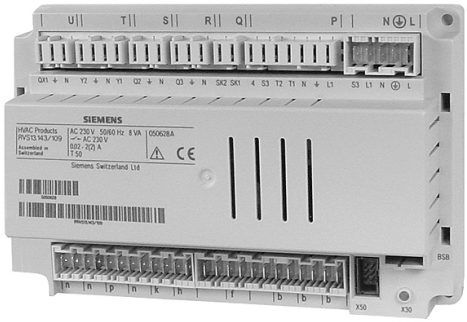
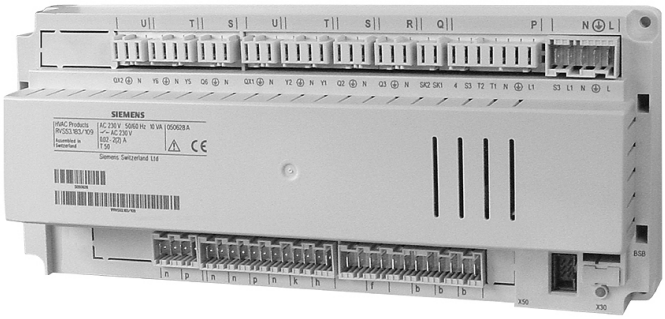
SIEMENS





Albatros[2]
Boiler controllers
User manual

RVS43..
RVS63..
AVS75..
AVS37..
QAA75..
QAA78..
QAA55..

Edition 2.0
Controller series B
CE1U2354en
11. May 2007

Building Technologies
HVAC Products

Table of contents

1 Summary

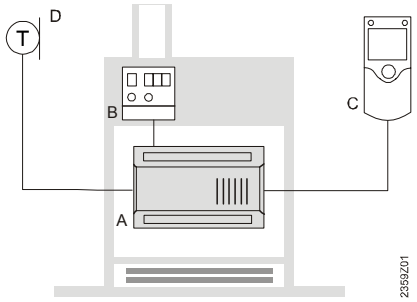
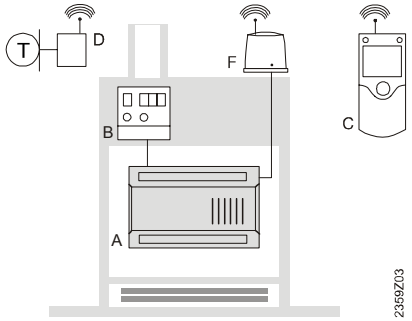
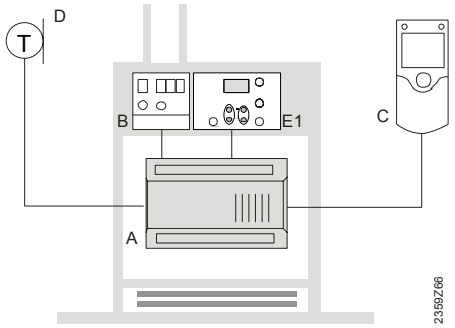
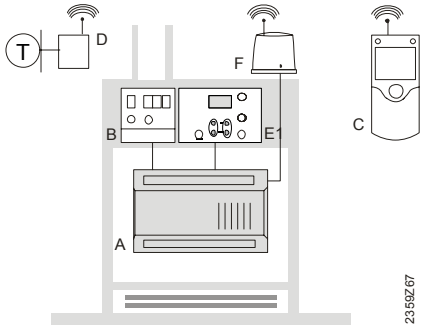
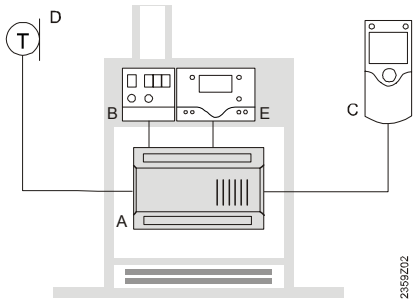
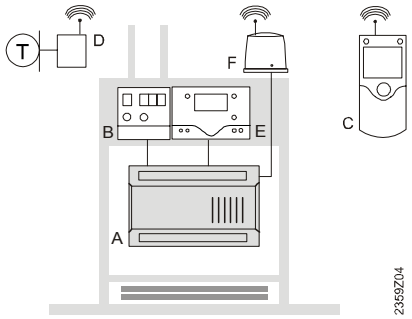
This User manual describes the products listed in the following table and covers handling and configuration of the controls for readers ranging from endusers to heating engineers.

Type reference (ASN)	Series	Name
RVS43.143	A	Basic unit boiler
RVS63.243	B	Basic unit boiler
RVS63.283	B	Basic unit boiler
AVS75.390	B	Extension module
AVS37.294	B	Operator unit
AVS37.390	A	Operator unit basic
QAA75.610	B	Room unit, wired
QAA75.611	B	Room unit with backlight, wired
QAA78.610	B	Room unit, wireless
QAA55.110	A	Room unit basic
AVS16.290	A	Power section
AVS71.390	A	Radio module
AVS14.390	A	Radio repeater
AVS13.399	A	Wireless outside sensor

The following products are described in separate pieces of documentation:

QAC34	Outside sensor NTC 1 kΩ
QAD36	Strap-on temperature sensor NTC 10 kΩ
QAZ36	Immersion temperature sensor NTC 10 kΩ

1.1 Type summary

	Wired	RF
Operation with room unit		
Operation with operator unit “basic” (optionally with additional room unit)		
Operation with operator unit “clear-text” (optionally with additional room unit)		

A Basic unit RVS…
B Power section AVS16…
C Room unit QAA75… / 78…
D Outside sensor AVS13…
E Operator unit AVS37.294 (clear-text)
E1 Operator unit AVS37.390 (basic)
F Radio module AVS71…

2 Safety notes

2.1 Product liability

- The products may only be used in building services plant and applications as described in this document
- When using the products, all requirements specified in chapters "Handling" and "Technical data" must be satisfied
- The local regulations (for installation, etc.) must be complied with
- Do not open the units. If not observed, warranty becomes void.

3 Mounting and installation

3.1 Regulations

Electrical installation

- Prior to installing the units, power must be turned off
- The connections for mains and low-voltage are separated
- For wiring, the requirements of safety class II must be satisfied. Sensor and power cables must not be run in the same cable duct

3.2 Basic units RVS…

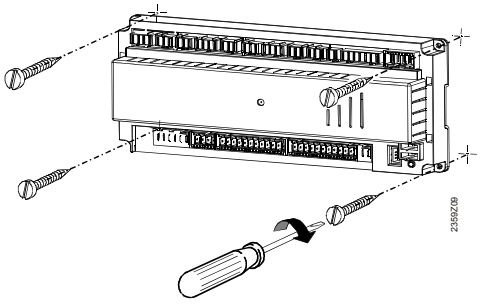
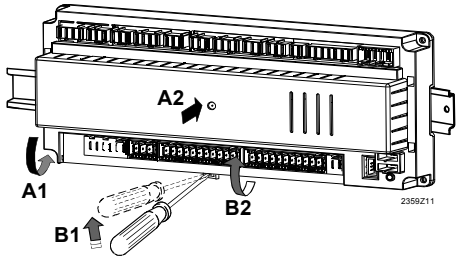
Planning

- Air circulation around the controller must be ensured, allowing the unit to emit the heat produced by it.
  A clearance of at least 10 mm must be provided for the unit's cooling slots at the top and bottom of the housing.
  That space should not be accessible and no objects should be placed there. If the controller is enclosed in another (insulating) casing, a clearance of up to 100 mm must be observed around the cooling slots
- The controller is designed conforming to the directives for safety class II devices mounted in compliance with these regulations
- Power to the controller may only be supplied when completely fitted. If this is not observed, there is a risk of electric shock hazard near the terminals and through the cooling slots
- The controller must not be exposed to dripping water.
- Permissible ambient temperature when mounted and when ready to operate: 0...50 °C
- Power cables must be clearly segregated from low-voltage cables (sensors) observing a distance of at least 100 mm

Mounting location

- Boiler
- Control panel
- Housing for wall mounting

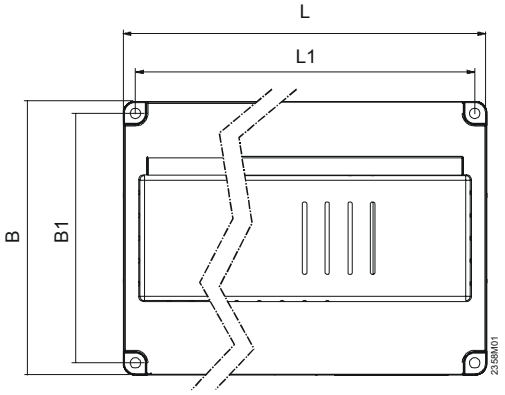
Mounting method

Screwed	On DIN rail
	

A: Mounting / B: Removal

Note:
To mount the controller on a DIN rail, a mounting clip is required!

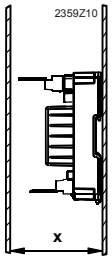
Dimensions and drilling plan



Dimensions in mm

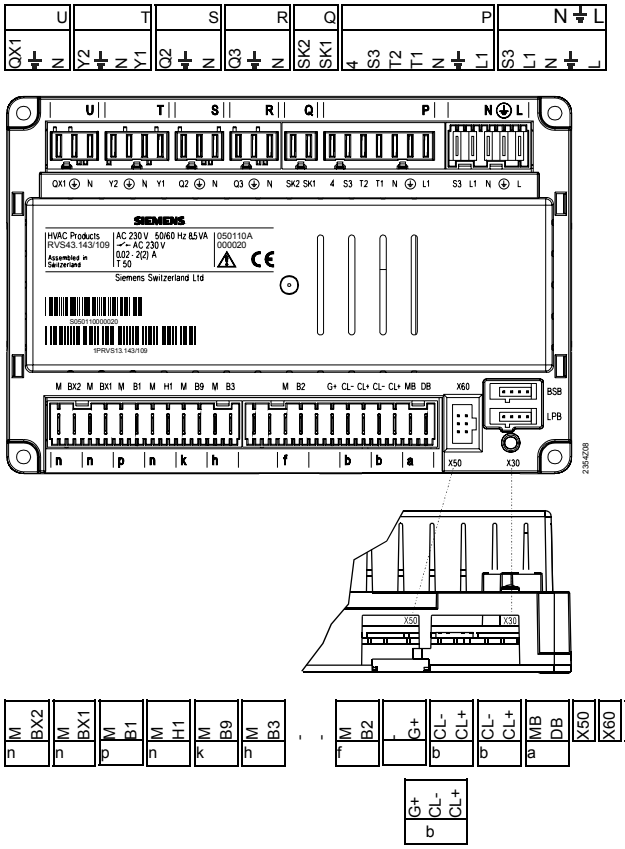
	L	*B*	*H*	*L1*	*B1*
RVS63…	280.7	120.7	51.7	270	110
RVS43…	180.7	120.7	51.7	170	110

Total height required

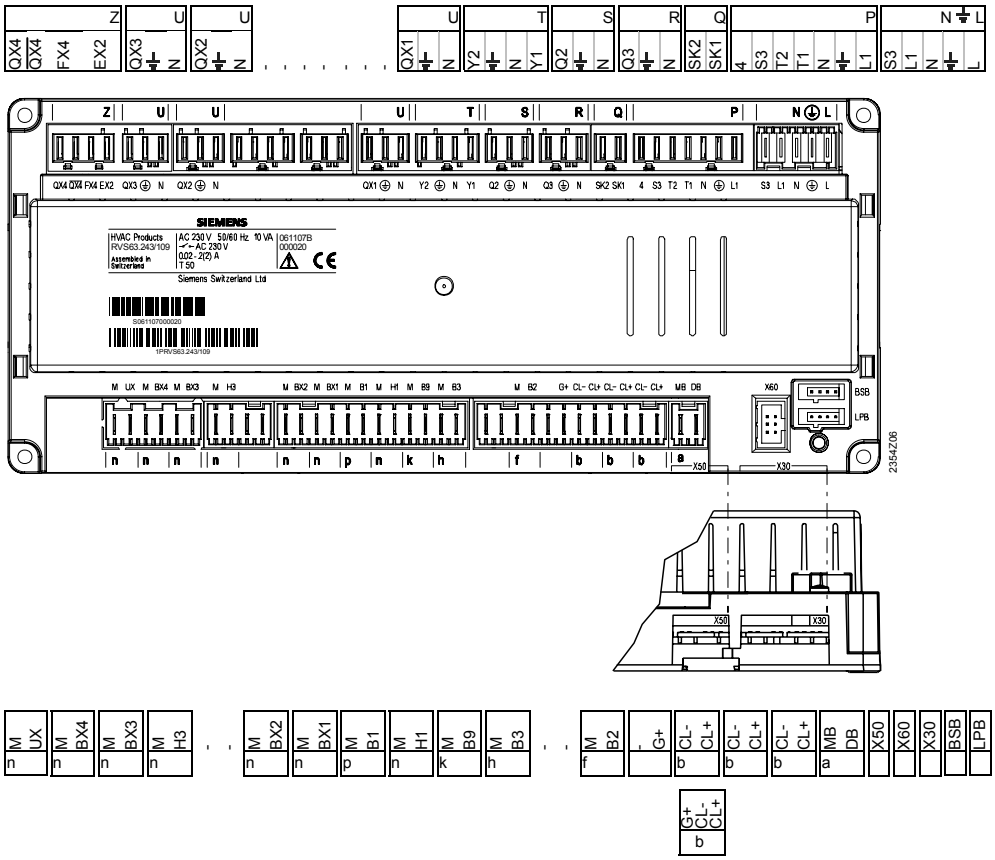


Dimension X:
Connectors with tongues minimum 70 mm
Connector without tongues minimum 60 mm

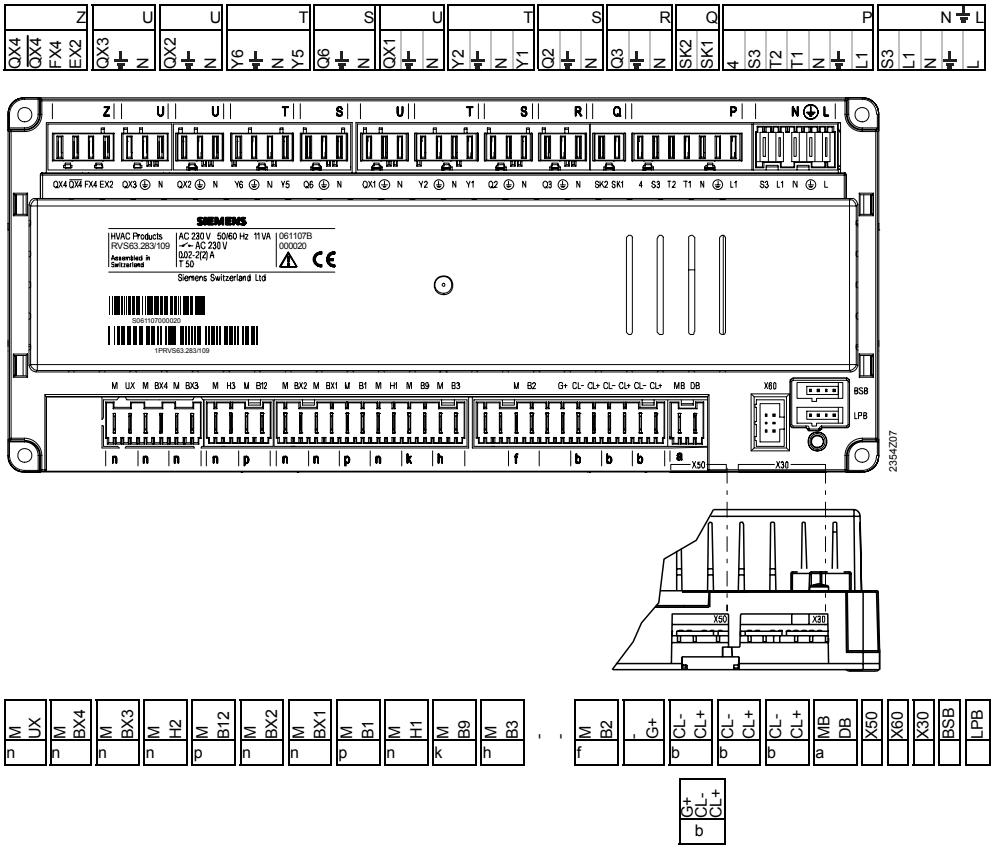
3.2.1 Connection terminals of RVS43.143



3.2.2 Connection terminals of RVS63.243



3.2.3 Connection terminals of RVS63.283



M UX	M BX4	M BX3	M H2	M B12	M BX2	M BX1	M B1	M H1	M B9	M B3	-	-	M B2	G+	CL- CL+	CL- CL+	CL- CL+	MB DB	X50	X60	X30	BSB	LPB
n	n	n	n	p	n	n	p	n	k	h			f		b	b	b	a					

G+ CL- CL+
b

Terminal markings

Mains voltage

	Use	*Space*	*Connector type*
L ⏚ N L1 S3	Live AC 230 V basic unit Protective earth Neutral conductor Live AC 230 V burner Output burner fault	N ⏚ L	AGP4S.05A/109
L1 ⏚ N T1 T2 S3 4	Live burner Protective earth Neutral conductor Phase 1st burner stage 1st burner stage on Input burner fault Input 1st burner stage hours run	P	AGP8S.07A/109
SK1 SK2	Safety loop Safety loop	Q	AGP8S.02E/109
N ⏚ Q3	Neutral conductor Protective earth DHW charging pump / diverting valve	R	AGP8S.03A/109
N ⏚ Q2	Neutral conductor Protective earth 1st heating circuit pump	S	AGP8S.03B/109
Y1 N ⏚ Y2	1st heating circuit mixing valve opening Neutral conductor Protective earth 1st heating circuit mixing valve closing	T	AGP8S.04B/109
N ⏚ QX1	Neutral conductor Protective earth 1st multifunctional output	U	AGP8S.03C/109
N ⏚ Q6	Nullleiter Protective earth 2nd heating circuit pump	S	AGP8S.03B/109
Y5 N ⏚ Y6	2nd heating circuit mixing valve opening Neutral conductor Protective earth 2nd heating circuit mixing valve closing	T	AGP8S.04B/109
N ⏚ QX2	Neutral conductor Protective earth 2nd multifunctional output	U	AGP8S.03C/109
N ⏚ QX3	Neutral conductor Protective earth 3rd multifunctional output	U	AGP8S.03C/109
EX2 FX4 (T6) $\overline{QX4}$ (T7) QX4 (T8)	Multifunctional input Phase 4th Multifunctional output (phase 2nd burner stage) 4th Multifunctional output off (2nd burner stage off) 4th Multifunctional output on (2nd burner stage on)	Z	AGP8S.04C/109

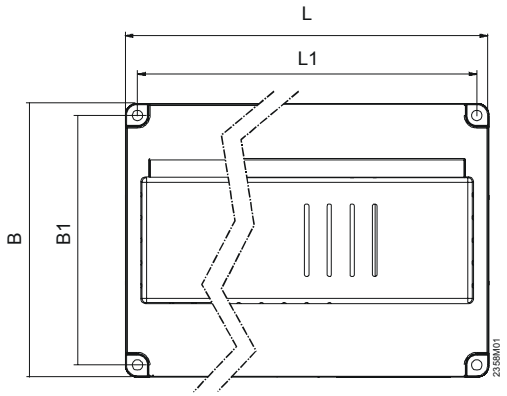
Low-voltage

	Use	*Space*	*Connector type*
BSB	Service tool OCI700	-	-
LPB	Local Process Bus	-	-
system			
X60	Radio module AVS71.390	-	-
X50	Extension module AVS75.390	-	AVS82.490/109
X30	Operator unit / boiler control panel	-	AVS82.491/109
DB	LPB data		AGP4S.02H/109
MB	LPB ground		
CL+	BSB data		AGP4S.02A/109
CL-	BSB ground	b	
CL+	Room unit 2 data		AGP4S.02A/109
CL-	Room unit 2 ground	b	
CL+	Room unit 1 data		AGP4S.02A/109
CL-	Room unit 1 ground	b	AGP4S.03D/109
G+	Room unit power supply 12 V		
B2	Boiler sensor		AGP4S.02B/109
M	Ground	f	
B3	DHW sensor top		AGP4S.02C/109
M	Ground	h	
B9	Outside sensor		AGP4S.02D/109
M	Ground	k	
H1	Digital / DC 0...10 V input		AGP4S.02F/109
M	Ground	n	
B1	Flow temperature sensor HK1		AGP4S.02G/109
M	Ground	p	
BX1	Multifunctional sensor input 1		AGP4S.02F/109
M	Ground	n	
BX2	Multifunctional sensor input 2		AGP4S.02F/109
M	Ground	n	
B12	Flow temperature sensor HK2		AGP4S.02G/109
M	Ground	p	
H3	Digital / DC 0...10 V input		AGP4S.02F/109
M	Ground	n	
BX3	Multifunctional sensor input 3		AGP4S.02F/109
M	Ground	n	
BX4	Multifunctional sensor input 4		AGP4S.02F/109
M	Ground	n	
UX	DC 0…10 V output	n	AGP4S.02F/109
M	Ground		

3.3 Extension module AVS75.390

For planning, mounting location and mounting method, refer to the information given for the basic modules.

Dimensions and drilling plan



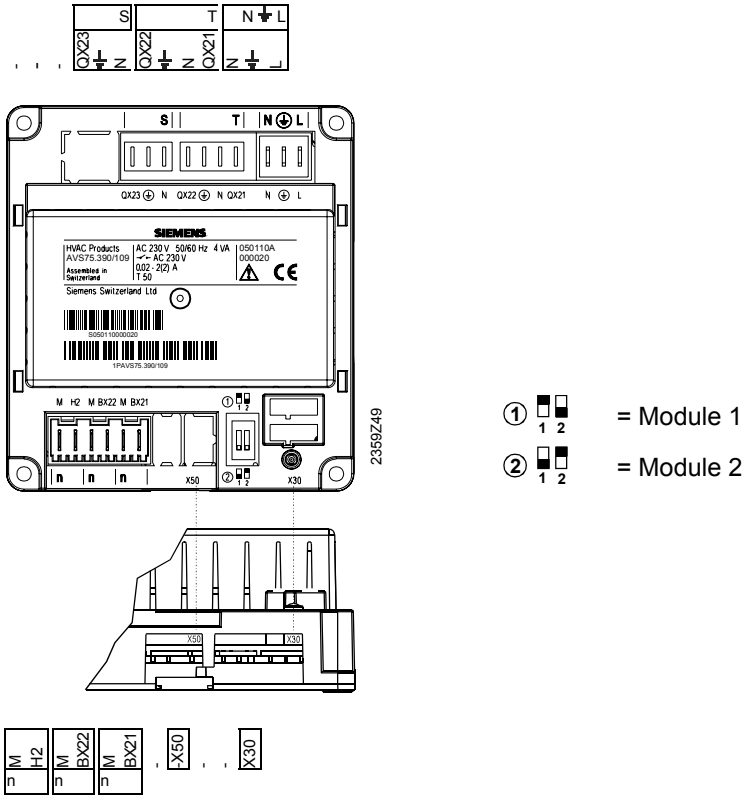
Dimensions in mm

	L	*B*	*H*	*L1*	*B1*
AVS75.390	108.7	120.9	51.7	98	110

Connections

The AVS75.390 extension module must be connected to terminal X50 of the basic unit using the AVS83.490/109 connecting cable. The connectors are coded.

3.3.1 Connection terminals of AVS75.390



Terminal markings

Mains voltage

	Use	*Space*	*Connector type*
L ⏚ N	Live AC 230 V basic unit Protective earth Neutral conductor	N ⏚ L	AGP4S.03E/109
QX21 N ⏚ QX22	Assignment according to function Neutral conductor Protective earth Assignment according to function	T	AGP8S.04B/109
N ⏚ QX23	Neutral conductor Protective earth Assignment according to function	S	AGP8S.03B/109

Low-voltage

	Use	*Space*	*Connector type*
X30	Operator unit / boiler control panel	-	AVS82.491/109
X50	Basic unit		AVS82.490/109
BX21 M	Assignment according to function Ground	n	AGP4S.02F/109
BX22 M	Assignment according to function Ground	n	AGP4S.02F/109
H2 M	Digital / DC 0...10 V input Ground	n	AGP4S.02F/109

Assignment of terminals

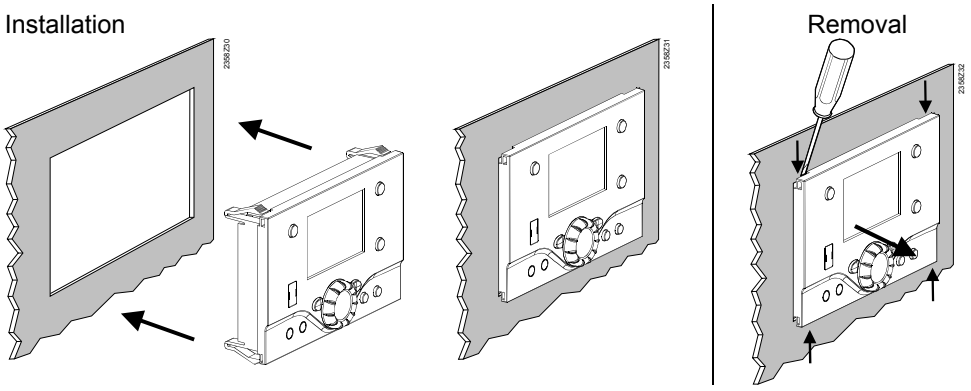
Using the 2 parameters

- Function extension module 1 (operating line 6020)
- Function extension module 2 (operating mode 6021)

usage of the respective module will be defined.

3.4 Operator unit AVS37.294

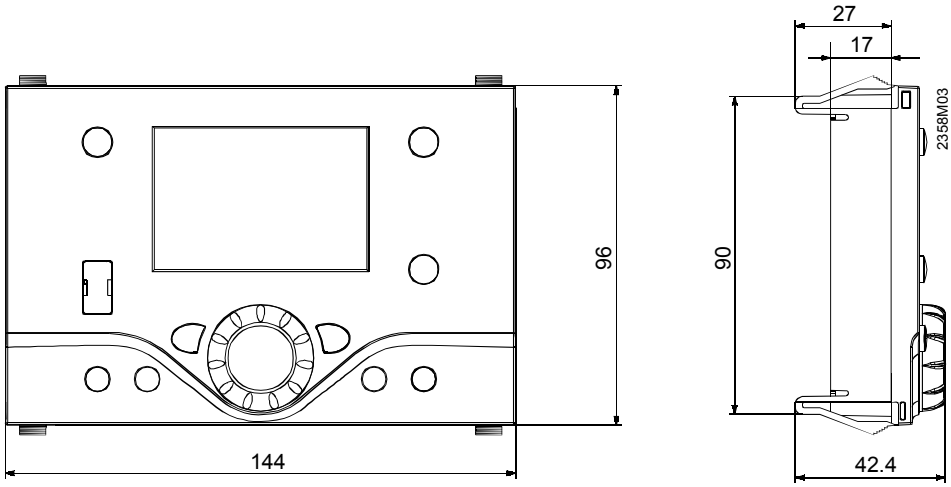
Mounting method



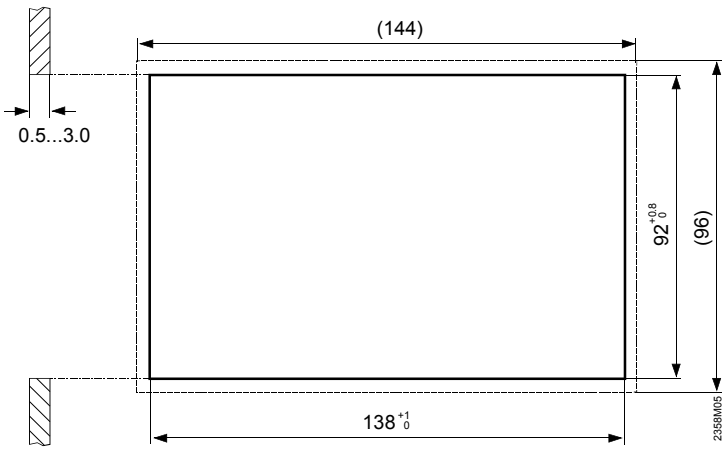
Connections

The AVS37.294 operator unit must be connected to terminal X30 of the basic unit using the AVS82.491/109 connecting cable. The connectors are coded.

Dimensions



Panel cutout

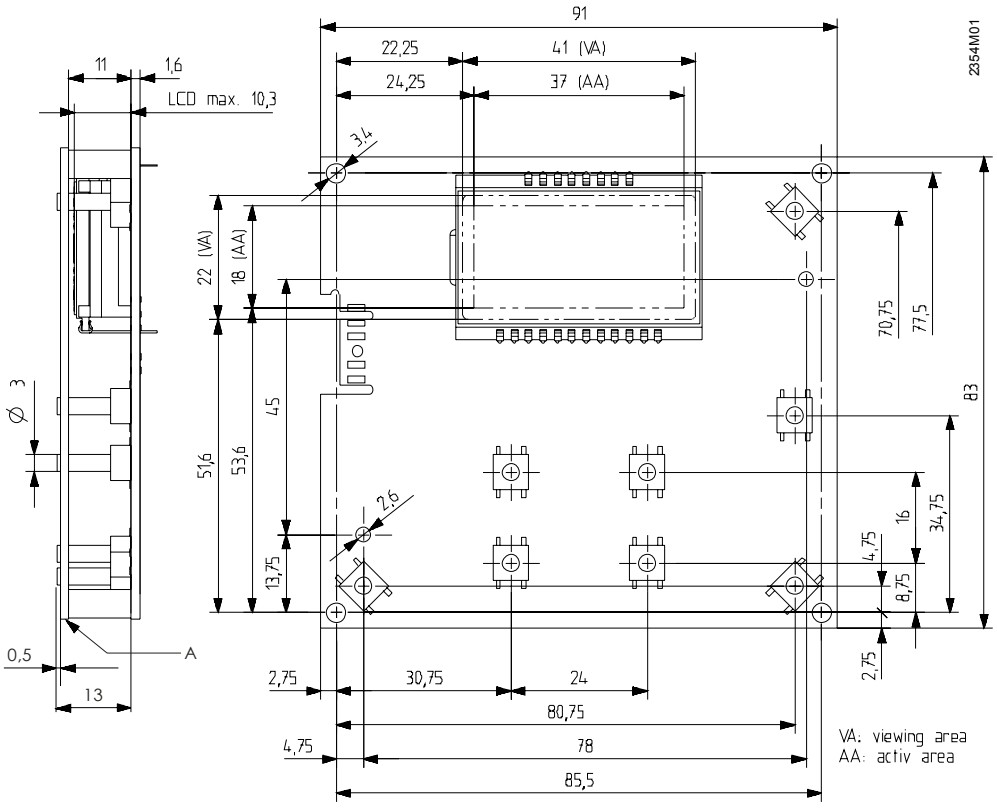


3.5 Operator unit AVS37.390

Connections

The AVS37.390 operator unit must be connected to terminal X30 of the basic unit using the AVS82.491/109 connecting cable. The connectors are coded.

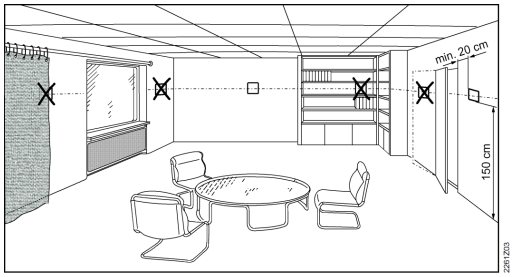
Dimensions



A Control panel, front

3.6 Room unit QAA55…

Planning

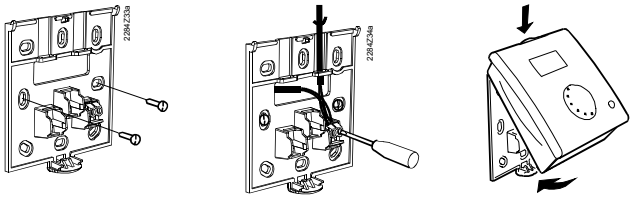


The room unit should be located in the main living room while giving consideration to the following points:

- The place of installation should be chosen so that the sensor can capture the room temperature as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources (about 1.5 meters above the floor)
- In the case of wall mounting, there must be sufficient clearance above the unit, enabling it to be fitted and removed

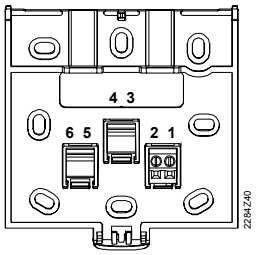
When the unit is removed from its base, power is cut off so that the unit is out of operation.

Mounting method



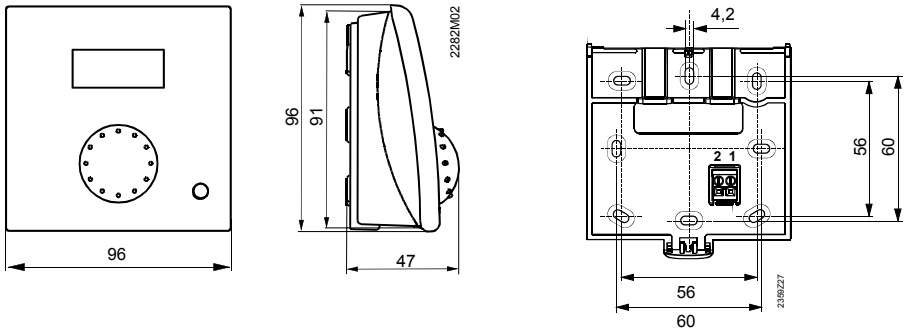
- The controller must not be exposed to dripping water

Connections



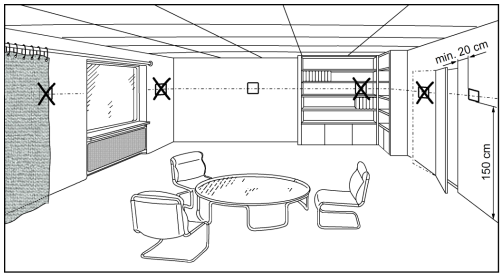
Terminal	Designation	QAA55..
1	CL+	BSB data
2	CL-	BSB ground

Dimensions and drilling plan



3.7 Room unit QAA75…

Planning

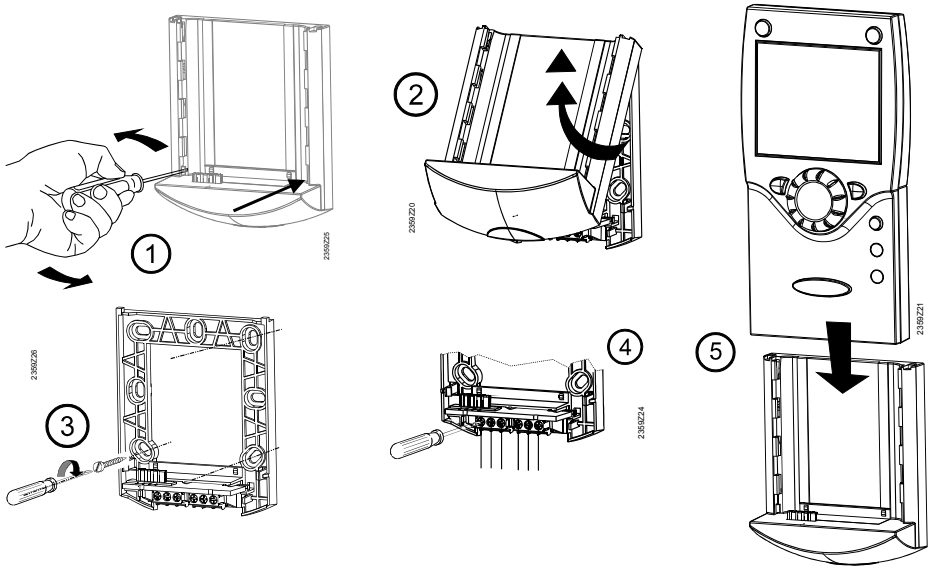


The room unit should be located in the main living room while giving consideration to the following points:

- The place of installation should be chosen so that the sensor can capture the room temperature as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources (about 1.5 meters above the floor)
- In the case of wall mounting, there must be sufficient clearance above the unit, enabling it to be fitted and removed

When the unit is removed from its base, power is cut off so that the unit is out of operation.

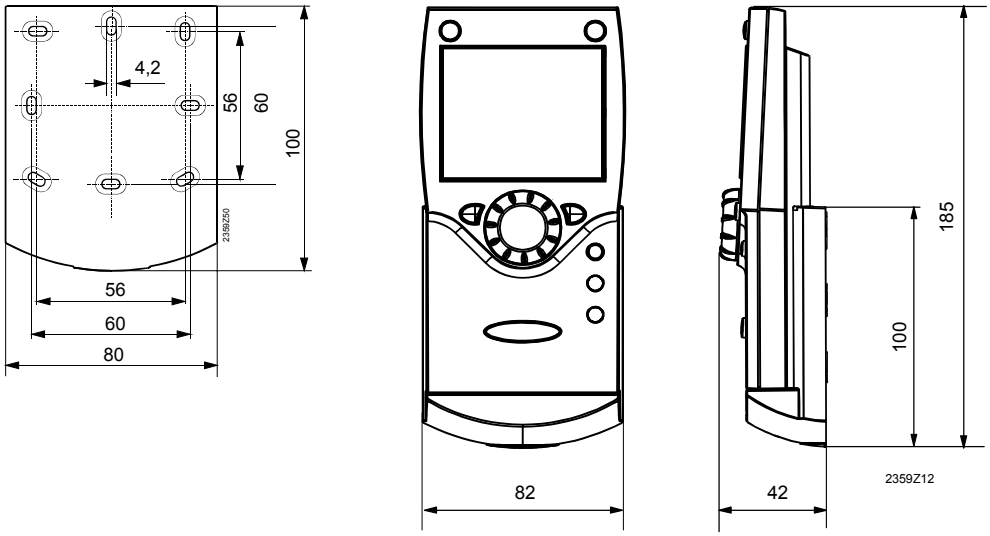
Mounting method



Connections

Terminal	Designation	QAA75.610	QAA75.611
1	CL+	BSB data	BSB data
2	CL-	BSB ground	BSB ground
3	G+	Reserved	Power supply DC 12 V

Dimensions and drilling plan



3.8 Wireless components

The wireless components should be located such that transmission will be as interference-free as possible. The following criteria must be observed:

- Not in the vicinity of electrical cables, strong magnetic fields or equipment like PCs, TV sets, microwave ovens, etc.
- Not near larger metal structures or constructional elements with fine metal meshes such as special glass or special concrete
- The distance to the transmitter should not exceed 30 meters or 2 floors

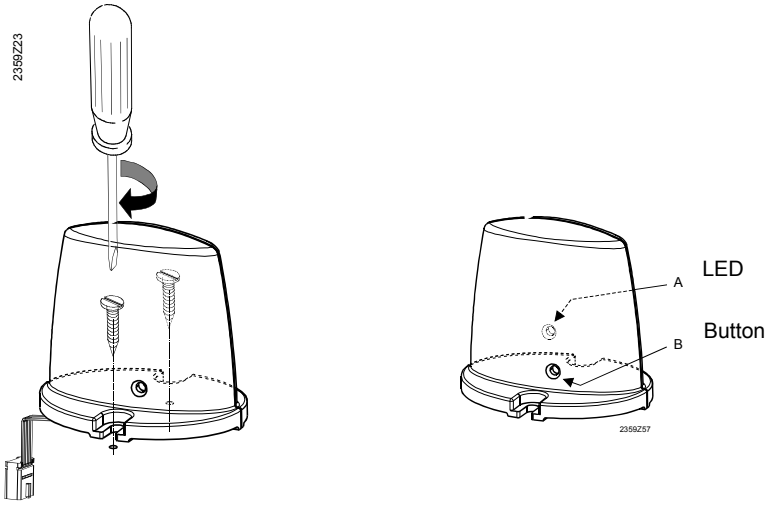
3.8.1 Radio module AVS71.390

The radio module extends the product range by introducing wireless communication. With this type of device, the system components, such as room units, transmit data with no need for laying cables.

Planning

Do not install the radio module inside metal casings (e.g. inside a boiler).

Mounting method



Connection

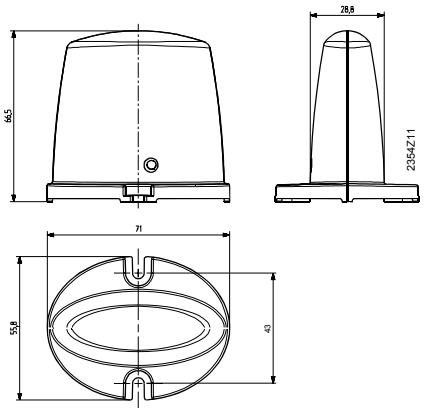
The prefabricated cable is to be connected to terminal X60 of the controller.

⚠ Prior to connecting, the basic unit must be disconnected from power!

Radio connection

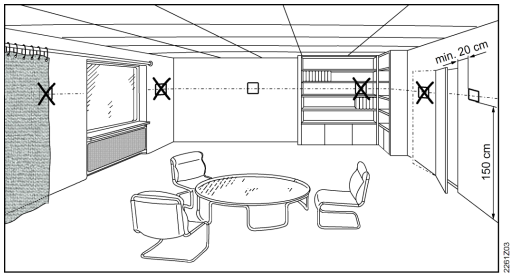
Establishment of the wireless connection is described in the following sections which cover the relevant radio-controlled units.

Dimensions and drilling plan



3.8.2 Room unit QAA78.610

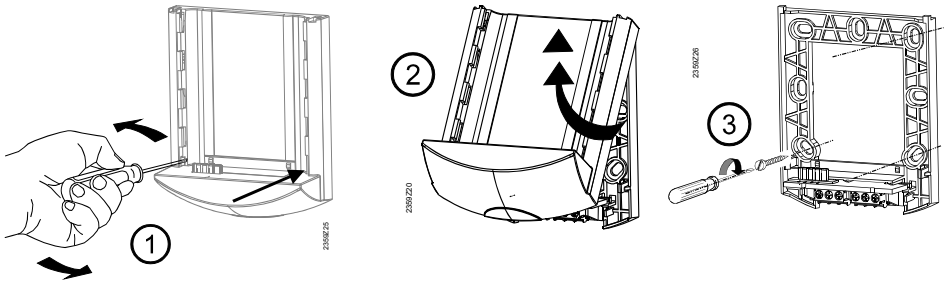
Planning

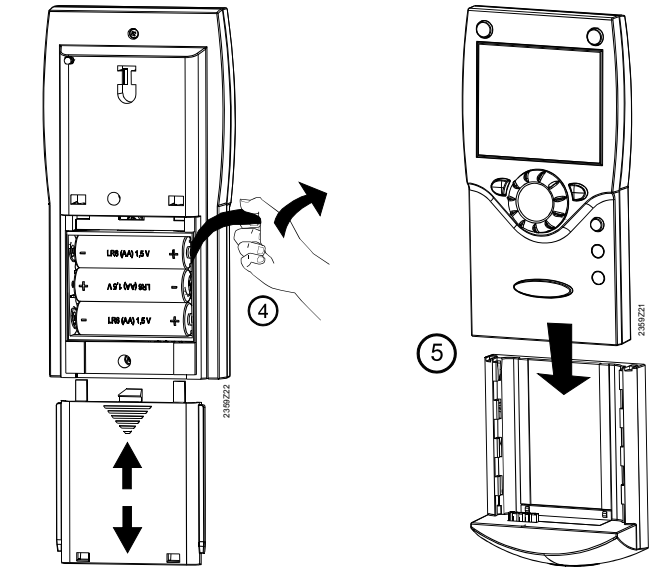


The room unit should be located in the main living room while giving consideration to the following points:

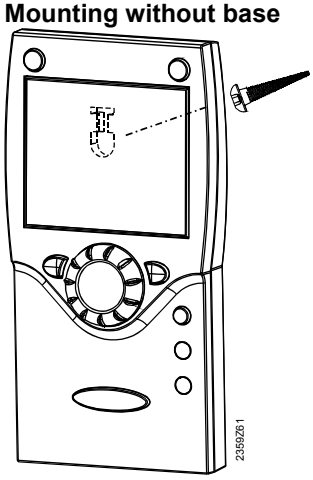
- The place of installation should be chosen so that the sensor can capture the room temperature as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources (about 1.5 meters above the floor)
- In the case of wall mounting, there must be sufficient clearance above the unit, enabling it to be fitted and removed

Mounting with base





Mounting without base



Connection / power supply

The room unit is powered by three 1.5 V Alkali batteries type AA (LR06).

Radio connection

Make the radio connection in the vicinity of the radio module prior to mounting so that all system are within easy reach.

Prerequisite for the radio connection is that all components receive power, which means that the radio module must be correctly connected to the basic unit and the batteries must be correctly installed in the room unit.

Establishment

1. Press the button on the installed radio module for at least 8 seconds until the LED on the radio module starts **flashing at high frequency**.
2. Press OK on the room unit to switch to programming.
3. Press the info button for at least 3 seconds and select operating level “Commissioning“ with the setting knob. Then, press OK.
4. Select operating page “Operator unit“ and press OK.
5. Select operating line “Used as“ (operating line 40) and make the appropriate selection. Then, press OK.
6. Select operating page “Radio“ and press OK.
7. Select setting line “Binding“ (line 120). Then, press OK.
8. Set the setting knob to “YES“ and press OK. Connection establishment is started.
9. The display shows the progress of connection establishment in %. This process can take 2 to 120 seconds.
10. The connection is established when “Device ready” appears and the LED on the radio module extinguishes

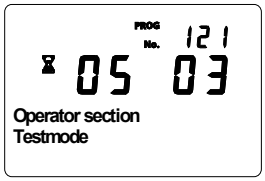
Testing

The test is made to check the quality of the radio link.

- The test can be aborted by pressing the ESC button.
- While the radio link can be opened on the controller, the test should be made at the location where the room unit will be installed

On the room unit, as described above (points 2 through 4), select operating page “Radio“ and activate the test mode on setting line “Test mode“ (line 121).

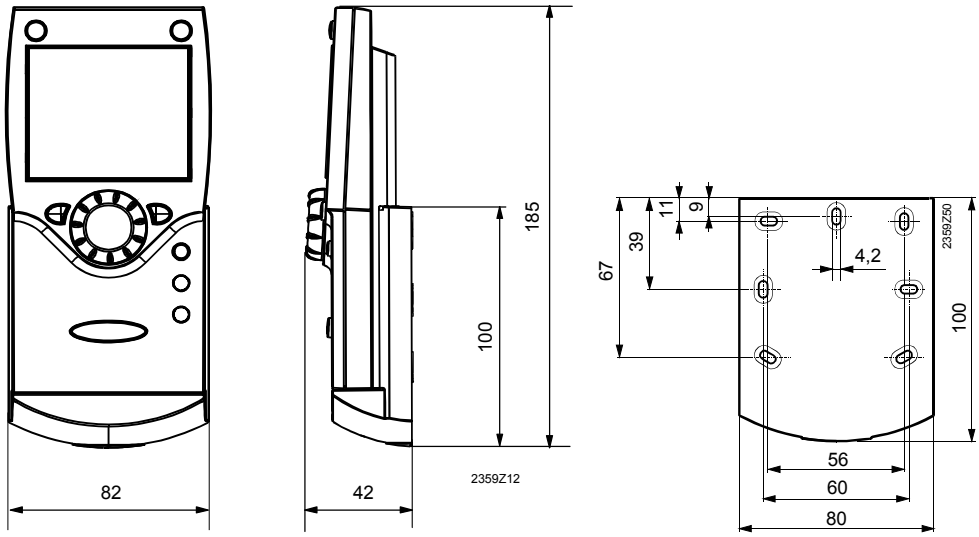
Example of a display during the test:



The digits on the left shows telegrams that have been sent, the digits on the right telegrams that have been received. The test will be ended after 24 telegrams. The test is considered successful when at least 50 % of the telegrams sent have been received.

If the test was not successful, some other mounting location is to be selected or the AVS14.390 radio repeater can be used.

Dimensions and drilling plan

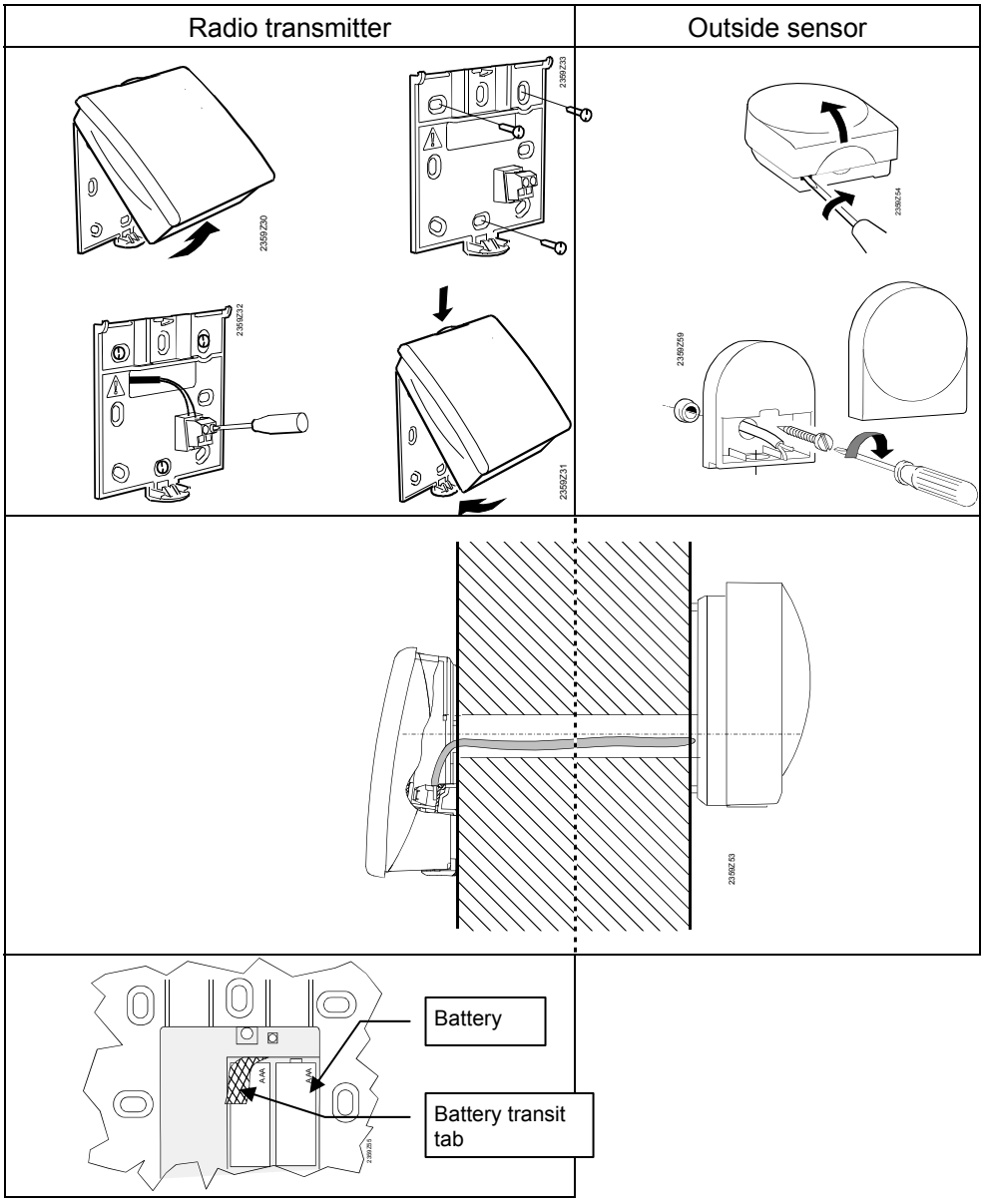


3.8.3 Wireless outside sensor AVS13.399

⚠

- The radio transmitter must be installed inside the building.
- The radio transmitter's mounting location should be chosen such that batteries can be easily changed.

Mounting method



Connections

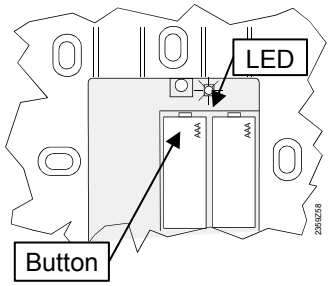
The outside sensor is to be connected to the radio transmitter via a 2-core cable, the connections are interchangeable.
The room unit is powered by 2 pieces 1.5 V Alkali batteries type AAA (LR03).

Radio connection

Make the radio connection in the vicinity of the radio module prior to mounting so that all system are within easy reach.

Prerequisite for the radio connection is that all components receive power, which means that the radio module must be correctly connected to the basic unit and the batteries must be correctly installed in the room unit.

Establishment



1. Press the button on the radio module for at least 8 seconds until the LED on the radio module starts flashing at **high frequency**.
2. Press the button on the transmitter of the wireless outside sensor for at least 8 seconds until that LED also starts flashing at **high frequency**.
3. The connection is established when the LED on the radio module extinguishes.
4. Press the button on the transmitter of the wireless outside sensor briefly again until the LED extinguishes.

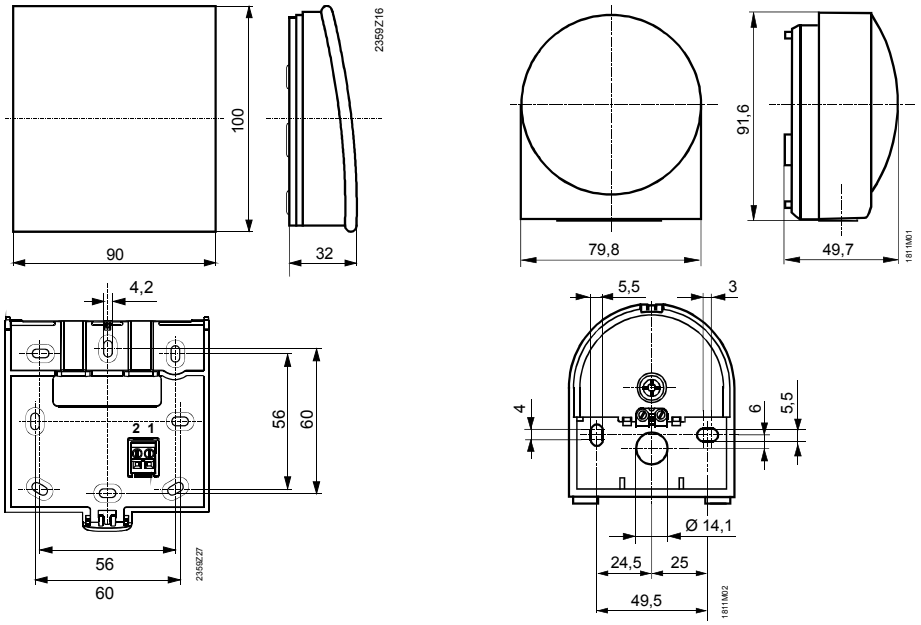
Testing

The test is made to check the quality of the radio link.

- The test can be aborted by pressing the ESC button.
- While the radio link can be opened on the controller, the test should be made at the location where the room unit will be installed

1. Press button 3 on the transmitter of the wireless outside sensor for a maximum of 8 seconds until the LED starts flashing at **low frequency**.
2. When radio communication works, the LED on the radio module flashes briefly at 10-second intervals.
3. After the test, press the button on the transmitter of the wireless outside sensor again briefly until the LED extinguishes.

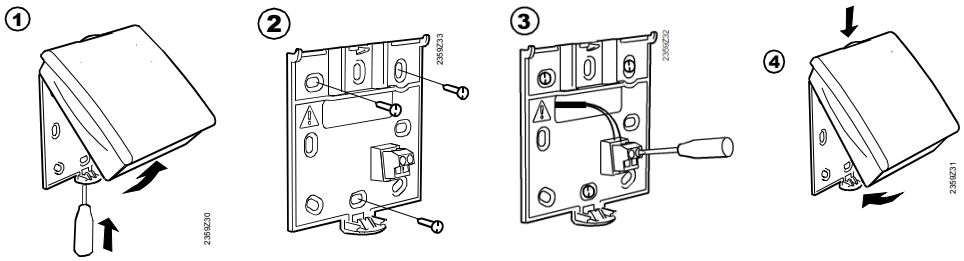
Dimensions and drilling plan



3.8.4 Radio repeater AVS14.390

⚠
- To establish the radio connection, the device must be provisionally connected to power prior to mounting, enabling the radio connection to be opened and tested.
- The radio repeater must be fitted inside the building.

Mounting method



Connections

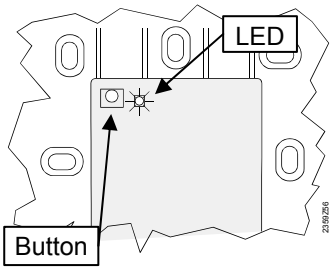
Power is supplied via the enclosed power pack. The wires are interchangeable.

Radio connection

ℹ Make the radio connection in the vicinity of the radio module prior to mounting so that all system are within easy reach.
Prerequisite for the radio connection is that all components receive power, which means that the radio module must be correctly connected to the basic unit and power must be correctly supplied to the radio repeater.

Establishment

1. Press the button on the radio module for at least 8 seconds until the LED on the radio module starts flashing at **high frequency**.
2. Press the button on the installed radio repeater until the LED start flashing at **high frequency**.
3. The connection is established when the LED on the radio module extinguishes.

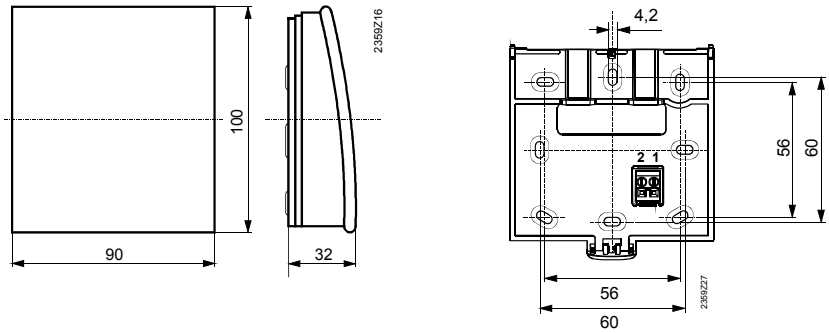


Testing

ℹ The test is made to check the quality of the radio link.
- The test can be aborted by pressing the ESC button.
- While the radio link can be opened on the controller, the test should be made at the location where the room unit will be installed

1. Press button 3 on the radio repeater for a maximum of 8 seconds until the LED starts flashing at **low frequency**.
2. When radio communication works, the LED on the radio module flashes briefly at 10-second intervals.
3. After the test, press the button on the radio repeater again briefly until the LED extinguishes.

Dimensions and drilling plan



3.8.5 Checking the wireless components

To check whether the connections to the required system components are operational, consult operating lines 130 through 135 on operating page “Wireless“ (operating level “Commissioning“).

3.9 Power supply AVS16.290

Mounting notes

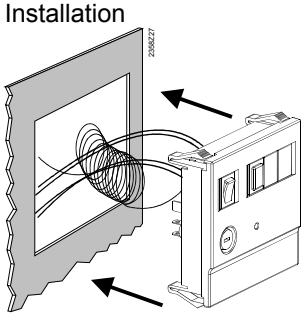
The boiler control panel is designed for installation in floor-standing or wall-hung oil or gas boilers and may only be used for that purpose. For installation, the following points must be observed:

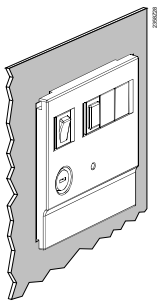
⚠
- Power to the control panel may be supplied only after the unit is completely fitted in the cutout Extension modules or dummy covers for which cutouts are provided must also be fitted beforehand
- Dimensions of cutout 92 x 92 mm,
  sheet metal thickness 0.5 to 3.0 mm
- The boiler control panel can be secured with the 4 clips provided on the panel

⚠
- Power to the control panel may be supplied only after the unit is completely fitted in the cutout Extensions or dummy covers for which cutouts are provided must also be fitted beforehand.
- The control panel wiring to the connection terminals does not feature strain relief and must therefore be secured inside the boiler
- The local regulations for electrical installation must be complied with

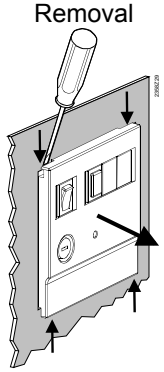
Mounting method

Installation





Removal



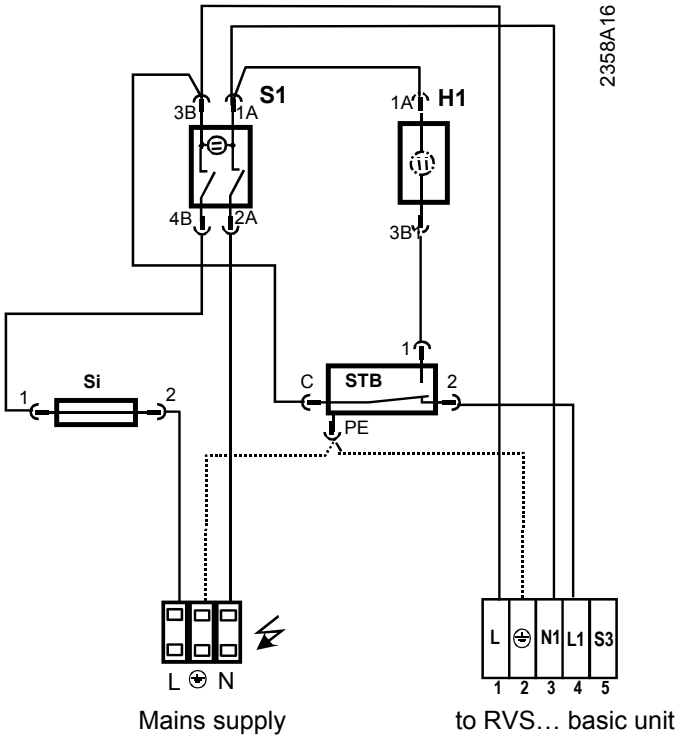
Connections

Mains

Terminal	Designation	
L	Live AC 230 V	blue
⏚	Protective earth	green + yellow
N	Neutral conductor	blue

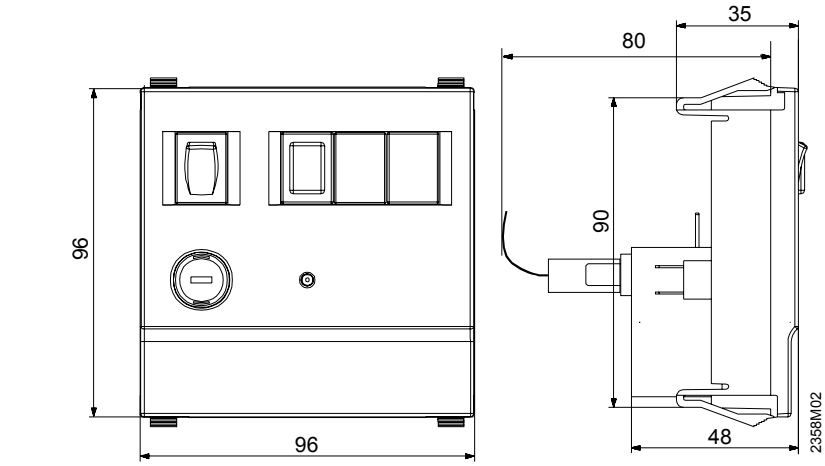
Connection to basic unit

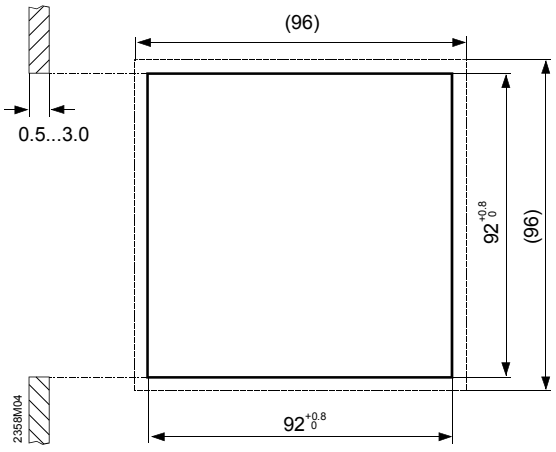
Terminal	Designation		
1	L	Live AC 230 V basic unit	brown
2	⏚	Protective earth	green + yellow
3	N	Neutral conductor	blue
4	L1	Live AC 230 V burner	black
5	S3	Input burner fault	-



Si Fuse 6.3AT
S1 Mains switch with green glow lamp
STB = SLT Safety limit thermostat 110°C
H1 Signal lamp, SLT has cut out

Dimensions





4 Commissioning

Prerequisites

To commission the units, the following working steps must be carried out:

- Prerequisite is the correct mounting and correct electrical installation and, in the case of wireless solutions, correctly working radio connections to all required auxiliary units.
- Make all plant-specific settings. Special attention must be paid to operating page ”Configuration“. For that purpose, the relevant operating level is to be selected as follows:
  Press OK on the room unit to switch to programming.
  Press the info button for at least 3 seconds and select operating level “Commissioning“ with the setting knob. Then, press OK.
- Make the functional check as described below.
- Reset the attenuated outside temperature
  (operating page “Diagnostics of consumers“, operating line “Outside temp attenuated“ (operating line 8703))

Functional check

To facilitate commissioning and fault tracing, the controller allows output and input tests to be made. With these tests, the controller’s inputs and outputs can be checked. To make the tests, switch to operating page “Input / output test“ and go through all available setting lines.

Operating state

The current operating state can be checked on operating page “State“.

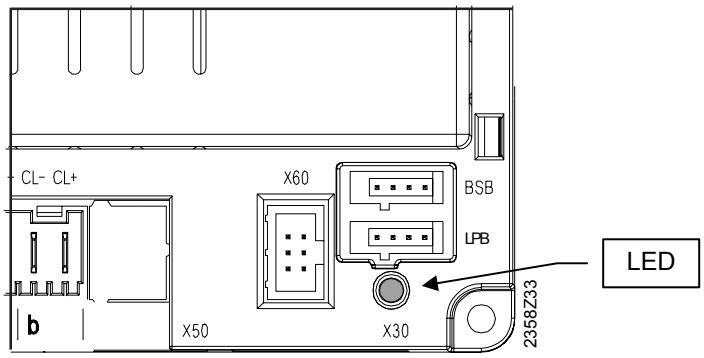
Diagnostics

For detailed diagnostics of the plant, check operating pages “Diagnostics heat source“ and “Diagnostics consumer”.

4.1 Basic units

Checking the LED

LED off:	No power supply
LED on	Ready to operate
LED flashes	Local fault



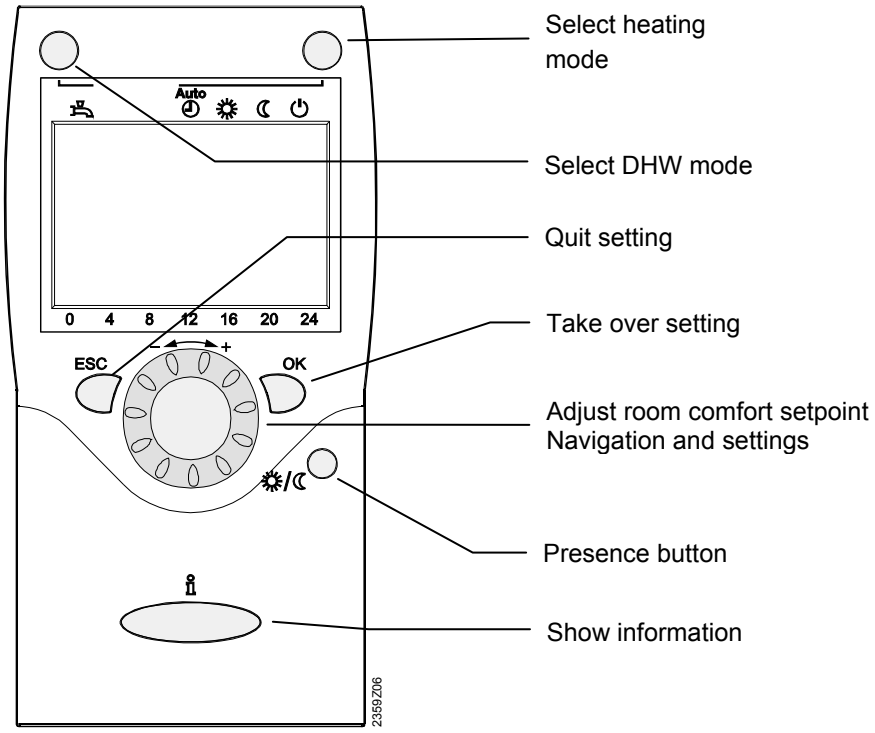
5 Handling

5.1 QAA75.. / QAA78… / AVS37..

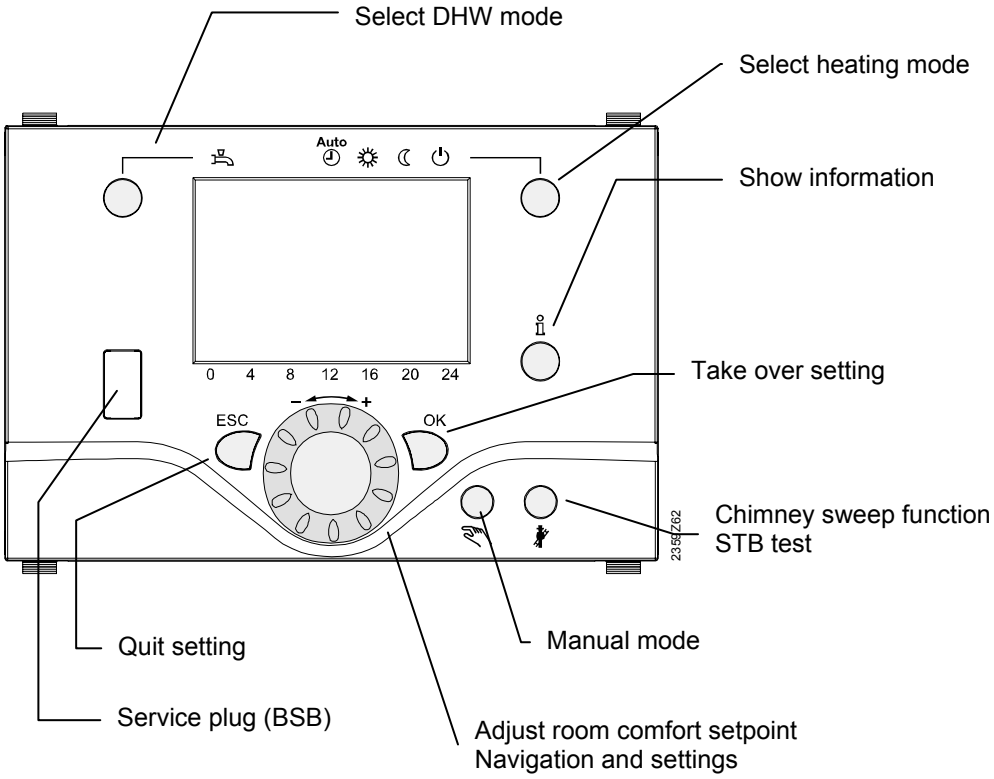
5.1.1 Operation

Operating elements

Room unit



Operator unit

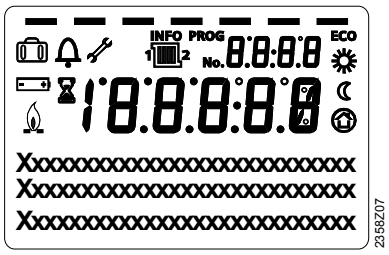


Display choices

- Heating to Comfort setpoint
- Heating to Reduced setpoint
- Heating to frost protection setpoint
- Process running – please wait
- Change battery
- Burner operating (only oil / gas boiler)
- INFO Info level activated
- PROG Programming activated
- ECO Heating temporarily switched off
  ECO function active
- Holiday function active
- Reference to heating circuit
- Maintenance / special operation
- Error messages

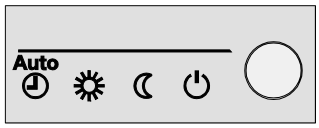
Display

Display of all symbols and segments.



Selecting heating mode

This setting is used to switch between the different operating modes. The selection made is indicated by a bar which appears below the respective symbol.



Automatic mode AUTO

Automatic mode controls the room temperature according to the time program.
Characteristics of automatic mode:

- Heating mode according to the time program
- Temperature setpoints according to heating program “Comfort setpoint“ ☼ or “Reduced setpoint“ ☼
- Protective functions active
- Automatic summer / winter changeover (ECO functions)

Continuous operation ☼ **or** ☾

Continuous operation maintains the room temperature at the selected operating level.

- ☼ Heating to Comfort setpoint
- ☾ Heating to Reduced setpoint

Characteristics of continuous operation:

- Heating mode with no time program
- Protective functions active
- Automatic summer / winter changeover (ECO functions) and 24-hour heating limit inactive in the case of continuous operation with Comfort setpoint

Protection ⏻

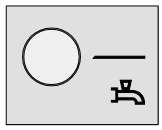
When using Protection, the heating system is off. But it remains protected against frost (frost protection temperature) provided there is no power failure.
Characteristics of Protection:

- Heating off
- Temperature according to frost protection
- Protective functions active
- Automatic summer / winter changeover (ECO functions) and automatic 24-hour heating limit active

Selecting DHW heating mode

The button is used to switch DHW heating mode on and off. The selection made is indicated by a bar which appears below the respective symbol.

DHW heating



- On

The DHW is heated according to the selected switching program.

- Off

No DHW heating, the protective function is active.

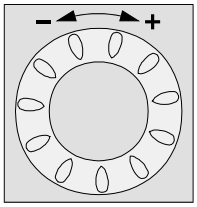
DHW push Triggering is effected by keeping the DHW operating mode button on the operator or room unit depressed for at least 3 seconds.

It can also be started when:

- The operating mode is “Off“
- Operating mode changeover acts via H1 or centrally (LPB)
- All heating circuits use the holiday function

Adjusting the room temperature setpoint

Turn the setting knob to increase or decrease the **Comfort setpoint** ☼.



For the **Reduced** setpoint ☾

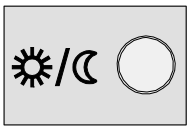
- Press OK
- Select operating page “Heating circuit“ and
- adjust the “Reduced setpoint“

After each readjustment, wait at least 2 hours, allowing the room temperature to adapt.

Occupancy button

If you do not use the rooms for a certain period of time, you can press the occupancy button to reduce the room temperature, thus saving heating energy.

When the rooms are occupied again, press again the occupancy button to resume heating operation.



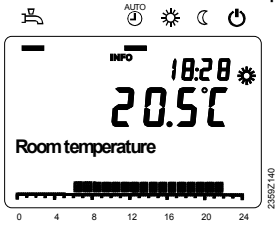
☼ Heating to Comfort setpoint

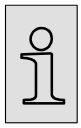
☾ Heating to Reduced setpoint

- The occupancy button is only active in automatic operation
- The current selection is active until the next switching action according to the heating program takes place

Displaying information

Various data can be displayed by pressing the info button.





Possible displays

Depending on the type of unit, configuration and operating state, some of the info lines listed below may not appear.

Display:

- Possible error messages from the error code list on page 129
- Possible service messages from the maintenance code list on page 130
- Possible special mode messages from page 169

Other displays:

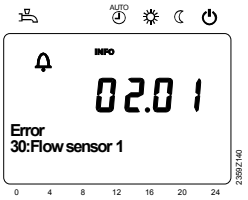
- Room temperature
- Room temperature minimum
- Room temperature maximum
- Boiler temperature
- Outside temperature
- Outside temp min
- Outside temp max
- DHW temp 1
- State of heating circuit 1
- State of heating circuit 2
- State heating circuit P
- State of DHW
- State of boiler
- State of solar
- State solid fuel boiler
- State buffer storage tank
- State swimming pool
- Date and time of day
- Telephone customer service

Exception

In exceptional cases, the basic display shows one of the following symbols:

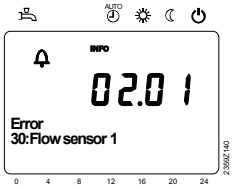
Error messages

If this symbol appears, an error in the plant has occurred. Press the info button and read further information



Maintenance or special operation

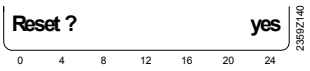
If this symbol appears, a maintenance alarm is delivered or the plant has changed to special mode. Press the info button and read further information.



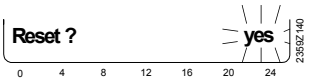
A list of possible displays is given on page 128.

Reset function

The reset function for meters and the resettable parameters appears on the bottom line of the display, provided a reset is permitted on the current operating line (enduser / commissioning / heating engineer).



After activation with the OK button, the display will show a flashing “Yes“.



After confirmation with the OK button, the relevant parameter or counter will be reset.

Manual operation

When manual operation is active, the relays are no longer energized and deenergized according to the control state, but are set to a predefined manual operation state depending on their function.

The burner relay energized in manual control can be deenergized by the electronic temperature controller (TR).

Setpoint adjustment in manual control

After manual control has been activated, a change to the basic display must be made. There, the maintenance / special mode symbol appears.

Press the info button to switch to info display “Manual mode“, where the setpoint can be adjusted.

Chimney sweep function

The chimney sweep function is activated by a short press (maximum 3 seconds) on the chimney sweep button. This function produces the operating state required to make emission measurements (flue gas).

SLT test

The SLT test (SLT = safety limit thermostat) is activated by a long press (longer than 3 seconds) on the chimney sweep button. The button must be kept depressed during the entire test. If released, the test will be aborted. The SLT test is shown on the display.

The test may only be made by qualified staff since the boiler temperature will be raised above the maximum limitations.

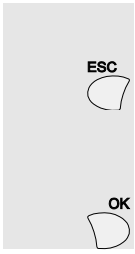
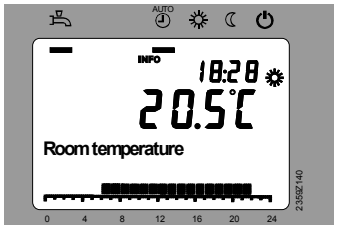
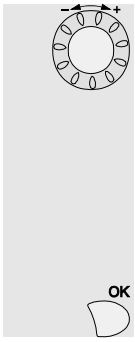
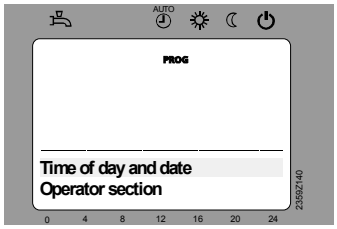
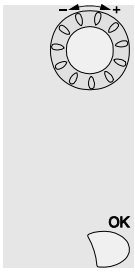
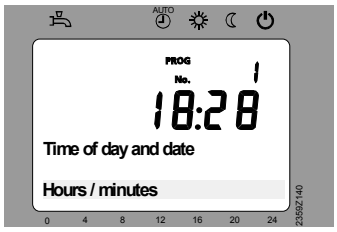
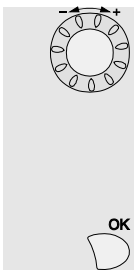
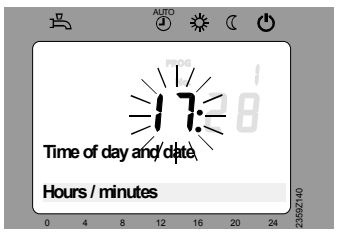
5.1.2 Programming

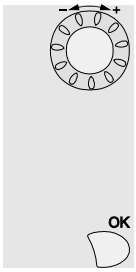
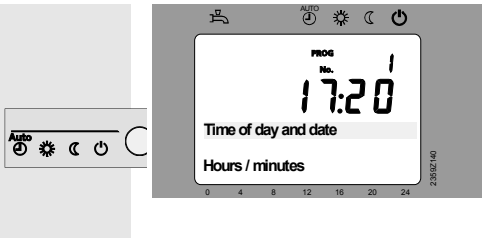
Setting principle

Settings that cannot be made directly with the operating elements are made in the form of programming. For this purpose, the individual settings are structured in the form of operating pages and operating lines, thus forming practical groups of settings.
The following example shows how to set the time of day and the date.

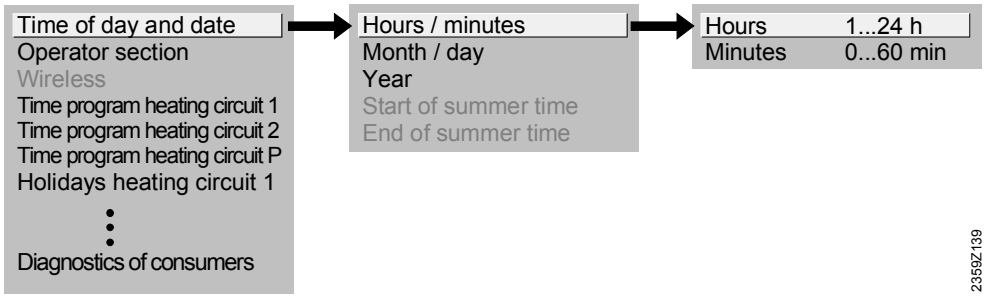
Example: "Setting the time of day"

- Press *ESC* to go one step back at a time, readjusted values are not be adopted
- If no setting is made for 8 minutes, the display returns automatically to the basic display
- Operating lines may be hidden, depending on the type of controller, the configuration made and the user level

	Operation	Display example	Description
1			Basic display. If the basic display is not shown, press the ESC button to return to it. Press OK.
2			The bottom section of the display shows a number of operating pages. Turn the setting knob until operating page *Time of day and date* appears. Press OK to confirm.
3			In the bottom section of the display, the first operating line of operating page Time of day and date appears. Turn the setting knob until operating line *Hours / minutes* appears. To confirm, press OK.
4			The display shows the hours flashing. Turn the setting knob until the hours of the time of day are correct. To confirm, press OK.

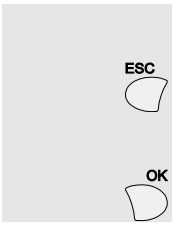
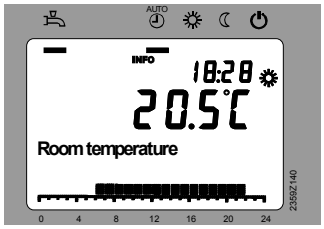
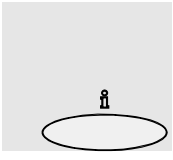
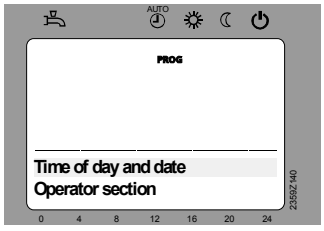
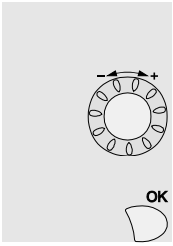
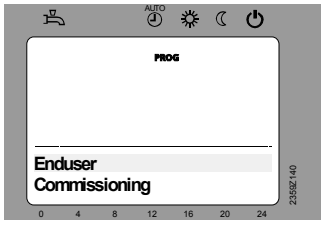
5			The display shows the minutes flashing. Turn the setting knob until the minutes of the time of day are correct. To confirm, press OK.
6			The settings are saved and the displays stops flashing. Now, you can make further settings or you press the operating mode button to return to the basic display.
7			Now, you see the basic display again.

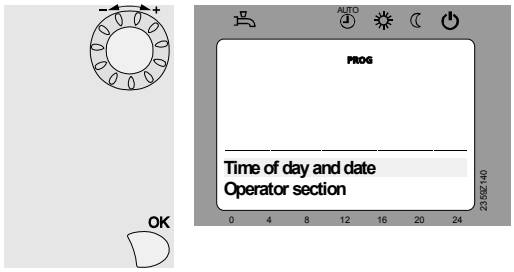
Example of menu structure



5.1.3 User levels

The user levels only allow authorized user groups to make settings. To reach the required user level, proceed as follows:

	Operation	Display example	Description
1			Basic display. If the basic display is not shown, press the ESC button to return to it. Press OK.
2			You are on the user level Enduser. Press the info button for 3 seconds.
3			You are now given a choice of user levels. Turn the setting knob until the required user level is reached. Press OK.

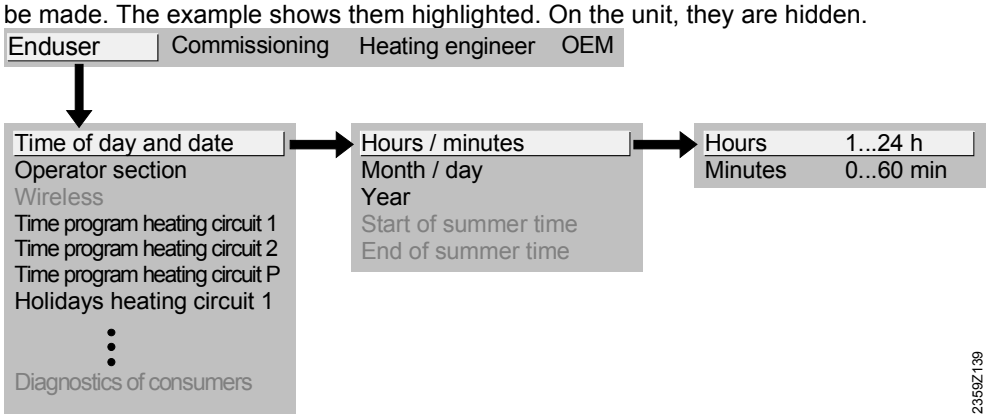


You are now on the required user level.

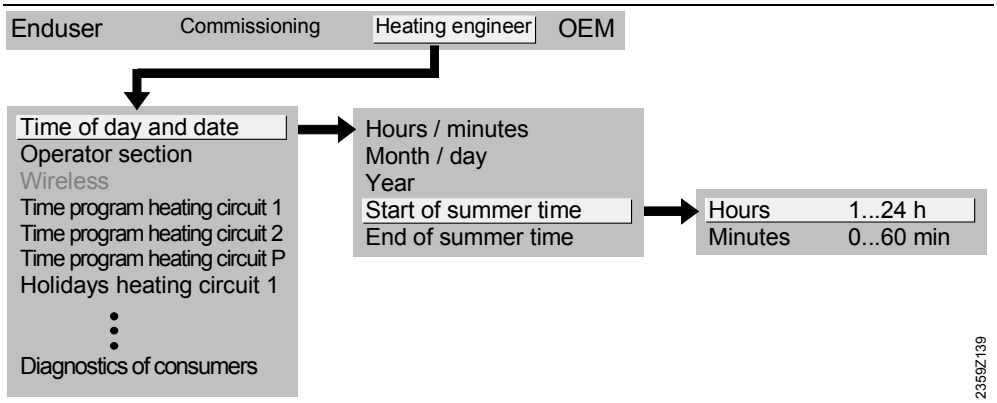
To reach the OEM level, the relevant code must be entered.

Setting structure “Enduser“

The example given here shows that certain user levels do not allow certain settings to be made. The example shows them highlighted. On the unit, they are hidden.



Setting structure ”Heating engineer“



5.1.4 Overview of settings

The table shows all available settings up to the heating engineer level. However, certain operating lines may be hidden, depending on the type of unit.

Legend E = enduser I = commissioning F = heating engineer
OL = operating line

Operating line	User level	Function	Default value	Min	max	Unit
Time of day and date						
1	E	Hours / minutes	-	00:00	23:59	hh:mm
2	E	Day / month	-	01.01	31.12	dd.MM
3	E	Year	-	2004	2099	yyyy
5	F	Start of summertime	25.03	01.01	31.12	dd.MM
6	F	End of summertime	25.10	01.01	31.12	dd.MM
Operator section						
20	E	Language German ¦ …	German			-
22	F	Info Temporarily ¦ Permanently	Temporarily			-
26	F	Operation lock Off ¦ On	Off			-
27	F	Programming lock Off ¦ On	Off			-
40	I	Used as Room unit 1 ¦ Room unit 2 ¦ Room unit P ¦ Operator unit 1 ¦ Operator unit 2 ¦ Operator unit P ¦ Service unit	Room unit 1			-
42	I	Assignment device 1 Heating circuit 1 ¦ Heating circuits 1 and 2 ¦ Heating circuits 1 and P ¦ All heating circuits	Heating circuit 1			-
44	I	Operation HC2 Commonly with HC1 ¦ Independently	Commonly with HC1			-
46	I	Operation HCP Commonly with HC1 ¦ Independently	Commonly with HC1			-
48	I	Action occupancy button None ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Commonly	Heating circuit 1			-
54	F	Readjustment room sensor	0.0	-3	3	°C
70	F	Software version	-	0	99.9	-
RF						
120	I	Binding No ¦ Yes	No			
121	I	Test mode Off ¦ On	Off			
130	I	Room unit 1 Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
131	I	Room unit 2 Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
132	I	Room unit P Missing ¦ Ready ¦ No recept'n ¦ Change batt				
133	I	Outside sensor Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
134	I	Repeater Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-

Operating line	user level	Function	Default value	Min	max	Unit
135	I	Operator unit 1 Missing ¦ Ready ¦ No recept'n ¦ Change batt				
136	I	Operator unit 2 Missing ¦ Ready ¦ No recept'n ¦ Change batt				
137	I	Operator unit P Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
138	I	Service unit Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
140	I	Delete all devices No ¦ Yes	No			-
Time prog heating circuit 1						
500	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
501	E	1st phase on	6:00	00:00	24:00	hh:mm
502	E	1st phase off	22:00	00:00	24:00	hh:mm
503	E	2nd phase on	24:00	00:00	24:00	hh:mm
504	E	2nd phase off	24:00	00:00	24:00	hh:mm
505	E	3rd phase on	24:00	00:00	24:00	hh:mm
506	E	3rd phase off	24:00	00:00	24:00	hh:mm
516	E	Default values No ¦ Yes	No			-
Time prog heating circuit 2						
520	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
521	E	1st phase on	6:00	00:00	24:00	hh:mm
522	E	1st phase off	22:00	00:00	24:00	hh:mm
523	E	2nd phase on	24:00	00:00	24:00	hh:mm
524	E	2nd phase off	24:00	00:00	24:00	hh:mm
525	E	3rd phase on	24:00	00:00	24:00	hh:mm
526	E	3rd phase off	24:00	00:00	24:00	hh:mm
536	E	Default values No ¦ Yes	No			-
Time program 3/HCP						
540	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
541	E	1st phase on	6:00	00:00	24:00	hh:mm
542	E	1st phase off	22:00	00:00	24:00	hh:mm
543	E	2nd phase on	24:00	00:00	24:00	hh:mm
544	E	2nd phase off	24:00	00:00	24:00	hh:mm
545	E	3rd phase on	24:00	00:00	24:00	hh:mm
546	E	3rd phase off	24:00	00:00	24:00	hh:mm
556	E	Default values No ¦ Yes	No			-
Time program 4/DHW						
560	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
561	E	1st phase on	6:00	00:00	24:00	hh:mm
562	E	1st phase off	22:00	00:00	24:00	hh:mm

Operating line	user level	Function	Default value	Min	max	Unit
563	E	2nd phase on	24:00	00:00	24:00	hh:mm
564	E	2nd phase off	24:00	00:00	24:00	hh:mm
565	E	3rd phase on	24:00	00:00	24:00	hh:mm
566	E	3rd phase off	24:00	00:00	24:00	hh:mm
576	E	Default values No ¦ Yes	No			-
Time program 5						
600	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
601	1st	1st phase on	6:00	00:00	24:00	hh:mm
602	E	1st phase off	22:00	00:00	24:00	hh:mm
603	E	2nd phase on	24:00	00:00	24:00	hh:mm
604	E	2nd phase off	24:00	00:00	24:00	hh:mm
605	E	3rd phase on	24:00	00:00	24:00	hh:mm
606	E	3rd phase off	24:00	00:00	24:00	hh:mm
616	E	Default values No ¦ Yes	No			-
Holidays heating circuit 1						
641	E	Preselection Period 1 ¦ Period 2 ¦ Period 3¦ Period 4¦ Period 5¦ Period 6¦ Period 7¦ Period 8	Period 1			-
642	E	Start	--.--	01.01	31.12	dd.MM
643	E	End	--.--	01.01	31.12	dd.MM
648	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Holidays heating circuit 2						
651	E	Preselection Period 1 ¦ Period 2 ¦ Period 3¦ Period 4¦ Period 5¦ Period 6¦ Period 7¦ Period 8	Period 1			-
652	E	Start	--.--	01.01	31.12	dd.MM
653	E	End	--.--	01.01	31.12	dd.MM
658	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Holidays heating circuit P						
661	E	Preselection Period 1 ¦ Period 2 ¦ Period 3¦ Period 4¦ Period 5¦ Period 6¦ Period 7¦ Period 8	Period 1			-
662	E	Start	--.--	01.01	31.12	dd.MM
663	E	End	--.--	01.01	31.12	dd.MM
668	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Heating circuit 1						
710	E	Comfort cooling setpoint	20.0	OL 712	OL 716	°C
712	E	Reduced setpoint	16	OL 714	OL 710	°C
714	E	Frost protection setpoint	10.0	4	OL 712	°C
716	F	Comfort setpoint maximum	35.0	OL 710	35	°C
720	E	Heating curve slope	1.50	0.10	4.00	-
721	F	Heating curve displacement	0.0	-4.5	4.5	°C
726	F	Heating curve adaption Off ¦ On	Off			-
730	E	Summer/winter heating limit	18	– – – / 8	30	°C

Operating line	user level	Function	Default value	Min	max	Unit
732	F	24-hour heating limit	-3	– – – / -10	10	°C
740	I	Flow temp setpoint min	8	8	OL 741	°C
741	I	Flow temp setpoint max	80	OL 740	95	°C
750	F	Room influence	20	– – – / 1	100	%
760	F	Room temp limitation	1	– – – / 0.5	4	°C
770	F	Boost heating	5	– – – / 0	20	°C
780	F	Quick setback Off¦Down to reduced setpoint¦Down to frost prot setpoint	Down to reduced setpoint			-
790	F	Optimum start control max	0	0	360	min
791	F	Optimum stop control max	0	0	360	min
800	F	Reduced setp increase start	– – –	– – – / -30	10	°C
801	F	Reduced setp increase end	-15	-30	OL 800	°C
820	F	Overtemp prot pump circuit Off ¦ On	On			-
830	F	Mixing valve boost	5	0	50	°C
832	F	Actuator type 2-position ¦ 3-position	3-position			-
833	F	Switching differential 2-pos	2	0	20	°C
834	F	Actuator running time	120	30	873	s
850	I	Floor curing function Off ¦ Functional heating ¦ Curing heating ¦ Functional / curing heating¦ Curing/functional heating ¦ Manually	Off			-
851	I	Floor curing setp manually	25	0	95	°C
861	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			
870	F	With buffer storage tank No ¦ Yes	Yes			-
872	F	With primary controller / system pump No ¦ Yes	Yes			
882	F	Pump speed min	100	0	100	%
883	F	Pump speed max	100	0	100	%
900	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection			
Heating circuit 2						
1010	E	Comfort cooling setpoint	20.0	OL 1012	OL 1016	°C
1012	E	Reduced setpoint	16	OL 1014	OL 1010	°C
1014	E	Frost protection setpoint	10.0	4	OL 1012	°C
1016	F	Comfort setpoint maximum	35.0	OL 1010	35	°C
1020	E	Heating curve slope	1.50	0.10	4.00	-
1021	F	Heating curve displacement	0.0	-4.5	4.5	°C
1026	F	Heating curve adaption Off ¦ On	Off			-
1030	E	Summer/winter heating limit	18	– – – / 8	30	°C
1032	F	24-hour heating limit	-3	– – – / -10	10	°C
1040	I	Flow temp setpoint min	8	8	OL 1041	°C
1041	I	Flow temp setpoint max	80	OL 1040	95	°C
1050	F	Room influence	20	– – – / 1	100	%
1060	F	Room temp limitation	1	– – – / 0.5	4	°C
1070	F	Boost heating	5	– – – / 0	20	°C
1080	F	Quick setback Off¦Down to reduced setpoint¦Down to frost prot setpoint	Down to reduced setpoint			-

Operating line	user level	Function	Default value	Min	max	Unit
1090	F	Optimum start control max	0	0	360	min
1091	F	Optimum stop control max	0	0	360	min
1100	F	Reduced setp increase start	– – –	– – – / -30	10	°C
1101	F	Reduced setp increase end	-15	-30	OL 1100	°C
1120	F	Overtemp prot pump circuit Off ¦ On	On			-
1130	F	Mixing valve boost	5	0	50	°C
1132	F	Actuator type 2-position ¦ 3-position	3-position			-
1133	F	Switching differential 2-pos	2	0	20	°C
1134	F	Actuator running time	120	30	873	s
1150	F	Floor curing function Off ¦ Functional heating ¦ Curing heating ¦ Functional / curing heating¦ Curing/functional heating ¦ Manually	Off			-
1151	F	Floor curing setp manually	25	0	95	°C
1161	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			
1170	F	With buffer storage tank No ¦ Yes	Yes			-
1172	F	With primary controller / system pump No ¦ Yes	Yes			
1182	F	Pump speed min	100	0	100	%
1183	F	Pump speed max	100	0	100	%
1200	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection			
Heating circuit P						
1300	E	Operating mode Protection ¦ Automatic ¦ Reduced ¦ Comfort	Automatically			-
1310	E	Comfort cooling setpoint	20.0	OL 1312	OL 1016	°C
1312	E	Reduced setpoint	16	OL 1314	OL 1310	°C
1314	E	Frost protection setpoint	10.0	4	OL 1312	°C
1316	F	Comfort setpoint maximum	35.0	OL 1310	35	°C
1320	E	Heating curve slope	1.50	0.10	4.00	-
1321	F	Heating curve displacement	0.0	-4.5	4.5	°C
1326	F	Heating curve adaption Off ¦ On	Off			-
1330	E	Summer/winter heating limit	18	– – – / 8	30	°C
1332	F	24-hour heating limit	-3	– – – / -10	10	°C
1340	F	Flow temp setpoint min	8	8	OL 1341	°C
1341	F	Flow temp setpoint max	80	OL 1340	95	°C
1350	F	Room influence	20	– – – / 1	100	%
1360	F	Room temp limitation	1	– – – / 0.5	4	°C
1370	F	Boost heating	5	– – – / 0	20	°C
1380	F	Quick setback Off¦Down to reduced setpoint¦Down to frost prot setpoint	Down to reduced setpoint			-
1390	F	Optimum start control max	0	0	360	min
1391	F	Optimum stop control max	0	0	360	min
1400	F	Reduced setp increase start	– – –	– – – / -30	10	°C
1401	F	Reduced setp increase end	-15	-30	OL 1400	°C
1420	F	Overtemp prot pump circuit Off ¦ On	On			-

Operating line	user level	Function	Default value	Min	max	Unit
1450	I	Floor curing function Off ¦ Functional heating ¦ Curing heating ¦ Functional / curing heating¦ Curing/functional heating ¦ Manually	Off			-
1451	I	Floor curing setp manually	25	0	95	°C
1455	F	Floor curing setp current	0	0	95	°C
1456	F	Floor curing day current	0	0	32	°C
1461	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			
1470	F	With buffer storage tank No ¦ Yes	Yes			-
1172	F	With primary controller / system pump Nein ¦ Ja	Ja			
1482	F	Pump speed min	100	0	100	%
1483	F	Pump speed max	100	0	100	%
1500	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection			
DHW						
1610	E	Nominal setpoint	55	OL 1612	OL 1614 OEM	°C
1612	F	Reduced setpoint	40	8	OL 1610	°C
1620	I	Release 24h/day ¦ Time programs HCs ¦ Time program 4/DHW	Time programs HCs			-
1630	I	Charging priority Absolute ¦ Shifting ¦ None ¦ MC shifting, PC absolute	MC shifting, PC absolute			-
1640	F	Legionella function Off ¦ Periodically ¦ Fixed weekday	Fixed weekday			-
1641	F	Legionella funct periodically	3	1	7	Days
1642	F	Legionella funct weekday Monday ¦ Tuesday ¦ Wednesday ¦ Thursday ¦ Friday ¦ Saturday ¦ Sunday	Monday			
1644	F	Legionella function time	– – –	– – – / 00:00	23:50	hh:mm
1645	F	Legionella funct setpoint	65	55	95	°C
1646	F	Legionella function dwelling time	30	– – – / 10	360	min
1647	F	Legionella funct circ pump Off ¦ On	On			-
1660	F	Circulating pump release Time program 3/HCP ¦ DHW release ¦ Time program 4/DHW¦ Time program 5	DHW release			-
1661	F	Circulating pump cycling Off ¦ On	On			-
1663	F	Circulation setpoint	45	8	80	°C
Pump H1/H2						
2010	F	H1 Excess heat draw Off ¦ On	On			
2012	F	H1 with buffer storage tank No ¦ Yes	Yes			-
2014	F	H1 prim contr/system pump No ¦ Yes	Yes			-
2035	F	H2 Excess heat draw Off ¦ On	On			
2037	F	H2 with buffer storage tank No ¦ Yes	Yes			-
2039	F	H2 prim contr/system pump No ¦ Yes	Yes			-

Operating line	user level	Function	Default value	Min	max	Unit
2046	F	H3 Excess heat draw Off ¦ On	On			
2048	F	H3 with buffer No ¦ Yes	Yes			
2050	F	H2 prim contr/system pump No ¦ Yes	Yes			
Swimming pool						
2055	F	Setpoint solar heating	26	8	80	°C
2056	F	Setpoint source heating	22	8	80	°C
2065	F	Charging priority solar No ¦ Yes	No			
2080	F	With solar integration No ¦ Yes	Yes			
Primary controller / system pump						
2150	I	Primary controller / system pump Before buffer st tank ¦ After buffer st tank	After buffer st tank			-
Boiler						
2203	F	Release below outside temp	– – –	– – – / -50	50	°C
2205	F	In economy mode Off ¦ Only DHW ¦ On	Off			
2208	F	Full charging buffer Off ¦ On	Off			
2210	F	Setpoint min	40	OL 2211 OEM	Setpoint manual operation	°C
2212	F	Setpoint max	80	Setpoint manual operation	OL 2213 OEM	°C
2270	F	Return setpoint min	8	8	95	°C
2330	F	Output nominal	50	0	1000	kW
2331	F	Output basic stage	30	0	1000	kW
2340	F	Auto source seq 2x1 casc	500	– – – / 10	990	h
Cascade						
3532	F	Restart lock	300	0	1800	s
3533	F	Switch-on delay	5	0	120	min
3540	F	Auto source seq ch'over	500	– – – / 10	990	h
3541	F	Auto source seq exclusion None ¦ First ¦ Last ¦ First and last	None			
3544	F	Leading source Source 1 ¦ Source 2 ¦ … ¦ Source 16	Source 1			
3560	F	Return setpoint min	8	8	95	°C
Solar						
3810	F	Temp diff on	8	0	40	°C
3811	F	Temp diff off	4	0	40	°C
3812	F	Charg temp min DHW st tank	– – –	– – – / 8	95	°C
3815	F	Charging temp min buffer	– – –	– – – / 8	95	°C
3818	F	Charging temp min swi pool	– – –	– – – / 8	95	°C
3822	F	Charging prio storage tank None ¦ DHW storage tank ¦ Buffer	DHW storage tank			
3825	F	Charging time relative prio	– – –	– – – / 2	60	min
3826	F	Waiting time relative prio	5	1	40	min
3827	F	Waiting time parallel op	– – –	– – – / 0	40	min
3828	F	Delay secondary pump	60	0	600	s

Operating line	user level	Function	Default value	Min	max	Unit
3830	F	Collector start function	– – –	– – – / 5	60	min
3831	F	Min run time collector pump	20	5	120	s
3840	F	Collector frost protection	– – –	– – – / -20	5	°C
3850	F	Collector overtemp prot	– – –	– – – / 30	350	°C
3860	F	Evaporation heat carrier	– – –	– – – / 60	350	°C
3870	F	Pump speed min	40	0	100	%
3871	F	Pump speed max	100	0	100	%
3880	F	Antifreeze None ¦ Ethylene glycol ¦ ¦ Propylene glycol ¦ Ethyl and propyl glycol	None			
3881	F	Antifreeze concentration	30	1	100	%
3884	F	Pump capacity	200	10	1500	l/h
Solid fuel boiler						
4102	F	Locking other heat sources Off ¦ On	Off			
4110	F	Setpoint min	40	8	120	°C
4130	F	Temp diff on	8	1	40	°C
4131	F	Temp diff off	4	0	40	°C
4133	F	Comparative temp DHW sensor B3 ¦ DHW sensor B31 ¦ Buff st tank sensor B4 ¦ Buff st tank sensor B41 ¦ Flow temp setpoint ¦ Setpoint min	Setpoint min			
Buffer storage tank						
4720	F	Auto generation lock None ¦ With B4 ¦ With B4 and B42/B41	With B4			-
4722	F	Temp diff buffer/HC	-5	-20	20	°C
4724	F	Min st tank temp heat mode	– – –	– – – / 8	95	°C
4750	F	Charging temperature max	80	8	95	°C
4755	F	Recooling temp	60	8	95	°C
4756	F	Recooling DHW/HCs Off ¦ On	Off			
4757	F	Recooling collector Off ¦ Summer ¦ Always	Off			
4783	F	With solar integration No ¦ Yes	No			
4790	F	Temp diff on return div	10	0	40	°C
4791	F	Temp diff off return div	5	0	40	°C
4795	F	Compar temp return div B4 ¦ B41 ¦ B42	B42			
4796	F	Optg action return diversion Temp decrease ¦ Temp increase	Temperature increase			
4800	F	Partial charging setpoint	– – –	– – – / 8	95	°C
4810	F	Full charging Off ¦ Heating mode ¦ Always				
4811	F	Full charging temp min	8	8	80	°C
4813	F	Full charging sensor With B4 ¦ With B42/B41	With B42/B41			
DHW storage tank						
5020	F	Flow setpoint boost	16	0	30	°C
5021	F	Increase of transfer boost	8	0	30	°C
5022	F	Type of charging With B3 and B31 ¦ With B3, legio B3 and B31	With B3 and B31			

Operating line	user level	Function	Default value	Min	max	Unit
5050	F	Charging temperature max	80	8	OL 5051 OEM	°C
5055	F	Recooling temp	80	8	95	°C
5056	F	Recooling heat gen/HCs Off ¦ On	Off			-
5057	F	Recooling collector Off ¦ Summer ¦ Always	Off			-
5060	F	Electric immersion heater operating mode Substitute ¦ Summer ¦ Always	Substitute			-
5061	F	Electric immersion heater release 24h/day ¦ DHW release¦ Time program4/ DHW	DHW release			-
5062	F	El immersion heater control External thermostat ¦ DHW sensor	DHW sensor			-
5085	F	Excess heat draw Off ¦ On	On			-
5090	F	With buffer storage tank No ¦ Yes	No			
5092	F	With primary controller / system pump No ¦ Yes	No			
5093	F	With solar integration No ¦ Yes	Yes			
5101	F	Pump speed min	40	0	100	%
5102	F	Pump speed max	100	0	100	%
Instantaneous DHW heater						
5406	F	Min setp diff to tank temp	4	0	20	°C
5544	F	Actuator running time	60	7.5	480	s
Configuration						
5710	I	Heating circuit 1 Off ¦ On	On			-
5715	I	Heating circuit 2 Off ¦ On	On			-
5730	I	DHW sensor B3 Sensor ¦ Thermostat	Sensors			-
5731	I	DHW controlling element Q3 None ¦ Charging pump ¦ Diverting valve	Charging pump			-
5736	I	Separate circuit Off ¦ On	Off			-
5770	I	Source type 1-stage ¦ 2-stage ¦ Modulating 3-position ¦ Modulating UX ¦ Without boiler sensor ¦ 2x1 cascade	2-stufig			-
5840	I	Solar controlling element Charging pump ¦ Diverting valve	Charging pump			
5841	I	External solar exchanger Common ¦ DHW storage tank ¦ Buffer	Common			
5890	I	Relay output QX1 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heating circuit pump HCP Q20 ¦ H pump Q18 ¦ System pump Q14 ¦ Heat en shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW intern circ pump Q33 ¦ Heat request K27	None			-

Operating line	user level	Function	Default value	Min	max	Unit
5891	I	Relay output QX2 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heating circuit pump HCP Q20 ¦ H pump Q18 ¦ System pump Q14 ¦ Heat en shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW intern circ pump Q33 ¦ Heat request K27	None			-
5892	I	Relay output QX3 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heating circuit pump HCP Q20 ¦ H pump Q18 ¦ System pump Q14 ¦ Heat en shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW intern circ pump Q33 ¦ Heat request K27	None			
5894	I	Relay output QX4 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heating circuit pump HCP Q20 ¦ H pump Q18 ¦ System pump Q14 ¦ Heat en shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW intern circ pump Q33 ¦ Heat request K27	None			
5930	I	Sensor input BX1 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			-
5931	I	Sensor input BX2 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			-

Operating line	user level	Function	Default value	Min	max	Unit
5932	I	Sensor input BX3 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			
5933	I	Sensor input BX4 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			
5950	I	Function input H1 Optg mode changeover HCs+DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode changeover HCP ¦ Heat generation lock ¦ Error/alarm message ¦ Min flow emp setpoint ¦ Excess heat discharge ¦ Release swimming pool ¦ Heat request 10V ¦ Pressure measurement 10V	Optg mode changeover HCs+DHW			-
5951	I	Contact type H1 NC ¦ NO	NO			-
5952	I	Min flow temp setpoint H1	70	8	120	°C
5954	I	Temp value 10V H1	100	5	130	°C
5956	I	Pressure value 3.5V H1	5.0	0.0	10.0	bar
5960	I	Function input H3 Optg mode changeover HCs+DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode changeover HCP ¦ Heat generation lock ¦ Error/alarm message ¦ Min flow emp setpoint ¦ Excess heat discharge ¦ Release swimming pool ¦ Heat request 10V ¦ Pressure measurement 10V	Optg mode changeover HCs+DHW			-
5961	I	Contact type H3 NC ¦ NO	NO			-
5962	I	Min flow temp setpoint H3	70	8	120	°C
5964	I	Temp value 10V H3	100	5	130	°C
5966	I	Pressure value 3.5V H3	5.0	0.0	10.0	bar
5982	I	Function input EX2 Counter 2nd burner stage ¦ Heat generation lock ¦ Error/alarm message ¦ SLT error message ¦ Excess heat discharge	Counter for second burner stage			-
5983	I	Cont type input EX2 NC ¦ NO	NO			-
6014	I	Function mixing group 1 Heating circuit 1 ¦ Return temp controller ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heater ¦ Return controller cascade	Heating circuit			-

Operating line	user level	Function	Default value	Min	max	Unit
6015	I	Function mixing group 2 Heating circuit 2 ¦ Return temp controller ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heater ¦ Return controller cascade				
6020	I	Function extension module 1 None ¦ Multifunctional ¦ Heating circuit 2 ¦ Return temp controller ¦ Solar DHW ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heater ¦ Return controller cascade	None			-
6021	I	Function extension module 2 None ¦ Multifunctional ¦ Heating circuit 2 ¦ Return temp controller ¦ Solar DHW ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heater ¦ Return controller cascade	None			-
6030	I	Relay output QX21 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ H2 pump Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW inerm circ pump Q33 ¦ Heat request K27	None			
6031	I	Relay output QX22 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ H2 pump Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW interm circ pump Q33 ¦ Heat request K27	None			
6032	I	Relay output QX23 None ¦ Circulating pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ H1 pump Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump speed HC1 Q21 ¦ 2nd pump speed HC2 Q22 ¦ 2nd pump speed HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ H2 pump Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Time program 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext exch K9 ¦ Solar ctrl elem buffer K8 ¦ Solar ctrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ H3 pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW interm circ pump Q33 ¦ Heat request K27	None			
6040	I	Sensor input BX21 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor	Kein			

Operating line	user level	Function	Default value	Min	max	Unit
		B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64				
6041	I	Sensor input BX22 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer sensor B4 ¦ Buffer sensor B41 ¦ Flue gas temp sensor B8 ¦ Common flow sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			
6046	I	Function input H2 Optg mode change HCs+DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode changeover HCP ¦ Heat generation lock ¦ Error/alarm message ¦ Min flow temp setpoint ¦ Excess heat discharge ¦ Release swimming pool ¦ Heat request 10V ¦ Pressure measurement 10V	Optg mode changeover HCs+DHW			
6047	I	Contact type H2 NC ¦ NO	NO			-
6048	I	Min flow temp setpoint H2	70	8	120	°C
6050	I	Temp value 10V H2	100	5	130	°C
6052	I	Pressure value 3.5V H2	5.0	0.0	10.0	bar
6070	I	Function output UX None ¦ Boiler pump Q1 ¦ DHW pump Q3 ¦ DHW interm circ pump Q33 ¦ Heat circ pump HC1 Q2 ¦ Heat circ pump HC2 Q6 ¦ Heat circ pump HCP Q20 ¦ Collector pump Q5 ¦ Solar pump ext exch K9 ¦ Solar pump buffer K8 ¦ Solar pump swi pool K18 ¦ Collector pump 2 Q16 ¦ Boiler setpoint ¦ Output setpoint ¦ Heat request	None			
6071	I	Signal logic output UX Standard ¦ Inverted	Standard			
6075	I	Temp value 10V UX	100	5	130	°C
6097	F	Sensor type collector NTC 10k ¦ Platinum 1000	NTC 10k			
6098	F	Readjustm collector sensor	0	-20	20	°C
6099	F	Readjustm coll sensor 2	0	-20	20	°C
6100	F	Readjustm outside sensor	0.0	-3.0	3.0	°C
6101	F	Sensor type flue gas temp NTC 10k ¦ Platinum 1000	NTC 10k			
6102	F	Readjustm flue gas sensor	0	-20	20	°C
6110	F	Time constant building	15	0	50	h
6120	F	Frost protection for the plant Off ¦ On	Off			-
6128	F	Heat request below OT	– – –	– – – / -50	50	°C
6129	F	Heat request above OT	– – –	– – – / -50	50	°C
6131	F	Heat req in economy mode Off ¦ Only DHW ¦ On	Off			
6200	I	Sensors saving No ¦ Yes	No			-

Operating line	user level	Function	Default value	Min	max	Unit
6205	F	Reset to default parameters No ¦ Yes	No			-
6212	I	Check no. heat source 1	-	0	199999	-
6213	I	Check no. heat source 2	-	0	199999	-
6215	I	Check no. storage tank	-	0	199999	-
6217	I	Check no. heating circuits	-	0	199999	-
6220	F	Software version	-	0	99.9	-
LPB system						
6600	I	Device address	1	0	16	-
6601	F	Segment address	0	0	14	-
6604	F	Bus power supply function Off ¦ Automatically	Automatically			-
6605	F	Bus power supply state Off ¦ On	On			-
6620	F	Action changeover functions Segment ¦ System	System			-
6621	F	Summer changeover Locally¦ Centrally	Locally			-
6623	F	Optg mode changeover Locally¦ Centrally	Centrally			
6624	F	Manual source lock Locally ¦ Segment	Locally			
6625	F	Assignment of DHW heating Local HCs ¦ All HCs in segment ¦ All HCs in system	All HCs in system			-
6631	F	Ext source with eco mode Off ¦ On DHW ¦ On	Off			
6640	I	Clock mode Autonomously ¦ Slave without remote ¦ Slave with remote setting ¦ Master	Autonomously			-
6650	F	Outside temp source	0	0	239	-
Errors						
6710	I	Reset alarm relay No ¦ Yes	No			-
6740	F	Flow temp 1 alarm	– – –	– – – / 10	240	min
6741	F	Flow temp 2 alarm	– – –	– – – / 10	240	min
6743	F	Boiler temp alarm	– – –	– – – / 10	240	min
6800	F	History 1	-			
	F	Error code 1	-	0	255	-
6802	F	History 2	-			
	F	Error code 2	-	0	255	-
6804	F	History 3	-			
	F	Error code 3	-	0	255	-
6806	F	History 4	-			
	F	Error code 4	-	0	255	-
6808	F	History 5	-			
	F	Error code 5	-	0	255	-
6810	F	History 6	-			
	F	Error code 6	-	0	255	-
6812	F	History 7	-			
	F	Error code 7	-	0	255	-

Operating line	user level	Function	Default value	Min	max	Unit
6814	F	History 8	-			
	F	Error code 8	-	0	255	-
6816	F	History 9	-			
	F	Error code 9	-	0	255	-
6818	F	History 10	-			
	F	Error code 10	-	0	255	-
Maintenance / special operation						
7040	F	Burner hours interval	– – –	– – – / 10	10000	h
7041	F	Burner hrs since maintenance	0	0	10000	h
7042	F	Burner start interval	– – –	– – – / 60	65535	-
7043	F	Burn starts since maint	0	0	65535	-
7044	F	Maintenance interval	– – –	– – – / 1	240	Months
7045	F	Time since maintenance	0	0	240	Months
7053	F	Flue gas temp limit	– – –	– – – / 0	350	°C
7054	F	Delay flue gas message	0	0	120	min
7130	E	Chimney sweep function Off ¦ On	Off			-
7139	E	Economy mode Off ¦ On	Off			
7140	E	Manual operation Off ¦ On	Off			-
7150	I	Simulation outside temperature	-	-50.0	50	°C
7170	I	Telephone customer service				-
Input / output test						
7700	I	Relay test No test ¦ Everything off ¦ 1st burner stage T2 ¦ 1st + 2nd burn stage T2/QX4 ¦ DHW pump Q3 ¦ Heating circuit pump Q2 ¦ Heat circ mix valve op Y1 ¦ Heat circ mix valve cl Y2 ¦ Heating circuit pump Q6 ¦ Heat circ mix valve op Y5 ¦ Heat circ mix valve cl Y6 ¦ Relay output QX1 ¦ Relay output QX2 ¦ Relay output QX3 ¦ Relay output QX4 ¦ Relay output QX21 module 1 ¦ Relay output QX22 module 1 ¦ Relay output QX23 module 1 ¦ Relay output QX21 module 2 ¦ Relay output QX22 module 2 ¦ Relay output QX23 module 2	No test			-
7710	I	Output test UX	-	0	100	%
7711	I	Voltage signal UX	0	0	10	Volt
7730	I	Outside temp B9	-	-50.0	50	°C
7732	I	Flow temp B1	-	0.0	140	°C
7734	I	Flow temp B12	-	0.0	140	°C
7750	I	DHW temp B3	-	0.0	140	°C
7760	I	Boiler temp B2	-	0.0	140	°C
7820	I	Sensor temp BX1	-	-28	350	°C
7821	I	Sensor temp BX2	-	-28	350	°C
7822	I	Sensor temp BX3	-	-28	350	°C
7823	I	Sensor temp BX4	-	-28	350	°C
7830	I	Sensor temp BX21 module 1	-	-28	350	°C
7831	I	Sensor temp BX22 module 1	-	-28	350	°C
7832	I	Sensor temp BX21 module 2	-	-28	350	°C
7833	I	Sensor temp BX22 module 2	-	-28	350	°C
7840	I	Voltage signal H1	-	0	10	Volt

Operating line	user level	Function	Default value	Min	max	Unit
7841	I	Contact state H1 Open ¦ Closed	-			-
7845	I	Voltage signal H2	0	0	10	°C
7846	I	Contact state H2 Open ¦ Closed	-			-
7854	I	Voltage signal H3	0	0	10	Volt
7855	I	Contact state H3 Open ¦ Closed	-			
7870	I	Burner fault S3 0V ¦ 230V	-			-
7881	I	1st burner stage E1 0V ¦ 230V	-			
7912	I	Input EX2 0V ¦ 230V	-			
State						
8000	I	State of heating circuit 1	-			-
8001	I	State of heating circuit 2	-			-
8002	I	State heating circuit P	-			-
8003	I	State of DHW	-			-
8005	I	State of boiler	-			-
8007	I	State of solar	-			-
8008	I	State solid fuel boiler	-			
8010	I	State buffer storage tank	-			
8011	I	State swimming pool	-			
Diagnostics cascade						
8100 to 8130	I	Priority source 1…16				
8101 to 8131	I	State source 1...16 Missing ¦ Faulty ¦ Manual control active ¦ Heat generation lock active ¦ Chimney sweep funct active ¦ Separate DHW circuit active ¦ Outside temp limit active ¦ Not released ¦ Released				
8138	I	Cascade flow temp	0	0	140	°C
8139	I	Cascade flow temp setpoint	0	0	140	°C
8140	I	Cascade return temp	0	0	140	°C
8141	I	Cascade return temp setp	0	0	140	°C
8150	I	Source seq ch'over current	0	0	990	h
Diagnostics of heat source						
8300	I	1st burner stage T2 Off ¦ On	-			-
8301	I	2nd burner stage Off ¦ On	-			-
8308	F	Boiler pump speed	0	0	100	%
8310	I	Boiler temperature	-	0.0	140.0	°C
8311	I	Boiler setpoint	-	0.0	140.0	°C
8312	I	Boiler switching point	0	0	140	°C
8314	I	Boiler return temp	-	0.0	140.0	°C
8316	I	Flue gas temp	0	0	350	°C
8315	I	Boiler return temp setpoint	0	0	140	°C
8316	I	Flue gas temp	0	0	350	°C

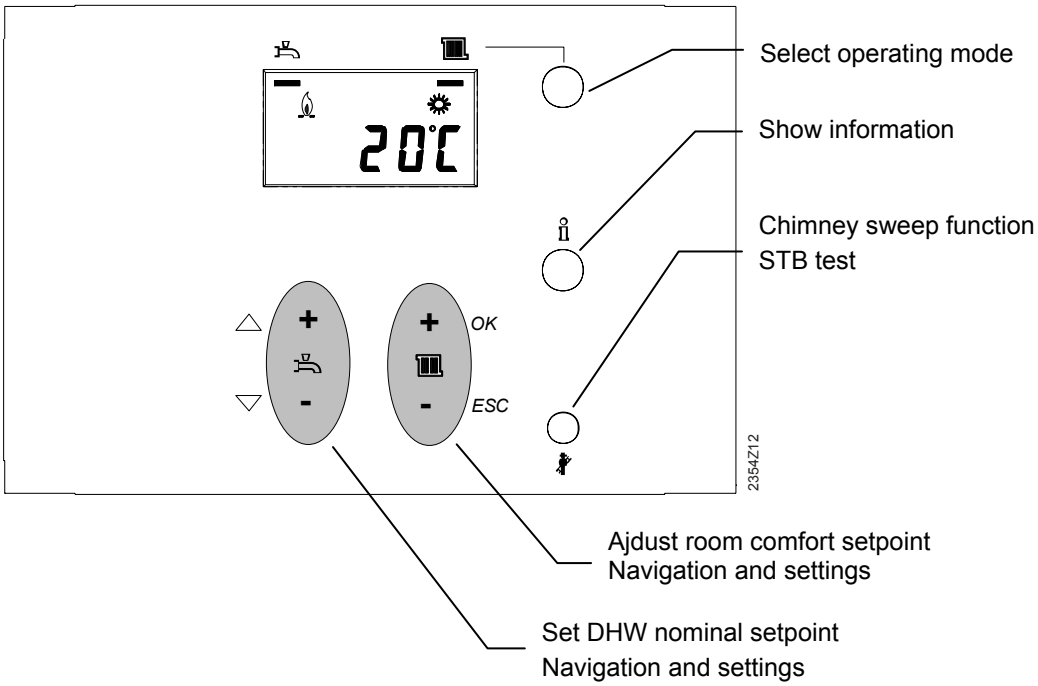
Operating line	user level	Function	Default value	Min	max	Unit
8318	I	Flue gas temp max	0	0	350	°C
8326	I	Burner modulation	0	0	100	%
8330	F	Hours run 1st stage	0	0	65535	h
8331	F	Start counter 1st stage	-	0	199'999	-
8332	F	Hours run 2nd stage	0	0	65535	h
8333	F	Start counter 2nd stage	0	0	199999	-
8505	F	Speed collector pump 1	0	0	100	%
8506	F	Speed solar pump ext exch	0	0	100	%
8507	F	Speed solar pump buffer	0	0	100	%
8508	F	Speed solar pump swi pool	0	0	100	%
8510	I	Collector temp 1	-	-28.0	350	°C
8511	I	Collector temp 1 max	0	-28.0	350	°C
8512	I	Collector temp 1 min	0	-28.0	350	°C
8513	I	dT collector 1/DHW	-	-168.0	350	°C
8514	I	dT collector 1/buffer	-	-168.0	350	°C
8515	I	dt collector 1/swimming pool	0	-168.0	350	°C
8519	I	Solar flow temp	0	-28.0	350	°C
8520	I	Solar return temp	0	-28.0	350	°C
8526	E	24-hour yield solar energy	0	0	999.9	kWh
8527	E	Total yield solar energy	0	0	9999999.9	kWh
8530	F	Hours run solar yield	-	00:00	15:00	h
8531	F	Hours run collect overtemp	-	00:00	15:00	h
8543	F	Speed collector pump 2	0	0	100	%
8547	I	Collector temp 2	0	-28	350	°C
8548	I	Collector temp 2 max	-28	-28	350	°C
8549	I	Collector temp 2 min	3500	-28	350	°C
8550	I	dT collector 2/DHW	0	-168	350	°C
8551	I	dT collector 2/buffer	0	-168	350	°C
8552	I	dt collector 2/swimming pool	0	-168	350	°C
8560		Solid fuel boiler temp	0	0	140	°C
8570	E	Hours run solid fuel boiler	0	00:00	15:00	h
Diagnostics consumers						
8700	I	Outside temperature	-	-50.0	50.0	°C
8703	I	Outside temp attenuated	-	-50.0	50.0	°C
8704	I	Outside temperature composite	-	-50.0	50.0	°C
8730	I	Heating circuit pump Q2 Off ¦ On	-			-
8731	I	Heating circ mix valve op Y1 Off ¦ On	-			-
8732	I	Heat circ mix valve cl Y2 Off ¦ On	-			-
8735	F	Speed heating circuit pump 1	0	0	100	%
8740	I	Raumtemperatur 1	-	0.0	50.0	°C
8741	I	Raumsollwert 1	-	4.0	35.0	°C
8743	I	Vorlauftemperatur 1	-	0.0	140.0	°C
8744	I	Vorlaufsollwert 1	-	0.0	140.0	°C
8760	I	Heating circuit pump 2 Off ¦ On	-			-

Operating line	user level	Function	Default value	Min	max	Unit
8761	I	Heat circ mix valve 2 open Off ¦ On	-			-
8762	I	Heat circ mix valve 2 close Off ¦ On	-			-
8765	F	Speed heating circuit pump 2	0	0	100	%
8770	I	Room temp 2	-	0.0	50	°C
8771	I	Room setpoint 2	-	4.0	35	°C
8773	I	Flow temperature 2	-	0.0	140	°C
8774	I	Flow temp setpoint 2	-	0.0	140	°C
8795	F	Speed heating circuit pump B	0	0	100	%
8800	I	Room temp P	-	0.0	50	°C
8801	I	Room setpoint P	-	4.0	35	°C
8803	I	Flow temp setpoint P	-	0.0	140	°C
8820	I	DHW pump Q3 Off ¦ On	-			-
8825	F	Speed DHW pump	0	0	100	%
8826	F	Speed DHW interm circ pump	0	0	100	%
8830	I	DHW temp 1	-	0.0	140	°C
8831	I	DHW temp setpoint	-	8.0	80	°C
8832	I	DHW temp 2	-	0.0	140	°C
8835	I	DHW circulation temp	-	0.0	140	°C
8836	I	DHW charging temp	0	0	140	°C
8850	I	DHW primary controller temp	0	0	140	°C
8851	I	DHW primary controller setp	0	0	140	°C
8852	I	Instant DHW heater temp	0	0	140	°C
8853	I	Instant DHW heater setpoint	0	0	140	°C
8900	I	Swimming pool temp	0	0	140	°C
8901	I	Swimming pool setpoint	24	8	80	°C
8930	I	Primary controller temp	-	0.0	140.0	°C
8931	I	Primary controller setpoint	-	0.0	140.0	°C
8950	I	Common flow temp	-	0.0	140.0	°C
8951	I	Common flow temp setpoint	-	0.0	140.0	°C
8952	I	Common return temp	0	0	140	°C
8962	I	Common output setpoint	0	0	100	%
8980	I	Buffer temp 1	-	0.0	140.0	°C
8981	I	Buffer setpoint	0	0	140	°C
8982	I	Buffer temp 2	-	0.0	140.0	°C
8983	I	Buffer temp 3	0	0	140	°C
9000	I	Flow temperature setpoint H1	-	5.0	130.0	°C
9001	I	Flow temp setpoint H2	-	5.0	130.0	°C
9004	I	Flow temp setpoint H3	8	8	120	°C
9005	I	Water pressure H1	-	0.0	10.0	bar
9006	I	Water pressure H2	-	0.0	10.0	bar
9009	I	Water pressure H3	0	0	10	bar
9031	I	Relay output QX1 Off ¦ On	-			-
9032	I	Relay output QX2 Off ¦ On	-			-

Operating line	user level	Function	Default value	Min	max	Unit
9033	I	Relay output QX3 Off ¦ On	-			-
9034		Relay output QX4 Off ¦ On				
9050	I	Relay output QX21 module 1 Off ¦ On	-			-
9051	I	Relay output QX22 module 1 Off ¦ On	-			-
9052	I	Relay output QX23 module 1 Off ¦ On	-			-
9053	I	Relay output QX21 module 2 Off ¦ On	-			-
9054	I	Relay output QX22 module 2 Off ¦ On	-			-
9055	I	Relay output QX23 module 2 Off ¦ On	-			-

5.1.5 AVS37.390Operation

Operating elements



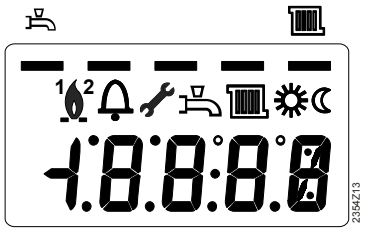
The above illustration shows an example of the front of an operator unit (not supplied as standard).

Display choices

- Heating to Comfort setpoint
- Heating to Reduced setpoint
- Boiler operation, heating active
- Boiler operation, DHW heating active
- Burner in operation
- Error messages
- Maintenance / special operation

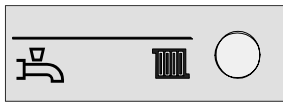
Display

Display of all symbols and segments.



Selecting the operating mode

Press the button to switch from heating mode on / off to DHW heating, and vice versa.
The selection made is indicated by a bar which appears below the respective symbol.

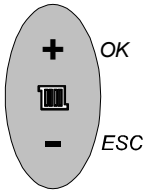


Adjusting the room temperature setpoint

Press the + / - buttons to increase or decrease the **Comfort setpoint** ☼ .

For the **Reduced setpoint** ☾

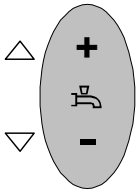
- Press OK
- Select the operating line for the “Reduced setpoint”



After each readjustment, wait at least 2 hours, allowing the room temperature to adapt.

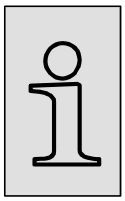
Adjusting the nominal DHW setpoint

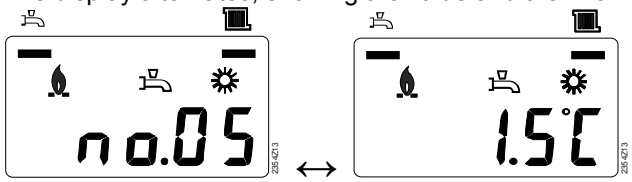
Press the + / - buttons to increase or decrease the nominal DHW setpoint.



Displaying information

Various data can be displayed by pressing the info button.
The display alternates, showing the value and the info no.



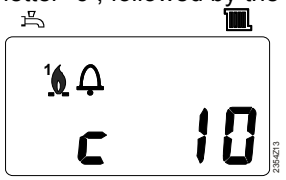


-	No. 1	Boiler temperature	-	No. 10	State of heating circuit 1
-	No. 2	Outside temperature	-	No. 11	State of heating circuit 2
-	No. 3	DHW temperature	-	No. 12	State of DHW
-	No. 4	Flow temperature 1	-	No. 13	State of boiler
-	No. 5	Flow temperature 2	-	No. 14	State of solar

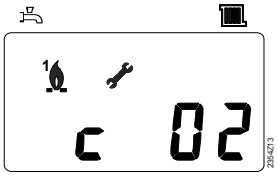
Exception

In exceptional cases, the basic display shows one of the following symbols:

Error messages
If this symbol appears, an error in the plant has occurred. The display shows letter “c”, followed by the error no.



Maintenance or special operation
If this symbol appears, a maintenance alarm is delivered or the plant has changed to special mode. The display shows letter “c”, followed by the message no.



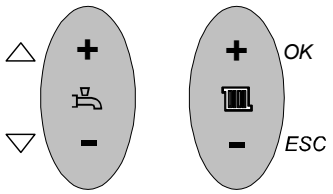
Chimney sweep function

To start the chimney sweep function , press the button for a moment (< 3 seconds). This function produces the operating state required to make emission measurements (flue gas).

3.1.2 Programming

Setting principle

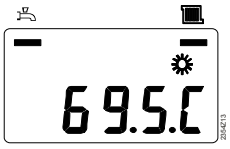
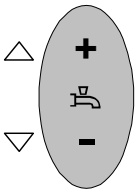
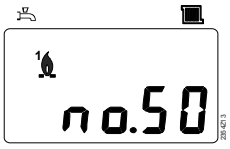
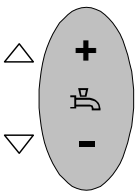
Settings that cannot be made directly with the operating elements require programming. For that, the respective setting buttons are used as follows:

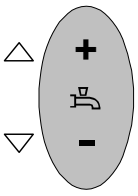
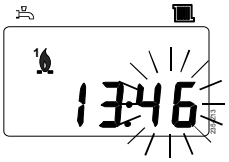
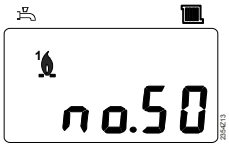


- Press *ESC* to go one step back at a time, readjusted values are not be adopted
- If no setting is made for 8 minutes, the display returns automatically to the basic display
- Operating lines may be hidden, depending on the type of controller, the configuration made and the user level

Example: “Setting the time of day“

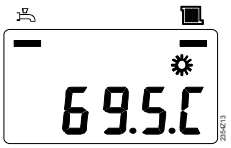
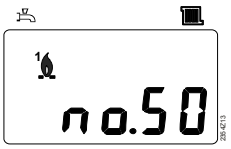
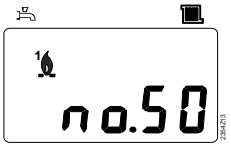
The following example shows how to set the time of day and the date.

	Operation	Display example	Description
1			Basic display. If the basic display does not appear, press the operating mode button. Press OK.
2		 	The display shows the first operating line, alternating with the value. Press the arrow button until you reach operating line “Hours / minutes” (e.g. 50). Press OK to confirm.
3			The display shows the hours flashing. Press the "+/-" button until the hours of the time of day are correct. Press OK to confirm.

4			The display shows the minutes flashing. Press the "+/-" button until the minutes of the time of day are correct. Press OK to confirm.
5		 	The settings are saved and the displays stops flashing. Now, you can make further settings or You can press the operating mode button to return to the basic display.
6			Now, you see the basic display again.

5.1.6 User levels

The user levels only allow authorized user groups to make settings. To reach the required user level, proceed as follows:

Operation	Display example	Description
1		You see the basic display. Press OK for 3 seconds.
2			Now, you are on the user level “Enduser”. Press the info button for 3 seconds.
3		You are on the user level “Heating engineer”. If the change to the “Heating engineer” level was successful, the display shows “ON” as a confirmation.

5.1.7 Overview of settings

The table shows all available settings up to the heating engineer level.

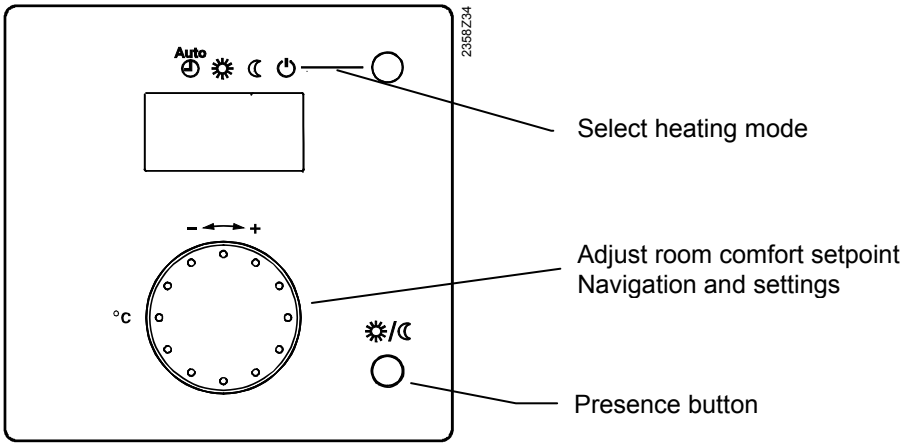
Legend
E = enduser F = heating engineer
OL = operating line

Operating line	Operating line clear-text units	user level	Function	Default value	Min	max	Unit
Time of day and date							
50	1	E	Hours / minutes	01:00	00:00	23:59	hh:mm
51	2	E	Day / month	1.01	01.01	31.12	dd.mm
52	3	E	Year	2004	2004	2099	yyyy
53	4	F	Start of summertime	25.03	01.01	31.12	dd.mm
54	5	F	End of summertime	25.10	01.01	31.12	dd.mm
59	6220	F	Software version	-	0	99.9	-
Time prog heating circuit 1							
61	500	E	Preselection	Mo-Su			-
62	501	E	1st phase on	-{}-6:00	00:00	24:00	hh:mm
63	502	E	1st phase off	22:00	00:00	24:00	hh:mm
64	503	E	2nd phase on	--:--	00:00	24:00	hh:mm
65	504	E	2nd phase off	--:--	00:00	24:00	hh:mm
66	505	E	3rd phase on	--:--	00:00	24:00	hh:mm
67	506	E	3rd phase off	--:--	00:00	24:00	hh:mm
Time prog heating circuit 2							
71	520	E	Preselection	Mo-Su			
72	521	E	1st phase on	6:00	00:00	24:00	hh:mm
73	522	E	1st phase off	22:00	00:00	24:00	hh:mm
74	523	E	2nd phase on	--:--	00:00	24:00	hh:mm
75	524	E	2nd phase off	--:--	00:00	24:00	hh:mm
76	525	E	3rd phase on	--:--	00:00	24:00	hh:mm
77	526	E	3rd phase off	--:--	00:00	24:00	hh:mm
Heating circuit 1							
81	712	E	Reduced setpoint	16	4	35	°C
82	720	E	Heating curve slope	1.5	0.10	4.00	°C
83	721	F	Heating curve displacement	0	-4.5	4.5	°C
84	730	E	Summer/winter heating limit	18	- - - / 8	30	°C
85	741	F	Flow temp setpoint max	80	8	95	°C
Heating circuit 2							
86	1012	E	Reduced setpoint	16	4	35	°C
87	1020	E	Heating curve slope	1.5	0.10	4.00	°C
88	1021	F	Heating curve displacement	0	-4.5	4.5	°C
89	1030	E	Summer/winter heating limit	18	- - - / 8	30	°C
90	1041	F	Flow temp setpoint max	80	80	95	°C

5.2 QAA55...

5.2.1 Operation

Operating elements



Display choices

☼	Heating to Comfort setpoint		Burner operating (only oil / gas boiler)
☾	Heating to Reduced setpoint		Error messages

Display

Display of all symbols and segments.

5.2.2 Programming

Configuration

A long press on the occupancy button enables the service level to be accessed.

Settings

Used as	ru = 1 (factory setting)	The room unit is addressed as room unit 1
	ru = 2	The room unit is addressed as room unit 2
Direct adjustment	P1 = 1 (factory setting)	Automatic storage: A setpoint readjustment with the knob is adopted either by pressing the operating mode button or without any further confirmation (timeout).
	P1 = 2	Storage with confirmation: A setpoint readjustment with the knob is adopted only after pressing the operating mode button.

6 The settings in detail

6.1 Time of day and date

The controller has a yearly clock with time of day, weekday and date. To ensure the controller's functionality, both the time of day and the date must be correctly set.

Line no.	*Operating line*
1	**Hours / minutes**
2	**Day / month**
3	**Year**
5	**Start of summertime**
6	**End of summertime**

Summer- / wintertime changeover

The dates set for the change from wintertime to summertime, and from summertime to wintertime, ensure that on the first Sunday after that date the time of day will change from 02:00 (wintertime) to 03:00 (summertime), and from 03:00 (summertime) to 02:00 (wintertime).

6.2 Operator section

Operation and display

Line no.	*Operating line*
20	**Language**
22	**Info** Temporarily Permanently
26	**Operation lock**
27	**Programming lock**

Info

Temporarily: After pressing the info button, a change to the "predefined" basic display is made after a maximum of 8 minutes or by pressing the operating mode button (with the QAA78… only 2 minutes) .

Continuously: After pressing the info button, a change back to the "new" basic display is made after a maximum of 8 minutes. The info value selected last will be adopted by the new basic display.
This setting is not possible with the QAA78…

Operation lock

When the operation lock is activated, the following operating elements can no longer be adjusted:
Heating circuit operating mode, DHW operating mode, room Comfort setpoint (setting knob), and occupancy button.

Programming lock

When the programming lock is activated, parameter values can still be displayed, but can no longer be changed.

- Temporary deactivation of the programming lock.
  Within the programming level, the programming lock can temporarily be overridden. To do this, press the OK and ESC buttons simultaneously for 3 seconds. Temporary deactivation of the programming lock is maintained until programming is quit.
- Constant deactivation of programming lock.
  First, make the temporary deactivation, then go to operating line "Programming lock" (operating line 27) and deactivate the programming lock

Used as

Line no.	*Operating line*
40	**Used as** Room unit 1 Room unit 2 Room unit P Operator unit 1 Operator unit 2 Operator unit P Service unit

This operating line is used to select the use of the operator unit. Depending on use, additional settings will then be required under “Heating circuit assignment“. When using several operator units, it is thus possible to match individual units to specific requirements.

- In the case several operator units are used, each application may only be used once.
- The AVS37.294 operator unit is supplied as operator unit 1 (operating line 40) acting on all heating circuits (operating line 42) and can only be readjusted on operating lines 44, 46 and 48

Depending on the selected use of the unit (operating line 40), the following settings (marked with X) can be made when assigning the heating circuit.

Operating line					
40	42	44	46	48	54
Room unit 1	Heating circuit 1				X
	Heating circuits 1 and 2	X		X	X
	Heating circuits 1 and P		X	X	X
	All heating circuits	X	X	X	X
Room unit 2					X
Room unit P					X
Operator unit 1	Heating circuit 1				
	Heating circuits 1 and 2	X		X	
	Heating circuits 1 and P		X	X	
	All heating circuits	X	X	X	
Operator unit 2					
Operator unit P					
Service unit					

Room unit 1
The operator unit supports the heating circuits released on operating line 42 “Assignment room unit 1” and activated in the basic unit.

Room unit 2
The operator unit only supports heating circuit 2.

Operator unit / service unit
The operator unit supports the heating circuits activated in the basic unit.

When using this setting, the operator unit does not acquire and deliver the room temperature.

Heating circuit assignment

Line no.	*Operating line*
42	**Assignment device 1** Heating circuit 1 Heating circuits 1 and 2 Heating circuits 1 and P All heating circuits
44	**Operation HC2** Commonly with HC1 Independently

46	**Operation HCP** Commonly with HC1 Independently
48	**Action occupancy button** None Heating circuit 1 Heating circuit 2 Jointly

Assignment room unit 1

As room unit 1 (setting 40), the action of the relevant operator unit on heating circuit 1 or on both heating circuits can be assigned. The latter is required especially when using 2 heating circuits and only 1 room unit.

Operation HC2

Depending on operating line 40, the action of operation (operating mode button or setting knob) on room unit 1, on the operator unit or service unit can be defined for heating circuit 2.

Commonly with HC1

Operation acts commonly on heating circuits 1 and 2.

Independently

The action of operation is queried on the display as soon as the operating mode button is pressed or the setting knob is operated.

Operation HCP

Depending on operating line 40, the action of operation (operating mode button or setting knob) on room unit 1, on the operator unit or service unit can be defined for heating circuit P.

Commonly with HC1

Operation acts commonly on heating circuits 1 and 2.

Independently

Operating mode changes or readjustments of the Comfort setpoints are to be made in programming mode.

Action occupancy button

The action of the occupancy button on the operator unit can be assigned to the relevant heating circuits.

If only 1 heating circuit is assigned, the occupancy button always acts on that heating circuit.

Room sensor

Line no.	*Operating line*
54	**Readjustment room sensor**

The temperature display can be readjusted.

Device data

Line no.	*Operating line*
70	**Software version**

The display shows the current version of the room unit.

6.3 Radio

Binding

Line no.	*Operating line*
120	**Binding**
121	**Test mode**

For more detailed information, refer to the descriptions of the wireless components in section 3.8.

Binding

When commissioning the system, the wireless peripheral devices (room unit) are assigned to the basic unit.

Test mode

The test mode is used for checking the wireless communication. The test should be made when the installation is fully completed.

Device list radio

Line no.	*Operating line*
130	**Room unit 1** Missing Ready No recept'n Change batt
131	**Room unit 2** Same as on operating line 130
132	**Room unit P** Same as on operating line 130
133	**Outside sensor** Same as on operating line 130
134	**Repeater** Same as on operating line 130
135	**Operator unit 1** Same as on operating line 130
136	**Operator unit 2** Same as on operating line 130
137	**Operator unit P** Same as on operating line 130
138	**Service unit** Same as on operating line 130
140	**Delete all devices**

Delete all devices

The wireless connection to all devices will be canceled. If radio communication is required again, a new binding must be established.

6.4 Time programs

For the heating circuits and DHW heating, a number of switching programs are available. They are activated in "Automatic" operation and control the change of the temperature levels (and the associated setpoints) via the selected switching times.

Entering the switching times

The switching times can be set in a combined way, that is, either commonly for several days or separate times for individual days. When preselecting groups of days like for instance Mo...Fr and Sa...Su that use the same switching times, setting of the switching programs is simplified.

Switching points

Line no.					*Operating line*
HC1	*HC2*	*3/HCP*	*4/DHW*	*5*	
500	**520**	**540**	**560**	**600**	**Preselection** Mo - Su Mo - Fr Sa - Su Mo - Su
501	**521**	**541**	**561**	**601**	**1st phase on**
502	**522**	**542**	**562**	**602**	**1st phase off**
503	**523**	**543**	**563**	**603**	**2nd phase on**
504	**524**	**544**	**564**	**604**	**2nd phase off**
505	**525**	**545**	**565**	**605**	**3rd phase on**
506	**526**	**546**	**566**	**606**	**3rd phase off**

Standard program

Line no.	*Operating line*
516, 536, 556, 576, 616	**Default values**

All time programs can be reset to the default settings. Each time program has its own operating line to make this reset.

In that case, individual settings will be lost!

6.5 Holidays

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
641	**651**	**661**	**Preselection**
642	**652**	**662**	**Start**
643	**653**	**663**	**End**
648	**658**	**668**	**Operating level** Frost protection Reduced

The holiday program is used to switch the heating circuits to a selectable operating level according to calendar dates.

- The holiday program can only be used in “Automatic“ operation

6.6 Heating circuits

For heating circuits, there are various functions available which can be individually set for each heating circuit.

Operating mode

Line no.	*Operating line*
1300	**Operating mode** Protection Automatically Reduced Comfort

The operating mode of heating circuits 1 and 2 is selected directly with the operating mode button while the operating mode of heating circuit P is to be selected in programming mode (operating line 1300).

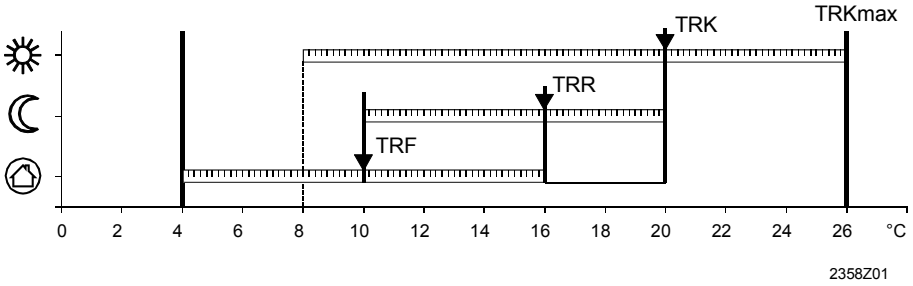
This setting is used to switch between the different operating modes. The functionality corresponds to operating mode selection with the operating mode button. For details, refer to section ”Operation“.

Setpoints

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
710	**1010**	**1310**	**Comfort setpoint**
712	**1012**	**1312**	**Reduced setpoint**
714	**1014**	**1314**	**Frost protection setpoint**
716	**1016**	**1316**	**Comfort setpoint maximum**

Room temperature

The room temperature can be shifted according to different setpoints. These setpoints become active depending on the selected operating mode, thus producing different temperature levels in the rooms.
The ranges of adjustable setpoints result from the interdependencies, as this is shown in the following diagram.



TRKmax Comfort setpoint maximum
TRK Comfort cooling setpoint
TRR Reduced setpoint
TRF Frost protection setpoint

Frost protection

In Protection mode, the room temperature is prevented from falling below a certain level. Thus, the frost protection setpoint of the room temperature is maintained.

Comfort setpoint maximum

The room temperature can be shifted according to different setpoints. These setpoints become active depending on the selected operating mode, thus producing different temperature levels in the rooms.
The ranges of adjustable setpoints result from the interdependencies, as this is shown in the following diagram.

Heating curve

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
720	**1020**	**1320**	**Heating curve slope**
721	**1021**	**1321**	**Heating curve displacement**
726	**1026**	**1326**	**Heating curve adaption**

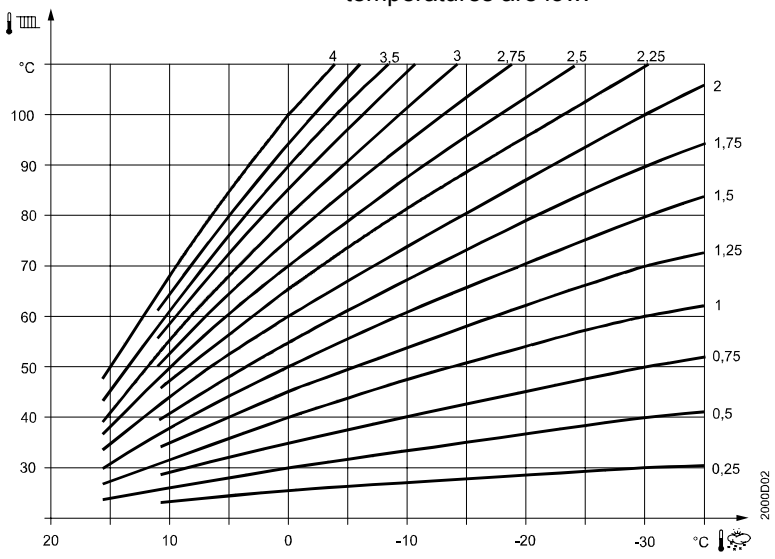
The heating curve is used to generate the flow temperature setpoint, which is used to maintain a certain flow temperature depending on the prevailing weather conditions. The heating curve can be adjusted with a number of settings, thus matching heat output and room temperature to individual needs.

Heating curve slope

As the heating curve slope is raised, the flow temperature increases the quicker the lower the outside temperature or, in other words, if the room temperature is not correct at low outside temperatures but correct at higher outside temperatures, the heating curve slope requires readjustment.

Increase adjustment: Raises the flow temperature, especially when outside temperatures are low.

Decrease adjustment: Lowers the flow temperature, especially when outside temperatures are low.



Heating curve displacement

Parallel displacement of the heating curve is used to change the flow temperature evenly across the entire outside temperature range or, in other words, if the room temperature is always too high or too low, a readjustment must be made with the help of the parallel displacement.

Heating curve adaption

Adaptation of the heating curve is used by the controller to automatically adapt the heating curve to the prevailing conditions. In that case, a readjustment of heating curve slope and parallel displacement is not required. It can only be switched on or off.

To assure this function, following must be observed:

- A room sensor must be connected.
- The ”Room influence“ setting must be selected between 1 and 99
- There should be no thermostatic radiator valves in the reference room (mounting location of room sensor) (If such valves are present, they must be set to their fully open position).

ECO functions

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
730	**1030**	**1330**	**Summer/winter heating limit**
732	**1032**	**1332**	**24-hour heating limit**

Summer/winter heating limit

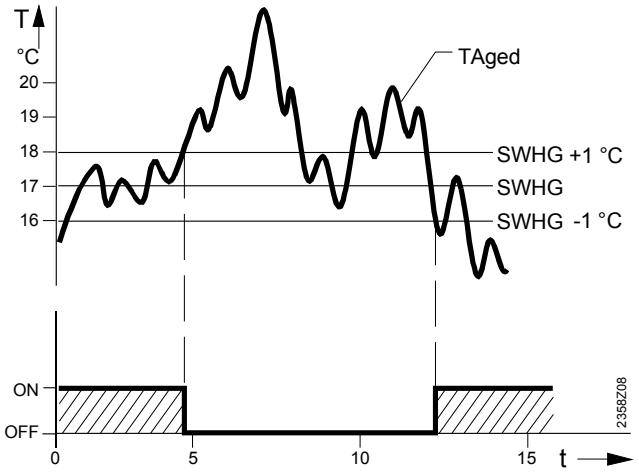
The summer / winter heating limit is used to switch the heating on and off in the course of the year, depending on temperature conditions. In Automatic mode, switching on / off takes place automatically, so there is no need for the user to do this manually. By changing the setting, the respective periods of time will be shortened or extended.

Increase: Winter operation will start *earlier*
Summer operation will start *later*

Decrease: Winter operation will start *later*
Summer operation will start *earlier*

- The function is not active in operating mode ”Continuously Comfort temperature“
- The display shows ECO
- To consider the building’s thermal dynamics, the outside temperature is attenuated

Example:



SWHG Summer/winter heating limit
TAged Attenuated outside temperature
T Temperature
t Days

24-hour heating limit

The 24-hour heating limit is used to switch the heating on and off in the course of the day, depending on the outside temperature. This function is used primarily during intermediate seasons (spring and fall) to respond to short-time temperature variations.

Example:

Setting line	*e.g.*
Comfort setpoint (TRw)	22 °C
24-hour heating limit (THG)	-3 °C
Changeover temperature (TRw-THG) heating off	= 19 °C

Switching differential (fixed)	-1 °C
Changeover temperature heating on	= 18 °C

By changing the value entered, the respective heating periods will be shortened or extended.

Increase: Heating mode will start *earlier,* changeover to ECO *later.*

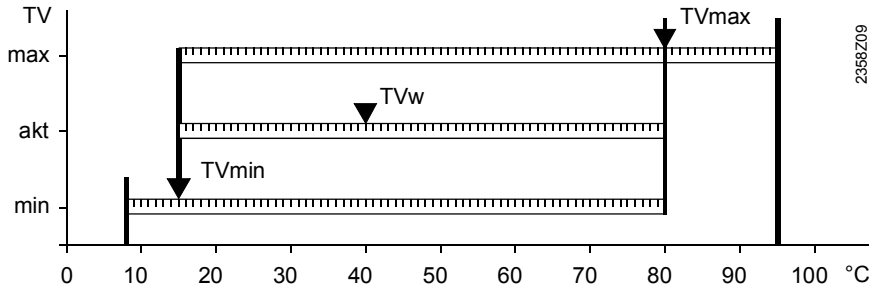
Decrease: Heating mode will start *later,* changeover to ECO *earlier.*

- The function is not active in operating mode ”Continuously Comfort temperature“
- The display shows ECO
- To consider the building’s thermal dynamics, the outside temperature is attenuated

Flow temperature setpoint limitations

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
740	**1040**	**1340**	**Flow temp setpoint min**
741	**1041**	**1341**	**Flow temp setpoint max**

Using this limitation, a temperature range for the flow temperature setpoint can be defined. If the flow temperature setpoint demanded by the heating circuit reaches the relevant limit and the heat request increases or decreases, the flow temperature setpoint will be maintained at the maximum or minimum limit.



TVw Current flow temperature setpoint
TVmax Flow temperature setpoint maximum
Tvmin Flow temp setpoint minimum

Room influence

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
750	**1050**	**1350**	**Room influence**

Types of compensation

When a room temperature sensor is used, there is a choice of 3 different types of compensation.

Setting	*Type of compensation*
– – – %	Pure weather compensation *
1…99 %	Weather compensation with room influence *
100 %	Pure room compensation

* Outside sensor required.

Pure weather compensation

The flow temperature is calculated via the heating curve, depending on the composite outside temperature.
This type of compensation calls for a correct adjustment of the heating curve since in that case the control gives no consideration to the room temperature.

Weather compensation with room influence

Deviations of the actual room temperature from the setpoint are acquired and taken into account when controlling the temperature. Heat gains can thus be considered, facilitating more accurate room temperature control. The authority of deviation is set as a percentage figure. The better the reference room (correct room temperature, correct mounting location, etc.) the higher the value can be set.

- Example:

Approx. 60 % Good reference room
Approx. 20 % Unfavorable reference room

To activate the function, following must be considered:

- A room sensor must be connected.
- "Room influence" must be set to a value between 1 and 99 %.
- There should be no thermostatic radiator valves in the reference room (mounting location of the room sensor). (If such valves are present, they must be set to their fully open position).

Pure room compensation

The flow temperature is controlled depending on the room temperature setpoint, the current room temperature and the progression of the room temperature. For example, a slight increase of the room temperature causes an immediate drop of the following temperature.

To activate the function, following must be considered:

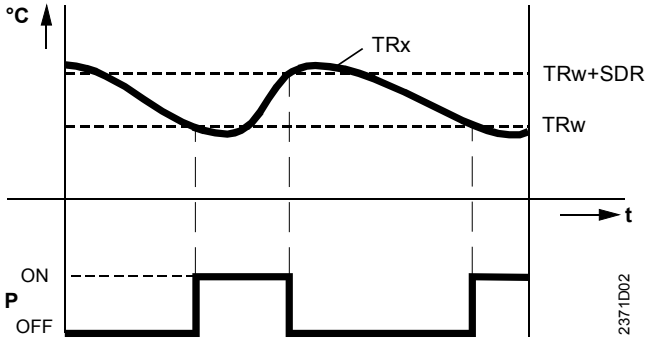
- A room sensor must be connected.
- "Room influence" must be set to 100 %.
- There should be no thermostatic radiator valves in the reference room (mounting location of the room sensor). (If such valves are present, they must be set to their fully open position).

Room temp limitation

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
760	**1060**	**1360**	**Room temp limitation**

In the case of pump heating circuits, a switching differential for temperature control must be set. The function necessitates a room temperature sensor.

Room temperature limitation does not work in the case of pure weather compensation.



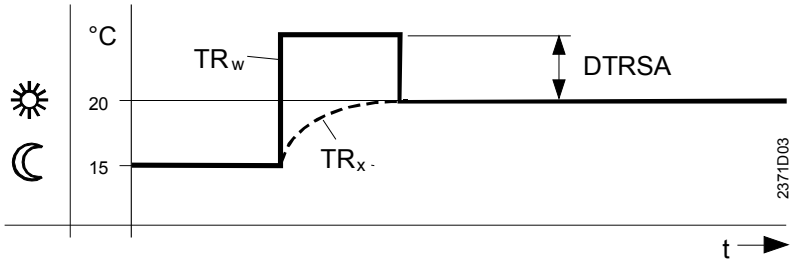
TRx Actual value of room temperature
TRw Room temperature setpoint
SDR Room's switching differential
P Pump
T Time

Boost heating

Line no.			Operating line
HC1	*HC2*	*HCP*	
770	**1070**	**1370**	**Boost heating**

Boost heating is used to reach the new setpoint more quickly when switching from the Reduced setpoint to the Comfort setpoint, thus reducing the heating up time. During boost heating, the room temperature setpoint is raised by the value set here.
A higher setting leads to shorter heating up times, a lower setting to longer heating up times.

- Boost heating is possible with or without room sensor



TRw The room temperature setpoint
TRx Actual value of the room temperature
DTRSA Increase of room temperature setpoint

Quick setback

Line no.			Operating line
HC1	*HC2*	*HCP*	
780	**1080**	**1380**	**Quick setback** Off Down to reduced setpoint Down to frost prot setpoint

During quick setback, the heating circuit pump is deactivated and, in the case of mixing valve circuits, the mixing valve is fully closed.

- Function with room sensor:

When using the room sensor, the function keeps the heating switched off until the room temperature has dropped to the level of the Reduced setpoint or the frost level.
When the room temperature has fallen to the Reduced level or the frost level, the heating circuit pump will be activated and the mixing valve will be released.

- Function without room sensor:

Quick setback switches the heating off for a certain period of time, depending on the outside temperature and the building time constant.

Example

Duration of quick setback when Comfort setpoint minus Reduced setpoint = 2°C (e.g. Comfort setpoint = 20°C and Reduced setpoint =18°C)

Outside temperature composite:	Building time constant: 0	2	5	10	15	20	50
15 °C	0	3.1	7.7	15.3	23	30.6	76.6
10 °C	0	1.3	3.3	6.7	10	13.4	33.5
5 °C	0	0.9	2.1	4.3	6.4	8.6	21.5
0 °C	0	0.6	1.6	3.2	4.7	6.3	15.8
-5 °C	0	0.5	1.3	2.5	3.8	5.0	12.5
-10 °C	0	0.4	1.0	2.1	3.1	4.1	10.3
-15 °C	0	0.4	0.9	1.8	2.6	3.5	8.8
-20 °C	0	0.3	0.8	1.5	2.3	3.1	7.7
	Duration of quick setback in hours						

- Quick setback is possible with or without a room sensor

Optimum start / stop control

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
790	**1090**	**1390**	**Optimum start control max**
791	**1091**	**1391**	**Optimum stop control max**

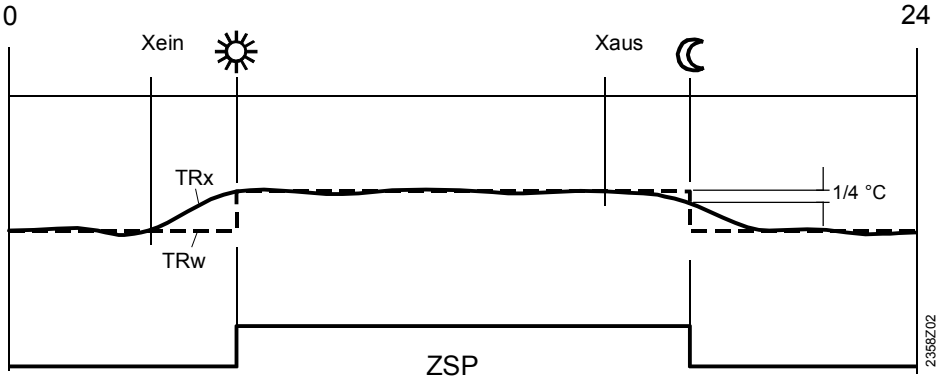
Optimum start control max

The change from one temperature level to the other is optimized in a way that the Comfort setpoint is reached at the relevant switching time.

Optimum stop control max

The change from one temperature level to the other is optimized in a way that the Comfort setpoint minus 1/4 °C is reached at the relevant switching time

- Optimum start / stop control is possible with or without room sensor.

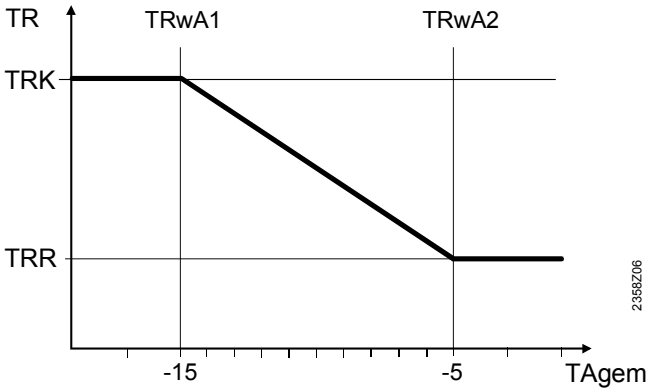


Xein Switch-on time shifted forward in time
Xaus Switch-off time shifted forward in time
ZSP Time program
TRx Actual value of room temperature
TRw Room temperature setpoint

Increase of Reduced setpoint

Line no.			Operating line
HC1	HC2	HCP	
800	**1100**	**1400**	**Reduced setp increase start**
801	**1101**	**1401**	**Reduced setp increase end**

The function is used primarily in connection with heating systems with **only** little spare capacity (e.g. low-energy houses). In that case, the heating up time would be too long if outside temperatures are low. When the Reduced setpoint is raised, the rooms are prevented from cooling down to too low levels, thus shortening the heating up time when changing to the Comfort setpoint.



TRwA1 Reduced setp increase start
TRwA2 Reduced setp increase end
TRK Comfort cooling setpoint
TRR Reduced room temperature setpoint
Tagem Composite outside temperature

Overtemperature protection pump heating circuit

Line no.			Operating line
HC1	HC2	HCP	
820	**1120**	**1420**	**Overtemp prot pump circuit**

In the case of heating plant with pump heating circuits, the flow temperature of the heating circuit can be higher than the flow temperature demanded by the heating curve, due to requests from other heat consumers (mixing heating circuit, DHW charging, external heat demand), or a parameterized minimum boiler temperature. As a result of this too high flow temperature, the pump heating circuit would assume excessive temperatures.
Function “Overtemperature protection for pump heating circuits” ensures that the energy supply for pump heating circuits corresponds to the demand from the heating curve by activating / deactivating the pump.

Mixing valve control

Line no.		Operating line
HC1	HC2	
830	**1130**	**Mixing valve boost**
832	**1132**	**Actuator type** 2-position ¦ 3-position
833	**1133**	**Switching differential 2-pos**
834	**1134**	**Actuator running time**

Actuator type

The selection of the type of actuator determines the control behavior for the type of mixing valve actuator used.

Switching differential 2-pos

For the 2-position actuator, the 2-position switching differential must also be adapted. This is not required when using a 3-position actuator.

Mixing valve boost

To ensure proper mixing valve flow temperature control, the flow temperature must be higher than the demanded setpoint of the mixing valve flow temperature. The value set here is added to the request.

Actuator running time

Setting the running time of the actuator used with the mixing valve.

Floor curing function

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
850	**1150**	**1450**	**Floor curing function** Off Functional heating (Fh) Curing heating (Bh) Functional/curing heating Curing heating/ functional heating Manually
851	**1151**	**1451**	**Floor curing setp manually**

The floor curing function ensures controlled drying of the floor. It controls the flow temperature according to a temperature profile. Drying of the floor is ensured via the floor heating system and the mixing valve or pump heating circuit.

Floor curing function

Off:
Function is deactivated.

Functional heating (Fh) :
The first part of the temperature profile is automatically completed.

Floor curing heating (Bh)
The second part of the temperature profile is passed automatically.

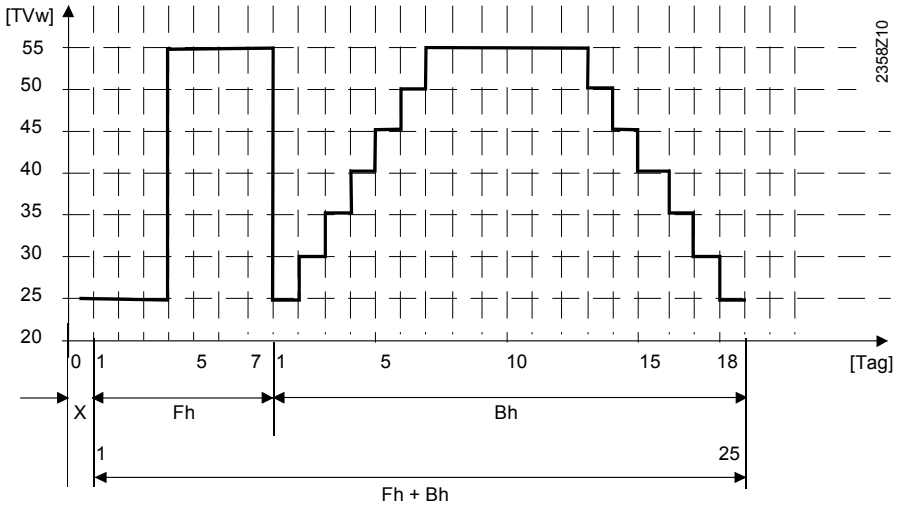
Functional and floor curing heating
The entire temperature profile (first and second part) is passed automatically.

Floor curing heating and functional heating
The entire temperature profile (first and second part) is traversed automatically.

Manually
It is not a temperature profile that is completed, but the floor setpoint is controlled manually.

⚠

- Observe the relevant standards and regulations of the floor manufacturer!
- Proper functioning is ensured only when the plant is correctly installed (hydraulic system, electrical installation, settings)!
  If not observed, the floor might get damaged!
- The function can be aborted prematurely by choosing **Off**.
- Maximum limitation of the flow temperature remains active.



X Start day
Fh Functional heating
Bh Floor curing heating

Excess heat draw

Line no.				Operating line
HC1	*HC2*	*HC3P*		
861	**1161**	**1461**		**Excess heat draw** Off Heating mode Always

Excess heat draw can be triggered by the following functions:
- Inputs H1, H2, H3 or EX2
- Storage tank recooling
- Solid fuel boiler excess heat draw

When dissipation of excess heat is activated, it can be drawn by space heating. This can be adjusted separately for each heating circuit.

Buffer storage tank / primary controller

Line no.			Operating line
HC1	*HC2*	*HCP*	
870	**1170**	**1470**	**With buffer storage tank**
872	**1172**	**1472**	**With primary controller / system pump**

With buffer storage tank

If a buffer storage tank is used, it must be entered here whether the heating circuit shall receive its heat from the buffer storage tank or directly from the boiler.
When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

It is to be set whether the heating circuit receives its heat via the primary controller or with the help of the system pump (depending on the type of plant).

Speed-controlled pump

Line no.			Operating line
HC1	*HC2*	*HCP*	
882	**1182**	**1482**	**Pump speed min**
883	**1183**	**1483**	**Pump speed max**

Pump speed min

The minimum speed of the heating circuit pump can be defined.

Pump speed max

The maximum speed of the heating circuit pump can be defined.

Remote

Line no.			Operating line
HC1	HC2	HCP	
900	**1200**	**1500**	**Optg mode changeover** None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic

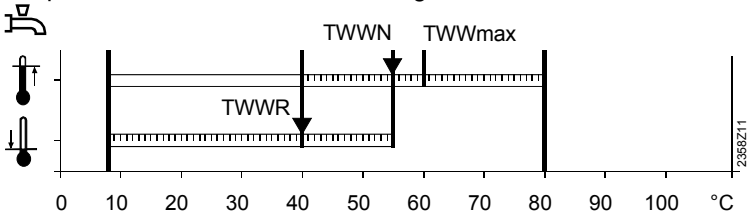
In the case of external changeover via inputs H1 / H2 / H3, the operating mode to be used can be selected.

6.7 DHW

Setpoints

Line no.	Operating line
1610	**Nominal setpoint**
1612	**Reduced setpoint**

The DHW can be heated up according to different setpoints. These setpoints are activated depending on the selected operating mode, thus leading to different temperature levels in the DHW storage tank.



TWWR DHW reduced setpoint
TWWN DHW nominal setpoint
TWWmax DHW nominal setpoint maximum

Priority

Line no.	Operating line
1630	**Charging priority** Absolute Shifting None MC shifting, PC absolute

When both space heating and DHW heating call for heat, the “DHW priority“ function ensures that during DHW charging the boiler’s capacity is used primarily for DHW.

Absolute priority
The mixing and pump heating circuit stay locked until DHW heating is finished.

Shifting priority
If the capacity of the heat source is not sufficient, the mixing and pump heating circuit will be restricted until DHW is heated up.

No priority
DHW charging and space heating take place at the same time.
In the case of tightly sized boilers and mixing heating circuits, it can happen that the DHW setpoint will not be reached if space heating demands considerable amounts of heat.

Mixing heating circuit shifting, pump heating circuit absolute
The pump heating circuits stay locked until the DHW storage tank is heated up. If the capacity of the heat source is not sufficient, the mixing heating circuits will also be restricted.

Legionella function

Line no.	*Operating line*
1640	**Legionella function** Off Periodically Fixed weekday
1641	**Legionella funct periodically**
1642	**Legionella funct weekday** Monday…Sunday
1644	**Legionella funct time**
1645	**Legionella funct setpoint**
1646	**Legionella funct duration**
1647	**Legionella funct circ pump**

Legionella function

- Periodically

The legionella function is repeated according to the period of time set (operating line 1641). The legionella setpoint is attained via a solar plant, independent of the period of time set, the period of time will be newly started.

- Fixed weekday

The legionella function can be activated on a fixed weekday (operating line 1642). When using this setting, heating up to the legionella setpoint takes place on the selected weekday, independent of previous storage tank temperatures.

Legionella funct circ pump

During the time the legionella function is carried out, the DHW circulating pump can be activated.

⚠ During the time the legionella function is carried out, there is a risk of scalding when opening the taps.

Circulating pump

Line no.	*Operating line*
1660	**Circulating pump release** Time program 3/HCP DHW release Time program 4/DHW Time program 5
1661	**Circulating pump cycling**
1663	**Circulation setpoint**

Circulating pump cycling

When the function is activated, the circulating pump is switched on for 10 minutes within the release time and then switched off again for 20 minutes.

Circulation setpoint

If a sensor is installed in the DHW distribution pipe, the controller will monitor its actual value during the time the legionella function is performed. The adjusted setpoint must be maintained at the sensor during the adjusted “Dwelling time“.

6.8 Pump H1/H2/H3

Pump H1/H2/H3

Line no.	*Operating line*
2010	**H1 Excess heat draw**
2012	**H1 with buffer storage tank**
2014	**H1 prim contr/system pump**
2035	**H2 Excess heat draw**
2037	**H2 with buffer storage tank**
2039	**H2 prim contr/system pump**
2046	**H3 Excess heat draw**
2048	**H3 with buffer**
2050	**H2 prim contr/system pump**

Excess heat draw

Excess heat draw can be triggered by the following functions:
- Inputs H1, H2, H3 or EX2
- Storage tank recooling
- Solid fuel boiler excess heat draw

When dissipation of excess heat is activated, it can be drawn by space heating. This can be adjusted separately for each heating circuit.

With buffer storage tank

If a buffer storage tank is used, it must be entered here whether the H1/H2/H3 circuit shall receive its heat from the buffer storage tank or directly from the boiler.
When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

It is to be set whether the H1/H2/H3 circuit receives its heat via the primary controller or with the help of the system pump (depending on the type of plant).

6.9 Swimming pool

Setpoints

Line no.	*Operating line*
2055	**Setpoint solar heating**
2056	**Setpoint source heating**

Setpoint solar heating

When using solar energy, the swimming pool is heated up until this setpoint is reached. The protective collector overtemperature function can reactivate the collector pump until the maximum swimming pool temperature is reached.

Setpoint source heating

When using the heat source, the swimming pool is heated up until this setpoint is reached.

Priority

Line no.	*Operating line*
2065	**Charging priority solar**

- Off:

Swimming pool heating through solar charging does not give consideration to any priorities. If the storage tank's charging priority (operating line 3822) is also deactivated, the swimming pool is heated alternately with the storage tanks, the temperature increase being 5 °C.

- On:

Swimming pool heating through solar charging is given priority. This also applies if a storage tank with charging priority (operating line 3822) would have to prefer other heat exchangers.

Plant hydraulics

Line no.	*Operating line*
2080	**With solar integration**

This setting is made to indicate iff the swimming pool can be charged by solar energy.

6.10 Primary controller / system pump

Primary controller / system pump

Line no.	*Operating line*
2150	**Primary controller / system pump** Before buffer st tank After buffer st tank

If the plant uses a buffer storage tank, it is to be set here whether, hydraulically, the primary controller or the system pump is installed upstream from the buffer storage tank.

6.11 Boiler

Operating mode

Line no.	*Operating line*
2203	**Release below outside temp**
2205	**In economy mode** Off ¦ On DHW ¦ On
2208	**Full charging buffer** Off ¦ On

Release below outside temp

The boiler is commissioned only if the mixed outside temperature is below this threshold. For the release, a fixed switching differential of ½ °C is used.

Economy mode

Economy mode can be selected from menu ”Maintenance / Special operation” (OL 7139).
In Economy mode, the boiler is operated as follows:

Off:	Remains locked
DHW only:	Boiler will be released for DHW charging
On:	Always released

Full charging buffer

To ensure long on times, the heat source keeps operating until the buffer storage tank is fully charged.

Setpoints

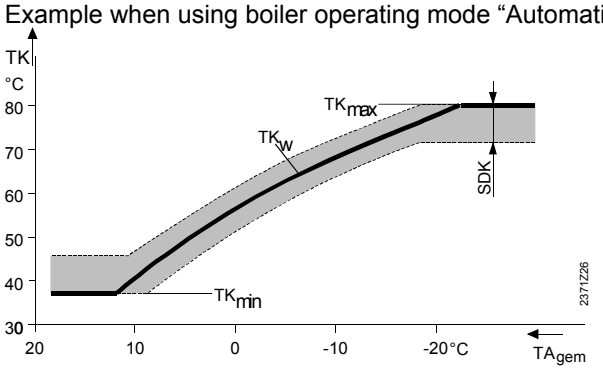
Line no.	*Operating line*
2210	**Setpoint min**
2212	**Setpoint max**

The controlled boiler temperature setpoint can be limited by selecting setpoint minimum and setpoint maximum. These limitations can be regarded as protective functions for the boiler.
In normal operation, minimum limitation of the boiler temperature is the lower limit value of the controlled boiler temperature setpoint, depending on the boiler’s operating mode.

In normal operation, maximum limitation of the boiler temperature is the upper limit value of the controlled boiler temperature setpoint and, at the same time, setpoint of the electronic limit thermostat (TR).

The setting range of setpoint minimum and setpoint maximum is limited by the setpoint of manual operation.

Example when using boiler operating mode “Automatic“:



Legend	
TK	Boiler temperature
TKw	Boiler temperature setpoint
...TKmax	maximum limitation of the boiler temperature
Tkmin	Minimum limitation of the boiler temperature
SDK	Switching differential
Tagem	Composite outside temperature

Minimum limitation of the return temperature

Line no.	*Operating line*
2270	**Return setpoint min**

Return setpoint min

If the boiler return temperature falls below the return temperature setpoint, maintained boiler return temperature becomes active.
Maintained boiler return temperature allows consumers to be influenced, control of a bypass pump or use of a return temperature controller.

Output data

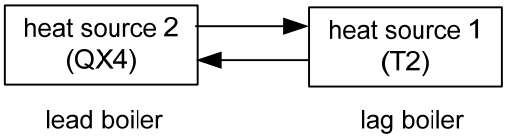
Line no.	*Operating line*
2330	**Output nominal**
2331	**Output basic stage**

These settings are required in the case of cascaded boilers with different outputs.

2 x 1 cascade

Line no.	*Operating line*
2340	**Auto source seq 2x1 casc**

Automatic changeover of the heat source enables a lead boiler change at certain intervals. The boiler sequence changes when the selected time has elapsed.



When switching on automatic changeover, heat source 1 (T2) is always started up as the lead boiler.

The time remaining until the next changeover takes place and the current lead boiler are not displayed.

6.12 Cascade

Control

Line no.	*Operating line*
3532	**Restart lock**
3533	**Switch-on delay**

Restart lock

The restart lock prevents a deactivated heat source from being switched on again. It is released again only after the set time has elapsed. This prevents too frequent switching actions of the heat sources and ensures stable plant operating states.

Switch-on delay

Correct setting of the switch-on delay ensures that the plant maintains stable operating states. This prevents too frequent switching actions of the boilers (cycling).
In the case of a DHW request, the delay time is fixed at 1 minute.

Boiler sequence

Line no.	*Operating line*
3540	**Auto source seq ch'over**
3541	**Auto source seq exclusion** None First Last First and last
3544	**Leading source** Device 1…device 16

Auto source seq ch'over

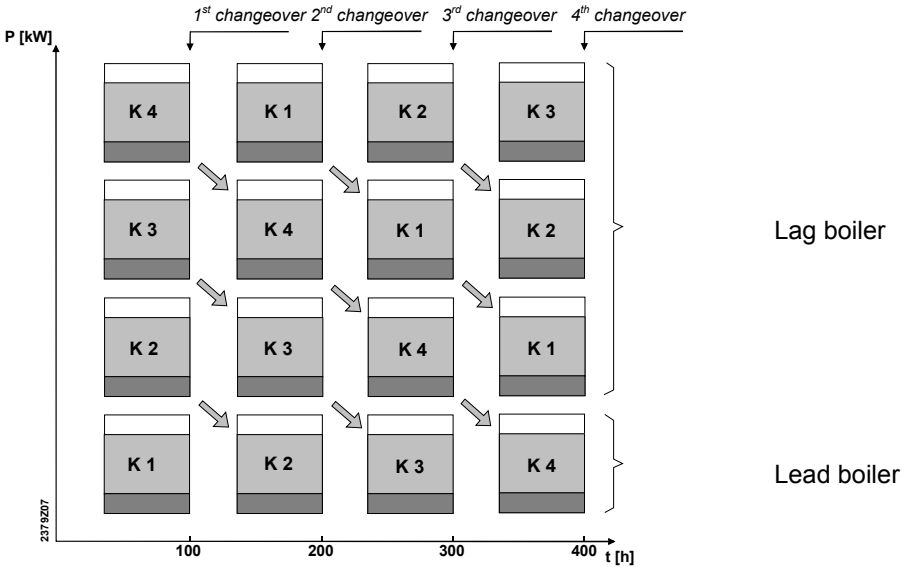
With automatic source sequence changeover, the boiler loads in a cascade can be influenced by defining the order of lead and lag boiler.

Fixed order

Setting - - - defines a fixed order. In that case, the lead boiler can be selected on operating line 3544; the other boilers are then switched on and off in the same order as the LPB device addresses.

Order according to the number of operating hours

On completion of the number of hours set, the boiler sequence in the cascade changes. It is always the boiler with the next higher device address which assumes the role of the lead boiler.



t = total number of operating hours of all lead boilers [h]
P = total output of cascade [kW]

Auto source seq exclusion

Setting automatic source sequence exclusion is only used in connection with the activated heat source sequence (operating line 3540).
Using automatic source sequence exclusion, the first and / or the last boiler can be exempted from automatic changeover.

None
The order of switching on the boilers changes when the number of hours set is reached (operating line 3540).
First
The first boiler in terms of addressing is always the lead boiler. With the other boilers, the order of switching on changes when the set number of hours is reached (operating line 3540).
Last
The last boiler in terms of addressing will always stay the last. The other boilers change when the set number of hours is reached (operating line 3540).
First and last
The first boiler in terms of addressing will always be the lead boiler. The last boiler in terms of addressing will always be the last. The boilers in between change when the set number of hours is reached (operating line 3540).

Leading source

The leading source is only selected in connection with the fixed order of the heat source sequence (operating line 3540).
The boiler selected as the lead boiler is always the first to be switched on, or the last to be switched off. The other boilers are switched on and off in the order of their device addresses.

Minimum limitation of the return temperature

Line no.	*Operating line*
3560	**Return setpoint min**

Return setpoint min

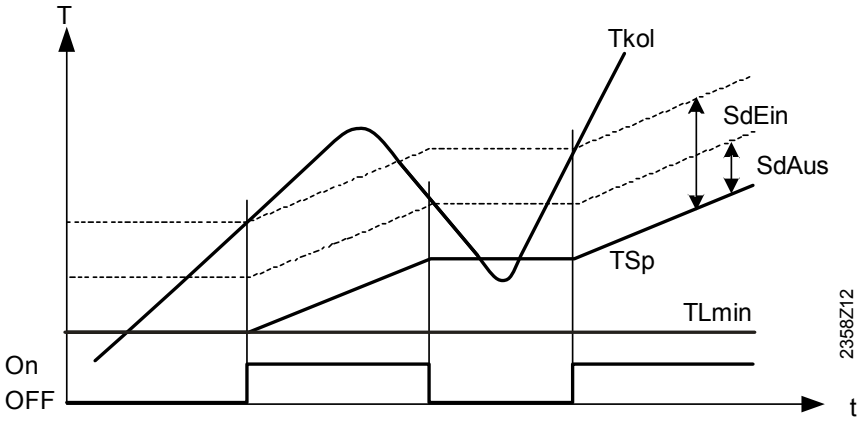
If the return temperature drops below the adjusted return setpoint, maintained boiler return temperature becomes active.
Maintained boiler return temperature allows consumers to be influenced or a return temperature controller to be used.

6.13 Solar

Charging controller (dT)

Line no.	*Operating line*
3810	**Temp diff on**
3811	**Temp diff off**
3812	**Charg temp min DHW st tank**
3815	**Charging temp min buffer**
3818	**Charging temp min swi pool**

For charging the storage tank via the heat exchanger, the temperature differential between collector and storage tank / swimming pool must be sufficient, and the collector must have reached the minimum charging temperature for the storage tank / swimming pool .



Tkol Collector temperature
On / Off Collector pump
SdEin Temperature differential ON
SdAus Temperature differential OFF
TSp Storage tank temperature
TLmin Charging temp min DHW storage tank / buffer / swimming pool

Priority

Line no.	*Operating line*
3822	**Charging prio storage tank** None DHW storage tank Buffer storage tank
3825	**Charging time relative prio**
3826	**Waiting time relative prio**
3827	**Waiting time parallel op**
3828	**Delay secondary pump**

⚠ The priority circuit for the swimming pool (operating line 2065) can impact storage tank priority of solar charging and possibly charge the swimming pool before the storage tanks.

Charging prio storage tank

If a plant uses several heat exchangers, it is possible to set a priority for the integrated storage tanks, which defines the charging sequence.

None

Every storage tank is charged alternately by 5 °C at a time, until every setpoint of level A, B or C (see below) is reached. The setpoints of the next higher level are approached only when all setpoints of the previous level have been reached.

DHW storage tank
During solar charging, preference is given to the DHW storage tank. At every level A, B or C (see below), it is charged with priority. Only then will the other consumers of the same level be charged. As soon as all setpoints of a level are attained, those of the next level are approached, whereby priority is again given to the DHW storage tank.

Buffer storage tank
During solar charging, preference is given to the buffer storage tank. At every level A, B or C (see below), it is charged with priority. Only then will the other consumers of the same level be charged. As soon as all setpoints of a level are attained, those of the next level are approached, whereby priority is again given to the buffer storage tank.
Storage tank setpoints:

Level	DHW storage tank	Buffer storage tank	Swimming pool (1)
A	1610 Nominal setpoint	Buffer setpoint (slave pointer)	2055 Setpoint solar heating
B	5050 Charging temperature max	4750 Charging temperature max	2055 Setpoint solar heating
C	5051 Storage tank temp max	4751 Storage tank temp max	2070 Swimming pool temp max

(1) When priority for the swimming pool is activated (operating line 2065), the swimming pool is charged before the storage tanks.

Charging time relative prio

If the preferred storage tank cannot be charged in accordance with charging control, priority is transferred to the next storage tank or the swimming pool for the period of time set (e.g. too great temperature differential between collector and storage tank). As soon as the preferred storage tank (according to setting "Charging priority storage tank") is again ready to be charged, the transfer of priority will immediately be stopped.

If the parameter is off (---), setting Charging tank priority is used as a rule.

Waiting time relative prio

During the period of time set, the transfer of priority will be delayed. This prevents relative priority from intervening too frequently.

Waiting time parallel op

If solar output is sufficient and solar charging pumps are used, parallel operation is possible. In that case, the storage tank of the priority model can be the next to be simultaneously charged, in addition to the storage tank to be charged next. Parallel operation can be delayed by introducing a waiting time. This way, in the case of parallel operation, switching on of the storage tanks can be effected in steps.
Setting (---) switches off parallel operation.

Delay secondary pump

To remove any existing cold water in the primary circuit, operation of external heat exchanger's secondary pump can be delayed.

Start function

Line no.	*Operating line*
3830	**Collector start function**
3831	**Min run time collector pump**

Collector start function	If the temperature at the collector (especially in the case of vacuum tubes) cannot be correctly acquired when the pump is deactivated, the pump can be activated from time to time.
Min run time collector pump	The function periodically activates the collector pump for at least the selected minimum running time.

Frost protection for the collector

Line no.	*Operating line*
3840	**Collector frost protection**

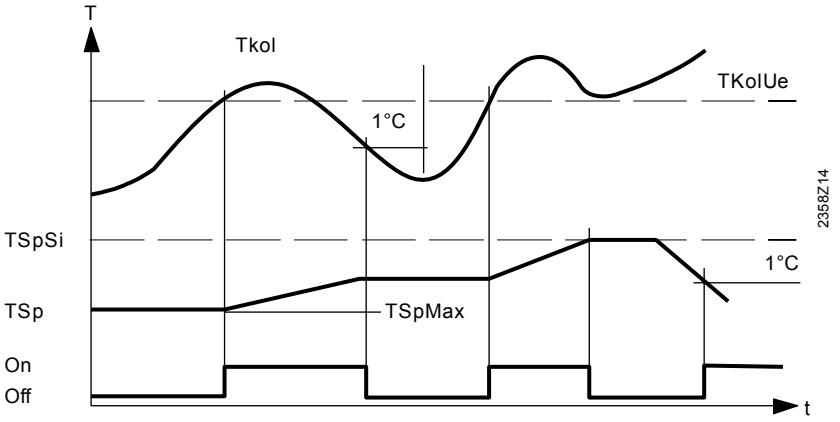
When there is risk of frost at the collector, the collector pump will be activated to prevent the heat-carrying medium from freezing.

- If the collector temperature falls below the frost protection temperature, the collector pump will be activated: TKol < TKolFrost.
- When the collector temperature returns to a level of 1°K above the frost protection temperature, the collector pump will be deactivated again: TKol > TKolFrost + 1.

Overtemperature protection for the collector

Line no.	*Operating line*
3850	**Collector overtemp prot**

If there is risk of overtemperature at the collector, storage tank charging is continued to reduce the amount of surplus heat. When the storage tank's safety temperature is reached, charging will be stopped.



TSpSi	Storage tank safety temperature
TSp	Storage tank temperature
TKolUe	Collector temperature for overtemperature protection
TSpmax	Maximum charging temperature
Tkol	Collector temperature
On / Off	Collector pump
T	Temperature
t	Time

Medium's evaporation temperature

Line no.	*Operating line*
3860	**Evaporation heat carrier**

If there is a risk of the heat carrying medium evaporating due to high collector temperatures, the collector pump will be deactivated to prevent it from reaching excessive temperatures. This is a protective pump function.

Speed control

Line no.	*Operating line*
3870	**Pump speed min**
3871	**Pump speed max**

Pump speed min — The minimum speed for all solar pumps can be selected.

Pump speed max — The maximum speed for all solar pumps can be selected.

Yield measurement

Line no.	*Operating line*
3880	**Antifreeze**
3881	**Antifreeze concentration**
3884	**Pump capacity**

The 24-hour and total solar energy yield (operating lines 8526 and 8527) is calculated, based on these data.

Antifreeze — Since the mixing ratio of the collector medium has an impact on heat transmission, the type of antifreeze used and its concentration must be entered in order to be able to determine the energy yield.

Pump capacity — The flow rate in l/h of the pump used must be determined and serves for calculating the volume delivered.

6.14 Solid fuel boiler

Operating mode

Line no.	*Operating line*
4102	**Locking other heat sources**

Locking other heat sources — When the solid fuel boiler is put into operation, other heat sources, such as oil / gas boilers, will be locked.
Locking takes place as soon as the boiler temperature rises to a degree that crossing of the comparison temperature can be expected.
This anticipating function enables the locked heat sources to terminate any overrun of pumps before the solid fuel boiler pump is activated. Also, in the case of a common stack, it can be made certain that only one boiler is in operation at a time.

Setpoints

Line no.	*Operating line*
4110	**Setpoint min**

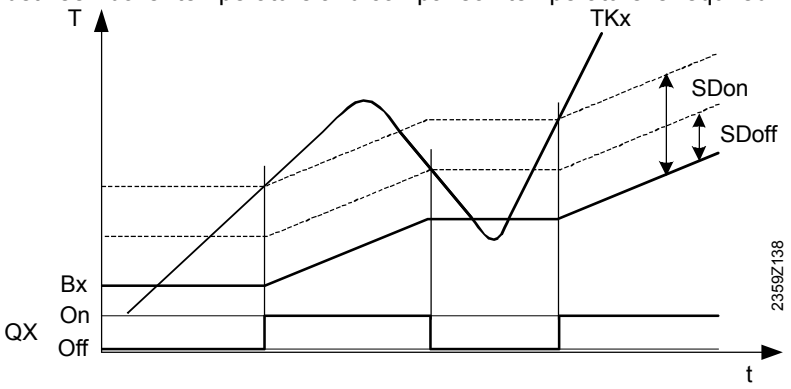
Setpoint min — The boiler pump will be put into operation only when the boiler temperature has reached a minimum temperature level, in addition to the required temperature differential.

Boiler / burner control

Line no.	*Operating line*
4130	**Temp diff on**
4131	**Temp diff off**
4133	**Comparative temp** DHW sensor B3 DHW sensor B31 Buffer sensor B4 Buffer sensor B41 Flow temp setpoint Setpoint min

Delta T-controller

For the boiler pump to be put into operation, a sufficiently great temperature differential between boiler temperature and comparison temperature is required.



TKx	Boiler temperature
Bx	Actual value of comparison temperature
On / Off	Boiler pump
SDon	Temp diff on
SDoff	Temp diff off

6.15 Buffer storage tank

Automatic locks

Line no.	*Operating line*
4720	**Auto generation lock** None With B4 With B4 and B41 / B42
4722	**Temp diff buffer/HC**
4724	**Min st tank temp heat mode**

Automatic heat generation lock ensures a temporary hydraulic disconnection of heat source and buffer storage tank. The heat sources will be put into operation only if the buffer storage tank is no longer able to satisfy the current demand for heat.
The minimum temperature differential between buffer storage tank and heating circuit can be adjusted.

Min st tank temp heat mode

If the actual temperature of the buffer storage tank falls below this level, the heating circuits are shut down if no heat source is available.

Overtemperature protection

Line no.	*Operating line*
4750	**Charging temperature max**

Solar energy charges the buffer storage tank up to the adjusted maximum charging temperature.

The protective collector overtemperature function can reactivate the collector pump until the maximum storage tank temperature is reached.

Recooling

Line no.	*Operating line*
4755	**Recooling temp**
4756	**Recooling DHW/HCs**
4757	**Recooling collector** Off Summer Always

2 functions are available for recooling the buffer storage tank down to the recooling temperature.

Recooling DHW/HCs

- Heating energy can be drawn off either by space heating or the DHW storage tank. This can be selected separately for each heating circuit (operating page heating circuit 1…).

Recooling collector

- If the collector is cold, the energy can be emitted to the environment via the collector's surfaces.

Plant hydraulics

Line no.	*Operating line*
4783	**With solar integration**

Select here whether the buffer storage tank can be charged by solar energy.

Return diversion

Line no.	*Operating line*
4790	**Temp diff on return div**
4791	**Temp diff off return div**
4795	**Compar temp return div** B4 ¦ B41 ¦ B42
4796	**Optg action return diversion** Temp decrease Temp increase

If there is a certain temperature differential between the common return temperature sensor (B73) and the selectable comparative temperature, the return is diverted through the lower section of the buffer storage tank. The function can be used for a **return temperature increase** or **return temperature decrease** (to be selected on operating line 4796). This is defined on operating line 4796.

.

In addition, the setting of the respective relay output is to be made as "Buffer diverting valve Y15" in configuration "Relay output QX1, 2 ,3, 4" (operating lines 5890, 5891, 5892 and 5894) and the common return temperature sensor (B73) at BX.

Temp diff on/off return div

The selected temperature differential defines the switch-on / off point of return diversion.

Compar temp return div

Selection of the buffer storage tank temperature sensor with which the return temperature is compared in order to switch the return diversion based on the selected temperature differentials.

Optg action return diversion

Temperature decrease

If the consumers' return temperature is higher than the temperature at the selected sensor (operating line 4795), the return can be used to preheat the lower storage tank section. As a result, the return temperature drops further which, in the case of a condensing boiler, leads to higher efficiency.

Temperature increase

If the consumers' return temperature is lower than the temperature at the selected sensor (operating line 4795), the return temperature can be raised by diverting the return through the lower storage tank section. As a result, the return temperature increases.

Partial charging

Line no.	*Operating line*
4800	**Partial charging setpoint**

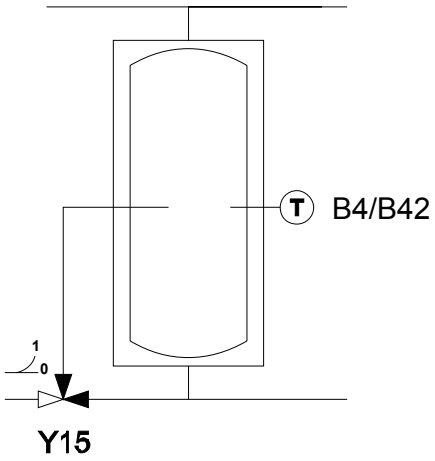
By hydraulically decoupling the lower buffer storage tank section, the chargeable storage volume is reduced. As a result, the upper storage tank section is charged in a shorter period of time. The lower storage tank section is only charged when charging of the upper section is completed.

As soon as the temperature acquired by the temperature sensor (B4/B42) reaches the setpoint of partial charging, the diverting valve change over to “through-port” and the rest of the storage tank is charged also.
For changeover, a fixed switching differential of ¼ °C is used.

If the slave pointer is higher than the adjusted setpoint of partial charging, charging to the slave pointer value takes place.

Configuration:

Extra function QX… (operating lines 5890…5894)	Return diverting valve Y15 in the buffer storage tank
Sensor input BX… (operating lines 5930…5933)	Buffer storage tank sensor B4 or B42



Full charging

Line no.	*Operating line*
4810	**Full charging** Off ¦ Heating mode ¦ Always
4811	**Full charging temp min**
4813	**Full charging sensor** With B4 ¦ With B42/B41

Full charging

To ensure long on times, the heat source keeps operating until the buffer storage tank is fully charged.

Off: Function is deactivated.

Heating mode: Full charging only when there is a request for heat

Always: Full charging also when there is no request for heat

Full charging temp min

The buffer storage tank is fully charged until the slave pointer setpoint is reached, or at least to the temperature level set here.

Full charging sensor

Select the type of buffer storage tank sensor for full charging.

6.16 DHW storage tank

Charging control

Line no.	*Operating line*
5020	**Flow setpoint boost**
5021	**Transfer boost**
5022	**Type of charging** With B3 With B3 and B31 With B3, legio B3 and B31

Flow setpoint boost

The DHW request to the boiler is made up of the current DHW setpoint plus the adjustable charging increase.

Increase of transfer boost

Heat transfer makes it possible to transport energy from the buffer storage tank to the DHW storage tank. In that case, the actual buffer storage tank temperature must be higher than the actual temperature of the DHW storage tank.
The temperature differential can be set here.

Type of charging

The storage tank can be charged using up to 2 sensors.
It is also possible to combine partial charging with 1 sensor and the legionella function with 2 sensors (setting 3).

Overtemperature protection

Line no.	*Operating line*
5050	**Charging temp max**

Solar energy charges the DHW storage tank up to the adjusted maximum DHW charging level.

The protective collector overtemperature function can reactivate the collector pump until the maximum storage tank temperature is reached.

Recooling

Line no.	*Operating line*
5055	**Recooling temp**
5056	**Recooling heat gen/HCs**
5057	**Recooling collector** Off Summer Always

For recooling the DHW storage tank, there are 2 functions available:

Recooling heat gen/HCs

- Heating energy can be drawn off either by space heating or the DHW storage tank. This can be selected separately for each heating circuit (operating page heating circuit 1…).

Recooling collector

- If the collector is cold, the energy can be emitted to the environment via the collector's surfaces.

Electric immersion heater

Line no.	*Operating line*
5060	**El imm heater optg mode** Substitute Summer Always
5061	**El immersion heater release** 24 h/day DHW release Time program 4/DHW

5062	**EI immersion heater control** External thermostat DHW sensor

Electric immersion heater operating mode

Substitute

The electric immersion heater is only used if the boiler delivers a fault status message or has been shut down via boiler lock. This means that in normal situations the DHW is always heated by the boiler.

Summer

The electric immersion heater is used as soon as all connected heating circuits have switched to summer operation. The DHW is again heated by the boiler as soon as at least one of the heating circuits has switched back to heating operation. But the electric immersion heater is also used if the boiler delivers a fault status message or has been shut down via boiler lock.

Always

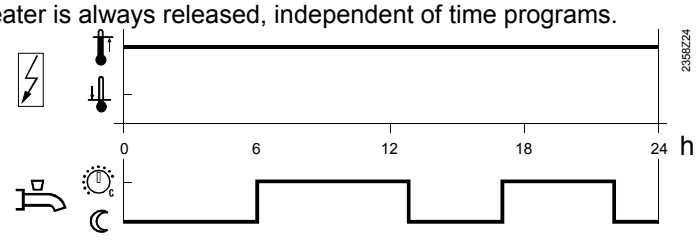
DHW is heated with the electric immersion heater throughout the year. This means that when using this application, the boiler is never required for DHW heating.

Electric immersion heater release

24 h/day

The electric immersion heater is always released, independent of time programs.

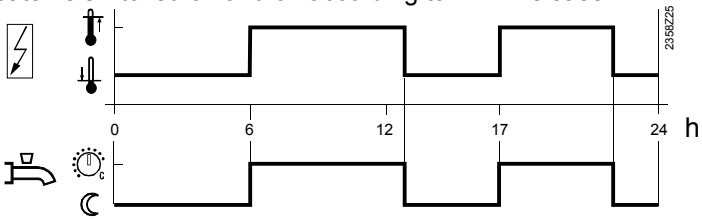
Example:



DHW release

The electric immersion heater is switched on and off according to DHW release.

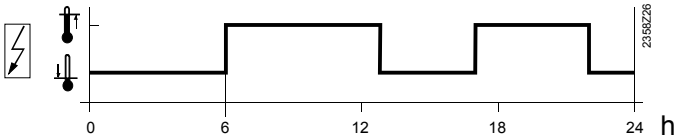
Example:



Time program 4/DHW

For the electric immersion heater, time program 4 / DHW of the local controller is taken into account.

Example:



EI immersion heater control

External thermostat

The storage tank is charged with an external thermostat without setpoint compensation of the controller.

DHW sensor

The storage tank is charged with an external thermostat, but with setpoint compensation of the controller.

Important: To ensure that setpoint compensation works correctly, the external thermostat must be set to its minimum setting value.

Plant hydraulics

Line no.	*Operating line*
5090	**With buffer storage tank**
5092	**With prim contr/system pump**
5093	**With solar integration**

With buffer storage tank

If a buffer storage tank is used, it is to be entered here whether the DHW storage tank receives its heat from the buffer storage tank or directly from the boiler.
When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

It is to be set whether the DHW storage tank receives its heat via the primary controller or with the help of the system pump (depending on the type of plant).

With solar integration

It is to be set whether the DHW storage tank receives its heat from the solar collectors.

Speed-controlled pump

Line no.	*Operating line*
5101	**Pump speed min**
5102	**Pump speed max**

Pump speed min

The minimum speed of the heating circuit pump can be defined. It is thus possible to negate the lowest pump speeds, which can no longer be correctly controlled.

Pump speed max

The minimum speed of the heating circuit pump can be defined. It is thus possible to disable the highest pump speeds, if required.

6.17 Instantaneous DHW heater

Setpoints

Line no.	*Operating line*
5406	**Min setp diff to tank temp**

The maximum DHW temperature setpoint controlled is the current storage tank temperature minus the adjustable setpoint differential.

Mixing valve control

Line no.	*Operating line*
5544	**Actuator running time**

Actuator running time

Setting the running time of the actuator used with the mixing valve.

6.18 Configuration

Heating circuits 1 and 2

Line no.				Operating line
HC1	HC2			
5700	**5710**			**Heating circuit 1, 2**

Using this setting, the heating circuits can be switched on and off.

DHW sensor B3

Line no.	Operating line
5730	**DHW sensor B3** Sensors Thermostat

Sensors
The collector calculates the switching points including the switching differential from the DHW setpoint and the acquired DHW storage tank temperature.
Thermostat
The DHW temperature is controlled based on the switching state of a thermostat connected to B3.

When using a DHW thermostat, Reduced mode is not possible. This means that when Reduced mode is active, DHW heating with the thermostat is locked.

- The adjustment of the nominal DHW temperature setpoint must be equal to or higher than the setpoint adjustment on the thermostat (thermostat calibrated at switch-off point)
- The flow temperature setpoint for DHW must be set to a minimum of 10 °C (has an impact on the charging time).
- In that case, the DHW is not protected against frost.

DHW controlling element Q3

Line no.	Operating line
5731	**DHW control element Q3** None Charging pump Diverting valve

None
No DHW charging via Q3.

Charging pump
The DHW is heated up with a pump connected to terminals Q3 / Y3.

Diverting valve
The DHW is heated up with a diverting valve connected to terminals Q3 / Y3. With this setting, pump Q2 becomes a boiler pump, provided the boiler pump is not yet defined for use at a multifunctional relay output QX...

Separate circuit

Line no.	Operating line
5736	**Separate circuit**

The separate circuit can only be employed if a boiler cascade is used.

- OFF: The separate circuit is switched off. Every boiler in use can charge the DHW storage tank
- ON: The separate circuit is switched on. DHW charging takes place exclusively via the boiler defined for that purpose.

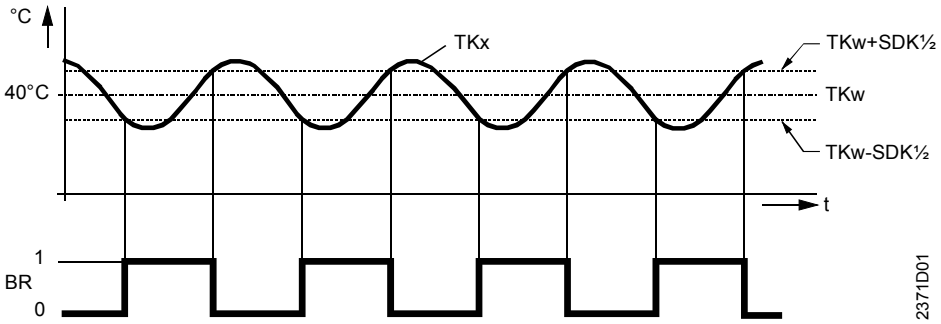
For the separate circuit, DHW controlling element Q3 must be set to “Diverting valve”!

Boiler

Line no.	*Operating line*
5770	**Source type** 1-stage 2-stage Modulating 3-position Modulating UX Without boiler sensor 2 x 1 cascade

1-stage

In the case of a 1-boiler plant, the burner stage of the 1-stage boiler will be released as soon as a valid boiler temperature setpoint becomes active.



Connections:

	Use	*Space*	*Connector type*
L1	Live burner	P	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase 1st burner stage		
T2	1st burner stage on		
S3	Input burner fault		
4	Input 1st burner stage operating hours		

2-stage

If the required boiler temperature setpoint cannot be reached with the first burner stage, the second burner stage will be released (release integral satisfied). When the second burner stage is released, the first burner stage stays active, but setpoint control will be ensured by the second stage. The first stage can be switched off again only when the second stage is locked (reset integral satisfied).

Connections:

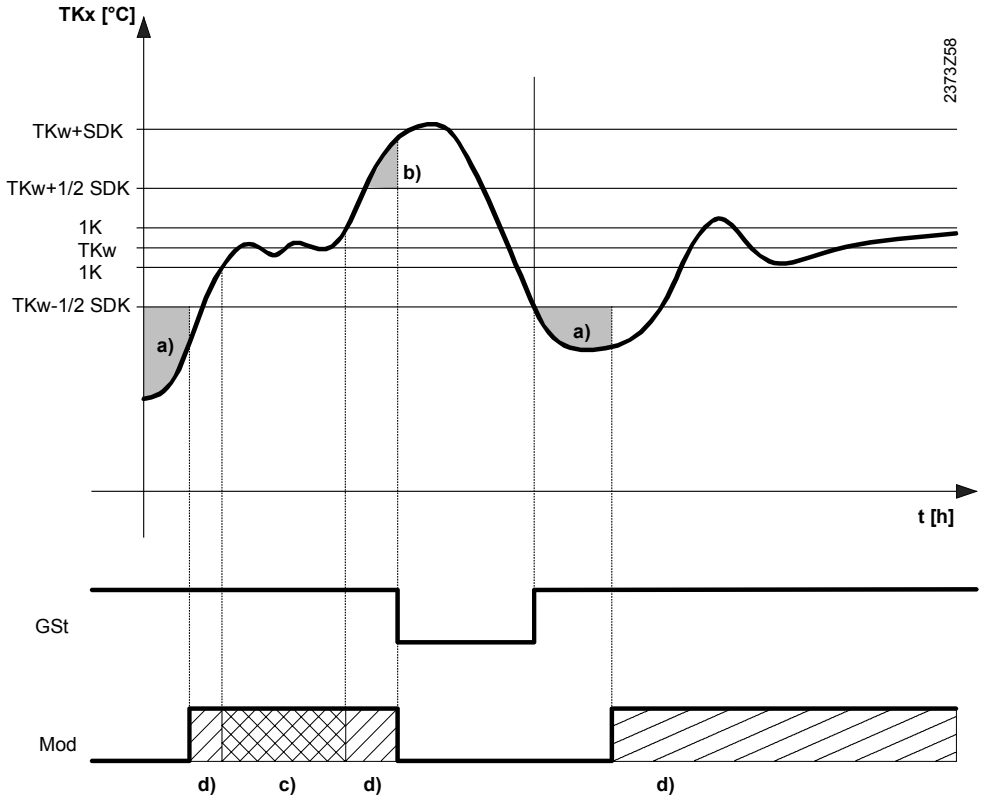
	Use	*Space*	*Connector type*
L1	Live burner	P	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase 1st burner stage		
T2	1st burner stage on		
S3	Input burner fault		
4	Input 1st burner stage operating hours		

	Use	*Space*	*Connector type*
EX2	Input 1st burner stage hours run	Z	AGP8S.04C/109
FX4 (T6)	Phase 2nd burner stage		
QX4 (T7)	2nd burner stage off		
QX4 (T8)	2nd burner stage on		

Modulating 3-position
Modulating UX

Boiler temperature control

The functioning and activation and deactivation of the first stage corresponds to that of 2-stage burner operation. Release of modulation is analogous to the release of burner stage 2.
Deactivation or locking of modulation takes place at the same time the change from the first burner stage to cycling occurs.
Maximum limitation of the boiler temperature, minimum burner running time, cascade operation and DHW separation circuit are handled analogous to 2-stage burner operation.



Release integral modulation
a) Release integral modulation (release integral second stage “2-stage burner”)
b) Reset integral modulation (reset integral second stage “2-stage burner”)
c) Neutral zone
d) On / off pulses
GSt Basic stage
Mod Modulating stage
SDK Switching differential boiler
TKw Boiler temperature setpoint

Burner control

- 3-position control and modulating UX

The actuator is controlled in PID mode. By setting the proportional band (Xp), the integral action time (Tn) and the derivative action time (Tv), the controller can be matched to the type of plant (controlled system). Also, the actuator running time is to be set.

- Neutral zone

For control operation, a neutral zone is used which is at +/- 1K about the current boiler temperature setpoint. If the boiler temperature stays in the neutral zone for more than 16 seconds, the neutral zone becomes active and positioning pulses are no longer delivered. As soon as the boiler temperature leaves the neutral zone again, control is resumed. If the boiler temperature does not stay long enough in the neutral zone, positioning pulses will also be delivered within the neutral zone.

3-position connections:

	Use	*Space*	*Connector type*
L1 ⏚ N T1 T2 S3 4	Live burner Protective earth Neutral conductor Phase release modulating burner Release modulating burner Input burner fault Input burner hours run	P	AGP8S.07A/109
QX1	Air damper modulating burner closing	U	AGP8S.03C/109
FX4 (T6) QX4 (T8)	Phase air damper modulating burner opening Air damper modulating burner opening	Z	AGP8S.04C/109

Connections modulating UX:

	Use	*Space*	*Connector type*
L1 ⏚ N T1 T2 S3 4	Live burner Protective earth Neutral conductor Phase release modulating burner Release modulating burner Input burner fault Input burner hours run	P	AGP8S.07A/109
UX M	DC 0…10 V modulation output Ground	n	AGP4S.02F/109

Without boiler sensor

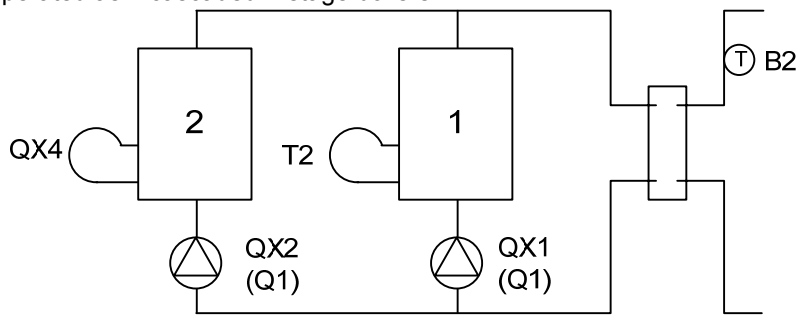
The boiler is released as soon as a valid boiler temperature setpoint is active.

Connections:

	Use	*Space*	*Connector type*
L1 ⏚ N T1 T2 S3 4	Live burner Protective earth Neutral conductor Phase boiler release Boiler release Input burner fault Input 1st burner stage operating hours	P	AGP8S.07A/109

2 x 1 cascade

The 2x1 cascade is a special configuration of the basic unit, where the 2-stage boiler is operated as 2 cascaded 1-stage boilers.



Due to the temperature differential between boiler temperature setpoint and boiler temperature sensor B2 (common, mandatory cascade flow temperature sensor), switching on / off of the lag boiler (release and reset integral) takes place according to the control of a 2-stage burner. The same parameters are used.

If a boiler pump is required, QX1 and QX2 (operating lines 5890 and 5891) must be appropriately set.
A common boiler pump can be operated at any other multifunctional relay output QX parameterized as boiler pump Q1. The boiler pump of the lead boiler is always mapped on these outputs.

With the configuration of the 2x1 cascade (parameter “Type of heat source”), the following outputs and functions will be ready used or assigned.

	Use	*Space*	*Connector type*
L1	Live burner	P	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase burner 1		
T2	Burner 1 on		
S3	Input burner fault		
4	Input burner 1 hours run		
EX2	Input burner 2 hours run	Z	AGP8S.04C/109
FX4 (T6)	Phase burner 2		
$\overline{QX4}$ (T7)	Burner 2 off		
QX4 (T8)	Burner 2 on		

Solar

Line no.	*Operating line*
5840	**Solar controlling element** Charging pump Diverting valve
5841	**External solar exchanger** Jointly DHW storage tank Buffer

Solar controlling element

In place of a collector pump and diverting valves for integrating the storage tanks, the solar plant can also be operated with charging pumps.

When using a diverting valve, it is always only one heat exchanger that can be used at a time. Only alternative operation is possible.
When using a charging pump, all heat exchangers can be used at the same time. Either parallel or alternative operation is possible.

External solar exchanger

In the case of solar plants with 2 storage tanks, it must be selected whether the external heat exchanger shall be used jointly for DHW and as a buffer storage tank, or exclusively for one of the two.

Output relay QX

Line no.	*Operating line*
5890 **5891** **5892** **5894**	**Relay output QX1, QX2, QX3, QX4** None Circulating pump Q4 El imm heater DHW K6 Collector pump Q5 H1 pump Q15 Boiler pump Q1 Bypass pump Q12 Alarm output K10 2nd pump speed HC1 Q21 2nd pump speed HC2 Q22 2nd pump speed HCP Q23 Heat circ pump HCP Q20 H2 pump Q18 System pump Q14 Heat gen shutoff valve Y4 Solid fuel boiler pump Q10 Time program 5 K13 Buffer return valve Y15 Solar pump ext exch K9 Solar ctrl elem buffer K8 Solar ctrl elem swi pool K18 Collector pump 2 Q16 H3 pump Q19 Flue gas relay K17 Assisted firing fan K30 Cascade pump Q25 St tank transfer pump Q11 DHW mixing pump Q35 DHW interm circ pump Q33 Heat request K27

Depending on the selection made, setting of the relay outputs assigns appropriate extra functions to the basic diagrams. For detailed information, see “Application diagrams“.

Multifunctional output QX4 can be used only if operating line "Source type" (operating line 5770) is set to "1-stage", "Modulating UX" or "Without boiler sensor".

DHW circulating pump Q4
The connected pump serves as a DHW circulating pump.
Operation of the pump can be scheduled as required on operating page “DHW”, operating line “Release circulating pump”.

DHW electric immersion heater K6
Using the connected electric immersion heater, the DHW can be heated up according to operating page “DHW storage tank“, operating line “Electric immersion heater“.

The electric immersion heater must be equipped with a safety limit thermostat!

Operating line 5060 of the electric immersion heater’s operating mode must be appropriately set.

Collector pump Q5
When using a solar collector, a circulating pump for the collector circuit is required.

Pump H1 Q15
Pump H1 can be used for an additional consumer. Together with an external request for heat at input H1, it is possible to operate an air heater or similar.

Boiler pump Q1
The connected pump is used for circulating the boiler water.

Bypass pump Q12
The pump connected serves as a boiler bypass pump for maintaining the boiler return temperature.

Alarm output K10
The alarm relay signals faults, should they occur.
Switching on takes place with a delay of 2 minutes.
When the fault is corrected, that is, when the error message is no longer present, the relay will be deenergized with no delay.
If the fault cannot immediately be corrected, it is still possible to reset the alarm relay. This is made on operating page “Faults“.

2nd pump speed
This function facilitates the control of a 2-speed heating circuit pump, allowing the pump’s capacity to be lowered in Reduced mode (e.g. during night setback). In that case, multifunctional relay QX is used to activate the 2nd pump speed in the following manner:

1st speed output Q2/Q6/Q20	2nd speed Output Q21/Q22/Q23	Pump state
Off	Off	Off
On	Off	Part load
On	On	Full load

Heating circuit pump HCP Q20
Pump heating circuit P will be activated.
- Time program

For heating circuit P, only time program 3/HCP is available. For more detailed information, refer to section "Time program".

H2 pump Q18
Pump H2 can be used for an additional consumer. Together with an external demand for heat at input H2, it is possible to serve an air heater or similar.

System pump Q14
The connected pump serves as a system pump for supplying heat to other consumers. The system pump is put into operation as soon as one of consumers calls for heat. If there is no demand for heat, the pump will be deactivated followed by overrun.

Heat gen shutoff valve Y4
If the buffer storage tank holds a sufficient amount of heat, the consumers can draw their heat from it, and the heat sources need not be put into operation.
Automatic heat generation lock locks the heat sources and hydraulically disconnects them from the rest of the plant with the help of heat source shutoff valve Y4.
This means that the heat consumers draw their energy from the buffer storage tank and wrong circulation through the heat sources will be eliminated.

Solid fuel boiler pump Q10
For the connection of a solid fuel boiler, a circulating pump for the boiler circuit is required.

Time program 5 K13
The relay is controlled according to the settings made in time program 5.

Buffer return valve Y15
This valve must be configured for return temperature increase / decrease or partial charging of the buffer storage tank.

Solar pump ext exch K9
For the external heat exchanger, solar pump “Ext heat exchanger K9“ must be set at the multifunctional relay output (QX).
If both a DHW and a buffer storage tank are available, operating line 5841 “External solar heat exchanger“ must also be set.

Solar ctrl elem buffer K8
If several heat exchangers are used, the buffer storage tank must be set at the respective relay output and, in addition, the type of solar controlling element must be defined on operating line 5840).

Solar ctrl elem swi pool K18
If several heat exchangers are used, the swimming pool must be set at the respective relay output and, in addition, the type of solar controlling element must be defined on operating line 5840).

Collector pump 2 Q16
When using a second solar collector, a separate circulating pump for this collector circuit is required.

H3 pump Q19
Pump H2 can be used for an additional consumer. Together with an external demand for heat at input H2, it is possible to serve an air heater or similar.

Flue gas relay K17
If the flue gas temperature exceeds the level set on operating line 7053 "Flue gas temperature limit", relay K17 closes.

Assisted firing fan K30
This setting has no function.

Cascade pump Q25
Common boiler pump for all boilers in a cascade.

St tank transfer pump Q11
If the temperature level of the buffer storage tank is high enough, the DHW storage tank can be charged by the buffer. This transfer can be made by means of transfer pump Q11.

DHW mixing pump Q35
Separate pump for storage tank circulation during the time the legionella function is active.

DHW interm circ pump Q33
Charging pump with DHW storage tank using an external heat exchanger.

Heat request K27
As soon as there is demand for heat, output K27 is activated.

Input sensor BX

Line no.	*Operating line*
5930,5931, 5932, 5933	**Sensor input BX1, 2, 3, 4** None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solar flow sensor B63 Solar return sensor B64

Depending on the selection made, setting of the sensor input assigns appropriate extra functions to the basic diagrams. For detailed information, refer to section “Application diagrams“.

Input H1/H3

Line no.	*Operating line*
5950	**Function input H1** Optg mode changeover HCs+DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HCP Heat generation lock Error/alarm message Min flow temp setpoint Excess heat discharge Release swimming pool Heat request 10V Pressure measurement 10V
5951	**Contact type input H1** NC NO
5952	**Min flow temp setpoint H1**
5954	**Temp value 10V H1**
5956	**Pressure value 3.5V H1**

5960	**Function input H3** Optg mode changeover HCs+DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HCP Heat generation lock Error/alarm message Min flow temp setpoint Excess heat discharge Release swimming pool Heat request 10V Pressure measurement 10V
5961	**Contact type H3** NC NO
5962	**Min flow temp setpoint H3**
5964	**Temp value 10V H3**
5966	**Pressure value 3.5V H3**

Input H1/H3

Changeover of operating mode

- Heating circuit

The operating modes of the heating circuits are switched to Protection mode via terminals H1/H3 (e.g. using a remote telephone switch).

- DHW

DHW heating is locked only when using setting 1: HCs+DHW.

Heat generation lock

The heat source will be locked via terminals H1/H3.
All temperature requests made by the heating circuits and by DHW will be ignored.
Frost protection for the boiler will be maintained.

The chimney sweep function can be activated although the heat generation lock is switched on.

Error/alarm message

Input H1 generates a controller-internal error message.
If the “Alarm output” (relay outputs QX2-4, operating lines 5891 – 5894) is appropriately configured, the error message will be forwarded or displayed by an additional contact (e.g. an external lamp or horn).

Minimum flow temperature setpoint TVHw

The adjusted minimum flow temperature setpoint will be activated via terminals H1/2 (e.g. an air heater function for a warm air curtain) closes its contact.

Excess heat discharge

Active dissipation of excessive heat enables an external heat source to force consumers (heating circuit, DHW storage tank, Hx pump) to draw excessive heat by delivering a forced signal.
Using parameter “Excessive heat draw“, it is possible to select for every consumer whether or not the forced signal shall be considered, thus deciding whether or not the consumer shall contribute to the dissipation of heat.

- Local effect

When using LPB device address 0 or >1, excessive heat dissipation only acts on the local consumers connected to the controller.

- Central effect (LPB)

When using LPB device address = 1, excessive heat dissipation also acts on the consumers connected to the other controllers in the same segment.
The distribution of excessive heat from segment 0 across other segments of the system is not possible.

Temperature value
Heat generation receives heat requests in the form of voltage signals (DC 0...10V).
The associated setpoint is to be adjusted on operating line 5954.

Pressure measurement
The voltage signal present at input H1 is converted to a pressure value in a linear manner.
The pressure value at 0.5 V is fixed at 0 bar.
The pressure value at 3.5 V can be adjusted using the parameter *Pressure value 3.5 V H1* (operating line 5956).

Input H1/H3

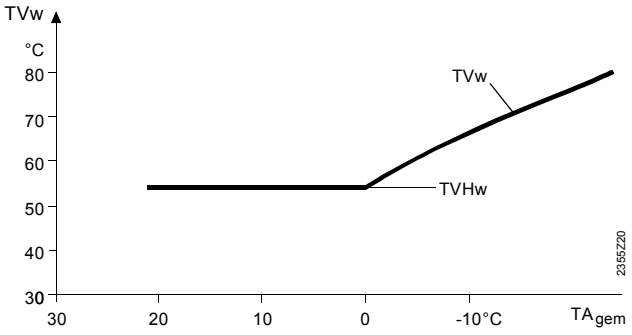
NC
The contact is normally closed and must be opened to activate the selected function.

NO
The contact is normally open and must be closed to activate the selected function.

Minimum flow temperature setpoint H1/H3

Function “Min flow temp setpoint” on operating line 5950 is activated via contact H1.
The boiler maintains the temperature level set here until contact H1 opens again or until a higher heat request is received.

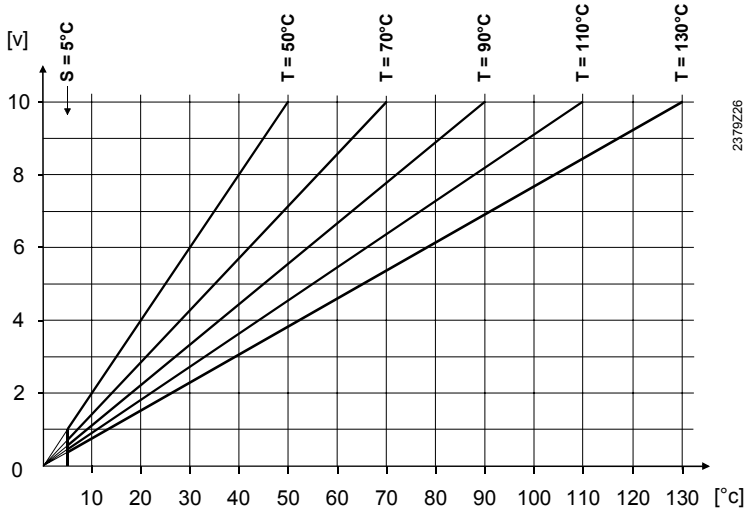
If several heat requests are received at the same time (LPB, contact H1, DHW, or from the controller itself), the highest of them will automatically be selected.



TVHw Minimum flow temperature setpoint
TVw Flow temperature setpoint

Heat request 10V H1/H3

The voltage signal present at input H1/H3 is converted to a temperature value in a linear manner and then forwarded as the flow temperature setpoint.
The flow temperature setpoint corresponding to the voltage level of 10 V can be adjusted with parameter “Heat request 10V H1/H2“.

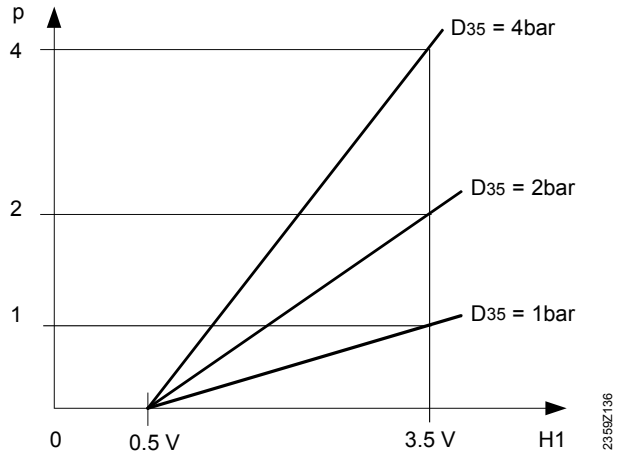


T = maximum value of heat request
S = minimum limitation of heat request = 5 °C

Pressure value 3.5V H1/H3

The voltage signal present at input H1/H2 is converted to a pressure value in a linear manner.
The pressure value at 3.5 V can be adjusted with parameter ”Pressure value 3.5V H1/2”.

Example:



p Pressure value (bar)
H1 Voltage to H1/H3

Input EX2

Line no.	*Operating line*
5982	**Function input EX2** Counter for second burner stage Heat generation lock Error/alarm message SLT error message Excess heat discharge
5983	**Cont type input EX2** NC NO

Function input EX2

Counter for second burner stage
The counting values (hours run and number of starts) for the second burner stage are recorded based on the signal received at input EX2. If the function is not activated, the counting values are counted based on the state of relay K5 .

Heat generation lock
The heat source will be locked via terminals EX2.

All temperature requests made by the heating circuits and by DHW will be ignored. Frost protection for the boiler will be maintained.

The chimney sweep function can be activated although the heat generation lock is switched on.

Error/alarm message
Input EX2 generates a controller-internal error message.
If the “Alarm output” (relay outputs QX2-4, operating lines 5891 – 5894) is appropriately configured, the error message will be forwarded or displayed by an additional contact (e.g. an external lamp or horn).

SLT error message
The input generates error message 110.

Excess heat discharge
Active dissipation of excessive heat enables an external heat source to force consumers (heating circuit, DHW storage tank, Hx pump) to draw excessive heat by delivering a forced signal.
Using parameter “Excessive heat draw“, it is possible to select for every consumer whether or not the forced signal shall be considered, thus deciding whether or not the consumer shall contribute to the dissipation of heat.

- Local effect

When using LPB device address 0 or >1, excessive heat dissipation only acts on the local consumers connected to the controller.

- Central effect (LPB)

When using LPB device address = 1, excessive heat dissipation also acts on the consumers connected to the other controllers in the same segment.

The distribution of excessive heat from segment 0 across other segments of the system is not possible.

Mixing valve groups basic unit

Line no.	*Operating line*
6014 **6015**	**Function mixing group 1** Heating circuit 1/2 Return temp controller Primary controller / system pump DHW primary controller Instantaneous DHW heater Return controller cascade

The following connections are assigned to the mixing groups

Mixing valve group 1	Mixing valve group 2
Q2, Y1, Y2, B1	Q6, Y5, Y6, B12

Heating circuit 1/2
For this application, the respective settings of operating page “Heating circuit 1/2” can be adapted.

Return temp controller
For this application, the respective settings of operating page “Boiler” can be adapted.

Primary controller / system pump
For this application, the respective settings of operating page “Primary controller / system pump” can be adapted.

DHW primary controller
For this application, the respective settings of operating page “DHW storage tank” can be adapted.

Instantaneous DHW heater
For this application, the respective settings of operating page “Instantaneous DHW heater” can be adapted.

Return controller cascade
For this application, the settings of operating page “Cascade” can be adapted.

Extension module

6020, 6021	**Function extension module 1, 2** None Multifunctional Heating circuit 2 Return temp controller Solar DHW Primary controller / system pump DHW primary controller Instantaneous DHW heater Return controller cascade

Multifunctional
Functions that can be assigned to the multifunctional inputs / outputs appear on operating lines 6030, 6031, 6032 and 6040, 6041.

Heating circuit 2
For this application, the settings of operating page “Heating circuit 2” can be adapted.

Return temp controller
For this application, the settings of operating page “Boiler” can be adapted.

Solar DHW
For this application, the settings of operating page “Solar” can be adapted.

Primary controller / system pump
For this application, the settings of operating page “Primary controller / system pump” can be adapted.

DHW primary controller
For this application, the settings of operating page “DHW storage tank” can be adapted.

Instantaneous DHW heater
For this application, the settings of operating page “Instantaneous DHW heater” can be adapted.

Return controller cascade

For this application, the respective settings of operating page “Cascade” can be adapted.

Connections:

Terminal	QX21	QX22	QX23	BX21	BX22	H2	Page
Multifunction	*	*	*	*	*	*	
Heating circ.2	Y5	Y6	Q6	B12	*	*	**140**
Return temp controller	Y7	Y8	Q1	B7	*	*	140
Solar DHW heating	*	*	Q5	B6	B31	*	140
Primary controller	Y19	Y20	Q14	B15	*	*	140
DHW primary controller	Y31	Y32	Q3	B35	*	*	141
Instantaneous DHW heater	Y33	Y34	Q34	B38	B39	Flow switch	141
Return contr. cascade	Y25	Y26	Q25	B70	B10	*	141

* Free selectable in QX…/ BX...

QX extension module

Can be configured for freely selectable QX…/ BX...

Line no.	*Operating line*
6030 **6031** **6032**	**Relay output QX21, QX22, QX23** None Circulating pump Q4 El imm heater DHW K6 Collector pump Q5 H1 pump Q15 Boiler pump Q1 Bypass pump Q12 Alarm output K10 2nd pump speed HC1 Q21 2nd pump speed HC2 Q22 2nd pump speed HCP Q23 Heat circuit pump HCP Q20 H2 pump Q18 System pump Q14 Heat gen shutoff valve Y4 Solid fuel boiler pump Q10 Time program 5 K13 Buffer return valve Y15 Solar pump ext exch K9 Solar ctrl elem buffer K8 Solar ctrl elem swi pool K18 Collector pump 2 Q16 H3 pump Q19 Flue gas relay K17 Assisted firing fan K30 Cascade pump Q25 St tank transfer pump Q11 DHW mixing pump Q35 DHW interm circ pump Q33 Heat request K27

Refer to function description, operating line "Relay output QX1".

BX extension module

Can be configured for freely selectable QX…/ BX...

Line no.	*Operating line*
6040	**Sensor input BX21, BX22**
6041	None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solar flow sensor B63 Solar return sensor B64

Refer to function description, operating line "Sensor input BX1".

H2 extension module

Line no.	*Operating line*
6046	**Function input H2** Optg mode changeover HCs+DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HCP Heat generation lock Error/alarm message Min flow temp setpoint Excess heat discharge Release swimming pool Heat request 10V Pressure measurement 10V
6047	**Contact type H2** NC NO
6048	**Min flow temp setpoint H2**
6050	**Temp value 10V H2**
6052	**Pressure value 3.5V H2**

Refer to function description, operating line "Function input H1".

10V output UX

Line no.	*Operating line*
6070	**Function output UX** None Boiler pump Q1 DHW pump Q3 DHW interm circ pump Q33 Heat circ pump HC1 Q2 Heat circ pump HC2 Q6 Heat circ pump HCP Q20 Collector pump Q5 Solar pump ext exch K9 Solar pump buffer K8 Solar pump swi pool K18 Collector pump 2 Q16 Boiler setpoint Output setpoint Heat request

6071	**Signal logic output UX** Standard Inverted
6075	**Temp value 10V UX**

Function output UX

The voltage-modulated output can be used either for speed-controlled pumps or as an output for a voltage-proportional temperature request.

Signal logic output UX

The voltage signal can be inverted. Thus, it can also be used to control pumps with variable speeds, or temperature request receivers that use inverted signal logic.

Temperature value 10V UX

This operating line is used to define the maximum temperature request (corresponding to 10 V).

Types of sensors/readjustments

Line no.	*Operating line*
6097	**Sensor type collector** NTC 10k Platinum 1000
6098	**Readjustm collector sensor**
6099	**Readjustm coll sensor 2**
6101	**Sensor type flue gas temp** NTC 10k Platinum 1000
6102	**Readjustm flue gas sensor**

Sensor type collector

Selection of type of sensor used. The controller will use the respective temperature characteristic.

Readjustm collector sensor

The measured value can be corrected.

Building and room model

Line no.	*Operating line*
6110	**Time constant building**

When the outside temperature varies, the room temperature changes at different rates, depending on the building's thermal storage capacity.
The above setting is used to adjust the response of the flow temperature setpoint when the outside temperature varies.

- Example:

> > 20 hours
The room temperature will respond *slower* to outside temperature variations.

10 - 20 hours
This setting can be used for most types of buildings.

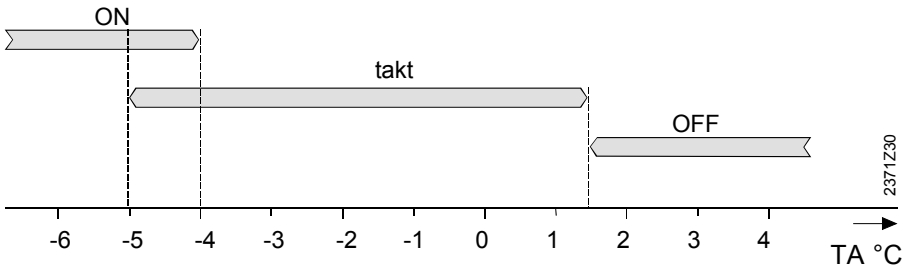
< 10 hours
The room temperature will respond *quicker* to outside temperature variations.

Frost protection for the plant

Line no.	*Operating line*
6120	**Frost protection plant**

The pumps are activated depending on the **current** outside temperature, even if there is no heat request.

Outside temperature	Pump	Graph
...-4 °C	Continuously on	ON
-5…1.5 °C	ON for 10 minutes at 6-hour intervals	cycle
1.5 °C...	Continuously off	OFF



External requirements

Line no.	*Operating line*
6128	**Heat request below OT**
6129	**Heat request above OT**
6131	**Heat req in economy mode** Off ¦ On DHW ¦ On

Heat request below OT

The heat source (K27 with QX… or output UX) is put into operation only if the outside temperature lies below / above the threshold.

Heat req in economy mode

Economy mode can be selected from menu ”Special operation / service” (operating line 7139).
In Economy mode, the heat source (K27 with QX.. or output UX) operates as follows:
Off: Remains locked
Only DHW: Released for DHW charging
On: Always released

sensor state

Line no.	*Operating line*
6200	**Save sensors**

At midnight, the basic unit stores the states at the sensor terminals.
If, after storage, a sensor fails, the basic unit generates an error message.
This setting is used to ensure immediate saving of the sensors. This becomes a requirement when, for instance, a sensor is removed because it is no longer needed.

Parameter reset

Line no.	*Operating line*
6205	**Reset to default parameters**

All parameters can be reset to their default values. Exempted from this are the following operating pages: Time of day and date, operator section, radio communication and all time programs.

Plant diagram

Line no.	*Operating line*
6212	**Check no. heat source 1**
6213	**Check no. heat source 2**
6215	**Check no. storage tank**
6217	**Check no. heating circuits**

To identify the current plant diagram, the basic unit generates a check number. The check number is made up of the lined up part diagram numbers.

Structure of control number

Every control number consists of 3 columns, each representing the application of a plant component. Every column shows a number with a maximum of 2 digits. Exception is the first column. If the first digit in the first column is a 0, the 0 will be hidden.

1st column 2 digits	2nd column 2 digits	3rd column 2 digits
	Solar	Oil / gas boiler
	Solid fuel boiler	
	Buffer storage tank	DHW storage tank
Heating circuit P	Heating circuit 2	Heating circuit 1

Check no. heat source 1

	Solar					Oil / gas boiler					
	One collector field with sensor **B6** and collector pump **Q5**	Two collector fields with sensors B6, **B61** and collector pumps **Q5**, **Q16**	Storage charging pump buffer **K8**	Solar changeover valve buffer **K8**	Solar charging pump swimming pool **K18**	Solar changeover valve swimming pool **K18**	External solar exchanger solar pump **K9** DHW = domestic hot water, P = buffer	control number	1-stage burner	2-stage burner	Modulating burner	Boiler pump	Bypass pump	Return temp. controler
	0		No solar					00	No boiler					
	1						*	01	x					
	3						DHW/P	02		x				
	5		x					03	x			x		
	6			x				04		x		x		
	8		x				DHW +P	05	x				x	
	9			x			DHW /P	06		x			x	
	10		x				DHW	07	x			x	x	
	11			x			DHW	08		x		x	x	
	12		x				P	09	x			x		x
	13			x			P	10		x		x		x
	14				x			11			x			
	15					x		12			x	x		
	17				x		DHW /P	13			x		x	
	18					x	DHW /P	14			x	x	x	
	19		x		x			15			x	x		x
	20			x		x								
	22		x				DHW +P							
	23			x		x	DHW /P							
	24		x		x		DHW							
	25			x		x	DHW							
	26		x		x		P							
	27			x		x	P							
		31					*							
		33					DHW /P							
		35		x										
		37	x				DHW +P							
		38		x			DHW /P							
		39	x				DHW							
		40		x			DHW							
		41		x			P							
		42				x								
		44			x		DHW /P							
		45				x	DHW /P							
		46		x		x								
		48	x		x		DHW +P							
		49		x		x	DHW /P							
		50	x		x		DHW							
		51		x		x	DHW							
		52		x		x	P							

* The DHW storage tank is charged with collector pump Q5.

Check no. heat source 2

	Solid fuel boiler
0	No solid fuel boiler
1	Solid fuel boiler, boiler pump
2	Solid fuel boiler, boiler pump, integration DHW storage tank

Check no. storage tank

	Buffer storage tank	DHW storage tank
0	No buffer storage tank	No DHW storage tank
1	Buffer storage tank	Electric immersion heater
2	Buffer storage tank, solar	Solar connection

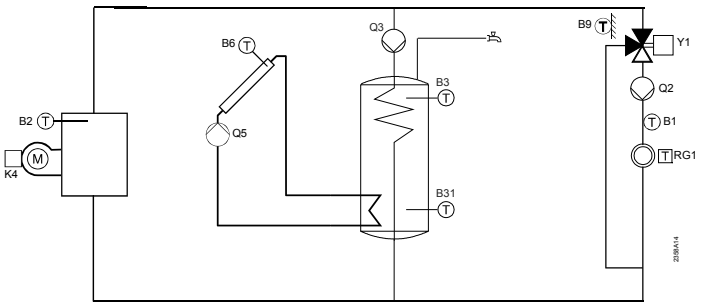
	connection 4 Buffer storage tank, heat source valve 5 Buffer storage tank, solar connection, heat source valve	4 Charging pump 5 Charging pump, solar connection 13 Diverting valve 14 Diverting valve, solar connection 16 Primary controller, without heat exchanger 17 Primary controller, 1 heat exchanger 19 Intermediate circuit, without heat exchanger 20 Intermediate circuit, 1 heat exchanger 22 Charging pump / intermediate circuit, without heat exchanger 23 Charging pump / intermediate circuit, 1 heat exchanger 25 Diverting valve / intermediate circuit, without heat exchanger 26 Diverting valve / intermediate circuit, 1 heat exchanger 28 Primary controller / intermediate circuit, without heat exchanger 29 Primary controller / intermediate circuit, 1 heat exchanger

Check no. heating circuits

Heating circuit P		Heating circuit 2		Heating circuit 1	
0	No heating circuit	00	No heating circuit	00	No heating circuit
2	2nd heating circuit pump	02	2nd heating circuit pump	01	Circulation via boiler pump
		03	Heating circuit pump, mixing valve	02	2nd heating circuit pump
				03	Heating circuit pump, mixing valve

Example

Heat source: Solar with collector sensor and pump, 1-stage burner and boiler pump
Storage tank: Charging pump and solar connection
Heating circuit 1: Heating circuit pump and mixing valve



Displays on the operator unit:

Check no. heat source 1				1	0	1
Check no. storage tank						5
Check no. heating circuits						3

Device data

Line no.	*Operating line*
6220	**Software version**

The software version indicated here represents the current version of the basic unit.

6.19 LPB system

Address / power supply

Line no.	*Operating line*
6600	**Device address**
6601	**Segment address**
6604	**Bus power supply function** Off Automatically
6605	**Bus power supply state** Off On

Device address and segment address

The controller's LPB address is divided into 2 parts each consisting of two 2-digit numerals. Example:

14 . 16
Segment number Device number

Bus power supply

The bus power supply enables the bus system to be powered directly by the individual controllers (no central bus power supply). The type of bus power supply can be selected.

- Off: No bus power supply via the controller.
- Automatically: The bus power supply (LPB) via the controller is automatically switched on and off depending on the requirements of the LPB.

Bus power supply state

The display shows whether the controller currently supplies power to the bus:

- Off: The bus power supply via controller is currently inactive.
- On: The bus power supply via controller is currently active. At the moment, the controller supplies some of the power required by the bus.

Central functions

Line no.	*Operating line*
6620	**Action changeover functions** Segment System
6621	**Summer changeover** Locally Centrally
6623	**Optg mode changeover** Locally Centrally
6624	**Manual source lock** Locally Segment
6625	**DHW assignment** Local HCs All heating circuits in the segment: All HCs in system
6631	**Ext source with eco mode** Off ¦ On DHW ¦ On

These settings are only relevant for device address 1.

Range of action of changeover

The range of action of central changeover can be defined.
This concerns:

- Summer changeover (when selecting "Central" on setting line 6623)
- Summer changeover (when selecting "Central" on setting line 6621)

Entries:

- Segment: Changeover takes place with all controllers in the same segment.

- System: Changeover takes place with all controllers in the entire system (in all segments). The controller must be located in segment 0!

Summer changeover

The range of action of summer changeover is as follows:
- Locally:
  Local action; the local heating circuit is switched based on operating lines 730, 1030 and 1330.
- Centrally:
  Central action; depending on the setting made on operating line “Action changeover functions“, either the heating circuits in the segment or those of the entire system are switched based on operating line 730.

Optg mode changeover

The range of action of operating mode changeover via input H is as follows:
- Locally:
  Local action; the local heating circuit is switched on and off.
- Centrally:
  Central action; depending on the setting made on operating line “Action changeover functions“, either the heating circuits in the segment or those of the entire system are switched based on operating line 730.

Manual source lock

The range of action of summer changeover is as follows:
- Locally:
  Local action; the local source is locked.
- Segment:
  Central action; all sources of the cascade are locked.

Assignment of DHW heating

Assignment of DHW heating is required only if it is controlled by a heating circuit program (refer to operating lines 1620 and 5061).
Settings:
- Local heating circuits:
  DHW is only heated for the local heating circuit
- All heating circuits in the segment:
  DHW is heated for all heating circuits in the segment
- All heating circuits in the system:
  DHW is heated for all heating circuits in the system.

With all settings, controllers in holiday mode are also considered for DHW heating.

Ext source with eco mode

Economy mode can be selected from menu ”Special operation / service” (operating line 7139).
In Economy mode, external heat sources on the LPB are operated as follows:
Off: Remains locked
Only DHW: Released for DHW charging
On: Always released.

Clock

6640	**Clock mode** Autonomously Slave without remote Slave with remote setting Master
6650	**Outside temp source**

Clock mode

This setting defines the impact of the system time on the controller’s time setting. The impact is as follows:
- Autonomously: The time of day on the controller can be readjusted
  The controller's time of day is not matched to the system time

- Slave without remote adjustment: The time of day on the controller cannot be readjusted
  The controller's time of day is constantly and automatically matched to the system time
- Slave with remote adjustment: The time of day on the controller can be readjusted; at the same time, the system time is readjusted since the change is adopted from the master.
  The controller's time of day is still automatically and constantly matched to the system time
- Master: The time of day on the controller can be readjusted
  The time of day on the controller is used for the system. The system time will be readjusted

Outside temperature source

Only 1 outside temperature sensor is required in the LPB plant. This sensor is connected to a freely selectable controller and delivers via LPB the signal to the controllers without sensor.
The first numeral to appear on the display is the segment no. followed by the device no.

6.20 Errors

When an error is pending, an error message can be displayed on the info level by pressing the info button. The display describes the cause of the fault.

Acknowledgements

Line no.	*Operating line*
6710	**Reset alarm relay**

When an error is pending, an alarm can be triggered via relay QX... The QX... relay must be appropriately configured.
This setting can be used to reset the alarm relay.

temperature alarms

Line no.	*Operating line*
6740	**Flow temp 1 alarm**
6741	**Flow temp 2 alarm**
6743	**Boiler temp alarm**

The difference of setpoint and actual temperature is monitored. A control offset beyond the set period of time triggers an error message.

Error history

Line no.	*Operating line*
6800…6819	**History …**

The basic unit stores the last 10 faults in nonvolatile memory. Any additional entry deletes the oldest in the memory. For each error entry, error code and time of occurrence will be saved.

6.21 Maintenance / service

Maintenance functions

Line no.	*Operating line*
7040	**Burner hours interval**
7041	**Burner hrs since maintenance**
7042	**Burner start interval**
7043	**Burn starts since maint**
7044	**Maintenance interval**
7045	**Time since maintenance**
7053	**Flue gas temp limit**
7054	**Delay flue gas message**

Burner hours run interval, burner start interval

As soon as the selected number of burner operating hours or the selected number of burner starts has elapsed, a service message will be displayed.
Counted for the message are the number of operating hours and the number of starts of the first burner stage (input E1).

Burner hours run, burner starts since service

The current value is summated and displayed. Don this operating line, the value can be reset to 0.

Flue gas temp limit

Shows a maintenance message on the display and, if configured, activates flue gas relay K17.

Delay flue gas message

Delays display of the maintenance message and activation of the flue gas relay (K17).

Chimney sweep

Line no.	*Operating line*
7130	**Chimney sweep function**

The burner will be switched on. To ensure continuous burner operation, the only switch-off point used is the boiler temperature's maximum limitation (TKmax).
First, all connected loads will be locked, enabling the boiler temperature to reach the setpoint of 64 °C as quickly as possible.
When the minimum temperature of 64 °C is attained, the available heating circuits are switched on one by one, using a dummy load, to make sure that the heat generated by the boiler is drawn off so that the burner will remain in operation.
For safety reasons, maximum limitation of the boiler temperature (TKmax) remains active as long as the chimney sweep function is active.

The function is deactivated by setting -.- on this operating line, or automatically after a timeout of 1 hour.

Economy mode

Line no.	*Operating line*
7139	**Economy mode** Off ¦ On

Economy mode controls the boiler or an external heat source. The type of changeover can be selected from the respective menus of the heat sources.

OL 2205	Boiler
OL 6631 OL 6131	Ext heat generator Heat request ext heat generator

Manual operation

Line no.	*Operating line*
7140	**Manual control**

When manual control is activated, the relay outputs are no longer energized and deenergized according to the control state but are set to a predefined manual control state in accordance with their functions (see table below).
The burner relay energized in manual control can be deenergized by the electronic temperature controller (TR).

Designation		Relay	State
Oil / gas boiler	Burner 1st stage	K4	On
	Burner 2nd stage	K5	On
	Burner mod. Release	K4	On
	Burner mod. open	Y17 (K5)	On
	Burner mod. closed	Y18	Off
	Boiler pump	Q1	On
	Bypass pump	Q12	On

	Return mixing valve open / closed	Y7/Y8	Off
Solid fuel boiler	Boiler pump	Q10	On
Solar	Collector pump	Q5	Off
	Collector pump 2	Q16	Off
	Ext. heat exchanger pump	K9	Off
	Controlling element buffer storage tank	K8	Off
	Controlling element swimming pool	K18	Off
DHW	Charging pump	Q3	On
	Diverting valve	Q3	Off
	Mixing pump	Q32	Off
	Intermediate circuit pump	Q33	On
	Mixing valve opening / closing	Y31/Y32	Off
	Instantaneous DHW heater pump	Q34	On
	Instantaneous DHW heater on / off	Y33/Y34	Off
	Circulating pump	Q4	On
	Electric immersion heater	K6	On
Buffer storage tank	Source shutoff valve	Y4	On
	Return valve	Y15	Off
Heating circuit 1...3	Heating circuit pump	Q2 Q6 Q20	On
	Heating circuit mixing valve opening / closing	Y1 / Y2 Y5 / Y6	Off
	Heating circuit pump 2nd speed Stage	Q21 Q22 Q23	On
Cooling circuit 1	Cooling circuit pump	Q24	On
	Cooling circuit mixing valve opening / closing	Y23/Y24	Off
	Diverting valve for cooling	Y21	Off
Primary controller	System pump	Q14	On
	Mixing valve opening / closing	Y19/Y20	Off
Hx group	Pump H1	Q15	On
	Pump H2	Q18	On
	Pump H3	Q19	On
Auxiliary functions	Alarm output	K10	Off
	Time program 5	K13	Off
	Heat request	K27	On
	Refrigeration requisition	K28	OFF
	Storage tank transfer pump	Q11	Off

Setpoint adjustment in manual control

After manual control has been activated, a change to the basic display must be made. There, the maintenance / special mode symbol appears.
Press the info button to switch to info display “Manual mode“, where the setpoint can be adjusted.

Simulations

Line no.	*Operating line*
7150	**Simulation outside temp**

To facilitate commissioning and fault tracing, outside temperatures in the range from -50 to +50°C can be simulated. During simulation, the actual, the composite and the attenuated outside temperature will be overridden by the set simulated temperature. During simulation, calculation of the 3 mentioned outside temperatures continues and the temperatures are available again when simulation is completed.

The function is deactivated by setting -.- on this operating line, or automatically after a timeout of 1 hour.

Telephone customer service

Line no.	*Operating line*
7170	**Telephone customer service**

Setting of phone number that appears on the info display.

6.22 Input / output test

Line no.	*Operating line*
7700…7999	

The input / output test is used to check the correct functioning of the connected components.
When selecting a setting from the relay test, the relevant relay is energized, thus putting the connected component into operation. The correct functioning of the relays and wiring can thus be tested.

⚠ Important:
During the relay test, limitation of the boiler temperature by the electronic control thermostat (TR) remains activated. Other limitations are deactivated.
Selector sensor values are updated within a maximum of 5 seconds.
The display is made with no measured value correction.

6.23 State

The current operating state of the plant is visualized by means of status displays.

Messages

Line no.	*Operating line*
8000	**State of heating circuit 1**
8001	**State of heating circuit 2**
8002	**State heating circuit P**
8003	**State of DHW**
8005	**State of boiler**
8007	**State of solar**
8008	**State solid fuel boiler**
8010	**State buffer storage tank**
8011	**State swimming pool**

State heating circuit

Enduser (info level)	Commissioning, heating engineer
Limit thermostat has cut out	Limit thermostat has cut out
Manual control active	Manual control active
Floor curing function active	Floor curing function active
	Overtemp protection active
	Restricted, boiler protection
	Restricted, DHW priority
	Restricted, buffer priority
Heating mode restricted	
	Forced discharging buffer storage tank
	Forced discharging DHW
	Forced discharging heat source
	Overrun active
Forced heat release	
	Opt start control + boost heating
	Optimum start control
	Boost heating
Heating mode Comfort	Heating mode Comfort
	Optimum stop control

Heating mode Reduced	Heating mode Reduced
	Frost protection room active
	Frost protection flow active
	Frost protection plant active
Frost protection active	
Summer operation	Summer operation
	24-hour Eco active
	Setback Reduced
	Setback frost protection
	Room temp lim
Off	Off

State of DHW

Enduser (info level)	Commissioning, heating engineer
Limit thermostat has cut out	Limit thermostat has cut out
Manual control active	Manual control active
Frost protection active	Frost protection active
Recooling active	Recooling via collector
Charging lock active	Discharging protection active Charging time limitation active Charging locked
Forced charging active	Forced, max stor tank temp Forced, max charging temp Forced, legionella setpoint Forced, nominal setpoint
Charging el im heater	Charging electric, leg setpoint Charging electric, nominal setpoint Charging electric, Red setpoint Charging electric, frost setpoint El imm heater released
Push active	Push, leg setpoint Push, nominal setpoint
Charging active	Charging, leg setpoint Charging, nominal setpoint Charging, Reduced setpoint
Overrun active	Overrun active
	Charged, max charg temp
	Charged, max charg temp
	Forced, legio temp
	Forced, nominal temp
Charged	Forced, Reduced temp
Off	Off

State of boiler

Enduser (info level)	*Commissioning, heating engineer*
SLT has cut out	SLT has cut out
SLT test active	SLT test active
Fault	Fault
Limit thermostat has cut out	Limit thermostat has cut out
Manual control active	Manual control active
Chimney sweep function active	Chimney sweep function, high-fire Chimney sweep function, low-fire
Locked	Locked, manually Locked, solid fuel boiler Locked, automatically Locked, outside temperature Locked, Economy mode
Minimum limitation active	Minimum limitation, high-fire Minimum limitation, low-fire Minimum limitation active
In operation	Protective startup Protective startup, low-fire Return limitation Return temperature limitation, low-fire

Charging buffer storage tank In operation for HC, DHW In partial load operation for HC, DHW Released for HC, DHW In operation for DHW In partial load operation for DHW Released for DHW In operation for heating circuit In partial load operation for HC Released for HC Overrun active	Charging buffer storage tank In operation for HC, DHW In partial load operation for HC, DHW Released for HC, DHW In operation for DHW In partial load operation for DHW Released for DHW In operation for heating circuit In partial load operation for HC Released for HC Overrun active
Released	Released
Frost protection active	Frost protection plant active
Off	Off

State of solar

Enduser (info level)	*Commissioning, heating engineer*
Manual control active	Manual control active
Fault	Fault
Frost protection collector active	Frost protection collector active
Recooling active	Recooling active
Max stor tank temp reached	Max stor tank temp reached
Evaporation protection active	Evaporation protection active
Overtemp protection active	Overtemp protection active
Max charg temp reached	Max charg temp reached
Charging DHW+buffer+swi pool	Charging DHW+buffer+swi pool
Charging DHW+buffer	Charging DHW+buffer
Charging DHW+swi pool	Charging DHW+swi pool
Charging buffer+swi pool	Charging buffer+swi pool
Charging DHW	Charging DHW
Charging buffer storage tank	Charging buffer storage tank
Charg swimm pool	Charg swimm pool
Radiation insufficient	Min charg temp not reached Temp diff insufficient Radiation insufficient

State solid fuel boiler

Enduser (info level)	*Commissioning, heating engineer*
Fault	Fault
Manual control active	Manual control active
Overtemp protection active	Overtemp protection active
In operation	Pump overrun In operation
Frost protection active	Frost protection plant active Frost protection boiler active
Off	Off

State buffer storage tank

Enduser (info level)	*Commissioning, heating engineer*
Frost protection active	Frost protection active
Charging el im heater	Charging electric, em operation Charging electro, source prot Charging electric, defrost
Charging restricted	Charging locked Restricted, DHW priority
Charging active	Forced charging active Charging active
Recooling active	Recooling via collector Recooling via DHW/HCs
Charged	Charged, max stor temp Charged, max charg temp Charged, forced charg required temp Charged, required temp Charged, min charg temp
Cold	Cold
No heat request	No heat request

6.24 Diagnostics of heat source

For making diagnostics, the various setpoints, actual values, relay switching states and meter readings can be displayed.

Line no.	*Operating line*
8610…8699	

6.25 Diagnostics consumers

For making diagnostics, the various setpoints, actual values, relay switching states and meter readings can be displayed.

Line no.	*Operating line*
8700…9099	

6.26 List of displays

Priorities are assigned to pending errors. From priority 6, alarm messages are delivered, which are used by remote supervision (OCI). In addition, the alarm relay will be set.

6.26.1 Error code

Error code	Description of error	Priority
0	No error	
10	Outside temperature sensor error	6
20	Boiler temperature 1 sensor error	9
25	Solid fuel boiler temperature (wood) sensor error	9
26	Common flow temperature sensor error	6
28	Flue gas temperature sensor error	6
30	Flow temperature 1 sensor error	6
32	Flow temperature 2 sensor error	6
38	Flow temperature primary controller sensor error	6
40	Return temperature 1 sensor error	6
46	Return temperature cascade sensor error	6
47	Common return temperature sensor error	6
50	DHW temperature 1 sensor error	9
52	DHW temperature 2 sensor error	9
54	DHW primary controller sensor error	6
57	DHW circulation temperature sensor error	6
60	Room temperature 1 sensor error	6
65	Room temperature 2 sensor error	6
68	Room temperature 3 sensor error	6
70	Buffer storage tank temperature 1 sensor error	6
71	Buffer storage tank temperature 2 sensor error	6
72	Buffer storage tank temperature 3 sensor error	6
73	Collector temperature 1 sensor error	6
74	Collector temperature 2 sensor error	6
81	Short-circuit LPB	6
82	LPB address collision	3
83	BSB wire short-circuit	6
84	BSB address collision	3
85	BSB radio communication fault	6
98	Extension module 1 fault (common fault status message)	6
99	Extension module 2 fault (common fault status message)	6
100	2 clock time masters (LPB)	3
102	Clock time master without backup (LPB)	3
105	Maintenance message	5
109	Boiler temperature supervision	9
110	Lockout by SLT	9
117	Upper pressure limit (crossed)	6
118	Critical lower pressure limit (crossed)	6
121	Flow temperature 1 (HC1) supervision	6
122	Flow temperature 2 (HC2) supervision	6
126	DHW charging supervision	6
127	Legionella temperature not reached	6
131	Burner fault	9
146	Configuration error common message	3
171	Alarm contact 1 (H1) active	6
172	Alarm contact 2 (H2) active	6
173	Alarm contact 3 (EX2/230VAC) active	6
174	Alarm contact 4 (H3) active	6
176	Upper pressure limit 2 (crossed)	6
177	Critical lower pressure limit 2 (crossed)	6
178	Temperature limiter heating circuit 1	3
179	Temperature limiter heating circuit 2	3
217	Sensor error common message	6
218	Pressure supervision common message	6
243	Swimming pool temperature sensor error	6
320	DHW charging temperature sensor error	6

321	Instantaneous DHW heater outlet temperature sensor error	6
322	Upper pressure limit 3 (crossed)	6
323	Critical lower pressure limit 3 (crossed)	6
324	BX same sensors	3
325	BX/extension module same sensors	3
326	BX/mixing valve group same sensors	3
327	Extension module same function	3
328	Mixing valve group same function	3
329	Extension module / mixing valve group same function	3
330	Sensor BX1 no function	3
331	Sensor BX2 no function	3
332	Sensor BX3 no function	3
333	Sensor BX4 no function	3
334	Sensor BX5 no function	3
335	Sensor BX21 no function	3
336	Sensor BX22 no function	3
337	Sensor BX1 no function	3
338	Sensor BX12 no function	3
339	Collector pump Q5 missing	3
340	Collector pump Q16 missing	3
341	Collector sensor B6 missing	3
342	Solar DHW sensor B31 missing	3
343	Solar integration missing	3
344	Solar controlling element buffer K8 missing	3
345	Solar controlling element swimming pool K18 missing	3
346	Solid fuel boiler pump Q10 missing	3
347	Solid fuel boiler comparison sensor missing	3
348	Solid fuel boiler address error	3
349	Buffer return valve Y15 missing	3
350	Buffer storage tank address error	3
351	Primary controller / system pump address error	3
352	Pressureless header address error	3
353	Cascade sensor B10 missing	3

6.26.2 Maintenance code

Maintenance code	Description of maintenance	Priority
1	Burner hours run exceeded	6
2	Burner starts exceeded	6
3	Maintenance interval exceeded	6
5	Water pressure heating circuit too low (dropped below lower pressure limit 1)	9
18	Water pressure 2 heating circuit too low (dropped below lower pressure limit 2)	9
10	Replace battery of outside sensor	6
21	Maximum flue gas temperature exceeded	6
22	Water pressure 3 too low (dropped below lower pressure limit 3)	9

6.26.3 Special operation code

Special operation code	Description
301	Manual operation
302	SLT test
303	Chimney sweep function
309	Simulation outside temperature
310	Alternative energy operation
314	Economy mode

7 Plant diagrams

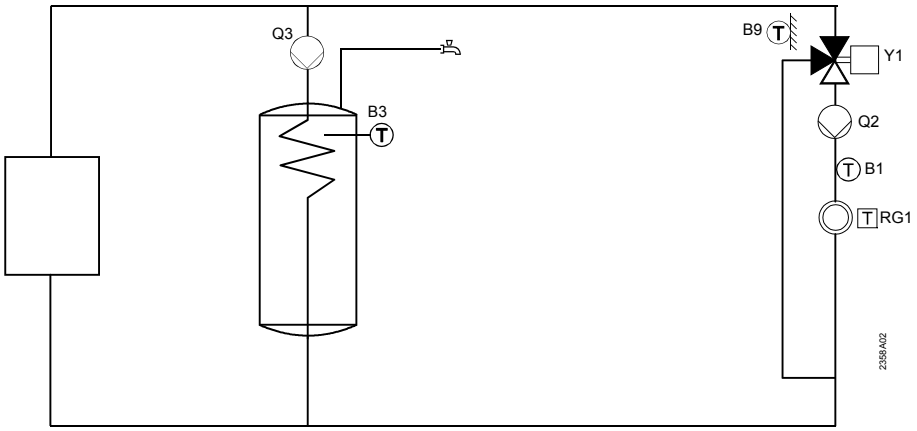
The various applications are shown in the form of basic diagrams and extra functions. The basic diagrams show possible applications that can be implemented without the use of multifunctional outputs.

7.1 Basic diagrams

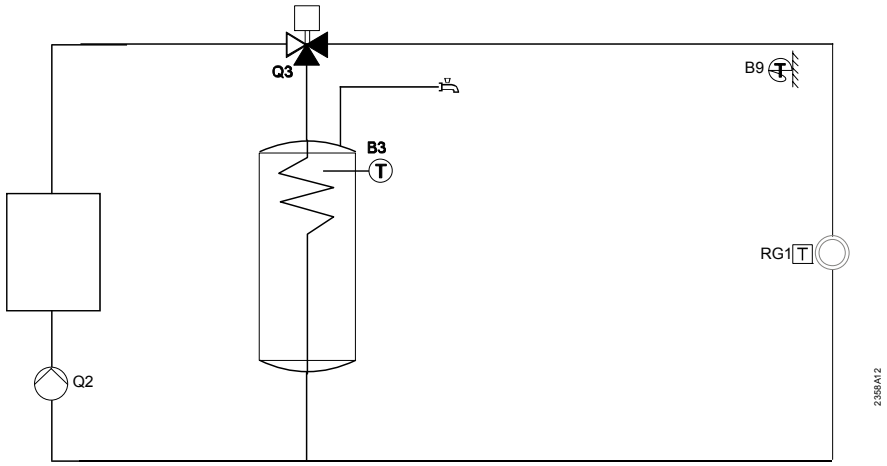
The basic diagrams are examples of plant that can be implemented with standard outputs requiring only a few settings.

7.1.1 Basic diagram RVS43.143

Standard diagram

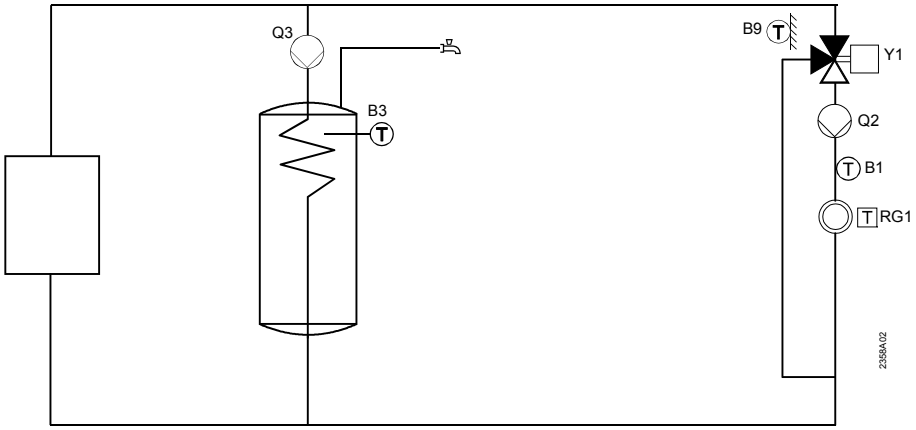


DHW heating with diverting valve

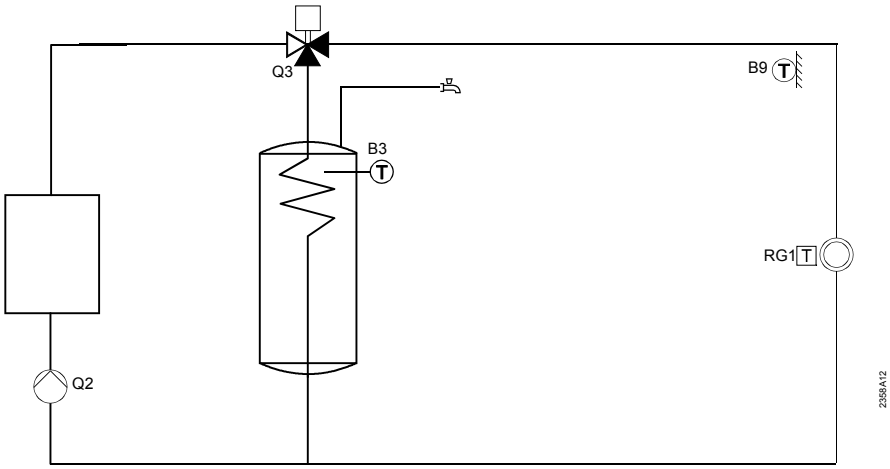


7.1.2 Basic diagram RVS63.243

Standard diagram

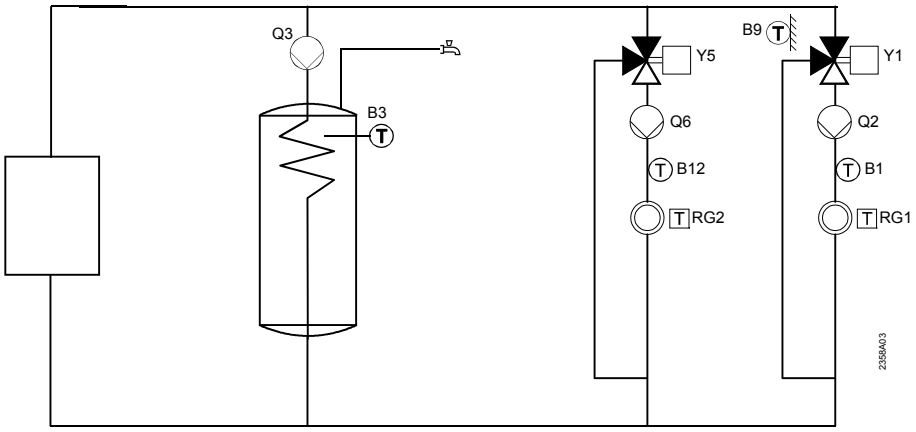


DHW heating with diverting valve



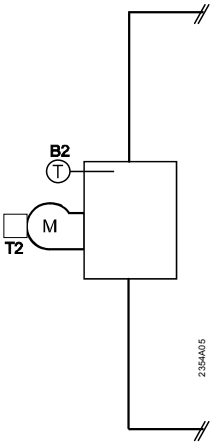
7.1.3 Basic diagram RVS63.283

Standard diagram



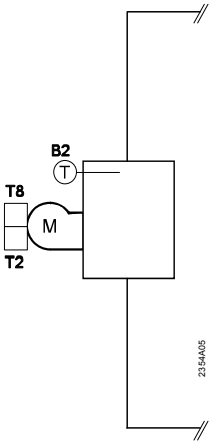
7.2 Versions of heat sources

1-stage burner



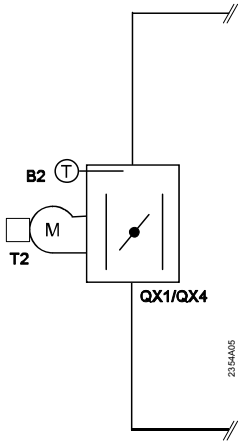
RVS43…
RVS63…

2-stage burner



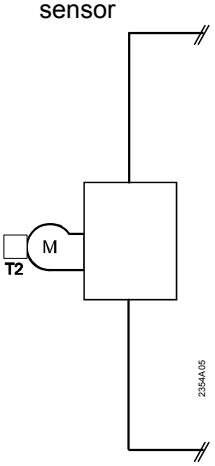
RVS63…

Modulating
3 position 0…10 V



RVS63…

Burner without boiler sensor



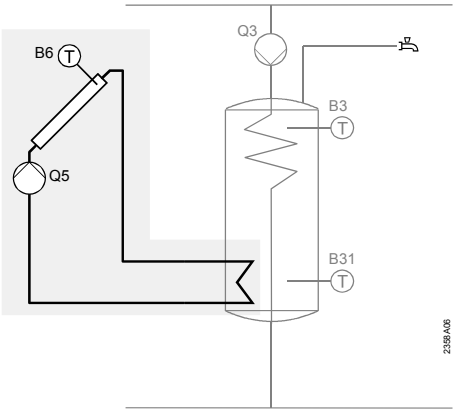
RVS63…

7.3 Extra functions in general

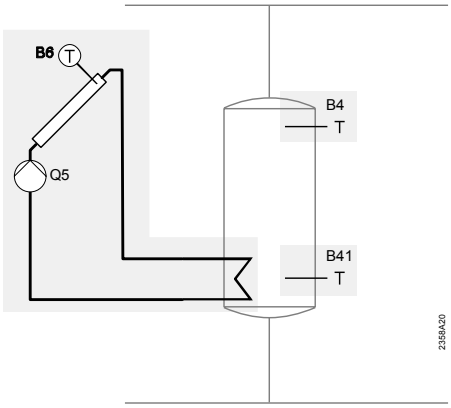
The extra functions can be selected via operating page “Configuration” and complement the basic diagrams of the respective controllers.
The type and number of extra functions that can be applied depend on the multifunctional outputs and inputs QX… or BX…
Depending on the type of application, the use of extra functions necessitates a number of appropriate operating line settings.

Solar

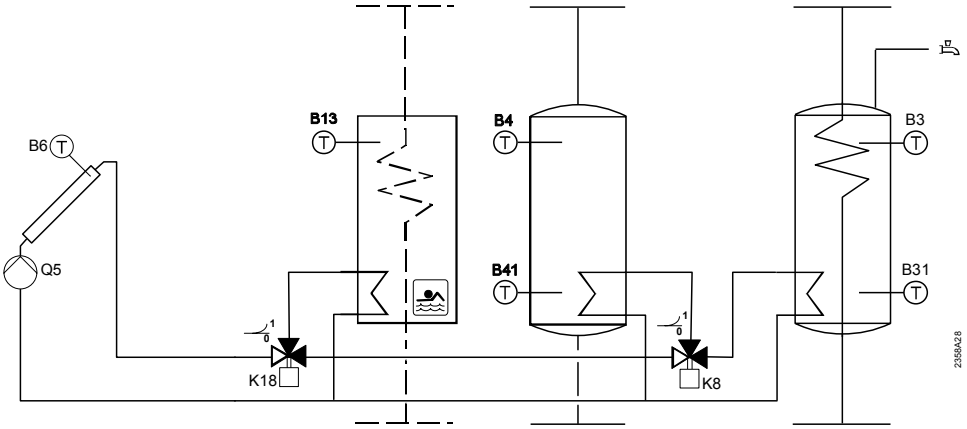
DHW charging collector pump, collector sensor



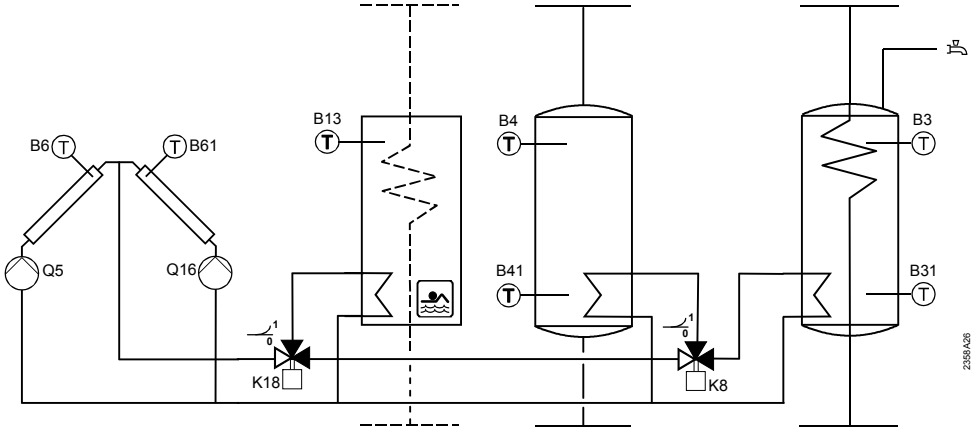
Buffer charging



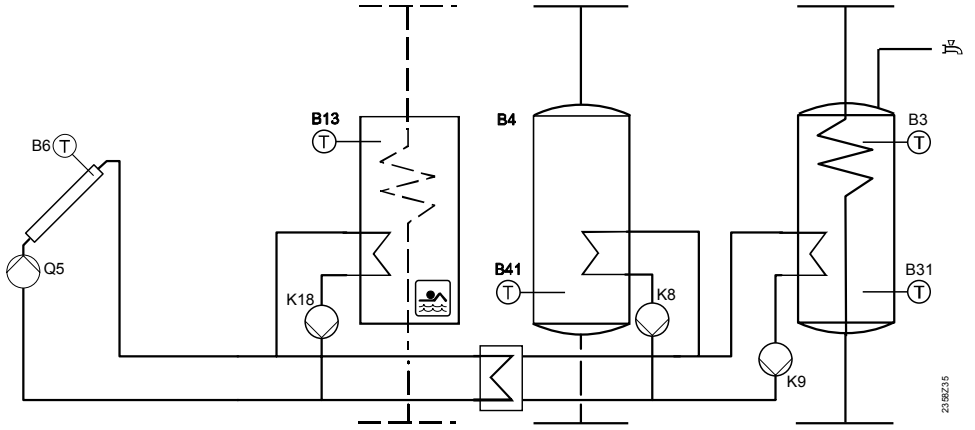
Solar storage tank and swimming pool charging via diverting valves with 1 collector



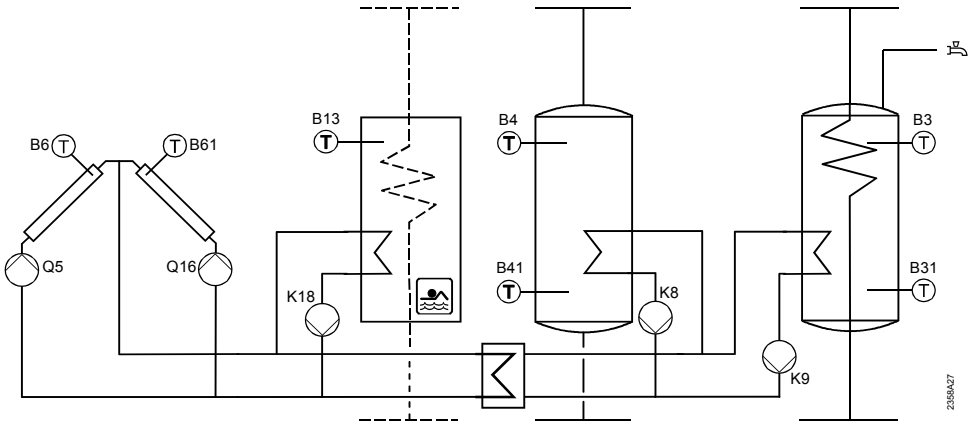
Solar storage tank and swimming pool charging via diverting valves with 2 collectors



Solar storage tank and swimming pool charging via charging pumps with 1 collector

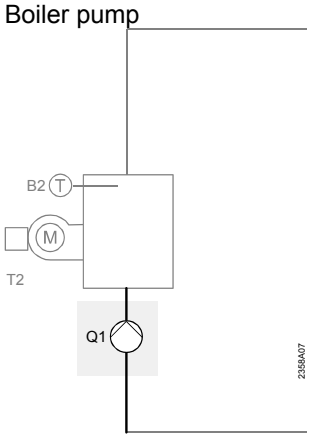


Solar storage tank and swimming pool charging via charging pumps with 2 collectors

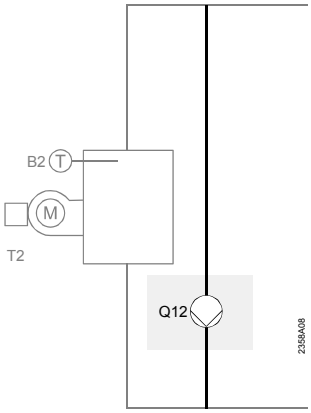


Boiler

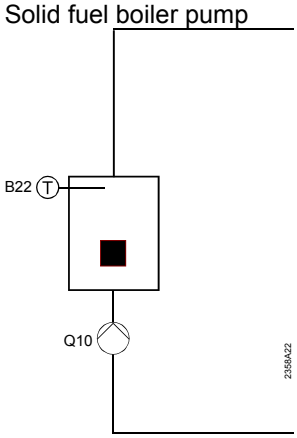
Boiler pump



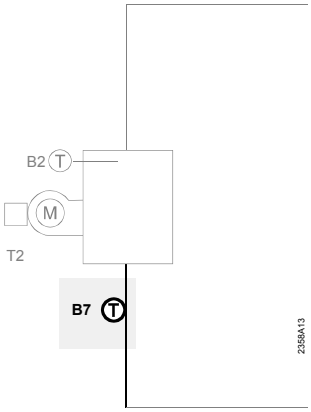
Bypass pump



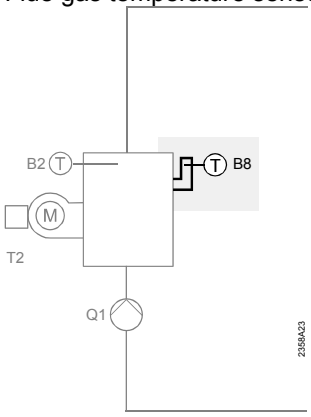
Solid fuel boiler pump



Return temperature sensor

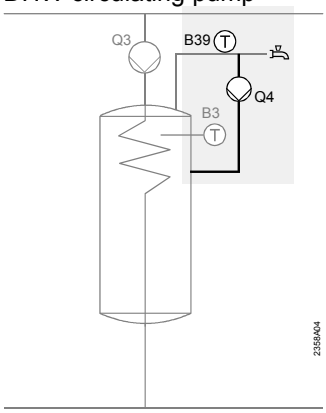


Flue gas temperature sensor

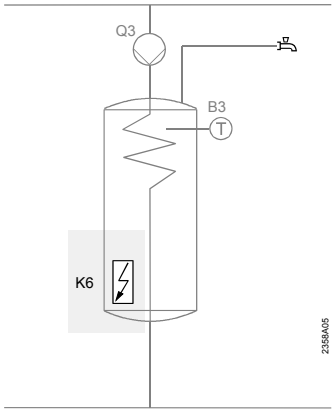


Storage tank temperature

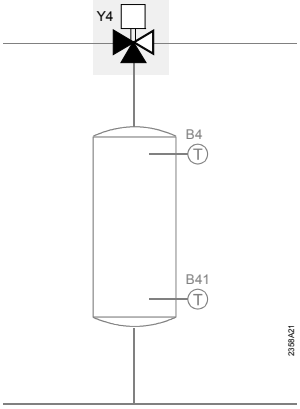
DHW circulating pump



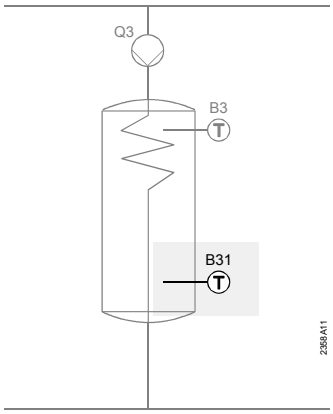
DHW el imm heater



Heat source shutoff valve buffer

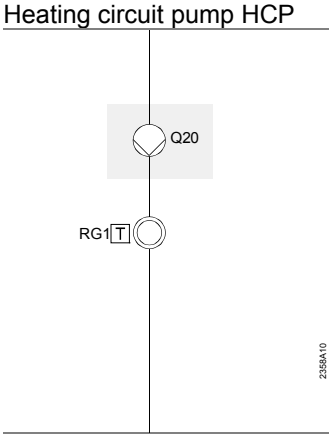


2nd DHW sensor



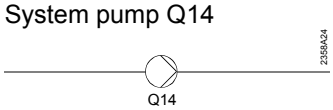
Heating circuit

Heating circuit pump HCP



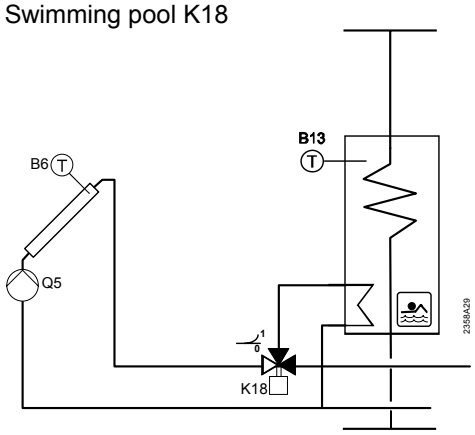
Heat converter

System pump Q14



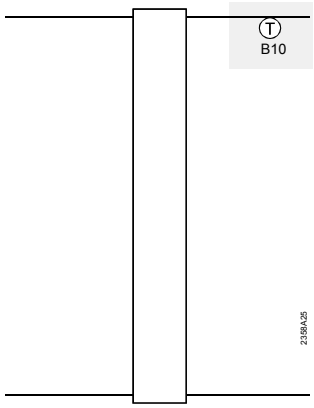
Swimming pool

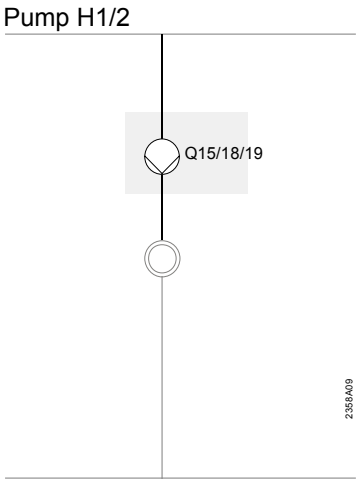
Swimming pool K18



Pressureless header

Common flow sensor

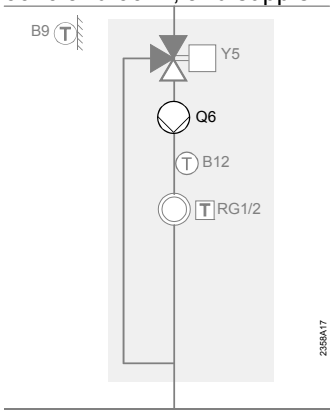



Pump H1/2
Q15/18/19
2358A09

7.4 Extra functions with AVS75.390

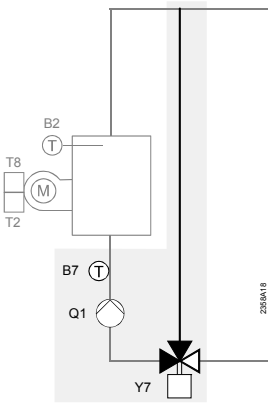
The extra functions can be selected via operating page “Configuration“, operating lines 6020 and 6021, and supplement the basic diagrams of the respective controllers.

Mixing heating circuit

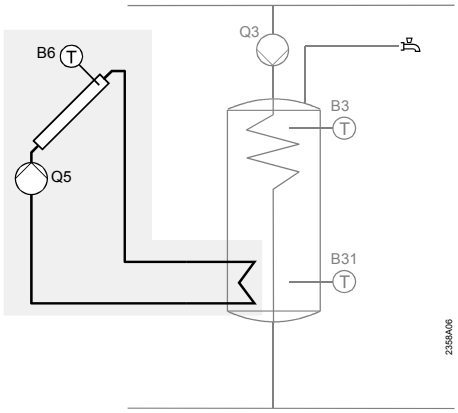


This extra function is not possible with 63.283.

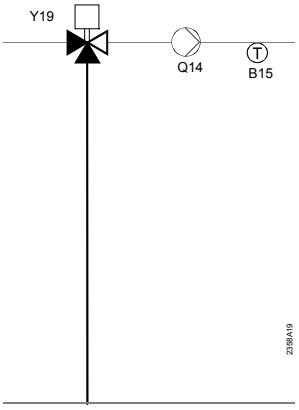
Return temp controller



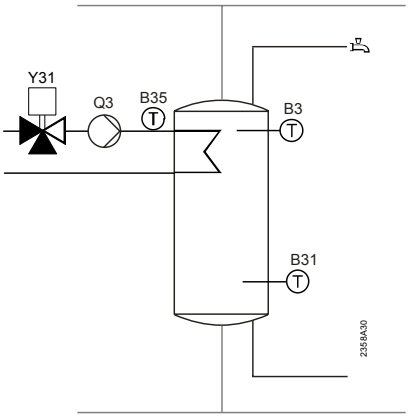
Solar DHW heating



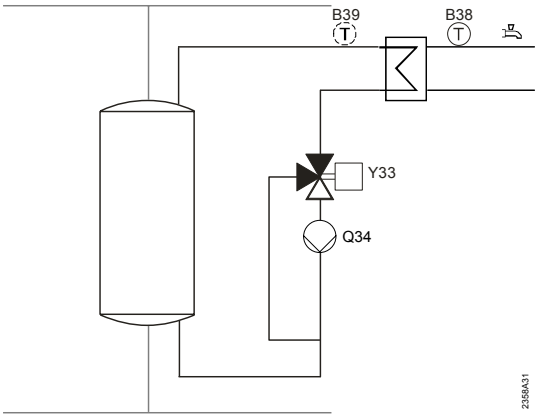
Primary controller



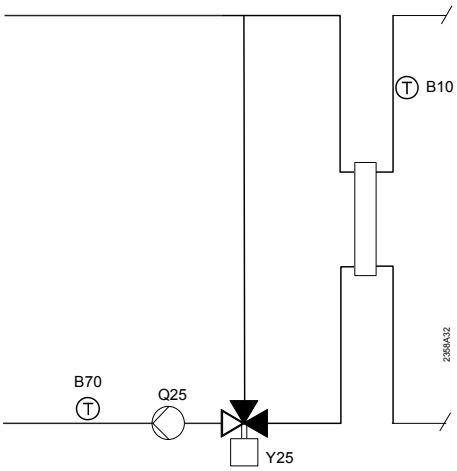
Primary DHW controller



Instantaneous DHW heater



Return controller cascade



Legend mains voltage

Diagram	*Function*	*Connection*
T2	Burner 1st stage Release modulating burner	T1, T2
T8	Burner 2nd stage Air damper modulating burner = OPEN	QX4
Q1	Boiler pump	QX1, QX2, QX3, QX4
Q2	1st heating circuit pump Boiler pump	Q2
Q3	DHW charging pump / diverting valve	Q3
Q4	Circulating pump	QX1, QX2, QX3, QX4
Q5	Collector pump	QX1, QX2, QX3, QX4
Q6	2nd heating circuit pump	Q6, QX21
Q10	Solid fuel boiler pump	QX1, QX2, QX3, QX4
Q12	Bypass pump	QX1, QX2, QX3, QX4
Q14	System pump	QX23
Q15/18/19	H1/2/3 pump	QX1, QX2, QX3, QX4
Q16	Collector pump 2	QX1, QX2, QX3, QX4
Q20	Heating circuit pump HCP	QX1, QX2, QX3, QX4
Q25	Cascade pump	QX1, QX2, QX3, QX4
Q34	Instantaneous heater pump	QX23
Y1	1st heating circuit mixing valve	Y1 / Y2
Y4	Heat source shutoff valve	QX1, QX2, QX3, QX4
Y5	2nd heating circuit mixing valve opening	Y5, QX21
Y6	2nd heating circuit mixing valve closing	Y6, QX22
Y7	Maintained boiler return temperature	Y7, Y8
Y19	Primary controller	QX21, QX22
Y25	Maintained boiler return temperature valve opening	QX21
Y26	Maintained boiler return temperature valve closing	QX22
Y31	DHW primary controller mixing valve opening	QX21
Y32	DHW primary controller mixing valve closing	QX22
Y33	Instantaneous DHW heater valve opening	QX21
Y34	Instantaneous DHW heater valve closing	QX22
K6	Electric immersion heater	QX1, QX2, QX3, QX4
K5	Air damper modulating burner closing	QX1, QX2, QX3, QX4
K8	Solar controlling element buffer	QX1, QX2, QX3, QX4
K9	Solar pump ext. heat exchanger	UX
K18	Solar controlling element swimming pool	QX1, QX2, QX3, QX4

Legend low-voltage

B1	Flow temperature sensor HK1	B1
B12	Flow temperature sensor HK2	B12
B13	Swimming pool sensor	BX1, BX2, BX3, BX4
B2	Boiler temperature sensor TK1	B2
B22	Solid fuel boiler sensor	BX1, BX2, BX3, BX4
B3	DHW sensor top	B3
B31	2nd DHW sensor bottom	BX1, BX2, BX3, BX4
B35	DHW flow temperature sensor	BX21
B38	DHW temperature outlet sensor	BX21
B4	Buffer storage tank temperature sensor	BX1, BX2, BX3, BX4
B41	Buffer storage tank temperature sensor	BX1, BX2, BX3, BX4
B15	Flow sensor primary controller	BX21
B39	DHW circulation sensor B39	BX1, BX2, BX3, BX4
B6	Collector sensor	BX1, BX2, BX3, BX4
B61	Collector sensor 2	BX1, BX2, BX3, BX4
B7	Return temperature sensor	BX1, BX2, BX3, BX4
B70	Cascade return sensor	BX1, BX2, BX3, BX4
B8	Flue gas temperature sensor	BX1, BX2, BX3, BX4
B9	Outside sensor	B9
B10	Common flow sensor	BX1, BX2, BX3, BX4
RG1	Room unit 1	CL-, CL+
RG2	Room unit 2	CL-, CL+

8 Technical data

8.1 Basic units RVS…

Power supply	Rated voltage	AC 230 V (±10%)
	Rated frequency	50/60 Hz
	Power consumption	RVS43.143: max. 8.5 VA RVS63.243: max. 10 VA RVS63.283: max. 11 VA
	Fusing of supply lines	max. 10 AT
Wiring of terminals	Power supply and outputs	solid wire or stranded wire (twisted or with ferrule): 1 core: 0.5...2.5 mm^2 2 cores: 0.5. mm^2..1.5 mm^2 3 cores: not permitted
Functional data	Software class	A
	Mode of operation to EN 60 730	1.B (automatic)
Inputs	Digital inputs H1 and H2	safety extra low-voltage for potential-free low-voltage contacts: voltage with contact open: DC 12 V current with contact closed: DC 3 mA
	Analog input H1, H2	protective extra low-voltage operating range: DC (0...10) V internal resistance: > 100 kΩ
	Mains voltage S3, 4 and EX2	AC 230 V (±10 %) internal resistance: > 100 kΩ
	Sensor input B9	NTC1k (QAC34)
	Sensor inputs B1, B2, B3, B12, BX1, BX2, BX3, BX4	NTC10k (QAZ36, QAD36)
	Sensor inputs BX1…BX4	PT1000 (optionally for collector and flue gas sensor)
	Perm. sensor cables (copper)	
	with cross-sectional area:	0.25 0.5 0.75 1.0 1.5 mm^2
	Max. length:	20 40 60 80 120 m
Outputs	Relay outputs	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A for ≤1 s
	Max. total current (of all relays)	AC 10 A
	Rated voltage range	AC (24...230) V (for potential-free outputs)
	Triac output QX3	
	Rated current range	
	On / off operation	AC 0.05…2 (2) A
	Speed control	AC 0.05…1.4 (1.4) A
	Max. switch-on current	4 A for ≤1 s
	Analogous to output U1	output is short-circuit-proof
	Output voltage	U_{out} = 0 ... 10.0 V
	Current rating	±2 mA RMS; ±2.7 mA peak
	Ripple	≦ 50 mVpp
	Accuracy at zero point	< ± 80 mV
	Error remaining range	≦ 130 mV

Interfaces, cable lengths	BSB	2-wire connection, not interchangeable
	Max. cable length	
	Basic unit – peripheral device	200 m
	Max. total length	400 m (max. cable capacitance) 60 nF)
	Min. cross-sectional area	0.5 mm^2
	LPB	(copper cable 1.5 mm^2, 2-wire **not** interchangeable)
	with bus power supply via controller (per controller)	250 m
	With central bus power supply	460 m
	Bus loading number	E = 3
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP 00
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class II, if correctly installed
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 60730-2-9
Climatic conditions	Storage to IEC721-3-1 class 1K3	temp. -20…65 °C
	Transport to IEC721-3-2 class 2K3	temp. -25…70°C
	Operation to IEC721-3-3 class 3K5	temp. 0...50 °C (non-condensing)
Weight	Without packaging	RVS43.143: 587 g RVS63.243: 614 g RVS63.283: 648 g

8.2 Extension module AVS75.390

Power supply	Rated voltage	AC 230 V (±10%)
	Rated frequency	50/60 Hz
	Power consumption	max. 4 VA
	Fusing of supply lines	max. 10 AT
Wiring of terminals	(Power supply and outputs)	solid wire or stranded wire (twisted or with ferrule): 1 core: 0.5...2.5 mm^2 2 cores 0.5...1.5 mm^2
Functional data	Software class	A
	Mode of operation to EN 60 730	1b (automatic operation)
Inputs	Digital inputs H2	safety extra low-voltage for potential-free low-voltage contacts: voltage with contact open: DC 12 V current with contact closed: DC 3 mA
	Analog input H2	protective extra low-voltage operating range: DC (0...10) V internal resistance: > 100 kΩ
	Mains input L	AC 230 V (±10 %) internal resistance: > 100 kΩ
	Sensor inputs BX6, BX7	NTC10k (QAZ36, QAD36)
	Perm. sensor cables (copper)	
	with cross-sectional area:	0.25 0.5 0.75 1.0 1.5 mm^2
	Max. length:	20 40 60 80 120 m

Outputs	Relay outputs	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A for ≤1 s
	Max. total current (of all relays)	AC 6 A
	Rated voltage range	AC (24...230) V (for potential-free outputs)
Interfaces	BSB	2-wire connection, not interchangeable
	Max. cable length	
	Basic unit – peripheral device	200 m
	Max. total length	400 m (max. cable capacitance) 60 nF)
	Min. cross-sectional area	0.5 mm^2
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP 00
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class II, if correctly installed
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 60730-2-9
Climatic conditions	Storage to IEC721-3-1 class 1K3	temp. -20…65 °C
	Transport to IEC721-3-2 class 2K3	temp. -25…70°C
	Operation to IEC721-3-3 class 3K5	temp. 0...50 °C (non-condensing)
Weight	Without packaging	293 g

8.3 Operator unit and room units AVS37... / QAA7x… / QAA55..

Power supply	For devices without batteries:	
	Bus power supply	BSB
	For devices with batteries:	
	Batteries	3 pcs
	Type of batteries	1.5 V Alkali size AA (LR06)
	Battery life	approx. 1.5 years
Room temperature measurement (only with QAA7x...) / QAA55...)	Measuring range:	0...50 °C
	According to EN12098:	
	Range 15...25 °C	within tolerance of 0.8 K
	range 0..15 °C or 25...50 °C	within tolerance of 1.0 K
	resolution	1/10 K
Interfaces	AVS37../QAA75../QAA55..	BSB-W, 2-wire connection, not interchangeable
	Max. cable length basic unit – peripheral device	QAA75../QAA55.. = 200 m AVS37.. = 3 m
	QAA78...	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20 for QAA7../ QAA55.. IP40 for AVS37… IP20 (when mounted) Normal pollution
	Safety class to EN 60 730	If correctly fitted, low-voltage parts meet the requirements of safety class III
	Degree of pollution to EN 60 730	Normal pollution

Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 50090-2-2
	RF	EN 300 220-1 (25-1000MHz)
Climatic conditions	For devices without batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…65 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
	For devices with batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…30 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
Weight	Without packaging	AVS37.294: 160 g QAA75.61x: 170 g QAA78.610: 312 g QAA55.110: 115 g

8.4 Power supply AVS16.290

Power supply	Nominal voltage	AC 230 V (±10 %)
	Nominal frequency	50 Hz
	Fuse	6.3 AT (5 x 20 mm)
	Power consumption	max. 0.4 VA
	Fusing of supply lines	max. 10 A
Functional data	Switching capacity SLT	16 (12) A, AC 230V (+-10%), 50Hz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP 40 (when mounted) corresponding to safety class II if adequately mounted
	Safety class to EN 60 730	
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety	CE conformity to	
	low-voltage directive	73/23/EEC
	electrical safety	EN 60 730-1, EN 60 730-2-9
Climatic conditions	Storage to IEC721-3-1 class 1K3	temp. -20…65 °C
	Transport to IEC721-3-2 class 2K3	temp. -25…70°C
	Operation to IEC721-3-3 class 3K5	temp. 0...50 °C (non-condensing)
Weight	Without packaging	310 g

8.5 Radio module AVS71.390

Power supply	Via RVS… basic unit	DC 5.5 V
	Power consumption	max. 0.11 VA
Interfaces	Connection to RVS… basic units (power supply, communication)	6-pole prefabricated ribbon cable, ready fitted, 1.5 m 1.5m
	Radio transmitter	BSB-RF frequency band 868 MHz

Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP40
	Safety class to EN 60 730	If correctly fitted, low-voltage parts meet the requirements of safety class III
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-1, EN 61000-6-2
	- Emissions	- EN 61000-6-3, EN 61000-6-4
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730, EN 50090-2-2
	RF	EN 300 220-1 , -3 (25-1000MHz) EN 301 489-1 , -3
Climatic conditions	Storage to EN 60721-3-1	class 1K3, temp. -20…65 °C
	Transport to EN 60721-3-2	class 2K3, temp. -25…70°C
	Operation to EN 60721-3-3	class 3K5, temp. 0...50°C (non-condensing)
Weight	Without packaging	54 g

8.6 Wireless outside sensor AVS13.399

Power supply	Batteries	2 pcs
	Type of batteries	1.5 V Alkali size AAA (LR03)
	Battery life	approx. 2 years
Interfaces	Radio transmitter	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20
	Safety class to EN 60 730	If correctly fitted, low-voltage parts meet the requirements of safety class III
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 50090-2-2
	RF	EN 300 220-1 (25-1000MHz)
Climatic conditions	For devices without batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…65 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
	For devices with batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…30 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
Outside temperature acquisition	Outside sensor	QAC34/101
	Measuring range	-50…70 °C
	Cable length	max. 5 m
Weight	Without packaging	Radio transmitter 160 g Outside sensor QAC34 73 g Cable 70 g

8.7 Radio repeater AVS14.390

Power supply	Nominal voltage	AC 230 V ±10 % (primary side AC/AC adapter)
	Nominal frequency	50 Hz ±6 %
	Power consumption	max. 0.5 VA
Interfaces	Radio transmitter	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20
	Safety class to EN 60 730	If correctly fitted, low-voltage parts meet the requirements of safety class III
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 50090-2-2
	RF	EN 300 220-1 (25-1000MHz)
Climatic conditions	Storage to IEC721-3-1 class 1K3	temp. -20…65 °C
	Transport to IEC721-3-2 class 2K3	temp. -25…70°C
	Operation to IEC721-3-3 class 3K5	temp. 0...50 °C (non-condensing)
Weight	Without packaging	Radio repeater 112 g Power supply 195 g

8.8 Sensor characteristics

8.8.1 NTC 1 k

T [°C]	R[Ohm]	T [°C]	R[Ohm]	T [°C]	R[Ohm]
-30.0	13’034	0.0	2’857	30.0	827
-29.0	12’324	1.0	2’730	31.0	796
-28.0	11’657	2.0	2’610	32.0	767
-27.0	11’031	3.0	2’496	33.0	740
-26.0	10’442	4.0	2’387	34.0	713
-25.0	9’889	5.0	2’284	35.0	687
-24.0	9’369	6.0	2’186	36.0	663
-23.0	8’880	7.0	2’093	37.0	640
-22.0	8’420	8.0	2’004	38.0	617
-21.0	7’986	9.0	1’920	39.0	595
-20.0	7’578	10.0	1’840	40.0	575
-19.0	7’193	11.0	1’763	41.0	555
-18.0	6’831	12.0	1’690	42.0	536
-17.0	6’489	13.0	1’621	43.0	517
-16.0	6’166	14.0	1’555	44.0	500
-15.0	5’861	15.0	1’492	45.0	483
-14.0	5’574	16.0	1’433	46.0	466
-13.0	5’303	17.0	1’375	47.0	451
-12.0	5’046	18.0	1’320	48.0	436
-11.0	4’804	19.0	1’268	49.0	421
-10.0	4’574	20.0	1’218	50.0	407
-9.0	4’358	21.0	1’170		
-8.0	4’152	22.0	1’125		
-7.0	3’958	23.0	1’081		
-6.0	3’774	24.0	1’040		
-5.0	3’600	25.0	1’000		
-4.0	3’435	26.0	962		
-3.0	3’279	27.0	926		
-2.0	3’131	28.0	892		
-1.0	2’990	29.0	859		

8.8.2 NTC 10 k

T [°C]	R[Ohm]	T [°C]	R[Ohm]	T [°C]	R[Ohm]
-30.0	175203	50.0	3605	130.0	298
-25.0	129289	55.0	2989	135.0	262
-20.0	96360	60.0	2490	140.0	232
-15.0	72502	65.0	2084	145.0	206
-10.0	55047	70.0	1753	150.0	183
-5.0	42158	75.0	1481	155.0	163
0.0	32555	80.0	1256	160.0	145
5.0	25339	85.0	1070	165.0	130
10.0	19873	90.0	915	170.0	117
15.0	15699	95.0	786	175.0	105
20.0	12488	100.0	677	180.0	95
25.0	10000	105.0	586	185.0	85
30.0	8059	110.0	508	190.0	77
35.0	6535	115.0	443	195.0	70
40.0	5330	120.0	387	200.0	64
45.0	4372	125.0	339		

8.8.3 PT1000

T [°C]	R[Ohm]	T [°C]	R[Ohm]	T [°C]	R[Ohm]
–30	882.2	50	1194.0	130	1498.3
–25	901.9	55	1213.2	135	1517.1
–20	921.6	60	1232.4	140	1535.8
–15	941.2	65	1251.6	145	1554.6
–10	960.9	70	1270.8	150	1573.3
–5	980.4	75	1289.9	155	1591.9
0	1000.0	80	1309.0	160	1610.5
5	1019.5	85	1328.0	165	1629.1
10	1039.0	90	1347.1	170	1647.7
15	1058.5	95	1366.1	175	1666.3
20	1077.9	100	1385.1	180	1684.8
25	1097.3	105	1404.0	185	1703.3
30	1116.7	110	1422.9	190	1721.7
35	1136.1	115	1441.8	195	1740.2
40	1155.4	120	1460.7	200	1758.6
45	1174.7	125	1479.5		

Index

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9 Revision history

All changes made to the document since the last issue (see front page) have been registered with the Microsoft Word function "Highlight". To show such text, use the following key combinations:

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