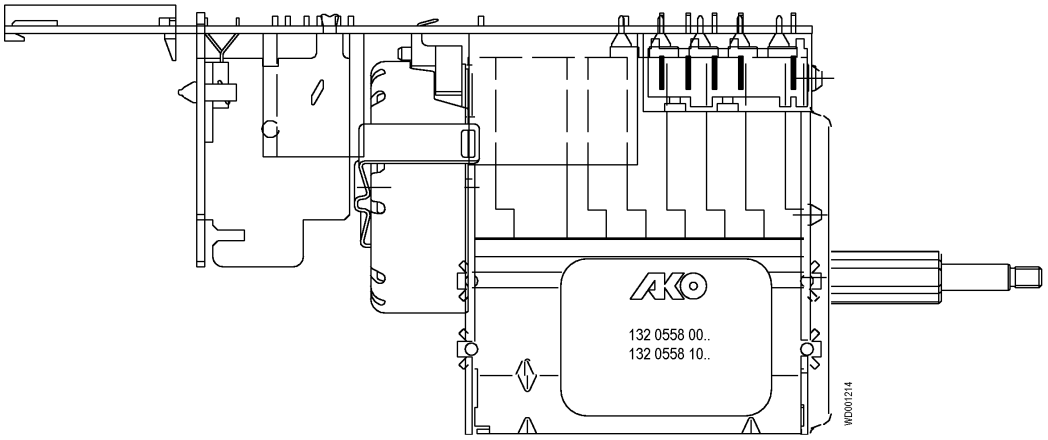
Electrolux DISTRIPARTS ORIGINAL ©

SERVICE MANUAL

WASHING



WASHING MACHINES AND WASHER-DRYERS WITH TIMER
132 0558 1..

FUNCTIONALITY
VS81 (AKO)

Spares & Service Documentation
Corso Lino Zanussi, 30
I - 33080 PORCIA /PN (ITALY)
Tel +39 0434 394850
Fax +39 0434 394096

Publication no.

599 34 85-05

IT/eb

Edition: 2001.08.28

CONTENTS

1 GENERAL FEATURES

The VS81 timer, manufactured by AKO, is used in a number of front-loading washing machines and washer-dryers.

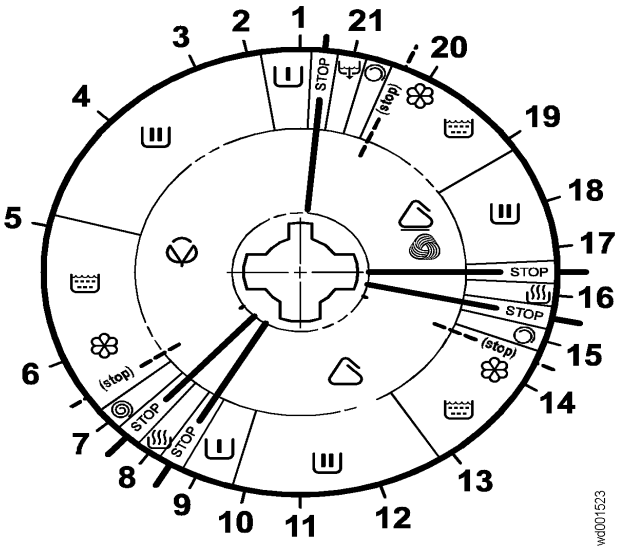
ZP: front-loading appliances produced in Italy (Porcia)
ZA: front-loading appliances produced in Spain (Alcalà)

FUNCTIONALITY	**VS 81 (ZP)**	**VS 81 (ZA)**
WASHING SYSTEM:	Traditional/with "Eco-ball"	Traditional/with "Eco-ball"
TYPE OF RINSE:	Traditional	Traditional
WATER FILL - "**EUROPE**" version - "**UK**" version	Cold Warm and cold	Cold Warm and cold
POWER SUPPLY - "**EUROPE**" version - "**UK**" version - "**Far East**" version	 230V - 10A 50Hz 240V - 10A 50Hz 220V - 10A 60Hz	 230V - 10A 50Hz 240V - 10A 50Hz 220V - 10A 60Hz
Control of water level in tub:	2 levels with pressure switch	2 levels with pressure switch
Washing temperature:	Fixed/adjustable	Fixed/adjustable
Temperature control:	NTC Sensor	NTC Sensor
Type of tub (drum volume):	G17 (26l); G18 (38 L); G19 (42l); G20 (47 L)	G800 (41l) G1000 (41l)
Type of motor:	commutator	commutator
Final spin speed:	850÷1150	800-1000
Control of drying temperature (washre/dryers)	Timer-controlled (max. 120 minutes)	------

2 WASHING PROGRAMMES

"EUROPE" MODELS (cold water solenoid only)						
	Models with fixed temperatures			**Models with adjustable temperatures**		
	COTTON - LINEN	Wash (°C)	Rinses	**COTTON - LINEN**	Wash (°C)	Rinses
1	WHITES WITH PREWASH	95	3	WHITES/COLOUREDS WITH PREWASH	30-95	3
2	WHITES	95	3	WHITES/COLOUREDS	30-95	3
3	COLOUREDS-FAST	60	3	-----	-	-
4	DELICATE COLOUREDS	40	3	-----	-	-
5	RINSES	-	4	RINSES	-	4
6	CONDITIONER	-	1	CONDITIONER	-	1
7	SPIN	-	-	SPIN	-	-
8	DRYING (washer-dryers only)	-	-	DRYING (washer-dryers only)	-	-
	SYNTHETICS-MIXED			**SYNTHETICS-MIXED**		
9	WHITES WITH PREWASH	60	3	WHITES/COLOUREDS WITH PREWASH	30-60	3
10	WHITES	60	3	WHITES/COLOUREDS	30-60	3
11	COLOUREDS	40	3	-----	-	-
12	SHORT CYCLE	30	3	SHORT CYCLE	30	3
13	RINSES	-	3	RINSES	-	3
14	CONDITIONER	-	1	CONDITIONER	-	1
15	SHORT SPIN	-	-	SHORT SPIN	-	-
16	DRYING (washer-dryers only)	-	-	DRYING (washer-dryers only)	-	-
	DELICATES - WOOL			**DELICATES - WOOL**		
17	WOOL	40	3	WOOL	40	3
17	-----	-	-	HAND WASH	30	3
18	DELICATES	40	3	DELICATES	30-40	3
19	RINSES	-	3	RINSES	-	3
20	CONDITIONER	-	1	CONDITIONER	-	1
21	DRAIN	-	-	DRAIN	-	-

The programmes can be modified using the following push-button:
SHORT CYCLE
- only in programmes 1, 2, 3, 4, 9, 10 and 11



"UK" MODELS (warm and cold water solenoid)						
	Models with fixed temperatures			**Models with adjustable temperatures**		
	COTTON - LINEN	Wash (°C)	Rinses	**COTTON - LINEN**	Wash (°C)	Rinses
1	WHITES WITH PREWASH	95	3	WHITES/COLOUREDS WITH PREWASH	40-95	3
2	WHITES	95	3	WHITES/COLOUREDS	40-95	3
3	COLOUREDS-FAST	60	3	-----	-	-
4	DELICATE COLOUREDS	40	3	DELICATE COLOUREDS	30-40	3
5	RINSES	-	4	RINSES	-	4
6	CONDITIONER	-	1	CONDITIONER	-	1
7	SPIN	-	-	SPIN	-	-
8	DRYING (washer-dryers only)	-	-	DRYING (washer-dryers only)	-	-
	SYNTHETICS-MIXED			**SYNTHETICS-MIXED**		
9	WHITES WITH PREWASH	50	3	WHITES/COLOUREDS WITH PREWASH	30-50	3
10	WHITES - minimum iron	50	3	WHITES/COLOUREDS	30-50	3
11	ANTI-CREASE	40	3	ANTI-CREASE	30-40	3
12	SHORT CYCLE	30	3	SHORT CYCLE	30	3
13	RINSES	-	3	RINSES	-	3
14	CONDITIONER	-	1	CONDITIONER	-	1
15	SHORT SPIN	-	-	SHORT SPIN	-	-
16	DRYING (washer-dryers only)	-	-	DRYING (washer-dryers only)	-	-
	DELICATES - WOOL			**DELICATES - WOOL**		
17	WOOL	40	3	WOOL	40	3
17	-----	-	-	HAND WASH	30	3
18	DELICATES	40	3	DELICATES	30-40	3
19	RINSES	-	3	RINSES	-	3
20	CONDITIONER	-	1	CONDITIONER	-	1
21	DRAIN	-	-	DRAIN	-	-

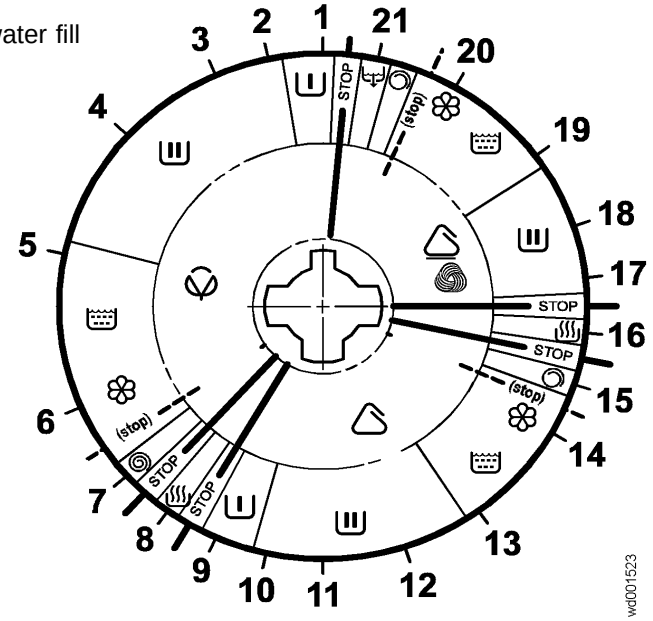
Water fill:

- Programmes with heating to 70-95°C: hot water fill
- Programmes with heating to 50-60°C: hot and cold water fill
- Programmes with heating to ≤ 40°C: cold water fill

Programmes can be modified using following push-buttons:

SHORT CYCLE
- Only in programmes 1, 2, 3, 4, 9, 10 and 11

HEAVY SOIL
- Only in programmes 1, 2, 3, 9 and 10



2.1 PUSH-BUTTON FUNCTIONS

2.1.1 ON/OFF

- Switches the appliance ON and OFF.

2.1.2 Half load

- Eliminates one rinse in COTTON programmes (at first level). This function has no effect in the RINSE cycle (5).

2.1.3 Extra rinse

- Adds one rinse in COTTON cycles (at second level). This function has no effect in the RINSE cycle (5).

2.1.4 Rinse hold

- Stops the appliance with water in the tub at the end of the final rinse; this function can be selected in the COTTON, SYNTHETICS, DELICATES and WOOL cycles.
  When the same button is pressed again, the programme is completed by the drain and spin phases.

2.1.5 Heavy soil

- Models with hot and cold water fill only: the appliance fills with cold water only in the 60-90°C COTTON and 50°C SYNTHETICS cycles.

2.1.6 Cold wash

- Skips the heating phases in all programmes.

2.1.7 50°

- In 90°C COTTON cycles, reduces the temperature to 50°C and adds a 20-minute wash phase; in 60°C COTTON and 60°C SYNTHETICS cycles, reduces the temperature to 50°C.

2.1.8 No spin

- Eliminates all spins (intermediate and final); adds one rinse in COTTON cycles (to second level).

2.1.9 Reduced spin

- Reduces the final spins as shown in the table below (the intermediate spins are not affected in order to assure the efficiency of the rinses).

	Cotton				**Delicates (EU-UK)**	**Wool (EU-UK)**	
					Synthetics (UK washing machines only)	**Synthetics** (EU washing machines and all washer-dryers)	
Normal spin	800	850	1000	1150	650	800	850
Reduced spin	450	650	650	650	450	450	450

2.1.10 Short cycle

- Reduces the duration of the wash phases as follows: in 0-60°C COTTON cycles by approximately 30 minutes; in 70-90°C COTTON and SYNTHETICS cycles, by approximately 15 minutes.

2.1.11 Daily wash

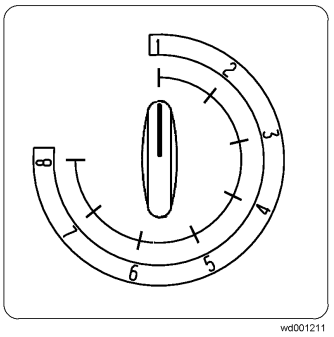
- Reduces the duration of the wash phases as follows: in 0-60°C COTTON cycles by approximately 15 minutes; in 70-90°C COTTON and SYNTHETICS cycles, by approximately 10 minutes.

2.2 SELECTORS FUNCTIONALITY

2.2.1 Washing temperature selector

An 8-position potentiometer can be used to reduce the washing temperature as shown in the table below:

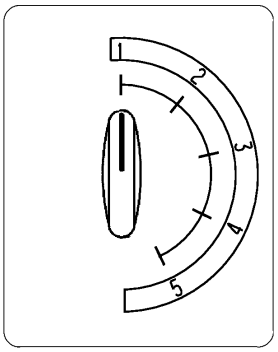
Position	COTTON (°C)	SYNTHETICS (°C)	DELICATES-WOOL PREWASH SOAK (°C)
1	Cold	Cold	Cold
2	30	30	30
3	40	40	40
4	50	50	40
5	60	60 (50 UK)	40
6	70	60 (50 UK)	40
7	80	60 (50 UK)	40
8	90	60 (50 UK)	40



wd001211

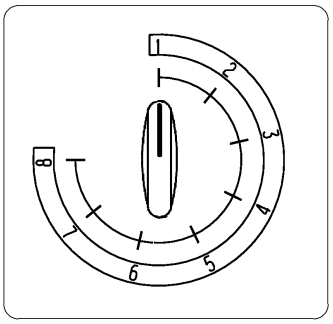
In some models you can also find a 5-position selector:

Position	COTTON (°C)	SYNTHETICS (°C)	DELICATES-WOOL PREWSH (°C)
1	Cold	Cold	Cold
2	30	30	30
3	40	40	40
4	50	50	40
5	60	60	40



2.2.2 Washing time selector

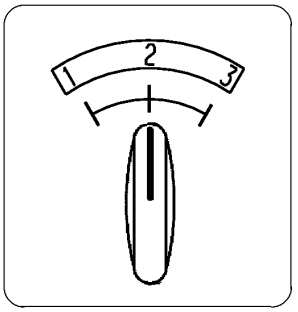
In certain models, this selector can be used to reduce the duration of the washing phase in COTTON and SYNTHETICS cycles. The table below shows the various times (which do NOT include the heating phase).
The <u>normal</u> duration of the cycle is shown in potentiometer position no. 8, which corresponds to the cycle used to obtain the consumption data (Energy Label).



wd001211

Position of potentiometer	COTTON 0÷ 60°C Time reduction (min)	COTTON 70 ÷ 90°C Time reduction (min)	SYNTHETICS Time reduction (min)
1	-28'	-14'	-14'
2	-24'	-12'	-12'
3	-20'	-10'	-10'
4	-16'	-8'	-8'
5	-12'	-6'	-6'
6	-8'	-4'	-4'
7	-4'	-2'	-2'
8	Standard cycle	Standard cycle	Standard cycle

2.2.3 Wash load selector

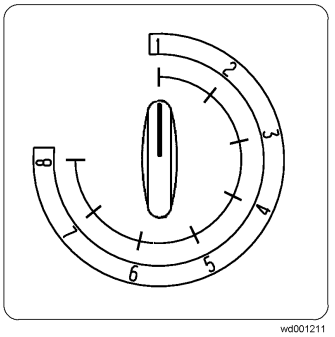


wd001213

In some washing machines, a 3-position commutator can be used to modify the structure of the COTTON cycles according to the quantity of washing in the drum (the intermediate position corresponds to the standard programme).

Selector position	COTTON 70 ÷ 90	COTTON 0 ÷ 60
1	Adds 1 rinse at second level	Adds 1 rinse at second level
2	**Standard cycle**	**Standard cycle**
3	eliminates 1 rinse, reduces washing time by 8 minutes (heating unaltered)	eliminates 1 rinse, reduces washing time by 16 minutes (heating unaltered)

2.2.4 Spin speed selector (**8-position**)

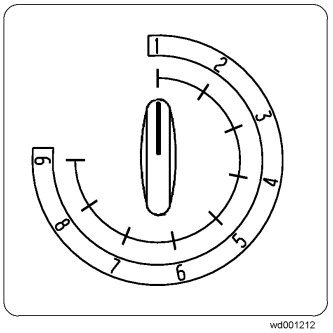


wd001211

This selector reduces the speed of the **final spins** as shown in the table below (the intermediate spins are not affected in order to assure the efficiency of the rinses).

Programmes		**COTTON**				**DELICATES** **SINTETICI** (**UK** washing machines only)	**WOOL** (all versions) **SYNTHETICS** (**EU** washing machines and all washer-dryers)	
Spin type		**CF**				**C6**	**C4**	
Position of selector	1	0	0	0	0	0	0	0
	2	350	450	450	450	350	350	350
	3	400	550	550	550	400	400	400
	4	450	650	650	650	450	450	450
	5	550	700	725	750	500	550	550
	6	650	750	800	850	550	650	650
	7	750	800	900	1000	600	750	750
	8	800	850	1000	1150	650	800	850

2.2.5 Spin speed and rinse hold selector (9-position)



In this case it is used a 9-position potentiometer.
In the first position (rinse hold), the appliance stops leaving the water in the tub at the end of the final rinse. This function can be selected for COTTON, SYNTHETICS, DELICATES and WOOL cycles.
The intermediate spin cycles are not affected. To restart the appliance and complete the programme, it is sufficient to turn the potentiometer to select the desired spin speed.
In the remaining positions, this selector reduces the speed of the **final spin** as shown in the table below (the intermediate spins are not affected in order to assure the efficiency of the rinses).

Programmes		**COTTON**				**DELICATES**	**WOOL** (all versions)	
						SYNTHETICS (**UK** washing machines only)	**SYNTHETICS** (**EU** washing machines and all washer-dryers)	
Type of spin		**CF**				**C6**	**C4**	
Position of the selector	1	Rinse hold	Rinse hold	Rinse hold	Rinse hold	Rinse hold	Rinse hold	Rinse hold
	2	0	0	0	0	0	0	0
	3	350	450	450	450	350	350	350
	4	400	550	550	550	400	400	400
	5	450	650	650	650	450	450	450
	6	550	700	725	750	500	550	550
	7	650	750	800	850	550	650	650
	8	750	800	900	1000	600	750	750
	9	800	850	1000	1150	650	800	850

2.2.6 Drying time selector (washer-dryers)

This knob can be used to select the duration of the drying phase:

- the first sector, with a maximum duration of 120 minutes, is used for cotton, with both elements of the drying heater switched on.

- the second sector, also with a maximum duration of 120 minutes, is used for synthetics, with only one element of the drying heater switched on (delicate drying).

The following factors should be taken into consideration when selecting the drying time:

- the quantity of washing in the drum (maximum half load)
- the spin speed
- the desired degree of dryness

Drying can be selected as a separate programme (n° **8** and n° **16**) or together with any programme for COTTON or SYNTHETIC FABRICS. In the latter case, it is sufficient to select the desired drying time; drying will start automatically at the end of the wash cycle.

The knob should be turned only in a clockwise direction.

2.3 COTTON PROGRAMMES - MODELS WITH FIXED TEMPERATURES

Prog	10/07/01 Step	Press.	Basic function	Lev	Det. disp	COTTON (fixed temperatures) 90° with pre-wash.	90°	60°	40°	OPTIONS Cold wash	Washing temp.	1/2 load	Extra rinse	Rinse hold	No spin	Red. spin	Auto dry	VS81 Notes
1	1	L1	Fill+rinse+wash	2	PW	L1+40° D				L1+2.5"								Cold water / TO = 30'
	2	L2	Fill+wash	2	PW	10'D												
2	3	L1	Drain+spin/R.A.		PW	L1<+C1+10"	L1<+5"								L1<+45"			
	4	L1	Drain		PW	2.5"	2.5"											
3	5	L1	Drain		PW	2.5"	2.5"	L1<+8"										
	6	L1	Fill (mix)	1	PW	2.5"	12.5"	12.5"		2.5"								Hot and cold water for UK
	7	L1	Fill (mix)	1	W	2.5"	2.5"	L1+10' N		2.5"								Hot and cold water for UK
	8	L1	Fill (hot)	1	W	L1+10' N	L1+10' N	2.5"		2.5"								Hot water for UK
4	9	L1	Fill (cold)	1	W	2.5"	2.5"	2.5"	L1+10' N	L1+10'N	3' - 10'N							Cold water
	10	L1	Fill+rinse+wash	1	W	L1+87° N	L1+87° N	L1+57° N	L1+42° N	L1+2.5"								Cold water / TO = 75'
	11		Wash		W	20' N+3' D1	20' N+3' D1	20' E+3' D1+ 20' E+3' D1	20' E+3' D1+ 20' E+3' D1		6' - 20' N or 12'- 40' E							
	12	L2	Fill	2	W	L2+2' N	L2+2' N	2.5"	2.5"									Fill to 2nd level if T>57°
	13	L1	Drain+spin		W	L1<+C2+10"	L1<+C2+10"	L1<+C2+10"	L1<+C2+10"						L1<+ 150"			
5	14	L1	Fill+wash	1	B	L1+ t1 N	L1+ t1 N	L1+ t1 N	L1+ t1 N									t1 = 3' after last reset
	15	L1	Drain+spin		B	L1<+C5+10"	L1<+C5+10"	L1<+C5+10"	L1<+C5+10"			2.5"			L1<+ 45"			No spin prevails
	16	L2	Fill+wash	2	B	L2+ t1 N	L2+ t1 N	L2+ t1 N	L2+ t1 N									t1 = 3' after last reset
	17	L1	Drain+spin		B	2.5"	2.5"	2.5"	2.5"				L1<+C5		L1<+ 45"			No spin prevails
	18	L2	Fill+wash	2	B	2.5"	2.5"	2.5"	2.5"				L2+ t1 N		L2+ t1 N			t1 = 3' after last reset
	19	L1	Drain+spin		B/S	L1<+C5+10"	L1<+C5+10"	L1<+C5+10"	L1<+C5+10"						L1<+ 45"			
6	20	L2	Fill (cleaning)	2	S	L2+ 2.5"	L2+ 2.5"	L2+ 2.5"	L2+ 2.5"									Fan
	21	L2	Fill+wash	2	S	L2+ t1 N	L2+ t1 N	L2+ t1 N	L2+ t1 N									t1 = 3' after last reset
	22	L1	R.A.		>	2.5"	2.5"	2.5"	2.5"					Stop				
7	23	L1	Drain+spin		>	L1<+CF+2' D1	L1<+CF+2' D1	L1<+CF+2' D1	L1<+CF+2' D1						L1<+ 80"+2'D1	X		CF: see figure
	24	L1	STOP		>	STOP	STOP	STOP	STOP								2.5"	
8	25		Drain+drying		>	DRY	DRY	DRY	DRY									R.A. if no drying/TO = 150'
	26		STOP		>	STOP	STOP	STOP	STOP									

Notes:
- Step 6: 20 sec fill instead of 12.5" in "EU" version
- Programmes 1, 2, 3 and 4 select "half load" automatically if no reset in step 14
- Programme 5: always 4 rinses (1 at level 1, 3 at level 2)
- In 800 rpm models, programmes 1 and 2 heat to 82°C instead of 87°C.

2.4 PROGRAMMES FOR SYNTHETICS/MIXED FABRICS - MODELS WITH FIXED TEMPERATURES

Prog	10/07/2001				Det. disp	SYNTHETICS (Fixed temperatures)					OPTIONS						VS81
	Step	Press.	Basic function	Lev		60° with pre-wash	60°	40°	30°	Rinses	Cold wash	Wash time	Rinse hold	No spin	Red. spin	Auto drying	Notes
9	27	L1	Fill+rinse+wash	2	PW	L1+40° D					L1+2.5"						Cold water / TO = 30'
	28	L2	Fill+wash	2	PW	10' D											
10	29	L1	Drain+spin/R.A.		PW	L1<+C1+10"	L1<+5"							L1<+ 45"			
	30	L1	Fill+wash	1	W	L1+10' N	L1+10' N				2.5"						Hot and cold water for UK
11	31	L1	Fill+wash	1	W	2.5"	2.5"	L1+10' N			L1+10' N	3' ÷ 10'N					Cold water
	32	L1	Fill+rinse+wash	1	W	L1+50° E	L1+50° E	L1+40° E			L1+2.5"						Cold water / TO = 30'
	33		Wash		W	20' E	20' E	20' E				6' ÷ 20'E					
12	34	L1	Fill+rinse+wash	2	W	2.5"	2.5"	2.5"	L1+30° D		2.5"						Cold water / TO = 20'
	35	L2	Fill+wash	2	W	L2+2' N	L2+2' N	L2+2' N	L2+6' D								
	36	L1	Drain		W	L1<+45" E	L1<+45" E	L1<+45" E	L1<+30"								Movimento E da L>
13	37	L1	Fill+wash	2	B	L1+3' E	L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	38	L1	Drain		B	L1<+45" E	L1<+45" E	L1<+45" E	L1<+30"	L1<+30"							Movimento E da L>
	39	L1	Fill+wash	2	B	L1+3' E	L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	40	L1	Drain+spin		B/S	L1<+C1+10"	L1<+C1+10"	L1<+C1+10"	L1<+45"	L1<+45"				L1<+ 45"			If C1 present
14	41	L1	Fill+wash	2	S	L1+3' E	L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	42		Rinse hold		>	STOP	STOP	STOP	STOP	STOP			X				R.A. if rinse hold not activated
15	43	L1	Drain+spin		>	L1<+C6+2' D1	L1<+C6+2' D1	L1<+C6+2' D1	L1<+C6+2' D1	L1<+C6+2' D1				L1<+ 20"+2'D1	X		C4 and C6: see figures
	44	L1	STOP		>	STOP	STOP	STOP	STOP	STOP						2.5"	
16	45		Drain+drying		>	Drying	Drying	Drying	Drying	Drying							R.A. if no drying/TO = 150'
	46		STOP		>	STOP	STOP	STOP	STOP	STOP							

Notes:
- The **57°C** temperature (instead of **50°C**) is obtained using jumper "EU"
- Spin **C4** instead of **C6** is performed by fitting jumpers "EU" or "WD"
- Steps **36** and **38**: movement "E" when pressure switch is on "FULL"

2.5 COTTON PROGRAMMES - MODELS WITH ADJUSTABLE TEMPERATURES

Prog	Step	10/07/2001			Det. disp.	COTTON (adjustable temperatures)				OPTIONS								VS81
		Press.	Basic functions	Lev		Cold - 90° with pre-wash	70° - 90° with pre-wash	50° - 60° with pre-wash	30° - 40°	Cold wash	Wash time	Half load	Extra rinse	Rinse hold	No spin	Red. spin	Auto drying	Notes
1	1	L1	Fill+rinse+wash	2	PW	L1+40° D				L1 + 2.5"								Cold water / TO 30'
	2	L2	Fill+wash	2	PW	10" D												
2	3	L1	Drain+spin/R.A.		PW	L1<C1+10"	L1<+5"	L1<+5"	L1<+5"						L1<+45"			
	4	L1	Drain		PW	2.5"	2.5"	2.5"	2.5"									
3	5	L1	Drain		PW	2.5"	2.5"	2.5"	2.5"									
	6	L1	Fill (mix)	1	PW	2.5"	12.5"	12.5"	12.5"	2.5"								Hot and cold water for UK
	7	L1	Fill (mix)	1	W	⇨	2.5"	L1+10' N	2.5"	2.5"								Hot and cold water for UK
	8	L1	Fill (hot)	1	W		L1+10' N	2.5"	2.5"	2.5"								Hot water for UK
4	9	L1	Fill (cold)	1	W		2.5"	2.5"	L1+10' N	L1+10'N	3' ÷ 10'N							Cold water
	10	L1	Fill+rinse+wash	1	W		L1+70°-87° N	L1+50°-57° N	L1+30°-42° N	L1+2.5"								Cold water / TO = 75'
	11		Wash		W		20' N+3' D1	20' E+3' D1+ 20' E+3' D1	20' E+3' D1+ 20' E+3' D1		6'÷20' No 12'÷40' E							
	12	L2	Fill	2	W		L2+2' N	2.5"	2.5"									Fill to 2nd level if T>57°
	13	L1	Drain+spin		W		L1<+C2+10"	L1<+C2+10"	L1<+C2+10"						L1<+ 150"			
5	14	L1	Fill+wash	1	B		L1+ t1 N	L1+ t1 N	L1+ t1 N									t1 = 3' after last reset
	15	L1	Drain+spin		B		L1<+C5+10"	L1<+C5+10"	L1<+C5+10"			2.5"			L1<+ 45"			No spin prevalent
	16	L2	Fill+wash	2	B		L2+ t1 N	L2+ t1 N	L2+ t1 N									t1 = 3' after last reset
	17	L1	Drain+spin		B		2.5"	2.5"	2.5"				L1<+C5		L1<+ 45"			No spin prevalent
	18	L2	Fill+wash	2	B		2.5"	2.5"	2.5"				L2+ t1 N		L2+ t1 N			t1 = 3' after last reset
	19	L1	Drain+spin		B/S		L1<+C5+10"	L1<+C5+10"	L1<+C5+10"						L1<+ 45"			
6	20	L2	Fill (cleaning)	2	S		L2+ 2.5"	L2+ 2.5"	L2+ 2.5"									Fan
	21	L2	Fill+wash	2	S		L2+ t1 N	L2+ t1 N	L2+ t1 N									t1 = 3' after last reset
	22	L1	R.A.		>		2.5"	2.5"	2.5"					Stop				
7	23	L1	Drain+spin		>		L1<+CF+2' D1	L1<+CF+2'D 1	L1<+CF+2'D1						L1<+ 80"+2'D1	X		CF: see figures
	24	L1	STOP		>		STOP	STOP	STOP								2.5"	
8	25		Drain+drying		>		Drying	Drying	Drying									R.A. if no drying/TO = 150'
	26		STOP		>		STOP	STOP	STOP									

Notes:

- Step **6**: 20 sec fill instead of 12.5" in "EU" version
- Programmes **1**, **2**, **3** and **4** select "half load" automatically if no reset in step 14
- Programme **5**: always 4 rinses (1 at level 1, 3 at level 2)
- In 800 rpm models, programmes **1** and **2** heat to 82°C instead of 87°C.

2.6 PROGRAMMES FOR SYNTHETICS/MIXED FABRICS - MODELS WITH ADJUSTABLE TEMPERATURES

Prog	10/07/2001				Det. disp.	SYNTHETICS (Adjustable temperatures)					OPTIONS						VS81
	Step	Press.	Basic functions	Lev		Cold - 50° with pre-wash	50°	30° - 40°	30°	Rinses	Cold wash	Half load	Extra rinse	No spin	Red. spin	Auto dry	Notes
9	27	L1	Fill+rinse+wash	2	PW	L1+40° D					L1+2.5"						Cold water / TO = 30'
	28	L2	Fill+wash	2	PW	10' D											
10	29	L1	Drain+spin/R.A.		PW	L1<+C1+10"	L1<+5"	L1<+5"						L1<+ 45"			
	30	L1	Fill+wash	1	W		L1+10' N	2.5"			2.5"						Hot and cold water for UK
11	31	L1	Fill+wash	1	W		2.5"	L1+10' N			L1+10' N	3' to 10'N					Cold water
	32	L1	Fill+rinse+wash	1	W		L1+50° E	L1+40° E			L1+2.5"						Cold water / TO = 30'
	33		Wash		W		20' E	20' E				6' to 20'E					
12	34	L1	Fill+rinse+wash	2	W		2.5"	2.5"	L1+30° D		2.5"						Cold water / TO = 20'
	35	L2	Fill+wash	2	W		L2+2' N	L2+2' N	L2+6' D								
	36	L1	Drain		W		L1<+45" E	L1<+45" E	L1<+30"								Movement E from L>
13	37	L1	Fill+wash	2	B		L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	38	L1	Drain		B		L1<+45" E	L1<+45" E	L1<+30"	L1<+30"							Movement E from L>
	39	L1	Fill+wash	2	B		L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	40	L1	Drain+spin		B/S		L1<+C1+10"	L1<+C1+10"	L1<+45"	L1<+45"				L1<+ 45"			If C1 present
14	41	L1	Fill+wash	2	S		L1+3' E	L1+3' E	L1+3' D	L1+3' D							
	42		Rinse hold		>		STOP	STOP	STOP	STOP			X				R.A. if rinse hold not activated
15	43	L1	Drain+spin		>		L1<+C6+2' D1	L1<+C6+2' D1	L1<+C6+2' D1	L1<+C6+2' D1				L1<+ 20"+2'D1	X		C4 and C6: see figures
	44	L1	STOP		>		STOP	STOP	STOP	STOP						2.5"	
16	45		Drain+drying		>		DRY	DRY	DRY	DRY							R.A. if no drying/TO = 150'
	46		STOP		>		STOP	STOP	STOP	STOP							

Notes:
- The **57°C** temperature (instead of **50°C**) is obtained using jumper "EU"
- Spin **C4** instead of **C6** by fitting jumpers "EU" or "WD"
- Steps **36** and **38**: movement "E" when pressure switch is on "FULL"

2.3 WOOL AND DELICATES PROGRAMMES – Models with fixed and adjustable temperatures

Prog	10/07/01				Det. Disp.	WOOL-DELICATES (all)			OPTIONS				VS81
	Step	Press.	Basic functions	Lev.		WOOL 30º - 40°	DELICATES 30º - 40°	Rinses	Cold wash	Rinse hold	No spin	Reduced spin	Notes
17	47	L2	Drain		W	L1< + 8"							
	48	L2	Fill+wash	2	W	L2 + 3' D3							Cold water
18	49	L1	Fill+rinse+wash	2	W	L1 + 40° D2	L1 + 40° D		L1+2.5"				Cold water / TO = 30'
	50	L2	Fill+wash	2	W	L2 + 14' D3	L2 + 14' D						Cold water
	51	L1	Drain		W	L1< + 30"	L1< + 30"						
19	52	L2	Fill+wash	2	B	L2 + 3' D3	L2 + 3' D	L2 + 3' D3					
	53	L1	Drain		B	L1< + 30"	L1< + 30"	L1< + 30"					
	54	L2	Fill+wash	2	B	L2 + 3' D3	L2 + 3' D	L2 + 3' D3					
	55	L1	Drain		B/S	L1< + 30"	L1< + 30"	L1< + 30"					
20	56	L2	Fill+wash	2	S	L2 + 3' D3	L2 + 3' D	L2 + 3' D3					
	57		Rinse hold		>	STOP	STOP	STOP		X			R.A. if Rinse hold is not active
	58	L1	Drain+spin		>	L1< + C4 + 10"	L1< + C6 + 10"	L1< + C6 + 10"			L1<+20"	X	C4 & C6 : see spin cycles
21	59	L1	Drain		>	L1< + 30"	L1< + 30"	L1< + 30"					
	60		STOP		>	STOP	STOP	STOP					

PROGRAMMES TABLE - KEY

L1 1st level
L2 2nd level
L1< "empty" on 1st level

R.A. rapid advance
TO maximum time (timeout)

Detergent dispenser:
PW prewash
W wash
B bleach
S conditioner

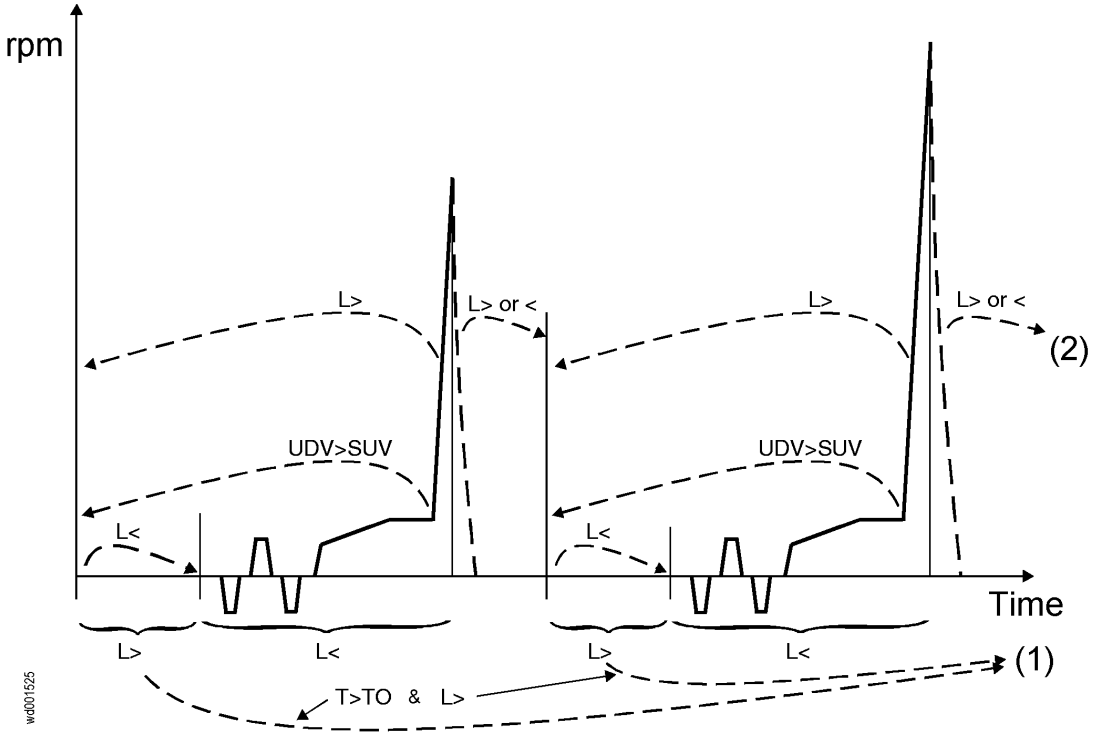
	MOVIMENTO MOTORE					
TYPE	**CLOCKWISE MOVEMENT (sec.)**	**PAUSE (sec.)**	**COUNTER-CLOCKWISE MOVEMENT (sec.)**	**PAUSE (sec.)**	**SPEED (rpm)**
D	4	12	4	12	52
D1	4	12	4	12	35
D2	2	58	2	58	35
D3	2	28	2	28	35
N	9	8	7	8	52
E	9	4	7	4	52
DRY	58	2	58	2	52

2.4 TYPES OF SPIN CYCLE

2.4.1 Anti-unbalancing during spinning

The check for balancing of the wash load is performed while the drum rotates at a speed of 85 rpm, before the spin phase. If the wash load is unbalanced, the spin cycle is not carried out; after rotating the drum several times at low speed in alternate directions, the spin cycle is restarted.
If the wash load is still unbalanced, this procedure is repeated until the correct balance is achieved.
If the wash load is still unbalanced after the maximum time (about 20 minutes), the timer passes to the subsequent phase and the spin cycle is skipped.

2.4.2 Example of intervention of anti-unbalancing and pressure switch level during spin phases



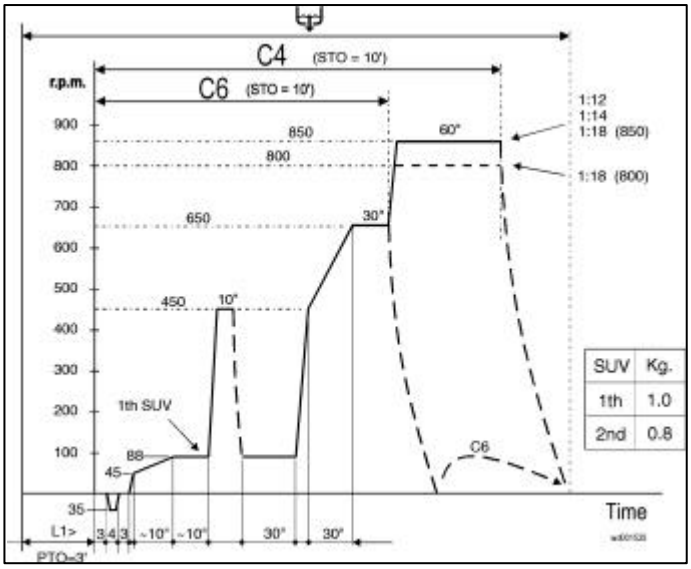
(**1**) passe to the subsequent step or next stop
(**2**) passes to the subsequent phaase

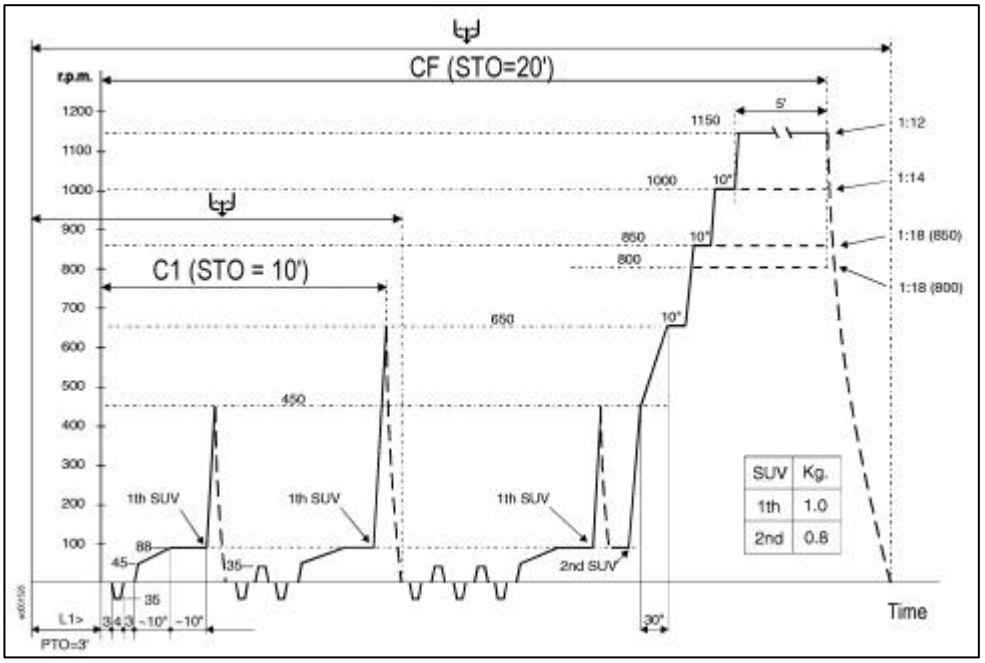
2.4.3 Spin phases key

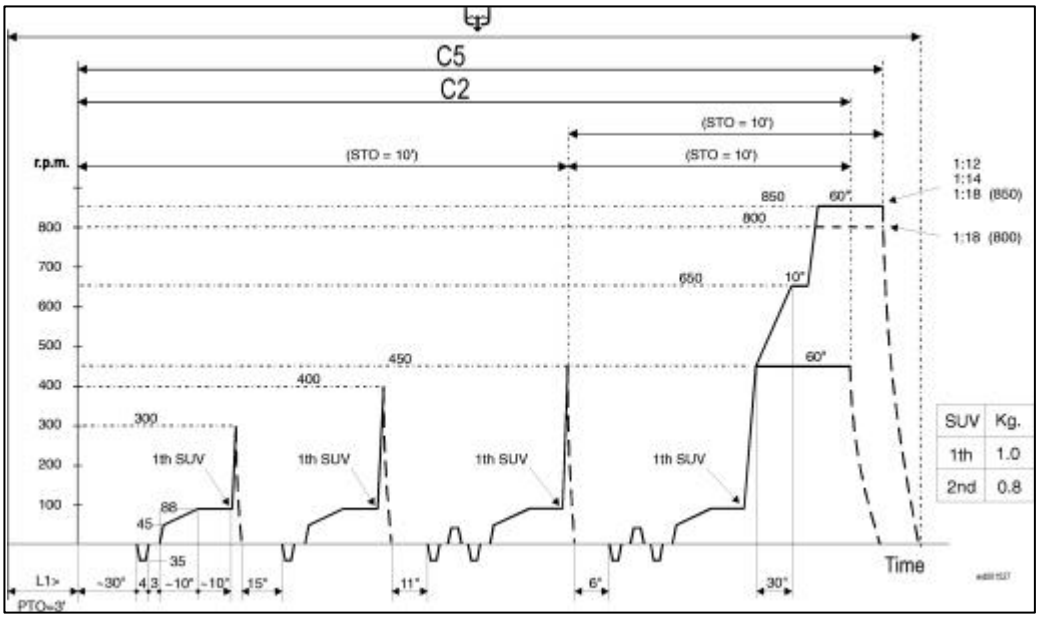
Time	***T****ime*
TO	*maximum time (**T**ime**O**ut)*
SUV	***S****oftware **U**nbalance **V**alue*
UDV	***U****nbalance **D**etected **V**alue*
L>, L1>	***1st L****evel pressure switch on "Full"*
L<	***1st L****evel pressure switch on "Empty"*
PTO	*maximum drain time (**P**ump **T**ime**O**ut)*
STO	*maximum time for spin sequence (**S**equence **T**ime**O**ut)*

2.4.4 Spin sequences

Note: If the maximum times are exceeded (PTO – STO) the timer passes to the subsequent phase.







2.5 ATTENTION TO THE OPERATING PARTICULARITY!

In order to avoid unnecessary operations on models with VS81 timers, we point put some particularity which characterise their operating.

2.5.1 Rapid advances in 90/60°C cotton cycles

As may be seen from the timer diagrams, the programmes in question are started in steps **3** – **5**. When the appliance is switched on, the timer advances rapidly to a position between the starting points for COTTON 60 and 40 programmes, during which the water fill takes place. Heating is performed only in the COTTON 40 programme. These phases of rapid advance, especially **in models with fixed temperatures (i.e. without a temperature regulator)** may be interpreted erroneously as phases of the programme that are not performed.
Actually, the operation of the timer is correct, since it is a hybrid timer, and it is the electronic control system which, after memorizing the selected programme, actions the timer motor in order to perform all the phases necessary to complete the cycle.

2.5.2 Automatic "half load" function in cotton cycles

If no reset is carried out after the starting water fill to 1º level during the drum rotation in step no.14 of cotton cycles (1, 2, 3 e 4), the timer recognizes that the washing load is reduced.
In this condition it passes quickly to position 16 with no drain in position 15, thus reducing the number of rinses from 3 to 2.

Note: in cotton rinse programme (no. 5) 4 rinses will be always carried out.

2.5.3 Rapid advances in 60/50°C synthetics cycles, 40°C wool

In these cycles, though in a less evident way, the timer operates like in the cotton cycles: the programme starts carrying out a rapid advance, then the water is filled and the heating is performed only in the subsequent programme (40°C synthetics or 40°C delicates).

2.5.4 Lack of power supply

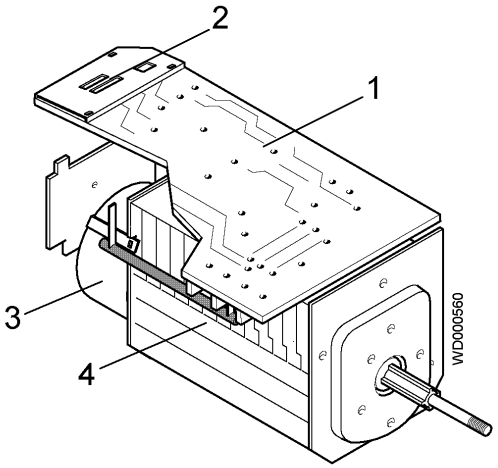
In models with **fixed** temperatures**,** in case of lack of power supply or of repeated switching off of the appliance, the electronic control does not memorise the cycle which was in function: when the power is reset, the electronic control reads the position of the timer to start the cycle again.
In some cases this situation could modify the washing cycle (es: heating at 40° insteaf of 90°).

In models with temperature selector, the heating is performed in any case at the temperature set by the user.

3 TECHNICAL FEATURES

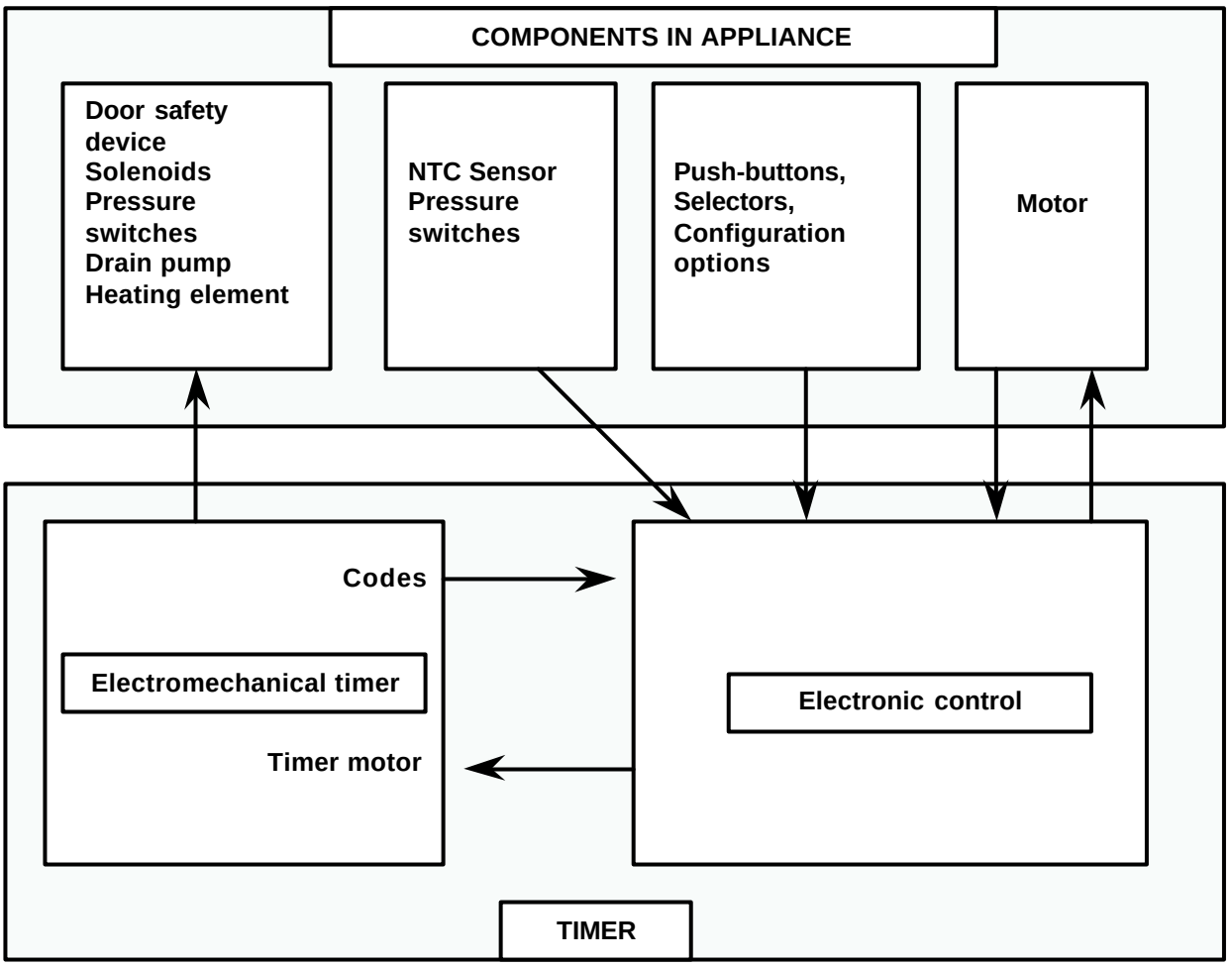
3.1 HYBRID TIMER

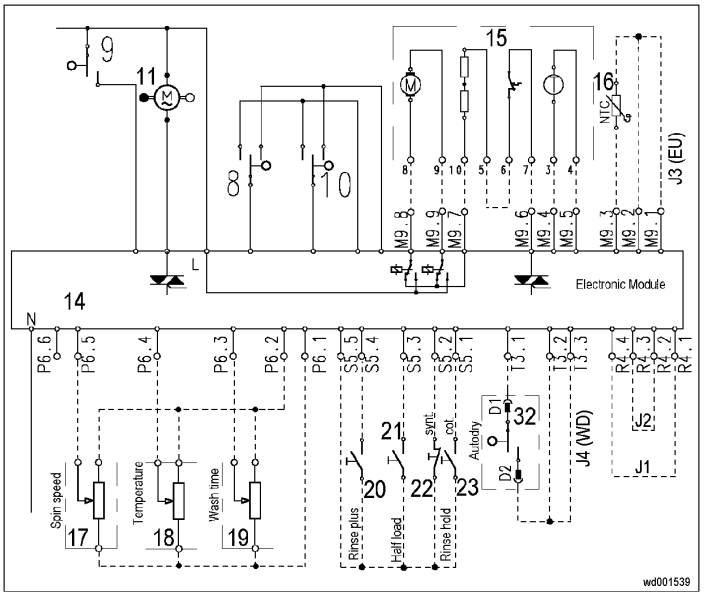
This timer consists of two main components: the electromechanical timer and an electronic board; the electronic board is soldered directly to the timer connectors.



1. Electronic control
2. Microprocessor
3. Timer motor
4. Electromechanical timer

3.2 Operatin principle of timer





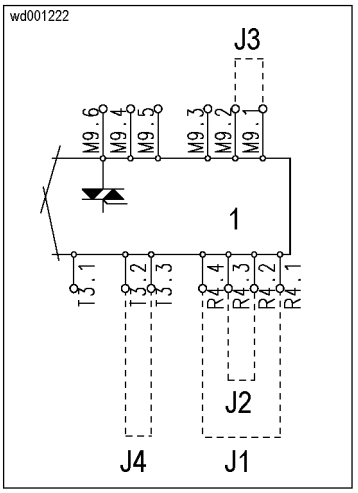
Depending on the closure of a series of contacts (8-9-10), the timer transmits to the electronic control board (14) the codes which determine the operations to be carried out at the various steps.

The electronic control board, on the basis of the appliance configuration and of the selected options (push-buttons and selectors) controls the washing cycle:

- on completion of the cycle phase carried out in a determined position, the board powers a timer motor via a TRIAC: the timer motor (11) advances to the subsequent phase.
- controls the closure of the pressure switches
- controls the temperature of the washing solution via the NTC sensor (16)
- via a second TRIAC, the board directly powers the drum rotation motor (15) and controls the speed of rotation according to the signal received from the tachometric generator (T). The direction of rotation is determined by the closure of the contacts of two relays.

All the remaining electromechanical components in the washing machine are powered via the timer contacts.

3.2.1 Configuration of timer functions



Configuration of timer functions is effected by setting certain wiring connectors.

1. Timer electronic control

J1 - J2 Connectors which, for the various models, determine the transmission radio between the drive pulley and the drum pulley and the speed of the final speed cycle.

J2	J1	Transmission ratio	Maximum spin speed
0	0	1/18	800
0	1	1/14	1000
1	0	1/12	1150
1	1	1/18	850

J3 Connector which determines the functions of the timer:

- "**UK**" if there is no connectin between M9.1-M9.2 (hot and cold water solenoid, maximum temperature for synthetics 50ºC, final spin for synthetics C6)
- "**Europe**" if a connection is fitted between M9.1-M9.2 (cold water solenoid, maximum temperature for synthetics 60°C, final spin for synthetics C4)

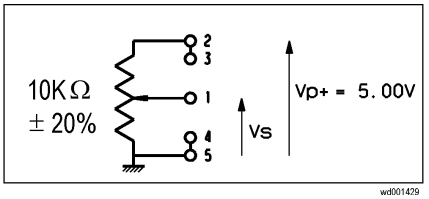
J4 Connector fitted to washer-dryers to carry out the drying phase

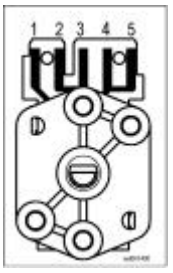
3.3 SELECTORS

3.3.1 8-position selector

This potentiometer (0-10000Ω) can have the following functions:

- temperature regulator
- washing time regulator
- spin speed selector

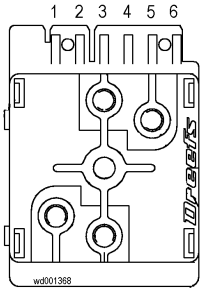


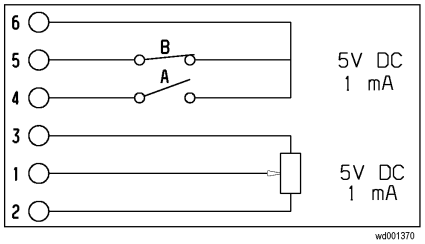


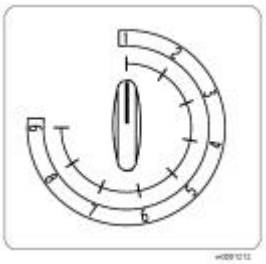
3.3.2 9-position selector

This selector can be used as speed regulator: the last position stops the appliance with water in tub.

1: rinse hold
2: no spin
9: maximum speed





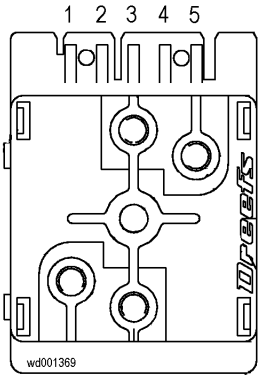


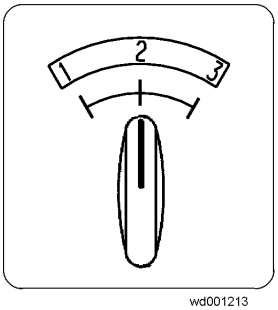
	A (4-6)	B (5-6)	1-2	1-3
			KΩ ± 5%	
1		■	< 0.01	10
2	■		10	< 0.01
3	■		8.4	1.6
4	■		7.2	2.8
5	■		5.6	4.1
6	■		4.1	5.6
7	■		2.8	7.2
8	■		1.6	8.4
9	■		0.01	10

wd001371

3.3.3 3-position selector

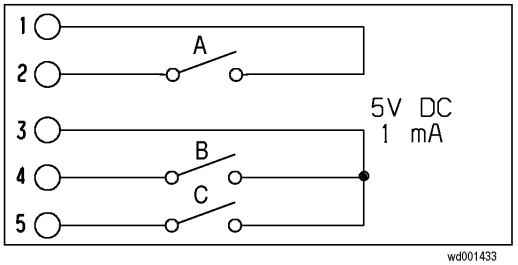
This commutator can be used to vary the structure of the cotton cycle depending on the wash load (position 2 corresponds to basic programme).





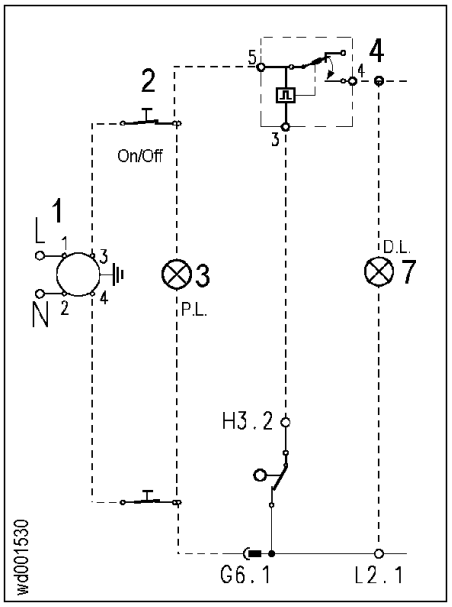
		1	2	3
3-5	C			■
3-4	B	■		
1-2	A			■

wd001434



3.4 DESCRIPTIONS OF MAIN FUNCTIONS

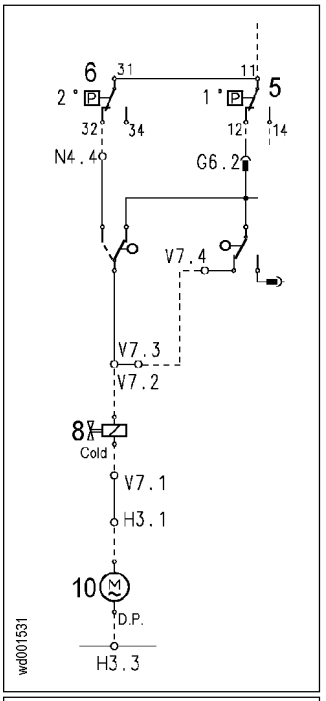
3.4.1 Door lock



The door safety device is powered through the closure of contacts of the main switch and by the G6.1-H3.2 timer contact.
Few seconds after the starting, the door is locked and the device contact closes supplying the appliance (contact 5-4).

1. Interference suppressor
2. ON/OFF push-button
3. Pilot lamp
4. Door interlock
7. Door lock lamp (on some models)

3.4.2 Cold water fill

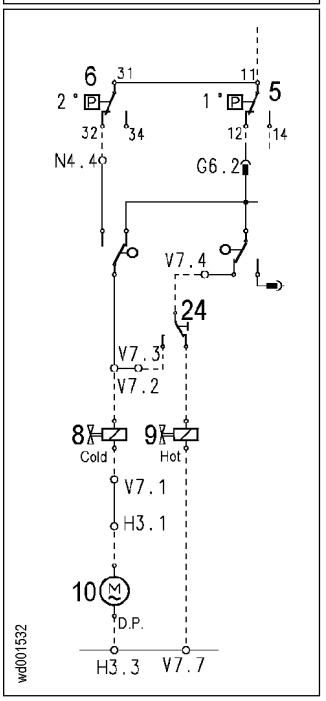


The cold water fill solenoid (8) is powered in the following way:

- **1st level:**
- pressure switch 1st level (5) contact closed on “empty”
- closure of timer contact V7.2-G6.2
- drain pump winding (10).
- at step 8 closure of contact V7.4-G6.2 powers.

- **2nd level:**
- pressure switch 2° level (6) contact closed on “empty”
- closure of timer contact V7.2-N4.4
- drain pump winding (10).

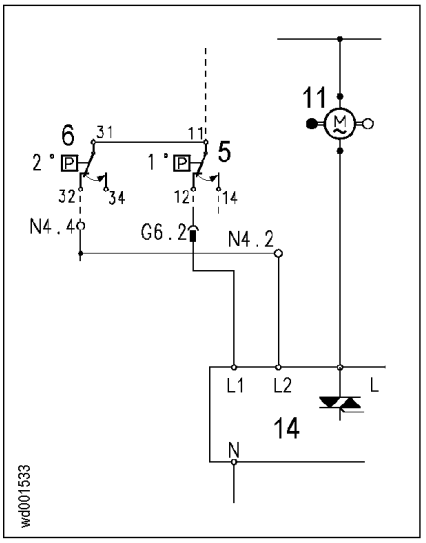
3.4.3 Hot water fill (some models)



The hot water fill solenoid (9) is powered in the following way:

- pressure switch 1st level (5) contact closed on “empty”
- closure of timer contact V7.4-G6.2
- closure of “heavy soil” push-button contact (24), if present.

3.4.4 Control of pressure switches closure



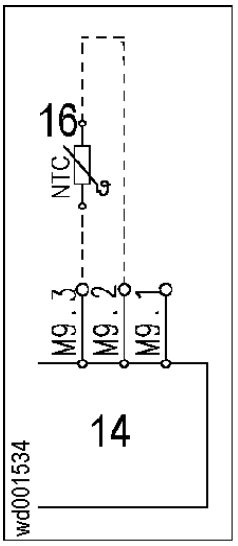
The check of position of pressure switch contacts (empty or full) is detected by the electronic board (14) by means of two “sensing“ lines:

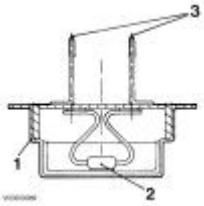
- L1: 1st level (5) pressure switch check
- L2: 2nd level (6) pressure switch check

3.4.5 Control of washing temperature

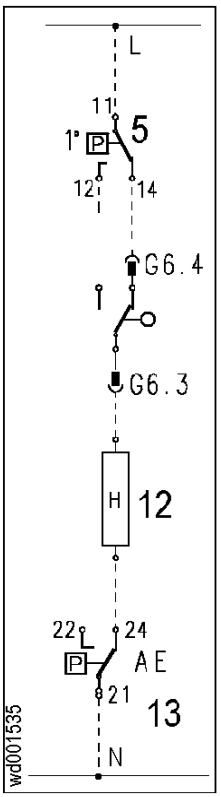
The temperature control is carried out by the electronic control via a NTC sensor. The NTC (16) sensor is connected directly to the timer electronic control (14) to contacts M9.2-M9.3.

If NTC sensor is in short-circuit or interrupted the heating phase is skipped.



NTC temperature sensor	Temperature (°C)	Resistance ± 10% (Ω)
 *1. Plastic casing* *2. NTC Resistance* *3. Terminals*	30	17300
	40	11500
	50	7840
	60	5460
	70	3900
	78	2970
	85	2320

3.4.6 Heating element

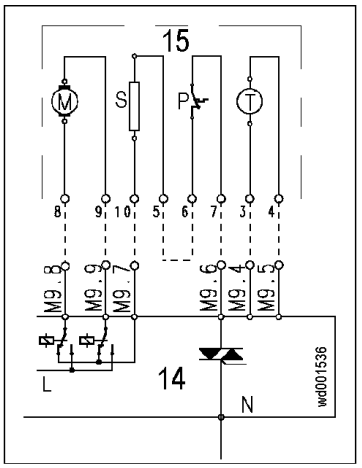


The heating element (12) is powered in the following way:

- closure of timer contact G6.3-G6.4
- first level pressure switch (5) closed on full
- safety pressure switch (13) closed on full

3.4.7 Motor

The motor (15) is powered by the electronic control via a triac; the rotation inversions are effected by the commutation of two relays.



14 Electronic control
M Rotor
S Stator
P Moto-protection
T Tachometric generator

3.4.8 Motor safety

- **Motor power Triac short-circuited**

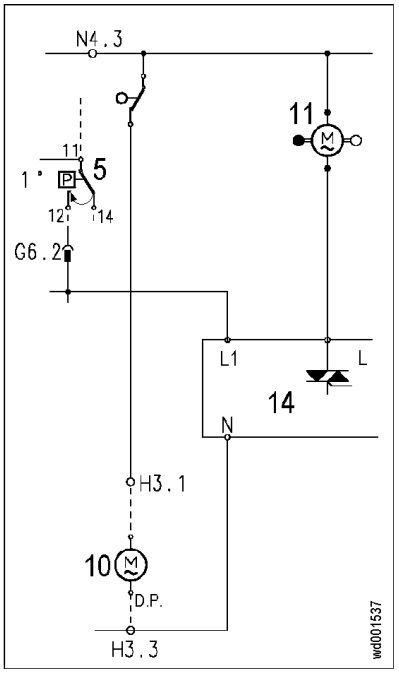
If the Triac which powers the motor is short-circuited, the electronic control (14) disconnects the motor by switching the relays. After 30 seconds, the power to the motor is restored. If after three attempts, the fault persists (2 attempts in spin cycles), the motor is definitively disconnected and the timer advances to the STOP position.

- **Tachometric generator or faulty motor**

If no signal is received from the tachometric generator (tachometric generator or motor faulty), the electronic control (14) disconnects the motor for 30 seconds, after which the motor is switched on again.
If the fault persists, this sequence of attempts to power the motor is repeated every 30 seconds until the end of the cycle.

3.4.9 Drain

The drain pump is powered through the timer contact N4.3-H3.1 and the drain pump lasts till the first level pressure switch advances to the “empty” position.
Therefore the timer advances to the subsequent spin phase or a prefixed drain time is added.

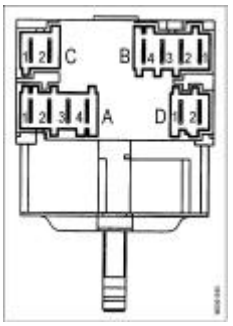


5 *1st level pressure switch*
10 *drain pump*
11 *timer motor*
14 *electronic control*
L1 *1st level pressure switch control*

- **Drain pump safety**

In case the drain pump is faulty, after the maximum time of 3 minutes (timeout) the timer advances to subsequent position even if the pressure switch in “full” position and the cycle continues as programmed.

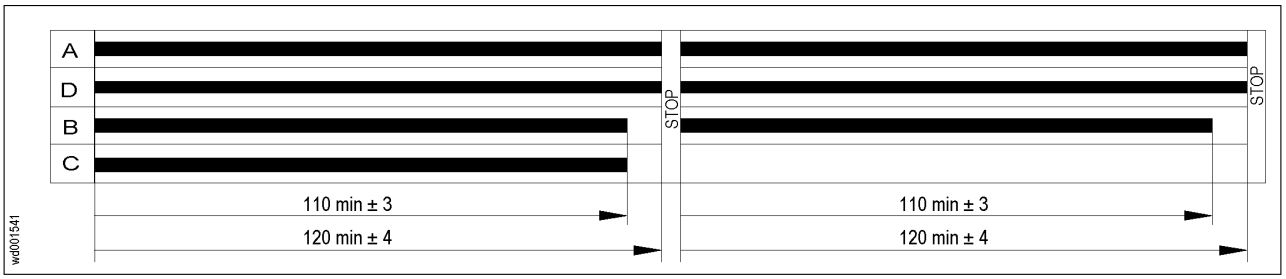
3.5 DRYING (WASHER-DRYERS)



3.5.1 Time switch drying

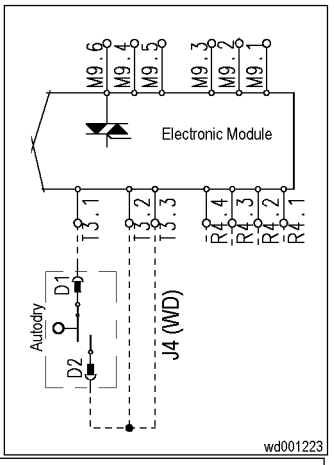
The components of the drying circuit are powered by a two-sector time switch (it can vary in function of the model); the maximum time of drying is 120 minutes for both sectors.
The last 10 minutes are dedicated to the cooling phase.

Diagram of drying time switch type 12426685..



3.5.2 Automatic drying

The electronic control recognises, through the closure of contact D1-D2 of the time switch, that a drying time has been selected and automatically, after the washing cycle, it will advance the timer to the drying phase for all the preset time. Once the drying has been completed, when the time switch reaches the zero, the contact opens and the electronic control powers the timer motor to bring it back to the STOP position.



3.5.3 Drying circuit:

The components of the drying circuit are powered in the following way:

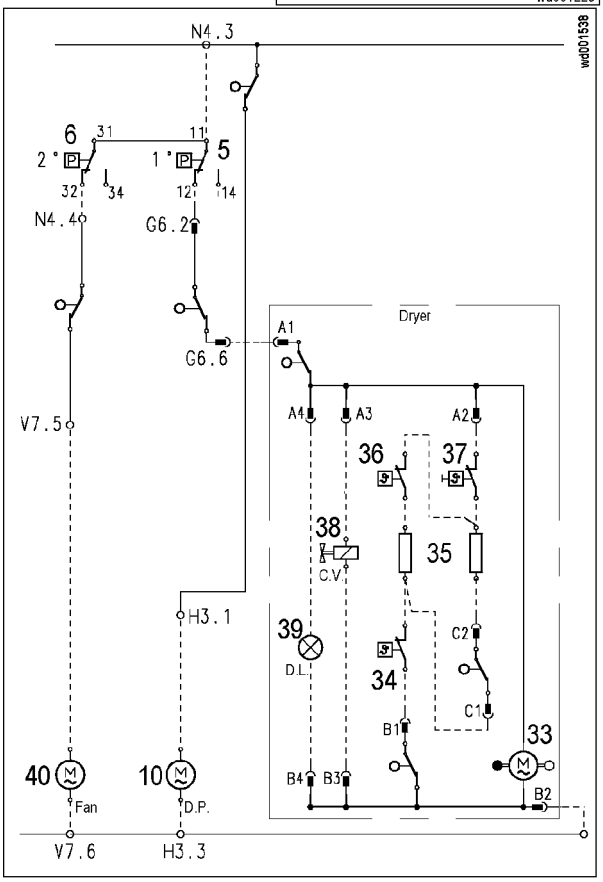
- **Drying time switch motor (33) / drying pilot lamp (39) / condensation solenoid (39):**
- 1st level pressure switch contact closed on “empty”
- closure of timer contact G6.2-G6.6
- closure of time switch contact A1 – A4, A3

- **Drying resistance (35):**
- 1st level pressure switch contact closed on “empty” (5)
- closure of timer contact G6.2-G6.6
- closure of time switch contact A1 – A2
- closure of time switch contact B1 – B2
- closure of manual-reset thermostat contact (37)
- closure of drying thermostat contact (36)
- closure of safety thermostat contact (34)

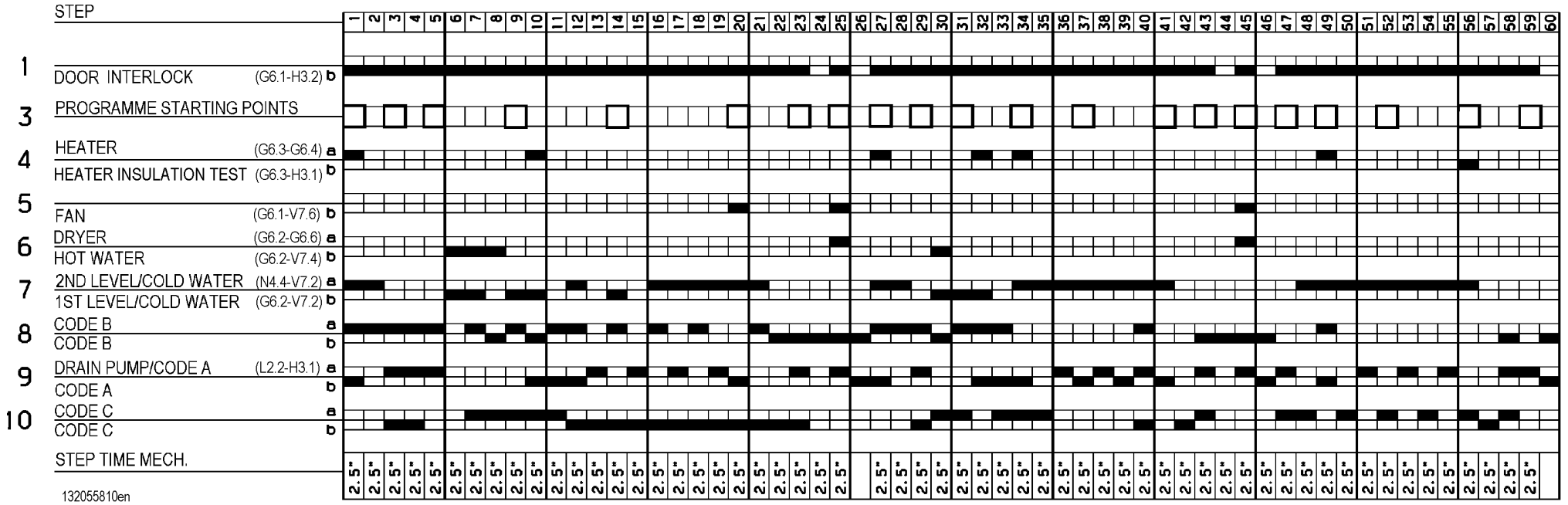
During the full power drying (cotton) also the second heating element is inserted via the closure of time switch contact C1-C2.

- **Fan motor (40):**
- 2nd level pressure switch closed on “empty” (6)
- closure of timer contact V7.5-N4.4

During drying phase, drain pump and motor are powered in the same way as during washing cycle.

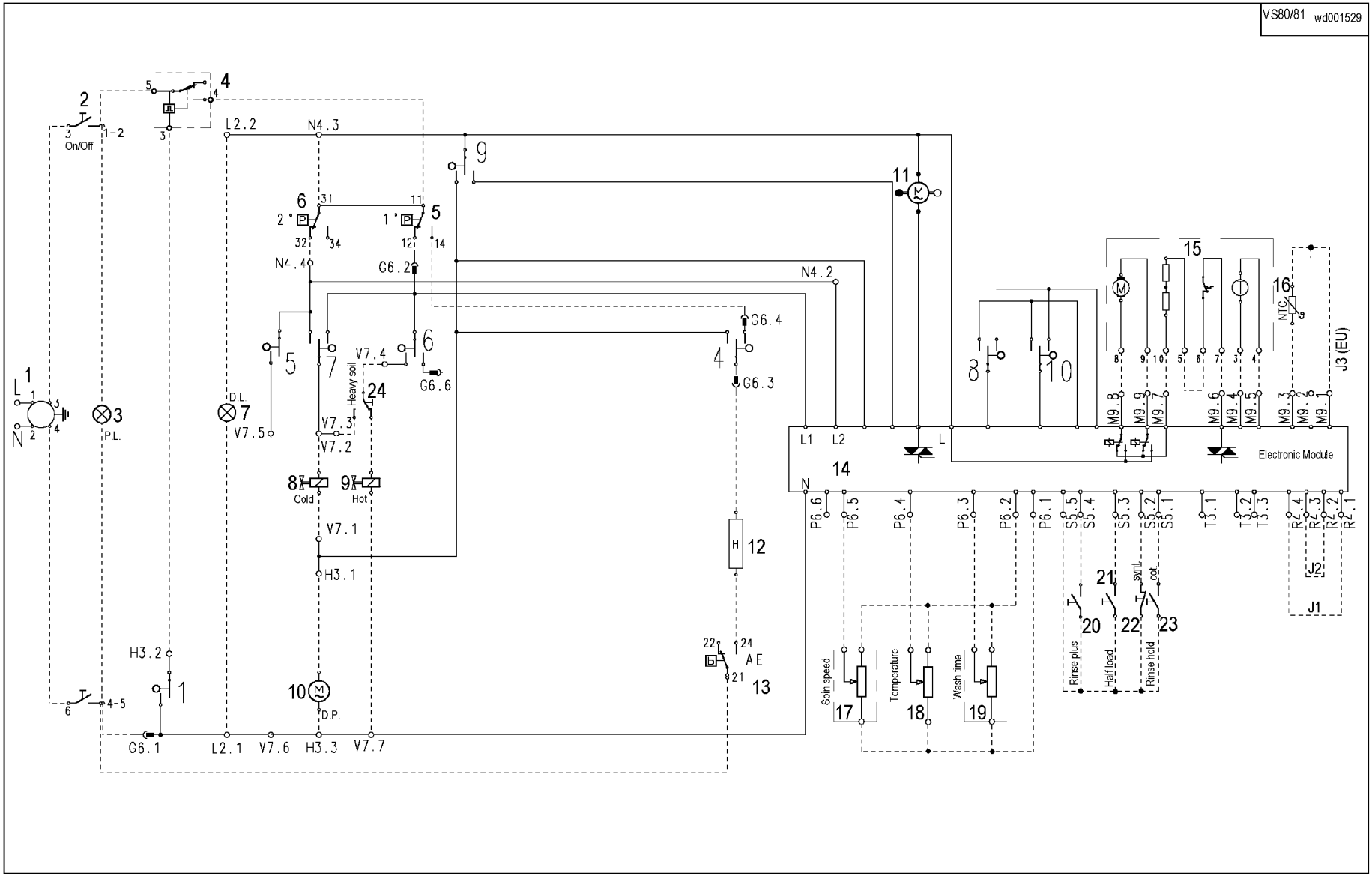


4 TIMER DIAGRAM

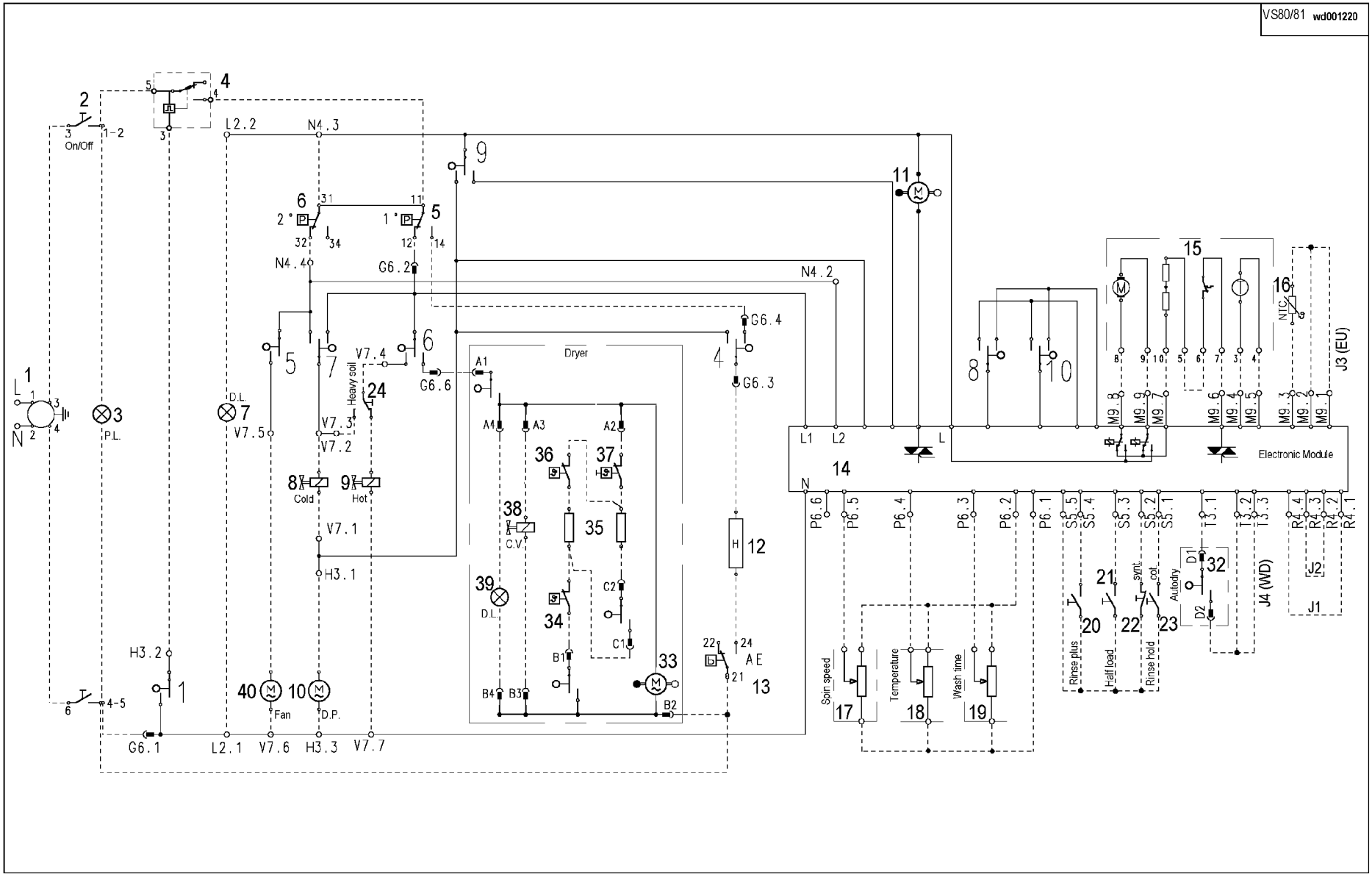


5 BASIC CIRCUIT DIAGRAM

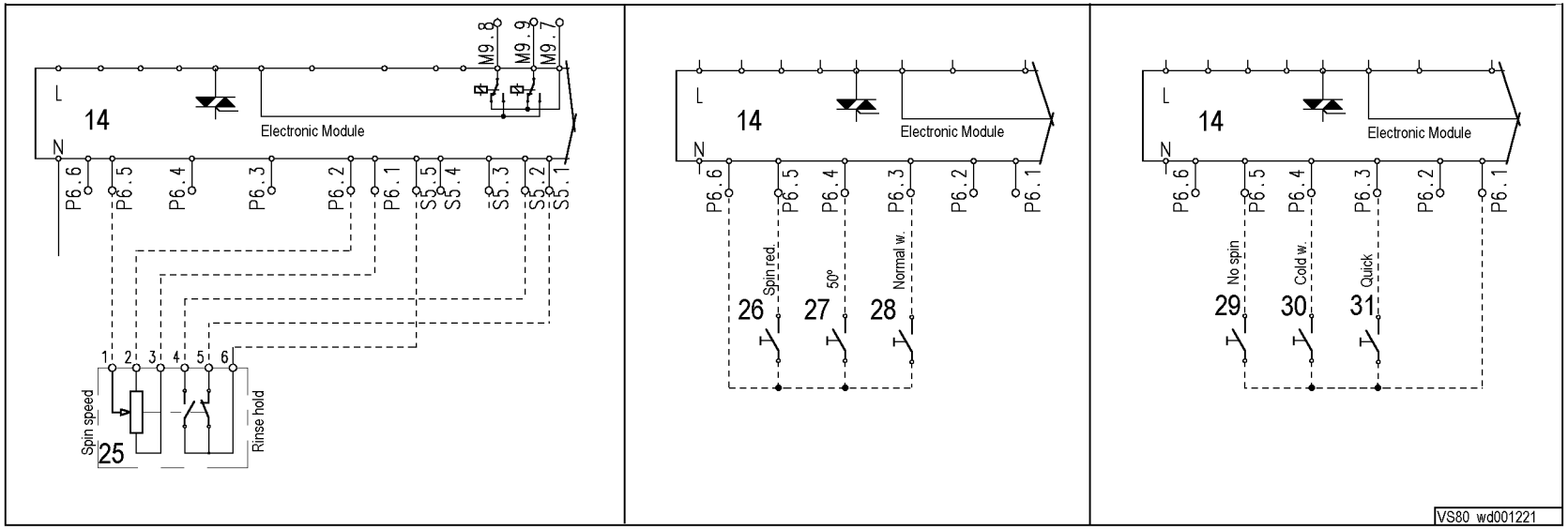
5.1 WASHING MACHINES



5.2 WASHER-DRYERS



5.3 OTHER OPTIONS



5.4 KEY TO CIRCUIT DIAGRAM

Washing machines and washer dryers		Washer dryers only
1. Interference supressor	17. Spin speed selector	32. Automatic drying contact
2. ON/OFF push button	18. Washing temperature selector	33. Drying timer motor
3. Pilot lamp	19. Washing time selector	34. Safety thermostat
4. Door delay interlock	20. Extra rinse push-button	35. Drying heaters
5. Pressure switch (1st level)	21. Half load push-button	36. Drying thermostat
6. Pressure switch (2nd level)	22. Rinse hold push-button	37. Manual-reset thermostat
7. Door lock pilot lamp	23. Rinse hold push-button (cotton)	38. Condensation solenoid
8. Cold water solenoid	24. Heavy soil push-button	39. Drying pilot lamp
9. Hot water solenoid (UK version)	25. Spin speed/rinse hold selector	40. Fan motor
10. Drain pump	26. Reduced spin push-button	
11. Timer motor	27. 50ºC push-button	
12. Heating element	28. Daily wash push-button	
13. Pressure switch (anti-boiling device)	29. No spin push-button	
14. Electronic board	30. Cold wash push-button	
15. Motor	31. Short cycle push-button	
16. NTC temperature sensor		

6 TEST CYCLE AND TROUBLESHOOTING

6.1 Test cycle

Please find below a short cycle to be used to check the different functions of the appliance.

Testing the VS81timer			
Phase	**Step - programme**	**Functions control**	**Performed operations**
1	**23 – FINAL SPIN – COTTON**	Closure of door, (drain pump), motor	Water drain until 1st level pressure switch EMPTY (3 min. timeout) + sequence of 3 spin impulses + final cotton spin (CF – 15 min. timeout); each spin impulse is preceded by a number of low-speed reverse movements
2	**3 - 90°C COTTON**	(Drain pump), rapid timer advance and water fill to 1st level	Drain pump, after 5 seconds the timer advances rapidly to position 8 [in positions 6 (2.5 sec) and 7 (12.5 sec) water is ducted into the pre-wash compartment (cold water in EU versions, mixed water in UK versions)]; in position 8, water fills the wash compartment to 1st level without motor movement (hot water for UK version) + (10 minutes normal movement N)
3	**49 - DELICATES**	Water fill to 2nd level + heating	(Water fill to 1st level without motor movement), water fill in wash compartment to 2nd level with delicate (D) motor movement and heating to 40°C.
4	**59 - DRAIN**	Drain pump (from full)	Water drain until 1st level pressure switch is “EMPTY” + 30 sec. drain (3 min. timeout)
5	**25 – COTTON DRYING**	Drying heater + condensation solenoid + drying time switch + fan motor + (motor and drain)	Drying at full power for the time entered using the drying time switch (150 min. timeout) with drying motor movement and drain.

Note

- Water fill to the prewash compartment is checked in the 1st step (cotton prewash)
- Water fill to the bleach compartment (if any) is checked in position 14
- Water fill to the conditioner compartment is checked in position 20
- Other faults are checked in the respective timer positions.
- Correct operation of the various functions is checked during the respective step: before replacing the timer, check that the push-button contacts close correctly, check the value of the potentiometers and check the wiring that connects them to the timer

6.1.1 Operations to be performed during the first phase of the test cycle

Phase	Knob position	® Functional check	® Fault	® Check with machine off	® Component to be repaired/replaced
1	Select the **FINAL COTTON SPIN** programme (step 23) and switch the appliance on	Switching on	The WM does not switch on: the pilot lamp is OFF	Check the continuity of the power cable, the wiring and the suppressor (connectors on filter 1-3, 2-4). If these are OK, check the main switch.	Power cable, wiring, suppressor, main switch
		Start/door closure	The WM does not start: the pilot lamp is ON	Check the closure of the timer contact H3.2-G6.1. If these are OK, check the wiring and door lock	**Timer.** Wiring/Door locking device
		Drain	Drain pump inoperative	Winding / Impeller slippage	Drain pump
			Drain pump blocked	Foreign bodies / Filter clogged	Clean pump and repeat test
		Motor inversions when empty (no water in tub)	No power to motor	Motor winding interrupted	Motor
				Motor brushes (rotor broken)	Motor brushes / Motor
				Timer contact / Relay faulty	Timer
				Pressure switch contacts faulty	Pressure switch
				Wiring	Motor wiring
			The motor starts at low speed then stops immediately in both directions	Winding of tachometric generator short-circuited or open	Coil of tachometric generator
			Motor does not reverse / rotates in one direction only	Timer faulty (electronic section)	Timer
			Uncontrolled high-speed start	Timer faulty (electronic section)	Timer
			Timer advances to STOP	Timer	Timer

6.1.2 Operations to be carried out during the second phase of the test cycle

Phase	Knob position	® Functional check	® Fault	® Check with machine off	® Component to be repaired/replaced
2	Select the COTTON 90° PROGRAMME (step no. 3 – heating element not switched on)	Timer advance after a few seconds (8 – 15)	Timer does not advance	Timer or pressure switch blocked on “FULL” 1 level	Timer / 1st level pressure switch
				Timer motor blocked/interrupted	Timer
		Water fill to 1st level	Solenoid valve does not fill	Timer contact	Timer
				Solenoid interrupted/blocked	Solenoid valve
				Wiring to solenoid valve	Wiring / Connectors
			Fills beyond 1st level	Solenoid valve does not close	Solenoid valve / Wiring
				Pressure switch does not switch/leaks	1st level pressure switch faulty
				Tubes / Air chamber blocked or perforated	Check, clean and repeat the test
		Motor inversions when full (with water in tub)	“FULL” consensus signal not received, faulty contacts on pressure switch	Pressure switch does not switch correctly	1st level pressure switch faulty (rarely occurs)
			Motor does not rotate only with load (i.e. washing in drum) or in impulse mode; when empty, motor rotates correctly	Timer faulty (electronic section)	Timer (rarely occurs)
			Motor “jerks” when loaded	Tachometric generator faulty (damaged)	Coil of tachometric generator

6.1.3 Operations to be carried out during the third/fourth phases of the test cycle

Phase	Knob position	® Functional check	® Fault	® Check with machine off	® Component to be repaired/replaced
3	Select DELICATES cycle (step 49) Select 40°C if the WM features a temperature selector	2nd level water fill	Solenoid valve does not fill	Timer contact	Timer
				Solenoid interrupted/blocked	Solenoid valve
				Wiring to solenoid valve	Wiring / Connectors
			Fills beyond 2nd level	Solenoid valve blocked	Solenoid valve
				Pressure switch does not switch/leaks	2nd level pressure switch faulty
		Heating element switch-on	Heating element does not switch on	Heating element interrupted/earthed	Heating element
				Anti-boiling pressure switch faulty	Anti-boiling pressure switch
				Check closure of timer contact: G6.3-G6.4	Timer
			The phase is skipped after a few seconds	Check the NTC sensor (25 KΩ approx. at room temperature)	NTC sensor
				If the wiring and the NTC sensor are OK, check continuity of wiring and replace the timer	Wiring / Timer
	If a temperature regulator is fitted, set to 0°C	Skipping of phase	Timer does not advance	Continuity of wiring to selector	Wiring / Connector
				Temperature selector faulty	Selector
	If temperature regulator is not featured, wait until the water reaches 40°C	Skipping of phase	Timer does not advance	NTC sensor incorrectly calibrated	NTC temperature sensor
				Timer motor blocked	Timer
			Timer advances before the temperature is reached	NTC sensor incorrectly calibrated	NTC temperature sensor
4	Then turn to step 49 (DRAIN)	Drain from full	Drain pump inoperative	Winding faulty / Impeller slippage	Drain pump
			Drain pump blocked	Foreign bodies / Filter clogged	Clean pump/drain filter and repeat the test
		Check for empty tub. 30 seconds after empty is reached, rapid timer advance	Pressure switch does not switch, the timer advances after the maximum time of 3 minutes	Pressure switch closed on “EMPTY”	Pressure switch
			The timer does not advance	Timer motor blocked / no power supply	Timer

(washer-dryers only)

6.1.4 Operations to be carried out durong the drying phase (5[a]) of the test cycle

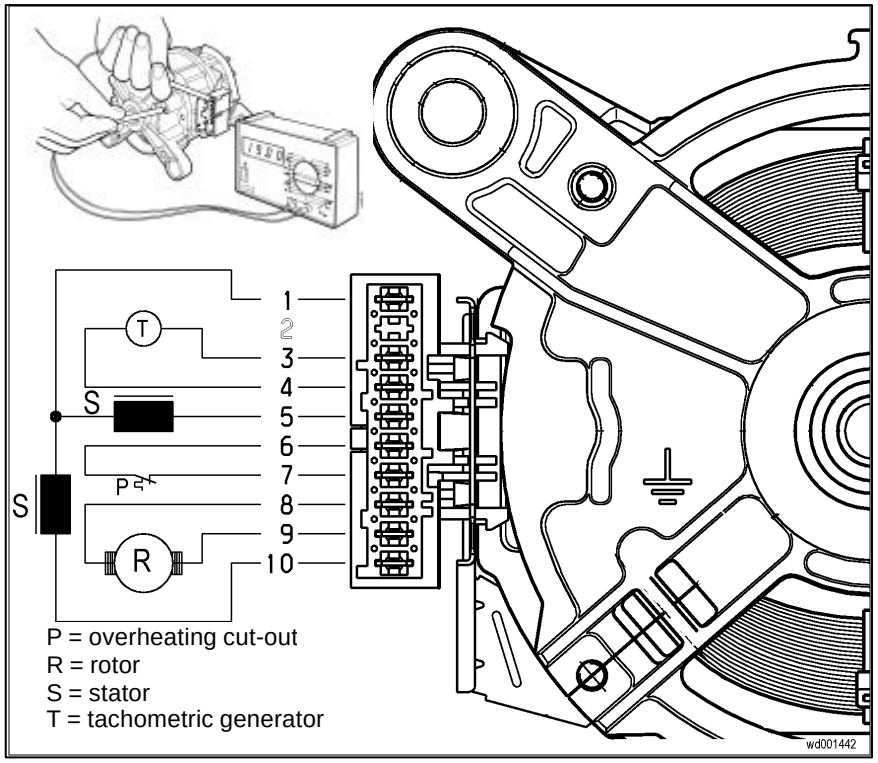
Phase	Knob position	® Functional check	® Fault	® Check with machine off	® Component to be repaired/replaced
5	Select a drying time and select **cotton drying** (step 49)	Drying	The drying phase is skipped	Drying time switch contact faulty	Drying time switch
				Wiring faulty / interrupted	Wiring
			The drying heater does not switch on	Thermostats faulty (open)	Thermostats
				Heating element interrupted/earthed	Drying heater
				Timer contact G6.2-G6.6 does not close correctly	Timer
			Fan does not switch on	Fan motor winding interrupted or short-circuited; wiring	Fan motor / Wiring
				Timer contact N4.4-V7.5 does not close correctly	Timer
			Does not dry correctly	Condensation solenoid valve faulty (does not load, interrupted)	Condensation solenoid valve
	Turn the drying timer to 0	Phase skipping and stop	Timer does not advance to stop	Drying timer contact faulty	Drying time switch

6.1.5 Checking the commutator motor

1) Check the connector blocks (wiring) and check for detached or bent terminals.
2) Check for the presence of traces / residue / build-up of water or detergent, and identify the source.
3) Use a tester with a minimum scale of 40 Mohm to check for windings or other components that are connected to mass or poorly earthed (read ∞) across each terminal and the casing.
4) Check that each of the windings is as shown in the table below:

Motor terminals	Check:	SOLE motor [Ohms]	F.H.P. motor [Ohms]	CE.SE.T. motor [Ohms]
3 - 4	Winding of tachometric generator	171 ÷ 196 469 ÷ 540	126 ÷ 147	64 ÷ 73
5 - 10	Stator winding (full range)	1.0 ÷ 2.2	1.0 ÷ 3.0	1.0 ÷ 2.0
6 - 7	Overheating cut-off	0	0	0
8 - 9	Rotor winding	1.5 ÷ 3.0	1.5 ÷ 3.0	1.5 ÷ 3.0
1 - 10	Stator winding (half range, presence of terminal 1)	0.5 ÷ 1.0	0.5 ÷ 1.5	0.5 ÷ 1.0

N.B.: When checking the rotor winding, the measurement should be taken around the entire perimeter, turning the shaft very slowly and checking for the presence of short-circuits between the visible plates. Check the brushes for wear.



6.2 TIMER CONNECTORS

(detach all connectors before measuring the contacts!)

6.2.1 Burns on the timer electronic board

In case of burning of the printed circuit of the timer, check that the problem is not caused by another electrical component (short circuits, poor insulation, water leakage etc.). Identify the timer connector that is connected to the burnt-out tracks and check the wiring that powers the component.

Examples:

Connector / track	***Component that caused burning***
L2.1-L2.2	Pilot lamp wiring
H3.1-H3.3	Drain pump
M9.4÷M9.9	Motor
Track that connects L2.1 to H3.3	Drain pump