

Installation and Commissioning

1. Notes

1.1 Place of installation

- In a dry space (e.g. the boiler room), on a control panel or control panel rail, on the control panel fascia or in the sloping front of a control desk.
- The controller must not be exposed to dripping water.
- Permissible ambient temperature: 0...50 °C.

1.2 Electrical installation

The local standards and regulations for electrical installations must be observed.

Cable tension relief must be ensured.

The wires from the controller to the actuator and the pumps carry mains voltage.

The wires from the controller to the detectors carry protective low voltage.

- The permissible cable lengths for all detectors are the following:
 - Copper cable 0.6 mm dia. 20 m max.
 - Copper cable 1.0 mm² 80 m max.
 - Copper cable 1.5 mm² 120 m max.
- The cables to the detectors should not be run parallel to mains carrying cable (e.g. power supply for the pumps).

2. Installation and wiring

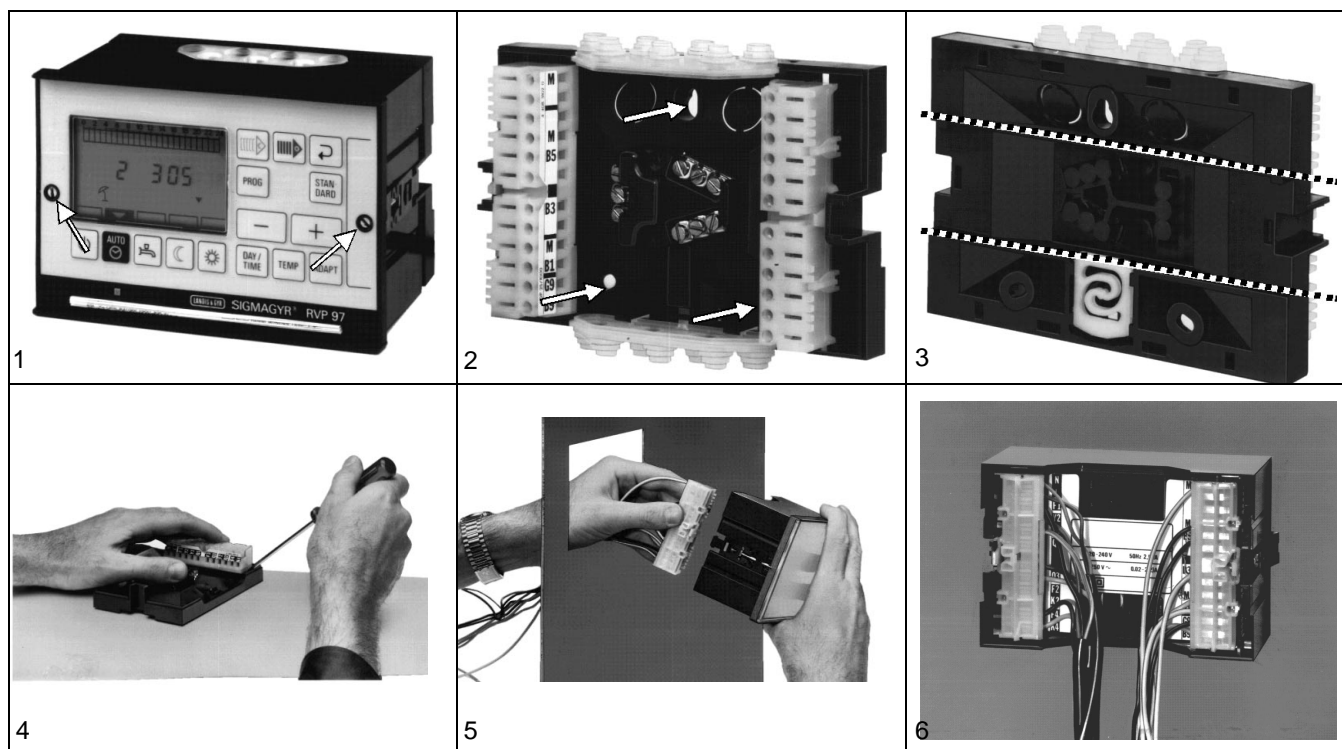
2.1 Wall mounting

1. Separate base from the controller by loosening the two fixing screws on the front of the controller (Fig. 1).
2. Fit base to the wall (Fig. 2) or to a DIN mounting rail (Fig. 3).
3. Wire base according to the plant wiring diagram.
4. Place the controller on the base and secure by tightening the two fixing screws on the front of the controller.

2.2 Flush panel mounting

1. Separate base from the controller by loosening the two fixing screws on the front of the controller (Fig. 1).
2. Remove terminal strips from the base (Fig. 4).
3. Wire the terminal strips. Make certain the cables will be sufficiently long, allowing the control panel door to be opened and the wired terminal strips to be moved about.
4. Introduce terminal strips through the panel cutout and plug them into the controller (Fig. 5). In that case, the base will no longer be required.
5. Place controller in the panel cutout and secure (Fig. 6).

Note: tighten the fixing screws only slightly!



3. Functional check

- DO NOT switch on power yet!
- With wall mounting: separate controller from the base.
With flush panel mounting: separate terminal strips from the controller.
- Check wiring to make certain it is in compliance with the plant wiring diagram.
- Fit controller or terminal strips, depending on the method of installation.
- Check the regulating unit: Seat or slipper valve:
 - Ensure it is correctly fitted (observe direction of flow indicated on the valve body)
 - Make certain the slipper operates in the correct range (note position indicator)
 - Ensure the manual adjuster is disengaged
- Note with underfloor and ceiling heating systems: the limit thermostat must be correctly set. During the functional check, the flow temperature must not exceed the max. permissible level (usually 55 °C). If that is the case, proceed immediately as follows:
 - Close the seat or slipper valve manually
 - Switch off the pump
 - Close the pump isolating valve
- Switch on power.
The display must show something (e.g. the time of day). If that is not the case, the cause is probably one of the following:
 - No power
 - Main fuse blown
 - Manual switch not in position I

3.1 Detector test

The detector test or the display of the actual temperature is activated by pressing the TEMP button. Press TEMP several times. First, the 5 adjusted set value temperatures appear, then the 8 following temp.:

Display	Detector	VG1-VG6	VG0
TEMP 1	D.h.w. temperature detector 1 / Primary return temp. detector 2 Remote telephone switch	B31	B11
TEMP 2	D.h.w. temperature detector 2 Secondary return temp. detector 2	B3	B3
TEMP 3	Primary return temperature detector	B7	B7
TEMP 4	Secondary return temperature detector / D.h.w. charging detector	B71	B71
TEMP 5	Secondary flow temp. detector	B1	B1
TEMP 6	Flow temp. detector heating circuit Flow temp. detector d.h.w. circuit Primary return temp. detector 2	B11	B11
TEMP 7	Outside detector	B9	B9
TEMP 8	Room temperature detector	A6	A6

Check:

If, in case of display of an actual temperature, o o o appears in place of the temperature, the respective detector has a short-circuit.

If, in case of display of an actual temperature, - - - appears in place of the temperature, the respective detector is not connected.

The detector test mode can be quit either immediately by pressing one of the operating mode buttons, or automatically after about eight minutes.

3.2 Relay test

	Button	Display	Relay	Effect
0				Relay test mode active
1		R	Q1	Heating circuit pump 1 on
2		R	Q3 / Y3	D.h.w. charging pump on
3		R	Q4	Storage tank charging pump on
4		R	Q5	D.h.w. circulating pump on
5	 	R 5:XX ▲ R 5:XX ▼ R 5:XX	Y1 Y2	Control valve opens Control valve closes
6	 	R 6 ▲ R 6 ▼ R 6	Y11 Y22	Valve opening Valve closing

The relay test mode can be quit immediately by pressing any of the operating mode buttons, or automatically after about eight minutes.

Note:

- Test step 5
XX = valve position according to stroke model (in %)
- Terminal Y4 is always under voltage when Q3/Y3 is deenergized!

4. Enduser settings

These are settings that can be made to meet individual needs. They are directly accessible from the user interface. For procedure, please refer to the operating instructions supplied with each controller.

5. Installer settings

These are plant-related settings that should only be changed by the heating installer. They are subdivided into different groups that can only be selected by pressing combinations of buttons (please refer to the table below).

The display shows the selected group, the parameter and the adjusted value.

	Combination of buttons	Function
1		Selecting group C, F or H
2	+ 5 Sek.	Selecting group U Note: first, select button combination 1
3	+ +	Selecting the parameters of the group Note: forward and reverse selection possible
4	+	Adjusting the values

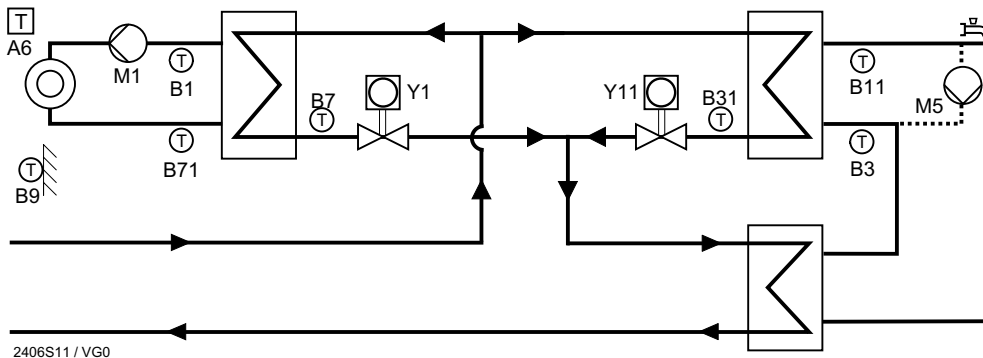
The parameter setting level can be quit either immediately by pressing one of the operating mode buttons, or automatically after about eight minutes.

Factory-set parameters:

Plant diagram VG1

5.1 Plant diagram VG0

Heating circuit control with heating circuit pump, d.h.w. control with second heat transfer station and preheating.



2406S11 / VG0

5.1.1 Recommended components

- Fast-running actuator for valve Y11: SKD32.21; SQS35.53
- Temperature detector B11: must be very fast
(use immersion type detector with no pocket!)
- Temperature detector B3: required for fast controlled systems (fast heat exchangers)

5.1.2 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	0	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost (H-bus master)	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temperature acc. to U4		
C8	Not used	-				
C9	Not used	-				

5.1.3 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for poorly insulated buildings		
F6	Switching differential room temperature limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value boost with boost heating	5	0...15		°C	

F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential between flow temperature and room temperature set value (F14)	6	0...30		°C	

5.1.4 Parameter settings group H - „D.h.w.“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	No function	-				
H5	(Function acc. to U18)	-				
H6	No function	-				
H7	(Function acc. to U19)	-				
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Not used	-				
H12	Not used	-				
H13	Not used	-				
H14	Not used	-				

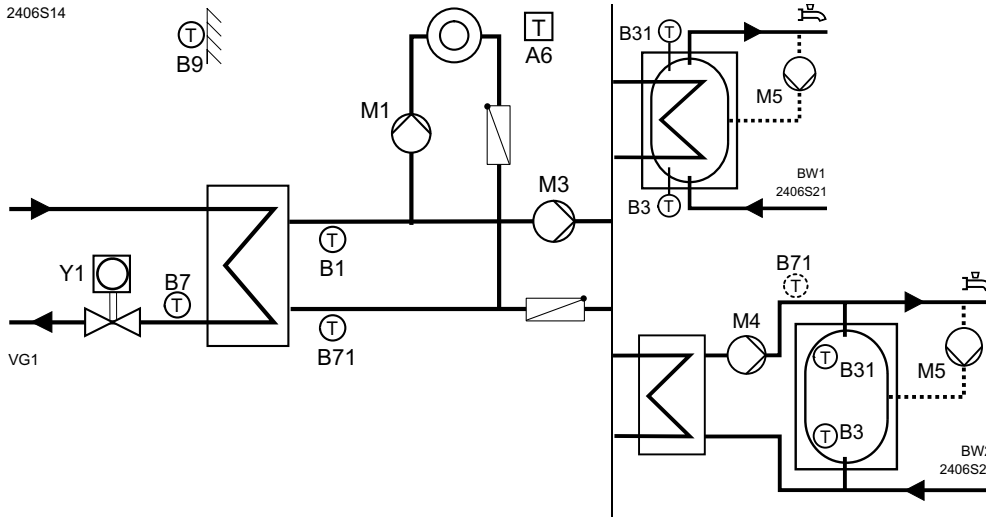
5.1.5 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temp.	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential of primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10		4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>Popen</i> for valve Y11 Control gain (KP), multiplied by running time open , divided by 5 ⇒ For SKD32.21 (30 s open/10 s close), SQS35.53 (35 s open/close)	SKD:15 SQS:17	0...255	Contr. system oscillates: reduce setting value Contr. system too slow: increase setting value		
U15	Integral action time of valve Y11	60	30/60/ 120/240		s	
U16	<i>Pclosed</i> for valve Y11 Control gain (KP), multiplied by running time close , divided by 5 ⇒ For SKD32.21 (30 s open/10 s close), SQS35.53 (35 s open/close)	SKD: 5 SQS:17	0...255	Contr. system oscillates: reduce setting value Contr. system too slow: increase setting value		
U17	Limitation of return temperature differential between primary and secondary circuit during d.h.w. charging	0	0 0.5...50	Passive Active	°C	
U18	Derivative action time, d.h.w. charging, VG0	1	0...15		s	
U19	Authority of cold water detector B3, VG0 0.5 °C per controller sampling rate of 2 s	4	0...15			

5.2 Plant diagram VG1 (factory-setting)

Heating circuit control with heating circuit pump, d.h.w. temperature control with d.h.w. pump

2406S14



5.2.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	1	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost (H-bus master)	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc. to U4		
C8	Not used	-				
C9	Not used	-				

5.2.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	
F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		

F15	Min. temperature differential between flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	
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5.2.3 Parameter settings group H - „D.h.w.“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temperature with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temperature during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time of M4 (after M3)	0	0...15		min	

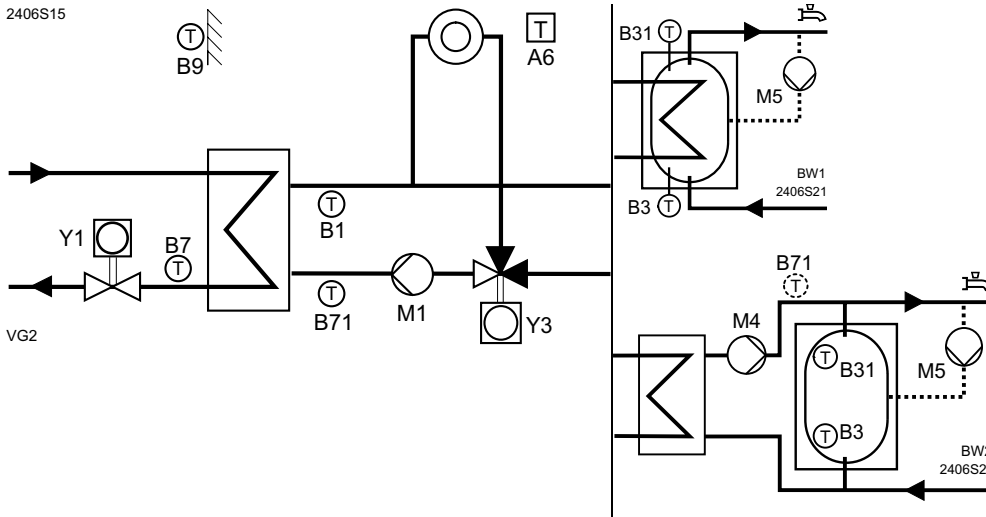
5.2.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temperature	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential of primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	Not used	-				
U15	Not used	-				
U16	Not used	-				
U17	Limitation of return temperature differential between primary and secondary circuit during d.h.w. charging	0	0 0.5...50	Passive Active	°C	
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.3 Plant diagram VG2

Heating circuit control with main pump and changeover valve for d.h.w. control

2406S15



5.3.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	2	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost (H-bus master)	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc. to U4		
C8	Not used	-				
C9	Not used	-				

5.3.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	

F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential between flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	

5.3.3 Parameter settings group H - „D.h.w.“

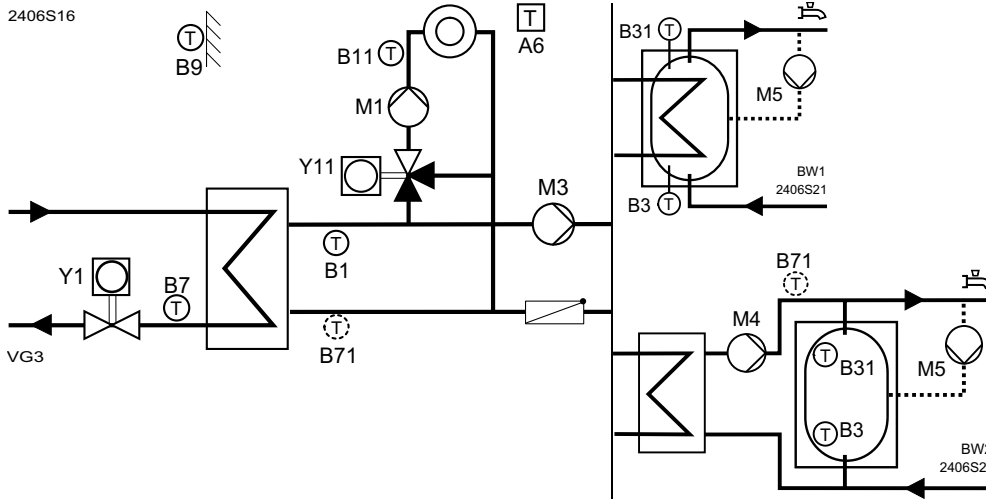
No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temp. with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temp. during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time for M4 (after M3)	0	0...15		min	

5.3.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temperature	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential of primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	Not used	-				
U15	Not used	-				
U16	Not used	-				
U17	Limitation of return temperature differential between primary and secondary circuit during d.h.w. charging	0	0 0.5...50	Passive Active	°C	
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.4 Plant diagram VG3

Heating circuit control with mixing valve and heating circuit pump, d.h.w. control with d.h.w. pump



5.4.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	3	1...6	Acc. to plant diagram		VG...
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost mixing circuit and H-bus master	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc. to U4		
C8	Not used	-				
C9	Not used	-				

5.4.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	
F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		

F15	Min. temp. differential between flow temp. and room temp. set value with convectors (F14)	6	0...30		°C	
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5.4.3 Parameter settings group H - „D.h.w.“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temp. with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temperature during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time for M4 (after M3)	0	0...15		min	

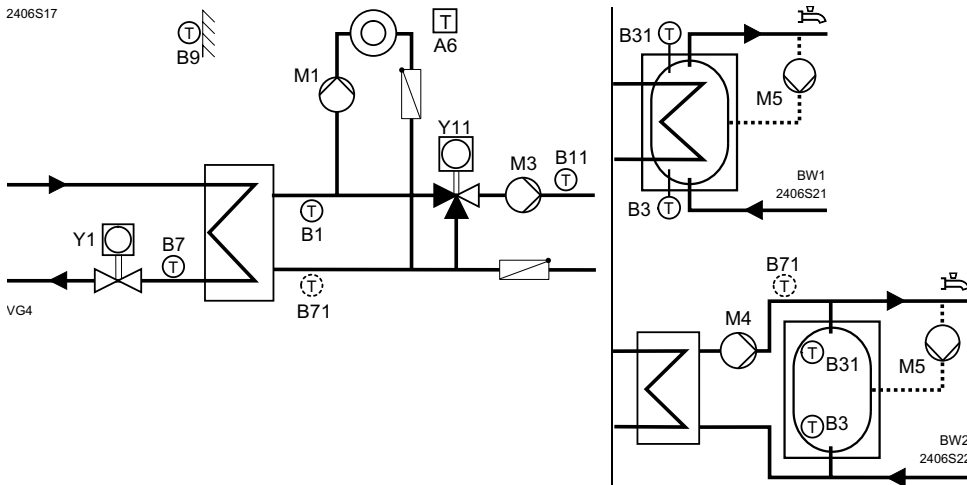
5.4.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temp.	7	0...39.5			
U8	Max. set value of return temp. with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential of primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke%	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>P_{open}</i> for valve Y11 Control gain (KP), multiplied by running time open , divided by 5	72	0...255	Controlled system oscillates: reduce setting value/Controlled system too slow: increase setting value		
U15	Integral action time valve Y11	60	30/60/ 120/240		s	
U16	<i>P_{closed}</i> for valve Y11 Control gain (KP), multiplied by running time close , divided by 5	72	0...255	Controlled system oscillates: reduce setting value/Controlled system too slow: increase setting value		
U17	Limitation of return temperature differential between primary and secondary circuit during d.h.w. charging	0	0 0.5...50	Passive Active	°C	
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.5 Plant diagram VG4

Heating circuit control with heating circuit pump, d.h.w. control with mixing valve and d.h.w. pump.

2406S17



5.5.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	4	0..6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost mixing circuit and H-bus master	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc.to U4		
C8	Not used	-				
C9	Not used	-				

5.5.2 Parameter settings F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	
F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential between flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	

5.5.3 Parameter settings group H - „D.h.w.“

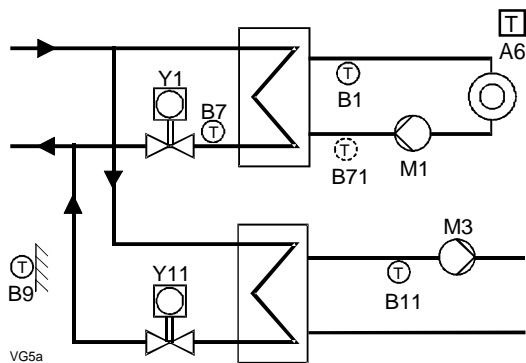
No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temperature with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temperature during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time for M4 (after M3)	0	0...15		min	

5.5.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temp.	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential of primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>P_{open}</i> for valve Y11 Control gain (KP), multiplied by running time open , divided by 5	72	0...255	Controlled system oscillates: reduce setting value/Controlled system too slow: increase setting value		
U15	Integral action time valve Y11	60	30/60/ 120/240		s	
U16	<i>P_{closed}</i> for valve Y11 Control gain (KP), multiplied by running time close , divided by 5	72	0...255	Controlled system oscillates: reduce setting value/Controlled system too slow: increase setting value		
U17	Limitation of return temperature differential of primary and secondary circuit during d.h.w.	0	0 0.5...50	Passive Active	°C	
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.6 Plant diagram VG5a

Heating circuit control with heating circuit pump, d.h.w. control with second heat transfer station and d.h.w. pump.



- For the d.h.w. diagrams 1.) and 2.) no special settings are required!

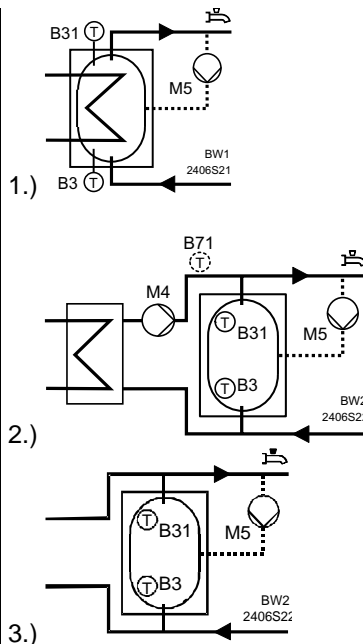
- For d.h.w. diagram 3.):

Parameter H5 should be set as follows:

$$H5 \approx \left(\frac{H7}{2} + 1 \right)$$

⇒ H5 only permits even setting values; select the next higher value for H5 !

(Example: H7=8: H5 = 8/2+1 = 5 ⇒ Setting: H5 = 6)



5.6.1 Parameter settings group C - „General parameter“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	5	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost mixing circuit and H-bus master	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc.to U4		
C8	Not used	-				
C9	Not used	-				

5.6.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	

F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential of flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	

5.6.3 Parameter settings group H - „D.h.w.“

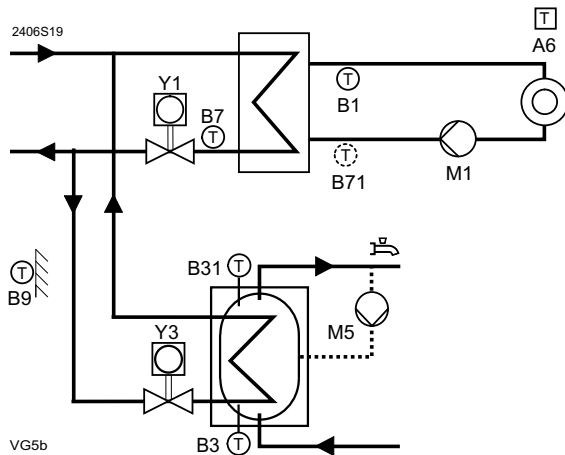
No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		2°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		1°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temp. with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temp. during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time for M4 (after M3)	0	0...15		min	

5.6.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point const./shifting max. set value of return temp.	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temp.	7	0...39.5			
U8	Max. set value of return temp. with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential between primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>P_{open}</i> for valve Y11 Control gain (KP), multiplied by running time open , divided by 5	72	0...255	Controlled system oscillates:reduce setting value/Controlled system too slow: increase setting value		
U15	Integral action time valve Y11	60	30/60/ 120/240		s	
U16	<i>P_{closed}</i> for valve Y11 Control gain (KP), multiplied by running time close , divided by 5	72	0...255	Controlled system oscillates:reduce setting value/Controlled system too slow: increase setting value		
U17	<i>Not used</i>	-				
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.7 Plant diagram VG5b

Heating circuit control with heating circuit pump and direct d.h.w. control.



5.7.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	5	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost mixing circuit and H-bus master	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc. to U4		
C8	Not used	-				
C9	Not used	-				

5.7.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temperature limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	

F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential between flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	

5.7.3 Parameter settings group H - „D.h.w.“

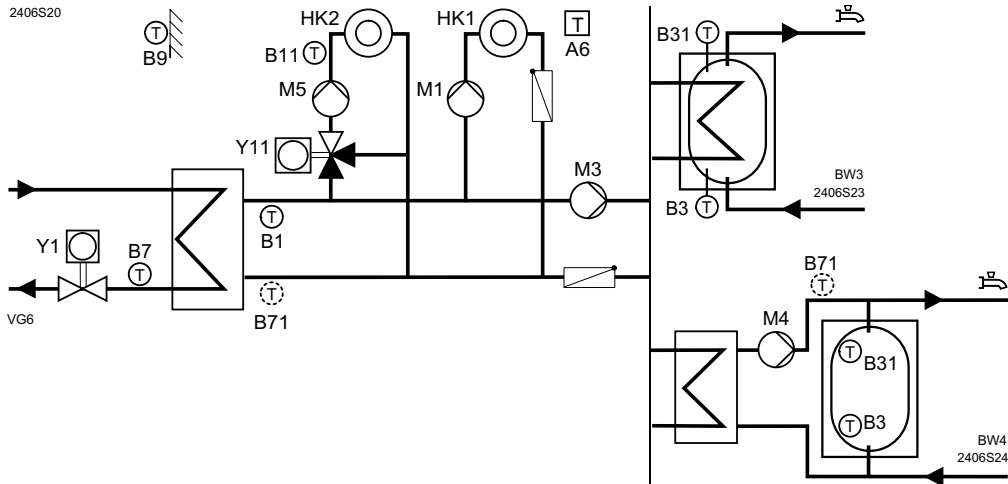
No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	<i>Not used</i>	-				
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		1°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	<i>Not used</i>	-				
H12	<i>Not used</i>	-				
H13	Set value of d.h.w. temperature during the legionella function	65	0 1...80	Passive Active	°C	
H14	<i>Not used</i>	-				

5.7.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of return temperature	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temperature	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential between primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke %	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>Not used</i>	-				
U15	<i>Not used</i>	-				
U16	<i>Not used</i>	-				
U17	<i>Not used</i>	-				
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.8 Plant diagram VG6

Heating circuit control HK1 with heating circuit pump, heating circuit control HK2 with mixing valve and heating circuit pump, d.h.w. control with d.h.w. pump.



5.8.1 Parameter settings group C - „General parameters“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
C1	Type of plant	6	0...6	Acc. to plant diagram	VG...	
C2	Bus address	0	0 1...7 15	Standalone Slave Master		
C3	Set value boost mixing circuit and H-bus master	10	0...15		°C	
C4	Pump overrun time	4	0...7.5		min	
C5	Display	1	0 1	Outside temperature Time of day		
C6	Pump Q1	0	0 1	Heating circuit pump Main pump		
C7	H4 function	0	0 1	Ymin function Min. flow temp. acc.to U4		
C8	Slope of heating circuit 2	8	0...39.5	8 - for underfloor heating circuit 15 - for radiator circuit		
C9	Weekly program heating circuit 2	1	0 1	PROG1 PROG2		

5.8.2 Parameter settings group F - „Heating circuit“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
F1	Min. limitation of flow temperature	8	8...119.5		°C	
F2	Max. limitation of flow temperature	95	8...119.5		°C	
F3	Room temperature detector	1	0 1	Passive Active		
F4	Room temperature compensation	4	0 1...15	Passive Active		
F5	Optimum start control and quick setback with no room unit	8	0...15	Smaller for buildings with poor insulation		
F6	Switching differential room temp. limitation with room unit	0	0...15		¼ °C	
F7	Type of building structure	1	0 1	Heavy Light		
F8	Adaptation of heating curve	0	0 1	Passive Active		
F9	Frost protection for the plant	1	0 1	Passive Active		
F10	Max. forward shift for optimum start control	0	0 10...150	Passive Active	min	
F11	Max. forward shift for optimum stop control	0	0 10...150	Passive Active	min	
F12	ECO extension	0	0...150		min	
F13	Room set value temperature boost with boost heating	5	0...15		°C	

F14	Type of heating system	1	0 1 2	Convectors Radiators Underfloor		
F15	Min. temperature differential between flow temperature and room temperature set value with convectors (F14)	6	0...30		°C	

5.8.3 Parameter settings group H - „D.h.w.“


No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
H1	D.h.w. charging time	1	0 1 2	PROG1 PROG2 24h/day		
H2	Enabling of d.h.w. charging	1	0 1	Once/day Several times/day		
H3	D.h.w. circulating pump	1	0 1 2	PROG1 PROG2 24h/day		
H4	Enabling of d.h.w. circulating pump during d.h.w. charging	0	0 1	Enabled Disabled		
H5	Boost with d.h.w. charging	16	0...30		°C	
H6	Set value of flow temperature during d.h.w. charging	1	0 1	Max. selection D.h.w. charging set value		
H7	Switching differential d.h.w.	8	0...15		°C	
H8	D.h.w. priority	0	0 1 2	None (parallel) Shifting Absolute		
H9	Delay time for d.h.w. priority, shifting	3	0...15		min	
H10	Heating circuit locking time with d.h.w. charging, shifting	10	0...150		min	
H11	Min. actual value of flow temp. with d.h.w. charging (for M4)	50	8...119.5		°C	
H12	D.h.w. charging detector (B71)	0	0 1	No Yes		
H13	Set value of d.h.w. temperature during the legionella function	65	0 1...80	Passive Active	°C	
H14	Pump overrun time for M4 (after M3)	0	0...15		min	


5.8.4 Parameter settings group U - „Precontroller“

No.	Function	Recomm. setting	Range	Remarks	Unit	Values set
U1	Control gain KP of primary control valve Y1	3	1...25.5			
U2	Integral action time of primary control valve Y1	60	30/60/ 120/240		s	
U3	Running time of primary control valve Y1	120	0 ...255		s	
U4	Min. limitation of secondary flow temperature	0	0...119.5		°C	
U5	Max. set value of return temperature, constant range	50	8...119.5		°C	
U6	Inflection point constant/shifting max. set value of retur temp.	10	-10...20		°C	
U7	Slope of shifting range max. set value of return temperature	7	0...39.5			
U8	Max. set value of return temperature with d.h.w. charging	50	8...119.5		°C	
U9	Limitation of return temperature differential between primary and secondary circuit in heating mode	0	0 0.5...50	Passive Active	°C	
U10	Max. limitation of pulse rate per minute	0	0 1...2047	Passive Active		
U11	Integral action time for U8, U9, U10	16	4/8/16/32		min	
U12	Min. limitation of primary flow rate (hydraulic creep)	4	0...15		Stroke%	
U13	Locking time after min. limitation (U12)	6	0...15		min	
U14	<i>Popen</i> for valve Y11 Control gain (KP), multiplied by running time open , divided by 5	72	0...255	Controlled system oscilates:reduce setting value/ Controlled system too slow: increase setting value		
U15	Integral action time of valve Y11	60	30/60/ 120/240		s	
U16	<i>Pclosed</i> for valve Y11 Control gain (KP), multiplied by running time close , divided by 5	72	0...255	Controlled system oscilates:reduce setting value/ Controlled system too slow: increase setting value		
U17	Limitation of return temperature differential between primary and secondary circuit during d.h.w. charging	0	0 0.5...50	Passive Active	°C	
U18	(Function according to H5)	-				
U19	(Function according to H7)	-				

5.9 Setting the heating curve

The setting must be made according to the data used for plant sizing.

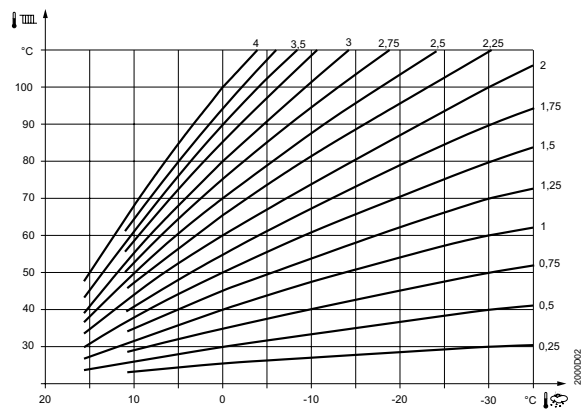
 Press briefly until ADAPT1 appears.

 Press to adjust the displayed value.

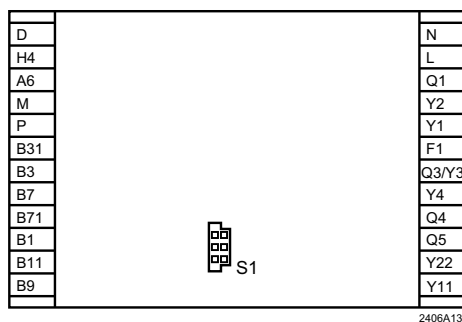
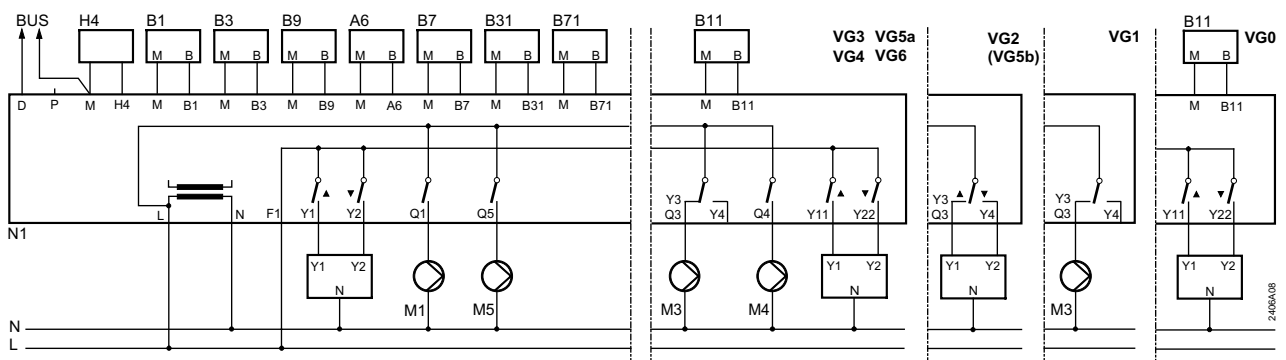


Note:

The value displayed is ten times the actual slope S. This means that if the value displayed reads 14, for example, the actual slope is 1.4.



6. Connection diagrams



2406A13

Connection terminals for measuring voltage

- A6 Room unit (PPS)
- B1 Secondary flow temperature detector 1
- B3 D.h.w. temperature detector 2, or secondary return temperature detector 2 with VG0
- B7 Primary return temperature detector 1
- B9 Outside detector
- B11 Heating circuit flow temperature detector with VG3 and VG6
D.h.w. flow temperature detector with VG4 and VG5a
D.h.w. temperature detector with VG0
- B31 D.h.w. temperature detector 1, or primary return temperature detector 2 with VG0
- B71 Secondary return temperature detector 1, or d.h.w. charging detector with VG0
- D H-bus
- H4 Auxiliary switch
- P Pulse input

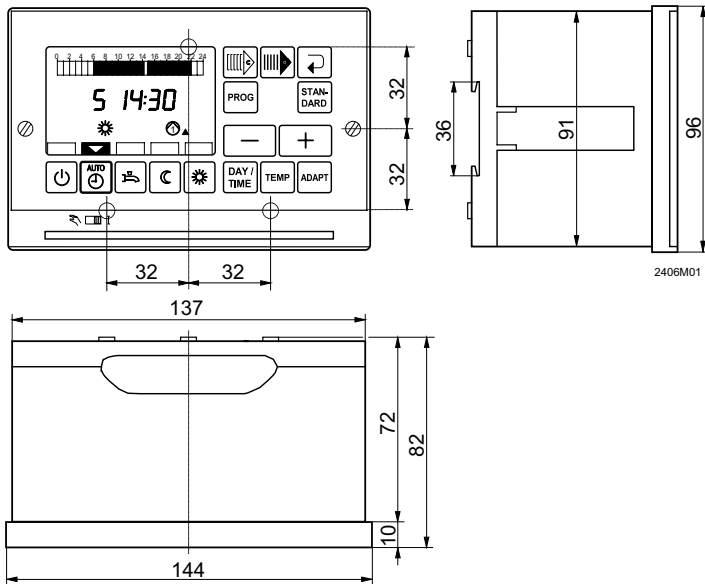
Connector at the rear of the RVP97...

- S1 Connector for communication interface

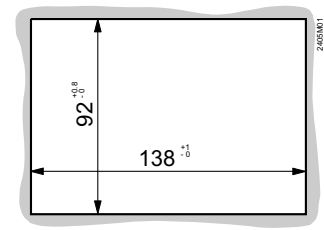
Connection terminals for mains voltage

- F1 Live of control relay
- L Live, AC 230 V
- M Measuring neutral
- N Neutral conductor
- Q1 Heating circuit pump M1 or main pump M1 with VG2
- Q3 D.h.w. pump M3
- Q4 Storage tank charging pump M4
- Q5 D.h.w. circulating pump M5, or HK2 pump M5 with VG6
- Y1 Primary control valve 1 (open)
- Y2 Primary control valve 1 (closed)
- Y3 Changeover valve on d.h.w. with VG2/ Primary control valve 2 (open) with VG5b
- Y4 Changeover valve on heating circuit with VG2/ Primary control valve 2 (closed) with VG5b
- Y11 Heating circuit valve open with VG3 and VG6/ D.h.w. valve open with VG4/ Primary control valve 2 open with VG0 and VG5a
- Y22 Heating circuit valve closed with VG3 and VG6/ D.h.w. valve closed with VG4/ Primary control valve 2 closed with VG0 and VG5a

7. Dimensions



Controller with base



Panel cutout

Commissioning Protocol for RVP97

Serial number:

Type of plant: Plant no.:

Operator/owner:

Location:

Weekly program		Program 1			Program 2		
		NZ1	NZ2	NZ3	NZ1	NZ2	NZ3
1 Monday	Start - end						
2 Tuesday	Start - end						
3 Wednesday	Start - end						
4 Thursday	Start - end						
5 Friday	Start - end						
6 Saturday	Start - end						
7 Sunday	Start - end						

Heating curve	Slope	ADAPT 1
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Set values	Temperature	°C
TEMP	Normal room temperature set value	
TEMP	Reduced room temperature set value	
TEMP	D.h.w. temperature set value	
TEMP	Room temperature set value for frost protection	
TEMP	Summer/winter changeover	

Signature customer

Signature commissioning engineer