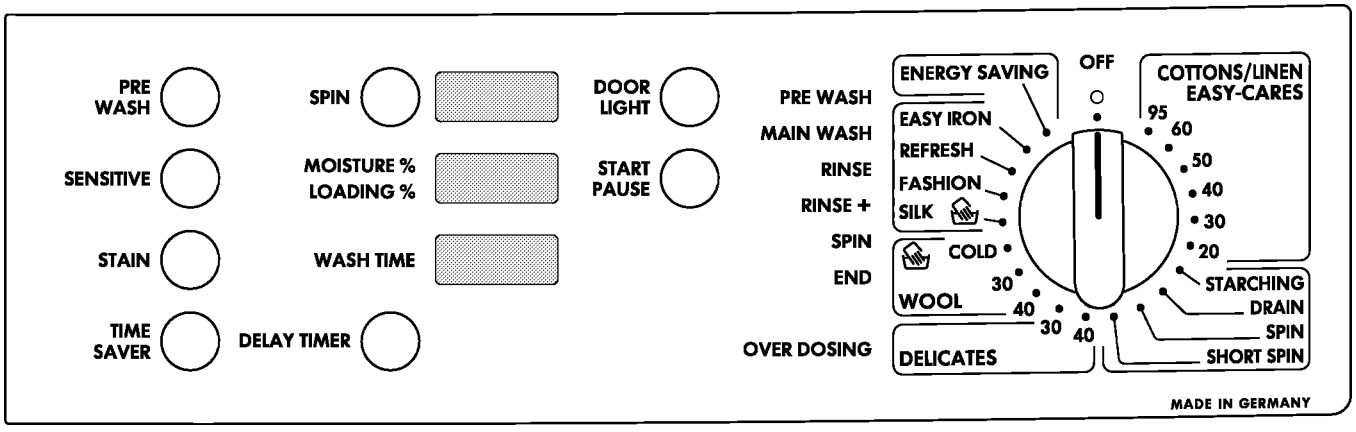
Electrolux
Distriparts

SERVICE MANUAL

Washing



Frontloading washing machines

EWM 3000 Advanced

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Index

Characteristics (features)

- Electronic machine
- Foam detection
- FUCS unbalanced load system
- Motor is puls width controlled
- Pressure sensor
- Recirculation - system
- Carboran tub
- Maximal number of drum revolution 1800 1/min
- Automatic foot
- 4 additional programmes

1. Operating elements / panel

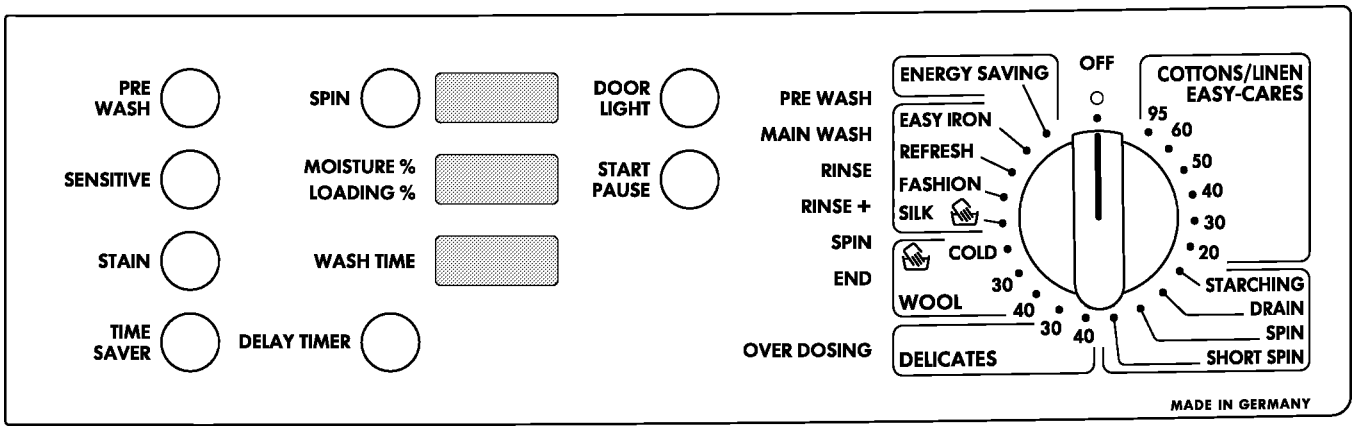
1.1 One button input philosophy

Every washing program with its temperature can be adjusted with the program selection switch.

1.2 The panel

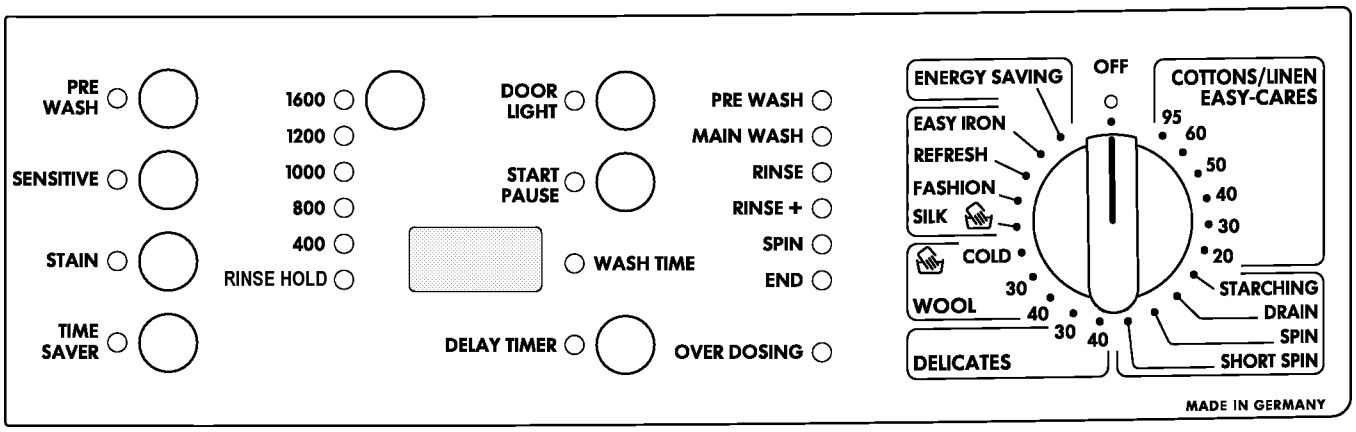
Machine class 8xx4x / background illuminated

- 3 multidisplays, spinspeed adjustment
  rest moisture in % / load in %, time of duration
- Display for the program cycle is background illuminated
- Function of the buttons are background illuminated

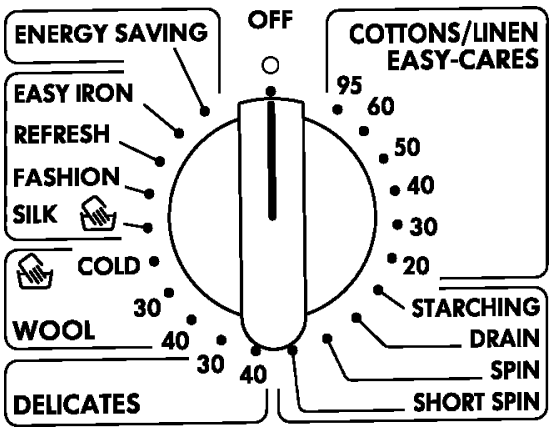


Machine class 8xx4x / LED version

- 1 multidisplay, time of duration
- LED´s for the program cycle
- LED´s for option buttons



1.3 The program selection switch



- 15 basic programs
- 6 program blocks
  - Cotton / Linen / Easy-Cares
  - Starching / Drain / Spin
  - Energy-Saving
  - Easy Iron / Refresh / Fashion / Silk
  - Delicates
  - Handlaundry / Wool
- On / Off - switch integrated in program-selector
- Quick program correction possible

2. Additional programes

2.1 Gentle spin

Select with program selection switch „gentle spin“
almost same as handlaundry - final spin

2.2 Spining

Select with program selection switch „spining“
almost the same as boiled / colored final spin with 2 pre-spinning phases

2.3 Fast unbalance control system FUCS

Common function:

The FUCS system has 4 phases:

1. Start phase
2. Distribution phase
3. Time out phase
4. **Measuring phase**

1. Start phase:
In this phase the drumspeed is increased up to 80 1/min.

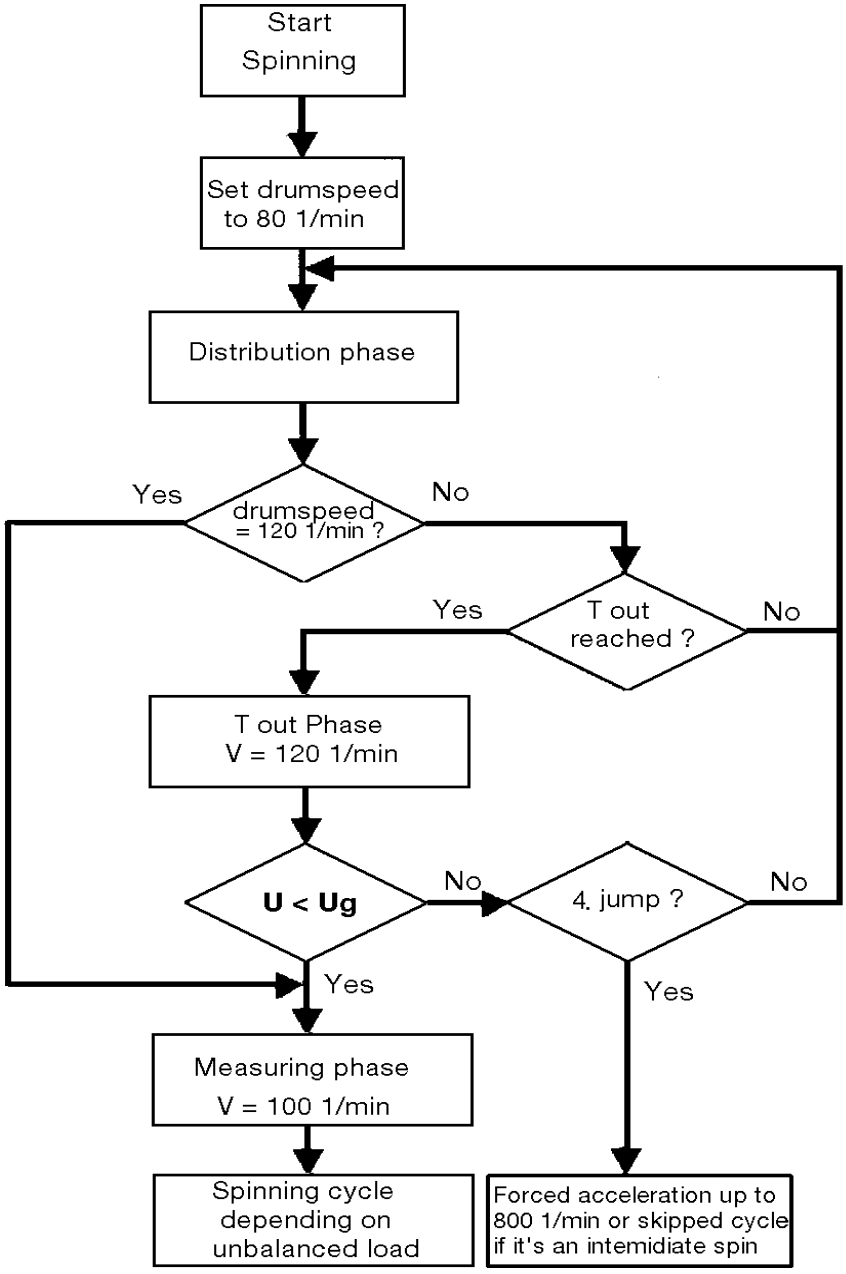
2. Distribution phase:
During this phase the laundry should be distributed well balanced by regulating the drumspeed.
This phase ends, if 120 1/min are reached or the time of 120s (at woll 60s) is expired.
If the time is expired it’s called “Time out (Tout)“.

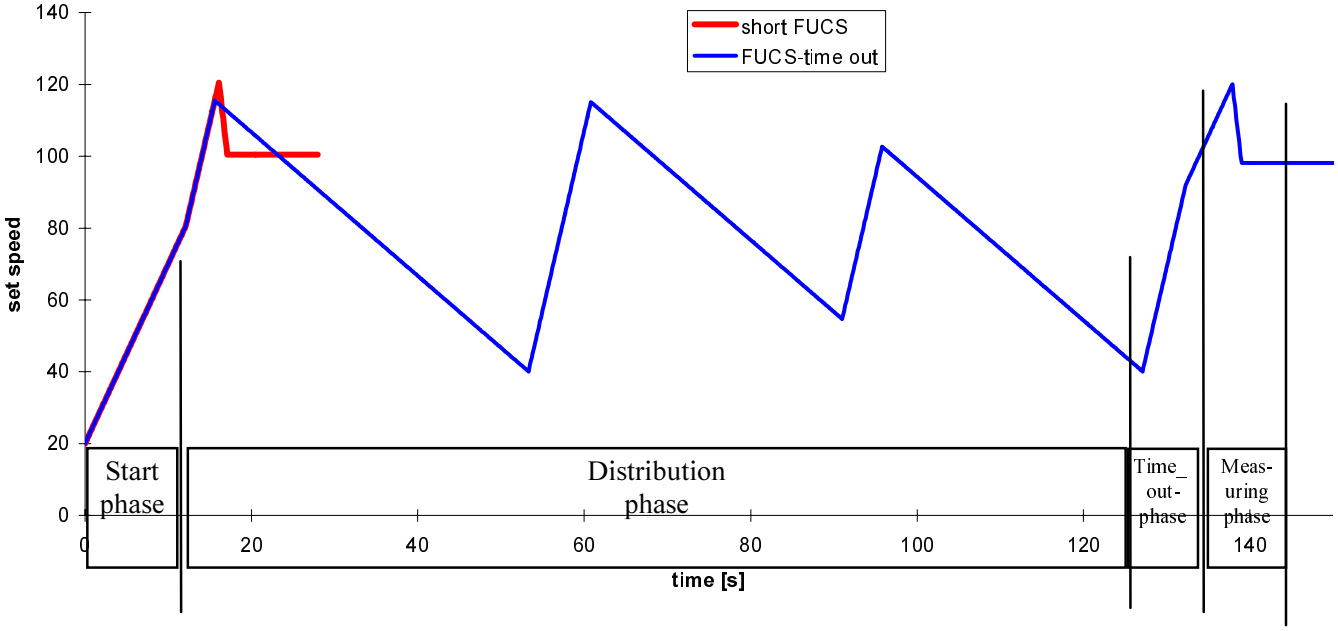
3. Time out phase:
This phase is excecuted, if the distribution phase has ended in cause of a time out.
This step is neccessary because the drumspeed has to be increased up to 120 1/min.

4. Measuring phase:
During this phase a unbalanced load detection is excecuted like known before.
The spinning cycle is excecuted, depending on the amount of unbalanced load.
An forced acceleration happens if the unbalanced load is to high.

Forced acceleration: Small unbalanced load 1023 1/min
Big unbalanced load 700 1/min

2.3.1 Fast unbalance control system FUCS





2.4 Pumping

Select with program selection switch position **pumping**.
Pumping until switching point of the pressure switch (Foam niveau)
additional 30 sec. fixed pumping time

2.5 Starching

Select with program selection switch position **starching**.
It's the same rinse as the 3. rinse from boiled / colored

- filling to washing level (ca. 5,4 l) chamber 1,
- after that filling over softener chamber (2,5 l - 1 min. mechanic - 2,5 l) + circulation pump,
- then 3,4min. reversing 70% mech. 53 1/min + circulation pump, final spin

2.6 E-Program

Select with program selection switch position **energy saving.**

- energy and water saving, wash cycle at approx. 67°C
- extended wash time

2.7 Easy Iron

Selection with program selection switch, position **easy iron**.

- temperature 40°C; load 1 kg
- filling to cottons/linen level
- mechanic 25%
- ON 12 sec / OFF 4 sec, 53 1/min
- 3 rinse cycles
- program takes about 90 min

2.8 Refresh

Selection with program selection switch, position **refresh**.

- temperature 30°C; load 2.5 kg
- filling to refresh level
- mechanic 70%
- ON 21 sec / OFF 9 sec, 53 1/min
- 2 rinse cycles
- program takes about 20 min

2.9 Fashion

Selection with program selection switch, position **fashion**.

- temperature 40°C; load 2.5 kg
- filling to delicate level
- mechanic 40%
- ON 8 sec / OFF 12 sec, 40 1/min
- 3 rinse cycles
- program takes about 70 min

2.10 Silk

Selection with program selection switch, position **silk**.

- temperature 30°C; load 1 kg
- filling to delicate level
- mechanic 10%
- ON 3 sec / OFF 27 sec, 27 1/min
- 3 rinse cycles
- program takes about 46 min

3. Option buttons / display

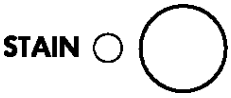
3.1 Prewash

- If you chose wool with prewash it is not possible because this function is locked.
- Prewash is generaly cold
- Different wash mechanics
  They depend on the chosen main program
- It takes about 25 min.
- 5 min circulation pump „on“
- **After the prewash the main program is automatically started**

3.2 Sensitive

- special program supplement with an additional rinse cycle
- reduced washing mechanic
- automatic cooling

3.3 Stain



- to treat very dirty laundry
- stain remover is rinsed in optimized in time (after the bio phase)

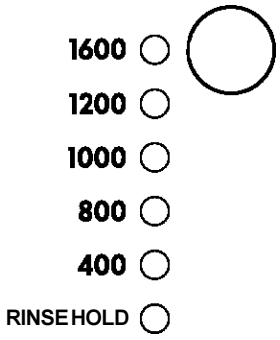
When setting wool / hand wash you can not select the program supplements using the buttons!

3.4 Time saver

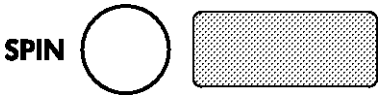
- Reduced wash cycle for less dirty laundry with the program white / colored, easy care in 3 steps (L, M, S)
- setting via ”key button function”

L	approx. 119 min	
M	approx. 91 min	(saving 25% time)
S	approx. 63 min	(saving 50% time)

3.5 Speed deselection

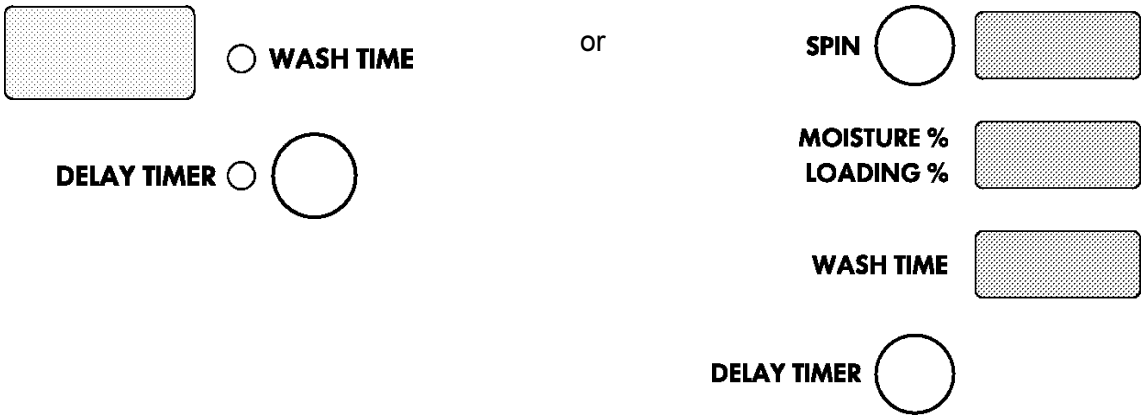


or



- the speed deselection button only influences the final spin speed
- setting via ”key button function”
- With the automatic cycles the maximum final speed is indicated first.
- You can deselect the final spin with all cycles, i.e. **rinse hold**.

3.6 The multi-display



- indicates pre-selected start time (up to 19h), adjustable in 1h steps
- after the start time is chosen the start button must be pushed to activate the pre-selected start time.
- If you press the break button during the pre-selected start time the door can be opened.
- indicates the additional soaking time
- once programe has started, indicates the estimated duration of program / remaining duration inminutes
- indicates faults (for example C1)
- update IR - Interface

3.7 The duration-display

- Before programstart, it indicates the estimated program time. The estimated program time can be corrected automatically. The times of prewash, mainwash, rinse and spinning will be added and corrected.
- indicates estimated duration of program / remaining duration in minutes. The duration in minutes can be corrected because of the Sensorlogic, Fuzzy - Logic and UKS.
- indicates the end of program

3.8 Moisture / loading

- without button, only multy display
- Only 8xxxx range with bachground illumination has the display
- If the load is defently recognized (after approx. 10 min.), the rest moisture is displayed. They are alternating displayed in a 1min. rhytm in %
- If wool / delicate wash or additional programs are chosen the display is out of function.
- The load is displayed in 10 % steps.

3.9 Start - Pause

- After the program and the options are chosen you start the machine with the start button.
  After that moment you can only change the spinspeed.
- Pause: Program stops in any position.
- During the pausetime the change of the program isn't possible.
- If you turn the selection switch during the program you must restart the machine.

3.10 The electronic program-cycle display

PRE WASH ◯
MAIN WASH ◯
RINSE ◯
RINSE + ◯
SPIN ◯
END ◯

OVER DOSING ◯

- indicates the selected program steps
- indicates the actual steps during the program
- indicates the end of program
- indicates at the end of program "Over Dosing", that means too much detergent is used.
- indicates fault codes
- In the customer service program it also indicates waterlevels

Displayed with LED's or backround illumination

3.10 The intelligent door lock

- Electrical - magnetic door lock ; To open the door you have to use the button on the panal
- If you want to open the door the machine must have power
- Emergency opening with the knob on the base panel.

Displayed with LED's or backround illumination

Before start - door is open	"Red"	Door is open
	"Red flashing"	Start button is pressed while the door is open.
Before start - door is closed	"Green"	Door can be opened
After start - door is closed	"Green"	Door will be locked. LED stays on "Green" as long as no locking conditions are fulfilled, also if the break button is pushed.
	"Off"	Is not illuminated if the the door is locked. (Locking conditions)
After end of programe	"Green"	The door is not locked and can be opened.
	"Red"	The door is opened.

3.11 Door locking conditions

1. Niveau >= fN2
2. water temperature >= 60°C
3. n_{ist} >= 60 1/min drum
4. n_{soll} >= 120 1/min drum at the end of spinning
5. NTC short circuit
6. Broken tacho generator
7. Since the first heating the door must be locked

4. Additional features
4.1 Stand-by operation

Only machines with background illumination have this feature!

1. During the pre - selected start time:
   3 min. after the last operation all displays exept the multi display are shut down.
   Any kind of operation (press a button) stops the stand - by - modus and starts all the according displays.

2. After the end of program:
   3 min. after the end of program without any operation all displays are shut down exept the LED "END" or perhaps a displayed fault code.

   You can stop this standby like shown in point 1.

   Use : Less energy consumption.

4.2 Drum light

The drum light is activated....

.... if the machine is switched on and the door is opened,
.... or the user opens the door
.... or the user presses the door / light button if the machine isn't in the stand-by-modus.

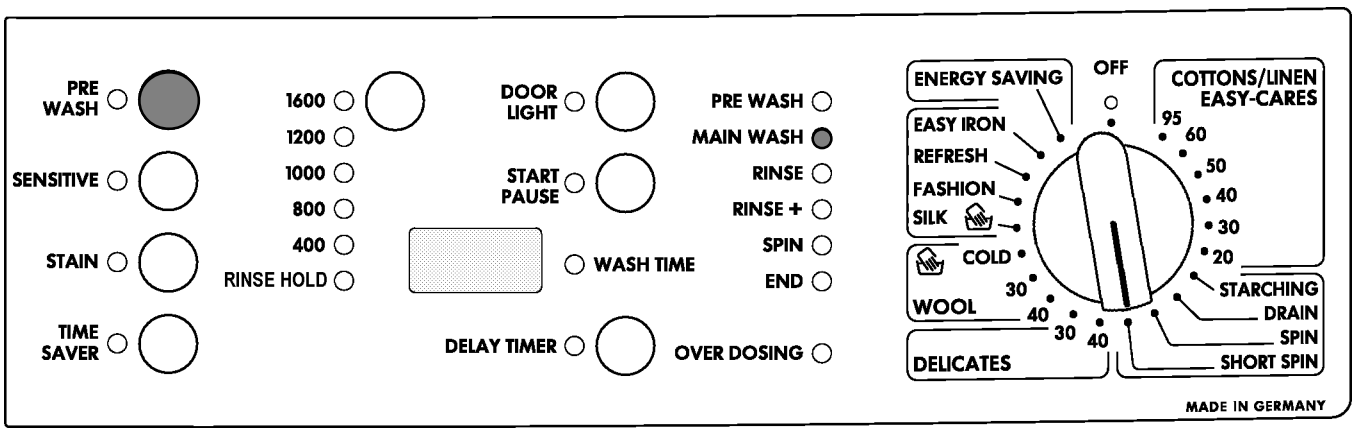
The drum light is switched off ....

.... if the fixed time of 3 min. has run out,
.... or the user closes the door
.... or the machine starts the stand-by-modus.

The halogen lamp is lowered in small brightness steps.
If the drum light is switched on, the user is able to lenghten the fixed illumination time, when he presses the door / light button.

4.2 Suds cooling

4.2.1 Activate suds cooling



Programming before program start:

- Set selection switch to position ”short spin”.
- Keep ”prewash” button pressed at least 5 sec.
- To confirm the ”main wash” LED is flashing for 5 sec.
- While the ”main wash” LED is flashing, release the ”prewash” button.
- When the flashing has stopped, the suds cooling is active.

4.2.2 Deactivate suds cooling

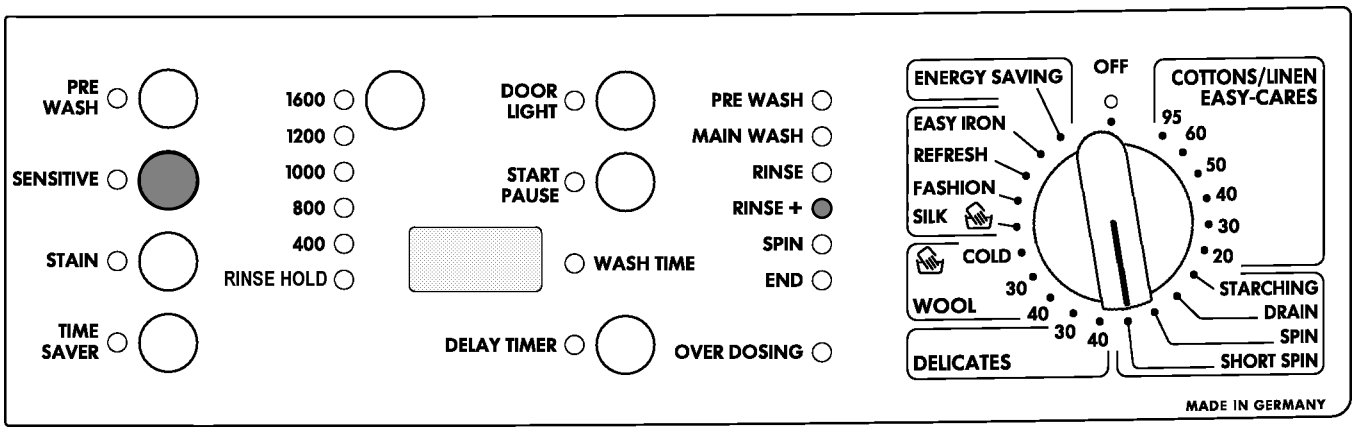
Programming before program start:

- Set selection switch to position ”short spin”.
- Keep ”prewash” button pressed at least 5 sec.
- Immediately when pressing the button, the ”main wash” LED is flashing.
- After 5 sec the flashing stopps and the LED is lit continuously for 5 sec.
- While the ”main wash” LED is lit continuously, release the ”prewash” button.
- After the ”main wash” LED has stopped lighting, the suds cooling is cancelled.

In order to check whether the suds cooling is activated, set the program selection switch to ”short spin” and press the ”prewash” button shortly. When the ”main wash” LED is flashing, the suds cooling is activated.

4.3 Rinse+ cycle

4.3.1 Activate rinse+ cycle



Programming before program start:

- Set selection switch to position ”short spin”.
- Keep ”sensitive” button pressed at least 5 sec.
- To confirm the ”rinse+” LED is flashing for 5 sec.
- While the ”rinse+” LED is flashing, release the ”sensitive” button.
- When the flashing has stopped, the rinse+ cycle is active.

4.3.2 Deactivate rinse+ cycle

Programming before program start:

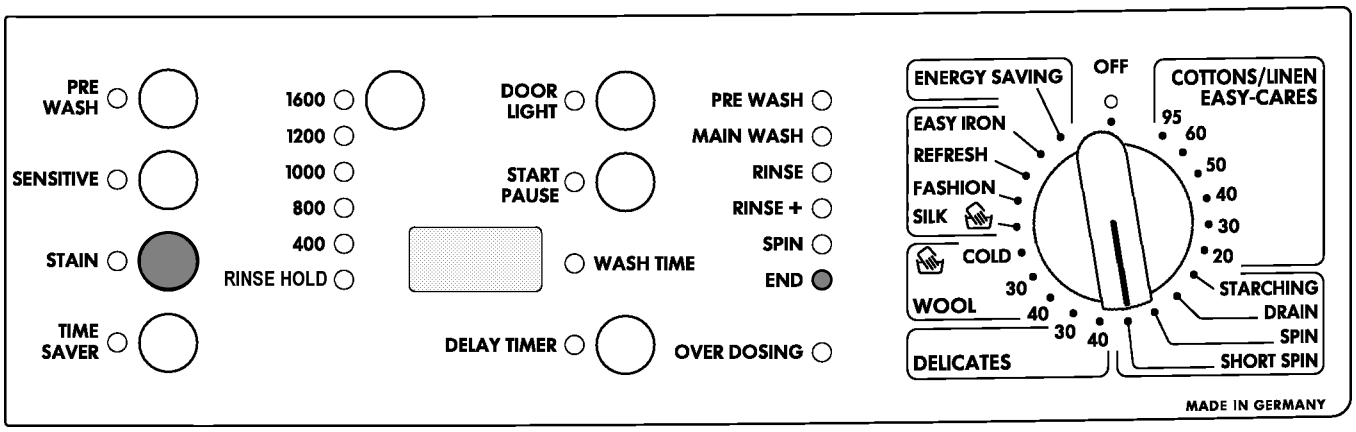
- Set selection switch to position ”short spin”.
- Keep ”sensitive” button pressed at least 5 sec.
- Immediately when pressing the button, the ”rinse+” LED is flashing.
- After 5 sec the flashing stopps and the LED is lit continuously for 5 sec.
- While the ”rinse+” LED is lit continuously, release the ”sensitive” button.
- After the ”rinse+” LED has stopped lighting, the rinse+ cycle is cancelled.

In order to check whether the rinse+ cycle is activated, set the program selection switch to ”short spin” and press the ”sensitive” button shortly. When the ”rinse+” LED is flashing, the rinse+ cycle is activated.

An extra rinse cycle increases water consumption and program run time!

4.4 Variomatic loosening-up spin

4.4.1 Activate variomatic loosening-up spin



Programming before program start:

- Set selection switch to position ”short spin”.
- Keep ”stain” button pressed at least 5 sec.
- To confirm the ”end” LED is flashing for 5 sec.
- While the ”end” LED is flashing, release the ”stain” button.
- When the flashing has stopped, the variomatic loosening-up spin is active.

4.4.2 Deactivate variomatic loosening-up spin

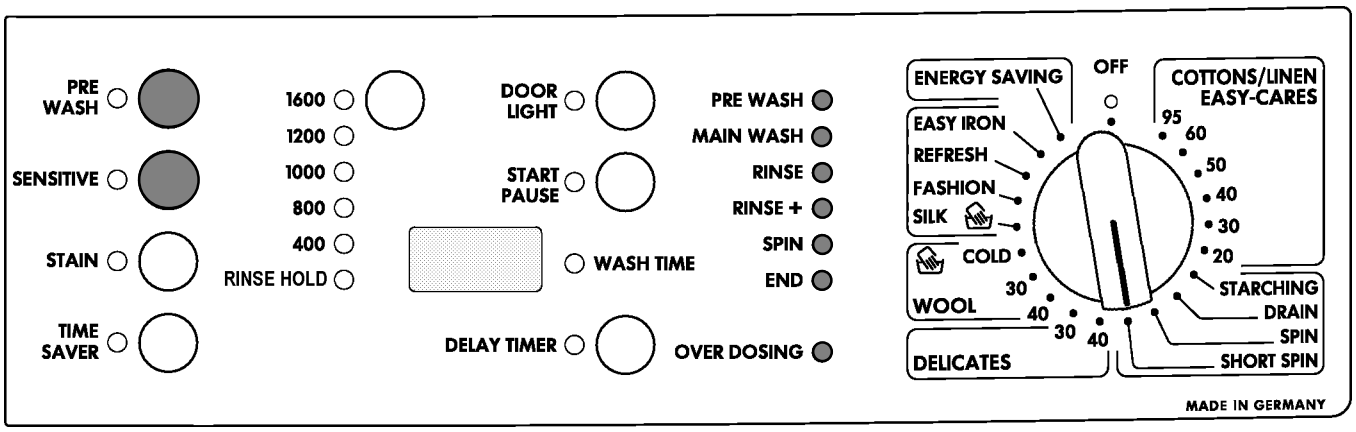
Programming before program start:

- Set selection switch to position ”short spin”.
- Keep ”stain” button pressed at least 5 sec.
- Immediately when pressing the button, the ”end” LED is flashing.
- After 5 sec the flashing stopps and the LED is lit continuously for 5 sec.
- While the ”end” LED is lit continuously, release the ”stain” button.
- After the ”end” LED has stopped lighting, the variomatic loosening-up spin is cancelled.

In order to check whether the loosening-up spin is activated, set the program selection switch to ”short spin” and press the ”stain” button shortly. When the ”end” LED is flashing, the loosening-up spin is activated.

4.5 Safety device

4.5.1 Activate the safety device



- You can activate it, if the program is started with the start button.
- Press the buttons „prewash“ and „sensitive“ at the same time for about 5 sec.
- You can see that the safety device is started if all LED's of the program duration display are flashing for about 5 sec.
- After that the duration of the program is displayed in the usual way.
- The safety device is started and stays active also at the end of program.

Behaviour if a button is pressed:

- All LED's of the program duration display are flashing for about 5 sec. After that the duration of the program is displayed in the usual way.

Behaviour if the prorgam selection switch is turned:

- All LED's of the program duration display are flashing, until the original position of the program knob is selected.
- The program which was chosen before continues.
- It doesn't influence the savety device in it's activity, if the program knob is turned to the position "OFF".

4.5.2 Switch off the savety device

- Press the buttons „prewash“ and „sensitive“ at the same time for about 5 sec.
- You can see that the savety device is stopped if all LED's of the program duration display are flashing for about 5 sec. and then the program duration display must illuminate complete.
- After that the duration of the program is displayed in the usual way.

4.5 The hand-laundry program

Every piece of laundry with the sign " only suited for hand-laundry " can now be washed with the appliance.

The machine wash has an advantage regarding the hand wash. This proves an expert's report of the Wfk-Institute.

- less shrink
- the laundry is less felted -> The surface is more even and fleecy
- less bleaching of colours
- less formation of crease

4.5.1 Differences to the wool program

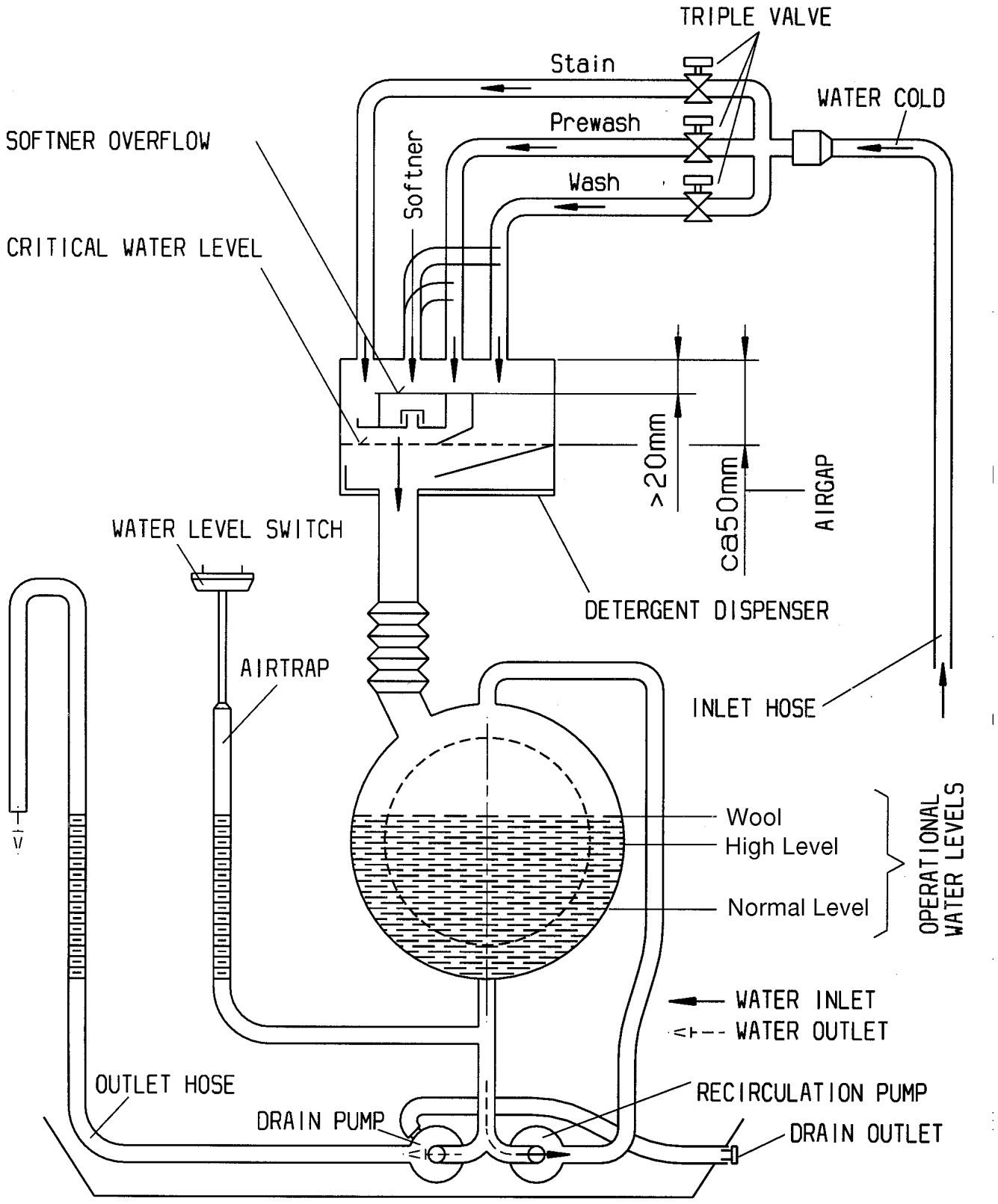
	Wool	Hand-laundry programme
Drum movement	422°	324°
Pause	57 sek	58 sek

- about 60 % less shrink
- water consumption (39l at 30°C), decreased for about 25%
- the wash and rinse results are the same as previous results.
- program duration (36 min. at 30°C), decreased for about 25%
- energy consumption (0,2 kWh at 30°C), decreased for about 10%
- the final spin speed of 1200 1/min is possible

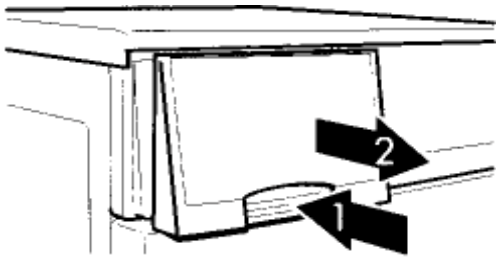
5. Water intake system

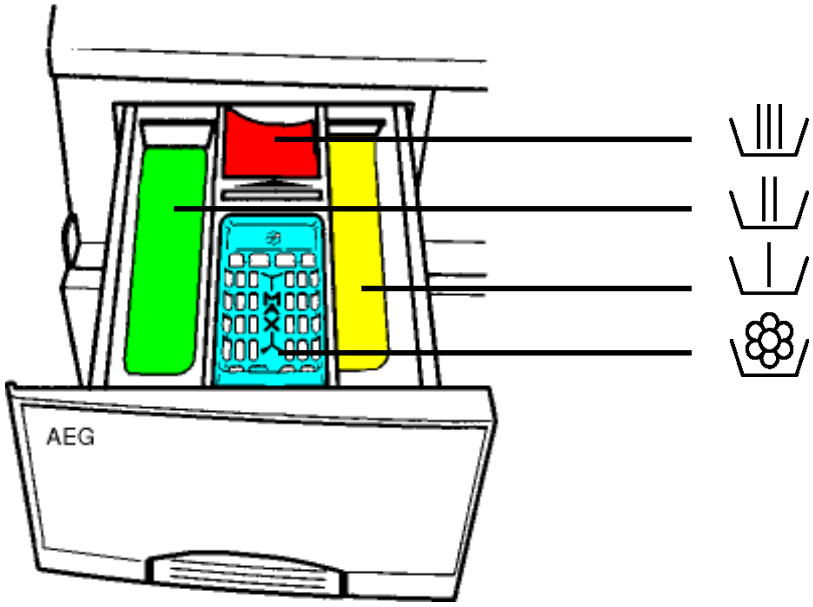
5.1 Waterdistributer + valve

- 4 detergent chambers; recirculation pump and drain pump
- 4 - Way Waterdistributer mechanically moved
- 3 - Valves



5.2 Drawer





Compartment for **prewash** powder/**soaking** powder
or **water softener**
Will be taken in at the very beginning of the program
Active valve: S1

Compartment for the **main wash** powder.
Will be taken in at the beginning of the main wash.
If you like to use water softener and the right compartment is filled with prewash or soaking powder, add the water softener to the washing powder.
Active valve: S2

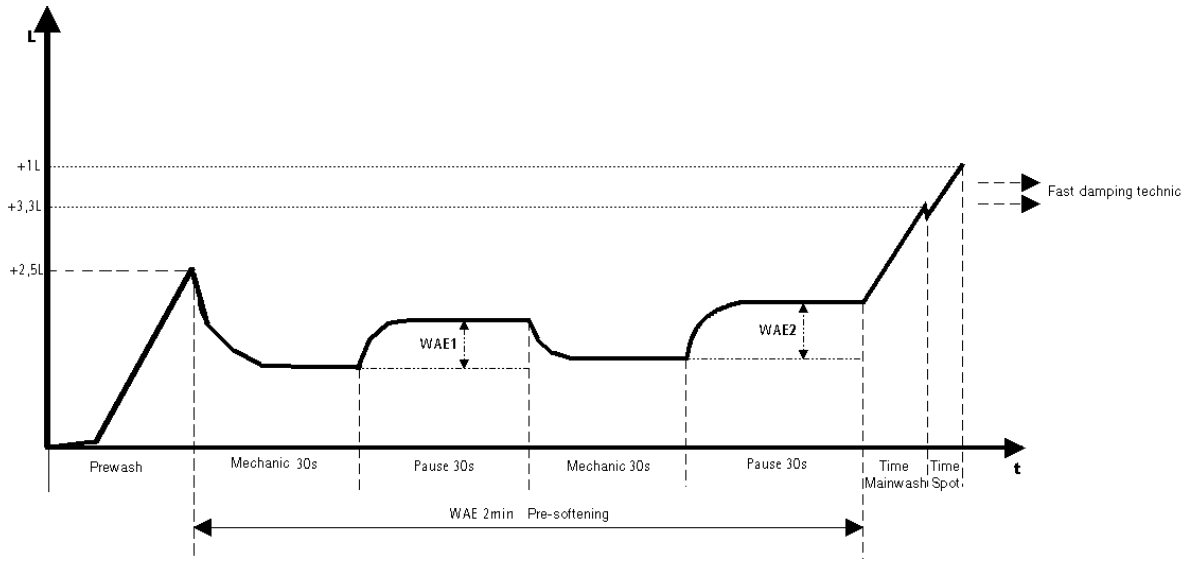
Compartment for the **spot** powder
The intake is delayed during the main wash.
Active valve: S15

Compartment for the **liquid softener** or **starching powder**
Intake at the last rinse.
Caution: Fill the compartment to the mark maximum.
Dilute high viscidity fluids.
Active valves: S1+S2

5.3 Water-intake diargrams

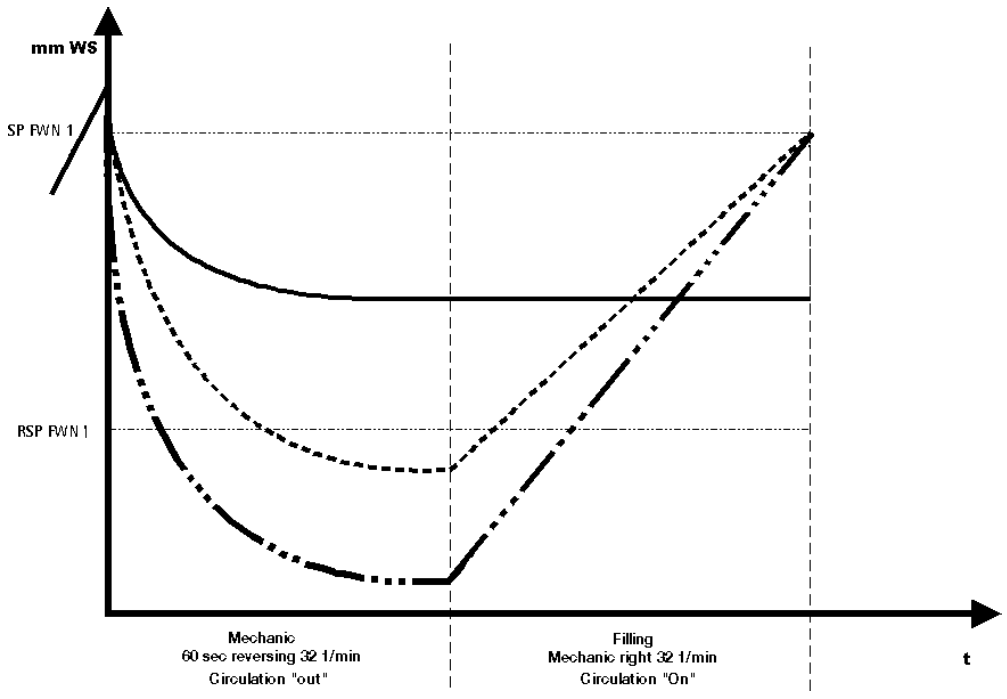
5.3.1 Kind of laundry messurement

With these two values WAE 1 and WAE 2, which are pressure differences, the machine calculates the soaked water amount.
The soaked water amount is a synonym for the amount of laundry.



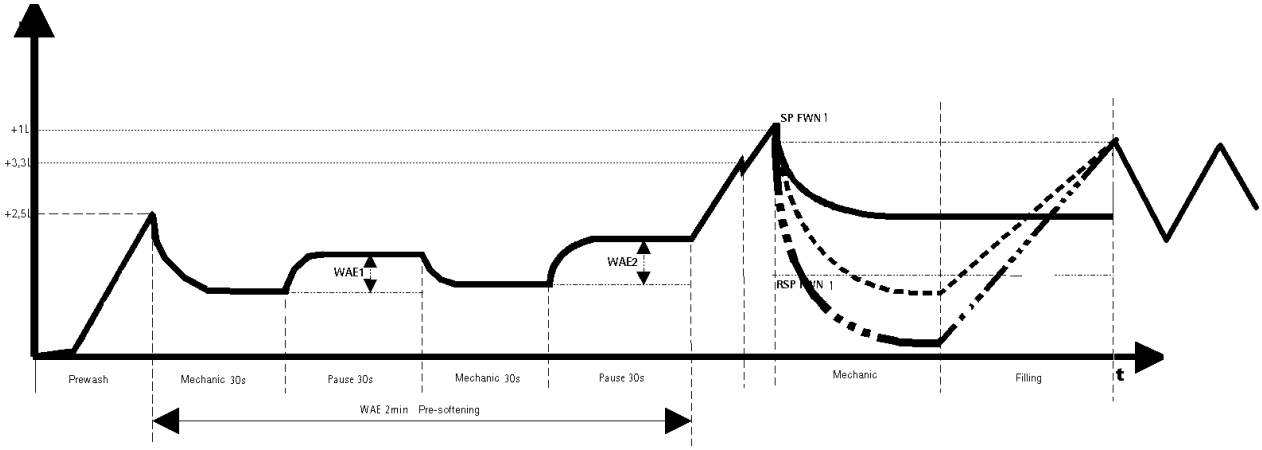
5.3.2 Fast damping technic

One "Fastwetniveau" is used to dampen the laundry in a fast way.
Both measurements have the load of the machine as a result.
The load is displayed after approximately 10 min.



After this a washing phase follows for a time of 5 min with activated circulation pump and the 3,5 min. without circulation pump -> biophase

5.3.3 Water intake diagrames



All messured values such as valve opening times, the amount of refilling steps up to washing level... are used to calculate the Fuzzy values.

5.4 Definition "ART2" rinsing

What does **"ART**" mean : **A**dvanced **R**inse **T**echnology
New kind of rinse system only in the machine class 8xxxx.

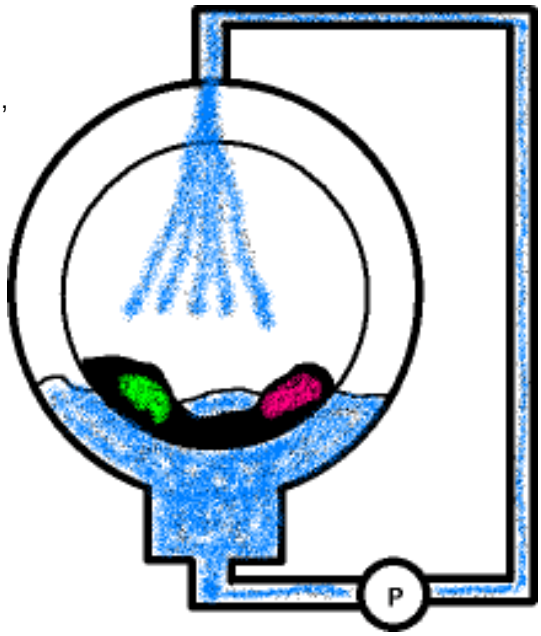
"ART2" - Rinse

SPMFF
Rinse with free water

The amount of rinse cycles is reduced down to 4 (5), because there is more water needed in each rinse cycle.

This rinse techcnology has no disadvantage, because the recirculation system guaranties the rinse result.

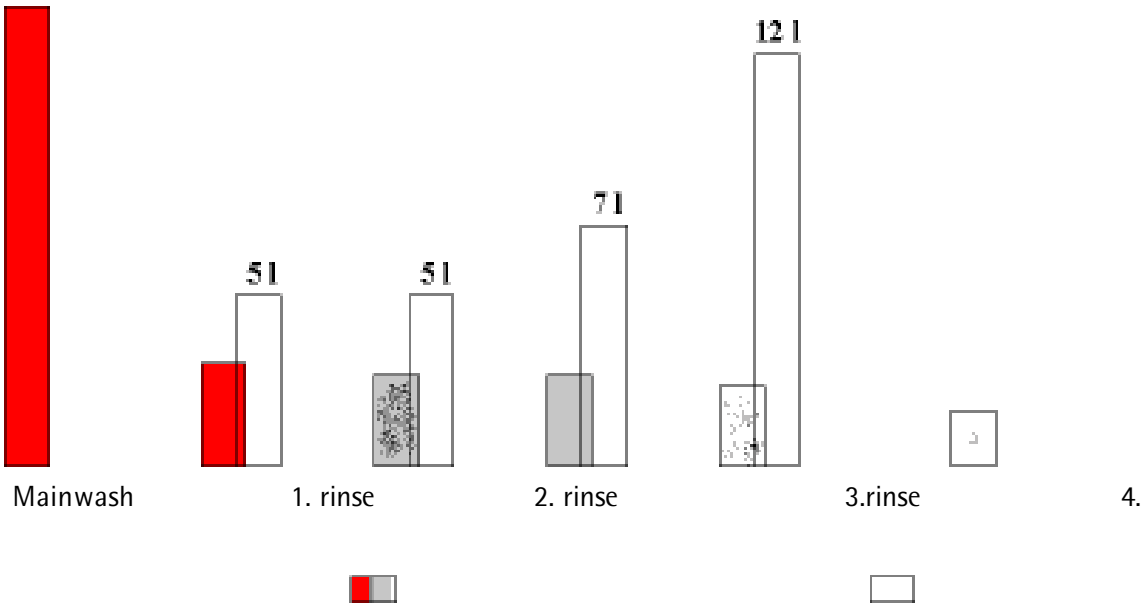
The last range of washing machines had the same amount of water and needed therfore more rinse cycles (SPOFF), because the free water couldn't be used.



5.4 Definition “ART2” rinsing

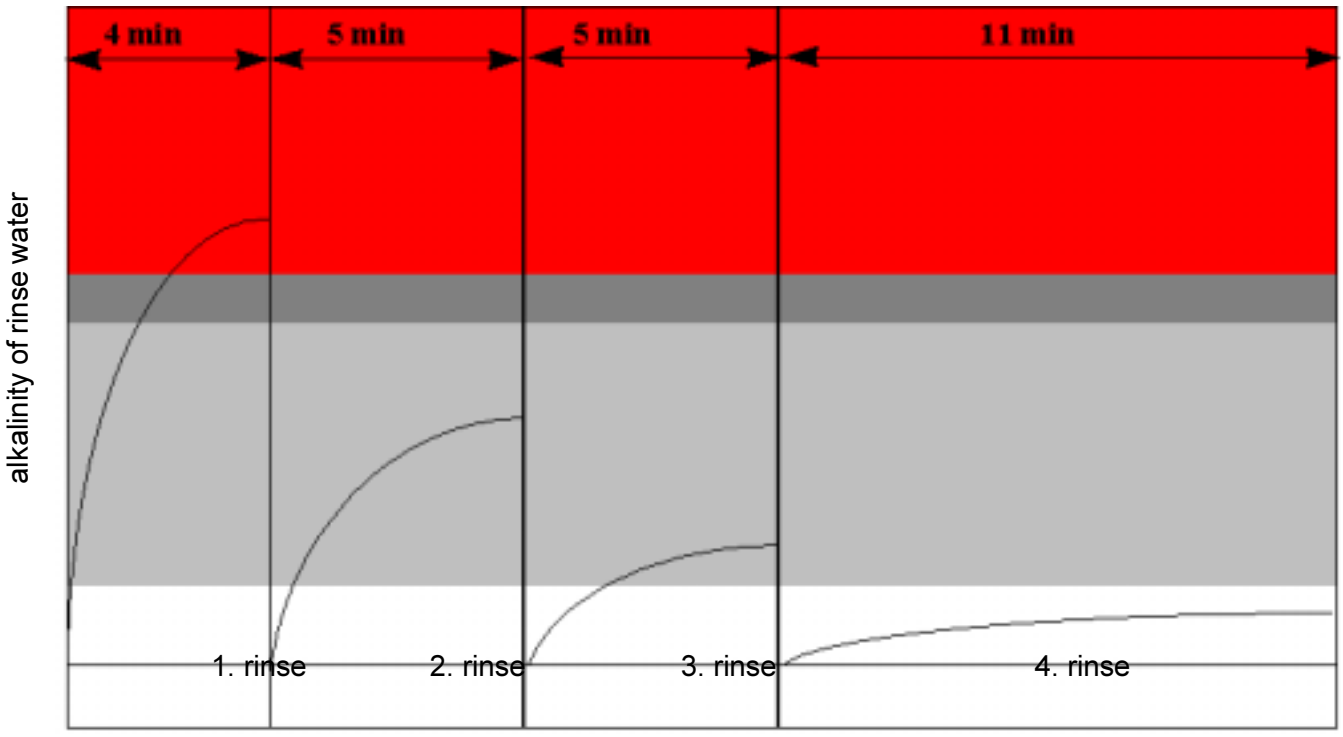
5.4.1 Rinse technology

Gradual increasing of the water used at the rinse cycle and the intermidiate spin.



Soaked water after the rinse cycle and its remaining alkalinity.

rinse water



Gradual increasing the duration of the rinsing cycle.
The saturation of the rinse water is reached.

5.5 First rinse

a) Boiled / Colored and Easy care:
- filling up to Fuzzy (x) table value (prewash chamber)
- 2 min without circulation and refilling
  5 min with circulation without refilling
  mechanic (rinse)

b) Delicate wash and easy iron:
- filling up to fH high level (prewash chamber)
  and circulation pump is on.

c) Wool Handlaundry:
- Filling up to handlaundry level over the pre-wash chamber and refilling

5.6 Additional rinse

a) Selectable with the more water switch :

Boiled / Colored and Easy care:
- filling up to Fuzzy (x) table value (prewash chamber)
  10 min with circulation and refilling
  mechanic (rinse)

Delicate wash and easy iron:
- filling up to fH high level (prewash chamber)
  3 min with circulation and refilling

b) Automatic insert depending on 3 times foam detection only at
Boiled / Colored and Easy care
- filling up to fH high level (prewash chamber)
  10 min with circulation and refilling

5.7 Second rinse

a) Boiled / Colored and Easy care:
- filling up to Fuzzy (x) table value (prewash chamber)
- 2 min without circulation and refilling
  6 min with circulation without refilling
  mechanic (rinse)

b) Delicate wash and easy iron:
- filling up to fH high level (prewash chamber)
  and circulation pump is on.

c) Wool Handlaundry:
- filling up to handlaundry level over the pre-wash chamber and refilling

5.8 Softening rinse

The automatic softener intake happens at the optimum time of the program (at the last rinse).

- SPMFF (A)
- filling fixed amount of water 5l
- after that filling up to Fuzzy (x) table value
- 2 - Step intake
- 2,5l over the softener chamber
- 1 min mechanic
- 2,5l over the softener chamber
- softening mechanic

As a result we have a maximum of 4 (5) rinse cycles inclusive softening rinse.

Foam detection:

function / priorty	spinning	1. rinse	spinning	extra rinse	spinning	2. rinse	spinning	3. rinse
1. foam detection:	yes	table + 5l	yes	-> fH	yes	table	yes	table

6. Cool down

If there is a cool down, then 5l are taken in over the ART - Nozzle.

- Boiled/Colored depending on how the more water switch is programed (additional it´s depending on the temperature look at more water switch).

- Automatic cool down depending on the chosen temperature > 40°C general with cool down, < 40°C without cool down.

- Delicate wash and wool general without cool down

7. Aqua control system

7.1 General construction

- Safty hose with a „normal“ pressure hose inside, without integrated electrical connection between the machine and the water tab valve.
- Hose system is all around closed and watertight
- At the water tab is a „mechanic“ safty valve without electric connection
- The hose is connected at the water inlet valve
- In case of a fault, that means the inner hose is leaking, a sponge as a part of the mechanic safty valve expands and closes the valve at the water tab.
- The water inlet valve with a flow regulator is positioned in the machine.
- There is no need for for special AC water distributer or valves.

7.2 Floating switch

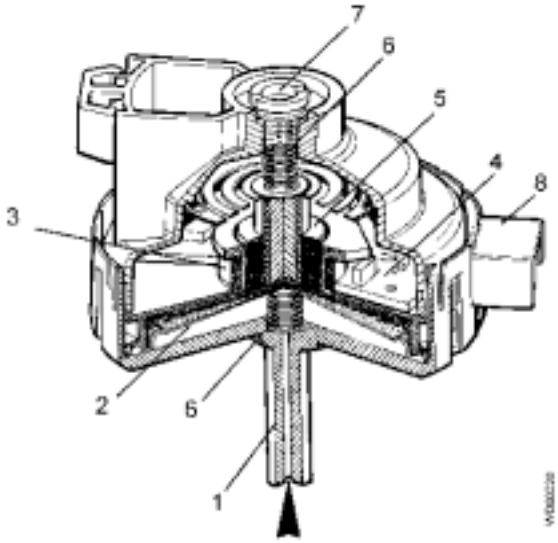
- Aqua-Control general with buzzer
- There is no need for a special electronic concerning AC
  Differences are made with the rotating programe knob or the wiring diagrames concerning the buzzer.
  Only at the range 8xxxx the pump and the floating switch are connected on the rotating programe knob.

Floating switch f16 with 2 alternating contacts:

- Switches on the pump - the pump has direct voltage.
- Electronic recognizes the opened pump contact and therefore the AC- case.
- The fault code „C3“ is shown.
- At this position the program stops.
- If the floating switches back the machine stops pumping.

  If you start the machine again the program will continue.

8. The pressure sensor

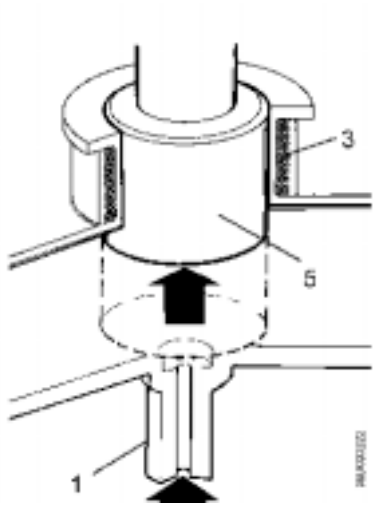


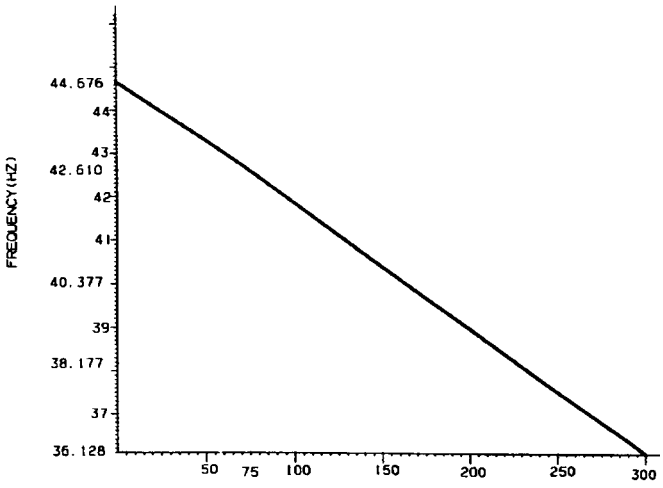
1	Air inlet
2	Membrane
3	Coil
4	Oscillator (Elektronic)
5	Magnetic ring
6	Spring
7	Screw to adjust
8	Connector

8.1 Function of the analog sensor

1 Over the air inlet the water pressure moves the membrane.

2 The membrane moves the magnetic ring (5) into the coil (3). Then the oscillator puts an other frequency on the main electronic. The water level is recognized.





PRESSURE (mm H20)	FREQUENCY (Hz)
0	44.676
75	42.610
300	36.128

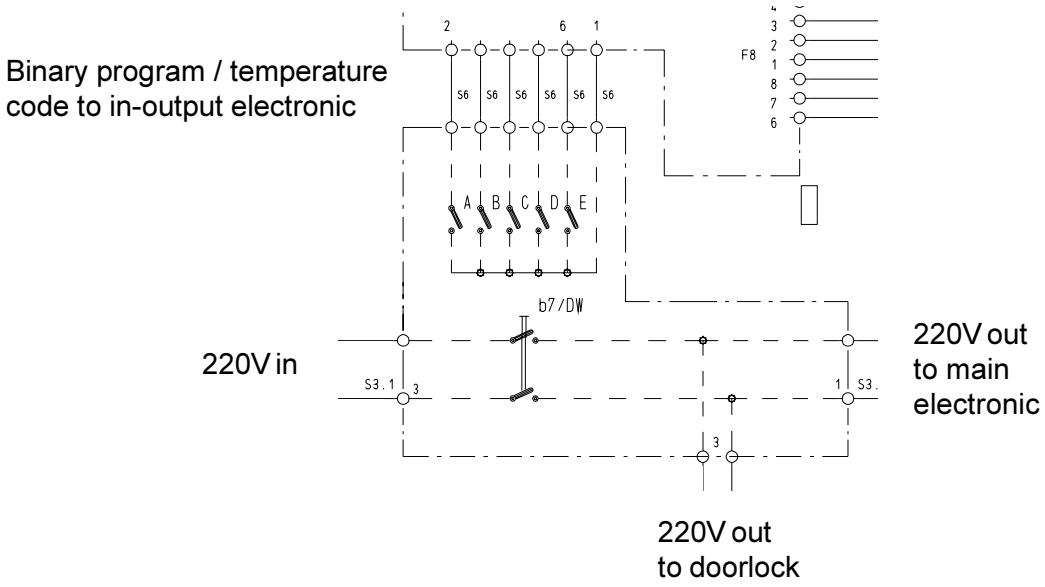
9. The automatic foot

The automatic foot is a kind of shock absorber.
The machine stands on three fixed points (The usal adjustable feet).
The adjustable range of the automatic foot is about 11 mm.

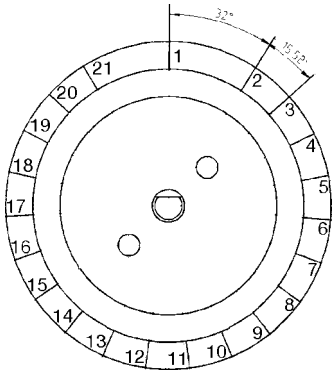
- It is not necessary to adjust the feet anymore

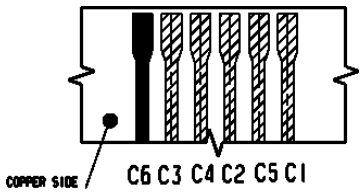
- The machine allways stands nicely

10. Components
10.1 Program / temperature selection switch



Binary code					
C3	C4	C2	C5	C1	Position
⊙	⊙	⊙	⊙		1
		⊙	⊙		2
⊙		⊙			3
	⊙	⊙			4
⊙	⊙	⊙			5
	⊙		⊙		6
				⊙	7
	⊙			⊙	8
	⊙	⊙	⊙		9
⊙			⊙		10
	⊙		⊙	⊙	11
⊙	⊙				12
⊙			⊙	⊙	13
⊙	⊙			⊙	14
⊙	⊙		⊙	⊙	15
		⊙		⊙	16
⊙		⊙	⊙		17
			⊙		18
		⊙			19
	⊙				20
⊙					21

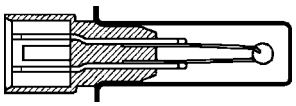




To check the program / temperature selection switch, measure the resistance between the common contact C6 and the several contacts, which should be closed according this tables.

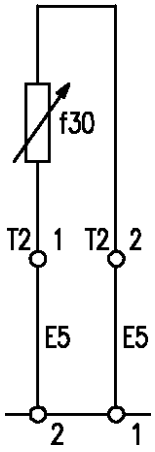
10.2 The NTC sensor

The electronic controls the drain temperature by means of a NTC temperature sensor.
If the NTC sensor should have a short circuit or an interruption, the fault code C8 will be displayed at the end of the program.



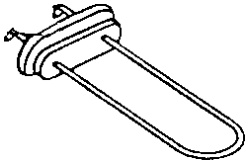
NTC resistance f30:

°C	Ω
20	6050
60	1250
80	640



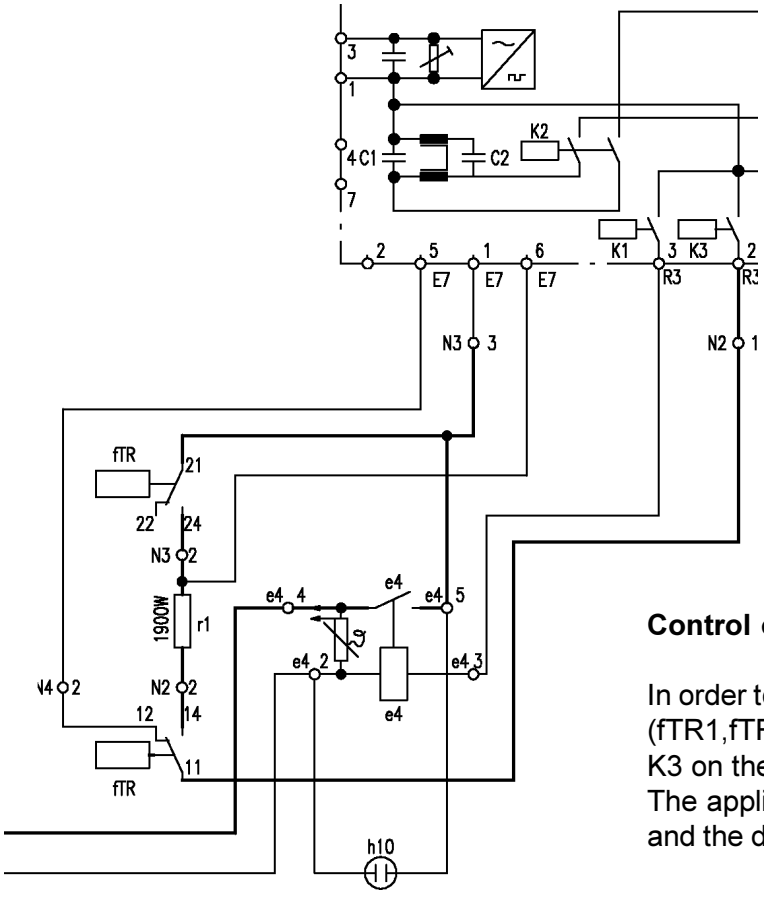
To check the NTC sensor function you can measure the ohmic resistance between the contacts T2/1 and T2/2. In figure 2 you can see the circuit diagram of the NTC sensor in the wiring diagram.

10.3 The heating element



Heating element :

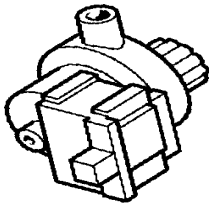
Connection:	230V; 50 Hz;
Power:	1950W
Fuse:	10A



Control of heating element (r1):

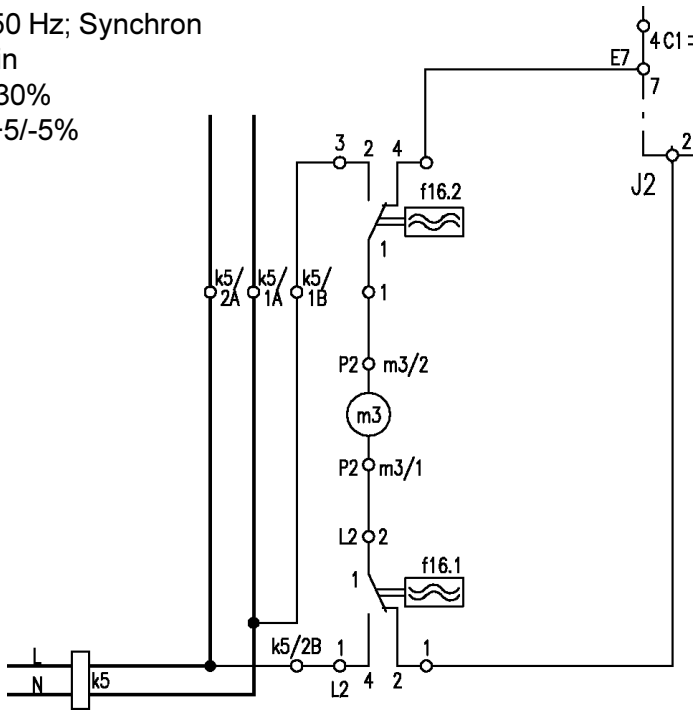
In order to heat, the dry-running protection level (fTR1,fTR2) must be achieved. The heating relay K3 on the electronic has to be closed.
The appliance must be switched on (b7/DW) and the door locked (e4).

10.4 The drain pump



Drain pump:

Connection:	230V; 50 Hz; Synchron
Flowrate:	22 L/min
Power:	34W +30%
Resistance:	164Ω +5/-5%

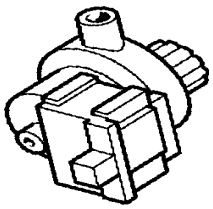


Pump control (m3):
In order to pump, the appliance must be switched on (b7/DW), the safety level and the floating switch have to be in empty position. The electronic controls the pump by a triac, depending on the program.

In case of aqua control the floating switch is in full position and the drain pump is active until the plug is pulled or the water is removed out of the bottom tray.

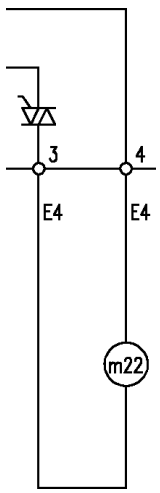
The appliance would even pump when the appliance is switched on and the safety level (fS) has reacted. Over-filling protection!

10.5 The recirculation pump



Recirculation pump:

Connection:	230V; 50 Hz; Synchron
Flowrate:	25 L/min
Power:	22W +30%
Resistance:	202Ω +5/-5%

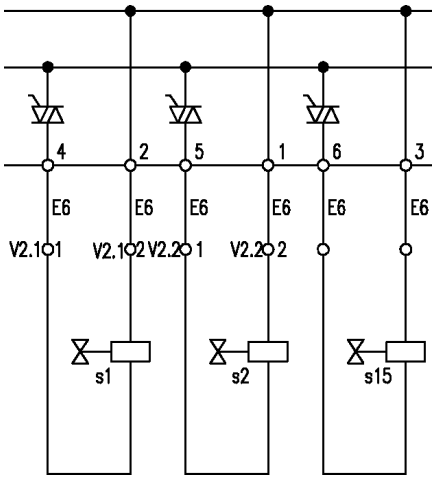


Circulation pump control (m22):
The recirculation pump is controled by a triac located on the main electronic board depending on the program cycle.

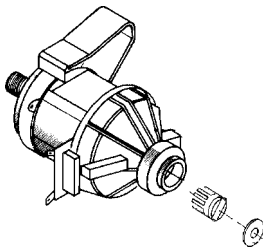
10.6 The inlet valves

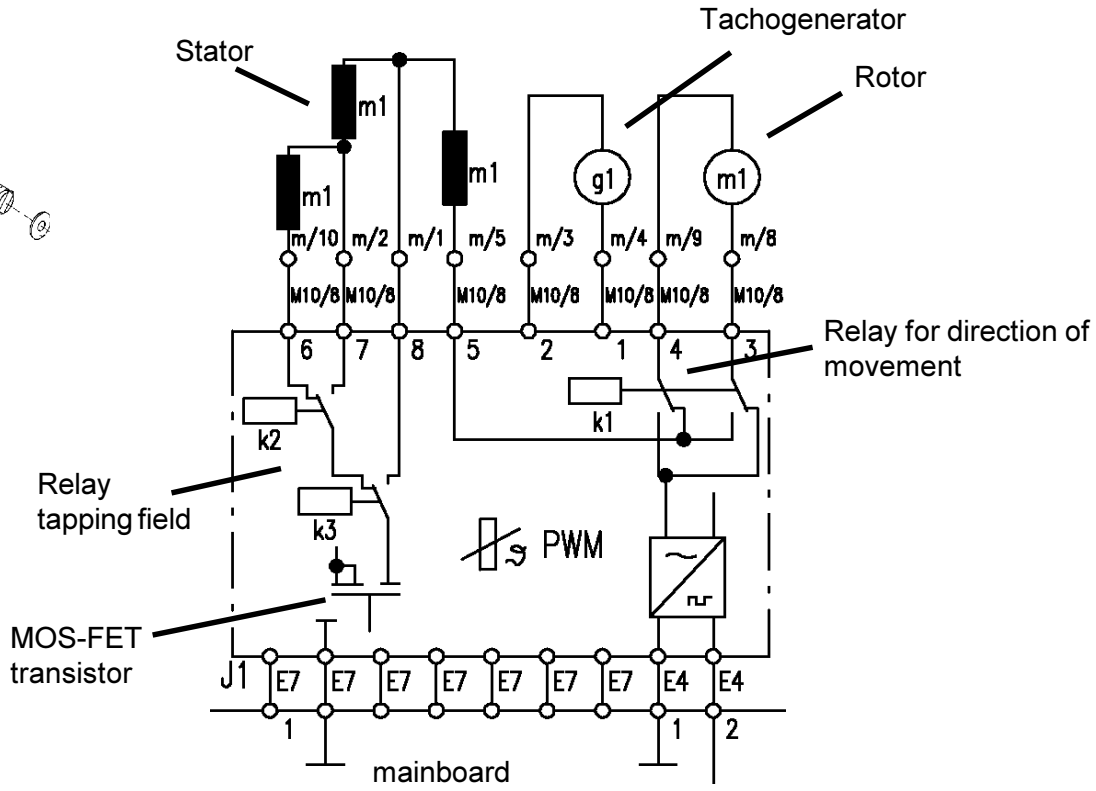
Inlet valve:

Connection:	220/240V +6-15%; 50 Hz;
Pressure:	0,6 - 10 bar
Flowrate:	8 L/min



10.7 The motor

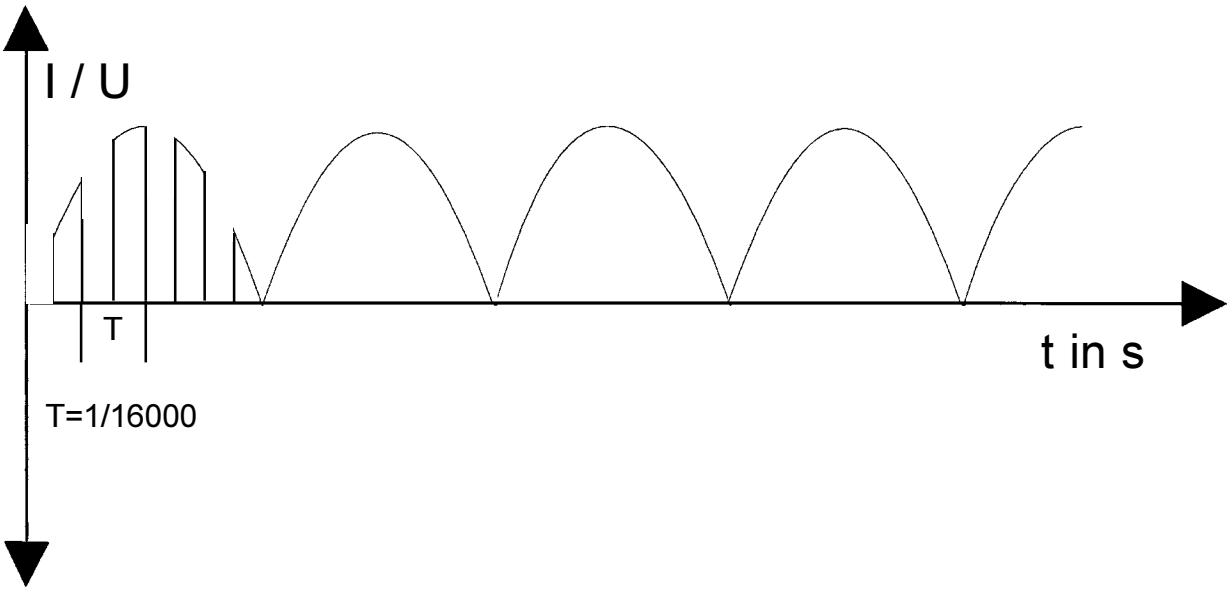




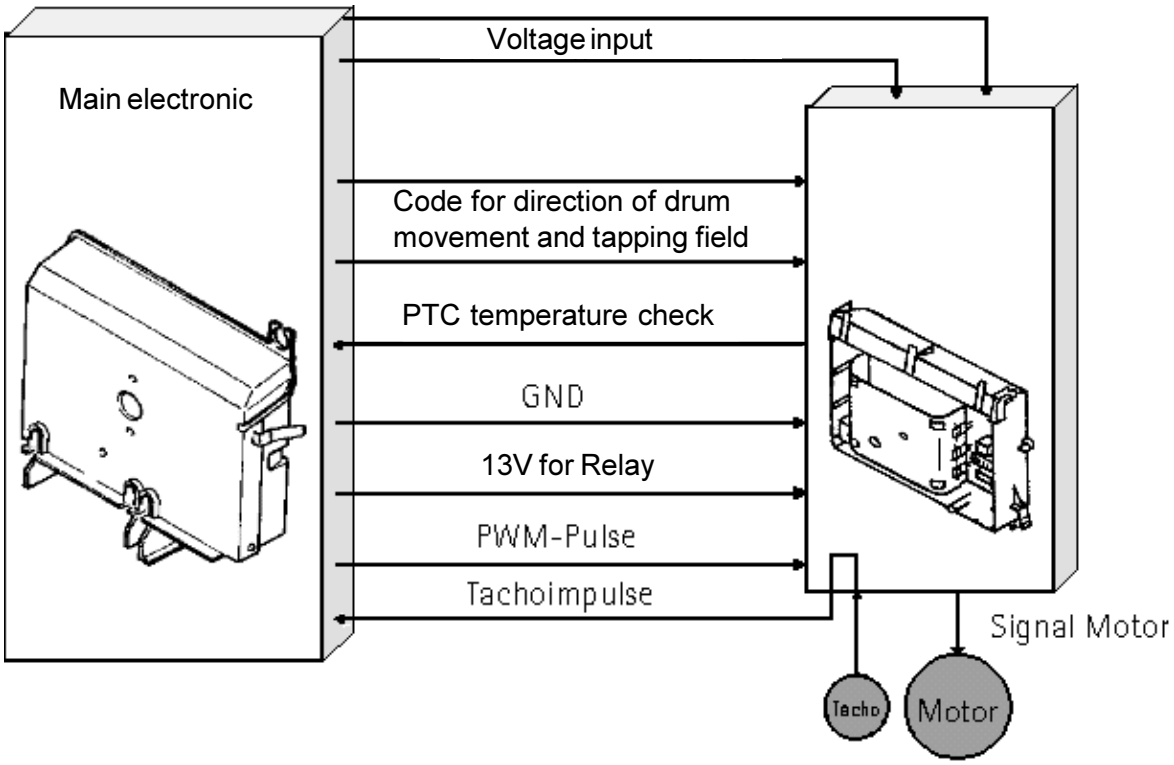
Article number	Connection	Tacho (3-4)	Rotor (8-9)	Stator (5-1)	Stator complete (5-10)
110 536 100 FHP	230V; DC	223Ω +/-8%	1,45Ω +/-8%	1,00Ω +/-8%	2,50Ω +/-8%
110 536 400 FHP	230V; DC	223Ω +/-8%	1,45Ω +/-8%		2,50Ω +/-8%

11. Motor controling (Puls width modulation)

Motor is controled with a pulsing DC, frequency 16kHz.
The revolution is controlled with the on- and off time of the DC.
If the drum revolution is the highest, we have the smallest off time.
Smallest possible off time is 2 %.



11.1 Signals from main electronic board to the motor electronic



12. Customer service test program

Start of the customer service test program :

With „Prewash“ and „Sensitve“ buttons pressed, set rotary selector knob to „ Energy Saving“

Position of rotary knob		Button	Test function
01	**Off**		Off
21	**Energy Saving**	Prewash / Sensitve	❶ Start of the customer service test programe ❷ LED - Test ❸ Reactivation of the machine
20	**Easy Iron**		Water channel pre-wash + level indication
19	**Refresh**		Water channel mainwash + level indication
18	**Fashion**		Water channel stain + level indication
17	**Silk**		Water channel softening rinse + level indication
15	**Wool 30°C**		Water channel mainwash / hotwater+ level indication
14	**Wool 40°C**		Fault code displayed (Display + programe cycle LED‘s)
13	**Delicates 30°C**		❶ Water channel mainwash fN2 ❷ Heating and reversing ❸ Circulation pump
12	**Delicates 40°C**		Pump out
11	**Short Spin**		Reversing
10	**Spin**		- Spinning with complete field 600 1/min - Pump off after FUCS
09	**Starching**		- Spinning with tapped field 950 1/min and 1550 1/min - Pump out after FUCS
03	**Cotton / Linen, Easy - Cares**		Clear fault file

12.1 Fault indications

Fault Indication		Type of Fault	Procedure with fault finding	Classifi-cation	Time
	C0	incongruence between pressure sensor and pressure switch heating element defective	check pressure switch check heating element check wiring	1	S
prewash	C1	no water inlet valve does not open/ interruption flow rate too low	check water inlet clean sieve check inlet valve check pressure sensor check wiring	1	S
main wash	C2	pump blocked / does not function pump interruption reduced delivery	check pump check drain system check pressure sensor check pressure switch check wiring	1	S
prewash main wash	C3	aqua control has responded drain pump defective main-electronic defective	leakage in appliance check float switch check drain pump check wiring exchange main-electronic	2	S
rinse	C4	circulation pump defective	check circulation pump check wiring exchange main-electronic	2	S
prewash rinse	C5	over-temperature drive motor	check drive motor	0	P
main wash rinse	C6	pressure sensor defective pressure switch defective	check pressure sensor check pressure switch check wiring	1	S
prewash main wash rinse	C7	heating element defective heating relay defective	check heating check heating relay check pressure switch check NTC check wiring	1	E
rinse +	C8	NTC defective	check NTC check wiring	1	E
prewash rinse +	C9	tachometer impulses are missing	check drive motor check carbon brushes check tacho generator check wiring	3	E
main wash rinse +	CA	MOS– FET transistor defective	exchange motor-electronic	3	S
prewash main wash rinse +	CB	5 x safety level	check inlet valves check pressure switch check wiring	1	E
rinse rinse +	CC	PTC for MOS– FET transistor defective	check wiring exchange motor-electronic	1	S
prewash rinse rinse +	CD	door-lock defective	check door-lock check wiring	1 1	S E
prewash main wash rinse rinse +	CF	checksum-fault EEPROM	wrong i/o- or main- electronic update faulty wrong update	1 1	S E

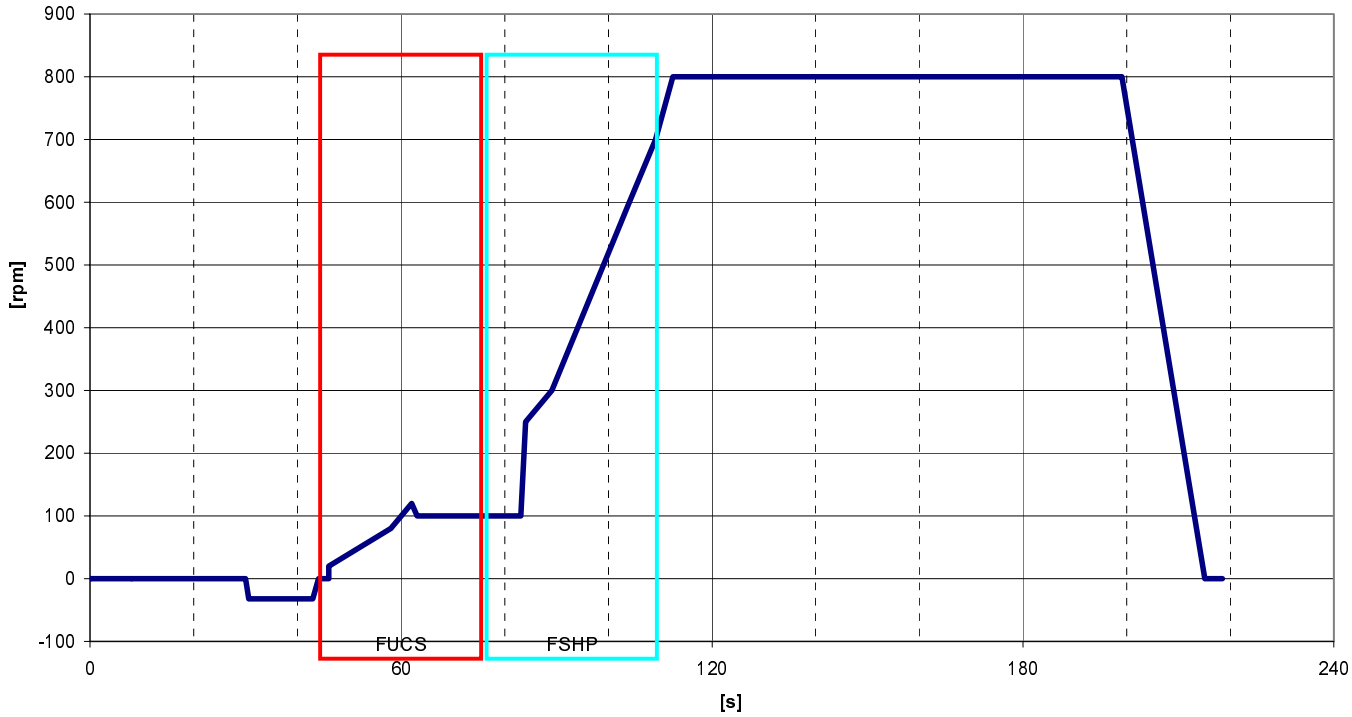
12.2 Classification of the alarm codes

Composition of Alarm Codes			
Classification		**Time of Indication in the Display**	
0	Fault code is not indicated Fault code is saved in fault register No program interruption	**S**	immediately, program stops
1	Fault code is indicated Program run is interrupted **Fault can be reset by customer:** Start/pause button resets alarm and program continues. Switching off appliance resets the alarm and appliance is ready for operation again.	**E**	at the cycle end
2	Fault code is indicated Program run is interrupted **Fault cannot be reset by customer.** Alarm is reset automatically when fault is removed. Start/Pause button continues program.	**P**	only in the test routine
3	Fault code is indicated Program run is stopped **Fault can be eliminated only by after-sales service.** Appliance is ready for operation again only by activating test routine.		

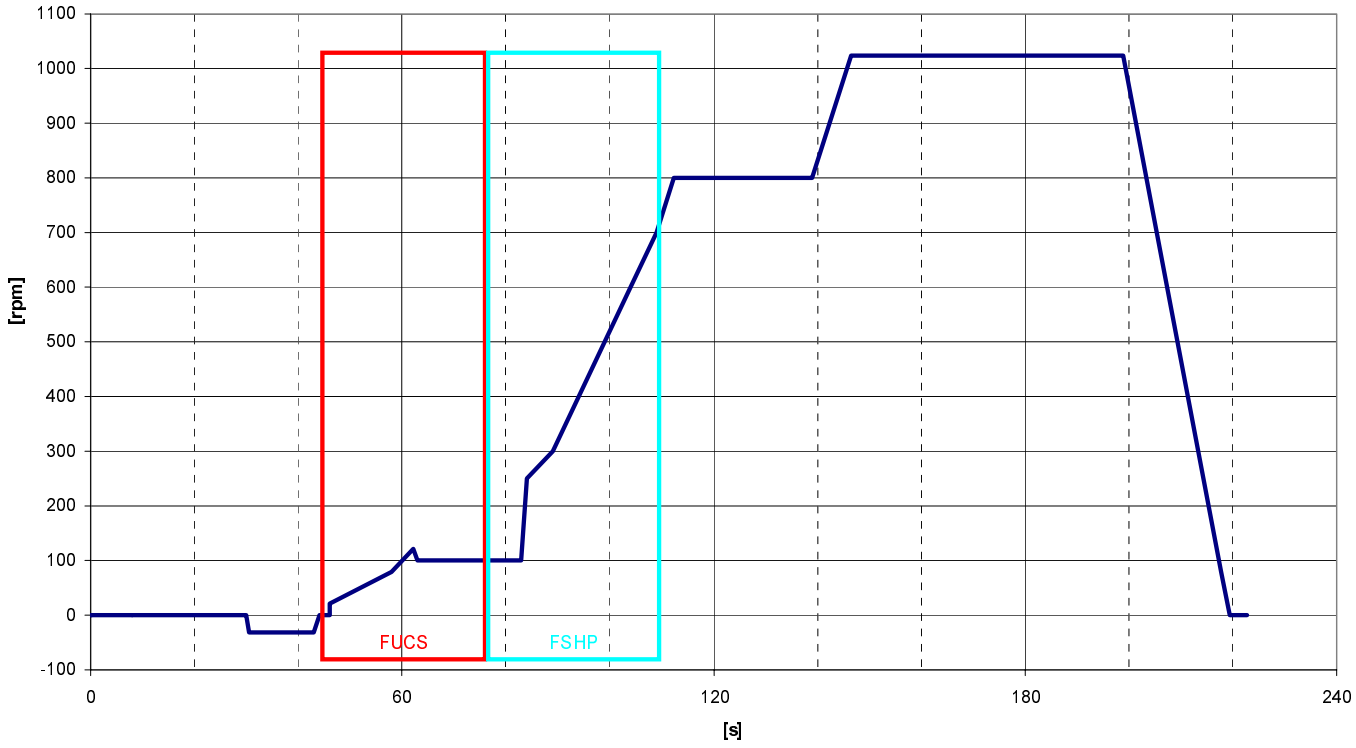
Level indication in the after-sales service test routine	
LED program run display	**checked function**
prewash	= cooling active
main wash	= rinse + active
rinse	= fS
spin	= fN
end	= fSch

13. Spinning profiles
13.1 Intermediate spin

Intermediate spin with FSHP cottons / linen

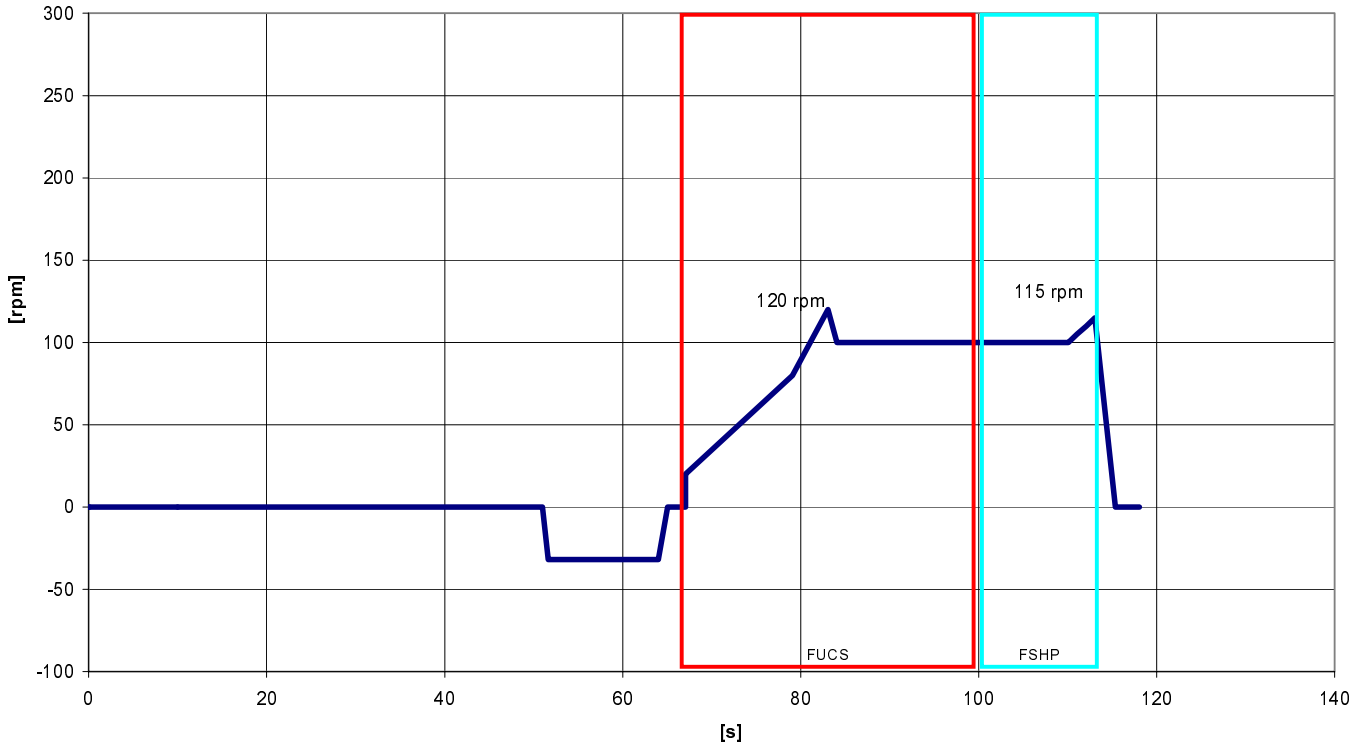


Intermediate spin 2 with FSHP cotton / linen

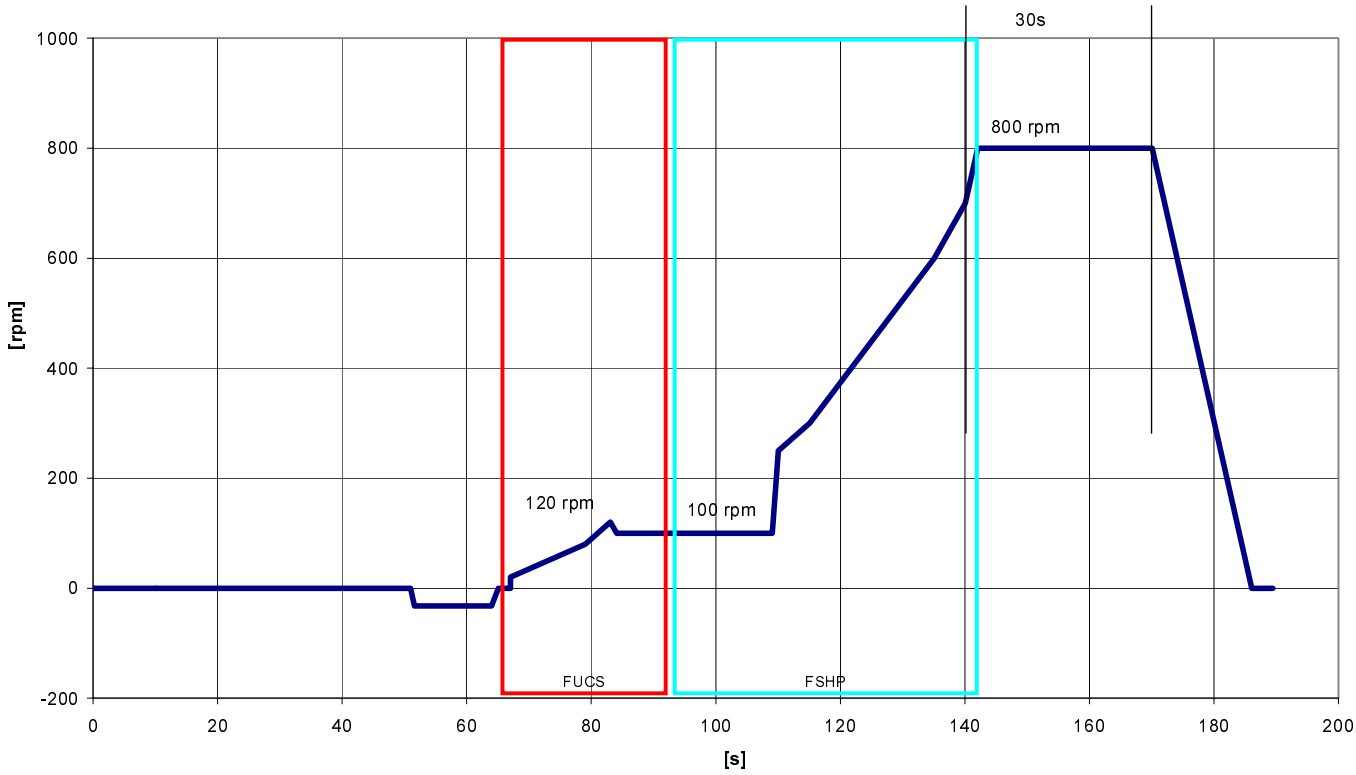


13.1 Intermediate spin

Intermediate spin 1 easy care



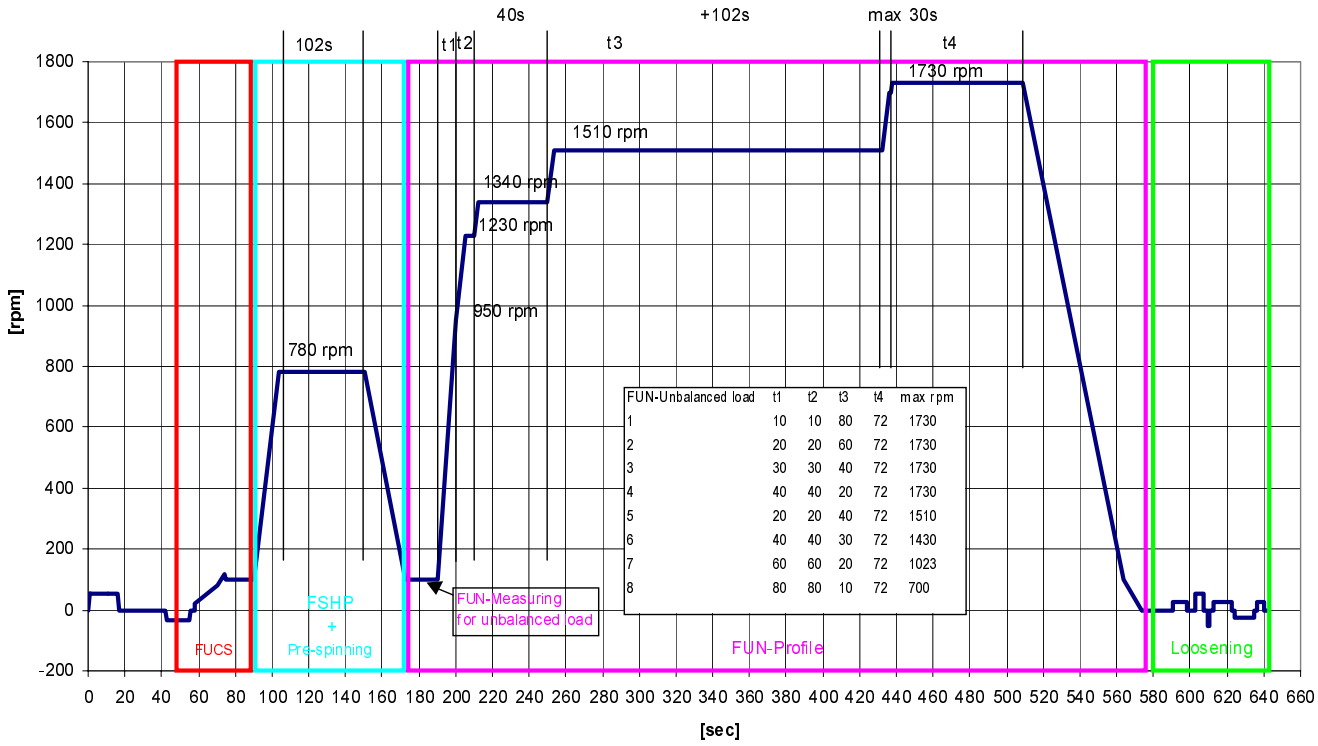
Intermediate spin 2 easy care



Intermediate spin for delicate, hand laundry, easy iron

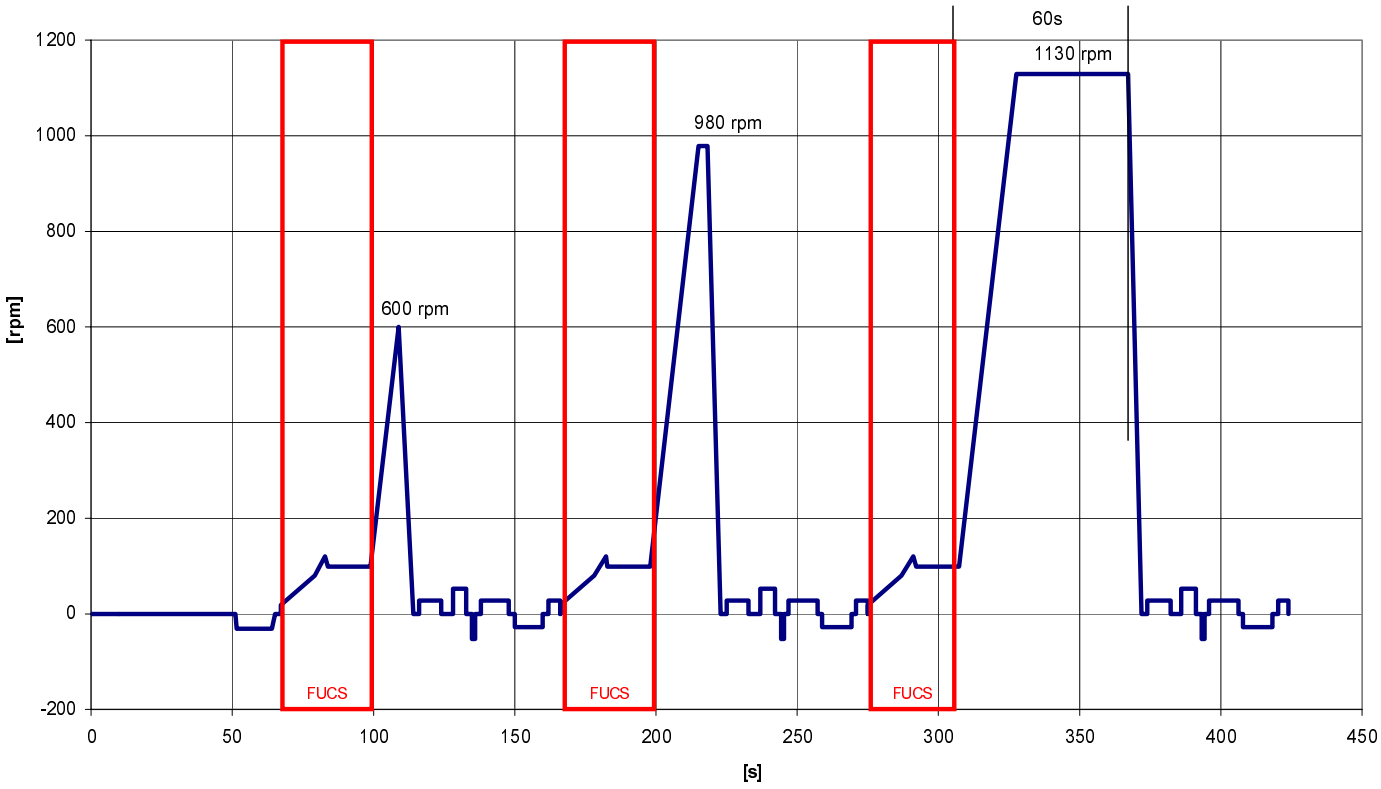
13.2 Final spin

Final spin cotton / linen



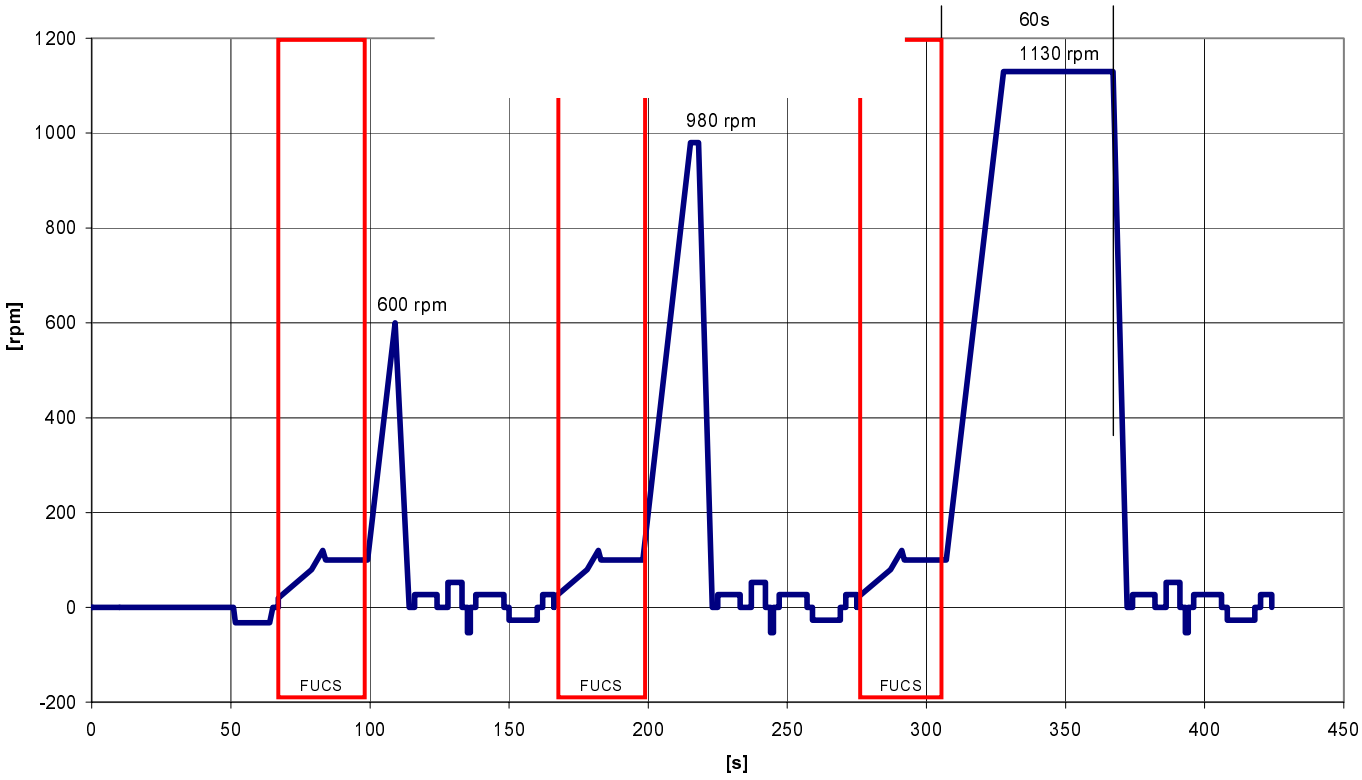
FUN-Unbalanced load	t1	t2	t3	t4	max rpm
1	10	10	80	72	1730
2	20	20	60	72	1730
3	30	30	40	72	1730
4	40	40	20	72	1730
5	20	20	40	72	1510
6	40	40	30	72	1430
7	60	60	20	72	1023
8	80	80	10	72	700

Final spin cotton / linen

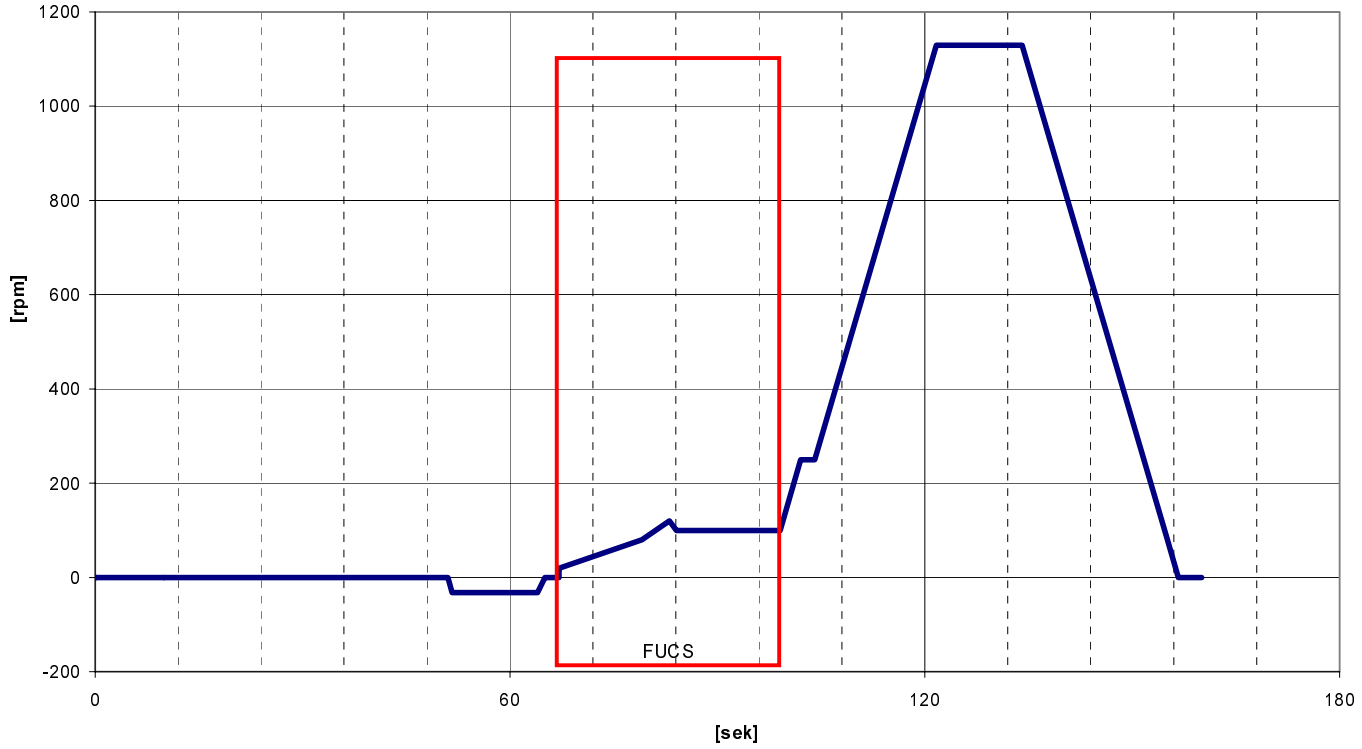


13.2 Final soin

Short variomatic final spin delicate wash

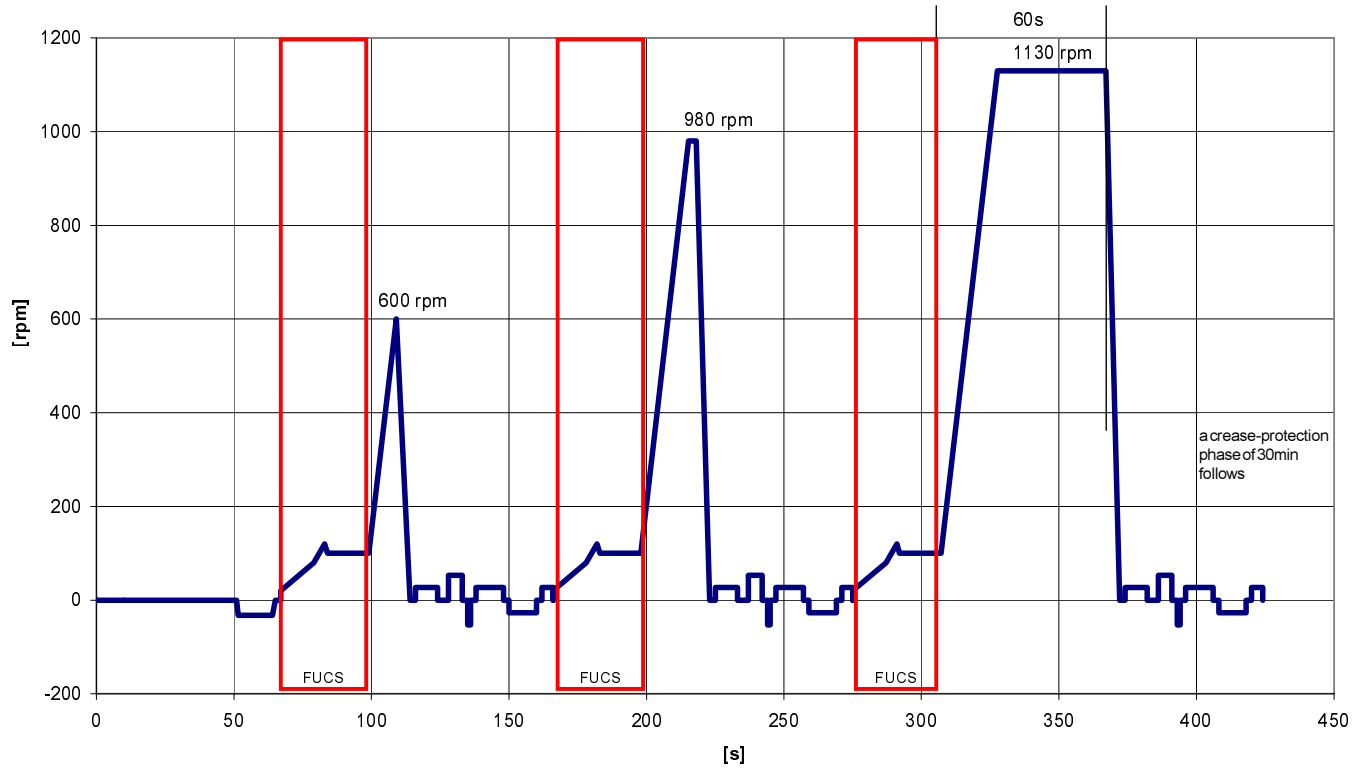


Final spin handlaundry

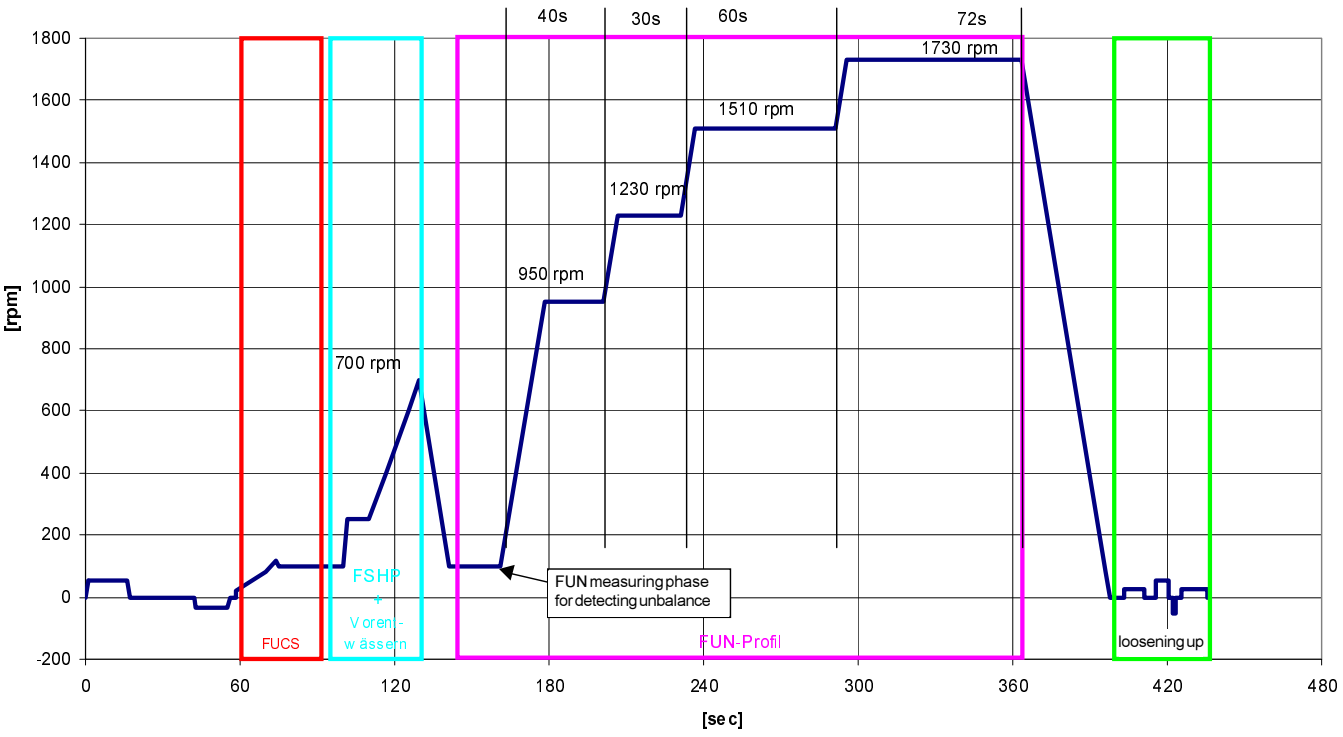


13.2 Final spin

Final spin easy iron

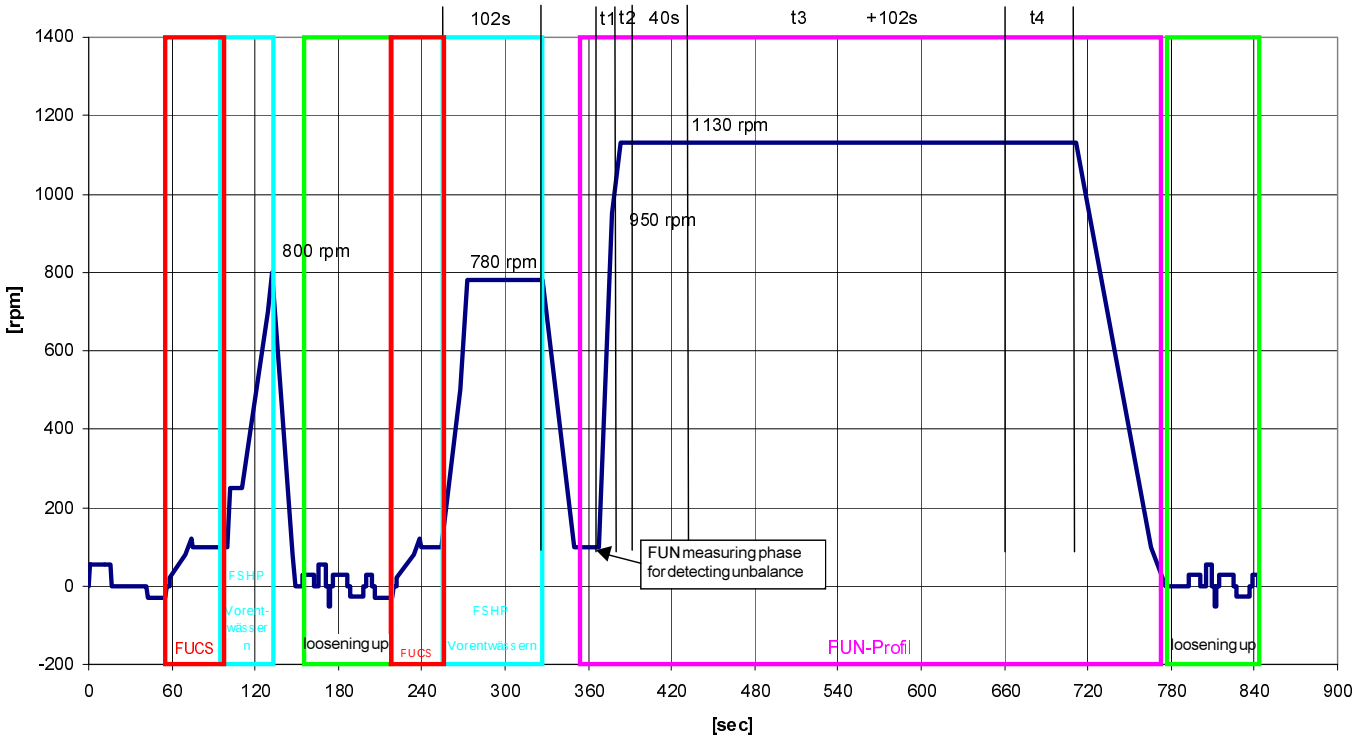


Final spin cotton / linen quick

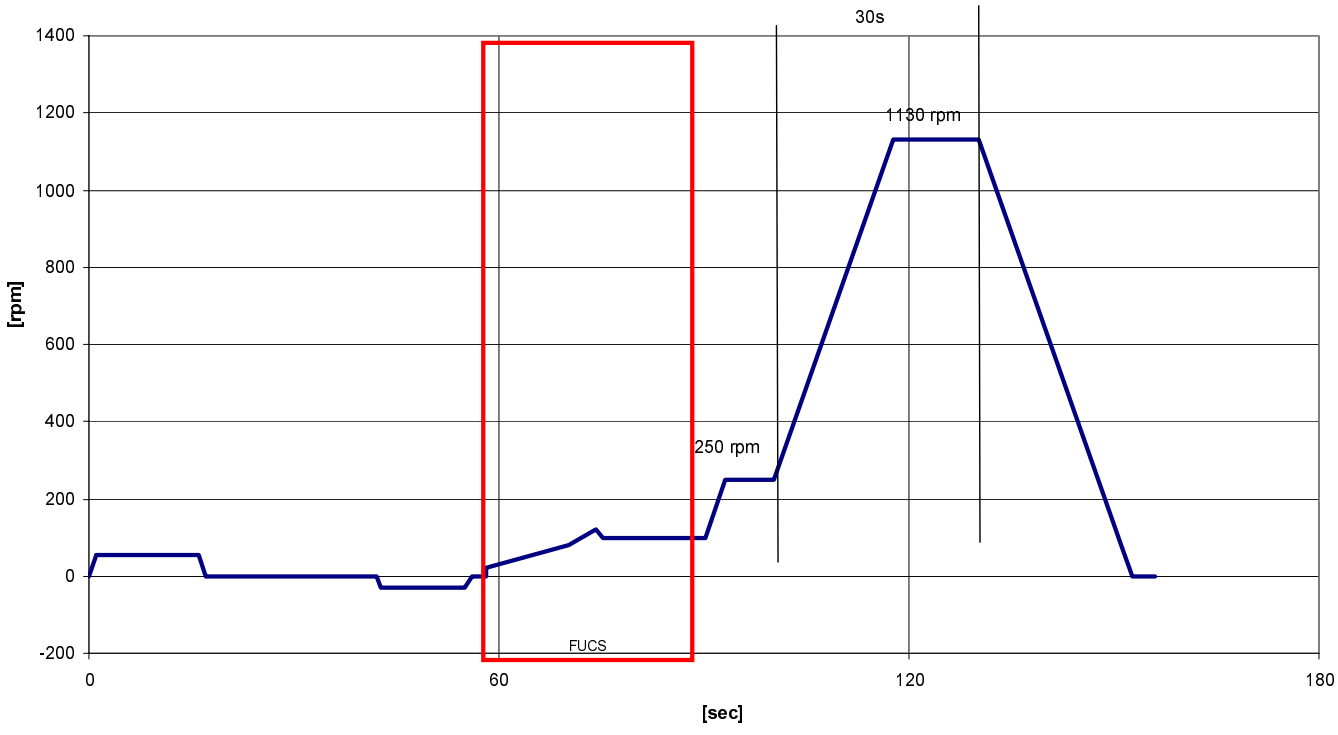


13.3 Spinning cycles of the extra programs

Extra program spinning

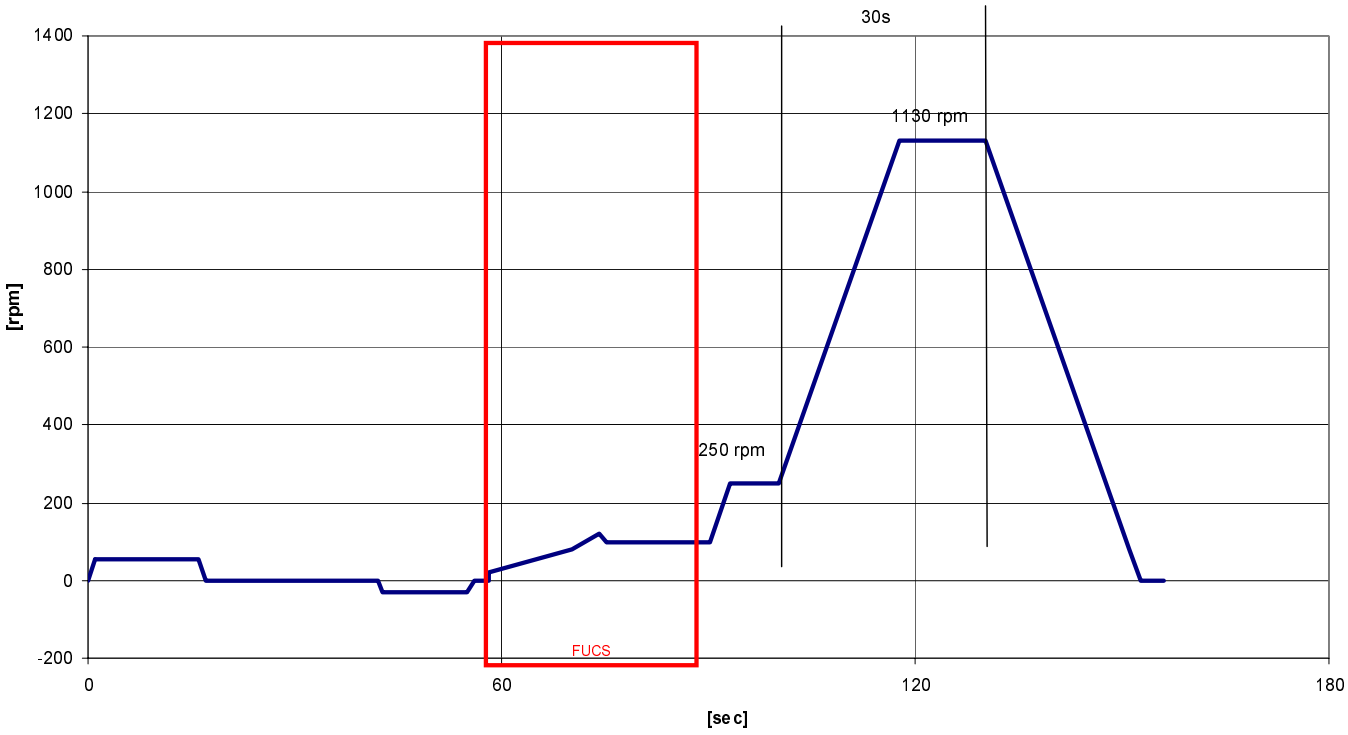


Extra program delicate spin



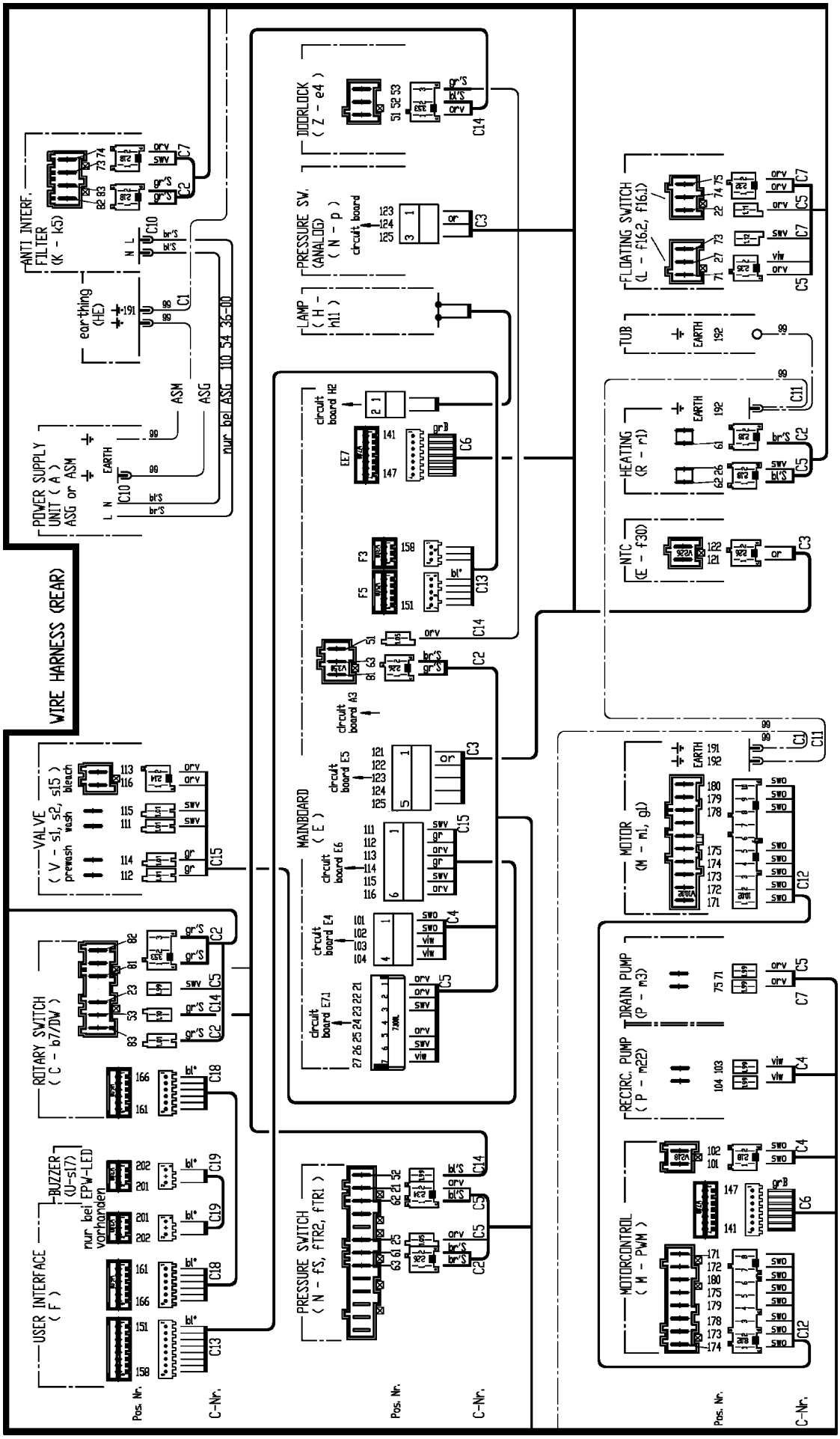
13.3 Spinning cycles of the extra programs

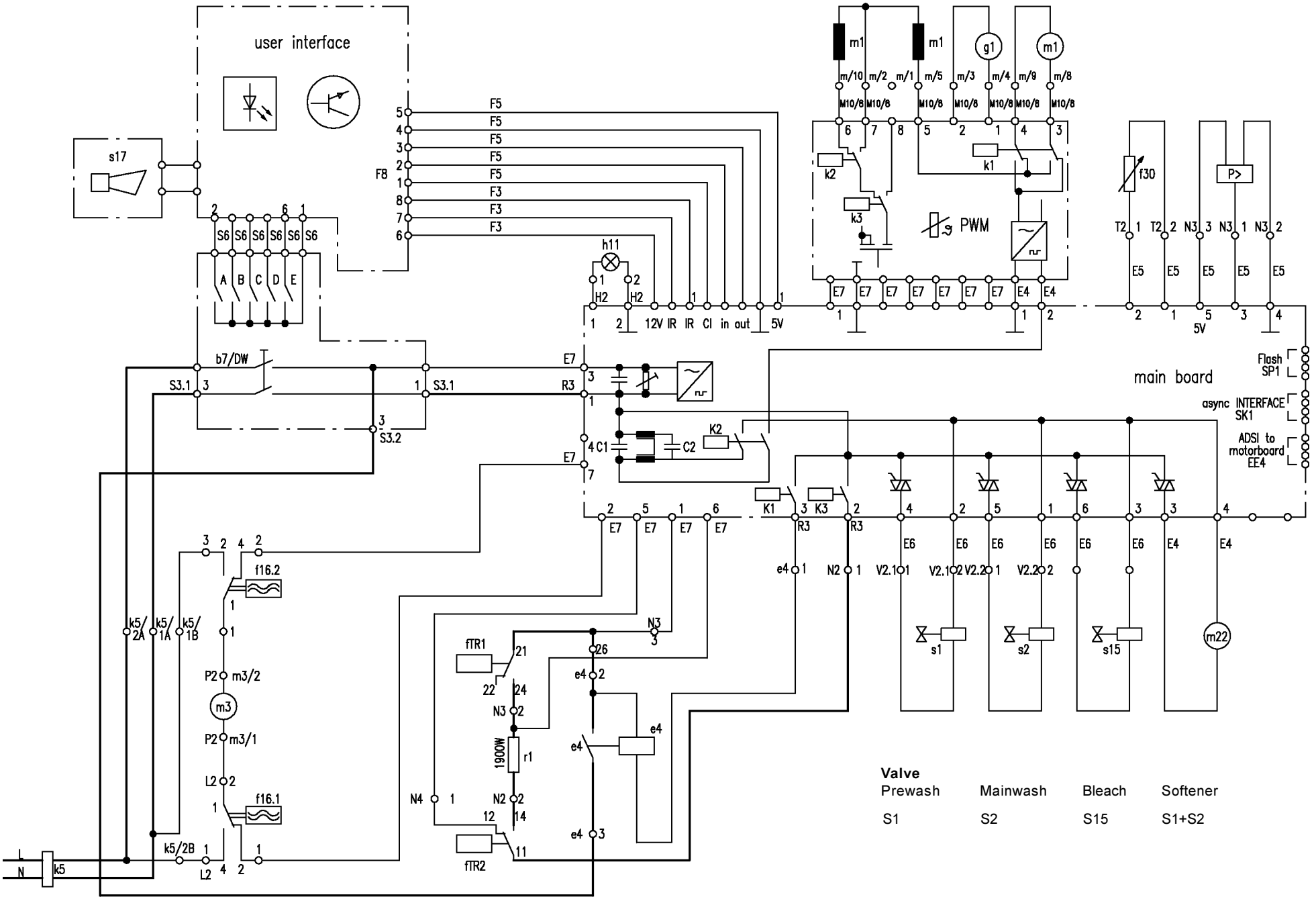
Extra program soft rinse



14. Technic

14.1 Wiring plan





Valve

Prewash	Mainwash	Bleach	Softener
S1	S2	S15	S1+S2

14.3 Legend

Legend wiring plan

Short name	Description	Description in the wiring plan
A	Connection housing	
C	Selection switch	b7/DW
E	NTC - Sensor	f30
E	Main electronic	
F	In / Output electronic	S17
H	Lamp	h11
HE	Main earth	
K	Suppressor	k5
L	Floating switch	f16.1 ; f16.2
M	Motor	m1
M	Motor electronic	PWM
N	Pressure switch	fs;fTR2;fTR1
N	Pressure sensor	p
P	Recirculation pump	m22
P	Pump	m3
R	Heating	r1
V	Valve	s1;s2;s15
Z	Door lock	e4

Legend circuit diagram

b7 / DW	Selection switch
e4	Door lock
E	Main electronic
f16.1 f16.2	Floating switch
f 30	NTC - Sensor
fS	Safety level
fTR1 ; fTR2	Boil-dry protection
g 1	Tacho generator
h11	Lamp
k1	Direction of drum movement
k2 k3	Tapping / complete field
k 5	Suppressor
m 1	Main motor
m 3	Drain pump
m22	Recirculation pump
p	Pressure sensor
r1	Heating element
s1 s2 s15	Valve
s17	In / Output electronic

Program structure ”automatic program”

	Module	Submodules	Filling (l)	Compartment V	H	B	S	Re-Pumping	Mechanic on/off/rpm	Time [min]	parameter change
clear wash	start	calibration									
	pre-softening	filling in	3.5	X						2	
		detection of laundry type	-								
	cold wash phase	filling in	5		X						
		filling in	1			X					
		fast humidification	according to need		X			yes	4/12/40	4	time
		fast humidifaction	according to need		X				3/10/53	3.5	time
		“fire” module	-								
		load indication on	-								
		decision colored/easy care	-								
	heating phase	heating to final temp.	according to need		X				21/9/53-11/19/53	fct(heat.temp.)	temp.
		after-wash I	according to need		X				21/9/53-11/19/53	5 min	
		after-heating II	according to need		X				21/9/53-11/19/53	5 min	
	after-wash time	after-wash III	-					yes	21/9/53-11/19/53	fct(time-saving)	time
			-								
	thinning with “sensitive” or “thinning” or “easy care”	thinning	5		X			yes	21/9/53-11/19/53	approx. 2	
rinse		1st intermediate spin	-					-	100 or 800 1/min – 0 1/min		
	1st rinse cycle	filling in	table value	X				yes	80 1/min		
		1st rinse	-					yes	21/9/53-11/19/53	6	time
		drain	-					-	21/9/53-11/19/53		
		2nd intermediate spin	-					-	800 or 1000 1/min – 100 1/min		
	1st extra rinse cycle with “foam” (lev.), with “AWS” (table)	filling in	table value/level	X				yes	80 1/min		
		1st extra rinse	rinse lev./high lev.	X				yes	21/9/53-11/19/53	10	
		drain	-					-	21/9/53-11/19/53		
		2nd intermediate spin	-					-	1,000 1/min		
	2nd extra rinse cycle with “AWS”&”North”, with “sensitive”	filling in	level	X				yes	80 1/min		
		2nd extra rinse	high level	X				yes	21/9/53-11/19/53	4.2	
		drain	-					-	21/9/53-11/19/53		
		2nd intermediate spin	-						1,000 1/min		
	2nd rinse cycle	filling in	table value	X				yes	80 1/min		
		2nd rinse	rinse level	X				yes	21/9/53-11/19/53	8	time
		drain	-					-	21/9/53-11/19/53		
		3rd intermediate spin	-					-	800 or 1,200 1/min		
	3rd rinse cycle	filling in	table value	X				yes	80 1/min		
		filling in	1				X	yes	21/9/53-11/19/		
		humidification	-					yes	21/9/53-11/19/53	1	
		filling in	4				X	yes	21/9/53-11/19/53		
		3rd rinse	rinse level					yes	21/9/53-11/19/53	6	time
		drain	-					-	21/9/53-11/19/53		
spin	final spin	FUCS	-					-	profile		
		1st run-up	-					-	profile		profile/time
		loosening-up spin	-					-	profile		
		2. run-up	-					-	profile		profile/time
		loosening up	-					-	profile		

14.4 Funktion chart

Hand wash program without laundry and option keys

MW	program section	function	time	level	com-partm.	temperat.	circul.	mechanic on/off	recircul. pump
clear wash	pre-pumping	pumping pumping pumping pause	variable variable 30 sec 6 sec	< ttr (AE1) < fSch					
	softening	filling meas.phase	1 min	to f_{N2}	1				
	filling in detergent	filling		fwool	2		27 $^{J}/_{min}$	324° / 58 s	
	addition of stain remover	filling	is not carried out						
	bio phase	heating 1	is not carried out						
	addition of stain remover	filling	is not carried out						
	heating thinning pumping	heating 2 after-wash time 1 filling pumping	variable max. 5 min and 3.5 min 5 min. variable	(fwool) (fwool) (fwool) (fwool) to f_{N2}	(2) (2) (2) (2)	cold (40°C) (40°C)	27 $^{J}/_{min}$ 27 $^{J}/_{min}$ 27 $^{J}/_{min}$	324° / 58 s 324° / 58 s 324° / 58 s	
	1st intermediate spin*	pumping	30 sec						
1st rinse cycle	1st intermediate rinse cycle	filling rinse pumping	variable 3.5 min variable	fwool (fwool) to f_{N2}	1 (2)		27 $^{J}/_{min}$	324° / 58 s	
	2nd intermediate spin *	pumping	30 sec						
2nd rinse cycle	2nd intermediate rinse cycle	*filling rinse pumping	variable 3.5 min variable	fwool (fwool) to f_{N2}	1 (2)		27 $^{J}/_{min}$	324° / 58 s	
	3rd intermediate spin *	pumping	30 sec						
softening	3rd rinse cycle	filling filling filling filling rinse	variable 1 min 3.5 min	fwool 1 l (fwool) 1 l (fwool)	1 3 (1) 3 (1)		27 $^{J}/_{min}$ 27 $^{J}/_{min}$ 27 $^{J}/_{min}$ 27 $^{J}/_{min}$	324° / 58 s 324° / 58 s 324° / 58 s 324° / 58 s	
spin	final spin	pumping pumping *pumping *spin *spin spin pumping	variable variable 30 sec ~ 30 sec variable 30 sec variable	<(fN2pump) <(f_{Sch}) <(f_{Sch}) <(f_{Sch})			FUCS 250 1/min max. 1,130 1/min		

All functions marked with *** are with a wash cycle with laundry “Fuzzy – controlled” (not defined)

10. Service - Instructions

10.1 Access from the front side of the appliance

10.1.1 Worktop

The worktop is tightened to the rear side of the appliance by 2 screws.
Untighten both screws and pull the worktop away to the back.

Abb.: 1

Abb.: 2

10.1.2 Panel, knobs and buttons

In order to remove panel, knobs and buttons you have to remove the worktop. See 10.1.1)

To disassemble the panel you have to remove the 2 screws in the upper area (Fig. 3) and the screws behind the drawer (Fig. 4).

Abb.: 3

Abb.: 4

10.1.2 Panel, knobs and buttons

The panel is locked additionally on the right side (Fig. 5).
Pull the pilot lamp out of its support (Fig. 5).
Now the panel is disassembled and you can remove buttons and knobs depending on your need (Fig. 5, Fig. 6).

Abb.: 5

Abb.: 6

10.1.3 Bellows

The bellows is buttoned at the crimped part of the front side and secured by a plastic tension band.
It is fixed to the tub by a helical worm spring.

- To exchange the bellows refer to the working instructions of chapters 10.1.1 and 10.1.2, as the front plate of the appliance has to be removed.
- Take off the tension band and remove the bellows from the crimped part. (Fig. 7)
- Turn up the bellows to the inside.

Abb.: 7

10.1.3 Bellows

- The door lock is screwed to the front plate with 2 screws. Unscrew them (Fig. 8).
- The front plate is screwed to the casing with 4 screws at the top and at the bottom.
  In order to get access to the lower 2 screws you have to remove the base panel.
  For this purpose untighten the screws behind the pump cover (Fig. 9).
  The base panel is locked in on the left side of the appliance.
- Now unscrew the front panel as shown in the figures (Fig. 10, Fig. 11, Fig. 12).
- Pulling the bellows untightens it from the cramped part of the tub.

Abb.: 8

Abb.: 9

Abb.: 10

Abb.: 11

Abb.: 12

10.1.4 Drain pump

- The pumps are fastened to the base panel via rubber dampers.
- To exchange the pumps refer to the working instructions of chapters 10.1.1, 10.1.2 and 10.1.3.
- It is not necessary to remove the bellows from the tub.

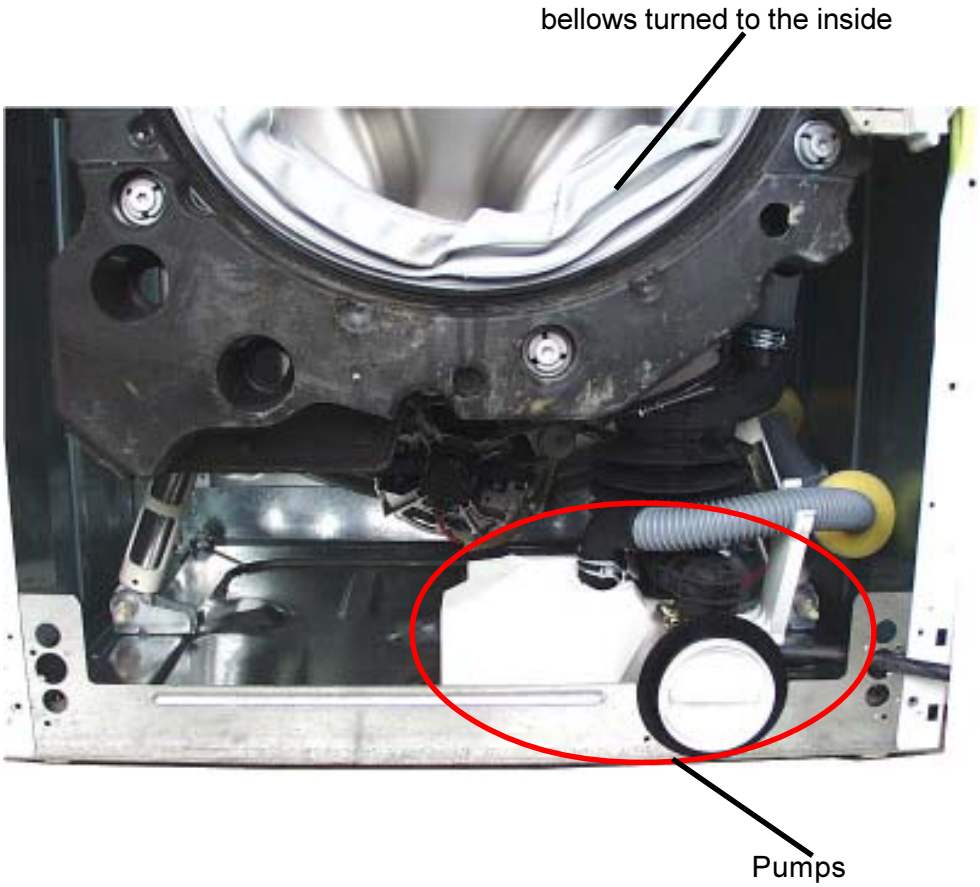


Abb.: 13

10.1.5 Door lock

The door lock is screwed to the front plate with 2 screws.

- Untighten them (Fig. 14).
- Then untighten the bellows from the front plate as described in the instructions 10.1.3 (Fig. 7). Turn the bellows to the inside. Now you can pull out the door lock between the front plate and the tub and untighten the plug.

Abb.: 14

10.1.6 Tub front, weight

The tub front is screwed with 17 special screws with the rear side of the tub. If the weight must be exchanged, the complete tub front has to be exchanged.

- Remove the worktop; instructions 10.1.1
- Disassemble the panel; instructions 10.1.2
- Untighten the front plate and the bellows; instructions 10.1.3
- Now you can unscrew the tub front (Fig. 15).

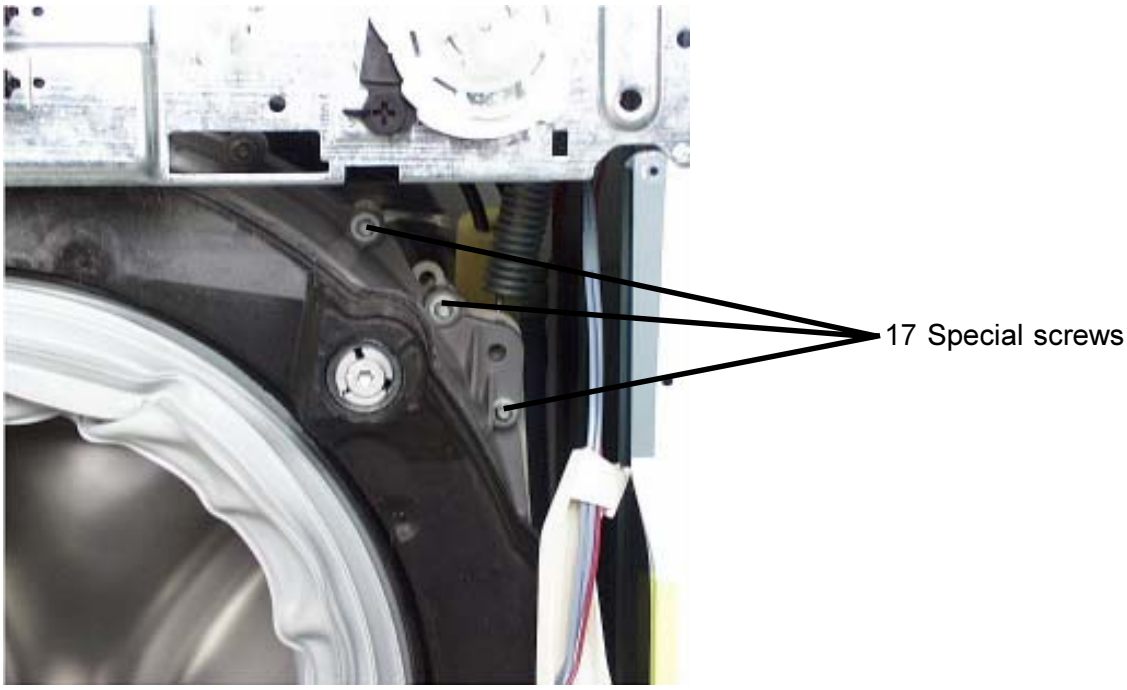


Abb.: 15

10.1.7 Door, door glass, door rings, door hinge and locking hook

The door is fastened to the front plate by the door hinge.

- Untighten the door hinge screws in order to separate the door from the front plate.
- To exchange door glass, locking hook, door hinge or one of the door rings, remove the door ring screws.

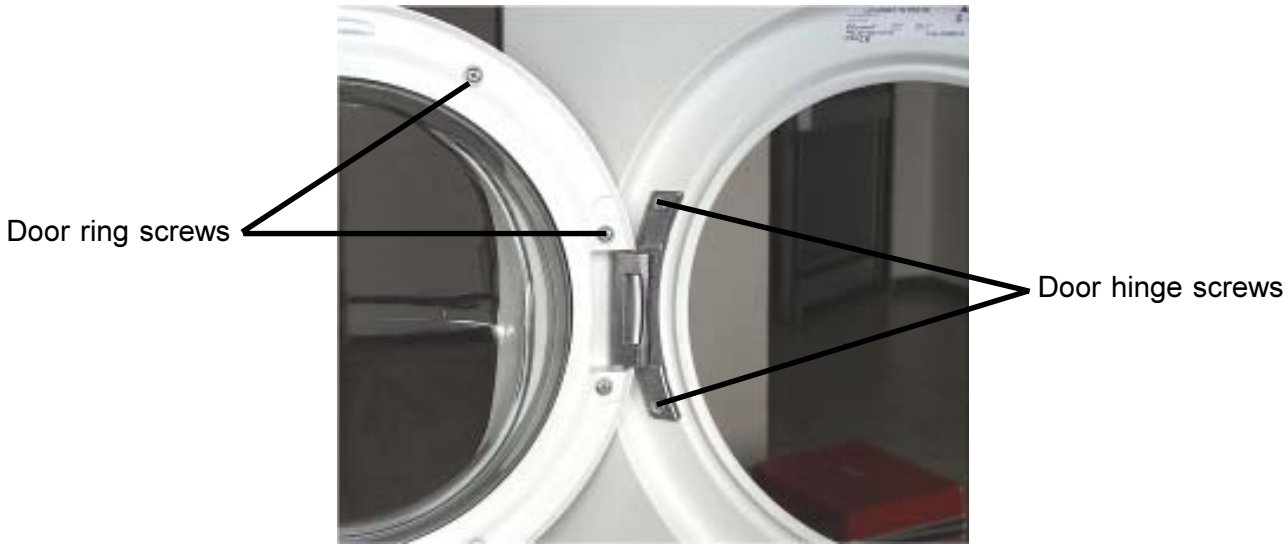


Abb.: 16

10.2 Access from the rear side of the appliance

10.2.1 Rear plate

The rear plate is screwed to the casing with sheet metal screws (Fig. 17)

- In order to get access to motor, heating element, shock absorber, NTC, belt and pulley, you have to remove the rear plate.

Abb.: 17

10.2.2 Assembling position of motor, motor electronic DC,heating element, shock absorber, NTC, belt and pulley

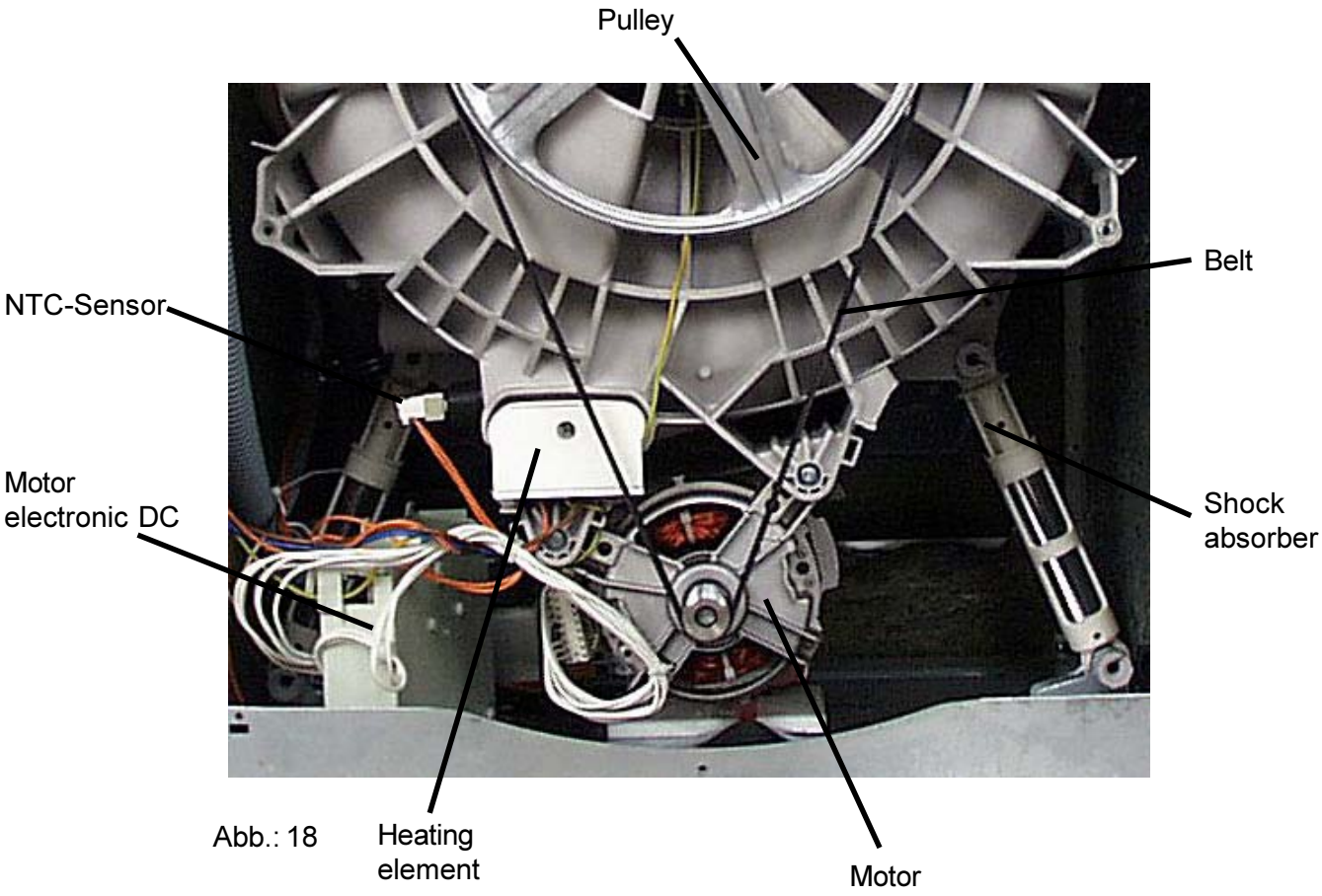


Abb.: 18

10.2.3 Motor

The drive motor is fastened to the tub with 4 screws.

- Take off the rear plate; instructions 10.2.1
- Draw off the motor plug.
- Remove the drive belt.
- Now unscrew the motor

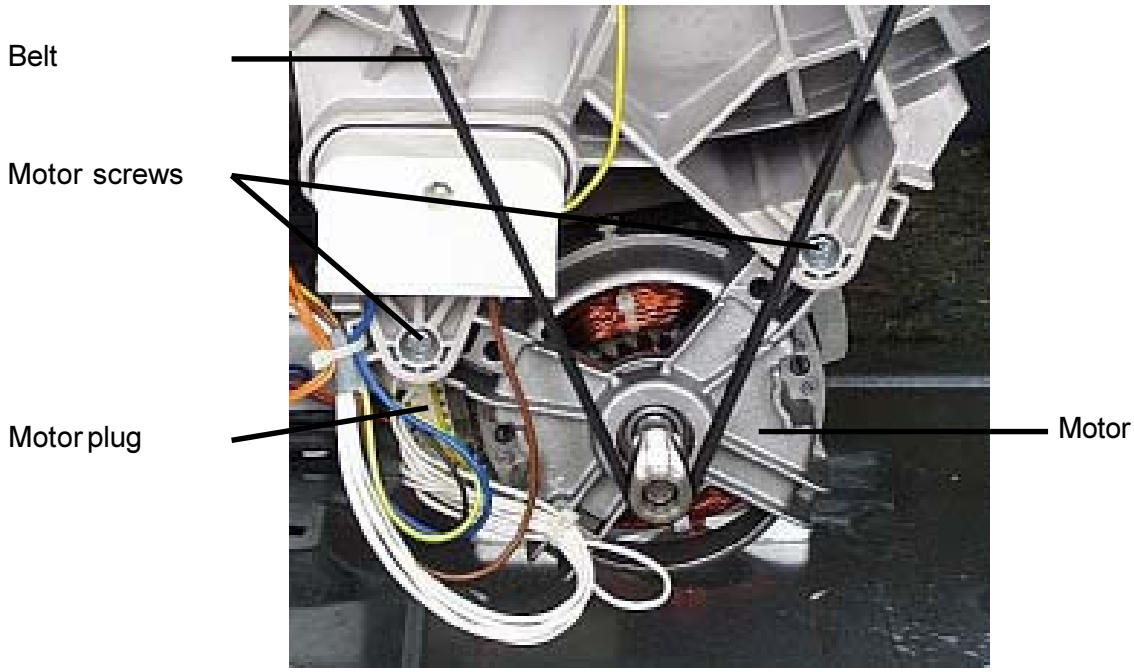


Abb.: 19

10.2.4 The heating element

The heating element is inserted in the rear side of the tub and the contacts are protected by tahe clipped cover. Tightening the pressure plate to the heating flange expands the sealing and thus fastens the heating element.

- Carry out an emergency drain of the appliance.
- Take off the rear plate; instructions 10.2.1
- Remove the cover
- Disconnect the electrical connections
- Untighten the flange nut to the end of the thread and press in the stud bolt with the nut as far as to the pressure plate (sealing gets released).
- Loosen the heating element by moving it laterally and pull it out of the tub.

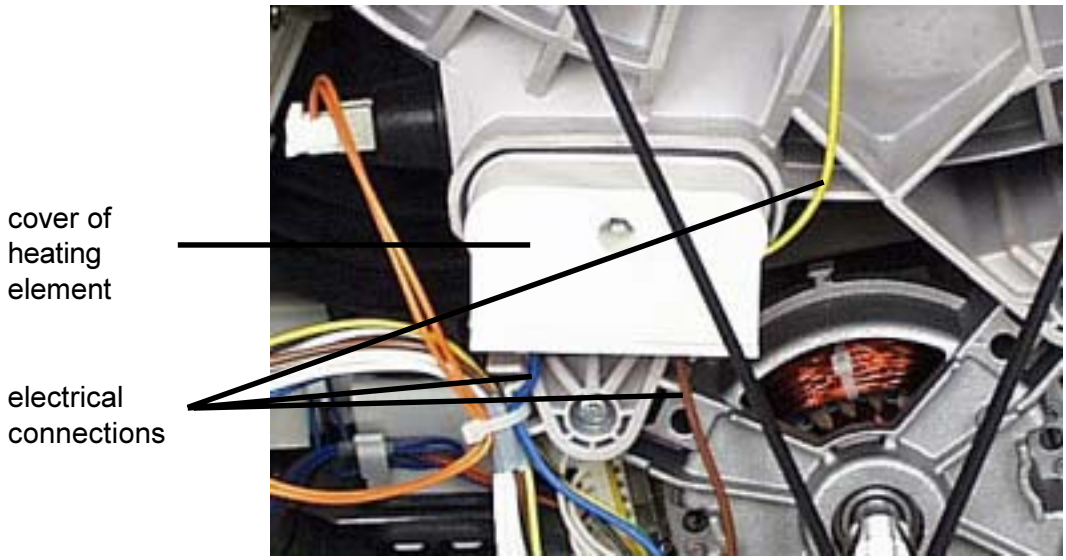


Abb.: 20

10.2.5 NTC sensor

The NTC sensor (temperature sensor) is inserted in the rear side of the tub at the side next to the heating element.

- Carry out an emergency drain of the appliance
- Take off the rear plate; instructions 10.2.1
- Disconnect the electrical connections
- Pull the NTC sensor out of the sealing

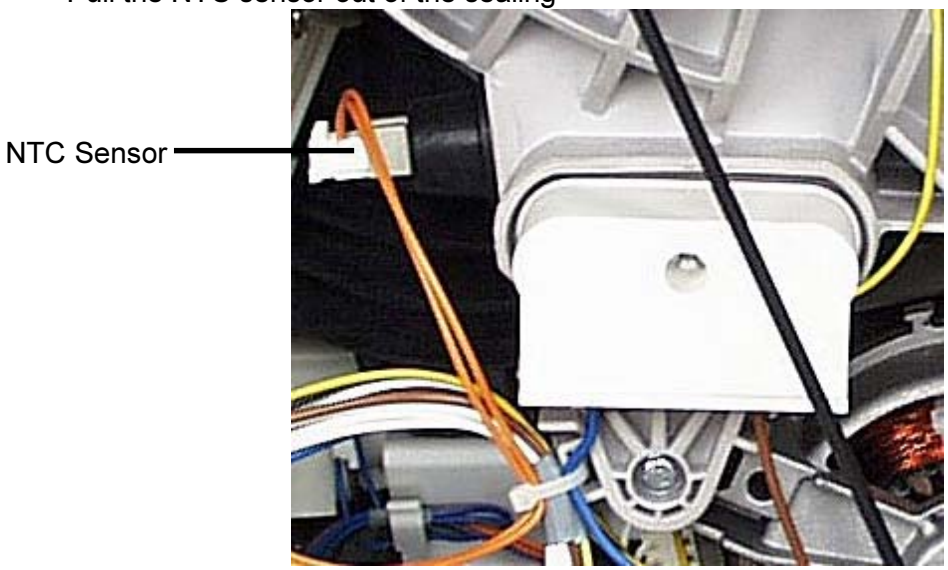


Abb.: 21

10.3 Access from the top side of the appliance

10.3.1 Pressure switches

The pressure switches are clipped in the right upper area of the cross bar.

- Remove the worktop; instructions 10.1.1
- Pull off the pressure switch hose.
- Mark the plugs and then pull them off.
- Now snap out the pressure switch from the support (cross bar).

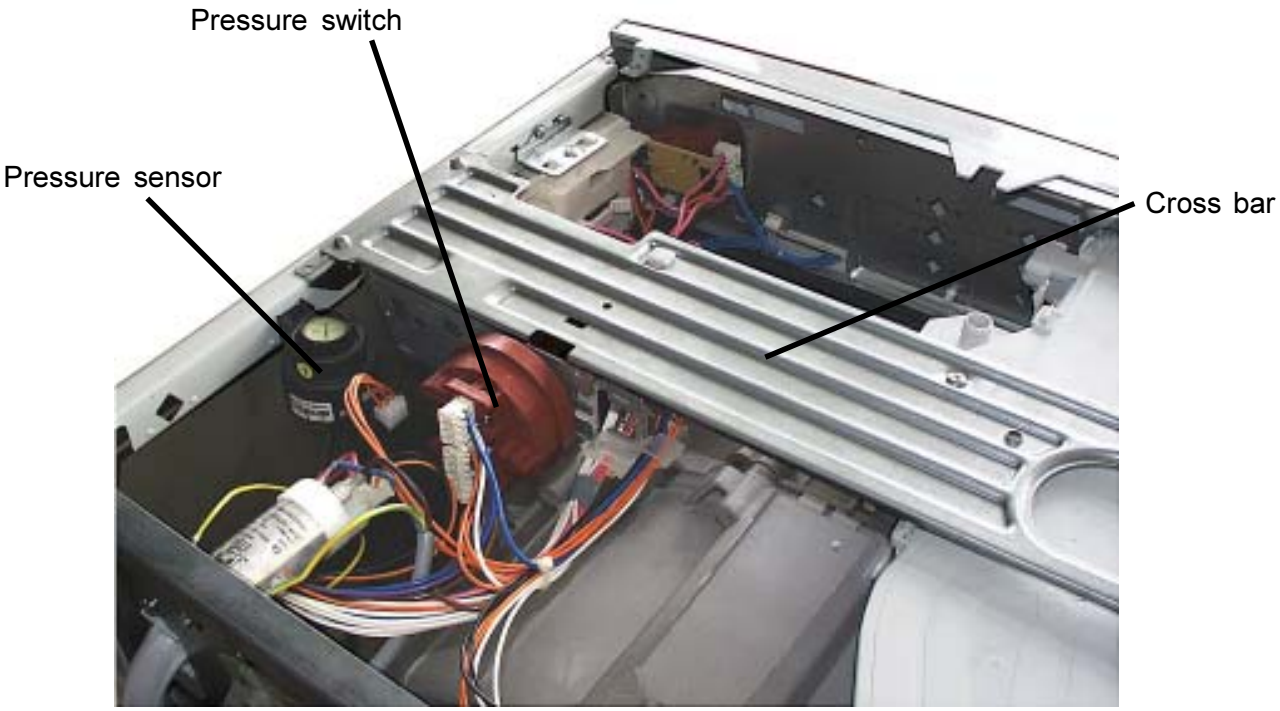


Abb.: 22

10.3.2 Disassembly of the main electronic board

- Remove the worktop, instructions 10.1.1
- Mark the plugs and pull them off from the respective component.
- Now you can exchange the main electronic board

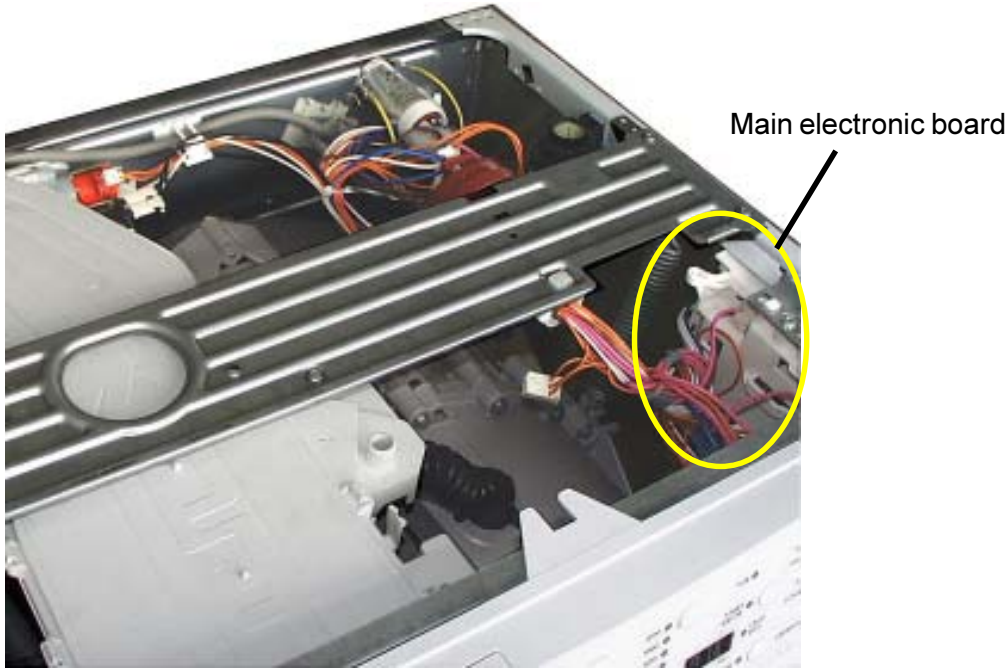


Abb.: 23

10.3.3 The valves

The valves is screwed to the water distributor.
The connection of the inlet hose is guided out of the rear side of the appliance via a valve adaptor.

- Remove the worktop; instructions 10.1.1
- Mark the plugs and pull them off
- Unscrew the valves

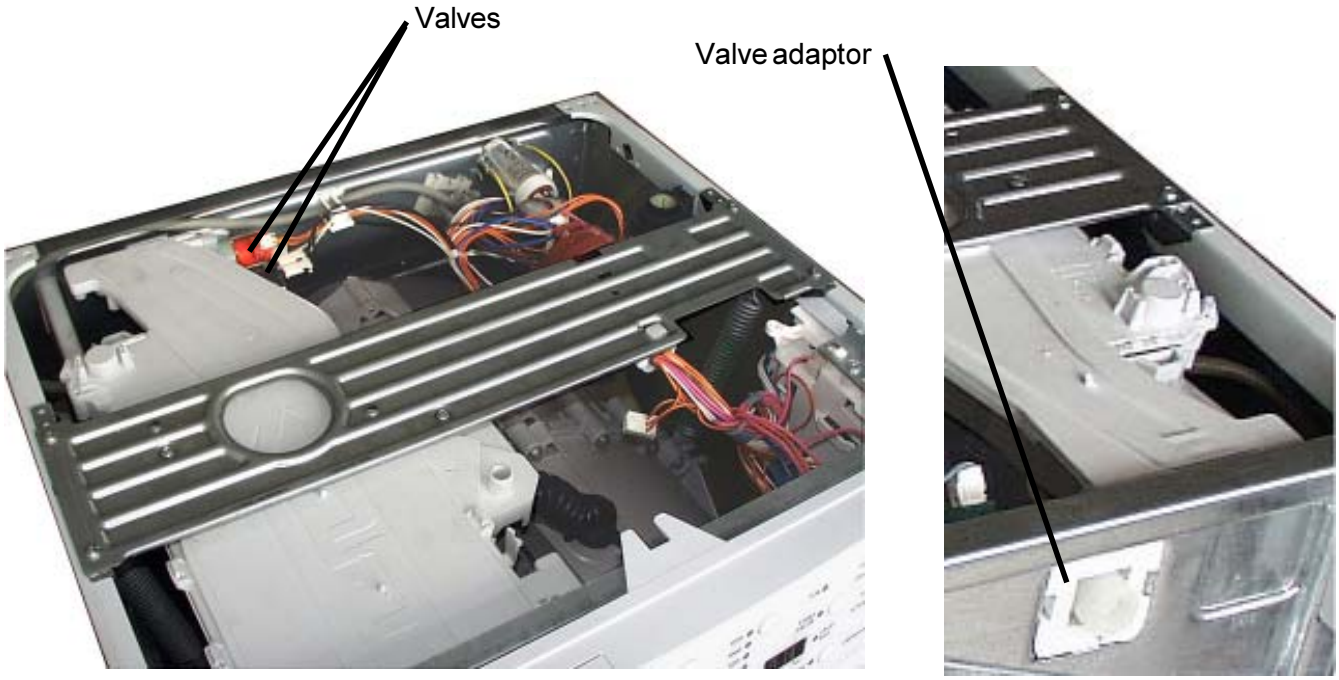


Abb.: 24

10.3.4 Water distributor

The water distributor is screwed with the panel at the front. The cross bar tightens it in the middle of the appliance. The connection of the inlet hose and the overflow are guided out of the rear side of the appliance.

- Remove the worktop; instructions 10.1.1
- Disassemble the panel; instructions 10.1.2
- Untighten the valve; instructions 10.3.3
- Unscrew the cross bar
- Now remove the complete water distribution system

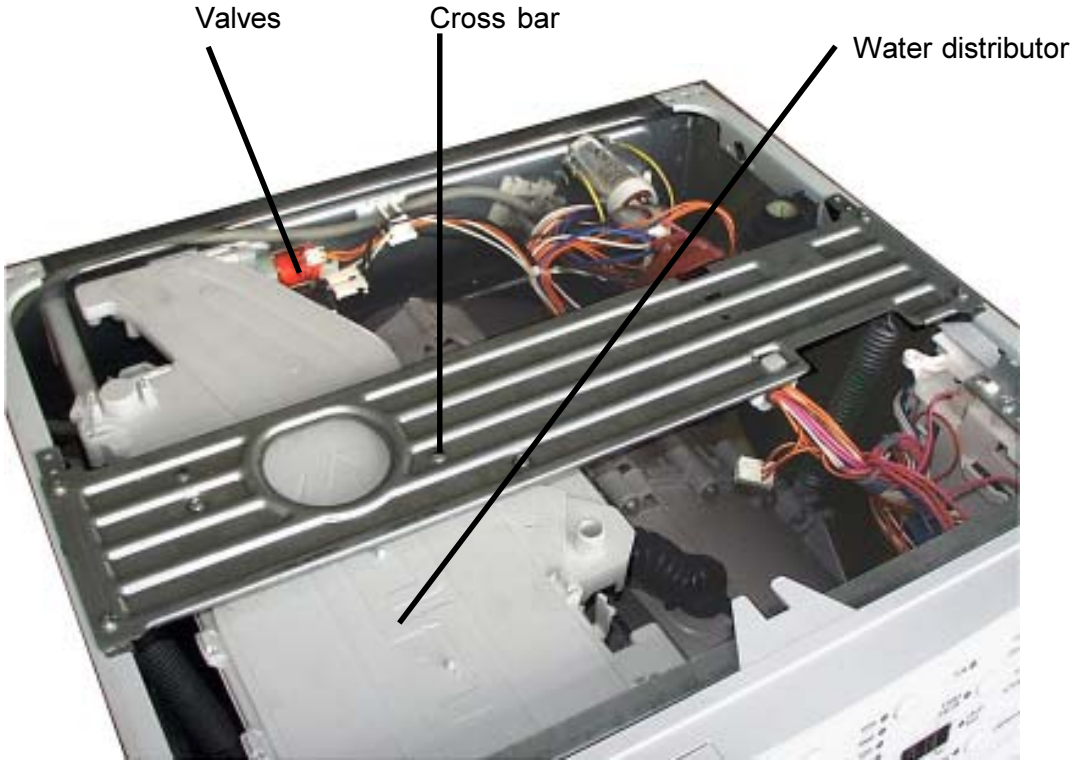


Abb.: 25