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1 GENERAL FEATURES

The VD54/VD55 timers produced by AKO, are used in certain washing machines models.

- ♦ Front-loading washing machines produced in Spain (Alcala de Henares) **(ESA)**
- ♦ Top-loading washing machines produced in France (Revin) **(FFH)**
- ♦ Front-loading compacted in Sweden (Torsvik) **(TN)**
- ♦ Front-loading washing machines produced in Italy (Porcia) **(ZP)**

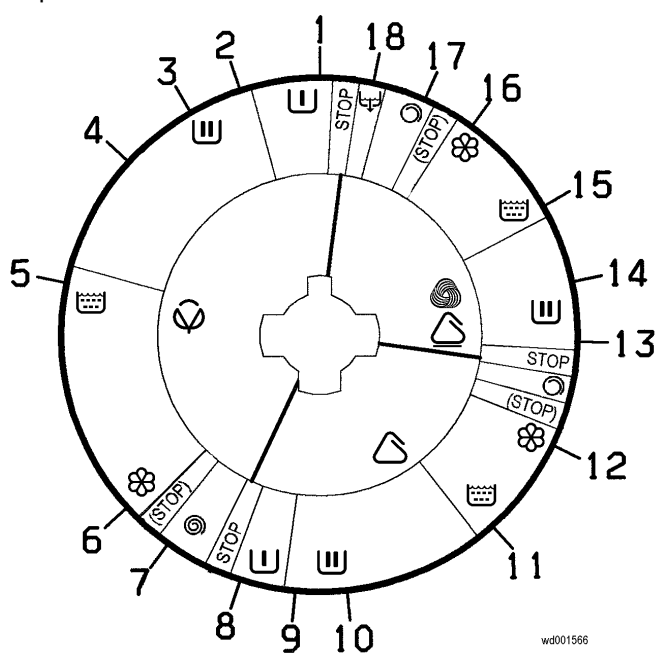
FUNCTIONS	VD54	VD55
WASHING SYSTEM:	- traditional - with "Eco-ball" - (jetsystem)	- traditional - with "Eco-ball" - (jetsystem)
TYPE OF RINSE:	traditional: - 4 rinses in cotton cycles - 3 rinses in synthetics, delicates and wool	traditional: - 3 rinses in cotton cycles - 3 rinses in synthetics, delicates and wool
WATER FILL:	cold	cold
POWER SUPPLY	220 -240V / 10A 50Hz	220 -240V / 10A 50Hz
Ignition system:	- versions with ON/OFF switch - versions with ignition by means of the timer knob (push-pull)	
Control of water level in tub:	- versions with 2 levels by means of pressure switch - versions with 1 level by means of pressure switch	
Washing temperature:	Fixed or adjustable	
Temperature control:	- versions with adjustable thermostat - versions with fixed thermostat	
Heating element	1950 W (max)	
Type of motor:	commutator	
Final spin speed (rpm):	600, 800, 900, 1000	

2 WASHING PROGRAMMES

2.1 Possible programmes of models with VD54 function

	Models with fixed temperatures			Models with adjustable temperatures		
	COTTON - LINEN	Wash (°C)	Rinses	COTTON - LINEN	Wash (°C)	Rinses
1	WHITES WITH PREWASH	60/95 *	4	WHITES and COLOURED WITH PREWASH	30-95	4
2	WHITES	60/95 *	4	WHITES and COLOURED	30-95	4
3	COLOURED-FAST	60	4	DELICATE COLOURED	30-60	4
4	DELICATE COLOURED	40	4	SHORT SPIN	30-40	4
5	RINSES	....	4	RINSES	....	4
6	CONDITIONER	....	1	CONDITIONER	....	1
7	SPIN	....	....	SPIN	....	....
	SYNTETICS – MIXED Fabrics			SYNTETICS – MIXED Fabrics		
8	WHITES WITH PREWASH	60	3	WHITES and COLOURED WITH PREWASH	30-60	3
9	WHITES	60	3	WHITES and COLOURED	30-60	3
10	COLOURED	40	3	....	....	....
11	RINSES	....	3	RINSES	....	3
12	CONDITIONER	....	1	CONDITIONER	....	1
	DELICATE - WOOL Fabrics			DELICATE- WOOL Fabrics		
13	DELICATES	40	3	DELICATES	30-40	3
14	WOOL	40	3	WOOL	40	3
15	RINSES	....	3	RINSES	....	3
16	CONDITIONER	....	1	CONDITIONER	....	1
17	SHORT SPIN	....	....	SHORT SPIN	....	....
18	DRAIN	....	....	DRAIN	....	....

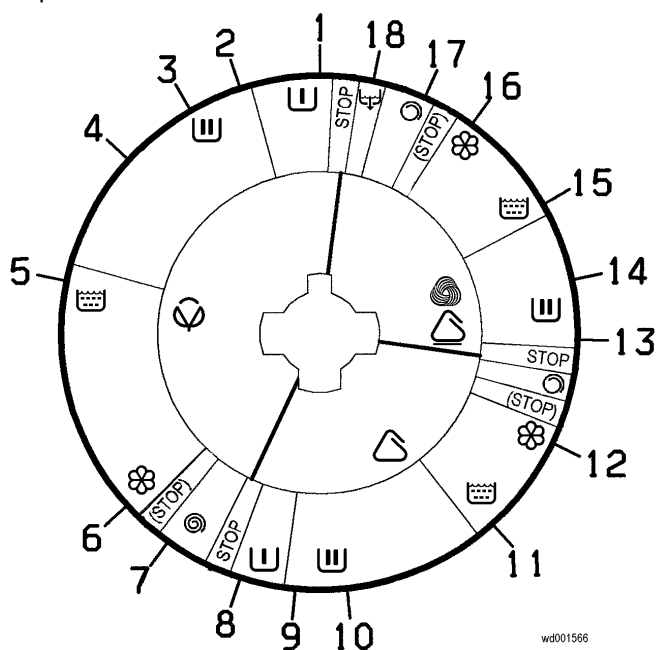
- Programme obtained with push-button 90°



2.2 Possible programmes of models with VD55 function

	Models with fixed temperatures			Models with adjustable temperatures		
	COTTON - LINEN	Wash (°C)	Rinses	COTTON - LINEN	Wash (°C)	Rinses
1	WHITES WITH PREWASH	60/95 *	3	WHITES and COLOURED with PREWASH	30-95	3
2	WHITES	60/95 *	3	WHITES and COLOURED	30-95	3
3	FAST-COLOURED	60	3	DELICATE COLOURED	30-60	3
4	DELICATE COLOURED	40	3	SHORT CYCLE	30-40	3
5	RINSES	....	4	RINSES	....	4
6	CONDITIONER	....	1	CONDITIONER	....	1
7	SPIN	....	....	SPIN	....	....
	SYNTETICS – MIXED Fabrics			SYNTETICS – MIXED Fabrics		
8	WHITES WITH PREWASH	60	3	WHITES and COLOURED WITH PREWASH	30-60	3
9	WHITES	60	3	WHITES and COLOURED	30-60	3
10	COLOURED	40	3	....	....	....
11	RINSES	....	3	RINSES	....	3
12	CONDITIONER	....	1	CONDITIONER	....	1
	DELICATES - WOOL Fabrics			DELICATES - WOOL Fabrics		
13	DELICATES	40	3	DELICATES	30-40	3
14	WOOL	40	3	WOOL	40	3
15	RINSES	....	3	RINSES	....	3
16	CONDITIONER	....	1	CONDITIONER	....	1
17	SHORT SPIN	....	....	SHORT SPIN	....	....
18	DRAIN	....	....	DRAIN	....	....

- Programme obtained with push-button 90°



2.3 PUSH-BUTTONS FUNCTIONS

2.3.1 ON/OFF

- Switches the appliance on and off (only some models).

2.3.2 Half load

- For VD4 function reduces the no. of rinses from 4 to 3 in COTTON cycles;
- For VD55 function reduces the no. of rinses from 3 to 2 in COTTON cycles.

2.3.3 Super rinse

- It fills water in two rinses of the cotton cycle at the second level instead of at first one (only in models with water fill at two levels).

2.3.4 Economy

- Reduces the washing temperature at 60° in 95° COTTON cycles (the programme duration remains unaltered).

2.3.5 90° Cotton

- In models with thermostats at fixed temperatures: performs the heating phase in COTTON cycles (n. 1 and 2) at 90° instead of 60°C.

2.3.6 Cold wash

- In models with fixed-temperature thermostats, disconnects the power supply to the heating elements.

2.3.7 Rinse hold

- Stops the appliance leaving water in the tub at the end of the final rinse (in cycles for SYNTHETICS, DELICATES and WOOL). If a jumper is fitted between timer contacts H2.1 and H2.2, this option can also be selected in cycles for COTTON. When the push-button is pressed again, the programme is completed with the phase of drain and spin.

2.3.8 Delicate spin

- Performs the function opposite to that of the "rinse hold" push-button.

2.3.9 No-spin

- It excludes all spin phases.

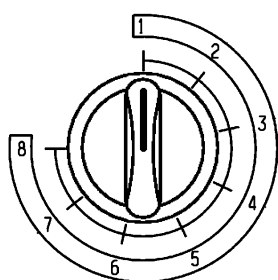
2.3.10 Spin reduction

- It reduces the final spins as shown in the table below. It can be of 2 types on the basis of how it is connected to the electronic control.

	COTTON (rpm)				SYNTETICS-WOOL-DELICATES (rpm)	
Final spin	600	800	900	1000	540	740
Push-button type 1	380	400	500	600	380	400
Push-button type 2	300	300	300	300	300	300

2.4 Spin speed selector

It is possible to select the speed of the final spins as shown in the table below, by means of a 8-position commutator (it does not affect the intermediate speeds).



		COTTON (rpm)				SYNTETICS-WOOL-DELICATES (rpm)	
Knob position	1	0	0	0	0	0	0
	2	300	300	300	300	300	300
	3	340	350	400	500	340	350
	4	380	400	500	600	380	400
	5	420	500	600	700	420	500
	6	460	600	700	800	460	600
	7	500	700	800	900	500	700
	8	600	800	900	1000	540	740

2.5 WASHING PROGRAMMES TABLE

Programme	Step	vd52_11 Basic functions (VD54)	level (*)	Time	Motor movement	VD55 (bridge JC)	Options									
							VD55 Rinses (prog. No. 5)	Cotton 60°	Cotton 40°	Synthetics 40°	Super rinse	Half load push-button	Wool	Spin reduction	No spin	Rinse hold push- button and Jumper J1
1	1	Load+heating+wash	2	P+9'	NA											
	2	Load+heating+wash	2	P+4.5'	NA											
	3	Drain		3'	DA											
2	4	Load+heating+wash	1	P+9'	NA											
	5	Load+heating+wash	1	P+9'	NA											
3	6	Load+heating+wash	1	P+4'	NA			P+9'								
	7	Load+heating+wash	1	P+9'	NA			P+9'								
	8	Load+heating+wash	1	P+6'	NA			P+4'								
4	9	Load+heating+wash	1	P+12'	NA			P+9'	P+9'							
	10	Load+heating+wash	1	P+12'	NA			P+6'	P+9'							
	11	Load+wash	1	P+12'	EA											
	12	Load+wash	2	P+3'	NA											
	13	Drain /RA		1.5'	DA Un	3"										
5	14	Load+wash/RA	2	P+14'	EA	3"	P+14"									
	15	Load+wash	2	P+4.5'	EA	2'NA	P+4.5'									
	16	Drain +spin		3'+TO	90°+90°DA+C2	C3.1	C3.2								X	
	17	Load+wash	2	P+3"	EA						P+1'					
	18	Load+wash	1	P+4.5'	EA						P+4'					
	19	Drain +spin		3'+TO	90°+90°DA+C2	C3.2	C3.2					90°off+ 90°DA			X	
	20	Load+wash	2	P+3"	EA						P+1'	3"				
	21	Load+wash	1	P+4.5'	EA						P+4'	90°DA				
	22	Drain +spin		3'+TO	90°+90°DA+C2	C3.2	C3.2								X	
6	23	Load+wash	2	P+4.5'	EA						P+5'					
	24	RA/ Rinse hold		3"	Off											∞
7	25	Drain		5"	Off											
	26	Drain+spin		3'+TO	3'DA+C1									X	X	
	27	STOP		∞	Off											
8	28	Load+heating+wash	2	P+9'	NA											
	29	Drain		4.5'	DA											
9	30	Load+heating+wash	1	P+4.5'	EA											
	31	Load+heating+wash	1	P+4.5'	NA											
10	32	Load+heating+wash	1	P+9'	NA					P+4.5'EA +4.5'NA						
	33	Load+heating+wash	1	P+12'	EA					P+9'NA						
	34	Load+wash	1	P+6'	NA					P+12'EA						
	35	Load+wash	1	P+12'	EA					P+6'NA						
	36	Load+wash	2	P+3'	NA											
	37	Drain		3'	DA											
11	38	Load+wash	2	P+4.5'	EA											
	39	Drain		3'	DA											
	40	Load+wash	2	P+4.5'	EA											
	41	Drain		3'	DA											
12	42	Load+wash	2	P+4.5'	EA											
	43	Rinse hold/RA		∞/3"	Off											∞
	44	Drain+spin		3'+TO	3'DA+C2	C3.2	C3.2							X	X	
	45	STOP		∞	Off											
13	46	Load+wash	2	P+3"	DA											
	47	Load+wash	2	3"	DA											
14	48	Load+heating+wash	2	P+18'	DA								6'D33+ 9'Off			
	49	Load+wash	2	p+6'	DA								6'D33			
	50	Drain		2'	Off											
15	51	Load+wash	2	P+6'	DA								6'D33			
	52	Drain		2'	Off											
	53	Load+wash	2	P+6'	DA								6'D33			
	54	Drain		2'	Off											
16	55	Load+wash	2	P+6'	DA								6'D33			
	56	Rinse hold/RA		∞/3"	Off											∞
17	57	Drain		5"	Off											
	58	Drain+spin		3'+TO	C2	C3.2	C3.2							X	X	
18	59	Drain		2'/4'	Off											
	60	STOP		∞	Off											

2.5.1 Programmes tables legend

- * In models with one-level pressure switch, all water fills are performed at the same level
- P** 1st level water fill time
- '** Minutes
- "** Seconds
- RA** Rapid advance
- TO** Spin max. time (timeout)

2.5.2 Motor Movements

Type	Phase duration (minutes)	Drum speed (rpm)	Movement (sec)	Pause (sec)
DA33	6'	33	4	40
DA	1.5'	55	4	12/3
DA	3'	55	4	11
DA	6'	55	7	19
DA	12'	55	7	19
NA	2'	55	10	15
NA	3'	55	7	6
NA	4.5'	55	10	9
NA	6'	55	14	12
EA	4.5'	55	14	5
EA	6'	55	19	7
DA Un	1.5'	55	Unidirectional movement	
Off	Motor stopped			

2.6 SPIN

2.6.1 Spin anti-unbalancing

The anti-unbalancing control of the load is performed during the 85 rpm movement before the spin phase. If the washing load is particularly unbalanced, the motor is stopped and then the ramp is repeated at 85 rpm.

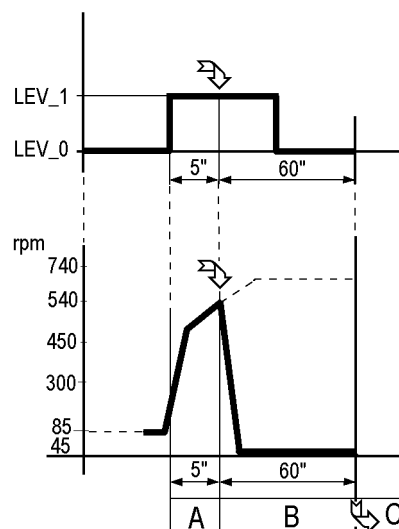
If the load is still unbalanced, this procedure is repeated for several times and after a time of 4-5 minutes, the timer passes to the subsequent phase without performing any spin cycle.

2.6.2 Safety against foam

During spin phases, the electronic control checks the correct position of the pressure switch contact (1st level), which has to be on "empty".

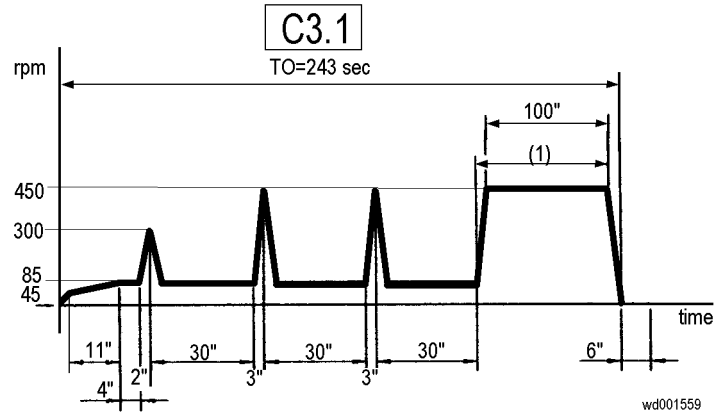
If the contact should remain closed on "full" for at least 5 seconds, the electronic control cuts power to the motor, then a one-minute drain phase is performed and then the timer passes to the subsequent step.

- LEV_0** pressure switch on "empty"
- LEV_1** pressure switch on "full"
- A** closure time of pressure switch on full
- B** drain phase with motor stopped
- C** timer advance



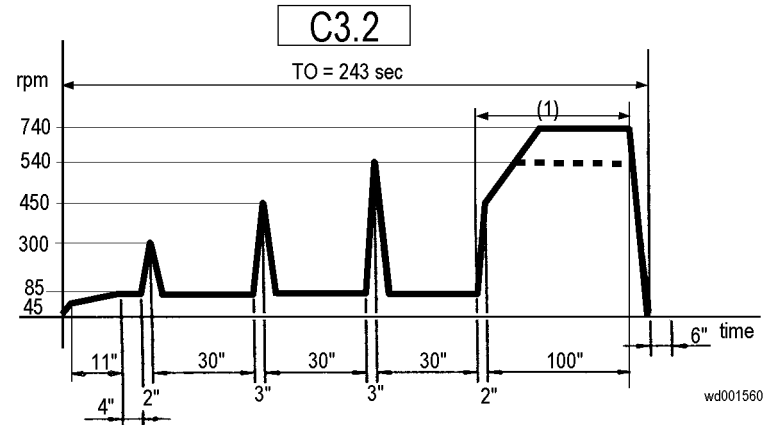
2.6.3 Spin C3.1

- COTTON rinses first intermediate spin in VD55 function



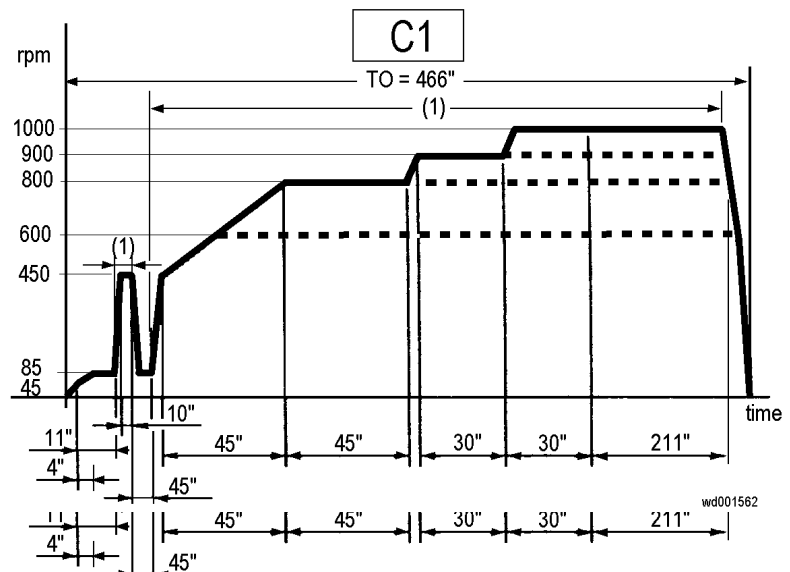
2.6.4 Spin C3.2

- COTTON rinses intermediate spins in VD55 function
- DELICATES and WOOL final spins in VD55 function



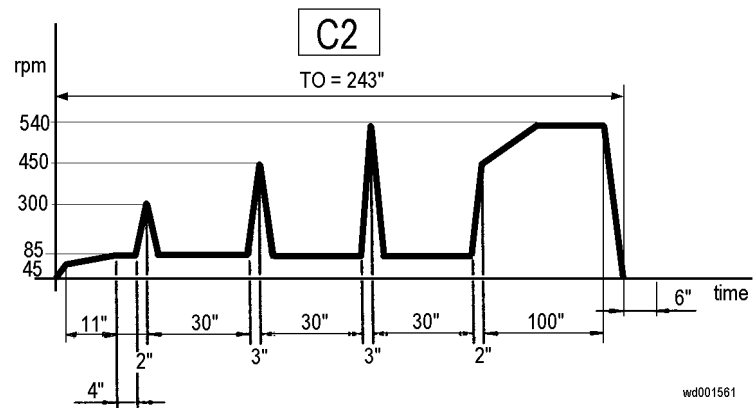
2.6.5 Spin C1

- COTTON final spin



2.6.6 Spin C2

- COTTON rinses intermediate spins in VD54 function
- DELICATES and WOOL spins in VD54 function



Notes

(1) = phase during which the anti-foam control is active

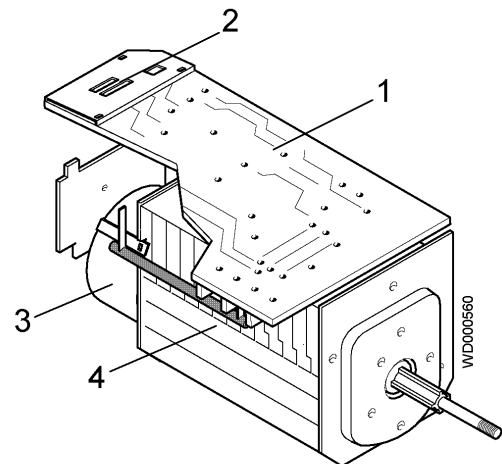
TO = max. time (timeout)

3 TECHNICAL CHARACTERISTICS

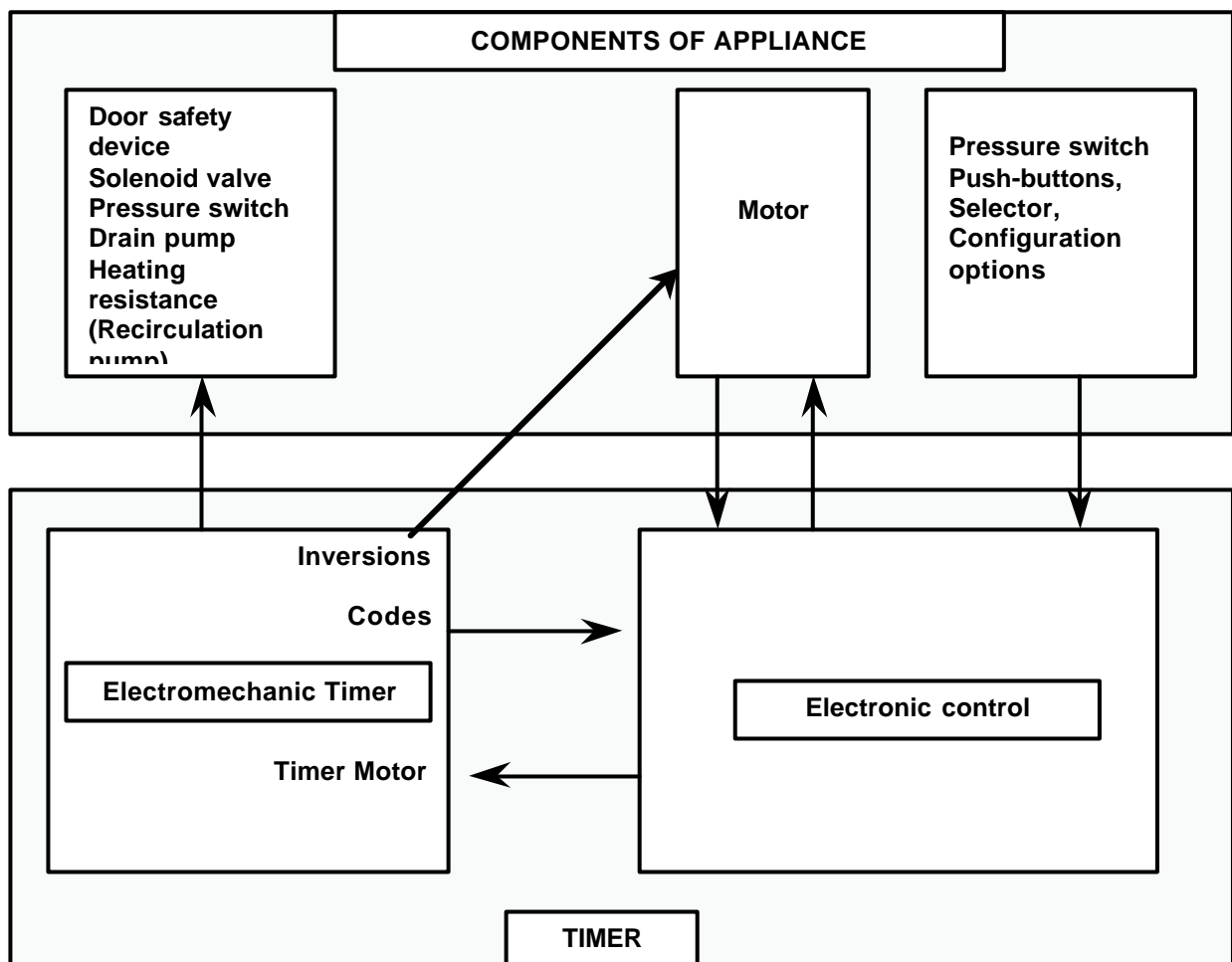
3.1 HYBRID TIMER

This timer consists of two components: the electromechanic timer and the electronic board; the electronic board is welded directly to the timer connectors.

- 1. *Electronic control*
- 2. *Microprocessor*
- 3. *Timer motor*
- 4. *Electromechanic timer*



3.2 Timer operating principle

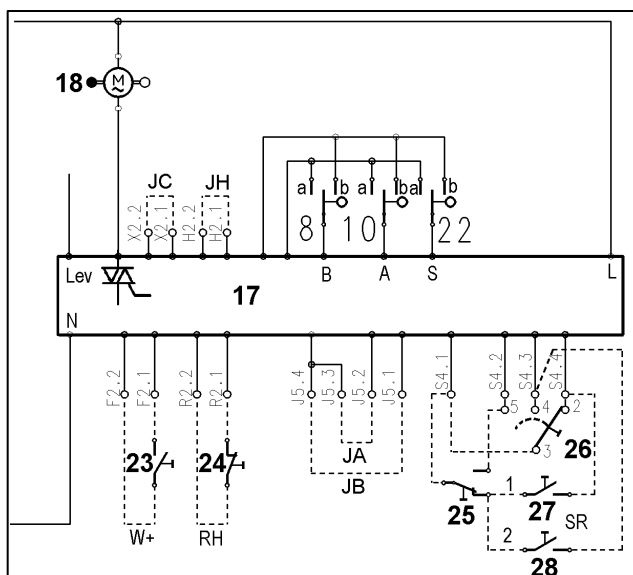


3.2.1 Washing programme control

The timer, through the closure of a series of contacts (8-a, 8-b, 10-a, 10-b), transmits to the electronic control (17) the codes that define what operations must be carried out in the various steps.

The electronic board, on the basis of the appliance configuration and of the selected options (push-buttons and selector 23÷28) controls the washing cycle:

- checks the closure of pressure switch
- powers the timer motor (18) through a TRIAC to control sense and time of direction of the drum and to advance in the various steps.

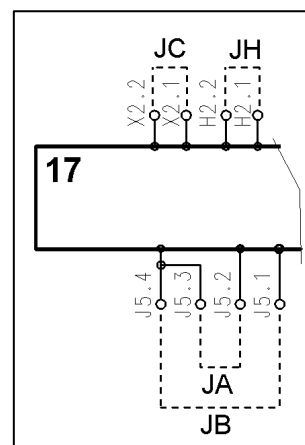


3.2.2 Configuration of timer function

17 Electronic control of timer

JC Connector which determines the **function** of timer

- **VD54** if there is no jumper between X2.1-X2.2:
 - 4 rinses in cotton cycle
 - cotton rinses intermediate spins and final synthetics, delicates and wool at 540 rpm.
- **VD55** if there is a jumper between X2.1-X2.2:
 - 3 rinses in cotton cycle
 - cotton rinses intermediate spins and final synthetics, delicates and wool at 740 rpm.



JH This connector is used in conjunction with the push-button "rinse hold":

- if there is no jumper between H2.1-H2.2, when the push-button is pressed there is the rinse hold function in synthetics, delicates and wool cycles
- in case there is a jumper between H2.1-H2.2 this function is performed also at the end of rinses of cotton cycles

JA, JB Connectors which determine, in function of the different models, the transmission relation between motor pulley / drum pulley and the speed of **final spin**

JB	JA	Transmission relation	Max. spin
0	0	1/18	600
0	1	1/18	800
1	0	1/14	900
1	1	1/14	1000

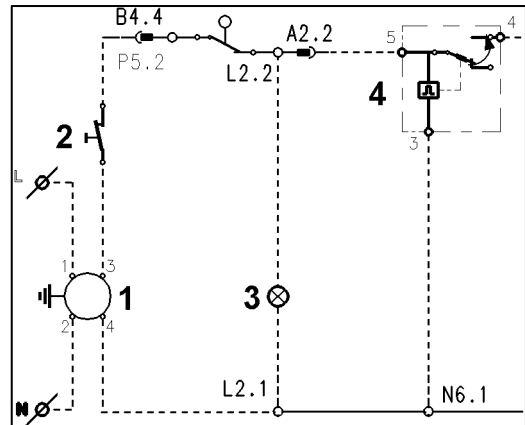
3.3 DESCRIPTION OF MAIN FUNCTIONS

3.3.1 Door closure

The door safety device is powered through the closure of contacts of the main switch and by the B4.4-A2.2 timer contact.

A few seconds after the switching on, the door is locked and the device contact closes powering the appliance (contact 5-4).

1. Interference suppressor
2. ON/OFF push-button (some models)
3. Pilot lamp
4. Door safety device



3.3.2 1st level water fill

The water fill solenoid valve (7) is powered in the following way:

All models:

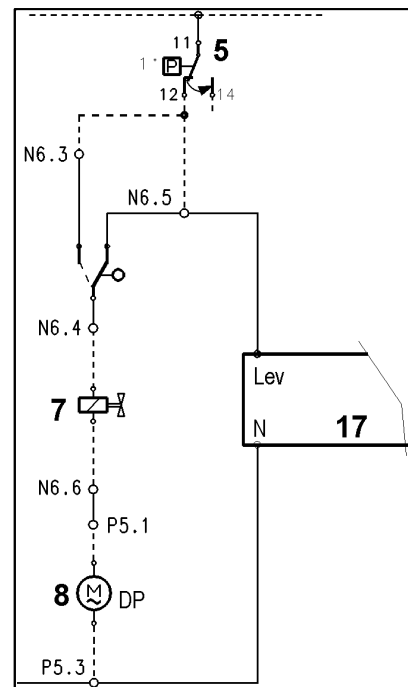
- 1st level pressure switch contact (5) closed on “empty”
- closure timer contact N6.4-N6.5
- drain pump winding (10).

Models with one level:

- at some steps the supply occurs also through the closure of contact N6.4-N6.3

Control of pressure switch closure

- The control of the position of pressure switch contact (empty or full) is detected by the electronic board (17) through “sensing” line (Lev).

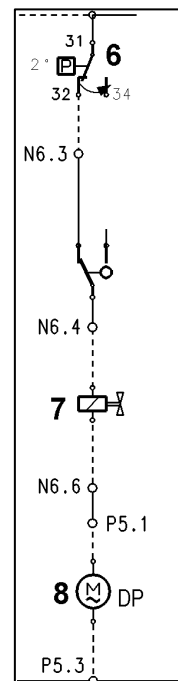


3.3.3 2nd level water fill

Models with two levels

To fill water at 2nd level, the solenoid valve (7) is powered in the following way:

- 2nd level pressure switch contact (6) closed on “empty”
- closure of timer contact N6.4-N6.3
- drain pump winding (10).



3.3.4 Heating

The heating element (10) is powered in the following way:

- first level pressure switch (5) closed on full
- safety pressure switch (12) closed on full
- closure of timer contact A2.1-B4.2
- 90° adjustable or fixed thermostat normally closed (11)

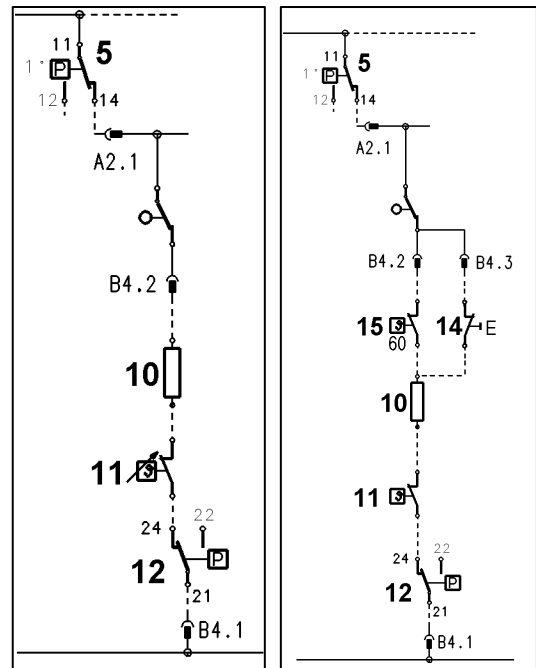
Warning!

This timer is “thermogradual”, therefore the heating time of water is predetermined. Through the adjustable thermostat you can diminish the prefixed temperature of the selected cycle, but the performing time does not change.

Economy/90° Push-button

In some models with fixed temperatures it is possible that the heating is powered through a two-temperature thermostat:

- a 90° thermostat normally closed (11)
- a 60° thermostat normally closed (15)
- a push-button (14) can be of two types:
 - **E**: this push-button is normally closed, if pushed the heating temperature of 90° cotton cycles will be reduced to 60°C
 - **90°**: this push-button is normally open and the heating temperature of cotton cycles will be limited to 60°C, if pushed will be increased to 90°C.



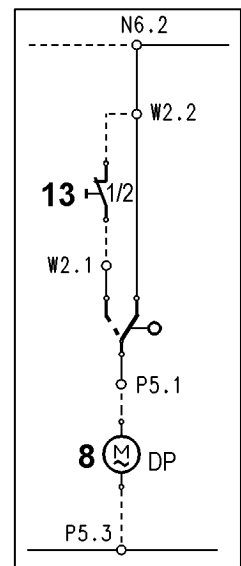
3.3.5 Drain

The drain pump is powered:

- Normally through P5.1-W2.2 contact timer
- At 19 step by half load push-button (if present) and by P5.1-W2.1 timer contact

3.3.6 “Half load” push-button

If pushed the drain with spin is not carried out at step 19, thus saving a water fill in cotton rinses.

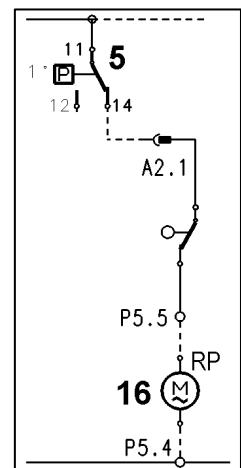


3.3.7 Recirculation pump (some models)

The recirculation pump (16) is powered in the following way:

- first level pressure switch (5) closed on full
- closure of timer contact P5.5-A2.1

(the timer with contact P5.5-A2.1 has specific codes)

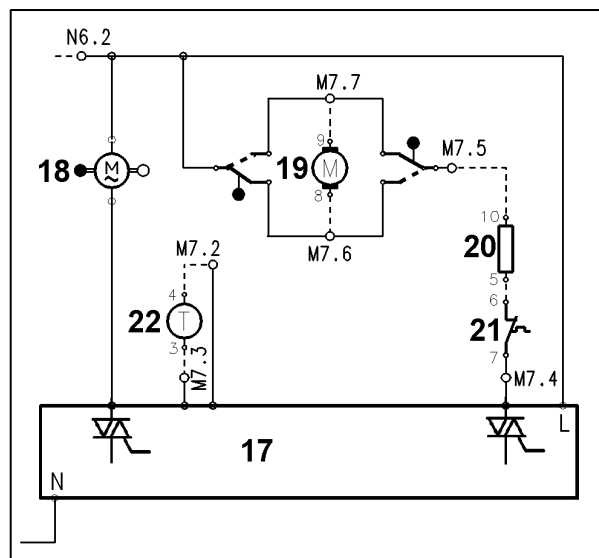


3.3.8 Drum rotation motor

- 17 Electronic control
- 18 Timer motor
- 19 Rotor
- 20 Stator
- 21 Moto-protector
- 22 Tachymetric generator

The motor is powered by the electronic control through a triac; the rotation speed is regulated on the basis of the sound emitted by the tachymetric generator.

The sense of motor rotation is determined by two secondary cams of timer (fast), that action the contacts to reverse the connection between rotor and stator.



- "A" position of timer cam
- "B" advance time when the motor timer is powered continuously
- "C" example of advance times during cycle (NA-3'): the electronic control powers the timer motor at intervals ("stop and go") to obtain the rotation and pause times suitable to the programme phase that is running.
- "D" sense of rotation of motor pulley drum rotation:
 - **CW**: clockwise
 - **ACW**: anti-clockwise

"D"	CW	OFF	ACW	OFF	CW	OFF	ACW	OFF	CW	OFF	ACW	OFF	CW	OFF	ACW	OFF
"C"	7"	6"	7"	6"	7"	6"	7"	6"	7"	6"	7"	6"	7"	6"	7"	6"
"B"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"
"A"	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
N6.2-M7.6																
N6.2-M7.7																
M7.5-M7.7																
M7.5-M7.6																

3.3.9 Motor protection

Power Triac for motor short-circuited

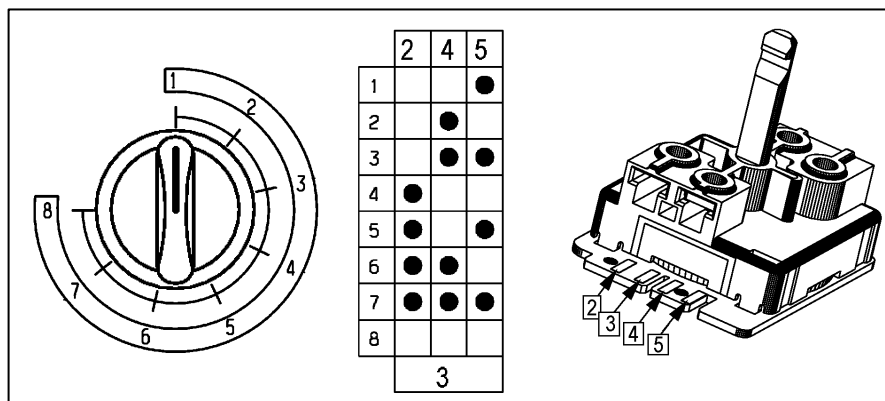
In case the triac for power motor is short-circuited, the electronic control moves the fast cams of timer in the position in which the motor is not powered. After 30 seconds it powers the motor again; if after 3 attempts the defect persists, the motor is not powered anymore and the timer remained locked in the position where it is.

Faulty tachymetric generator or other problems of the motor

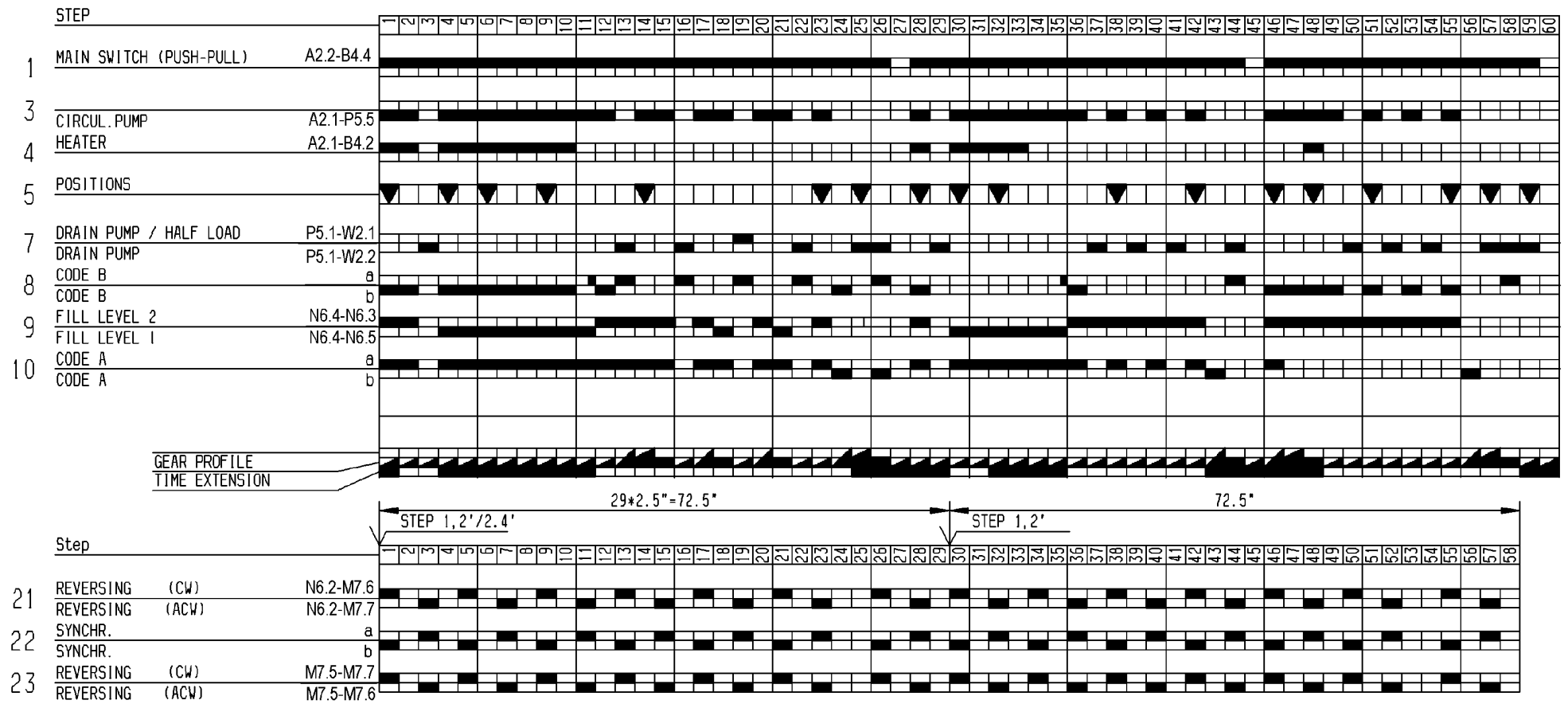
In case of detecting of an error of the tachymetric generator, the electronic control cuts power to the motor for 30 seconds and then tries to power the motor again. If the defect persists, this sequence of attempts of motor power is repeated every 30 seconds till the end of the cycle.

3.3.10 Spin speed selector

In some models it is possible to find a 8-position speed selector to regulate the speed of final spins.

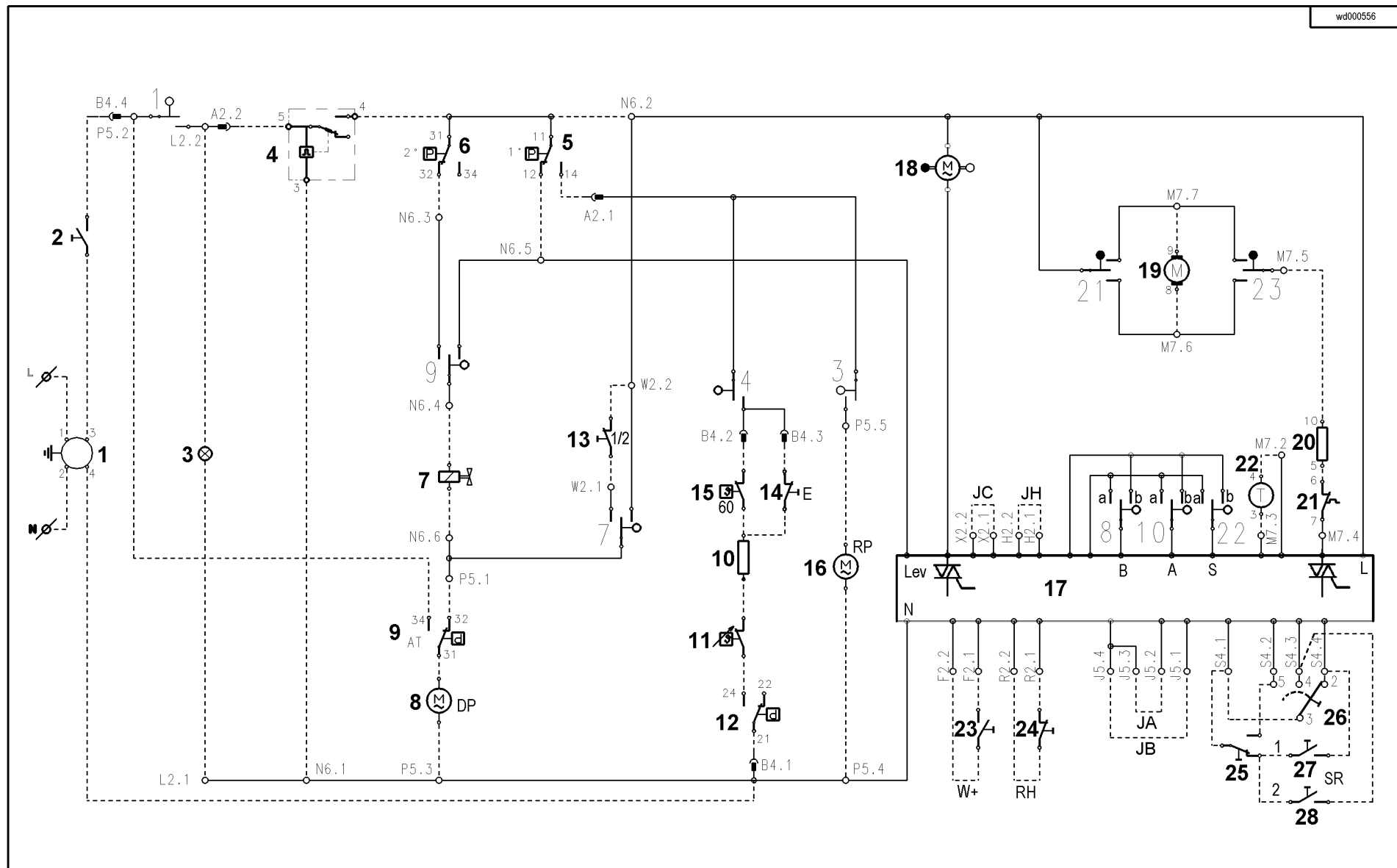


4 TIMER DIAGRAM

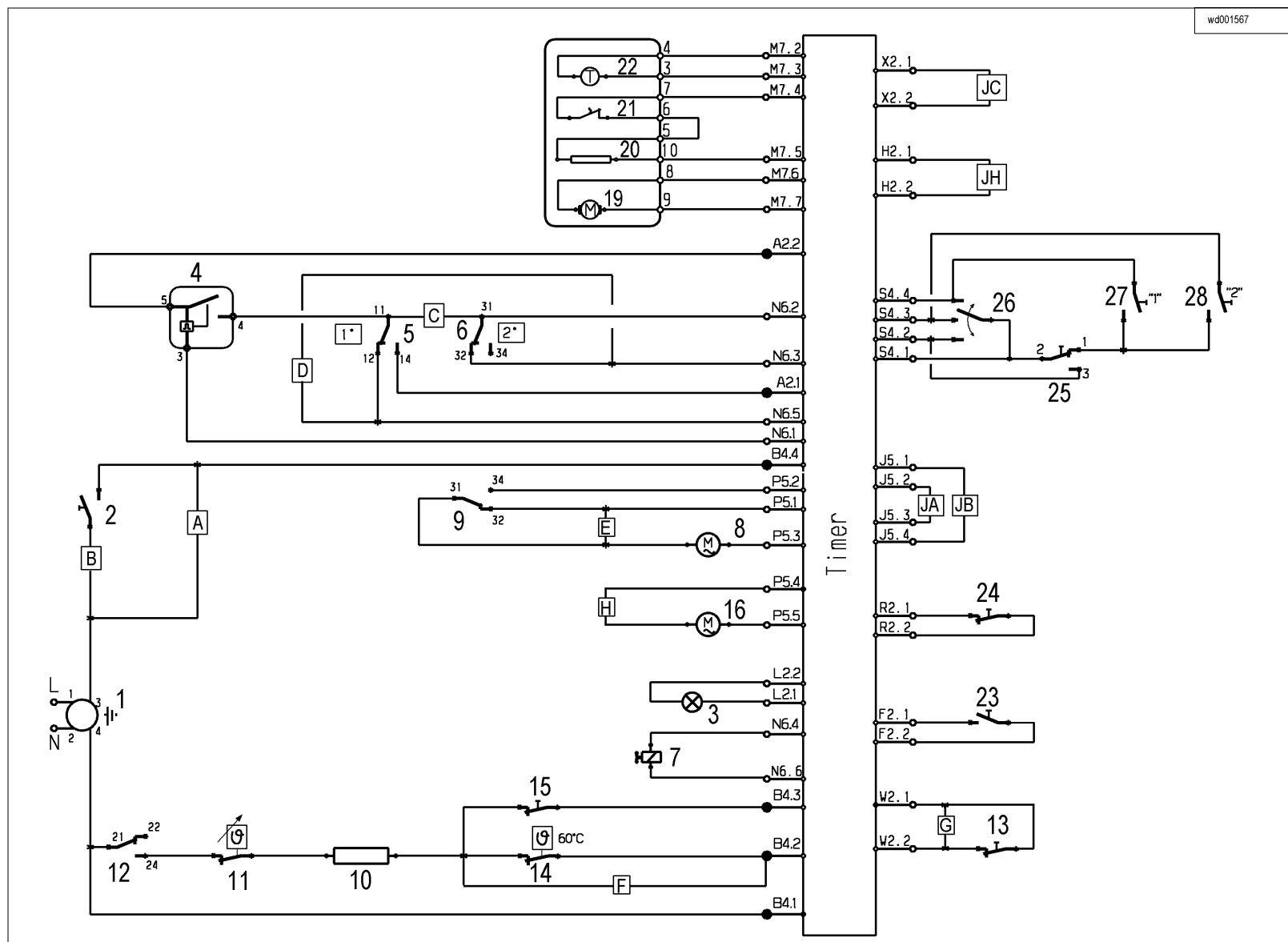


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5 BASIC CIRCUIT DIAGRAM



5.1 Diagram of the versions for each model



5.2 Diagram key

1 Interference suppressor	10 Washing heaters	19 Rotor
2 ON/OFF push-button	11 Adjustable thermostats	20 Stator
3 Pilot light	13 Pressure switch (safety heater)	21 Motor protection
4 Door safety device	13 Half load push-button	22 Tachymetric generator
5 Pressure switch (1st level)	14 Economy push-button	23 Super-rinse push-button
6 Pressure switch (2nd level)	15 60°C Thermostat	24 Rinse hold push-button
7 Cold water solenoid valve	16 Recirculation pump	25 No spin push-button
8 Drain pump	17 Electronic control	26 Speed regulator
9 Pressure switch (antioverflow)	18 Timer motor	27 Spin reduction push-button (type 1)
		28 Spin reduction push-button (type 2)

- A** Connection for models without ON/OFF push-button (push-pull)
- B** Connection for models with ON/OFF push-button
- C** Connection for models with 2-level pressure switch
- D** Connection for models with 1-level pressure switch
- E** Connection for models without antioverflow pressure switch
- F** Connection for models without Economy push-button - 90° and without 60°C thermostat
- G** Connection for models without half load push-button
- H** Only for models with recirculation pump

6 TEST CYCLE AND TROUBLESHOOTING

6.1 Test cycle of VD54/55 timer

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

VD54/55 Timer test			
Phase	Position the knob on the programme	Step	Functions to check
1	Select: 1 - COTTON WITH PREWASH and switch the appliance on	1	<ul style="list-style-type: none"> • Door closure • Water fill of prewash tub (without waiting for the level)
2	Move the knob on: 2 - 90°C COTTON (adjustable thermostat on 30°)	4	<ul style="list-style-type: none"> • Water fill of wash tub • 1st level pressure switch closure • Motor rotation at low speed • Heating (By rotating the adjustable thermostat on cold wash, the heating resistance is excluded)
3	Move the knob on: 16 – DELICATES CONDITIONER	55	<ul style="list-style-type: none"> • Water fill at 2nd level conditioner tub (in models with two levels)
4	Advance the knob of one position: DELICATES CONDITIONER + one position (push rinse hold push-button, if present)	56	<ul style="list-style-type: none"> • Rinse hold (if rinse hold push-button is present, push the button again to check the timer advance)
5	Move the knob on: 7 – COTTON SPIN	25-26	<ul style="list-style-type: none"> • Drain + motor inversions at low speed • Cotton spin – see profiles at page 9. At 26 step control: <ul style="list-style-type: none"> - No spin push-button - Spin reduction push-button - Spin speed selector

Notes:

- The possible water fill in bleacher tub is to be checked at 14 step.
- The water fill in conditioner tub can be controlled at steps 23-42-55.
- The half load push-button should be controlled at step 19: when it is pushed it interrupts the operation of the drain pump.
- The no spin push-button cancels all spin cycles (steps 16-19-22-26-44-58)
- The rinse hold push-button, if there is the jumper JH, stops the appliance with water in tub also in cottons (step 24)
- Particular defects must be checked in the specific timer position.

6.2 Troubleshooting

TYPE OF FAULT		POSSIBLE CAUSES/COMPONENTS TO CHECK	Phase of test cycle
WASHING MACHINE DOES NOT START	Pilot lamp off	Supply cable; interference suppressor; ON/OFF switch – if present; interference suppressor wiring-timer (B4.4 -B4.1); timer (contact closure B4.4 - A2.2)	1
	Pilot lamp on	Door safety device; door delayer wiring-timer (A2.2- N6.2 - N6.1); timer (internal circuits)	1
IT DOES NOT FILL WATER		Tap closed; insufficient water pressure; water fill solenoid valve; solenoid valve wiring-timer (N6.4 - N6.6); 1st level pressure switch does not close on empty; pressure switch hydraulic circuit (clogging); pressure switch-timer wiring (N6.5); drain pump-timer wiring or interrupted drain pump winding (P5.1-P5.3); timer (contact closure N6.5-N6.4)	1-2
IT FILLS WATER CONTINUOUSLY	It fills water also with appliance off	Solenoid valve mechanically blocked	2
	It fills beyond the level	Pressure switch, pressure switch hydraulic circuit (leakage of pressure switch tube, pressure chamber clogging)	2-3
	It does not reach the level	Drain tube too low positioned or problems with the house drainage system; leakage of hydraulic circuit of the appliance	2-3
INCORRECT WATER LEVEL		Non-calibrated pressure switch; pressure switch hydraulic circuit clogged	2-3
IT DOES NOT FILL WATER AT 2ND LEVEL		2nd level pressure switch does not close on “empty”; pressure switch-timer wiring (N6.3); timer (contact closure N6.3-N6.4)	3
IT DOES NOT WARM		Faulty heating resistance; safety heater pressure switch contact does not close on “full”; thermostat contact open; resistance-thermostats-pressure switch-timer wiring (A2.1-B4.2-B4.3-B4.1); timer (contact closure A2.1-B4.2/B4.3)	2
INCORREC TEMPERATURE		Non-calibrated thermostats; low voltage; timer (contact A2.1-B4.2/B4.3 does not close on all foreseen positions)	2
RECIRCULATION PUMP DOES NOT WORK (only in jetsystem models)		Faulty recirculation pump; recirculation pump-timer wiring (P5.4-P5.5); timer (contact closure A2.1-P5.5)	2



TIPY OF FAULT	POSSIBLE CAUSES/COMPONENTS TO CHECK	Phase of test cycle
MOTOR NEVER STARTS	motor (stator, rotor, moto-protector, brushes) (see 62.1 page 22); motor - timer wiring (M7.4-M7.5-M7.6,M7.7); timer	2-5
MOTOR TURNS FOR A SECOND, THEN STOPS FOR 30 SECONDS (sequence repeated max. 3 times, then the timer stops)	Timer	2-5
MOTOR TURNS FOR A SECOND, THEN STOPS FOR 30 SECONDS (the cycle continues)	motor (tachymetric generator) (see 6.2.1 page 22); tachymetric generator - timer (M7.2- M7.3) wiring; timer	2-5
MOTOR TURNS ONLY IN ONE SENSE	timer	2
ONLY SPIN CYCLE OPERATES	timer; wiring (S4.1-S4.4, S4.1-S4.3); spin speed selector; spin reduction push-button; no spin push-button	2-5
MOTOR DOES NOT PERFORM THE CORRECT SPEED	timer J5.1-J5.4, J5.2-J5.3 wiring (see specific electric diagram of the model); wiring (S4.1-S4.4, S4.1-S4.3); spin reduction push-button; timer	2-5
IT DOES NOT DRAIN	Drain pump; drain pump - timer (P5.1-P5.3) wiring; timer (contacts closure N6.2-P5.1); antioverflow pressure switch, if present	5
TIMER DOES NOT ADVANCE	timer	1, 5
CYCLE IS NOT CORRECT	Options wirings; push-buttons and relative wiring; timer	1, 5
CYCLE OPTIONS INCORRECT	Check the various push-buttons and relative wiring; timer	1, 5

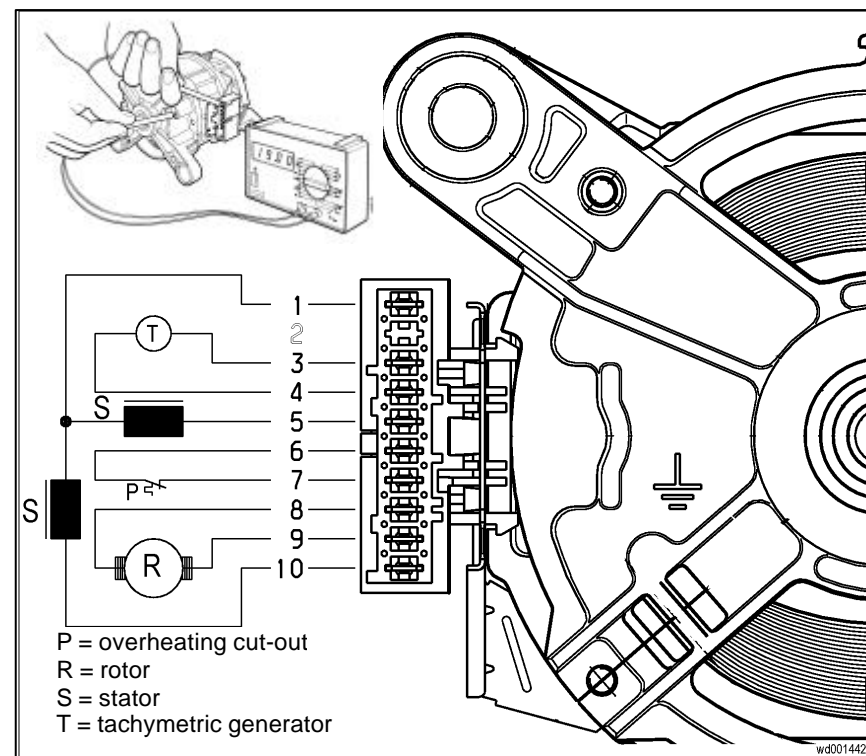
6.2.1 Checking the commutator motors

- 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 [W]	F.H.P. Motor [W]	CE.SE.T. Motor [W]
3 - 4	Tachymetric generator winding	171 ÷ 196	126 ÷ 147	64 ÷ 73
		469 ÷ 540		
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

Note:

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.



6.3 Timer connectors

(Disconnect all connectors before measuring the contacts!)

6.3.1 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 track and check the wiring that powers the affected component.

