fast heat
19. Heating
20. Heating interval timer
21. Automatic drying
22. Automatic drying
23. Outlet pump
24. Timer direct feed
25. Changeover switch

With this type of timer, the drying time is set with the interval timer switch.

When the main switch (1) is pressed, after setting the drying programme and drying time, current is directed to door delay unit (4) and then to all other components via contact (17) and manual-reset thermostat (3).

The main control lamp (2) and dryer control lamp (13) light up immediately.

Current reaches the dryer circuitry via pressure switch contact (5) in the "off" position. Current reaches the heating element (7), the fan motor (10) and the condensate solenoid (11) via timer contact (19).

Timer contact (18) directs current to the other heating element (8) for fast drying.

Heating is regulated by the drying thermostat (6), the safety thermostat (9) and the timer contact (20).

The power consumption of each heating element is 700W.

The fan motor (10) and the condensate solenoid (11) are supplied with current at the same time as the heating elements.

Contact (24) directs current to the timer motor and to the main motor (16). The operation of the motor is governed by the various contacts on the changeover switch (25).

Current is directed to the outlet pump (14) by timer contact (23).

The NC thermostat (6) is also set to switch on at 106°C and to switch off at 90°C. The safety thermostat (9) switches on at 98°C and off at 75°C. The manual-reset NC thermostat (3) switches on at 150°C and interrupts the power to the drying circuit and to all the components. This thermostat activates only in the event that there is a problem with both the safety thermostat (9) and one of the fan components.

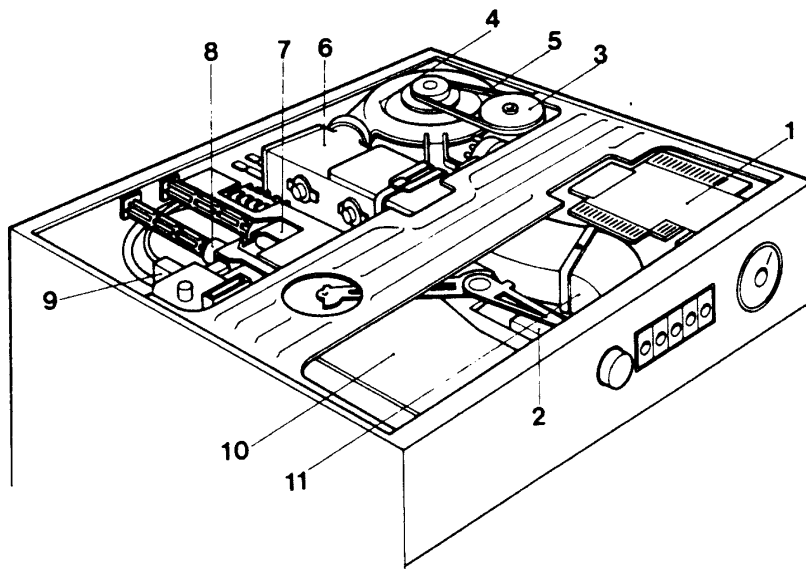
The interval timer opens contact (20) 8 to 10 minutes before the end of the drying programme, cutting off the current supply to the heating elements. The fan still operates during the cool-down period.

The timer is advanced to the stop position at the end of the drying programme.

The "auto dry" button (12) should be pressed if automatic drying is required following the wash programme. This acts via timer contacts (21-22) to ensure that the end of programme is skipped and that drying proceeds automatically.

10. ACCESS TO THE COMPONENTS FOR REPAIR

10.1 Access from the top of the machine



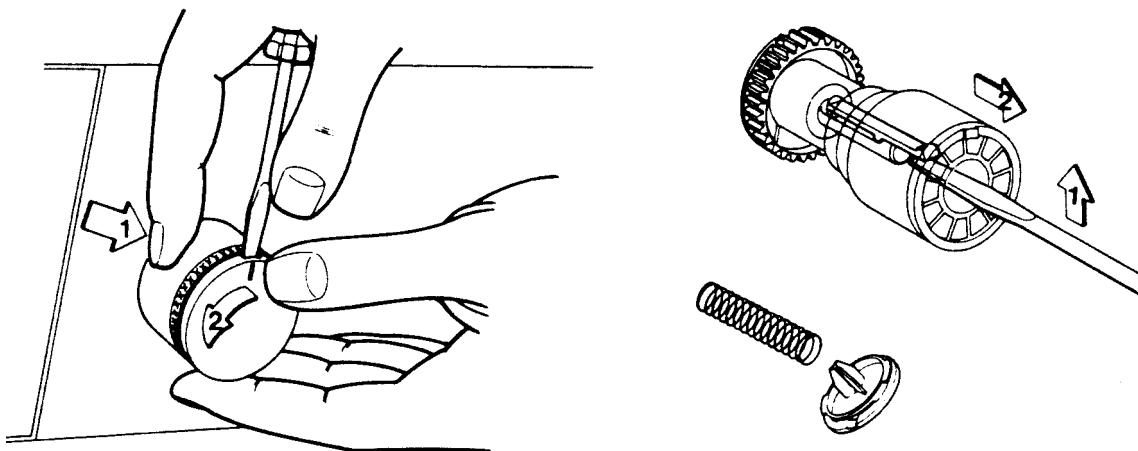
- 1. Timer
- 2. Interval timer
- 3. Fan motor
- 4. Fan
- 5. Drive belt
- 6. Heating element housing
- 7. Solenoid valve, warm water
- 8. Solenoid valve, cold water
- 9. Adapter
- 10. Detergent reservoir
- 11. Heater duct

Remove both screws at the back of the machine, pull the worktop back and release.
You now have access to the following components:

- a. Timer
- b. Adjustable thermostat
- c. Control panel
- d. Fan belt

10.1.1 Interval timer (drying)

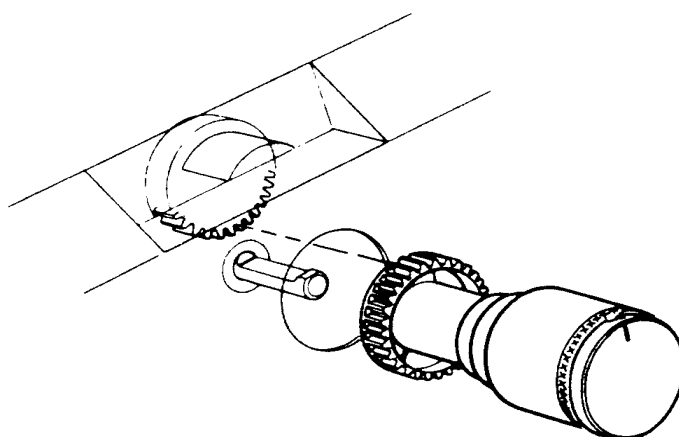
- a) Remove the cover from the rotary knob using a small screwdriver or a thin blade.



- b) Lift up the locking tab between the knob and shaft and pull out the barrel.
c) Release the lever system from the detergent reservoir.
d) Undo both retaining screws from the interval timer support.
e) Unplug the connectors.
f) Take out the interval timer.

Note on Reassembly

It is recommended that you first attach the spring and the cover before refitting the knob. Make sure that the knob is fitted so that it points to the correct position on the fascia.



10.1.2 Solenoid valve

- a) Remove the supply tube.
- b) Undo the retaining screws on the connecting block retainer and release the clamp that holds the solenoid to the detergent reservoir.
- c) Undo the screws and release the rear cable grip.
- d) Remove the pipes from the adapter.
- e) Remove the solenoid/ heater duct unit from the detergent reservoir and pull out the plugs.
- f) Remove the solenoid/ connector tube.
- g) Unscrew the solenoid from the connector.

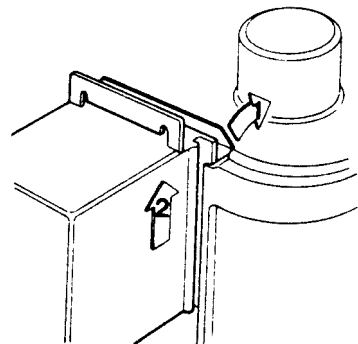
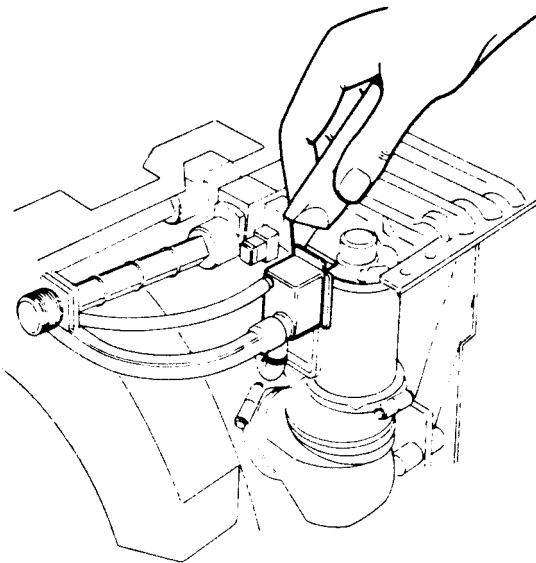
Note on Reassembly

The gasket must be fitted to the solenoid before it is reassembled.

10.1.3 Adapter

To gain access to the adapter between the solenoid and the detergent reservoir, you have to remove the reservoir. To do this:

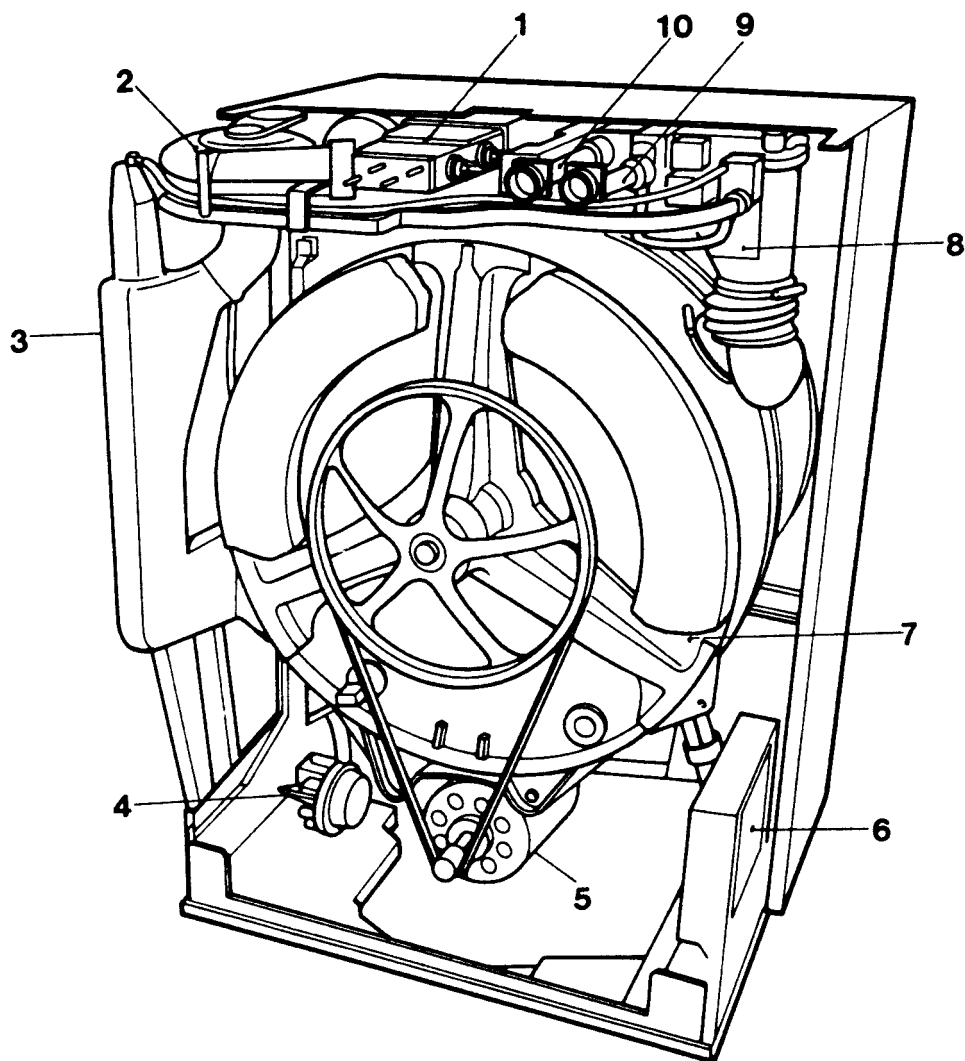
- a) Make an incision on both sides of the baffle plate with a knife, as shown in the illustration.
- b) Remove the adapter from the detergent reservoir.



10.2 Access via the Rear Panel

Please note:

Be very careful how you move the washer dryer once you have removed the rear panel. Do not lie it on its side or its back, as this will damage the machine's structural frame.



1. Heater housing unit
2. Fan
3. Condenser
4. Circulation pump
5. Motor
6. Electronic speed regulator
7. Drum
8. Detergent reservoir
9. Solenoid valve, hot and cold condensate
10. Warm water solenoid valve

10.2.1 Removing the Rear Panel

- a) Remove the screws that fix the rear panel to the frame.
- b) Remove the screws on the rear panel. Take out the fan.

You now have access to the following components:

10.2.2 Fan unit

- a) Remove the fixing screws from the cross-member.
- b) Slip the gasket on the fan/ heater adapter onto the fan side of the tube.
- c) Lift the fan away from the condenser.
- d) Unplug the connector.

Note on Reassembly

Put the o-ring back on the fan.

You now have access to the following components:

10.2.3 Fan motor

- a) Remove the three fixing screws.

10.2.4 Condenser

- a) Remove the connecting hoses from the condenser.
- b) Jerk the condenser upwards and pull it out of the frame.

10.2.5 Heater Housing Unit

- a) Remove the connectors from the heater elements and thermostats.
- b) Slip the gasket onto the fan tube.
- c) Remove the screws that hold the housing to the heater duct as well as the two screws to the cross-member.
- d) Withdraw the housing.

You now have access to the thermostats.

10.2.6 Drying Thermostat and Safety Thermostats

- a) Withdraw the thermostat housing from the washer dryer.
- b) Undo the screws and take out the thermostat.

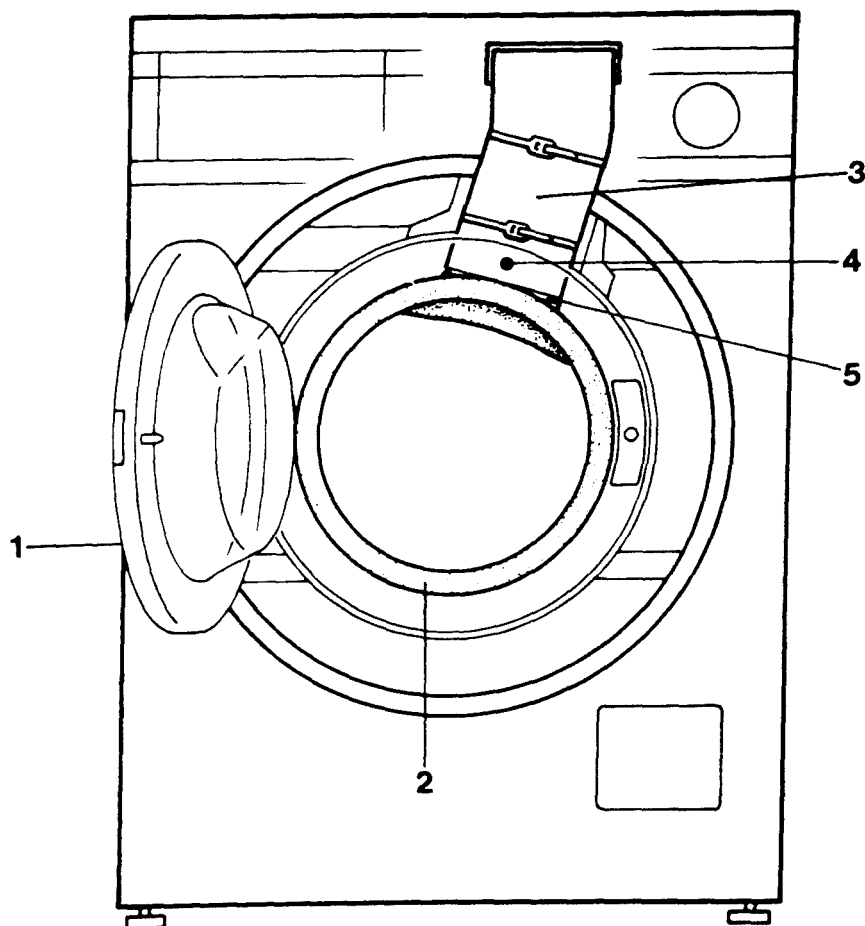
10.2.7 Drying Heating Element

- a) Remove the connectors
- b) Unscrew both retaining screws from the heater housing

Note on Reassembly

When refitting, please make sure that the heating element is correctly located in its support.

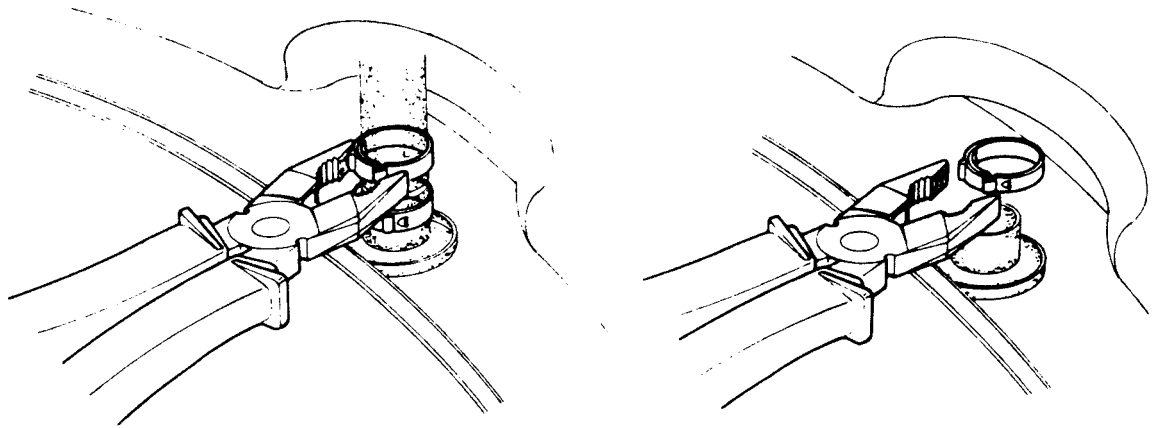
10.3 Access through the Porthole



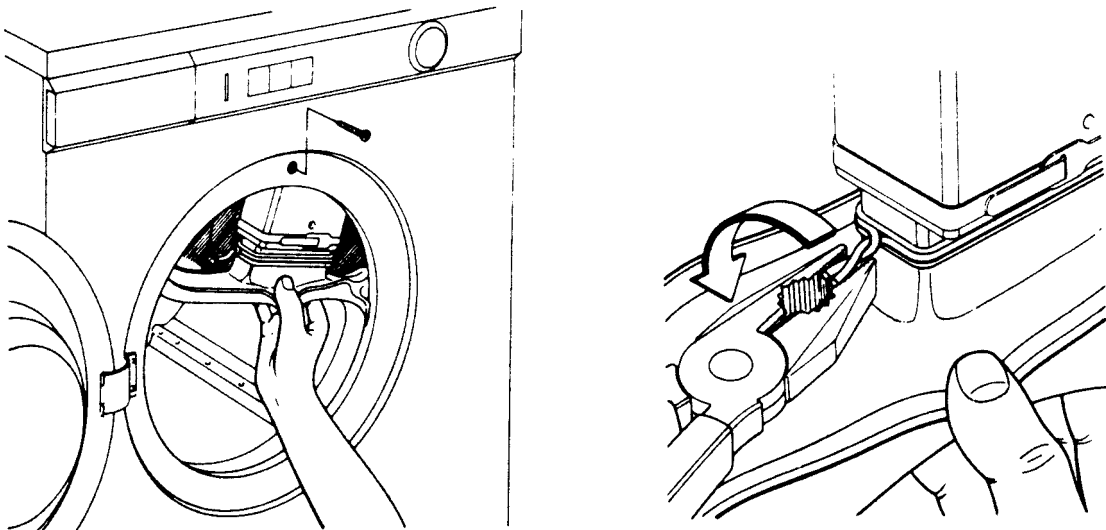
1. Porthole
2. Door seal
3. Heater duct
4. Fixing screw
5. Steel wire clamp

10.3.1 Door Seal and Heater Duct

- a) Remove the top cover.
- b) Unscrew the retaining screws from the heater duct casing
- c) Open the door and undo the screw holding the heater duct to the case of the machine.
- d) Free the seal from the shell lip.
- e) Remove the water drain hose from the seal.



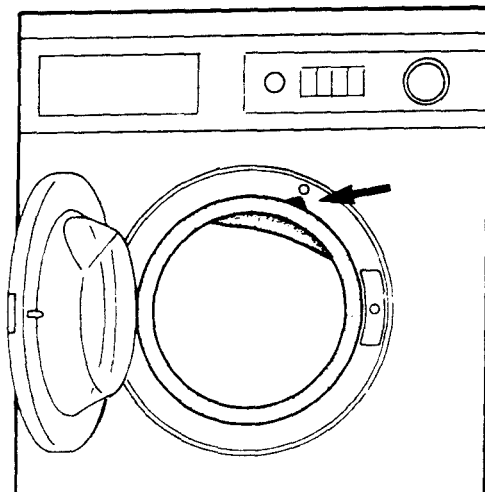
- f) Remove the steel wire clamp from the seal/ heater duct and release the seal.



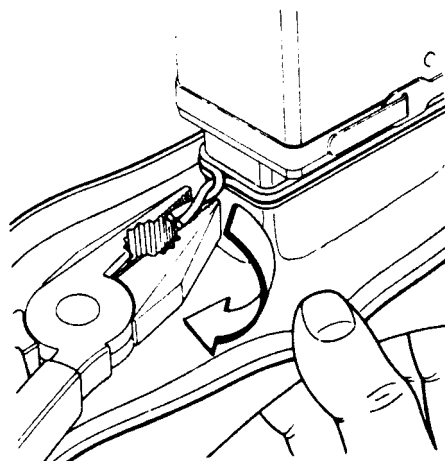
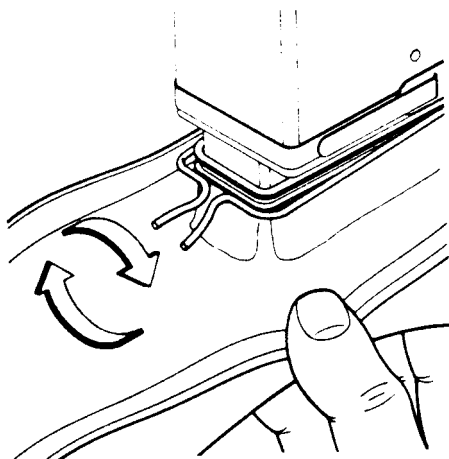
- g) Pull out the seal and the wire clamp.

Note on Reassembly

- a) When reinstalling the door seal, make sure to line up the notch on the seal with the hole for the heater duct.

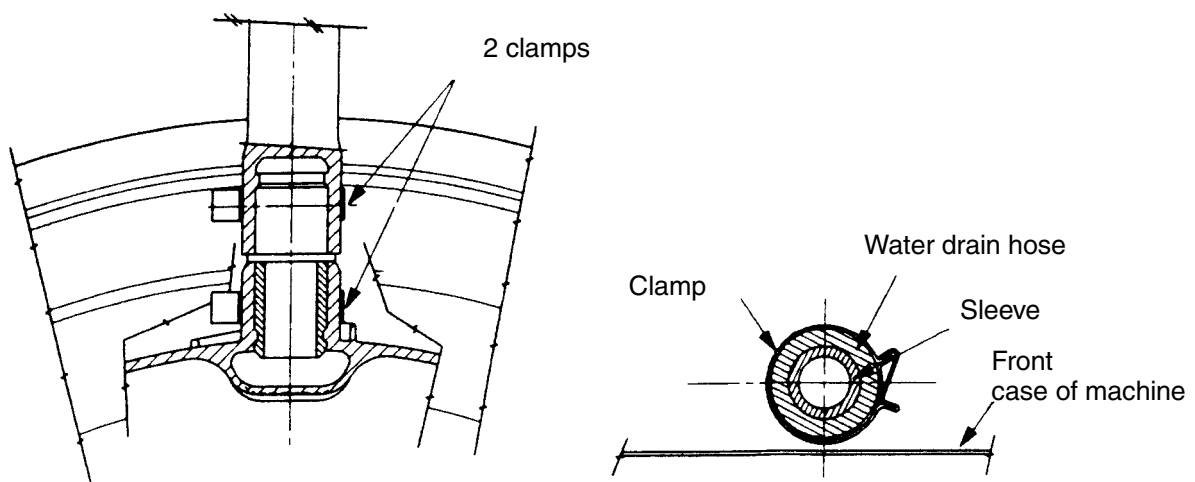


- b) When refitting the wire clamp, please make sure that it is correctly seated in the gasket, as shown in the illustration.

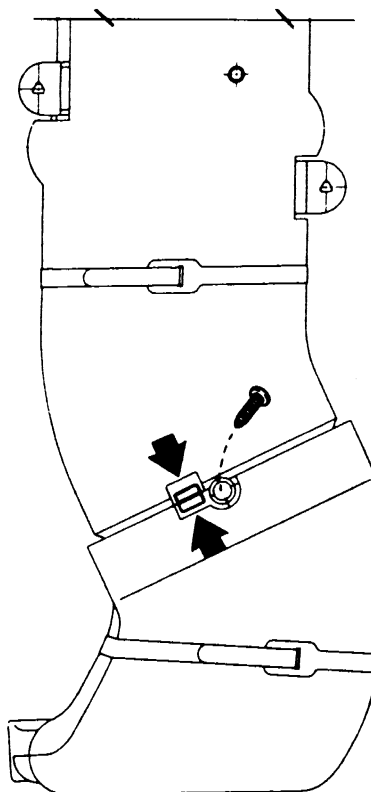
**Please Note:**

When fitting a new door seal, lightly coat the outer section (i.e. the part which comes into contact with the porthole) with silicone oil. This will prevent the porthole from sticking to the seal the first time a drying programme is run.

- c) The clamp fitted to the water drain hose should be mounted as shown in the illustration.



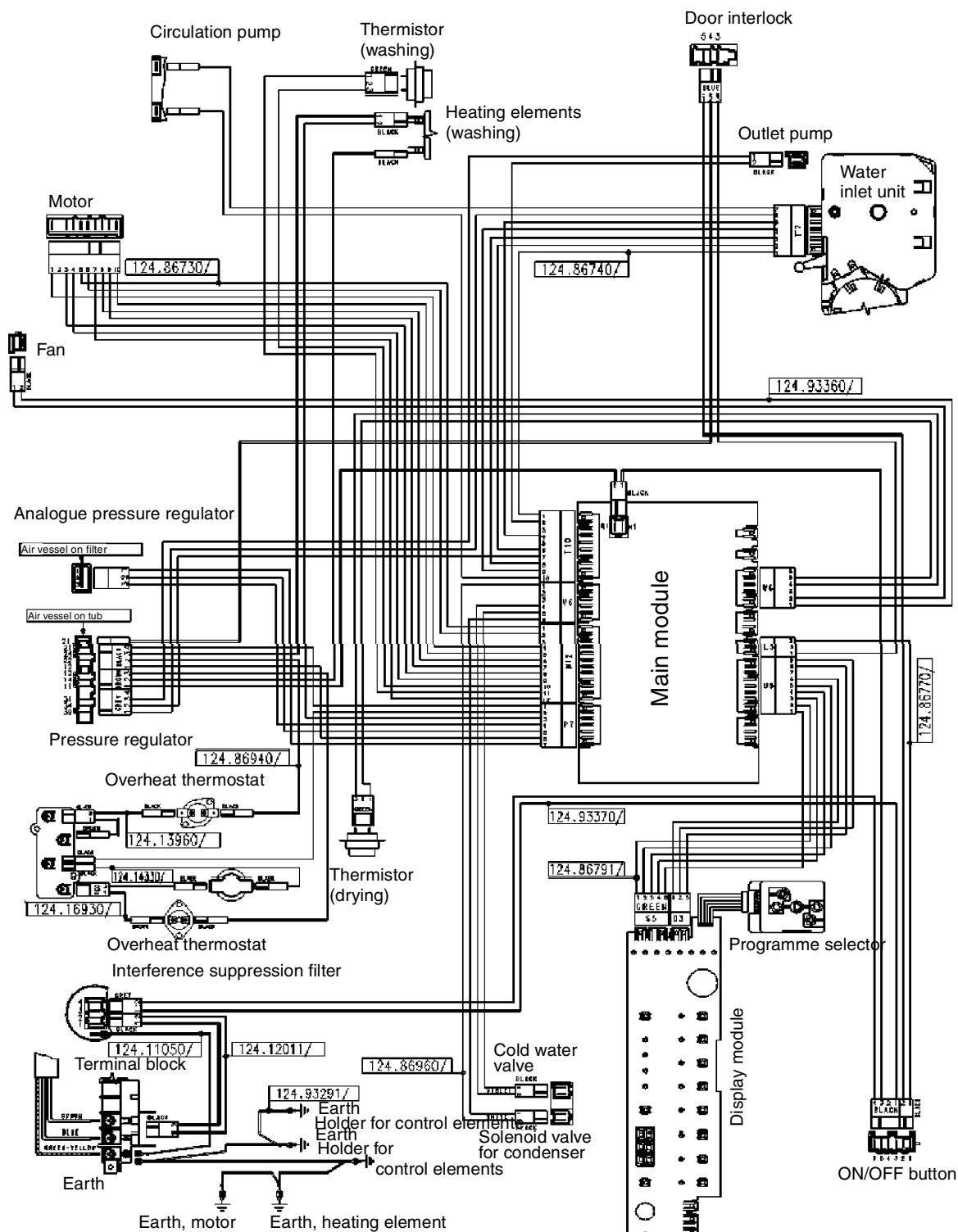
- d) Reconnect the heater duct to the heater casing. Bend the two lugs with pliers as shown in the illustration.



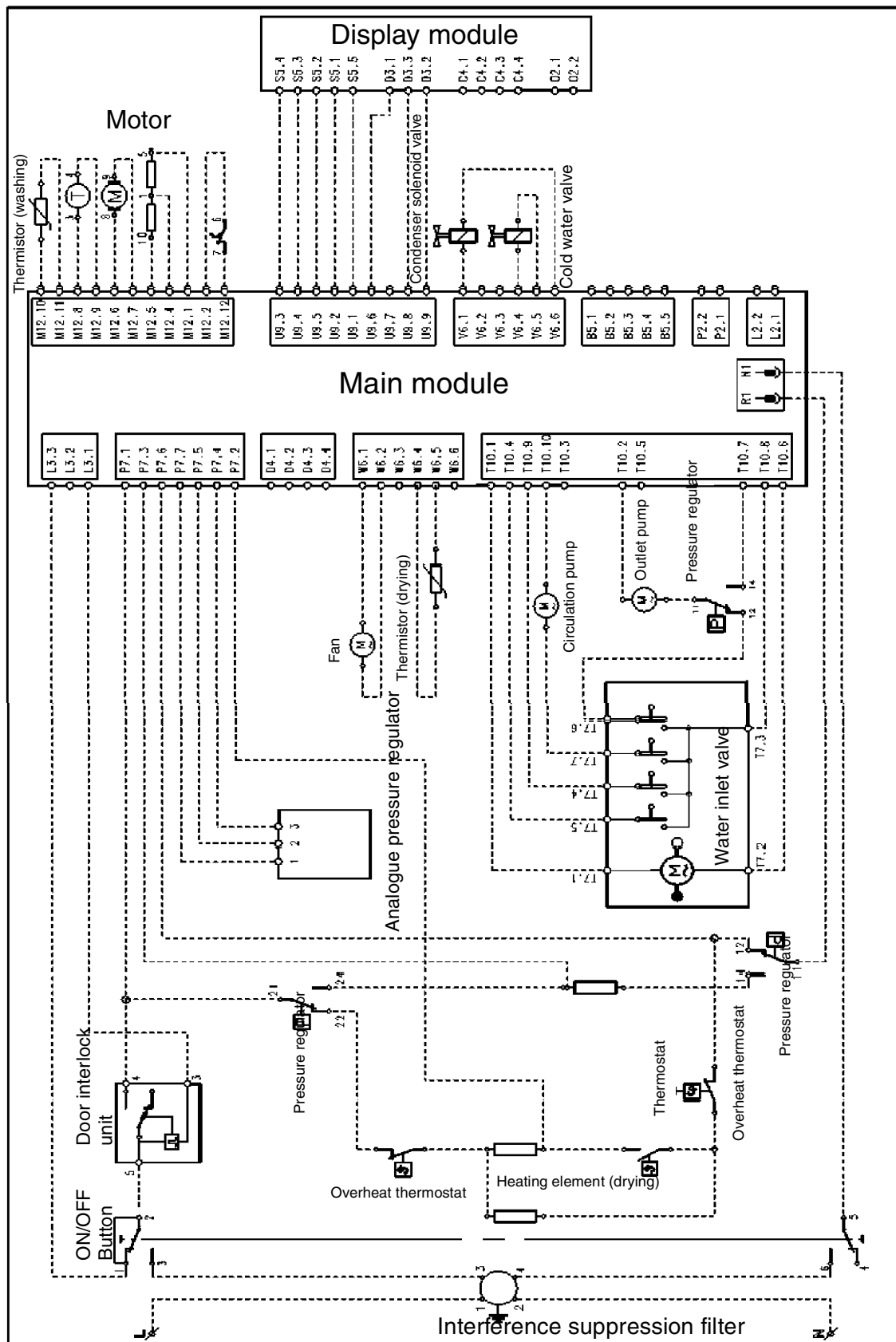
- e) Refit the screws to the heater duct.

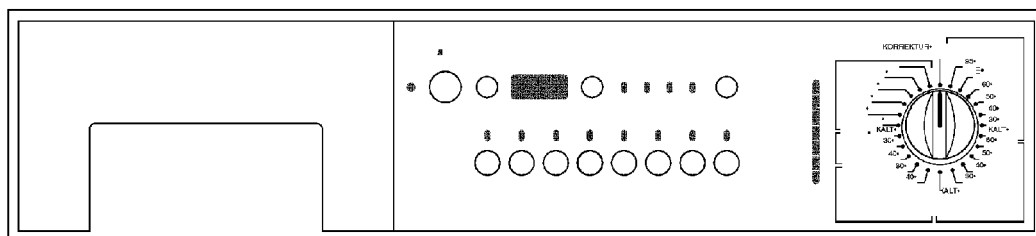
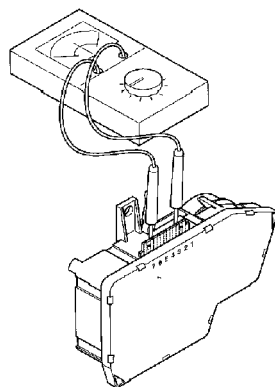
11. CIRCUIT DIAGRAMS

11.1 IWT 1259.0



IWT 1259.0





Fault Indicator and Test Programmes

Electronic Washing Machines

Multipanel Version

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12. INTRODUCTION

This documentation describes the fault indicator and the diagnostic and test programmes for electrical appliances (washing machines/ washer dryers) fitted with the MULTIPANEL system (version MWM 1.5).

You will also find here details of the control system for the fault indicator, diagnostic and test programmes.

How the System has been Designed

One of the fundamental characteristics of this system is that it is hidden from the consumer. In other words, if a fault occurs, the customer cannot access the diagnostic programmes nor can he/she see the codes or other information, except in a few instances.

All of the fault codes and fault data are stored in the EEPROM microprocessor.

Fault code

Number of faults logged (from the last system reset)

The EEPROM also stores information on:

- a) the last fault to occur
- b) the cycle and subdivision of the cycle during which it occurred, and
- c) the total number of complete programme cycles carried out by the machine (i.e. complete washing and drying cycles, excluding short cycles such as rinse, drain, spin, soak etc).

The test system is an extremely useful troubleshooting tool which helps you identify and repair each individual component in the machine.

Accessing the System

You can only access the system by following a special procedure for setting the machine to the appropriate maintenance mode.

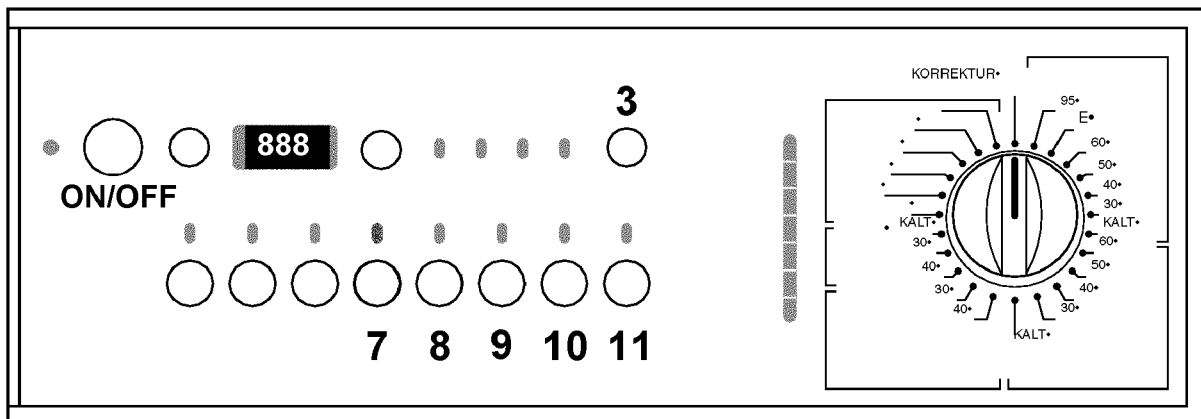
After carrying out a diagnostic or test programme, you can cancel the maintenance mode simply by switching off the machine.

When the machine is switched back on again, it will be in normal operating mode.

Reading the Fault Codes

If a fault occurs, the service technician can, by referring to the fault code table, discover all of the fault - conditions that have occurred during the lifetime of the machine. This information, in conjunction with the customer's description of the fault, enables the technician to accurately identify a defective component. To access this service tool, set the machine to "FAULT CODE DISPLAY" mode, by following the special set-up procedure.

13. FAULT CODES



13.1 Reading the Fault Codes

To read the fault codes, proceed as follows:

- ◆ Switch the machine on using the **ON/OFF** button, at the same time holding down buttons **10** and **7**.
- ◆ Press buttons **8** and **9** within five seconds.

The display will now alternately show the total number of cycles completed by the machine and the word **'tot'** (dead). You should multiply the number by 10 (e.g. If the machine has completed 251 programme cycles, you will see the number **25**).

Pressing any button now will show you the last fault code, alternating with the cycle and the subdivision the cycle during which the fault occurred. For example, **E30** alternating with **2-3** means: fault in the electronic pressure switch during the heating up phase in the washing programme.

Pressing the same button again will show all the faults that have previously occurred with the machine. The fault code and the number of interventions will appear alternately in the display.

If no previous faults have been logged, the number **A00** appears.

Switch the machine off and on to restart.

13.2 Resetting the Fault Log

After completing a repair, you can reset the fault log to zero, in order to re-examine the machine later.

To reset the fault log, proceed as follows:

- ◆ Switch the unit on using the **ON/OFF** button, at the same time pressing buttons **8** and **11**.
- ◆ Press buttons **10** and **7** within **five seconds**.

The fault resetting procedure will begin and take about 1 second. During this time the display will read **"EE"**.

If resetting is successful, you will see the word **"End"** on the display.

Switch the machine off and on to restart.

13.3 Fault Codes

Fault Code	Description	User Fault Code	Result of Fault	Possible Causes of Fault
E00	Water supply problem on wash cycle	E00	Programme pauses	Shut-off valve closed. Solenoid, inlet valve, wiring, main PCB, pressure switch.
E01	Water intake problem on drying cycle	E00	Programme pauses	Shut-off valve closed. Solenoid. Wiring, main PCB, pressure switch
E10	Draining problem on wash cycle	E10	Programme pauses	Kink in outlet hose, blocked filter, outlet pump, inlet valve, wiring. main PCB, pressure switch
E11	Draining problem on drying cycle	E10	Programme pauses	Kink in outlet hose, blocked filter, outlet pump, inlet valve.
E20	Door open	E20	Programme pauses	Door delay unit, wiring, main PCB
E21	Defective supply triac in door delay unit	E20	Programme pauses	Wiring, main PCB
E30	Defective electronic pressure switch	---	Programme stops	Electron. pressure switch, wiring, main PCB
E31	Fault in electr. pressure switch circuit	---	Programme stops	Main PCB (fault in electronic pressure switch circuit)
E32	Calibration error in electronic pressure switch	E10	Programme pauses/stops	Electron. pressure switch, outlet pump, wiring, main PCB
E33	Incompatibility between electronic pressure switch and safety pressure switch 1	---	Programme stops	Electron. pressure switch, safety pressure switch, wiring, main PCB
E34	Incompatibility between electronic pressure switch and safety pressure switch 2	---	Programme stops	Electron. pressure switch, safety pressure switch, wiring, main PCB
E35	Overflow pressure switch triggered	---	Programme stops	Solenoid valve, water inlet valve, wiring, main PCB, overflow pressure switch
E36	Water leaks (with more than 15 reset operations)	---	Programme stops	Water leaks, drain hose too low, pressure switch, wiring, main PCB
E40	Short-circuited motor supply triac	---	Programme stops	Main PCB (triac short-circuit)
E41	No signal from tachogenerator	---	Programme stops	Motor tachogenerator, wiring, main PCB
E42	Fault in motor circuit of tachogenerator	---	Programme stops	Main PCB (circuit reading (tachogenerator))
E43	Motor protection switch triggered	---	Programme stops	Motor, wiring, main PCB
E50	Insufficient water heating during wash cycle	---	Skips a cycle	NTC thermistor out of calibration heating element, wiring, main PCB
E51	Overheating on wash cycle	---	Cooling, draining and programme stop	Heating element (earthed), main PCB relay
E52	Air not heating up sufficiently on drying cycle	---	Skips a cycle	NTC thermistor out of calibration, safety pressure switch, thermostats, drying heater element, wiring, main PCB (relay)

Fault Code	Description	User Fault Code	Result of Fault	Possible Causes of Fault
E53	Overheating on drying-cycle	---	Skips a cycle	Heating element (earthed), main PCB (relay)
E54	Blockage in drying condenser	---	Skips a cycle	Blockage in drying condenser safety pressure switch, main PCB
E55	Faulty supply relay (K3) to heating element	---	Programme stops	Safety pressure switch 2, wiring, main PCB
E60	Defective NTC thermistor (washing)	---	Skips a cycle	Defective NTC thermistor (washing), wiring main PCB
E61	Defective NTC drying thermistor (condenser)	--	Skips a cycle	Defective NTC drying thermistor (condenser), wiring main PCB
E62	Defective NTC drying thermistor (outlet duct)	---	Skips a cycle	Defective NTC drying thermistor (outlet duct), wiring, main PCB
E63	Defective half-power thermostat	---	Skips a cycle	Defective NTC drying thermistor (outlet duct), half-power thermostat, wiring, main PCB
E70	Short-circuited supply triac for water inlet unit stepper motor	---	Programme stops	Main PCB (triac short-circuit)
E71	Defective supply relay, inlet valve - load	---	Programme stops	Main PCB (relay open)
E72	No signal, water inlet unit - position	---	Programme stops	Water inlet unit stepper motor, wiring, main PCB
E73	Incorrect timing of inlet valve contacts	---	---	Water inlet unit, wiring main PCB
E82	Defective programme selector (showing unknown setting)	---	None during programme. LED's go out when setting programmes	Programme selector, wiring, display PCB, main PCB
E90	Defective tank filling pump	---	Programme stops	Blocked hose, tank filler pump,,wiring
E91	Defective tank drain pump	---	Programme stops	Blocked hose, tank drain pump, wiring
E92	Defective supply triac in tank filler pump	---	Programme stops	Tank filler pump, wiring main PCB

To bypass the fault condition, proceed as follows:

- ◆ If the machine is on PAUSE, press the ON/ PAUSE button to instruct the machine to repeat the last cycle.
- ◆ If the machine has stopped, use the ON/ OFF switch.

The following table lists all the cycles and subdivisions of these cycles, together with the codes which appear (alternately with the fault codes) when they are running.

The first number refers to the cycle and the second to the subdivision of the cycle.

<i>Cycle</i>		<i>Subdivision</i>	
Number	Description	Number	Description
0	Programme or delay timer setting	---	---
1	Prewash/ soak	1	Water intake
2	Main wash	2	Agitation
3	1st rinse	3	Heating
4	2nd rinse	4	Drain
5	3rd rinse	5	Spin
6	4th rinse	6	Dry
7	Fabric treatment	7	Test
8	Spin	---	---
9	Dry	---	---
A	Cool	---	---
B	Creasecare	---	---
C	Test	---	---
D	End of programme	---	---

14. DIAGNOSTIC PROGRAMMES

Using the diagnostic and test programmes, you can check all the components in the machine very quickly. The system is capable of automatic diagnosis but allows for “manual” testing as well.

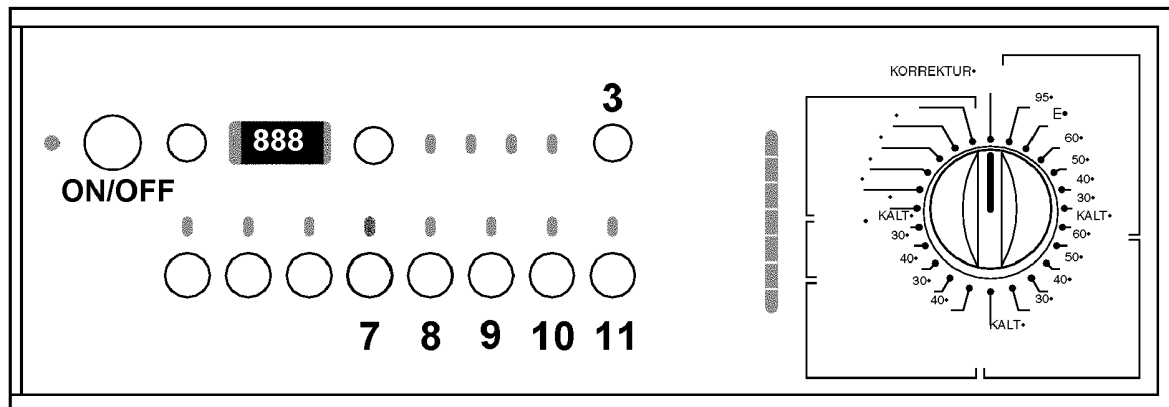
To access the diagnostic programme, set the machine to “TEST MACHINE” mode, by following the special set-up procedure.

Checking the Electromechanical Components:

Checking these components is quite complex and often requires certain conditions to be met. For example, before you can test the wash programme heating element, there must be water in the tub. For this reason, functional programmes (washing and drying) have been developed to allow the testing of individual components using a special test procedure. It is also possible to read some of the variables monitored by the microprocessor during the different programme cycles, in order to confirm the value of a particular component or to make sure it is working properly.

A special self-diagnosis programme has been developed to check the operation of the water inlet valve, as the traditional visual inspection and meter test is particularly awkward on this component.

14.1 Diagnostic Programme – Display and Switch Module



This diagnostic programme checks all of the components on the control panel. Although it doesn't actually activate the functions, it tests each individual button, LED and the programme selector.

Accessing the Diagnostic Programme:

- ◆ Switch the machine on using the **ON/OFF** button, at the same time holding down buttons **8** and **9**.
- ◆ Press buttons **3** and **11** within **five seconds**.

If you have successfully activated the diagnostic mode, you will see "**t01**" in the display for 3 seconds. Then the appliance model configuration reference, i.e. 100, will appear.

By pressing each button in turn, you will see the corresponding LED light up. The display will show a number and you will hear a beep.

When you turn the programme selector, you will see a number on the display between 1 and 23 that refers to the position of the knob. If you select RESET, you will see the number **88**.

Turn the knob to the first position – WHITES 95 °C – and the number **1** will appear. Carry on turning the knob in a clockwise direction and the subsequent numbers **2**, **3** etc. will be displayed.

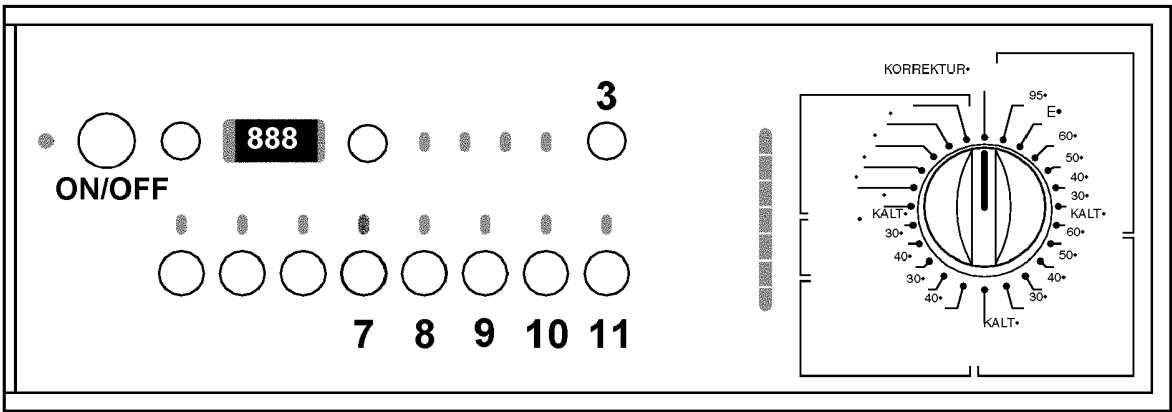
The letters **FF** appear if the programme fails to obtain a reading, or if a particular switch position is not valid.

If the selector switch is held in the same position for longer than 2 seconds, the machine's configuration reference number will reappear.

If you cannot access the diagnostic programme, there may be a problem with:

- ◆ the wiring between the two PCBs
- ◆ the main PCB
- ◆ the display module

14.2 Water Inlet Valve Diagnostic Programme



This self-diagnostic programme can check the operation of the following components:

- ◆ Water inlet valve stepper motor
- ◆ Contact timing

A fault code will appear if any fault is found.

Accessing the Diagnostic Programme:

- ◆ Switch the machine on using the **ON/OFF** button, at the same time holding down buttons **7** and **10**.
- ◆ Press buttons **3** and **11** within **five seconds**.

If you have successfully activated the diagnostic mode, you will see "t02" in the display for 3 seconds.

By pressing a button, you can now advance the inlet water valve by one position at a time, from position "0" through to position 16. Then use a meter to check that the contacts are closing properly (see table below):

Position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
T7.5 - T7.3																	
T7.7 - T7.3																	
T7.6 - T7.3																	
T7.4 - T7.3																	

14.3 Diagnostic Programme - Washing

This diagnostic programme provides a semi-automatic check of all components used by the machine during the washing programmes.

Accessing the diagnostic programme:

- ◆ Switch the machine on using the ON/OFF button, at the same time holding down buttons **7** and **9**.
- ◆ Press buttons **8** and **10** within **five seconds**.

If you have successfully activated the diagnostic mode, you will see "**t03**" in the display for 3 seconds.

The diagnostic programme is divided into phases; one or more components may be tested during each phase.

It is possible to exit certain of the phases before completion by pressing the **11** button.

All of the fault code functions are active and are displayed during each phase.

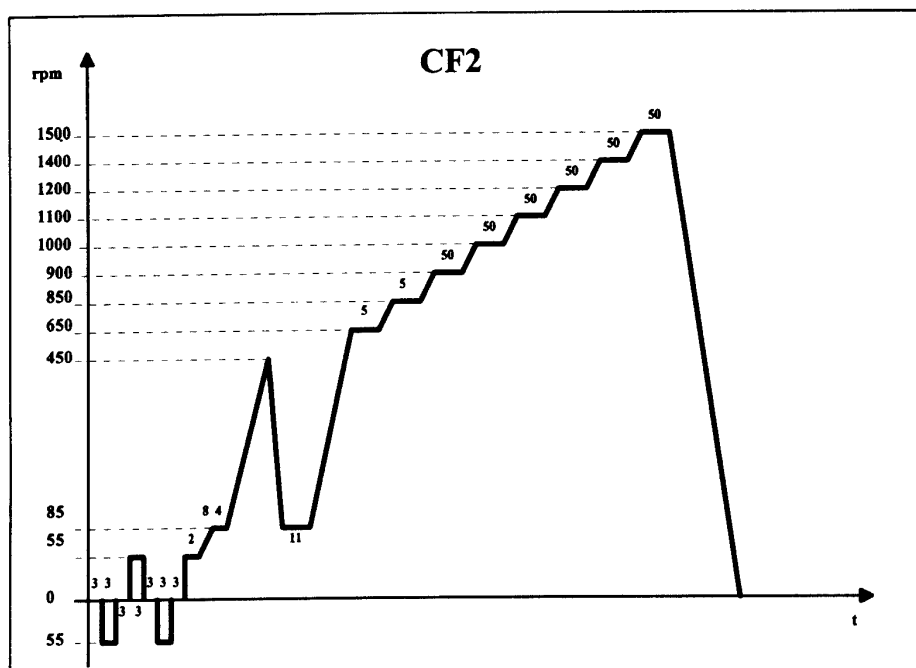
Press button **3** to view a number of variable parameters. First, the parameter reference appears briefly (PO1, PO2 etc.), then its value.

- ◆ **P1:** Water level (mm)
- ◆ **P2:** Condition of safety pressure switch 1(0-1)
- ◆ **P3:** NTC thermistor (°C), washing
- ◆ **P4:** Motor speed, washing (rpm x 10)
- ◆ **P5:** Position of water inlet valve (0 – 16)

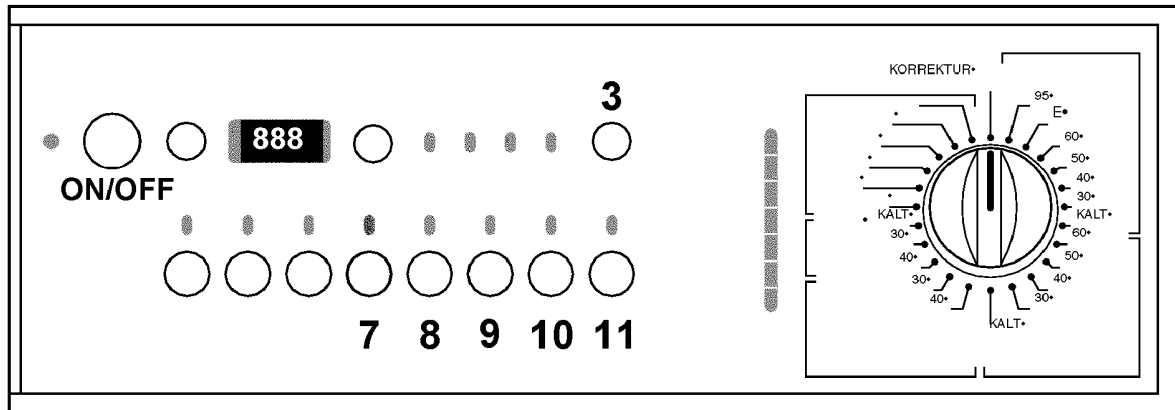
Phase	Test	Loading Activated	State at End of Phase	Exit from Phase Possible
1	Calibration electron. pressure switch	Drain pump Water inlet valve	Draining tub Calibration completed	NO
2	Water supply prewash dispenser	Solenoid valve Water inlet valve	1st water level reached	NO
3	Water supply to mainwash dispenser	Solenoid valve Water inlet valve	Timeout (8 seconds)	YES
4	Water supply to bleach dispenser	Solenoid valve Water inlet valve	Timeout (8 seconds)	YES
5	Water supply to fabric conditioner dispenser	Solenoid valve Water inlet valve	Timeout (8 seconds)	YES
6	Circulation pump	Water inlet valve Circulation pump	Timeout (10 minutes)	YES
7	Heating	Heating element Circulation pump	Timeout (10 minutes)	YES
8	Motor rotation	Motor, turning 15 sec. to the right 4 second pause 15 sec. to the left	Timeout (10 minutes)	YES
9*	Filling tank	Tank filler pump	Timeout (10 minutes)	YES
10*	Emptying tank	Tank drain pump	Timeout (10 minutes)	YES
11	Drain	Drain pump. Water inlet valve	Empty level reached	NO
12	Spin	Motor end of spin	Spin stop	YES

* only on models fitted with a tank

Spin (phase 12)



14.4 Diagnostic Programme - Drying



This diagnostic programme provides a semi-automatic check of all components used by the machine during the drying programmes.

Accessing the Diagnostic Programme

- ◆ Switch the machine on using the **ON/OFF** button, at the same time holding down buttons **8** and **10**.
- ◆ Press buttons **7** and **9** within **five seconds**.

If you have successfully activated the diagnostic mode, you will see **"t04"** in the display for 3 seconds. The diagnostic programme is subdivided into individual programme phases; one or more components can be tested during each phase. It is possible to exit certain of the phases before completion by pressing the **11** button.

All of the fault code functions are active and are displayed during each phase.

Press button **3** to view a number of variable parameters. First, the parameter reference appears briefly (PO1, PO2 etc.), then its value.

- ◆ **P1:** Water level (mm)
- ◆ **P2:** Condition of safety pressure switch 1(0-1)
- ◆ **P3:** Condition of half-power thermostat (0-1)
- ◆ **P4:** Motor speed (rpm x 10)
- ◆ **P5:** Position of water inlet valve (0 – 16)
- ◆ **P6:** Outlet duct NTC thermistor, drying (°C)
- ◆ **P7:** NTC thermistor, drying - condenser (°C)

Phase	Test	Loading Activated	State at End of Phase	Exit from Phase Possible
1	Calibration electron. pressure switch	Drain pump, inlet valve	The tub is emptied when the calibration is finished.	NO
2	Condenser fan	Motor fan Condenser solenoid valve	Timeout (10 Minuten)	JA
3	Drain	Drain pump, inlet valve	Empty level reached	NO
4	Drying, half-power	One rod of the dryer heating element	Closing of ½ power thermostat Half-power	NO
5	Drying (full power)	Both rods of the dryer heating element, motor fan, condenser solenoid valve	Timeout (10 minutes)	YES