

Heating controller

Installation Instructions

RVL472

1. Installation

1.1 Place of installation

- In a dry room, e.g. the boiler room
- Mounting choices:
 - In a control panel (on the inner wall or on a DIN rail)
 - On a panel
 - In the control panel front
 - In the sloping front of a control desk
- Permissible ambient temperature: 0...50 °C

1.2 Electrical installation

- Local regulations for electrical installations must be complied with
- Cable strain relief must be provided
- Cables from the controller to the actuator and the pump carry mains voltage
- Cables to the sensors should not be run parallel to mains carrying cable (e.g. power supply for the pump)

1.3 Permissible cable lengths

- For all sensors, thermostats and external contacts:

Copper cable 0.6 mm dia.	max. 20 m
Copper cable 1.0 mm ²	max. 80 m
Copper cable 1.5 mm ²	max. 120 m
- For the room units:

Copper cable 0.25 mm ²	max. 25 m
Copper cable 0.5 mm ²	max. 50 m
- For the data bus:

0.75...2.5 mm ²	refer to data sheets N2030E and N2032E
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1.4 Mounting and wiring the base

1.4.1 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.

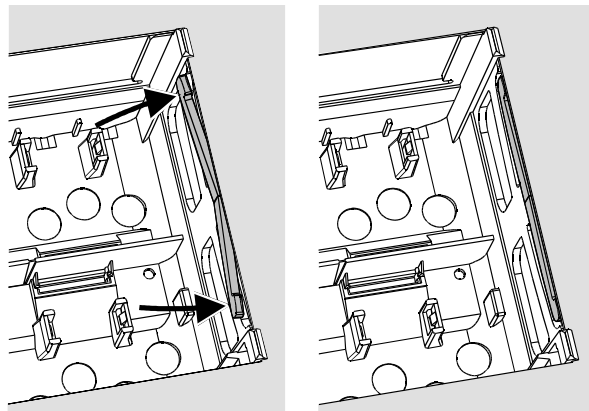
1.4.2 DIN rail mounting

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.

1.4.3 Flush panel mounting

- Panel cutout required: 138 x 138 mm (+1 mm / -0 mm)
- Maximum thickness: 3 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).
 5. Wire up base. Make sure the cable lengths are such that there is sufficient space to open the control panel door.



Wrong

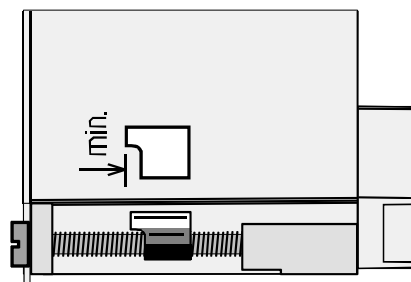
Correct

Place tongues correctly – they may not be inside the cutout!

2. Commissioning

2.1 Preparatory checks

1. DO NOT switch on power yet.
2. Check wiring according to the plant connection diagram.
3. Ensure correct position and location of levers by turning the fixing screws. Refer to illustration on the lateral wall of the controller:



4. Insert unit in the base until stop is reached. Marking TOP must be at the top!
5. Tighten fixing screws **alternately**.
6. Check controlling element (seat or slipper valve): See if
 - it is correctly installed (observe direction of flow indicated on the valve body)
 - the slipper travels in the correct angular range (note position indicator)
 - the manual lever is disengaged
7. 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
8. 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 present
 - Main fuse defect
 - Main switch not set to ON

2.2 General information about operation

- Setting elements:
 - Heating curve
 - Setting knob
 - Display; one operating line is assigned to each setting
 - Buttons for selecting and readjusting the values:
 - ▽ Selecting the next operating line below
 - △ Selecting the next operating line above
 - ◀ Decreasing the displayed value
 - ▶ Increasing the displayed value
- Adopting a setting value:
The setting value is adopted by selecting the next operating line (or: Press Info button or one of the operating mode buttons)
- Entering --: or --:-- :
Press ◀ or ▶ until the required display appears
- Block jump function:
To select a single operating line quickly, two button combinations can be used:
Press ▽ and ▶ for selecting the next line block above
Press ▽ and ◀ for selecting the next line block below

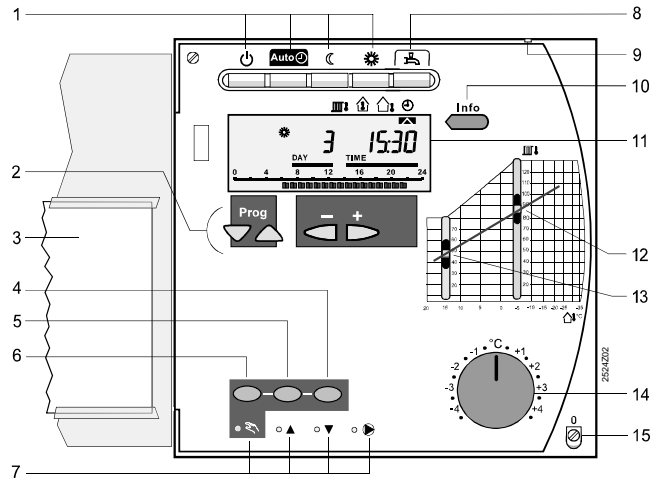
2.3 Setting procedure

1. Only with analog adjustment of heating curve: Adjust the bar in agreement with the planning documentation or according to local practice.
2. Make settings on operating lines 1... 41 («Enduser», refer to table on pages 4...5).
3. Select plant type on operating line 51 (page 5).
4. Make the required settings according to the following parameter list. All functions and operating lines required for the selected plant type will be activated and can be set. All operating lines that are not required are locked.
5. Enter the values set in the table!
6. Select the service functions, if required (independent of type of plant).
7. Carry out the final work.

2.4 Notes on commissioning and functional check

- Specific operating lines for the functional check:
 - 161 = simulation of outside temperature
 - 162 = relay test
 - 163 = sensor test
 - 164 = test of contacts «H»
- If the display shows ERROR: Query operating line 50 to pinpoint error

2.5 Setting elements

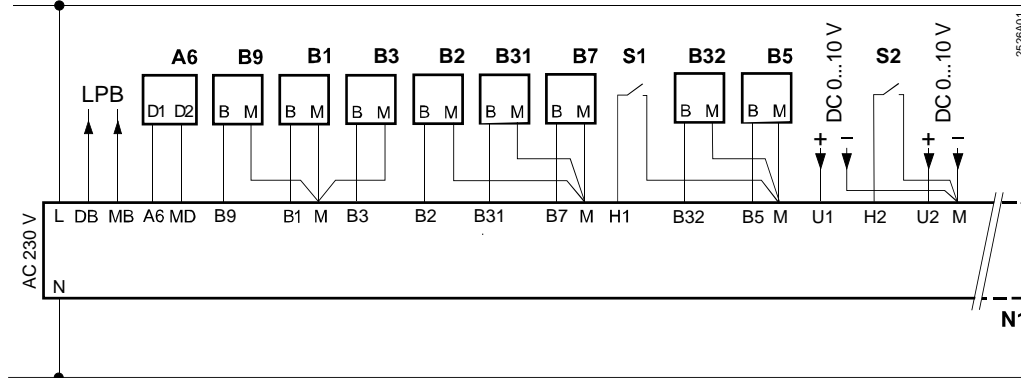


- 1 Operating mode buttons (selected button is lit)
- 2 Buttons for operating the display:
Prog = selection of operating line
– + = adjustment of displayed value
- 3 Operating instructions
- 4 Button for «Close heating circuit mixing valve» or reduce modulation, or burner stage 2 ON / OFF in manual operation
- 5 Button for «Open heating circuit mixing valve» or increase modulation in manual operation
- 6 Button for manual operation
- 7 LEDs for:
 - ☛ Manual operation
 - ▲ Heating circuit mixing valve opens / burner modulation actuator OPENS / burner stage 1 ON
 - ▼ Heating circuit mixing valve closes / burner modulation actuator CLOSES / burner stage 2 ON
 - ⦿ Pump runs
- 8 Button for d.h.w. heating ON / OFF (ON = button lit)
- 9 Sealing facility in the cover
- 10 Info button for the display of actual values
- 11 Display (LCD)
- 12 Setting slider for flow temperature setpoint at an outside temperature of –5 °C
- 13 Setting slider for flow temperature setpoint at an outside temperature of 15 °C
- 14 Setting knob for readjustment of room temperature
- 15 Fixing screw with sealing facility

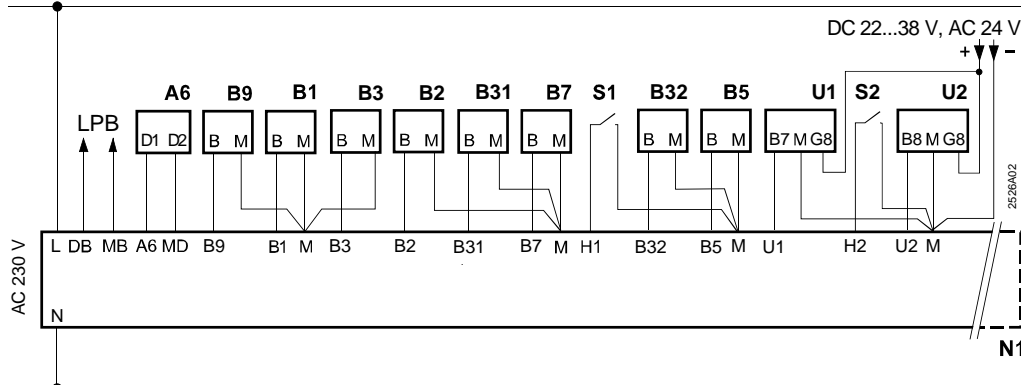
3. Connection diagrams

A6	Room unit QAW50 or QAW70	E1	2-stage or modulating burner	S1	Remote operation "Operating mode"
B1	Flow temperature sensor	F1	Limit thermostat	S2	Remote operation "Flow temperature setpoint"
B2	Boiler temperature sensor	F2	Manual reset safety limit thermostat	U1	Solar sensor
B3	Flow temperature sensor for d.h.w.	LPB	Data bus	U2	Wind sensor
B31	D.h.w. storage tank temperature sensor / thermostat 1	M1	Circulating pump / bypass pump	Y1	Actuator "Heating circuit"
B32	D.h.w. storage tank temperature sensor / thermostat 2	M2	Heating circuit pump	Y7	Actuator "D.h.w. circuit" or "Minimum limitation of boiler return temperature"
B5	Room temperature sensor	M3	Charging pump	1)	Multifunctional output
B7	Return temperature sensor	M4	Boiler pump or circulating pump		
B9	Outside sensor	N1	Controller RVL472		

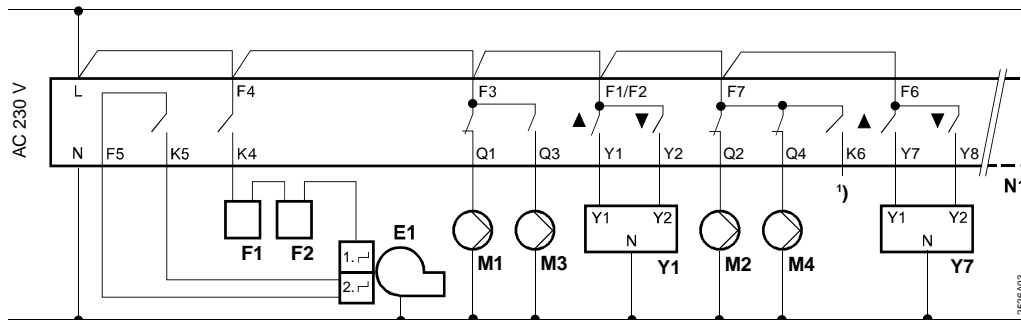
3.1 Basic connections on the low voltage side – plants with external heat demand signals



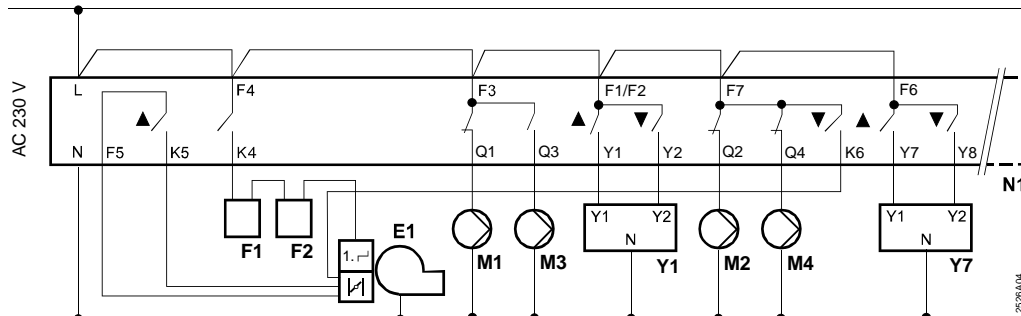
3.2 Basic connections on the low voltage side – plants with solar and wind sensors



3.3 Basic connections on the mains voltage side – plants with 2-stage burner



3.4 Basic connections on the mains voltage side – plants with modulating burner





4. Settings

Legend for the setting tables:

Adjustable

Display only

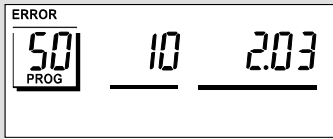
4.1 Settings on the «Enduser» level

Press  or  to activate the «Enduser» level.

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
1	Setpoint for NORMAL heating	20.0 °C	0...35	..... °C	
2	Setpoint for REDUCED heating	14.0 °C	0...35	..... °C	
3	Setpoint for holiday mode / frost protection	10.0 °C	0...35	..... °C	
4	Weekday (for heating program)	1-7	1...7	.....	1 = Monday 2 = Tuesday, etc. 1-7 = entire week
5	First heating period, start of NORMAL heating	06:00	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
6	First heating period, end of NORMAL heating	22:00	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
7	Second heating period, start of NORMAL heating	--:--	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
8	Second heating period, end of NORMAL heating	--:--	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
9	Third heating period, start of NORMAL heating	--:--	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
10	Third heating period, end of NORMAL heating	--:--	00:00...24:00	.... : ....	Switching program for heating circuit --:-- = period inactive
11	Holiday period	--:--	1...8	.....
12	Date of first day of holiday	--:--	01.01. ... 31.12.	.... ....	Day.Month
13	Date of last day of holiday	--:--	01.01. ... 31.12.	.... ....	Day.Month
14	Heating curve, flow setpoint TV1 at 15 °C outside temperature	30 °C	20...70	..... °C	These operating lines are only active if digital adjustment of the heating curve has been selected (refer to entry made on operating line 73)
15	Heating curve, flow setpoint TV2 at -5 °C outside temperature	60 °C	20...120	..... °C	
26	Setpoint d.h.w. temperature NORMAL	55 °C	20...100	..... °C	With plant types x-0 and x-4, these operating do not appear
27	D.h.w. temperature	Display function			
28	Setpoint d.h.w. temperature REDUCED	40 °C	8...80	..... °C	
31	Weekday (for switching program 2)	1-7	1...7	.....	1 = Monday 2 = Tuesday, etc. 1-7 = entire week
32	Start of first ON period	05:00	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
33	End of first ON period	22:00	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
34	Start of second ON period	--:--	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
35	End of second ON period	--:--	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
36	Start of third ON period	--:--	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
37	End of third ON period	--:--	00:00...24:00	.... : ....	Switching program 2 --:-- = period inactive
38	Time of day		00:00...23:59		Hours:Minutes
39	Weekday		1...7		1 = Monday 2 = Tuesday, etc.
40	Date		01.01. ... 31.12.	.....	Day.Month (e.g. 02.12 for 2 Dec.)
41	Year		1995...2094	.....

With plant types 4-x and 5-x, these operating lines cannot be used

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
50	Faults	Display function Display example for interconnected plants			10 = fault outside sensor 11 = fault solar sensor 12 = fault wind sensor 20 = fault boiler temperature sensor 30 = fault flow temperature sensor 40 = fault return temperature sensor 50 = fault d.h.w. storage tank temperature sensor / thermostat 1 52 = fault d.h.w. storage tank temperature sensor / thermostat 2 54 = fault flow temperature sensor for d.h.w. 60 = fault room temperature sensor 61 = fault room unit 62 = wrong room unit connected 81 = short-circuit on data bus (LPB) 82 = same bus address used several times 100 = two clock masters on the data bus (LPB) 120 = flow alarm 140 = inadmissible bus address (LPB) or plant type



10 = error code
2 = segment number (data bus address)
03 = device number (data bus address)

4.2 Settings on the «Heating engineer» level

Press and simultaneously for 3 seconds to activate the «Heating engineer» level for selecting the plant type and the plant-related variables.

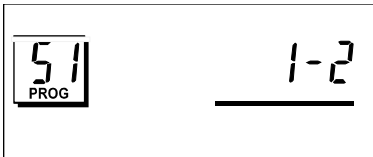
Selecting the plant type on operating line 51:

The required plant type must be selected on operating line 51 using buttons and . This activates all functions required for the respective type of plant and shows the associated operating lines.

A plant type is comprised of a space heating circuit (5 different types) and a d.h.w. circuit (4 different types). The 2 types of circuits can be combined in 21 different ways. The following plant diagrams show all possible combinations.

The controller's operating line 51 only accepts combinations that are possible.

Example of a setting:



1 = space heating type 1
2 = d.h.w. circuit type 2

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
51	Plant type	1-1	1-0 ... 5-4	... -	Type numbers in the following section 0

4.3 Plant types

Plant types «Space heating»		
<p>1</p> <p>Space heating with a mixing zone. 3-position control acting on mixing valve</p> <p>Optional d.h.w. combinations: → 1, 2, 3 0, 4</p>		
<p>2</p> <p>Space heating with a mixing zone. 2-position control acting on mixing valve</p> <p>Optional d.h.w. combinations: → 1, 2, 3 0, 4</p>		
<p>3</p> <p>Space heating with a mixing zone. 3-position control acting on mixing valve. Minimum limitation of return temperature with own mixing valve</p> <p>Optional d.h.w. combinations: → 1 0, 4</p>		
<p>4</p> <p>Precontrol with boiler, heat demand signal via data bus</p> <p>Optional d.h.w. combinations: → 1, 2, 3 0, 4</p>		
<p>5</p> <p>Precontrol with boiler, heat demand signal via data bus. Minimum limitation of return temperature with own mixing valve</p> <p>Optional d.h.w. combinations: → 1 0, 4</p>		

Plant types «D.h.w. heating»	
<p>0</p> <p>No d.h.w. heating</p>	
<p>1</p> <p>D.h.w. heating through control of the charging pump. Circulating pump M4 only possible with space heating types 1, 2 and 4. Optional electric immersion heater not possible with modulating burner</p>	
<p>2</p> <p>D.h.w. heating through control of the mixing valve. Circulating pump M4 only possible with space heating types 1, 2 and 4. Optional electric immersion heater not possible with modulating burner</p>	
<p>3</p> <p>D.h.w. heating through control of the valve. Circulating pump M4 only possible with space heating types 1, 2 and 4</p>	
<p>4</p> <p>D.h.w. heating exclusively with electric immersion heater. Not possible with modulating burner. Circulating pump M4 only possible with space heating types 1, 2 and 4</p>	

* Circulating pump or bypass pump can be selected

A6 Room unit QAW50 or QAW70
B1 Flow temperature sensor
B2 Boiler temperature sensor
B3 Flow temperature sensor for d.h.w.
B31 D.h.w. storage tank temperature sensor / thermostat 1
B32 D.h.w. storage tank temperature sensor / thermostat 2
B5 Room temperature sensor
B7 Return temperature sensor

B9 Outside sensor
E1 Heat source (boiler)
E2 Consumer (space)
LPB Data bus
K6 Electric immersion heater
M1 Circulating pump / bypass pump
M2 Heating circuit pump
M3 Charging pump

M4 Boiler pump or circulating pump
N1 Controller RVL472
U1 Solar sensor
U2 Wind sensor
Y1 Heating circuit mixing valve
Y7 D.h.w. mixing valve or mixing valve for minimum limitation of the boiler return temperature

4.4 Parameter list

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
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4.4.1 Block «Type of heat source»

54	Type of heat source	2	1...3	1 = single-stage burner 2 = 2-stage burner 3 = modulating burner
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4.4.2 Block «Modulating burner»

55	Running time of modulation actuator	60 s	7.5...480s	
56	P-band modulating control (Xp)	20 °C	1...200	.....°C	
57	Integral action time modulating control (Tn)	150 s	10...500	.....s	
58	Derivative action time modulating control (Tv)	4.5 s	0...30	.....s	

4.4.3 Block «Cascade slave»

59	Boiler sequence release limit	200 °C·min	0...500	..... °C·min	
60	Boiler sequence reset limit	50 °C·min	0...500	..... °C·min	

4.4.4 Block «Space heating»

61	Heating limit for NORMAL heating (ECO day)	17.0 °C	-- / -5...+25	..... °C	Setting -- = function deactivated
62	Heating limit for REDUCED heating (ECO night)	5.0 °C	-- / -5...+25	..... °C	Setting -- = function deactivated
63	Building time constant	20 h	0...50	..... h	Light = 10 h, medium = 25 h, heavy = 50 h
64	Quick setback	1	0 / 1	.....	0 = no quick setback 1 = quick setback
65	Room temperature source	A	0 / 1 / 2 / 3 / A	.....	0 = no room temperature sensor present 1 = room unit at terminal A6 2 = room temperature sensor at terminal B5 3 = mean value of the two units at terminals A6 and B5 A = automatic selection
66	Type of optimization	0	0 / 1	.....	0 = optimization with room model 1 = optimization with room unit / room temperature sensor (setting 0 only allows optimum start control)
67	Maximum heating up time	00:00 h	00:00...42:00	..... h	Maximum forward shift for switching on before occupancy starts Setting 00:00 = no optimum start control
68	Maximum optimum shutdown	0:00 h	0:00...6:00	..... h	Maximum forward shift for switching off before occupancy ends Setting 0:00 = no optimum stop control
69	Maximum limitation of room temperature	--	-- / 0...35	..... °C	Setting -- = limitation deactivated Function possible only with room unit / room temperature sensor
70	Effect of room temperature	4	0...20	.....	Gain factor for effect of room temperature Function possible only with room unit / room temperature sensor
71	Boost of room temperature setpoint with boost heating	5 °C	0...20	..... °C	
72	Parallel displacement of heating curve	0.0 °C	-4.5...+4.5	..... °C	Value in °C room temperature
73	Type of heating curve adjustment	0	0...2	.....	0 = analog adjustment 1 = digital adjustment on the controller and via bus 2 = digital adjustment via bus only

4.4.5 Block «3-position actuator for heating circuit»

81	Maximum limitation of flow temperature	---	--- / 0...140	..... °C	Setting --- = function deactivated No safety function
82	Minimum limitation of flow temperature	---	--- / 0...140	..... °C	Setting --- = function deactivated
83	Maximum rate of increase of flow temperature	---	--- / 1...600	...°C/h	Setting --- = function deactivated (function prevents cracking noise in piping)
84	Excess flow temperature mixing	10 °C	0...50	..... °C	Setpoint boost for precontroller in interconnected plants
85	Actuator running time	120 s	30...873	..... s	
86	P-band of control (Xp)	32.0 °C	1...100	..... °C	
87	Integral action time of control (Tn)	120 s	10...873	..... s	

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
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4.4.6 Block «Boiler»

91	Boiler operating mode	0	0...2	0 = with manual shutdown (⏻ key) 1 = with automatic shutdown (OFF when there is no demand for heat) 2 = without shutdown
92	Maximum limitation of boiler temperature	95 °C	25...140	..... °C	No safety function
93	Minimum limitation of boiler temperature	10 °C	5...140	..... °C	
94	Switching differential of boiler	6 °C	1...20	..... °C	
95	Minimum limitation of burner running time	4 min	0...10	.... min	
96	Release limit for second burner stage	50 °C·min	0...500	.... °C·min	
97	Reset limit for second burner stage	10 °C·min	0...500	.... °C·min	
98	Waiting time for second burner stage	20 min	0...40	.... min	

4.4.7 Block «Pump M1»

99	Operating mode pump M1	1	0...3	.....	0 = circulating pump without shutdown in the case of protective boiler startup 1 = circulating pump with shutdown in the case of protective boiler startup 2 = bypass pump parallel to burner stage 1 3 = bypass pump with control via return temperature sensor B7
100	Switching differential bypass pump	6	1...20	..... °C	Function is of importance only if operating line 99 = 3

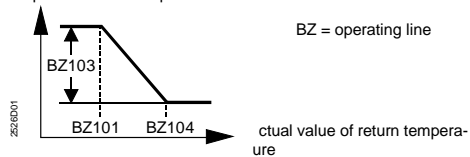
4.4.8 Block «Setpoint of return temperature limitation»

101	Setpoint of return temperature limitation / bivalent starting point	---	--- / 0...140 °C	Entry --- = function deactivated For explanation of "bivalent", refer to operating lines 103 and 104
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4.4.9 Block "Type of limitation of return temperature"

102	Type of limitation of return temperature	0	0 / 1	0 = minimum 1 = maximum If the plant has a bypass pump controlled via return temperature sensor B7, this setting is inactive. In that case, the type of limitation is always minimum limitation
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4.4.10 Block «Bivalent maximum limitation of return temperature»

103	Maximum setback of boiler temp. setpoint	10 °C	1...50 °C	Setpoint of boiler temperature  BZ = operating line actual value of return temperature
104	End point bivalent	60 °C	0...140 °C	

4.4.11 Block "3-position actuator for d.h.w. / mixing circuit"

108	Actuator running time	120 s	30...873	..... s	
109	P-band of control (Xp)	32.0 °C	1...100	..... °C	
110	Integral action time of control (Tn)	120 s	10...873	..... s	

4.4.12 Block "Integral action time of maximum limitation of return temperature"

114	Integral action time of maximum limitation of return temperature	30 min	0...60 min	
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4.4.13 Block «Assignment of d.h.w. heating»

121	Assignment of d.h.w. heating	0	0...2	D.h.w. heating for 0 = own controller 1 = all controllers in the interconnected system that use the same segment number 2 = all controllers in the interconnected system
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4.4.14 Block «Circulating pump»

122	Program for d.h.w. circulating pump	2	0...3	0 = 24 h per day 1 = according to the heating program(s), depending on the setting made on line 121 2 = according to switching program 2 3 = according to switching program 3
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Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
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4.4.15 Block «Release, priority and flow temperature setpoint of d.h.w. heating»

123	Release of d.h.w. heating	2	0...2	0 = released 24 hours a day 1 = released according to the heating program(s), depending on the setting made on operating line 121; start of release is shifted forward by one hour 2 = released according to switching program 2																		
124	D.h.w. priority, flow temperature setpoint	0	0...4	<table border="1"> <thead> <tr> <th></th> <th>D.h.w. priority</th> <th>Flow temperature setpoint according to</th> </tr> </thead> <tbody> <tr> <td>0 =</td> <td>absolute priority</td> <td>D.h.w.</td> </tr> <tr> <td>1 =</td> <td>shifting priority</td> <td>D.h.w.</td> </tr> <tr> <td>2 =</td> <td>shifting priority</td> <td>Maximum 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>Maximum selection</td> </tr> </tbody> </table>		D.h.w. priority	Flow temperature setpoint according to	0 =	absolute priority	D.h.w.	1 =	shifting priority	D.h.w.	2 =	shifting priority	Maximum selection	3 =	none (parallel)	D.h.w.	4 =	none (parallel)	Maximum selection
	D.h.w. priority	Flow temperature setpoint according to																					
0 =	absolute priority	D.h.w.																					
1 =	shifting priority	D.h.w.																					
2 =	shifting priority	Maximum selection																					
3 =	none (parallel)	D.h.w.																					
4 =	none (parallel)	Maximum selection																					

4.4.16 Block «D.h.w. storage tank»

125	D.h.w. heating	0	0...3	.....	0 = parallel with space heating 1 = alternating with space heating / electric; changeover according to own controller 2 = alternating with space heating / electric; changeover according to all controllers in the interconnected system that have the same segment number 3 = alternating with space heating / electric; changeover according to all controllers in the interconnected system If operating line 54 = 3, this operating line cannot be changed. In that case, charging always takes place via space heating .
126	D.h.w. temperature sensor / d.h.w. thermostat	0	0...3	.....	0 = 1 sensor 1 = 2 sensors 2 = 1 thermostat 3 = 2 thermostats
127	D.h.w. charging temperature boost	10 °C	0...50	..... °C	
128	D.h.w. switching differential	8 °C	1...20	..... °C	
129	Maximum d.h.w. charging time	60 min	--- / 5...250	.... min	Setting --- = function deactivated
130	Setpoint of legionella function	---	--- / 20...100	..... °C	Setting --- = function deactivated
131	Forced charging	0	0 / 1	.....	0 = none 1 = daily on first release

4.4.17 Block «3-position actuator d.h.w.»

132	Flow temperature boost mixing valve / heat exchanger	10 °C	0...50	..... °C	
133	Actuator opening time	120 s	10...873	..... s	
134	Actuator closing time	120 s	10...873	..... s	
135	P-band (Xp) d.h.w.control	32.0 °C	1...100	..... °C	
136	Integral action time (Tn) d.h.w.control	120 s	10...873	..... s	

4.4.18 Block «Derivative action time d.h.w. heating via heat exchanger»

137	Derivative action time (Tv) d.h.w. control	0 s	0...255 s	
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4.4.19 Block «Multifunctional relay»

141	Function of multifunctional relay	0	0...7		0 = no function 1 = outside temperature switch (set operating lines 143...145) 2 = ON / OFF according to time switch (select time switch on operating line 146) 3 = relay ENERGIZED in the case of fault 4 = relay ENERGIZED during occupancy time 5 = relay ENERGIZED during occupancy time incl. optimizations 6 = relay ENERGIZED when there is a demand for heat 7 = manually ON / OFF according to operating line 142 If operating line 54 = 3, or operating line 125 is not 0, this operating line cannot be changed
142	Manually ON / OFF	0	0 / 1	.....	0 = relay DEENERGIZED 1 = relay ENERGIZED Function can be provided only when operating line 141 = 7

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
143	Outside temperature switch Switch-off value for occupancy time	5.0 °C	-35...+35	..... °C	Function can be provided only when operating line 141 = 1
144	Outside temperature switch Switch-off value for non-occupancy time	-5.0 °C	-35...+35	..... °C	Function can be provided only when operating line 141 = 1
145	Outside temperature switch Switching differential	3 °C	1...20	..... °C	Function can be provided only when operating line 141 = 1
146	Selection time switch	3	1...3	.....	1 = heating program 2 = switching program 2 3 = switching program 3

4.4.20 Block «Legionella function»

147	Periodicity of legionella function	1	0...7	.....	0 = daily 1...7 = weekly, whereby: 1 = always on Monday 2 = always on Tuesday; etc.
148	Time for charging	05:00	00:00...24:00 :	
149	Dwelling time at legionella setpoint	30 min	0...360	.... min	For setpoint of legionella function, refer to line 130
150	Circulating pump operation during legionella function	1	0 / 1	.... : ....	0 = no impact on the circulating pump 1 = with impact on the circulating pump

4.4.21 Block «Switching program 3»

151	Weekday (for switching program 3)	1-7	1...7	1 = Monday 2 = Tuesday, etc. 1-7 = entire week
152	Start of first ON period	06:00	00:00...24:00 :	Switching program 3 --:-- = period inactive
153	End of first ON period	22:00	00:00...24:00 :	
154	Start of second ON period	--:--	00:00...24:00 :	
155	End of second ON period	--:--	00:00...24:00 :	
156	Start of third ON period	--:--	00:00...24:00 :	
157	End of third ON period	--:--	00:00...24:00 :	

4.4.22 Block «Service functions and general settings»

161	Outside temperature simulation	--	-- / -50...+50	..... °C	Simulation automatically terminated after 30 minutes -- = no simulation
162	Relay test	0	0...12		0 = normal operation 1 = all contacts open 2 = burner stage 1 ON K4 3 = burner stages 1 ON K4 and 2 ON / burner modulation actuator OPEN K5 4 = circulating pump / bypass pump ON M1 5 = charging pump ON M3 6 = heating circuit mixing valve OPEN Y1 7 = heating circuit mixing valve CLOSED Y2 8 = heating circuit pump ON M2 9 = boiler pump/circulating pump ON M4 10 = multifunctional relay energized K6 / burner modulation actuator CLOSE K6 11 = d.h.w. valve/ return mixing valve OPEN Y7 12 = d.h.w. valve/return mixing valve CLOSED Y8 Terminate the relay test: Select next line or auto- matically after 30 minutes
163	Sensor test SET = setpoint or limit value ACTUAL = sensor value Sensor: 000 = short-circuit --- = open-circuit Control thermostat: 000 = contact closed --- = contact open	Display function			0 = outside sensor B9 1 = flow temp. sensor B1 2 = room sensor B5 3 = room unit sensor A6 4 = return temp. sensor B7 with minimum limit value 5 = return temp. sensor B7 with maximum limit value 6 = flow temp. sensor for d.h.w. B6 7 = d.h.w. storage tank temp. sensor / control thermostat 1 B31 8 = d.h.w. storage tank temp. sensor / control thermostat 2 B32 9 = boiler temp. sensor B2
164	Test contacts H 000 = contact closed --- = contact open	Display function			H1 = overriding the operating mode H2 = manually generated heat demand
165	Flow temperature setpoint	Display function			Current setpoint according to the composite outside temperature, heating curve, setting knob position and setting on operating line 72
166	Resulting heating curve	Display function			Setpoint incl. setting knob position and setting on operating line 72 <i>Left:</i> TV1 at 15 °C outside temperature <i>Right:</i> TV2 at -5 °C outside temperature

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips																																	
167	Outside temp. for frost protection for the plant	2.0 °C	--./ 0...25 °C	Setting --. = no frost protection for the plant																																	
168	Flow temp. setpoint for frost protection for the plant	15 °C	0...140 °C																																		
169	Device number	0	0...16	Data bus address (LPB) 0 = device with no bus																																	
170	Segment number	0	0...14	Data bus address (LPB)																																	
171	Flow alarm	--:--	--:-- / 1...10 h	Period of time during which the flow / boiler temperature may stay outside the limit values. Plant types 1-x, 2-x, and 3-x: Sensor B1 Plant types 4-x and 5-x: Sensor B2 --:-- = function deactivated																																	
172	Operating mode when terminals H1-M are linked	0	0...9	<table border="1"> <thead> <tr> <th></th> <th>Space heating mode</th> <th>D.h.w.</th> </tr> </thead> <tbody> <tr> <td>0 =</td> <td> STANDBY</td> <td>OFF</td> </tr> <tr> <td>1 =</td> <td> AUTO</td> <td>OFF</td> </tr> <tr> <td>2 =</td> <td> REDUCED</td> <td>OFF</td> </tr> <tr> <td>3 =</td> <td> NORMAL</td> <td>OFF</td> </tr> <tr> <td>4 =</td> <td> STANDBY</td> <td>ON</td> </tr> <tr> <td>5 =</td> <td> AUTO</td> <td>ON</td> </tr> <tr> <td>6 =</td> <td> REDUCED</td> <td>ON</td> </tr> <tr> <td>7 =</td> <td> NORMAL</td> <td>ON</td> </tr> <tr> <td>8 =</td> <td> AUTO</td> <td>ON, 24 h/day</td> </tr> <tr> <td>9 =</td> <td> NORMAL</td> <td>ON, 24 h/day</td> </tr> </tbody> </table>		Space heating mode	D.h.w.	0 =	STANDBY	OFF	1 =	AUTO	OFF	2 =	REDUCED	OFF	3 =	NORMAL	OFF	4 =	STANDBY	ON	5 =	AUTO	ON	6 =	REDUCED	ON	7 =	NORMAL	ON	8 =	AUTO	ON, 24 h/day	9 =	NORMAL	ON, 24 h/day
	Space heating mode	D.h.w.																																				
0 =	STANDBY	OFF																																				
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7 =	NORMAL	ON																																				
8 =	AUTO	ON, 24 h/day																																				
9 =	NORMAL	ON, 24 h/day																																				
173	Amplification of locking signal	100 %	0...200 %	Response to locking signals																																	
174	Pump overrun time	6 min	0...40 min																																		
175	Periodic pump run (pump kick)	0	0 / 1	0 = no periodic pump run 1 = weekly pump run enabled																																	
176	Winter- / summertime changeover	25.03	01.01. ... 31.12		Setting: Earliest possible changeover date																																	
177	Summer- / wintertime changeover	25.10	01.01. ... 31.12		Setting: Earliest possible changeover date																																	
178	Clock operation	0	0...3	0 = autonomous clock in the controller 1 = clock from bus (slave), with no remote setting 2 = clock from bus (slave), with remote setting 3 = controller is the central clock (master)																																	
179	Bus power supply	A	0/A	0 = no bus power supply through the controller A = bus power supply through the controller																																	
180	Outside temperature source	A	A / 00.01 ... 14.16	No display means: Controller is autonomous (no data bus present) Setting when supplied via the data bus: Segment and device number of source, or «A» for automatic identification of source																																	
182	DC 0...10 V heat demand signal U1	130 °C	30...130°C	Scaling for 10 V																																	
183	DC 0...10 V heat demand signal U2	130 °C	30...130°C	Scaling for 10 V																																	

4.4.23 Block «Contact H2»

184	Function when terminals H2-M are linked	0	0 / 1	0 = heat demand signal to heat source 1 = heat demand signal to heating circuit
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4.4.24 Block «External inputs»

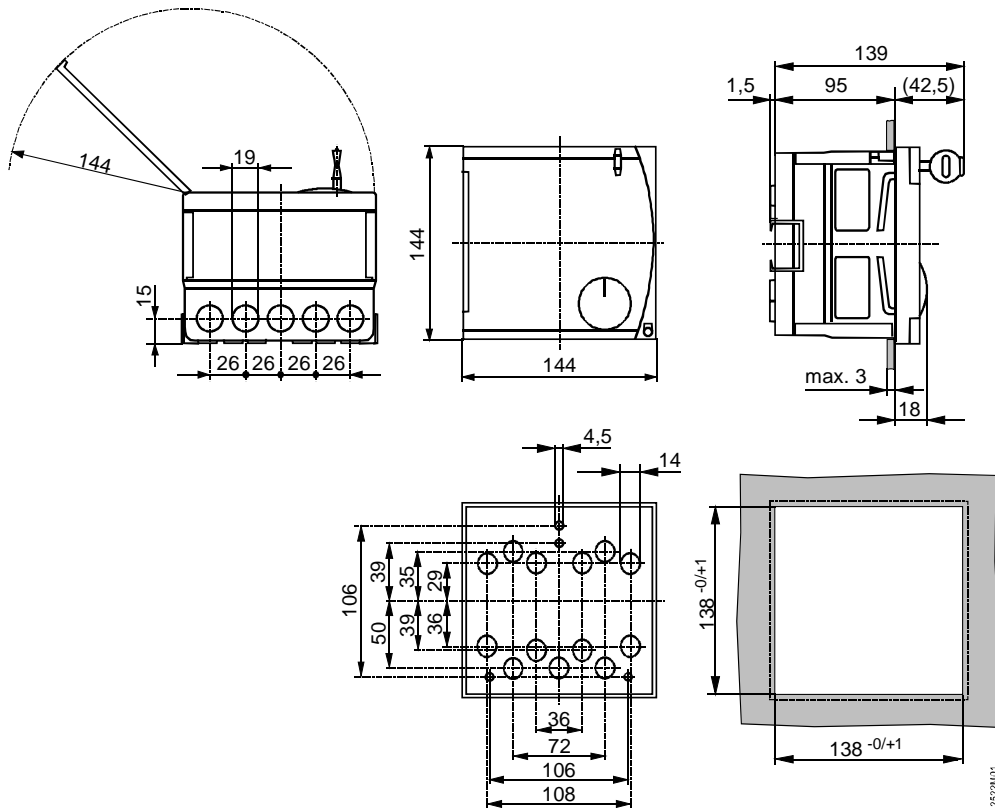
185	Effect when connection terminals H2-M are linked	0	0 / 1	0 = constant 1 = minimum
186	Demand for heat when connection terminals H2-M are linked	70	0...140	..... °C	
187	Values of voltage inputs	Display function			0 = solar radiation in W/m ² 1 = wind speed in m/s 2 = heat demand at terminal U1 in °C 3 = heat demand at terminal U2 in °C
188	Function of voltage input 1 (U1)	0	0...2	.....	0 = not used 1 = solar sensor 2 = heat demand signal (DC 0...10 V = 0...x °C; for value «x», refer to operating line 182)
189	Effect of solar radiation	0	0...20	..... °C	Room temperature setpoint change at a solar radiation of 1000 W/m ²
190	Source of solar radiation signal	A	A / 00.01 ... 14.16		No display means: Controller is autonomous (no data bus) Entry when data bus is the source: Segment and device number of the source, or A for automatic identification of source
191	Function of voltage input 2 (U2)	0	0...2	.....	0 = not used 1 = wind sensor 2 = heat demand signal (DC 0...10 V = 0... x °C; for value «x», refer to operating line 183)

Line	Function, display	Factory setting	Range	Setting	Explanations, notes and tips
192	Effect of wind speed	0	0...20		Room temperature setpoint change at a wind speed of 20 m/s
193	Source of wind speed	A	A / 00.01 ... 14.16		No display means: Controller is autonomous (no data bus present) Entry when data bus is the source: Segment and device number of the source, or «A» for automatic identification of source
194	Hours run counter	Display function			Number of controller operating hours
195	Controller's software version	Display function			
196	Identification code of room unit	Display function			
197	Radio clock, elapsed time since last reception	Display function			Range: 00:00...42:00 h --:-- = no radio clock connected

5. Final work

1. Enter the settings made in these Installation Instructions, which should be kept in a safe place.
2. Make entries in the Operating Instructions:
 - Release of d.h.w. heating on page 8
 - Setting choice of heating curve on page 10
 - Function of switching program 2 on page 19
 - Heating engineer's name and address on page 27
3. Keep Operating Instructions in the unit cover.
4. Seal the unit cover, if required.

6. Dimensions



Dimensions in mm