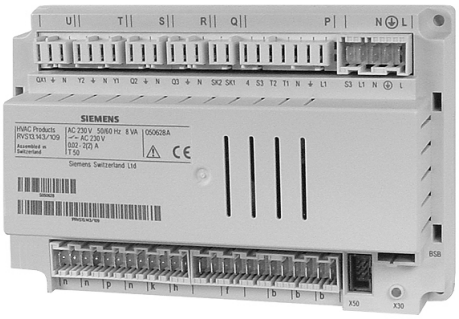
SIEMENS



Albatros^2
Boiler controller
User Manual

RVS43.345
AVS75...
AVS37...
QAA75...
QAA78...
QAA55...

Edition 1.0
Controller series B
CE1U2354en02
14.01.2011

Building Technologies

Siemens Switzerland Ltd
Industry Sector
Building Technologies Division
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
Fax +41 41-724 35 22
www.siemens.com/sbt

Table of contents

1 Overview

The present User Manual describes the products listed in the following table and covers handling and configuration of the controls for readers ranging from end users to heating engineers.

Product No. (ASN)	Series	Name
RVS43.345	B	Basic unit boiler
AVS75.390	B	Extension module
AVS37.294	B	Operator unit with text display
AVS37.390	A	Operator unit basic
QAA75.610	B	Room unit, for wiring
QAA75.611	B	Room unit, for wiring, with backlit display
QAA78.610	B	Room unit, wireless
QAA55.110	A	Room unit basic, wired
QAA55.110	A	Room unit basic, RF.
AVS16.290	A	Power section
AVS71.390	A	Radio module
AVS14.390	A	Radio repeater
AVS13.399	A	Wireless outside sensor

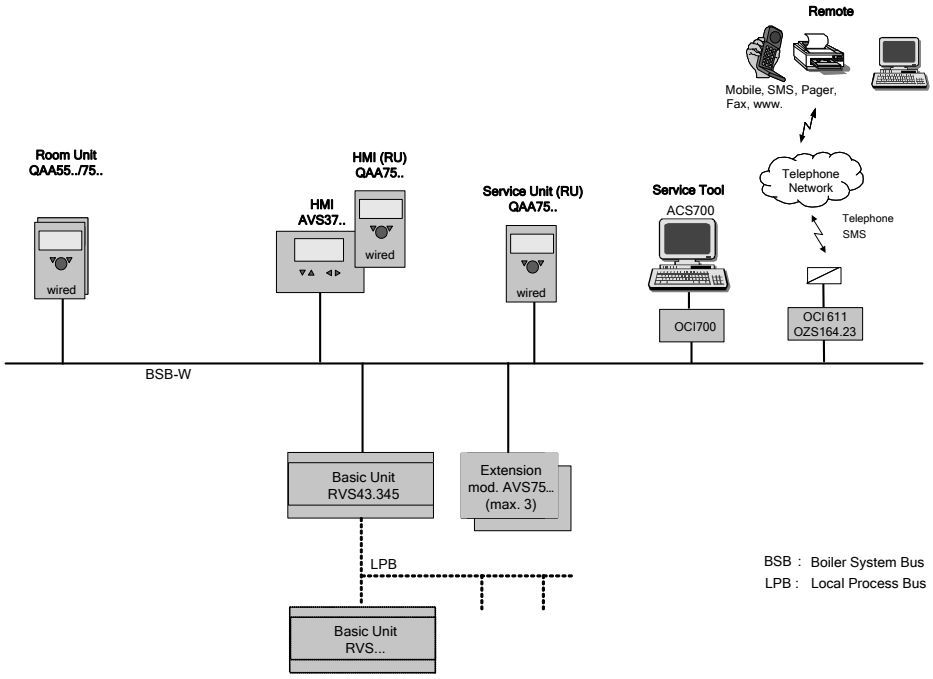
The following products are described in separate pieces of documentation:

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

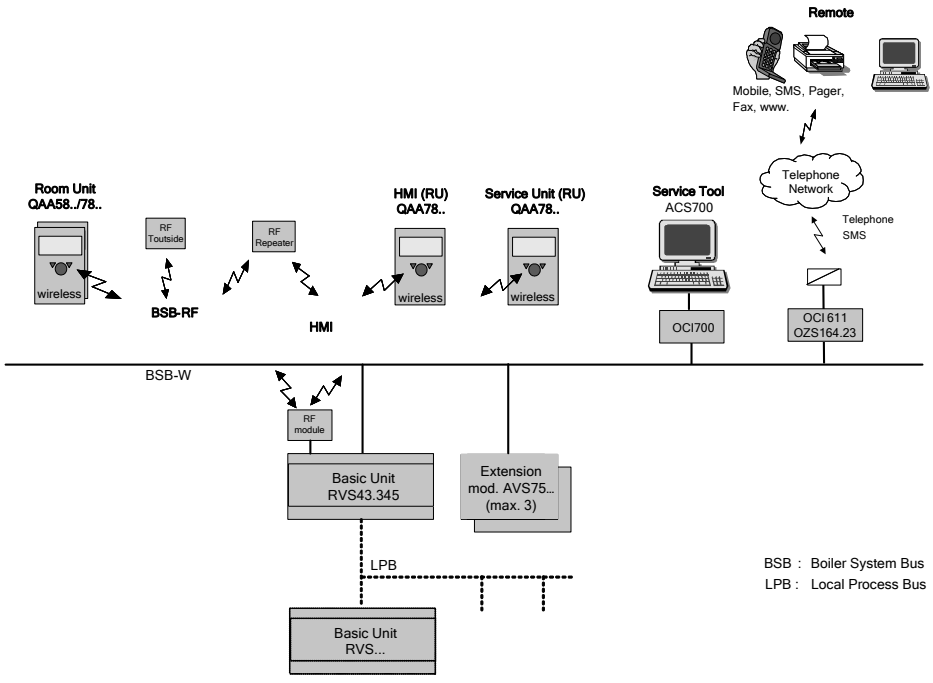
1.1 Type summary

1.1.1 Topology

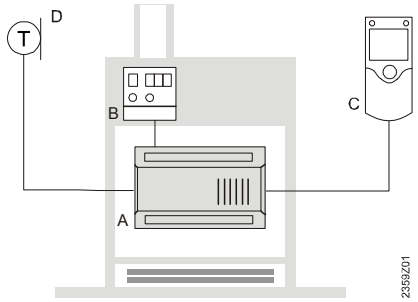
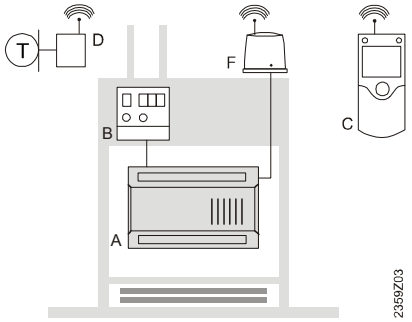
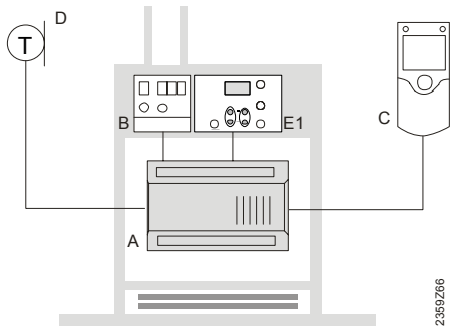
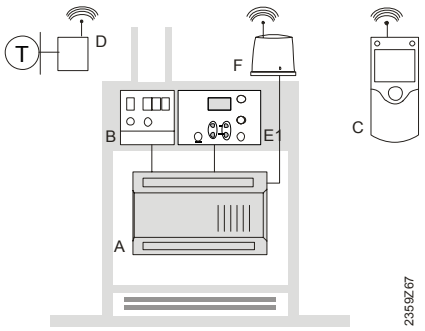
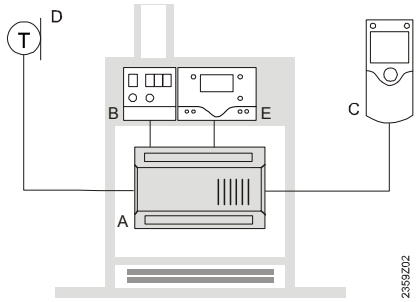
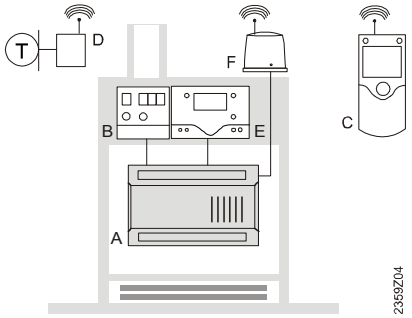
Wired



Wireless



1.1.2 Operation options

	Wired	Wireless
Operation with room unit		
Operation with operator unit "basic" (optionally with additional room unit)		
Operation with "clear text" operator unit (optionally with additional room unit)		

A Basic unit RVS43.345
B Power section AVS16…
C Room unit QAA75… / 78… / QAA55..
D Outside sensor AVS13…
E Operator unit AVS37.294 (clear-text)
E1 Operator unit AVS37.390 (basic)
F RF module AVS71…

2 Safety notes

2.1 Notes on product liability

- The products may only be used in building services plant and applications as described above
- Comply with all requirements specified in Section "Mounting and installation" when using the products.
- Comply with all local regulations (for installation, etc.).
- Do not open the units. If not observed, warranty becomes void.

3 Mounting and installation

3.1 Regulations

Electrical installation

- Prior to installing the controller, the power supply 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
- One and the same sensor cannot be connected to several inputs

3.2 Basic units RVS43.345

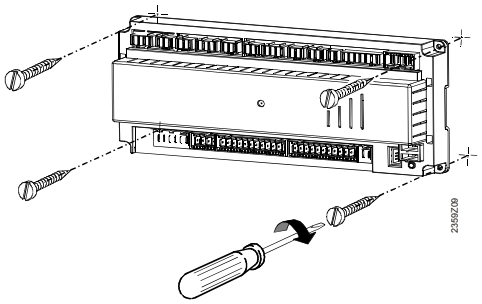
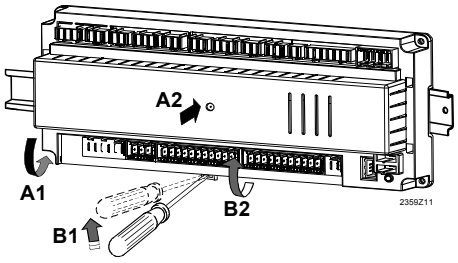
Engineering

- 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 controller's cooling slots which are situated at the top and bottom of the housing.
  The 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 mounted in compliance with these regulations.
- Power to the controller may only be supplied when completely installed. If this is not observed, there is a risk of electric shock hazard near the terminals and through the cooling slots.
- The controller may not be exposed to dripping water.
- Permissible ambient temperature when mounted and when ready to operate: 0-0.50°C.
- Power cables must be clearly separated from low-voltage cables (sensors) observing a distance of at least 100 mm

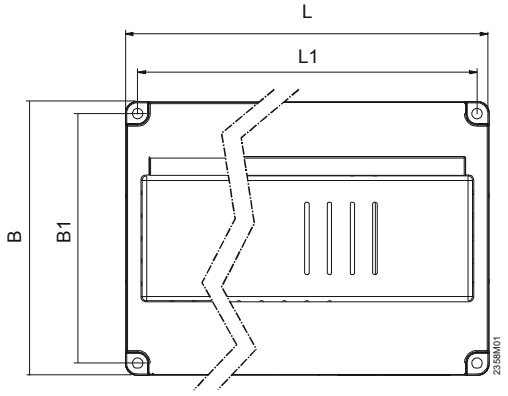
Mounting location

- 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!

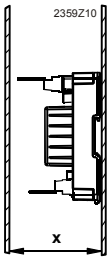
Dimensions and drilling plan



Dimensions in mm

	L	*B*	*H*	*L1*	*B1*
RVS43.345	180.7	120.7	51.7	170	110

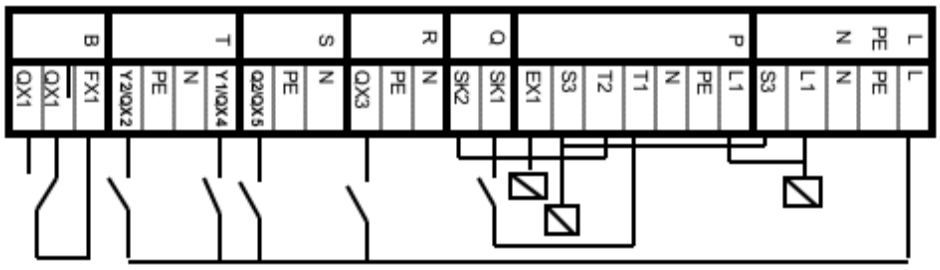
Total height required



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

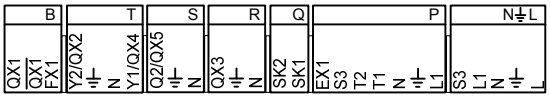
3.2.1 Connection terminals RVS43.345

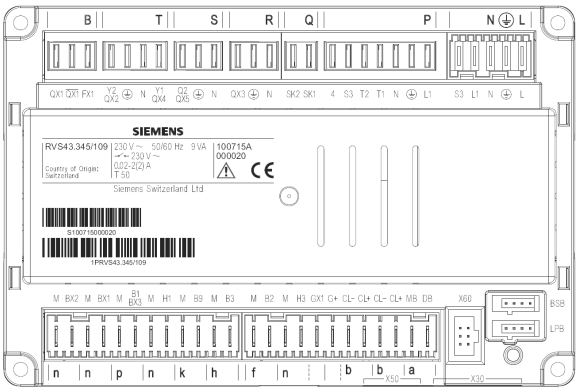
Power terminals



Connection diagramboard

Terminal markings RVS43.345





Mains voltage

	Use	*Space*	*Connector type*
L ⏚ N L1 S3	Live AC 230 V basic unit Protective earth Neutral conductor Phase AC 230 V burner Output burner fault	N ⏚ L	AGP4S.05A/109
L1 ⏚ N T1 T2 S3 EX1	Phase burner Protective earth Neutral conductor Phase burner 1st stage Burner 1st stage ON Input burner fault Multifunctional input AC230V EX1	P	AGP8S.07A/109
SK1 SK2	Safety loop Safety loop	Q	AGP8S.02E/109
N ⏚	Neutral conductor Protective earth	R	AGP8S.03A/109

	Use	Space	Connector type
QX3	DHW charging pump/diverting valve/multifunctional output		
N ⏚ Q2 / QX5	Neutral conductor Protective earth 1st Heating circuit pump/ 5th multifunctional output	S	AGP8S.03B/109
Y1 / QX4 N ⏚ Y2 / QX2	1st Heating circuit mixing valve opening/ 4th multifunctional output Neutral conductor Protective earth 1st heating circuit mixing valve closing/ 2nd multifunctional output	T	AGP8S.04B/109
FX1 $\overline{QX1}$ QX1	Phase 1st multifunctional output Inverted signal from QX1 1st Multifunctional output / 2nd burner stage	B	AGP8S.03G/109

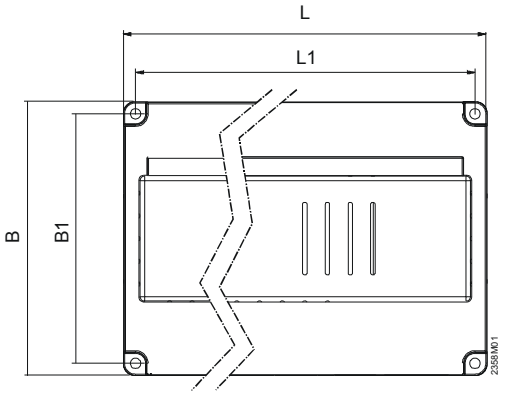
Low voltage

	Use	Space	Connector type
BSB	Service tool OCI700	-	-
LPB	Service tool OCI700	-	-
X60	RF module AVS71.390	-	-
X50	Extension module AVS75.390 / AVS75.391	-	AVS82.490/109
X30	Operator unit / boiler control panel	-	AVS82.491/109
DB MB	LPB data LPB ground		AGP4S.02H/109
CL+ CL-	Room unit 2 data Room unit 2 ground	b	AGP4S.02A/109
CL+ CL-	Room unit 1 data Room unit 1 ground	b	AGP4S.02A/109 AGP4S.03D/109
G+	Room unit 1 power supply 12 V		
GX1	Power supply 5V/12V for active sensor		
H3 M	Digital / DC 0...10 V input Ground	n	AGP8S.02I/109
B2 M	Boiler sensor Ground	f	AGP4S.02B/109
B3 M	DHW sensor top Ground	h	AGP4S.02C/109
B9 M	Outside sensor Ground	k	AGP4S.02D/109
H1 M	Digital / DC 0...10 V input Ground	n	AGP4S.02F/109
B1 / BX3 M	Flow temperature sensor HC1/ Multifunctional sensor input 3 Ground	p	AGP4S.02S/109
BX1 M	Multifunctional sensor input 1 Ground	n	AGP4S.02F/109
BX2 M	Multifunctional sensor input 2 Ground	n	AGP4S.02F/109

3.3 Extension module AVS75.39x

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

Dimensions and drilling plan



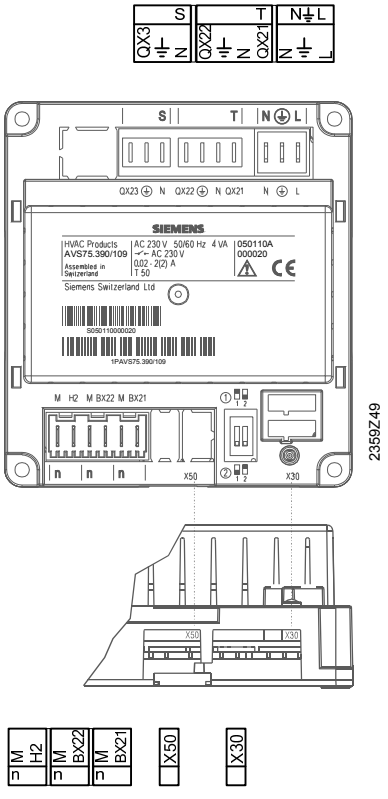
Dimensions in mm

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

Connections

The AVS75.39x extension module is connected to terminal X50 of the basic unit using the AVS83.490/109 connecting cable. The connectors are coded.
Additional modules are connected using connector X30 on the first module to connector X50 for the next module.
Up to 3 extension modules can be connected to the basic module.

3.3.1 Connection terminals AVS75.390



① = module 1

② = module 2

③ = module 3

Terminal markings
AVS75.390

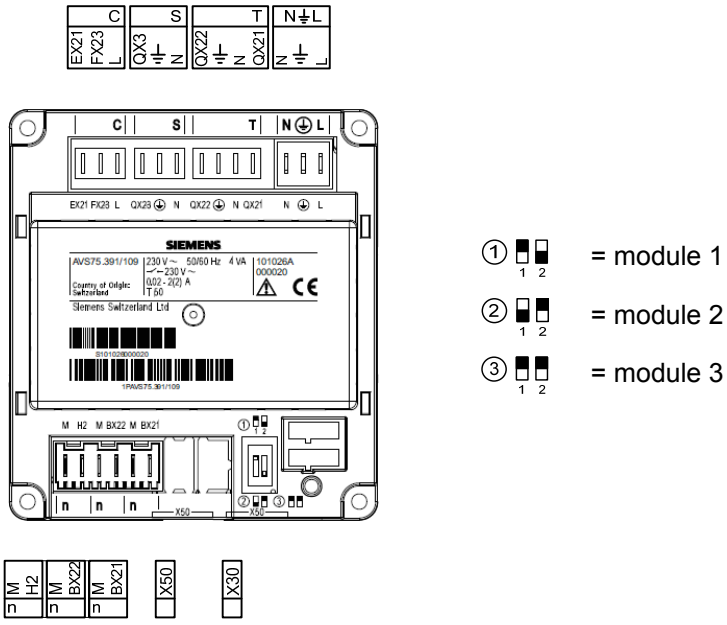
Mains voltage

	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	Connection for additional extension module	-	AVS82.490/109
X50	Connection to basic unit or first extension module		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

3.3.2 Connection terminals AVS75.391



Terminal markings:
AVS75.391

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
L FX23 EX21	Live AC 230 V Power QX23 EX21	C	AGP8S.03K/109

Low voltage

	Use	*Space*	*Connector type*
X30	Connection for additional extension module	-	AVS82.490/109
X50	Connection to basic unit or first extension module		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

With the parameters:

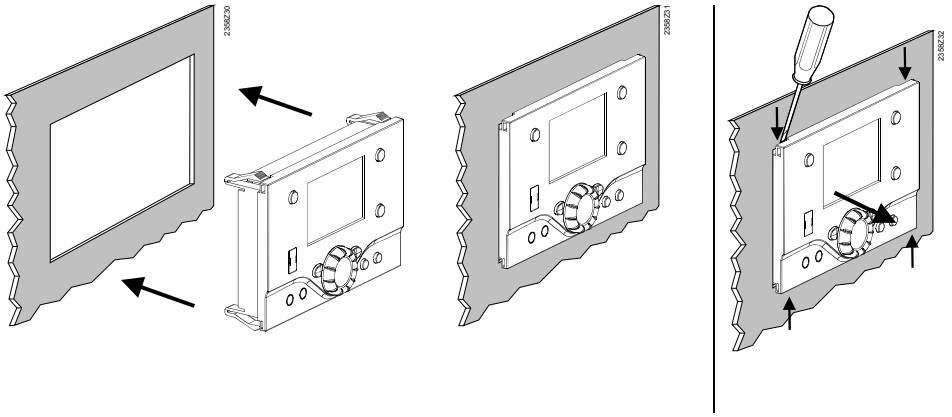
- Function extension module 1 (6020)
- Function extension module 2 (6021)
- Function extension module 2 (6022)

are used to define usage of the respective module.

3.4 Operator unit AVS37.294

Mounting method

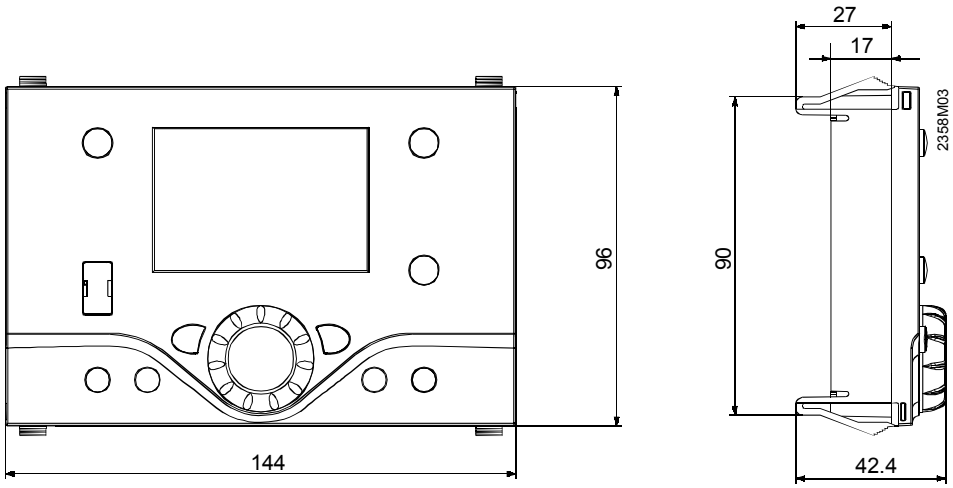
Installation **Removal**



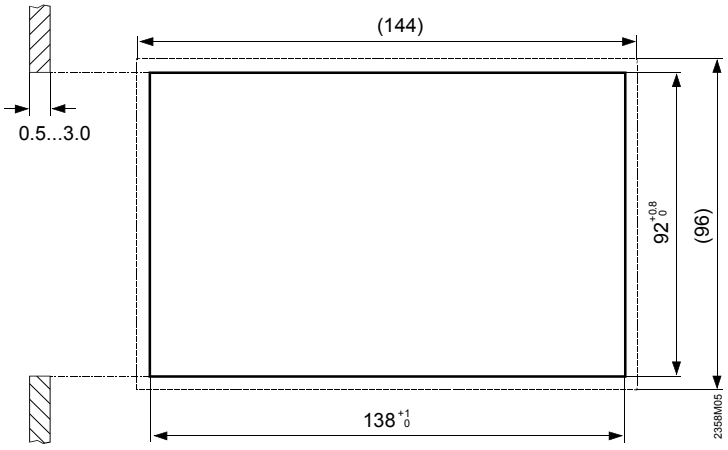
Connections

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

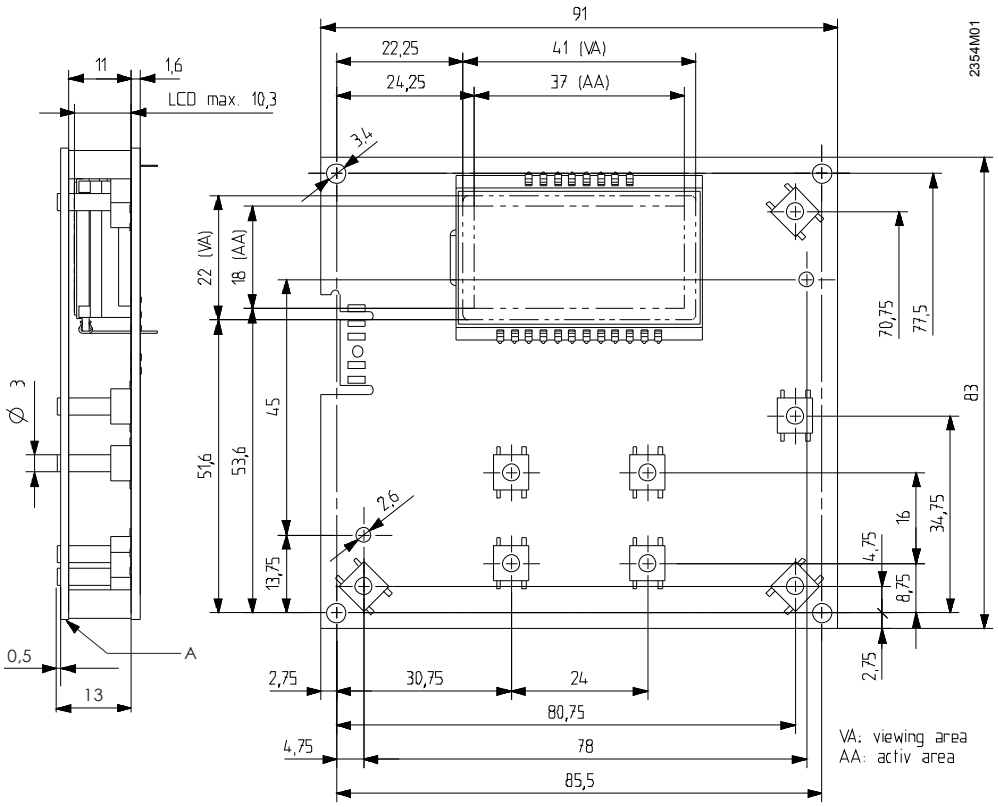


3.5 Operator unit AVS37.390

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

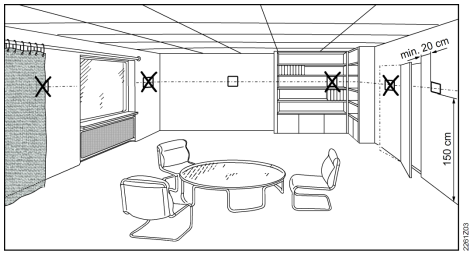


A Control panel, front

The AVS37.390 operator unit is a PCB version without casing, supplied by Siemens.

3.6 Room unit QAA55…

Engineering

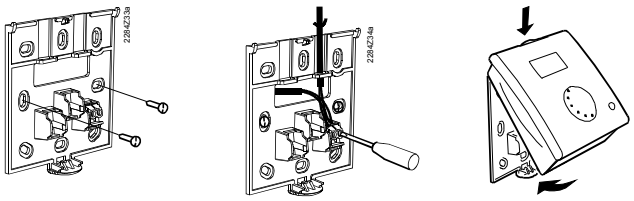


The room unit should be located in the main living room while giving consideration to the following criteria:

- 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

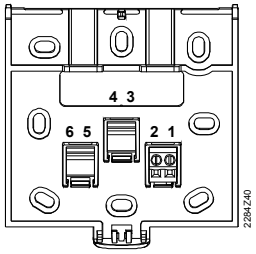
When the unit is removed from its base, power is cut off so that the unit is out of operation.

Mounting method



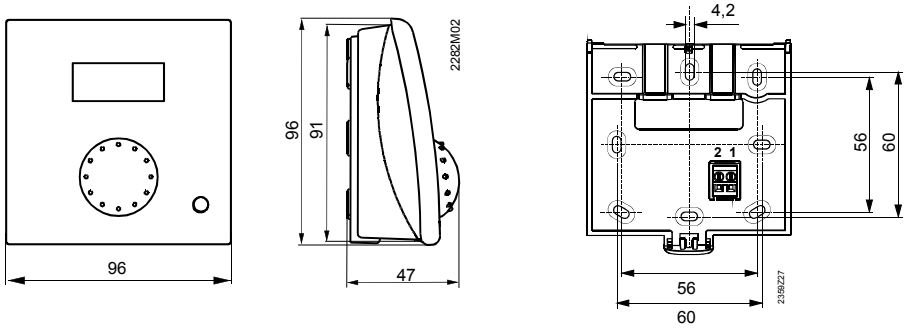
The controller must not be exposed to dripping water

Connections



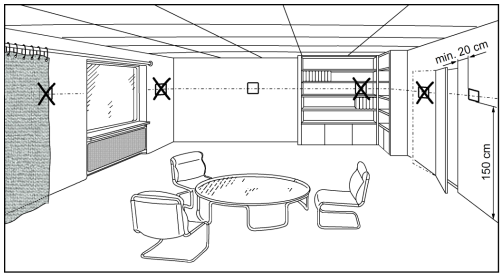
1	**CL+**	**BSB data**
2	**CL-**	**BSB ground**

Dimensions and drilling plan



3.7 Room unit QAA75…

Engineering

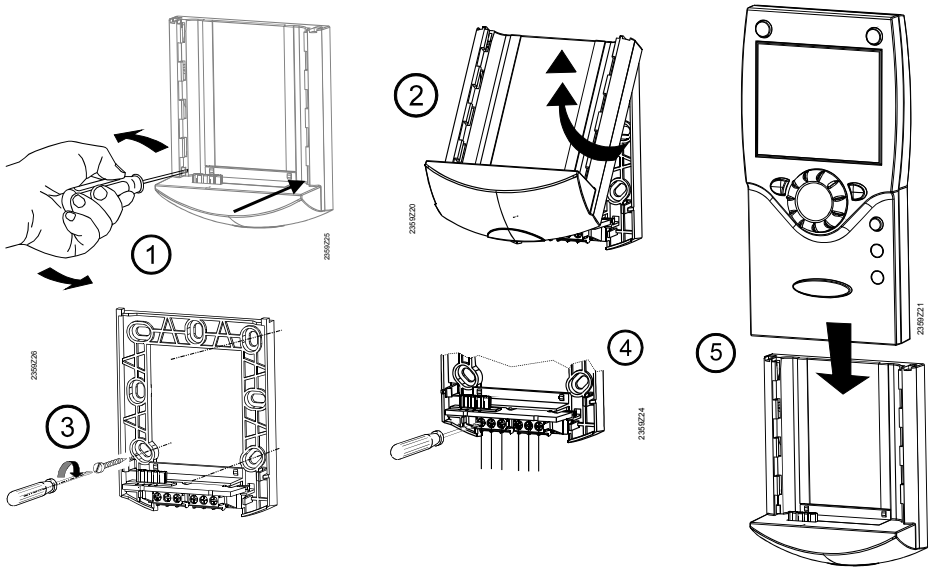


The room unit should be located in the main living room while giving consideration to the following criteria:

- 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.

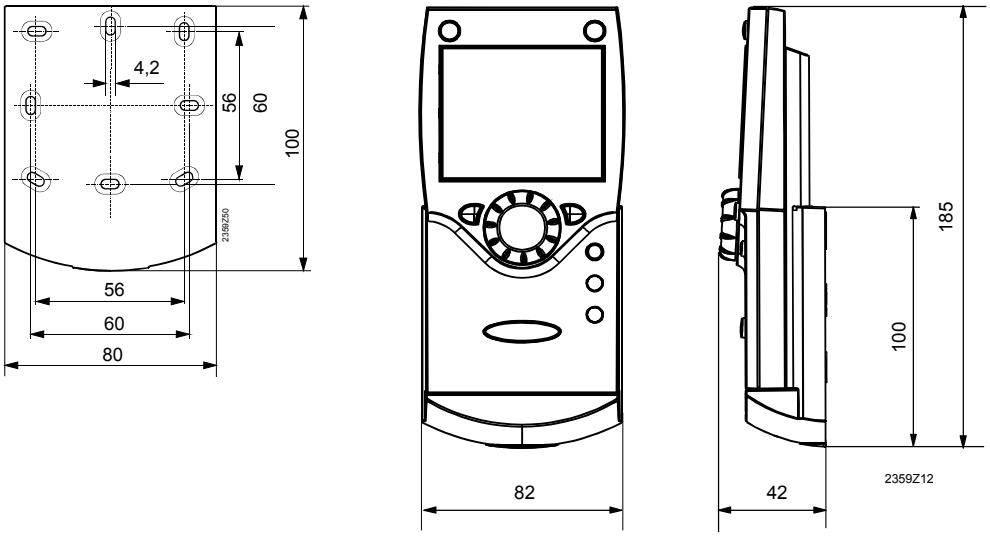
Mounting method



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 RF components

The wireless components should be located such that transmission is as interference-free as possible. Observe the following:

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

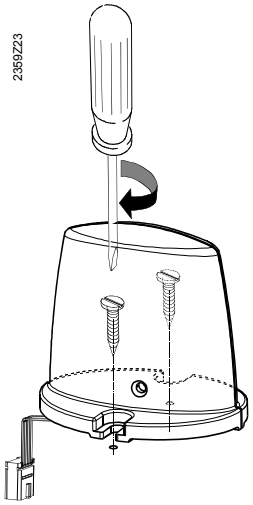
3.8.1 RF module AVS71.390

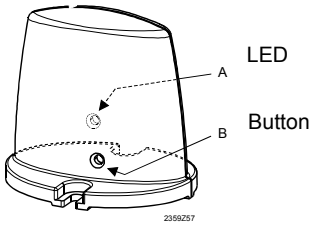
The RF module extends the product range by introducing wireless communication. With this type of device, the system components, such as room units, transmit data with no need for laying cables.

Engineering

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

Mounting method





Terminals

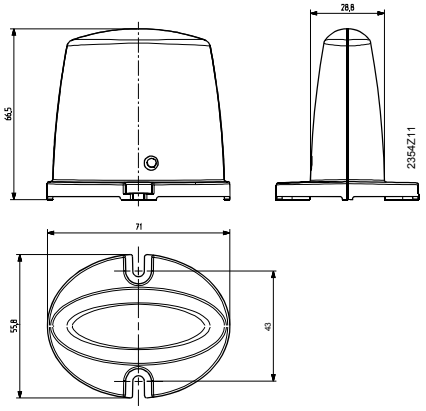
The prefabricated cable is to be connected to terminal X60 of the controller.

⚠ Disconnect all power prior to connecting the basic unit!

Radio connection

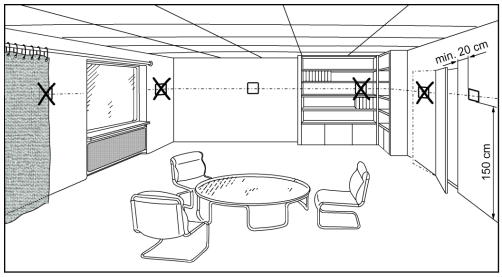
Establishment of the wireless connection is described in the following sections which cover the relevant RF components.

Dimensions and drilling plan



3.8.2 Room unit QAA78.610

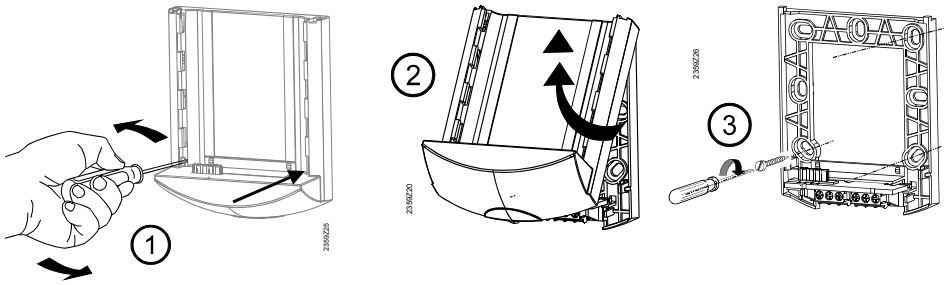
Engineering

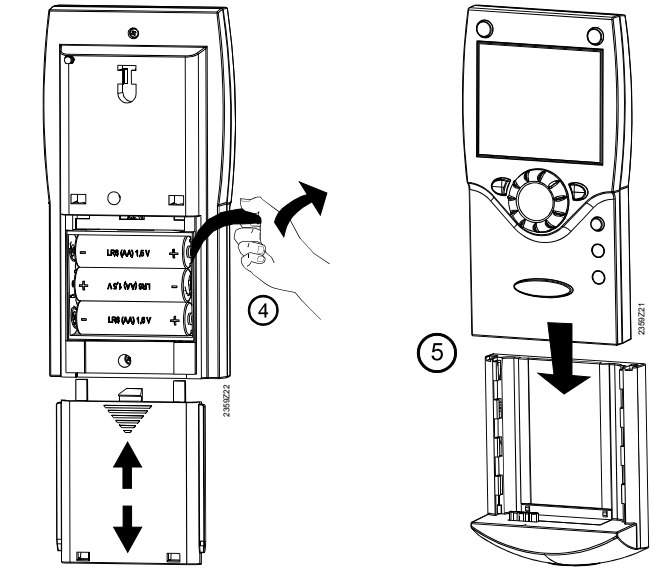


The room unit should be located in the main living room while giving consideration to the following criteria:

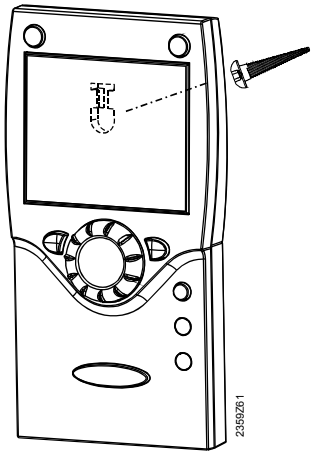
- The place of installation should be chosen so that the sensor can capture the room temperature as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources (about 1.5 meters above the floor)
- In the case of wall mounting, there must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

Mounting with the base





Mounting without the base



Connections / power supply

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

Radio connection

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

Prerequisite for the radio connection is that all components receive power, which means that the RF module must be correctly connected to the controller 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 the OK button 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 the OK button.
4. Select operating page "Operator unit" and press OK.
5. Select operating line "Used as" (40) and make the appropriate selection. Then, press the OK button.
6. Select menu "Wireless" and press the OK button.
7. Select setting line "Binding" (line 120). Then, press the OK button.
8. Set the setting knob to "YES" and press the OK button. The process of opening the connection is started.
9. The display shows the progress of opening the connection in %. This process can take 2 to 120 seconds.
10. The connection is established when "Device ready" appears and the LED on the RF module extinguishes

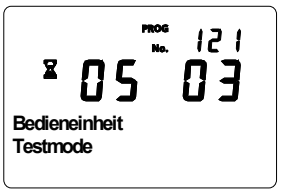
Testing

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

- The test can be stopped 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 menu "Radio" and activate the test mode on setting line "Test mode" (121).

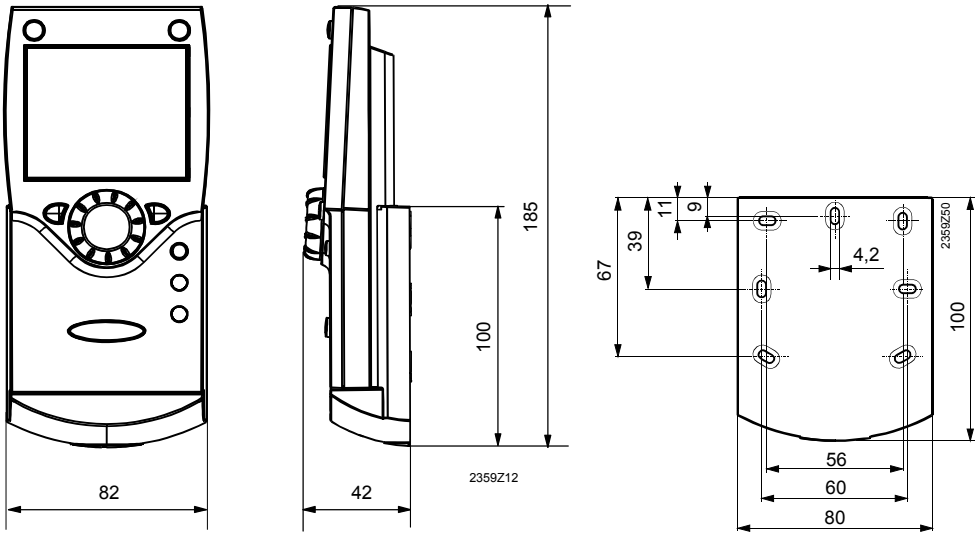
Example of a display during the test:



The digits on the left show 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 should be chosen, or the AVS14.390 RF repeater should be used.

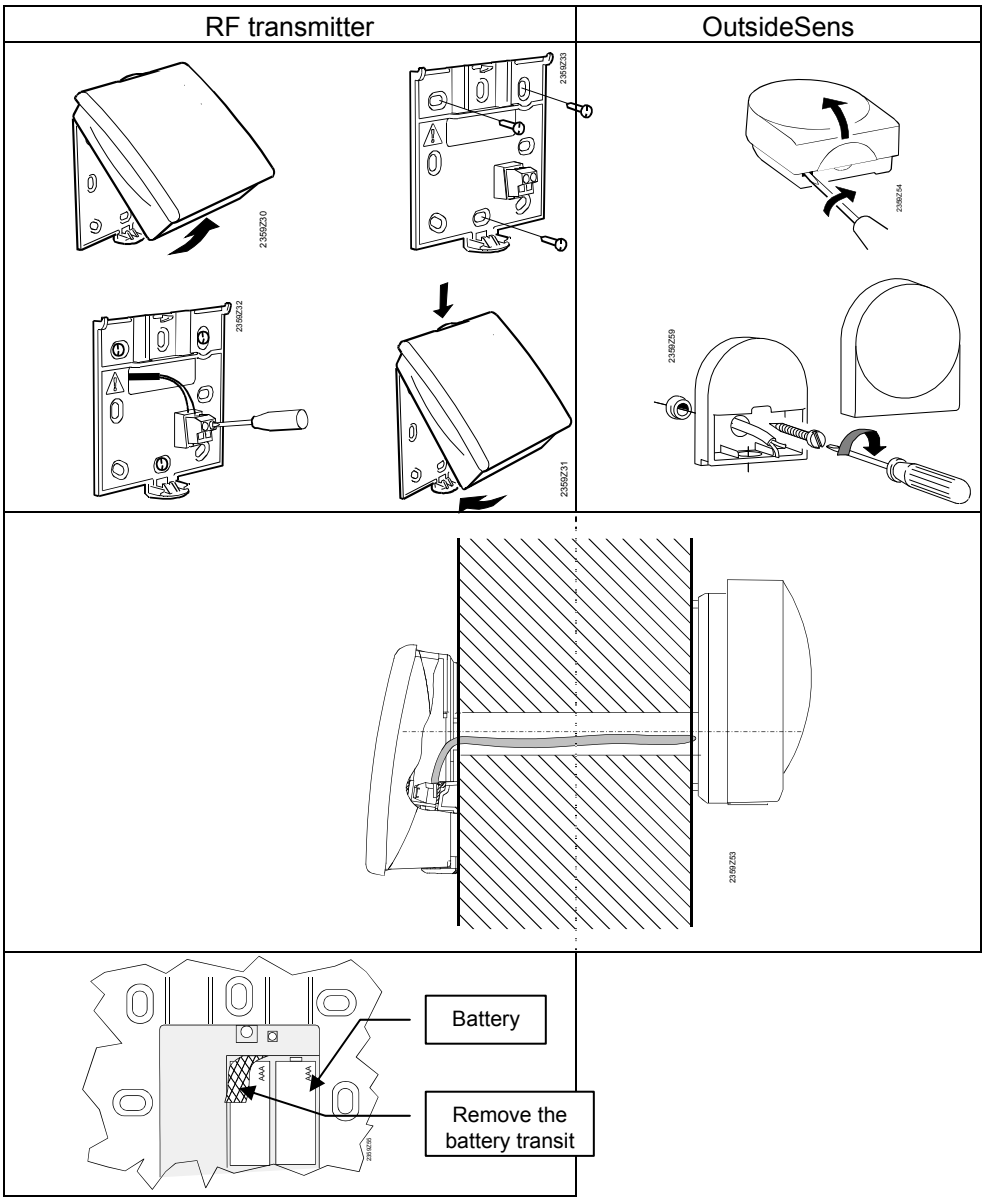
Dimensions and drilling plan



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.

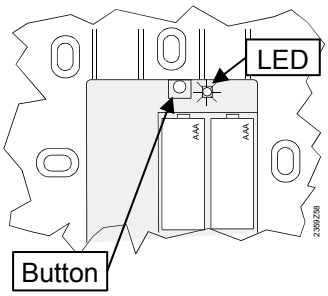
The device is powered by two 1.5 V alkaline batteries type AAA (LR03).

Radio connection

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

Prerequisite for the radio link is that all components receive power, which means that the RF 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 RF module for at least 8 seconds until the LED on the RF module starts blinking **rapidly**.
2. Press the button on the transmitter of the wireless outside sensor for at least 8 seconds until that LED also starts blinking **rapidly**.
3. The connection is established when the LED on the RF module extinguishes.
4. Press the button on the transmitter of the wireless outside sensor briefly again until the LED extinguishes.

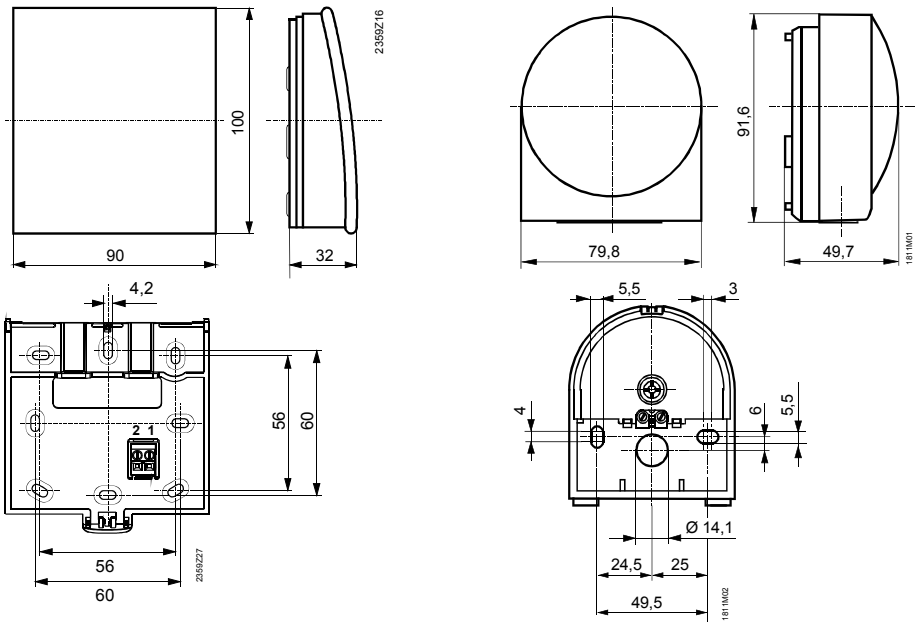
Testing

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

- The test can be stopped 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 start **blinks slowly**.
2. When radio communication works correctly, the LED on the RF module blinks 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 turns off.

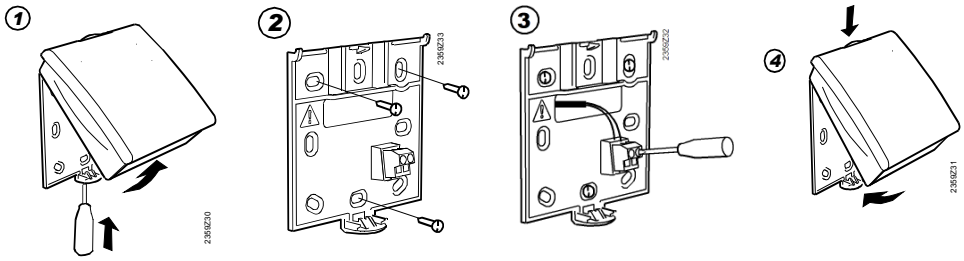
Dimensions and drilling plan



3.8.4 RF 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 RF repeater must be fitted inside the building

Mounting method



Connections

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

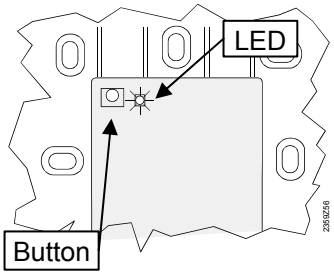
Radio connection

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

Prerequisite for the radio link is that all components receive power, which means that the RF module must be correctly connected to the basic unit and power must be correctly supplied to the RF repeater.

Establishment

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



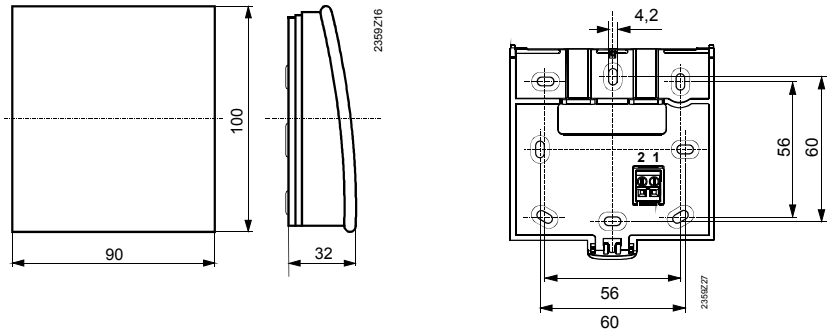
Testing

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

ℹ
- The test can be stopped 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 RF repeater for a maximum of 8 seconds until the LED starts blinking **slowly**.
2. When radio communication works correctly, the LED on the RF module blinks briefly at 10-second intervals.
3. After the test, press the button on the RF repeater again briefly until the LED extinguishes.

Dimensions and drilling plan



3.8.5 Checking the RF components

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

3.9 Power supply AVS16.290

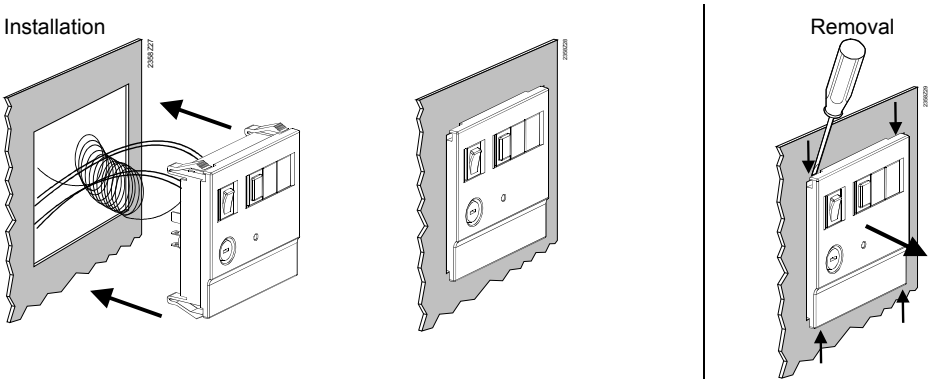
Mounting notes

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 it is completely fitted in the cut-out. 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 must be secured with the 4 clips provided on the panel

⚠
- Power to the control panel may be supplied only after it is completely fitted in the cut-out. Extensions or dummy covers for which cutouts are provided must also be fitted beforehand
- Control panel wiring to the connection terminals does not feature strain relief so that the cables must be secured inside the boiler
- Local regulations for electrical installation must be complied with

Mounting method



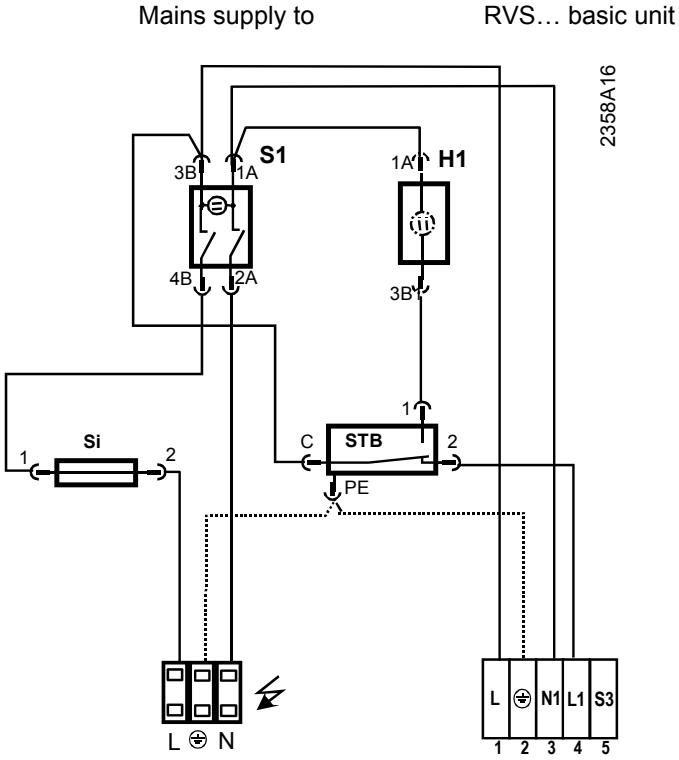
Connections

Mains

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

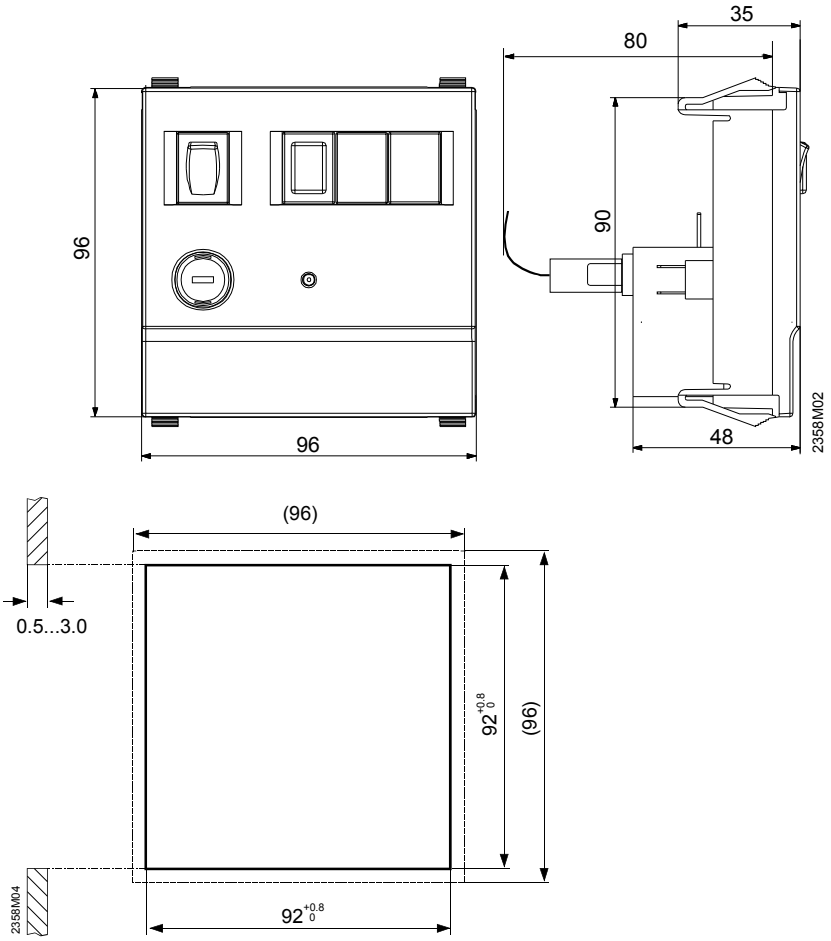
Connection to basic unit

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



Si Fuse 6.3AT
S1 Mains switch with green glow lamp
SLT Safety limit thermostat (SLT) 110 °C
H1 Signal lamp (SLT tripped)

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 products, correctly working radio connections to all required auxiliary units
- Make all plant-specific settings. Special attention must be paid to menu "Configuration". For that purpose, the relevant operating level is to be selected as follows:
  - Press the **OK** button 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 the OK button.
- Make the function check as described below
- Reset the attenuated outside temperature (menu "Diagnostics of consumers", operating line "Outside temp attenuated" (8703))

Function check

To facilitate commissioning and fault tracing, the controller can be used to make input and output tests. With these tests, the controller's inputs and outputs can be checked. To make the tests, switch to menu "Input / output test" and go through all available setting lines.

Operating state

The current operating state can be checked on menu "State".

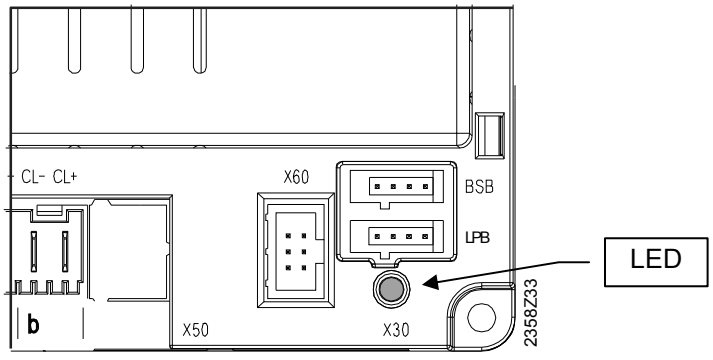
Diagnostics

For detailed diagnostics of the plant, check menus "Diagnostics heat generation" and "Diagnostics consumers".

4.1 Basic unit RVS43.345

Checking the LEDs

LED off	No power
LED on	Ready
LED blinks	Local fault

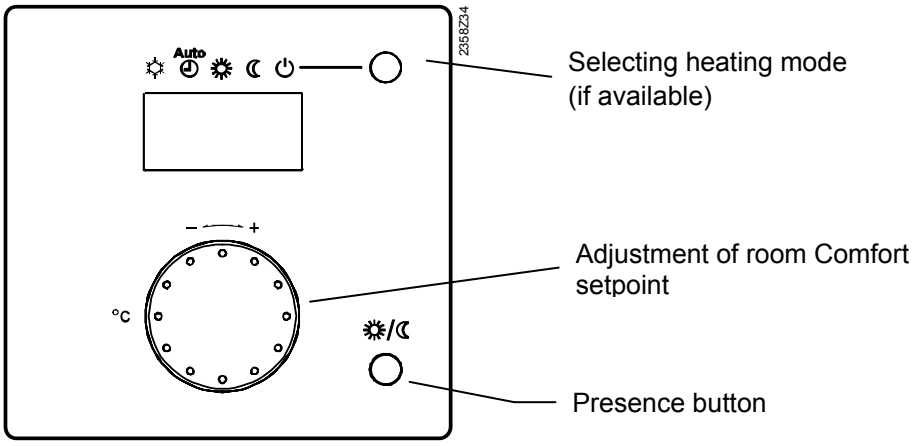


5 Handling

5.1 QAA55...

5.1.1 Operation

Operating elements



Display choices

- Heating / cooling to the Comfort set point
- Heating to Reduced setpoint
- Error messages

Display

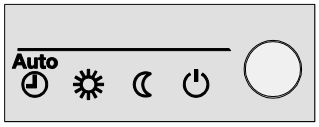
Display of all segments.

Display of all segments:

Example of basic display:

Selecting pace heating mode

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



Automatic operation AUTO

In automatic mode, the room temperature is controlled in accordance with the time program.

Characteristics of automatic mode:

- Heating mode according to the time program
- Temperature setpoints as per heating program "Comfort setpoint" or "Reduced setpoint"
- Protective functions active.
- Automatic summer / winter changeover and automatic 24-hour heating limit active (ECO functions)

Continuous operation ☼ or ☾

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

☼ Heating to the Comfort set point
☾ Heating to Reduced setpoint

Characteristics of continuous operation:

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

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

Indication of cooling mode

Cooling mode ☼ (depending on type)

Release of cooling mode is indicated by a bar which appears below the symbol. Cooling mode is active when the bar for heating mode is hidden.

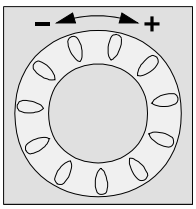
.

Characteristics of cooling mode:

- Cooling mode based on time program
- Temperature set point in accordance with "Comfort set point cooling"
- Protective functions active.
- Cooling limit depending on the outside temperature

Adjusting the room temperature set point

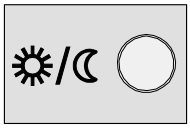
The heating or cooling set point is set depending on the active operating state.
Turn the setting knob to increase or decrease the **Comfort setpoint ☼** .



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

Presence button

If you do not use the rooms for short periods of time, you can press the presence button to temporarily reduce heating / cooling.
When the rooms are occupied again, press again the occupancy button.



ℹ
- 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

5.1.2 Programming

Configuration

A long press on the occupancy button (> 3 seconds) enables the service level to be accessed. When the parameter is selected, the current value blinks. The setting knob is used to adjust the value. The next setting can be selected by a short press on the occupancy button.

Settings

	Display	*Function*
Used as	ru = 1	The room unit is addressed as room unit 1 (default setting)
	ru = 2	The room unit is addressed as room unit 2
	ru = 3	The room unit is addressed as room unit 3
Direct adjustment	P1 = 1	**Automatic storage**: (default setting) A set point readjustment made with the knob is adopted either by pressing the operating mode button or without any further confirmation (timeout).
	P1 = 2	**Storage with confirmation**: A set point readjustment made with the knob is adopted only after pressing the operating mode button.
Operation lock	P2 = 0	**OFF**: All operating elements enabled (default setting)
	P2 = 1	**ON**: Following operating elements are locked: •Operating mode changeover heating circuit •Readjustment of Comfort set point •Changeover of operating level (occupancy button)

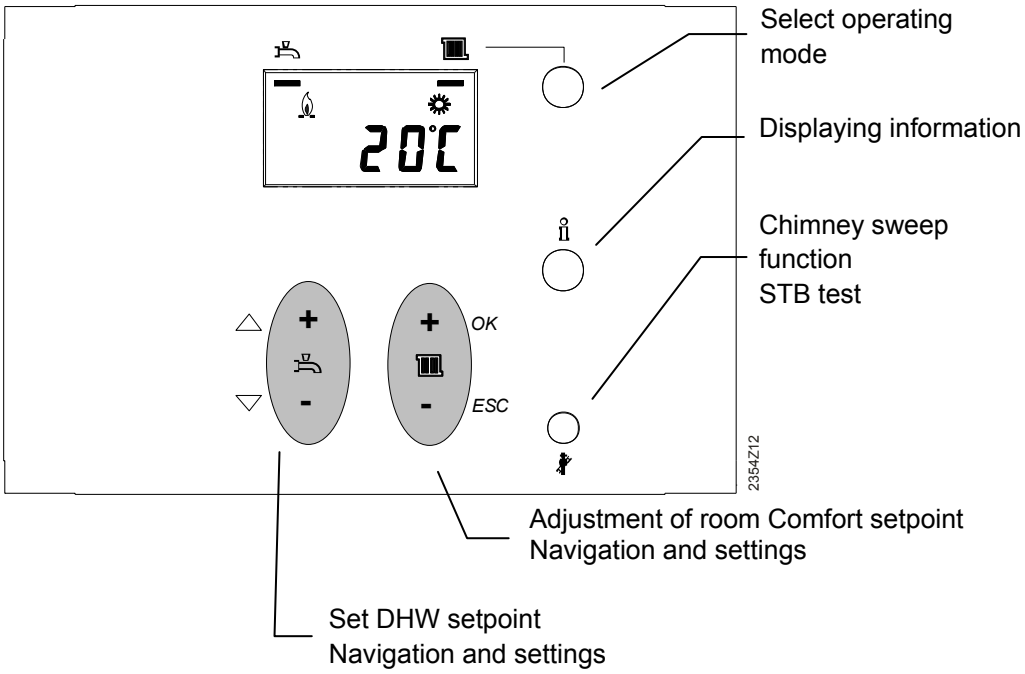
If operation lock is active and one of the locked buttons is pressed, OFF is displayed for 3 seconds.

The operation lock does not prevent the service level from being accessed.

5.2 AVS37.390

5.2.1 Operation

Operating elements



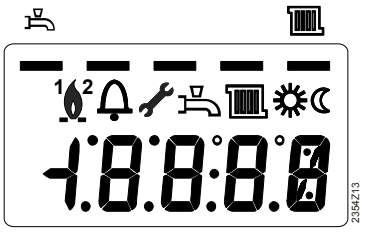
The above illustration shows an example of the front of an operator unit (not supplied as standard).

Display choices

- Heating to the Comfort set point
- Heating to Reduced setpoint
- Boiler operation active
- Boiler operation DHW heating active
- Burner in operation
- Error messages
- Service / special operation

Display

Display of all segments.

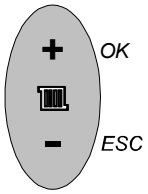


Selecting operating mode

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 set point

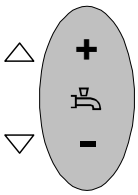
Turn the setting knob to increase or decrease the Comfort setpoint ☼ .
For the **Reduced set point** ☾
- Press the OK button
- Select the operating line for the "Reduced setpoint"



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

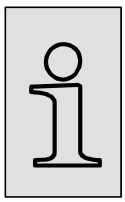
Set nominal DHW setpoint

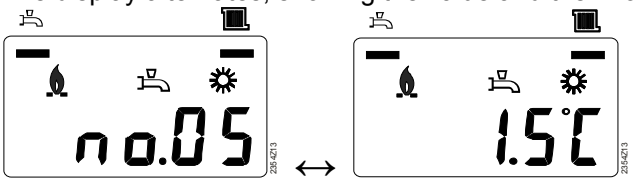
Press the + / - buttons to increase or decrease the nominal DHW setpoint.



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

Service or special operation
If this symbol appears, a maintenance message is delivered or the plant has changed to special operation. The display shows letter "c", followed by the message no.

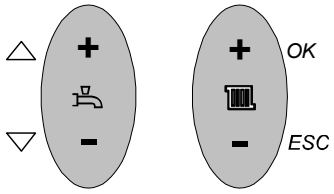
Chimney sweep function

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).

5.2.2 Programming

Setting principle

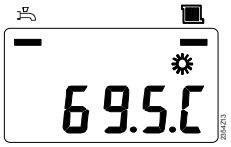
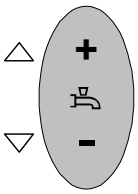
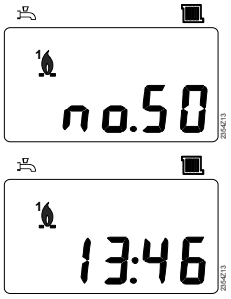
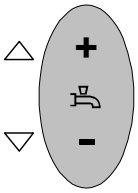
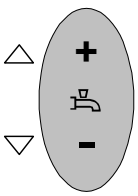
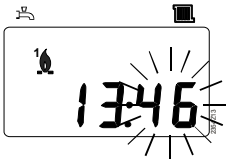
Settings that cannot be made directly with the help of operating elements are made through programming. For that, the respective setting buttons are used as follows:

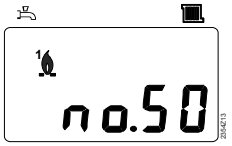


- When pressing the *ESC* button, you go one step back; adjusted values will not be adopted
- If no setting is made for 8 minutes, the display returns automatically to the basic display
- Operating lines may be hidden, depending on the type of controller, the configuration made and the user level

Example: "Setting the time of day"

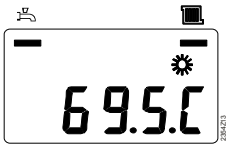
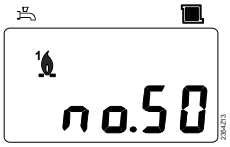
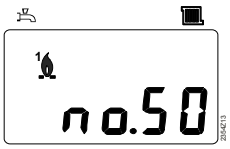
The following example shows how to set the time of day and the date.

	Operation	Display example	Description
1			Basic display. If the basic display is not shown, press the ESC button to return to it. 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 the OK button to confirm.
3			The display shows the hours blinking. Press the "+/-" button until the hours of the time of day are correct. Press the OK button to confirm.
4			The display shows the minutes blinking. Press the "+/-" button until the minutes of the time of day are correct. Press the OK button to confirm.

5		 	The settings are saved and the displays stops blinking. Now, you can make further settings or press the operating mode button to return to the basic display.
6			Unit now returns to basic display.

5.2.3 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		You see the basic display. Press the Info button for 3 seconds.
2	 	Now, you are on the user level "End user". Press the info button for 3 seconds.
3		You are on user level "Enduser". If the change to the "Heating engineer" level was successful, the display shows "ON" as a confirmation.

5.2.4 Overview of the settings

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

Key
E = end user F = heating engineer
OL = Operating line

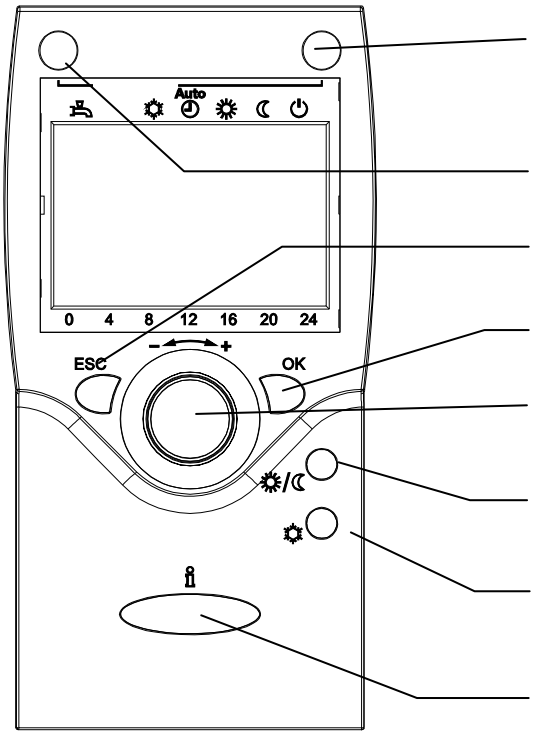
Operating line	Operating line clear-text units	User level	Function	Default value	Min	max	Unit
Time of day and date							
50	1	E	Hours/minutes	01:00	00:00	23:59	hh:mm
51	2	E	Day / month	1.01	01.01	31.12	dd.mm
52	3	E	Year	2004	2004	2099	yyyy
53	4	F	Start of summertime	25.03	01.01	31.12	dd.mm
54	5	F	End 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

5.3 QAA75... / QAA78… / AVS37…

5.3.1 Operation

Operating elements

Room units
QAA75... / QAA78…



Selecting pace heating mode

Selection of DHW heating mode

Quitting the setting

Adopting the setting

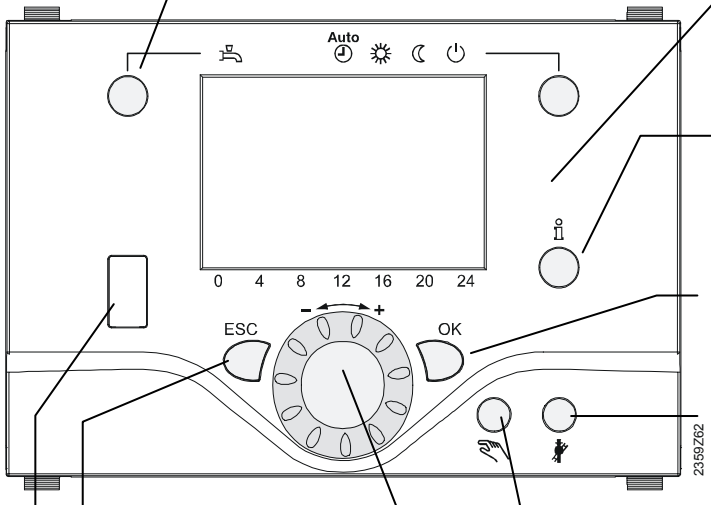
Adjustment of room Comfort setpoint
Navigation and settings

Presence button

Cooling button
(not available with all variants)

Displaying information

Operator unit
AVS37...



Selection of DHW heating mode

Selecting pace heating mode

Displaying information

Adopting the setting

Chimney sweep function
STB test

Quitting the setting

Manual operation

Service socket (BSB)

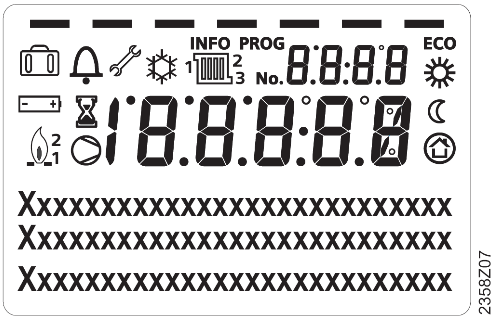
Adjustment of room Comfort setpoint
Navigation and settings

Display choices

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

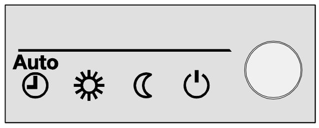
Display

Example of all displayable segments.



Selecting pace heating mode

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



Automatic operation AUTO

In automatic mode, the room temperature is controlled in accordance with the time program.

Characteristics of automatic mode:

- Heating mode according to the time program
- Temperature setpoints as per heating program "Comfort setpoint" or "Reduced setpoint"
- Protective functions active.
- Automatic summer / winter changeover and automatic 24-hour heating limit active (ECO functions)

Continuous operation or

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

- Heating to the Comfort set point
- Heating to Reduced setpoint

Characteristics of continuous operation:

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

Protection

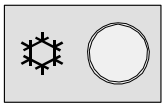
When using Protection, the heating system is off. But it remains protected against frost (frost protection temperature) provided there is no power failure.

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

Selection of cooling mode

To select cooling mode, press the Cooling button. The selection made is indicated by a bar which appears below the symbol.



Cooling mode

In cooling mode, the room temperature is controlled in accordance with the time program.

Characteristics of cooling mode:

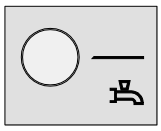
- Manual cooling mode (24h/day released)
- Cooling mode based on time program
- Temperature set point in accordance with "Comfort set point cooling"
- Protective functions active.
- Automatic summer / winter changeover active
- Summer compensation

Selecting the 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 mode

On
The DHW is heated according to the selected switching program.



Off
No DHW heating, protective function is active.

DHW push

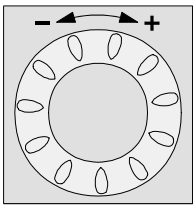
The DHW push is triggered by keeping the DHW operating mode button on the operator or room unit depressed for at least 3 seconds.

It can also be started when:

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

Adjusting the room temperature set point

Turn the setting knob to increase or decrease the **Comfort set point** ☼ . During active heating mode, you can readjust Comfort set point "Heating", and during active cooling mode, you can readjust Comfort set point "Cooling".



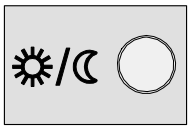
For the **Reduced set point** ☾

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

After each readjustment, wait at least 2 hours, allowing the room temperature to adapt.
The Reduced set point can only be set in the case of heating mode. In cooling mode, there is no reduced set point, only the Comfort set point.

Presence button

If, during the Comfort period, the rooms are not used for short periods of time, you can press the occupancy button to lower the room temperature, thus saving heating energy (changeover from Comfort to Reduced set point), or saving cooling energy (changeover from Comfort set point to OFF).



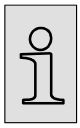
When the rooms are occupied again, press again the occupancy button to return to normal heating (changeover from Reduced to Comfort set point), or to cooling (changeover from OFF to Comfort set point).

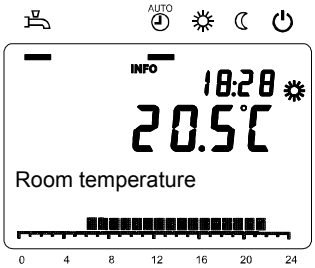
In heating mode:		*In cooling mode:*	
☼	Heating to the Comfort set point	☼	Cooling to the Comfort set point
☾	Heating to Reduced setpoint		Cooling off (no symbol)

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.

Displays

- Possible error messages from the error code list, Section 7.31.1
- Possible service messages from the service code list, Section 7.31.2
- Possible special mode messages, Section 7.31.3

Other possible displays:

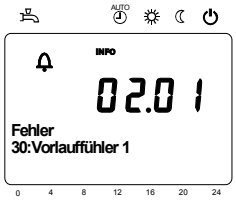
- Room temperature.
- Room temp min
- Room temp max
- Room setpoint 1
- Room setpoint 2
- Room setpoint 3
- Cascade flow temp
- Boiler temp
- Outside temperature
- Outside temp min
- Outside temp max
- DHW temp 1
- DHW temp 2
- Buffer temp 1
- Buffer temp 2
- Buffer set point
- Flow temp 1
- Flow temp set point 1
- Flow temp 2
- Flow temp set point 2
- Flow temp 3
- Flow temp set point 3
- Collector temp 1
- Solid fuel boiler temp
- Solar flow temp
- Solar return temp
- 24-hour yield solar energy
- Total yield solar energy
- Swimming pool temp
- Swimming pool set point
- State heating circuit 1
- State heating circuit 2
- State heating circuit 3
- State cooling circuit
- State DHW
- State of boiler
- State solar
- State solid fuel boiler
- State buffer
- State swimming pool
- error message
- Maintenance message
- floor curing function
- 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.



Service or special operation

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

The LPB number on the display indicates the device in the LPB system from which the error or maintenance message, or special operation, was triggered. The first 2 digits give the segment address, the 2 digits after the dot the device address.

Hence, 02.01 denotes segment 2, device 1.

A list of possible displays is provided on page 181.

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 (end user / 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 is displayed.
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) of 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 limits.

5.3.2 Programming the QAA75... / QAA78… / AVS37…

Setting principle

Settings that cannot be made directly with the help of operating elements are made through programming. For this purpose, the individual settings are structured in the form of menus and operating lines, thus creating practical groups of settings.

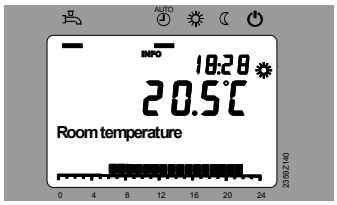
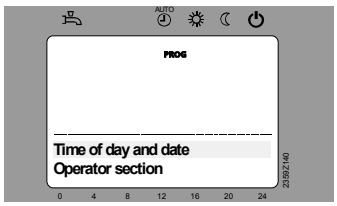
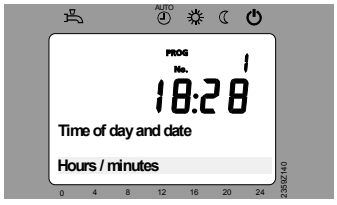
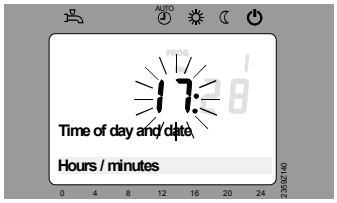
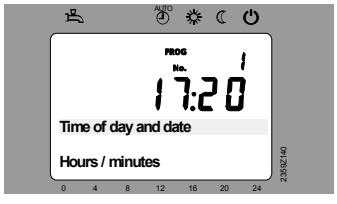
The following example shows how to set the time of day and the date.

Example: "Setting the time of day"

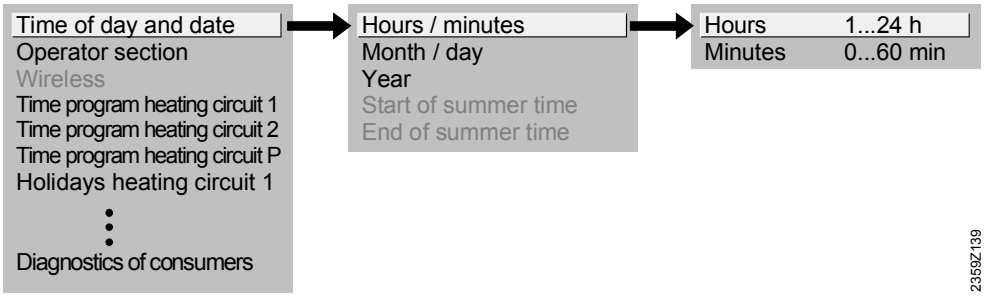
ℹ When pressing the *ESC* button, you go one step back; adjusted values will not be adopted

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

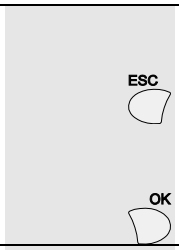
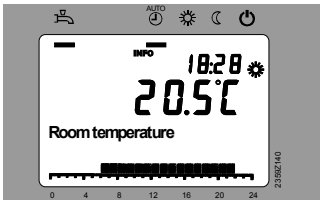
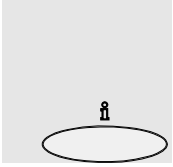
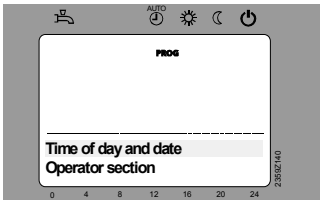
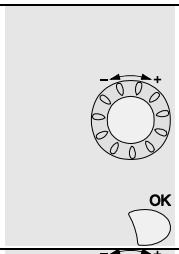
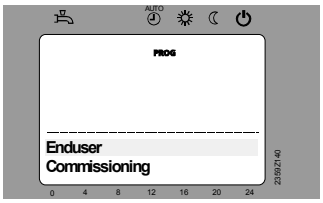
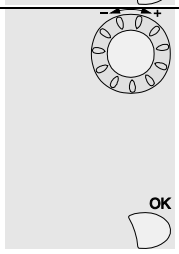
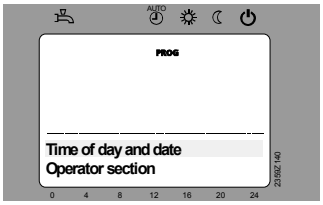
	Operation	*Display example*	*Description*
1	ESC OK		Basic display. If the basic display is not shown, press the ESC button to go back. Press OK.
2	OK		The bottom section of the display shows various menus. Turn the setting knob until menu *Time of day and date* appears. Press the OK button to confirm.
3	OK		In the bottom section of the display, the first operating line of menu *Time of day and date* appears. Turn the setting knob until operating line *Hours / minutes* appears. Press the OK button to confirm.
4	OK		The display shows the hours blinking. Turn the setting knob until the hours of the time of day are correct. Press the OK button to confirm.
5	OK		The display shows the minutes blinking. Turn the setting knob until the minutes of the time of day are correct. Press the OK button to confirm.
6			The settings are saved and the displays stops blinking. Now, you can make further settings or press the operating mode button to return to the basic display.
7			Unit now returns to basic display.

Example of menu structure



5.3.3 User levels

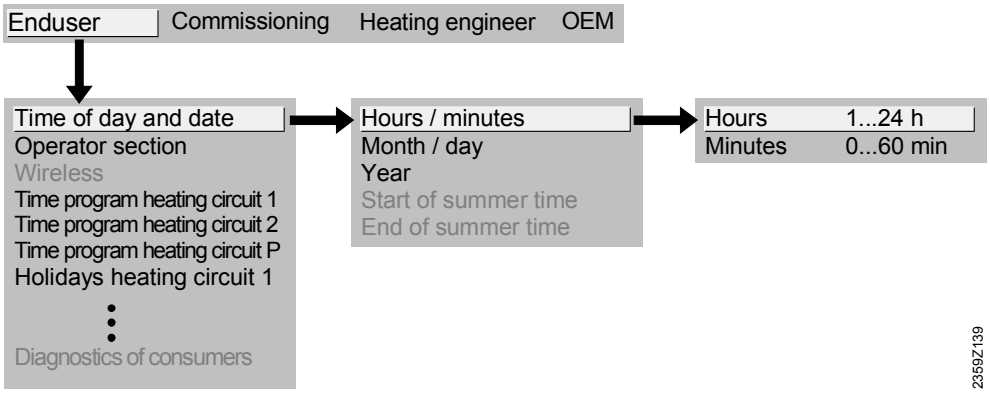
The user levels only allow authorized user groups to make settings. To reach the required user level, proceed as follows:

	Operation	*Display example*	*Description*
1			Basic display. If the basic display is not shown, press the ESC button to go back. Press OK.
2			You are on 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 at the selected user level.

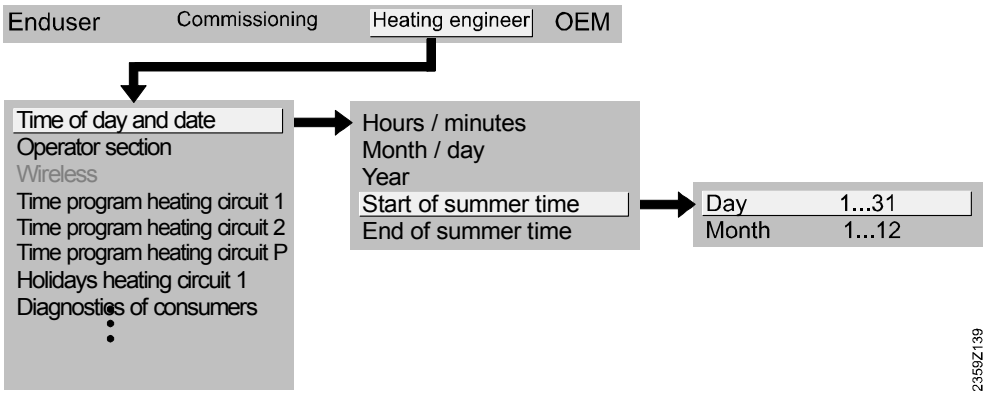
To reach the OEM level, the relevant code must be entered.

Setting structure "End user"

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



Setting structure "Heating engineer"



6 Overview of the settings

The table displays all available settings. However, certain operating lines may be hidden, depending on the type of unit.

Key E = end user I = commissioning F = heating engineer
OL = Operating line

[1] Only QAA75../78..

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 unit						
20	E	Language German ¦ …	German			-
22	F	Info Temporarily ¦ Permanently	Temporary			-
26	F	Operation lock Off ¦ On	Off			-
27	F	Programming lock Off ¦ On	Off			-
28	I	Direct adjustment Automatic storage ¦ Storage with confirmation	Storage with confirmation			
40[1]	I	Used as Room unit 1 ¦ Room unit 2 ¦ Room unit P ¦ Operator unit 1 ¦ Operator unit 2 ¦ Operator unit 3 ¦ Service unit	Room unit 1			-
42[1]	I	Assignment device 1 Heating circuit 1 ¦ Heating circuit 1 and 2 ¦ Heating circuit 1 and 3 ¦ All heating circuits	Heating circuit 1			-
44	I	Operation HC2 Commonly with HC1 ¦ Independently	Commonly with HC1			-
46	I	Operation HC3 Commonly with HC1 ¦ Independently	Commonly with HC1			-
48[1]	I	Action occupancy button None ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Commonly	Heating circuit 1			-
54[1]	F	Readjustment room sensor	0.0	-3	3	°C
70	F	Software version	-	0	99.9	-
Wireless						
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 3 Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			
133	I	Outside sensor Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-

Operating line	User level	Function	Default value	Min	Max	Unit
134	I	Repeater Missing ¦ Ready ¦ No recept'n ¦ Change batt	-			-
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 3 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/HC3						
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
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

Operating line	User level	Function	Default value	Min	Max	Unit
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	E	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 8		1	8	-
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 8		1	8	-
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 3						
661	E	Preselection Period 1 … Period 8		1	8	-
662	E	Start	--.--	01.01	31.12	tt.MM
663	E	End	--.--	01.01	31.12	tt.MM
668	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Heating circuit 1						
710	E	Comfort 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 max	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
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
742	F	Flow temp setpoint room stat	65	OL 740	OL 741	°C
750	F	Room influence	20	– – – / 1	100	%
760	F	Room temp limitation	1	– – – / 0.5	4	°C
770	F	Boost heating	3	– – – / 0	20	°C

Operating line	User level	Function	Default value	Min	Max	Unit
780	F	Quick setback Off ¦ Down to reduced setpoint ¦ Down to frost prot setpoint	Down to reduced set point			-
790	F	Optimum start control max	0	0	360	min
791	F	Optimum stop control max	0	0	360	min
794	F	Heat up gradient	60	0	600	Min/K
800	F	Reduced setp increase start	– – –	– – – / -30	10	°C
801	F	Reduced setp increase end	-15	-30	OL 800	°C
810	F	Frost prot plant HC pump Off ¦ On	On.			-
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
856	I	Floor curing day current	0	0	32	-
857	I	Floor curing days completed	0	0	32	-
861	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			-
870	F	With buffer No ¦ Yes	Yes			-
872	F	With prim contr/system pump No ¦ Yes	Yes			-
900	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection mode			-
Cooling circuit 1						
901	E	Operating mode Off ¦ Automatic*	Automatically			-
902	E	Comfort setpoint	24.0	15	40	°C
907	E	Release 24h/day ¦ Time progr HC ¦ Time program 5	24h / day			-
908	I	Flow temp setp at OT 25°C	20	8	35	°C
909	I	Flow temp setp at OT 35°C	16	8	35	°C
912	I	Cooling limit at OT	20	– – – / 8	355	°C
913	F	Lock time at end of heating	24	– – – / 8	100	h
918	F	Summer comp start at OT	26	20	35	°C
919	F	Summer comp end at OT	35	20	35	°C
920	F	Summer comp setp increase	4	– – – / 1	10	°C
923	F	Flow temp setp min OT 25°C	18	8	35	°C
924	F	Flow temp setp min OT 35°C	18	8	35	°C
928	F	Room influence	80	– – – / 1	10	%
932	F	Room temp limitation	0.5	– – – / 0.5	4	°C
937	F	Frost prot plant CC pump Off ¦ On	Off		1	-
938	F	Mixing valve decrease	0	0	20	°C
939	F	Actuator type 2-position ¦ 3-position	3-position			-
940	F	Switching differential 2-pos	2	0	20	°C

Operating line	User level	Function	Default value	Min	Max	Unit
941	F	Actuator running time	120	30	873	s
945	F	Mixing valve in heating mode Control ¦ Open	Controls			-
946	F	Lock time dewpoint monitor	60	– – – / 10	600	min
947	F	Flow temp setp incr hygro	10	– – – / 1	10	°C
948	F	Flow setp incr start at r.h.	60	0	100	%
950	I	Flow temp diff dewpoint	2	– – – / 0	10	°C
962	F	With buffer No ¦ Yes	No			-
963	F	With prim contr/system pump No ¦ Yes	No			-
969	I	Optg mode changeover None ¦ Off ¦ Automatic	Off			-
Heating circuit 2						
1010	E	Comfort 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 max	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
1042	E	Flow temp setpoint room stat	65	OL 1040	OL 1041	°C
1050	F	Room influence	20	– – – / 1	100	%
1060	F	Room temp limitation	1	– – – / 0.5	4	°C
1070	F	Boost heating	3	– – – / 0	20	°C
1080	F	Quick setback Off ¦ Down to reduced setpoint ¦ Down to frost prot setpoint	Down to reduced set point			-
1090	F	Optimum start control max	0	0	360	min
1091	F	Optimum stop control max	0	0	360	min
1094	F	Heat up gradient	60	0	600	Min/K
1100	F	Reduced setp increase start	– – –	– – – / -30	10	°C
1101	F	Reduced setp increase end	-15	-30	OL 1100	°C
1110	F	Frost prot plant HC pump Off ¦ On	On.			-
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
1156	I	Floor curing day current	0	0	32	-
1157	I	Floor curing days completed	0	0	32	-

Operating line	User level	Function	Default value	Min	Max	Unit
1161	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			
1170	F	With buffer No ¦ Yes	Yes			-
1172	F	With prim contr/system pump No ¦ Yes	Yes			-
1200	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection mode			-
Heating circuit 3						
1300	E	Operating mode Protection ¦ Automatic ¦ Reduced ¦ Comfort	Automatically			-
1310	E	Comfort setpoint	20.0	OL 1312	OL 1316	°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 max	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
1342	E	Flow temp setpoint room stat	65	OL 1340	OL 1341	°C
1350	F	Room influence	20	– – – / 1	100	%
1360	F	Room temp limitation	1	– – – / 0.5	4	°C
1370	F	Boost heating	3	– – – / 0	20	°C
1380	F	Quick setback Off ¦ Down to reduced setpoint ¦ Down to frost prot setpoint	Down to reduced set point			-
1390	F	Optimum start control max	0	0	360	min
1391	F	Optimum stop control max	0	0	360	min
1394	F	Heat up gradient	60	0	600	Min/K
1400	F	Reduced setp increase start	– – –	– – – / -30	10	°C
1401	F	Reduced setp increase end	-15	-30	OL 1400	°C
1410	F	Frost prot plant HC pump Off ¦ On	On.			-
1420	F	Overtemp prot pump circuit Off ¦ On	On.			-
1430	F	Mixing valve boost	5	0	50	°C
1432	F	Actuator type 2-position ¦ 3-position	3-position			-
1433	F	Switching differential 2-pos	2	0	20	°C
1434	F	Actuator running time	120	30	873	s
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
1456	I	Floor curing day current	0	0	32	-
1457	I	Floor curing days completed	0	0	32	-
1461	F	Excess heat draw Off ¦ Heating mode ¦ Always	Always			
1470	F	With buffer No ¦ Yes	Yes			-

Operating line	User level	Function	Default value	Min	Max	Unit
1472	F	With prim contr/system pump No ¦ Yes	Yes			-
1500	F	Optg mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection mode			-
Domestic hot water						
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 funct time	– – –	– – – / 00:00	23:50	hh:mm
1645	F	Legionella funct setpoint	65	55	95	°C
1646	F	Legionella funct duration	30	– – – / 10	360	min
1647	F	Legionella funct circ pump Off ¦ On	On.			-
1648	F	Legio funct circ temp diff	– – –	– – – / 0	20	°C
1660	F	Circulating pump release Time program 3/HC3 ¦ 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
1680	F	Optg mode changeover None ¦ Off ¦ On	Off			-
Consumer circuit 1						
1859	I	Flow temp setp cons request	70	8	120	°C
1860	F	Frost prot plant CC pump Off ¦ On	On.		-	
1875	F	Excess heat draw Off ¦ On	On.			-
1878	F	With buffer No ¦ Yes	Yes			-
1880	F	With prim contr/system pump No ¦ Yes	Yes			-
Consumer circuit 2						
1909	I	Flow temp setp cons request	70	8	120	°C
1910	F	Frost prot plant CC pump Off ¦ On	On.		-	
1925	F	Excess heat draw Off ¦ On	On.			-
1928	F	With buffer No ¦ Yes	Yes			-
1930	F	With prim contr/system pump No ¦ Yes	Yes			-

Operating line	User level	Function	Default value	Min	Max	Unit
Swimming pool circuit						
1959	I	Flow temp setpoint	70	8	120	°C
1960	F	Frost prot plant pool pump Off ¦ On	Off		-	
1975	F	Excess heat draw Off ¦ On	On.			-
1978	F	With buffer No ¦ Yes	Yes			-
1980	F	With 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 Priority 1 ¦ Priority 2 ¦ Priority 3	priority 3			-
2080	F	With solar integration No ¦ Yes	Yes			-
Primary contr/system pump						
2120	F	Frost prot plant syst pump Off ¦ On	On.		-	
2150	I	Primary contr/system pump Before buffer ¦ After buffer	After buffer			-
Boiler						
2203	F	Release below outside temp	– – –	– – – / -50	50	°C
2204	F	Release above outside temp	– – –	– – – / -50	50	°C
2205	F	With Economy mode Off ¦ On DHW ¦ On	Off			-
2208	F	Full charging buffer Off ¦ On	Off			-
2210	F	Setpoint min	40	OL 2211 OEM	Setpoint manual control	°C
2212	F	Setpoint max	80	Setpoint manual control	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
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 Heat source 1 ¦ Heat source 2 ¦ … ¦ Heat source 16	Heat source 1			-
3560	F	Return setpoint min	8	8	95	°C
3570	F	Actuator running time	120	30	873	s
Supplementary source						
3690	F	Setpoint incr main source	0	0	10	°C
3691	F	Output limit main source	90	– – – / 1	100	%
3692	F	With DHW charging Locked ¦ Substitute ¦ Complement ¦ Instantly	Substitute			-
3700	F	Release below outside temp	– – –	-50	50	°C

Operating line	User level	Function	Default value	Min	Max	Unit
3701	F	Release above outside temp	– – –	-50	50	°C
3702	F	With Economy mode Off ¦ On DHW ¦ On	Off			-
3703	F	Full charging buffer Off ¦ On	Off			-
3705	F	Overrun time	5	0	120	min
3710	F	Setpoint min	40	– – – / 0	80	°C
3720	F	Switching integral	0	0	500	°C*min
3722	F	Switching diff off	15	0	20	°C
3723	F	Locking time	5	0	120	min
3725	F	Control sensor Common flow temp ¦ Buffer sensor B4	Common flow temp			-
3750	F	Source type Other ¦ Solid fuel boiler ¦ Heat pump ¦ Oil/gas boiler	Anderer			-
3755	F	Delay lockout position	– – –	1	40	min
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	20	– – – / 8	95	°C
3815	F	Charging temp min buffer	20	– – – / 8	95	°C
3818	F	Charging temp min swi pool	20	– – – / 8	95	°C
3822	F	Charging prio storage tank None ¦ DHW storage tank ¦ Buffer storage tank	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
3830	F	Collector start function	– – –	– – – / 5	60	min
3831	F	Min run time collector pump	20	5	120	s
3834	F	Collector start funct grad	4	– – – / 1	20	Min/°C
3835	F	Min collector temp start fct	5	10	100	
3840	F	Collector frost protection	– – –	– – – / -20	5	°C
3850	F	Collector overtemp prot	120	– – – / 30	350	°C
3860	F	Evaporation heat carrier	140	– – – / 60	350	°C
3862	F	Impact evaporation superv On own collector pump ¦ On both collector pumps	On both collector pumps			-
3880	F	Antifreeze Kein ¦ 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
3886	F	Pulse count yield None ¦ With input H1 ¦ With input H3				-
3887	F	Pulse unit yield None ¦ kWh ¦ Liter				-
3888	F	Pulse value yield numer	10	1	1000	-
3889	F	Pulse value yield denom	10	1	1000	-
3891	F	Flow measurement yield None ¦ With input H1 ¦ With input H3 ¦ With input H31 ¦ With input H32 ¦ With input H33	None			-
3896	F	Readj solar flow sensor	0	-20	20	°C
3897	F	Readj solar return sensor	0	-20	20	°C

Operating line	User level	Function	Default value	Min	Max	Unit
Solid fuel boiler						
4102	F	Locks other heat sources Off ¦ On	On.			-
4103	F	Charg prio DHW stor tank Off ¦ On	Off			-
4110	F	Setpoint min	40	8	120	°C
4114	F	Temp differential min	4	0	40	°C
4130	F	Temp diff on	4	1	40	°C
4134	F	Connection DHW stor tank With B3 ¦ With B31 ¦ With B3 and B31	With B3			-
4135	F	Boiler temp setp DHW charg Storage tank temp ¦ Storage tank setpoint ¦ Boiler temp setpoint min	Storage tank temp			-
4136	F	DHW charging with Q3 No ¦ Yes	Yes			-
4137	F	Connection buffer With B4 ¦ With B42/B41 ¦ With B4 and B42/B41	With B4			-
4138	F	Boil temp setp buffer charg Storage tank temp ¦ Storage tank setpoint ¦ Boiler temp setpoint min	Storage tank temp			-
4140	F	Pump overrun time	20	0	120	min
4153	F	Return setpoint min	8	8	95	°C
4158	F	Flow influence return ctrl Off ¦ On	Off			-
4190	F	Residual heat fct dur max	10	5	60	min
4192	F	Residual heat fct trigg Once / Several times	Once			-
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
4728	F	Rel temp diff buffer/HC	0	-50	50	%
4739	F	Stratification protection Off ¦ Always ¦ With solid fuel boiler	Off			-
4749	F	Min charging setpoint solar	8	8	94	°C
4750	F	Charging temp max	80	8	95	°C
4755	F	Recooling temp	70	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	Temp increase			-
4800	F	Partial charging setpoint	– – –	– – – / 8	95	°C
DHW storage tank						
5020	F	Flow setpoint boost	16	0	30	°C
5021	F	Transfer boost	8	0	30	°C

Operating line	User level	Function	Default value	Min	Max	Unit
5022	F	Type of charging Recharging ¦ Full charging ¦ Full charging legio ¦ Full charg 1st time day ¦ Full charg 1st time legio	Full charge			-
5050	F	Charging temp max	80	8	OL 5051 OEM	°C
5055	F	Recooling temp	70	8	95	°C
5056	F	Recooling heat gen/HCs Off ¦ On	Off			-
5057	F	Recooling collector Off ¦ Summer ¦ Always	Off			-
5060	F	El imm heater optg mode Substitute ¦ Summer ¦ Always	Substitute			-
5061	F	El immersion heater release 24h/day ¦ DHW release ¦ Time program 4/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 No ¦ Yes	No			-
5092	F	With prim contr/system pump No ¦ Yes	No			-
5093	F	With solar integration No ¦ Yes	Yes			-
5124	F	Actuator running time	120	30	873	S
5130	F	Transfer strategy Off ¦ Always ¦ DHW release	Always			-
5131	F	Comparison temp transfer With B3 ¦ With B31 ¦ With B3 and B31	With B3			-
5140	F	Intermediate circuit boost	2	0	10	°C
5146	F	Full charging with B36 No ¦ Yes	Yes			-
5148	F	Min start temp diff Q33	0	-20	20	°C
5160	F	Legionella funct mixing pump Off ¦ With charging ¦ With charging and duration	With charging and duration			-
5165	F	Restratification Off ¦ On	Off			-
5166	F	Restrat temp min	8	8	95	°C
5167	F	Restrat temp diff min	8	0	40	°C
Instantaneous water heater						
5406	F	Min setp diff to tank temp	4	0	20	°C
5420	F	Flow setpoint boost	6	0	30	°C
5455	F	Setp readj cons 40°C	0	-20	20	°C
5456	F	Setp readj cons 60°C	0	-20	20	°C
5460	F	Setpoint keep hot	50	10	60	°C
5461	F	Readj setp keep hot 40°C	4	-20	20	°C
5462	F	Readj setp keep hot 60°C	4	-20	20	°C
5464	F	Keep hot release None ¦ 24h/day ¦ DHW release ¦ Time program 3/HC3 ¦ Time program 4/DHW ¦ Time program 5	24h / day			-
5470	F	Keep hot time wo heating	2	0	1440	min
5471	F	Keep hot time with heating	0	0	30	min
5472	F	Pump overrun time keep hot	0	0	255	min
5473	F	Pump overrun time keep hot	20	0	59	s

Operating line	User level	Function	Default value	Min	Max	Unit
5475	F	Control sensor keep hot Boiler sensor B2 ¦ Return sensor B7 ¦ DHW outlet sensor B38	Boiler sensor B2			
5476	F	Keep hot periodically	1	1	255	Min
5477	F	Min keep hot time	0	0	255	s
5478	F	Keep hot in heating mode Off ¦ On	Off			-
5489	F	Overrun via inst WH No ¦ Yes	No			-
5544	F	Actuator running time	15	7.5	480	s
Configuration						
5710	I	Heating circuit 1 Off ¦ On	On.			-
5711	I	Cooling circuit 1 Off ¦ 4-pipe system ¦ 2-pipe system	Off			-
5712	I	Use of mixing valve 1 None ¦ Heating ¦ Cooling ¦ Heating and Cooling	Heating and cooling			
5715	I	Heating circuit 2 Off ¦ On	Off			-
5721	I	Heating circuit 3 Off ¦ On	Off			
5730	I	DHW sensor B3 Sensor ¦ Thermostat	Sensor			-
5731	I	DHW ctrl elem Q3 None ¦ Charging pump ¦ Diverting valve	charging pump			-
5734	F	Basic pos DHW div valve Last demand ¦ Heating circuit ¦ DHW	Heating circuit.			
5736	I	DHW separate circuit Off ¦ On	Off			-
5750	I	Consumer circuit 1 Heating ¦ 4-pipe system cooling ¦ 2-pipe system cooling	Heating			-
5751	I	Consumer circuit 2 Heating ¦ 4-pipe system cooling ¦ 2-pipe system cooling	Heating			-
5770	I	Source type 1-stage ¦ 2-stage[6)] ¦ Modulating 3-position[6)] ¦ Modulating UX[6)] ¦ Without boiler sensor ¦ 2x1 cascade[6)]	1-stage[4)] 2-stage[6)]			-
5840	I	Solar controlling element Charging pump ¦ Diverting valve	Charging pump			
5841	I	External solar exchanger Jointly ¦ DHW storage tank ¦ Buffer storage tank	Jointly			
5890	I	Relay output QX1 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			-

Operating line	User level	Function	Default value	Min	Max	Unit
5891	I	Relay output QX2 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			-
5892	I	Relay output QX3 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			-
5894	I	Relay output QX4 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			-
5895	I	Relay output QX5 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration	None			-

Operating line	User level	Function	Default value	Min	Max	Unit
		request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.				
5930	I	Sensor input BX1 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			-
5931	I	Sensor input BX2 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			-
5932	I	Sensor input BX3 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
5950	I	Function input H1 Optg mode changeover HCs +DHW ¦ Optg mode changeover DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode change HC3 ¦ Error /alarm message ¦ Cons request CC1 ¦ Cons request CC2 ¦ Release swim pool source ¦ Release swim pool solar ¦ Operational level DHW ¦ Operational level HC1 ¦ Operational level HC2 ¦ Operational level HC3 ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HC3 ¦ circ pump thermostat ¦ Pulse count ¦ Dewpoint monitor ¦ Flow temp setp incr hygro ¦ Boiler return thermostat ¦ Operational signal supplementary source ¦ Flow measurement Hz ¦ Cons request CC1 10V ¦ Cons request CC2 10V ¦ Pressure measurement 10V ¦ Relative room humidity 10V ¦ Room temperature 10V ¦ Flow measurement 10V ¦ Temperature measurement 10V.	Optg mode changeover HCs+DHW			-
5951	I	Contact type H1 NC ¦ NO*	Make contact (NO)			-
5953	I	Input value 1 H1	0	0	1000	-
5954	I	Function value 1 H1	0	-100	500	-
5955	I	Input value 2 H1	0	0	1000	-
5956	I	Function value 2 H1	100	-100	500	-
5957	I	Temperature sensor H1 None ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			-
5960	I	Function input H3 Optg mode changeover HCs +DHW ¦ Optg mode changeover DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode change HC3 ¦ Error /alarm message ¦ Cons request CC1 ¦ Cons request CC2 ¦ Release swim pool	Optg mode changeover HCs+DHW			-

Operating line	User level	Function	Default value	Min	Max	Unit
		source ¦ Release swim pool solar ¦ Operational level DHW ¦ Operational level HC1 ¦ Operational level HC2 ¦ Operational level HC3 ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HC3 ¦ circ pump thermostat ¦ Pulse count ¦ Dewpoint monitor ¦ Flow temp setp incr hygro ¦ Boiler return thermostat ¦ Operational signal supplementary source ¦ Flow measurement Hz ¦ Cons request CC1 10V ¦ Cons request CC2 10V ¦ Pressure measurement 10V ¦ Relative room humidity 10V ¦ Room temperature 10V ¦ Flow measurement 10V ¦ Temperature measurement 10V.				
5961	I	Contact type H3 NC ¦ NO	Make contact (NO)			-
5963	I	Input value 1 H3	0	0	1000	-
5964	I	Function value 1 H3	0	-100	500	-
5965	I	Input value 2 H3	10	0	1000	-
5966	I	Function value 2 H3	100	-100	500	-
5967	I	Temperature sensor H3 None ¦ Solar flow sensor B63 ¦ Solar return sensor B64	None			-
5980	F	Function input EX1 None ¦ Counter 1st burner stage ¦ Heat gen lock ¦ Error/alarm message ¦ Excess heat discharge	Counter 1st burner stage			-
5981	F	Cont type input EX1 NC ¦ NO	NO			-
5986	F	SLT error message input L1 Off ¦ Always ¦ Automatically	Automatically			-
6014	I	Function mixing group 1 Multifunctional ¦ Heating circuit 1 ¦ Return controller ¦ Prim cntr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heater ¦ Return temp controller cascade ¦ Cooling circuit ¦ Heating circuit/Cooling circuit 1 ¦ Return controller solid fuel boiler.	Heating circuit 1			-
6020	I	Function extension module 1 No function ¦ Multifunctional ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Heating circuit 3 ¦ Solar DHW ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heat ¦ Return controller cascade ¦ Cooling circuit 1 ¦ Heating circuit/cooling circuit 1 ¦ Solid fuel boiler.	No function.			-
6021	I	Function extension module 2 No function ¦ Multifunctional ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Heating circuit 3 ¦ Solar DHW ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heat ¦ Return controller cascade ¦ Cooling circuit 1 ¦ Heating circuit/cooling circuit 1 ¦ Solid fuel boiler.	No function.			-
6022	I	Function extension module 3 No function ¦ Multifunctional ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Heating circuit 3 ¦ Solar DHW ¦ Prim contr/system pump ¦ DHW primary controller ¦ Instantaneous DHW heat ¦ Return controller cascade ¦ Cooling circuit 1 ¦ Heating circuit/cooling circuit 1 ¦ Solid fuel boiler.	No function.			-
6030	I	Relay output QX21 module 1 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW	None			

Operating line	User level	Function	Default value	Min	Max	Unit
		iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.				
6031	I	Relay output QX22 module 1 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6032	I	Relay output QX23 module 1 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6033	I	Relay output QX21 module 2 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6034	I	Relay output QX22 module 2 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦	None			

Operating line	User level	Function	Default value	Min	Max	Unit
		Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.				
6035	I	Relay output QX23 module 2 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6036	I	Relay output QX21 module 3 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6037	I	Relay output QX22 module 3 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source	None			

Operating line	User level	Function	Default value	Min	Max	Unit
		control K32 ¦ Overtemperature protection K11.				
6038	I	Relay output QX23 module 3 None ¦ Circulation pump Q4 ¦ El imm heater DHW K6 ¦ Collector pump Q5 ¦ Cons circ pump CC1 Q15 ¦ Boiler pump Q1 ¦ Bypass pump Q12 ¦ Alarm output K10 ¦ 2nd pump stage HC1 Q21 ¦ 2nd pump stage HC2 Q22 ¦ 2nd pump stage HC3 Q23 ¦ Heating circuit pump HC3 Q20 ¦ Cons circ pump CC2 Q18 ¦ System pump Q14 ¦ Heat gen shutoff valve Y4 ¦ Solid fuel boiler pump Q10 ¦ Scheduler 5 K13 ¦ Buffer return valve Y15 ¦ Solar pump ext. Exch K9 ¦ Solar ctrl element buffer K8 ¦ Solar cntrl elem swi pool K18 ¦ Collector pump 2 Q16 ¦ Swim pool pump Q19 ¦ Flue gas relay K17 ¦ Assisted firing fan K30 ¦ Cascade pump Q25 ¦ St tank transfer pump Q11 ¦ DHW mixing pump Q35 ¦ DHW iterm circ pump Q33 ¦ Heat request K27 ¦ Refrigeration request K28 ¦ Aid dehumidifier K29 ¦ Diverting valve, cooling Y21 ¦ Heating circuit pump HC1 Q2 ¦ Heating circuit pump HC2 Q6 ¦ DHW ctrl elem Q3 ¦ Supplementary source control K32 ¦ Overtemperature protection K11.	None			
6040	I	Sensor input BX21 module 1 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
6041	I	Sensor input BX22 module 1 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
6042	I	Sensor input BX21 module 2 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
6043	I	Sensor input BX22 module 2 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
6044	I	Sensor input BX21 module 3 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler	None			

Operating line	User level	Function	Default value	Min	Max	Unit
		sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.				
6045	I	Sensor input BX22 module 3 None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ DHW circulation sensor B39 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ DHW charging sensor B36 ¦ Buffer st tank 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 ¦ Solid fuel return sensor B72.	None			
6046	I	Function input H2 module 1 Optg mode changeover HCs +DHW ¦ Optg mode changeover DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode change HC3 ¦ Error /alarm message ¦ Cons request CC1 ¦ Cons request CC2 ¦ Release swim pool source ¦ Release swim pool solar ¦ Operational level DHW ¦ Operational level HC1 ¦ Operational level HC2 ¦ Operational level HC3 ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HC3 ¦ circ pump thermostat ¦ Dewpoint monitor ¦ Flow temp setp incr hygro ¦ Boiler return thermostat ¦ Operational signal supplementary source ¦ Flow measurement Hz ¦ Cons request CC1 10V ¦ Cons request CC2 10V ¦ Pressure measurement 10V ¦ Relative room humidity 10V ¦ Room temperature 10V ¦ Flow measurement 10V ¦	Optg mode changeover HCs+DHW			
6047	I	Contact type H2 module 1 NC ¦ NO	Make contact (NO)			-
6049	I	Voltage value 1 H2 module 1	0	0	10	Volt
6050	I	Funct value 1 H2 module 1	0	-100	500	-
6051	I	Voltage value 2 H2 module 1	10	0	10	Volt
6052	I	Funct value 2 H2 module 1	100	-100	500	-
6054	I	Function input H2 module 2 Optg mode changeover HCs +DHW ¦ Optg mode changeover DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode change HC3 ¦ Error /alarm message ¦ Cons request CC1 ¦ Cons request CC2 ¦ Release swim pool source ¦ Release swim pool solar ¦ Operational level DHW ¦ Operational level HC1 ¦ Operational level HC2 ¦ Operational level HC3 ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HC3 ¦ circ pump thermostat ¦ Dewpoint monitor ¦ Flow temp setp incr hygro ¦ Boiler return thermostat ¦ Operational signal supplementary source ¦ Flow measurement Hz ¦ Cons request CC1 10V ¦ Cons request CC2 10V ¦ Pressure measurement 10V ¦ Relative room humidity 10V ¦ Room temperature 10V ¦ Flow measurement 10V ¦	Optg mode changeover HCs+DHW			
6055	I	Contact type H2 module 2 NC ¦ NO	Make contact (NO)			
6057	I	Voltage value 1 H2 module 2	0	0	10	Volt
6058	I	Funct value 1 H2 module 2	0	-100	500	-
6059	I	Voltage value 2 H2 module 2	10	0	10	Volt
6060	I	Funct value 2 H2 module 2	100	-100	500	-

Operating line	User level	Function	Default value	Min	Max	Unit
6062	I	Function input H2 module 3 Optg mode changeover HCs +DHW ¦ Optg mode changeover DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode change HC3 ¦ Error /alarm message ¦ Cons request CC1 ¦ Cons request CC2 ¦ Release swim pool source ¦ Release swim pool solar ¦ Operational level DHW ¦ Operational level HC1 ¦ Operational level HC2 ¦ Operational level HC3 ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HC3 ¦ circ pump thermostat ¦ Dewpoint monitor ¦ Flow temp setp incr hygro ¦ Boiler return thermostat ¦ Operational signal supplementary source ¦ Flow measurement Hz ¦ Cons request CC1 10V ¦ Cons request CC2 10V ¦ Pressure measurement 10V ¦ Relative room humidity 10V ¦ Room temperature 10V ¦ Flow measurement 10V ¦	Optg mode changeover HCs+DHW			
6063	I	Contact type H2 module 3 NC ¦ NO	Make contact (NO)			
6065	I	Voltage value 1 H2 module 3	0	0	10	Volt
6066	I	Funct value 1 H2 module 3	0	-100	500	-
6067	I	Voltage value 2 H2 module 3	10	0	10	Volt
6068	I	Funct value 2 H2 module 3	100	-100	500	-
6097	F	Sensor type collector NTC ¦ Pt 1000	NTC			-
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	-3.0	3.0	°C
6101	F	Sensor type flue gas temp NTC ¦ Pt 1000	NTC			
6102	F	Readjustm flue gas sensor	0	-20	20	°C
6110	F	Time constant building	10	0	50	h
6120	F	Frost protection plant Off ¦ On	On.			-
6135	F	Air dehumidifier Off ¦ On	Off			
6136	F	Release air dehumidifier 24h/day ¦ Time progr HC ¦ Time program 5	24h / day			
6137	F	Air dehumidifier r.h. on	55	0	100	%
6138	F	Air dehumidifier r.h. SD	5	2	50	%
6148	F	Static press supervision 1 None ¦ With input H1 ¦ With input H2 module 1 ¦ With input H2 module 2 ¦ With input H2 module 3 ¦ With input H3	None			-
6154	F	Static press supervision 2 None ¦ With input H1 ¦ With input H2 module 1 ¦ With input H2 module 2 ¦ With input H2 module 3 ¦ With input H3	None			-
6184	F	Static press supervision 3 None ¦ With input H1 ¦ With input H2 module 1 ¦ With input H2 module 2 ¦ With input H2 module 3 ¦ With input H3	None			-
6200	I	Save sensors No ¦ Yes	No			-
6204	F	Save parameters No ¦ Yes	No			
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	-

Operating line	User level	Function	Default value	Min	Max	Unit
6217	I	Check no. heating circuits	-	0	199999	-
6220	I	Software version	-	0	99.9	-
6270	F	Excess heat discharge temp	95	20	350	°C
6271	F	SD excess heat discharge	4	0	50	°C
6272	F	Excess heat discharge sens None ¦ DHW sensor B31 ¦ Collector sensor B6 ¦ Return sensor B7 ¦ Buffer st tank sensor B4 ¦ Buffer st tank sensor B41 ¦ Flue gas sensor B8 ¦ Common flow temperature sensor B10 ¦ Solid fuel boiler sensor B22 ¦ Buffer st tank sensor B42 ¦ Common return sensor B73 ¦ Cascade return sensor B70 ¦ Swimming pool sensor B13 ¦ Collector sensor 2 B61 ¦ Solid fuel return sensor B72 ¦ Boiler sensor B2 ¦ DHW sensor B3.	None			-
6273	F	Excess heat dischar dur min	0	0	42	min
6358	F	Voltage output GX1 5 Volt ¦ 12 Volt	5 Volt			-
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	Local			-
6623	F	Optg mode changeover Locally ¦ Centrally	Centrally			
6624		Manual source lock Lokal ¦ Segment				
6625	F	DHW assignment Local HCs ¦ All HCs in segment ¦ All HCs in system	All HCs in system			
6627	F	Refrigeration request Locally ¦ Centrally	Lokal			
6630	F	Cascade master Off ¦ Always ¦ Automatically	Automatically			
6631	F	Ext source in Eco mode Off ¦ On DHW¦ On	Off			
6632	F	Note OT limit ext source No ¦ Yes	No			
6640	I	Clock mode Autonomously ¦ Slave without remote setting ¦ Slave with remote setting ¦ Master	Autonomously			-
6650	F	Outside temp source	0	0	239	-
Fault						
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
6742	F	Flow temp 3 alarm	– – –	– – – / 10	240	min
6743	F	Boiler temp alarm	– – –	– – – / 10	240	min
6745	F	DHW charging alarm	– – –	– – – / 1	48	h
6746	F	Flow temp cooling 1 alarm	– – –	– – – / 10	240	min
6800	F	History 1	-			

Operating line	User level	Function	Default value	Min	Max	Unit
6801	F	Error code 1	-	0	255	-
6802	F	History 2	-			
6803	F	Error code 2	-	0	255	-
6804	F	History 3	-			
6805	F	Error code 3	-	0	255	-
6806	F	History 4	-			
6807	F	Error code 4	-	0	255	-
6808	F	History 5	-			
6809	F	Error code 5	-	0	255	-
6810	F	History 6	-			
6811	F	Error code 6	-	0	255	-
6812	F	History 7	-			
6813	F	Error code 7	-	0	255	-
6814	F	History 8	-			
6815	F	Error code 8	-	0	255	-
6816	F	History 9	-			
6817	F	Error code 9	-	0	255	-
6818	F	History 10	-			
6819	F	Error code 10	-	0	255	-
Service/special operation						
7040	F	Burner hours interval	– – –	– – – / 10 / 100	10000	h
7041	F	Burn hrs since maintenance	0	0	10000	h
7042	F	Burner start interval	– – –	– – – / 60 / 100	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
7056	F	DHW scalding risk	70	40	80	°C
7119	F	Economy function Locked ¦ Released	Locked			-
7120	E	Economy mode Off ¦ On	Off			-
7130	E	Chimney sweep function Off ¦ On	Off			-
7140	E	Manual control Off ¦ On	Off			-
7150	I	Simulation outside temp	-	-50.0	50	°C
7170	I	Telephone customer service				-
Input/output test						
7700	I	Relay test No test ¦ Everything off ¦ Burner stage T2 ¦ DHW pump Q3 ¦ Heating circuit pump Q2 ¦ Heating circ mix valve op Y1 ¦ Heat circ mix valve cl Y2 ¦ Relay output QX1 ¦ 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 ¦ Relay output QX21 module 3 ¦ Relay output QX22 module 3 ¦ Relay output QX23 module 3.	No test			-
7730	I	Outside temp B9	-	-50.0	50	°C
7732	I	Flow temp B1	-	0.0	140	°C
7750	I	DHW temp B3	-	0.0	140	°C

Operating line	User level	Function	Default value	Min	Max	Unit
7760	I	Boiler temp B2	-	0.0	140	°C
7820	I	Sensor temp BX1	-	-28.0	350	°C
7821	I	Sensor temp BX2	-	-28.0	350	°C
7830	I	Sensor temp BX21 module 1	0	-28	350	°C
7831	I	Sensor temp BX22 module 1	0	-28	350	°C
7832	I	Sensor temp BX21 module 2	0	-28	350	°C
7833	I	Sensor temp BX22 module 2	0	-28	350	°C
7834	I	Sensor temp BX21 module 3	0	-28	350	°C
7835	I	Sensor temp BX22 module 3	0	-28	350	°C
7840	I	Voltage signal H1	-	0	10	Volt
7841	I	Contact state H1 Open ¦ Closed	-			-
7842	I	Pulse counter H1	0	0	65535	-
7843	I	Frequency H1	0	0	1000	Hz
7845	I	Voltage signal H2 module 1	0	0	10	°C
7846	I	Contact state H2 module 1 Open ¦ Closed	-			-
7848	I	Voltage signal H2 module 2	0	0	10	°C
7849	I	Contact state H2 module 2 Open ¦ Closed	-			-
7851	I	Voltage signal H2 module 3	0	0	10	°C
7852	I	Contact state H2 module 3 Open ¦ Closed	-			-
7854	I	Voltage signal H3	0	0	10	Volt
7855	I	Contact state H3 Open ¦ Closed	-			-
7856	I	Pulse counter H3	0	0	65535	
7857	I	Frequency H3	0	0	1000	Hz
7870	I	Burner fault S3 0V ¦ 230V	-			-
7881	I	1st burner stage E1 0V ¦ 230V	-			-
7884	I	SLT error message L1 0V ¦ 230V				-
State						
8000	I	State heating circuit 1	-			-
8001	I	State heating circuit 2	-			-
8002	I	State heating circuit 3	-			-
8003	I	State DHW	-			-
8004	I	State cooling circuit 1	-			-
8005	I	State boiler	-			-
8007	I	State solar	-			-
8008	I	State solid fuel boiler	-			-
8010	I	State buffer	-			-
8011	I	State swimming pool	-			
8022	I	State supplementary source	-			-

Operating line	User level	Function	Default value	Min	Max	Unit
Diagnostics cascade						
8100, 8102, ..8130	I	Priority/state source 1…16				-
8101, 8103, … 8131	I	State source 1...16 Missing ¦ Faulty ¦ Manual control active ¦ Heat generation lock active ¦ Chimney sweep funct active ¦ Separate DHW circuit active[8)] ¦ Temporarily unavailable[7)] ¦ Outside temp limit active ¦ Not released ¦ Released				-
8138	I	Cascade flow temp	0	0	140	°C
8139	I	Cascade flow temp setp	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 heat generation						
8300	I	1st burner stage T2 Off ¦ On	-			-
8301	I	2nd burner stage Off ¦ On	-			-
8310	I	Boiler temp	-	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
8315	I	Boiler return temp setpoint	0	0	140	°C
8316	I	Flue gas temp	0	0	350	°C
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	-
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
8521	I	Solar throughput	0	0	500	l/min
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	-	0	65535	h
8531	F	Hours run collect overtemp	-	0	65535	h
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	I	Solid fuel boiler temp	0	0	140	°C

Operating line	User level	Function	Default value	Min	Max	Unit
8561	I	Solid fuel boiler setpoint	0	0	140	°C
8563	I	Solid fuel boiler return temp	0	0	140	°C
8564	I	Solid fuel boiler return setp	0	0	140	°C
8570	E	Hours run solid fuel boiler	0	0	65535	h
Diagnostics consumers						
8700	I	Outside temp	-	-50.0	50.0	°C
8703	I	Outside temp attenuated	-	-50.0	50.0	°C
8704	I	Outside temp composite	-	-50.0	50.0	°C
8720	I	Rel room humidity	-	0	100	%
8721	I	Room temperature	-	0	50.0	°C
8722	I	Dewpoint temp 1	-	0	50.0	°C
8730	I	Heating circuit pump 1 Off ¦ On	-			-
8731	I	Heat circ mix valve op Y1 Off ¦ On	-			-
8732	I	Heat circ mix valve cl Y2 Off ¦ On	-			-
8740	I	Room temp 1	-	0.0	50.0	°C
8741	I	Room setpoint 1	-	4.0	35.0	°C
8743	I	Flow temp 1	-	0.0	140.0	°C
8744	I	Flow temp setpoint 1	-	0.0	140.0	°C
8749	I	Room thermostat 1 No demand ¦ Demand	No demand			-
8751	I	Cooling circuit pump 1 Off ¦ On	-			-
8752	I	Cool circ mix valve 1 open Off ¦ On	-			-
8753	I	Cool circ mix valve 1 close Off ¦ On	-			-
8754	I	Diverting valve cooling 1 Off ¦ On	-			-
8756	I	Flow temp cooling 1	-	0	140	°C
8757	I	Flow temp setp cooling 1	-	0	140	°C
8760	I	Heating circuit pump 2 Off ¦ On	-			-
8761	I	Heat circ mix valve 2 open Off ¦ On	-			-
8762	I	Heat circ mix valve 2 close Off ¦ On	-			-
8770	I	Room temp 2	-	0.0	50	°C
8771	I	Room setpoint 2	-	4.0	35	°C
8773	I	Flow temp 2	-	0.0	140	°C
8774	I	Flow temp setpoint 2	-	0.0	140	°C
8779	I	Room thermostat 1 No demand ¦ Demand	No demand			-
8790	I	Heating circuit pump 3 Off ¦ On	-			-
8791	I	HC mixing valve 3 open	-			-
8792	I	HC mixing valve 3 closed	-			-
8800	I	Room temp 3	-	0.0	50	°C
8801	I	Room setpoint 3	-	4.0	35	°C
8803	I	Flow temp setpoint 3	-	0.0	140	°C

Operating line	User level	Function	Default value	Min	Max	Unit
8804	I	Flow temp 3	-	0.0	140	°C
8809	I	Room thermostat 3 No demand ¦ Demand	No demand			-
8820	I	DHW pump Off ¦ On	-			-
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	DHW consumption temp	0	0	140	°C
8853	I	Instant WH setpoint	0	0	140	°C
8875	I	Flow temp setp VK1	5	5	130	°C
8885	I	Flow temp setp VK2	5	5	130	°C
8895	I	Flow temp setp swimming pool	5	5	130	°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
8957	I	Common flow setp refrig	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
9005	I	Water pressure 1	-	0.0	10.0	bar
9006	I	Water pressure 2	-	0.0	10.0	bar
9009	I	Water pressure 3	0	0	10	bar
9031	I	Relay output QX1 Off ¦ On	-			-
9032	I	Relay output QX2 Off ¦ On	-			-
9033	I	Relay output QX3 Off ¦ On	-			-
9034	I	Relay output QX4 Off ¦ On	-			-
9035	I	Relay output QX5 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	-			-

Operating line	User level	Function	Default value	Min	Max	Unit
9054	I	Relay output QX22 module 2 Off ¦ On	-			-
9055	I	Relay output QX23 module 2 Off ¦ On	-			-
9056	I	Relay output QX21 module 3 Off ¦ On				
9057	I	Relay output QX22 module 3 Off ¦ On				
9058	I	Relay output QX23 module 3 Off ¦ On				

7 The settings in detail

7.1 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**

Daylight saving time/standard time changeover

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

7.2 Operator unit

Operation and display

Line no.	*Operating line*
20	**Language** German ¦ English ¦ French ¦ Italian ¦ etc.
22	**Info** Temporarily ¦ Permanently
26	**Operation lock** Off ¦ On
27	**Programming lock** Off ¦ On
28	**Direct adjustment** Automatic storage ¦ Storage with confirmation

Languages

Language sets: Available languages vary depending on country and version.

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 cannot be made with the QAA78…

Operation lock

The operation lock locks the following operating elements:
Heating circuit operating mode, DHW operating mode, room Comfort setpoint (setting knob), and occupancy button.

Programming lock

Parameter values can still be displayed, but not changed if the programming lock is enabled.

- Temporary deactivation of programming.
  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.
  First, make the temporary deactivation, then go to operating line "Programming lock" (27) and deactivate the programming lock

Direct adjustment

Automatic storage:
A setpoint readjustment made with the knob is adopted either by pressing the OK button or without any further confirmation (timeout).

Storage with confirmation:
A setpoint readjustment made with the knob is adopted only after pressing the OK button.

Used as

Line no.	*Operating line*
40	**Used as** Room unit 1 Room unit 2 Room unit 3 Operator unit 1 Operator unit 2 Operator unit 3 Operator unit 1

This operating line is used to select the use of the operator section. 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 (40) acting on all heating circuits (42) and can only be readjusted on operating lines 44, 46 and 48

Depending on the selected use of the unit (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 3		X	X	X
	All heating circuits	X	X	X	X
Room unit 2					X
Room unit 3					X
Operator unit 1	Heating circuit 1				
	Heating circuits 1 and 2	X		X	
	Heating circuits 1 and 3		X	X	
	All heating circuits	X	X	X	
Operator unit 2					
Operator unit 3					
Operator unit 1					

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.

Room unit 3
The operator unit only supports heating circuit 3.

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 3 All heating circuits
44	**Operation HC2** Commonly with HC1 Independently
46	**Operation HC3** Commonly with HC1 Independently
48	**Action occupancy button** None Heating circuit 1 Heating circuit 2 Jointly

Assign Room unit

As room unit 1 (setting 40), the action of the relevant operator section 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 HC3

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 3.

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 one 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.

7.3 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 radio link. The test should be made when the installation is entirely completed.

List of RF devices

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 3** Same as on operating line 130
133	**OutsideSens** Same as on operating line 130
134	**RF repeaters** 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 3** Same as on operating line 130
138	**Operator unit 1** Same as on operating line 130
140	**Delete all devices**

Delete all devices

The radio link to all devices will be cancelled. If radio communication is required again, a new binding must be made.

7.4 Time programs

For the heating circuits and DHW heating, a number of switching programs are available. They are activated in "Automatic" mode 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 combined, i.e. either in common for several days or in the form of separate times for individual days. The preselection of groups of days like for instance Mo...Fr and Sa-Su that use the same switching times simplifies setting of the switching programs.

Switching points

Line no.					*Operating line*
HC1	*HC2*	*HK3*	*4/DHW*	*5*	
500	**520**	**540**	**560**	**600**	**Preselection** Mo - Su Mo - Fr Sa - Su Mo - Su
501	**521**	**541**	**561**	**601**	**1. phase on**
502	**522**	**542**	**562**	**602**	**1. phase off**
503	**523**	**543**	**563**	**603**	**2. phase on**
504	**524**	**544**	**564**	**604**	**2. phase off**
505	**525**	**545**	**565**	**605**	**3. phase on**
506	**526**	**546**	**566**	**606**	**3. phase off**

Standard program

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

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

In that case, individual settings will be lost!

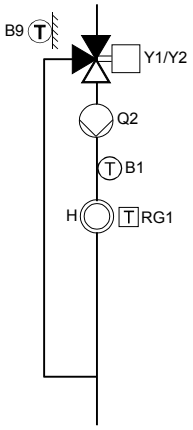
7.5 Holidays

Line no.			*Operating line*
HC1	*HC2*	*HK3*	
641	**651**	**661**	**Preselection** Period 1 … Period 8
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. Up to 8 independent holiday periods can be entered.

Important:
The holiday program can only be used in "Automatic" mode

7.6 Heating circuits



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

Operating mode

Line no.			*Operating line*
HC1	*HC2*	*HK3*	
700	**1000**	**1300**	**Operating mode** Protection Automatic Reduced Comfort

You can directly select operating mode for the heating circuits via the operating mode button on the operator units.

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

Automatic operation AUTO

Automatic mode controls the room temperature according to the selected time program.

Characteristics of automatic mode:

- Heating mode according to the time program
- Temperature setpoints as per heating program "Comfort setpoint" ☼ or "Reduced setpoint" ☾
- Protective functions active.
- Automatic summer / winter changeover and automatic 24-hour heating limit active (ECO functions)

Reduced ☾

The reduced operating mode maintains the room temperature at the set operating level.

Characteristics of reduced mode:

- Heating mode with no time program.
- Protective functions active.

Comfort ☼

The Comfort operating mode maintains the room temperature at the set operating level.

Characteristics of Comfort mode:

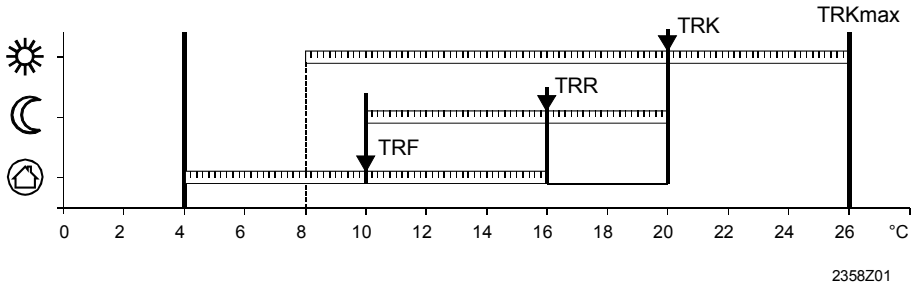
- Heating mode with no time program.
- Protective functions active.
- Automatic summer / winter changeover (ECO functions) and automatic 24-hour heating limit are inactive in Comfort mode.

Setpoints

Line no.			*Operating line*
HC1	*HC2*	*HK3*	
710	**1010**	**1310**	**Comfort setpoint**
712	**1012**	**1312**	**Reduced setpoint**
714	**1014**	**1314**	**Frost protection setpoint**
716	**1016**	**1316**	**Comfort setpoint max**

Room temperature

The setpoint setting ranges are obtained as a result of the interdependency of setpoints. This is shown in the following graph: Setpoints for each heating circuit can be set individually.



TRKmax	Comfort setpoint max
TRK	Comfort setpoint
TRR	Reduced setpoint
TRF	Frost protection setpoint

Comfort setpoint

The Comfort setpoint is the desired room temperature during normal room occupancy (e.g. during the daytime). It is used as the setpoint for Automatic mode (during the Comfort phase) and in Comfort mode.

Reduced setpoint

The Reduced setpoint is the desired room temperature during reduced room occupancy (e.g. at night or when not used for a number of hours). It is used as the setpoint for Automatic mode (during the reduced phase) and in Comfort mode.

Frost protection setpoint

The frost protection setpoint is the desired room temperature when the room is not used (e.g. during holidays), but water installations or animals and plants, etc., required protection against temperatures that are too low.
It is used as the setpoint in protection mode.

Comfort setpoint max

The Comfort setpoint max limits the uppermost adjustable Comfort setpoint. The Comfort setpoint cannot be set to value that is higher than the defined value on the corresponding room unit or operating lines.

Heating curve

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
720	**1020**	**1320**	**Heating curve slope**
721	**1021**	**1321**	**Heating curve displacement**
726	**1026**	**1326**	**Heating curve adaption**

The heating curve generates the flow temperature setpoint, which is used to maintain a certain flow temperature depending on the prevailing weather conditions.

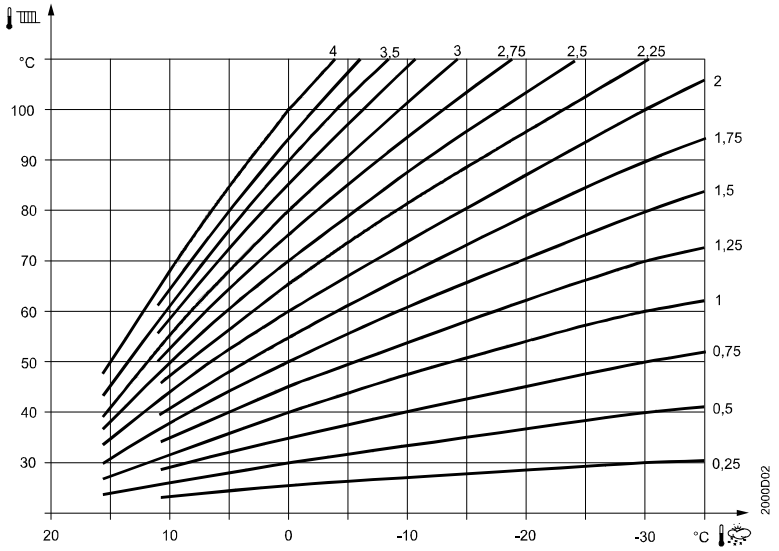
The heating curve can be adjusted with a number of settings, thus matching heat output and room temperature to individual needs.

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.

Increasing the setting:	Raises the flow temperature, especially when outside temperatures are low.
Decreasing the setting:	Lowers the flow temperature, especially when outside temperatures are low.

The set heating curve is based on a room temperature setpoint of 20 °C. If the room temperature setpoint is adjusted, the heating curve adapts automatically to the new value.



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

With this function the controller **automatically** adapts the heating curve to prevailing conditions.

To assure this function, following must be observed:

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

ECO functions

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
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

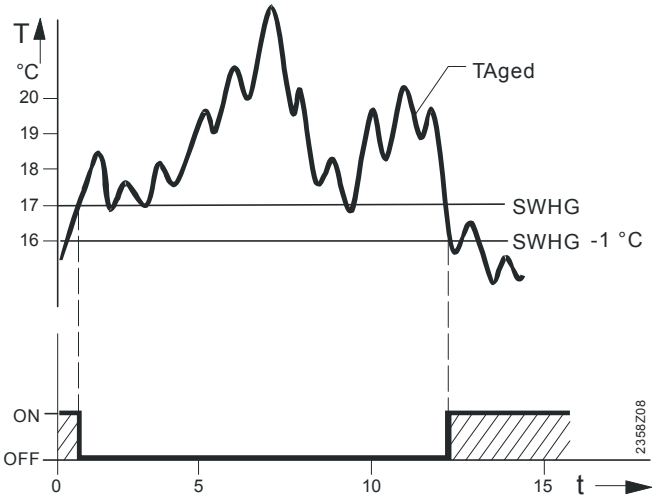
this manually. By changing the setting, the respective periods of time will be shortened or extended.

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

Decrease: Winter operation starts *later*
Summer operation starts *earlier.*

- The function is not active in operating mode "Continuously Comfort temperature"
- The display will show ECO
- To give consideration to the building's thermal dynamics, the outside temperature is attenuated

Example:



SWHG Summer/winter heating limit
TAged The 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 autumn) to respond to short-time temperature variations.

Example:

Operating 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

A change in value shortens or extends the corresponding heating phases.

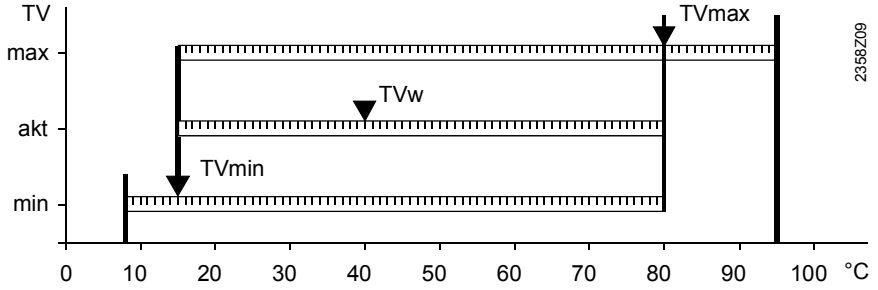
Increase: Heating mode will start *earlier,*
changeover to ECO *later.*
Decrease: Heating mode will start *later,*
changeover to ECO *earlier.*

- The function is not active in operating mode "Continuously Comfort temperature" ☼
- The display is ECO
- To give consideration to the building's thermal dynamics, the outside temperature is attenuated

Flow temperature setpoint limits

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
740	**1040**	**1340**	**Flow temp setpoint min**
741	**1041**	**1341**	**Flow temp setpoint max**
742	**1042**	**1342**	**Flow temp setpoint room stat**

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 temp setpoint max
Tvmin Flow temp setpoint min

Flow temperature setpoint: Room thermostat

The heating circuit is only switched on when using the room thermostat if the room thermostat requests heat.

A fixed temperature or weather-compensated temperature is requested depending on the selected setting:

Setting	*Compensation variant*
– – –	Temperature demand as per heating curve
8…95 °C	Temperature demand as per set value *

* In Comfort mode only –
outside the Comfort there is no temperature demand and the heating curve remains switched off

The room thermostat can be connected via an Hx input (H1, H2 (module 1-3), H3) to the controller or an extension module.

"Room influence"

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
750	**1050**	**1350**	**Room influence**

Types of compensation

* different types of compensation are available when using a room temperature sensor.

Setting	*Compensation variant*
– – – %	Pure weather compensation *
1…99 %	Weather compensation with room influence *
100 %	Pure room compensation

* Outside sensor required.

Pre 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

The deviation of the actual room temperature from the setpoint is measured and taken into account when controlling the temperature. Heat gains can thus be considered, ensuring 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 conditions

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 room temperature.

For example, a slight increase in room temperature leads to an immediate drop of the flow 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 temperature limitation

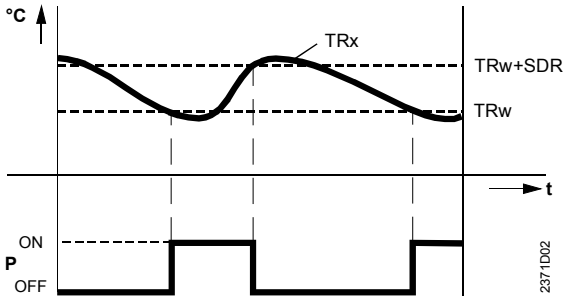
Line no.			*Operating line*
HC1	*HC2*	*HC3*	
760	**1060**	**1360**	**Room temp limitation**

The "Room temperature limitation" function enables the heating circuit pump to be deactivated if the room temperature exceeds the current room temperature setpoint by more than the adjusted differential.

The heating circuit pump is activated again as soon as the room temperature returns to a level below the current room temperature setpoint.

During the time the "Room temperature limitation" function is active, no heat request is sent to the heat source.

Room temperature limitation does not function with pure weather compensation.



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

Boost heating

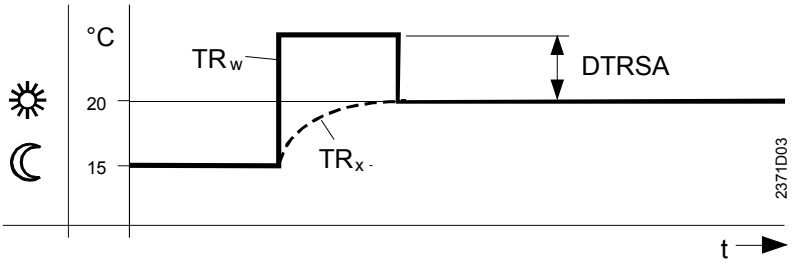
Line no.			Operating line
HC1	*HC2*	*HC3*	
770	**1070**	**1370**	**Boost heating**

Boost heating is used to reach the new setpoint more quickly when switching from the Reduced setpoint to the Comfort setpoint, thus shortening 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 temperature sensor.



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

Quick setback

Line no.			Operating line
HC1	*HC2*	*HC3*	
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 circuits, the mixing valve is fully closed.

Function with room sensor

When using a room temperature 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 frost level, the heating circuit pump will be activated and the mixing valve will be released.

Function without room temperature sensor

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

Examples

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 room temperature sensor

Optimum start / stop control

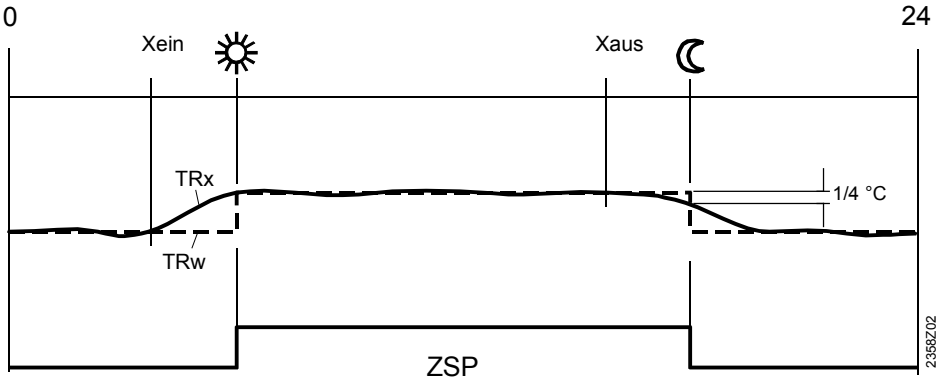
Line no.			*Operating line*
HC1	*HC2*	*HC3*	
790	**1090**	**1390**	**Optimum start control max**
791	**1091**	**1391**	**Optimum stop control max**
794	**1094**	**1394**	**Heat up gradient**

Optimum start control max

Optimum start control optimizes the change from one temperature level to the other in a way that the Comfort setpoint is achieved at the switching times.
The setting "Optimum start control max" limits the period of precontrol.

Optimum stop control max

Optimum stop control advances changeover of the temperature level to achieve Comfort setpoint -1/4 °C at the switching times.
The setting "Optimum stop control max" limits the period of precontrol.



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

Optimum start / stop control is also possible without room sensor A room model is used to calculate optimum start / stop control.

Heating up gradient

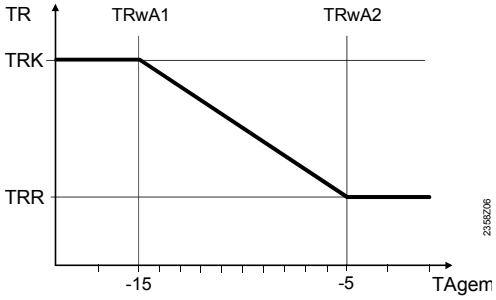
The heating up gradient defines the period required to increase the room temperature by 1°C.
The setting must be increased is the room temperature does not achieve the room temperature at the switching times.

The heating up gradient is only effective when optimum start up is active.

Raising the Reduced setpoint

Line no.			Operating line
HC1	HC2	HC3	
800	**1100**	**1400**	**Reduced setp increase start**
801	**1101**	**1401**	**Reduced setp increase end**

The function is used primarily on heating systems with **only** little spare capacity (e.g. low-energy houses). In such cases, the heating up time at low outside temperatures would be too long. 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 setpoint
TRR Reduced room temperature setpoint
Tagem Composite outside temperature

Plant frost protection HC pump

Line no.			Operating line
HC1	HC2	HC3	
810	**1110**	**1410**	**Frost prot plant HC pump** Off ¦ On

Under the setting "On", the corresponding HC pump is operated for active plant frost protection. (see description of plant frost protection)

Overtemp prot pump heating circuit

Line no.			Operating line
HC1	HC2	HC3	
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	HC3	
830	**1130**	**1430**	**Mixing valve boost**
832	**1132**	**1432**	**Actuator type** 2-position ¦ 3-position
833	**1133**	**1433**	**Switching differential 2-pos**
834	**1134**	**1434**	**Actuator running time**

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 controller adds the mixing valve boost set here to the current flow temperature setpoint and uses the value as the value for heat generation setpoint.

Actuator type

2-position
The controller drives the actuator with only one relay output. When the output delivers a signal, the valve opens. When there is no signal, the valve closes automatically.

3-position
The controller drives the actuator with 2 relay outputs. One of the outputs is used for opening the valve, the other for closing it.

Switching differential 2-pos

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

Actuator running time

For the 3-position actuator, the running time of the mixing valve actuator can be adjusted. The actuator running time has no impact on 2-position actuators.

Floor curing function

Line no.			Operating line
HC1	HC2	HC3	
850	**1150**	**1450**	**Floor curing function** Off Functional heating (Fh) Curing heating (Bh) Functional/curing heating Curing/functional heating Manually
851	**1151**	**1451**	**Floor curing setp manually**
856	**1156**	**1456**	**Floor curing day current**
857	**1157**	**1457**	**Floor curing days completed**

The floor curing function serves for controlled drying of the floor. It controls the flow temperature in accordance with a certain temperature profile.

⚠
- Observe the relevant standards and regulations of the company supplying the floor!
- 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 selecting Off
- Maximum limitation of the flow temperature remains active

Floor curing function

Off:
Function is deactivated.

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

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

Manual
No temperature profile is completed in manual operating mode. The required flow temperature is set individually for every heating circuit, using parameter "Floor curing setp manually".
The function is automatically ended after 25 days.

Floor curing setp manually

The flow temperature setpoint for the "manual" floor curing function can be set separately for each heating circuit.

⚠ The "Attic function" must first be started and then the manual setpoint is set. The start value is 25 °C and can be manually adjusted at any time. "*Floor curing setp manually*" (TVEm) can only be adjusted within the 2 limit values "Flow temperature setpoint maximum" (TVMax) and "*Flow temperature setpoint minimum*" (TVmin).

The function ends after the function days (Fh+Bh = 25 days) expire or the function is switched off via the parameter start day (day 0) which is not counted as a functional day.

Attic day present
Present setpoint for attic

Displays present day and setpoint for the ongoing attic function.

Floor curing days completed

The days completed are stored continuously and remain in the function until the next start of function.

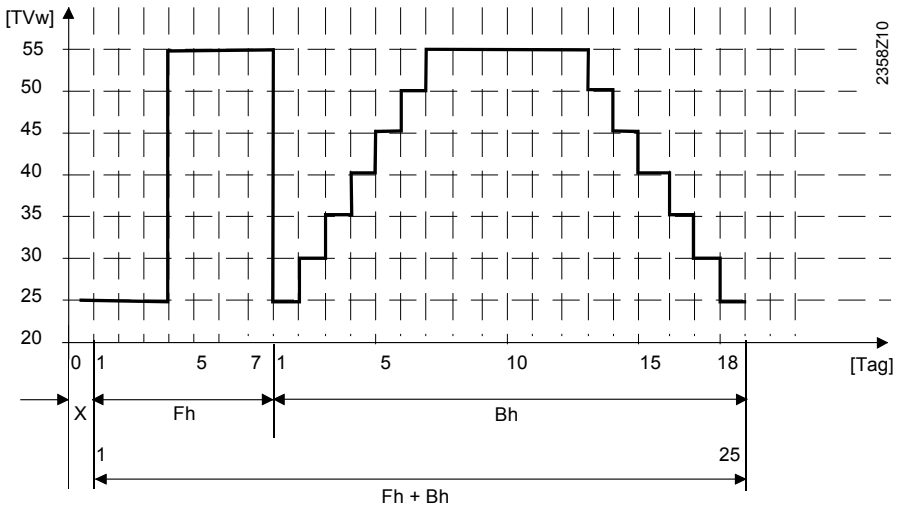
The temperature is regarded maintained if the deviation from the setpoint is less than 2 K. The period of time during which the flow temperature is correct is added up by a meter.

If the required temperature is not reached after more than 1 hour, the meter is stopped until the deviation is again smaller than 2 K.

⚠ After a power failure, the plant resumes the floor curing function at the point in time the power failure occurred.

Temperature profile

In automatic operating modes, the controller ensures automatic completion of the selected temperature profile.



The temperature change always takes place at midnight. The start day (day 0), that is, the period of time from activation to midnight does not count as a functional day. The setpoint used for the start day is the value of the first functional day.

During "Floor curing mode", the profile temperature is limited within the 2 limit values "Flow temperature setpoint maximum" (TVMax) and "Flow temperature setpoint minimum" (TVmin).

The function is terminated when the functional days have elapsed or when it is deactivated with the parameter.

Excess heat draw

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
861	**1161**	**1461**	**Excess heat draw** Off ¦ Heating mode ¦ Always

The source, input Hx or a storage tank can trigger an excess heat draw.

If excess heat draw is activated, excess heat can be made available to heat transfer. This can be selected separately for each heating circuit.

Off
Excess heat draw is deactivated.

Heating mode
Excess heat is drawn only when the controller operates in heating mode.

Always
Excess heat is drawn in all operating modes.

Buffer storage tank / primary controller

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
870	**1170**	**1470**	**With buffer**
872	**1172**	**1472**	**With prim contr/system pump**

With buffer

No
Hydraulically speaking, the heating circuit is connected **upstream** of the buffer storage tank and cannot draw any heating or cooling energy from it. The heat or refrigeration request is forwarded to the heat / refrigeration source upstream of the buffer storage tank.

Yes
The heating circuit is connected **after** the buffer storage tank. It draws heating or cooling energy from the buffer storage tank and its temperature request is taken into account by buffer management.

With primary controller / system pump

No
Hydraulically speaking, the heating circuit is connected **upstream** of the primary controller / system pump and cannot draw any "precontrolled" heating or cooling energy. The heat or refrigeration request is always forwarded to the heat / refrigeration source upstream of the primary controller.

Yes
The heating circuit is connected **downstream** of the primary controller / system pump. The primary controller ensures control of a valid heat or refrigeration request, or the system pump is activated.

Remote control

Line no.			Operating line
HC1	HC2	HC3	
900	**1200**	**1500**	**Optg mode changeover** None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic

Changeover of operating mode

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

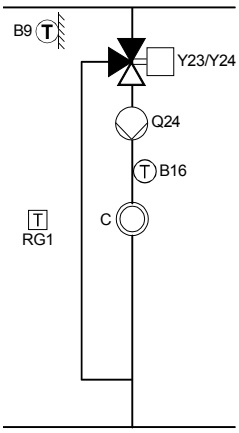
Frost protection for the heating circuit

Heating circuit frost protection is always active.

If the flow temperature falls below 5 °C, the controller switches on heating circuit pumps – regardless of the present operating mode for heating.

The controller switches of the pump after 5 minutes if the flow temperature once again increases above 7°C.

7.7 Cooling circuit



To be able to operate the cooling circuit, an appropriate partial diagram "Heating / cooling" must be used.

The system starts to operate in cooling mode when the room temperature rises above the Comfort cooling setpoint (902). The cooling function must be activated (901 = Auto) and enabled in accordance with the time program (907).

Furthermore, the criteria "Cooling limit at OT" (operating line 912) and "Lock time at end of heating" (operating line 913) must be met.

Cooling mode is cancelled in a 2-pipe system (with active cooling) when a consumer requires heat.

It is possible to charge DHW and heat (using another heating circuit) a heating circuit during cooling mode with a 4-pipe system.

Operating mode

Line no.	Operating line
901	**Operating mode** Off ¦ Automatic*

The operating mode can be selected either via the operating mode button on the room or operator unit or via the above operating line.

This setting is the same as the cooling mode selecting using the cooling button on a room unit.

Off

The cooling function is deactivated.

Automatically

The cooling function is automatically enabled on the basis of the selected time program (907), the holiday program and the occupancy button, and then activated if required.

Manual mode

If the cooling enable signal is set to 24h/day via operating line 907, then the cooling button can be used as an on/off button. (Manual mode)

Setpoints

Line no.	Operating line
902	**Comfort setpoint**

Comfort setpoint

In cooling mode, room temperature control maintains the Comfort setpoint adjusted here. The Comfort setpoint for cooling can also be adjusted with the setting knob on the room unit.

In the summer, the Comfort setpoint is shifted as a function of the outside temperature (918 - 920).

Release

Line no.	Operating line
907	**Release** 24h/day ¦ Time programs HCs ¦ Time program 5

Parameter "Release" determines the time program in accordance with which cooling is enabled.

24 hours a day

Cooling is permanently enabled (24 hours a day)

Time programs, HCs

Cooling is enabled in accordance with the heating circuit's time program

Time program 5 / DHW

Release of cooling takes place in accordance with time program 5.

Cooling curve

Line no.	Operating line
908	**Flow temp setp at OT 25°C**
909	**Flow temp setp at OT 35°C**

Flow temperature setpoint

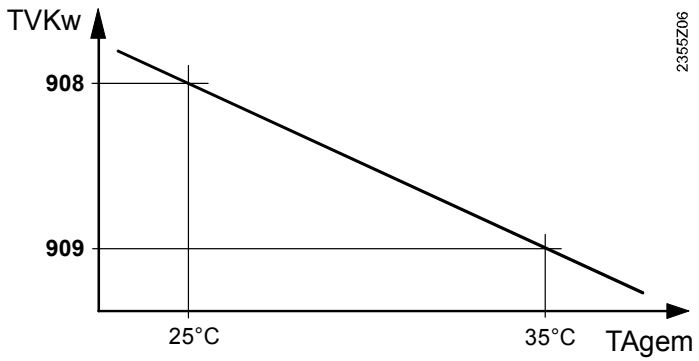
The controller determines the required flow temperature at a certain composite outside temperature. The cooling curve is determined by defining 2 fixed points (flow temperature setpoint at 25 °C and 35 °C).

Flow setp at OT 25°C

This determines the flow temperature required for cooling at a composite outside temperature of 25°C without giving consideration to summer compensation.

Flow setp at OT 35 °C

This determines the flow temperature required for cooling at a composite outside temperature of 35 °C without giving consideration to summer compensation.



TVKw Flow temperature setpoint for cooling
TAgem The composite outside temperature

The set cooling curve is based on a room temperature setpoint of 25 °C. If the room temperature setpoint is changed, the cooling curve automatically adapts to the new value.

ECO

Line no.	Operating line
912	**Cooling limit at OT**
913	**Lock time at end of heating**

Cooling limit at OT (outside temperature)

If the composite outside temperature rises above the cooling limit temperature, cooling is released; cooling is disabled when the outside temperature drops to at least 0.5°C below the cooling limit temperature.

Lock time at end of heating

To avoid too rapid a change to cooling at the end of the heating phase, the cooling function is disabled for the period of time which can be set here. This "locking period" begins when there is no heating demand from heating circuit 1.
and heating requests from heating circuit 2 or heating circuit P are not taken into consideration.

The locking period is ignored if the cooling function is enabled via the operating mode button.

Summer compensation

Line no.	Operating line
918	**Summer comp start at OT**
919	**Summer comp end at OT**
920	**Summer comp setp increase**

In summer, the cooling Comfort setpoint (902) is shifted upwards as the outside temperature increases. This saves cooling energy, and prevents too great a differential between the room and the outside temperature.

The resulting room temperature setpoint (cooling) can be displayed on the info level.

Summer comp start at OT

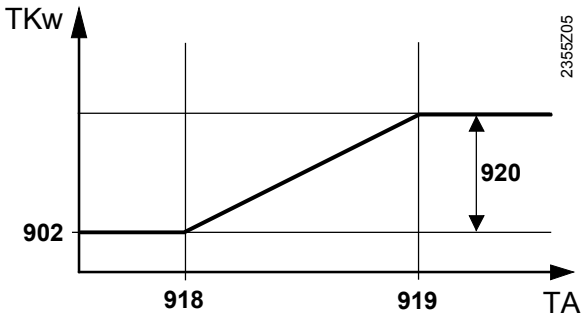
Summer compensation starts to take effect at the outside temperature set here. If the outside temperature continues to rise, the Comfort setpoint is raised continuously.

Summer comp end at OT

Summer compensation takes full effect at this outside temperature (920). The Comfort setpoint is not affected by any further increase in the outside temperature.

Summer compensation setpoint increase

This setting determines the maximum permissible increase in the Comfort setpoint.



TRKw Cooling setpoint
OT Outside temperature

Flow temperature setpoint limits

Line no.	*Operating line*
923	**Flow temp setp min OT 25°C**
924	**Flow temp setp min OT 35°C**

A low limit can be defined for the flow temperature required for cooling. The limit curve is determined by defining 2 fixed points.

There is also a low limit for the resulting flow temperature setpoint, which must not fall below 5 °C.

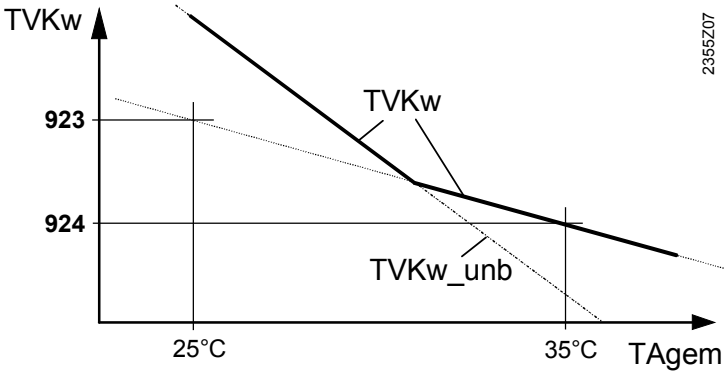
Flow temp setpoint min OT 25°C

This determines the lowest permissible flow temperature at a composite outside temperature of 25°C.

Flow temp setp min at OT 35°C

This determines the lowest permissible flow temperature at a composite outside temperature of 35 °C.

⚠ If there is no valid outside temperature available, the controller uses the value "Flow temp setp min OT = 35 °C".



TVKw Flow temperature setpoint for cooling (with minimum limitation)
TVKw_unb Flow temperature setpoint for cooling (without minimum limitation)
TAgem The composite outside temperature

"Room influence"

Line no.	*Operating line*
928	**Room influence**

Types of compensation

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

Setting	*Compensation variant*
– – – %	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 with the help of the cooling curve as a function of the composite outside temperature.
This type of compensation requires correct adjustment of the heating curve, since in this case, control does **not** consider room temperature.

Weather compensation with room influence

The deviation of the actual room temperature from the setpoint is measured and taken into account when controlling the temperature. In this way, account is taken of room temperature deviations to facilitate more accurate room temperature control. The authority of deviation is set as a percentage figure. The better the reference room conditions (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:
- Room temperature sensor must be connected
- The "Room influence" setting must be between 1 and 99
- There should be no controlled valves in the reference room (mounting location of the room sensor) (If such valves are installed, 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 room temperature. For example, a slight increase in room temperature leads to an immediate drop of the flow temperature.

To activate the function, following must be considered:
- Room temperature sensor must be connected
- "Room influence" must be set to 100%
- There should be no controlled valves in the reference room (mounting location of the room sensor) (If such valves are installed, they must be set to their fully open position).

Room temperature limitation

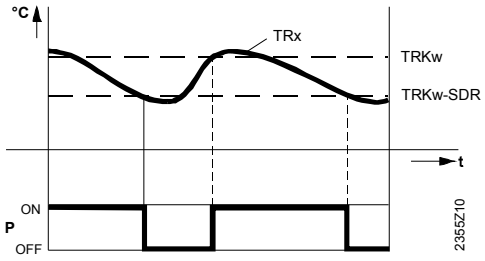
Line no.	*Operating line*
932	**Room temp limitation**

The room temperature limitation function makes it possible to disable the cooling circuit pump if the room temperature falls by more than the programmed offset from the effective room setpoint (with summer compensation, operating line 920).

The heating circuit pump will be activated again as soon as the room temperature returns to a level below the current room temperature setpoint.

While the "Room temperature limitation" function is active, no cooling request is sent to the heat source.

The function is deactivated in the following situations:
- No room temperature sensor
- "Room temp limitation" = ---
- "Room influence" (928) = --- (pure weather compensation)



TRx	Actual value of the room temperature
TRKw	Room temperature cooling setpoint (including summer compensation)
SDR	Room's switching differential
P	Pump
t	Time

Plant frost protection CC pump

Line no.	*Operating line*
937	**Frost prot plant CC pump** Off ¦ On

Under the setting "On", the corresponding CC pump is operated for active plant frost protection.

Mixing valve control

Line no.	*Operating line*
938	**Mixing valve decrease**
939	**Actuator type** 2-position ¦ 3-position
940	**Switching differential 2-pos**
941	**Actuator running time**
945	**Mixing valve in heating mode** Control ¦ Open

Mixing valve decrease

The refrigeration request from the mixing valve circuit to the source is reduced by the preset value. The purpose of this reduction is to enable the mixing valve controller to compensate for the variations in temperature caused by the refrigeration source (2-position control).

Actuator type

2-position
The controller drives the actuator with only one relay output. When the output delivers a signal, the valve opens. When there is no signal, the valve closes automatically.

3-position
The controller drives the actuator with 2 relay outputs. One of the outputs is used for opening the valve, the other for closing it.

Switching differential 2-pos

For the 2-position actuator, the "2-position switching differential" must also be adapted. The switching differential has no impact on 3-position actuators.

Actuator: running time

For the 3-position actuator, the running time of the mixing valve actuator can be adjusted. The actuator running time has no impact on 2-position actuators.

Mixing valve in heating mode

This defines the position of mixing valve 1 (Y1 / Y2) when heating mode is active. This parameter has no impact on systems with hydraulically separate heating and cooling circuits.

Controls The valve is used for control in heating and cooling mode.

Open The valve is used for control in cooling mode, it is open in heating mode.

Dewpoint monitoring

Line no.	*Operating line*
946	**Lock time dewpoint monitor**
947	**Flow temp setp incr hygro**
948	**Flow setp incr start at r.h.**
950	**Flow temp diff dewpoint**

Dewpt monitor locking time

When the connected dewpoint monitor detects the **formation of condensation** it closes the contact, thereby **deactivating the cooling**.

The "Lock time dewpoint limiter" set here starts running as soon as the contact reopens. Cooling can only start after expiry of this locking time.

⚠ The dewpoint monitor must be assigned to the H.. input as "dewpoint monitor".

Flow setpt increase hygro

To prevent the formation of condensation due to excess indoor air humidity, a hygrostat can be used to implement a **fixed increase in the flow temperature**. As soon as the air humidity exceeds the value set on the hygrostat, the contact closes and the flow temperature setpoint is increased by the amount set here.

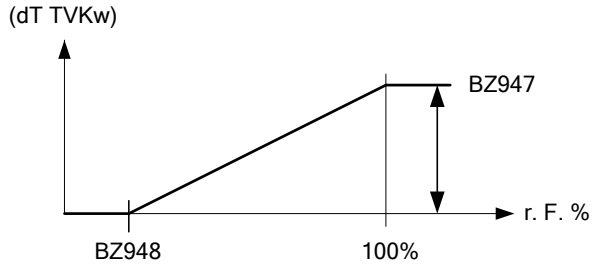
⚠ The hygrostat must be assigned to the H.. input as "Flow setpt increase hygro".

Flow setp incr start at r.h.

To prevent the formation of condensation due to excess indoor air humidity, a 0…10 V humidity measurements can be used to implement a **proportional increase in the flow temperature**.

If the relative humidity in the room exceeds the value defined by "Flow setp incr start at r.h." the flow temperature setpoint is increased continuously. The start of the increase (OL 948) and the maximum increase (OL 947) can be programmed.

⚠ The humidity sensor must be assigned to the H.. input as "Relative room humidity 10V".



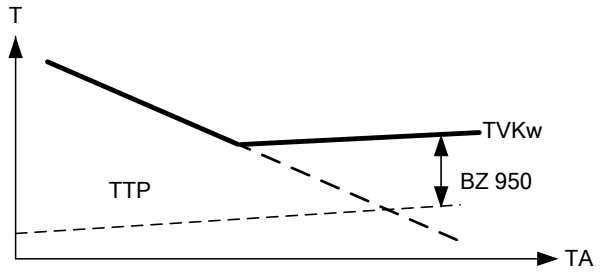
dT TVKw Flow temperature setpoint increase
r.h. Relative humidity
OL Operating line

Flow temp diff dewpoint

The dewpoint temperature is determined on the basis of the relative humidity of the indoor air and the associated room temperature.
To prevent the formation of condensation on surfaces, a minimum limit is applied to the flow temperature so that it remains above the dewpoint temperature by the value set here (950).

The function can be deactivated with setting – – –.

⚠ The humidity sensor must be assigned to an Hx.. input as "Relative room humidity 10V", and a room temperature sensor must also be available (assigned to the H.. input as "Room temperature 10V" or room unit).



TVKw Flow temperature setpoint cooling
TTP Dewpoint temperature
OT Outside temperature
OL Operating line

Buffer storage tank / primary controller

Line no.	*Operating line*
962	**With buffer** No ¦ Yes
963	**With prim contr/system pump** No ¦ Yes

With buffer

If there is a buffer storage tank, this setting must be made to define whether the cooling circuit can draw cooling energy from it.

No
Hydraulically speaking, the cooling circuit is connected **upstream** of the buffer storage tank, which means that it cannot draw any cooling energy from it. The refrigeration request is forwarded to the refrigeration source upstream of the buffer storage tank.

Yes
The cooling circuit is connected **after** the buffer storage tank. It draws cooling energy from the buffer storage tank and its temperature request is taken into account by buffer management.

With primary controller / system pump

The setting defines whether the primary controller / system pump has an impact on the cooling circuit.

No
Hydraulically speaking, the cooling circuit is connected **upstream** of the primary controller / system pump, which means that it cannot draw any precontrolled cooling energy**.** The refrigeration request is always forwarded to the refrigeration source located upstream of the buffer storage tank.

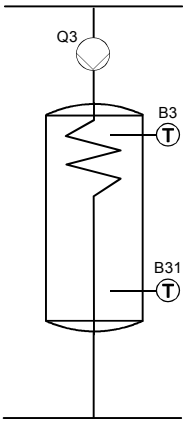
Yes
The cooling circuit is connected **downstream** of the primary controller / system pump. The primary controller ensures control of a valid refrigeration request, or the system pump is activated.

Remote control

Line no.	*Operating line*
969	**Optg mode changeover** None ¦ Off ¦ Automatic

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

7.8 Domestic hot water



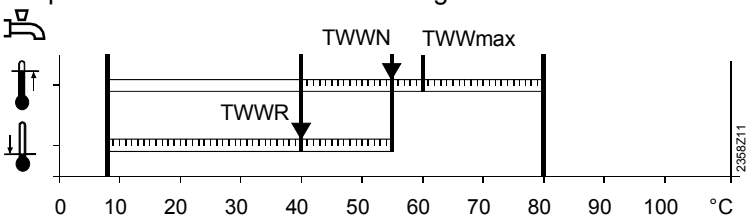
The unit controls the DHW temperature according to the time program, or constantly to the relevant setpoint. Priority of DHW charging over space heating can be selected.

The controller features a legionella function with a number of setting choices, fighting legionella viruses both in the storage tank and in the circulation pipe. The circulating pump is controlled according to the selectable time program and the operating mode.

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 Reduced DHW setpoint
TWWN Nominal DHW setpoint
TWWmax Nominal DHW setpoint maximum

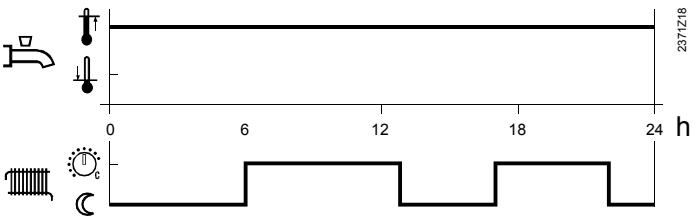
Release

Line no.	*Operating line*
1620	**Release** 24h/day Time programs HCs T'prog 4/DHW or low-tariff

24h / day

The DHW temperature is constantly maintained at the nominal DHW setpoint, independent of any time programs.

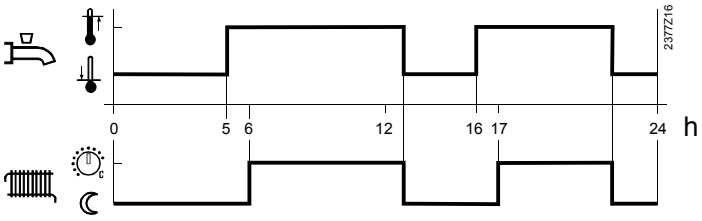
Example:



Time programs HCs

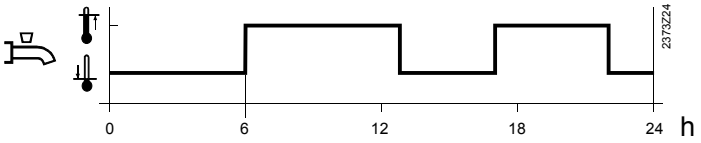
The DHW setpoint changes between the nominal DHW setpoint and the reduced DHW setpoint according to the heating circuits' time program. The first switch-on point of each phase is shifted forward in time by one hour.

Example:



Time program 4 / DHW
For DHW heating, time program 4 of the local controller is taken into consideration. The set switching times of that program are used to switch between the nominal DHW setpoint and the reduced DHW setpoint. This way, the DHW storage tank is charged independently of the heating circuits.

Example:



Priority

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

When both space heating and DHW heating demand 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 heating and space heating take place at the same time.
In the case of tightly sized boilers and mixing heating circuits, it can occur 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 are locked until 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**
1648	**Legio funct circ temp diff**

Legionella function

Off
The legionella function is deactivated.

Periodically
The legionella function is repeated according to the interval set (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 (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 time

Set the time to start legionella function. The setpoint is increased at this time; this starts DHW charging.

If no time (--.--) is parameterized, the legionella function is started on the respective day together with the first normal release of DHW heating. If on this day is no Release (continuously reduced) the legionella function will be prepared.

The legionella function is activated if DHW heating is switched off (Operating mode = Off or the holiday function controls the heating circuits) as soon as DHW heating is switched back on (Operating mode = On or end of holidays).

Legionella function setpoint

The DHW storage tank is heated to the entered setpoint (55-95°C).
For the legionella function to be regarded as fulfilled, the sensor at the top (B3) or both sensors (B3 and B31) must reach the legionella setpoint which must be maintained for the dwelling time set, depending on charging type (OL 5022).
The higher the setpoint, the shorter the required dwelling time to safely kill off any legionella in the DHW.

Legionella funct duration

The defined minimum period to maintain the legionella setpoint in the storage tank / circulation pipes.

Legionella funct circ pump

During the period of time the legionella function is performed, the DHW circulating pump can be activated.

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

Legionella funct circ temp diff

The circulating pump continues to operate until the temperature at circulation sensor B39 achieves setpoint (OL 1645) minus the circulation difference (OL 1648),
and the set dwelling period (OL 1646) is met.

The error message (Number: 127) is sent is the circulation pipe fails to achieve the required level for 48 hour.
The temperature at B39 is not monitored during the legionella function without a set differential temperature.

Circulating pump

Line no.	*Operating line*
1660	**Circulating pump release** Time program 3/HC3 DHW release Time program 4/DHW Time program 5
1661	**Circulating pump cycling**
1663	**Circulation setpoint**

Release of circulating pump

When using setting "Release DHW", the circulating pump runs when DHW heating is released. The other settings as per the applicable time program.

Circulating pump cycling

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

Circulation setpoint

The circulation pump Q4 switches on as soon as the set value is breach if sensor B39 is located in the DHW distribution pipe. The pump then operates fixed for 10 minutes or more until the setpoint is once again achieved. A set difference of 8 K always exists between the setpoint for the DHW storage tank and the setpoint for sensor B39 (Par 1663). This ensures that the circulation setpoint can be achieved again and keeps the circulation pump from running continuously.

Example 1:

- DHW setpoint: 55°C (nominal setpoint)
- Circulation setpoint: 45°C

→ The circulation pump switches on when the sensor actual value drops below 45°C and runs for at least 10 min

Example 2:

- DHW setpoint: 50°C
- Circulation setpoint: 45°C

→The circulation pump switches on when the sensor actual value falls below 42°C (50°C - 8K) and operates for at least 10 minutes.

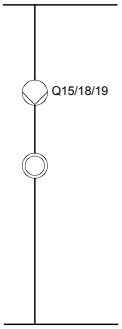
Remote control

Line no.	*Operating line*
1680	**Optg mode changeover** None ¦ Off ¦ On ¦ ECO

In the case of external changeover via the Hx inputs, the operating mode to be used for DHW heating can be selected.

7.9 Consumer circuits and swimming pool circuit

Overview



Other consumers, in addition to heating circuits HC1-HC3 and the cooling circuit, can be connected or controlled (e.g. door heating, swimming pools, etc.).

The controller can receive its temperature request via an Hx input and control the corresponding pumps via a relay output QX.

Various settings are available for consumer circuits.

An appropriately defined Hx input on the device or extension module (OL 5950, 5960 or 6046, 6054, 6062) required to use consumer circuits / swimming pool circuit. The input can be defined as follows:

- Cons request CC1, 2
- Cons request 10V CC1, 2
- Release swimming pool generation

The heating or cooling circuit is set for the consumer circuits via operating lines 5750 and 5751.

The pumps are to be connected to the appropriately defined multifunctional relay outputs Qx.. (OL 5890-5896 and 6030 - 6038).

The consumer circuit pumps (Q15 / Q18) are put into operation when there is a heat or refrigeration request at the respective input, or when excess heat draw is called for.

The swimming pool circuit (Q19) starts up when the release is pending at the corresponding input Hx and the swimming pool temperature is below the setpoint (OL 2056).

Consumer circuits 1, 2 swimming pool circuit

Line no.			*Operating line*
CC1	*CC2*	*SK*	
1859	**1909**	**1959**	**Flow temp setp cons request 1, 2 or swimming pool**
1860	**1910**	**1960**	**Frost prot plant CC pump (1860, 1910), Frost prot plant pool pump**
1875	**1925**	**1975**	**Excess heat draw** Off On.
1878	**1928**	**1978**	**With buffer** No Yes
1880	**1930**	**1980**	**With prim contr/system pump** No Yes

The present flow setpoints for the consumer circuits are displayed on OL 8875, 8885 and the one for the swimming pool circuit on OL 8895.

Flow temperature setpoint

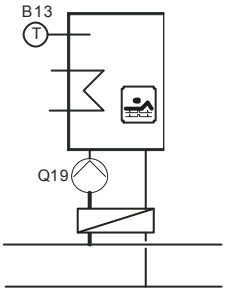
The consumer circuit is controlled to the set flow temperature as soon as a heat or refrigeration request is pending via a correspondingly defined Hx input.

A request from swimming pool sensor B13 required for the swimming pool circuit, in addition to release to Hx.

Frost protection for the plant	Defines whether to start up the consumer circuit pumps and swimming pool pump if plant frost protection is triggered.
Excess heat draw	The heat source, input Hx or a storage tank can trigger an excess heat draw. If excess heat draw is activated, excess energy can be provided to space heating of consumer circuits / swimming pool circuit. This can be adjusted separately for each consumer circuit / swimming pool circuit. **Off** Excess heat draw is deactivated. **On** Excess heat draw is activated.
With buffer	**No** The consumer circuit / swimming pool circuit is, hydraulically speaking, connected **upstream** of the buffer storage tank and cannot draw any heating or cooling energy from it. The heat or refrigeration request is forwarded to the heat / refrigeration source upstream of the buffer storage tank. **Yes** The consumer circuit / swimming pool circuit is connected downstream of the buffer storage tank. It draws heating or cooling energy from the buffer storage tank and its temperature request is taken into account by buffer management.
With primary controller / system pump	**No** Hydraulically speaking, the consumer circuit / swimming pool circuit is connected **upstream** of the primary controller / system pump and cannot draw any "precontrolled" heating or cooling energy. The heat or refrigeration request is always forwarded to the heat / refrigeration source upstream of the primary controller. **Yes** The consumer circuit / swimming pool circuit is connected **downstream** of the primary controller / system pump. The primary controller ensures control of a valid heat or refrigeration request, or the system pump is activated.

7.10 Swimming pool

Overview



The controller facilitates swimming pool heating with solar energy or heat generation based on separately adjustable setpoints. In the case of solar heating, it is possible to select priority of swimming pool heating over storage tank charging.

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.

Solar swimming pool heating can be dependent on a release via one or two Hx inputs.

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** Priority 1 ¦ Priority 2 ¦ Priority 3

Priority 1
Swimming pool charge has the highest priority.

Priority 2
Swimming pool charge is second priority (after buffer storage tank and DHW storage tank).

Priority 3
Swimming pool charge is without priority (after buffer storage tank, DHW storage tank, heating circuits, consumer circuits).

Release and priority can also be influenced using Hx inputs.

Plant hydraulics

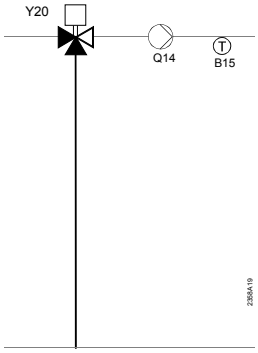
Line no.	*Operating line*
2080	**With solar integration**

Solar integration

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

7.11 Primary controller/system pump

Overview



The primary controller makes it possible to mix the flow, aimed at obtaining flow temperatures for heating / cooling groups with setpoints higher or lower than those of the common flow.

The system pump can be used to overcome the pressure drop to remote heating / cooling groups.

Primary controller/system pump

Line no.	*Operating line*
2120	**Frost prot plant syst pump** Off ¦ On
2150	**Primary contr/system pump** Before buffer After buffer

Frost protection for the plant

Defines whether to start up the system pump if plant frost protection is triggered.

Primary controller/system pump

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

7.12 Boiler

Operating mode

Line no.	*Operating line*
2203	**Release below outside temp**
2204	**Release above outside temp**
2205	**With Economy mode** Off ¦ On DHW ¦ On
2208	**Full charging buffer** Off ¦ On

Release below outside temp

The boiler is only started up when the mixed outside temperature is below this threshold. It calculates a switching differential of ½ °C for the release.

Release above outside temp

The boiler is only started up when the mixed outside temperature is above this threshold. It calculates a switching differential of ½ °C for the release.

To ensure continuous release of the boiler, setting "---" must be selected on the respective operating lines.

The outside temperature must meet both criteria if the release values are switched on to release the boiler.

For Eco mode

Economy mode can be selected from menu "Special operation / service" (operating line 7120).

The boiler is operated as follows in Eco mode:

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

Full charging of buffer storage tank

Off:	Boiler does not participate in full charging of the buffer storage tank.
On:	Boiler participates in full charging of the buffer storage tank. The boiler continues to operate until the storage tank is fully charged to achieve a long runtime.

Setpoints

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

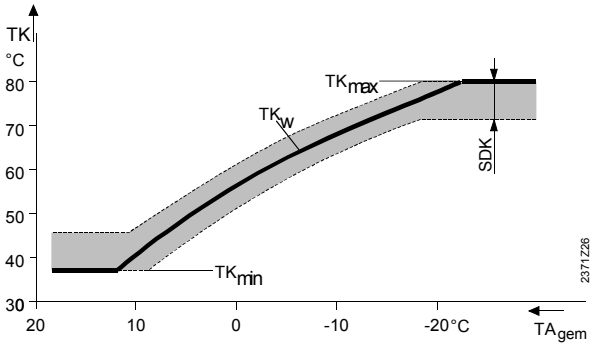
The controlled boiler temperature setpoint can be limited by selecting setpoint minimum and setpoint maximum. These limitations can be regarded as protective functions for the boiler.

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 control.

Example when using boiler operating mode "Automatic":



Key

TK	Boiler temp
TKw	Boiler temperature setpoint
TKmax	Maximum limitation of the boiler temperature
Tkmin	Minimum limitation of the boiler temperature
SDK	Switching differential
TAgem	The 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.

Maintain return temperature influences consumers, bypass pump control or the use of a return controller.

Output data

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

Output nominal/basic stage

These settings required to cascade boilers with various outputs.

7.13 Cascade

Control

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

Restart lock

The restart lock prevents re-switching on switched off heat generation. Is only released after the timeframe expires. This prevents frequent cycling of the BMUs and ensures that plant conditions will be more stable.

Switch-on delay

Correct adjustment of the switch-on delay ensures that plant operating conditions will be stable. This prevents frequent cycling of the boiler.
With DHW requests, the delay time is fixed at one minute.

Boiler sequence

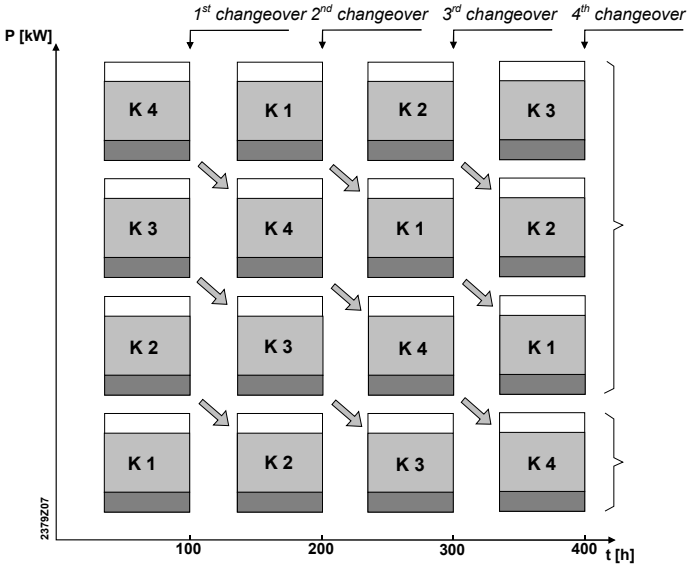
Line no.	*Operating line*
3540	**Auto source seq ch'over**
3541	**Auto source seq exclusion** None First Last First and last
3544	**Leading source** --- / 1..16

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 boilers.

Fixed order
Setting - - - defines a fixed order. The lead boiler can be selected using OL 3544; the other boilers are switched on and off in the order of the LPB device addresses.

Order according to the number of operating hours
On completion of the number of hours set, the heat source sequence in the cascade changes. It is always the heat source with the next higher device address that takes on the role of lead heat source.



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

Auto source seq exclusion

Setting of the source sequence exclusion is only used in connection with the activated source sequence (3540).

With source sequence exclusion, the first and / or the last boiler can be exempted from automatic changeover.

None
The order of switching on the heat sources changes when the number of hours set is reached (3540).

First
The first heat source in the addressing scheme always remains the lead heat source. With the other boilers, the switching on sequence changes when the set number of operating hours have elapsed (line 3540).

Last
The last heat source in the addressing scheme always remains the last. The other heat sources change when the set number of hours is reached (3540).

First and last
The first heat source in the addressing scheme always remains the lead heat source. The last heat source in the addressing scheme always remains the last. The heat sources in between change when the set number of hours is reached (3540).

Leading source

The leading heat source is only selected in connection with the fixed order of the heat source sequence (3540).

The heat source defined as the lead heat source is always the first to be switched on and the last to be switched off. The other heat sources 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 falls below the return temperature setpoint, maintained boiler return temperature becomes active.

Maintain return temperature influences consumers or use of a return controller.

Return circuit mixing valve

Line no.	*Operating line*
3570	**Actuator running time**

Actuator: running time

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

7.14 Supplementary source

Supplementary generation can be operated as a supplement to main generation (boiler).

Release of supplementary generation depends on various parameters which are explained in detail in the next few pages.

The release occurs via relay release K27.
2-point control occurs via the control relay K32.

Control on flow temperature control sensor

The control of the enabled supplementary generation is based on the temperature deviation on the selected control sensor (flow temperature sensor B10 or buffer storage tank sensor B4, see OL 3725).

Release relay K27 and control relay K32 are switched on if the temperature on the control sensor drops below the setpoint by 5°C. An integrated switch (OL 3720) if set, must be fulfilled after dropping below 5°C.

Control relay K32 is immediately switched off if the temperature on the control sensor exceeds the setpoint by the "Switching differential" (OL 3722) and the release relay K27 drops off after the overrun time expires.

Operating mode

Line no.	*Operating line*
3690	**Setpoint incr main source**
3691	**Output limit main source**
3692	**With DHW charging** Locked ¦ Substitute ¦ Complement ¦ Instantly

Setpoint incr main source

The setpoint for the main source is increased by the value entered here for the duration of the supplementary source release to prevent it switching off or to reduce the degree of modulation.

This prevents a reduction in output for the main source for an active supplementary source.

The setpoint for the main source continuously controlled again to its own setpoint after the supplementary source is locked.

Output limit main source

The supplementary source is only released if the main source exceeds the entered output [%]. This prevents switching on the supplementary source the main source is modulating at a lower output.

The lock period only starts if the main source exceeds the set output in percentages.

For DHW charging

Set the release for the supplementary source for DHW:

Locked
The supplementary source is not released.

Substitute
The supplementary source is only released if the main source cannot be operated (e.g. for a fault).

Supplement
The supplementary source is released if the output from the main source is not sufficient.

Immediate
The supplementary source is always released.

Supplementary source

Line no.	*Operating line*
3700	**Release below outside temp**
3701	**Release above outside temp**
3702	**With Economy mode** OFF ¦ On DHW ¦ On
3703	**Full charging buffer** Off ¦ On
3705	**Overrun time**

Release below / above the outside temperature

Operation of the supplementary source is released when the composite outside temperature lies above or below the set temperature limit.

This enables the supplementary source to lock in a selected outside temperature range in order to attain bivalent operation of supplementary source and heat pump. Also refer to operating line 2910.

To ensure continuous release of the supplementary source, setting "---" must be selected on the respective operating lines.

The outside temperature must meet both criteria if the release values are switched on to release the supplementary source.

For Eco mode

Defines possible releases for the supplementary source during active Eco mode:

Off
The supplementary source is locked in Eco mode.

On DHW
The supplementary source can be started up for forced buffer storage tank charging.

On
The supplementary source can be started up for all heat requests.

Full charging of buffer storage tank

Off: Boiler does not participate in full charging of the buffer storage tank.

On: Boiler participates in full charging of the buffer storage tank.
The boiler continues to operate until the storage tank is fully charged to achieve a long runtime.

Overrun time

If the integral indicates another heat deficit before the overrun time has elapsed, the release for supplementary source remains activated.

If the set overrun time elapses before the common flow temperature drops below the common flow temperature setpoint, the release is also deactivated.

Setpoint min

Line no.	*Operating line*
3710	**Setpoint min***

* active only is a control sensor is available

The setpoint for the supplementary source is increased to the set "Setpoint min" if the supplementary source is released.

The "Setpoint min" acts as a minimum switch-on temperature during the overrun period.

The function requires a control sensor (common flow sensor B10 or buffer storage tank sensor B4).

Flow control

Line no.	*Operating line*
3720	**Switching integral***
3722	**Switching diff off***
3723	**Locking time**
3725	**Control sensor** Common flow temp ¦ Buffer sensor B4

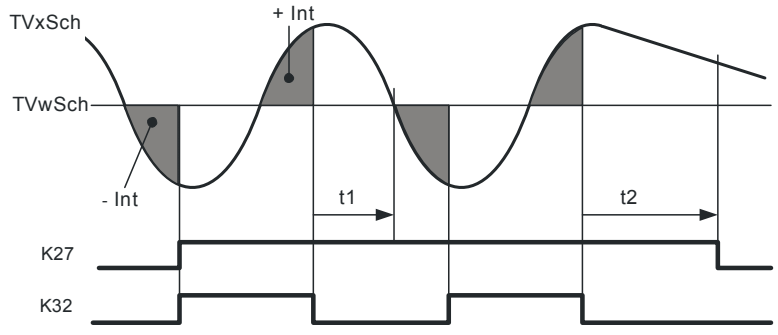
* active only is a control sensor is available

Switching integral

The temperature-time integral is a continuous summation of the temperature differential over time. In this case, the decisive criterion is the difference by which the temperature lies above or below the common flow temperature setpoint.

The temperature-time integral gives consideration not only to the period of time, but also to the extent of over / undershoot.

This means that when the over/undershoot is significant, the supplementary source is released earlier, or locked earlier, than with minor over/undershoots.



TVx Actual value of the flow temperature
TVw Flow temperature setpoint
+ Int Excess integral
- Int Deficit integral
t1 Overrun time (not fully expired)
t2 Overrun time (fully expired)
K27 Release output K27
K32 Control K32

The function requires a control sensor (common flow sensor B10 or buffer storage tank sensor B4).

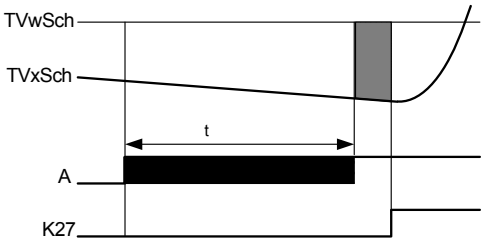
Switching diff off

If the common flow temperature exceeds the flow temperature setpoint by the amount of the switch-off differential, switching off takes place immediately, independent of the switching integral of the supplementary source (K32), and the request for heat (K27) is aborted on completion of the overrun time.

The function requires a control sensor (common flow sensor B10 or buffer storage tank sensor B4).

Lock time

The locking time enables the internal controller heat source to reach a stable operating state before the supplementary source is allowed to switch on.
The supplementary source is released only when the locking time has elapsed.
The locking time starts as soon as a valid flow temperature setpoint is available.
Calculation of the release integral starts only when the locking time has elapsed.



TVxSch Actual value of the common flow temperature
TVwSch Setpoint of the common flow temperature
A Requirement
K27 Release output K27

No consideration is given to the locking time, if the controller internal heat source malfunctions or is locked, or if the supplementary source must end DHW charging.

The function can be deactivated using the setting "- - -".

Control sensor

The supplementary source is controlled based on measured temperature on the defined sensor here (common flow temperature B10 or buffer storage tank temperature B4).

Type of heat source

Line no.	*Operating line*
3750	**Source type** Other ¦ Solid fuel boiler ¦ Heat pump ¦ Oil/gas boiler

Set the source type for the supplementary source.
This allows operator units that support this function to display the operational supplementary source on the display.

Delay lockout position

Line no.	*Operating line*
3755	**Delay lockout position**

The following applies when input Hx is configured as "Operating signal operating state" **and** a delay time is entered at parameter "Delay lockout position":

- The output supplementary source (K32) supplies an operating signal on the corresponding Hx input after initiating operation within the delay time set here. The controller reports a "Fault" if lacking.

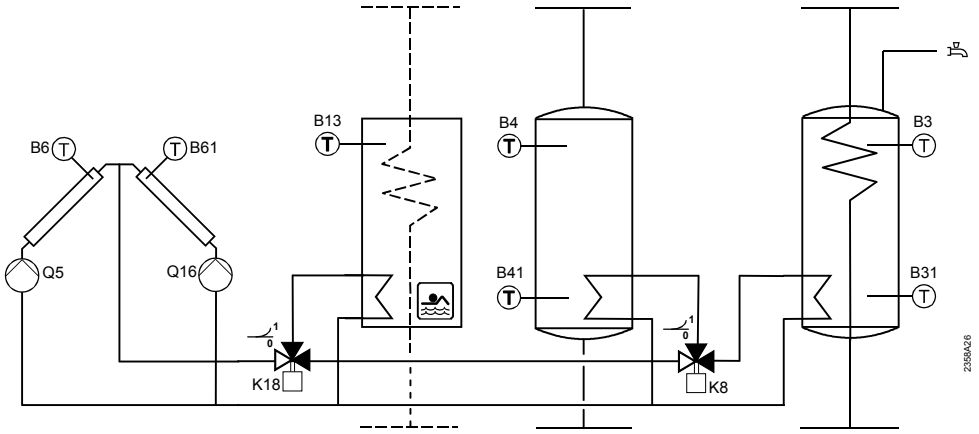
The "Delay lockout position" operates as of release (K27) if no output (relay) supplementary source (K32) is configured.

For a fault, the controller switches off release (K27) but keeps output (relay) supplementary source (K32) switched on.
The controller also allows the release (K27) to remain if no supplementary source (K32) is configured.

The lockout position function can be deactivated by switching off the delay time.

7.15 Solar

Overview

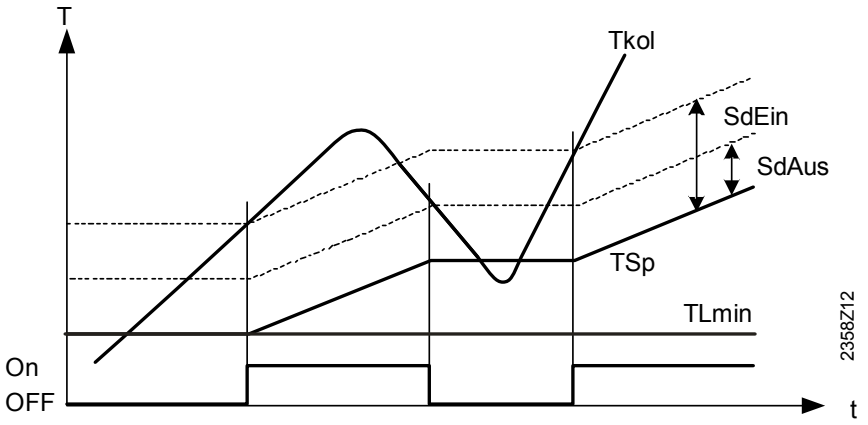


The solar plant can heat the swimming pool, DHW storage tank and buffer storage tank if there is sufficient solar energy available. Priorities for heating or charging can be selected. The plant is protected against frost and overtemperatures.

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 temp
On / Off Collector pump
SdOn Temperature differential on
SdOff 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 (2065) can impact the storage tank priority of solar charging and possibly charge the swimming pool before charging the storage tanks.

Charging prio storage tank

None 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 for a temperature increase of 5 °C at a time, until every setpoint of level A, B or C (see below) is reached. The set points of the next higher level are approached only when all set points 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 set points 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 set points of a level are attained, those of the next level are approached, whereby priority is again given to the buffer storage tank.
Storage tank set points:

Level	DHW storage tank	buffer storage tank	Swimming pool [1]
A	1610 Nominal setpoint	Buffer storage tank setpoint (slave pointer)	2055 Setpoint solar heating
B	5050 Charging temp max	4750 Charging temp 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 (2065), the swimming pool is charged before the set priority for 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. temperature differential between collector and storage tank too great).

As soon as the preferred storage tank (according to setting "Charging prio storage tank") is again ready to be charged, the transfer of priority will immediately be stopped.

If the parameter is deactivated (---), priority always follows the settings "Charging priority storage tank".

Waiting time relative prio

During the period of time set, the transfer of priority is delayed. This prevents relative priority from intervening too often.

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 charged at the same time, 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 (---) disables parallel operation.

Delay secondary pump

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

Start function

Line no.	*Operating line*
3830	**Collector start function**
3831	**Min run time collector pump**
3834	**Collector start funct grad**
3835	**Min collector temp start fct**

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. This setting defines the interval at which the collector pump is put into operation. Then, the pump will operate for the set time "Min run time collector pump" (3831).

Min run time collector pump

The collector pump remains switched on at a minimum for the parameterized minimum running time.

Collector start funct grad

When the temperature at the collector sensor rises, the collector pump is activated.

Min collector start funct

The collector pump may only be switched on if the collector sensor achieve the measured temperature of the value entered here, at a minimum.

Collector frost protection

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

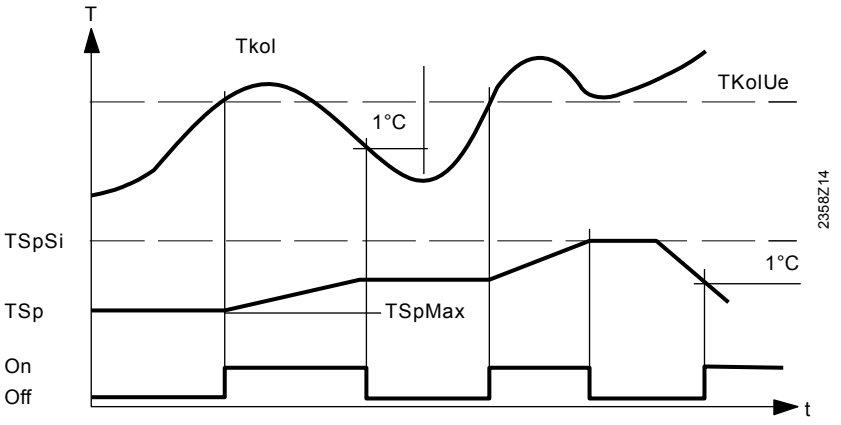
When there is risk of frost at the collector, the collector pump is activated to prevent the heat-carrying medium from freezing.

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

Overtemperature protection for the collector

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

If there is a risk of over temperature at the collector, storage tank charging is continued to reduce the amount of excess heat. When the storage tank's safety temperature is reached, charging is stopped.



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

Medium's evaporation temperature

Line no.	Operating line
3860	**Evaporation heat carrier**
3862	**Impact evaporation superv** On own collector pump ¦ On both collector pumps

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 exceeding certain temperature levels. This is a protective pump function.

Impact of evaporation monitoring

For collector fields with 2 collector pumps: May select whether to shut down the pump for collector circuits at risk of evaporation or for both collector circuits.

Yield measurement

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

To ensure accurate solar yield measurement, both additional sensors (B63 in the solar flow and B64 in the solar return) should be connected. If one or both sensors are missing, the controller uses collector sensor B6 or B61 and the respective storage tank sensor B31 or B41 for the calculation.

Accurate measurements are made with B63/B64.

The 24-hour and total solar energy yield (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

For yield measurement without external pulse or flow measurement, the flow must be determined corresponding to the built-in pump in l/hr and is used to calculate the supplied volume.

This setting must be switched off if the flow is measured via Hx.

Yield measurement pulse

3886	**Pulse count yield** None With Input H1 With input H3

Pulse meter yield

The parameter *Pulse count yield* determines which input Hx is used to meter heat volume or water volume flow:

None:
No count from input Hx.

With input Hx
The pulse count is read from the set input and the established energy is added to the meter for supplied heat.

It is important that the count input set here is also set in the configuration for the pulse count.

Pulse measurement

3887	**Pulse unit yield** None kWh Liters
3888	**Pulse value yield numer**
3889	**Pulse value yield denom**

Each pulse received can be interpreted as a value (kWh or liters).
The pulse value is defined using settings 3887-3889 (unit, counter and denominator).

Examples

1 pulse value corresponds to $\frac{\text{counter}}{\text{denominatator}} * \text{unit} = \frac{\text{OL3888}}{\text{OL3889}} * \text{OL3887}$

In other words, for example $\frac{1}{10} * \text{kWh}$ or $\frac{11}{2} * \text{liter}$

The pulse measurement occurs via the input Hx selected via OL 3886.
The sum of the counted pulses is displayed in the pulse counter (OL 7842).

Pulse unit yield

None
The pulse value is not counted.

kWh
The pulse value is interpreted as kWh and added to operating line 8526 "24-hour yield solar energy".

Liters
The pulse value is counted as liters. The yield in kWh is determined based on the volumetric flow and temperature differential between collector flow and return and then added to operating line 8526 "24-hour yield solar energy".

Pulse value yield counter/ pulse value yield dominator

The calculation model is compared to the applied pulse counter using the settings counter and denominator.

Flow measurement yield

Line no.	*Operating line*
3891	**Flow measurement yield** None ¦ With input H1 ¦ With input H2 module 1 ¦ With input H2 module 2 ¦ With input H2 module 3 ¦ With input H3

The flow measurement can also be conduced via a flow sensor (10V or Hz) connected on Hx instead of pulse count.

Flow measurement yield

The parameter *Flow measurement yield* determines which input Hx is used to meter flow:

None
No measurement of input Hx.

With input Hx
The flow of the set input is recorded and used to calculate volume. The determined volume is multiplied by the measured temperature difference and added to OL 8526 "Daily yield solar energy".

The Hx input selected here must be set in the configuration for the flow measurement.

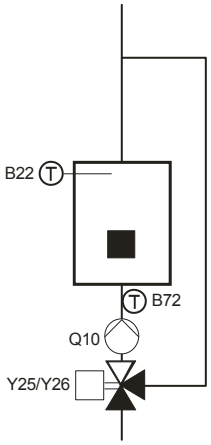
Sensor calibration

Line no.	*Operating line*
3896	**Readj solar flow sensor**
3897	**Readj solar return sensor**

Readjustment corrects imprecision to the sensor measured values.

7.16 Solid fuel boiler

Overview



At a sufficiently high solid fuel boiler temperature, the boiler pump is switched on and the DHW storage and/or buffer storage tank is heated.

The solid fuel boiler can in principle only be operated
- with boiler sensor B22 only or
- with boiler sensor B22 and return sensor B72

Operating mode

Line no.	*Operating line*
4102	**Locks other heat sources**
4103	**Charg prio DHW stor tank** Off ¦ On

Locks other heat sources

When the solid fuel boiler is put into operation, other heat sources, such as oil / gas boilers, will be locked.

The lock occurs as soon as it determines an increase in boiler temperature.

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.

Charging priority DHW storage tank

During solid fuel boiler operation, DHW can be charged at priority (ON) versus the other consumers.

The setting "Off" results in the normal DHW charging priority (OL 1630).

Setpoints

Line no.	*Operating line*
4110	**Setpoint min**
4114	**Temp differential min**
4130	**Temp diff on**

Setpoint min

The boiler pump is starts up the boiler temperature has reached the minimum level and the temperature differential reaches ON.
The pump is shut off again after the overrun if the boiler temperature drops below the minimum level.

Temperature differential minimum

The pump is shut off after overrun when the temperature differential (difference between the boiler temperature and return temperature) is too small.
The temperature differential is calculated from the boiler temperature and the return setpoint minimum (e.g. when using a thermal return temperature controller).

Temperature differential ON

See description for setpoint minimum.

DHW charging

Line no.	*Operating line*
4134	**Connection DHW stor tank** With B3 ¦ With B31 ¦ With B3 and B31
4135	**Boiler temp setp DHW charg** Storage tank temp ¦ Storage tank setpoint ¦ Boiler setpoint minimum
4136	**DHW charging with Q3** No ¦ Yes

DHW setpoint connection

The following loadable sensors must be selected for solid fuel boiler integration.

Boiler setpoint DHW charging

This setting selects the desired boiler setpoint calculated during DHW charging.

Storage tank temp
The boiler setpoint is calculated from DHW charging boost (BZ5020) and storage tank actual value (as per OL 4134).
Storage tank setpoint
The boiler setpoint is calculated from DHW charging boost (BZ5020) and storage tank setpoint (nominal and legionella setpoint).
Boiler temp setpoint min
The boiler setpoint corresponds to the minimum setpoint.

DHW charging with Q3

Determines whether the charging pump is used by the soil fuel boiler to charge DHW.

No
The solid fuel boiler charges the DHW storage tank directly via boiler pump Q10. The solid fuel boiler does not control charging pump Q3.
Yes
Charging pump Q3 must operate for DHW charging using the solid fuel boiler.

Buffer charge

Line no.	*Operating line*
4137	**Connection buffer** With B4 ¦ With B42/B41 ¦ With B4 and B42/B41
4138	**Boil temp setp buffer charg** Storage tank temp ¦ Storage tank setpoint ¦ Boiler temp setpoint min

Buffer storage connection:

The following loadable sensors must be selected for solid fuel boiler integration.

Boiler setpoint buffer storage tank charge

This setting selects the desired boiler setpoint calculated during DHW charging.

Storage tank temp
Boiler setpoint corresponds to storage tank actual value (as per OL 4137).
Storage tank setpoint
The boiler setpoint corresponds to the buffer storage tank setpoint (slave pointer).
Boiler temp setpoint min
The boiler pump operates as long as the boiler temperature is above the minimum setpoint.

Pump overrun time / Return setpoint minimum

Line no.	*Operating line*
4140	**Pump overrun time**
4153	**Return setpoint min**
4158	**Flow influence return ctrl** Off ¦ On

Pump overrun time

If the boiler temperature drops below the minimum temperature differential or the minimum setpoint, the boiler pump keeps running for the parameterized overrun time.

Return setpoint min

The controller prevents the return temperature from dropping below the set value by through mixing the flow.

Flow influence return temp control

The return temperature controller can also be used to achieve the flow setpoint if wanted. Flow influence on return temperature control can be switched on or off.

Return sensor B72 must be connected for both functions.

Residual heat function

4190	**Residual heat fct dur max**
4192	**Residual heat fct trigg** Once ¦ Several times

The boiler pump overrun time diverts the residual heat from the boiler circuit. This prevents an overtemperature and any shut down by the safety limit thermostat.

Residual heat function duration max

The residual heat function is cancelled at the latest by the set maximum duration.

Residual heat function trigger

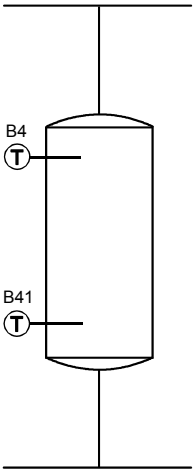
The residual heat function may only be conducted once or several times, as needed.

Once
The residual heat function remains switched off after finishing.

Several times
The residual heat function is resumed when the switch-on criteria are met.

7.17 Buffer storage tank

Overview



A buffer storage tank can be integrated in the plant. Can be heated by heat generation or solar energy.

In the case of active cooling, it can also be used for storing cooling energy.

The controller controls heating / cooling and forced charging of the buffer storage tank, protects it against overtemperatures and maintains stratification whenever possible.

Automatic locks

Line no.	*Operating line*
4720	**Auto generation lock** None With B4 With B4 and B41 / B42
4722	**Temp diff buffer/HC**
4728	**Rel temp diff buffer/HC**

Consumers draw required heat from the buffer storage tank if the temperature level for the buffer storage is sufficiently high. The heat source is locked via the "automatic generation lock".

Auto generation lock

None
There is no generation lock based on the buffer temperature.
A heat demand from the consumer is forwarded directly to the heat source.

With B4
The heat source is locked if the temperature at sensor B4 is sufficiently high. The consumer draws heat from the buffer storage tank.

The heat request is forwarded to the source if the temperature at sensor B4 is too low.

With B4 and B41 / B42
The heat source is locked if the temperature on both sensors B4 and B41 (or B42) is sufficiently high. The consumer draws heat from the buffer storage tank.

A heat request is forwarded to the source if the temperature at both sensors B4 and B41 (or B42) is too low.

Temp diff buffer/HC

A mixing valve boost is often set for plant with a high switching differential for switching on/of generation. This mixing valve boost is not required for heat source from a storage tank and can be compensated using the parameter "Temp’diff buffer/HC" (OL 4722).

Relative T'diff buffer/HC

The tolerance versus the demanded flow temperature setpoint can be determined relative to the temperature level. In other words, for a higher temperature demand, a larger deviation is permitted as for a lower temperature demand.

The reduction is calculated based on the entered percentage (-50 - +50%) as follows:

Reduction = (TVLw - Ts) * % / 100

TVLw = Flow temperature setpoint
Ts = Base demand 20°C
% = Percentage on OL 4728 (-50 - +50%)

Example using TVLw of 60°C, or 40°C and a tolerance of -10% each:

Reduction$^{60°}$ = (60-20) * (-10) / 100 = -4K
Reduction$^{40°}$ = (40-20) * (-10) / 100 = -2K

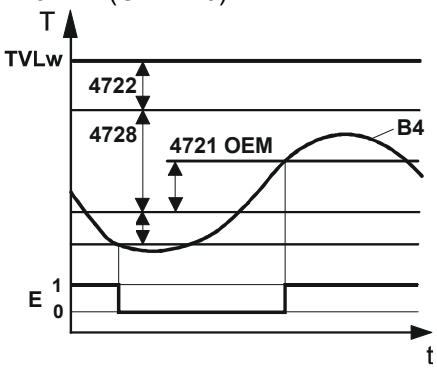
Source lock inactive

The source lick is deactivated as soon as the selected buffer storage tank sensor(s) is below the demanded flow temperature setpoint by the "Temp'diff buffer/HC" **plus** "Relative T'diff buffer/HC".
The heat source is released.

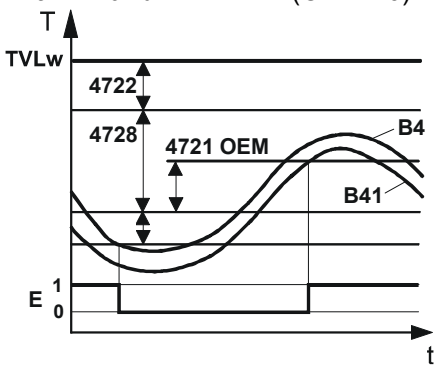
Source lock active

The source lick is activated as soon as the selected buffer storage tank sensor(s) is below the demanded flow temperature setpoint by less than the "Temp'diff buffer/HC" **plus** "Relative T'diff buffer/HC" **minus** "Auto lock source SD".
The heat sources are locked.

With B4 (OL 4720)



With B4 and B41 / B42 (OL 4720)



4721 Auto heat gen lock OEM
4722 Temp diff buffer/HC
4728 Relative T'diff buffer/HC
B4 Upper buffer or combi storage tank sensor
B41 Lower buffer or combi storage tank sensor
TVLw Flow temperature setpoint
E Source lock (1=active, 0=inactive)

Stratification protection

Line no.	*Operating line*
4739	**Stratification protection** Off ¦ Always ¦ With solid fuel boiler
4749	**Min charging setpoint solar**

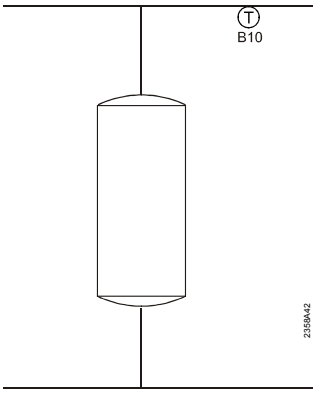
The buffer storage tank's stratification protection function provides for hydraulic balancing between the consumers and the heat source without the need for additional shutoff valves for the buffer storage tank.

When the function is active, the volume of water on the consumer side is adjusted so that, where possible, the addition of colder water from the buffer storage tank is avoided.

Off
Strat prot is off.

Always
Stratification protection is active when the heat source is on.

With solid fuel boiler
Stratification protection is active when the solid fuel boiler is on.



For the function, a common flow sensor B10 must be connected.

Minimum charging setpoint solar

The solar plant can first charge the buffer storage tank when the minimum charging setpoint is achieved in the solar circuit to avoid destroying stratification in the buffer storage tank.

Overtemperature protection

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

Solar energy charges the buffer storage tank until the set maximum charging temperature is reached.

The Protective collector over temperature function can reactivate the collector pump until the maximum swimming pool temperature is reached.

Recooling

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

Recooling temp

If the buffer storage tank had to be charged via "Charging temp max", recooling to the recooling temperature set here takes place as soon as possible.

For recooling the buffer storage tank, the 2 following functions are available:

Recooling DHW/HCs

The heat energy can be drawn off either by space heating or the DHW storage tank. The function is activated or deactivated on this operating line. This can be selected separately for each heating circuit (menu "Heating circuit 1…").

Recooling collector

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

Off
Recooling via the collector is deactivated.

Summer
Recooling via the collector is permitted in summer only.

Always
Recooling via the collector is activated throughout the year.

Solar integration

Line no.	Operating line
4783	**With solar integration** No ¦ Yes

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

At the corresponding temperature differential between the common return sensor B73 and the selectable comparative temperature, the return is diverted through the lower part of the buffer storage tank.

This function can be used to either **raise or lower the return temperature**. It is defined in OL 4796.

In addition, set the corresponding relay output as "Buffer return valve Y15" in the configuration relay output QX1, 2, 3, 4, 5 (OL 5890, 5891, 5892, 5894, 5895) and the common return sensor B73 to BX.

Temp diff ON / OFF return diversion

The set temperature differential determines the switch on/off point for return diversion.

Comparative temperature return diversion

Select the buffer storage tank temperature sensor for comparison with the return temperature to switch return diversion based on the set temperature differential.

Operation action of return diversion

Temperature setback
If the return temperature from the consumers is higher than the temperature at the selected sensor (OL 4795), the return can be used to preheat the lower part of the storage tank. As a result, the return temperature continues to drop which, in the case of a condensing boiler, leads to higher efficiency.

Temperature boost
If the return temperature from the consumers is lower than the temperature at the selected sensor (OL 4795), the return can be preheated by diverting it via the lower part of the storage tank. It is thus possible to preheat the return, for example.

Partial charging

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

Due to the hydraulic decoupling of the lower part of the buffer storage tank, the storage tank volume that can be heated up will be reduced. The upper part of the storage tank will therefore be heated quicker. The lower part of the storage tank is only heated, when
the upper storage section is charged.

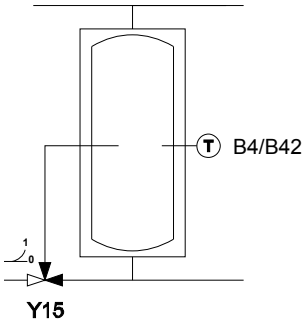
As soon as the temperature acquired with sensor B4 has reached the partial charging setpoint, the diverting valve will change to "throughput" and the rest of the storage tank will also be charged.

It calculates a switching differential of ¼ °C for the release.

It is charges to the slave pointer value if the slave pointer is higher than the set partial charging load.

Configuration:

Auxiliary function QX.. (OL 5890 - 5895)	Return diverting valve Y15 in the buffer storage tank
Sensor input BX.. (OL 5930 - 5932)	Buffer storage tank sensor B4 or B42.



Cooling

The buffer storage tank is locked to refrigeration requests for a period of 24 hours if the buffer storage tank was used for a heat request.

7.18 DHW storage tank

The DHW storage tank can be charged in a number of ways:

- Via solar collectors.
- through the buffer storage tank.
- By oil/natural gas boilers, solid fuel boilers or cascade.
- through the supplementary source.
- through the electrical heating elements.

Selection depends on available components and their configuration. The components supplement each other as needed in a series that makes sense from an energy viewpoint.

Charging control

Line no.	*Operating line*
5020	**Flow setpoint boost**
5021	**Transfer boost**
5022	**Type of charging** Recharging ¦ Full charging ¦ Full charging legio ¦ Full charg 1st time day ¦ Full charg 1st time legio

Increase of the flow temperature setpoint

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

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 by transfer boost than the actual temperature of the DHW storage tank.

The temperature differential can be set here.

Type of charging

One or two sensors can be used for charging.
Only the "boost" setting applies if only one sensor is configured (available).

Boost
The DHW storage tank is charged until the upper sensor B3 achieves its setpoint. The lower storage tank sensor B31 is disregarded.

Full charge
The DHW storage tank is fully charged. Storage tank sensors B3 and B31 must achieve the setpoint.

Full charge Legio
Sensor B3 only is used for storage tank charging.
Both sensors (B3+B31) must achieve the setpoint for the legionella function.

Full charge 1st charge
The first storage tank charge of the day occurs as a full charge with sensors B3+B31. B3 only is then used for additional charges and the legionella function.

Full charge Legio and 1st charge
The first storage tank charge of the day and the legionella function occurs as full charge with sensors B3+B31. B3 is used for additional charging.

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 over temperature 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** Off ¦ On
5057	**Recooling collector** Off ¦ Summer ¦ Always

Recooling temp

An activated recooling function remains in operation until the set recooling temperature in the DHW storage tank is reached.

Recooling heat gen / HC / Consumer circuit

Surplus energy can be drawn off either by heat transfer to heating circuits / consumer circuits or the heat source. This can be selected separately for each heating circuit / consumer circuit (operating page "Heating circuit / consumer circuit X…")

Recooling collector

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

Electrical immersion heater

Line no.	*Operating line*
5060	**El imm heater optg mode** Substitute ¦ Summer ¦ Always
5061	**El immersion heater release** 24h/day ¦ DHW release ¦ Time program 4/DHW
5062	**El 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 if it has been shut down via boiler lock. This means that in normal situations the DHW is heated by the boiler.

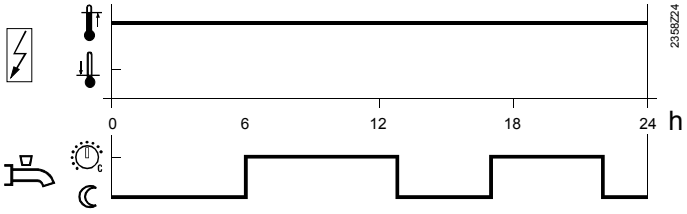
Summer
The electric immersion heater is used as soon as all connected heating circuits have switched to summer operation. The DHW is again heated by the boiler as soon as at least one of the heating circuits has switched back to heating mode. But the electric immersion heater is also used if the boiler 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. An electric immersion heater **must** be available for this setting. The boiler does not charge!

Electric immersion heater: release

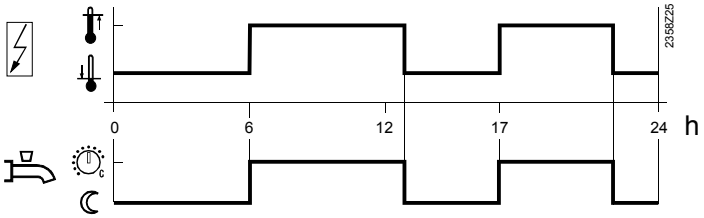
24h / day
The electric immersion heater is always released, independent of time programs.

Example:



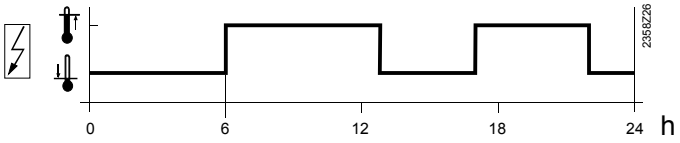
DHW release
The electric immersion heater is switched according to DHW release.

Example:



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

Example:



Electric immersion heater: Control

In the case of DHW heating with an electric immersion heater, the storage tank temperature can be monitored using either an external (to the controller) thermostat or the controller's inbuilt sensors.

Control with external thermostat
The controller continuously releases DHW heating using the electric immersion heater **regardless** of the storage tank temperature within the release period. The current DHW setpoint in the controller has no impact.

The required storage tank temperature must be adjusted on the external thermostat. The manual push cannot be activated. The legionella function is deactivated.

Control with DHW sensor
The controller releases DHW heating using the electric immersion heater **dependent** on the storage tank temperature within the release period. The current DHW setpoint in the controller is maintained.

If sensor input B3 is used for a thermostat, temperature control is affected based on the thermostat's contact position.

The manual push can be activated. When the legionella function is activated, charging to the legionella setpoint takes place.

To ensure that setpoint compensation operates as required, the external thermostat must be set to the minimum storage temperature.

Excess heat draw

Line no.	*Operating line*
5085	**Excess heat draw** Off ¦ On

Excess heat draw

Excess heat draw can be triggered by the following functions:

- Inputs H1, H2, H3 or EX2
- Buffer storage tank recooling
- Solid fuel boiler excess heat draw

If excess heat draw is activated, excess heat can be made available to the DHW storage tank.

Plant hydraulics

Line no.	*Operating line*
5090	**With buffer** No ¦ Yes
5092	**With prim contr/system pump** No ¦ Yes
5093	**With solar integration** No ¦ Yes

With buffer

If there is a buffer storage tank, enter whether the DHW storage tank can draw heat from it.

With primary controller / system pump

Select whether the DHW storage tank receives its heat via the primary controller or with the help of the system pump.

With solar integration

Set whether the DHW storage tank is charge from the solar collectors.

Mixing valve precontrol

Line no.	*Operating line*
5124	**Actuator running time**

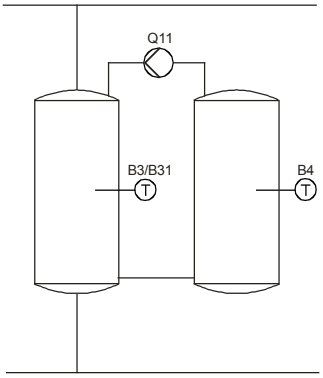
Actuator: running time

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

Transfer

Line no.	Operating line
5130	**Transfer strategy** Off ¦ Always ¦ DHW release
5131	**Comparison temp transfer** With B3 ¦ With B31 ¦ With B3 and B31

Transfer strategy



The DHW storage tank can be charged by the buffer if the temperature level of the buffer storage tank is high enough. Depending on the hydraulic circuit used, this heat transfer can be accomplished either with charging pump Q3 or transfer pump Q11, which is specifically parameterized for this function.

Transfer is also switched off when DHW is switched off.

The following transfer strategies are available:

Off

No transfer takes place with the "Off" setting.

Always

The DHW storage tank is always transferred to nominal setpoint when the DHW operating mode is switched on. Transfer takes place to the legionella value when the legionella function is switched on and the legionella time is active.

DHW release

The DHW storage tank is always transferred to the present setpoint per the DHW release times (OL1620) when the DHW operating mode is switched on. Transfer takes place to the legionella value when the legionella function is switched on and the legionella time is active.

The function "With buffer storage tank" (OL 5090) is activated (setting "Yes") for charging with Q3 from the buffer storage tank.
If Q3 is parameterized as a diverting valve (OL 5731) or its own transfer pump Q11 is available, Q3 is not used for the transfer.

A normal DHW charge to the DHW nominal setpoint is triggered is a manual DHW push occurs during an active transfer.
If the buffer storage tank fulfills this temperature demand as well (buffer storage temperature > DHW nominal setpoint + charging increase), the transfer remains active and the heat source is not started up.

Transfer with combination storage tank

The transfer occurs as well for the combination storage tank is its own transfer pump Q11 exists.

If only Q3 exists and the transfer is active, the controller waits until the DHW range is reheated by the surrounding storage are and restarts the heat source, still Q3, during this period.

The transfer function must be switched off if this waiting period is not wanted.

Comparison temp transfer

For the transfer, the desired DHW sensor can be selected to get a comparative temperature.

B3

The transfer is carried out if sensor B3 is at least 1K below the present transfer setpoint and the buffer storage tank sensor B4 is warmer at a minimum by the transfer increase as sensor B3.

No transfer takes place if B3 is not available.

The source cannot charge and transfer at the same time.

B31

The transfer is carried out if sensor B31 is at least 1K below the present transfer setpoint and the buffer storage tank sensor B4 is warmer at a minimum by the transfer increase as sensor B31.

Transfer takes place using B3, if B31 is not available.

Charging by the source and transfer are possible at the same time as long as the transfer takes place via a separate transfer pump Q11.

B3 and B31

Both sensors B3 and B31 are considered for the transfer.

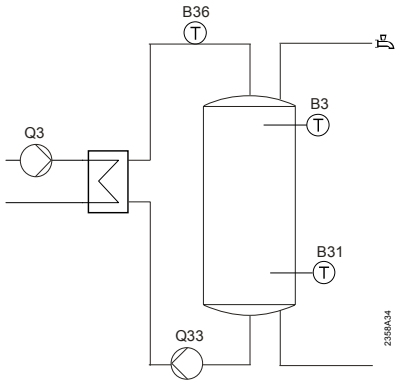
The transfer is carried out if sensor B3 is at least 1K below the present transfer setpoint and the buffer storage tank sensor B4 is warmer at a minimum by the transfer increase as sensor B3.
Transfer is completed as soon as sensor B31 achieves the present transfer setpoint.

Transfer takes place using B3, if B31 is not available.

The source cannot charge and transfer at the same time.

Intermediate circuit

Line no.	*Operating line*
5140	**Intermediate circuit boost**



Intermediate circuit boost

To charge via intermediate circuit / heat exchanger, the flow temperature in the intermediate circuit must be higher than the demanded DHW setpoint by the value entered here since not all the energy can be transferred via the heat exchanger. The value set here is added to the request.

Full charge

Line no.	Operating line
5146	**Full charging with B36** No ¦ Yes

The DHW charging sensor B36 can be used to full charge the DHW storage tank instead of sensor B31.
The charging process is complete when sensor B36 achieves the desired temperature (DHW setpoint **plus** OL 5140 **plus** 3 °C) while sensor B3 achieves the demanded setpoint at the same time.

The intermediate circuit sensor is only considered during start up of storage tank charging when the intermediate circuit pump is switched on for at least 30 seconds.

Mixing pump Q35

The functions stratification and restratification is enabled is the mixing pump is configured.

Line no.	Operating line
5160	**Legionella funct mixing pump** Off ¦ With charging ¦ With charging and duration
5165	**Restratification** No ¦ Yes
5166	**Restrat temp min**
5167	**Restrat temp diff min**

Legionella funct mixing pump

Off
The "Off" setting does not use the mixing pump when the legionella function is active.

During charging
The mixing pump Q35 is started up during active legionella function.

During charging and dwelling period
The mixing pump Q35 is started up during active legionella function and during the subsequent dwelling period (OL 1646).

Restratification

The restratification can be switched on and off:

No
There is no restratification using the mixing pump.
During active legionella function, restratification can still be started up.

Yes
The restratification function compares the two storage tank sensors B3 and B31.

Restratification temperature min

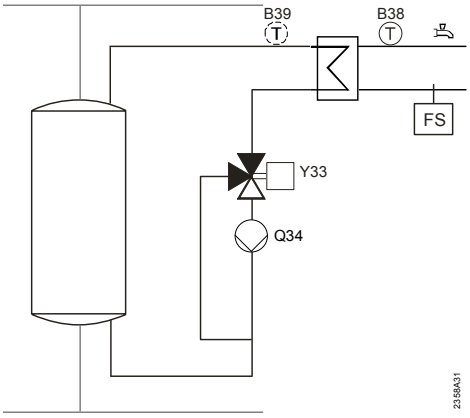
The lower storage tank sensor B31 must meet the entered level for the restratification function.

Restratification temperature differential min

The mixing pump Q35 is started up if the lower sensor B31 is warmer than the upper storage tank sensor B3 by the adjustable restratification temperature difference (OL 5167). The switching differential is 2 K.

7.19 Instantaneous DHW heater

Overview



The controller supports DHW heating via an external heat exchanger. The heating energy required is delivered by the buffer, DHW or combi storage tank.

Heat is added to the DHW circuit based on demand via a pump and mixing valve:

When the flow switch (FS) detects flow, sensor B38 ensures that the current DHW nominal setpoint is maintained. But since heat losses across the external heat exchanger always occur, parameter 5406 (Min setp diff to tank temp) is used to allow an adjustable differential for sensor B38. In other words: the mixing valve tries to reach or maintain the nominal setpoint minus the setting of parameter 5406 at sensor B38. As soon as the flow switch detects no more flow, pump Q34 stops.

Configuration

When using a mixing valve and a pump with fixed speed, parameter 6020 (Function extension module 1 – 3) must be configured to "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 setpoint differential that can be adjusted here.

Boost

Line no.	*Operating line*
5420	**Flow setpoint boost**

The DHW request to the storage tank/boiler is made up of the current DHW setpoint plus the adjustable flow setpoint boost.

Tap setpoint adjustment

Line no.	*Operating line*
5455	**Setp readj cons 40°C**
5456	**Setp readj cons 60°C**

A setpoint adjustment may be required if the sensor is placed in an unfavorable position.

The setpoint adjustment for the current tap setpoint is calculated as per the straight line by the two curve points "Tap setpoint adjustment 40°C or 60°C".

Keep hot

Line no.	*Operating line*
5460	**Setpoint keep hot**
5461	**Readj setp keep hot 40°C**
5462	**Readj setp keep hot 60°C**
5464	**Keep hot release** None 24h/day DHW release Time program 3/HC3 Time program 4/DHW Time program 5
5470	**Keep hot time wo heating**
5471	**Keep hot time with heating**
5472	**Pump overrun time keep hot**
5473	**Pump overrun time keep hot**
5475	**Control sensor keep hot** Boiler sensor B2 Return sensor B7 DHW outlet sensor B38
5476	**Keep hot periodically**
5477	**Min keep hot time**
5478	**Keep hot in heating mode** Off ¦ On
5489	**Overrun via inst WH** No ¦ Yes

The heat exchanger for the instantaneous heater can be kept warm to an adjustable value (5460) to provide the desired DHW setpoint with as little delay as possible for DHW demand.

Keep hot is triggered within the release times (5464) if the tapping is completed or if the circulation temperature sensor B39 drops below the keep hot setpoint (5460) by more than a switching differential.

Keep hot is unavailable for DHW operating modes Off and Eco.
The diverting valve remains in the DHW position for active keep hot. The pump is switched as needed.

Keep hot setpoint

The instantaneous heater is maintained at the set keep hot setpoint for the set period (5470/5471) if keep hot is enabled (5464).

Keep hot setpoint adj. 40°C or 60°C

A setpoint adjustment may be required if the sensor is placed in an unfavorable position.

The setpoint adjustment for the current keep hot heat setpoint is calculated as per the straight line by the two curve points "Keep hot setpoint adjustment 40°C or 60°C".

Keep hot release

Keep hot can be released never, always, as per DHW release or as per scheduler program (HC3, DHW or 5).

Keep hot without heating mode

Keep hot applies by tapping for the set period if the plant is **not** in heating mode.

Keep hot in heating mode

Keep hot applies by tapping for the set period if the plant is in heating mode.

Pump overruning time keep hot

The instantaneous heater pump Q34 overruns by the set period after completing the keep hot function.

Keep hot periodically

The controller can periodically trigger the keep hot function. The intervals can be set.

Minimum keep hot time

The heat exchanger for the instantaneous heater is kept hot at a minimum by the "minimum keep hot time" when the keep hot function is triggered.

Keep hot time with heating

The keep hot function can remain active or be switched off if the plant is in heating mode.

Overrun in instantaneous DHW heater

The instantaneous heater pump Q34 overruns by the set period after tapping is finished.

Mixing valve control

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

Setting the actuator running time for the mixing valve used for the instantaneous heater.

7.20 Configuration

Heating/cooling circuit 1

Line no.	*Operating line*
5710	**Heating circuit 1** Off ¦ On
5711	**Cooling circuit 1** Off ¦ 4-pipe system ¦ 2-pipe system
5712	**Use of mixing valve 1** None ¦ Heating ¦ Cooling ¦ Heating and Cooling

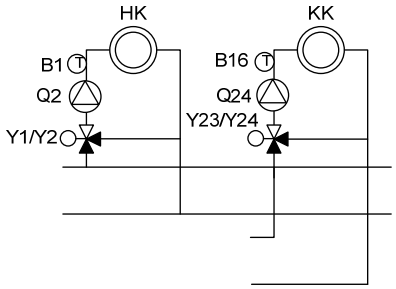
Heating circuit 1

Using this setting, heating circuit 1 can be switched on and off.

Cooling circuit 1

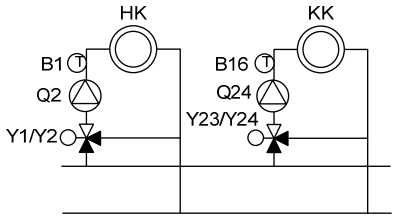
Off
Overtemperature protection deactivated

4-pipe system



Draw their cooling / heating energy from separate circuits.

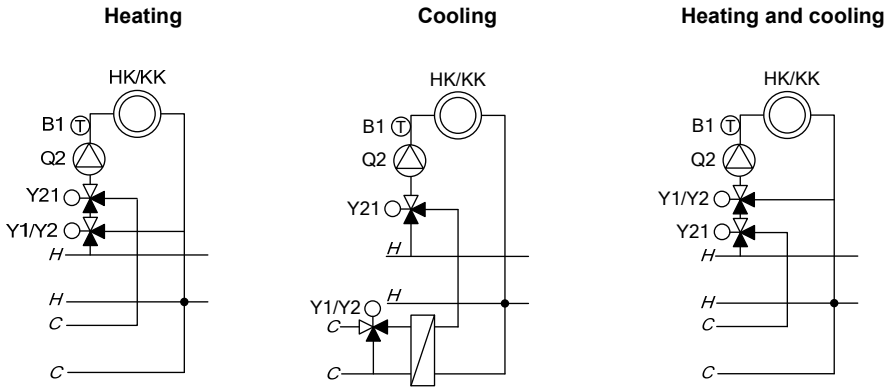
2-pipe system



Draw their cooling / heating energy from the same common flow.

Use of mixing valve 1

The parameter is only active in a 4-pipe system.



HC Heating circuit.
KK Cooling circuit
H Primary heating circuit
C Primary cooling circuit

The setting is required when one of the QX… relay outputs (configuration) is used as a diverting cooling valve Y21.

Heating circuit 2

Line no.	*Operating line*
5715	**Heating circuit 2** Off ¦ On

Heating circuit 2

Using this setting, heating circuit 2 can be switched on and off.

Heating circuit 3

Line no.	*Operating line*
5721	**Heating circuit 3** Off ¦ On

Heating circuit 3

Using this setting, heating circuit 3 can be switched on and off.

DHW sensor B3

Line no.	*Operating line*
5730	**DHW sensor B3** Sensor thermostat

Sensor

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 (with impact on the charging time)
In that case, the DHW is not protected against frost.

DHW control element

Setting	Operating line
5731	**DHW ctrl elem Q3** None ¦ Charging pump ¦ Diverting valve
5734	**Basic pos DHW div valve** Last demand ¦ Heating circuit ¦ DHW

DHW controlling element Q3

None
No DHW charging via Q3.

Charging pump
The DHW is charged with a pump connected to terminal Q3/Y3.

Diverting valve
The DHW is charged with a diverting valve connected to terminals Q3/Y3.

Basic pos DHW div valve

Defines the basic position for the diverting valve at standstill:

Last demand
Leaves the diverting valve at the last position.

Heating circuit.
The diverting valve is located at the "Heating circuit" position without a demand.

Domestic hot water
The diverting valve is located at the "DHW" position without a demand.

The function only works if the diverting valve was selected as DHW controlling element (OL 5731)

Separate DHW circuit

In the case of multi-boiler plants (cascades), one of the heat sources can temporarily be used for DHW charging only. When DHW charging is activated, the respective heat source hydraulically decouples itself from the system by means of the so-called separate circuit and is not available for space heating during that period of time.

On completion of DHW charging, the heat source is again available for space heating, which means that it informs the cascade about it.

Line no.	Operating line
5736	**DHW separate circuit**

OFF
The separate circuit is switched off.
Every available heat source can charge the DHW storage tank.

ON:
The separate circuit is switched on.
DHW charging takes place exclusively via heat generation defined for that purpose.

Consumer circuits 1 and 2

Consumer circuit 1 and 2 can be used as a heating or heating / cooling circuit (e.g. for a door curtain function or cold storage room).

The consumer circuit is activated if the demand signal (contact or 0 - 10V) is parameterized on input Hx **and** the use of the consumer circuit is set. Use of a pump is optional.

Line no.		Operating line
CC1	CC2	
5750	**5751**	**Consumer circuit 1 or 2** Off ¦ Heating ¦ 4-pipe system cooling ¦ 2-pipe system cooling

Off
Consumer circuit 1 / 2 is switched off.

Heating
The corresponding consumer circuit is used for heating only.

4-pipe system cooling
The corresponding consumer circuit draws refrigeration and cooling from separate lines.

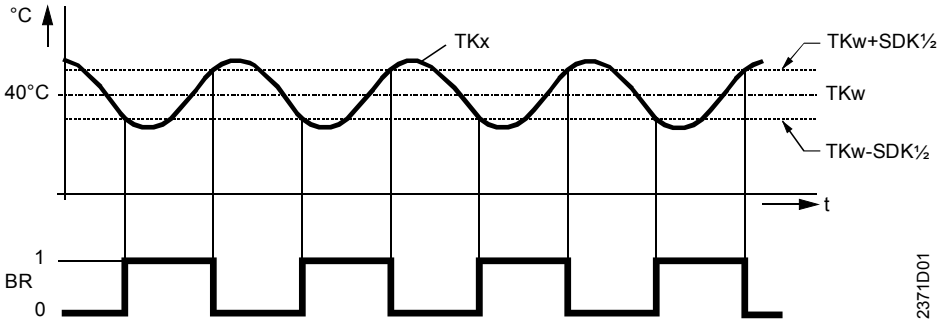
2-pipe system cooling
The corresponding consumer circuit draws refrigeration and cooling from the same lines.

Boiler

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

1-stage

In the case of a 1-stage boiler plant, the burner stage of the 1-stage boiler is released as soon as a boiler temperature setpoint is active.



Connections

	Use	*Space*	*Connector type*
L1	Phase burner	P	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase burner 1st stage		
T2	Burner 1st stage ON		
S3	Input burner fault		
EX1	Input burner 1st stage hours run.		

2-stage

If the required boiler temperature setpoint cannot be attained 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 ⏚ N T1 T2 S3 EX1	Phase burner Protective earth Neutral conductor Phase burner 1st stage Burner 1st stage ON Input burner fault Input burner 1st stage hours run	P	AGP8S.07A/109
FX1 (T6) QX1 (T8)	Phase burner 2nd stage Burner 2nd stage on	Z	AGP8S.04C/109

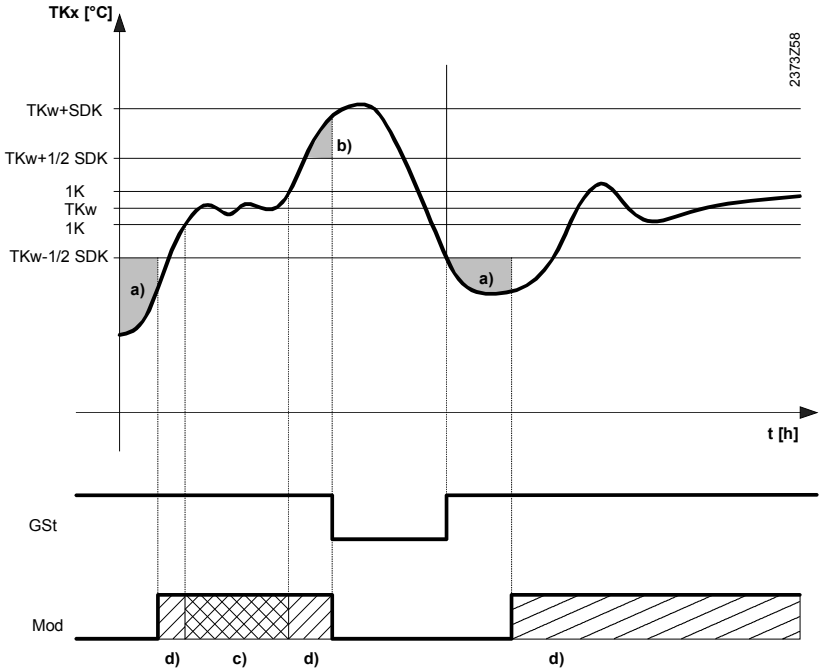
Modulating 3-position

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 Modulation stage
SDK Switching differential of the boiler
TKw Boiler temperature setpoint

Burner control

3-position control

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). The actuator running time is also set.

Neutral zone

For control operation, a neutral zone is used which is at +/- 1 K 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.

Pins 3-position

	Use	*Space*	*Connector type*
L1 ⏚ N T1 T2 S3 EX1	Phase burner Protective earth Neutral conductor Release modulating burner Release modulating burner Input burner fault Input burner hours run	P	AGP8S.07A/109
QX2	Air damper modulating burner = CLOSED	U	AGP8S.03C/109
FX1 (T6) QX1 (T8)	Air damper modulating burner = OPEN Air damper modulating burner = OPEN	Z	AGP8S.04C/109

Without boiler sensor

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

Connections

	Use	*Space*	*Connector type*
L1 ⏚ N T1 T2 S3 EX1	Phase burner Protective earth Neutral conductor Phase boiler release Release of the boiler Input burner fault Input burner 1st stage hours run	P	AGP8S.07A/109

Solar

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

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 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** **5895**	**Relay output QX1, QX2, QX3, QX4, QX5** None Circulating pump Q4 El imm heater DHW K6 Collector pump Q5 Cons circuit pump VK1 Q15 Boiler pump Q1 Bypass pump Q12 Alarm output K10 2nd pump speed HC1 Q21 2nd pump speed HC2 Q22 2nd pump speed HC3 Q23 Heat circuit pump HC3 Q20 Cons circuit pump VK2 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 Swimming pool 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 Refrigeration request K28 Air dehumidifier K29 Diverting valve cooling Y21 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 DHW ctrl elem Q3 Suppl source control K32 Excess heat discharge K11

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

Relay outputs QX…

None
The relay output cannot be assigned any function. The relay is inactive.

Circulating pump Q4
The connected pump serves as a DHW circulating pump.
The time schedule for the circulating pump can be set on operating line "Circulating pump release" (1660). "Circulating pump cycling" can be set on operating line 1661, "Circulation setpoint" on operating line 1663.

El imm heater DHW K6
Using the connected electric immersion heater, the DHW can be charged according to operating lines "El imm heater optg mode" (5660) and "El immersion heater release" (5061).

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

ℹ "El imm heater optg mode" must be appropriately set.

Collector pump Q5
For control of the collector pump.

Cons circuit pump VK1 Q15
Consumer circuit pump 1 can be used for an additional consumer.
Together with the corresponding external request for heating / cooling at input Hx, the application is suited for an air heating coil / air cooling coil, for instance.

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

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

Alarm output K10
If a fault occurs in the controller or the system, one of the alarm relays delivers a signal.
When the fault is corrected, that is, when the fault status is no longer present, the relay will be deenergized with no delay.

ℹ If the fault cannot immediately be corrected, it is still possible to reset the alarm relay. This occurs on operating line 6710.

2nd pump speed HC1 Q21 / HC2 Q22 / HCP Q23
This function facilitates 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

Heat circuit pump HC3 Q20
The relay is used for the control of heating circuit pump 3 at Q20.

Cons circuit pump VK2 Q18
Consumer circuit pump 2 can be used for an additional consumer.
Together with the corresponding external request for heating / cooling at input Hx, the application is suited for an air heating coil / air cooling coil, for instance.

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 heat request, the pump is 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 shutoff valve Y4.

This means that the heat consumers draw energy from the buffer storage tank and wrong circulation through the heat sources is prevented.

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 switches any connected component at the points in time set in time program 5 (601 – 616).

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

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 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 OL 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 solar collector, a circulating pump for the collector circuit is required.

Swimming pool pump Q19
The connect pump is used for the swimming pool circuit.

Flue gas relay K17
Relay K17 closes if the flue gas temperature exceeds value set in operating line "flue gas temperature limit" OL 7053.

Assisted firing fan K30
The setting has no function assigned.

Cascade pump Q25
Common 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.
Depending on the hydraulic circuit used, this heat transfer can be accomplished either with charging pump Q3 or transfer pump Q11, which is specifically parameterized for this function.
Parameterization for transfer strategy (5130), comparative temperature (5131) and transfer boost (5021) apply for both plant configurations.

The charging pump Q3 is only used for source boost if transfer pump Q11 is available.

The transfer with Q11 is independent of the function "With buffer storage" (OL 5090).

The transfer function is also active if a combination storage tank and one transfer pump Q11 available.

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
Release relay K27 is used together with control relay K32 for the flow control of the supplementary source (see OL 3690-3755).

The supplementary source is released to control via the release relay when a heat request is pending and the required hydraulic switching actions (e.g. diverting valves, etc.) are triggered.

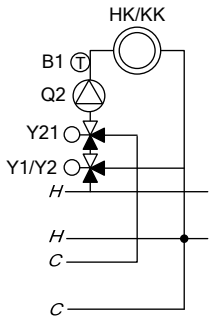
Refrigeration request K28
Output K28 is enabled as soon as there is a refrigeration request.

In the case of device with address 1, a refrigeration demand from the system also can activate output K28. For this purpose, operating line 6627 "Refrig demand K28" on menu "LPB system" must be set to "Centrally".

Air dehumidifier K29
When room humidity rises, an external air dehumidifier can be switched on. A humidity sensor must be connected to H.. input.

The functionality of the air dehumidifier is independent of the functionality of cooling mode.
Operation of the dehumidifier is not affected by operating modes, holiday programs, presence button, etc.

Diverting valve cooling Y21
Control of the diverting valve for cooling. This necessitates a 4-pipe system. The diverting valve for cooling is required in the case of a commonly used heating and cooling circuit for changeover from heating to cooling when the heat pump is used not only for heating but also and **simultaneously** for cooling.



Example:
4-pipe system

Heat circuit pump HC1 Q2
The connected pump serves as the circulating pump for heating circuit 1.

Heat circuit pump HC2 Q6
The connected pump serves as the circulating pump for heating circuit 2.

DHW ctrl elem Q3
Output Q3 controls a connected DHW charging pump or a diverting valve.

Suppl source control K32
Control K32 is used together with release relay K27 to control the supplementary source (see OL 3690-3755).
2-point control of the supplementary source to the setpoint on the selected control sensor occurs via the control relay.

Excess heat discharge K11
Contact K11 is closed for active overtemperature protection.
Residual energy can be led to a released, external consumer.

Input sensor BX

Line no.	*Operating line*
5930 **5931** **5932**	**Sensor input BX1, BX2, BX3** None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer storage tank sensor B4 Buffer storage tank sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer storage tank 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 Solid fuel return sensor B72

The sensor input settings assign the basic diagrams depending on the selection of the appropriate extra functions. See Section "Auxiliary functions" (see pg.188).

7.21 Input H1 and H3

Input H1 and H3

These operating lines are used to determine the function of input H1 or H3.

Line no.	*Operating line*
5950, 5961	**Function input H1, H3** Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 (or cooling circuit 1) Optg mode changeover HC2 Optg mode changeover HC3 Heat generation lock Error/alarm message Consumer request VK1 Consumer request VK2 Release swi pool source heat Excess heat discharge Release swi pool solar Operating level DHW Operating level HC1 Operating level HC2 Operating level HC3 Room thermostat HC1 Room thermostat HC2 Room thermostat HC3 Circulating pump thermostat Pulse count Dewpoint monitor Flow temp setp incr hygro Boiler return thermostat Status info suppl source Charg prio DHW sol fuel boil Flow measurement Hz Consumer request VK1 10V Consumer request VK2 10V Pressure measurement 10V Rel room humidity 10V Room temp 10V Flow measurement 10V Temp measurement 10V

Inputs H2 and extension modules 1-3 are set on OL 6046-6068.

Function input H1, H3

Operating mode changeover (Digital)

Heating circuits / cooling circuits

The present operating mode for the corresponding heating circuit(s) / cooling circuit is changed over by closing contact Hx to the setting (Protection mode, Reduced, Comfort, Comfort) selected under "Changeover actions".

The settings are made under the following operating lines:

OL 900 "Changeover actions" for heating circuit 1
OL 969 "Changeover actions" for cooling circuit 1
OL 1200 "Changeover actions" for heating circuit 2
OL 1500 "Changeover actions" for heating circuit 3
OL 1680 "Changeover actions" for DHW heating

When the contract is opened, the various consumers return to the operating mode as per the original setting and the time switch program.

The contact is used to remotely control the operating mode (e.g. using a telephone remote switch).
Local operation of the operating mode is locked for a closed contact.

The settings that impact heating circuit 1 always refer to heating circuit 1 / cooling circuit 1.

Domestic hot water
The present operating mode for DHW charging is changed over by closing contact Hx to the setting (Off, On) selected under "Changerover actions".
Changeover of DHW charging is only possible in setting 1 (HCs+DHW) and setting 2 (DHW).
Frost protection continues even when DHW charging is switched off.

Heat generation lock (digital)
The heat source is locked via terminals HX.
All temperature requests made by the heating circuits and by DHW are ignored.
Frost protection for the boiler is maintained.

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

Error / Alarm message (digital)
An external error message can be connected and displayed by closing input Hx.

Consumer request CC1 and CC2 (digital)
Closing input Hx sends a consumer request (heating or cooling) to the controller.
The flow setpoint for the corresponding consumer circuit is controlled to the value set for the consumer request (OL1859 or 1909).

A voltage-proportional demand for heat occurs via the setting "Cons request 10V for CC1 and CC2.

Release swim pool source (digital)
Closing input Hx (e.g. manual switch) causes the heat source to release the swimming pool heater.

Excess heat draw (digital)
Active dissipation of excessive heat enables consumers (heating circuit, DHW storage tank, Hx pump) to draw excessive heat by delivering a forced signal.

The parameter "Excessive heat draw" can be used to determine for every consumer whether or not it should take account of the "forced" signal, and hence whether or not that consumer should participate in 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.

Release swimming pool solar (digital)
You can externally (e.g. manual switch) release the solar swimming pool heater through the use of **one** Hx input.

Using **two** Hx inputs allows you to set the charge priority for the swimming pool heater versus the storage tank.
For a description of the function, refer to operating line 2065 "Charging priority solar".

Operational level HC1, HC2, HC3 (digital)
Closing the corresponding contact changeover the operating mode to "Reduced" if the selected heating circuit is in "Automatic" operating mode.

Cooling circuit 1 changes from "Automatic" to "Off" by closing the contact.

The setting can be used, for example, to control a heating circuit / cooling circuit using an external time switch.

Operational level HC1, HC2, HC3 (digital)
A connected room thermostat transmit the "demand" or "no demand" signal to the H input.

In comfort, a heat request is triggered upon demand from the room thermostat for the corresponding heating circuit to the setpoint selected under "Flow step room thermostat" (see OL 742 for HC1, 1042 for HC2 and 1342 for HC3).

Circ pump thermostat (digital)
A thermostat can be connected instead of sensor B39.

Pulse counter (pulse input)
The basic unit provides two pulse inputs to interconnect externally installed electricity meters, natural gas meters, heating meters or volume flow meters.

The count (electricity, natural gas, heat) used must be parameterized on the application, i.e. in the *Energy counter*.

The counter value can be viewed on OL 7842 (H1), 7856 (H3).

The parameter *Contact type Hx* is not relevant to pulse count.

Dewpoint monitor (digital)
To detect the formation of condensation in the cooling circuit, a dewpoint monitor can be connected to input Hx.

If the dewpoint monitor trips, the cooling circuit is immediately switched off.

The cooling is enabled again when the dewpoint monitor reverts to normal and an adjustable locking time (946) has elapsed.

Flow temp setp inc hygro (digital)
To prevent the formation of condensation due to high indoor air humidity, a hygrostat can be connected to input Hx.

If the hygrostat trips, the flow temperature setpoint is increased by the fixed value of "Flow temp setp incr hygro" (947). As soon as the hygrostat reverts to normal, the flow temperature setpoint returns to the "normal value".

Boiler return thermostat (digital)
A connect boiler return thermostat closes the contact and transmit in this manner to the controller that the demanded return temperature was breeched. This starts up the boiler bypass pump.

Operational signal supplementary source (digital)
Closing the contact signals the controller that the supplementary source successfully started. See as well setting "Delay lockout position" (OL 3755).

Charging priority DHW solid fuel (digital)
The DHW storage tank is charged (after the buffer storage tank is first charged) by closing the contract. The other consumers are only released after the DHW storage tank achieves its setpoint.

Flow measurement Hz (frequency input)
The controller includes a frequency [Hz] as a signal for the measured flow.
The respective flow is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

The present flow can be viewed on the following operating lines per this setting:

Operating line 8521 "Solar flow"

Setting unavailable with H2.

Cons demand CC1 10V and
Cons demand CC2 10V (analog input)
The controller receives a voltage signal (DC 0...10 V) for heat demand (flow temperature) for consumer circuit 1 or 2.

The desired flow temperature is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

A constant temperature request via the contact occurs using the setting "Cons request 10V CC1 and CC2".

Pressure measurement 10V (analog input)
The controller receives the pressure signal in the form of voltage signals (DC 0...10 V).
The respective pressure value is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

If the pressure value crosses one of the set limit values, an error or maintenance message is delivered. If the value falls below the critical pressure limit (burner), the boiler is shut down.

The values of the maximum, minimum and critical water pressure for H1 can be set under 6140 OEM...6142 OEM, for H2 under 6150 OEM…6152 OEM, and for H3 under 6180 OEM…6182 OEM

Rel room humidity 10V (analog input)
The controller receives the relative humidity signal in the form of voltage signals (DC 0...10 V).

The respective room humidity is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

The controller compares room humidity with the limit values set on operating lines 6137 and 6138 and switches external air dehumidifier K29 connected to an appropriately defined output QX1 – QX5 (5890 – 5895).

Room temperature 10V (analog input)
The controller receives the room temperature signal in the form of voltage signals (DC 0...10 V). The room temperature in connection with relative room humidity is used to calculate the dewpoint temperature in the cooling circuit.

If there is no room unit with a room sensor (BSB) connected for heating / cooling circuit 1, the room temperature measured at Hx is also used for room heating / cooling 1 (variant with compensation and room influence).

The respective room temperature is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

Flow measurement 10V (analog input)
The controller receives the measured flow as a voltage signal (DC 0...10 V).

The respective, present flow is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

Temperature measurement 10V (analog input)
The controller receives the measured temperature signal as a voltage signal (DC 0...10 V).

The respective temperature is calculated via the linear characteristic which is defined by 2 fixed points (input value 1 / input value 1 and input value 2 / function value 2).

Use of measured temperature is defined via the parameter "Temperature sensor H1, H3" (OL 5957, 5967).
Setting unavailable with H2.

Operating action H1, H3

5951, 5961	**Contact type H1, H3** Break contact (NC) Make contact (NO)

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

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

Input / function value, H1, H3

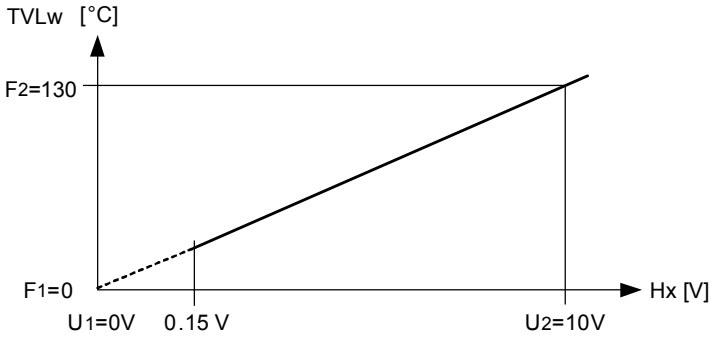
5953, 5963	**Input value 1 H1, H3**
5954, 5964	**Function value 1 H1, H3**
5955, 5965	**Input value 2 H1, H3**
5956, 5966	**Function value 2 H1, H3**

Input value 1
Function value 1
Input value 2
Function value 2

These settings are available for each input Hx.
The linear characteristic is defined via 2 fixed points. The setting is made with 2 parameter pairs for *input value* and *Voltage value* (F1/U1 and F2/U2).

The setting "Flow measurement Hz" converts the voltage value to a frequency value.

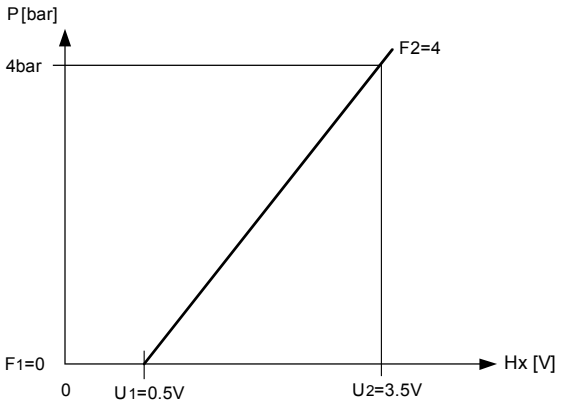
Example for consumer circuit request CC1 10V



TVLw Flow temperature setpoint
Hx Input value at Hx
U1 Input value 1
F1 Function value 1
U2 Input value 2
F2 Function value 2

If the input signal drops below the limit value of 0,15 V, the heat request is invalid and therefore inactive.

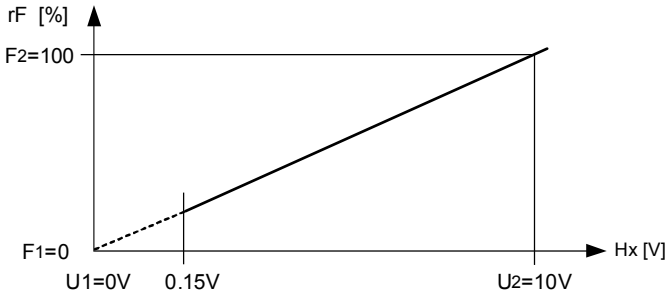
Example of pressure measurement 10 V



P Pressure value
Hx Input value at Hx
U1 Input value 1
F1 Function value 1
U2 Input value 2
F2 Function value 2

If the measured value lies below 0.15 V, it is regarded invalid.

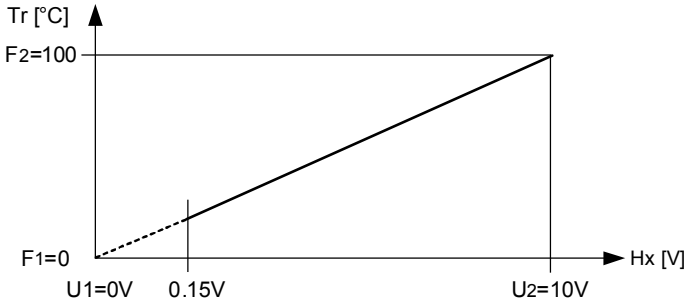
Example of relative room humidity 10 V



rF Relative humidity
Hx Input value at Hx
U1 Input value 1
F1 Function value 1
U2 Input value 2
F2 Function value 2

If the measured value lies below 0.15 V, it is regarded invalid.

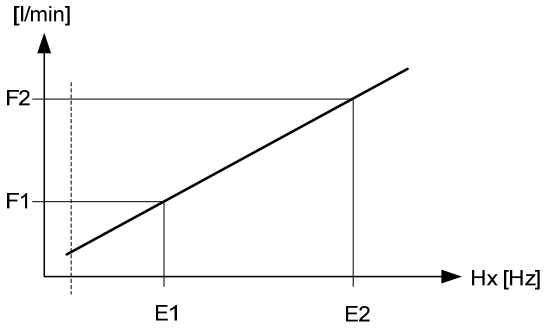
Example of room temperature 10 V



Tr Room temperature.
Hx Input value at Hx
U1 Input value 1
F1 Function value 1
U2 Input value 2
F2 Function value 2

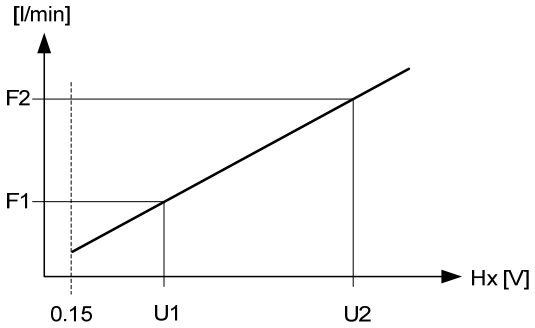
If the measured value is below 0.15 V, it is regarded invalid and an error message is delivered.

Example for flow measurement Hz



l/min Flow in liters per minute
Hx Input value at Hx
E1 Input value 1 [Hz]
F1 Function value 1
E2 Input value 2 [Hz]
F2 Function value 2

Example for flow measurement 10V



l/min Flow in liters per minute
Hx Input value at Hx
U1 Input value 1
F1 Function value 1
U2 Input value 2
F2 Function value 2

If the measured value is below 0.15 V (of 5 Hz), it is regarded as "no flow".

Temperature sensor H1, H3

5957 **5967**	**Temperature sensor H1, H3** Solar flow sensor B63 Solar return sensor B64

Determines the temperature is measured using the temperature sensors connected to input H1 or H3 (solar flow / or return). The controller applies the measured temperature to control the corresponding components.

The sensor on BX has priority is the same sensor is defined for the temperature measurement on both BX and Hx.

Input EX 1

This operating line defines the function of input Ex1 (230 V).

Line no.	*Operating line*
5980	**Function input EX1** None Counter 1st burner stage Heat generation lock Error / alarm message Excess heat discharge
5981	**Cont type input EX1** NC ¦ NO
5986	**SLT error message input L1** Off ¦ Always ¦ Automatically

Function input EX1

None
Activation of input Ex has no impact.

Counter 1st burner stage
Input EX1 acquires the signals for counter values (operating hours and starts) for the 1st burner stage.

If the function is not activated, the counting values are counted based on the state of relay.

Heat generation lock
The source is locked by closing contact EX1.
All temperature requests made by the heating circuits and by DHW are 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
A controller-internal error message is triggers when contact EX1 is closed.
If the "Alarm output" (relay outputs QX2-5, operating lines 5890 – 5895) is appropriately configured, the error message will be forwarded or displayed by an additional contact (e.g. external lamp or horn).

Excess heat discharge
Excess heat draw is triggered by closing the contact.
Active dissipation of excessive heat enables an external heat source to force consumers (heating circuit, DHW storage tank) to draw excessive heat by delivering a forced signal.

The parameter "Excessive heat draw" can be used to determine for every consumer whether or not it should take account of the "forced" signal, and hence whether or not that consumer should participate in 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.

Cont type input EX1

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

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

SLT error message input L1The safety limit thermostat can be considered to monitor the maximum boiler temperature.

Off
The safety limit thermostat is not considered.

Always
The safety limit thermostat is always considered. The heat source is shut down if triggered.

Automatically
The control checks whether a boiler sensor exists.
The SLT is considered if available.
SLT is not considered if no boiler sensor exists.

Mixing valve groups basic unit

Line no.	*Operating line*
6014	**Function mixing group 1** Multifunctional Heating circuit 1 Return temp controller Primary controller/system pump DHW primary controller Instantaneous DHW heater Return controller cascade Cooling circuit 1 Heating/cooling circuit 1 Return controller solid fuel boiler

The mixing valve groups are assigned to the following connections:

Connection terminal on module	**QX21**	**QX22**	**QX23**	**BX21**	**BX22**	**H2**
Multifunctional	*	*	*	*	*	*
Heating circuit 1	Y1	Y2	Q2	B1	*	*
Heating circuit 2	Y5	Y6	Q6	B12	*	*
Heating circuit 3	Y11	Y12	Q20	B14	*	*
Return temp controller	Y7	Y8	Q1	B7	*	*
Solar DHW	*	*	Q5	B6	B31	*
Primary controller/system pump	Y19	Y20	Q14	B15	*	*
DHW primary controller	Y31	Y32	Q3	B35	*	*
Instantaneous DHW heater	Y33	Y34	Q34	B38	B39	F_S
Return controller cascade	Y25	Y26	Q25	B70	B10	
Cooling circuit 1	Y23	Y24	Q24	B16	*	*
Heating/cooling circuit 1	Y1	Y2	Q2	B1	*	*
Solid fuel boiler	Y9	Y10	Q10	B72	B22	

* Freely selectable in QX…/ BX...
FS = flow switch

Multifunctional
Under the setting "Multifunctional", the terminals planned for the mixing group (QX2, 4, 5 and BX3) are released for other applications
Possible functions that can be assigned to these multifunctional inputs / output, are: Displayed on OL 5891, 5894, 5895 and 5932.

Heating circuit 1
For this application, the respective settings of operating page "Heating circuit 1" 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 respective settings of operating page "Cascade" can be adapted.

Cooling circuit 1
For this application, the respective settings of operating page "Cooling circuit 1" can be adapted.

Heating/cooling circuit 1
For this application, the respective settings of operating page "Heating circuit 1 and cooling circuit 1" can be adapted.

Return controller solid fuel boiler
For this application, the respective settings of operating page "Solid fuel boiler" can be adapted.

Extension module

6020, 6021, 6022	**Function extension module 1, 2, 3** No function. Multifunctional Heating circuit 1 Heating circuit 2 Heating circuit 3 Return temp controller Solar DHW Primary controller/system pump DHW primary controller Instantaneous DHW heater Return controller cascade Cooling circuit 1 Heating/cooling circuit 1 Solid fuel boiler

None
The extension module is not assigned a function.

Multifunctional
Possible functions that can be assigned to these multifunctional inputs / output, are: Displayed on OL 6030-6045.

Heating circuits 1-3
The corresponding settings on the operating pages "Heating circuit 1", "Heating circuit 2" and "Heating circuit 3" can be modified for this application.

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

Solar DHW
For this application, the respective settings of operating page "Solar" 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 respective settings of operating page "Cascade" can be adapted.

Cooling circuit 1
For this application, the respective settings of operating page "Cooling circuit 1" can be adapted.

Heating/cooling circuit 1
You can modify the corresponding settings on operating page "Heating circuit 1" and "Cooling circuit 1" for this application.

Solid fuel boiler
For this application, the respective settings of operating page "Solid fuel boiler" can be adapted.

Connections

Connection terminal on module	**QX21**	**QX22**	**QX23**	**BX21**	**BX22**	**H2**
Multifunctional	*	*	*	*	*	*
Heating circuit 1	Y1	Y2	Q2	B1	*	*
Heating circuit 2	Y5	Y6	Q6	B12	*	*
Heating circuit 3	Y11	Y12	Q20	B14	*	*
Return temp controller	Y7	Y8	Q1	B7	*	*
Solar DHW	*	*	Q5	B6	B31	*
Primary controller/system pump	Y19	Y20	Q14	B15	*	*
DHW primary controller	Y31	Y32	Q3	B35	*	*
Instantaneous DHW heater	Y33	Y34	Q34	B38	B39	F_S
Return controller cascade	Y25	Y26	Q25	B70	B10	
Cooling circuit 1	Y23	Y24	Q24	B16	*	*
Heating/cooling circuit 1	Y1	Y2	Q2	B1	*	*
Solid fuel boiler	Y9	Y10	Q10	B72	B22	

* Freely selectable in QX…/ BX...
FS = flow switch

QX extension module

This extension module defines use of the QX… relay outputs.

Line no.			*Operating line*
Module 1	*Module 2*	*Module 3*	
6030	**6033**	**6036**	**Relay output QX21 module 1, module 2, module 3**
6031	**6034**	**6037**	**Relay output QX22 module 1, module 2, module 3**
6032	**6035**	**6038**	**Relay output QX23 module 1, module 2, module 3**
			None
			Circulating pump Q4
			Electric immersion heater DHW K6
			Collector pump Q5
			Cons circ pump CC1 Q15
			boiler pump Q1
			bypass pump Q12
			alarm output K10
			2. 2nd pump speed HC1 Q21
			2. 2nd pump speed HC2 Q22
			2. 2nd pump speed HC3 Q23
			Heating circuit pump HC3 Q20
			Cons circ pump CC2 Q18
			System pump Q14
			Heat generator shutoff valve Y4
			Solid fuel boiler pump Q10
			Time program 5 K13
			Buffer return valve Y15
			Solar pump external exchanger K9
			Solar controlling element buffer K8
			Solar controlling element swimming pool K18
			Collector pump 2 Q16
			Cons circ pump SC1 Q19
			Flue gas relay K17
			Assisted firing fan K30
			Cascade pump Q25
			Storage tank transfer pump Q11
			DHW mixing pump Q35
			DHW intermediate circuit pump Q33
			Heat request K27
			Refrigeration request K28
			Air dehumidifier K29
			Diverting valve, cooling Y21
			Heating circuit pump HC1 Q2
			Heat circuit pump HC2 Q6
			DHW controlling element Q3
			Supplementary source control K32
			Overtemperature protection K11

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

BX extension module

This extension module defines use of the BX… sensor inputs.

Line no.			*Operating line*
Module 1	*Module 2*	*Module 3*	
6040	**6042**	**6044**	**Sensor input BX21 module 1, module 2, module 3**
6041	**6043**	**6045**	**Sensor input BX22 module 1, module 2, module 3**
			None
			DHW sensor B31
			Collector sensor B6
			Return sensor B7
			DHW circulation sensor B39
			Buffer storage tank sensor B4
			Buffer storage tank sensor B41
			Flue gas temp sensor B8
			Common flow sensor B10
			Solid fuel boiler sensor B22
			DHW charging sensor B36
			Buffer storage tank 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
			Solid fuel return sensor B72

See the function description for operating line "Sensor input BX1".

H2 on extension module 1, 2 and 3

Line no.			*Operating line*
Module 1	*Module 2*	*Module 3*	
6046	**6054**	**6062**	**Function input H2 module 1, module 2, module 3** Optg mode changeover HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Heat generation lock Error / alarm message Cons demand CC1 Cons demand CC2 Freigabe Schw'bad Erzeuger Excess heat discharge Release swimming pool solar Operational level DHW Operational level HC1 Operational level HC2 Operational HC3 Room thermostat HC1 Room thermostat HC2 Room thermostat HC3 Circ pump thermostat Dewpoint monitor Flow temp setp incr hygro Boiler return thermostat Operational signal supplementary source Charging priority DHW solid fuel Cons demand CC1 10V Cons demand CC2 10V Pressure measurement 10V Rel room humidity 10V Room temp 10V Flow measurement 10V
6047	**6055**	**6063**	**Contact type H2 module 1, module 2, module 3** Break contact (NC) Make contact (NO)
6049	**6057**	**6065**	**Voltage value 1 H2 module 1, module 2, module 3**
6050	**6058**	**6066**	**Funct value 1 H2 module 1, module 2, module 3**
6051	**6059**	**6067**	**Voltage value 2 H2 module 1, module 2, module 3**
6052	**6060**	**6068**	**Funct value 2 H2 module 1, module 2, module 3**

The settings for input H2 on the extension module are largely the same as those for the Hx inputs on the basic unit (without pulse measurement, flow measurement Hz and temperature measurement 10V). They are described under the operating line "Function of input H..".

Types of sensor / readjustment

Line no.	*Operating line*
6097	**Sensor type collector** NTC Pt1000
6098	**Readjustm collector sensor**
6099	**Readjustm coll sensor 2**
6100	**Readjustm outside sensor**
6101	**Sensor type flue gas temp** NTC Pt1000
6102	**Readjustm flue gas sensor**

Sensor type collector and flue gas temperatureSelection of type of sensor used. The controller uses the respective temperature characteristic.

A table of the temperatures and associated resistances is available at the end of the document under "Sensor characteristics".

Readjustment temperature sensor

The measured value of the outside temperature can be readjusted by +/- 3 K.

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 slowly to outside temperature variations

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

< 10 hours
The room temperature responds quickly to outside temperature variations

Frost protection for the plant

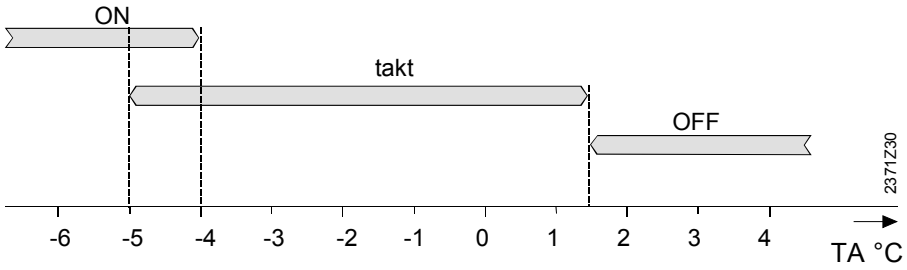
Line no.	*Operating line*
6120	**Frost protection plant** Off On.

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

Boiler pump	Q1
Solid fuel boiler pump	Q10
Bypass pump	Q12
Heating circuit pump 1, 2, 3	Q2 / Q6 / Q20
System pump	Q14
Consumer circuit pump 1	Q15
Consumer circuit pump 2	Q18
Swimming pool circuit pump	Q19
Cooling circuit pump	Q24
Cascade pump	Q25

The pumps can be switched off individually.

Outside temperature	Pump	Diagram
...-4 °C	Continuously on	ON
-5...1.5°C	On for 10 minutes at 6-hour intervals	Cycle
1.5°C...	Continuously OFF	OFF



Air dehumidifier

Line no.	*Operating line*
6135	**Air dehumidifier** Off On.
6136	**Release air dehumidifier** 24h / day Time programs, HCs Time program 5 / DHW
6137	**Air dehumidifier r.h. on**
6138	**Air dehumidifier r.h. SD**

Air dehumidifier

Activates and deactivates the air dehumidification function.

Release air dehumidifier

24h / day
The air dehumidifier is released 24 hours a day.

Time program HC
The air dehumidifier is released according to the time program of heating circuit 1.

Time program 5 / DHW
The air dehumidifier is released according to time program 5.

Air dehumidifier r.h. on

If the relative humidity acquired via one of the Hx inputs exceeds the setpoint adjusted here, the air dehumidifier is switched on. For that, the air dehumidification function must be activated and the dehumidifier must be released (refer to the 2 functions above).

Air dehumidifier r.h. SD

If the relative humidity falls by the switching differential set here below "Air dehumidifier r.h. on", the dehumidifier is switched off again.

Pressure supervision H1, H2, H3

Line no.			*Operating line*
H1	*H2*	*H3*	
6148	**6154**	**6184**	**Static press supervision 1, 2 oder 3** None ¦ With input H1 ¦ With input H2 module 1 ¦ With input H2 module 2 ¦ With input H2 module 3 ¦ With input H3

Static pressure supervision 1, 2 or 3Determines the Hx input used for the given static pressure supervision.

The Hx input must be defined accordingly and a pressure sensor connected.

Sensor state

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

At midnight, the basic unit saves the statuses at the sensor terminals, provided the controller has previously been in operation for at least 2 hours.
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 is necessary when, for instance, a sensor is removed because it is no longer needed.

Save parameters

Line no.	*Operating line*
6204	**Save parameters**

.

The current parameter settings can be saved as new default settings. Exempted from this are the following menus: Time of day and date, operator section, wireless, and all time programs, as well as the number of operating hours and the different counters.

Warning
With this process, the factory settings will be overwritten and cannot be retrieved!

Parameter reset

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

The parameters can be reset to their default values.

Exempted from this are the following menus: Time of day and date, operator section, wireless, and all time programs, as well as setpoint for manual operation, number of operating hours and the different counters.

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 depicts a 2-digit number. All leading zeros prior to the first non-zero are hidden.

	1st column 2 digit	2nd column 2 digit	3rd column 2 digit
OL6212	Blank	Solar	Oil / gas boiler
OL6213	Blank	Solid fuel boiler	00
OL6215	Blank	buffer storage tank	DHW storage tank
OL6217	Heating circuit 3	Heating circuit 2	Heating /cooling circuit 1

For meaning of the numbers for the relevant operating lines, refer to the following tables:

Check-No. heat source 1

	Solar							Oil / gas boiler						
	One collector field with sensor B6 and collector pump Q5	2 collector fields with sensors B6 and B61 and collector pumps Q5 and Q16	Storage tank charging pump buffer K8	Solar diverting valve buffer K8	Solar charging pump swimming pool K18	Solar diverting valve swimming pool K18	External solar heat exchanger pump K9 DHW = domestic hot water, P = buffer	KontrollNummer	1-stage burner	2-stage burner	Modulating burner	Boiler pump	Bypass pump	Return circuit mixing valve
0			**No solar plant**					**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				**TWW**	**07**	x			x	x	
11				x			**TWW**	**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		**TWW**							
25				x		x	**TWW**							
26			x		x		**P**							
27				x		x	**P**							
	31						*							
	33						**DHW/P**							
	35			x										
	37		x				**DHW+P**							
	38			x			**DHW/P**							
	39		x				**TWW**							
	40			x			**TWW**							
	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		**TWW**							
		51		x		x	**TWW**							
		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	0 No DHW storage tank
	1	buffer storage tank	1 electric immersion heater
	2	Buffer storage tank, solar connection	2 Solar connection
	4	Buffer storage tank, heat source shutoff valve	4 charging pump
	5	Buffer storage tank, solar connection, heat source shutoff valve	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 circuit

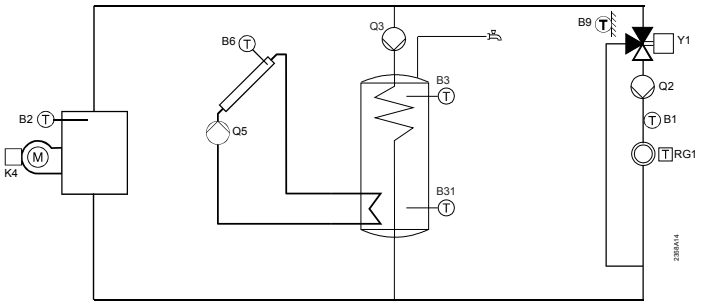
	Heating circuit 3		Heating circuit 2		Heating circuit 1
	0	No heating circuit	00	No heating circuit	0 No heating circuit
	2	Heating circuit pump	02	Heating circuit pump	1 Circulation via boiler pump
	3	Heating circuit pump, mixing valve	03	Heating circuit pump, mixing valve	2 Heating circuit pump
					3 Heating circuit pump, mixing valve
					5-7 Heating/cooling, 2-pipe, separate distribution
					8-10 Cooling only, 2-pipe
					12 Heating/cooling, 4-pipe, separate distribution
					14-16 Heating/cooling, 4-pipe, separate distribution
					20-27 Heating/cooling 2-pipe, separate distribution.
					30-38 Heating/cooling 4-pipe, separate distribution.
					40-42 Cooling only, 4-pipe.

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:

Operating line 6212	Check-No. heat source 1				**1**	**0**	**1**
Operating line 6215	check no. storage tank						**5**
Operating line 6217	check no. heating circuit						**3**

Device data

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

The software version installed represents the state of the software available at the time the unit was produced.
The first 2 digits denote the software version, the third digit gives the software upgrade (e.g. 01.0).

Overtemperature protection

Line no.	*Operating line*
6270	**Excess heat discharge temp**
6271	**SD excess heat discharge**
6272	**Excess heat discharge sens** None DHW sensor B31 Collector sensor B6 Return sensor B7 Buffer storage tank sensor B4 Buffer storage tank sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 Buffer storage tank sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solid fuel return sensor B72 Boiler sensor B2 DHW sensor B3
6273	**Excess heat dischar dur min**

Overtemperature protection

The overtemperature protection function is triggered if the temperature on the selected sensor reaches the "Overtemperature protection temperature". Contact K11 is switched.

Overtemperature protection switching differential

The overtemperature protection function ends if the temperature drops below the "Overheat temperature protection temperature" by the switching differential entered here.
The "Minimum overtemperature protection time" is also considered.

Overtemperature protection sensor

Define the sensor used to monitor overtemperature protection.

Overtemperature protection time minimum

The overtemperature protection must operate at a minimum for the set "Overtemperature protection time min" once started.

Voltage external sensor

Line no.	*Operating line*
6358	**Voltage output GX1 (5V/12V)**

Set the voltage used to power the external sensor (by basic unit). Generally 5 V for room units / sensors; 5 V for combination sensors (e.g. pressure/temperature.

7.22 LPB

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: **function**

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: Bus power supply via the 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** Local Centrally
6623	**Optg mode changeover**
6624	**Manual source lock**
6625	**DHW assignment** Local HCs All heating circuits in the segment: All HCs in system
6627	**Refrigeration request** Locally¦ Centrally
6630	**Cascade master** Always ¦ Automatically
6631	**Ext source in Eco mode** Off ¦ On DHW ¦ On
6632	**Note OT limit ext source** No I Yes

⚠ These settings are only relevant for device address 1.

Action changeover functions

The range of action of central changeover can be defined.
This applies to the following types of limitation:

- Operating mode changeover via H input (for setting "central" in setting lines 6623)
- Summer changeover (when selecting "Central" on operating line 6621)

The possible settings are the following:

- Segment: Changeover takes place with all controllers in the same segment
- System: With all controllers, changeover takes place in the entire system (in all segments). For that, the controller must be located in segment 0!

Summer changeover

The range of action of summer changeover is as follows:

- Local entry:
  Local action; the local heating circuit is switched on the basis of operating lines 730, 1030 and 1330
- Central entry: 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.

Changeover of operating mode

The range of action of operating mode changeover via input H is as follows:

- Local entry:
  Local action; the local heating circuit is switched on and off
- Central entry:
  Central action; depending on the setting made on operating line "Action changeover functions", either the heating circuits in the segment or those in the entire system are switched

Manual source lock

The range of the generation lock via H input is as follows:

- Local entry:
  Local action; the local source is locked.
- Entry segment:
  Central action; all sources of the cascade are locked.

DHW assignment

Assignment of DHW heating is required only if it is controlled by a heating circuit time 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.

"Refrigeration request"

"Refrigeration request K28" sets the relay parameter at the QX.. for the output of the refrigeration request.
Depending on the setting (locally / centrally) the request is delivered by the local cooling circuit or all cooling circuits in the system. This option only applies to the device with device address 1.

- Local entry:
  Only cooling circuit 1 is considered.
- Central entry:
  Consideration is given to all refrigeration requests from the system

Cascade master

The menu "Cascade" (OL 3510-3590) can always be displayed or only under certain circumstances.

Always
The menu "Cascade" is always displayed even when the controller is not the cascade master.

Automatically
The menu "Cascade" is only displayed when the controller is the cascade master.

Ext source with eco mode

Economy mode can be selected from menu "Special operation / service" (operating line 7120).

In Economy mode, external heat sources on the LPB are operated as follows:

- Off: Remains locked.
- DHW only: Released for DHW charging
- On: Always released.

TA limit ext. BoilerSupplementary sources connected via the LPB bus can be locked or released (e.g. air/water HP) pursuant to its own parameters. The status is distributed via LPB. Thus a master knows in a cascade whether a supplementary source (slave) available according to its own employment limits (outside temperature) and can switch on another source accordingly.

No
The Ecobit from the external generator is not observed.

⚠ Note: If an LMU control (slave) is connected as an additional generator, the parameter must be set to "No"!

Yes
The Ecobit from the external generator is observed and the cascade is controlled per the provided generators.

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.
  Nevertheless, the controller's time of day is 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 clock is modified.

outside temperature source

Only one outside 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 with no sensor.

The first numeral that appears on the display is the segment no. followed by the device no.

7.23 Fault

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

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

When a fault is pending, an alarm can be triggered via relay QX... The QX... relay must be appropriately configured.

This setting is used to reset the relay, but the alarm is maintained.

Temperature alarms

Line no.	*Operating line*
6740	**Flow temp 1 alarm**
6741	**Flow temp 2 alarm**
6742	**Flow temp 3 alarm**
6743	**Boiler temp alarm**
6745	**DHW charging alarm**
6746	**Flow temp cooling 1 alarm**

Temperature are continuously monitored. An alarm is triggered with display of the associated error message when the actual value is longer than the time set by the setpoint.

Error code 121: Flow temperature heating circuit 1 is too low (par.6740)
Error code 122: Flow temperature heating circuit 2 is too low (par. 6741)
Error code 371: Flow temperature heating circuit 3 is too low (par. 6742)
Error code 126: DHW charging supervision (par. 6745)
Error code 357: Flow temperature cooling circuit is achieved (Par 6746)

The flow temperature is regarded as having been complied with if the deviation from the setpoint is less than 1°K. If the flow temperature setpoint is reduced by more than 4K, the monitoring function will be deactivated until the flow temperature has dropped to the new setpoint.

The function is also passive if the heating circuit pump is off due to an ECO function or quick setback.

Error history

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

The basic unit stores the last 10 faults in non-volatile memory. Any additional entry deletes the oldest in the memory. For each error entry, error code and time of occurrence are saved.

The ACS 700 PC tool can be used to display the relevant actual values, setpoints and relay outputs for each error.

List of error codes is available in Section "List of displays".

7.24 Service / special operation

Maintenance functions

Line no.	*Operating line*
7040	**Burner hours interval**
7041	**Burn 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**
7056	**DHW scalding risk**
7119	**Economy function** Locked ¦ Released
7120	**Economy mode** Off ¦ On

Burner hours interval, burner start interval

As soon as the selected number of burner hours run or the selected number of burner starts has elapsed, a maintenance alarm will be displayed.

Counted for the alarm are the number of hours run and the number of starts of the first burner stage (input E1).

Burner hours run, burner starts since maintenance

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

Flue gas temperature limitTriggers maintenance message in the display and flue gas relay K17, if configured.

Delay flue gas messageDelays display of maintenance message and activation of flue gas relay (K17).

DHW scalding riskThe function triggers the maintenance message "scalding risk" (Code 23) as soon as the upper DHW temperature in the storage tank (sensor B3) exceed the set limit value.

The maintenance message is reset once the storage tank temperature drops below the limit value by 1°K.

"---" means that the function is deactivated.

The function is not available without no storage tank sensor B3.

Economy function

Locked
Economy mode is not possible.

Released
Economy mode can be activated.

Economy mode

Switches economy mode on or off

chimney sweep

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

The burner will be switched on. To achieve continuous burner operation, the only switch-off point used is the boiler temperature's maximum limitation (TKmax).

First, all connected loads will be locked to ensure the boiler temperature will 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 the heat generated by the boiler is drawn off so that the burner will remain in operation.

For safety reasons, the maximum boiler temperature limitation (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.

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 module. Release	K4	On
	Burner module open.	Y17 (K5)	On
	Burner module closed.	Y18	Off
	Boiler pump	Q1	On
	Bypass pump	Q12	On
	Return mixing valve open/close	Y7/Y8	Off
Solid fuel boiler	Boiler pump	Q10	On
Supplementary source	Supplementary source control	K32	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
Domestic hot water	charging pump	Q3	On
	Diverting valve	Q3	Off
	Mixing pump	Q32	Off
	Intermediate circuit pump	Q33	On
	Instantaneous heating control element	Q34	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 pump 1 Heating pump 2 Heating pump 3	Q2 Q6 Q20	On On On
	Heating circuit mixing valve 1 opening / closing Heating circuit mixing valve 2 opening / closing Heating circuit mixing valve 3 opening / closing	Y1 / Y2 Y5 / Y6	Off Off Off
	HC1 2nd stage HC2 2nd stage HC3 2nd stage	Q21 Q22 Q23	On. On On
Consumer circuits 1 - 3	Cons circuit pump CC1	Q15	On
	Cons circuit pump CC2	Q18	On
	Cons circuit pump SC	Q19	On
Cooling circuit 1	Cooling circuit pump	Q24	On
	Cooling circuit mixing valve opening / closing	Y23/Y24	Off
	Diverting valve 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 / DHW	K13	Off
	heat demand	K27	On
	"Refrigeration request"	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 is displayed.

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 are 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.

7.25 Input / output test

Line no.	*Operating line*
7700…7999	

The input / output test is used to check correct functioning of the connected components.

By selecting a setting from input test sensors, the relevant state or pending input sign is displayed.

When selecting a setting from the output test, the relevant relay is energized or the defined output signal issues, thus putting the connected component into operation. The correct functioning of the relays and correct wiring can thus be tested.

Important:
During the relay test, limitation of the boiler temperature by the electronic limit 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.

7.26 State

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

Messages

Line no.	*Operating line*
8000	**State heating circuit 1**
8001	**State heating circuit 2**
8002	**State heating circuit 3**
8003	**State DHW**
8004	**State cooling circuit 1**
8005	**State boiler**
8007	**State solar**
8008	**State solid fuel boiler**
8010	**State buffer**
8011	**State swimming pool**
8022	**State supplementary source**

State heating circuit

End user (info level)	Commissioning, heating engineer	
Limiter has tripped	Limiter has tripped	3
Manual control active	Manual control active	4
Floor curing function active	Floor curing function active	102
	Overtemp prot active	56
	Restricted, boiler protection	103
	Restricted, DHW priority	104
	Restricted, buffer	105
Heating mode restricted		106
	Forced draw buffer	107
	Forced draw DHW	108
	Forced draw source	109
	Forced draw	110
	Overrun active	17
Forced draw		110
	Opt start ctrl+boost heating	111
	Optimum start control	112
	Boost heating	113
Comfort heating mode	Comfort heating mode	114
	Optimum stop control	115
Reduced heating mode	Reduced heating mode	116
	Frost prot room active	101
	Frost protection flow active	117
	Frost prot plant active	23
Frost protection active		24
Summer operation	Summer operation	118
	24-hour Eco active	119
	Setback reduced	120
	Setback frost protection	121
	Room temp limitation	122
Off	Off	25

State DHW

End user (info level)	Commissioning, heating engineer	
Limitter has tripped	Limitter has tripped	3
Manual control active	Manual control active	4
Consumption	Consumption	199
	Recooling via collector	77
	Recooling via heat gen/HCs	78
Recooling active		53
	Discharging prot active	79
	Charg time limitation active	80
	Charging locked	81
Charging lock active		82
	Forced, max st tank temp	83
	Forced, max charging temp	84
	Forced, legionella setp	85
	Forced, nominal setp	86
Forced charging active		67
	El charging, legionella setp	87
	El charging, nominal setp	88
	El charging, reduced setp	89
	El charging, frost prot setp	90
	El imm heater released	91
Charg el imm heater		66
	Push, legionella setp	92
	Push, nominal setp	93
Push active		94
	Charging, legionella setp	95
	Charging, nominal setp	96
	Charging, reduced setp	97
Charging active		69
Frost protection active	Frost protection active	24
Overrun active	Overrun active	17
Standby charging	Standby charging	201
	Charged, max st tank temp	70
	Charged, max charging temp	71
	Charged, legionella temp	98
	Charged, nominal temp	99
	Charged, reduced temp	100

Charged		75
Off	Off	25
Ready	Ready	200

Cooling

End user (info level)	Commissioning, heating engineer	
Dewpoint monitor active	Dewpoint monitor active	133
Manual control active	Manual control active	4
Fault	Fault	2
	Frost protection flow active	117
Frost protection active		24
	Locked, heating mode	135
	Locked, source	205
	Locked, buffer	206
Cooling mode locked		146
	Flow temp setp incr hygro	136
	Limit flow min dewpoint	177
	Limit flow min OT	178
Cooling mode restricted		144
	Cooling mode Comfort	150
	Overrun active	17
Cooling mode Comfort		150
Protection mode cooling	Protection mode cooling	149
	Frost prot plant active	23
Frost protection active		24
Cooling limit OT active	Cooling limit OT active	134
	Off	25
	Room temp limitation	122
	Flow limit reached	179
Off		25
Cooling mode off	Cooling mode off	138

State of boiler

End user (info level)	Commissioning, heating engineer	
SLT has tripped	SLT has tripped	1
SLT test active	SLT test active	123
Fault	Fault	2
Limitter has tripped	Limitter has tripped	3
Manual control active	Manual control active	4
	Chim sweep fct, high-fire	5
	Chim sweep fct, low-fire	6
Chimney sweep funct active		7
	Locked, manual	8
	Locked, solid fuel boiler	172
	Locked, automatic	9
	Locked, outside temp	176
	Locked, Economy mode	198
Locked		10
	Min limitation	20
	Min limitation, low-fire	21
Min limitation active	Min limitation active	22
	Protective start	11
	Protective start, low-fire	12
	Return limitation	13
	Return limitation, low-fire	14
In operation		18
Charging buffer	Charging buffer	59
In op for HC, DHW	In op for HC, DHW	170
In part load op for HC, DHW	In part load op for HC, DHW	171
Released for HC, DHW	Released for HC, DHW	173
In operation for DHW	In operation for DHW	168
In part load op for DHW	In part load op for DHW	169
Released for DHW	Released for DHW	174
In operation for HC	In operation for HC	166
In part load op for HC	In part load op for HC	167
Released for HC	Released for HC	175
Overrun active	Overrun active	17
Released	Released	19
	Frost prot plant active	23
Frost protection active		24
Off	Off	25

State solar

End user (info level)	Commissioning, heating engineer	
Manual control active	Manual control active	4
Fault	Fault	2
Frost prot collector active	Frost prot collector active	52
Recooling active	Recooling active	53
Max st tank temp reached	Max st tank temp reached	54
Evaporation prot active	Evaporation prot active	55
Overtemp prot active	Overtemp prot active	56
Max charging temp reached	Max charging temp reached	57
Charg DHW+buffer+swi pool	Charg DHW+buffer+swi pool	151
Charging DHW+buffer	Charging DHW+buffer	152
Charging DHW+swi pool	Charging DHW+swi pool	153
Charging buffer+swi pool	Charging buffer+swi pool	154
Charging DHW	Charging DHW	58
Charging buffer	Charging buffer	59
Charging swimming pool	Charging swimming pool	60
	Min charg temp not reached	61
	Temp diff insufficient	62
Radiation insufficient	Radiation insufficient	63

State solid fuel boiler

End user (info level)	Commissioning, heating engineer	
Manual control active	Manual control active	**4**
Fault	Fault	**2**
Overtemp prot active	Overtemp prot active	**56**
	Locked, manual	**8**
	Locked, automatic	**9**
Locked		**10**
	Min limitation	**20**
	Min limitation, low-fire	**21**
Min limitation active	Min limitation active	**22**
	Protective start	**11**
	Protective start, low-fire	**12**
	Return limitation	**13**
	Return limitation, low-fire	**14**
In operation for HC	In operation for HC	**166**
In part load op for HC	In part load op for HC	**167**
In operation for DHW	In operation for DHW	**168**
In part load op for DHW	In part load op for DHW	**169**
In op for HC, DHW	In op for HC, DHW	**170**
In part load op for HC, DHW	In part load op for HC, DHW	**171**
Overrun active	Overrun active	**17**
In operation	In operation	**18**
Assisted firing active	Assisted firing active	**163**
Released	Released	**19**
	Frost prot plant active	**23**
	Boiler frost prot active	**141**
Frost protection active		**24**
Off	Off	**25**

State buffer

End user (info level)	Commissioning, heating engineer	
Frost prot cooling active	Frost prot cooling active	202
	Locking time after heating	135
	Charging locked	81
Charging restricted		124
	Forced charging active	67
	Full charging active	203
Charging active		69
	Charged, forced temp	72
	Charged, required temp	73
	Charged, min charging temp	143
Charged		75
Hot	Hot	147
No request	No request	51
Frost protection active	Frost protection active	24
	El charg, emergency mode	64
	El charg, source protection	65
	Electric charging defrost	131
	Electric charging, forced	164
	Electric charging, substitute	165

Charg el imm heater		66
	Charging locked	81
	Restricted, DHW priority	104
Charging restricted		124
	Forced charging active	67
	Full charging active	203
Charging active		69
Source released	Source released	244
	Recooling via collector	77
	Recooling via DHW/HCs	142
Recooling active		53
	Charged, max st tank temp	70
	Charged, max charging temp	71
	Charged, forced temp	72
	Charged, required temp	73
	Part charged, required temp	74
	Charged, min charging temp	143
Charged		75
Cold	Cold	76
No request	No request	51

State swimming pool

End user (info level)	Commissioning, heating engineer	
Manual control active	Manual control active	4
Fault	Fault	2
Heating mode restricted	Heating mode restricted	106
Forced draw	Forced draw	110
	Heating mode source	155
Heating mode		137
Heated, max swi pool temp	Heated, max swi pool temp	156
	Heated, setpoint solar	158
	Heated, setpoint source	157
Heated		159
	Heating mode solar off	160
	Heating mode source off	161
Heating mode off		162
Cold	Cold	76

State supplementary source

End user (info level)	Commissioning, heating engineer	
Fault	Fault	2
	Locked, solid fuel boiler	172
	Locked, outside temp	176
	Locked, Economy mode	198
Locked	Locked	10
Charging buffer	Charging buffer	59
In op for HC, DHW	In op for HC, DHW	170
Released for HC, DHW	Released for HC, DHW	173
In operation for DHW	In operation for DHW	168
Released for DHW	Released for DHW	174
In operation for HC	In operation for HC	166
Released for HC	Released for HC	175
Overrun active	Overrun active	17
Off	Off	25

7.27 Diagnostics cascade

For making diagnostics, priority and state of the sources, various temperature values, and the current order of sources and stages can be displayed.

Priority/state

Line no.	*Operating line*
8100, 8102, ... 8130	**Priority/state source 1 … Priority/state source 16**
8101, 8103, … 8131	**state source 1 … state source 16**
8138	**Cascade flow temp**
8139	**Cascade flow temp setp**
8140	**Cascade return temp**
8141	**Cascade return temp setp**
8150	**Source seq ch'over current**

7.28 Diagnostics, heat generation

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

Line no.	*Operating line*
8300…8570	

7.29 Diagnostics, consumers

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

Line no.	*Operating line*
8700…9058	

7.30 Pump kick

To ensure that pumps and valves do not get damaged during off times, they are operated for short periods of time at regular intervals.

The kick function is triggered every Friday at 10:00 (not adjustable).

The relay outputs for pumps and mixing valves are activated one by one for 30 seconds at an interval of 1 minute.

With the multifunctional relay outputs QX, it depends on the setting made whether or not the kick function acts on the relay.

Designation		*relay*	*Kick*
Boiler	Boiler pump	Q2	Yes
	Bypass pump	Q12	Yes
	Maintained boiler return temperature	Y7	Yes
	Maintain return temp valve OPENING	Y25	Yes, when there is no heat request from the heating circuit
	Maintain return temp valve CLOSING	Y26	No
Solid fuel boiler	Solid fuel boiler pump	Q10	Yes
Cascade	Cascade pump	Q25	Yes
	Return mixer open	Y25	Yes, when there is no heat request from the heating circuit
	Return mixer closed	Y26	No
Solar	Collector pump	Q5	Yes
	Collector pump 2	Q16	Yes
	Ext. heat exchanger pump	K9	Yes
	Controlling element buffer storage tank	K8	Yes
	Controlling element swimming pool	K18	Yes
Domestic hot water	Charging pump / diverting valve	Q3	Yes
	Primary controller mixing valve fully open	Y31	Yes, when there is no heat request from the heating circuit
	Primary controller mixing valve fully closed	Y32	No
	Mixing pump	Q35	Yes
	Intermediate circuit pump	Q33	Yes
	Storage tank transfer pump	Q11	Yes
	DHW pump	Q34	Yes
	DHW pump open	Y33	Yes, when there is no heat request from the heating circuit
	DHW pump closed	Y34	No
	circulating pump	Q4	Yes

Buffer storage tank	Source shutoff valve	Y4	Yes
	Return valve	Y15	Yes
Heating circuit 1...3	Heating circuit pump	Q2,Q6, Q20	Yes
	Heating circuit mixing valve fully open	Y1,Y5,Y11	Yes, when there is no heat request from the heating circuit
	Heating circuit mixing valve fully closed	Y2,Y6,Y12	No
	Heating circuit pump 2nd speed	Q21 / Q22 / Q23	No
Cooling circuit 1	Cooling circuit pump	Q24	Yes
	Cooling circuit mixing valve open	Y23	Yes, when there is no cooling request from the refrigeration circuit
	Cooling circuit mixing valve closed	Y24	No
	Diverting valve cooling	Y21	Yes
CC group	CC1 pump	Q15	Yes
	CC2 pump	Q18	Yes
	Swimming pool pump	Q19	Yes

7.31 List of displays

The errors are assigned priorities. From priority 5 (that is, priorities 5 - 9), alarm messages are delivered, which are used for remote monitoring (OCI). In addition, the alarm relay is set.

7.31.1 Error codes

Error code	Description of error	Priority
0	0:No error	
10	10:Outside sensor	6
20	20:Boiler sensor 1	9
25	25:Boiler sensor solid fuel	9
26	26:Common flow sensor	6
28	28:Flue gas temp sensor:	6
30	30:Flow sensor 1	6
31	31:Flow sensor cooling 1	6
32	32:Flow sensor 2	6
38	38:Flow sensor prim contr	6
40	40:Return sensor 1	6
43	43:Return sensor solid fuel	6
46	46:Return sensor cascade	6
47	47:Common return sensor	6
50	50:DHW sensor 1	9
52	52:DHW sensor 2	9
54	54:DHW flow sensor	6
57	57:DHW circulation sensor	6
60	60:Room sensor 1	6
65	65:Room sensor 2	6
68	68:Room sensor 3	6
70	70:Storage tank sensor 1	6
71	71:Storage tank sensor 2	6
72	72:Storage tank sensor 3	6
73	73:Collector sensor 1	6

74	74:Collector sensor 2	6
76	76:Special sensor 1	3
81	81:LPB short-circuit/comm	6
82	82:LPB address collision	3
83	83:BSB short-circuit	6
84	84:BSB address collision	3
85	85:BSB Radio communication	6
98	98:Extension module 1	6
99	99:Extension module 2	6
100	100:2 clock time masters	3
102	102:Clock without backup	3
103	103:Communication failure	3
105	105:Maintenance message	5
109	109:Boiler temp supervision	9
110	110:Lockout SLT	9
117	117:Water pressure too high	6
118	118:Water pressure too low	6
121	121:Flow temp HC1 zu tief	6
122	122:Flow temp HC2 zu tief	6
123	123:Flow temp DHW too low	6
126	126:DHW charg temp	6
127	127:Legionella temp	6
131	131:Burner lockout	9
140	140:LPB address not valid	3
141	141:LPB config not consist	6
142	142:No device on LPB	3
146	146:Configuration error	3
171	171:Alarm contact 1 active	6
172	172:Alarm contact 2 active	6
174	174:Alarm contact 4 active	6
176	176:Water press 2 too high	6
177	177:Water press 2 too low	6
178	178:Limit thermostat HC1	3
179	179:Limit thermostat HC2	3
207	207:Fault cooling circuit	6
217	217:Sensor fault	6
218	218:Pressure supervision	6
241	241:Flow sensor yield	6
242	242:Return sensor yield	6
243	243:Swimming pool sensor	6
320	320:DHW charging sensor	6
321	321:DHW outlet sensor	6
322	322:Water press 3 too high	6
323	323:Water press 3 too low	6
324	324:BX same sensors	3
325	325:BX/e'module same sens	3
326	326:BX/m'grp same sens	3
327	327:E'module same funct	3
328	328:Mix group same funct	3
329	329:E'mod/m'grp same funct	3
330	330:BX1 no function	3
331	331:BX2 no function	3
332	332:BX3 no function	3
333	333:BX4 no function	3
334	334:BX5 no function	3
335	335:BX21 no function	3
336	336:BX22 no function	3
337	337:B1 no function	3
338	338:B12 no function	3
339	339:Coll pump Q5 missing	3
340	340:Coll pump Q16 missing	3
341	341:Coll sensor B6 missing	3
342	342:Solar DHW B31missing	3
343	343:Solar integration missing	3
344	344:Solar buffer K8 missing	3
345	345:Sol swi pool K18 missing	3
346	346:Boiler pump Q10 missing	3
347	347:Solid fuel boil comp sens	3
348	348:Solid fuel boil addr err	3

349	349:Buff valve Y15 missing	3
350	350:Buffer address error	3
351	351:Prim/sys pump addr err	3
352	352:Pr'less header addr err	3
353	353:Casc sens B10 missing	3
354	354:Special sensor 2	3
357	357:Flow temp cooling 1	6
365	365:Inst heater Q34 miss	3
366	366:Room temp sensor Hx	6
367	367:Room humidity sens Hx	6
371	371:Flow temp HC3	3
373	373:Extension module 3	3
388	388:DHW sensor no function	3

7.31.2 Maintenance code

Maintenance code	Description of maintenance	Priority
1	1:Burner hours run	6
2	2:Number of burner starts	6
3	3:Maintenance interval	6
5	5:Water pressure too low (dropped below lower pressure limit 1)	9
18	18:Water pressure 2 too low (dropped below lower pressure limit 2)	9
10	10:Battery outside sensor	6
21	21:Flue gas temp too high	6
22	22:Water pressure 3 too low (dropped below lower pressure limit 3)	9
23	23:DHW scalding risk	9

7.31.3 Special operation code

Special operation code	Description
301	301:Manual control
302	302:SLT test
303	303:Chimney sweep function
309	309:Simulation outside temp
310	310:Altern' energy mode
314	314:Economy operation

8 Plant diagrams

The diagrams depicted here represent a selection of possible solutions. Other solutions are possible.

The basic diagrams can serve as the basis and be modified depending on the application.

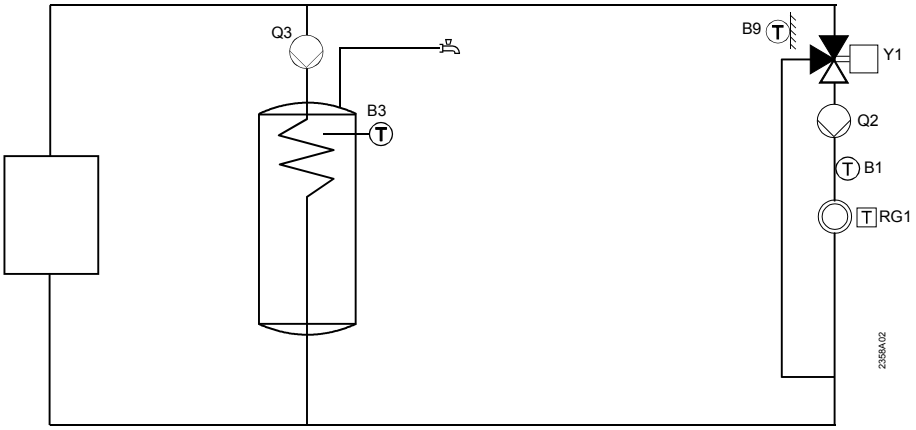
Some applications can be combined via the "Configuration" menu independently of these diagrams.

8.1 Basic diagrams

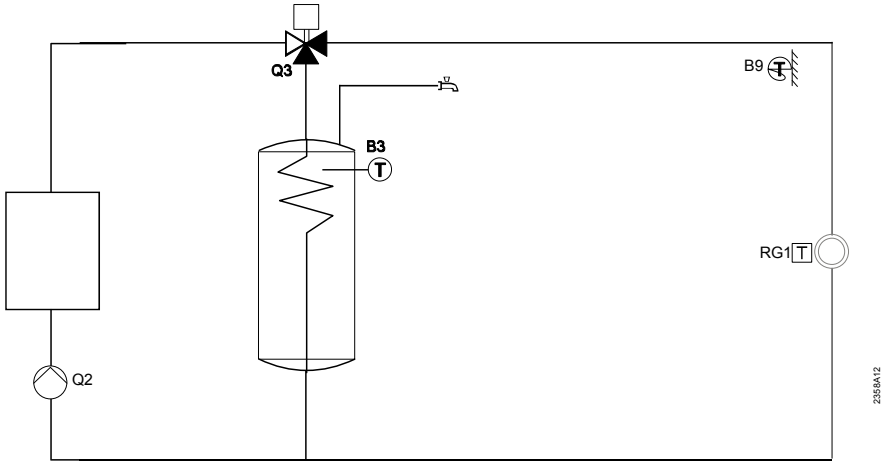
The basic diagrams are examples of plant that can be implemented with standard outputs requiring only a few settings.

8.1.1 Basic diagram RVS43.345

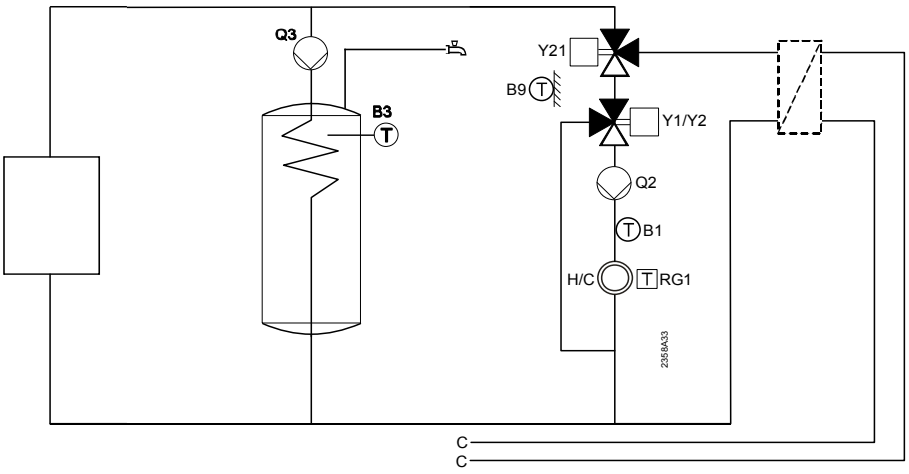
Standard diagram



DHW heating with diverting valve



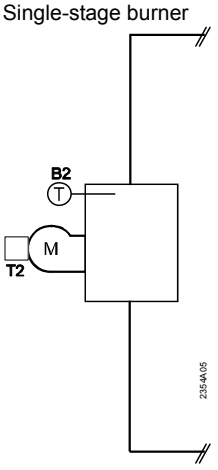
Heating/cooling via a diverting valve



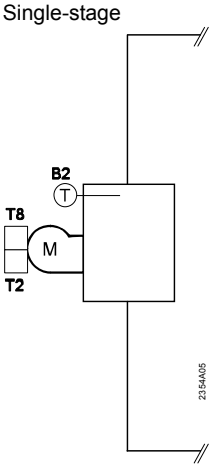
8.2 Source variants

Source variants can be set on the operating page "Configuration", operating line "Source type" (OL5770).

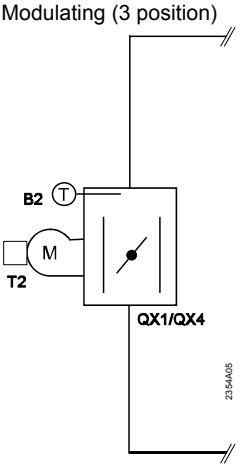
Single-stage burner



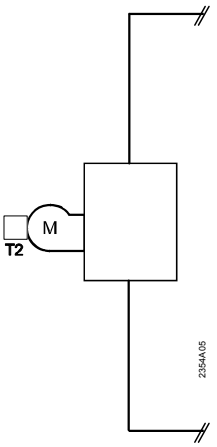
Single-stage



Modulating (3 position)



Burner without boiler sensor



8.3 Extra functions in general

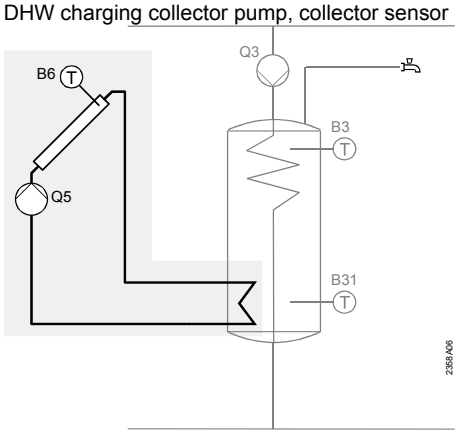
The extra functions can be selected via operating page "Configuration" and complement the basic diagrams of the respective controllers.

The type and number of extra functions that can be applied depend on the multifunctional outputs and inputs QX… or BX…

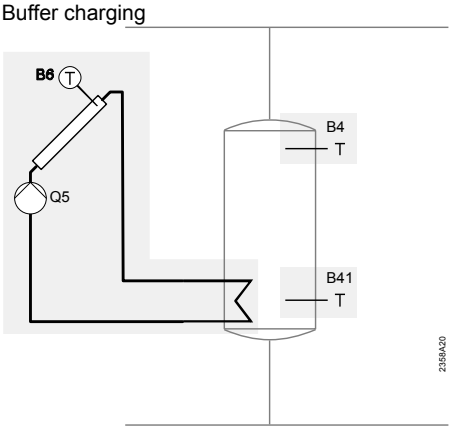
Depending on the type of application, the use of extra functions necessitates a number of appropriate operating line settings.

Solar

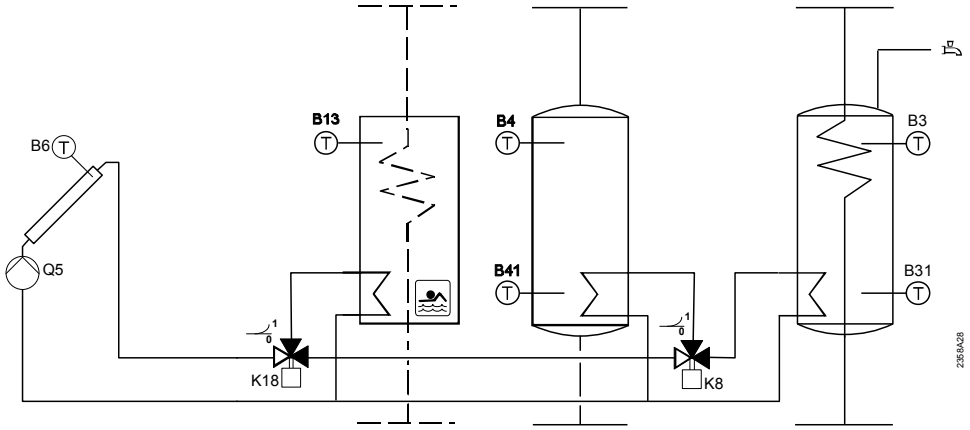
DHW charging collector pump, collector sensor



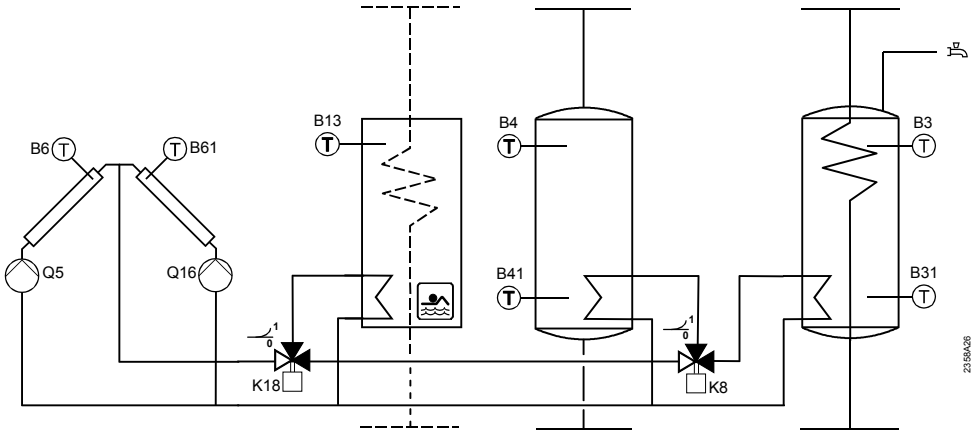
Buffer charging



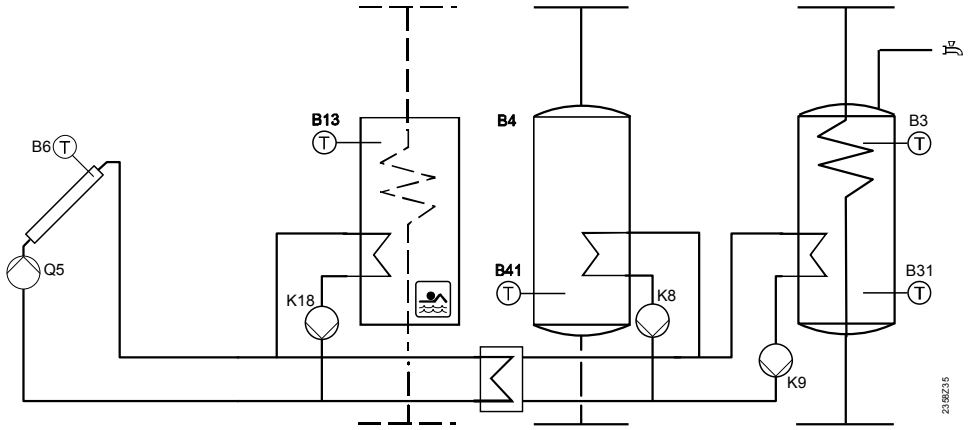
Solar storage tank and swimming pool charging via diverting valve with 1 collector field



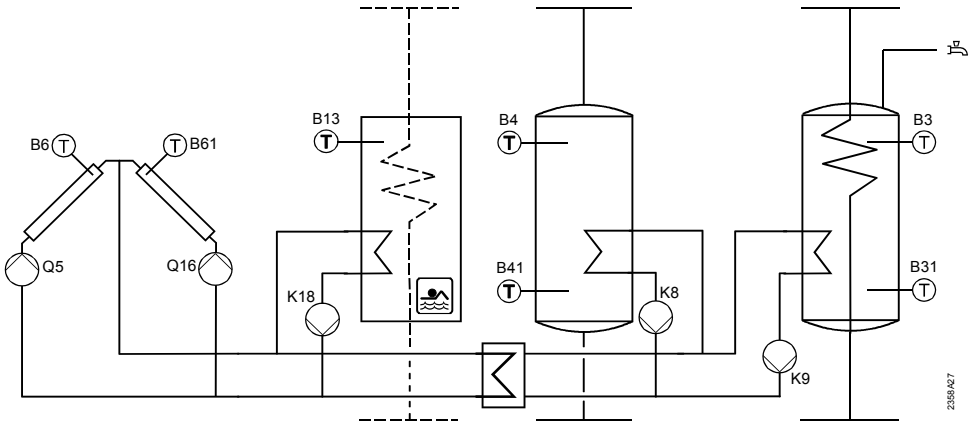
Solar storage tank and swimming pool charging via diverting valve with 2 collector fields



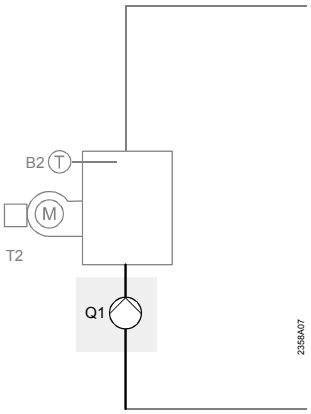
Solar storage tank and swimming pool charging via charging pumps with 1 collector field.



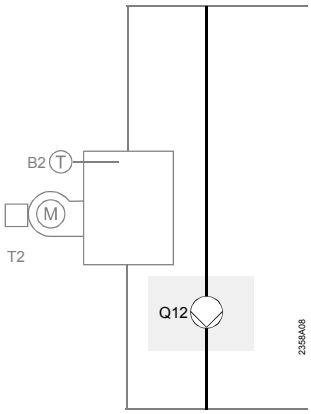
Solar storage tank and swimming pool charging via charging pumps with 2 collector fields.



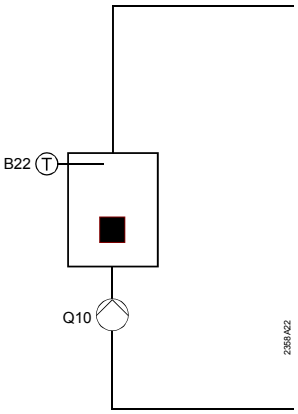
Boiler pump



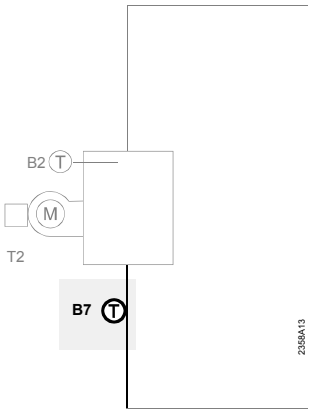
Bypass pump



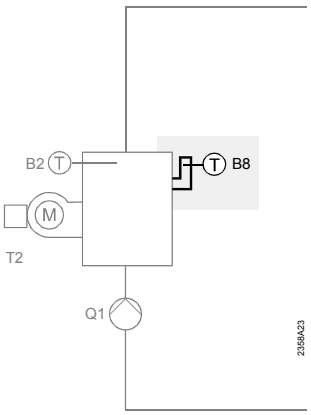
Solid fuel boiler pump



Return sensor

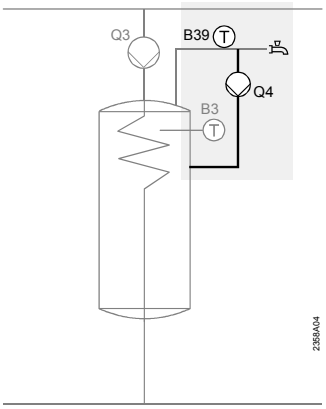


Flue gas temperature sensor

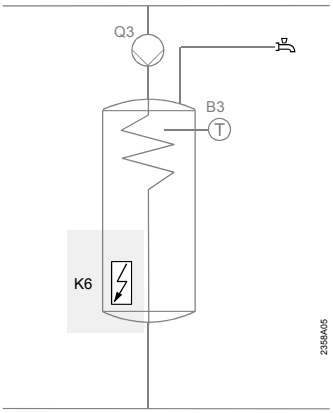


DHW storage tank (DHW)

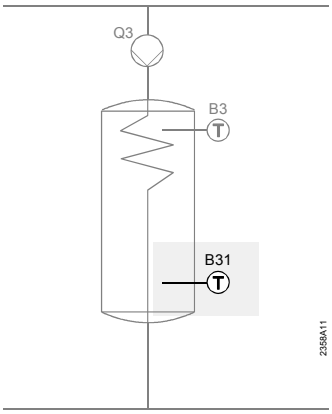
DHW circulating pump



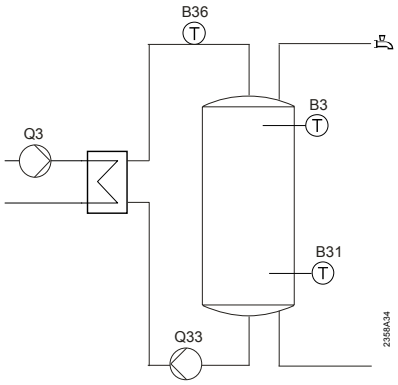
DHW el imm heater



2. DHW sensor

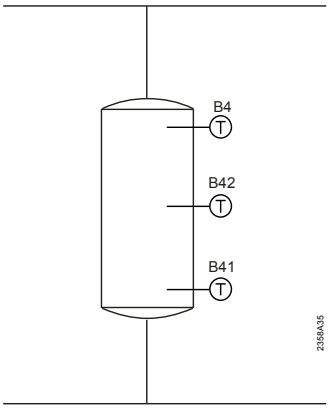


DHW tank with external heat exchanger, charging pump, intermediate circuit pump

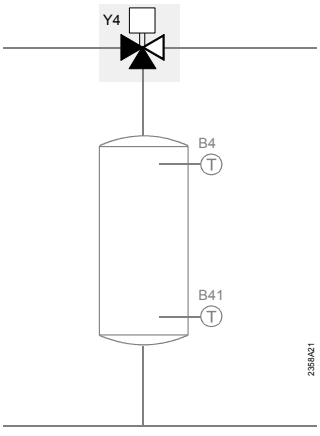


Buffer storage tank

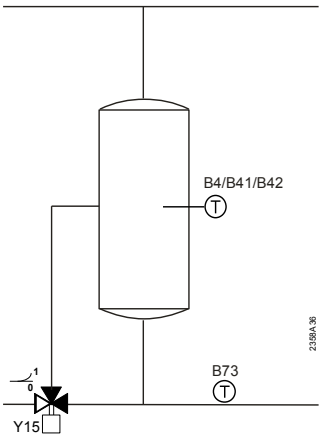
3. Buffer storage tank temperature sensor



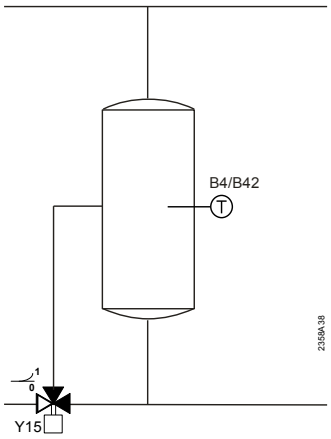
Source lock valve buffer



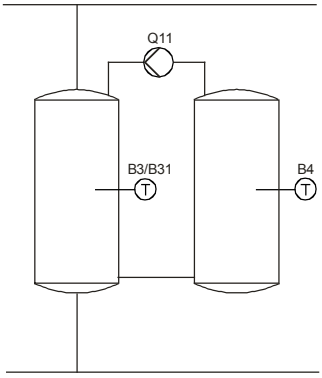
Return diversion



Storage tank partial charging

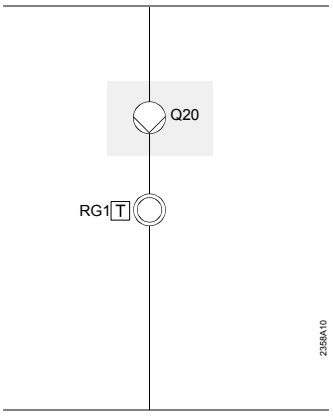


Storage tank transfer

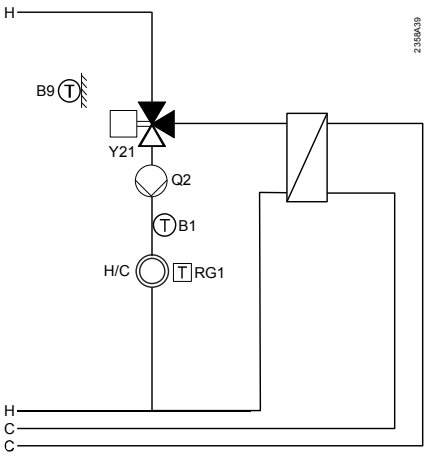


Heating / cooling circuit

Heating circuit pump HC3

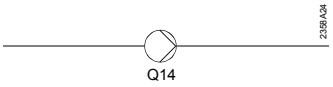


Diverting valve cooling



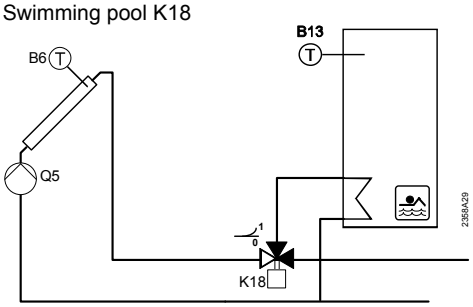
Heat converter

System pump Q14



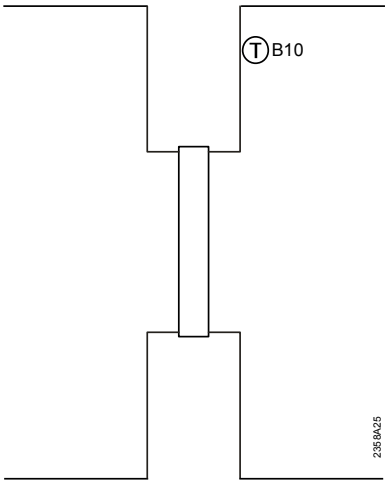
Swimming pool

Swimming pool K18



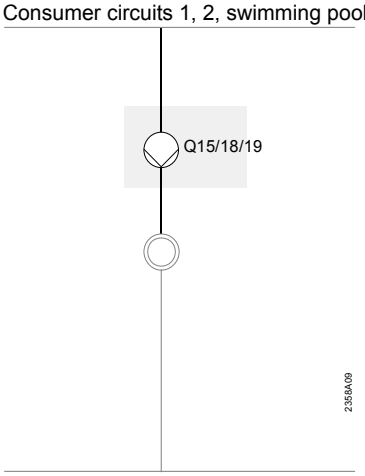
Pressureless header

Common flow sensor



Extra functions

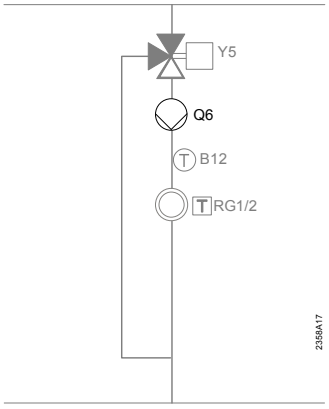
Consumer circuits 1, 2, swimming pool circuit



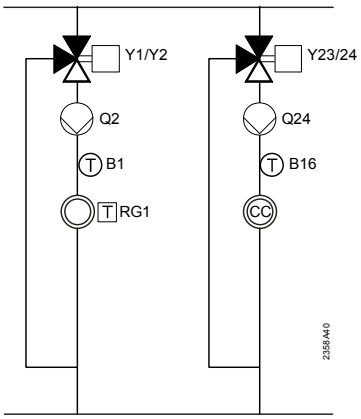
8.4 Auxiliary functions with extension module AVS75.39X

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

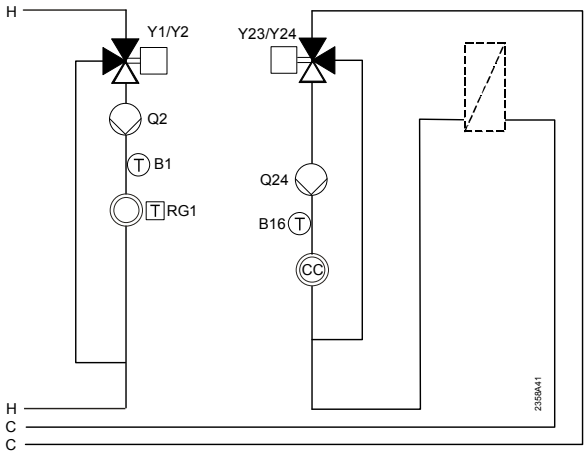
2. Mixing valve heating circuit



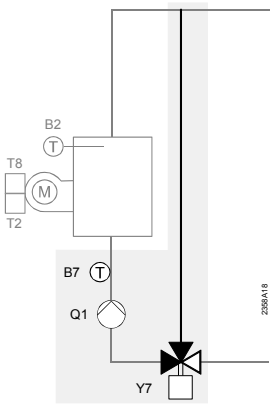
Cooling circuit



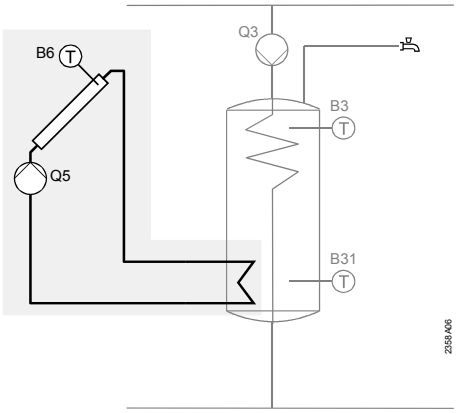
4-pipe



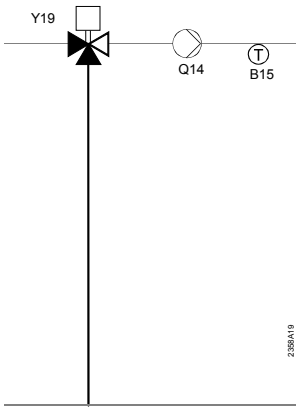
Return temp controller



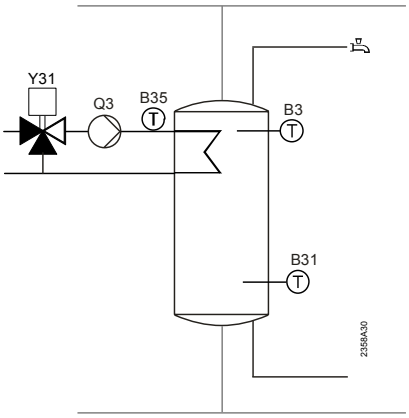
Solar DHW heating



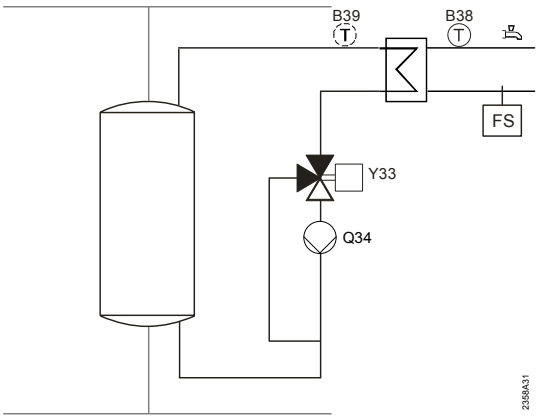
Primary controller



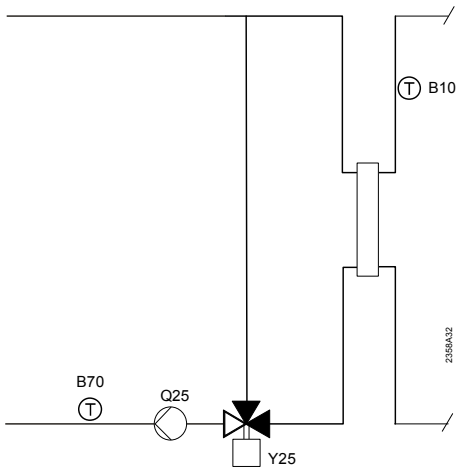
Primary DHW controller



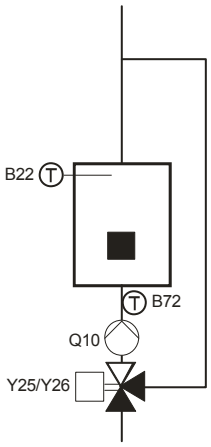
Instantaneous DHW heater



Return controller cascade



Return controller solid fuel boiler



Legend mains voltage

Diagram	*Function*
T2	Burner 1st stage
	Release modulating burner
T8	Burner 2nd stage
	Air damper modulating burner = OPEN
Q1	Boiler pump
Q2	1. Heating circuit pump
Q3	DHW charging pump / diverting valve
Q4	circulating pump
Q5	Collector pump
Q6	2. Heating circuit pump
Q10	Solid fuel boiler pump
Q11	Storage tank charging pump
Q12	Bypass pump
Q14	System pump
Q15	Consumer circuit pump 1
Q16	Collector pump 2
Q18	Consumer circuit pump 2
Q19	Swimming pool circuit pump
Q20	Heating circuit pump heating circuit 3:
Q21/22/23	2nd pump stage HC pump 1-3
Q24	Cooling circuit pump
Q25	Cascade pump
Q33	DHW intermediate circuit pump
Q34	Instantaneous DHW heater pump
	pump/controlling element
Q35	DHW mixing pump
Y1	1st Heating circuit mixing valve
Y4	Heat source shutoff valve
Y5	2nd Heating circuit mixing valve opening
Y6	2nd Heating circuit mixing valve closing
Y7	Maintained boiler return temperature
Y15	Buffer return valve
Y19	Primary controller
Y21	Diverting valve cooling
Y25	Maintain return temp valve OPENING
Y26	Maintain return temp valve CLOSING
Y31	DHW primary controller mixing valve opening
Y32	DHW primary controller mixing valve closing
Y33	Instantaneous DHW heater valve opening
Y34	Instantaneous DHW heater valve closing
K6	electric immersion heater
K5	Air damper modulating burner = CLOSED
K8	Solar controlling element buffer
K9	Solar pump ext. heat exchanger
K10	alarm output
K11	Overtemperature protection
K13	Time program 5 / DHW
K17	Flue gas relay
K18	Solar controlling element swimming pool
K27	heat demand
K28	"Refrigeration request"
K29	Air dehumidifier
K30	Ignition aid fan
K32	Supplementary source control

Legend low-voltage

B1	Flow temperature sensor HC1
B10	Common flow sensor
B12	Flow temperature sensor HC2
B13	Swimming pool sensor
B15	Flow sensor prim controller
B2	Boiler temperature sensor TK1
B22	Solid fuel boiler sensor
B3	DHW sensor top
B31	2nd DHW sensor bottom
B35	DHW flow temperature sensor
B36	DHW charging sensor
B38	DHW temperature outlet sensor
B39	DHW circulation sensor B39
B4	Buffer storage tank temperature sensor
B41	Buffer storage tank temperature sensor
B42	Buffer storage tank temperature sensor
B6	Collector sensor
B61	Collector sensor 2
B63	Solar flow sensor
B64	Solar return sensor
B7	Return sensor
B70	Cascade return sensor
B72	Solid fuel boiler return sensor
B73	Common return sensor
B8	Flue gas temperature sensor
B9	Outside temperature sensor
RG1	Room unit 1
RG2	Room unit 2
FS	Flow switch

9 Technical data

9.1 Basic unit RVS43.345

Power supply	Rated voltage	AC 230 V (-15% /+10%)
	Rated frequency	50 / 60 Hz
	Power consumption	RVS43.345: max. 9 VA
	Fusing of supply lines	Fuse switch: max. 13A (as per EN 60898-1) or Fuse: 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 allowed
Functional data	Software class	A
	Mode of operation to EN 60730	1b (automatic operation)
Inputs	Power inputs S3, EX1, L1(SLT)	AC 230 V
	Working range	AC 0 … 253 V
	Low	< 95 V
	High	> 115 V
	Internal resistance	> 100 kΩ
	Digital input H1, H3	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, H3	Protective low voltage
	Working range:	DC 0…10 V
	Internal resistance:	> 100 kΩ
	Pulse input H1, H3	Safety extra low-voltage for potential free low-voltage contacts:
	voltage with contact open:	DC 12 V
	Current with contact closed:	DC 3 mA
	Frequency max:	max. 25 Hz
	Pulse length:	min. 20 ms
	Frequency inputs H1, H3	Protective extra-low voltage
	Working range:	DC 0..0.12 V
	Low	< 1.7 V
	High	2.7 ... 12 V
	Internal resistance:	> 100 kΩ
	Frequency:	max. 500Hz
	Sensor input B9	NTC1k (QAC34)
	Sensor inputs B1, B2, B3	NTC 10k (QAZ36, QAD36)
	Sensor inputs BX1…BX4	NTC 10k (QAZ36, QAD36) 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 QX1...QX5	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A for ≤1 s
	Maximum overall electricity	AC 10 A (all relays)
	Temperature range	AC (24...230) V (for potential free outputs)
	Triac output ZX3 (if available)	Triac output, zero-voltage switching:
	Rated current range	AC 0.02…2(2) A (ON/OFF operation) AC 0.02…1.4(1.4) A (speed control)
	Maximum leakage current	2 mA
	Max. switch-on current	Imax = 50 A / tp ≤ 20 ms Imax = 4 A / tp ≤ 1 s
	G+ power	Protective low voltage, output is short-circuit-proof
	Output voltage	11.3V … 13.2V
	load	max. 88mA
	GX1 power switchable	Protective low voltage, output is short-circuit-proof
	Output voltage 5V	4.75V … 5.25V
	Output voltage 12V	11.3V … 13.2V
	Load	max. 20mA
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 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	2004/108/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	2006/95/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	RVS43.345: 400 g

9.2 Extension module AVS75.39x

Power supply	Rated voltage	AC 230 V (-15% /+10%)
	Rated frequency	50 / 60 Hz
	Power consumption	max. 4 VA
	Fusing of supply lines	Fuse switch: max. 13A (as per EN 60898-1) or Fuse: 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
Inputs	Power inputs EX21	AC 230 V
	Working range	AC 0 … 253 V
	Low	< 95 V
	High	> 115 V
	Internal resistance	> 100 kΩ
	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
	Sensor inputs BX21, BX22, BX23	NTC 10k (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
	Maximum overall electricity	AC 6 A (all relays)
	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 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	2004/108/EC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	2006/95/EC
	- 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

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

Power supply	For devices without batteries:	
	Bus power supply	BSB
	For battery-powered devices:	
	Batteries	QAA5x: 2 pcs. / QAA7x… 3 pcs.
	Type of batteries	1.5 V alkaline size AA (LR06)
	Battery life	approx. 1.5 years
Room temperature measurement (only with QAA7x...) / QAA55...)	Measuring range	0...50 °C
	According to EN 12098:	
	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
	QAA58.., QAA78..	BSB-RF Frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20 for QAA7x.../ QAA5x... IP40 for AVS37… IP20 (when mounted) Normal pollution
	Safety class to EN 60 730	Low-voltage-carrying parts meet the requirements of safety class III (if correctly installed)
	Degree of pollution to EN 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	2004/108/EC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	2006/95/EC
	- Electrical safety	- EN 60730-1, EN 50090-2-2
	Radio	EN 300 220-1 (25-1000 MHz).
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 (noncondensing)
	For battery-powered devices:	
	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 (noncondensing)
Weight	Without packaging	AVS37.294: 160 g QAA75.61x: 170 g QAA78.610: 312 g QAA55.11x: 115 g QAA58.11x: 165 g

9.4 Power supply AVS16.290

Power supply	Nominal voltage	AC 230 V (-15%/+10 %)
	Nominal frequency	50 Hz
	Fuse	6.3 AT (5 x 20 mm)
	Power consumption	max. 0,4 VA
	Fusing of supply lines	Fuse switch: max. 13A (as per EN 60898-1) or Fuse: max. 10 AT.
Functional data	Switching capacity SLT	16 (12) A, AC 230V (-15%/+10%), 50Hz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP40 (when mounted)
	Safety class to EN 60 730	According to the design of protective class II with proper installation
	Degree of pollution to EN 60730	Normal pollution
Standards, safety	CE conformity to	
	low-voltage directive	2006/95/EC
	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

9.5 RF module AVS71.390

Power supply	Via RVS… basic unit Power consumption	DC 5.5 V 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
	RF 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	Low-voltage-carrying parts meet the requirements of safety class III (if correctly installed)
	Degree of pollution to EN 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to EMC directive - Immunity - Emissions Low-voltage directive - Electrical safety Radio	 2004/108/EC - EN 61000-6-2 - EN 61000-6-3 2006/95/EC - EN 60730-1, EN 50090-2-2 EN 300 220-1 (25-1000 MHz) EN 301 489-1 , -3.
Climatic conditions	Storage to EN 60721-3-1 Transport to EN 60721-3-2 Operation to EN 60721-3-3	Class 1K3, temp. -20…65 °C Class 2K3, temp. -25…70°C Class 3K5, temp. 0...50°C (non-condensing)
Weight	Without packaging	54 g

9.6 Wireless outside sensor AVS13.399

Power supply	Batteries	2 pcs
	Type of batteries	1.5 V alkaline size AAA (LR03)
	Battery life	approx. 2 years
Interfaces	RF 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	Low-voltage-carrying parts meet the requirements of safety class III (if correctly installed)
	Degree of pollution to EN 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	2004/108/EC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	2006/95/EC
	- Electrical safety	- EN 60730-1, EN 50090-2-2
	Radio	EN 300 220-1 (25-1000 MHz).
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 (noncondensing)
	For battery-powered devices:	
	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 (noncondensing)
Outside temperature acquisition	OutsideSens	QAC34/101
	Measuring range	-50...50 °C
	cable length	max. 5 m
Weight	Without packaging	radio transmitter: 160 g Outside sensor QAC34 73 g cable: 70 g

9.7 RF repeater AVS14.390

Power supply	Nominal voltage	AC 230 V (+10% /-15%) (primary side AC/AC adapter)
	Nominal frequency	50 Hz ±6%
	Power consumption	max. 0.5 VA
Interfaces	RF 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	Low-voltage-carrying parts meet the requirements of safety class III (if correctly installed)
	Degree of pollution to EN 60730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	2004/108/EC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	2006/95/EC
	- Electrical safety	- EN 60730-1, EN 50090-2-2
	Radio	EN 300 220-1 (25-1000 MHz).
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	RF repeater: 112 g Power supply: 195 g

9.8 Sensor characteristics

9.8.1 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		

9.8.2 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		

9.8.3 Pt1000

T [°C]	R[ohm]	T [°C]	R[ohm]	T [°C]	R[ohm]
-30.0	882.24	100.0	1,385.00	230.0	1,868.21
-25.0	901.94	105.0	1,403.95	235.0	1,886.40
-20.0	921.61	110.0	1,422.86	240.0	1,904.57
-15.0	941.25	115.0	1,441.75	245.0	1,922.70
-10.0	960.86	120.0	1,460.61	250.0	1,940.81
-5.0	980.45	125.0	1,479.44	255.0	1,958.89
0.0	1,000.00	130.0	1,498.24	260.0	1,976.94
5.0	1,019.52	135.0	1,517.02	265.0	1,994.96
10.0	1,039.02	140.0	1,535.76	270.0	2,012.95
15.0	1,058.49	145.0	1,554.48	275.0	2,030.91
20.0	1,077.93	150.0	1,573.16	280.0	2,048.85
25.0	1,097.33	155.0	1,591.82	285.0	2,066.75
30.0	1,116.71	160.0	1,610.45	290.0	2,084.63
35.0	1,136.07	165.0	1,629.05	295.0	2,102.48
40.0	1,155.39	170.0	1,647.62	300.0	2,120.30
45.0	1,174.68	175.0	1,666.16	305.0	2,138.08
50.0	1,193.95	180.0	1,684.67	310.0	2,155.85
55.0	1,213.18	185.0	1,703.15	315.0	2,173.58
60.0	1,232.39	190.0	1,721.61	320.0	2,191.28
65.0	1,251.57	195.0	1,740.03	325.0	2,208.95
70.0	1,270.71	200.0	1,758.43	330.0	2,226.60
75.0	1,289.83	205.0	1,776.80	335.0	2,244.21
80.0	1,308.93	210.0	1,795.14	340.0	2,261.80
85.0	1,327.99	215.0	1,813.45	345.0	2,279.36
90.0	1,347.02	220.0	1,831.73	350.0	2,296.89
95.0	1,366.02	225.0	1,849.98		

Index

Siemens Switzerland Ltd
Industry Sector
Building Technologies Division
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
Fax +41 41-724 35 22
www.siemens.com/sbt