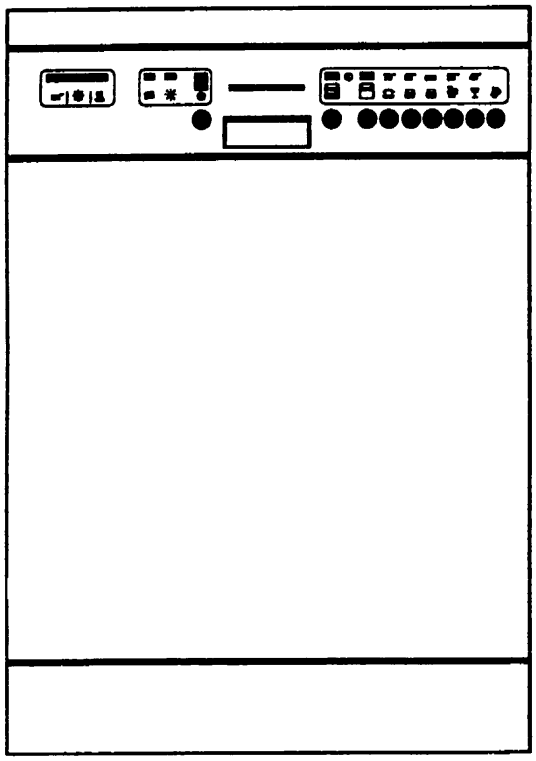
KÜPPERSBUSCH
CUSTOMER SERVICE



Technical Manual
IG 669.0

GB

VKS-H	Technical Manual IG 669.0	H7-410-02-01

Responsible: K.H. Hiby	Fax: 0209-4012743	Phone: 0209/-401732	Date: 23.06.1997

Contents:

Küppersbusch

THE HEART OF A GOOD KITCHEN

Responsible: K.H. Hiby	Fax: 0209-4012743	Phone: 0209/-401732	Date: 23.06.1997

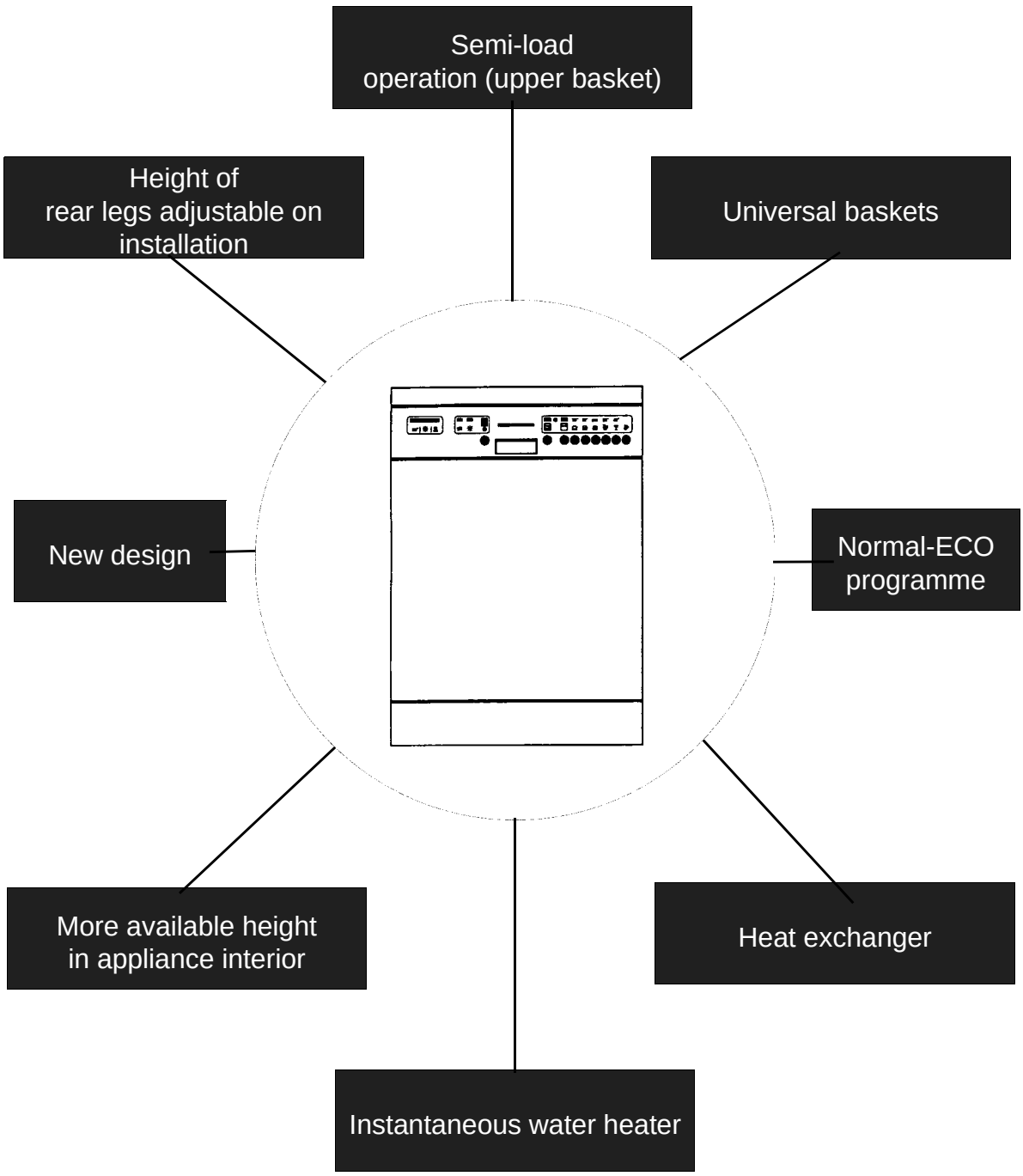
1 General technical description

1.1 List of models

Model	Manufacturing period
IG 669.0 J	from 7405
IG 669.0 B	from 7405
IG 669.0 W	from 7405
IG 669.0 S	from 7405

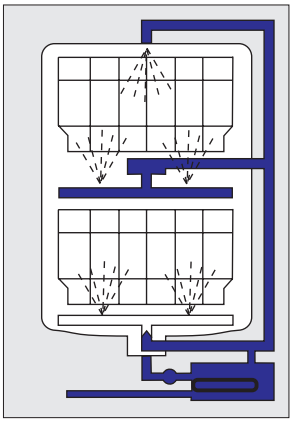
IG 669.0 S

1.2 Product features



Küppersbusch
THE HEART OF A GOOD KITCHEN

1.2.1 Semi-load operation



A selection switch in the operation fascia is used to run the appliance on semi load using just the upper basket.

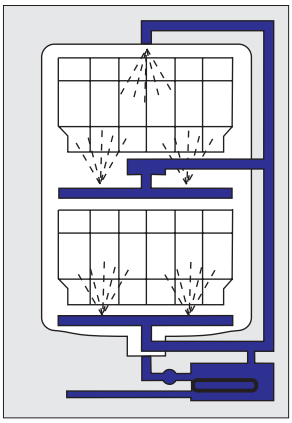
This function is used when the dishwasher is only half full and saves approx. 15% water, 30% electricity and 12% rinsing time in comparison with running the dishwasher on full load.

Other advantages:

Flexible universal baskets with two cutlery inserts allow more convenient and safer loading.

2 x 6 wash programmes. All wash programmes can be run on semi load with just the upper basket or on full load.

1.2.2 The instantaneous water heater

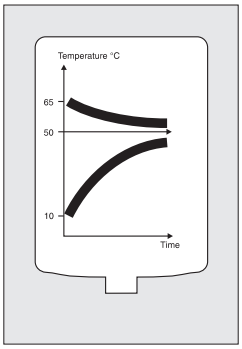


An instantaneous water heater underneath the internal cavity heats the rinsing water. The inner tubular heating element of former models is no longer used.

This prevents sensitive parts in the lower basket from overheating and becoming deformed.

The available space inside the dishwasher is consequently higher and can be better organised.

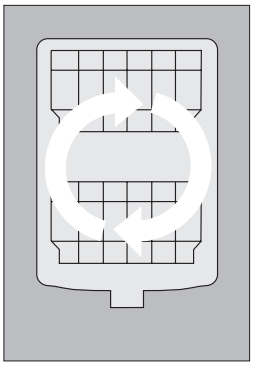
1.2.3 The heat exchanger for the recovery of heat



The rinsing water heated by the instantaneous water heater heats the water for the next rinse by up to 50 °C. This is done in the heat exchanger.

The heat exchanger for the recovery of heat makes a major contribution to saving energy.

1.2.4 The heat exchanger for economy drying



The heat exchanger provides a hygienic and germ-free method of drying condensation without using additional energy.

The items are dried reliably and economically, without the emission of steam.

1.2.5 The Aqua Stop safety system

All **Küppersbusch** automatic dishwashers are equipped with the Aqua-Stop safety system which prevents damage due to water.

You need have no worries about leaving the house while the dishwasher is in operation.

1.2.6 An extremely low noise level

The top models are provided with a particularly good sound absorption system, ensuring almost silent operation.

This means that you can also run the dishwasher during the night, taking advantage of the less expensive electricity rates.

Küppersbusch
THE HEART OF A GOOD KITCHEN

1.3 List of functions

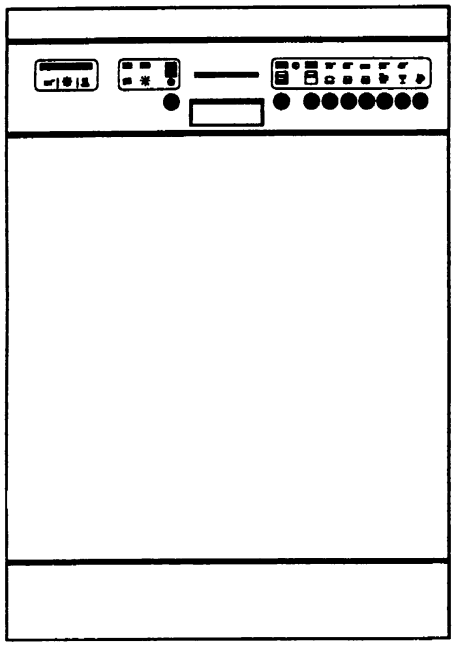
IG 669.0 J - in black

IG 669.0 W - in white

IG 669.0 B - in brown

IG 669.0 S - mirror-glass design

Integrated dishwasher
with semi-load operation + heat exchanger + instantaneous water heater



- Runs on semi load (upper basket)
- Heat exchanger
- Instantaneous water heater
- 2 x 6 programmes, including Normal and ECO programmes
- Programmes selected via push buttons
- 4 wash temperatures (70 °C, 65 °C, 55 °C, 40 °C)
- Main switch with pilot light
- Electronic indicators for salt and rinsing agent
- Refill indicator inside appliance
- Electronic advance time setting
- Universal baskets
- Rear legs adjustable from the front
- Low consumption of water and electricity in the Normal programme: 19 l / 1.3 kWh
- 50 dB (re 1 pW)
- Aqua Stop system
- New flush front (with fold-down door)

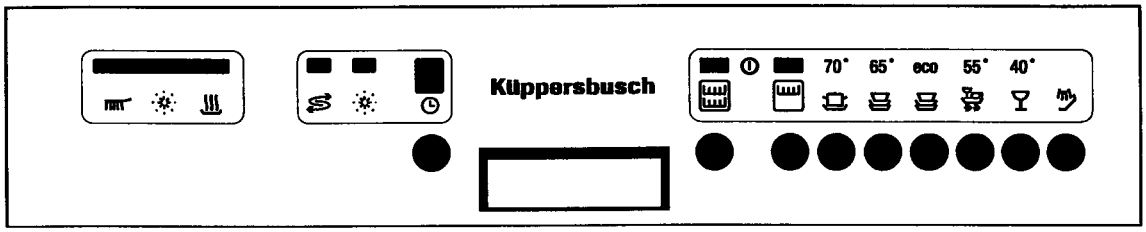
Optional accessories:

- Interchangeable hood in polished stainless steel: Acc. No. 512
- Interchangeable hood in brushed stainless steel: Acc. No. 513
- Interchangeable operation fascia in classical brown: Acc. No. 514

1.4 The operation fascia

New models with semi-load operation

2 x 6 programmes



2 Operating instructions

3 Technical data

3.1 Appliances with and without semi-load operation

IG 669.0 B; IG 669.0 W0; IG 669.0 J (with semi-load operation); IG 659.0 W0; IG 659.0 B; IG 659.0 J (without semi-load operation).

Integrated water inflow with water softening system

To improve energy consumption, the integrated water inflow unit and the attached water softening unit have been modified. The integrated inflow unit used in the original models has been replaced by the new version **as from model FD7411** in the appliances without semi-load operation and **as from model FD7412** in appliances with semi-load operation. In the new version the appliance is filled mainly with soft water, i.e. the regeneration chamber is also filled with soft water (see functional description). The hard water duct is no longer required. Due to the change in the flow resistance, there is no longer any need for the inductor in the hosepipe and in the lid of the water softening unit. The water softening unit with inductor, **spare part no. 425351**, is still available as a spare part for the appliances with the integrated inflow unit for hard water **spare part no. 426097**. The integrated inflow unit, **spare part no. 426097** has been replaced by the new integrated inflow unit for soft water, **spare part no. 426239** with the inductor in the hosepipe. The water softening unit without an inductor in the lid, **spare part no. 426288** (black lid) can only be used in connection with the new integrated inflow unit, **spare part no. 426239**. **From model FD7503** an air separation chamber (as required by DVGW), **spare part no. 426290** will be inserted between the integrated water inflow unit and the water softening unit (see functional description).

3.2 Wash system *with* and *without* semi-load operation

To improve the efficiency of the circulation pump and to avoid sucking noises, **as from model FD7501** the pump container will have a cover above the intake opening to the circulation pump. This pump container has been introduced as a spare part under the existing **spare part no. 426056**. As a further measure the lower rinsing arm with smaller jets is also available as a spare part under the existing number **spare part no. 426111 as from model FD 7502**.

3.2.1 Intake pipe of upper rinsing arm for *appliances with semi-load operation*

To avoid spray marks in the centre of the upper basket next to the bearing of the rinsing arm, **as from model FD7505** the intake pipe will have a jet pointing upwards. One of the jets pointing downwards will be sealed.

3.2.2 Intake pipe of upper rinsing arm for appliances *without semi-load operation*

In these appliances the rinsing arm will have an additional jet next to the bearing of the rinsing arm bearing pointing upwards. One of the jets pointing downwards will also be sealed.

Note: If there are complaints about the wash results regarding appliances with FD7410-7502, e.g. remains of food on the items or banging or knocking noises around the upper basket, the intake pipe with the rinsing arm must be replaced. The reason for this is that the catch from the intake pipe and the coupling shifts or twists when the temperature rises. When the rinsing arm sags downwards, this causes it to become blocked. To deal with this complaint repair kits have been stocked for both wash systems. These repair kits consist of upper rinsing arm and intake pipe. They are available for the appliances that run on semi load with just the upper basket, spare part no. 426326 and for the appliances that run only on full load, spare part no. 426353. Both repair kits have the improved features described under point 2.2.1 + 2.2.2.

3.2.3 Top spray with jets

If customers complain about "splashing noises", the outer intake pipe with top spray attached, **spare part no. 426120** must be exchanged. As from model **FD7503** the jets have been rotated by 5°; now the jets of water no longer hit the side panel without sound absorption.

3.3 Appliances with semi-load operation

3.3.1 Selection switch

As from model FD7410 these appliances have been equipped with an additional breaker contact between rocker switch f0/4 and the motor of the control unit m1.When the appliance runs on semi load with just the upper basket, this contact prevents the siphon of the inflow chamber from activating the rocker switch and thus continuing the operation of

the control unit. The switch without a breaker contact, **spare part no. 426060** bears the number 1 737 200 382 in the drawing and has been replaced by the new switch, **spare part no. 426235**, number 1 737 200 513 in the drawing. The electric terminals can be reversed 1:1. Wiring diagram no. S060/0212 and connection diagram no. S060/0216 have been prepared for this version (see appendix).

3.3.2 The control unit

In the original models ECO programme 55 °C" had a soaking pause lasting 20 mins. in pos. 11 during the pre-wash cycle. This did not allow any further improvement in the wash results in connection with the new cleaning agents (with enzymes). For this reason control units with no pause have been used **as from model FD7412**.

These control units differ only in their programme cylinder, a white cylinder meaning with pause and a blue cylinder meaning without pause. When appliances are repaired only the control unit without a pause is used, **spare part no. 426059**, number 1 737 200 884 in the drawing. The electric terminals are reversible 1:1. The introduction of this type of control unit has also meant the introduction of active drainage after the pre-wash cycle. In the overtravel paths the circulation pump is no longer switched off by means of the UK contact. This measure prevents food remains and fat etc. from being washed back into the preliminary hose between the pump container and the inflow unit. New circuit diagrams have been prepared for these appliances **as from model FD7412**. The numbers of these circuit diagrams are S060/0222, S060/0227 and S060/0229 (see appendix).

3.3.3 Change of "Economy 55 °C" to "Normal ECO 55 °C" as from model FD7504

IG 659.0 WO; IG 659.0 B; IG 659.0 J

The programme has been changed so that there is now a pre-wash cycle; this alteration has meant a new control unit and a new circuit diagram, no. S060/0262D. The new control unit will be stocked under the same article number (**spare part no. 42632**), after the present stocks have run out. This means that the programme "Economy 55 °C" will also have a prewash cycle (appliances **up to model FD7503**). Customers should be informed if the case should so require.

3.3.4 Basket group for appliances with upper basket rinsing

As from model FD7504 the upper basket will no longer have loop systems, but a row of spikes (see appendix). **As from model FD7505** the last row at the base of the lower basket will have a different slant to accommodate cups and glasses, allowing improved drainage of water from the bottom of the appliance (see appendix).

4 Functional description - Filling and safety system with water softening unit and heat exchanger

4.1 Dual basket and upper basket operation up to model FD 7411

4.1.1 Water inflow - dual basket operation up to model FD 7411

The untreated water flows from the filling and safety valve (AS) [1], through the softening unit (T) [4] to the water inflow unit (EK) [3] and, when softened, into the heat exchanger (WT) until the latter is full. Then the water flows through the upper outflow unit [5] through an integrated duct in the steam condensation tube into the inflow chamber (EK) of the water inflow unit.

The inflow chamber (EK) is then filled until the large discharge siphon (SA) is activated. The outflowing water activates the rocker switch (SW) and switches on the micro-switch (f0) above it. This micro-switch is a switchover device which applies voltage to the control unit motor and leaves the filling position. The filling valve (AS) is switched off and, at the same time, the drainage valve (AV) of the heat exchanger (WT) is opened. The water from the water inflow unit (EK) flows through the level chamber (NK) [6] directly into the pump container. The contents of the heat exchanger (WT) also flow through the level chamber (NK) 7 of the water inflow unit into the pump container.

4.1.2 Water inflow – dual basket operation from model FD 7412

The untreated water flows from the filling and safety valve (AS) [1], through the softening unit (T) [4] to the water inflow unit (EK) [3] and, when softened, into the heat exchanger (WT) until the latter is full. Then the water flows through the upper outflow unit [5] through an integrated duct in the steam condensation tube into the regeneration chamber (RK) of the water inflow unit until the latter is full. Any water which overflows then flows through a duct into the inflow chamber (EK).

The inflow chamber (EK) is then filled until the large discharge siphon (SA) is activated. The outflowing water activates the rocker switch (SW) and switches on the micro-switch (f0) above it. This micro-switch is a switchover device which applies voltage to the control unit motor and leaves the filling position. The filling valve (AS) is switched off and, at the same time, the drainage valve (AV) of the heat exchanger (WT) is opened. The water from the water inflow unit (EK) flows through the level chamber (NK) [6] directly into the pump container. The contents of the heat exchanger (WT) also flow through the level chamber (NK) 7 of the water inflow unit into the pump container.

Water inflow – upper basket operation
The heat exchanger in the appliances with upper basket operation has an additional level-manometric switch (f1) which, when the heat exchanger is full, immediately applies voltage to the control unit motor and leaves the filling position. At the same time, the outflow valve (AV) of the heat exchanger (WT) is opened again. This means that only the 3.5 l of water from the heat exchanger is conducted into the wash tub.

From FD no. 76.05:
To allow dirt to be washed away more easily, the water level for the upper and lower basket has been increased from 3.5 to 4.5 litres.

4.2 Regeneration circuit up to model FD7411

The water leaking away from the free flow path (FF) fills the regeneration chamber (RK) during the individual filling cycles. When the regeneration chamber is full, the surplus water overflows into a duct in the water inflow unit and is conducted into the level chamber and, from there, into the pump container. The volume of the regeneration water is set by means of the hardness adjustment switch (HS). The regeneration volume and thus the amount of salt water are set according to the degree of hardness of the water. The regeneration chamber is emptied by means of two siphons integrated into the chamber.

4.2.1 Regeneration circuit from model FD7412

When the appliance is being filled, the regeneration chamber is mainly filled with soft water. The water leaking away from the free flow path (FF) is also collected in the regeneration chamber.
The surplus water is conducted into the inflow chamber, as is the case during the filling cycle. The regeneration chamber is set and emptied as described under point 2.

When the valve (RV) is opened, the regeneration water flows into the salt container (SB), where salt is added to it and then, as salt water, flows into the ion exchanger (T) and, from there, into the heat exchanger [4].

The water softening unit is rinsed through during the rinsing cycle. When the water is drained away after rinsing the drainage valve (AV) opens, the regeneration/rinsing water flows through the level chamber (NK) 7 into the pump container (PT) 6 and is thus discharged from the appliance.

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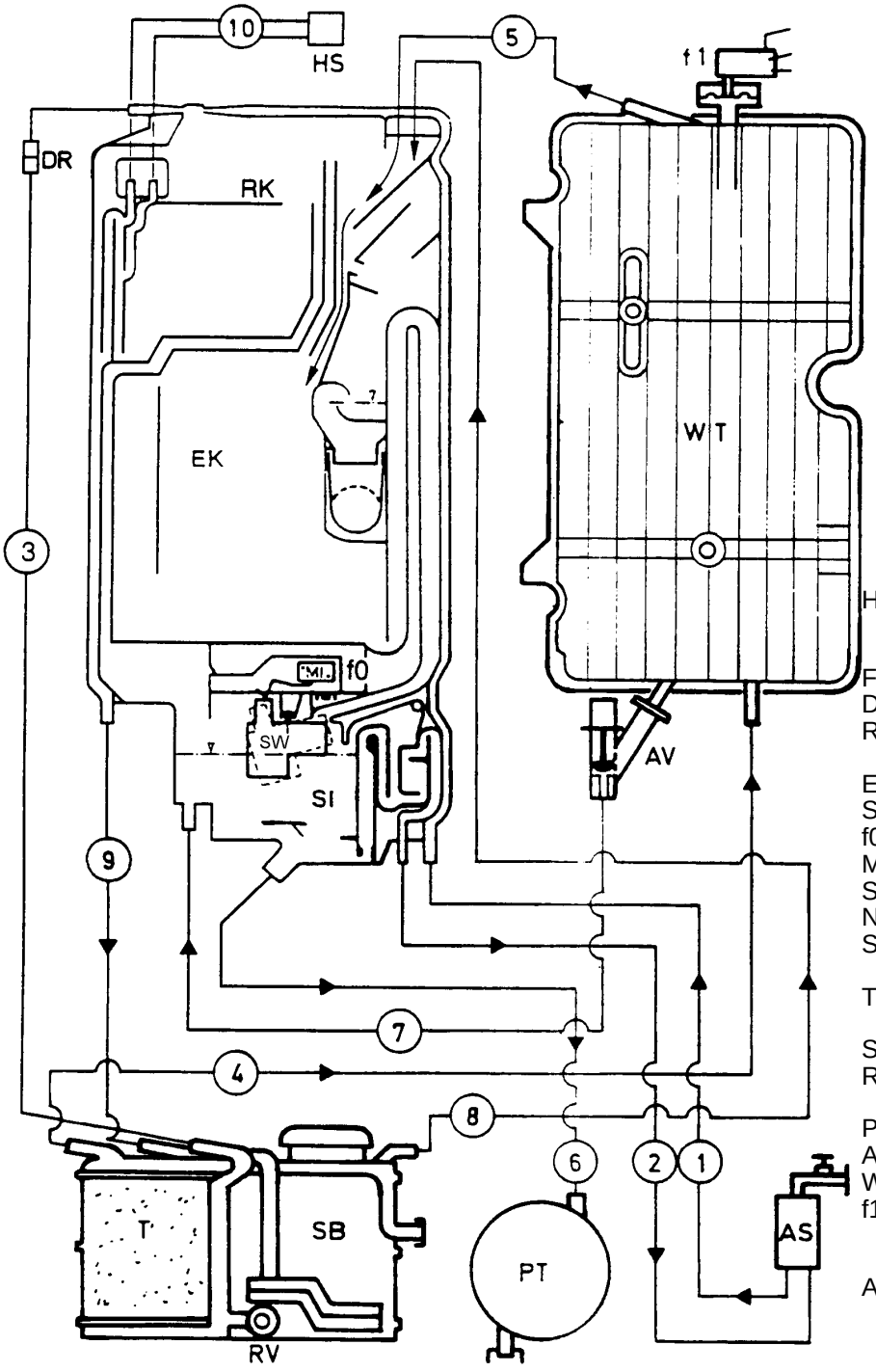
Filling system with water softening unit and heat exchanger up to model FD 7411



HS = Hardness adjustment switch
FF = Free flow path
DR = Inductor
RK = Regeneration chamber
EK = Inflow chamber
SA = Siphon
f0 = Level switch
MI = Micro-switch
SW = Rocker switch
NK = Level chamber
SI = Safety system
T = Water softening unit
SB = Salt container
RV = Regeneration valve
PT = Pump container
AS = Aqua Stop valve
WT = Heat exchanger
f1 = Level switch (for semi-load operation)
AV = Outflow valve

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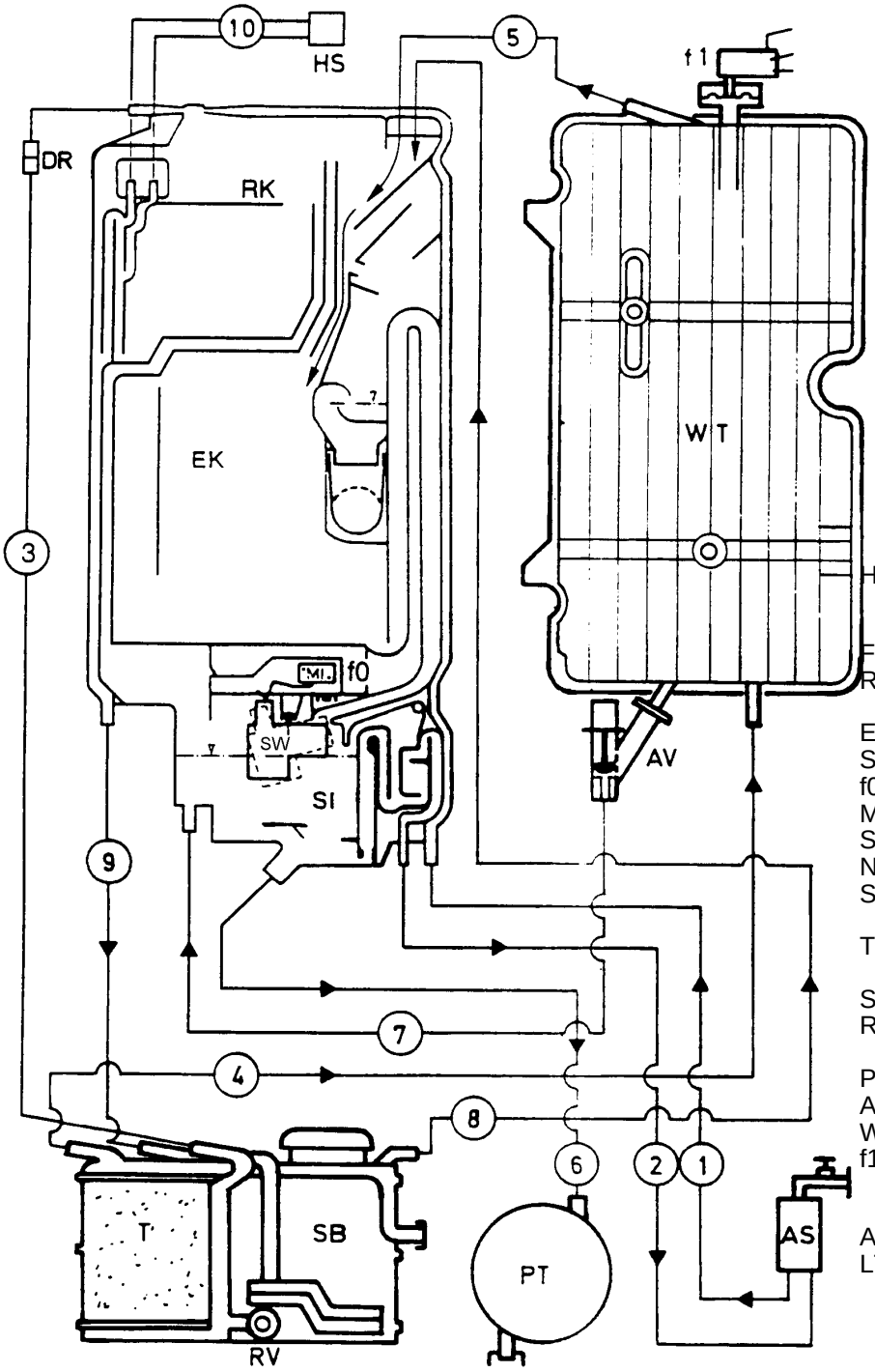
Filling system with water softening unit and heat exchanger up to model FD 74112



HS = Hardness adjustment switch
FF = Free flow path
RK = Regeneration chamber
EK = Inflow chamber
SA = Siphon
f0 = Level switch
MI = Micro-switch
SW = Rocker switch
NK = Level chamber
SI = Safety system
T = Water softening unit
SB = Salt container
RV = Regeneration valve
PT = Pump container
AS = Aqua Stop valve
WT = Heat exchanger
f1 = Level switch (for semi-load operation)
AV = Overflow valve
LTK = Air separation chamber

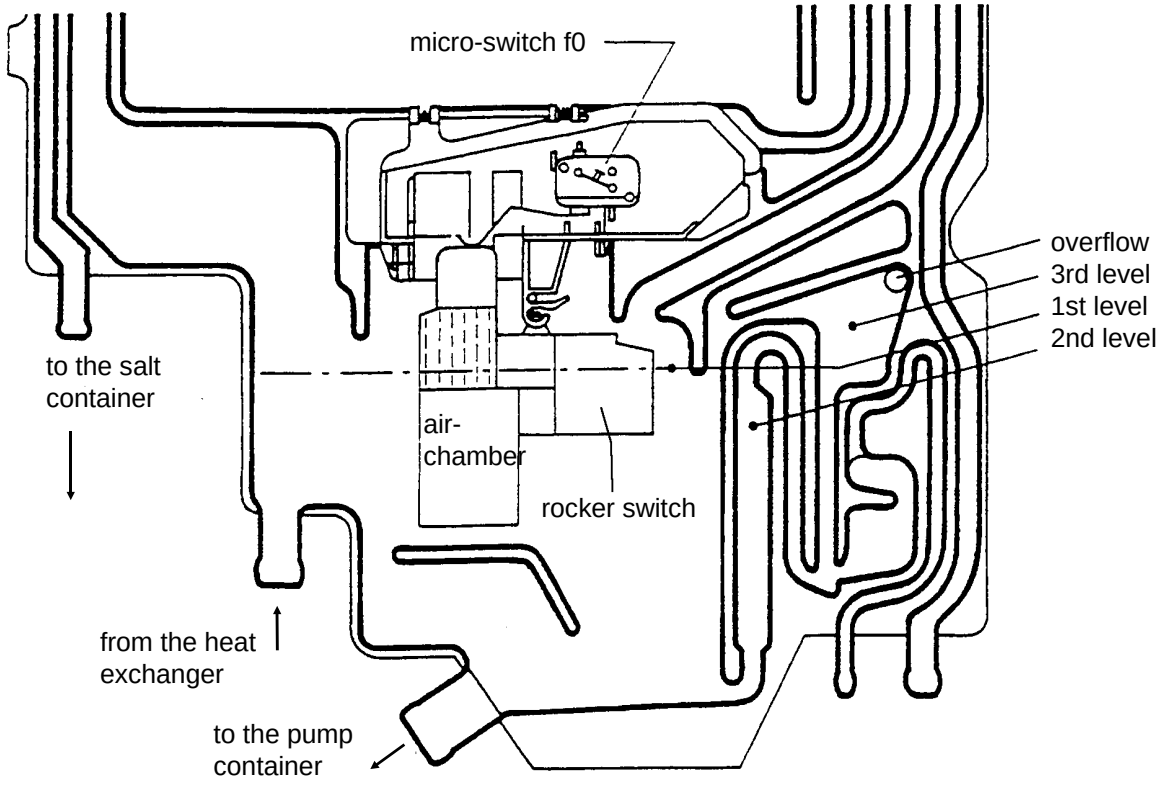
4.2.2 Safety filling system on the integrated water inflow unit

If the level of the water in the wash tub rises due to a fault, the 3-level safety system is activated.

Level I: approx. 8 l
The rocker switch in the level chamber is also designed as an air chamber. When the water level rises, the rocker is forced upwards by the rising water and, via the micro-switch, switches the control unit forwards and thus switches off the electricity supply to the filling valve.

Level II: approx. 11.5 l
The water flows over the siphon (S1) on the safety system, into the pressure chamber. The air pressure which is formed switches off the pressure chamber pneumatically via the safety valve and blocks any further water inflow.

Level III: approx. 13 l
If the siphon should fail, for instance due to becoming dirty or due to leftover water, the water can flow into the pressure chamber through an overflow duct which is located a little higher. This activates the safety valve pneumatically and blocks any further water inflow.



Level chamber with safety system

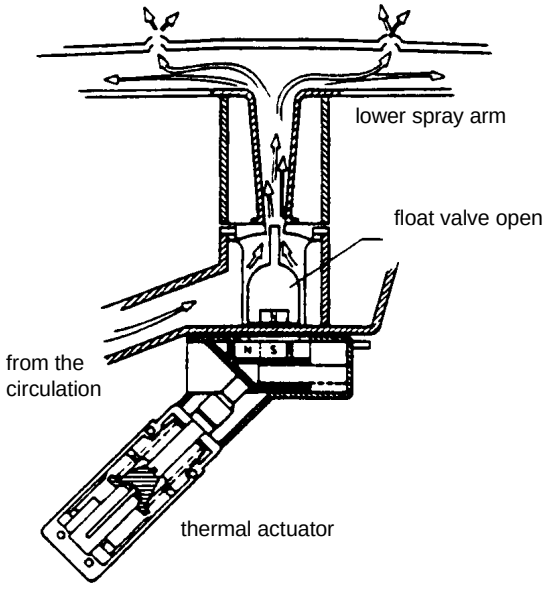
4.3 Rinsing circuit – dual basket operation

In the circuit of the rinsing system there is a float valve in the pump container underneath the spray arm bearing.

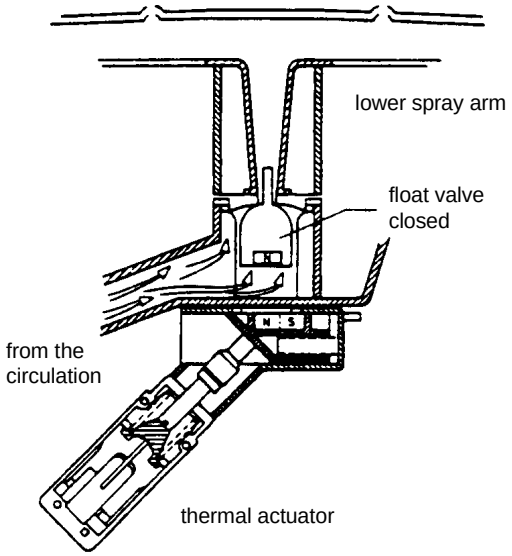
This valve controls water inflow to the upper basket or to the two baskets.

In the lower part of the float there is a permanent magnet. The retention magnet is located underneath the pump container and is accommodated in a guide where it can move freely. During dual basket operation the magnet keeps the float valve open and thus also permits water inflow to the upper spray arm and to the lower spray arm.

Dual basket operation



Upper basket operation



Upper basket operation

During upper basket operation the retention magnet underneath the pump container is moved hydraulically by a thermal actuator until the poles of the float and the retention magnet (which have the same names) are above each other and repel each other.

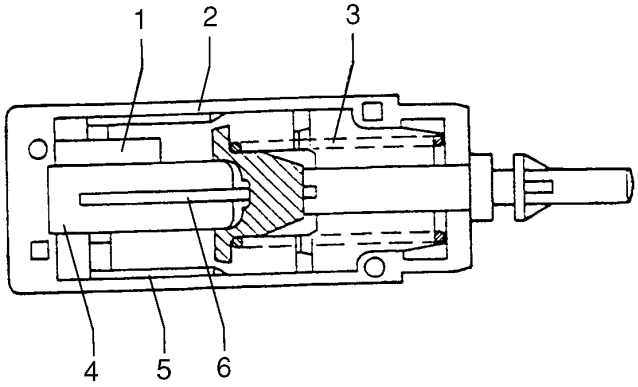
The pressure of the circulating water causes the float to close the opening to the lower spray arm and the entire water volume is conveyed to the upper spray arm.

4.4 Thermal actuator – structure

The thermo-hydraulic system consists of a metal cylinder with a tappet. The cylinder is filled with a material which greatly expands under the influence of heat.

A PTC (positive temperature coefficient) serves as the source of heat and has direct contact with the metal cylinder. A strong pressure spring returns the tappet to the home position after the source of heat has been switched off.

Structure



1. PTC
2. CONTACT
3. PRESSURE SPRING
4. WAX CYLINDER
5. CONTACT
6. TAPPET

Function

After voltage has been applied to the PTC, the PTC heats up and transmits the heat to the metal cylinder which is filled with wax. The wax expands and pushes the tappet upwards out of the cylinder. The tappet transmits the mechanical motion to the retention magnet which is located underneath the pump container. This controls the float valve.

When the source of heat is switched off, the wax cools down and shrinks in volume. This makes it possible for the pressure spring to return the tappet to the home position.

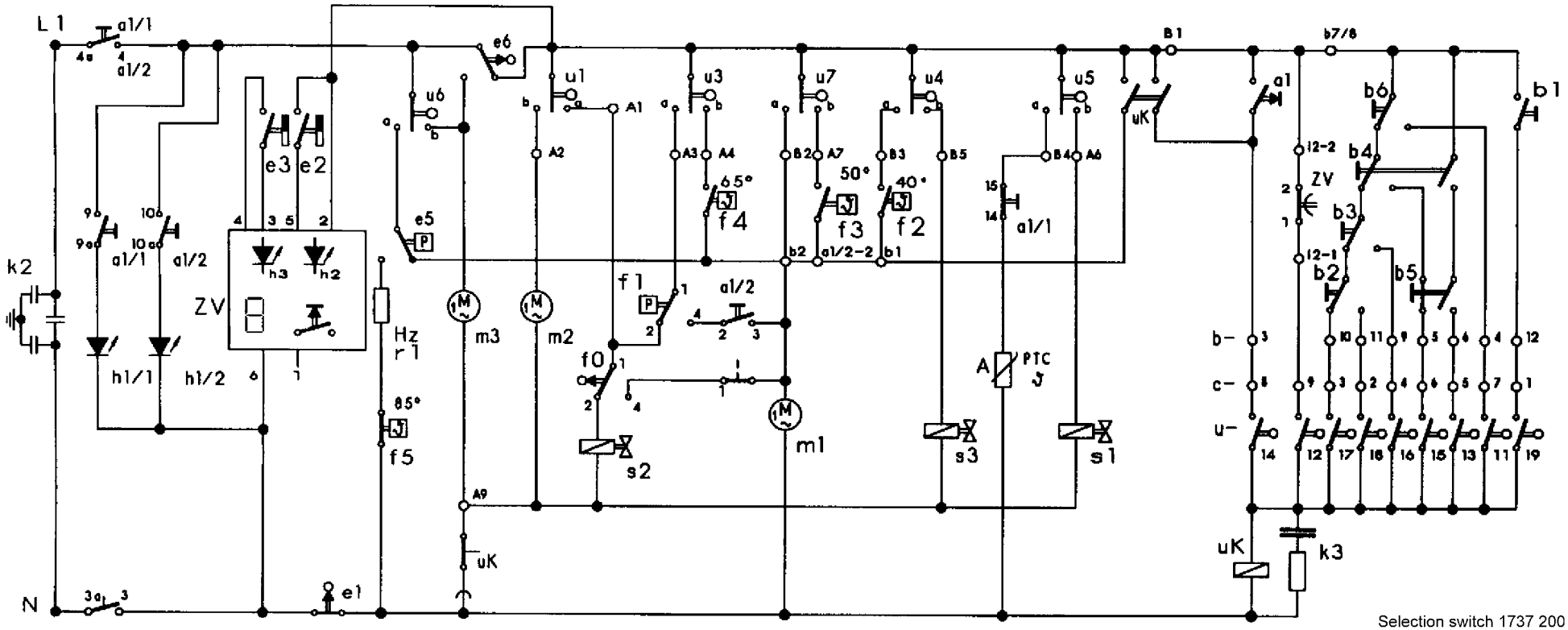
4.5 Instantaneous water heater

The instantaneous water heater is located in the water circuit leading to the upper spray arm. When lye flows through it, this activates a flange on the rubber membrane which switches on the safety pressure switch for the heating element. When the pressure falls the heating is switched off and the control unit motor is addressed by means of the switchover contact. This overtravels the heating position and prevents the equipment from heating until it runs dry.

The thermal cut-out (85 °C) is combined with the temperature switch (66 °C) for the spray arms.

If a fault occurs the heating is cut off when the temperature of the water reaches 85 °C (clocked).

5 Circuit diagrams



1	2	3	4	5		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

A	= Actuator	17
a1	= Start	19
a1/1	= Main switch 1	2
a1/2	= Main switch 2	5/6
e1	= Door switch	5/6
e5	= Security switch	6
e2/3	= Reed switch	4/5
e6	= Float switch	8
f0	= Water level regulator	10
f1	= Water level regulator	11
f2	= Temperature regulator	15
f3	= Temperature regulator	14
f4	= Temperature regulator	12
f5	= Temperature regulator	6
h1/1	= Pilot lamp	2
h1/2	= Pilot lamp	3
h2/3	= Error display	6/5
k2	= Noise filter	1
k3	= Noise filter	20
m1	= Control unit motor	13

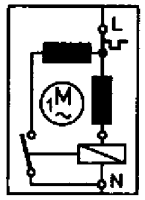
Current path

m2	= Circulation pump	9
m3	= Empty pump	7
r1	= Heating	6
s1	= Regeneration valve	18
s2	= Filling valve	10
s3	= Evacuation valve	16
uK	= Motor control unit	19
ZV	= Preset timer	5

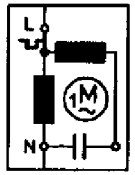
Current path

IG 669.0 B
IG 669.0 W - Ø } up from FD 7410-7412
IG 669.0 J

Relay motor



Capacitor motor

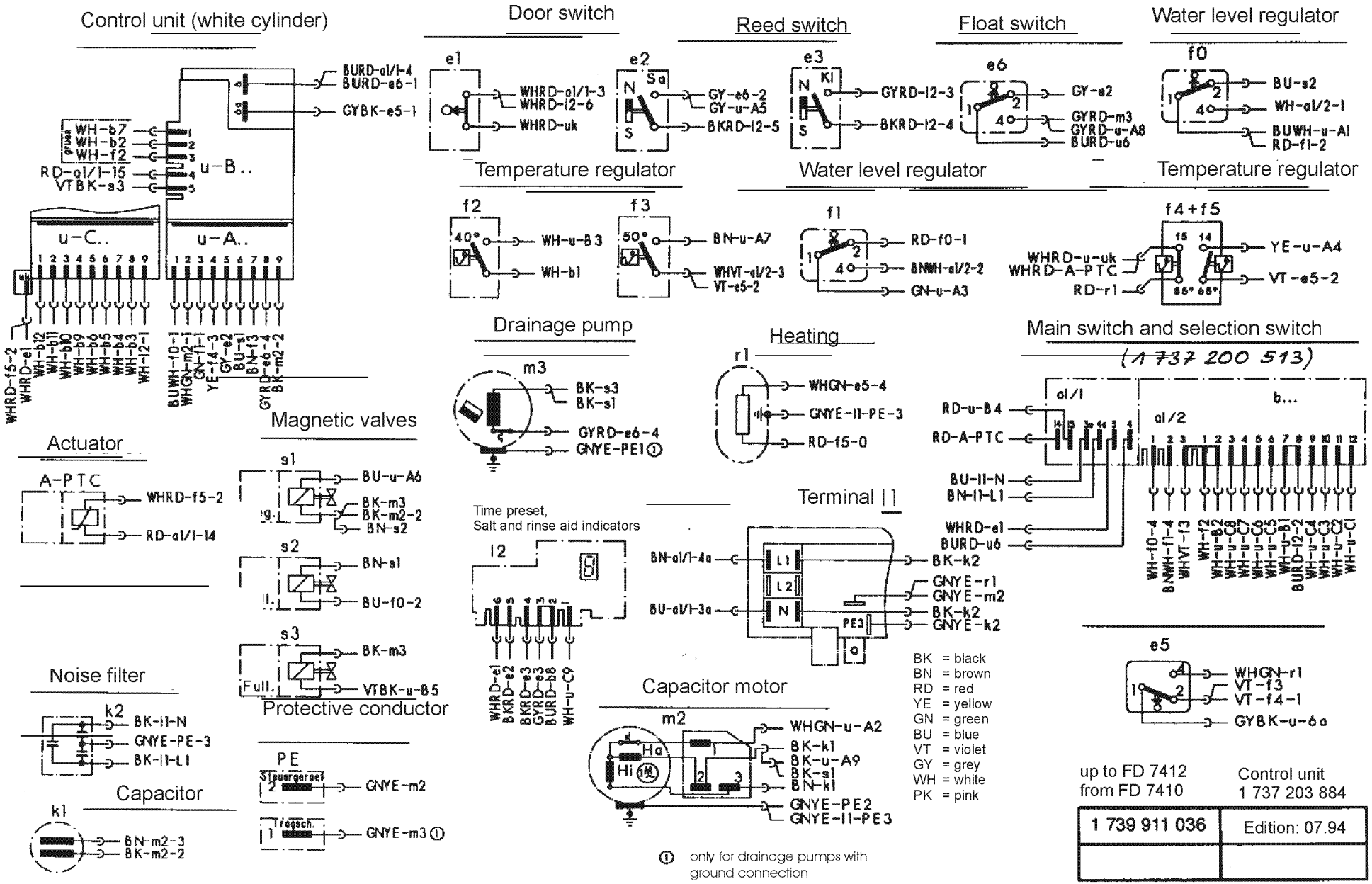


Selection switch 1737 200 513

b1	Prewash
b2	Glasses 40°
b3	Rapid wash 55°
b4	Economy wash 55°
b5	Normal 65°
b6	Super wash 65°
b1+b2	Reselection
Keys released:	Normal 65°
b4+b5	Test programme

Control unit
1 737 203 884 (white cylinder)

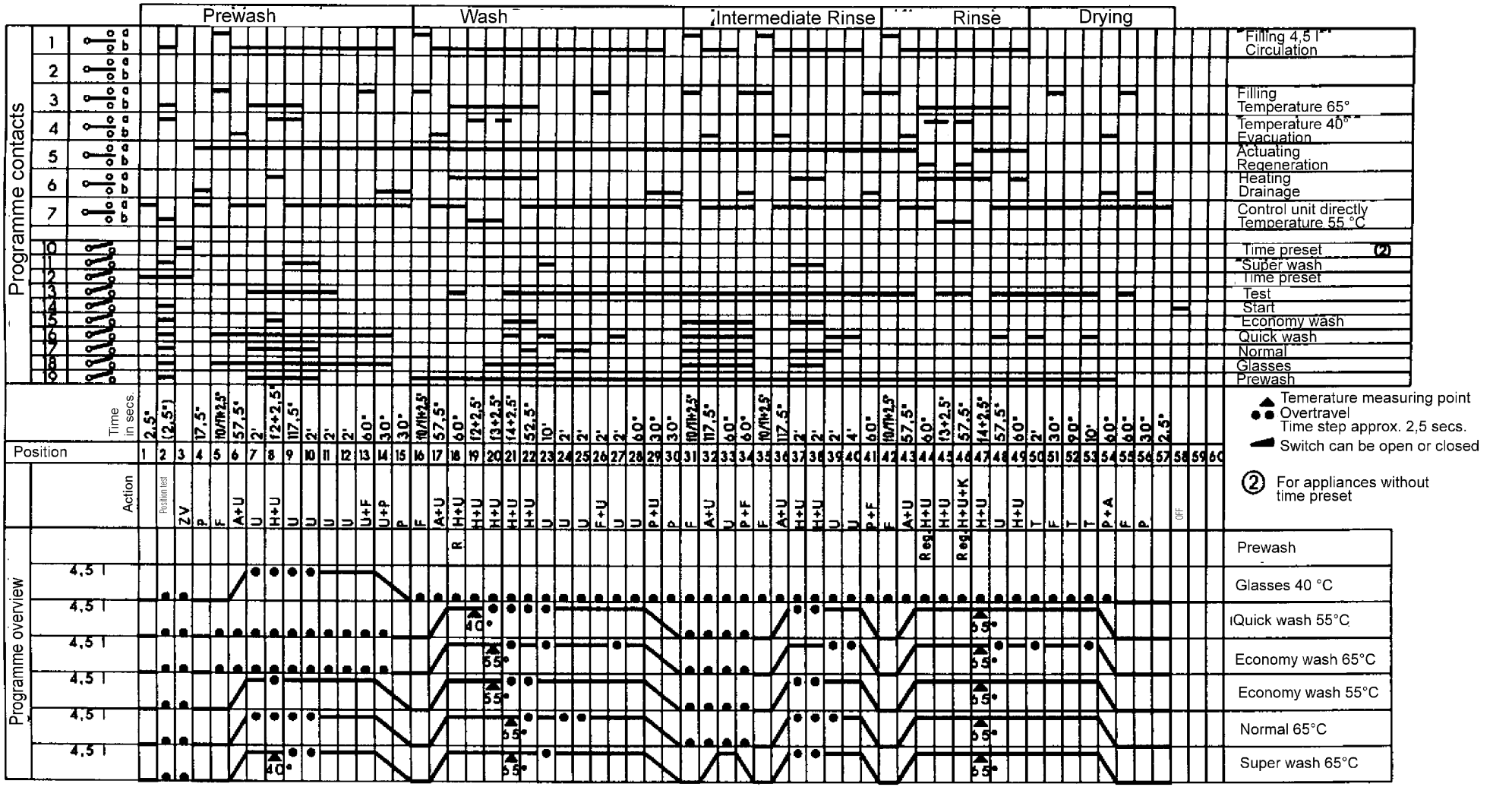
1 739 911 035	
Edition: 08.94	



up to FD 7412
from FD 7410

Control unit
1 737 203 884

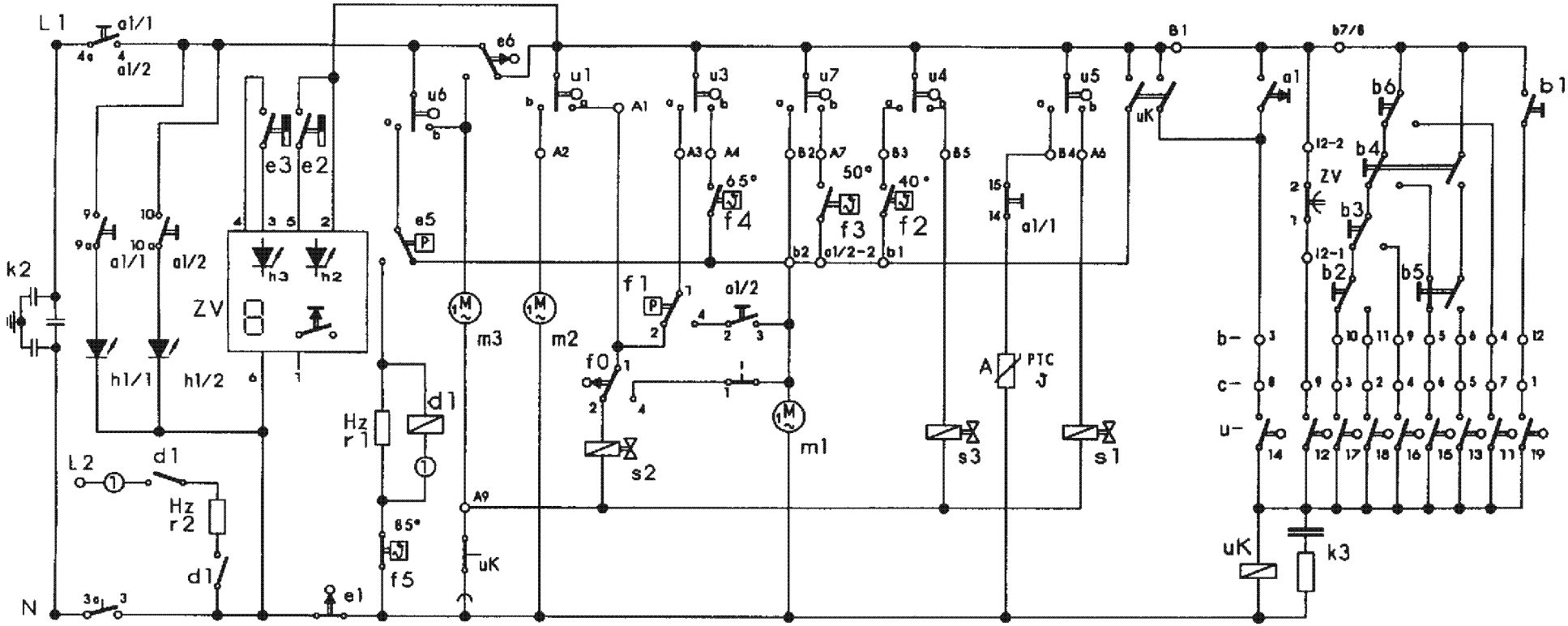
1 739 911 036	Edition: 07.94



A = Outflow
F = Filling
H = Heating
K = Adding rinse aid
P = Drainage
T = Drying
R = Adding detergent
U = Circulation
Reg = Regeneration
ZV = Time preset

Control unit: blue cylinder
1 737 203 801,802,804,805

1 739 911 042	Edition: 09.94
from FD 7501	



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Current path

A	= Actuator	17
a1	= Start	19
a1/1	= Main switch 1	2
a1/2	= Main switch 2 (OKS)	2
e1	= Door switch	5/6
e2/3	= Reed switch	5/6
e5	= Safety switch	6
e6	= Float switch	8
f0	= Water level regulator	10
f1	= Water level regulator	11
f2	= Temperature regulator	15
f3	= Temperature regulator	14
f4	= Temperature regulator	12
f5	= Temperature regulator	6
h1/1	= Pilot lamp	2
h1/2	= Pilot lamp	3
h2/3	= Error display	6/5
k2	= Noise filter	1
k3	= Noise filter	20
m1	= Control unit motor	13

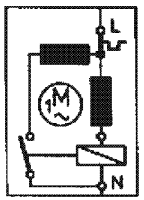
Current path

m2	= Circulation pump	9
m3	= Empty pump	7
r1	= Heating	6
s1	= Regeneration valve	18
s2	= Filling valve	10
s3	= Outflow valve	16
uK	= Control unit motor	19
ZV	= Preset clock	5

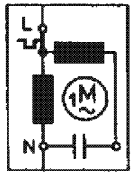
Current path

(1) Only for 2-phases versions

Relay motor



Capacitor motor



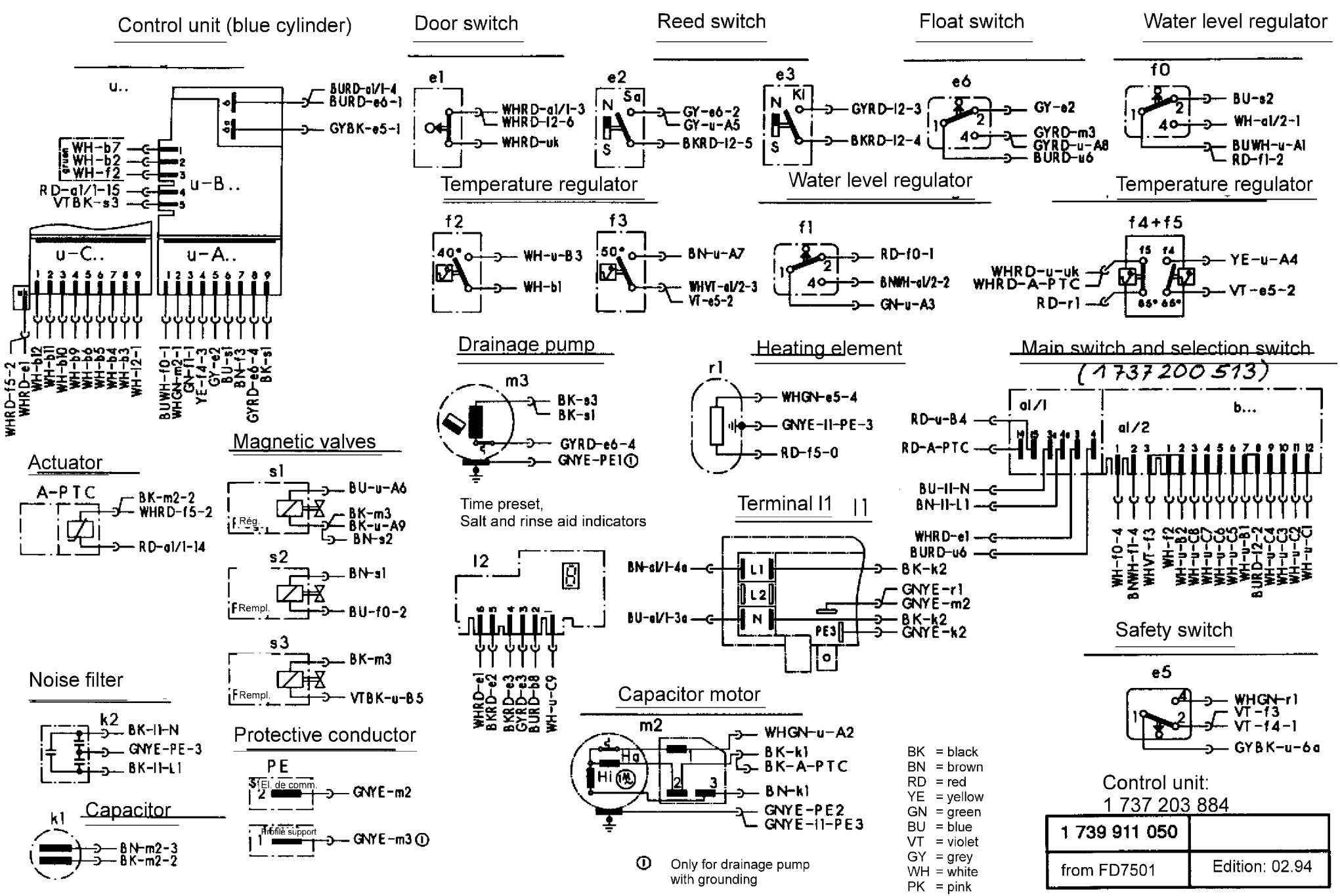
Selection switch 1737 200 513

b1	Prewash	Reselection: b1+b2
b2	Glasses 40°	Test: b4+b5
b3	Quick wash 55°	Keys released:
b4	Economy wash 55°	Normal wash 65°
b5	Normal wash 65°	
b6	Super wash 70°	

Control unit: blue cylinder
1 737 203 884.886

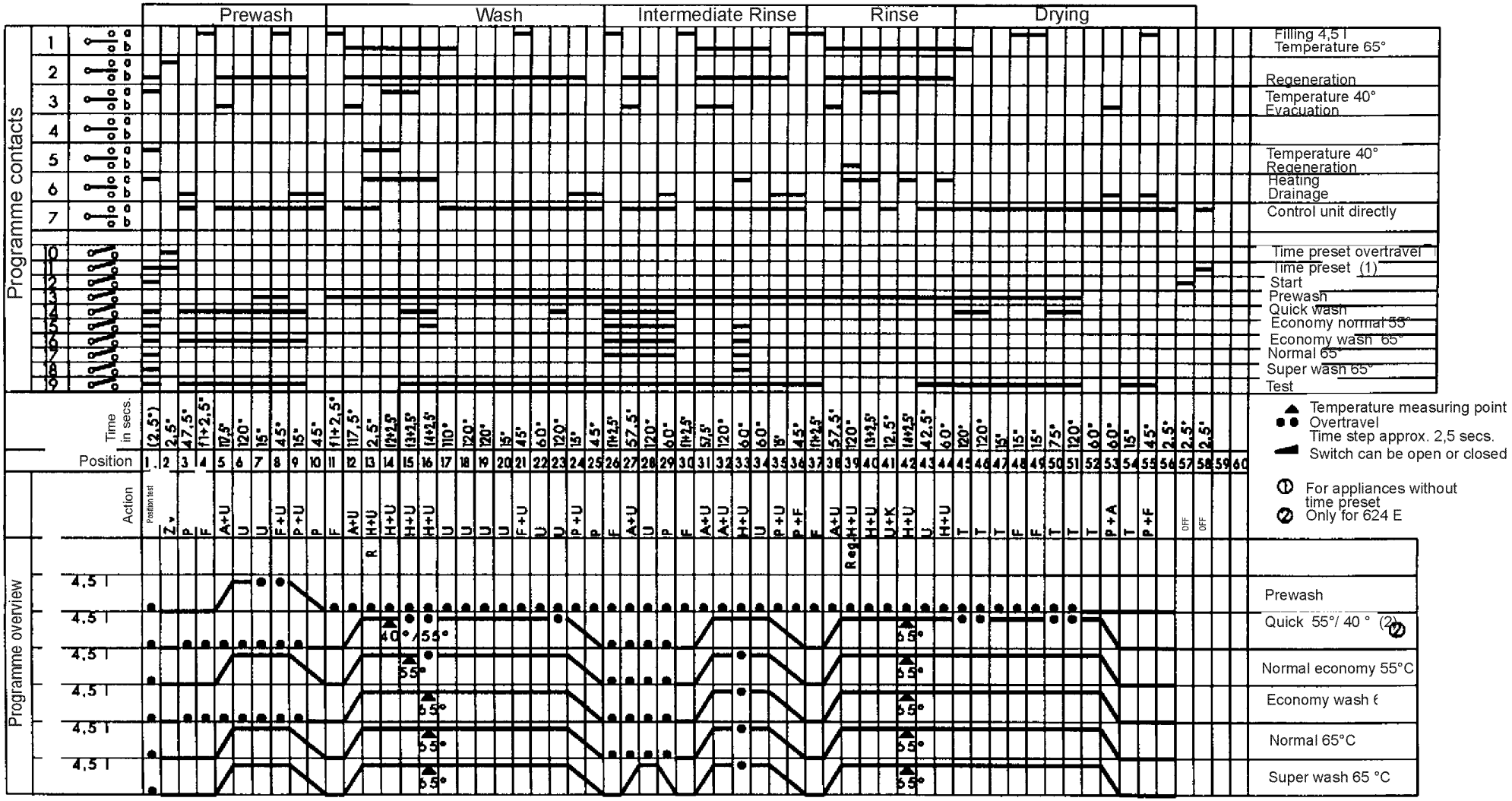
IG 669.0 B
IG 669.0 W-0
IG 669.0 J

1 739 911 048	Edition: 09.94
up from FD 7501	



Control unit:
1 737 203 884

1 739 911 050	
from FD7501	Edition: 02.94



A = Outflow
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R = Adding detergent
U = Circulation
Reg = Regeneration
ZV = Time preset

Control unit:
1 737 203 822,824,825

1 739 911 081	Edition: 02/.95
from FD 7501	