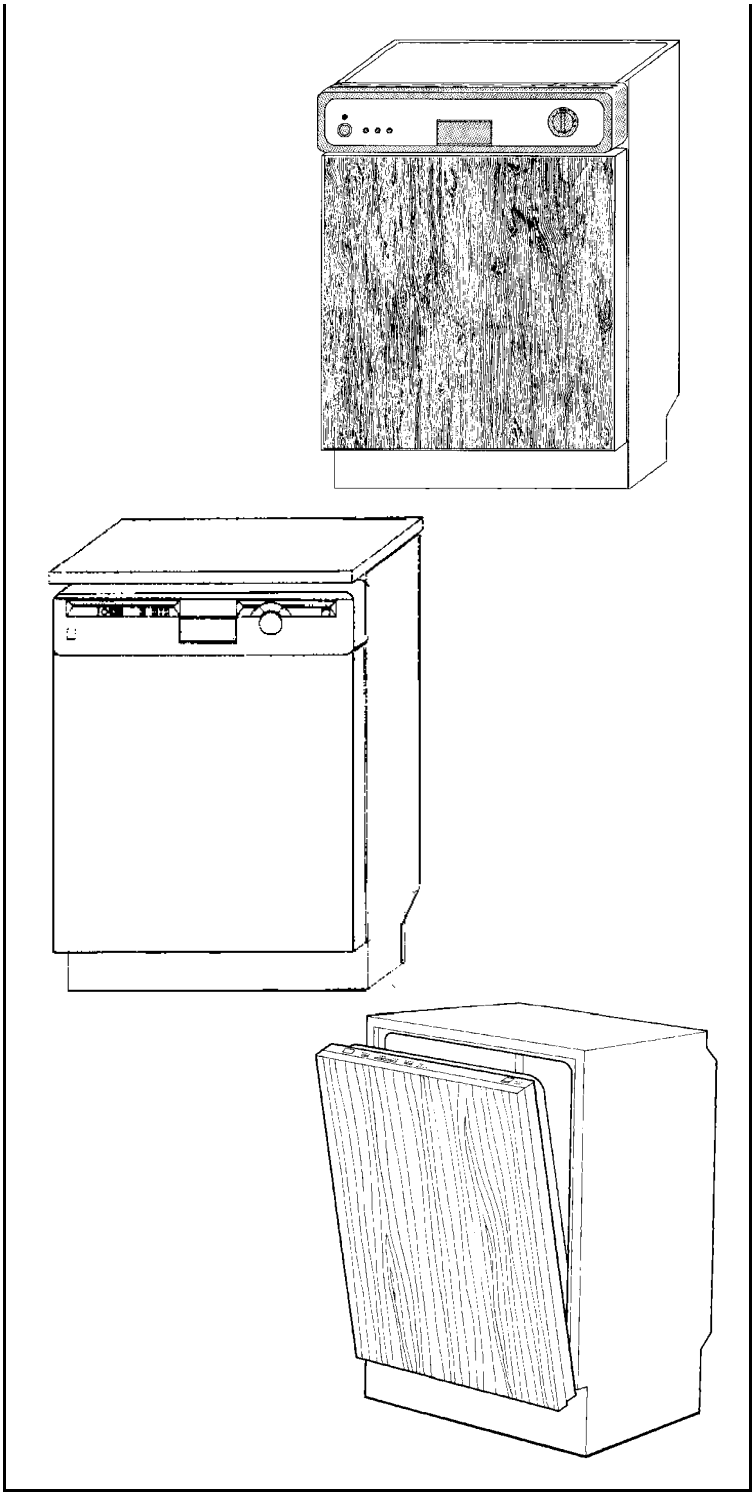

Dishwashers 1998

New Structure

Electromechanical

Itronic «HL»

Electronical «LL»

Küppersbusch

THE HEART OF A GOOD KITCHEN

GB

Service Manual: H7-410-03-02

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Contents

Purpose of this manual

The purpose of this service manual is to provide the customer service technicians who already have the necessary technical expertise to repair traditional dishwashers with specific information on the basic mode of operation of a new dishwasher type with an electronic control.

All the technical application possibilities of this dishwasher type are presented in this service manual, which acts as a general guideline.

Descriptions and function features of the components, the water circuit etc. which are already known are therefore disregarded in this edition.

1. Introduction

New technology

This new dishwasher has been designed using advanced computer technology and manufactured with the latest industrial production processes.

Result

The technological solutions and the production solutions which were applied in the manufacture of the new dishwasher as well as the details worked out by our design team have resulted in a really innovative appliance series which will satisfy all the demands of the ever changing market.

Main features

Design

- Adaptable modular design in three versions: free-standing appliance, fully integrated and built-in (control panel visible).
- Bottom section consists of sound-absorbing material and accommodates all the components.
- Removable side sections
- Flexible styling to suit the different aesthetic requirements.

Water circuit:

- Newly designed integrated water circuit.
- New integrated outlet tray (in bottom section) which permits simultaneous or alternate operation of the wash arms.
- Water softening up to the French degree of hardness 120 or the German figure 70.
- Accurate setting of the softening (10 levels).
- Mechanical setting of the softening levels (or with software in the electronic models).
- Reduction of the mains water consumption (-0.5 l per wash) compared with earlier models.

Electric system:

- Integrated dual-function pump motor (for circulation and draining).
- Newly designed programme switch mechanism/electronic controls (to optimise performance and consumption).
- Aerated drying system (in the electronic top models).

Safety and control circuits:

- Measurement of the wash water temperature by thermostat or temperature sensor (in electronic models).
- Measurement of the water level by pressure switch.
- Waterproofing facilities: protection against leakage, overflow protection, aquastop.
- Protection against overheating: safety thermostat, time-out feature.
- Door locking system.
- Function monitoring controlled entirely by software (only electronic models).

Convenient handling:

- Designed completely with recyclable materials.
- Extremely quiet running thanks to new materials and new technologies.
- Simple installation both as free-standing and fitted appliance.
- New setting system for the rear feet accessible from the front (top-of-the-range fitted models).

Service:

- Easy accessibility of all components thanks to the removable side walls and the well-designed arrangement of all major parts.

2. Features

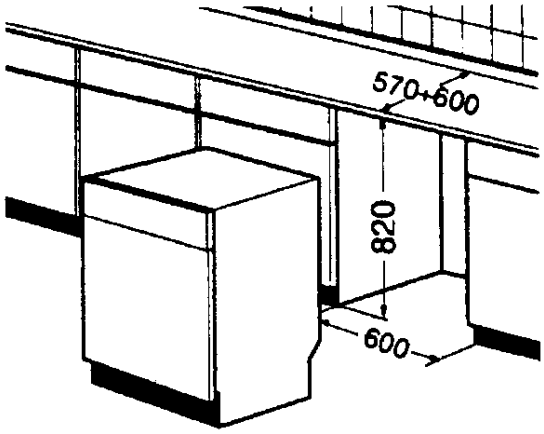
Dishwasher "New Structure 60 cm"
Product sector: Standard versions

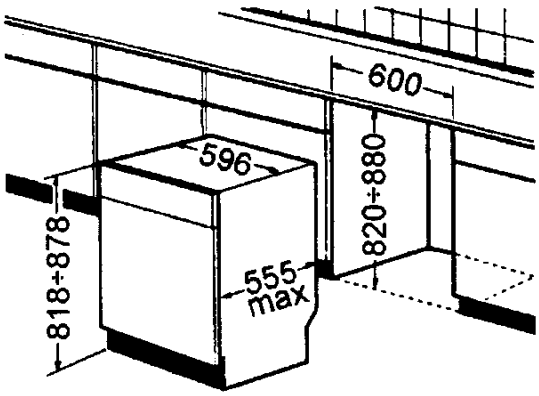
Model series	Features
Basic / Standard	
Versions	**Functions**
♦ FREE-STANDING APPLIANCE ♦ Built-in ♦ Fully integrated	♦ CAR/TCR ♦ Electromechanical programme switch mechanism ♦ 1/2 buttons ♦ 4/6 wash programmes ♦ 1/2 cleaning temperatures ♦ Programme selection knob ♦ 5 softening settings
Middle class / Luxury class	
Versions	**Functions**
♦ FREE-STANDING APPLIANCE ♦ Built-in ♦ Fully integrated	♦ CAR/TCR ♦ Electromechanical programme switch mechanism ♦ 3/4 buttons ♦ 6/9 wash programmes ♦ 2/3 cleaning temperatures ♦ Programme selection knob ♦ 5 softening settings ♦ Intermittent drying
ITRONIC «LL» Standard	
Versions	**Functions**
♦ Fully integrated	♦ TCR ♦ Electronic control ♦ 6 buttons ♦ 5 wash programmes ♦ 4 cleaning temperatures ♦ Programme selection button ♦ 5 softening settings ♦ Intermittent drying
ITRONIC «HL» Middle class / Luxury class	
Versions	**Functions**
♦ Fully integrated	♦ TCR ♦ Electronic control ♦ 5 buttons ♦ 9 wash programmes ♦ 5 cleaning temperatures ♦ Programme selection button + display ♦ Intermittent drying ♦ Delayed programme start

2.1 Mechanical design

Design:	60 cm				
Capacity:	12 place settings				
Versions:*		**Standard**	**Medium class**	**Luxury class**	**Itronic**
Water:	litres	22	20	19	19
Current:	kWh	1.5	1.5	1.4	1.4
Detergent:	grams	20	20	20	20
Programme duration (2,100 W):	min.	94	92	90	90

* The data given relate to the UNIVERSAL wash programme

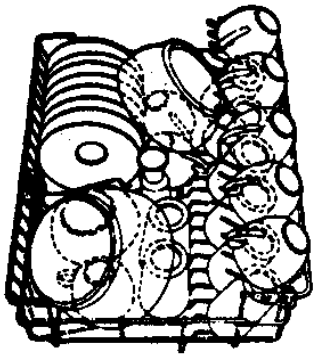


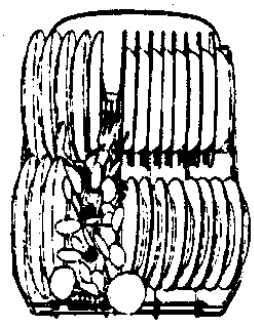


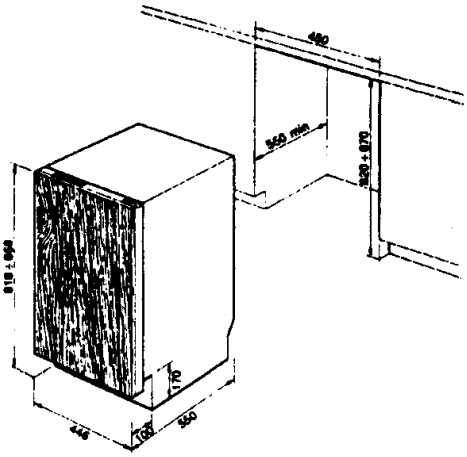
2.2 Features

Design	♦ fully integrated
Capacity	♦ 8 place settings
Consumption data	♦ water 17l ♦ current 1.1 kWh

SLIM 45 cm

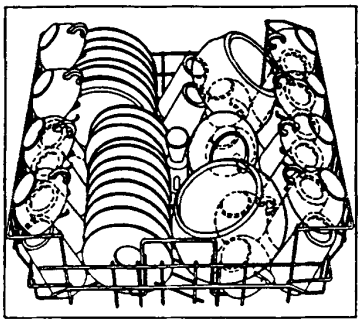


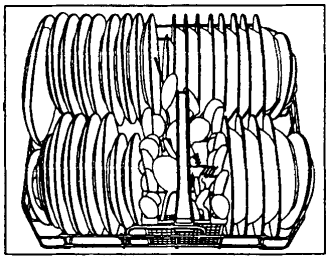


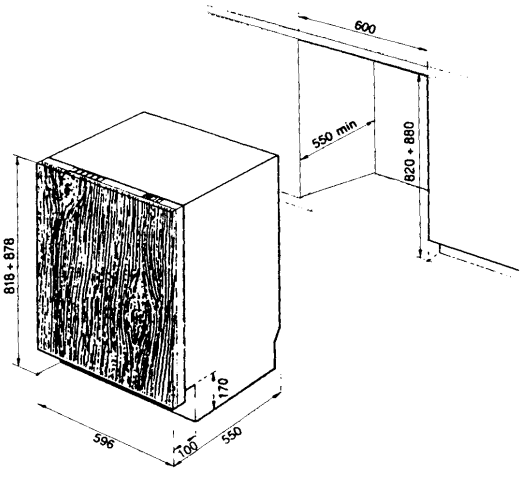


Design	♦ fully integrated
Capacity	♦ 12 place settings
Consumption data	♦ water 19l ♦ current 1.4 kWh

H.E. 60 cm (long door)



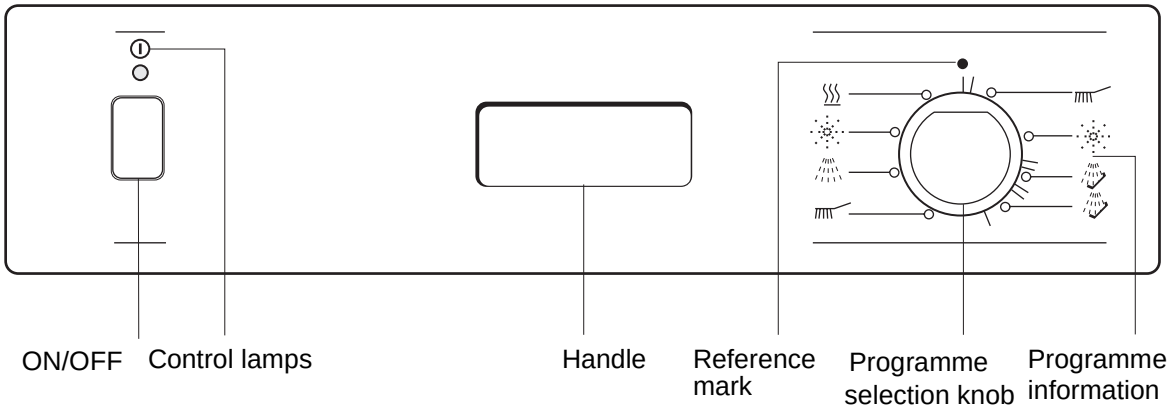




3. Appliance group features

3.1 Appliance group (A) features - IG 643.

- Electromechanical timer
- Upper basket without venturi jet
- Visible heating element
- Normal drying system
- Control panel summary:



Symbols:

Prewash

Wash

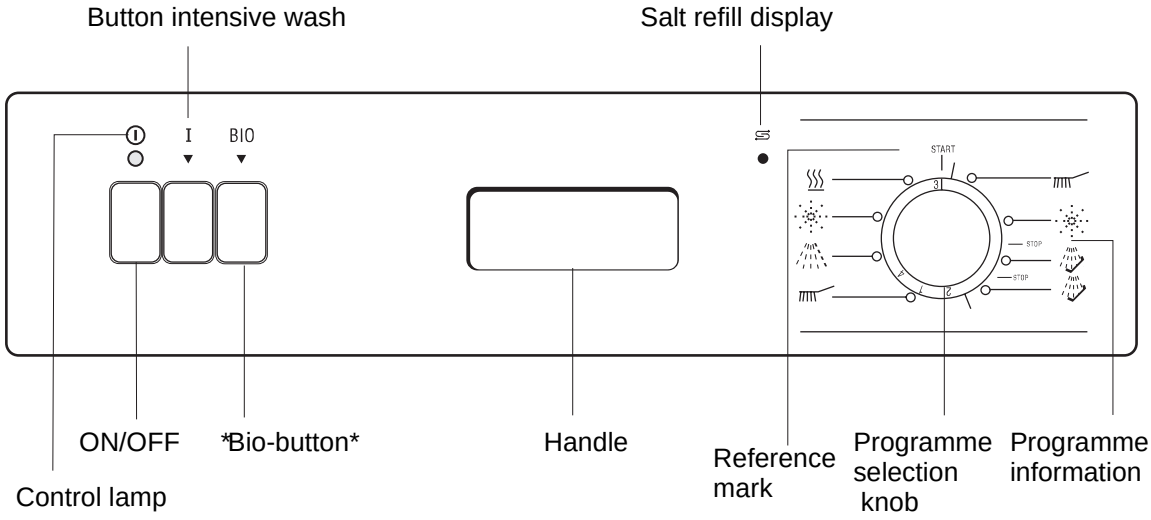
Cold rinse

Hot rinse

Hot air drying

3.2 Appliance group (A) features – IG 646.

- Electromechanical/electronic timer
- Simultaneous rinsing of upper and lower basket
- Integrated heating
- Active drying system
- Control panel summary



Symbols:

Prewash

Wash

Cold rinse

Cold rinse

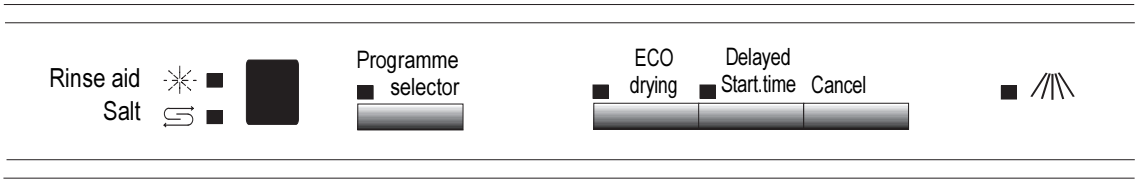
Hot air drying

* BIO: special programme for enzymatic compact detergent

3.3 Appliance group (B) features – IGV 658.

- Electronic timer
- Upper basket without venturi jet
- Simultaneous rinsing of upper and lower basket
- Integrated heating
- Active drying system
- Control panel summary:

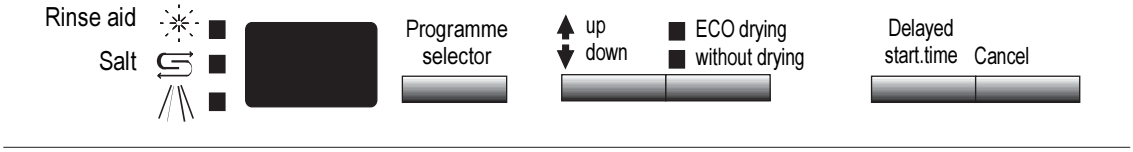
- Control panel in detail:



3.4 Appliance group (C) features – IGV 689.

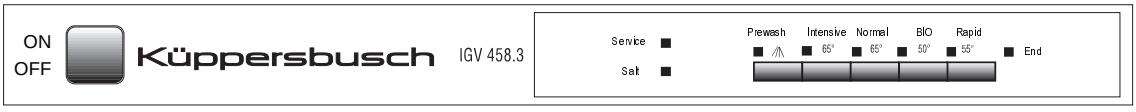
- Electronic timer
- Upper basket without venturi jet
- Alternating wash system
- Upper basket rinse technology
- Integrated heating
- Turbo drying system
- Control panel summary

- Control panel in detail:

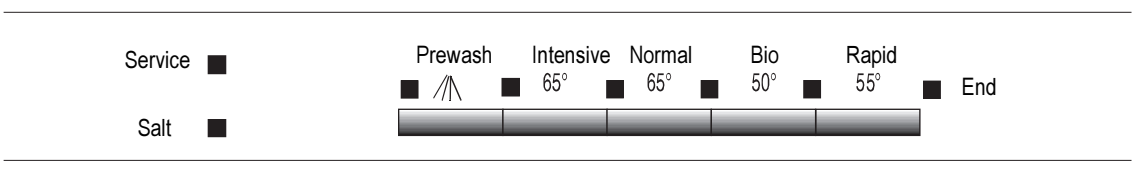


3.5 Appliance group (C) features – IGV 458.

- Electronic timer
- Upper basket without venturi jet
- Visible heating
- Normal drying system
- Control panel summary:



- Control panel in detail:

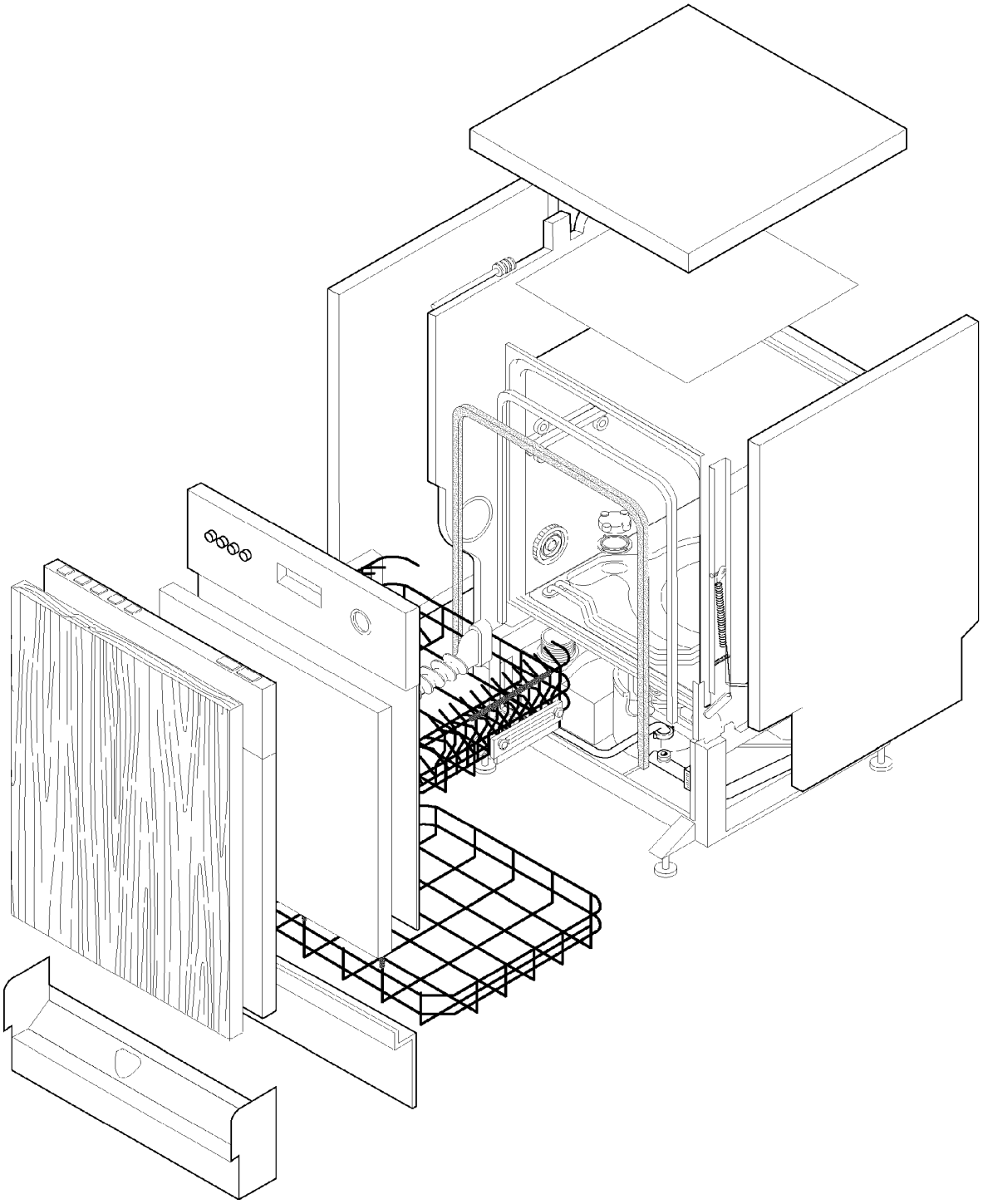


4. Comparison of earlier dishwashers with the new models

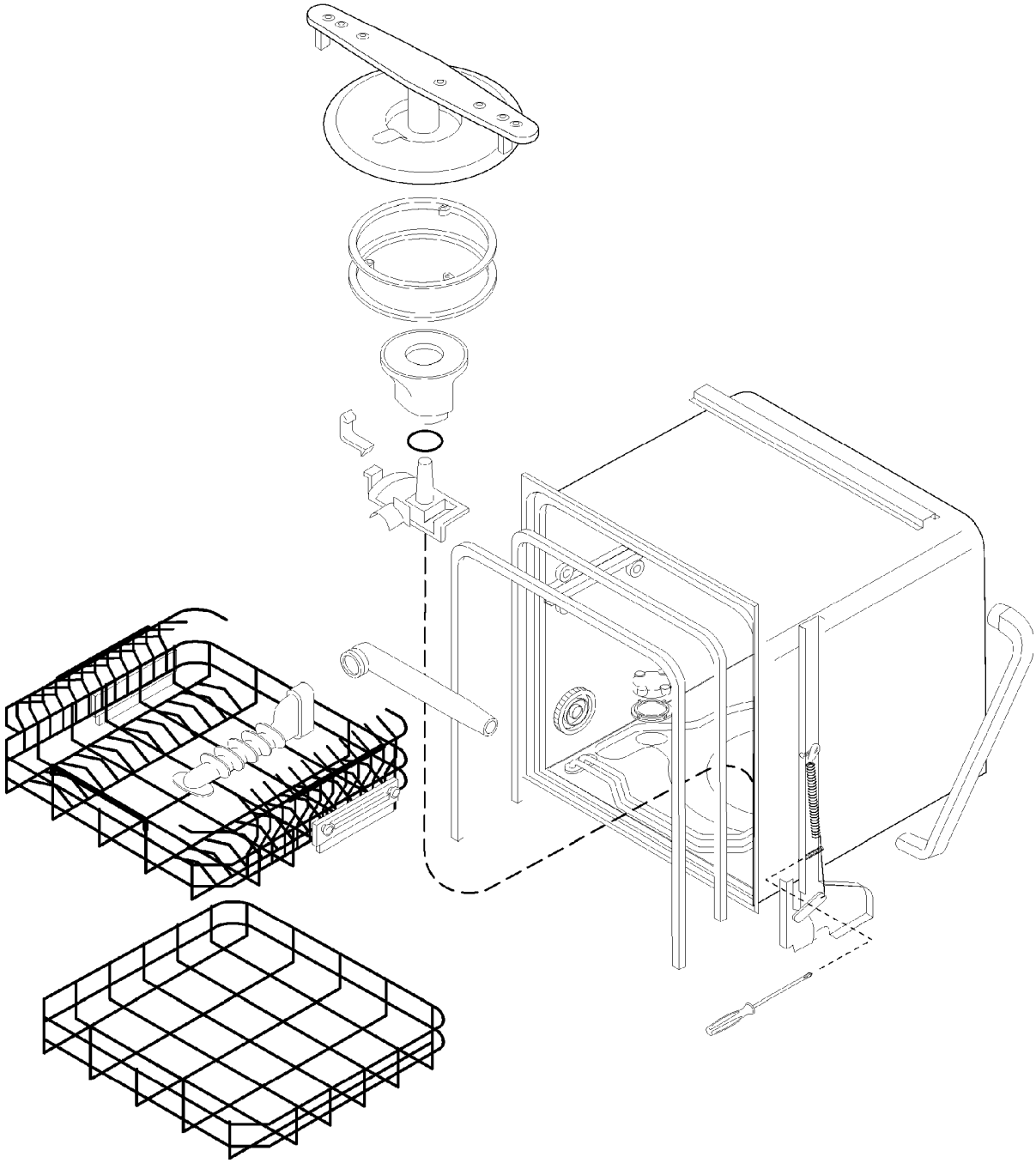
Model	Timer	Heating	Drying	Control buttons	Tempera-tures /°C	Pro-grammes	Water /l	Energy /kWh	Noise
IG 643.2	old	visible	air	1	65	4	20	1,5	57
IG 643.3	new	visible	air	1	65	4	19	1,4	52
IG 646.1	old	visible	air	3	65/55	6	20	1,4	55
IG 646.2	new			3	70/65/50	6	19	1,4	51
IGV 657	old	visible	air	6	65/55	5	20	1,4	52
IGV 658.0	electronic		air	5	70/65/55/50	9	19	1,4	51
IGV 689.0	electronic	visible	air	7	40 - 70 5 levels	10	17	1,2	48
IGV 689.1	new electronic.		air	6	40 - 70 5 levels	10	17	1,2	48
IG 446.0	old	visible	air	3	65/55	6	17	1,0	55
unchanged IG 446.0			air						54
IGV 458.2	old	visible	air	6	65/55	5	17	1,0	52
IGV 458.3	electronic	visible	air	6	70/65/50	5	17	1,0	51

5. Design

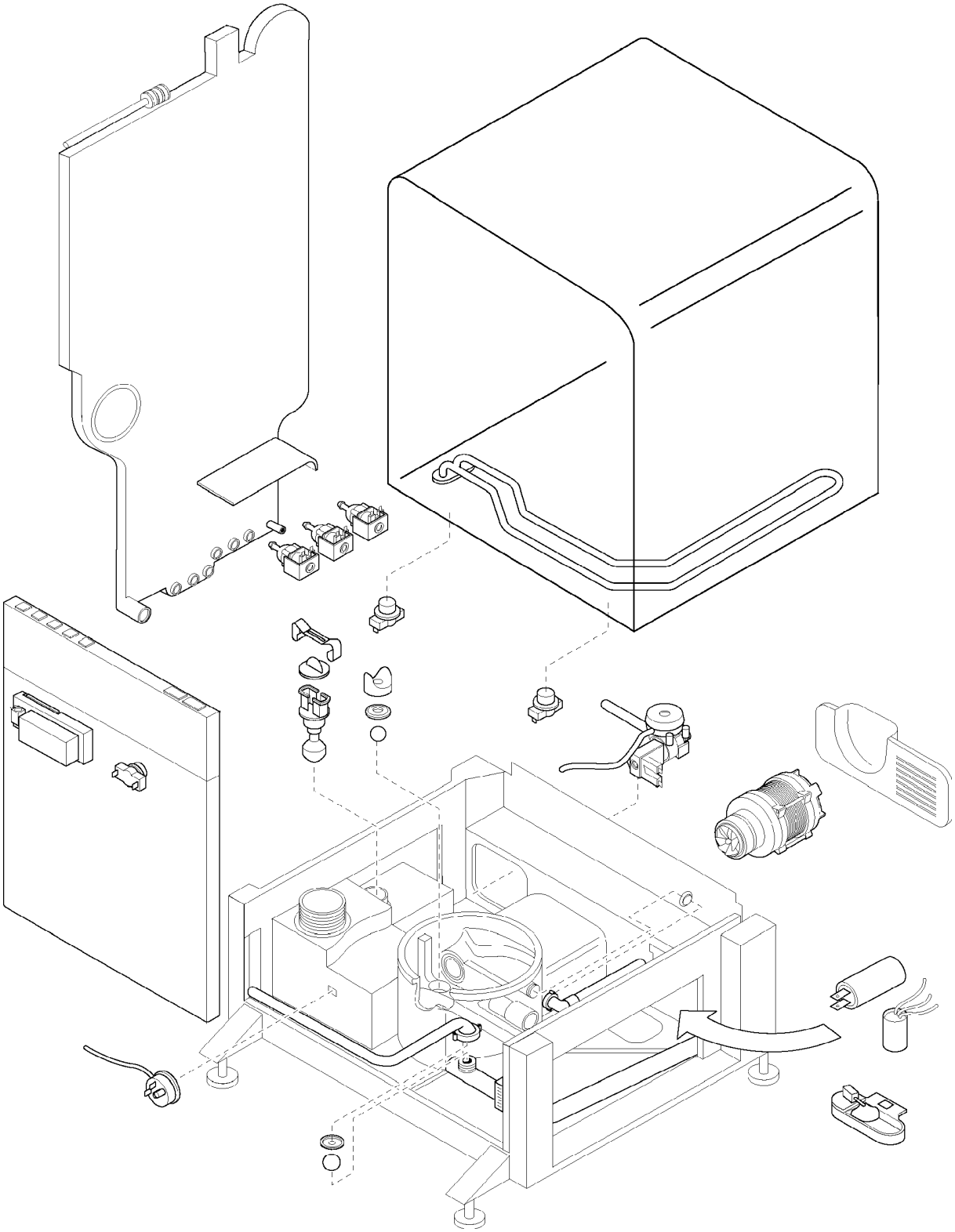
5.1 General components



5.2 Base pan / Outlet tray



5.3 Components of the water circuit / electrics



6. New designs

Pumps and outlet tray
Integrated heating
Drying systems

6.1 Pumps and outlet tray

Circulating pump/drainage pump

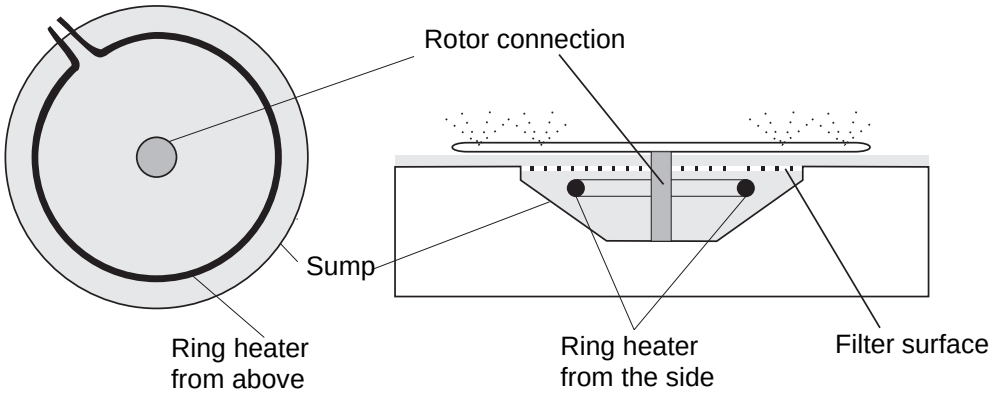
- Only one pump instead of the usual two pumps.
- For circulating water - normal operation.
- For draining water - reverse operation.

Outlet tray (sump)

- New design for alternating rinsing.
- Alternate rinsing of upper and lower basket.
- With waste scraps container for separating waste from circulating water.
- **New design reduces mains water consumption**.
- 0.5 l less per cycle compared to earlier models.

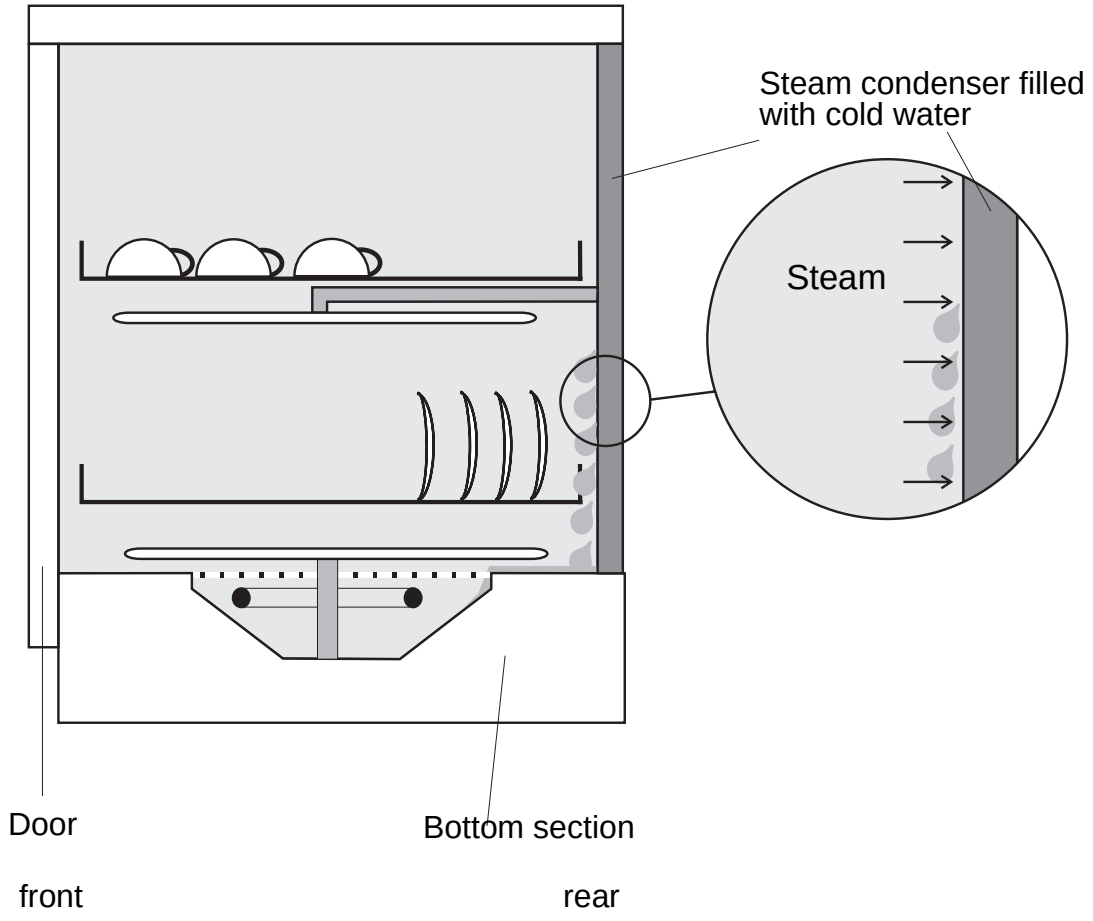
6.2 Integrated heating

- **Ring heater**
  fitted beneath the stainless steel filter in the sump.
- **Improved water circulation**
- **Drying results**
  – active drying: GOOD
  – turbo drying: VERY GOOD



6.3 New design - active drying system

- **Can be combined with integrated heating**
- **Condensation drying**
- **No fan**
  – no external air feed
  – no moisture outlet
- **Available for**
  – built-in appliances
  – fully integrated dishwashers
- **Drying results: GOOD**



Side view of dishwasher

6.4 New design - turbo drying system

- **Turbo condenser**
  – active drying with fan
  – no external air feed
  – no moisture outlet

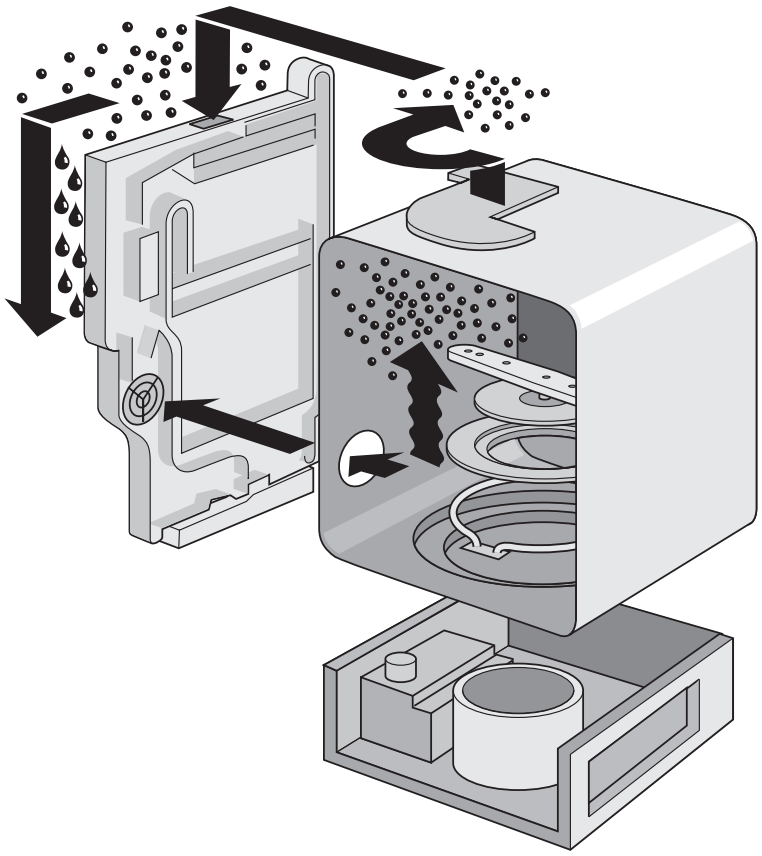
- **Can be combined with integrated heating and electronic controls.**

- **Available for**
  – built-in appliances
  – fully integrated appliances

- **Drying results: VERY GOOD**

6.5 New design - drying system summary

- **Active drying**
- **Turbo drying**
  like active drying but fan-assisted



7. Water management system - summary

- IWMS: Integrated water management system
- Upper rotor feed pipe
- Water softener
- Waterproofing devices
- Noise reduction

7.1 New water management IWMS

The IWMS is a plastic monobloc, which is attached to the left side of the dishwasher.

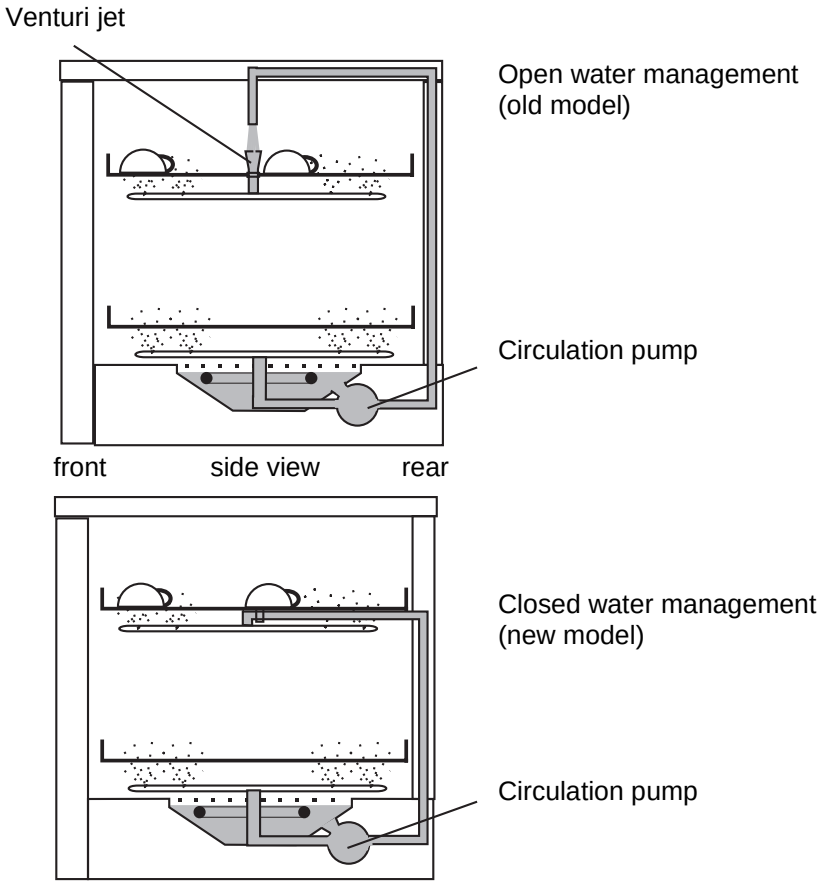
The IWMS regulates the following procedures:

- Mains water inflow
- Filler control
- Overflow protection
- Water softening
- Regenerating the water softener
- Drainage circuit
- Steam release

7.2 New water management - Upper rotor feed pipe

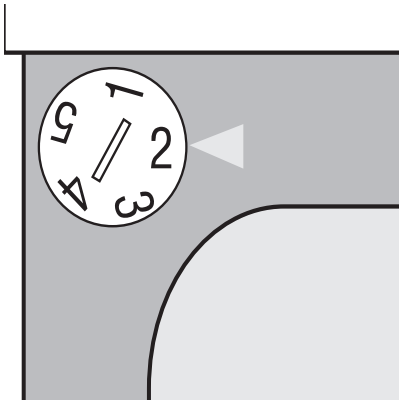
- **Enclosed water flow replaces venturi jet**
- **New SID**
  – Addition of detergent via the water feed
  – Pre-dissolving of detergent leads to greater efficiency.
  – No more detergent caking.
- **Also in 45 cm appliances for 9 international place settings**

- **Main advantages**
  – Simpler loading of the upper basket with more space
  – Less pressure loss and so lower energy requirements
  – Less water required per cycle
  – Noise reduction



7.3 New water management - Water softener

- **Reduced salt consumption**
  – from 25g per cycle to 15g per cycle at water hardness setting 4
- **Enlarged salt container**
  – sufficient for 140 instead of 60 cycles
- **Water hardness range**
  – water hardness range extended by 30%
- **Residual hardness at water hardness setting 4 only water hardness setting 1**
- **Better use of detergent - particularly with enzymatic compact detergent**
- **Adjustment**
  – 5 settings; simple and reversible adjustment



8. Water hardness and its units*

- **Water hardness: the sum of combined alkaline-earth metals (magnesium, calcium, strontium and barium) as a carbonate, sulphate, chloride, nitrate or phosphate.**
- **Units: alkalis in mmol/l or mval/l or German hardness degree.**

	Alkaline earth metals mmol*/l	German degree /°d	English degree /°e	French. degree /°f
1mmol*/l alkaline-earth metals		5,60	7,02	10,00
1 German degree	0.18		1.25	1.78
1 English degree	0.14	0.056		0.100
1 French degree	0.10	0.560	0.702	

* Under the law relating to units of measurement (2 July 1969), for commercial purposes only SI units may be used. Here only mmol/l are shown.

- **Breakdown according to German hardness degrees:**

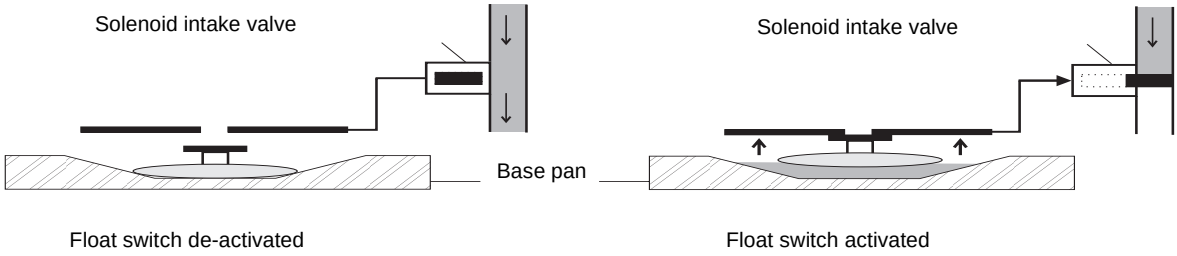
<4° d	very soft	water hardness setting 1
4-8°d	soft	water hardness setting 2
8-18°d	mid-range	water hardness setting 3
18-30°d	hard	water hardness setting 4
>30°d	very hard	water hardness setting 5

Taken from Merck, „Die Chemische Untersuchung von Wasser“

9. Waterproofing and other protective devices

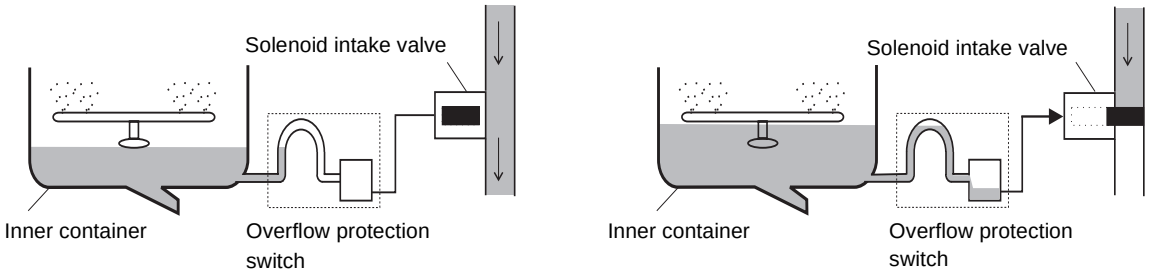
9.1 Protection against leakage

- **Electromagnetic protective device connected to intake valve.**
- **Floater switch at the base of the dishwasher.**
  – As soon as water enters the base trough, the floater activates the valve. Water intake is interrupted.



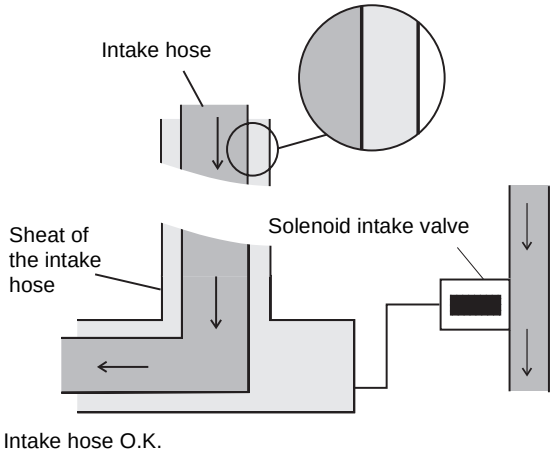
9.2 Overflow protection

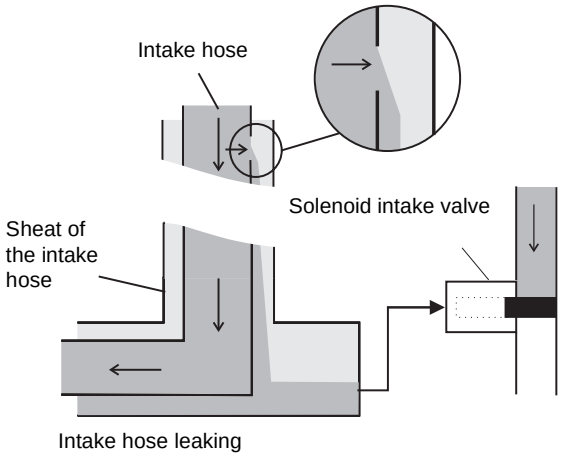
- **Mechanical IWMS device in the intake valve.**
- **Water level controls**:
  – The overflow system comes into play at raised water levels.
  – The intake valve is switched on and water intake is blocked.



9.3 Aquastop

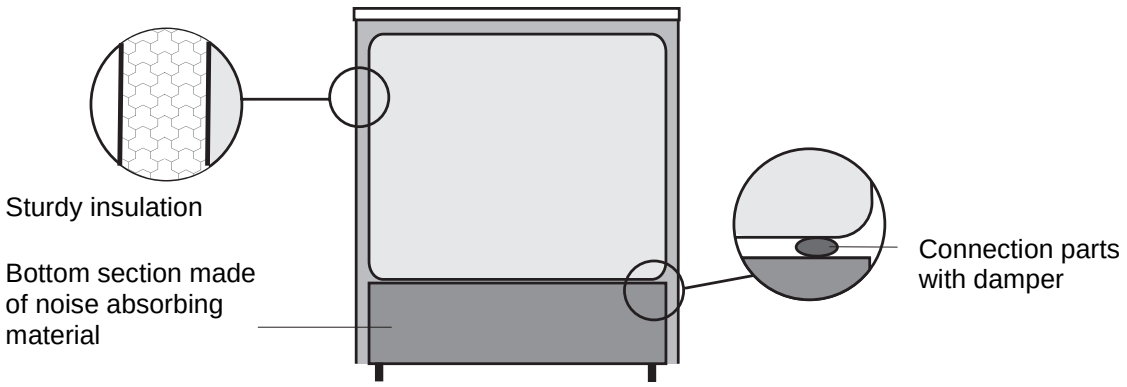
- **Mechanical system incorporated into the intake pipe.**
- **Responds when intake pipe is leaking.**
- **Function**:
  – Leaking water runs along the pipe sheath to the aquastop.
  – Aquastop switches off the water intake.





9.4 Noise reduction

- **Noise reduced to 48dB!**
- **How**:
  – Enclosed water management without venturi jets.
  – Separating mechanical parts from the housing.
  – Separation of inner container from housing.
  – Good insulation.



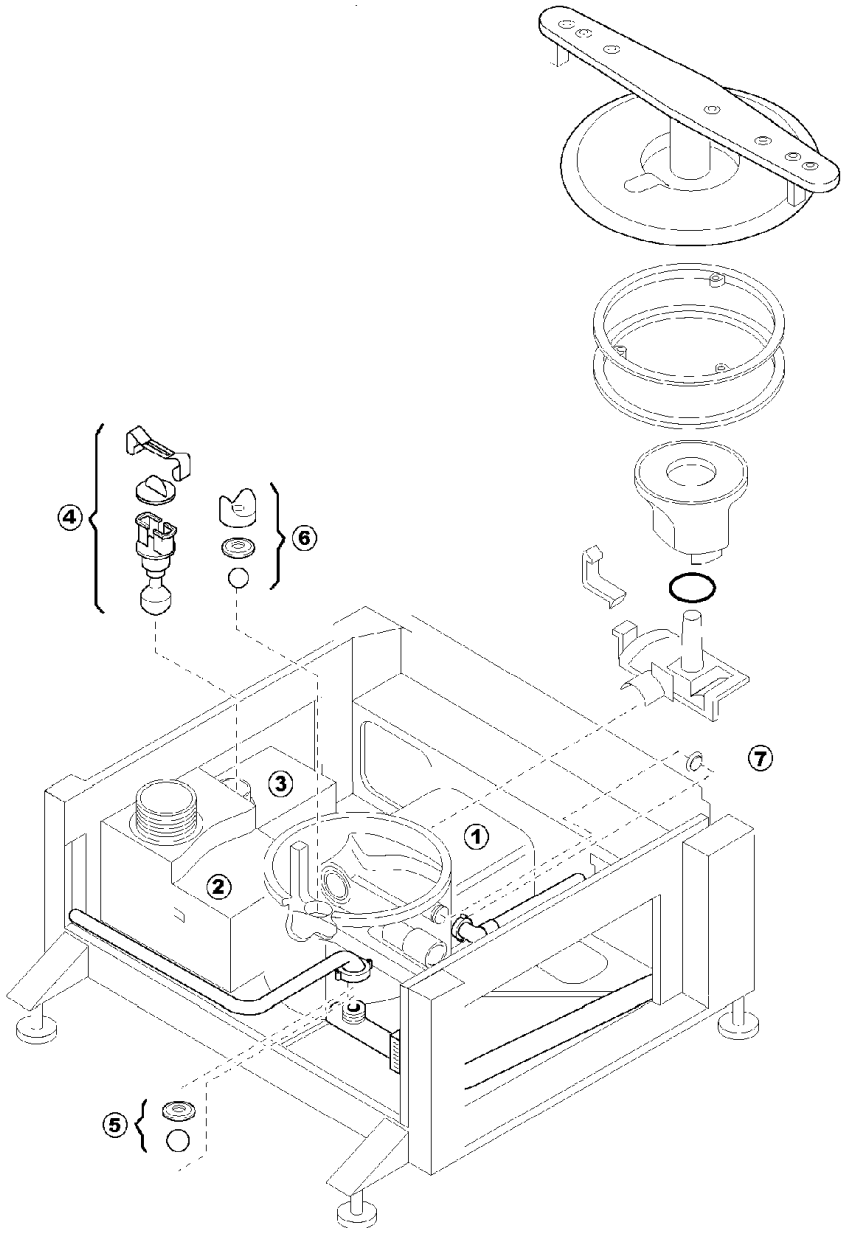
10. The water circuit

The water circuit system largely consists of two main components:

- The base containing the liquids
- The IWMS; its function is to soften the water.

10.1 The base

The base not only forms the bearing structure for the appliance but also contains the water circuit components.



The following components are installed in the base:

1. OUTLET TRAY

The outlet tray is a container which is fitted with special channels through which the water is collected and distributed for cleaning the dishes.
The outlet tray is connected by a series of channels to the IWMS; from the outlet tray the wash water is pumped to the wash arms and the waste water pumped out.

2. SALT CONTAINER

The salt container contains the salt which is needed during the regeneration cycle. The salt container is connected to the IWMS by the water circuit.

3. SALT WATER COLLECTING CONTAINER

This container holds the water which has been collected during the regeneration and ion exchange cycles. It is connected to the IWMS by the water circuit.
The water circuits which join the various components together are fitted with specially designed valves which ensure reliable operation and high system efficiency.

4. AERATION VALVE FOR THE SALT WATER COLLECTING CONTAINER

This float valve is attached to the salt water collecting container (underneath the base pan).

The valve has two functions:

- ♦ It opens the aeration valve of the container during the regeneration cycle so that the salty water can flow into the container.
- ♦ It closes the aeration valve during the draining cycle to ensure that the pump runs at maximum efficiency (required time to pump the container empty: 30 seconds).

5. ION EXCHANGE SEPARATING VALVE

The float ball valve is mounted on the outside of the outlet tray and is connected by a channel to the salt water collecting container. The purpose of this valve is to separate the salt water in the salt water collecting container from the softened wash water.

6. BOTTOM VALVE OF THE OUTLET TRAY

This float ball valve is mounted inside the discharge pump.

It has two functions:

- ♦ During the cleaning operation it must separate the water in the wash water circuit from the waste water.
- ♦ During the draining operation it must ensure that the outlet tray is also pumped empty when the filter system or the periscope is not fully operable.

7. NON-RETURN VALVE (NORMALLY CLOSED)

The diaphragm non-return valve is mounted outside the outlet tray and is connected directly to the drain. Its purpose is to ensure that the water in the base pan of the dishwasher is kept separate from external water circuits. This means that no water can enter the appliance through the waste water hose from outside the appliance (from drain, siphon etc.).
At the end of the draining phase it also reduces the amount of residual water which remains in the outlet tray.

10.2 IWMS

The **IWMS** is an integrated water softening system which controls the following operations:

- Mains water intake
- Filling control
- Water softening system
- Waste water circuit
- Steam release

MAINS WATER INTAKE

The mains water intake is in the "NORMAL" mode when the following conditions are fulfilled:

2 - The intake solenoid valve is supplied with power.
17 - The pressure switch is in the "EMPTY" position
14 - The container for the filling control is empty.
15 - The reset solenoid valve functions correctly..

FUNCTION OF THE MAINS WATER INTAKE

The mains water from the intake solenoid valve passes through the free air section **(5)**, enters the container with the ion exchange mass **(11)** and fills the water intake container **(12)**. Then it passes into the volume distributor **(13)** which splits the water into two directions.
A small amount (1/6) is passed into the container for the filling control **(14)**, the remainder (5/6 of the total volume) is passed directly into the base pan.

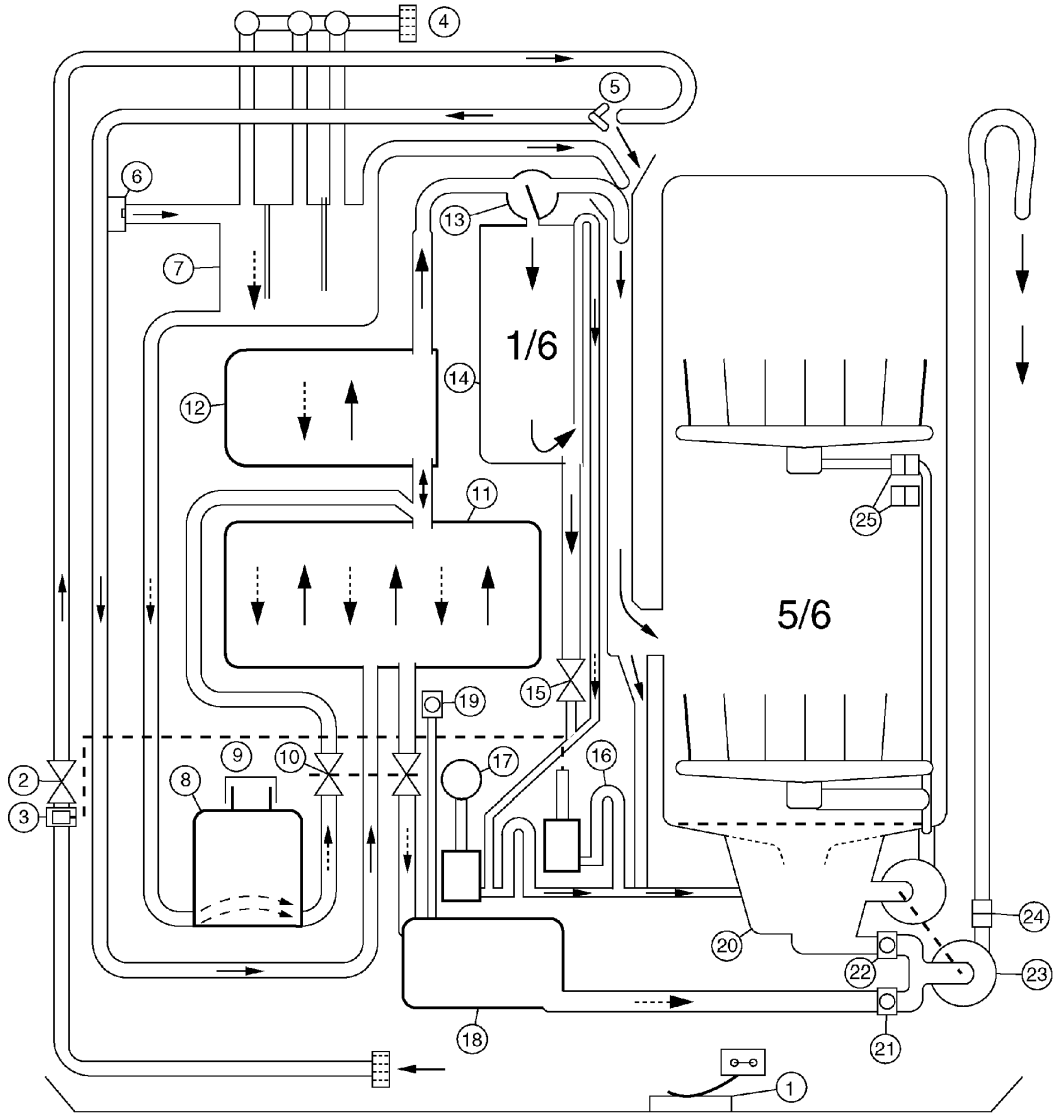
FLOW OF THE 1/6 OF THE WATER

This part of the water flows into the container for the filling control **(14)**. As soon as the water has reached the maximum level (full), the overflow siphon is activated which conveys the water through a channel to the bottom. In this phase the water flow generates a dynamic pressure in the pressure chamber of the pressure switch **(17)**. As a result, the pressure switch is activated and it switches off the intake solenoid valve; the programme can then continue.
At the end of the filling cycle and always before the start of the subsequent filling cycle, the reset solenoid valve **(15)** is opened to ensure that the container for the filling control **(14)** is completely emptied as residual water in the container would alter the amount of filling water.

FLOW OF THE 5/6 OF THE WATER

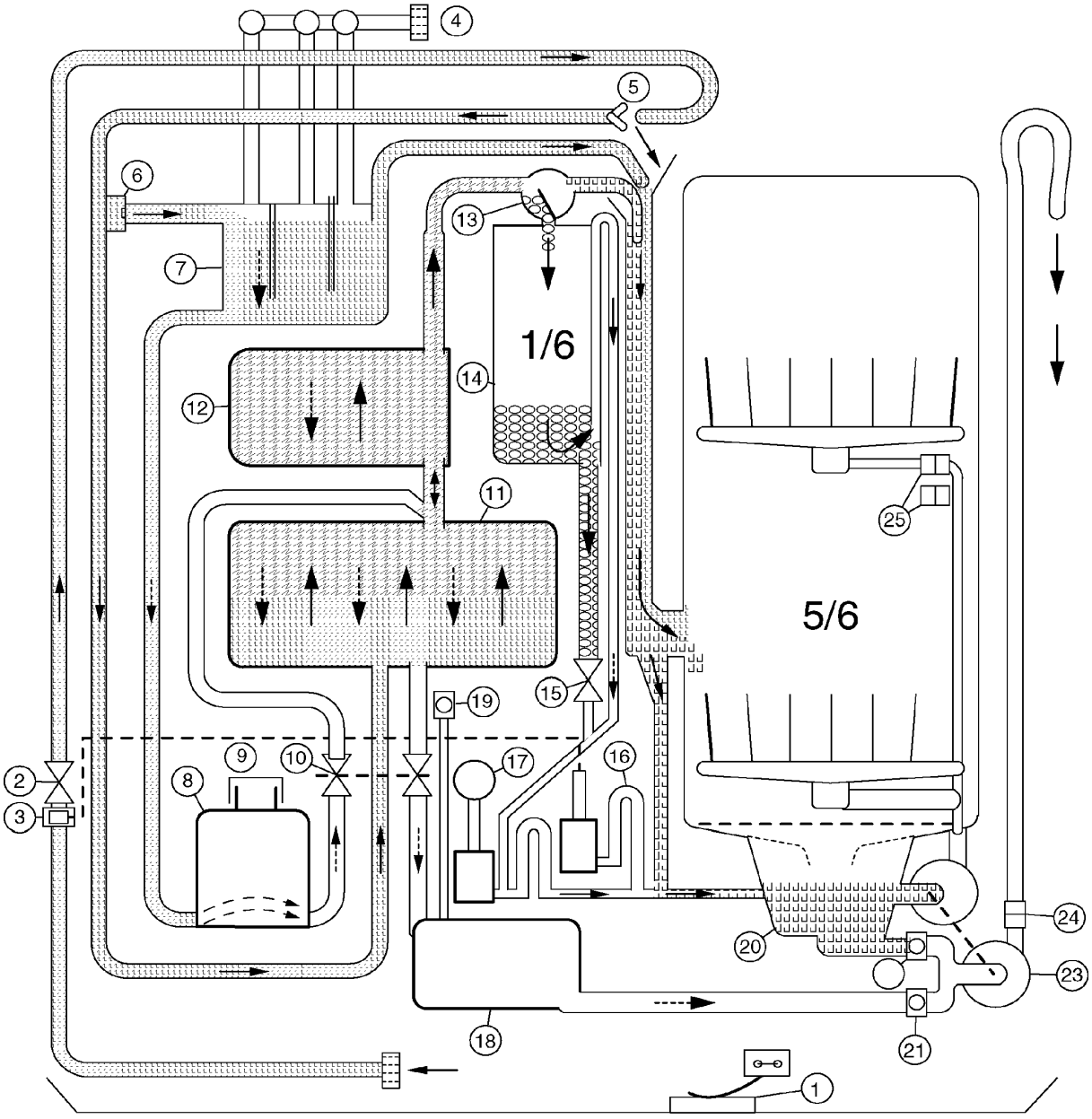
Most of the water volume which flows through the volume distributor **(13)** is fed to the base pan of the dishwasher in two different ways and in different amounts. A small amount of water is passed directly into the base pan through the steam release; the remaining amount of water flows through a separate channel into the outlet tray.
The main reason for passing different amounts of water in different routes is to ensure that the pressure chamber is continually cleaned and that the water level control operates with maximum reliability.

10.3 Water circuit



1 Protection against leakage
2 Intake solenoid valve
3 Aquastop
4 Softening setting (manual)
5 Free air section
6 Filling valve for regeneration tank
7 Regeneration tank
8 Salt container
9 Solenoid valve for regeneration
10 Solenoid valve for ion exchange
11 Container with the ion exchange mass
12 Water intake tank
13 Volume distributor
14 Container for filling control
15 Reset solenoid valve
16 Overflow protection system
17 Water level control (pressure switch)
18 Salt water collecting container
19 Aeration valve for salt water collecting container
20 Outlet tray
21 Ion exchange separating valve
22 Bottom valve of the outlet tray
23 Circulation/Draining pump
24 Non-return valve
25 Feed valve for upper wash arm

10.4 Mains water intake



10.4.1 Control of the mains water intake

This system controls the route through which the water flows during the intake cycle inside the IWMS - from the intake hose through the intake solenoid valve and the entire internal water circuits until the water reaches the base pan of the dishwasher.

The control consists of the following subsystems:

- ♦ Control of the intake water volume
- ♦ Control of the water level in the base pan
- ♦ Control of the overflow protection system
- ♦ Control of the water volume drained

This new volumetric system regulates the water volume for each intake cycle using a volume distributor which taps off a small amount of water (1/6 of the total amount) into a container for the filling control.

The system consists of the following components:

13 - Volume distributor
14 - Container for the filling control
14 - Overflow siphon (in the container for the filling control)
15 - Reset solenoid valve

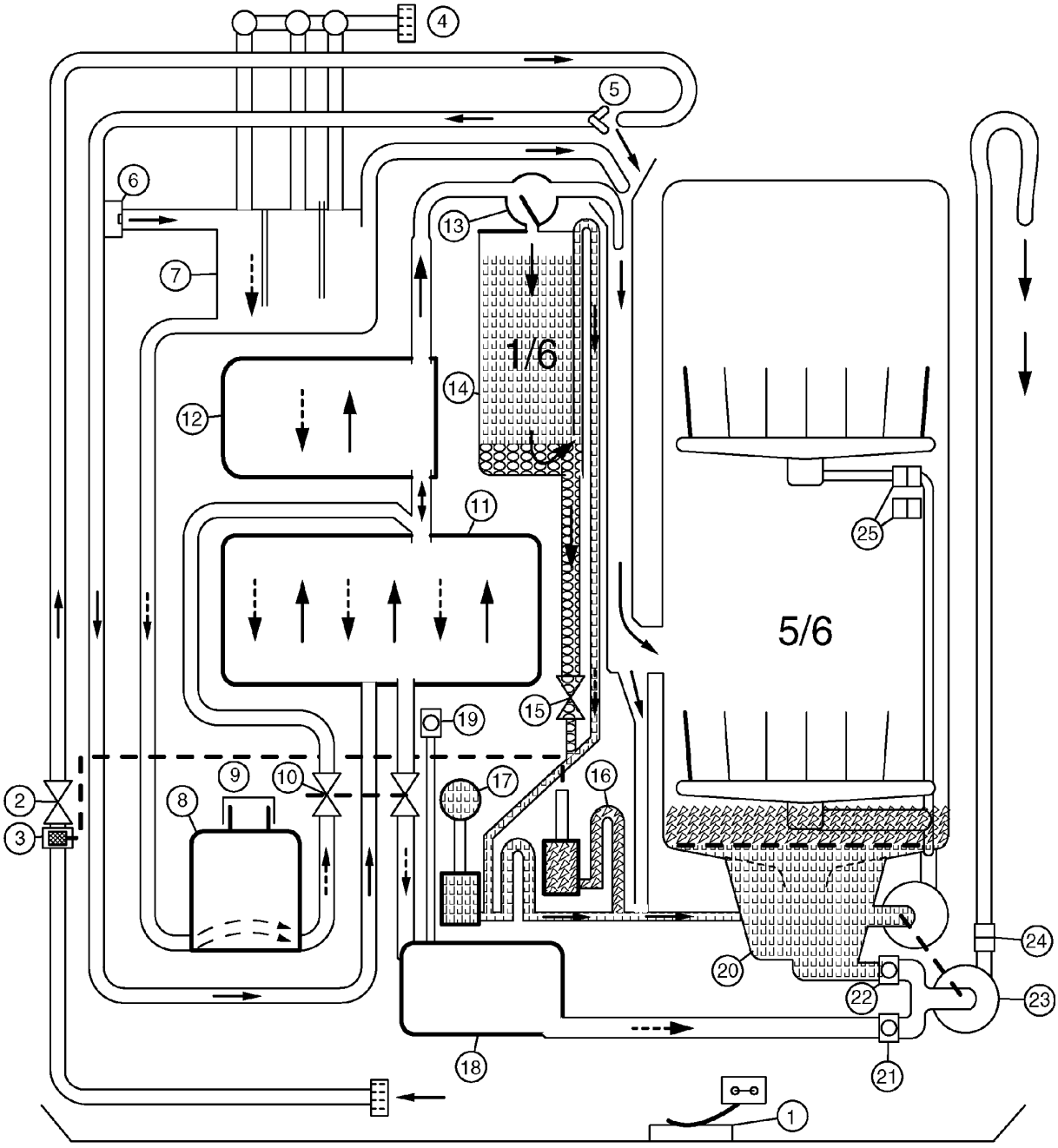
CONTROL OF THE WATER LEVEL IN THE BASE PAN (EMPTY/FULL)

This system is based on a conventional pressure switch which is connected to the pressure chamber **(17)** and whose arrangement permits both the water in the container for the filling control and the water level in the base pan to be regulated.
The pressure in the pressure chamber activates the pressure switch directly, which then switches the solenoid valve off.

CONTROL OF THE OVERFLOW PROTECTION SYSTEM

A second pressure chamber, which is arranged at a different height beside the pressure chamber for the water level pressure switch, controls the overflow protection system **(16).** The two pressure chambers are connected to each other. The signal that is generated in this pressure chamber when the water level in the base pan rises again directly activates the intake solenoid valve, which in turn closes the mechanical section of the circuit.

10.4.2 Water level control



10.5 Water treatment systems

The water treatment system fulfils two purposes: It softens the water (i.e. removes calcium and magnesium) using an ion exchange mass and regenerates the ion exchange mass by adding potassium chloride (salt).

The system consists of the following components:

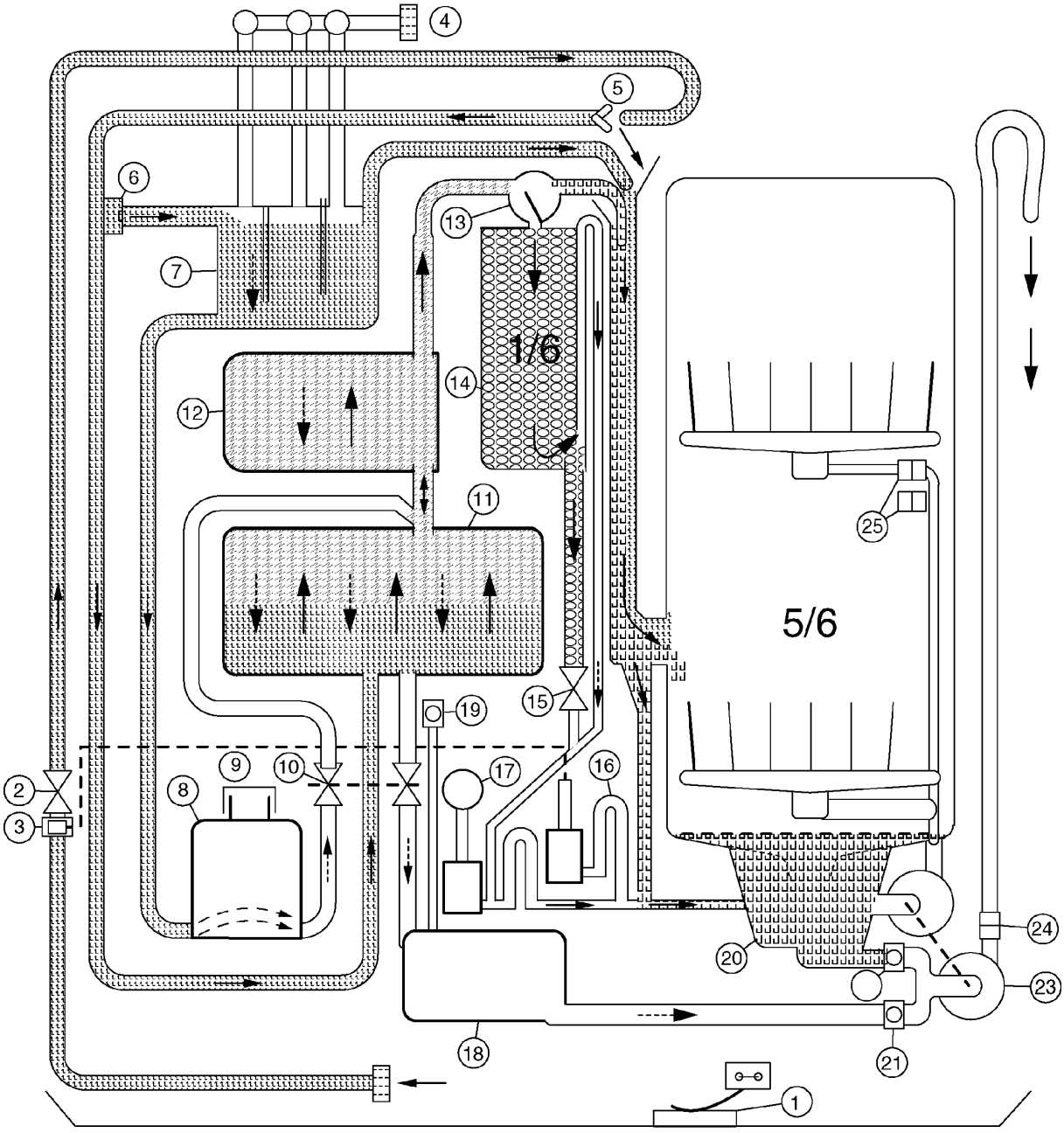
11 - Container with the ion exchange mass
7 - Regeneration tank with adjustable volume
4 - Softening setting feature
12 - Water intake tank
9 - Solenoid valve for regeneration
10 - Solenoid valve for ion exchange
18 - Salt water collecting container

WATER SOFTENING CIRCUIT

The water from the intake solenoid valve flows through the water circuit until it reaches the container with the ion exchange mass **(11)**. While it is slowly pressed upwards through the ion exchange mass, it is softened; the water then flows into the water intake tank **(12)** and from there through the volume distributor **(13)** into the base pan of the dishwasher.

In the part between the free air section **(5)** and the container with the ion exchange mass, the water passes through a calibrated filling valve **(6)** for the regeneration tank **(7)** containing untreated water. The water volume which flows into this container depends on the preset water hardness.

Water softening circuit



10.6 Regeneration systems

During this phase the solenoid valve for regeneration **(9)** and the solenoid valve for ion exchange **(10)** are opened at the same time.

The water in the regeneration tank flows (owing to gravity) into the salt container **(8)** which is located on the bottom of the appliance. While the water flows through the salt container, it removes an appropriate amount of the salt solution and flows upwards into the container with the ion exchange mass **(11)** where it then passes downwards through the ion exchange mass (in contrast to the water softening phase - here the water flows upwards through the ion exchange mass).

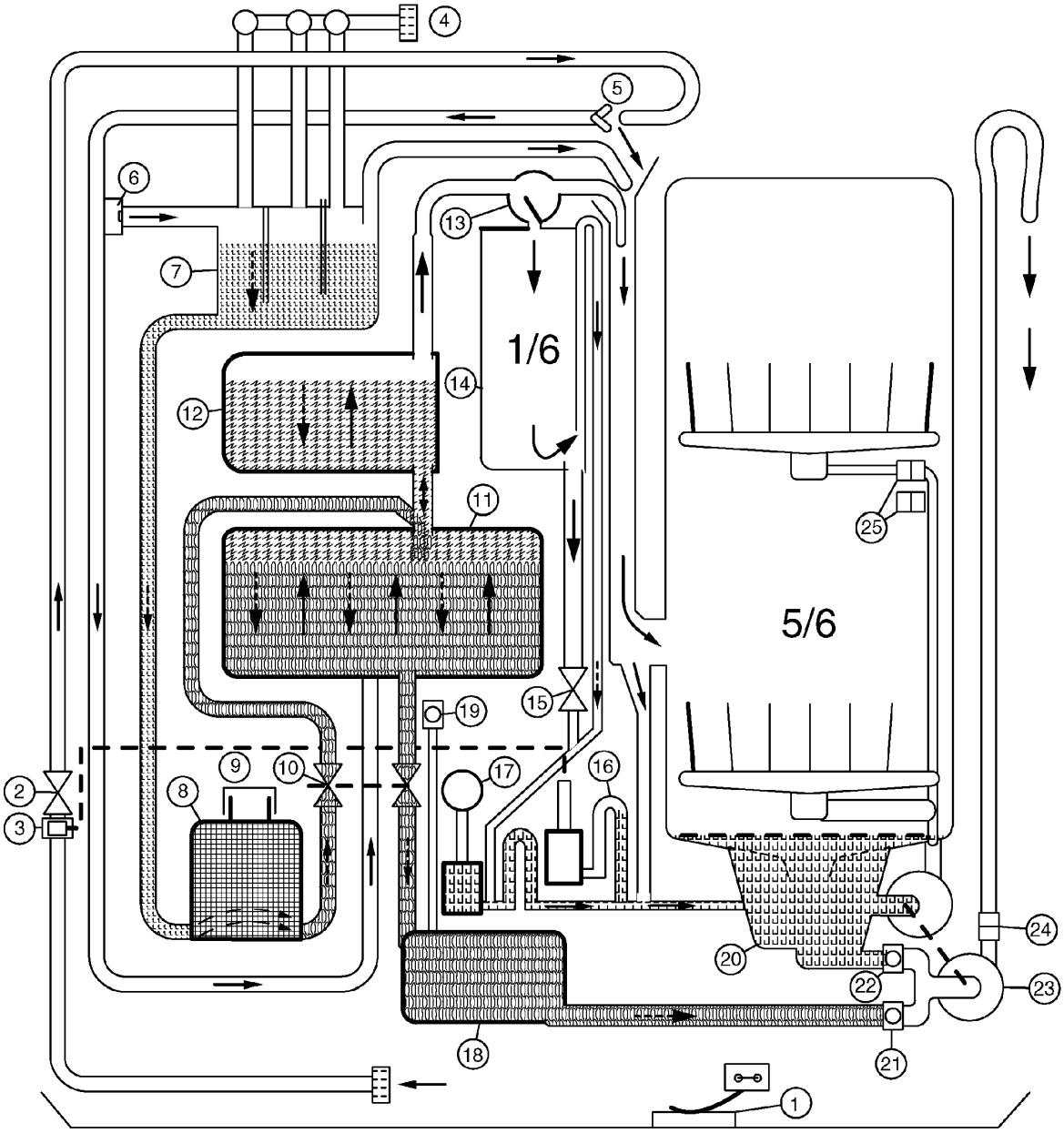
The water then flows into the salt water collecting container **(18)** which is located on the bottom of the appliance.

The water in the water intake tank **(12)** passes due to gravity through the ion exchange mass **(11)** where it is washed and it then flows slowly into the salt water collecting container **(18)**.

During this phase the aeration valve **(19)** mounted on the salt water collecting container is opened so that the water can easily flow through the circuit.

The salt water collecting container **(18)** is emptied in the first phase of the following draining cycle.

Regeneration system - Illustration of the circuit



Control of the regeneration volume

For regeneration four different water volumes are used amounting to a total of roughly 300 ccm. Depending on the type of dishwasher, the regeneration system is controlled and completed in different ways.

Dishwasher with electromechanical programme switch mechanism

Regeneration is performed at each wash operation.

CONTROL PROCEDURE

Five different regeneration stages can be selected with different water volumes which are determined by opening or closing various special valves.
The regeneration stage is selected by turning a selection knob with 5 positions (this knob is arranged on the front of the dishwasher in the top left-hand corner); set the marking to the level you want. The appliance is set at level 2 at the works.

Level	Degree of hardness		Regener-ation	Salt con	Valve	
No.	F	G	water	sumption	closed	open
1	8-25	4-14	25 cm³	8 g	A/B/C	—
2	26-40	15-22	50 cm³	15 g	A/C	B
3	41-60	23-34	90 cm³	65 g	B/C	A
4	61-90	35-50	270 cm³	75 g	C	A/C
5	91-120	51-70	300 cm³	85 g	—	A/B/C

DISHWASHER WITH ELECTRONIC CONTROL

Regeneration takes place at certain intervals depending on the level selected (and not at each wash operation).

CONTROL PROCEDURE

Ten regeneration stages can be selected; a fixed amount of water (300 ccm) and a fixed amount of salt (85 g) is required for each regeneration cycle.
The regeneration stage is controlled electronically and entered by pressing a button combination on the control panel. The appliance is set to stage 4 at the works.

Level	Regeneration		Degree of hardness treated	
No.	Autonomous	Intermittent	F	G
0	—	no regeneration	0-8	0-4
1	9 cycles	every 10 cycles	9-14	5-8
2	7 cycles	every 8 cycles	15-20	9-11
3	5 cycles	every 6 cycles	21-30	12-17
4	3 cycles	every 4 cycles	31-40	18-22
5	2 cycles	every 3 cycles	41-50	23-28
6	1 cycle	every 2 cycles	51-60	29-33
7	0 cycle	at every cycle	61-70	34-39
8	0 cycle	at every cycle	71-80	40-45
9	0 cycle	at every cycle	81-120	46-70

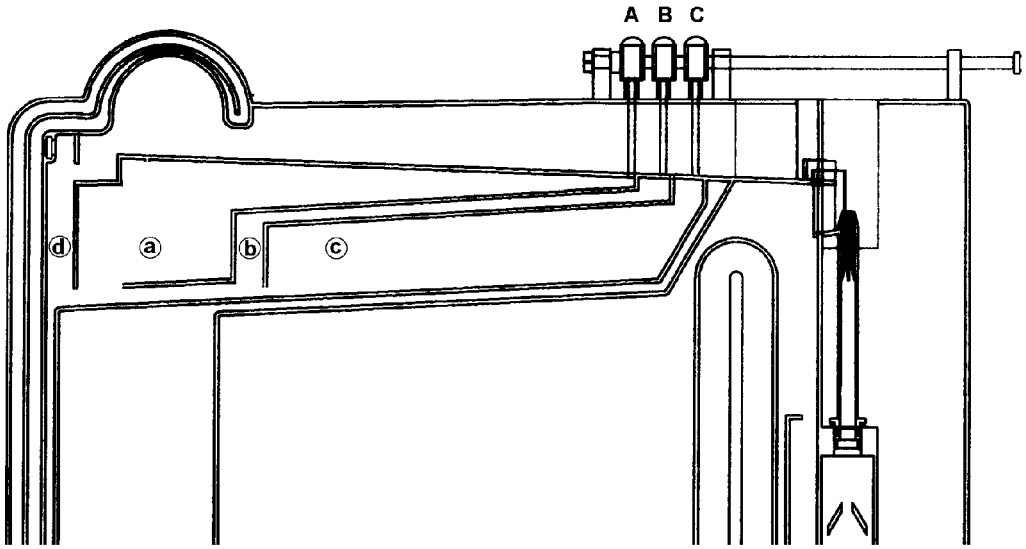
Regeneration tank - functional diagram

DISHWASHER WITH ELECTROMECHANICAL PROGRAMME SWITCH MECHANISM

- The valves **A, B** and **C** can be open or closed and are connected to the corresponding dosing chambers (**a, b** and **c**); chamber (**d**) is unaffected by this (cannot be influenced).
- If the valve is opened, the corresponding dosing chamber is filled during the mains water intake phase.
- If the valve is closed, the corresponding dosing chamber remains empty.
- If the solenoid valve for regeneration is opened, all the water flows out of all the chambers.

DISHWASHER WITH ELECTRONIC CONTROL

- The valves **A, B** and **C** remain open and therefore the corresponding dosing chambers (**a, b** and **c**) are always filled with water; the separate chamber (**d**) is also filled.
- If the solenoid valve for regeneration is opened, all the water flows out of all the chambers.

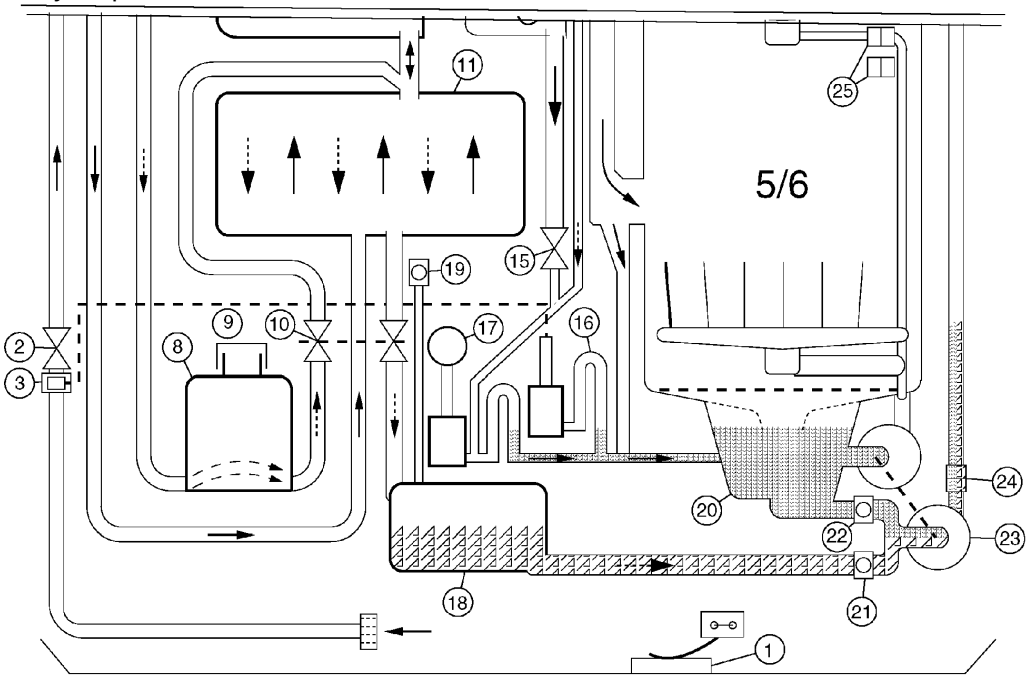


10.7 Waste water circuit

The waste water circuit is in the "NORMAL" mode when the following conditions are satisfied:
23 - The pump motor is ON: draining phase.
24 - The non-return valve is open.
22 - The bottom valve of the outlet tray is open.
21 - The ion exchange separating valve is open.
19 - The aeration valve for the salt water collecting container is closed.

FUNCTION OF THE WASTE WATER CIRCUIT

During the draining phase the pump motor runs in the opposite direction (clockwise as viewed from the impeller) and thus pumps out the contents of the outlet tray **(20)**.
As a result, a vacuum is generated in the waste water circuit which reduces the pressure in the pressure chamber of the pressure switch and causes the ion exchange separating valve **(21)** for the salt water to open; this ensures that the container **(18)** which holds the salt water is emptied. In order to guarantee that this container is drained completely, the aeration valve **(19)** mounted on the top of the salt water collecting container must be closed. This prevents the pump from being switched off before the container is completely emptied.



10.8 Steam release

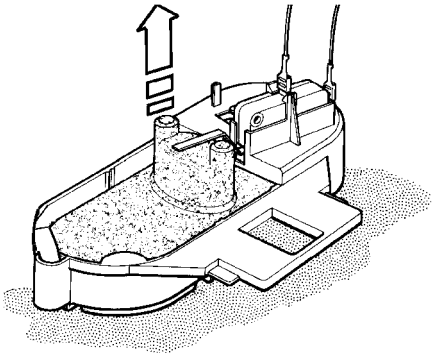
- The steam release chamber is connected directly to the base pan of the dishwasher and has several functions:
- During the water intake phase it passes the water which is collected at the free air section, excess water from the regeneration tank when it is full and a small amount of water from the volume distributor directly into the base pan of the dishwasher.
- It offsets the pressure differences between the inside and outside of the base pan during the wash programmes and even when the door is opened or closed. In this way possible deformation of the base pan, resetting of the pressure switch to the "empty" status or programme interruptions are avoided.
- It improves the drying results as the steam produced can condensate on the inside surface of the steam release chamber.

10.9 Waterproofing systems

The waterproofing systems detect all possible malfunctions in the water circuit or leaks of any components. The protective devices are activated electromagnetically or by water pressure and are active during the entire wash programme and in some cases even when the dishwasher is switched off. The waterproofing systems are installed in both the electromechanical and the electronic dishwashers.

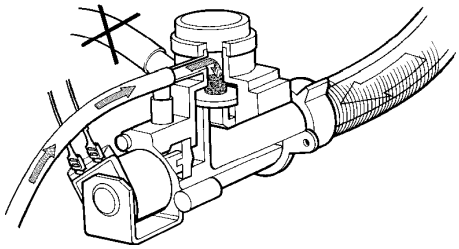
PROTECTION SYSTEM AGAINST LEAKS

This is an electromechanical protective facility which is connected in series with the intake solenoid valve.
A sensor activated by a float valve is installed on the bottom of the dishwasher; this sensor triggers a micro-switch. As soon as water enters the bottom tray of the appliance, the protective device is activated. The micro-switch is triggered and disconnects the intake solenoid valve from the mains, thus stopping the supply of water.



OVERFLOW PROTECTION SYSTEM

This is a mechanical device which is installed in the intake solenoid valve and connected to the IWMS.
As the water level rises in the outlet tray, the water level in the overflow protection chamber of the IWMS also rises as the outlet tray and this chamber are connected to each other by a pipe. When the water reaches the overflow level, it flows through the siphon into the IWMS chamber; as a result the air pressure in this chamber increases. This pressure is passed on to the overflow protection system by a thin hose. Here, the pressure activates a device which moves a piston downards, blocking the water intake and thus interrupting it.



AQUASTOP SYSTEM

This is a mechanical device which is installed in the intake hose.
This device is mounted at one end of the intake hose, its watertightness is ensured by a hermetic seal. If the intake hose starts to leak (or tears), the water is collected and passed through the outer sheath to the AQUASTOP device. It accommodates a sensor which expands on contact with water; as a result the valve is pressed downwards and the water flow stopped completely.