

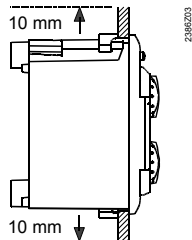
## Installation without base

### Place of installation

- Compact station front or control panel front
- Permissible ambient temperature: 0...50 °C
- The controller may not be exposed to dripping water

### Mounting

- Above and below the controller, there must be a clearance of at least 10 mm:



- That space should not be accessible and no objects may be placed there
- Panel cutout required:  
Dimensions of cutout: 92 × 138 mm (refer to "Dimensions")  
Maximum thickness: 2...10 mm

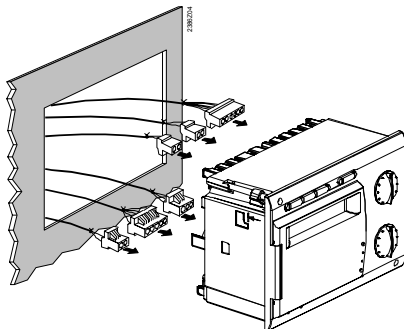
### Electrical installation

- Local regulations for electrical installations must be complied with
- Cable tension relief must be ensured
- The terminal strip at the top is used for low voltage connections, that at the bottom for the mains voltage connections
- The cables from the controller to the actuators and pumps carry mains voltage
- The cables to the sensors should not be run parallel to mains carrying cable (safety class II to EN 60730!)

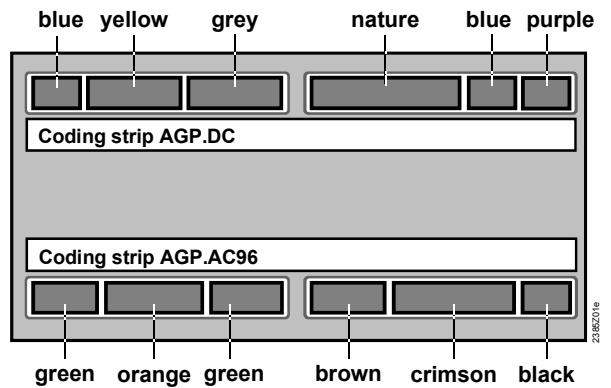
**Caution:** Power to the controller may be supplied only after it is completely fitted in the cutout. If this is not observed, there is a risk of electric shock near the terminals and through the cooling slots.

### Mounting procedure

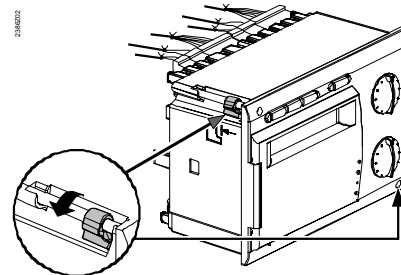
1. Turn off power supply
2. Fit the coding strips
3. Pull the prefabricated cables through the cutout



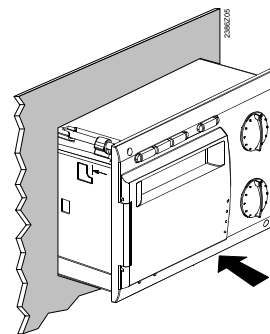
4. Plug the connectors into the respective sockets at the rear of the controller.  
Note: The connectors are coded to make certain they cannot be mixed up.



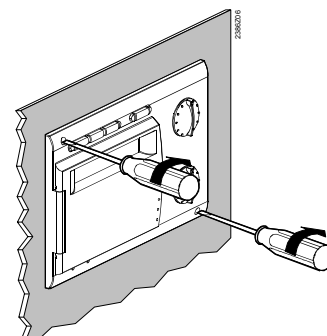
5. Check to ensure the fixing levers are turned inward
6. Check to make certain there is sufficient space between the front panel and the fixing levers



7. Slide the controller into the panel cutout without applying any force. Do not use any tools when inserting the unit into the cutout.  
If the unit does not fit, check the size of the cutout and the housing.



8. Secure the fixing levers by tightening alternately the two screws on the front of the controller



## Connection terminals

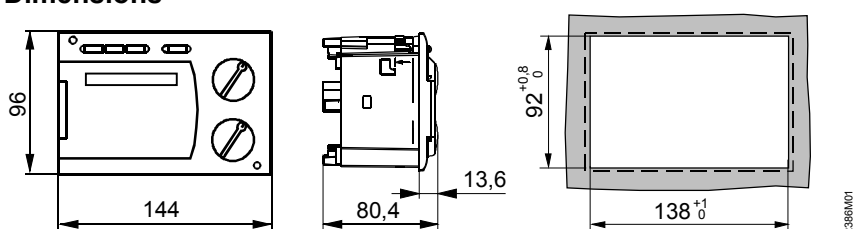
### Low voltage connections

No.	Marking on controller	Marking on connector	Colour of connector	Type reference of connector	Unit connected or function
1	DB		purple	AGP2S.02M/109	LPB
2	MB	M			Ground for LPB
3	A6		blue	AGP2S.02G/109	Room unit (PPS)
4	MD	M			Ground for PPS (digital)
5	B9	1	nature/ milky (white)	AGP2S.06A/109	Outside sensor
6	B1	2			Flow temperature sensor
7	M	M			Ground for sensors (analog)
8	B3	4			D.h.w. flow temperature sensor
9	B7	5			Primary return temperature sensor
10	B71/U1	6			Return temp. sensor / Analog input DC 0...10 V
11	P1	1	grey	AGP2S.04G/109	Variable speed pump (PWM output)
12	M	M			Ground (analog)
13	B72	3			Primary oder secondary return temp. sensor
14	B31	4			Storage tank temperature sensor
15	B32	1	yellow	AGP2S.04C/109	Storage tank or return temperature sensor
16	M	M			Ground (analog)
17	B12	3			Flow temperature sensor heating circuit
18	H5	4			Flow switch (binary input)
19	CM+		blue	AGP2S.02G/109	M-Bus connector plus
20	CM-	M			M-Bus connector minus

### Mains voltage connections

No.	Marking on controller	Marking on connector	Colour of connector	Type reference of connector	Function
1	N	N	black	AGP3S.02D/109	Neutral AC 230 V
2	L	L			Live AC 230 V
3	F1	F	crimson	AGP3S.05D/109	Input for Y1 and Y2
4	Y1	2			Primary valve OPEN
5		F			Not used
6	Y2	4			Primary valve CLOSE
7		5		Not used	
8	F3	F	brown	AGP3S.03B/109	Input for Q1 and Q3
9	Q1	2			Heating circuit / system pump ON
10	Q3	3			D.h.w. intermediate circuit pump ON
11	F4	F	green	AGP3S.03K/109	Input for Y5 and Y6
12	Y5	2			Two-port valve/mixing valve OPEN
13	Y6	3			Two-port valve/mixing valve CLOSE
14	F7	F	orange	AGP3S.04F/109	Input for Q2
15	Q2	2			Heating circuit or storage tank charging pump ON
16		3			Not used
17		4			Not used
18	F6	F	green	AGP3S.03K/109	Input for Y7 Q4 and Y8 K6
19	Y7/Q4	2			Two-port valve/mixing valve OPEN or d.h.w. intermediate circuit pump / storage tank charging pump ON
20	Y8/K6	3			Two-port valve/mixing valve CLOSE or circulating pump ON

## Dimensions



Dimensions in mm

## Installation with base

### Place of installation

- In a dry room, e.g. in the heat exchanger room
- Installation choices:
  - Compact station
  - Control cabinet (in the front, on the inner wall or on a DIN rail)
  - Control panel
  - Sloping front of a control desk
- Permissible ambient temperature 0...50 °C

### Electrical installation

- The local regulations for electrical installations must be complied with
- Cable tension relief must be ensured
- The cables from the controller to the actuators and pumps carry mains voltage
- The cables to the sensors should not be run parallel to mains carrying cable (safety class II to EN 60730)

### Permissible cable lengths

- For all sensors and contacts:
 

Copper cable 0.6 mm dia.	max. 20 m
Copper cable 1.0 mm <sup>2</sup>	max. 80 m
Copper cable 1.5 mm <sup>2</sup>	max. 120 m
- For room units:
 

Copper cable 0,6 mm dia.	max. 37 m
Copper cable ≥0,8 mm dia.	max. 75 m
- For data buses:
 

LPB	according to Siemens specifications: Basic Documentation P2370E
M-bus	Engineering Manual J5361E

## Mounting and wiring the base

### Wall mounting

1. Separate base from the controller.
2. Hold base against the wall. Marking "TOP" must be at the top!
3. Mark fixing holes on the wall.
4. Drill holes.
5. If required, knock out holes on the base for cable entry glands.
6. Screw base to the wall.
7. Wire up base.

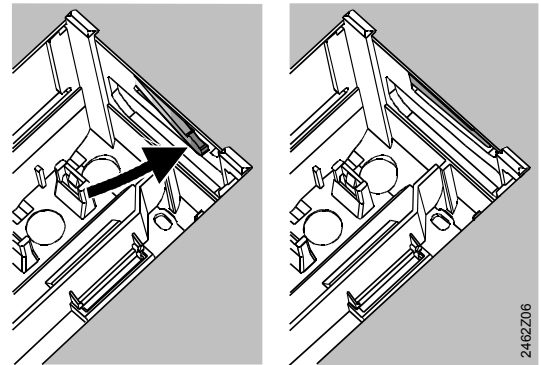
### DIN rail mounting

1. Fit rail.
2. Separate base from the controller.

3. If required, knock out holes on the base for cable entry glands.
4. Fit base to the rail. Marking "TOP" must be at the top!
5. If required, secure base (depending on the type of rail used).
6. Wire up base.

### Flush panel mounting

- Maximum thickness: 3 mm
  - Panel cutout required: 92 × 138 mm
1. Separate base from the controller.
  2. If required, knock out holes on the base for cable entry glands.
  3. Insert base in the panel cutout from behind until stop is reached. Marking "TOP" must be at the top!
  4. Push lateral tongues behind the front panel (refer to illustration below).



Wrong

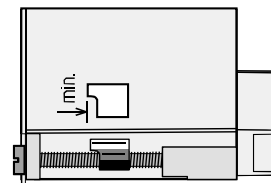
Correct

Place tongues on both sides correctly – they may not be located inside the cutout!

5. Wire up base. Make sure the cable lengths are such that there is sufficient space to open the control panel door.

### Securing the controller to the base

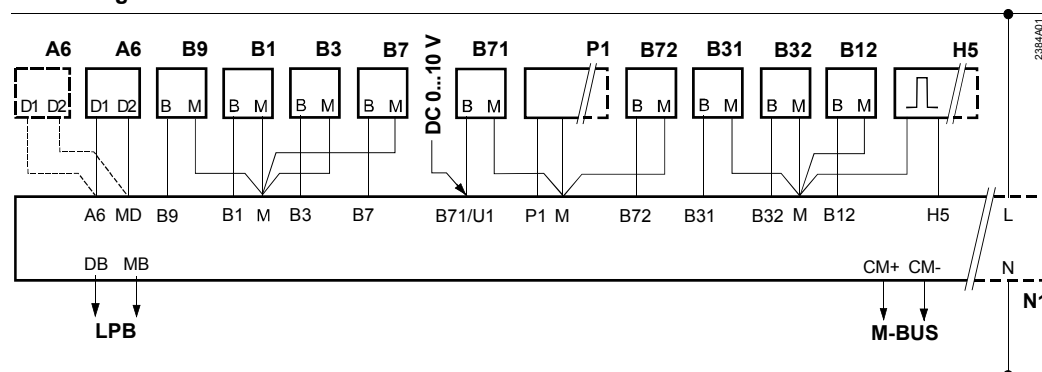
1. Ensure correct position and location of levers by turning the fixing screws (refer to illustration on the lateral wall of the unit).



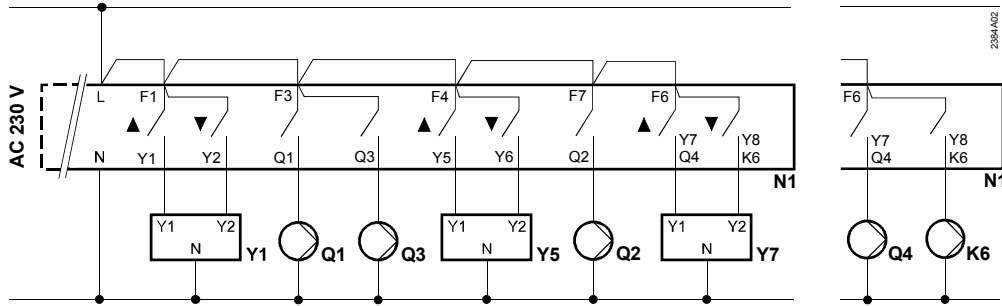
2. Insert controller in the base until stop is reached. Marking "TOP" must be at the top!
3. Tighten fixing screw alternately.

## Connection diagrams

### Low voltage side



## Mains voltage side

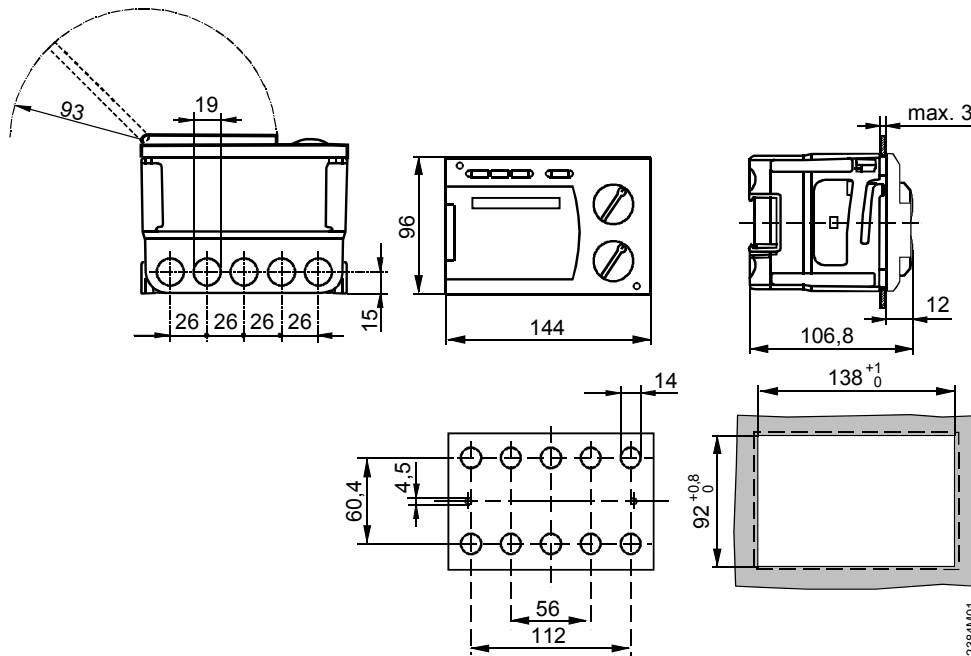


A6	Room unit (QAW50, QAW70 or QAA10)	K6	Circulating pump*
B1	Flow sensor, heating circuit 1 or common flow*	N1	Controller RVD245
B12	Flow sensor, heating circuit 2	P1	Variable speed pump (PWM output)
B3	Flow sensor, d.h.w. or heating circuit 2*	Q1	Heating circuit / system pump
B31	Storage tank sensor	Q2	Heating circuit or storage tank charging pump*
B32	Storage tank or return sensor*	Q3	D.h.w. intermediate circuit pump
B7	Primary return sensor**	Q4	D.h.w. intermediate circuit or storage tank charging pump*
B71	Primary or secondary return sensor*	U1	DC 0...10 V input
B72	Primary or secondary return sensor**	Y1	Actuator for two-port valve in the primary return
B9	Outside sensor	Y5	Actuator 2*
H5	Heat meter, flow switch, alarm contact, etc.	Y7	Actuator 3*

\* Depending on the type of plant

\*\* Suppression of hydraulic creep

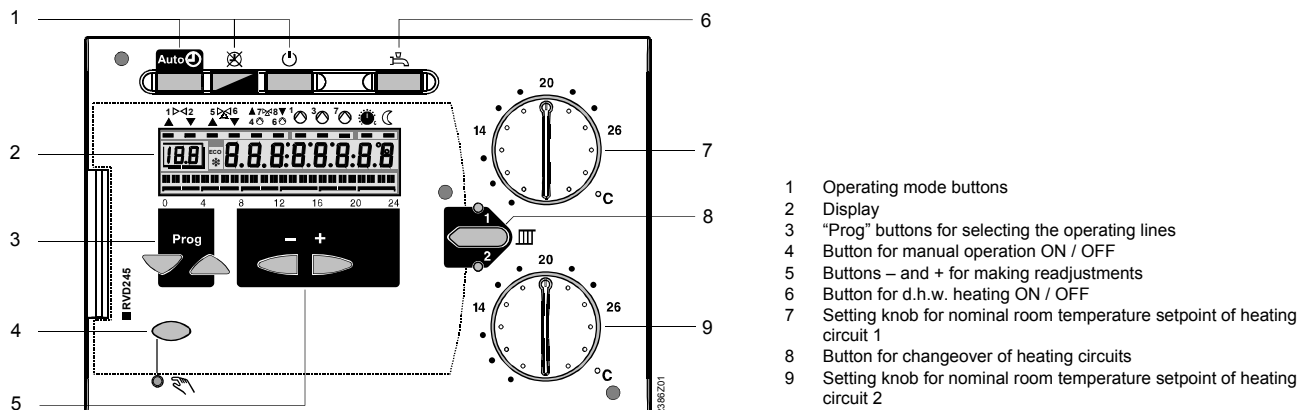
## Dimensions



Dimensions in mm

All information given below applies to both mounting methods (without and with base)


## Setting elements







- 1 Operating mode buttons
- 2 Display
- 3 "Prog" buttons for selecting the operating lines
- 4 Button for manual operation ON / OFF
- 5 Buttons - and + for making adjustments
- 6 Button for d.h.w. heating ON / OFF
- 7 Setting knob for nominal room temperature setpoint of heating circuit 1
- 8 Button for changeover of heating circuits
- 9 Setting knob for nominal room temperature setpoint of heating circuit 2

# Commissioning







## Preparatory checks

- DO NOT switch on power yet.
- Check wiring according to the plant connection diagram.
- Check each motorized valve: see if
  - it is correctly installed (observe direction of flow indicated on the valve body)
  - the manual lever is disengaged
- Note with underfloor and ceiling heating systems!**  
The limit thermostat must be set to the correct value. During the functional test, the flow temperature may not exceed the maximum permissible level (usually 55 °C). If it does, proceed immediately as follows:
  - Either close the valve manually, or
  - Switch off the pump, or
  - Close the pump isolating valve
- Switch on power. The display must show something (e.g. the time of day). If not, the reason may be one of the following:
  - No mains voltage
  - Main fuse defective
  - Mains isolator or main switch not set to ON
- Addressing to be made on the room units:
  - Room unit heating circuit 1 = address 1 (default)
  - Room unit heating circuit 2 = address 2
- If one of the operating mode buttons flashes, a room unit overrides the controller. Select operating mode  on the room unit.


## General information about operation

- Setting elements for commissioning:
  - Nominal room temperature setpoint: with the relevant setting knob, **separately for heating circuits 1 and 2!**
  - Other variables: on the display, where one operating line is assigned to each setting. **Where relevant, separate settings for heating circuits 1 and 2!**
- Buttons for selecting and readjusting the values:
  -  To select the next operating line below
  -  To select the next operating line above
  -  To decrease the displayed value
  -  To increase the displayed value
- Adopting a setting value:  
The setting value is adopted by selecting the next oper-

ating line (or by pressing one of the operating mode buttons)



- Entering -- / --: / --- (deactivating a function):  
Keep  or  depressed until the required display appears
- Block jump function:  
To select a single operating line quickly, two button combinations can be used:  
Keep  depressed and press  to select the next line block above.  
Keep  depressed and press  to select the next line block below.

## Setting procedure

-  Enter the adjusted values in the table!

  - Make settings on the “End-user” level (operating lines 1...50).
  - Configure plant type on operating lines 51...60.
  - Make the relevant settings in the parameter list below. All functions and operating lines configured for the type of plant are activated and adjustable. All operating lines that are not required are locked.
  - Make settings on the “Heating engineer’s” level (operating lines 61...170).
  - Make settings on the “Locking functions” level (operating lines 171...196).

## Commissioning and functional check

- Specific operating lines for the functional check:
  - 161 = sensor test
  - 162 = display of setpoint
  - 163 = relay test
  - 165 = digital input test
- If **Er** (ERROR) appears on the display: prompt operating line 50 to pinpoint the error
- If no line selection button has been pressed for eight minutes, or if one of the operating mode buttons is pressed (controller in the non-operated status), setting buttons  and  can be used to prompt all actual values and the time of day. The actual values are presented like those on operating line 161.

## Settings





### Settings on the “End-user” level

Press  or  to activate the “End-user” level.

 **With all shaded operating lines, the values of heating circuit 1 (HC1) and heating circuit 2 (HC2) must be set separately!**

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips (-x and x- mean “randomly”)
				HC1	HC2	

Line	Function, display	Factory setting	Range	Setting HC1	Setting HC2	Explanations, notes and tips
1	Current room temperature setpoint					Including room unit
2	Reduced room temperature setpoint	14 °C	Variable*	..... °C	..... °C	* From frost protection setpoint to nominal setpoint
3	Frost protection / holiday mode setpoint	8 °C	8... reduced setpoint	..... °C	..... °C	
5	Heating curve slope	15	2.5...40	.....	.....	For chart, refer to the next page. Effective slope is ten times smaller
6	Weekday, for entering the heating program	Current weekday	1...7, 1-7			1 = Monday, 2 = Tuesday, etc. 1-7 = entire week
7	Start of heating period 1	6:00	00:00...24:00	..... : .....	..... : .....	Switching program for heating circuit --:- = period inactive
8	End of heating period 1	22:00	00:00...24:00	..... : .....	..... : .....	Switching program for heating circuit --:- = period inactive
9	Start of heating period 2	--:-	00:00...24:00	..... : .....	..... : .....	Switching program for heating circuit --:- = period inactive

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips (-x and x- mean "randomly")
				HC1	HC2	
10	End of heating period 2	--:--	00:00...24:00	.... : .....	.... : .....	Switching program for heating circuit --:-- = period inactive
11	Start of heating period 3	--:--	00:00...24:00	.... : .....	.... : .....	Switching program for heating circuit --:-- = period inactive
12	End of heating period 3	--:--	00:00...24:00	.... : .....	.... : .....	Switching program for heating circuit --:-- = period inactive
13	Time of day	Unde- fined	00:00...23:59			
14	Weekday	1	1...7			1 = Monday, 2 = Tuesday, etc.
15	Date	01.01	01.01...31.12.			Day.Month
16	Year	2004	1995...2094			
17	Weekday, for entering the d.h.w. program	Current weekday	1...7, 1-7			1 = Monday, 2 = Tuesday, etc. 1-7 = entire week
18	Start of release period 1	6:00	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
19	End of release period 1	22:00	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
20	Start of release period 2	--:--	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
21	End of release period 2	--:--	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
22	Start of release period 3	--:--	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
23	End of release period 3	--:--	00:00...24:00	.... : .....		Switching program for d.h.w. --:-- = period inactive
24	Room temperature (terminal A6)	<b>Display function</b>				
25	Outside temperature	<b>Display function</b>				Press  and  for 3 s: actual outside temperature will be adopted as the attenuated outside temperature
26	D.h.w. temperature	<b>Display function</b>				Keep  or  depressed: current setpoint will be displayed
27	Flow temperature, heating circuit	<b>Display function</b>				
31	Holiday period	1	1...8	.....		
32	Date of the first day of the holiday period	--:--	01.01...31.12.	.....	.....	Day.Month
33	Date of the last day of the holiday period	--:--	01.01...31.12.	.....	.....	Day.Month
41	Setpoint d.h.w. temperature NORMAL	55 °C	variabel	..... °C		
42	Setpoint d.h.w. temperature REDUCED	40 °C	8...setpoint NORMAL	..... °C		
50	Display of faults	<b>Display function</b> 10 = fault outside sensor B9 30 = fault flow sensor, heating circuit 1 B1 32 = fault flow sensor B12 40 = fault primary return sensor B7 42 = fault return sensor B71 43 = fault return sensor B72 50 = fault storage tank sensor B31 52 = fault storage tank sensor B32 54 = fault d.h.w. flow sensor B3 61 = fault room unit, heating circuit 1 62 = device with wrong PPS identification connected (heating circuit 1) 66 = fault room unit, heating circuit 2 67 = device with wrong PPS identification connected (heating circuit 2) 81 = short-circuit on the data bus (LPB) 82 = two devices with the same bus address (LPB) 86 = short-circuit PPS 100 = two clock time masters 120 = flow alarm, common flow temperature 121 = flow alarm, heating circuit 1 122 = flow alarm, heating circuit 2 123 = flow alarm, d.h.w. flow 140 = inadmissible bus address (LPB) 171 = alarm message 180 = contact to heat meter at input H5 interrupted 181 = configuration error between operating lines 52 and 57 182 = configuration error between operating lines 52, 176 and 177 or 52 and 179 183 = configuration error between operating lines 177 and 171 or 176				

## Settings on the "Heating engineer's" level

Press  $\nabla$  and  $\triangle$  simultaneously for 3 seconds, thus activating the "Heating engineer's" level for configuring the plant type and for setting the plant-related variables.  
The "End-user" level remains activated.

### Enter the type of plant:

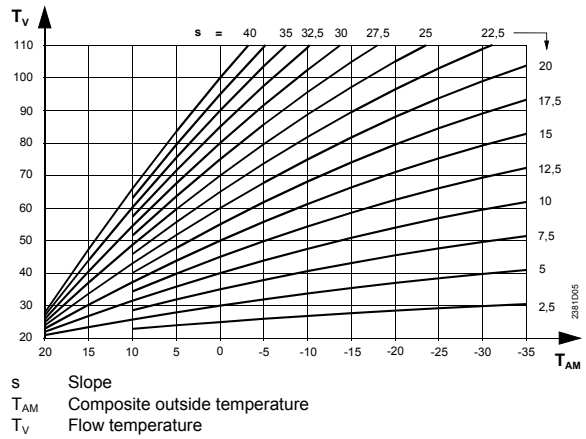
The required plant type is to be entered on operating line 51.  
This activates all functions required for the particular type of plant and shows the relevant operating lines.  
Each type of plant consists of a heating circuit and a d.h.w. circuit.  
There is a total of 14 plant types available. They are shown in the following plant diagrams.

Example (display of plant type 2-1):

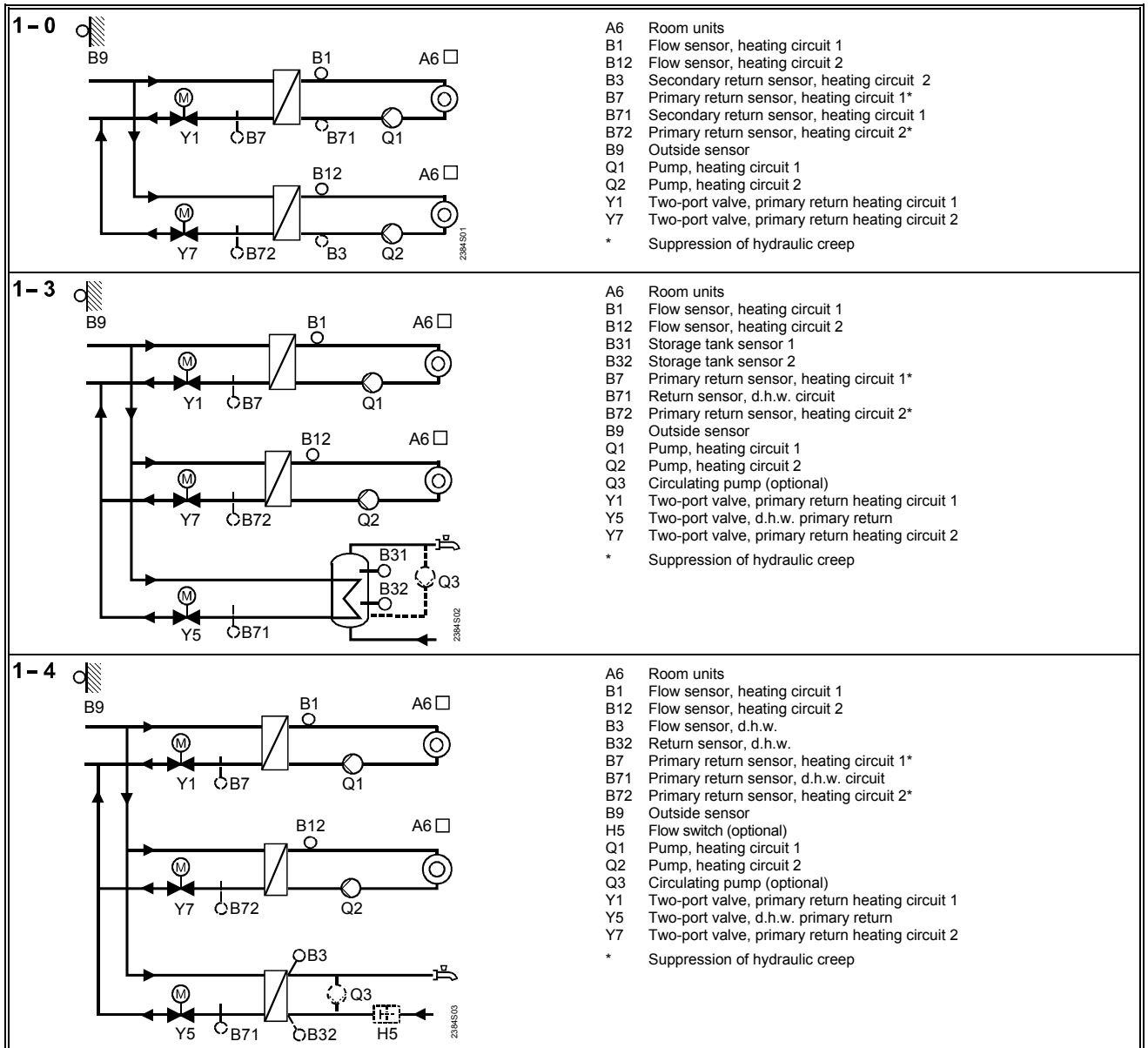


51 Operating line  
2 Type of heating circuit  
1 Type of d.h.w. heating

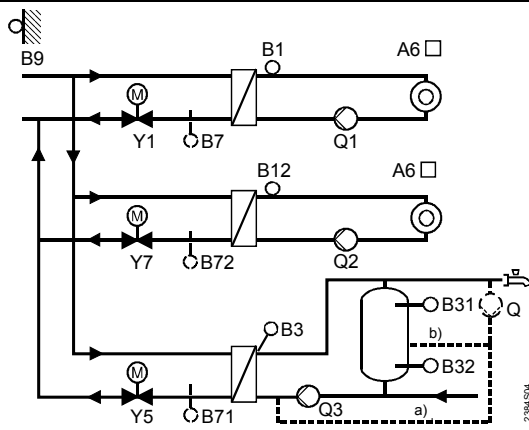
## Heating curve chart



## Plant types



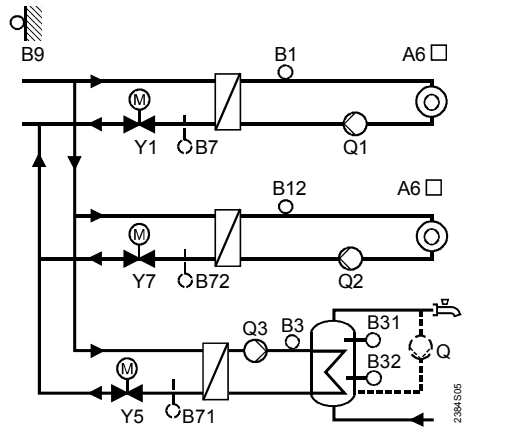
1-8



- a) Circulating pump feeding water into the heat exchanger's return
- b) Circulating pump feeding water into the storage tank

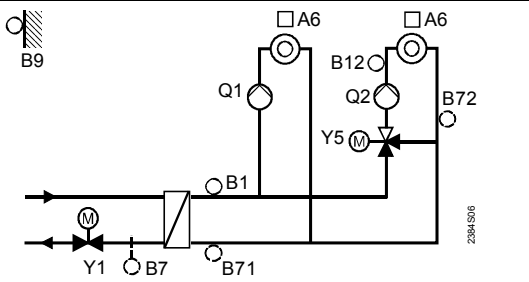
- A6 Room units
- B1 Flow sensor, heating circuit 1
- B12 Flow sensor, heating circuit 2
- B3 Flow sensor, d.h.w.
- B31 Storage tank sensor 1
- B32 Storage tank sensor 2
- B7 Primary return sensor, heating circuit 1\*
- B71 Primary return sensor, d.h.w. circuit
- B72 Primary return sensor, heating circuit 2\*
- B9 Outside sensor
- Q Circulating pump (optional, controlled externally)
- Q1 Pump, heating circuit 1
- Q2 Pump, heating circuit 2
- Q3 Storage tank charging pump
- Y1 Two-port valve, primary return heating circuit 1
- Y5 Two-port valve, d.h.w. primary return
- Y7 Two-port valve, primary return heating circuit 2
- \* Suppression of hydraulic creep

1-9



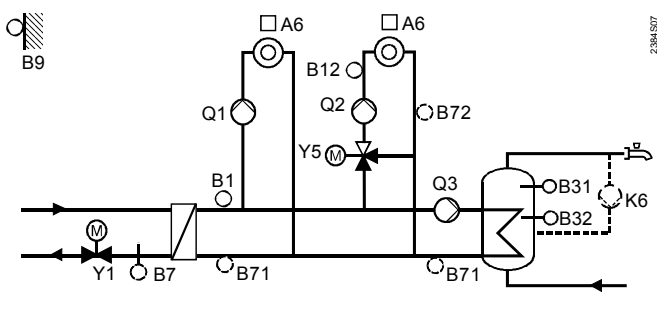
- A6 Room units
- B1 Flow sensor, heating circuit 1
- B12 Flow sensor, heating circuit 2
- B3 Flow sensor, d.h.w.
- B31 Storage tank sensor 1
- B32 Storage tank sensor 2
- B7 Primary return sensor, heating circuit 1\*
- B71 Primary return sensor, d.h.w. circuit
- B72 Primary return sensor, heating circuit 2\*
- B9 Outside sensor
- Q Circulating pump (optional, controlled externally)
- Q1 Pump, heating circuit 1
- Q2 Pump, heating circuit 2
- Q3 D.h.w. intermediate circuit pump
- Y1 Two-port valve, primary return heating circuit 1
- Y5 Two-port valve, d.h.w. primary return
- Y7 Two-port valve, primary return heating circuit 2
- \* Suppression of hydraulic creep

2-0



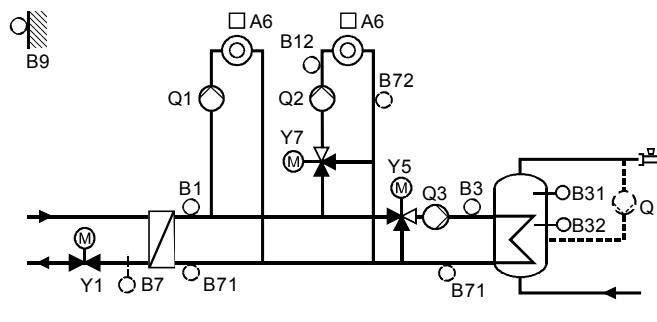
- A6 Room units
- B1 Sensor, common flow
- B12 Flow sensor, heating circuit 2
- B7 Sensor, common primary return\*
- B71 Sensor, common secondary return
- B72 Return sensor, heating circuit 2
- B9 Outside sensor
- Q1 Pump, heating circuit 1
- Q2 Pump, heating circuit 2
- Y1 Two-port valve, common primary return
- Y5 Mixing valve, heating circuit 2
- \* Suppression of hydraulic creep

2-1



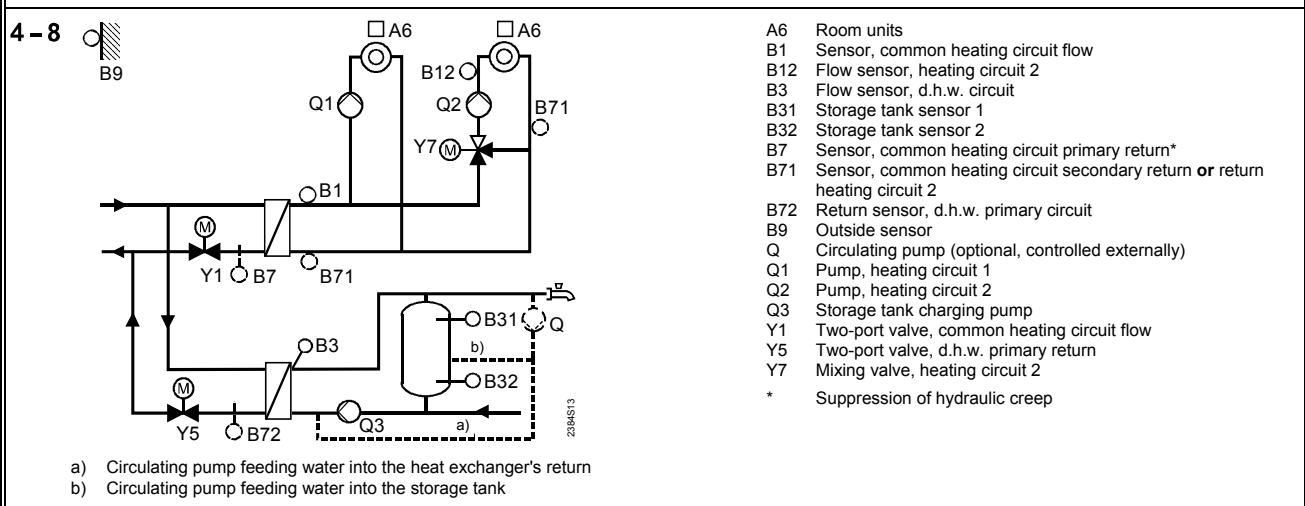
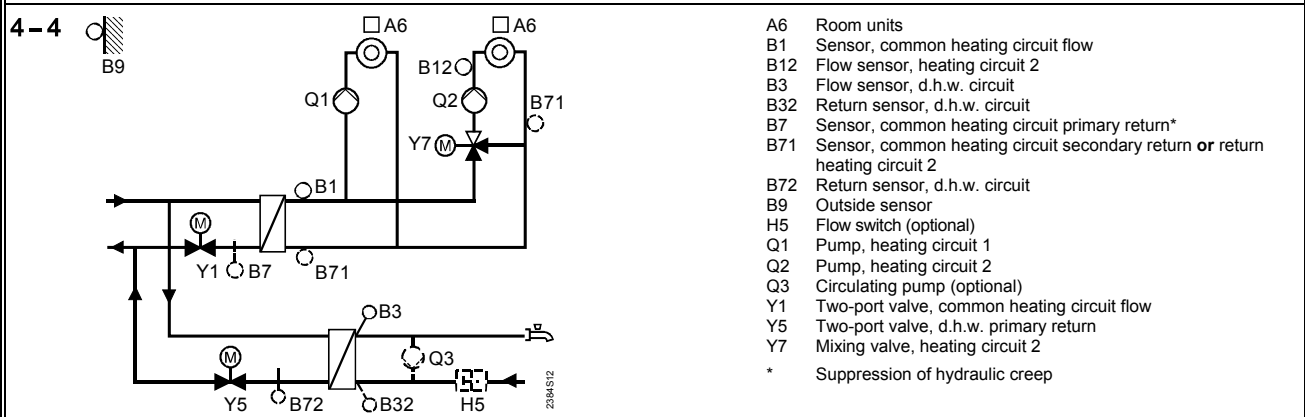
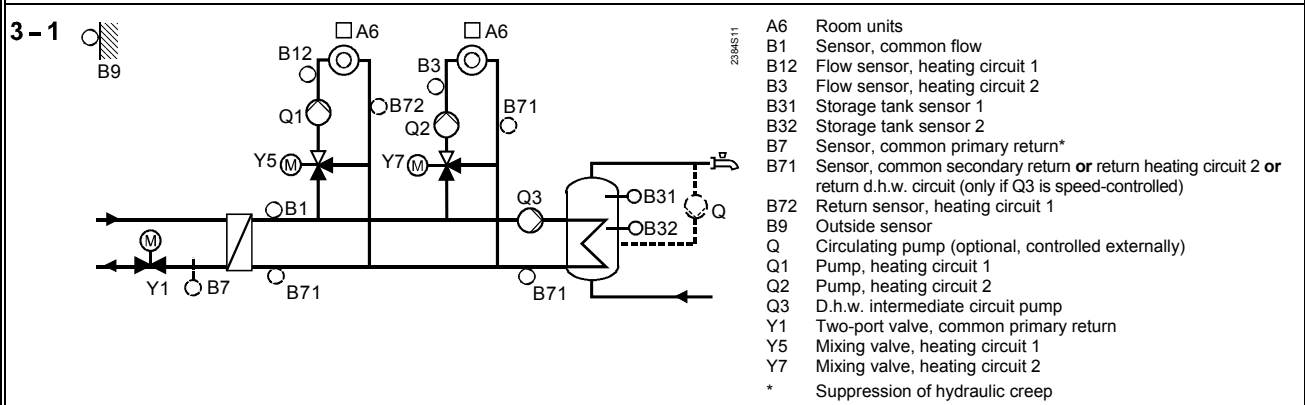
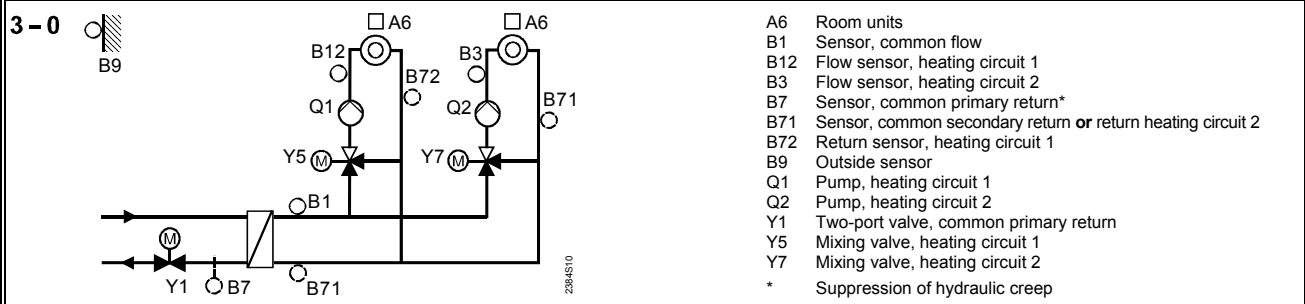
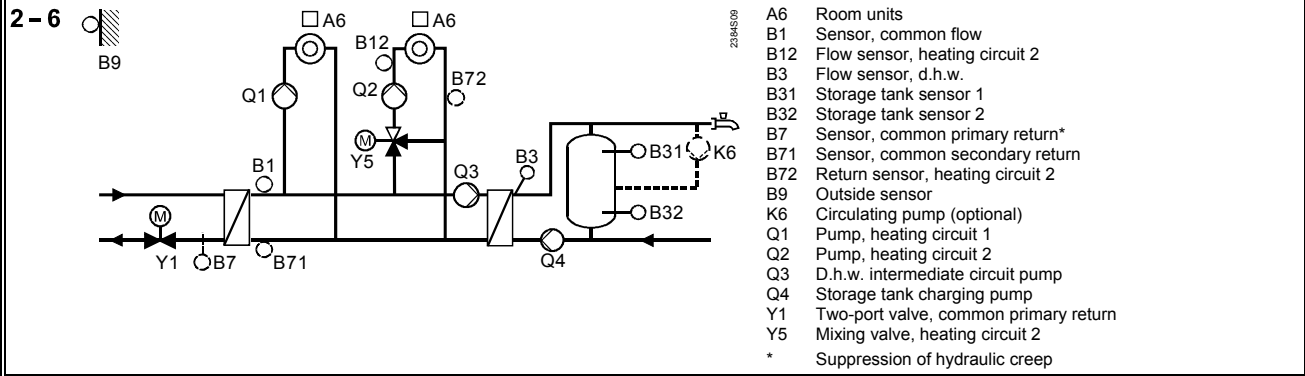
- A6 Room units
- B1 Sensor, common flow
- B12 Flow sensor, heating circuit 2
- B31 Storage tank sensor 1
- B32 Storage tank sensor 2
- B7 Sensor, common primary return\*
- B71 Sensor, common secondary return or return d.h.w. circuit (only if Q3 is speed-controlled)
- B72 Return sensor, heating circuit 2
- B9 Outside sensor
- K6 Circulating pump (optional)
- Q1 Pump, heating circuit 1
- Q2 Pump, heating circuit 2
- Q3 D.h.w. intermediate circuit pump
- Y1 Two-port valve, common primary return
- Y5 Mixing valve, heating circuit 2
- \* Suppression of hydraulic creep

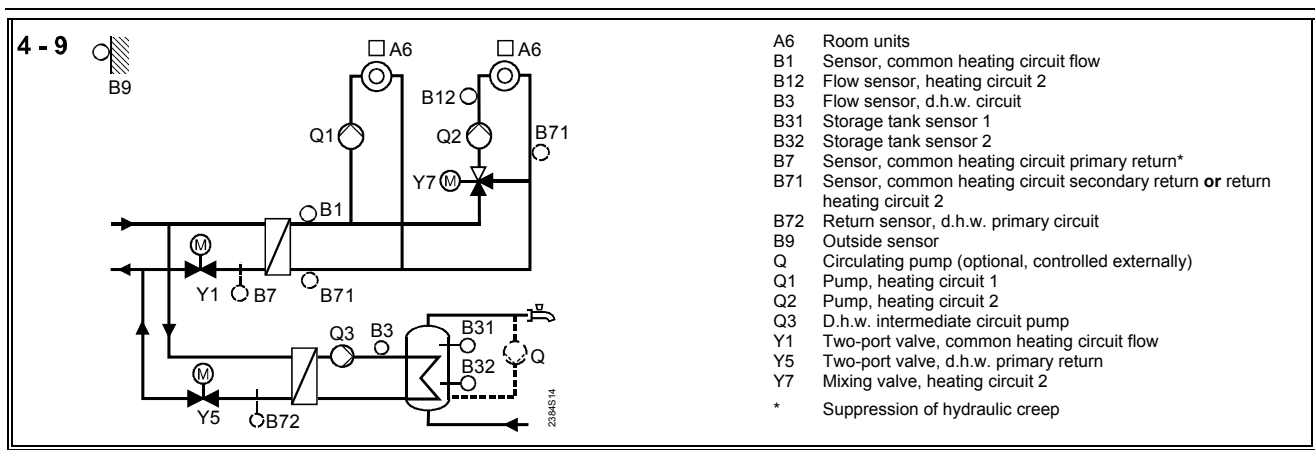
2-2



- A6 Room units
- B1 Sensor, common flow
- B12 Flow sensor, heating circuit 2
- B3 Flow sensor, d.h.w.
- B31 Storage tank sensor 1
- B32 Storage tank sensor 2
- B7 Sensor, common primary return\*
- B71 Sensor, common secondary return or return d.h.w. circuit (only if Q3 is speed-controlled)
- B72 Return sensor, heating circuit 2
- B9 Outside sensor
- Q Circulating pump (optional, controlled externally)
- Q1 Pump, heating circuit 1
- Q2 Pump, heating circuit 2
- Q3 D.h.w. intermediate circuit pump
- Y1 Two-port valve, common primary return
- Y5 Mixing valve, d.h.w. circuit
- Y7 Mixing valve, heating circuit 2
- \* Suppression of hydraulic creep







## Parameter list

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips
				HC1	HC2	

### Block "Plant configuration"

51	Plant type	1-0	1-0...4-9	.....	According to the summary given on pages 5 to 9
52	Function of input at terminal B71/U1	1	0...3	.....	0 = differential temperature sensor (DRT) 1 = sensor in the heating or d.h.w. circuit / no sensor 2 = signal reception DC 0...10 V 3 = heat demand DC 0...10 V
54	Function of circulating pump	0	0...3	.....	0 = no circulating pump 1 = feed into the storage tank 2 = feed into the heat exchanger's secondary return; heat losses partly compensated (80 %) 3 = feed into the heat exchanger's secondary return; heat losses fully compensated (100 %)
55	Function of contact connected to terminal H5	0	0...4	.....	0 = none 1 = input for pulses 2 = input for heat demand signal 3 = alarm input 4 = input for flow switch
56	Effect of pulse input on the heating circuits	1	1...3	.....	1 = acting on heating circuit 1 2 = acting on heating circuit 2 3 = acting on both heating circuits
57	Assignment of variable speed pump control	0	0...4	.....	0 = none 1 = pump Q1 2 = pump Q2 3 = pump Q3 4 = pump Q4
58	Min. speed of speed-controlled pump	50 %	0 %... variable*	..... %	* Max. value = operating line 59
59	Max. speed of speed-controlled pump	100 %	variable*... 100 %	..... %	* Min. value = operating line 58
60	Power factor at reduced pump speed	85 %	0...100 %	..... %	Set power delivered at minimum speed, in % of the power at maximum speed

### Block "Space heating"

61	Heating limit (ECO)	-3 K	--- / -10.0...+10.0 K	..... K	..... K	--- = function deactivated
62	Building time constant	20 h	0...50 h	..... h		10 h = light 20 h = medium 50 h = heavy
70	Room temperature influence (gain factor)	10	0...20	.....	.....	Function can be provided only with room sensor
71	Parallel displacement of heating curve	0.0 K	-15.0 ... +15.0 K	..... K	..... K	Setting in K room temperature
72	Overrun time, heating circuit pump	4 min	0...40 min	..... min	..... min	0 = no pump overrun

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips
				HC1	HC2	
73	Max. limitation of the room temperature	---	--- / 0.5...4 K	..... K	..... K	Limit value: nominal setpoint plus setting on this line --- = function deactivated
74	Optimization with / without room sensor	0	0 / 1	.....	.....	0 = without room sensor 1 = with room sensor
75	Max. heating up time	00:00 h	00:00...42:00 h	..... h	..... h	Max. forward shift of switching on before occupancy starts 0:00 = no optimization of switching on
76	Max. early shutdown	0:00 h	0:00...6:00 h	..... h	..... h	Max. forward shift of switching off before occupancy ends 0:00 = no optimization of switching off
77	Max. limitation of rate of flow temperature increase	---	--- / 1...600 °C/h	....°C/h	....°C/h	--- = function deactivated
78	Quick setback (with and without room sensor)	1	0 / 1	.....	.....	0 = no quick setback 1 = with quick setback

#### Block "Actuator heat exchanger"

81	Actuator running time, heat exchanger	120 s	10...873 s	..... s		Plant types 2-x to 4-x: two-port valve Y1, controlled according to function of flow sensor B1
82	P-band, heat exchanger control	35.0 K	1.0...100.0 K	..... K		
83	Integral action time, heat exchanger control	120 s	10...873 s	..... K		
84	Setpoint boost, heat exchanger	10 K	0...50 K	..... K		
85	Max. limitation of the flow temperature	---	---/ variable*... 140 °C	..... °C		* Min. value = operating line 86 --- = no limitation
86	Min. limitation of the flow temperature	---	--- / 8 °C... variable*	..... °C		* Max. value = operating line 85 --- = no limitation
87	Heat demand contact	60 °C	0...100 °C	..... °C		Temperature demand from an external consumer (B1/Y1). Function is activated when operating line 55 = 2
88	Priority external heat demand (contact and DC 0...10 V)	0	0 / 1	.....		0 = max. selection of external and internal heat demand 1 = external heat demand is given priority
89	Heat demand input DC 0...10 V	100 °C	5...130 °C	..... °C		Function is activated when operating line 52 = 3

#### Block "Actuator heating circuit"

91	Actuator running time, heating circuit	120 s	10...873 s	..... s	..... s	Valve in the heating circuit, controlled according to the heating circuit flow sensor
92	P-band, heating circuit	35.0 K	1.0...100.0 K	..... K	..... K	<ul style="list-style-type: none"> <li>Plant types 1-x: heating circuit 1 = Y1, heating circuit 2 = Y7</li> <li>Plant types 2-0, 2-1, 2-6: Y5</li> <li>Plant types 2-2, 4-x: Y7</li> <li>Plant types 3-x: heating circuit 1 = Y5, heating circuit 2 = Y7</li> </ul>
93	Integral action time, heating circuit	120 s	10...873 s	..... s	..... s	
94	Setpoint boost, mixing valve / heat exchanger	10 K	0...50 K	..... K	..... K	
95	Max. limitation of the flow temperature	---	---/ variable*... 140 °C	..... °C	..... °C	* Min. value = operating line 96 --- = no limitation
96	Min. limitation of the flow temperature	---	--- / 8 °C... variable*	..... °C	..... °C	* Max. value = operating line 95 --- = no limitation

#### Block "D.h.w. heating"

101	Release of d.h.w. heating	0	0...2	.....		0 = always (24 h / day) 1 = according to the heating programs of both heating circuits (max. selection), with forward shift 2 = according to the d.h.w. program
102	Release of circulating pump	1	0...2	.....		0 = always (24 h / day) 1 = according to the heating programs of both heating circuits (max. selection) 2 = according to the d.h.w. program
103	D.h.w. switching differential	5 K	1...20 K	..... K		

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips																		
				HC1	HC2																			
104	Legionella function	6	--- / 1...7 / 1-7	.....		1 = Monday 2 = Tuesday, etc. 1-7 = entire week --- = no legionella function																		
105	Setpoint of the legionella function	65 °C	60...95 °C	..... °C																				
106	D.h.w. priority	4	0..4	.....		<table border="1"> <thead> <tr> <th></th> <th>D.h.w. priority</th> <th>Flow temperature setpoints acc. to</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>absolute</td> <td>d.h.w.</td> </tr> <tr> <td>1</td> <td>shifting</td> <td>d.h.w.</td> </tr> <tr> <td>2</td> <td>shifting</td> <td>max. selection</td> </tr> <tr> <td>3</td> <td>none (parallel)</td> <td>d.h.w.</td> </tr> <tr> <td>4</td> <td>none (parallel)</td> <td>max. selection</td> </tr> </tbody> </table>		D.h.w. priority	Flow temperature setpoints acc. to	0	absolute	d.h.w.	1	shifting	d.h.w.	2	shifting	max. selection	3	none (parallel)	d.h.w.	4	none (parallel)	max. selection
	D.h.w. priority	Flow temperature setpoints acc. to																						
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2	shifting	max. selection																						
3	none (parallel)	d.h.w.																						
4	none (parallel)	max. selection																						
107	Overrun time, intermediate circuit pump	4 min	0...40 min	..... min																				
108	Extra overrun time, charging pump	1'00 min	0'10...40'00 min	..... min																				
109	Max. time d.h.w. heating	150 min	--- / 5...250 min	..... min		--- = no limitation																		
110	Discharging protection during the d.h.w. pump overrun time	1	0 / 1			0 = without protection 1 = with protection																		

#### Block "D.h.w. actuator"

111	Actuator opening time in the d.h.w. circuit	35 s	10...873 s	..... s		Valve in the d.h.w. circuit or heating circuit: • Plant types 1-x, 4-x: valve Y5 in the d.h.w. primary return • Plant types 2-2: mixing valve Y5 in the d.h.w. flow
112	Actuator closing time in the d.h.w. circuit	35 s	10...873 s	..... s		
113	P-band, d.h.w. control	35.0 K	1.0...100.0 K	..... K		
114	Integral action time, d.h.w. control	35 s	10...873 s	..... s		
115	Derivative action time, d.d.w. control	16 s	0...255 s	..... s		
116	Setpoint boost, d.h.w. heating	16 K	0...50 K	..... K		
117	Max. d.h.w. temperature setpoint	65 °C	20...95 °C	..... °C		
118	Setpoint boost mixing valve / d.h.w. heat exchanger	10 K	0...50 K	..... K		
119	Reduction d.h.w. setpoint for storage tank sensor at the bottom	5 K	0...20 K	..... K		Only when two sensors are used
120	Circulating pump with d.h.w. heating	0	0 / 1	.....		0 = OFF during d.h.w. heating 1 = ON during d.h.w. heating
124	Load limit when flow switch is activated	25 %	0...60 %	..... %		Setting in % of the current max. stroke

#### Block "Assignment of d.h.w."

125	Assignment of d.h.w.	0	0..2	.....		0 = locally 1 = all controllers in the interconnected system with same segment number 2 = all controllers in the interconnected system
-----	----------------------	---	------	-------	--	--

#### Block "Additional legionella functions"

126	Time for charging	--:--	--:--, 00:00...23:50	... : ...		
127	Dwelling time at legionella setpoint	---	---, 10...360 min	.....min		
128	Circulating pump operation during legionella function	1	0 / 1	...		0 = no 1 = yes

#### Block "LPB parameter"

131	Device number for the bus address	0	0...16	.....		
132	Segment number for the bus address	0	0...14	.....		
133	Type of clock operation	0	0...3	.....		0 = autonomous clock 1 = clock is the slave without remote setting 2 = clock is slave with remote setting 3 = clock is the master

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips
				HC1	HC2	
134	Bus power supply, operating mode and status indication	A	0, 1, A	.....		0 = OFF (no bus power supply) 1 = bus power supply ON A = automatic bus power supply
135	Outside temperature source	A	A / 00.01...14.16	.....		A = automatic, or segment and device number
136	Gain of locking signal	100 %	0...200 %	..... %		Response to locking signal
137	Response to uncritical locking signals from the data bus	1	0 / 1	.....		0 = function OFF 1 = function ON



#### Block "Control functions"

141	Actuator pulse lock	1	0 / 1	.....		0 = function OFF 1 = function ON
142	Frost protection for the plant	1	0 / 1	.....		0 = without frost protection for the plant 1 = with frost protection for the plant
143	Flow alarm	--:--	--:-- / 0:10...10:00 h	..... : ..... h		Period of time during which the flow temperature may remain outside the limit values. --:-- = function deactivated
144	Winter-/summertime changeover	25.03	01.01. ... 31.12	..... .....		Setting: earliest possible changeover date
145	Summer-/wintertime changeover	25.10	01.01. ... 31.12	..... .....		Setting: earliest possible changeover date
146	Periodic pump run (pump kick)	1	0 / 1	.....		0 = no periodic pump run 1 = weekly pump run enabled

#### Block "M-bus parameter"

151	M-bus primary address	0	0...250	.....		
152	M-bus secondary address	<b>Display function</b>				Corresponds to the serial number
153	Baud rate	2400 Baud	300 / 2400 Baud	..... Baud		
154	Passing on M-bus load management signals	2	0...2	.....		0 = locally 1 = to all controllers in the interconnected system with the same segment number 2 = to all controllers in the interconnected system
155	M-bus load management in the heating circuit	<b>Display function</b>				Display in % 100 % = internal demand for heat will be adopted unchanged

#### Block "PPS parameter"

156	Active slaves connected to the PPS	<b>Display function</b>				Call up identification of the slaves by pressing  or 																																									
158	Actions with one room unit and two heating circuits	0	0...5	.....		<table border="1"> <thead> <tr> <th rowspan="2">Room unit function</th> <th colspan="6">Setting</th> </tr> <tr> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>Room temperature influence on the heating circuit</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>1+2</td> <td>1+2</td> </tr> <tr> <td>Switching program and set-points act on the heating circuit</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>1</td> <td>1</td> </tr> <tr> <td>Display flow temperature of the heating circuit</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>1</td> <td>1</td> </tr> <tr> <td>Operating mode, operational level and holidays act on the heating circuit</td> <td>1</td> <td>1+2</td> <td>2</td> <td>1+2</td> <td>1</td> <td>1+2</td> </tr> </tbody> </table>	Room unit function	Setting						0	1	2	3	4	5	Room temperature influence on the heating circuit	1	1	2	2	1+2	1+2	Switching program and set-points act on the heating circuit	1	1	2	2	1	1	Display flow temperature of the heating circuit	1	1	2	2	1	1	Operating mode, operational level and holidays act on the heating circuit	1	1+2	2	1+2	1	1+2
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#### Block "Test and display"

161	Sensor test Input B9: ---- = open-circuit / no sensor oo.o = short-circuit Other inputs: ---- = open-circuit / no sensor ooo = short-circuit	0	0...11		No.	Input	Sensor for:
					0	B9	Weather (outside temperature)
					1	B1	Flow, heating circuit 1
					2	B3	D.h.w. flow
					3	A6	Room unit, heating circuit 1
					4	A6	Room unit, heating circuit 2
					5	B7	Return temperature
					6	B71	Return temperature
7	B72	Return temperature					

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips																																							
				HC1	HC2																																								
						8 B31 Storage tank 9 B32 Storage tank 10 B12 Flow, heating circuit 2 11 U1 DC 0...10 V / 0...130 °C																																							
162	Display of setpoints ---- = no setpoint available	0	0...11			<table border="1"> <thead> <tr> <th>No.</th> <th>Input</th> <th>Setpoint of:</th> </tr> </thead> <tbody> <tr><td>0</td><td>B9</td><td>Composite outside temp.</td></tr> <tr><td>1</td><td>B1</td><td>Flow, heating circuit 1</td></tr> <tr><td>2</td><td>B3</td><td>D.h.w. flow</td></tr> <tr><td>3</td><td>A6</td><td>Room temp., heating circuit 1</td></tr> <tr><td>4</td><td>A6</td><td>Room temp., heating circuit 2</td></tr> <tr><td>5</td><td>B7</td><td>Return temperature</td></tr> <tr><td>6</td><td>B71</td><td>Return temperature</td></tr> <tr><td>7</td><td>B72</td><td>Return temperature</td></tr> <tr><td>8</td><td>B31</td><td>Storage tank</td></tr> <tr><td>9</td><td>B32</td><td>Storage tank</td></tr> <tr><td>10</td><td>B12</td><td>Flow, heating circuit 2</td></tr> <tr><td>11</td><td></td><td>--- (not available)</td></tr> </tbody> </table>	No.	Input	Setpoint of:	0	B9	Composite outside temp.	1	B1	Flow, heating circuit 1	2	B3	D.h.w. flow	3	A6	Room temp., heating circuit 1	4	A6	Room temp., heating circuit 2	5	B7	Return temperature	6	B71	Return temperature	7	B72	Return temperature	8	B31	Storage tank	9	B32	Storage tank	10	B12	Flow, heating circuit 2	11		--- (not available)
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11		--- (not available)																																											
163	Relay test	0	0...10			<p><b>Note:</b> make relay test only when main shutoff valve is closed!</p> <p>0 = normal operation (no test)  1 = all relays de-energized  2 = relay at terminal Y1 energized  3 = relay at terminal Y2 energized  4 = relay at terminal Q1 energized  5 = relay at terminal Q3 energized  6 = relay at terminal Y5 energized  7 = relay at terminal Y6 energized  8 = relay at terminal Q2 energized  9 = relay at terminal Y7/Q4 energized  10 = relay at terminal Y8/K6 energized</p> <p>To terminate the relay test:</p> <ul style="list-style-type: none"> <li>• Select another operating line</li> <li>• Press an operating mode button</li> <li>• Automatically after 8 minutes</li> </ul>																																							
164	Speed of the speed-controlled pump			<b>Display function</b>		In % of the nominal speed (selection of pump: operating line 57)																																							
165	Display of the digital inputs:			<b>Display function</b>		Prompting with ◀ or ▶																																							
	Contact H5					0 = contact open 1 = contact closed																																							
	Pulse input					In pulses per minute																																							
	Radio clock receiver					Time since last reception																																							
169	Display of active limitations			<b>Display function</b>		Prompting with ◀ or ▶ <i>Max. limitations f :</i> 1 = volumetric flow or power, common flow 2 = common primary return 3 = temp. differential (DRT) common flow 4 = common secondary flow 5 = volumetric flow or power, heating circuits 6 = primary return heating circuit 1 7 = secondary return heating circuit 1 8 = temperature differential (DRT) heating circuit 1 9 = secondary flow heating circuit 1 10 = room temperature heating circuit 1 11 = rate of flow temperature increase heating circuit 1 12 = primary return heating circuit 2 13 = secondary return heating circuit 2 14 = temperature differential (DRT) heating circuit 2 15 = secondary flow heating circuit 2 16 = room temperature heating circuit 2 17 = rate of flow temperature increase heating circuit 2 18 = primary return d.h.w. 19 = secondary return d.h.w.																																							

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips
				HC1	HC2	
						<i>Minimum limitations f</i> : 20 = common flow rate primary side* 21 = common secondary flow 22 = flow rate heating circuit 1* 23 = primary return heating circuit 1 24 = reduced room temperature setpoint heating circuit 1 25 = flow rate heating circuit 2* 26 = primary return heating circuit 2 27 = reduced room temperature setpoint heating circuit 2 * Suppression of hydraulic creep
170	Software version		<b>Display function</b>			

### Settings on the "Locking functions" level

To access the "Locking functions" level, proceed as follows:

1. Press  $\nabla$  and  $\triangle$  at the same time for 6 seconds.
2. The display shows **Cod 00000**.
3. Enter the code (for information about the code, contact the Siemens Building Technologies service center nearest you).  
"End-user" and "Heating engineer's" level remain activated.

### Block "DRT and limitation of the return temperature"

171	Max. limitation of the primary return temperature, heating circuit	0	0 / 1	.....	.....	0 = without limitation 1 = with limitation
172	Upper constant value, max. limitation of the primary return temperature	70 °C	variable... 140 °C	..... °C		<p> <math>T_R</math> Return temperature  <math>T_A</math> Outside temperature         </p>
173	Slope, max. limitation of the primary return temperature	7	0...40	.....		
174	Start of shifting (point of inflection), max. limitation of the primary return temperature	10 °C	-50...+50 °C	..... °C		
175	Lower constant value, max. limitation of the primary return temp.	50 °C	0...variable*	..... °C		
176	Max. setpoint of the return temperature with d.h.w. heating	---	--- / 0...140 °C	..... °C		--- = no limitation
177	Max. limitation of the secondary return temperature, differential to the primary limit value	---	--- / 0...50 K	..... K		The secondary limit value is always lower than the primary limit value, the difference being this setting value. Applies to the heating <b>and</b> the d.h.w. circuit --- = no limitation
178	Integral action time of the primary return temperature limitations	30 min	0...60 min	..... min		Limitation of temperature differential and max. limitation
179	Limit value of max. limitation of temperature differential (DRT)	---	--- / 0.5...50.0 K	..... K	..... K	Max. limitation of temperature differential between primary return and secondary return temperature --- = no limitation of the temp. differential
180	Max. setpoint of the return temperature during d.h.w. heating on legionella setpoint	---	--- / 0...140 °C	..... °C		

### Block "Various functions"

181	Limit function at contact H5	1	1...2	.....		1 = limitation with an adjustable limit value (operating line 182) 2 = limitation with a fixed limit value (75 pulses / min) Function is activated when operating line 55 = 1
182	Limit value of volumetric flow or power limitation	75 Pulses/min	5...1500 Pulses/min	..... Pulses/min		Active only when operating line 181 = 1
183	Integral action time of limit function at contact H5	60 min	0...240 min	..... min		
188	Locking time after min. limitation for the suppression of hydraulic creep	6 min	--- / 1...20 min	..... min	..... min	--- = function deactivated

Line	Function, display	Factory setting	Range	Setting		Explanations, notes and tips
				HC1	HC2	
189	Start of shifting (point of inflection), raising the reduced room temperature setpoint	5 °C	-50...+50 °C	..... °C	..... °C	Influence of the outside temperature on the reduced room temperature setpoint Slope 0 = function deactivated
190	Slope, raising the reduced room temperature setpoint	0	0...10	.....	.....	<p> <math>T_R</math> °C Reduced room temperature setpoint  <math>T_A</math> °C Outside temperature </p>
191	Forced charging at the start of release period 1	1	0 / 1	.....		0 = function deactivated 1 = function activated
192	Idle heat function, primary flow	---	--- / 3...255 min	..... min		--- = function deactivated

### Block "Locking functions"

195	Locking settings on the software side	0	0...4	.....		0 = no locking 1 = d.h.w. settings locked 2 = heating engineer's level locked 3 = d.h.w. settings and heating engineer's level locked 4 = all settings locked
196	Locking the "Locking functions" level on the hardware side (operating lines 171...196)	0	0 / 1	.....		0 = no locking 1 = "Locking functions" level accessible only if terminals B31-M are linked

### Keep Instructions

After the settings have been entered in the appropriate columns, keep the Installation Instructions in a safe place!