Built-in Dishwashers

Series 635

IGV 699.0 / IGV 699.1

IGV 699.2 / IGV 699.3

IGV 699.4

IGV 6909.0

Küppersbusch

THE HEART OF A GOOD KITCHEN

GB

Service Manual: H7-71-06

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Contents

1. Safety

Danger!

Repairs may only be carried out by a qualified electrician!
Improper repairs can be extremely dangerous for the user.

It is essential that you observe the following instructions in order to prevent electric shocks:

- The casing and the frame may be live in the event of faults!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Disconnect the appliance from the mains prior to carrying out any repair work!
- When inspecting live parts, a residual current circuit breaker must always be used!
- The earthed conductor resistance must not exceed the resistance specified in the standard! It is vital for ensuring the safety of persons and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or in accordance with the corresponding regulations for your country!
- On completion of repairs, a function and impermeability inspection must be carried out.

Attention!

It is essential that you observe the following instructions:

- Due to the all-pole disconnection (relay, press switch), when carrying out measurements via the connector plug in accordance with VDE 0701, a direct measurement must be used to check the heating (flow heater) for insulation faults or the appliance's differential current must be measured!
- When changing additional devices and the pump pot, beware of sharp edges around the stainless steel components.
- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current circuit breaker.

Sharp edges: use protective gloves.

Components may be electrostatic!
Observe handling regulations!

2. General technical specification

This service manual serves the purpose of providing customer service technicians who already have the know-how required to repair dishwashers with specific information on the operating mode of the IGV 699.0 / IGV 699.1, IGV 699.2 / IGV 699.3, IGV 699.4 and IGV 6909.0.

This manual deals with all of the appliance specifications relevant to this model.

Descriptions and operating modes of components that are not new have therefore not been included in this edition.

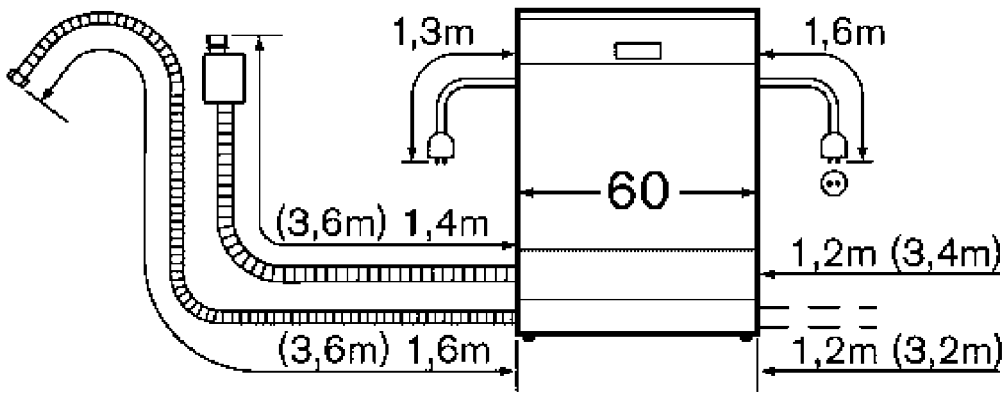
3. Installation and connection

3.1 Installing

In order to ensure that the lock functions perfectly and to prevent any leakages in the area of the door, the appliance must be perfectly aligned by means of the adjustable feet. In the case of integrated appliances, it is possible to adjust the middle adjustable foot at the back from the front. Screw the appliance in an upward direction by means of the adjustable feet until the outer casing is at the same level as the working top.

3.2 Water connection

If the appliance is installed onto the drain with the standard length of hose, the max. permissible height above the floor is 90 cm. If the discharge hose is extended, a max. height of 80 cm is not to be exceeded.



Connection dimensions
for all dishwashers 60 cm
( ) Figures with extensions

3.3 Electric connection

Connect the appliance to a wall socket with earthing in accordance with regulations only. Please observe the information on the identification plate (see the technical data).

4. Features

The new fully-automatic dishwashers comprise significant product innovations in various areas:

- Guaranteed results by means of monitoring soiling and loading, and fully automatic control of temperatures, water quantities and rinsing procedures.
- Easy operation thanks to “single-button operation” on the upper edge of the inner door and a selection of all of the functions by means of a clear text display.
- The appliance is given a new appearance with a clear text display and menu buttons.
- **Fully-automatic controls**
  For determining soiling and loading with the help of various sensors and fully-automatic control of all rinsing parameters: water quantity, temperature and time.
- **Heat exchanger**
  Economical by means of a transfer of energy, hygienic through drying without any inflow of outer air and gentle on dishes through avoiding temperature shocks.
- **Glass protection**
  Targeted control of water hardness in order to avoid damage to the glass surface caused by excessively softened water.
- **Clear text display**
  Simple operation by means of the indication of all functions as well as remote indications in a clear text (17 languages).
- **Aqua sensor II**
  Water and energy consumption depending on the degree of soiling of the dishes for optimal cleanliness and economy.
- **Speed sensor**
  Water consumption according to the volume of dishes loaded and offsetting of losses, for example through pots which have turned over.
- **Consumption data**
  In the test program (Normal Eco) consumption data of only 14 litres and 1.05 kWh.
- **Remaining time indication**
  Information on time remaining until completion of a program, in minutes.
- **Fold-over spikesin the bottom basket**
  Flexible loading of plates and large dishes in the bottom basket and in the top basket.
- **Fold-over spikes in the top basket**
  The spikes in the front part of the two rows (dark grey) can be folded over. Thus this space can be used for small plates or for bowls and pots, etc., as required.
- **Optosensor**
  Protects glasses and dishes against scaling.
- **Filter system with four settings**
- **Cutlery rack for long items of cutlery**
- **Aqua-stop optional**

- **Types of baskets:** Standard baskets and an additional small cutlery basket at the top.
- Normal Eco test program
- Consumption data: 14 litres / 1.05 kWh - Noise level 44 dB
- A-A-A energy label
- **Height-adjustable top basket** (Rackmatic)
  The rackmatic “basket adjustment” is a system which enables the top basket position to be adjusted easily, even when it is loaded. In order to lower the top basket press both of the handles on the sides. The basket must only be lifted in order to raise it.

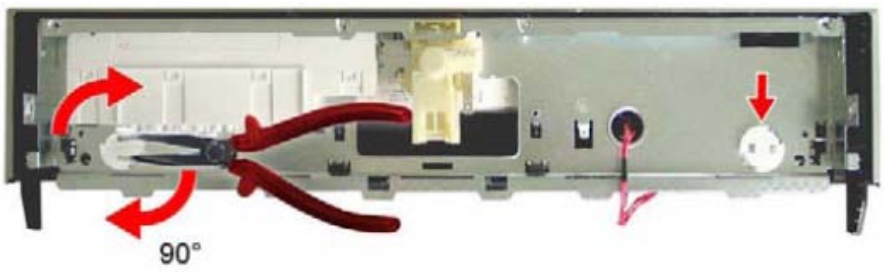
- **Multiflex premium baskets**
  Convenience and flexibility for optimal space utilisation

4.1 Operation and display module

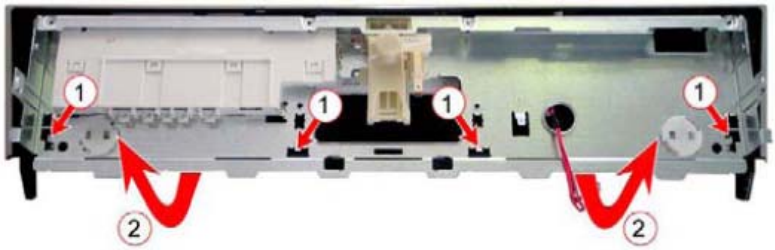
4.1.1 Disassembly

For fully-integrated models, the two decorative panels on the right and left of the door must be removed prior to dismantling the outer door or the panel.

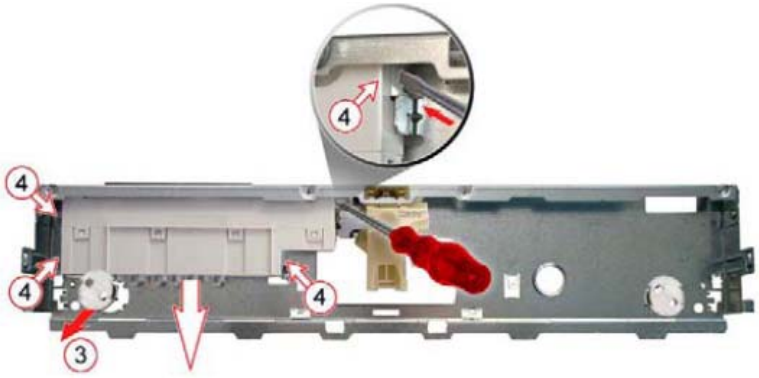
1. Remove the outer door and the complete panel.



2. Remove the panel cover; to do so, turn the two round white catches on the inside by 90° with a pair of pointed pliers.



3. Remove the support plate from the panel cover at the four catches (1).
4. Fold the support plate up (2).
5. Remove the front display module (if present).



6. Remove the round lock (3).

⚠ **Do not bend the catches on the support plate.**

7. Disengage the module from the support plate by the four catches on the module casing (4).
8. Push the module downwards and out.

4.2 Assembly

1. Push the module from below into the support plate until the four catches on the module casing engage into the support plate.

When installing make sure that

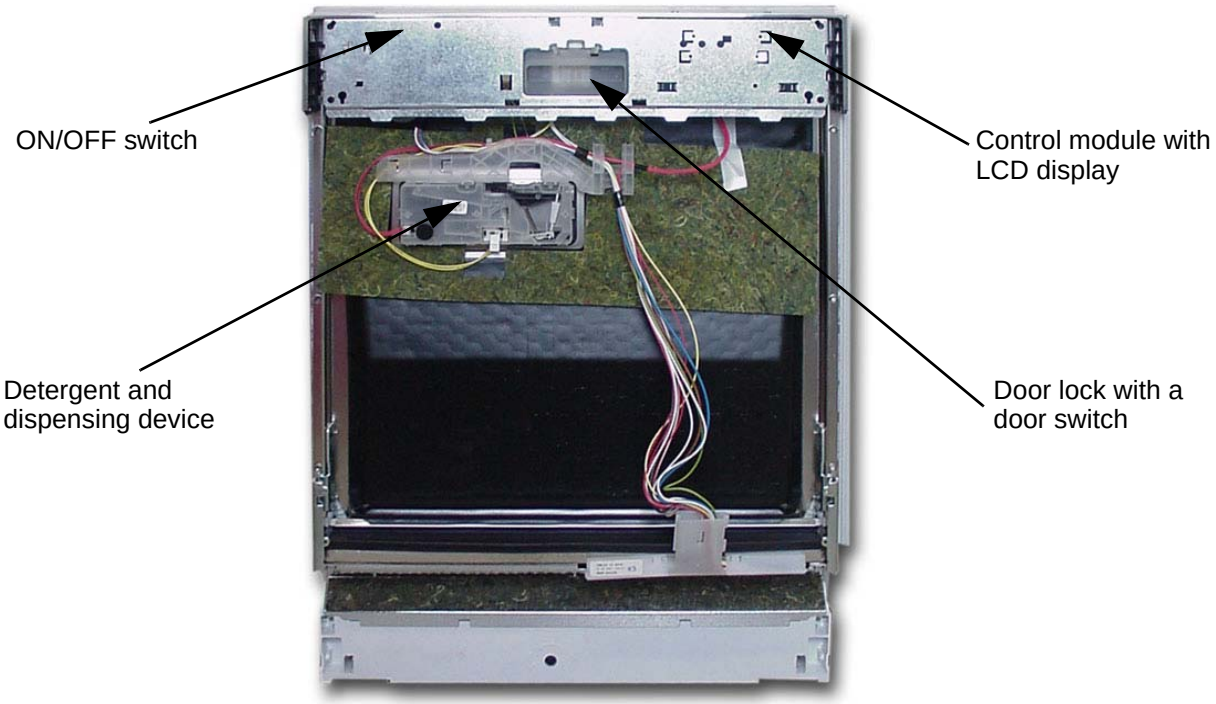
- the catches on the support plate are not bent;
- the sealing on the display is not crushed or damaged;
- the module has engaged properly into the support plate.

2. Insert the round lock (3) into the support plate.
3. Connect the front display module (if present).
4. Engage the support plate into the panel cover.
5. Lock the support plate and the panel cover; to do so use a pair of pointed pliers to turn the two white catches by 90°.
6. Mount the panel and the outer door.

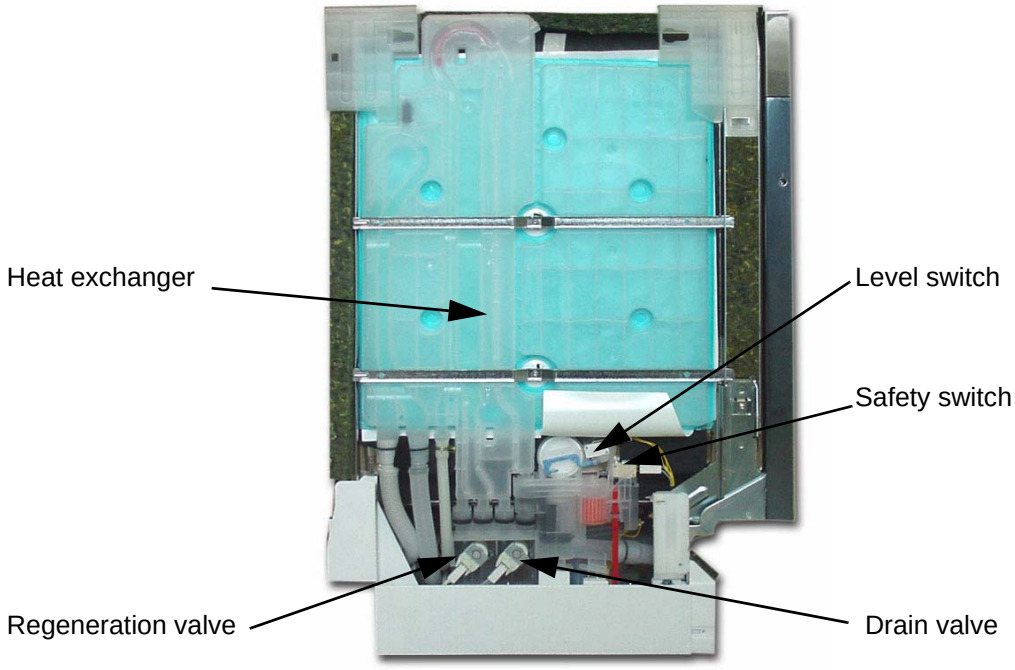
5. Components and dismounting

Control panel
Control module
Power module
Door lock
Rinse water pump
Circulating pump
Water diverter
Raw water valve
Aqua-sensor II
Level system
Water inlet

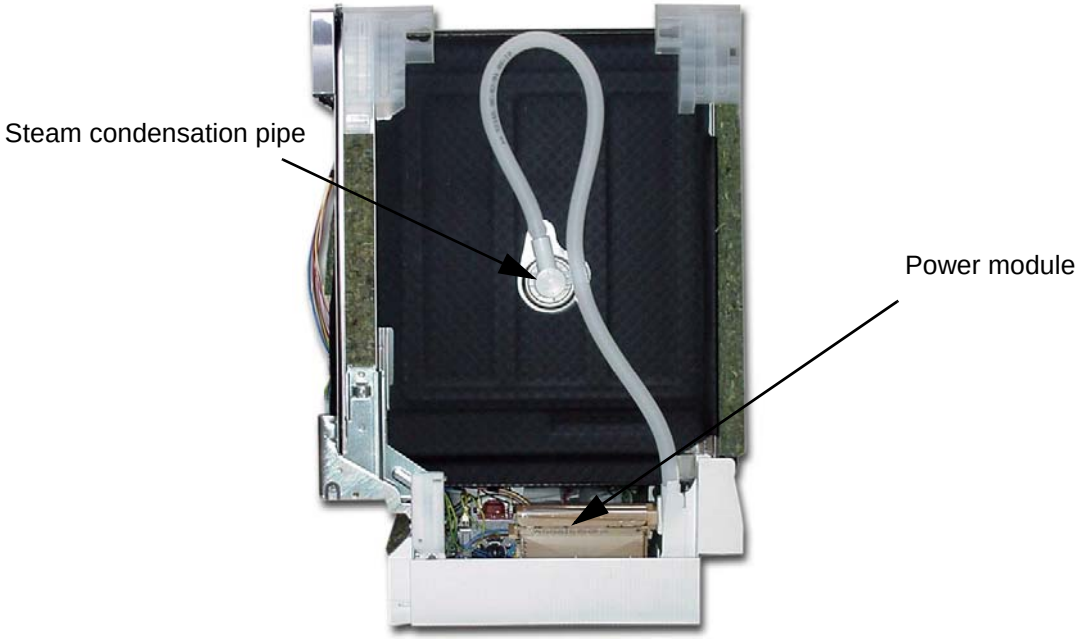
5.1 Door components



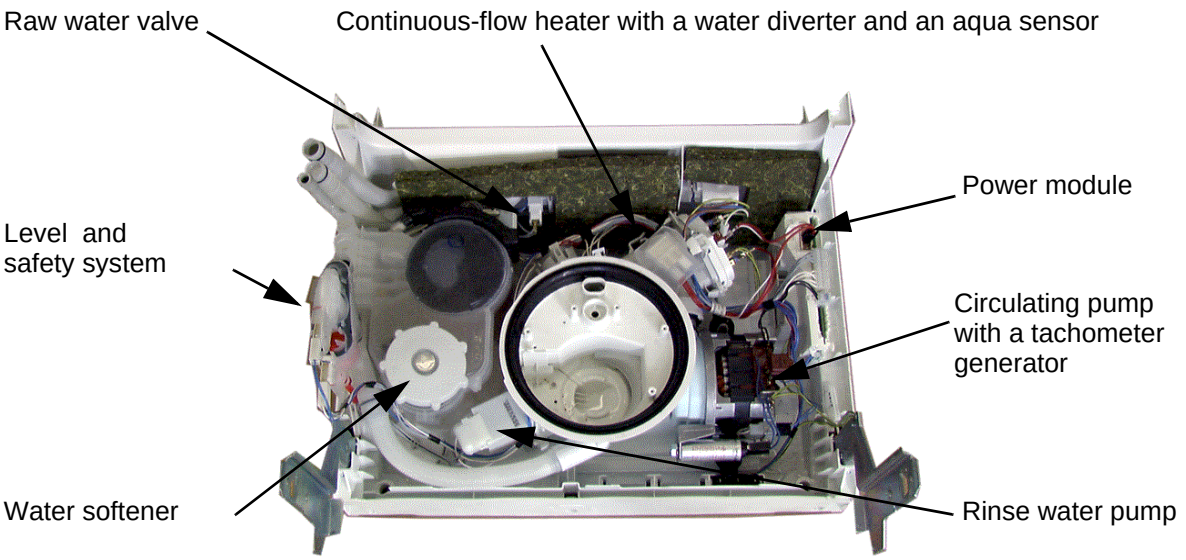
5.2 Left side wall components



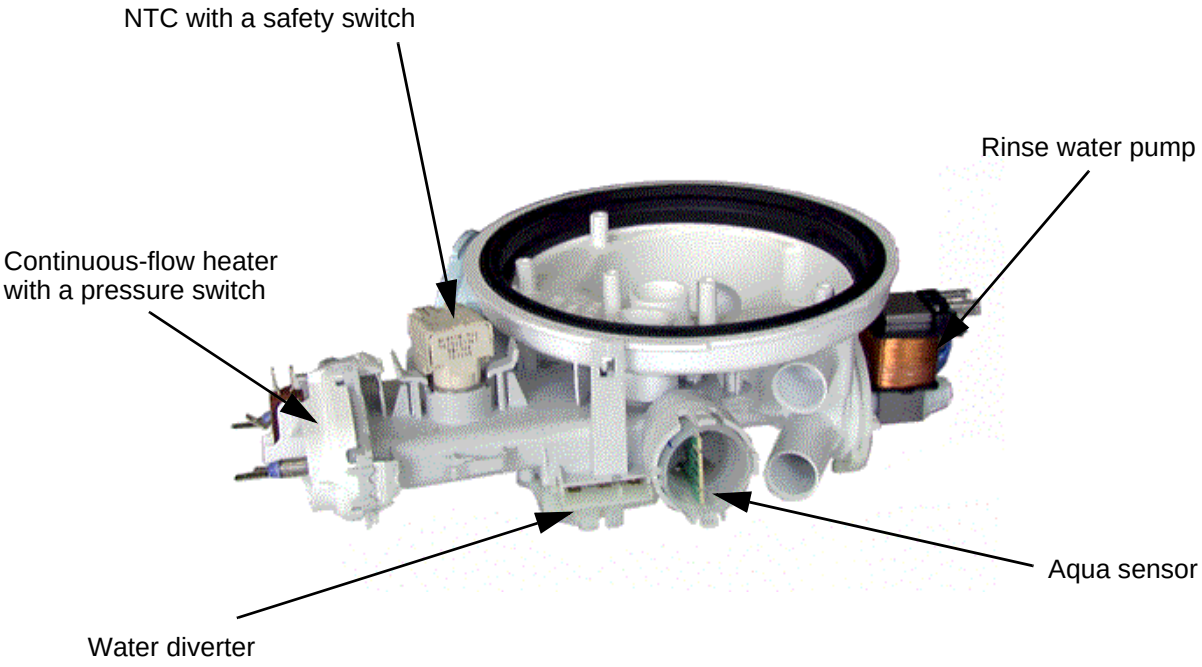
5.3 Right side wall components



5.4 Components in the plinth



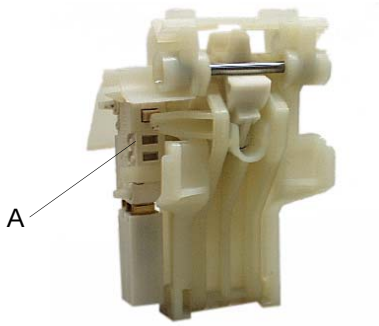
5.5 Pump cavity components



5.6 Door lock (servo lock)

The new “servo lock” in all of the fully-automatic dishwashers is extremely easy to handle due to smooth-running bearings. The door of the appliance does not need to be pressed on closing; instead it virtually closes by itself (from an opening angle of approx. 10°, depending on how the door springs are adjusted).

A Door switch

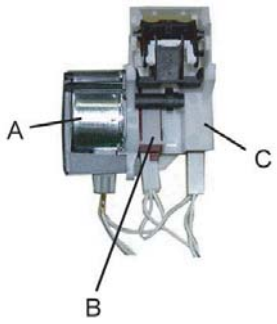


5.7 Door lock (motor lock)

The door of the dishwasher is motor-locked during the rinsing process; opening the door will hence require a great deal of force.

A Motor
B Door switch
C Position switch

Opening force:
- locked > 80 N
- open < 40 N

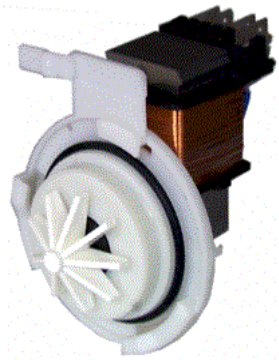


5.8 Rinse water pump

Apart from during the start-up of a program, the pump is operated on pump for 3 x 5 sec. / 5 sec. circulation.

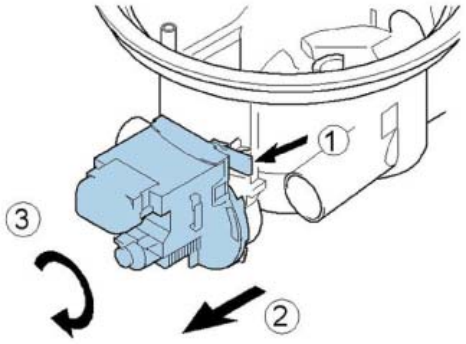
Alternating pumping results in an improved pumping out procedure and the micro-sieve is cleaned better.

Remove the base panel and the base sheet. The detergent water pump is engaged in the pump cavity at the front left. In order to remove the pump the lever (1) must be disengaged. The pump must then be turned towards the front (2). After approximately a quarter of a turn it will be possible to pull the pump off (3).



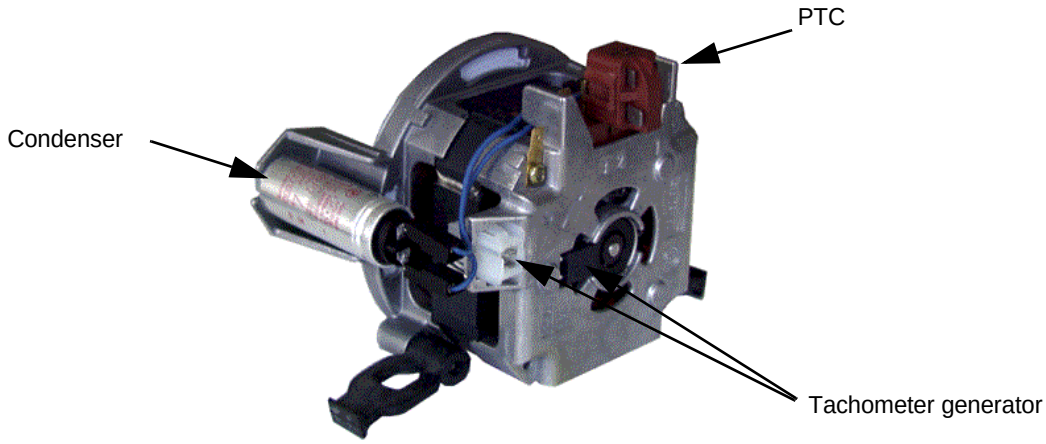
Technical data

Nominal voltage	230 - 240 V
Frequency	50 Hz
Resistance	110 - 260 Ω
Delivery height	0.9 m
Delivery performance	10 l/min



5.9 Circulation pump (SICASYM)

Single-phase alternating current motor

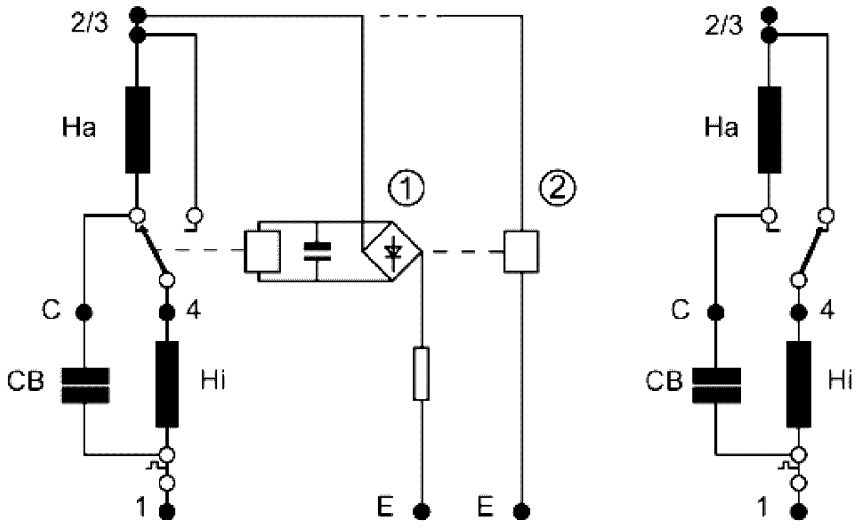


The circulation pump is operated by means of a single-phase alternator with a tachometer generator.

The tachometer generator registers the number of revolutions of the circulation pump and passes this information on to the electronics system. The number of revolutions is regulated by means of a phase-control device generated in the electronics system. Thus the regulation of the circulation pump influences:

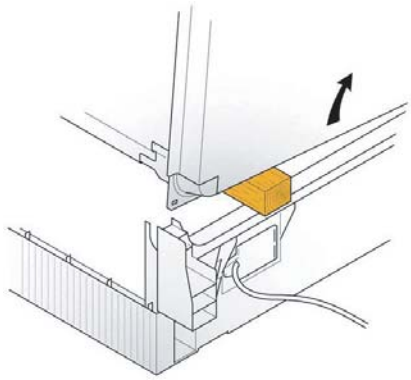
1. filling up to a consistent number of revolutions / (load recognition);
2. reduction of the number of revolutions for delicate cycles;
3. reduction of the number of revolutions for alternating rinses (switching from top basket rinses to bottom basket rinses);
4. the varying number of revolutions for bottom basket and top basket (2200/2800 rev/min).

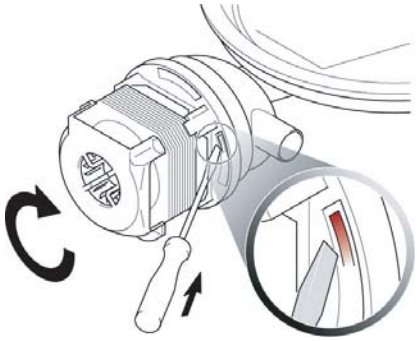
The control element between the two motor windings and the motor capacitor is either triggered by means of electronics or a relay on the motor connection ① or by means of module ②. During the start-up phase the two windings (in series with the capacitor) are parallel to one another direct on the power supply and generate an extremely powerful starting force. After switch-over the two windings will be in series (behind one another), i.e. the two windings are each supplied with half of the power supply. The motor will then be optimally adjusted to the pump (in operation) and, besides requiring very little power - for label AAA – it will also make very little noise, since both windings are supplied with half of the power supply in operation.



Disassembly

1. Remove the side panels and the base sheet.
2. Remove the two screws (at the front and the rear) connecting the stainless steel shell and the plastic base pan on the right-hand side.
3. Lift up the shell and secure it with an object which is approx. 4 cm thick.
4. The circulation pump is engaged in the pump case. Use a screwdriver to press the catch on the right-hand side of the circulation pump to the inside and turn the pump clockwise. You will then be able to remove the pump.





Assembly is carried out in reverse order. The gasket must be lubricated with detergent prior to installation.

Technical data

Nominal voltage	230 - 240 V
Frequency	50 Hz
Resistance	Ha approx. 44-57 Ω Hi approx. 50 - -55 Ω
Delivery height	3.9 - 4.1 m
Delivery performance	25 - 30 l/min
Starting current	2.4 A
Operating current	0.31 A

5.9.1 Circulation pump (SIBRUSYM)

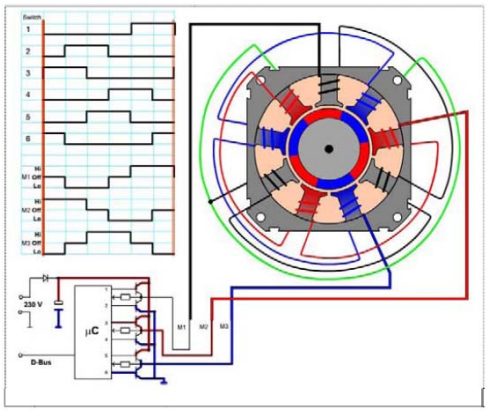
The circulation pump is driven with a brushless dc motor (BLDC). The individual coils of the stator winding (6) are combined in three branches and are star-connected.

The rotor (5) has permanent magnets and operates in the pumping medium with water-lubricated slide bearings (4) without any rotary seal.

1 Pump housing
2 Pump wheel
3 Panel mount
4 Slide bearing
5 Rotor with a permanent magnet
6 Housing with stator winding

The motor does not have any thermal winding protection since the motor electronics unit detects faults and overloading automatically and switches the motor off.

Direct electric current measurement not possible, since the current is distorted (pulsating direct currents)

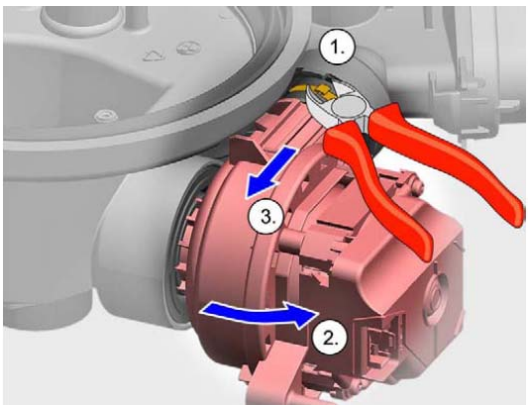


5.9.2 Disassembly

1. Remove the side panels and the base sheet.
2. Remove the screws connecting the stainless steel shell and the plastic base (2 screws at the front and 2 at the back).
3. Lie the appliance down on the rear wall.
4. Detach the load cables from the door hinges.
5. Bend the base pan downwards.

The circulation pump motor can only be replaced in one unit with the pump housing.

6. Remove the hose clamp at the connection between the pump housing and the continuous flow heater (1).
7. Remove the circulation pump and the pump housing from the pump cavity (2).
8. Remove the circulation pump and the pump housing from the continuous flow heater (3).



Technical data

Nominal voltage for electronics		230 - 240 V
Frequency for the electronic unit		50 Hz
Resistance across 2 cables, cold		65 - 75 Ω
Delivery pressure		370 mbar
Flow rate	(2900 rev./min.) (2950 rev./min.)	32 l/min. 38 l/min.
Starting current		not measurable
Operating current		not measurable

5.10 Tachometer generator

The number of revolutions and the variations in the number of revolutions of the circulation pump are gauged by means of a tachometer generator. The speed is controlled by means of an electronic phase control.

- Fill until a constant number of revolutions has been achieved
- Reduction in the number of revolutions in the gentle-wash cycles
- Reduction in the number of revolutions in the case of alternating rinsing (switching from top basket rinsing to bottom basket rinsing)
- Differing number of revolutions for the bottom basket and for the top basket (2800 / 2200 rpm)

Moistening with water, hollows or grooves in the dishes or containers which have turned over may result in losses of rinsing water. In this case air is transported through the pump. This will result in noisier operation of the dishwasher and in a changed (irregular) operation of the pump.

The tachometer generator will only recognise irregular operation on filling and will reduce the number of revolutions of the pump. In order for the pump to operate “smoothly” again, water is filled in until the optimal water level has been reached.

5.11 Recognising / filling up to concentric running

In the filling positions, water is filled in until the tachometer generator signals that the circulation pump is running concentrically.

On first filling, between 2,8 l and 3,7 l are filled in and 3 enquiries concerning concentrical running are made:

- a maximum of 200 ml is filled up for the first request;
- another maximum 200 ml is filled up for the second request;
- a maximum of 500 ml is filled up for the third request.

A maximum of up to 900 ml can be filled up during the first filling stage. During an intermediate rinse and a clear rinse, a maximum of another 500 ml respectively can be filled up.

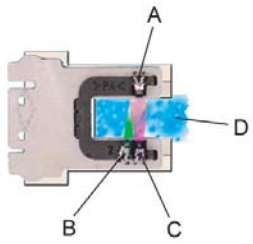
This means that:

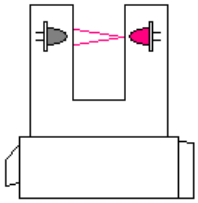
- a fill-up with too little water, due to containers / pots which have turned over, is avoided;
- the noise level of the circulation pump is reduced.

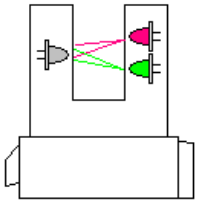
5.12 Aqua sensor I and II

In addition to an infra-red LED, the aqua sensor II is also equipped with a green LED, which means that undissolved substances such as tea or spinach can also be recognised. In the automatic program, for example, the aqua sensor II has the following functions:

1. Aqua-sensor infra-red LED check in the pre-wash cycle
   Depending on the result of this check, the water is either exchanged (extremely dirty) or still used (hardly dirty).
2. Aqua-sensor green LED check in the washing cycle:
   Depending on the result of this check, a final temperature of 45°C (little soiling) or 50°C or 55°C (heavy soiling) is reached during the washing cycle. Should the aqua sensor decide on a change of water during the pre-rinse cycle, the temperature for the washing cycle will be raised from 50° C to 55°C. Should the washing cycle be carried out at 50°C or 55°C, the filter will be rinsed through afterwards.
3. Aqua sensor green LED check in the first intermediate rinse
   Depending on the result of this check, an additional intermediate rinse will be carried out after the first intermediate rinse (heavy soiling) or only the filter will be rinsed through.



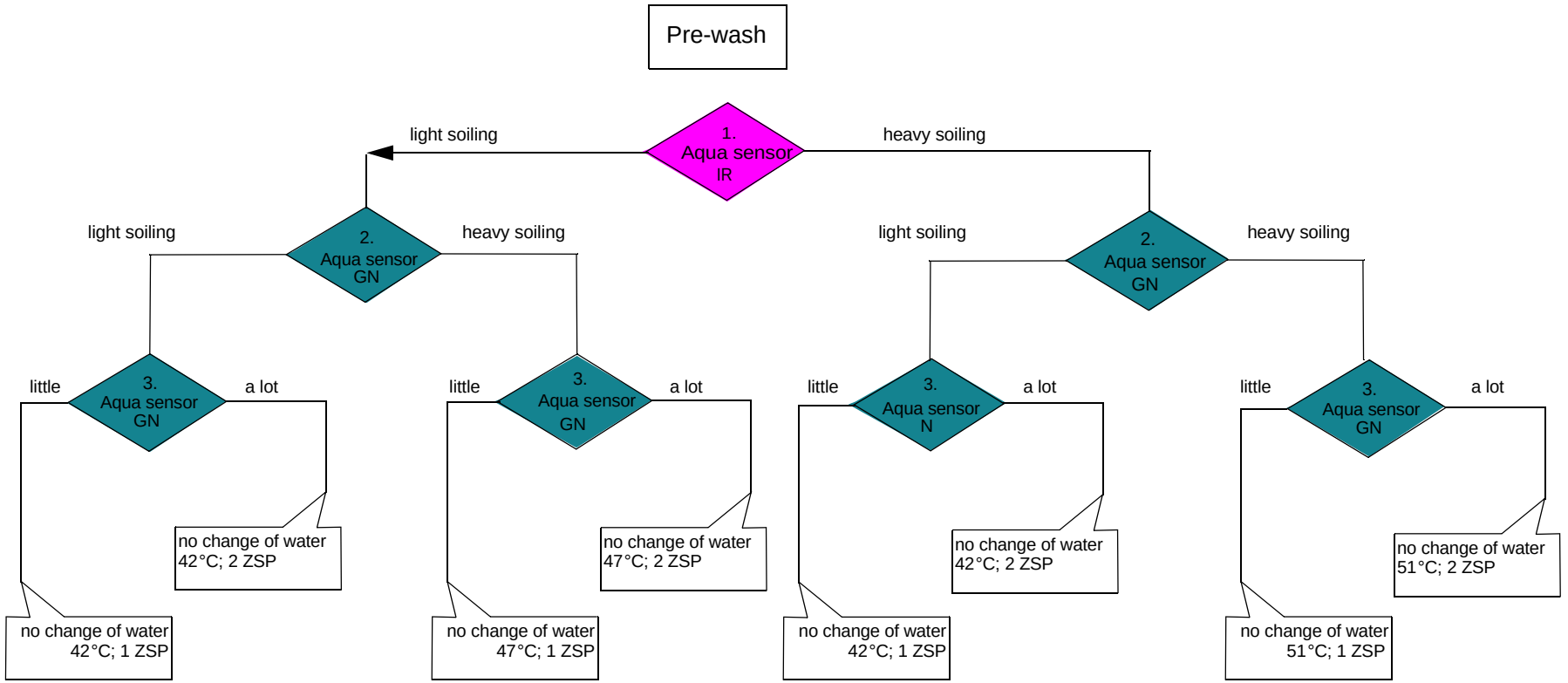




Calibrating the aqua sensor II

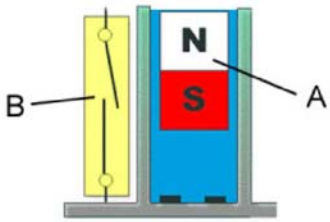
An additional 400 ml of water is required for the calibration procedure in the first three rinsing cycles. This step is repeated after 20 rinses.

5.13 Aqua sensor – decisions in the automatic program



ZSP = Intermediate rinse

5.14 Salt and clear rinse agent display

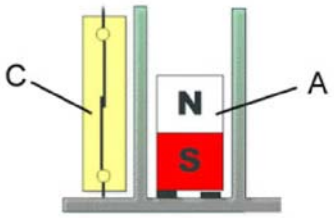


The reservoir is equipped with a float which has an integrated permanent magnet. This uses the magnetic field to activate a reed switch which is attached to the outside of the reservoir. This switch in turn activates the lamps of the fill-up displays in the control panel.

A = Permanent magnet

B = Reed switch open

C = Reed switch closed



5.15 Visual clear rinse fill-up sensor

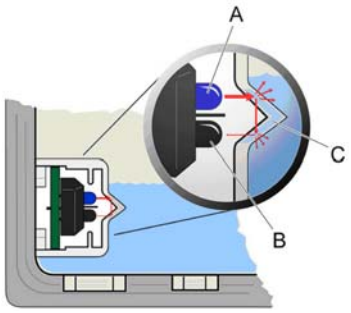
The visual clear rinse fill-up sensor comprises a transmission and a receiving diode.

The transmission diode sends a light beam to the receiving diode via a prism. If the reservoir is filled up, the light beam will be dispersed in the prism. The receiver signal will therefore be weaker than the sender signal.

A = Transmission diode

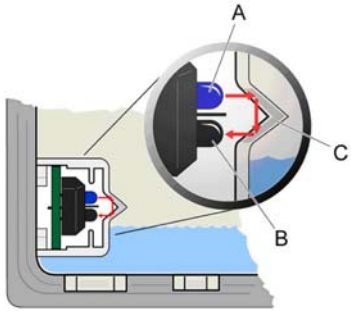
B = Receiver diode

C = Prism

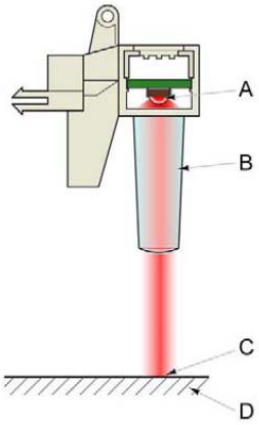


If the reservoir is empty the light beam will be reflected in the prism. The receiver signal is the same as the sender signal.

The module will evaluate the signal received and will activate the fill-up LED.



5.16 Info light (optional)



The fully-integratable models are fitted with a program status display (info light) which is visible from the outside and provides users with additional information.

The info light comprises an LED (A) and a fibre optic cable (B). The fibre optic cable focuses the light which is projected as a spot of red light (C) on the background (D) in front of the dishwasher while the program is in operation.

The info light is fastened on the hinge plate between the inner door and the outer door and is regulated by the module.

6. Functions

6.1 Safety function

Should functional defects in the dishwasher control system or in the structural elements occur, resulting in an over-filling of the machine, the valve combination will be closed by means of the safety system, thus blocking off the water supply. The discharge pump is switched on by means of the safety level switch. Pumping will continue until the filling level has once again been reached. Any leaks occurring within the machine are collected in the base pan. Leaks in the supply hose are guided to the base pan by means of the leakage water hose.

Once a set level in the base pan has been reached, the float activates the safety level switch by means of a switch lever, which then switches off the filling and safety valve electrically. At the same time the discharge pump is switched on, the rinse water is removed from the rinsing container, and the discharge pump switches onto continuous operation.

6.2 3 in 1 detergent recognition

Drying results will not be as good when a combined detergent (e.g. 3 in 1 detergent) is used. In order to improve the drying results, a special program sequence which uses less water in the intermediate rinse cycles is activated. The clear rinse temperature is also raised by 3K (the same temperature as for power drying). With the water which is saved the heat exchanger is filled up a second time in the drying cycle to enhance the drying results.

The special program cycle is activated if:

- the electronic system detects that the level of clear rinse agent is too low
- the clear rinse fill-up display is deactivated.

The additional “Intensive drying” function can still be activated if wished; it will however have no effect on the clear rinse temperature. The maximum temperature rise is 3K.

6.2.1 Application area

3 in 1 detergents may be used up to a water hardness level of 21 °dH (37 °fH, 26 °Clarke, 3.7 mmol/l). The water softening system does not need to be activated up to 21 °dH.

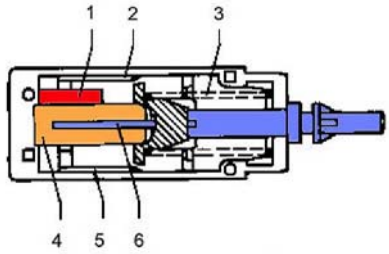
If water hardness is above 21 °dH, the water softening system must be activated and the hardness range set to 6.

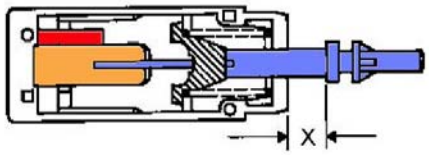
6.3 Actuator

The thermohydraulic system comprises a metal cylinder with a push rod. The cylinder is filled with a substance which greatly expands when heated. A PTC serves as a source of heat (Postive Temperature Coefficient), and this makes direct contact with the metal cylinder. Subsequent to switch-off of the heat source, a strong compression spring returns the push rod back to its original position.

Construction

1 PTC
2 Contact
3 Compression spring
4 Alternating cylinder
5 Contact
6 Rod





Rod drive

After voltage has been applied to the PTC, it heats up and transmits the heat to the metal cylinder which is filled with wax. The wax expands and presses the push rod out of the cylinder to the outside. The push rod transmits the mechanical movement to the release mechanism of the detergent and clear rinse agent dispensers. If the source of heat is switched off the volume of wax will be reduced on cooling down. The compression spring returns the push rod back to its original position.
The release period is approx. 2 min.; the resetting time is approx. 3 min.

Technical data

Nominal voltage	110-240 V
Frequency	50/60 Hz
Resistance	0.5 - 1.5 kΩ

6.4 Water points

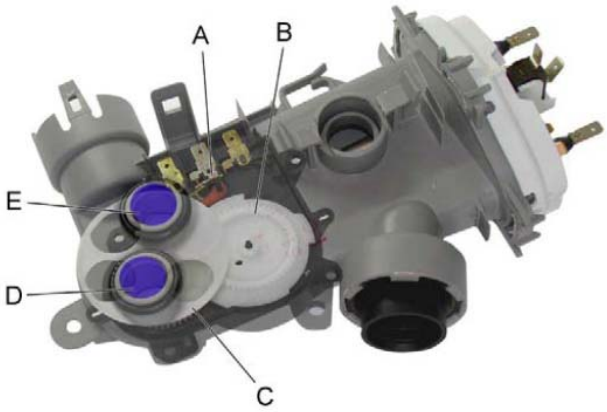
The water points are responsible for alternate rinsing and for different rinsing pressures.

They consist of a synchronous motor with gears, cam disc (B), microswitch (A) and locking disc (C).

The synchronous motor is activated with a triac. The controller receives information on the position of the locking disc (C) from the microswitch (A) which is actuated by the cam disc (B).

The synchronous motor drives the transmission and hence also the cam disk and the slide.

The locking disc has three openings and locks the relevant water channel to the spray arms. Water pressures vary depending on the position of the locking disc.



Alternate rinsing | Two-in-one | Change between two-in-one or top basket throttled

INFO! ***The water points are integrated in the continuous flow heater and can only be replaced as a full unit with the continuous flow heater.***

Type of rinse		**Water pressure**
Alternating rinse	Top basket or bottom basket	high
Two-in-one	Top basket and bottom basket	medium
Top basket	Throttled / two-in-one	low

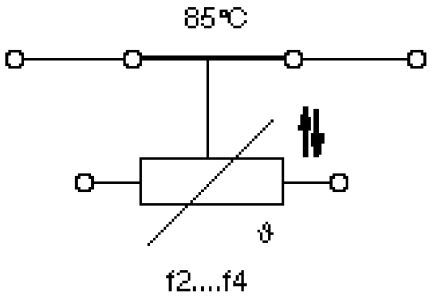
Technical data

Designation	**Setting**	**Unit**
Nominal voltage (synchronous motor)	230 - 240	V
Frequency	50 / 60	Hz
Resistance	approx. 9.3	kΩ

6.4.1 Temperature safety system (NTC)

The temperature cut-out switch (>85°C) is combined with the NTC sensor. In the event of a fault the heater will be switched off when the water temperature reaches 85°C.

Temperature °C	Resistance in kΩ	Tolerance +/- °C
25	48.4	7.9
30	38.5	7.1
50	16.5	6.2
60	11.0	5.6
65	9.1	5.5

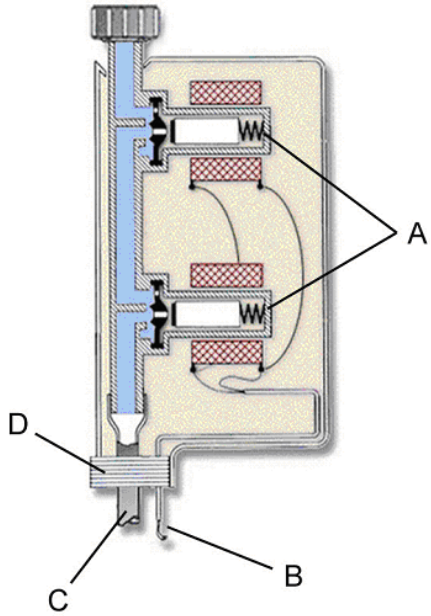


6.5 Aqua Stop System

The valve system comprises two series-connected, parallel-activated electrical solenoid valves, the filling valve and the safety valve. The safety function can be released with the safety level chamber or electrically by means of the float in the base pan. The flow of water is then stopped mechanically. An electric solenoid valve which is enclosed in a casing is attached to the water tap. From the valve the water supply hose is lead to the integrated water intake device and the electric trip line for the solenoid valve is lead to the base pan through a leak water hose attached to the valve casing in the power room.

Technical Data:

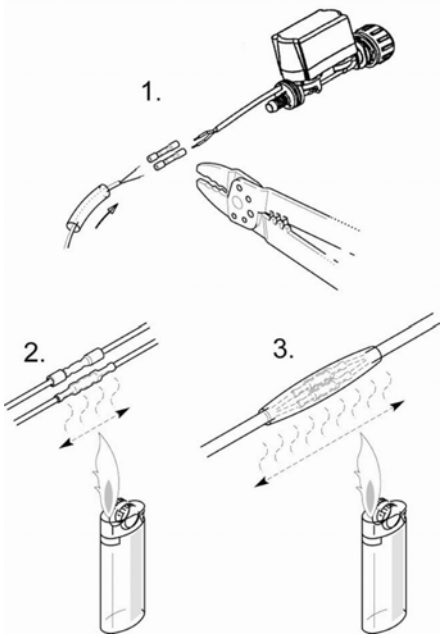
Nominal voltage	230-240 V
Frequency	50 Hz
Resistance	2 kΩ
Flow rate	2.75 l/min
Water pressure	0.5 - 10 bar



A = Solenoid valves
B = Trip line
C = Supply hose
D = Leaking water hose

Disassembly

1. Open the casing.
   Remove the supply hose and cut through the electric cables.
   Strip the ends of the wire.
   Insert shrinkdown plastic tubing over the lead and connect the electric cables with the insulating bushing (1).
2. After mounting heat up the connectors until the shrinking process has commenced and the hot-melt adhesive squeezes out of the ends of the connectors (2).
3. Push the shrinkdown plastic tubing over the connectors and warm it up too until the shrinking procedure has been completed (3).

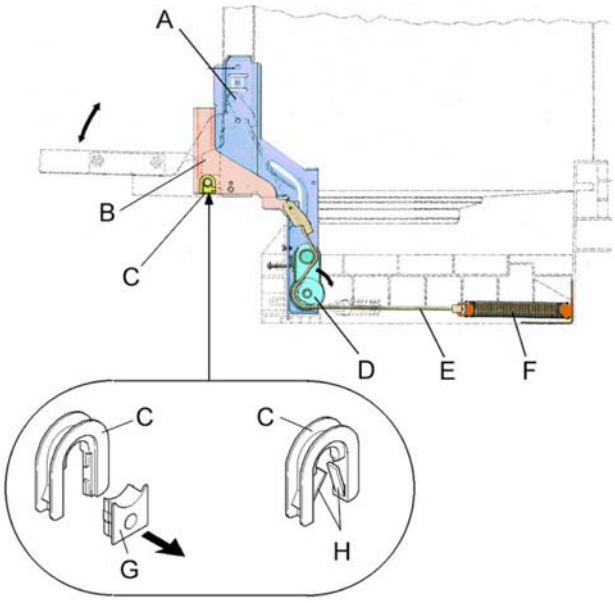


6.6 Door

6.6.1 Hinge

1. Unscrew the outer door, the base, the angle plate, and the side walls.
2. Detach the traction rope from the hinge lever.
3. Unscrew the hinge lever from the inner door.
4. Unscrew the hinge plate from the cavity frame.
5. Unscrew the fixing screw from between the hinge and the base pan.
6. Lift the hinge plate clear of the frame; and pull the hinge upwards.
7. Remove the spring compressor.

A Hinge plate
B Hinge lever
C Bearing bush
D Spring compressor
E Traction rope
F Traction spring
G Retaining piece
H Supporting lobes



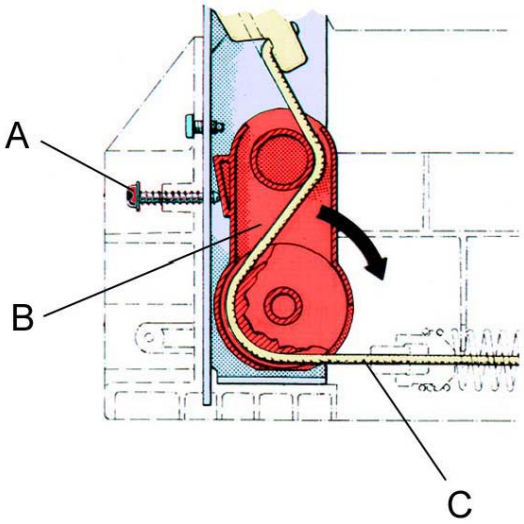
Two-piece hinge bearing bush
Open the bearing bush, disengage the retaining piece using screwdriver (see sketch).

One-piece hinge bearing bush
Open the bearing bush, bend out the supporting lobes using a screwdriver. The bearing bush also needs to be renewed after it has been removed.

6.6.2 Door spring

The weight of the front of the unit is balanced with the door springs. The door springs are located on the right and on the left side below the base pan. The traction force is transmitted to the door hinge with a cable drawn over a deflection pulley. With the adjusting screw supplied (for built-in appliances only) the traction force of the spring can be increased with the deflection pulley.

A Adjusting screw
B Spring clamp (deflection pulley)
C Traction rope

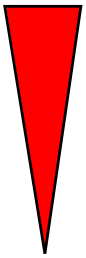


For very heavy unit doors (e.g. marble) the traction force of the springs which are installed as a standard and the maximum initial load of the spring clamp will not be sufficient.

In this case stronger door springs (see chart) can be used.

If the unit doors are extremely lightweight, the door springs may also be replaced with lighter ones.

Only pairs of door springs may be replaced!

Spring power	Colour dot	Spare-parts n.	Maximum unit door weight
max.  min.	grey	426 895	10.5 kg approx  1 kg
	green	426 490	
	black	427 073	
	brown	—	
	red	—	
	yellow	—	

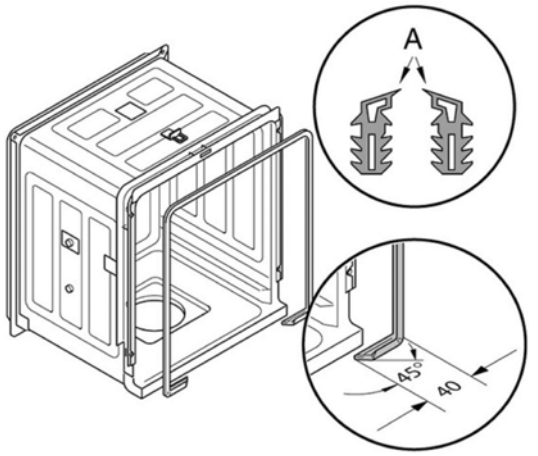
Note: The door springs are marked with a coloured dot on the rear.

6.6.3 Door seal

The new seal must be fitted before it is installed:

- The length of the seal must fit around the circumference of the cavity.
- Cut the ends of the seal at a 45° angle.
- Allow the seal to rest 40 mm on the base of the cavity (splashproof stop for the bottom corners).
- Press the seal in evenly without any kinks.

⚠ **Before installation, make sure that the sealing lip is in the correct position: it must point towards the centre of the dishwasher cavity otherwise there will be leaks around the door.**



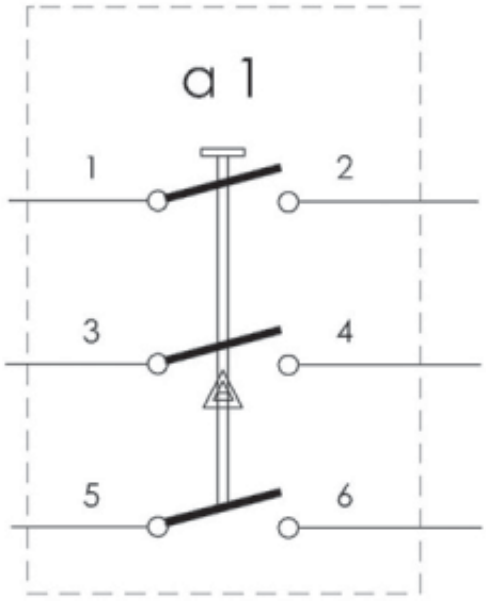
A = towards the centre of the dishwasher cavity

6.7 Main switch (IGV 699.0 and IGV 699.1)

The main switch comprises a dual-pole on / off switch and a wiping contact. The wiping contact 5 – 6 is activated briefly when the main switch is pressed. The wiping contact sets the controls in the start position at the end of a program.

The wiping contact also has the following functions:

- Reset function of the electronic system to the delivery status
- Access to the special programs



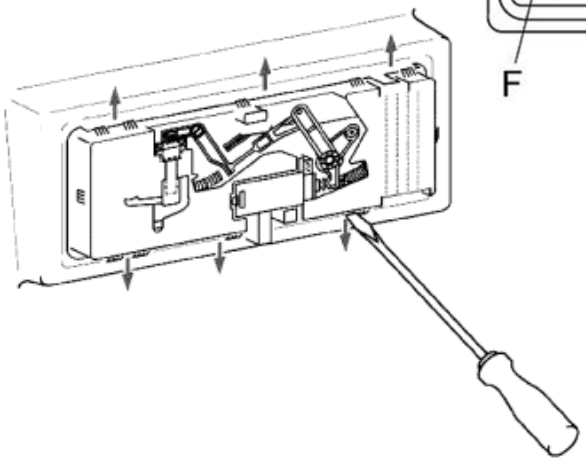
6.8 Dispensing device

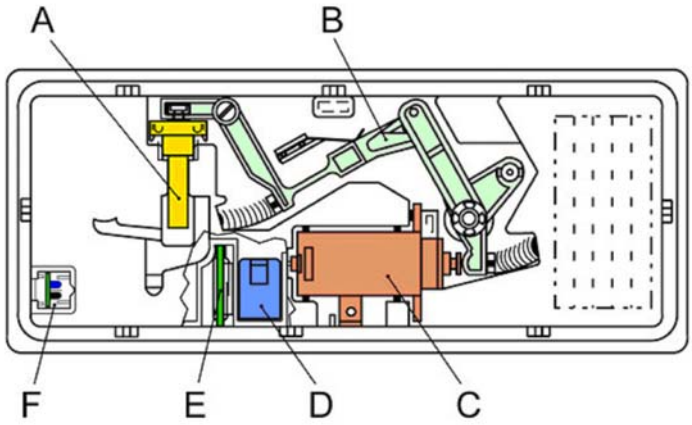
The triggering mechanism is controlled by an actuator. When first triggered, the cover of the detergent dispenser is opened, and at the same time the trigger catch snaps into the socket on the rinsing agent lever, enabling a dosing plunger for the rinsing agent to be raised next time the actuator is triggered.

Note!
To remove the dispenser, leave the upper basket in the appliance, close the door, then press the unlatched dispenser inwards.
Sharp edges! Use protective gloves.

Before installing the dispenser, align the holding flaps to the middle to ensure that all supporting cams snap in securely.

Before installing, lubricate the seal using cleaning agent.





A	Dosing plunger	D	Float magnet
B	Socket	E	Dry reed contact (optional)
C	Actuator	F	Optical sensor (optional)

Technical data

Rinsing agent fill quantity	120 ml
Setting 1-6	each 1 ml
Cleaning agent capacity max.	45 g

For further technical data, see the actuator.

Disassembly

1. Screw off the outer door.
2. Disconnect the electrical connections.
3. Use a screwdriver to lift the holding flaps that are stamped out of the inner door clear of the supporting cams.

6.9 Top addition

In the case of dispensing from the top, the detergent box can be swivelled out of the dispenser by pressing the button on the side. This makes it easier to refill.

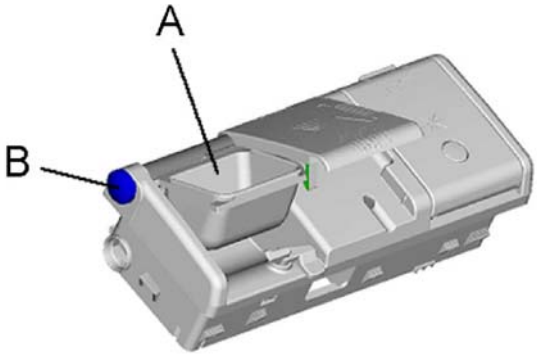
The release mechanism is activated by means of a coil which is activated by impulses from the electronic unit (detergent dispenser 20 sec. / rinse aid dispenser 14 sec. each). The first impulse opens the lid of the detergent dispenser, and at the same time the release latch engages in the switch dog of the rinse aid lever so that on re-activation of the coil the rinse aid plunger is lifted. The number of impulses for rinse aid will be adjusted depending on how the dispensing of rinse aid has been set in the electronic unit.

Rinse aid setting	Number of impulses
0	0
1	2
2	3
3	4
4	5
5	6
6	7

The rinse aid refill function is recognised with the help of a combination of IR-LED and photo transistor.

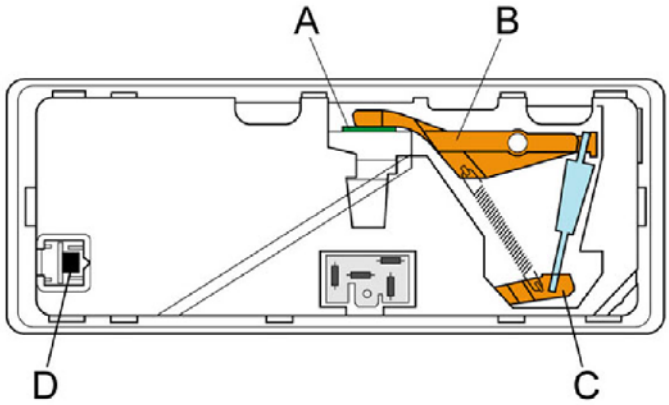
Technical data

Rinsing agent fill quantity	120 ml
Setting	0-6 1 ml each
Capacity	max. 45 g



A = Swinging dispenser
B = Rotation button

A	Dispensing plunger
B	Rocker
C	Switch dog
D	Sensor for rinse aid refill function



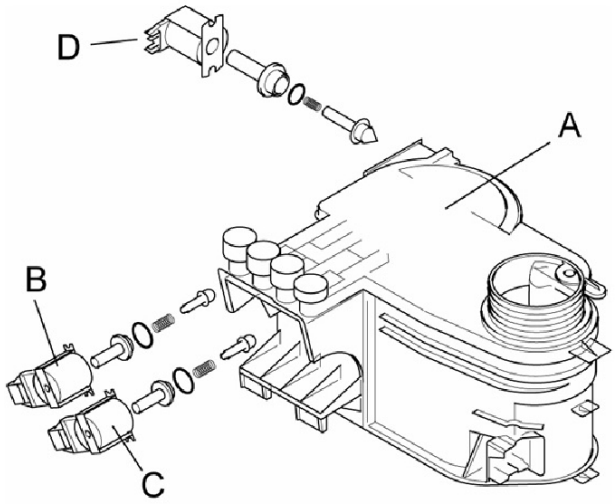
6.10 Regeneration, drain-off and raw water valves

The regeneration valve and the drain-off valve are located on the softening equipment. When the regeneration valve is activated the volume of water stored in the regeneration chamber is lead through the softening equipment. When the drain-off valve is activated the volume of water stored in the heat exchanger is lead through the softening equipment to the rinsing cavity.

Technical data

Nominal voltage	230-240 V
Frequency	50 Hz
Resistance	2.45 Ω

The raw water valve is located on the rear on the softening unit and is used for adding hard water.



A = Softening unit

B = Regeneration valve

C = Drain valve heat exchanger

D = Raw water valve

The raw water and the soft water valves are activated by the electronic unit which calculates how frequently and for how long the valve needs to be activated. This ensures a constant degree of water hardness of approx. 5° dH. For this reason it is vital to set the range of hardness precisely.

When the valve is activated (open) the raw water is lead through the softening equipment and is softened. If the valve is not activated (closed), the entry to the softening equipment is closed and the raw water flows direct from the water inlet to the heat exchanger.

Technical data

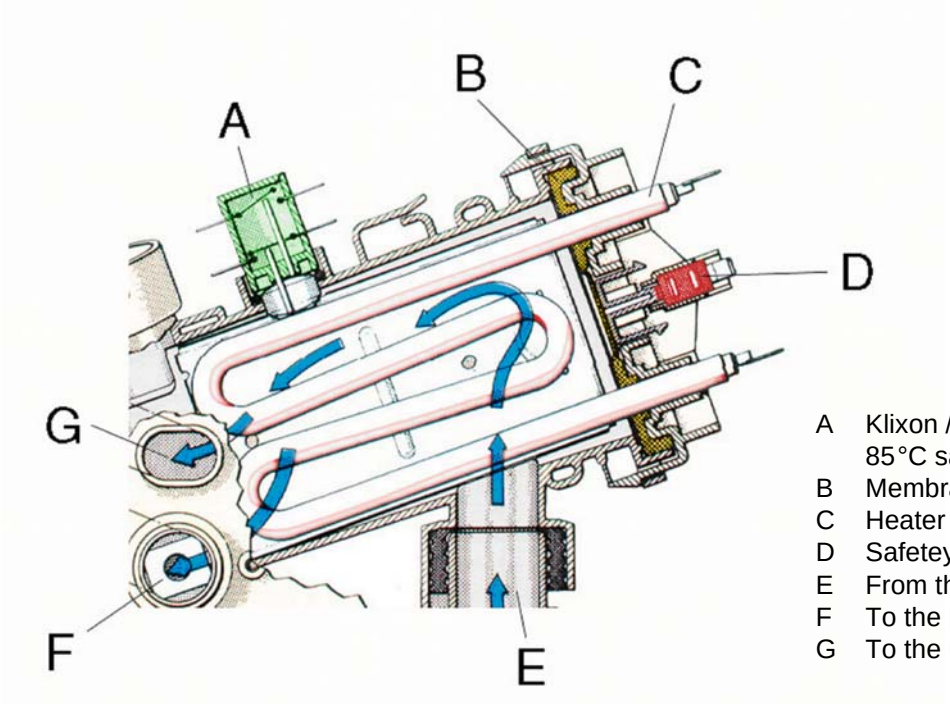
Nominal voltage	230-240 V
Frequency	50 Hz
Resistance	2.45 Ω

6.11 Continuous flow heater

The continuous flow heater is installed in the spray arms water circuit. When rinse water flows through, a rubber membrane located on a flange is activated that switches the heater's safety pressure switch. If the pressure falls, the heating is turned off. The heating position is overridden, thus avoiding the dry appliance being heated.

Disassembly

1. Unscrew the outer door, the base plate, the angle plate, and the side walls.
2. Detach the traction rope from the hinge levers.
3. Unscrew the screws between the base pan and the hinges.
4. Unscrew the rinse cavity on the back wall of the base pan.
5. Disconnect the door wiring harness at the plug connection in the base pan.
6. Lay the device on its rear side and carefully pull out the base pan. Release the lock from the level sensor case and the water softening unit.
7. Separate the circulation pump with the rubber bearing from the base pan.
8. Open the base pan enough for the continuous flow heater to be unscrewed from the pump cavity. Unscrew the continuous flow heater.
9. Release the lock on the pump cavity and lift the continuous flow pump away from the pump cavity/ circulation pump plug connections.

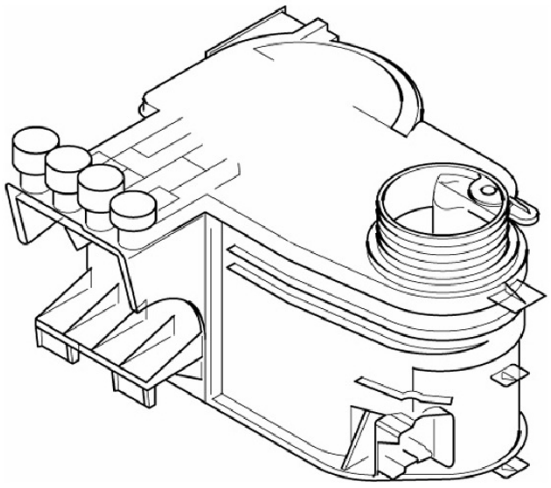


A Klixon / NTC ; 85 °C safety switch
B Membrane
C Heater
D Safetey pressure switch
E From the circulation pump
F To the lower spray arm
G To the upper spray arm

Technical data

Nominal voltage	230 - 240 V
Frequency	50 Hz
Power	2150 W
Resistance	approx. 22 Ω

6.12 Water softener



1. Screw off the outer door, the base cover, the L-strap and the side panels.
2. Detach the traction rope from the hinge levers.
3. Unscrew the screws between the base pan and the hinges.
4. Unscrew the rinse cavity on the back wall of the base pan.
5. Disconnect the door wiring harness at the plug connection in the base pan.
6. Remove the electrical connections from the regeneration and drain valves.
7. Screw off the fastening nut between the salt box and the rinsing vessel.
8. Suction the brine out of the reservoir with a suction syringe.
9. Lie the appliance down on the rear wall.
10. Carefully pull off the base pan and remove the catch from the level sensor casing and the softening unit.
11. Separate the circulation pump with the rubber bearing from the base pan.
12. Pull the base pan off further until the softening unit can be removed from the plug connections on the water supply and the level sensor casing.
13. Remove the Reed switch.

The following must be carried out before the softening unit is installed:

1. Put the seal onto the filler neck of the salt box.
2. Insert the sealing rings into the plug connections.
3. Put the rubber cap onto the bearing connection in the base pan for the pump cavity.
4. Insert the switch rod for activating the security level switch.
5. Put the rubber mounting onto the circulation pump.

Salt container - filling capacity

Fine-grained salt	approx. 2.0 kg
Coarse-grained salt	approx. 1.5 kg
Salt tablets	approx. 0.7 kg

6.13 Optosensor

A ray of light is sent through a glass coil at an angle by means of an IR LED. The ray of light is reflected on the surface of the glass about 200 times before it reaches the glass coil.

If there is no coating (haze / deposit) on the glass coil, the light is reflected almost 100% on the surface of the glass. The receiver signal is the same as the sender signal.

If a coating (haze / deposit) has built up on the glass coil, part of the light will be dispersed on the surface of the glass. The ray of light will be reduced at every reflection (approx. 200 reflections). The receiver signal will therefore be weaker than the sender signal. If a specific value is not reached, regeneration will be carried out.

The Optosensor® is flooded several times while the program is running and is emptied again. This means that deposits can build up on the glass coil; dirt is rinsed off.

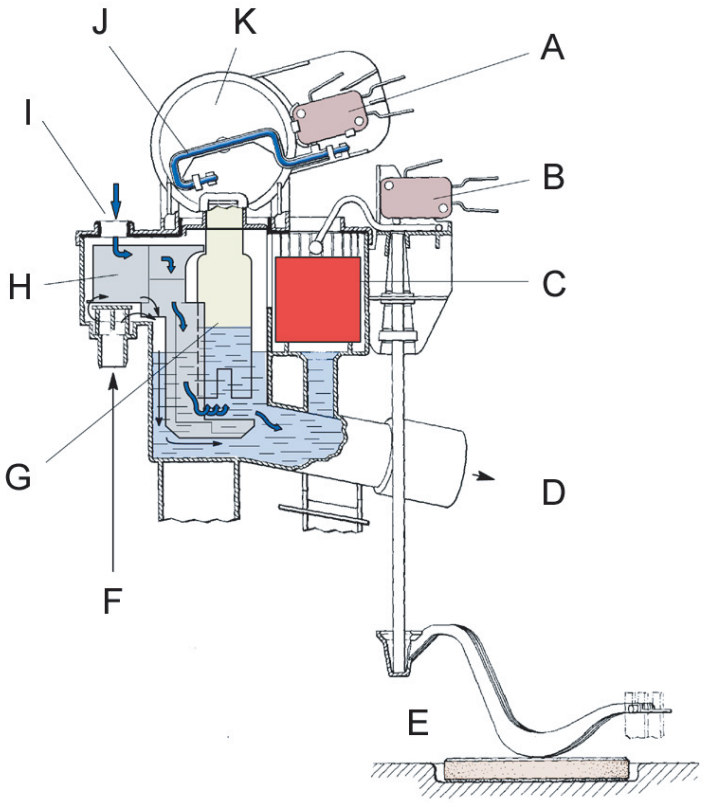
The valve is operated by means of a memory wire. If the connection contacts are supplied with power the memory wire and the PTC that are connected in series will warm up. The memory wire will contract and open up the valve by means of the rocker. Activation time is less than one second. The heating up of the PTC will increase resistance and the memory wire will expand again to its original length. The valve is closed by means of the rocker and the readjusting spring.

During the drying cycle the Optosensor® is empty. The interior of the Optosensor® is heated up by the PTC during this program phase (is permanently live). Deposits on the glass coil will therefore become visible sooner.

The coating on the glass coil cannot be recognised with the human eye. For this reason the coating is removed again in the rinsing cycle with softened water and dishwasher detergent (automatic rinse in the rinsing cycle).
The optosensor measuring is taken at the beginning of a program and during the drying process. Measuring is carried out every minute in the drying cycle.
From this series of measurements the setting with the strongest receiver signal is passed on to the module for evaluation.
When the optosensor or the evaluation module are replaced, the sensor with the special program “B” must be re-calibrated.

A = Activation module for the IR sender and the receiver
B = Glass coil
C = Valve
D = PTC
E = Memory wire
F = Readjusting spring

6.14 Equipotential system with a safety function



A	Level switch
B	Safety level switch
C	Float for safety level
D	To the pump cavity
E	Float in the base pan
F	From the discharge valve for dishwashers with heat exchanger
G	Air chamber
H	Throttle cup in appliances with heat exchanger
I	From overflow channel
J	Switch lever
K	Pressure socket

Should functional defects in the dishwasher control system or in the structural elements occur, resulting in an over-filling of the machine, the valve combination will be closed by means of the safety system, thus blocking off the water supply.
The discharge pump is switched on by means of the safety level switch. Pumping will continue until the filling level has once again been reached.

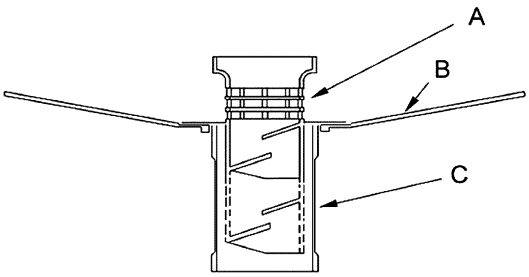
Any leaks occurring within the machine are collected in the base pan. Leaks in the supply hose are guided to the base pan by means of the leakage water hose.

Once a set level in the base pan has been reached, the float activates the safety level switch by means of a switch lever, which then switches off the filling and safety valve electrically.

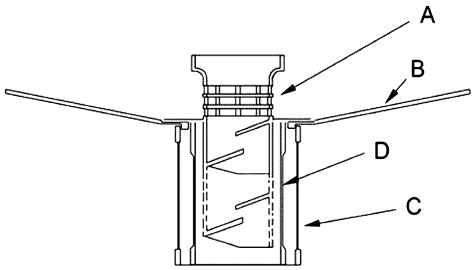
At the same time the discharge pump is switched on, the rinse water is removed from the rinsing container, and the discharge pump switches onto continuous operation.

6.15 Sieve system

To prevent dirt particles from getting into the rinsing circuit, the coarse sieve cylinder must be engaged tightly with the pump cavity (observe marking).



Threefold sieve system



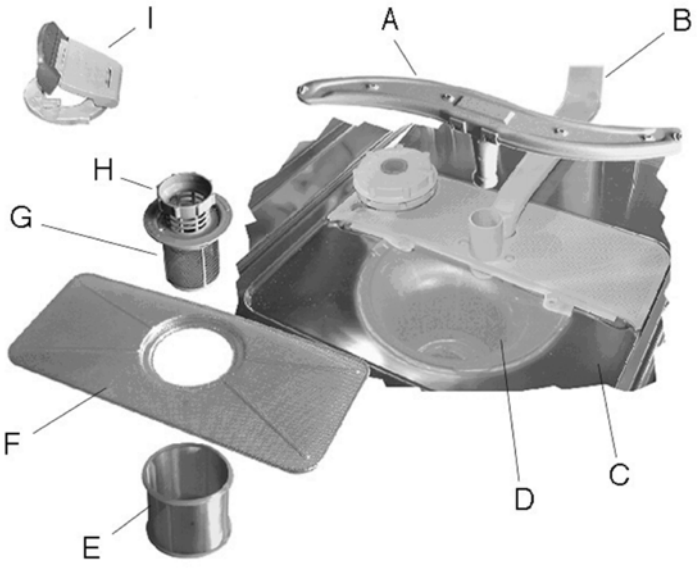
Fourfold sieve system

A Coarse sieve
B Flat sieve
C Micro-fine sieve cylinder
D Fine sieve cylinder

The sieve system comprises a threefold or fourfold sieve system (a course filter, fine sieve cylinder, a fine flat sieve, and a micro-fine sieve). The pump cavity, where the micro-fine sieve is located, is covered by the flat fine sieve. The flat fine sieve and the combined coarse and fine sieve cylinder are attached to the bottom of the pump cavity by means of a bayonet catch.

Sieve system m

A Lower spray arm
B Feed pipe to upper spray arm
C Rinse cavity
D Pump cavity
E Micro-fine sieve
G Fine sieve
H Coarse sieve
D Pump cavity
F Flat sieve
I Hinged lid (optional)

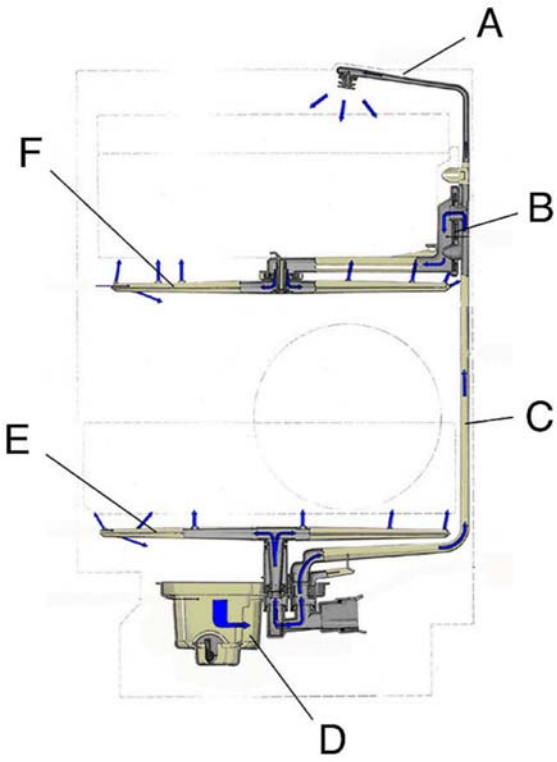


6.16 Rotary spray system

The rotary spray system consists of three spray levels, the lower and upper spray arm and a top spray .
The water supply to the upper spray arm and the top spray is brought through the inlet pipe attached to the inside of the container rear wall. This pipe is connected by a direct connection with the flow heater under the pump cavity at one of its two outlets.

The upper spray arm is directly fastened with its inlet pipe to the upper basket. The connection to the inlet pipe is through a variable coupling. The water entry is adapted to the spray arm using this variable coupling. The connection to the inlet pipe is through a variable coupling.

The lower spray arm with its bearing is connected directly through the pump cavity at the second outlet of the flow heater. The valve for the upper basket wash cycle is located in this outlet.

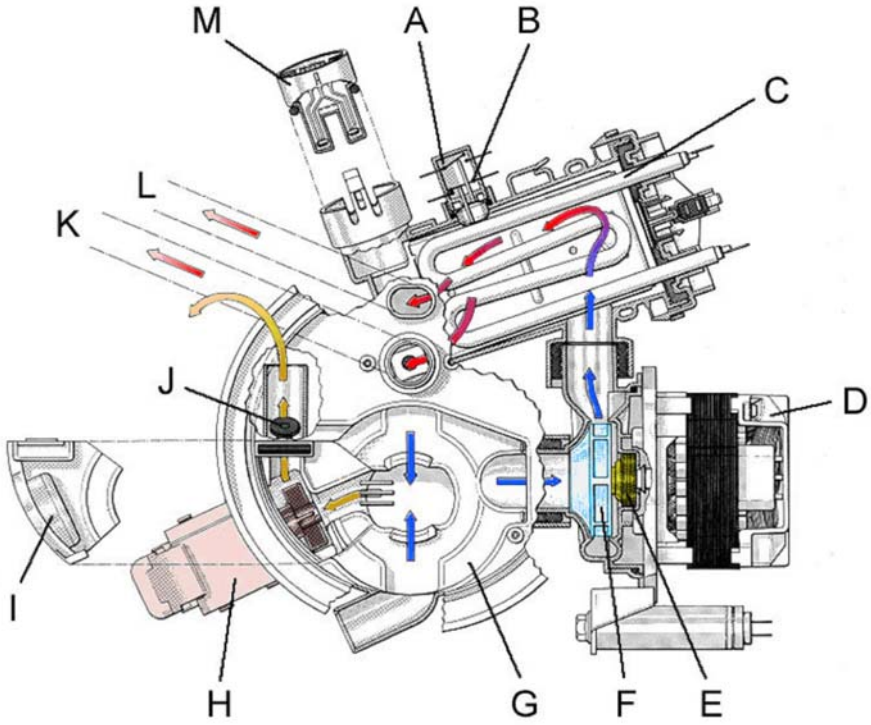


A	Top spray	D	Pump cavity
B	Coupling	E	Lower spray arm
C	Inlet pipe	F	Upper spray arm

6.17 Rinsing and pump system

The circulating pump and the discharge pump as well as the continuous flow heater are connected to the pump cavity by means of plug connections. The continuous flow heater is also screwed to the pump cavity in such a manner that no pressure can occur. The sieve system comprises a fourfold filter system (a course filter, fine sieve cylinder, a fine flat sieve and a micro-fine sieve). The pump cavity, where the micro-fine sieve is located, is covered by the flat fine sieve. The flat fine sieve and the combined coarse and fine sieve cylinder are attached to the bottom of the pump cavity by means of a bayonet catch. The rinse water which flows into the pump cavity is sucked up by the circulation pump and forced into the continuous flow heater.

If the pressure is sufficient, the push button for the heater is actuated by means of the flange membrane. A series-connected thermostat with a cut-off temperature of 85 ºC prevents overheating. For appliances with automatic controls, this temperature switch is combined with a 65 ºC thermostat and for appliances with electronic control it is combined into one component with an NTC sensor (negative temperature-coefficient. The surface of the sensing element makes direct contact with the rinse water. The aqua sensor is positioned at the exit of the continuous flow heater and has its sensor in the flow of the rinse water in order to determine how dirty the rinse water is. The direct fitting of the discharge pump onto the pump cavity means that the impeller and the non-return flap are accessible when the cover in the rinse cavity is removed.



A	NTC / Temperature control	H	Drain pump
B	Temperature control	I	Cover of the impeller (optional)
C	Continuous flow heater	J	Non-return flap
D	Circulation pump	K	To lower spray arm
E	Junction kit	L	To upper spray arm
F	Impeller	M	Aqua sensor (optional)
G	Pump cavity		

7. Fill system

7.1 Regeneration with heat exchanger

After the fill solenoid is opened, the water flows to the integrated inlet over the free flow line into the softener and then as softened water into the heat exchanger. After the regeneration chamber is filled the water flows through the overflow channel into the thredtle cup of the level sensor. The pressure build-up in the pressure socket causes the level switch to open the heat exchanger drain valve. The electronic determines the time between the open command of the fill solenoid and the closing of the level switch. From this time the additional fill time of the fill solenoid is calculated.

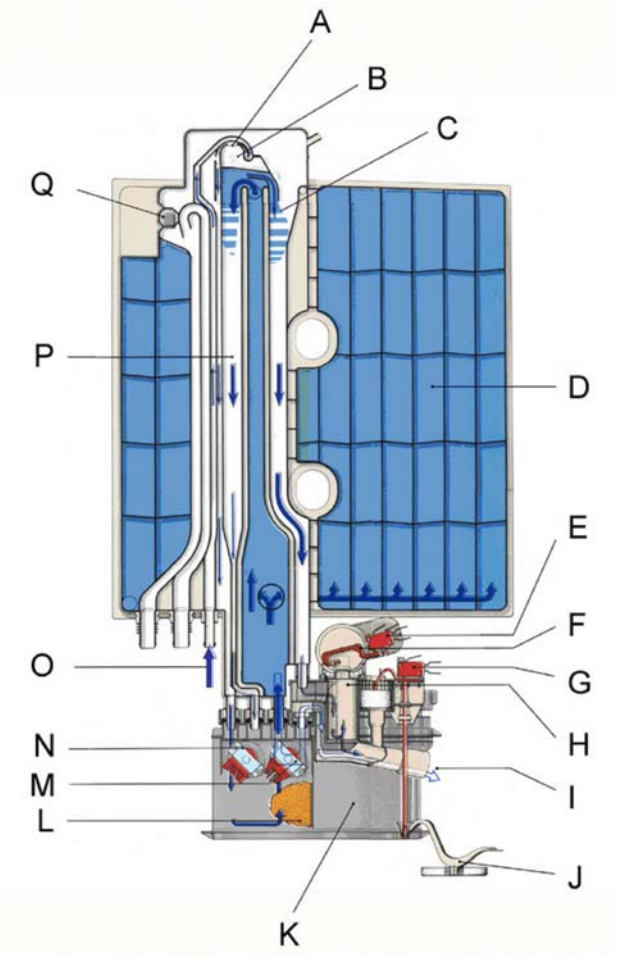
The recirculation pump is turned on time-delayed, the drain valve stays open until the heat exchanger is fully emptied.

The water quantities of the wash cycles which have already run are registered by the electronic system and determine the timing for regenerating of the softener.

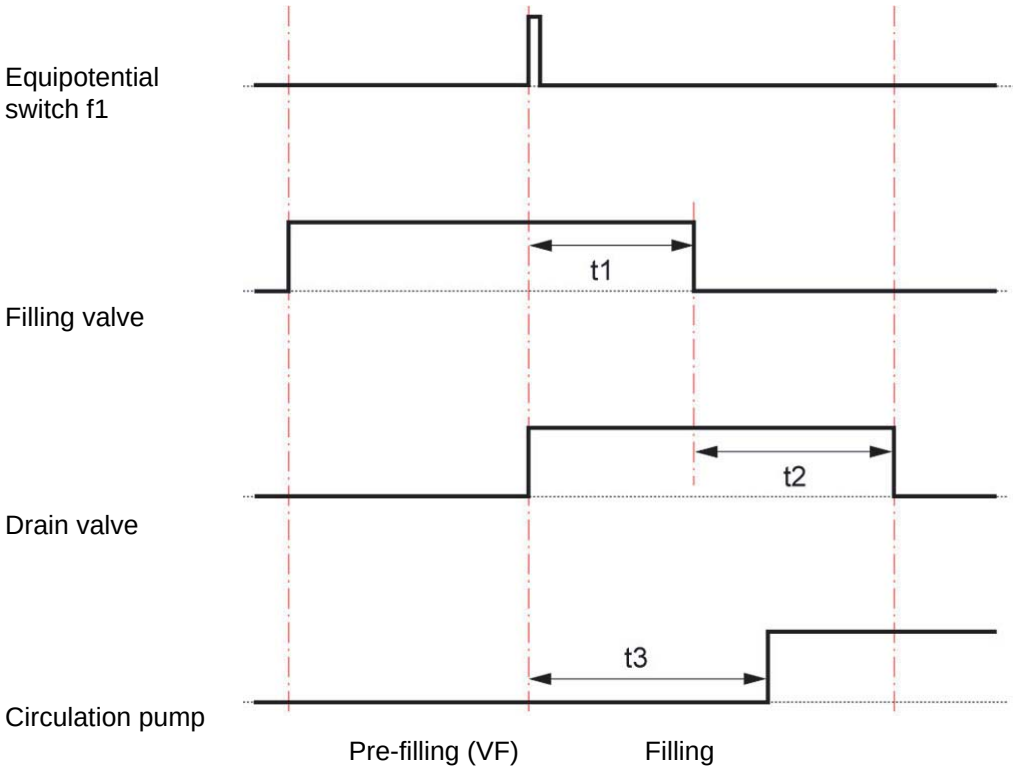
Before each regeneration step the electronic system checks whether the capacity of the softener is still sufficient for a complete normal program sequence. If not, regeneration is repeated.

Regeneration and rinsing through the water softener is carried out in the washing cycle. During regeneration the regenerating valve on the softener is opened. The reservoired quantity of water flows across the valve into the salt container, is enriched with salt, and flows as brine through the softener into the heat exchanger. This is done in three cycles, each with a determined quantity of water.

A	Free flow line
B	Leaking water
C	Overflow channel
D	Heat exchanger
E	Level pressure switch f1
F	Switch lever
G	Safety pressure switch
H	Level air chamber
I	To pump casing
J	Float in the base pan
K	Salt container
L	Ion exchanger
M	Drain valve heat exchanger
N	Regeneration valve
O	Water inlet
P	Regeneration chamber
Q	Discharge hose ventilation valve



The electronic system determines the time between the open command of the fill solenoid and the closing of the level switch (f1). From this time the additional fill time of the fill solenoid is calculated. For every initial fill-up in a rinsing program, 200 ml more water than the standard water volume will be filled in.



t1 = Refill time calculated

t2 = Drain-off valve stopping performance time

t3 = Circulation pump switch-on delay

On initial intake of water for the washing program, this volume of water is used to balance the water which is lost when the dry dishes are wet.

This ensures that the circulation pump runs concentrically and water is saved when the dishwasher is filled up again.

The recirculation pump is turned on time-delayed, the drain valve stays open until the heat exchanger is fully emptied.

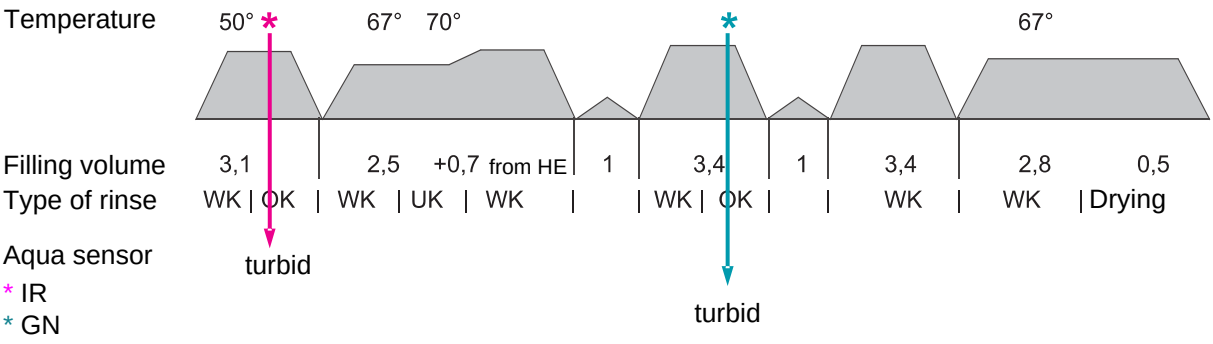
8. Program sequences

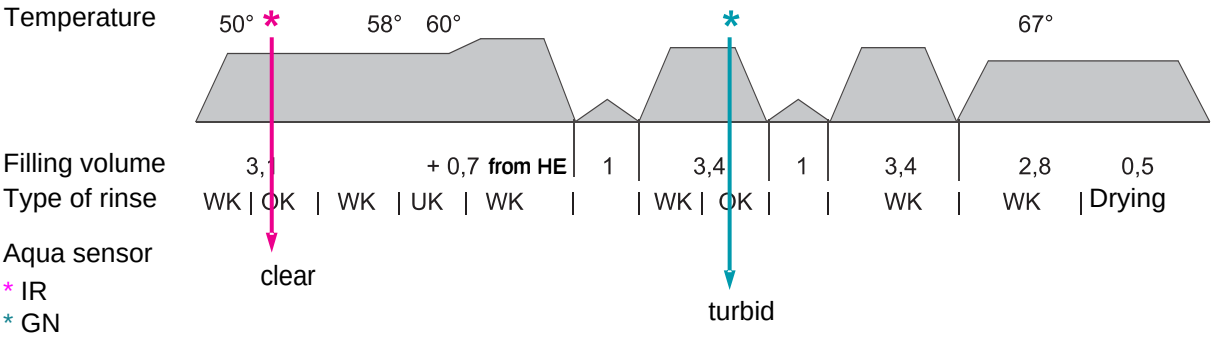
8.1 Program selection “Auto-plus rinse”

The program comprises a pre-rinse at 50°C, a washing cycle at 60°C / 70°C, an intermediate rinse, a clear rinse at 67°C and a drying cycle. Two aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 60°C to 70°C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

8.1.1 Program sequences in the auto-plus range, part 1

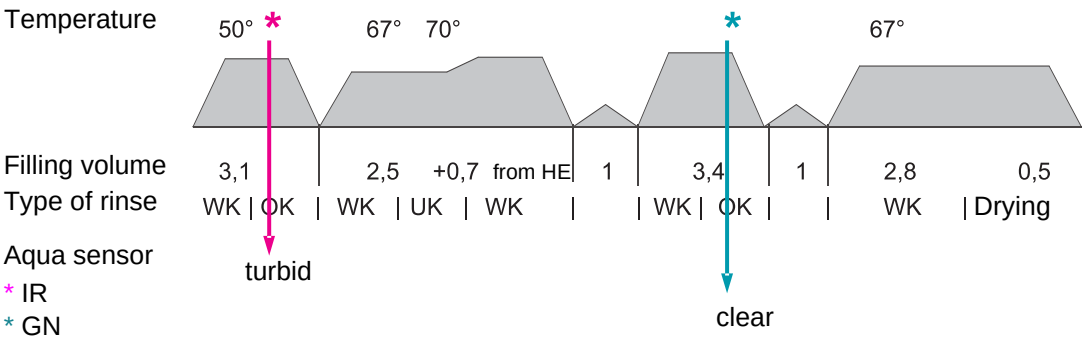


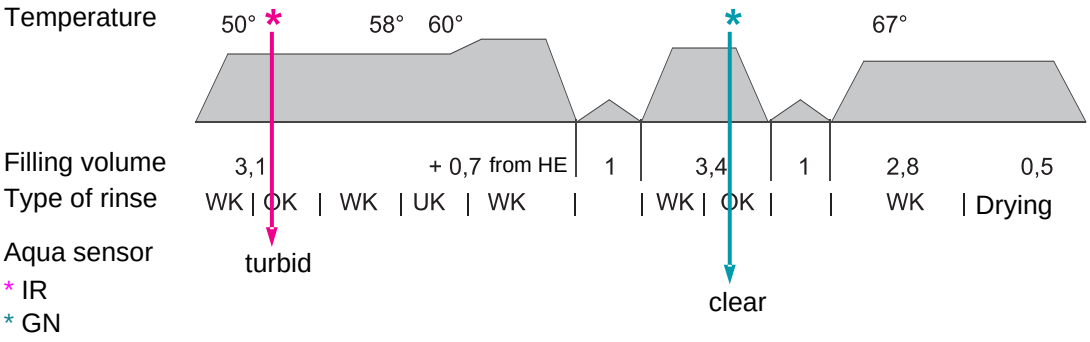


Energy: 1.20 kWh -> 1.40 kWh
Water: 14 – 20 litres
Time: 90 - 110 min.

WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

8.1.2 Program sequences in the auto-plus range, part 2





Energy:	1.20 kWh -> 1.40 kWh
Water:	14 – 20 litres
Time:	90 - 110 min.

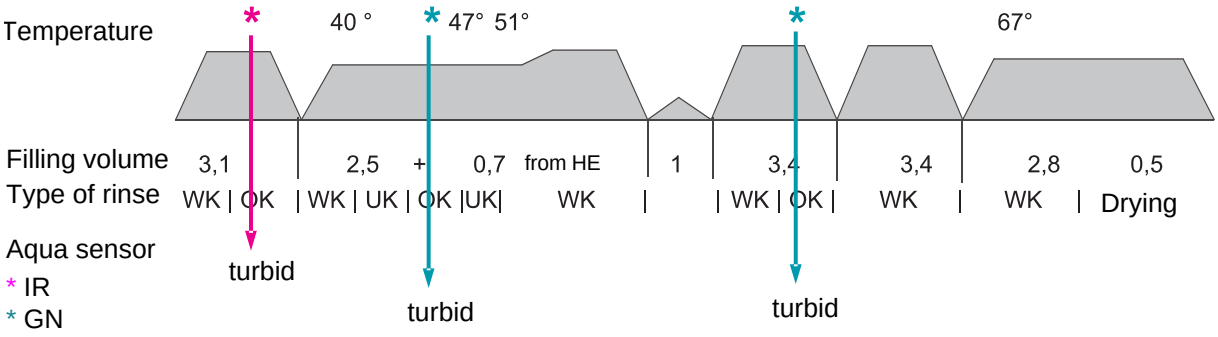
WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

8.2 Program selection “Automatic rinse”

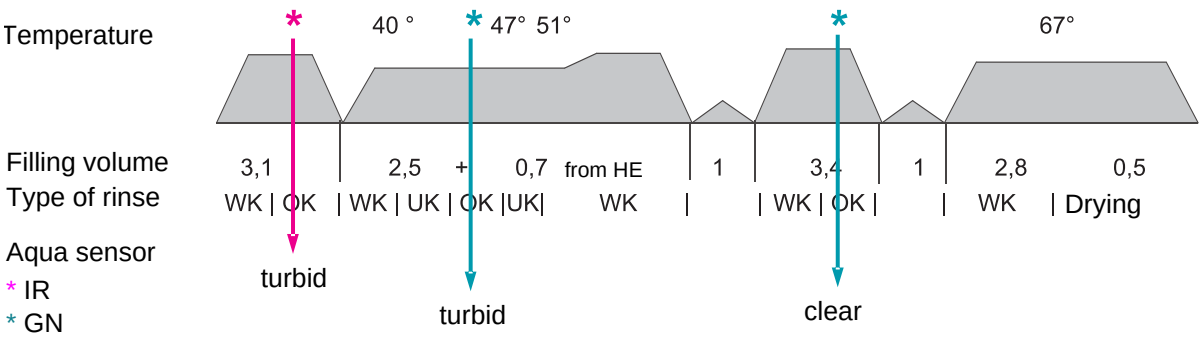
The program comprises a pre-rinse cycle, a washing cycle at 45 °C - 55 °C, an intermediate rinse, a clear rinse at 67 °C and a drying cycle. Three aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The second aqua sensor test will take place in the washing cycle. Depending on the decision taken in the two tests, washing will be carried out at 45 °C / 50 °C / 55 °C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

8.2.1 Program sequences in the automatic range, part 1

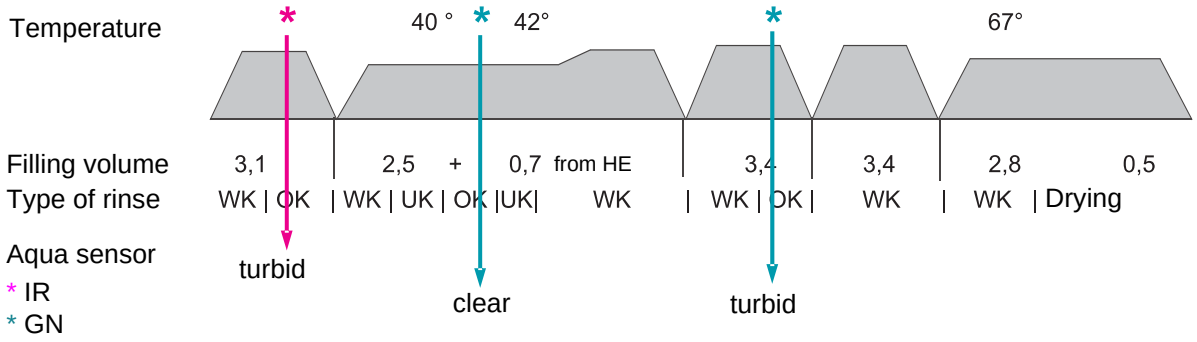


Energy: 1.20 kWh -> 1.20 kWh
Water: 12 -18 litres
Time: 100 - 130 min.

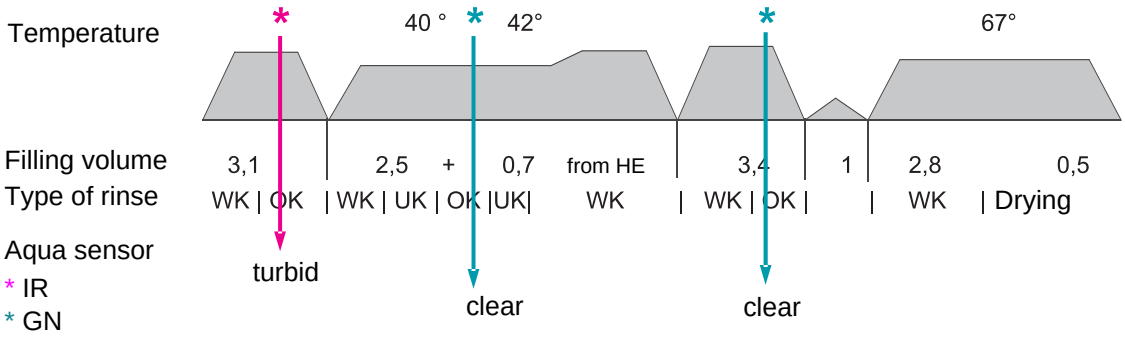


WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

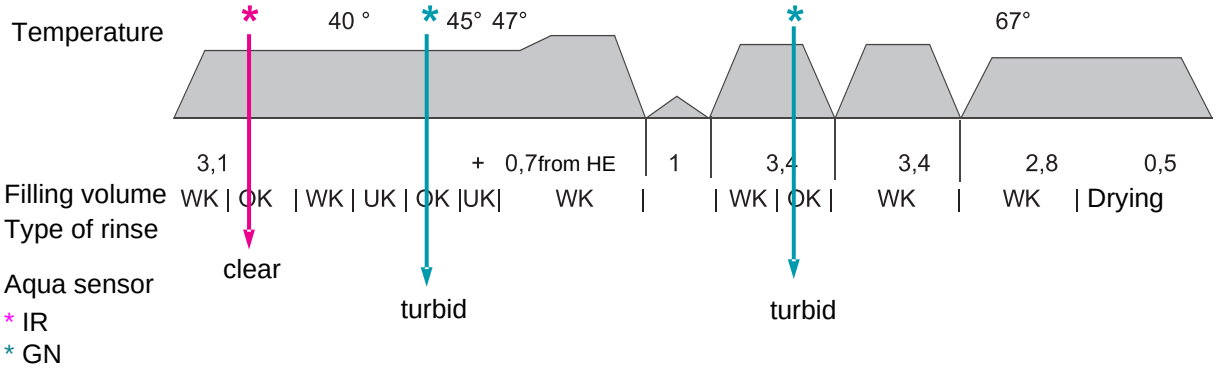
8.2.2 Program sequences in the automatic range, part 2



Energy: 1.20 kWh -> 1.20 kWh
Water: 12 – 18 litres
Time: 100 - 130 min.

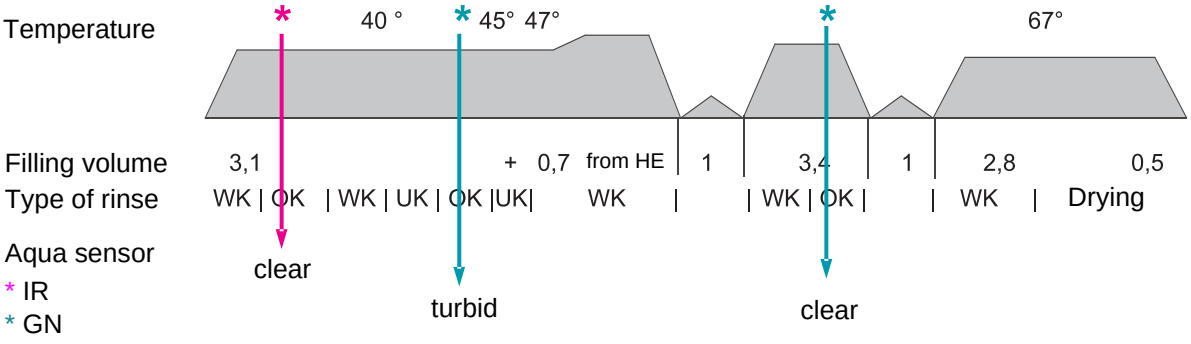


8.2.3 Program sequences in the automatic range, part 3

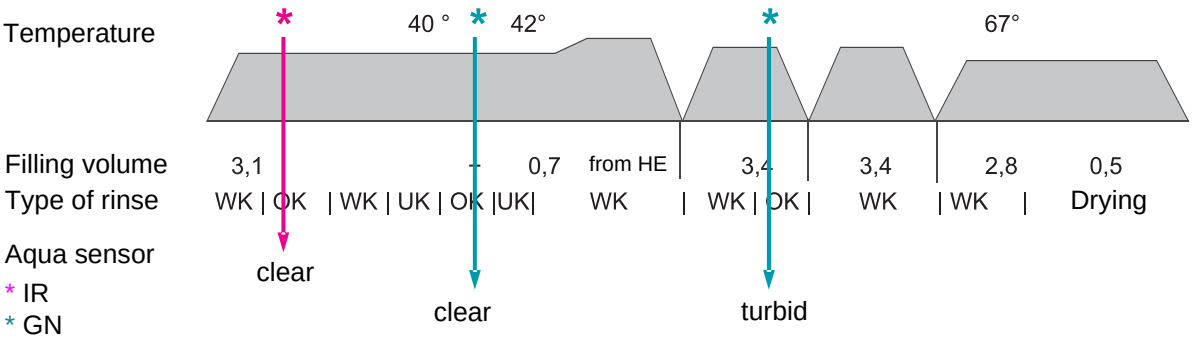


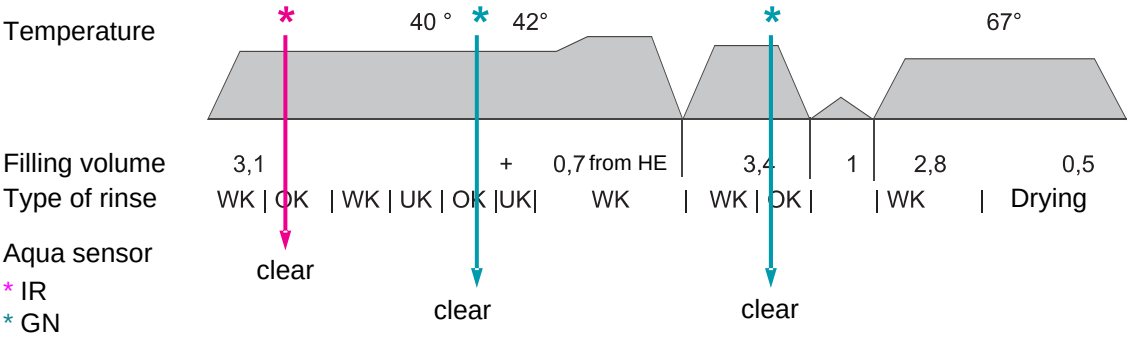
Energy: 1.20 kWh -> 1.20 kWh
Water: 12 – 18 litres
Time: 100 - 130 min.

WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger



8.2.4 Program sequences in the automatic range, part 4





Energy: 1.20 kWh -> 1.20 kWh
Water: 12 – 18 litres
Time: 100 - 130 min.

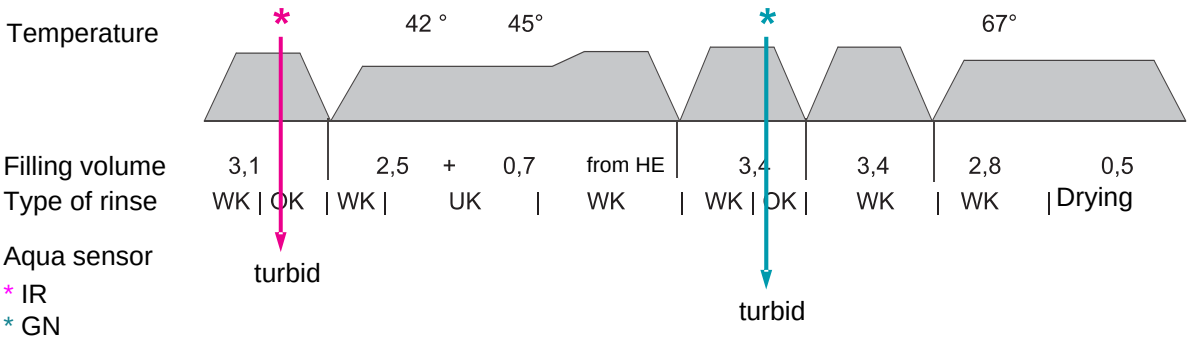
WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

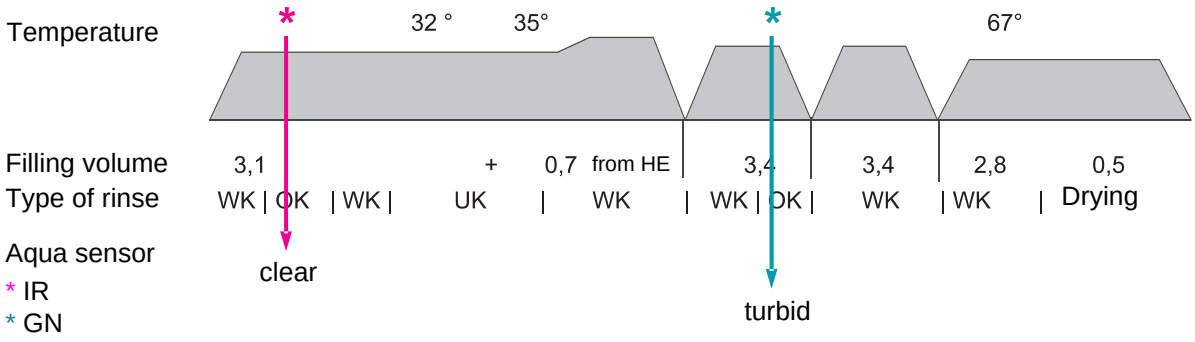
8.3 Program selection “Automatic gentle rinse”

The program comprises a pre-rinse cycle, a washing cycle at 35 °C / 45 °C, an intermediate rinse, a clear rinse at 67 °C and a drying cycle. Two aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 35 °C to 45 °C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

8.3.1 Program sequences in the automatic gentle range, part 1

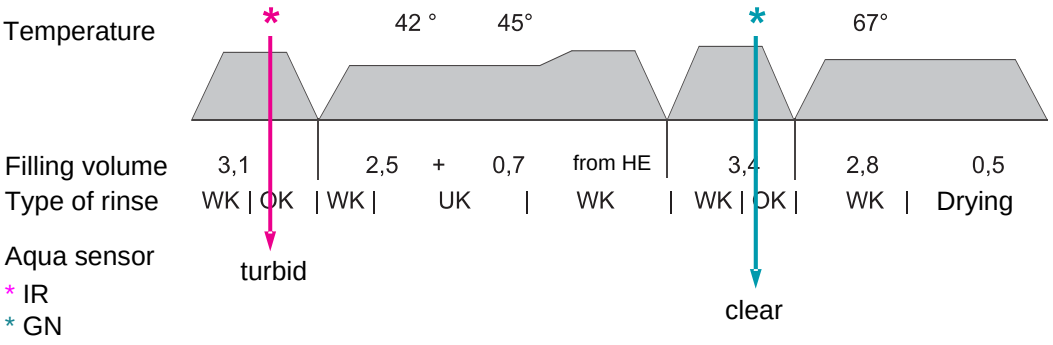


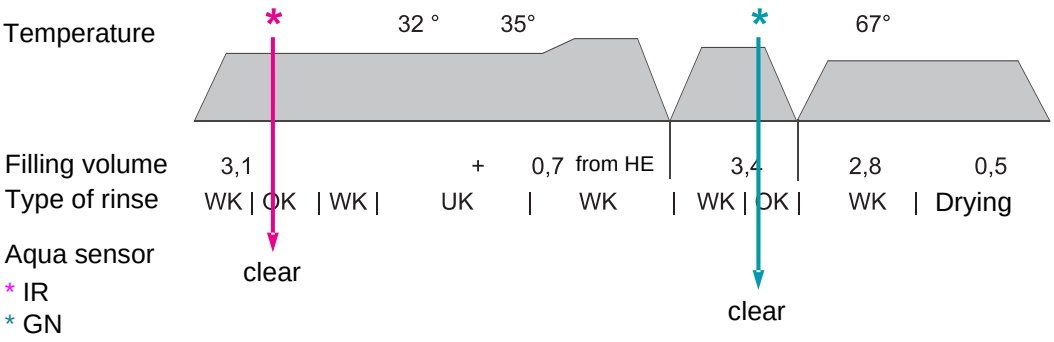


Energy: 0.8 kWh -> 1.00 kWh
Water: 10 -16 litres
Time: 80 - 100 min.

WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

8.3.2 Program sequences in the automatic gentle range, part 2





Energy:	0.8 kWh -> 1.00 kWh
Water:	10 – 16 litres
Time:	80 - 100 min.

WK=alternating basket rinse UK=bottom basket rinse OK=top basket rinse WT= heat exchanger

9. What do do, if...

Should your dishwasher develop a fault, please check up on the following before contacting our customer service (*see, too, the relevant section in the instructions for use)

9.1 Controller / module

⚠ **Start up the customer service program before replacing any modules.**

Customer information	Cause	Remedy
Program time too long	• Alternating rinse technology, energy saving	• Advise customer, see Consumption rates or Alternate rinsing technology.
Program too long and the dishwasher remains at “ready in 1 min.” when the program ends.	• Level sensor dirty, f1 does not switch back -> fills up too little water -> circuit breaker on the continuous flow heater is not activated -> dishwasher does not heat up -> program runs for longer than calculated.	• Check whether the level sensor and the heat exchanger are choked and replace if necessary; in the event of dirt in the ventilation valve of the heat exchanger discharge channel make sure that the siphon discharges sufficiently (back pressure).
Dishwasher remains at “ready in 1 min.” when the program ends.	• For dishwashers with KI /01; the sheeting on the back of the heat exchanger prevents water from flowing in properly; this results in a time lag between the effective time and the display time.	• Replace the heat exchanger.
	• Heat exchanger discharge valve does not open.	• Check the discharge valve on the heat exchanger.
The language selection menu is shown when the dishwasher is switched on.	• Passing contact on the main switch does not open, or the main switch was pressed for too long.	• Check contact 5 - 6 on the main switch. This contact is a passing contact which is activated when the switch is pressed and hence sets the controls from the end position to the starting position or resets the module when pressed for a long time.
Program time for the rapid rinse.	• For a rapid rinse 45 min. are shown when the program is started but the actual operation time is approx. 35 min.	• None
Component is not actuated	• Triac on the module does not switch properly, smoke traces may be visible on the module.	• Before replacing the module, always measure the connected consumers (valves, actuators, etc.). Observe safety instructions.

Customer information	Cause	Remedy
The display shows “wrong couple”.	• The data bus between the control module and the power module is not recognised, e.g.: ✓ Different software versions for the modules ✓ Processor has a defect on one module	• The software versions on the modules are compatible as of KI03. • Replace defect module.
Detergent dispenser does not open or opens too late.	• After replacing the module, the module is not set at the correct dispensing device (normal / top dispense). • When top dispense is set activation takes place with impulses (coil) and for normal dispensing it is permanent (actuator).	• Set the control module at the dispensing mode use with the S7 special program.

Customer information	Cause	Remedy
The dishwasher is switched ON / OFF unintentionally or the program is unintentionally changed.	• The sensor keys may assume that a higher difference in contrast means that a key is being pushed, e.g.: ✓ Through different worktop reflections when the doors is opened ✓ Through reflection, e.g. on trousers legs, etc. when the door is open	• Install a steam deflector under the worktop. • Advise the customer.
Dishwasher cannot be operated.	• Sensor keys are not pressed long enough. • Customers believe that the “Menu / ok” sensor key is two keys. • The fibre optic cable on the control module has come off the casing during transport.	• Sensor keys must be pressed for at least 1 sec. • Advise the customer. • Replace the control module.
Display remains dark.	• No power supply from the serial interface. • Bus cable short circuit near the hinge.	• Measure the control module power supply at the interface:• Contact 1 = +, Contact 2 = GND. The voltage between contacts 1 and 2 is 11 V =. • Repair the cable harness and make sure that there is sufficient clearance to the hinge.
Component is not actuated	• Triac on the module does not switch properly, smoke traces may be visible on the module.	• Before replacing the module, always measure the connected consumers (valves, actuators, etc.).
Charred connections, lead disconnection.	• Connector plug • Cable harness charred /cable torn	• To repair defective connections on the electronic controls, use plug repair set 435654. • Replace defect cable in the cable harness with universal cable 435802. **Use the extraction tool to remove the defect cable from the connector shell.**

9.2 Problem (user)

9.2.1 Discharge

Customer information	Cause	Remedy
The pump can be heard but it transports no water or only a little water.	• Sieve system blocked. • Trap in the air intake device (pump cavity) clogged. • Non-return valve in the discharge has got caught.	• Advise the customer. Observe the instructions in the user manual. Clean the sieve. • Advise the customer and clean the trap. • Remove the obstruction (do not forget the dishwasher hoses). Obstruction in the region of the hose connection to the water discharge; remove both discharge hoses to check.
Buzzing noise from the pump.	• Pump mechanically blocked (clogged or damaged).	• Clean pump, remove if necessary.
Pump not working.	• Pump mechanically blocked (clogged or damaged). • Water tap was closed during the drying cycle, heat exchanger was not yet filled, level switch waiting for filling. • Pump is not activated.	• Advise thecustomer; wait for completion of cycle and only then close the tap (refer to aqua-stop if present). • Activate the pump (test program) and check according to flow diagram. Observe safety instructions!
Dishwasher pumps off briefly, circulates, pumps off…	• Alternating pumps (detergent water pump and circulation pump) are activated alternately.	• Advise the customer.

9.2.2 Smell

Customer information	Cause	Remedy
Burnt smell.	• Connection cable improperly extended.	• Advise the customer. Observe the instructions in the user manual.
	• Socket burned (due to poor contact).	• Advise the customer. The socket and the connection cable must be replaced.
	• Winding damage or faulty insulation on the consumers.	• Check the consumers (test program) and check according to flow diagram. Observe safety instructions.
	• Poor electric connection or leakage paths on electrical components (inspect edge connectors).	• Rectify leakage paths and contact resistances; observe leaks. High-current cables may not be extended.
Smell of chemicals.	• Detergent or clear rinse.	• Advise the customer. The customer specifies on chemicals; possibly replace the product (with lemon aroma) or recommend an air freshener.
	• Binding agent of the noise reduction devices (fleece, insulation mats).	• Explain about new odour to customer.
	• Steaming of electrical components or circuit boards.	• Advise the customer
Smell of rotting.	• Permanent insufficient dispensing of detergent.	• Advise the customer; observe dosing instructions.
	• Deposits under the cover of the sieve, in the pump cavity or in the area of the sealing. The smell comes from the sink drainpipe (the siphon may be extremely soiled or evacuated).	• Advise the customer to clean the machine or use a more powerful program. Possibly refer customer to a plumber.
	• Dishwasher not properly connected to the siphon.	• Connect properly if possible; if necessary refer customer to a plumber.

9.2.3 Noises

Customer information	Cause	Remedy
Knocking noises in the pipes when water is being taken in.	• Improper installation or cross section of the water pipes (usually only occurs with appliances fitted with an aqua-stop valve since the valve is connected direct onto the tap).	• Advise the customer and refer him to a plumber (have a pressure reducer installed).
Clattering noises during the rinsing cycle.	• Spray arm knocks onto dishes. Dishes not loaded properly.	• Advise customer; load the dishwasher properly
Alternating noises in the washing program.	• Alternating rinsing technology (cycles of 55 sec. top basket rinsing, 5 sec. needed to change, 60 sec for the bottom basket) by the water diverter. • Alternating pumping (detergent water pump and circulation pump are activated alternately).	• Advise customer; if necessary replace the bottom spray arm with larger jets (see “Rotary spray system“ on page 37). • Advise the customer.

The next few charts deal with food or sandy residues which may impair the rinsing results. These are:

- Lime deposits (analyse with 10% hydrochloric acid in the diagnosis suitcase).
- Starch deposits (analyse with iodine solution in the diagnosis suitcase).
- Water-soluble residue or regenerating salt (analyse with distilled water in the diagnosis suitcase).
- Discolouration / colour deposits (e.g. tea, tomato juice, coffee, lipstick, etc.) (analyse with sodium hypochlorite bleach in the diagnosis suitcase).
- Residual detergent (analyse with distilled water in the diagnosis suitcase).
- Water-insoluble deposits / damage to dishes rinsed.

9.2.4 Food or sandy deposits

Customer information	Cause	Remedy
Residual food or sandy deposits	• Coarse, micro or fine sieve clogged; Sieve not engaged in the pump cavity.	• Advise the customer; sieve and care.
	• Spray arm jets, top spraying nozzle blocked.	• Clean parts if necessary, instruct customer on inserting the proper sieve.
	• Spray arm bearing stiff (dirt in the region of the bearing).	• Clean parts if necessary, instruct customer on inserting the proper sieve.
	• Foreign matter in the region of the discharge hose connections to the water inlet (discharge channel).	• Cleaning.
	• Trap in the pump cavity partially blocked.	• Advise the customer; cleaning.
	• Discharge hose bent.	• Connect the discharge hose properly.
	• No detergent dispensing or insufficient dispensing, wrong program selected.	• Advise the customer; observe the dosing instructions of the detergent, use program with a higher temperature; check the dispenser.
	• Dishes not arranged properly (large dishes, e.g. pots, in the bottom basket), avoid contact points, rows of spikes bent.	• Advise customer, align the rows of spikes (see instruction manual).
	• Spray arm blocked by dishes or cutlery.	• Advise the customer.

Customer information	Cause	Remedy
Residual food or sandy deposits	• Snorting noises; circulation pump does not run smoothly, too little water in the dishwasher (attention in the case of alternating rinse technology).	• Check the functioning of the equipotential transducer (carry out a filling procedure)
	• Non-return valve leaking; dirty water flows back into the dishwasher.	• Remove the non-return valve, check the valve and its position for dirt and clean if necessary.
	• Dishwasher does not circulate.	• Check the circulation pump.
	• Dishwasher does not heat up.	• Check the heating circuit in accordance with the circuit documents; observe the circuit breaker on the continuous flow heater (the circulation pump can only build up sufficient pressure if there is enough water in the dishwasher).
- in the top basket	• Dishwasher only rinses dishes in the bottom basket.	• Obstruction of the rinsing cycle of the top basket; it is essential to observe that in some steps in the program, rinsing will only take place in the bottom basket. Check with the help of the customer service program and diagnosis aids.
- in the bottom basket.	• Dishwasher only washes dishes in the top basket. For dishwashers with a top basket valve in the FD 7809 – FD 7811 production period, the float of the top basket valve may get caught between the continuous flow heater and the pump cavity.	• Replace the continuous flow heater.
Clattering noises during the rinsing cycle.	• Spray arm knocking on the dishes.	• Advise the customer; observe dosing instructions.

9.2.5 Lime deposits

Customer information	Cause	Remedy
Lime deposits on the dishes.	• Hardness level incorrectly set or raw water hardness > 50°dH. Check the residual heat in the washing and clear rinse cycles.	• Set the hardness level; advise the customer; use detergents containing phosphate.
	• Does not regenerate.	• Set the regenerating position and carry out a function check (observe the emptying of the regeneration chamber). Check the regeneration valve carefully (mechanical - valve stern; electrical – selection / coil).
	• Valve for raw water does not open -> filling with raw water only.	• Check the raw water valve (mechanical - valve stern; electrical – selection / coil).

9.2.6 Starch deposits

Customer information	Cause	Remedy
Starch deposits on the dishes.	• Insufficient detergent (unsuitable detergent).	• Advise the customer; use a detergent with enzymes.
	• Wrong program selected (program selected too weak).	• Advise the customer; select the right program.
	• Dishwasher connected to a warm water supply; inlet water temperature too high.	• Check the warm water connection (target: less than 60 °C), advise the customer, if necessary connect the dishwasher to a cold water supply.

9.2.7 Water-soluble or regeneration salt residue on the dishes

Customer information	Cause	Remedy
Water-soluble residue.	• Lime deposits on the dishes.	
	• Top of the salt dispenser not closed (check the screw of the top, regeneration chamber slowly emptied).	• Advise the customer, rectify leak.
	• Leaking regeneration valve (regeneration chamber is slowly emptied).	• Check the valve and its seating.
	• Regeneration valve permanently activated.	• Electrical check on the basis of circuit documents.
	• Commencing cloudiness of glass: can only apparently be wiped off.	• See damage to dishes.
	• Detergent water carried over.	• See residual food.
	• Combined product.	• Advise the customer.

9.2.8 Discolouration / residual colour

Customer information	Cause	Remedy
Residual colour.	• Too little detergent used.	• Advise customer, increase the quantity of detergent.
	• Plastic becomes discoloured, for example by tomato deposits, tea, coffee, etc.	• Use a detergent with chlorine bleaching. If the dishwasher becomes discoloured recommend a cleaning agent for the machine.
	• Detergent very lumpy, cleaning effect and dissolving properties diminish.	• Advise the customer, store the detergent in a sealed container in a dry place.
	• Program selected not powerful enough (if the program is too short and the temperature too low there will not be sufficient contact with the oxidation bleach).	• Advise the customer; use a more powerful program.
Rainbow-coloured smearing.	• Silicate deposits on glasses only (cannot be removed).	• No remedy possible (glass damaged).
	• Clear rinse agent excessively dosed (can be rinsed off with water).	• Reduce the dispensing setting.
Silver cutlery becomes tarnished.	• Discolouration occurs as a result of sulphur compounds contained in the air and in various food leftovers.	• Advise the customer; after use silver cutlery must immediately be rinsed.

9.2.9 Residual detergent

Customer information	Cause	Remedy
Residual detergent.	• Detergent dispenser lid blocked by dishes (does not fully open up).	• Advise the customer, dishes not well loaded.
	• Detergent dispenser lid does not fully open up.	• Renew the spring of the dispenser.
	• Wrong program selected	• Advise the customer.
	• Tabs used in the quick or short program.	• Tabs take too long to dissolve.
	• Tabs not used properly (make sure that they are used in the dispenser or in the cutlery basket).	• Advise the customer, observe instructions for use of tabs.
	• Spray arm jets blocked (sieves locked).	• Advise the customer.
	• Dispenser in the spray shadow, (large pot or similar vessel loaded at the bottom left).	• Advise the customer.
	• Check the pumping out procedure, non-return valve.	• See residual food.
	• Detergent very lumpy, cleaning effect and dissolving properties diminish	• Advise the customer.

9.2.10 Damage to rinsed dishes

Customer information	Cause	Remedy
Commencing or already present, irreversible (not rectifiable) cloudiness of glass.	• Degree of hardness set too high, residual hardness in washing or clear rinse cycle <5°dH.	• Optimise the setting after measuring.
	• Glasses not dishwasher-proof (glasses usually only suitable for use in a dishwasher).	• Advise the customer.
	• Program selected too strong.	• Advise the customer, use the most gentle program possible when rinsing glasses (low temperature < 50 °C).
	• Reaction time of steam in drying process too long.	• Advise customer; do not switch on the appliance and only take out the dishes after a few hours, e.g. leave them in overnight.
Mechanical damage (scratch or fracture).	• Scratches due to contact points / areas with other dishes.	• Advise the customer, avoid contact points when loading the dishwasher.
Dishes faded.	• Dishes not dishwasher-proof.	• Advise the customer; use dishwasher-proof dishes.
Rust on cutlery.	• Rust on cutlery: cutlery not dishwasher-proof (knife/knife blade steel is usually not very resistant to corrosion).	• (Larger proportion of chrome/nickel, at least 18/8 or 18/10)!
	• Rust film: rust caused by corroding dishes or dishwasher baskets.	• Advise the customer. Use rust-proof cutlery.

9.2.11 Drying results

Customer information	Cause	Remedy
Does not dry properly.	• No clear rinse in the dispenser.	• Advise the customer.
	• Dishwasher connected to a warm water supply. Dishwasher is suitable for hot water, but this is not recommendable.	• Advise the customer. Point out the function of the heat exchanger; if necessary, connect the dishwasher to a cold water supply.
	• Dishwasher does not heat up.	• Check the heating circuit in accordance with the circuit documents; observe the circuit breaker on the continuous flow heater (the circulation pump can only build up sufficient pressure if there is enough water in the dishwasher).
	• Program without drying selected.	• Advise the customer. The rapid program is without a drying cycle, the degree of drying option is set too low.
	• The clear rinse has dissolved too quickly for tabs with an integrated clear rinse agent.	• Advise the customer, the tabs are not suitable for this program.
	• Plastic dishes.	• Plastic materials hardly store heat and they have a hydrophobic surface which is difficult to wet. This results in the formation of drops during the drying cycle.
	• Combined detergents (2 in 1 / 3 in 1).	• Advise the customer. Recommend separate detergent products (separate rinse aid and detergent).

9.2.12 Circulation pump (SICASYM)

Customer information	Cause	Remedy
Circulation pump does not start up.	• After a long service life the set of seals may stick to the pump wheel.	• It is essential that the set of seals be renewed.

9.2.13 Circulation pump (SIBRUSYM)

Customer information	Cause	Remedy
Circulation pump attempts to start up 5 times but does not start.	• Pump wheel blocked by foreign matter. • Motor winding broken. • Contact problems on the cable harness between the motor control module and the motor.	• Remove foreign matter. • Check the resistance of the motor winding (approx. 65 – 75 Ω). • Check the transmission.
Circulation pump does not start up.	• The motor control module is not activated by the power module. • Fuse lines on the motor control module circuit board burnt through (humidity, motor winding short circuit, faulty component on the module).	• Check the cable harness. • Check the components.

9.3 Error message on the customer service program

IGV 699.2

Code	Description	Causes	Remedy
C	SIBRUSYM motor error message.	• Circulation pump defect. • Motor electronic unit defective. • Plug error (motor electronic unit to motor). • Contact problems on the plug connectors.	Circulation pump does not start up.
D	No bus communication with the SIBRUSYM motor.	• Motor electronic unit defective. • Power component electronic unit defective. • Discontinued cable between power component and motor electronic unit. • Contact problems on the plug connectors.	Circulation pump does not start up.

IGV 699.0-1

Code	Description	Causes	Remedy
C	No tachometer impulses	• Circulation pump defect. • Tachometer generator defect. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Electronic input defect. • Electronics output triac defect, disconnected.	The circulation pump is fully triggered and, if possible, it operates at full speed (approx. 2800 rev./min.). (approx. 2800 rev./min).
D	Triac short circuit. Circulation pump exit.	• Electronics system short circuit. • Electronics output triac defect, has transmission	The circulation pump operates as soon as the appliance is switched on and stays on all the time.

All the other models

Code	Description	Causes	Remedy
A / B	Aqua sensor calibration error Infrared / green measured section.	• Aqua sensor defect. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Aqua sensor excessively soiled. • Electronic input or output defect.	A stipulated procedure from the automatic program is carried out.
C	No tachometer impulses	• Circulation pump defect. • Tachometer generator defect. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Electronic input defect. • Electronics output triac defect, disconnected.	The circulation pump is fully triggered and, if possible, it operates at full speed (approx. 2800 rev./min.). (approx. 2800 rev./min).
D	Triac short circuit Circulation pump exit	• Electronics system short circuit. • Electronics output triac defect, has transmission.	The circulation pump operates as soon as the appliance is switched on and stays on all the time.
E	Water diverter, no circuit impulses	• Water diverter defect. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Electronic input defect. • Electronics output triac defect, disconnected.	The water diverter is constantly triggered (constant alternation between the top basket and the bottom basket within 6 seconds).
F	Filling error	• Filling level is not reached in the pre-defined time of 6 minutes.	Program cycle, remaining time indicator stops after approx. 3½ min., until the filling level is reached. The filling valve remains switched on during this period. The raw water valve is switched off after 3½ minutes.
G	Triac short circuit Water diverter outlet	• Electronics system short circuit. • Electronics output triac defect, has transmission.	The water diverter operates as soon as the appliance is switched on and stays on all the time.

Code	Description	Causes	Remedy
H	Heating error.	• Temperature is not reached within 60 minutes. • Heater is interrupted. • Press switch is defect. • Electronics system heater relay defect. • Lead disconnection to the heater. • The NTC has too much resistance but is nevertheless still within the permissible range, e.g. due to contact problems on the plug connectors to the NTC.	After 60 min. the heating step is discontinued and the program continues to run.
I	Motor lock, no circuit impulses.	• Motor lock is defect. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Electronics output triac defect, disconnected. • Electronic input defect. • ⚠ Appliance has no motor lock.	Within 30 seconds an attempt is made to position the motor lock, after which it remains standing in a random position. The next positioning command results in a renewed attempt to position the motor lock. Error also indicated for dishwashers without a motor lock.
J	Triac short circuit. Motor lock output triac short circuit (only in the case of appliances with a motor lock).	• Electronics output triac defect, has transmission	the motor lock starts up as soon as the appliance is switched on and remains in constant operation until the main switch is switched off.
K	NTC fault (interruption or short circuit)	• NTC figures are beyond the defined range (< 2.7 kΩ is equivalent to below 0 °C / > 135 kΩ is equivalent to more than 100 °C)	The heating step is immediately overrun.

Code	Description	Causes	Remedy
L	Optosensor error	• Cable / plug disconnection, strobing module sends out signals but gets no response. • Optosensor® cannot be calibrated; readings are beyond the viable range (e.g. glass spiral broken). • Valve does not open -> memory wire broken, valve covered up.	If the control system recognises an Optosensor® error, it will start up an *emergency program*. In *the emergency program* a regeneration cycle will always be carried out after 60 litres of soft water have been taken in and a raw water / soft water mixing ratio of 10 : 90 will be set (i.e. (i.e. regeneration will be carried out every 6th to 7th rinsing cycle). A remaining hardness level of approx. 10° will be set for raw water hardness of up to 30°. If the remaining hardness level exceeds approx. 12° (raw water hardness of > 30°dH), rinsing results may be poor.
M	Mains cutoff relay stuck	• Relay contact is stuck.	Consumers can be supplied with electricity in the stand-by mode.
N	Network synchronisation not possible	• Power module defect.	Circulation pump runs at the maximum no. of revolutions, program continues with normal operation.
O	Safety level recognised	• Filling switch defect. • Filling level system defect. • Rinse-water pump does not discharge. • Leaks, water in the base pan. • Line disconnection. • Plug error. • Contact problems on the plug connectors. • Electronic input defect.	Rinse-water pump starts (has been connected accordingly). Filling valve is switched off (has been connected accordingly), the filling step is abandoned (by the electronics system). If filling up to safety level always take place in 7 rinses, the electronics system will remain in the step in which the safety level occurs in the 8th rinse. Subsequent to main switch on/off, the step is carried out again.
P	Safety level was recognised in the last 8 rinses	• The error O has occurred in the current and in the last 8 rinses.	The rinse-water pump commences operation. The program remains in the step in which the safety level occurs.

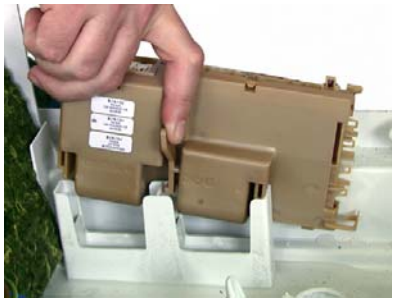
10. Power module

The power module is located behind the right side wall in the area of the base.

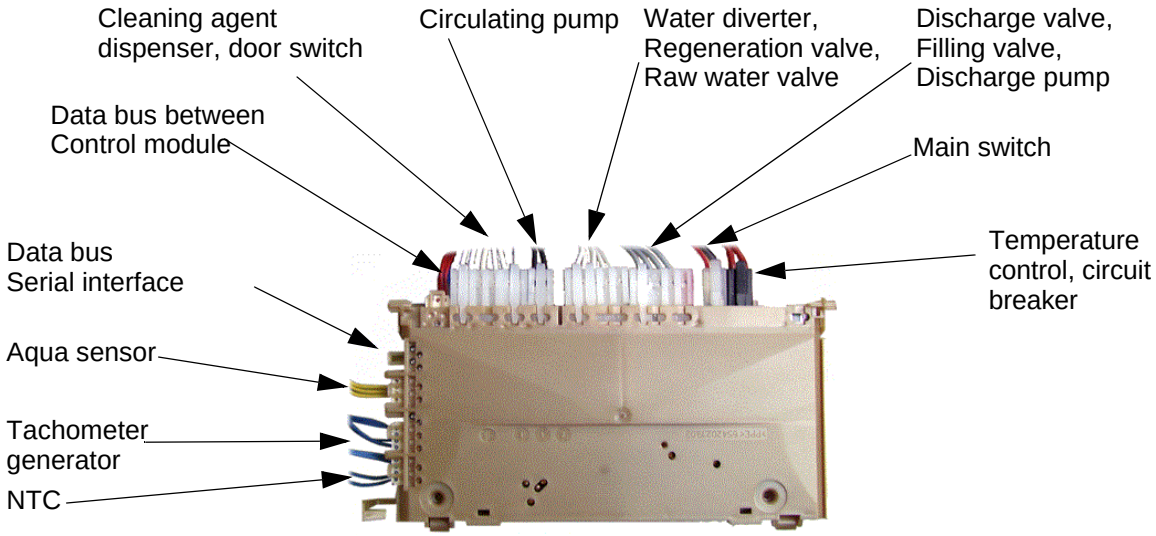
Removing

The power module is locked at the rear with a lever.

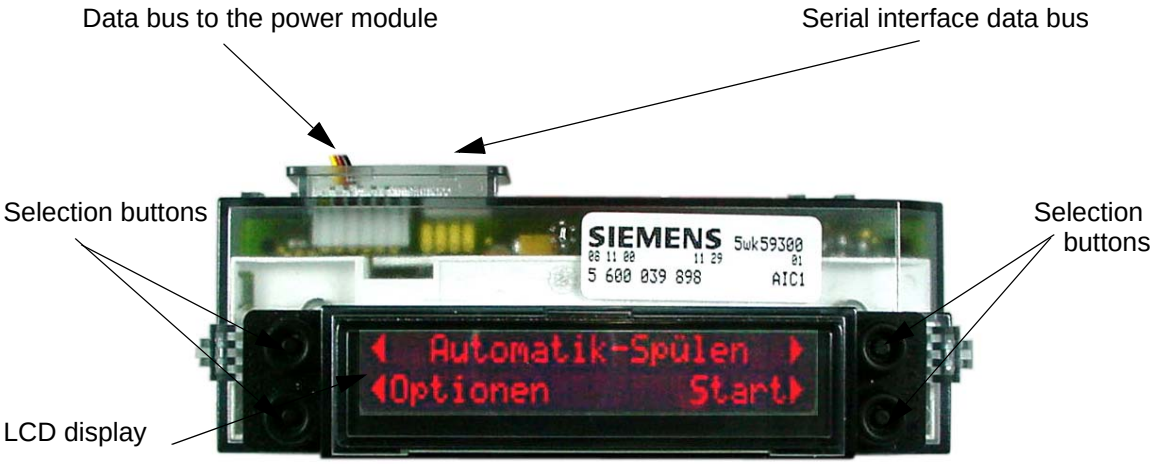
The lever must be pushed to the right for dismounting.



Connections



Control module, fully-integrated (U-type control) connections

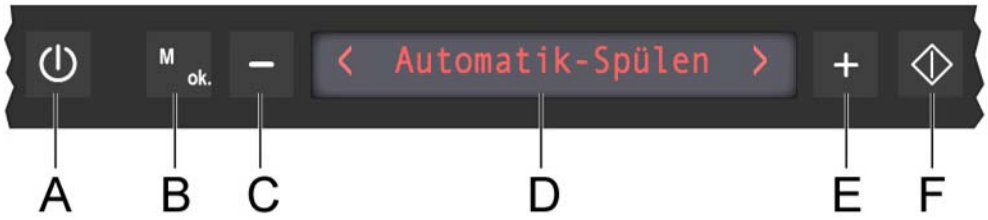


11. IGV 699.2 operation

The new dishwashers are equipped with clear text displays for selecting any required function and for indicating respective remote indications to the user.
All of the lines in the display comprise 20 characters in an 8x5 dot matrix. The appliances, with a total of 17 display languages (German, English, French, Dutch, Italian, Spanish, Portuguese, Greek, Norwegian, Swedish, Finnish, Danish, Russian, Polish, Hungarian, Czech and Turkish), can be used throughout Europe.

11.1 Function

After switching on the dishwasher, the following appears in the selection display.



Five sensor buttons are integrated in the operation / display module. Sensor button **A** is used to switch the dishwasher on and off (stand-by). Sensor button **B** is used to select from the options. Sensor buttons **C** and **E** are used for selecting programs and settings. Sensor button **F** starts up a program.

The display **D** gives information on programs to be selected, options, settings and remaining time.

11.2 Sensor buttons

Infra-red transmission diodes and receiver transistors are arranged in pairs under the control panel.

At certain times, specified by the control system, the individual transmission diodes will successively give off infra-red light. The infra-red light is modulated at a frequency of 1000 Hz, resulting in a distinguishing criterion from nominal-frequency household lamps.

The microprocessor analyses the respective receiving signals during the times when the individual transmission diodes are activated. If the receiving signal fulfills the criteria required, the respective command will be carried out.

⚠ **Do not press hard onto the control button when you wish to carry out a switching function; instead place your finger onto the control button for at least one second.**

11.2.1 Selecting a program

After switching on the appliance the start menu will indicate the “automatic rinse” program.

Press the +/- buttons to select from the following programs:

- Auto-plus program
- Automatic rinse
- Auto-delicate program
- Rapid rinse
- Pre-rinse only

The program sequence will automatically be adjusted to the degree of soiling of the dishes for the “auto” programs.

⚠ **Do not press hard onto the control button when you wish to carry out a switching function; instead place your finger onto the control button for at least one second.**

11.2.2 Auto-plus program

The program comprises a pre-rinse at 50°C, a washing cycle at 60°C / 70°C, an intermediate rinse, a clear rinse at 67° and a drying cycle. Two aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 60°C to 70°C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

11.2.3 Automatic rinse

The program comprises a pre-rinse cycle, a washing cycle at 45°C - 55°C, an intermediate rinse, a clear rinse at 67° and a drying cycle. Three aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The second aqua sensor test will take place in the washing cycle. Depending on the decision taken in the two tests, washing will be carried out at 45°C / 50°C / 55°C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

11.2.4 Auto-delicate program

The program comprises a pre-rinse cycle, a washing cycle at 35°C / 45°C, an intermediate rinse, a clear rinse at 67° and a drying cycle. Two aqua sensor decisions are taken.

Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 35° to 45°. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

11.2.5 Rapid rinse

This program comprises cleaning at 45°C, an intermediate rinse, rinsing with a rinsing agent at 55°C, and no drying.

11.2.6 Pre-rinse only

The program only comprises a cold rinse for the dishes.

11.3 Options

The following parameters can be changed by pressing the “B” sensor button (options). Pressing the button again will take you to the next option.

⚠ **If a setting is changed it will only be stored after it has been acknowledged by pressing sensor button B.**

11.3.1 Pre-set time

In the pre-set time menu the +/- buttons can be used to change the starting time in stages of 30 minutes each. The setting range is from 0:00 to 24:00 hours.

11.3.2 Saving time

In the saving time menu the function can be switched on or off with the +/- buttons. If the time-saving option has been activated, the aqua sensor in the automatic programs will only be activated once in the intermediate rinse, there will be no pre-rinse and the temperature will be raised.
This means that rinsing times are shorter and more water and energy are used.

11.3.3 Degree of drying

The degree of drying can be set in this menu by pressing the +/- buttons.

Economy dry	The drying time is shortened and the clear rinse temperature is reduced to 55 °C
Standard dry	Factory setting
Extra dry	The clear rinse temperature is raised by 3 K for this option. This results in better drying results.

11.3.4 Clear rinse setting (for appliances with top dispensing only)

The clear rinse doses can be set at seven different settings with the +/- buttons in this menu. (factory setting = 4).

11.3.5 Signal volume

In the signal volume menu the volume of acoustic signals can be set from 0-7.

0 = switched off
1 = low to 6 = high
6 = factory setting

If the buzzer is switched on, it will sound five times at 5-second intervals when the program is completed. This procedure is repeated five times after ten minutes.

11.3.6 Hardness range setting

In this menu the hardness range is set on automatic or manual.

Manual setting

°dH	°fH	°Clarke	mmol / l	Salt quantity in g per rinse	Setting
0-3	0-6	0-4	0-0,6	0	0
4-6	7-11	5-8	0.7-1.1	2	1
7-9	12-16	9-11	1.2-1.6	4	2
10-12	17-21	12-15	1.7-2.1	6	3
13-16	22-29	16-20	2.2-2.9	9	4
17-21	30-37	21-26	3.0-3.7	14	5
22-30	38-54	27-38	3.8-5.4	27	6
31-50	55-89	39-62	5.5-8.9	54	7

The hardness range will be contingent on the optosensor for the automatic setting. The “automatic” setting is only possible if the module has been set at optosensor. This setting is carried out with the special program “regeneration – special” (see “Regeneration - extra“ on page 73). The hardness range setting is set at automatic as a standard.
For manual setting the hardness range can be setting at 8 different levels with the +/- buttons.

11.3.7 Select language

In the select language menu the language of the clear text display can be set with the +/- buttons. Up to 17 languages can be set.

11.3.8 Standard programs

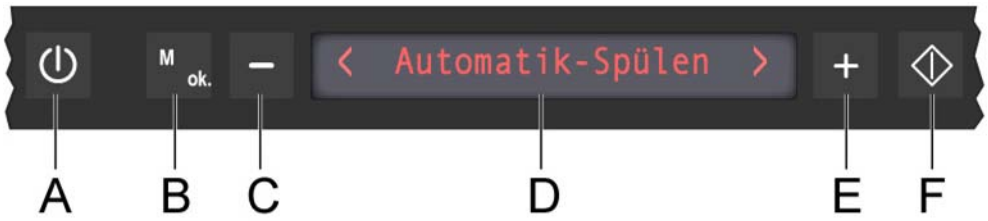
In addition to the rinsing programs indicated in the start-up menu, the following standard programs can be selected:

- Extra
- Eco
- Normal
- Plus

The program sequence for the standard programs is stipulated. No aqua sensor decisions are made.

11.4 Special programs - IGV 699.2 only

Calling up the special programs:



1. Open the door.
2. Switch the appliance off.
3. Press the two right-hand sensor buttons **E** and **F** simultaneously and keep them pressed; press sensor button **A** too for at least 3 seconds.

Selecting the special programs:

Pressing the sensor buttons **C** and **E** will enable the special programs to be selected.

Pressing the start button **F** will start up the respective program.

11.4.1 Functional test

Pressing the sensor buttons **B, C, E** and **F** will enable all of the pixels in the display to be activated.

11.4.2 HV – Factory test

This test program can only be used by factory staff members.

11.4.3 Customer Service (S3)

Reading out the error store:

If the customer service program is started up with sensor button **F**, the display will indicate the error store of the last rinsing cycle. The buttons **C** and **E** can be used to read out the error store of the last 8 rinsing cycles. The display will indicate S3 for the customer service program, the error code and the rinsing cycle.

Starting up the customer service program:

Once the error storage program has been read, the customer service program can be started by closing the door.

Use button **E** to skip program steps. The filling steps are an exception. The display will indicate S3 for the customer service program, the error code and the program step.

See circuit diagrams for program sequence.

While the customer service program is activated, every change of state of the analogous signal received will be acknowledged by the electronics system with an audible signal.

11.4.4 Lifecycle

This test program can only be used by factory staff members.

11.4.5 Showroom / Demonstration program

When the Showroom program is selected, a normal program sequence will run through the display without any consumers being activated. If the appliance is switched off the special program will not be stored.

11.4.6 Error - reset

Error reset can be used to delete the error storage.

11.4.7 Dispenser

The dispenser setting is used to set the different activation modes of the dispenser (“normal” or “top dispensing”).

When the “normal” dispensing mode is set, the setting in the option menu will be suppressed.

11.4.8 Water softener

This setting is used to set the module for dishwashers without a water softener. The setting in the option menu will then be suppressed.

Note If the setting “NO water softener” is set for appliances with a water softener, the softener will be switched off (as is the case for water softening setting 0).

11.4.9 Functional key test

This test program can only be used by factory staff members.

11.4.10 Regeneration - extra

This setting is used to set the module for dishwashers with or without an optosensor. If the setting with an optosensor is selected, the setting with or without a hardness menu will follow. If the setting without a hardness menu is selected the hardness range setting in the option menu will be suppressed.

11.4.11 Reset optosensor

When the optosensor is replaced the sensor with this special program will need to be re-calibrated.

11.4.12 Resetting the modules

Switch the dishwasher on and then press the main switch until the language selection menu is shown in the display.

Note All of the settings, such as the hardness range setting, have been set back to the delivery status and will need to be reset.

Indication: “check the water intake”

If, on filling, the filling level fl is not reached within 210 seconds, the display will indicate “check water intake”.

11.5 General instructions on the controls - IGV 699.2

11.5.1 Tap closed

If the filling level (fl) is not reached after 3 ½ minutes, the controls will remain in this position and wait until the level has been reached. For front-display appliances the message “check water intake” will be shown and a buzzer will sound.

If the water tap is opened after 3 ½ minutes, only raw water will be filled in during this filling step.

11.5.2 Regeneration electronics system

On comparing the degree of water hardness set in the appliance, the electronics system determines what quantity of water is possible before the water softener is exhausted.

The number of rinses carried out is counted. Once the subsequent maximum number of rinses has been reached, regeneration is carried out.

The discharge behaviour of the regeneration electronics system can be seen in the description under initial operation / replacing the electronics unit.

11.5.3 Warm water recognition

If the water which is taken into the dishwasher for a clear rinse is warmer than 45 °C, the temperature in the clear rinse cycle will be heated up to 72 °C, hence raising the temperature of the dishes themselves. The heat exchanger will not be filled up.

11.5.4 Power cut

The electronics system has a mains cut-off memory which ensures that a rinsing program that has been commenced when a power failure occurs will be continued.

11.5.5 Sensors

All of the signals leaving the door switch, the level switch, the NTC sensor and the refill switches are recorded and evaluated by the microprocessor at the respective point in time.

11.5.6 Load recognition

The number of revolutions of the circulation pump is measured by the tachometer generator.

Moistening with water, hollows or grooves in the dishes or containers which have turned over may result in losses of rinsing water. In this case air is transported through the pump. This will result in noisier operation of the dishwasher and in a changed (irregular) operation of the pump.

The tachometer generator recognizes the irregular operation of the pump on filling. In order for the pump to operate “smoothly” again, water is filled in until the optimal water level has been reached.

On first filling, between 2.8 l and 3.7 l are filled in and 3 enquiries concerning concentrical running are made:

A maximum of 200 ml is filled up for the first request.

Another maximum 200ml is filled up for the second request.

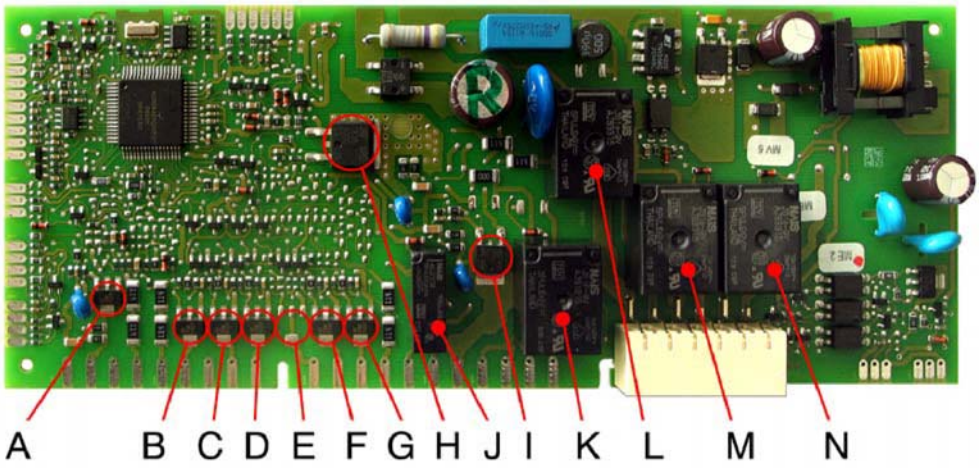
A maximum of 500 ml is filled up for the third request.

A maximum of up to 900 ml can hence be filled up again during the first filling stage. During an intermediate rinse and a clear rinse, a maximum of another 500 ml respectively can be filled up.

11.5.7 Consumers

Observe instructions on electrostatic hazards!

Consumers such as valves, detergent and clear rinse dispensers (actuators) are activated by means of triacs (see photo). The evacuation pump and the continuous flow heater are activated with relays.



Triacs	
A	Dispenser
B	Water diverter
C	Regeneration valve
D	Raw water valve
E	---
F	Charging valve
G	Drain valve heat exchanger
H	Circulation pump
I	PTC Optosensor

Relays	
J	Detergent water pump
K	SICSYM trigger
L	Mains cut-off relay
M	Mains relay
N	Heater

Start up the customer service program before replacing any modules.
Check the activated component before replacing a module due to a defective triac!

Instructions on electrostatic hazards are to be observed before a module is replaced!

11.5.8 Motor control module

A Sibruysm motor needs a specially adjusted motor electronic unit in order for it to be driven. This generates a three-phase alternating current from the mains alternating voltage which has the correct frequency and phase position for the motor.

Danger!

Risk of electric shocks!

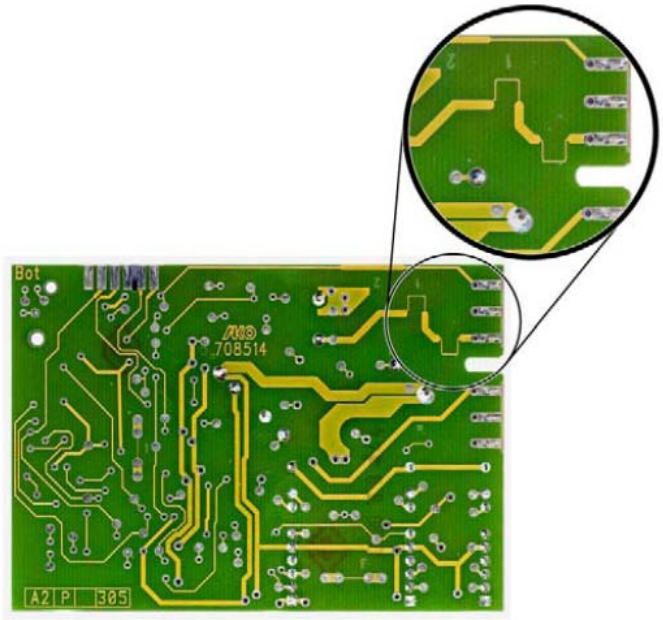
The motor electronics unit is fitted with a 100µF/400V capacitor which is loaded at 350V during operation. It is discharged very slowly when the motor is not in operation (>60s). It is essential to wait at least 60 sec. until the capacitor has been discharged before removing a module or pulling out the plug.

D-bus	+5 V=
L - N	230 V
M1, M2, M3	to the motor

11.5.9 Motor control safety fuse

Two fuse lines have been installed on the motor control module. The fuse lines will blow in the event of:

- Motor winding short circuit
- Humidity
- Faulty module component



12. IGV 699.0 and IGV 699.1 operation

The electronic control system comprises two modules, the operation / display module and the power module. All of the functions are set with the four buttons of the operation / display module.

12.1 Function

The display gives information on programs to be selected, options and settings and on operations which can be carried out.

12.2 Selecting a program

Switch on the appliance. The display will indicate the following start-up menu:

After switching on the appliance the start menu will always indicate the “automatic rinse” program.

Press the +/- buttons to select from the following programs:

- Auto-plus program
- Automatic rinse
- Auto-delicate program
- Rapid rinse
- Pre-rinse only

The program sequence will automatically be adjusted to the degree of soiling of the dishes for the “auto” programs.

12.2.1 Auto-plus program

The program comprises a pre-rinse at 50 °C, a washing cycle at 60 °C / 70 °C, an intermediate rinse, a clear rinse at 67 °C and a drying cycle. Two aqua sensor decisions are taken.
Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 60 °C to 70 °C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

12.2.2 Automatic rinse

The program comprises a pre-rinse cycle, a washing cycle at 45 °C - 55 °C, an intermediate rinse, a clear rinse at 67 °C and a drying cycle. Three aqua sensor decisions are taken.
Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The second aqua sensor test will take place in the washing cycle. Depending on the decision taken in the two tests, washing will be carried out at 45 °C / 50 °C / 55 °C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

12.2.3 Auto-delicate program

The program comprises a pre-rinse cycle, a washing cycle at 35 °C / 45 °C, an intermediate rinse, a clear rinse at 67 °C and a drying cycle. Two aqua sensor decisions are taken.
Depending on the first decision in the pre-rinse cycle, the water will be exchanged or the pre-rinse water will still be used for the washing cycle. The washing temperature is also raised from 35 °C to 45 °C. Depending on the third decision in the intermediate rinse, a second intermediate rinse will be carried out.

12.2.4 Pre-rinse only

The program only comprises a cold rinse for the dishes.

12.2.5 Rapid rinse

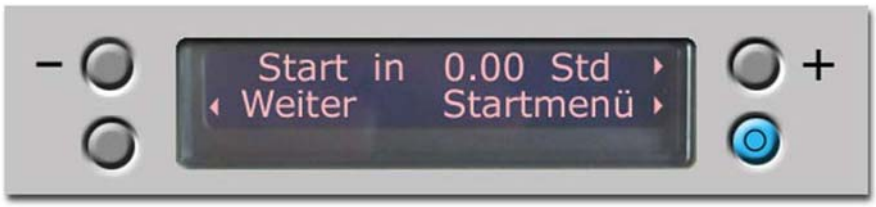
This program comprises cleaning at 35 °C, an intermediate rinse, rinsing with a rinsing agent at 55 °C, and no drying.

12.3 Options

The following parameters can be changed by pressing the “options” button. The “next” button is used to access the next menu.

12.3.1 Pre-set time

In the pre-set time menu the +/- buttons can be used to change the starting time in stages of 30 minutes each. The setting range is from 0:00 to 24:00 hours.



12.3.2 Saving time

In the saving time menu the function can be switched on or off with the +/- buttons. When the saving time option is activated, the aqua sensor will only be active once in the intermediate rinse of the automatic programs; there will be no intermediate rinse and the temperature will be raised.

This means that rinsing times are shorter and more water and energy are used.

12.3.3 Degree of drying

The degree of drying can be set in this menu by pressing the +/- buttons.

No drying	The program times are shortened by the drying time
Standard dry	Factory setting
Extra dry	The clear rinse temperature is raised by 3 K for this option. This results in better drying results.

12.3.4 Signal volume

In the signal volume menu the volume of acoustic signals can be set from 0-6.

0 = switched off

1 = low to 6 = high

4 = factory setting

If the buzzer is switched on, it will sound five times at 5-second intervals when the program is completed. This procedure is repeated five times after ten minutes.

12.3.5 Hardness range setting

In this menu the hardness range is set on automatic or manual.

The hardness range will be contingent on the optosensor for the automatic setting. The “automatic” setting is only possible if the module has been set at optosensor. This setting is carried out in the special program “A”. The hardness range setting is set at automatic as a standard.

For the manual setting the hardness range can be setting at 8 different levels with the +/- buttons.

Manual setting

°dH	°fH	°Clarke	mmol / l	Salt quantity in g per rinse	Setting
0-3	0-6	0-4	0-0.6	0	0
4-6	7-11	5-8	0.7-1.1	2	1
7-9	12-16	9-11	1.2-1.6	4	2
10-12	17-21	12-15	1.7-2.1	6	3
13-16	22-29	16-20	2.2-2.9	9	4
17-21	30-37	21-26	3.0-3.7	14	5
22-30	38-54	27-38	3.8-5.4	27	6
31-50	55-89	39-62	5.5-8.9	54	7

12.3.6 Clear rinse setting (for appliances with top dispensing only)

The clear rinse doses can be set at seven different settings with the +/- buttons in this menu.

12.3.7 Select language

In the select language menu the language of the clear text display can be set with the +/- buttons. Up to 17 languages can be set.

12.3.8 Standard programs

In addition to the rinsing programs indicated in the start-up menu, the following standard programs can be selected:

- Normal extra
- Normal eco
- Normal
- Normal plus

The program sequence for the standard programs is stipulated. No aqua sensor decisions are made.

12.4 Special functions

12.4.1 Reset

Switch the dishwasher on and when doing so keep the main switch pressed until the language selection menu is shown in the display.

Note All of the settings, such as the hardness range setting, have been set back to the delivery status and will need to be reset.

12.5 Special programs - IGV 699.0 and IGV 699.1 only

Calling up the special programs

1. Open the door.
2. Switch off the dishwasher and press the two left-hand buttons on the display and keep them pressed.
3. Switch on the main switch.

Selecting the special programs

Pressing the buttons **C** and **E** will enable the special programs (S1-SB) to be selected. Pressing the start button will start up the respective program.

12.5.1 S1 – In-plant test program

All of the display pixels can be activated by pressing the buttons.

12.5.2 S2 – In-plant test program

This test program can only be used by factory staff members.

12.5.3 S3 – Customer service program

Reading out the error store:

In the customer service program menu the +/- buttons can be used to select one of the 8 last rinsing cycles. The top line of the display will show the rinsing cycle selected as “In cycle …”. The bottom line will show S3 for the customer service program and all of the errors which occurred in the selected program will be shown as encoded errors.

Starting up the customer service program:

Once the error storage program has been read, the customer service program can be started by closing the door. Program steps can be skipped by pressing the top left-hand button (STEP); the filling steps are an exception. In the bottom line, errors which occurred in the customer service program will be shown as coded errors. The program step will be shown as two digits on the right-hand side of the bottom line.

See circuit diagrams for program sequence.

While the customer service program is activated, every change of state of the analogous signal received will be acknowledged by the electronics system with an audible signal.

INDEX	Function	°C	Time	Sensor	OK/UK	rpm UK	rpm OK	rpm WK	Time UK	Time OK	Mlock*	Volume
0	P		30									
1	FWW + AS_KAL_IR											
2	Pa + AS_KAL_IR		1									
3	FRW + AS_KAL_IR											
4	Pa + AS_KAL_IR		1									
5	VF + ASKAL_IR			F1								
6	Pa		1									
7	AS_KAL_GN		60									
8	AWT		60									
9	R		10									
10	ZR		90									
11	WWP				UB							
12	WWP				UK							
13	WWP				UB							
14	WWP				UK							
15	WWP				UB							
16	WWP				UK							
17	C		20		UK	2800						
18	U + WWP				UB			2800				
19	C		20		UB		2000					
20	C + H	65 °C max.	250		WS	2500	1500	2000	15	15		
21	P		30									
22	ZK		90									
23	MSP *										closed	
24	Pa		4									
25	MSP *										open	
26	FWW + AWT											1.0 l
27	AWT		10									
28	P		30									
00	End of program											

AWT = discharge valve (heat exchanger)
FRW = fill raw water
FWW = fill soft water
H = heater
MSP = position motor lock
P = pump
Pa = pause
U = circulate
VF = prefill heat exchanger f1
WS = alternating rinse
WWP = position water diverter
ZR = add cleaning agent
ZR = add rinsing aid
R = regeneration valve
OK = top basket
UK = bottom basket
AS_KAL_IR = clouding sensor calibration

* only if available

12.5.4 S4 – In-plant test program

This test program can only be used by factory staff members.

12.5.5 S5 – Show room / demonstration program

When the S5 special program is selected, a normal program sequence will run through the display without any consumers being activated. If the appliance is switched off the special program will not be stored.

12.5.6 S6 – Delete error storage

The error storage can be deleted with the special program 6.

12.5.7 S7 – Dispenser setting

The special program is used to set the different activation modes of the dispenser (“normal” or “top dispensing”).

When the “normal” dispensing mode is set, the setting in the option menu will be suppressed.

12.5.8 S8 – Setting without softening device

The special program S8 is used to set the module for dishwashers without softening equipment. The setting in the option menu will then be suppressed.

Please note If the setting “no water softener” is set for appliances with a water softener, the softener will be switched off (as for water softening setting 0).

12.5.9 S9 – In-plant test program

This test program can only be used by factory staff members.

12.5.10 SA – Setting with / without optosensor

The special program SA is used to set the module for dishwashers with or without an optosensor. If the setting with an optosensor is selected, the setting with or without a hardness menu will follow. If the setting without a hardness menu is selected the hardness range setting in the option menu will be suppressed.

12.5.11 SB – Calibration optosensor

When the optosensor or the evaluation module are replaced, the sensor with the special program “B” must be re-calibrated.

12.6 General instructions on the controls

12.6.1 Tap closed

If the filling level (fl) is not reached after six minutes, the controls will remain in this position and wait until the level has been reached. The display will show “check water intake” for appliances with a front display.

If the water tap is opened after six minutes, only raw water will be filled in during this filling step.

12.6.2 Regeneration electronics system

On comparing the degree of water hardness set in the appliance, the electronics system determines what quantity of water is possible before the water softener is exhausted.

The number of rinses carried out is counted. Regeneration is carried out after the maximum number of rinses possible has been reached.

The discharge behaviour of the regeneration electronics system can be seen in the description under Initial operation / replacing the electronics unit on page 87.

12.6.3 Warm water recognition

If the water which is taken into the dishwasher for a clear rinse is warmer than 45 °C, the temperature in the clear rinse cycle will be heated up to 72 °C, hence raising the temperature of the dishes themselves. The heat exchanger will not be filled up.

12.6.4 Power cut

The electronics system has a mains cut-off store which ensures that a rinsing program that has been commenced when a power failure occurs will be continued.

12.6.5 Sensors

All of the signals leaving the door switch, the level switch, the NTC sensor and the refill switches are recorded and evaluated by the microprocessor at the respective point in time.

12.6.6 Load recognition

The number of revolutions of the circulation pump is measured by the tachometer generator.

Moistening with water, hollows or grooves in the dishes or containers which have turned over may result in losses of rinsing water. In this case air is transported through the pump. This will result in noisier operation of the dishwasher and in a changed (irregular) operation of the pump.

The tachometer generator recognizes the irregular operation of the pump on filling. In order for the pump to operate smoothly again, water is filled in until the optimal water level has been reached.

On first filling, between 2.8 l and 3.7 l are filled in and 3 enquiries concerning concentrical running are made:

A maximum of 200 ml is filled up for the first request.

Another maximum 200ml is filled up for the second request.

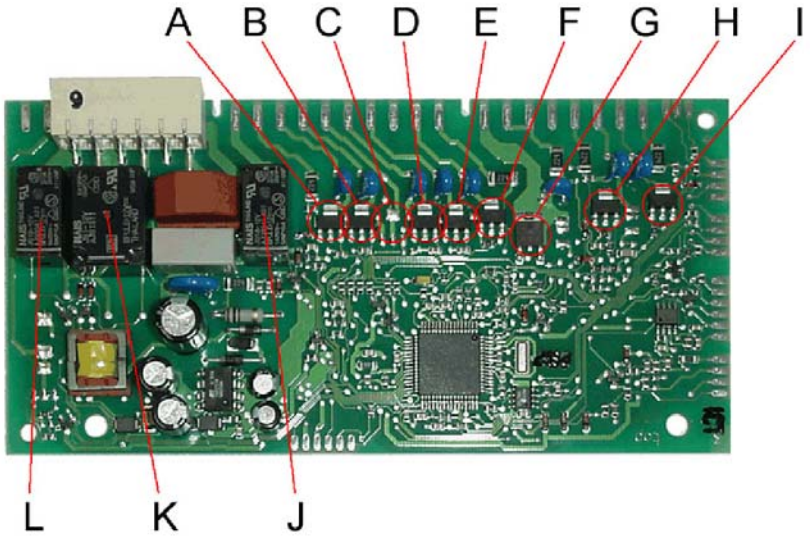
A maximum of 500 ml is filled up for the third request.

A maximum of up to 900 ml can hence be filled up again during the first filling stage. During an intermediate rinse and a clear rinse, a maximum of another 500 ml respectively can be filled up.

12.6.7 Consumers

Observe instructions on electrostatic hazards!

Consumers such as valves, detergent and clear rinse dispensers (actuators) are activated by means of triacs (see photo). The evacuation pump and the continuous flow heater are activated with relays.



Triacs

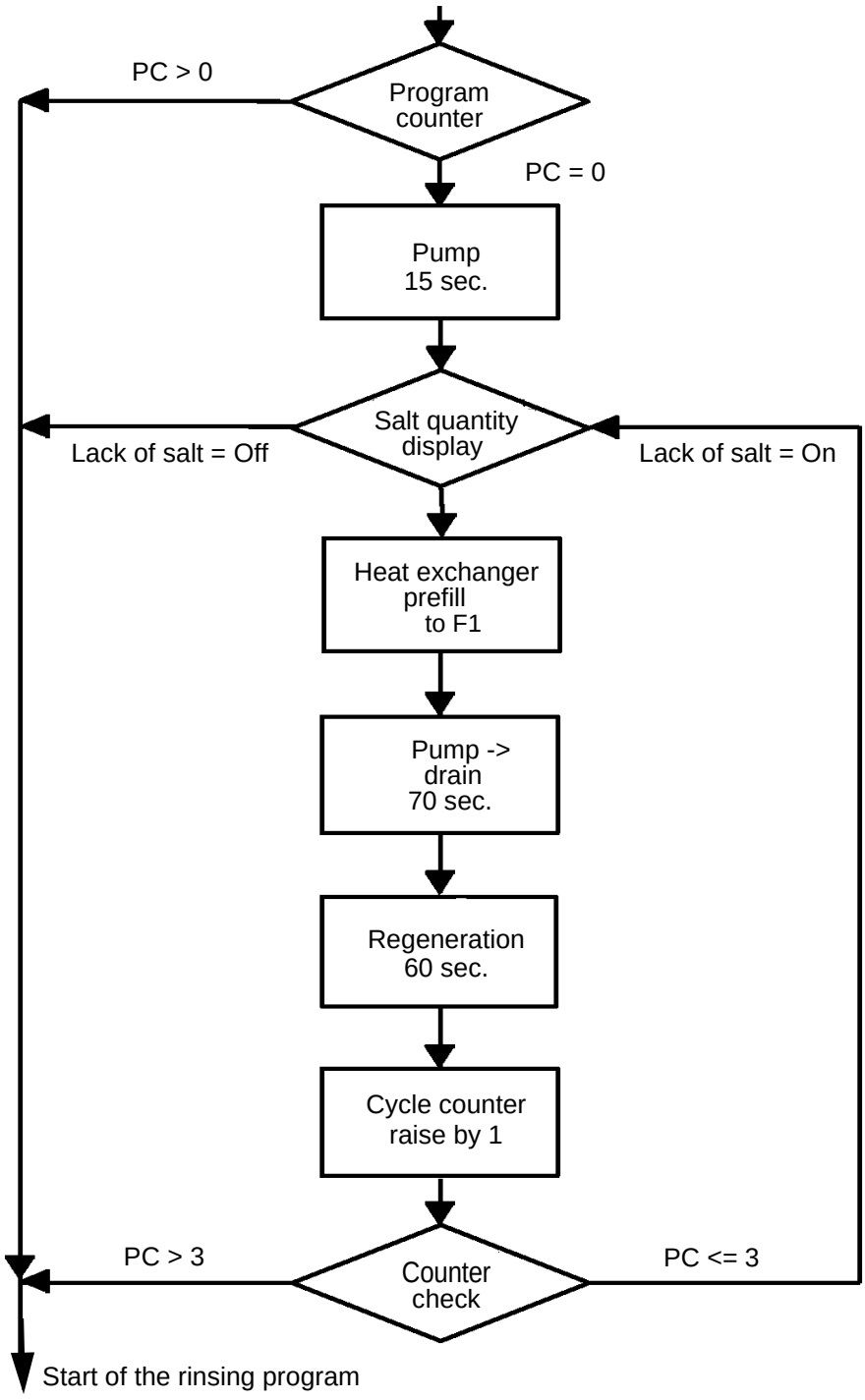
A	Charging valve
B	Heat exchanger drain-off valve
C	SICSYM trigger
D	Raw water valve
E	Regeneration valve
F	Water diverter
G	Circulation pump
H	Dispenser actuator
I	Motor lock

Relays

J	Detergent water pump
K	Heater
L	PTC optosensor

12.6.8 Initial operation / electronics exchange

In the case of initial operation or electronics exchange, the following program procedure is to be observed.
(Program scaler = 0!)
The program sequence is only activated if a lack of salt is recognised and the program counter is set at 0. If salt is recognized during the program sequence, the program will be stopped.



12.7 Customer service test program

Index	Function	Temperature	Filling volume	Time [s]	Motor lock	Sensor
1	P			15	closed	
2	VF					F1
3	F		3,9 l			
4	U + H + ZR	72°C approx.		120		
5	C + H	65°C				
6	C + H + RE	72°C approx.		120		
7	U + ZK			120		
8	AS_KAL_IR			0-480		
9	P			60		
10	FWW + AWT			60		
11	P + AWT			30	open	

P = pump
F = fill/dynamic
H = heat
ZK = add rinsing aid
FWW = fill soft water
AS_KAL_IR = clouding sensor calibration
VF = pre-fill/static heat exchanger (F1)
U = circulate
ZR = add cleaning agent
R = regenerate
WT = heat exchanger drain-off valve

Select test program: Keep the S2 and S4 buttons pressed and switch on the main switch.
The following will be indicated on the control panel:

- LEDs L2 and L4 blink.
- As long as both the S2 and S4 buttons are kept pressed subsequent to switching on, an indication for the variant code will be given in the case of a successful overhub contact enquiry.
  e.g. : 20 = Variant 0,
  21 = Variant 1, and so on.
- When one of the buttons are pressed, the respective LED will light up.
- When the S3 button is pressed the display “188” and the fault-indication LEDs as well as the procedure LEDs will also light up. The buzzer will sound at the same time.
- When the pre-set time switch is activated, an 18h-indication will light up in the 7-segment display.

The test program is started by means of pressing the S2 and S4 buttons. No pre-set time is possible. The customer service test routine ends when the main switch is switched off.

- The error number is indicated on the display:
  - 0 = No error has occurred
  - 1 = Aqua sensor defect **(Attention: Indication even if there is no aqua sensor!)**
  - 2 = Heating error
  - 4 = Filling error
  - 8 = NTC system error
  - 16 = Water diverter cannot be positioned
  - 32 = Motor lock position switch **(Attention: Indication even if there is no motor lock!)**

If more than one error code is recognised, the error code adds up

e.g. : Error code 3 = error code 1 + error code 2

Should neither of the two special functions be selected, alternating rinsing will be set. Should the soaking/top basket special function be selected, the water diverter will be positioned for the top basket. Should the shorten time/bottom basket special function be selected, the water diverter will be positioned for the bottom basket.

The next program step can be activated by means of pressing the S3 button. Skipping the heating step will be indicated as an error (**exception:** in the case of the filling step it is only possible to move on by means of the filling switch f1).
Error code indication is available in the customer service test program only!

13. Technical data

13.1 General technical data

Dimensions	
Height	81.0 cm
Width	59.6 cm
Depth	55.0 cm
Voltage / Frequency	230 - 240V / 50 Hz
Connected load	2.3 kW
Filament energy consumption	2.15 kW
Fuse protection	10 / 13 A

Dispensing device	
Rinsing agent fill quantity	120 ml
Setting 0-6	each 1 ml
Detergent filling quantity	45 g

circulating pump	
Nominal voltage	230 - 240 V
Frequency	50 Hz
Resistance	Ha ca. 44 - 57Ω Hi approx. 50 - 55 Ω
Delivery height	3.9 – 4.1 m
Discharge	25 - 30 l/min
Starting current	2.4 A
Operating current	0.31 A

Water diverter	
Nominal voltage	230-240 V (synchronous motor)
Frequency	50 / 60 Hz
Resistance	approx. 9.3 kΩ

Recovery / discharge / natural water valve	
Nominal voltage	230 - 240 V
Frequency	50 Hz
Resistance	2 kΩ
Flow rate	2.75 l/min.
Water pressure	0.5 - 10 bar

Actuator	
Nominal voltage	110 - 240 V
Frequency	50 / 60 Hz
Resistance	0.5 - 1.5 kΩ

Continuous flow heater	
Nominal voltage	230 - 240 V
Frequency	50 / 60 Hz
Output	2150 W
Resistance	ca. 22 Ω

Aqua Stop Valve	
Nominal voltage	230 - 240 V
Frequency	50 Hz
Flow rate	2.75 l/min.
Water pressure	0.5 - 10 bar

Energy label data	
Energy category	A
Washing performance	A
Drying performance	A

Volume (Permanent Rinse system)

Temperature	Resistance in kΩ	Tolerance
25	48.4	7.9
30	38.5	7.1
50	16.5	6.2
60	11.0	5.6
65	9.1	5.6

Klixon / NTC

85 °C safety switch

Salt container - filling capacity	
Fine-grained salt	approx. 2 kg
Coarse-grained salt	approx. 1.5 kg
Salt tablets	approx. 0.7 kg

Rinse water pump	
Nominal voltage	230 - 240 V
Frequency	50 Hz
Resistance	110 - 260 Ω
Delivery height	0.9 m
Delivery performance	10 l/min

13.2 Consumption data IGV 699.0 and IGV 699.1

13.2.1 Automatic programs

	Auto-plus program	Automatic rinse	Auto-delicate program	Quick rinse	Pre-rinse
Duration in min.	90 - 110	100 - 130	80 - 100	30	19
Power consumption in kWh	1.20 - 1.40	1.00 - 1.20	0.80 - 1.00	0.60	0.10
Water consumption in litres	14 - 20	12 - 18	10 - 16	10	4

13.2.2 Standard programs

	Normal-Extra	Normal-ECO	Normal	Normal Plus
Duration in min.	135	165	140	140
Power consumption in kWh	0.65	1.05	1.05	1.05
Water consumption in litres	19	14	14	15

The data indicated may deviate upwards or downwards. The figures are those resulting from laboratory tests in accordance with EN 50242 for the start of a series.

13.3 Consumption data IGV 699.2

13.3.1 Automatic programs

	Auto-plus program	Automatic rinse	Auto-delicate program	Quick rinse	Pre-rinse
Duration in hours : min.	1:40 - 2:20	1:40 - 2:40	1:20 - 1:50	0:30	0:19
Power consumption in kWh	1.20 - 1.60	1.00 - 1.30	0.80 - 1.00	0.80	0.10
Water consumption in litres	16 - 23	12 - 20	10 - 17	10	4

13.3.2 Standard programs

	Normal-Extra	Normal-ECO	Normal	Normal Plus
Duration in hours : min.	2:15	2:20	2:20	2:20
Power consumption in kWh	0.65	1.05	1.05	1.05
Water consumption in litres	19	12	14	15

The data indicated may deviate upwards or downwards. The figures are those resulting from laboratory tests in accordance with EN 50242 for the start of a series.

13.4 Consumption data IGV 699.3 / 4 and IGV 6909.0

13.4.1 Automatic programs

	Auto-plus program	Automatic rinse	Auto-delicate program	Quick rinse	Pre-rinse
Duration in h:min with Vario Speed	1:50 - 2:20 1:21 - 1:25	1:25 - 2:20 1:06 - 1:10	1:20 - 1:40 0: 48 - 0:52	0:30	0:19
Power consumption in kWh with Vario Speed	1.40 - 1.70 1.90 - 2.00	1.00 - 1.60 1.30 - 1.40	0.70 - 0.90 0.80 - 0.90	0.70	0.05
Water consumption in litres with Vario Speed	12 - 20 14 -18	9 - 19 12 - 16	10 - 18 10 - 14	10	4

13.4.2 Standard programs

	Extra	ECO 50°	ECO 45°	Normal 45°
Duration in hours : min. with Vario Speed	2:20 1:10	2:20 1:10	2:20 1:10	2:15 1:10
Power consumption in kWh with Vario Speed	1.05 1.44	1.05 1.44	1.05 1.44	0.6 1.44
Water consumption in litres with Vario Speed	15 14	12 14	10 14	14 14

The data indicated may deviate upwards or downwards. The figures are those resulting from laboratory tests in accordance with EN 50242 for the start of a series.