

REPAIR INSTRUCTION

Laundry Care

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1 SAFETY

1.3 ESD

Term



Electrostatic

Sensitive

Developed

General

State of the art electronics achieve economic efficiency, environmental protection, user comfort, high functionality and operating safety in electrical domestic appliances. This high quality technology requires professional handling and competent specialist knowledge.

All electronic modules are fitted with components which are at risk from electrostatic voltage.

1.1.1 Components which are at risk

The following components are at risk from electrostatic voltage:

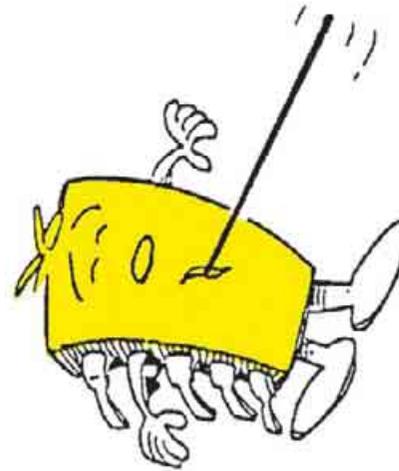
- ▶ μ processors and ICs
- ▶ Transistors, thyristors and triacs
- ▶ Diodes

1.1.2 Causes and effects

You are carrying an electrostatic voltage:

- ▶ of up to 35,000 volts if you walk across a non-conductive carpet,
- ▶ of up to 12,000 volts if you walk across a non-conductive PVC floor,
- ▶ of up to 1,800 volts if you are sitting on an upholstered chair.

The electrostatic voltage on your body is transferred to the electronic components and ESDs you touch which may be damaged as a result.



Shot down!

- ▶ A 'dead' component
- ▶ A 'dead' assembly
- ▶ A 'dead' appliance



Wounded!

- ▶ Damaged
- ▶ Debilitated
- ▶ Early failure

1.1.3 ESD instructions

All electronic modules and electronic assemblies feature electrostatic sensitive devices.

The following measures must be taken in order to protect these electrostatic sensitive devices:

Ensure that the assemblies and modules are appropriately identified.

Before you touch and measure the ESDs, put on an electrostatic protection system (wrist band with earthing module).

Avoid touching ESDs with chargeable plastics (film, etc.).

When taking hold of assemblies, modules and printed circuit boards, try not to touch the printed conductors or connections.

Keep ESDs away from monitors and television sets.

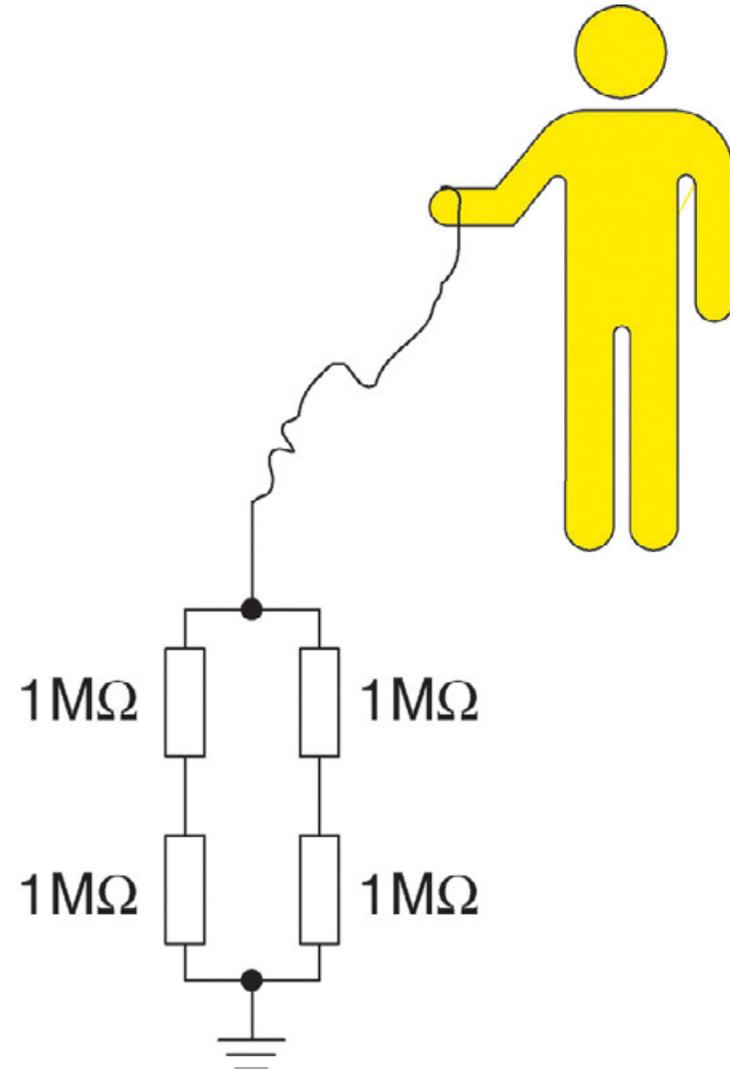
Only use conductive materials or the original packaging for transportation.

1.1.4 Electrostatic protection system

The electrostatic voltage of the body is discharged via the wrist band and the earthing module.

For reasons of safety this does not occur directly, but via a combination of resistors.

The earthing or protective conductor connection must not be damaged!



2 INSTALLATION

2.1 Aligning the appliance

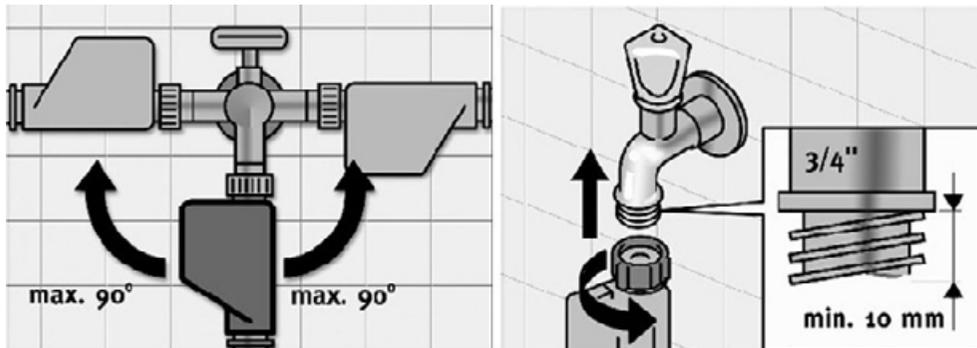
To ensure fault-free operation, the appliance must be aligned precisely via the height-adjustable feet. If the appliance is installed on a base, the appliance must be attached with the attachment kit, mat. no. 080451 for reasons of safety. If the appliance is built under, fit the VDE cover panel instead of the cover plate.

2.2 Water supply

The water connection (3/4 inch) requires a conventional water line with a water pressure of at least 1 bar (1 at.) (When the tap is turned on, the water flow rate must be at least 8 l/min.). If the water pressure has more than 10 bar (10 at.), a pressure reducing valve has to be installed.

2.2.1 Aqua Stop version (optional)

If appliances feature Aqua Stop, the supply hose can be extended by 250 cm with the Aqua Stop extension or with a longer Aqua Stop hose (available from customer service, hose length 310 cm). The valve may be connected only as illustrated in the diagram. The valve must not be situated in water, but may be connected in protection zone 1 if the appliance is fused with a 30 mA FI circuit-breaker. In this case the socket of the appliance must be in protection zone 3 or higher.



2.2.2 Warm water version (optional)

The warm water appliances feature 2 valves. The warm water connection is red and may be connected to maximum 60 °C.

2.3 Water outlet

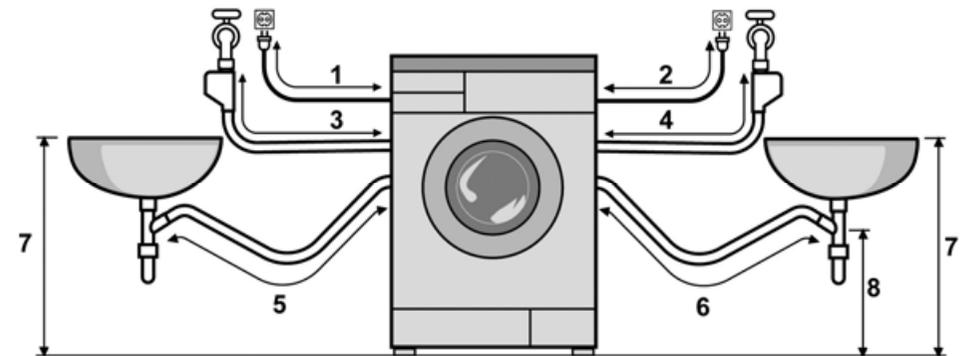
The waste water hose may be extended to 4 m (432060 2,20 m), but only if the hose is lying flat on the floor and has no more than one connection.

Appliances without Aqua-Stop neither have a Container return. The drain hose mustn't be mounted below 60 cm.

2.4 Electrical connection

Connect the appliance to a correctly installed earthed socket only. Comply with the specifications on the rating plate.

Fuse: 10 A

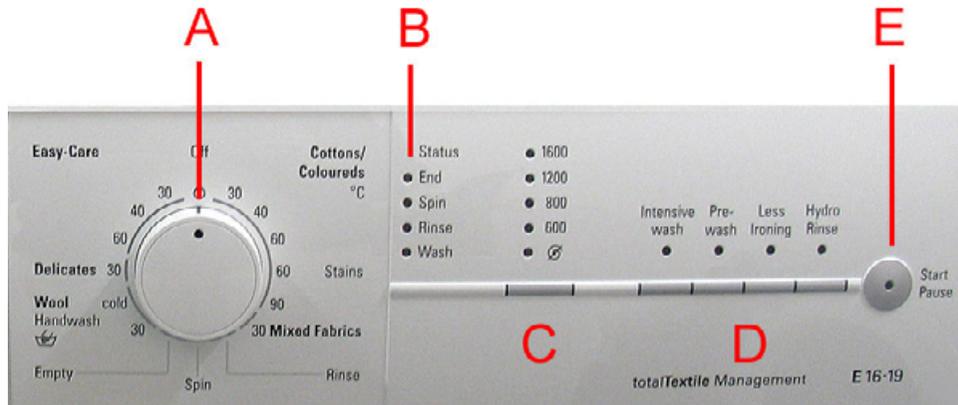
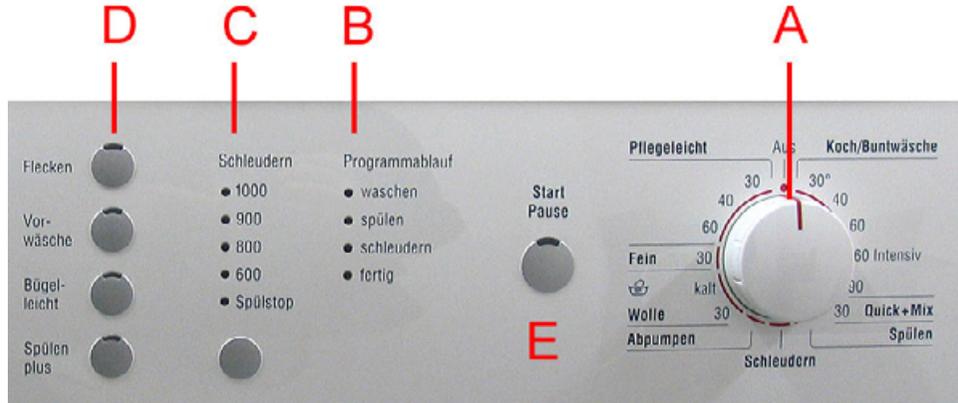


- | | | | | | |
|---|-------------|---|---------------------------------|---|------------|
| A | ca. 100 cm | B | ca. 150 cm | C | ca. 200 cm |
| D | ca. 145 cm | E | ca. 70 cm | F | ca. 130 cm |
| G | max. 100 cm | H | min. 60 cm (see „Water outlet“) | | |

3 OPERATION

3.1 Fascia

The programme progress is indicated by LEDs. The buttons are designed as capacitive pushbuttons.



- A** Rotary selector
- B** LED status display
- C** Spin speed selection
- D** Optimisation buttons
- E** Start / Pause button

3.1.1 (A) Programme selector

The programme selector with combined main switch has 16 positions. Special programmes, cottons/ coloureds programmes, easy-care programmes, delicates programmes and woollens programmes can be selected at different temperatures.

3.1.2 (B) LED programme status display

wash – rinse – spin – ready.

3.1.3 (C) Button and LED display “Spin speed”

This button under the LED is used to set the spin speed. “Rinse stop”  can also be selected, the intermediate spin cycle runs, the washing remains in the last rinsing water. The maximum spin speed which can be set depends on the selected programme.

3.1.4 (D) Optimisation buttons

The additional buttons are only optionally available depending on the appliance model!

3.1.4.1 “Stains” / “Intensive” button (D)

The washing time is increased, this button should be pressed for heavily soiled or more than 4.5 kg of washing.

3.1.4.2 “Extra Rinse” / “Super Rinse” button (D)

Press this button to activate an additional rinse cycle. The programme duration is extended accordingly.

3.1.4.3 “Anti-Crease” / “Easy-Iron” button (D)

This button selects a different spin profile (lower intermittent speed) and a longer loosening at the end of the programme. Creasing is reduced.

3.1.4.4 “Prewash” button (D)

This button activates a 30 °C prewash cycle. Prewash cannot be selected for the woollens programme. Switching OFF the “Prewash” button ends the prewash programme; the water is then pumped off and the programme resumed with the main wash.

3.1.4.5 “Extra water” button (optional) (D)

Press this button to activate an additional rinse cycle. The programme duration is extended accordingly.

3.1.5 (E) “Start / Pause” button

This button starts or suspends the programme.

3.2 Additional functions

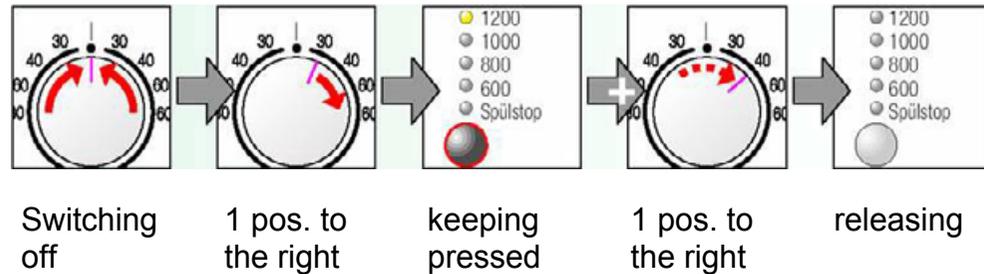
3.2.1 Operating and info signals / fault volume

The acoustic signal signals:

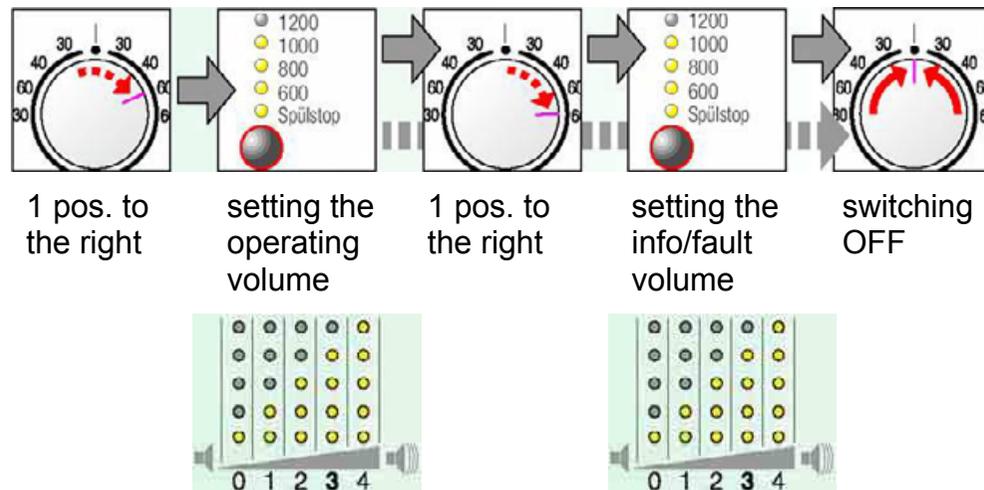
- ▶ Actuation of the Option buttons
- ▶ Individual programme statuses (e.g. malfunctions, operating faults, programme start, programme end)

The signal for the Option buttons can be switched on and off. It can be switched off before the programme starts and at the end of the programme or set to a different volume.

1. Selecting the signal mode

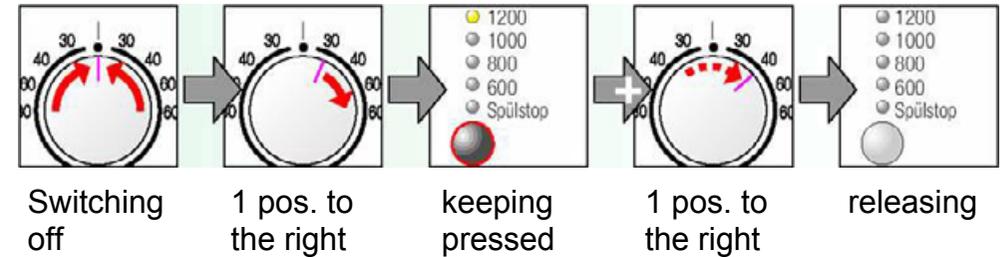


2. Setting the volume

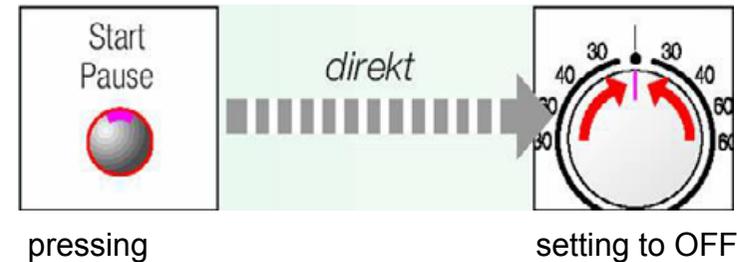


3.2.2 Blind mode (optional)

3. Starting signal mode



4. Switching blind mode on and off



- ▶ In blind mode the following settings are confirmed with an acoustic signal:

Speed	Acoustic signals
1600	1x
1200	2x
800	3x
600	4x
☺	1x

When the rotary selector is turned during a sequence of acoustic signals the following signals are emitted more loudly.

Option buttons: switching ON = long acoustic signal.
Switching OFF = short acoustic signal.

4 COMPONENTS

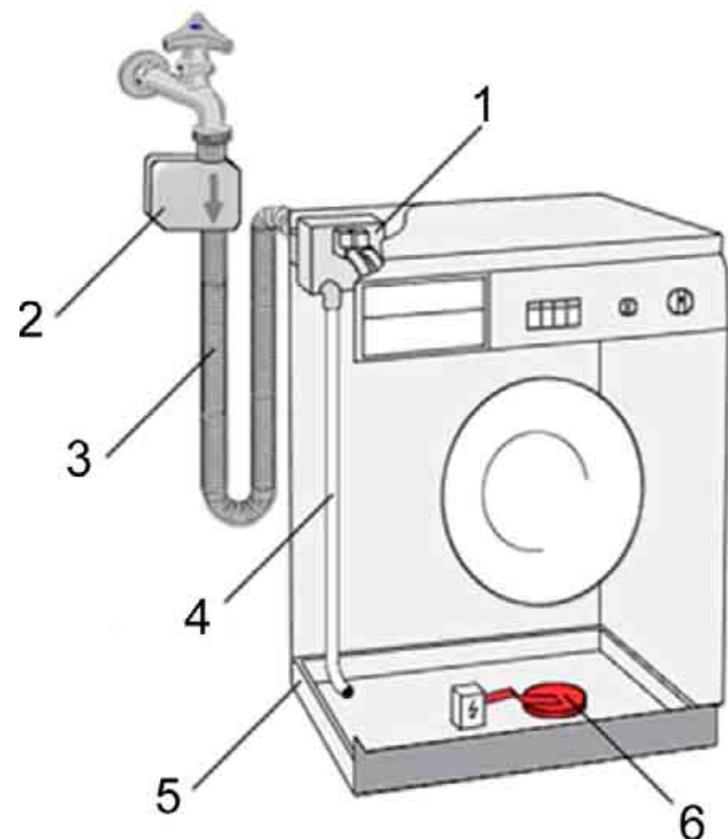
4.1 Aqua Stop valve (Optional)

4.1.1 Function:

An electric solenoid valve which is enclosed by a housing is attached to the tap. The housing is connected to the appliance with a double supply hose. The double supply hose contains the water supply hose and electric control cable for the solenoid valve. The safety function is actuated via the float in the base pan. The water flow is then stopped mechanically.

4.1.2 Technical specifications:

▶ Nominal voltage	230–240	V
▶ Frequency	50	Hz
▶ Resistance	4.13	kΩ ± 10 %
▶ Flow rate	10	l/min ± 10%
▶ Water pressure	1.0–10	bar
▶ Water inlet temperature max.	max. 25	°C

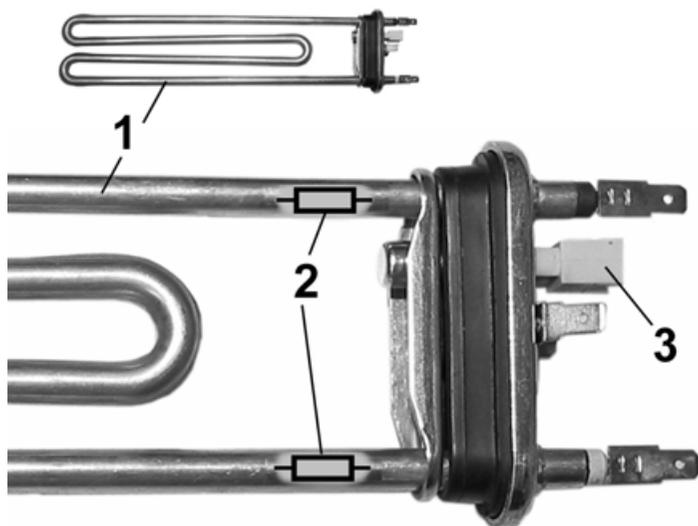


- A** Equipment valve **B** Aqua-stop **C** Double inlet hose
D Leakage water hose **E** Drip tray **F** Soil float

4.2 Heater

4.2.1 Function:

The heating element **A** has two integrated fuses **B** (boil-dry protection). The fuses cannot be changed.



- A** Heating elements
- B** Integrated fuses
- C** NTC (resistance with negative temperature coefficient)

4.2.2 Technical data:

- ▶ Nominal power: 2000 W ± 5% bei 70° C
- ▶ Resistance: see connection diagram

4.3 NTC

4.3.1 Function:

If the NTC value is outside the operating range (e.g. interruption or short-circuit), the programme continues cold without an error display. The test programme displays “NTC short circuit” or “NTC interruption”. The NTC is inserted into the heating flange and is sealed with the heater seal.

4.3.2 Technical data:

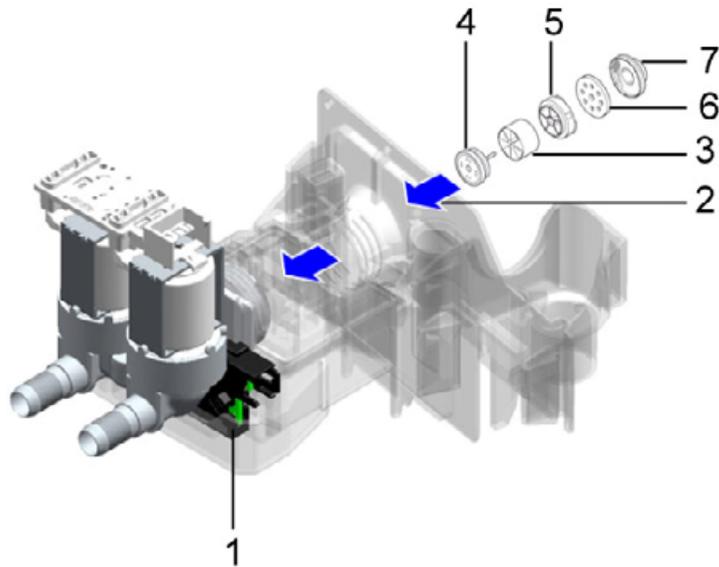
Operating range: from -5 °C to 103 °C

Temperature in °C	Resistance in kΩ
10	8.5–10.6
20	5.4–6.5
30	3.5–4.3
40	2.3–2.9
50	1.5–1.9
60	1.1–1.3
66	0.9–1.1
86	0.45–0.55

4.4 Flow sensor (Optional)

4.4.1 Function

The flow sensor seizes the quantity of water, directly before the valves. It consists of an impeller with a magnet core and a one resounds - to hall- IC. The impeller is shifted as a function of the water flow in turn. In the case of turn of the impeller by the magnet of impulses to resound - to hall-IC given.



- | | |
|--------------------------|-----------|
| 1 Hall-IC | 5 nozzle |
| 2 Flow direction | 6 limiter |
| 3 Impeller wiht a magnet | 7 Filter |
| 4 Impeller holder | |

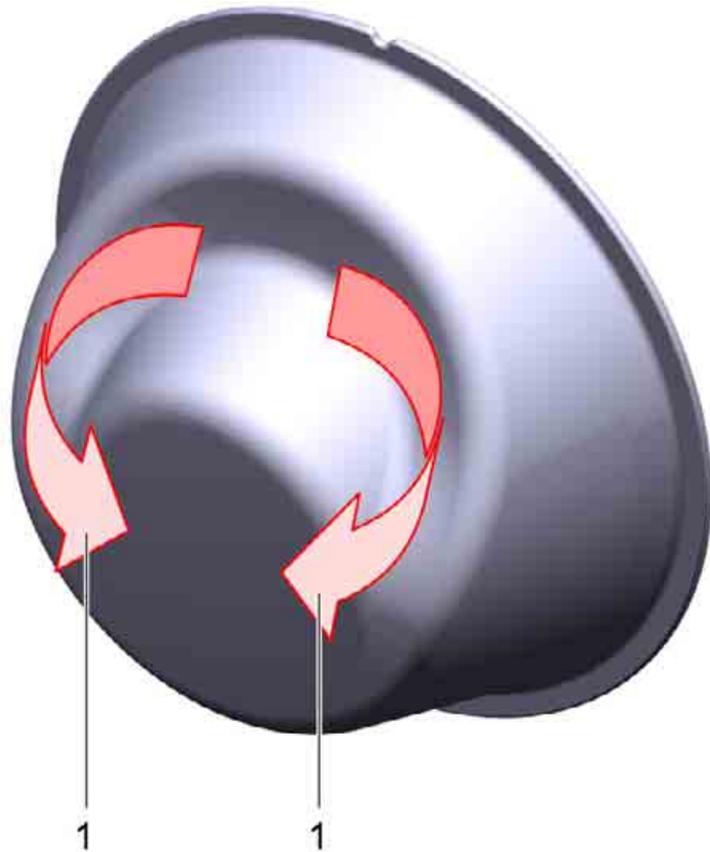
4.4.2 Technical data

- | | |
|------------------------|---------------------|
| ▶ Operational voltage: | 12 V (3,8 V – 24 V) |
| ▶ Rate of flow: | 2 - 10 l/min |
| ▶ Flow max.: | 10 l/min |

i **TIP:**
With bubbles can higher flow rates can be recognized

4.5 Door glass

The door glass features 2 washing deflectors. The deflectors direct the washing towards the middle of the drum.



1 Washing deflector

4.6 Detergent-solution pump

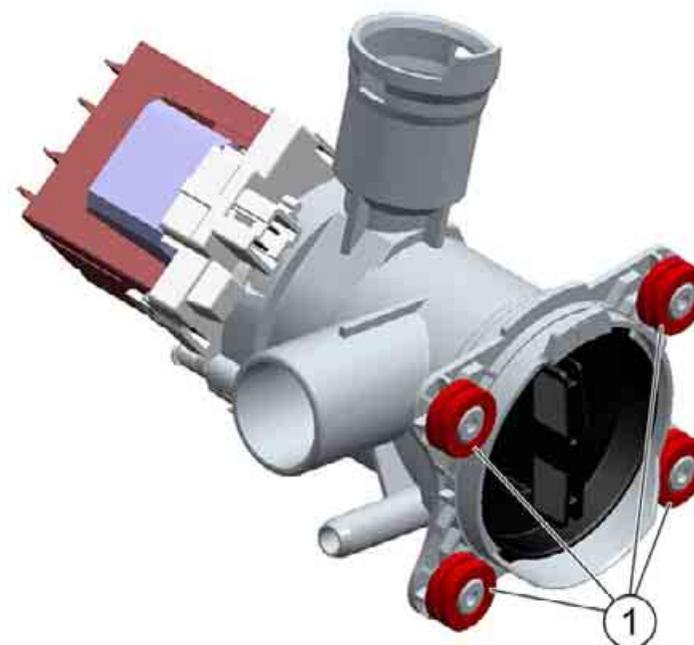
4.6.1 Function:

The pump is actuated by a relay.

The detergent-solution pump features a thermal protection device. The thermal protection device is actuated when the power input is too high.

4.6.2 Technical specifications:

▶ Nominal voltage	120 VAC / 60 Hz
▶ Voltage range	99 – 132 VAC
▶ Delivery head	1.0 m
▶ Delivery rate	18 l/min
▶ Resistance	see terminal diagram



1 Retaining bushes

4.7 3D sensor

Operating principle:

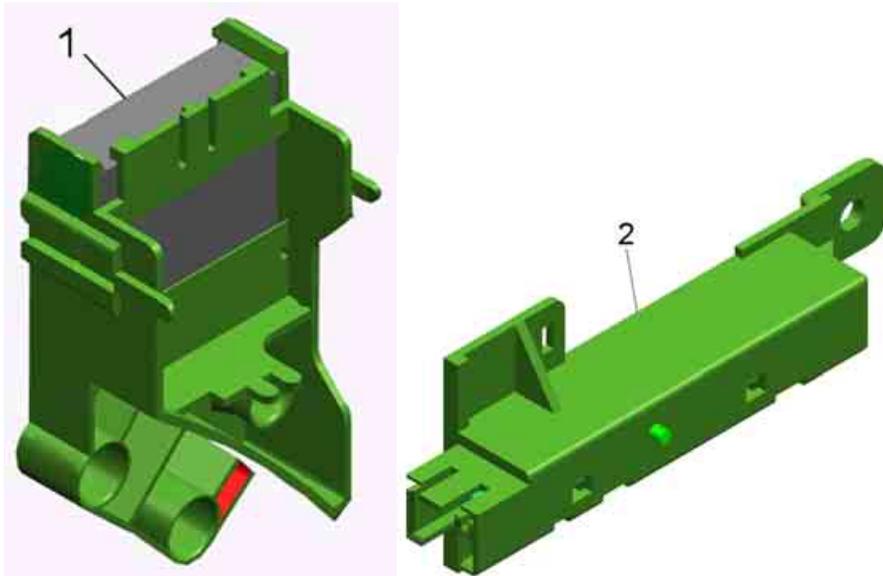
The sensor element with three-dimensionally integrated Hall elements and μ -controller is able to calculate the position of a permanent magnet and therefore the outer tub in the compartment.

Operating voltage: 9V DC

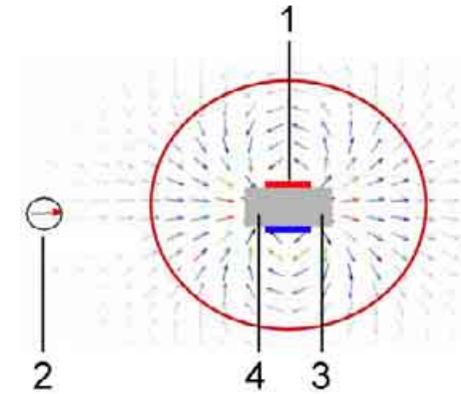
4.7.1 Functions of the 3D sensor

[Imbalance measurement:](#)

[Load measurement:](#)



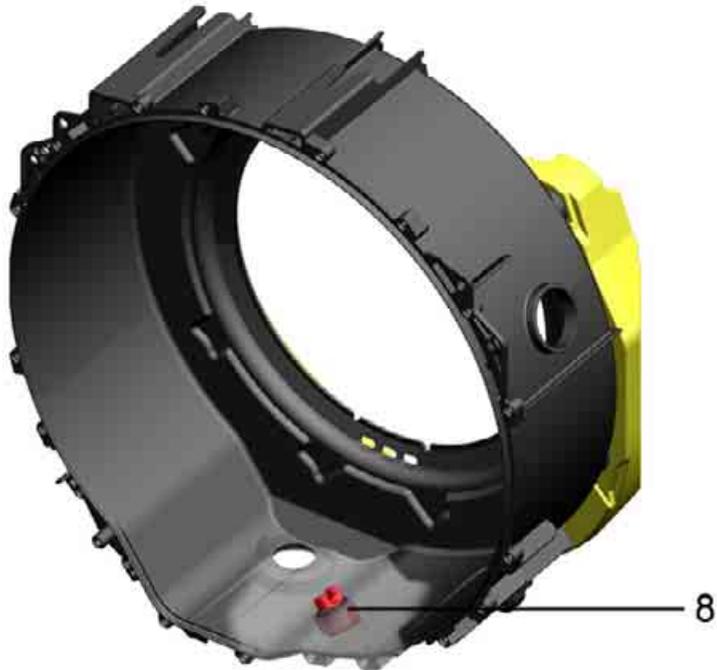
- 1 Permanent magnet (on the outer tub)
- 2 3D sensor (on the housing)



- 1 Magnetic field source of permanent magnet
- 2 3D sensor
- 3 North pole
- 4 South pole

4.8 Turbidity sensor (Optional)

The turbidity sensor sits in the front caustic solution container. The sensor seizes the turbidity of the detergent solution



8 Turbidity sensor

[Function turbidity sensor](#)

4.9 Door locking feature

4.9.1 Function:

The locking feature consists of a magnetic lock with two coils, two switching contacts and an emergency lock release. One coil is used for locking and the other for unlocking. One switching contact is the transducer for the control and the other contact actuates the power (motor, pump and valves). The lock can be mechanically unlocked via the emergency lock release (red ring behind the cover flap on the detergent-solution pump).

The locking feature is actuated if:

the drum rotates for longer than 2 seconds at more than 60 min^{-1} (spin acceleration).

the detergent-solution temperature is above $60 \text{ }^\circ\text{C}$.

The door lock level (water level) is exceeded.

5 FUNCTIONS

5.1 Load detection function:

The load detection function operates via the [3D sensor](#).

- ▶ The sensor measures how far the oscillation system drops when the drum is loaded with washing.
- ▶ This measurement result is used to calculate the weight of the washing. And is indicated on the display



5.2 Motor actuation

5.2.1 Function:

The motor control and regulation is managed by square wave voltage generated on the motor module. The actual speed value of the tachogenerator signal is compared with the required value of the electronics module. The direction of rotation is changed by two deenergised reversing relays. An integrated protector in the motor winding disconnects the motor in the event of an overload. The control does not disconnect the motor with a tachogenerator fault but continues trying to restart the motor. A motor fault is indicated in coded form.

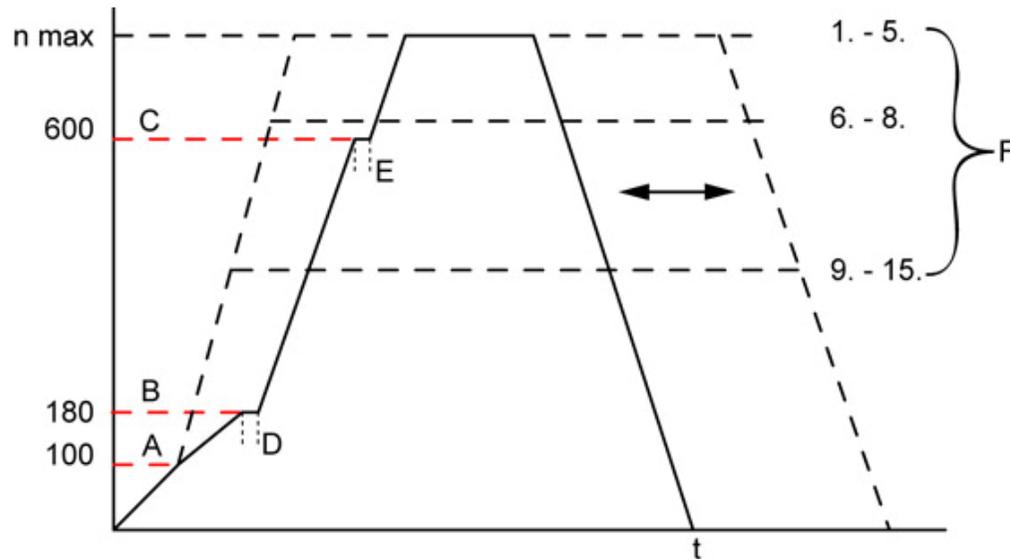
The following speeds apply to the washing machine with empty drum:

- ▶ Wool: 27 min⁻¹ +/- 5 %
- ▶ Wet: 35 min⁻¹ +/- 3 %
- ▶ Rinse: 50 min⁻¹ +/- 3 %
- ▶ Wash: 50 min⁻¹ +/- 3 %
- ▶ Spin: Spin speeds +/- 2.5 %

Measurement speeds for the unbalanced load detection system:

- ▶ Motor tachogenerator 100 rpm
- ▶ [3D sensor](#) (oscillation system amplitude) 180 rpm approx.
10 sec.
- ▶ [3D sensor](#) 600 rpm

5.3 Unbalanced load detection function:



- A** UKS 1 20 sec. imbalance detection
- B** UKS 2 With 3D sensor (oscillating system amplitude)
- C** UKS 3 With 3D sensor
- D** 10 sec.
- E** 10 sec.
- F** Reduced speed after start-up attempts

UKS Unbalanced load detection systems

UKS1 Motor tachogenerator

UKS2 With 3D sensor (oscillating system amplitude)

UKS3 With 3D sensor

Before each spin acceleration, the imbalance is measured in 3 steps:

15 start-up attempts are possible for UKS1 + UKS2. UKS3 does not run unless UKS1+2 were successful.

If the imbalance is very great, the spin cycle is terminated, for wool the spin cycle is terminated after 2 start-up attempts.

Measurement 1:

The imbalance (A) is measured for 20 seconds at 100 min⁻¹.

Measurement 2:

Then the imbalance is measured for 10 sec. at 180 r.p.m. The maximum oscillating system amplitude is measured.

Measurement 3:

Then the imbalance is measured for 10 sec. at 600 r.p.m. The actual imbalance in the drum is measured. Depending on the measured value UKS3, a high speed >1000, maximum 1550, is enabled.

Any speed value between 1000 and 1550 is possible depending on the current imbalance.

If the 3D sensor is defective, the spin cycle does not exceed 1000 r.p.m.

5.4 Door locking feature (optional)

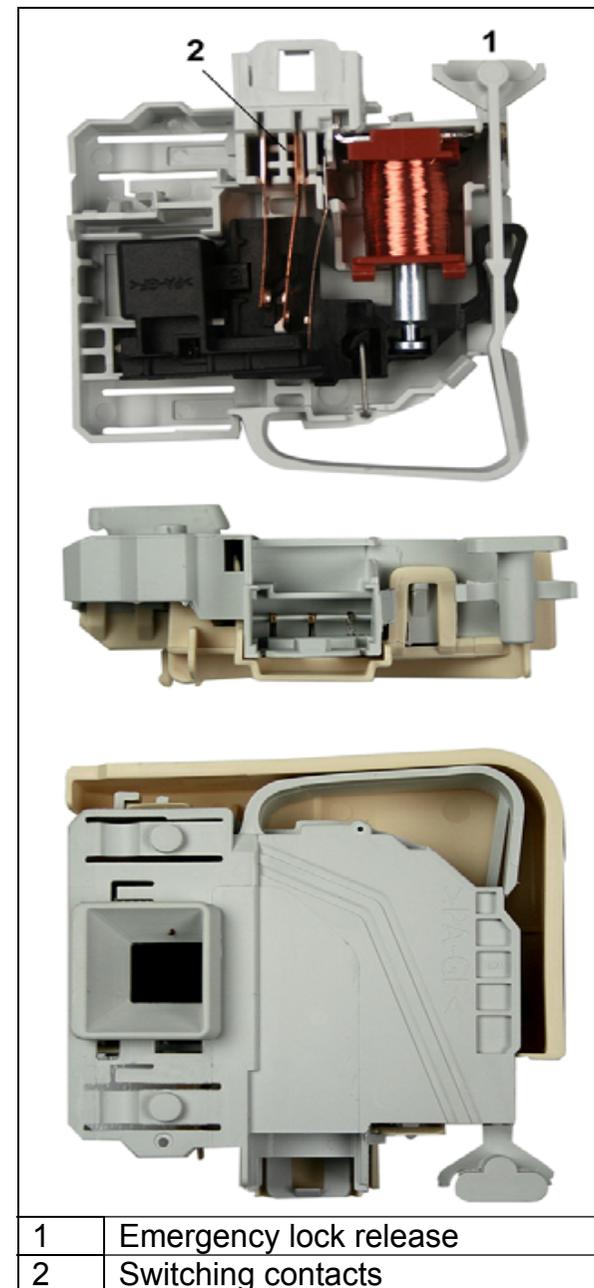
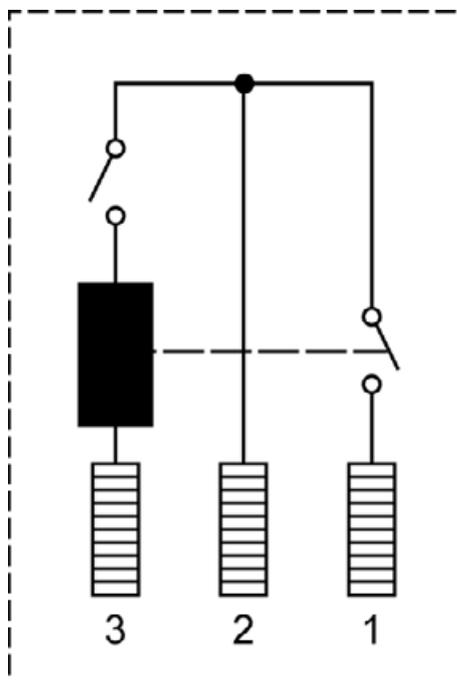
Technology data:

5.4.1.1 Magnetic lock:

Coil resistance	:	235 Ω +/- 10 %
Switching time	:	<40 ms
Contact 1-2	:	unlock
Contact 1-2	:	lock

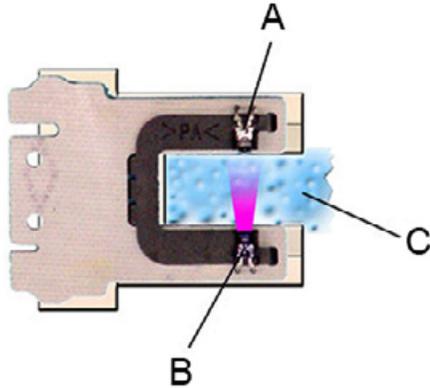
5.4.1.2 Contacts:

Contact load bearing capacity 1-2	:	250 VAC; 16 A
Contact load bearing capacity 1-2	:	250 VAC; 10 mA



5.5 Function of turbidity sensor (optional)

The turbidity sensor consists of an infrared LED and a phototransistor. They are positioned opposite each other on a board in a U-shaped transparent housing.



- A Phototransistor
- B Infrared LED
- C Detergent solution

The infrared diode transmits infrared light through the water flowing between the “U” to the light-sensitive base of the phototransistor which then becomes conductive.

If the water is turbid, the light emitted by the infrared diode can no longer reach the phototransistor. The absent voltage signal is detected by the microcomputer and the remaining programme sequence is specified accordingly.

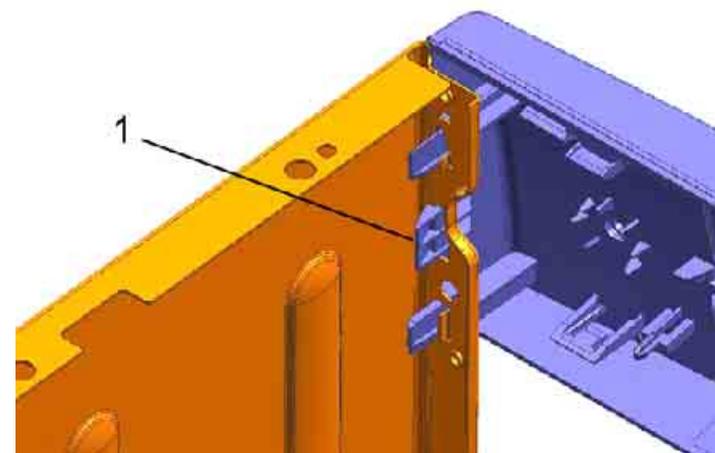
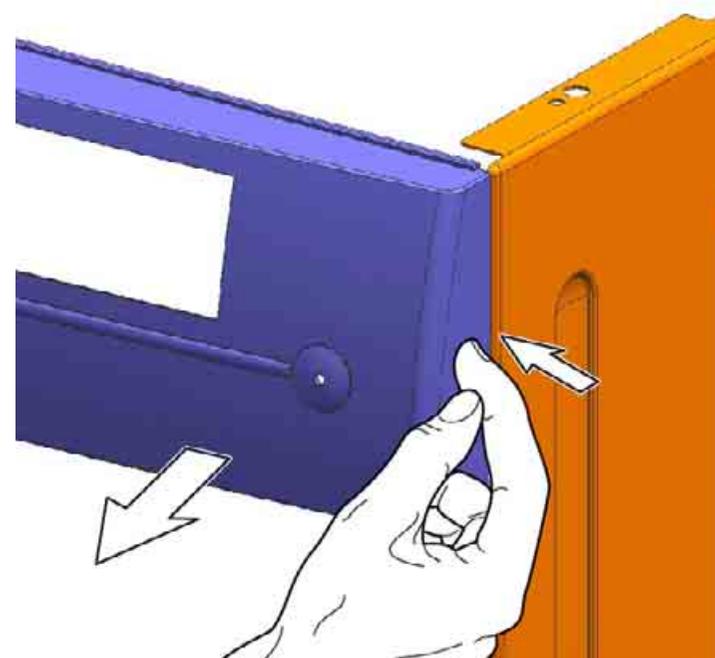
To ensure the sensitivity and the function of the turbidity sensor due to deposits (lime, detergent residue, etc.), the sensor is calibrated in every wash programme after the final spin.

The control decides whether 1, 2 or 3 more rinse cycles are also activated.

6 REPAIR

6.1 Removing the fascia

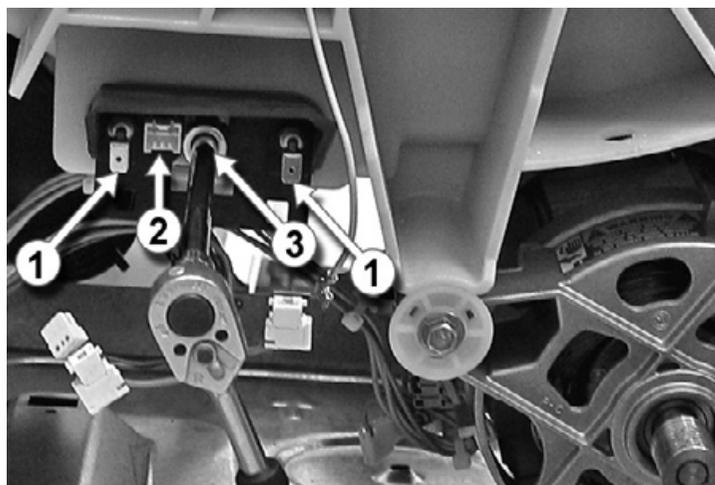
- ▶ Remove detergent dispenser
- ▶ Unscrew 3 screws (2) on the left of the fascia
- ▶ Detach locking hook on the right side (1) and remove fascia.



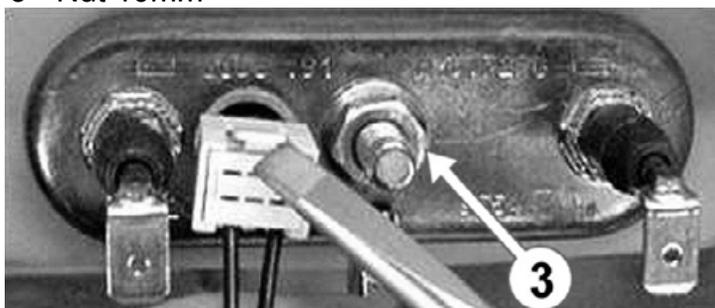
1 Fascia catch

6.2 Heater

1. Remove back panel
2. Remove electrical connections
3. Loosen the hex nut
4. Release the seal
5. Remove the heating element towards the back panel.
6. The [NTC](#) can be removed after removing the heater.



- 1 Elektric Connection 2 NTC
3 Nut 10mm



6.3 Removing the front panel

- ▶ Removing the panel
- ▶ Remove the retaining ring from the seal and knock out the seal.
- ▶ To lighten the weight, the door can be removed.
- ▶ Remove the base panel and unscrew 2 screws (2) from the front panel.
- ▶ Unscrew 3 screws (1) and remove front panel.
- ▶ The electrical connection on the lock can be removed after the front panel has been detached



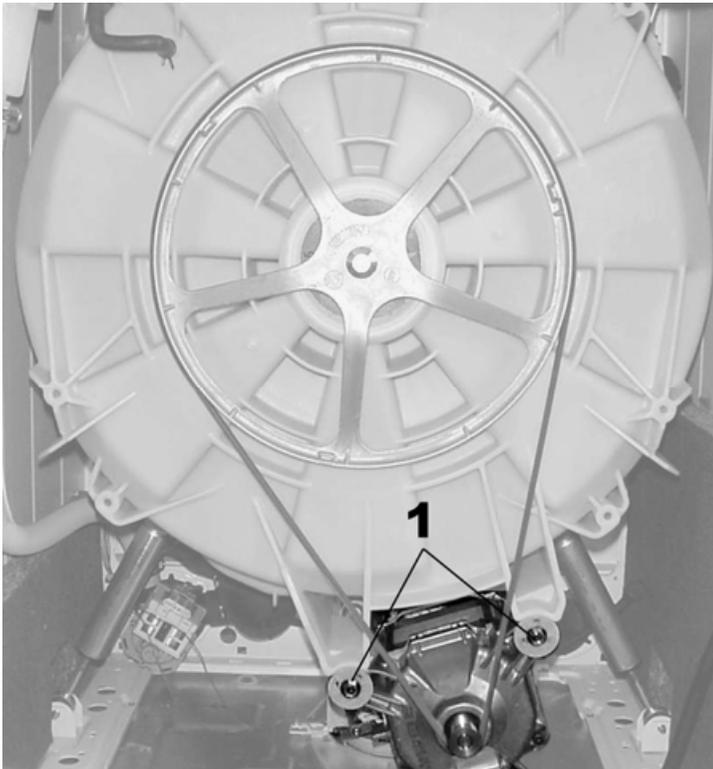
1 / 2 Retaining screws

6.4 Motor



- ▶ Warning of sharp edges at construction units
 - ▶ Protective gloves
-

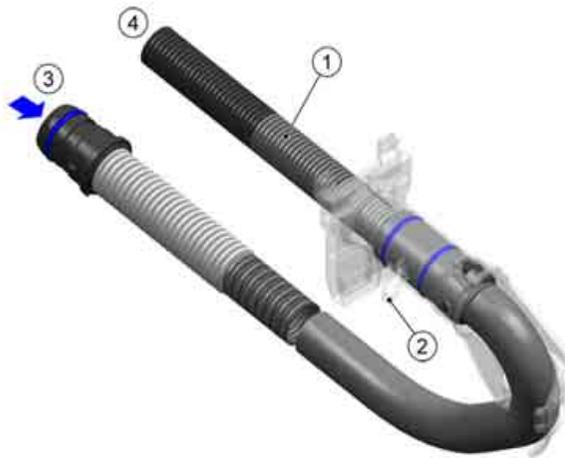
7. Rearpanel remove
8. Belts remove
9. Screws 1 of the motor attachment remove
10. Motor to the rear pull out



6.5 Removing the drainage hose

- ▶ Remove the worktop.
- ▶ Remove detergent dispenser
- ▶ Unscrew 3 screws (2) on the left of the fascia
- ▶ Detach locking hook on the right side (1) and remove fascia.
- ▶ Remove front and rear panels.
- ▶ Using a suitable tool, disconnect catch from the hose holder (3) and remove complete drainage hose.
- ▶ Pull down drainage hose and simultaneously detach inwards.

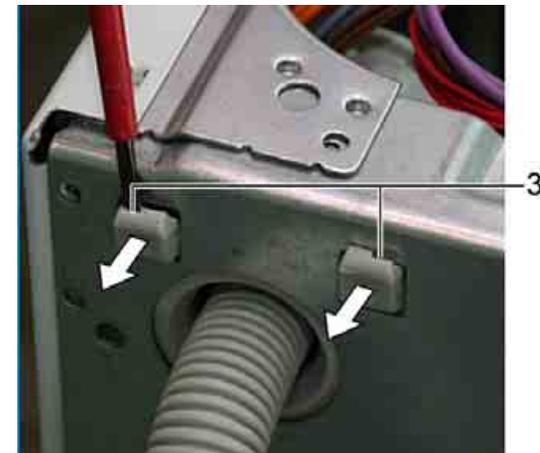
Complete drainage hose



Step 3

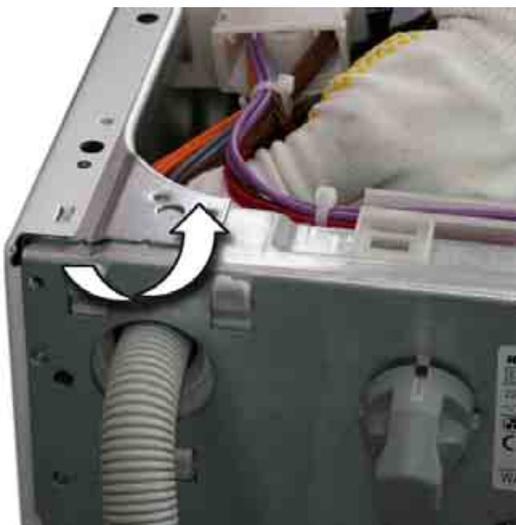


Step 6

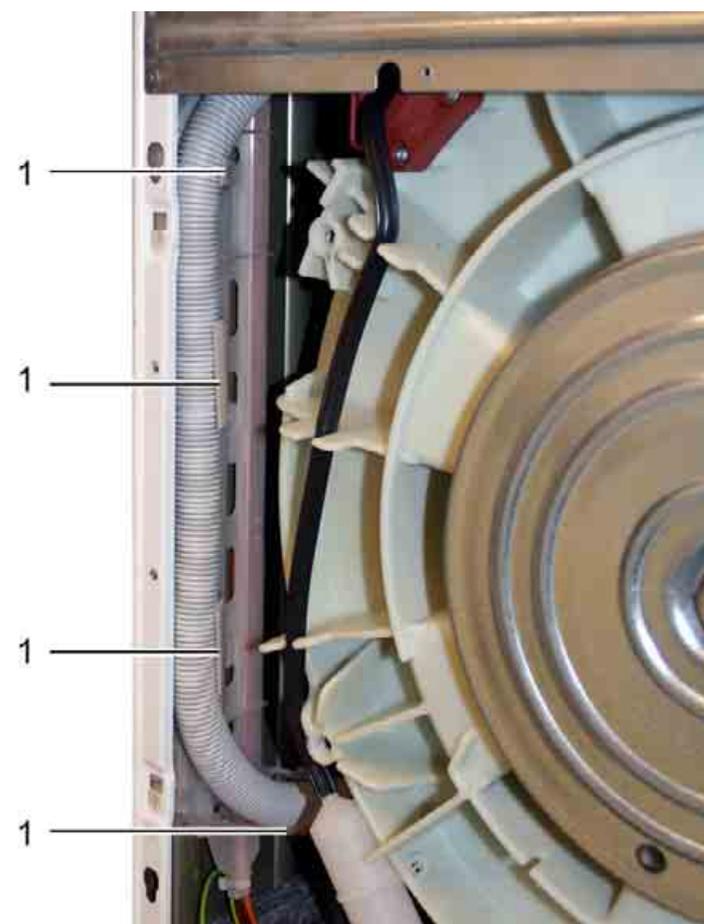


3 Catch

Step 7



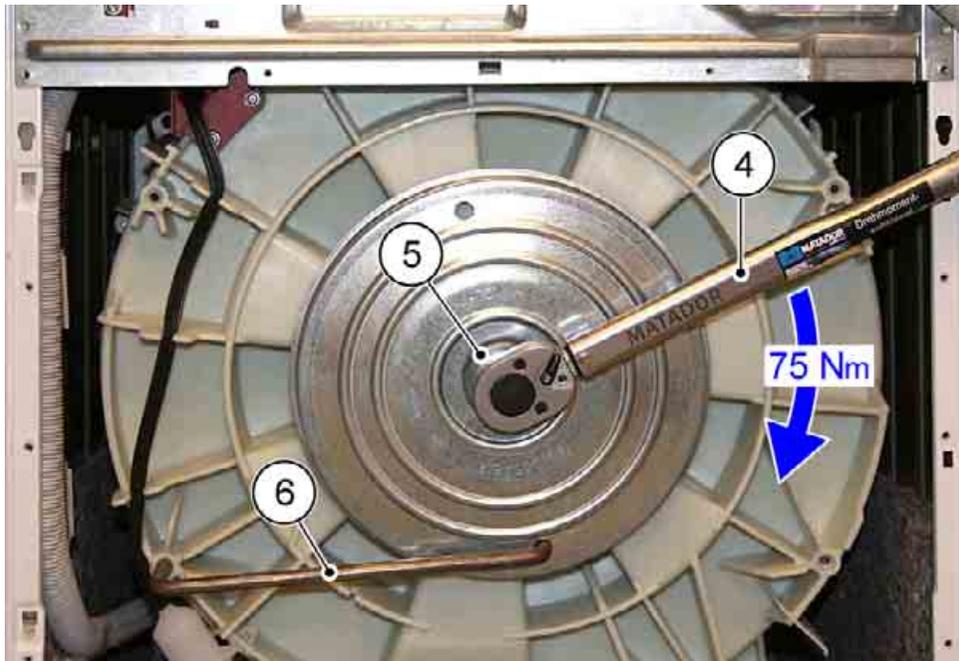
Step. 8



1 Holder

6.6 Pulley assembly with torque wrench

- ▶ Tighten the pulley hand-tight with the collar nut.
- ▶ Fix the pulley in position using auxiliary tool (6).
- ▶ Tighten to 75 Nm using the torque wrench.
- ▶ Remove the auxiliary tool, hoist the belt and make sure that it is seated correctly.
- ▶ Fit the rear panel.



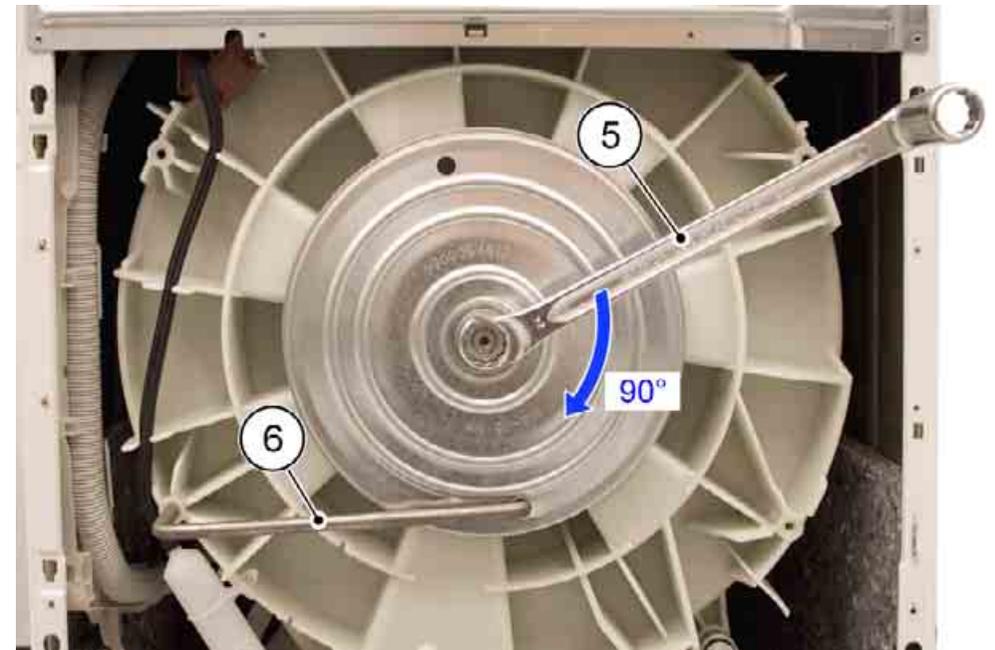
- 4 Torque wrench 341222
- 5 Size 24 socket wrench 341221
- 6 Auxiliary tool 341238

6.7 Pulley assembly without a torque wrench



Sharp edges:

- ▶ Wear protective gloves!
- ▶ Tighten the collar nut on the belt pulley hand-tight.
- ▶ Fix the pulley in position using auxiliary tool (6).
- ▶ Tighten the collar nut firmly using the 24-mm ring spanner (5). Then attach ring spanner again and turn it up to a ¼ turn further (approx. 90°) if possible. This will enable a torque of 75 Nm to be achieved. The union nut is not overloaded as it can withstand up to 130 Nm.
- ▶ Remove the auxiliary tool, hoist belt and make sure that it is seated correctly.
- ▶ Fit the rear panel.



- 5 24-mm ring spanner 341221
- 6 Auxiliary tool 341238

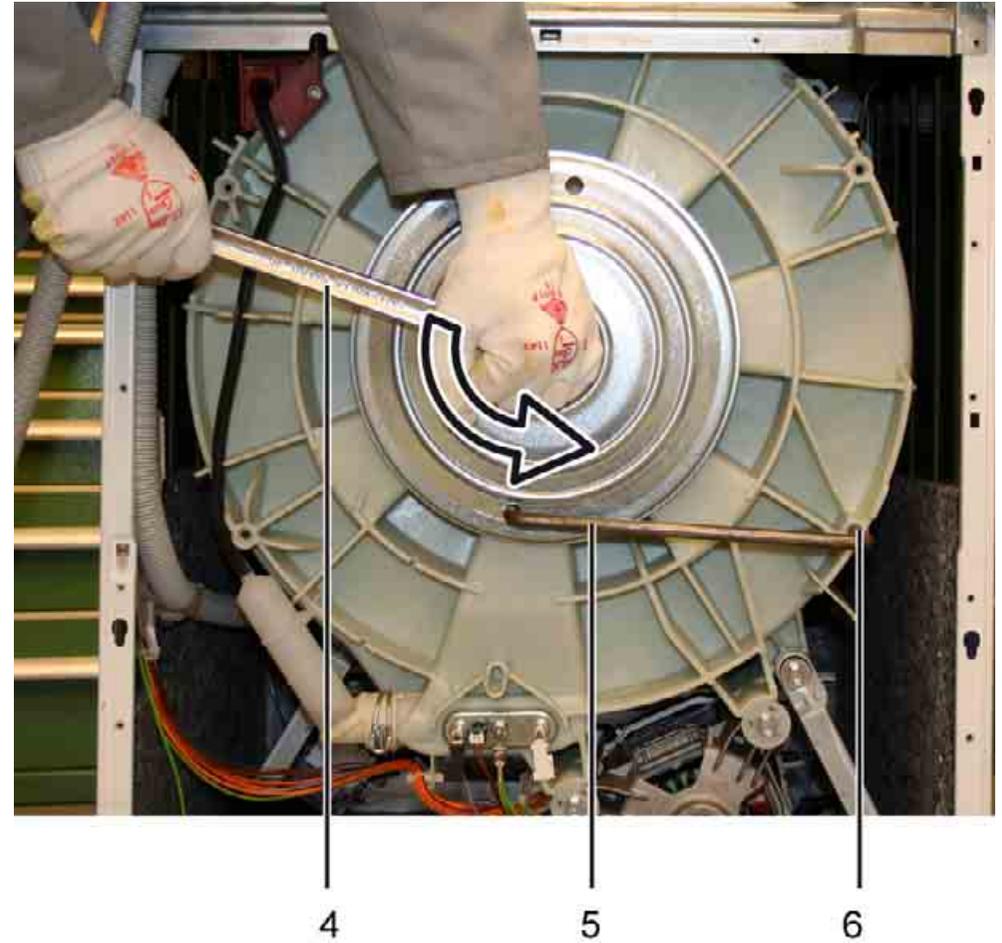
6.8 Removing the belt pulley



Attention

Do not slip off. [Wear gloves](#)

- ▶ Remove the rear panel
- ▶ Remove belt
- ▶ If required, support outer tub on the base plate
- ▶ Fix belt pulley with tool
- ▶ Remove collar nut with 24 box wrench



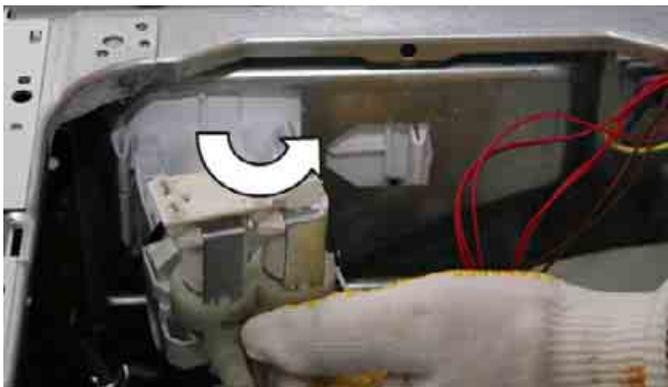
- 4 24 ring spanner 341221 5 Auxiliary tool 341238
6 Retaining hole for the transportation protection device

Step 6



2 / 3 catches

Step 7



Step 8



6.10 Removing the detergent-solution pump

- ▶ Remove base panel
- ▶ Remove the [Front panel](#).
- ▶ Drain residual water via the drainage hose.
- ▶ Unscrew 4 T20 screws on the pump and press the pump out of the holder towards the rear.
- ▶ Remove the electrical connection
- ▶ Remove hoses with a suitable tool.



Fastenings for the detergent-solution pump

Step 4



Step 4



6.11 Diagnosis / Repair aids

6.11.1 General

Before repairing or testing the appliance, always start the customer-service test programme.

6.11.2 Test prod

Test probe mat. no.: 340730 (remove the components from the module before measuring the resistance)



6.11.3 Protective gloves:

Material no.: size 9 = 340728
 size 10 = 340729

6.11.4 Unbalanced load detection

The termination of the spin cycle by the unbalanced load scan can be reset with the aid of a water-filled thermal bottle 341095. The thermal bottle must be filled with 1250 ml (overall weight: 1,5 kg).

6.11.5 Plastic side cutters

Plastic side cutters mat. no.: 340701 for repairs to the outer tub.

6.11.6 Drill bit

Drill bit (13.2 mm) mat. no.: 340700 for repairs to the friction dampers.

7 FAULT DIAGNOSTICS

7.1 Control unit

Fault details	Cause	Remedial action
Door cannot be opened, possibly display: "Temperature too high"	NTC detects temperature above 60 °C	Start test programme P6, temperature is indicated in the bottom left hand side of the display. Replace NTC if required.
Door cannot be opened, possibly display: "Water level too high"	Analogue sensor detects water above door level	Start test programme P7, water level is indicated by N _D in the top right hand side of the display. Replace analogue sensor if required.
Door cannot be opened, possibly display: "Speed too high"	The tachogenerator detects a drum speed above 60 min ⁻¹	Start test programme P3, speed is indicated at bottom right of display.

8 TECHNICAL SPECIFICATIONS