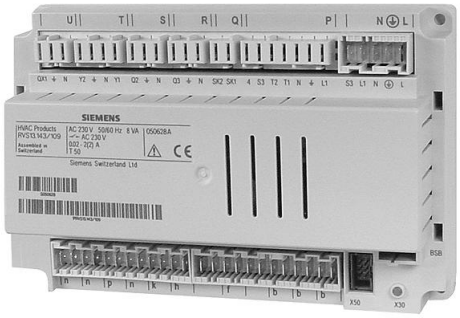
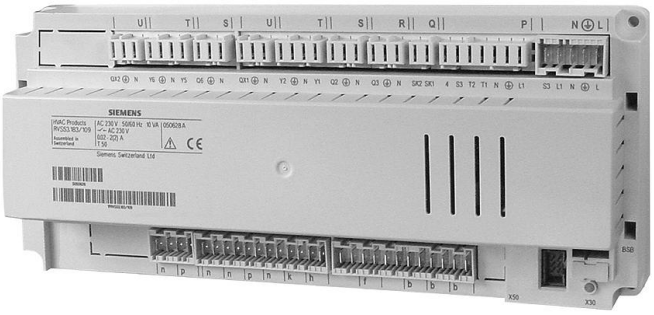




CONTROLLERS

CLIMA TOP (RVS63)

CLIMA COMFORT (RVS43)

User and OEM Manual

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

Contents

CONTROLLERS
CLIMA TOP (RVS63)
CLIMA COMFORT (RVS43)

USER MAUAL

1 Summary

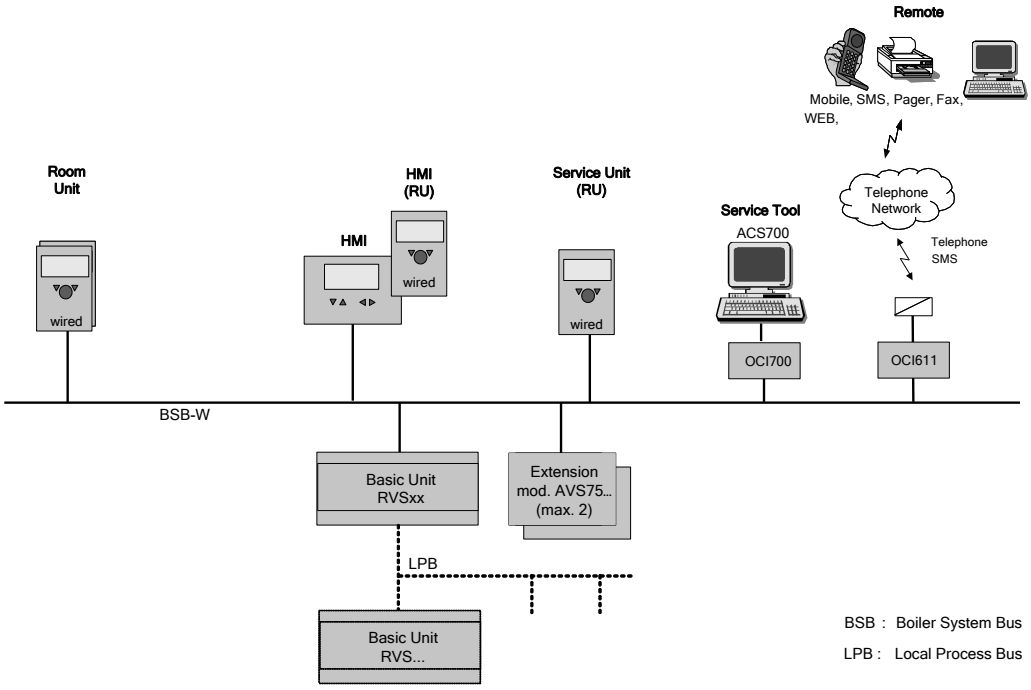
The present User Manual describes the products listed in the following table and covers handling and configuration of the controls for readers ranging from end users to heating engineers.

Type reference (ASN)	Serie	Name
RVS43.345	A	Basic unit boiler
RVS63.283	B	Basic unit boiler
AVS75.390	B	Extension module
AVS37.294	B	Operator unit
QAA75.610	B	Room unit, wired
QAA55.110	A	Room unit basic

1.1 Type summary

1.1.1 Topology

Wired



2 Mounting and installation

2.1 Regulations

Electrical installation

- Prior to installing the controller, the power supply must be turned off
- The connections for mains and low-voltage are separated
- The wiring must be made in compliance with the requirements of safety class II. This means that sensor and mains cables may not be run in the same duct

2.2 Basic units RVS…

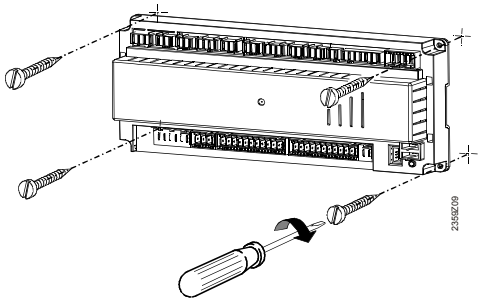
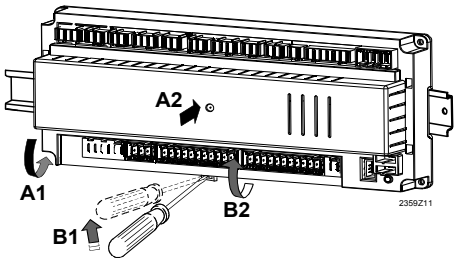
Engineering

- 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 a 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 fitted. 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..50°C.
- Power cables must be clearly segregated from low-voltage cables (sensors) observing a distance of at least 100 mm

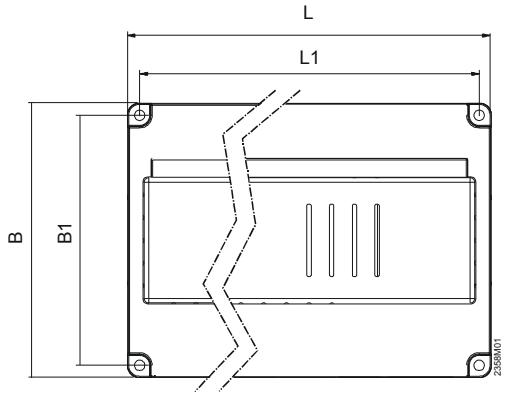
Mounting location

- Boiler
- Control panel
- Housing for wall mounting

Mounting method

Screwed	On DIN rail
	
	A: Mounting / B: Removal Note: To mount the controller on a DIN rail, a mounting clip is required!

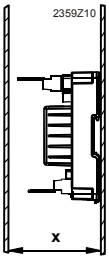
Dimensions and drilling plan



Dimensions in mm

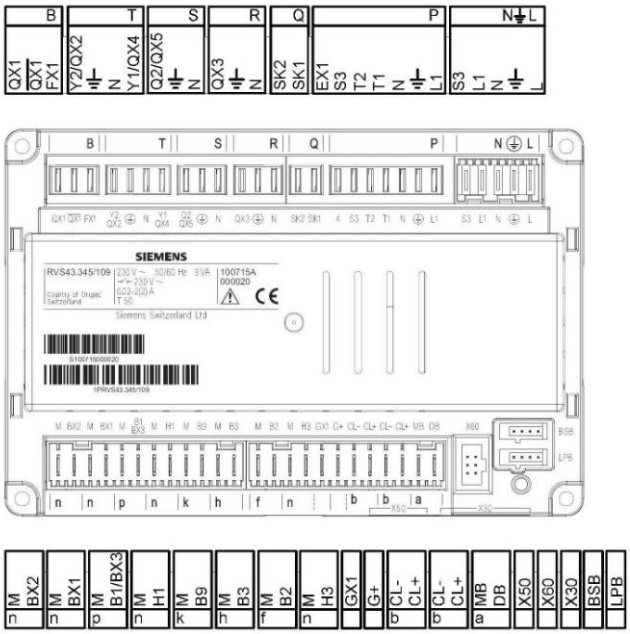
	L	*B*	*H*	*L1*	*B1*
RVS63…	281	121	52	270	110
RVS43…	181	121	52	170	110

Total height required

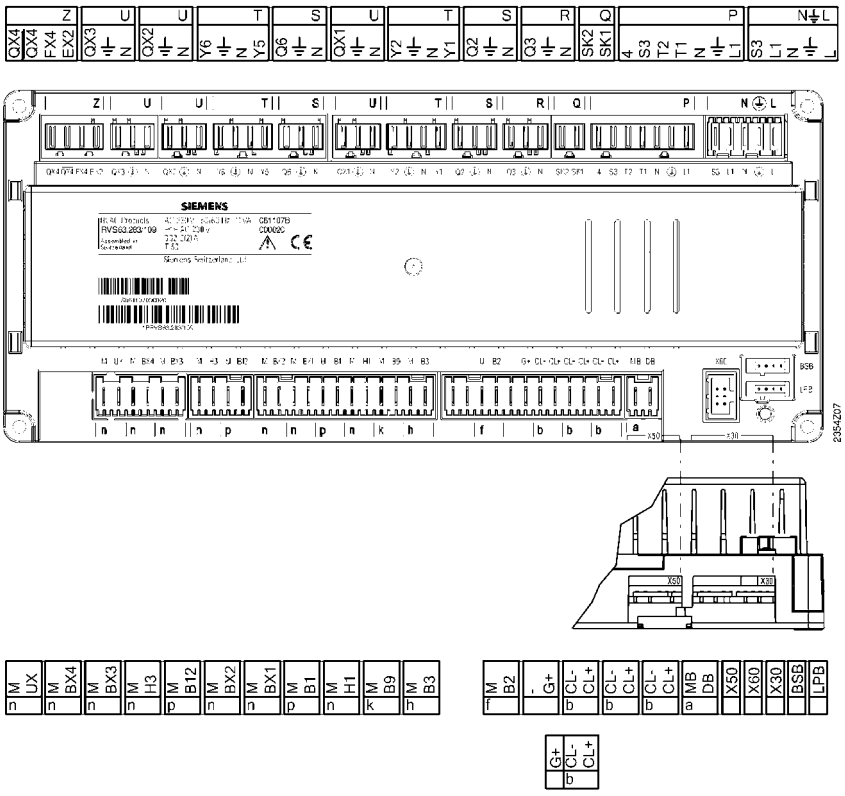


Dimension X:
Connectors with tongues minimum 70 mm
Connector without tongues minimum 60 mm

2.2.1 Connection terminals of RVS43.345



2.2.2 Connection terminals of RVS63.283



Mains power supply

	Use	*Terminal*	*Connector type*
L ⏚ N L1 S3	Basic unit 230 V AC power Earth/ground Neutral Burner 230 V AC power Burner fault output	N ⏚ L	AGP4S.05A/109
L1 ⏚ N T1 T2 S3 EX1	Burner power Earth/ground Neutral Burner 1st stage power Burner 1st stage Burner fault input Multifunction input, AC230 V EX1	P	AGP8S.07A/109
SK1 SK2	Safety chain Safety chain	Q	AGP8S.02E/109
N ⏚ Q3	Neutral Earth/ground DHW heating pump / diverter valve / multifunction output	R	AGP8S.03A/109
N ⏚ Q2 /QX5	Neutral Earth/ground Heating circuit pump 1 / 5th multifunction output	S	AGP8S.03B/109
Y1/QX4 N ⏚ Y2/QX2	Heating circuit mixer valve 1 opening / multifunction output Neutral Earth/ground Heating circuit mixer valve 1 closing / multifunction output	T	AGP8S.04B/109
FX1 QX1 QX1	1st multifunction output power QX1 signal reversed 1st multifunction output / 2nd burner stage	B	AGP8S.03H/109

Low voltage

	Use	*Terminal*	*Connector type*
BSB	OCI700 supervision connection	-	-
LPB	Local process bus	-	-
X60	RF module AVS71.390	-	-
X50	Expansion module AVS75.390 / AVS75.391	-	AVS82.490/109
X30	Control unit / Boiler control panel		AVS82.491/109
DB	LPB data		AGP4S.02H/109
MB	LPB earth/ground		
CL+	Room 2 control unit data bus		AGP4S.02A/109
CL-	Room 2 control unit earth/ground	b	
CL+	Room 1 control unit data bus		AGP4S.02A/109
CL-	Room 1 control unit earth/ground	b	
G+	Room control unit 12 V power supply		AGP4S.03D/109
GX1	5 V power supply / 12 V for active sensors		AGP4S.03H/109
H3	Digital input / DC 0 .. 10 V		AGP4S.02F/109
M	Earth/ground	n	
B2	Boiler temperature sensor		AGP4S.02B/109
M	Earth/ground	f	
B3	DHW top temperature sensor		AGP4S.02C/109
M	Earth/ground	h	
B9	Outdoor temperature sensor		AGP4S.02D/109
M	Earth/ground	k	
H1	Digital input / DC 0...10 V		AGP4S.02F/109
M	Earth/ground	n	
B1/BX3	HC1 flow temperature sensor / multifunction input 3 sensor		AGP4S.02G/109
M	Earth/ground	p	
BX1	Multifunction input 1 sensor		AGP4S.02F/109
M	Earth/ground	n	
BX2	Multifunction input 2 sensor		AGP4S.02F/109
M	Earth/ground	n	

RVS63
Mains voltage

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

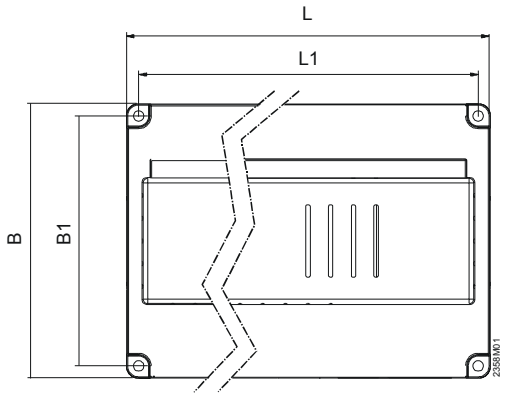
Low voltage

	Use	*Slot*	*Connector type*
BSB	Service tool OCI700	-	-
LPB	Local process bus	-	-
X50	Extension module AVS75.390	-	AVS82.490/109
X30	Operator unit / boiler control panel	-	AVS82.491/109
DB	LPB data		AGP4S.02H/109
MB	LPB ground		
CL+	BSB data		AGP4S.02A/109
CL-	BSB ground	b	
CL+	Room unit 2 data		AGP4S.02A/109
CL-	Room unit 2 ground	b	
CL+	Room unit 1 data		AGP4S.02A/109
CL-	Room unit 1 ground	b	AGP4S.03D/109
G+	Room unit power supply 12 V		
B2	Boiler sensor		AGP4S.02B/109
M	Ground	f	
B3	DHW sensor top		AGP4S.02C/109
M	Ground	h	
B9	Outside sensor		AGP4S.02D/109
M	Ground	k	
H1	Digital / DC 0...10 V input		AGP4S.02F/109
M	Ground	n	
B1	Flow temperature sensor HC1		AGP4S.02G/109
M	Ground	p	
BX1	Multifunctional sensor input 1		AGP4S.02F/109
M	Ground	n	
BX2	Multifunctional sensor input 2		AGP4S.02F/109
M	Ground	n	
B12	Flow temperature sensor HC2		AGP4S.02G/109
M	Ground	p	
H3	Digital / DC 0...10 V input		AGP4S.02F/109
M	Ground	n	
BX3	Multifunctional sensor input 3		AGP4S.02F/109
M	Ground	n	
BX4	Multifunctional sensor input 4		AGP4S.02F/109
M	Ground	n	
UX	DC 0…10 V output	n	AGP4S.02F/109
M	Ground		

2.3 Extension module AVS75.390

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

Dimensions and drilling plan



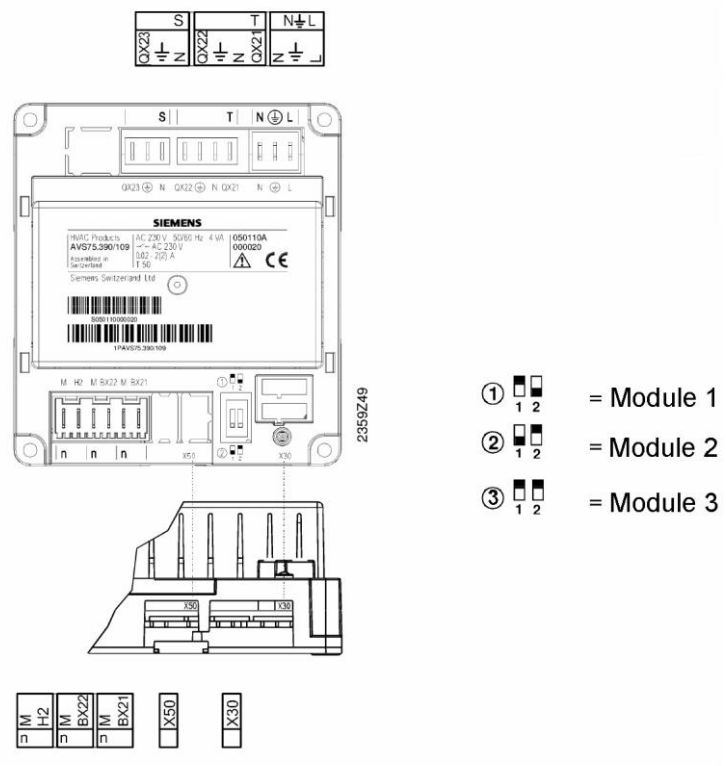
Dimensions in mm

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

Connections

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

2.3.1 Connection terminals of AVS75.390



Terminal markings

Mains voltage

	Use	*Slot*	*Connector type*
L ⏚ N	Line AC 230 V basic unit Protective earth Neutral conductor	N ⏚ L	AGP4S.03E/109
QX21 N ⏚ QX22	Assigned on the basis of function Neutral conductor Protective earth Assigned on the basis of function	T	AGP8S.04B/109
N ⏚ QX23	Neutral conductor Protective earth Assegnazione in base alla funzione	S	AGP8S.03B/109

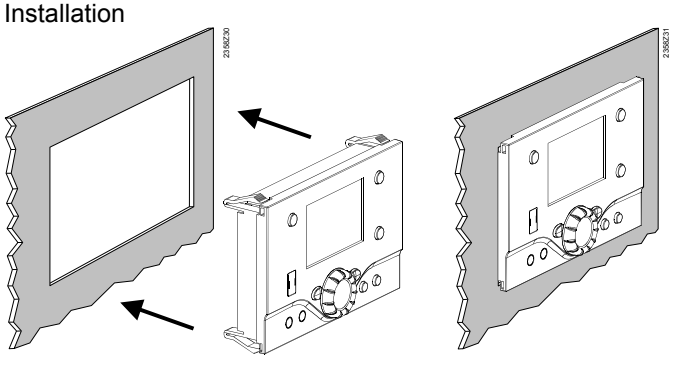
Low voltage

	Use	*Space*	*Connector type*
X50	Connection for additional expansion modules	-	AVS82.491/109
BX21 M	Assigned on the basis of function Ground	 n	AGP4S.02F/109
BX22 M	Assigned on the basis of function Ground	 n	AGP4S.02F/109
H2 M	Digital / DC 0...10 V input Ground	 n	AGP4S.02F/109

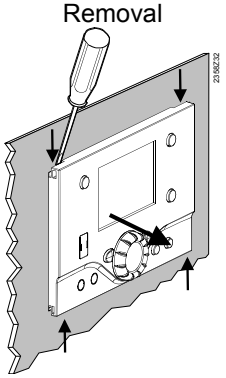
2.4 Operator unit AVS37.294

Mounting method

Installation



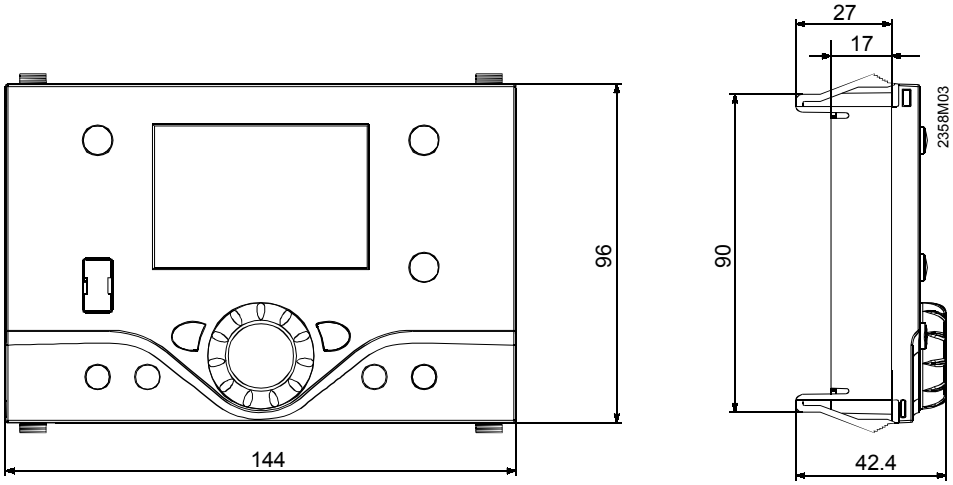
Removal



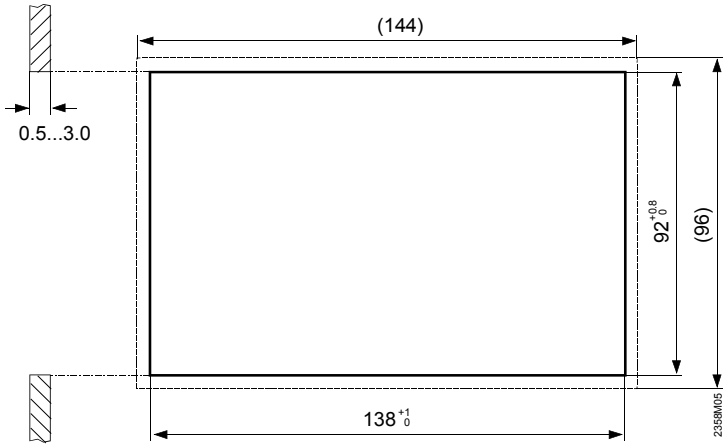
Connections

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.

Ground

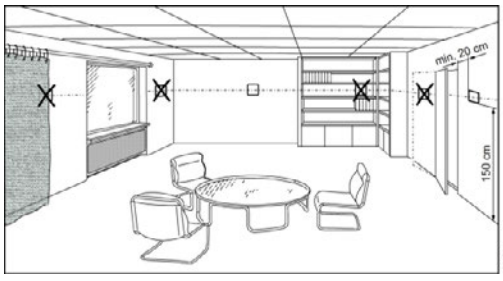


Panel cutout



2.5 Room unit QAA55…

Engineering

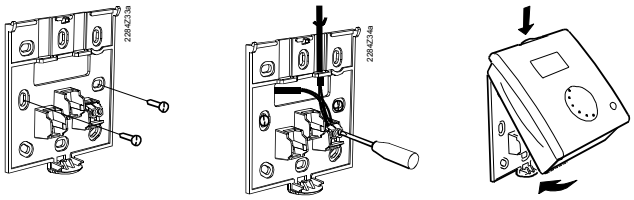


The room unit should be located in the main living room while giving consideration to the following points:

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

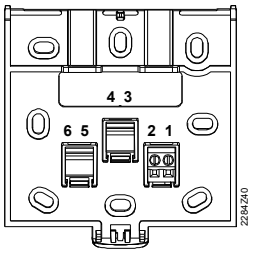
When the unit is removed from its base, power is cut off so that the unit is out of operation.

Mounting method



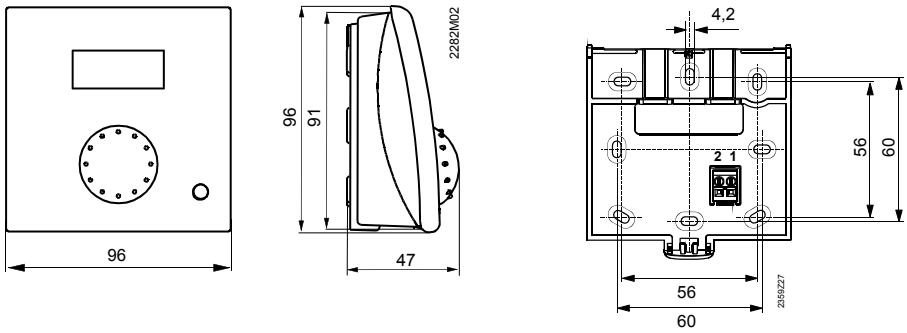
- The controller must not be exposed to dripping water

Connections



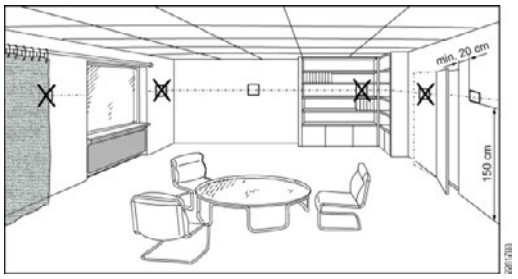
1	CL+	BSB data
2	CL-	BSB ground

Dimensions and drilling plan



2.6 Room unit QAA75…

Engineering



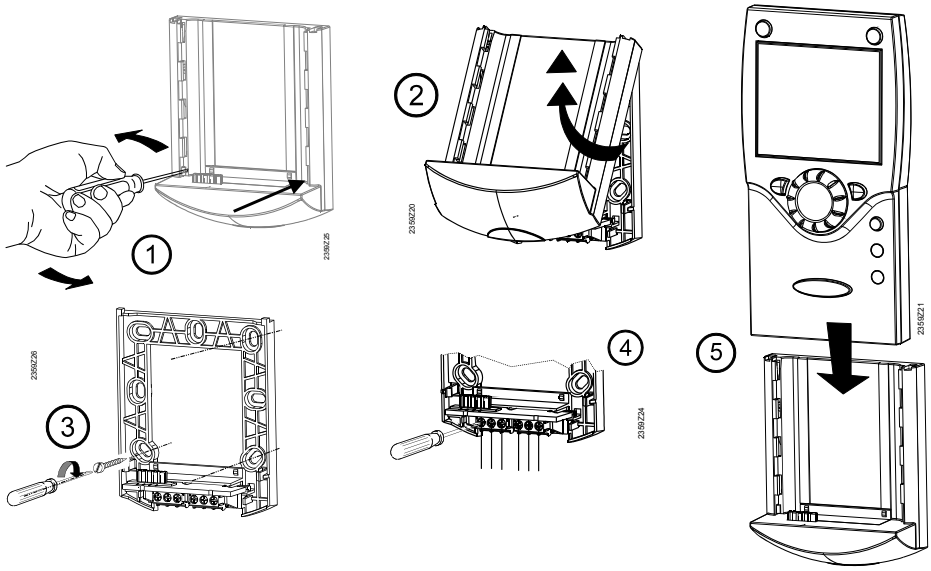
@

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

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

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

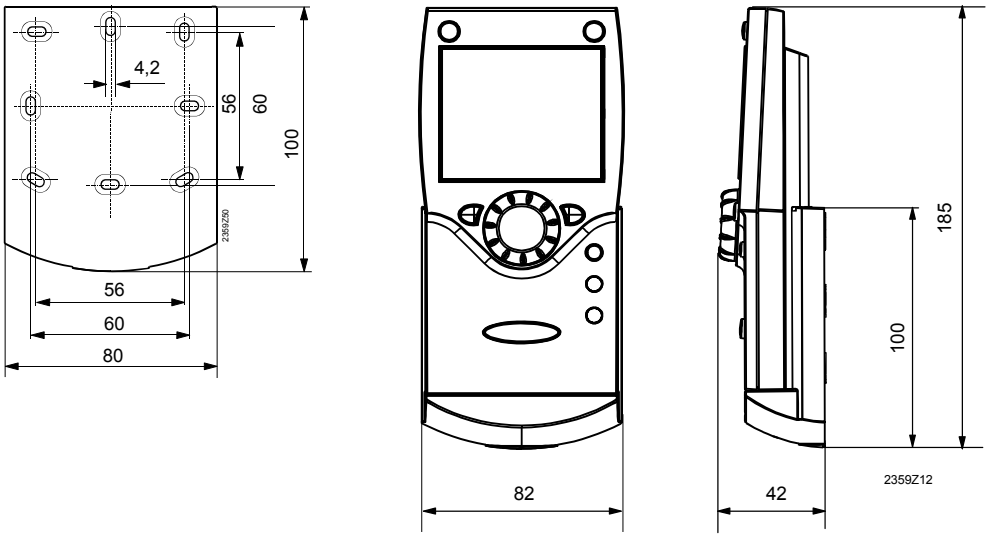
Mounting method



Connections

Terminal	Name	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 Commissioning

Prerequisites

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

- Prerequisite is the correct mounting and correct electrical installation and, in the case of wireless solutions, correctly working radio connections to all required auxiliary units.
- Make all plant-specific settings. Special attention must be paid to operating page ”Configuration“. For that purpose, the relevant operating level is to be selected as follows:
  Press OK on the room unit to switch to programming.
  Press the info button for at least 3 seconds and select operating level “Commissioning“ with the setting knob. Then, press OK.
- Make the functional check as described below.
- Reset the attenuated outside temperature
  (operating page “Diagnostics of consumers“, operating line “Outside temp attenuated“ (operating line 8703))
- Memorise the sensor readings by entering “YES” in parameter 6200. This step is necessary to monitor the functioning status of the sensors and to eliminate any old readings.

Functional check

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

Operating state

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

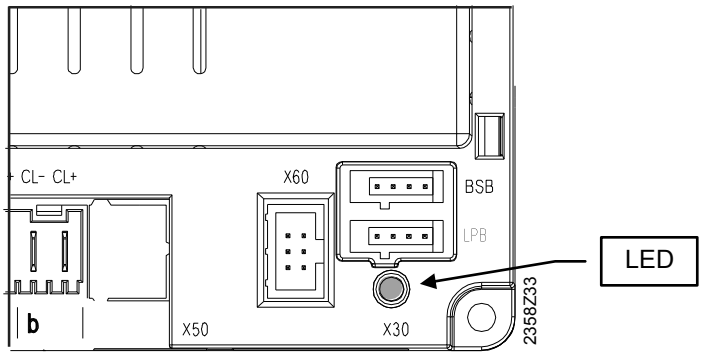
Diagnosis

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

3.1 Basic units

Checking the LED

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



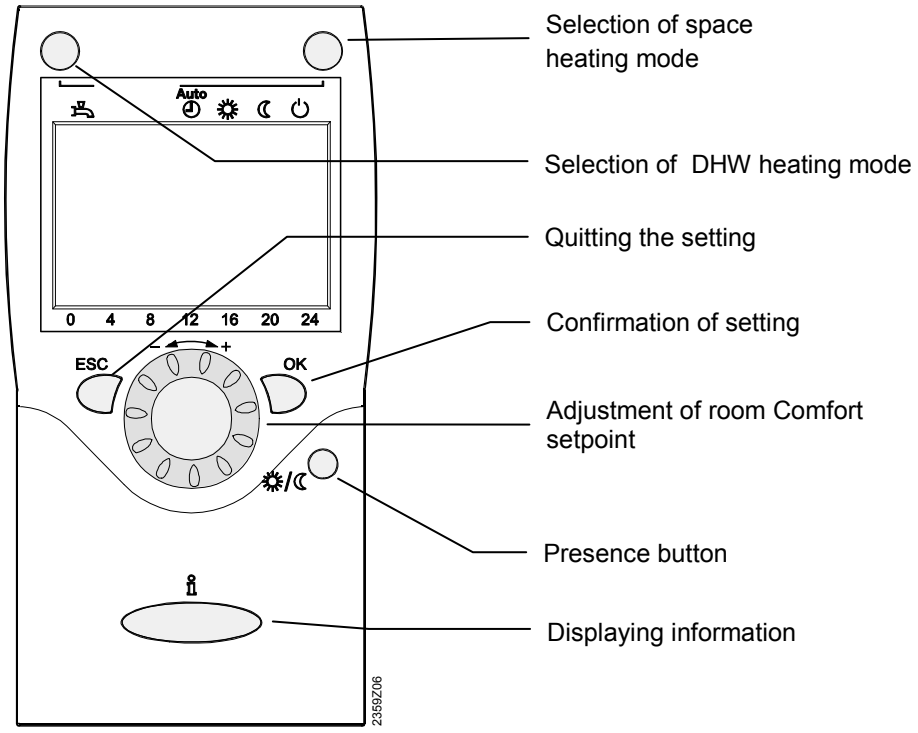
4 Handling

4.1 QAA75.. / AVS37..

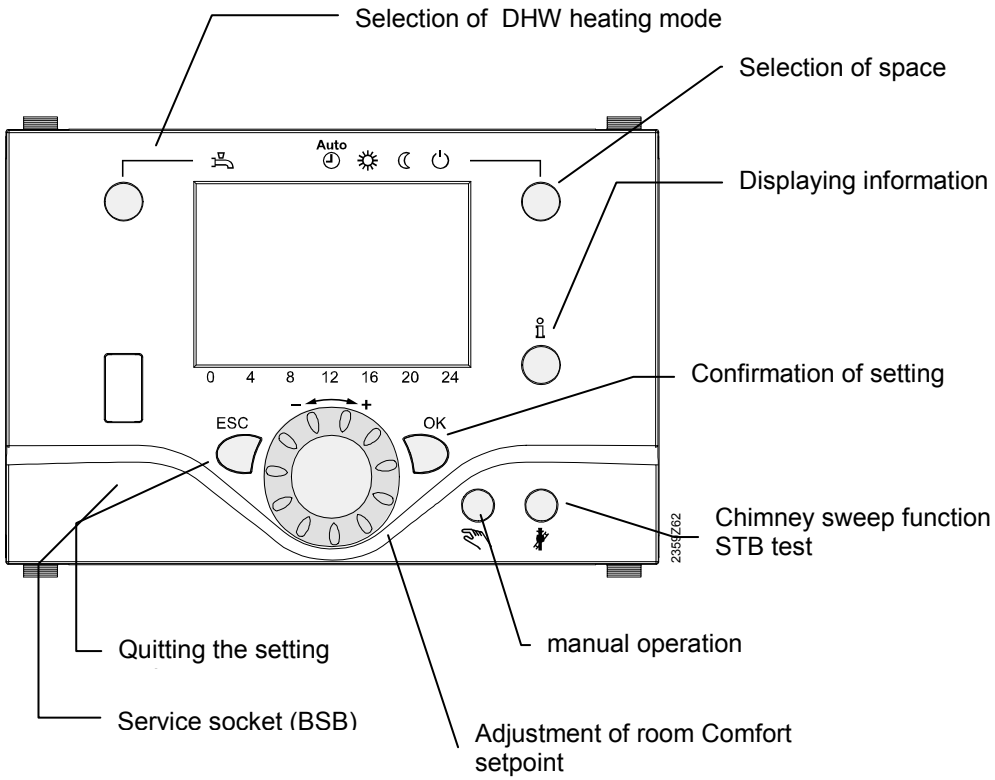
4.1.1 Operation

Operating elements

Type of room unit



Operator unit

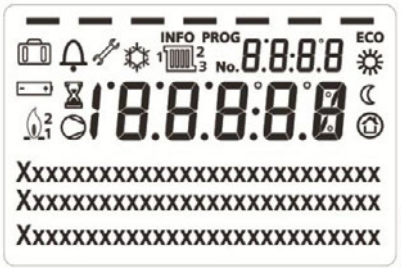


Display options

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

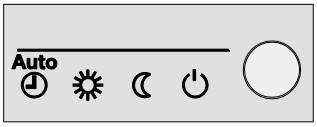
Display

Display of all symbols and segments.



Selection of space heating mode

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



Automatic mode AUTO

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

- Heating mode according to the time program
- Temperature setpoints according to the 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 Comfort setpoint
- ☾ Heating to Reduced setpoint

Characteristics of continuous operation:

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

Protection ⏻

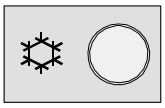
When using Protection mode, the heating system is off, but it remains protected against frost (frost protection temperature) provided there is no power failure.
Characteristics of Protection:

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

Selecting cooling mode

(if present)

Cooling mode ❄



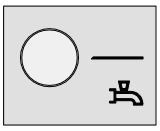
Press the cooling button to select the “cooling” function. A bar appears under the symbol on the display to confirm the selection.
The “cooling” function controls room temperature on the basis of the timer program.
Characteristics of the cooling function:

- Manual mode (24 h/day - off).
- Cooling according to timer program.
- Temperature setpoint according to “cooling to Comfort setpoint”.
- All protection functions active.
- Limitation of cooling on the basis of outdoor temperature.
- 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

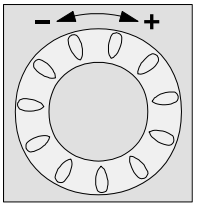
No DHW heating, but the protective function is active.

DHW push

Triggering is effected by keeping the DHW operating mode button on the operator or room unit depressed for at least 3 seconds.
It can also be started when:

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

Adjusting the room temperature setpoint



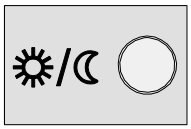
Turn the setting knob to increase or decrease the **Comfort setpoint** ☼.
For the **Reduced setpoint** ☾

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

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

The reduced setpoint can be modified only in heating mode.
No reduced setpoint exists in cooling mode, only the Comfort setpoint.

Presence button



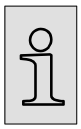
If you do not use the rooms for a certain period of time, you can press the presence button to reduce the room temperature, thus saving heating energy.
When the rooms are occupied again, press again the presence button to resume heating operation.

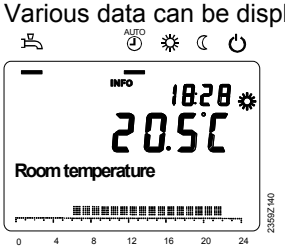
Heating mode		Cooling mode	
☼	Heating to Comfort setpoint	☼	Cooling to Comfort setpoint
☾	Heating to Reduced setpoint		Cooling Off

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

Displaying information

Various data can be displayed by pressing the info button.





Possible displays

Depending on the type of unit, configuration and operating state, some of the info lines listed below may not appear.
Display:
- Possible error messages from list of error codes 187
- Possible maintenance alarms from list of maintenance codes
- Possible special mode messages 188.

Other displays:

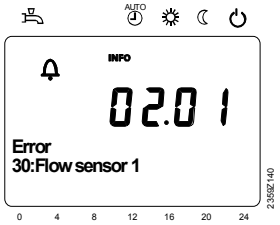
- Room temperature.
- Room temperature minimum
- Room temperature maximum
- Room 1 setpoint
- Room 2 setpoint
- Room 3 setpoint
- Cascade flow temperature
- Boiler temp
- Outside temperature
- Outside temp min
- Outside temp max
- DHW temp 1
- State of heating circuit 1
- State of heating circuit 2
- State of heating circuit 3
- Cooling circuit state
- DHW 2 temperature
- Buffer tank 1 temperature
- Buffer tank 2 temperature
- Buffer tank temperature setpoint
- Flow 1 temperature
- Flow 1 temperature setpoint
- Flow 2 temperature
- Flow 2 temperature setpoint
- Flow 3 temperature
- Flow 3 temperature setpoint
- Collector 1 temperature
- Wood fuelled boiler temperature
- Solar flow temperature
- Solar return temperature
- 24 hours solar energy yield
- Total solar energy yield
- Pool temperature
- Pool setpoint
- State of DHW
- State of boiler
- State of solar
- Pool state
- Error message
- Maintenance message
- Floor curing function
- Wood fuelled boiler state
- Buffer tank state
- Date and time of day
- Telephone customer service

Exception

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

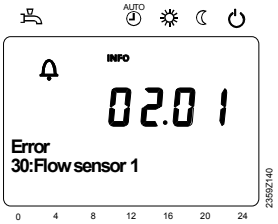
Error messages

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



Maintenance or special operation

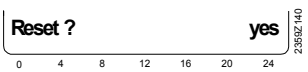
If this symbol appears, a maintenance alarm is delivered or the plant has changed to special mode. Press the info button and read further information.



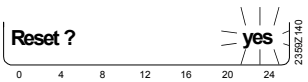
See the “List of messages” section for a list of possible messages.

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

Chimney sweep function

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

SLT test

The SLT test (SLT = safety limit thermostat) is activated by a long press (longer than 3 seconds) on the chimney sweep button. The button must be kept depressed during the entire test. If released, the test will be aborted. The SLT test is shown on the display.
The test may only be made by qualified staff since the boiler temperature will be raised above the maximum limits.

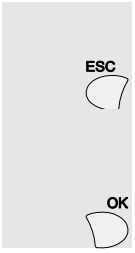
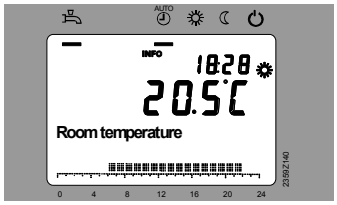
4.1.2 Programming

Setting principle

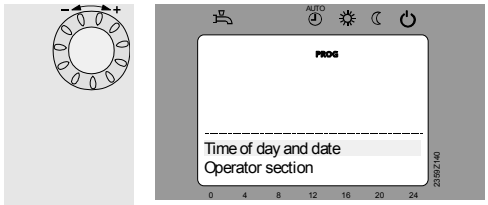
Settings that cannot be made directly with the operating elements require programming. For this purpose, the individual settings are structured in the form of operating pages and operating lines, thus forming practical groups of settings.
The following example shows how to set the time of day and the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

Example: “Setting the time of day“

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

	Operation	Display example	Description
1			Basic display. If the basic display is not shown, press the ESC button to return to it. Press OK.

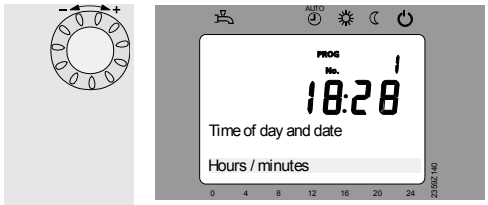
2



The bottom section of the display shows a number of operating pages.
Turn the setting knob until operating page *Time of day and date* appears.

Press OK to confirm.

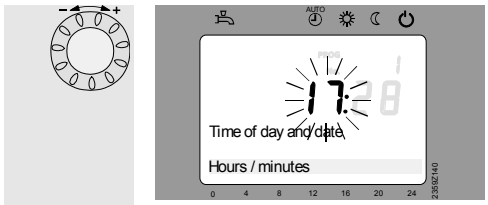
3



In the bottom section of the display, the first operating line of operating page *Time of day and date* appears.
Turn the setting knob until operating line *Hours / minutes* appears.

To confirm, press OK.

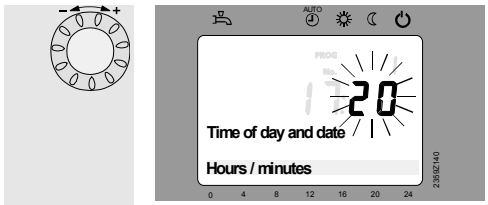
4



The display shows the hours flashing.
Turn the setting knob until the hours of the time of day are correct.

To confirm, press OK.

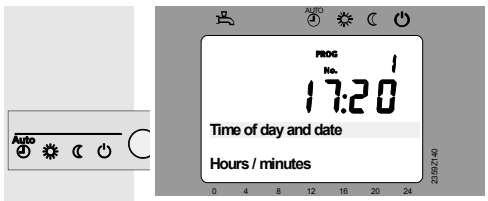
5



The display shows the minutes flashing.
Turn the setting knob until the minutes of the time of day are correct.

To confirm, press OK.

6

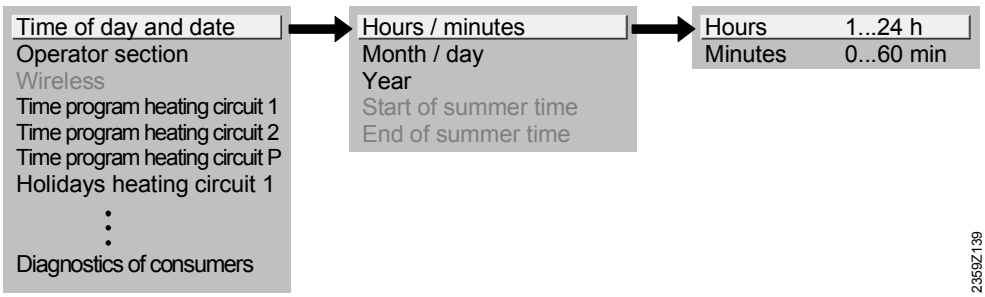


The settings are saved and the displays stops flashing.
Now, you can make further settings or you press the operating mode button to return to the basic display.

7

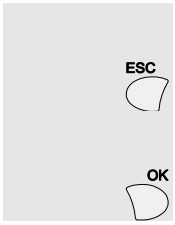
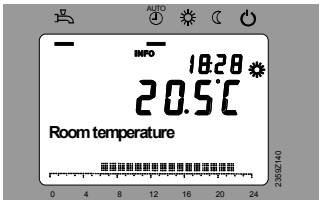
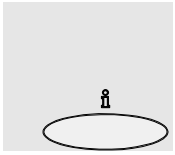
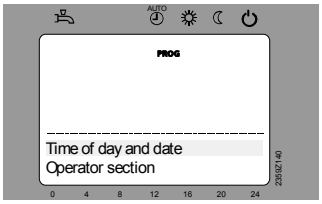
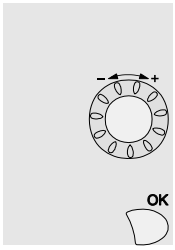
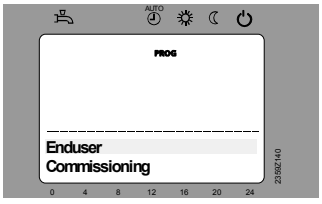
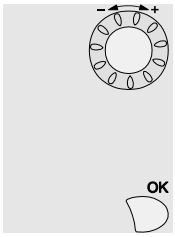
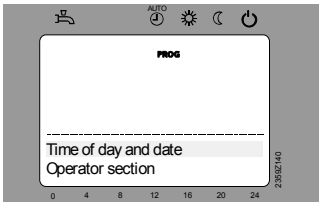
Now, you see the basic display again.

Example of menu structure



4.1.3 User levels

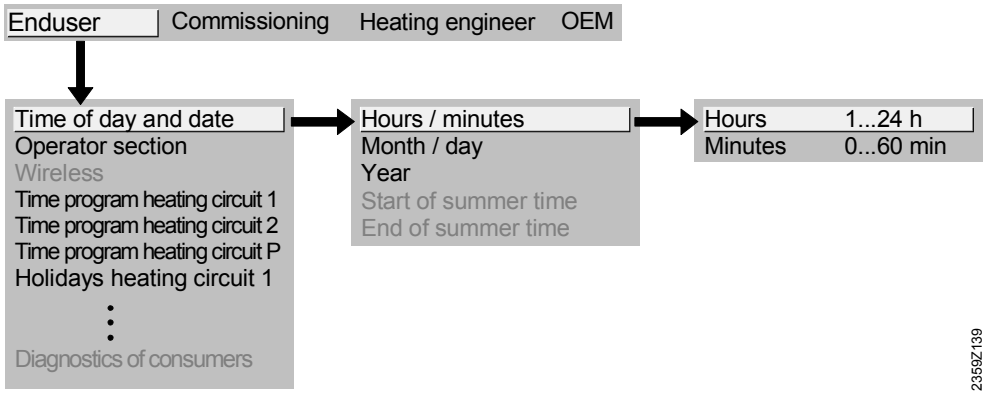
The user levels only allow authorized user groups to make settings. To reach the required user level, proceed as follows:

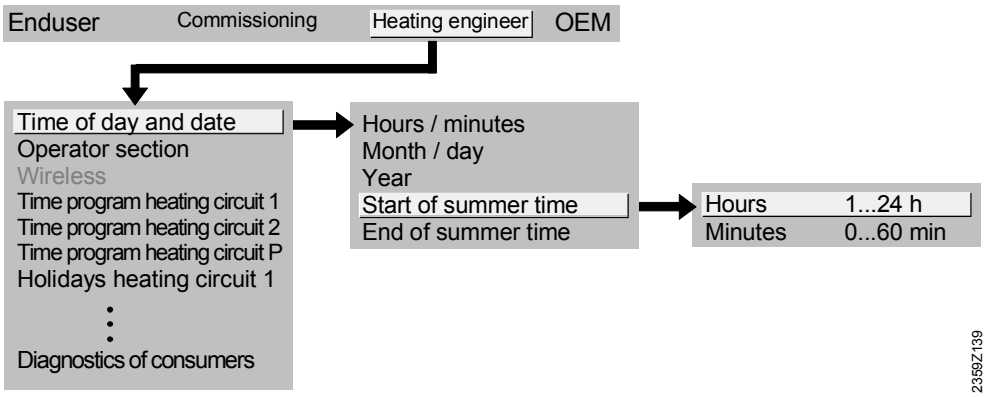
	Operation	Display example	Description
1			Basic display. If the basic display is not shown, press the ESC button to return to it. Press OK.
2			You are on the user level *End user*. Press INFO for 3 seconds.
3			You are now given a choice of user levels. Turn the setting knob until the required user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

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

Setting the structure "End user"

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

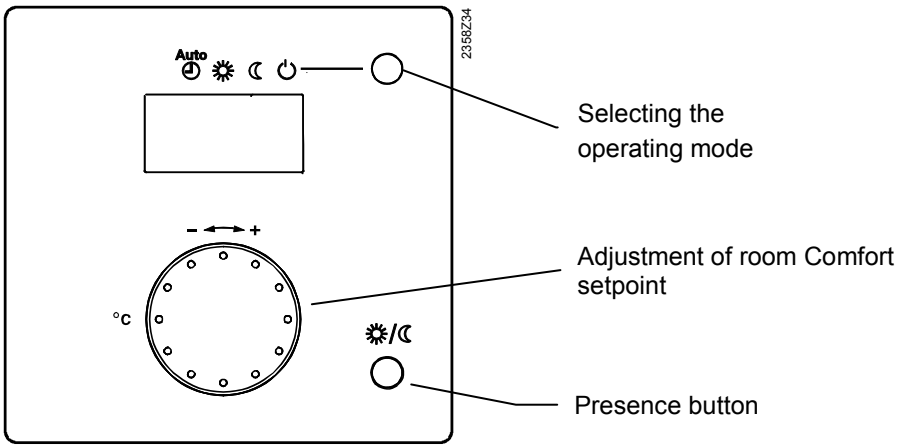




4.2 QAA55...

4.2.1 Operation

Operating elements



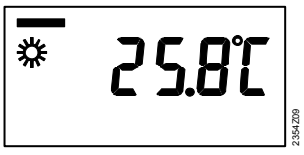
Display options

- Heating/cooling to Comfort setpoint
- Heating to Reduced setpoint
- Error messages

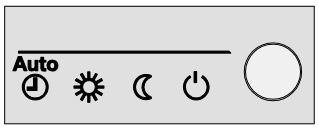
Display

Display of all displayable symbols and segments.

Example of basic display:



Selection of space heating mode



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

Automatic mode AUTO

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

- Heating mode according to the time program
- Temperature setpoints according to the heating program "Comfort setpoint" ☼ or "Reduced setpoint"☾
- Protective functions active
- Automatic summer / winter 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 Comfort setpoint
☾ Heating to Reduced setpoint

Characteristics of continuous operation:

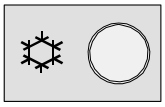
- Heating mode with no time program
- Protective functions active
- Automatic summer / winter changeover (ECO functions) and 24-hour heating limit inactive in the case of continuous operation with Comfort setpoint

Protection ⏻

When using Protection, the heating system is off. However, 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



The "Cooling" mode is selected by use of the Cooling button. The choice made is indicated by a bar which appears below the symbol.

Cooling mode

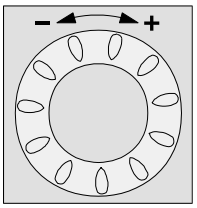
Cooling mode controls the room temperature in accordance with the time program.

Characteristics of cooling mode:

- Cooling mode based on time program
- Temperature setpoint based on "Comfort setpoint, cooling"
- Protective functions active
- Automatic summer/winter changeover active

Adjusting the room temperature setpoint

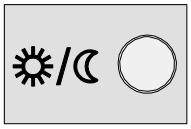
Turn the setting knob to increase or decrease the **Comfort setpoint** ☼ .
For the **Reduced** setpoint ☾
- Press OK
- Select operating page “Heating circuit“ and
- adjust the “Reduced setpoint“



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

Presence button

If you do not use the rooms for a certain period of time, you can press the presence button to reduce the room temperature, thus saving heating energy.
When the rooms are occupied again, press again the presence button to resume heating operation.



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

4.2.2 Programming

Configuration

A long press on the presence button (>3 seconds) enables the service level to be accessed. The value flashes when the parameter is active. Use the knob to modify the value. Press the presence button to select the next setting.

Settings		
Used as	ru = 1 (factory setting)	The room unit is addressed as room unit 1
	ru = 2	The room unit is addressed as room unit 2
	ru = 3	The room unit is addressed as room unit 3
Direct adjustment	P1 = 1 (factory setting)	Automatic storage: A setpoint readjustment with the knob is adopted either by pressing the operating mode button or without any further confirmation (timeout).
	P1 = 2	Storage with confirmation: A setpoint readjustment with the knob is adopted only after pressing the operating mode button.
Operation lock	P2 = 0	OFF: all functions are active (default setting)
	P2 = 1	ON: the following functions are locked: - central heating circuit switching mode - Comfort setpoint correction - user level switching (presence button)

If any of the locked buttons is pressed while the operation lock is active, the display reads out the message OFF for 3 seconds.

4.3 Overview of settings

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

E: End user
O: OEM
I: Start-up technician
F: Installer
OL: Parameter number

Legend

(*) Only for QAA75../78
(**) Only for RVS43
(***) Only for RVS63

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	-	1,01	31,12	dd.MM
3	E	Year	-	2004	2099	yyyy
5	F	Start of summertime	25,03	1,01	31,12	dd.MM
6	F	End of summertime	25,10	1,01	31,12	dd.MM
Operator unit						
20	E	Language German ...	German	-	-	-
21	O	Display of special operation On | Off	On	-	-	-
22	F	Info Temporarily Permanently	Temporary	-	-	-
26	F	Operation lock On | Off	Off	-	-	-
27	F	Programming lock On | Off	Off	-	-	-
29(**)	E	Units (°C,bar °F,PSI)	°C,bar	-	-	-
30	O	Save basic settings No | Yes	No	-	-	-
31	O	Activate basic settings No | Yes	No	-	-	-
32(**)	E	Basic setting	Compatible	-	-	-
39(**)	E	Commissionig menù On | Off	Off	-	-	-
40(*)	I	Used as Room unit 1 Room unit 2 Room unit 3 Operator unit 1 Operator unit 2 Operator unit 3 Service unit	Room unit 1	-	-	-
42(*)	I	Assignment device 1 Heating circuit 1 Heating circuit 1 and 2 Heating circuit 1 and 3 All heating circuits	Heating circuit 1	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
44	I	Operation HC2 Commonly with HC1 Independently	Commonly with HC1	-	-	-
46	I	Operation HC3 Commonly with HC1 Independently	Commonly with HC1	-	-	-
48(*)	I	Action occupancy button None Heating circuit 1 Heating circuit 2 Commonly	Heating circuit 1	-	-	-
54(*)	F	Readjustment room sensor	0,0	-3	3	°C
70	F	Software version	-	0	99,9	-
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	Mo - Su	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		Fr Sa 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
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	Period 1	1	8	-
642	E	Start	--.--	01.01	31,12	dd.MM

Operating line	User level	Function	Default value	Min	Max	Unit
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	Period 1	1	8	-
652	E	Start	--.--	1,01	31,12	dd.MM
653	E	End	--.--	1,01	31,12	dd.MM
658	E	Operating level Frost protection Reduced	Frost protection	-	-	-
Holidays heating circuit 3						
661	E	Preselection Period 1 … Period 8	Period 1	1	8	-
662	E	Start	--.--	1,01	31,12	dd.MM
663	E	End	--.--	1,01	31,12	dd.MM
668	E	Operating level Frost protection Reduced	Frost protection	-	-	-
Heating circuit 1						
700	E	Operating mode Protection Automatic Reduced Comfort	Automatically	-	-	-
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
733(**)	O	Ext'n 24-hour heating limit No Yes	Yes	-	-	-
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
744(**)	O	Swi-on ratio room stat	- - -	- - - / 1	99	%
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
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

Operating line	User level	Function	Default value	Min	Max	Unit
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
835	O	Mixing valve Xp	32	1	100	°C
836	O	Mixing valve Tn	120	10	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	-	-	-
880(**)	F	Pump speed reduction Operating level Characteristic	Characteristic	-	-	-
882	F	Pump speed min	40	0	OL 883	%
883	F	Pump speed max	100	OL 882	100	%
888(**)	O	Curve readj at 50% speed	33	0	100	%
890(**)	O	Flow setp readj speed ctrl 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

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-
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
941(**)	F	Actuator running time	120	30	873	s
942(**)	O	Mixing valve Xp	12	1	100	°C
943(**)	O	Mixing valve Tn	90	10	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						
1000	E	Operating mode Protection Automatic Reduced Comfort	Automatically	-	-	-
1010	E	Comfort setpoint	20,0	OL 1012	OL 1016	°C
1012	E	Reduced setpoint	16	OL 1014	OL	°C

Operating line	User level	Function	Default value	Min	Max	Unit
					1010	
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
1033(**)	O	Ext'n 24-hour heating limit No | Yes	Yes	-	-	-
1040	I	Flow temp setpoint min	8	8	OL 1041	°C
1041	I	Flow temp setpoint max	80	OL 1040	95	°C
1042(**)	F	Flow temp setpoint room stat	65	OL 1040	OL 1041	°C
1044(**)	O	Swi-on ratio room stat	- - -	- - - / 1	99	%
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	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
1135	O	Mixing valve Xp	24	1	100	°C
1136	O	Mixing valve Tn	90	10	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	-	-	-
1180(**)	F	Pump speed reduction Operating level Characteristic	Characteristic	-	-	-
1182	F	Pump speed min	40	0	OL 1183	%
1183	F	Pump speed max	100	OL 1182	100	%
1188(**)	O	Curve readj at 50% speed	33	0	100	%
1190(**)	O	Flow setp readj speed ctrl 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
1333(**)	O	Ext'n 24-hour heating limit No Yes	Yes	-	-	-
1340	F	Flow temp setpoint min	8	8	OL 1341	°C
1341	F	Flow temp setpoint max	80	OL 1340	95	°C
1342(**)	F	Flow temp setpoint room stat	65	OL 1340	OL 1341	°C
1344(**)	O	Swi-on ratio room stat	- - -	- - - / 1	99	%
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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
1435(**)	O	Mixing valve Xp	24	1	100	°C
1436(**)	O	Mixing valve Tn	90	10	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
1455(***)	F	Floor curing setp current	0	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	-	-	-
1472	F	With prim contr/system pump No | Yes	Yes	-	-	-
1480(**)	F	Pump speed reduction Operating level Characteristic	Characteristic	-	-	-
1482	F	Pump speed min	40	0	OL 1483	%
1483	F	Pump speed max	100	OL 1482	100	%
1488(**)	O	Curve readj at 50% speed	33	0	100	%
1490(**)	O	Flow setp readj speed ctrl No | Yes	Yes	-	-	-
1500	F	Optg mode changeover None Protection Reduced Comfort Automatic	Protection mode	-	-	-
Domestic hot water DHW						
1600	E	DHW operating mode Off | On	On	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
1601(**)	O	Optg mode selection Eco None Instantaneous water heater DHW storage tank Inst water heater + st tank	None	-	-	-
1610	E	Nominal setpoint	55	OL 1612	OL 1614 OEM	°C
1612	F	Reduced setpoint	40	8	OL 1610	°C
1614	O	Nominal setpoint max	65	8	80	°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/HCP DHW release Time program 4/DHW Time program 5	DHW release	-	-	-
1661	F	Circulating pump cycling Off | On	On	-	-	-
1663	F	Circulation setpoint	45	8	80	°C
1680(**)	F	Optg mode changeover None | Off | On	Off	-	-	-
Pumps H						
2008(***)	O	H1 DHW charging priority No | Yes	Yes	-	-	-
2010(***)	F	H1 Excess heat draw Off | On	On	-	-	-
2012(***)	F	H1 with buffer storage tank No | Yes	Yes	-	-	-
2014(***)	F	H1 prim contr/system pump No | Yes	Yes	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
2033(***)	O	H2 DHW charging priority No | Yes	Yes	-	-	-
2035(***)	F	H2 Excess heat draw Off | On	On	-	-	-
2037(***)	F	H2 with buffer storage tank No | Yes	Yes	-	-	-
2039(***)	F	H2 prim contr/system pump No | Yes	Yes	-	-	-
2046(***)	F	H3 Excess heat draw Off | On	On	-	-	-
2048(***)	F	H3 with buffer No | Yes	Yes	-	-	-
2050(***)	F	H2 prim contr/system pump No Yes	Yes	-	-	-
Consumer circuit 1						
1859(**)	I	Flow temp setp cons request	70	8	120	°C
1860(**)	F	Frost prot plant CC pump Off On	On	-	-	-
1874(**)	O	DHW charging priority No Yes	Yes	-	-	-
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	-	-	-
1924(**)	O	DHW charging priority No Yes	Yes	-	-	-
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	-	-	-
Swimming pool circuit						
1959(**)	I	Flow temp setpoint	70	8	120	°C
1960(**)	F	Frost prot plant pool pump Off On	Off	-	-	-
1974(**)	O	DHW charging priority No Yes	Yes	-	-	-
1975(**)	F	Excess heat draw Off On	On	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-
2070	O	Swimming pool temp max	32	8	95	°C
2080	F	With solar integration No Yes	Yes	-	-	-
Primary controller / system pump						
2110	O	Flow temp setpoint min	8	8	95	°C
2111	O	Flow temp setpoint max	80	8	95	°C
2112	O	Flow temp setp cooling min	8	8	20	°C
2120(**)	F	Frost prot plant syst pump Off On	On	-	-	-
2130	O	Mixing valve boost	10	0	50	°C
2131	O	Mixing valve decrease	0	0	20	°C
2132	O	Actuator type 2-position 3-position	3-position	-	-	-
2133	O	Switching differential 2-pos	2	0	20	°C
2134	O	Actuator running time	120	30	873	s
2135	O	Mixing valve Xp	24	1	100	°C
2136	O	Mixing valve Tn	90	10	873	s
2145(**)	O	DHW charging priority No Yes	Yes	-	-	-
2150	I	Primary contr/system pump Before buffer After buffer	After buffer	-	-	-
Boiler						
2200	O	Operating mode Continuous operation Automatic Auto, extended running time	Automatic	-	-	-
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
2211	O	Setpoint min OEM	40	8	95	°C

Operating line	User level	Function	Default value	Min	Max	Unit
2212	F	Setpoint max	80	Setpoint manual control	OL 2213 OEM	°C
2213	O	Setpoint max OEM	82	8	120	°C
2220	O	Release integral stage2/mod	50	0	500	°C min
2221	O	Reset integral stage2/mod	10	0	500	°C min
2232	O	Damper actuator run time	60	7,5	480	s
2233	O	Modulating Xp	20	1	200	°C
2234	O	Modulating Tn	150	10	873	s
2235	O	Modulating Tv	4,5	0	30	s
2240	O	Switching differential boiler	1	0	20	°C
2241	O	Burner running time min	2	0	20	min
2250	O	Pump overrun time	5	0	20	min
2260	O	Prot boil startup consumers Off On	Off	-	-	-
2261	O	Prot boil startup boil pump Off On	Off	-	-	-
2262	O	Optimum start control Off On	Off	-	-	-
2270	F	Return setpoint min	8	8	95	°C
2271	O	Return setpoint min OEM	30	8	95	°C
2272	O	Return influence consumers Off On	On	-	-	-
2282	O	Actuator running time	120	30	873	s
2283	O	Mixing valve Xp	32	1	100	°C
2284	O	Mixing valve Tn	120	10	873	s
2285	O	Mixing valve Tv	10	0	60	s
2290	O	Switching diff bypass pump	6	0	20	°C
2291	O	Control bypass pump Parallel burner operation Return temp	Return temperature	-	-	-
2300	O	Frost prot plant boiler pump Off On	Off	-	-	-
2310	O	Limit thermostat function Off On	On	-	-	-
2315 (***)	O	Temp differential min	- - -	- - -/ 0	80	°C
2316	O	Temp differential max	-	0	80	°C
2317(**)	O	Temp differential nominal	10	0	80	°C
2320(**)	O	Pump modulation None Demand Boiler setpoint Temp differential nominal Burner output	Burner output	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
2322	F	Pump speed min	40	0	100	%
2323	F	Pump speed max	100	0	100	%
2324	O	Speed Xp	32	1	100	°C
2325	O	Speed Tn	120	10	873	s
2326	O	Speed Tv	10	0	60	s
2330	F	Output nominal	50	0	1000	kW
2331	F	Output basic stage	30	0	1000	kW
2340(***)	F	Auto source seq 2x1 casc	500	- - -/ 10	990	h
Cascade						
3510	O	Lead strategy Late on, early off Late on, late off Early on, late off	Late on, late off	-	-	-
3511	O	Output band min	40	0	100	%
3512	O	Output band max	90	0	100	%
3530	O	Release integral source seq	50	0	500	°C min
3531	O	Reset integral source seq	20	0	500	°C min
3532	F	Restart lock	300	0	1800	s
3533	F	Switch on delay	5	0	120	min
3534	O	Forced time basic stage	0	0	1200	s
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	-	-	-
3550	O	Prot startup cascade pump Off On	Off	-	-	-
3560	F	Return setpoint min	8	8	95	°C
3561	O	Return setpoint min OEM	8	8	95	°C
3562	O	Return influence consumers Off On	On	-	-	-
3570	F	Actuator running time	120	30	873	s
3571	O	Mixing valve Xp	24	1	100	°C
3572	O	Mixing valve Tn	90	10	873	s
3590	O	Temp differential min	4	- - - / 0	20	°C
Supplementary source						
3690(**)	F	Setpoint incr main source	0	0	10	°C
3691(**)	F	Output limit main source	- - -	- - - / 1	100	%

Operating line	User level	Function	Default value	Min	Max	Unit
3692(**)	F	With DHW charging Locked Substitute Complement Instantly	Substitute	-	-	-
3694(**)	F	OT limit with DHW charging Ignore Note	Note	-	-	-
3700(**)	F	Release below outside temp	- - -	-50	50	°C
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	- - -	- - - / 0	80	°C
3720(**)	F	Switching integral	50	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	Other	-	-	-
3755(**)	F	Delay lockout position	1	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
3813	O	Temp diff on buffer	- - -	- - - / 0	40	°C
3814	O	Temp diff off buffer	- - -	- - - / 0	40	°C
3815	F	Charging temp min buffer	20	- - - / 8	95	°C
3816	O	Temp diff on swi pool	- - -	- - - / 0	40	°C
3817	O	Temp diff off swi pool	- - -	- - - / 0	40	°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

Operating line	User level	Function	Default value	Min	Max	Unit
3831	F	Min run time collector pump	20	5	120	s
3832	O	Collector start function on	07:00	00:00	23:50	hh:mm
3833	O	Collector start function off	19:00	00:00	23:50	hh:mm
3834	F	Collector start funct grad	- - -	- - - / 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	- - -	- - - / 30	350	°C
3860	F	Evaporation heat carrier	- - -	- - - / 60	350	°C
3862(**)	F	Impact evaporation superv On own collector pump On both collector pumps	On own collector pump	-	-	-
3870	F	Pump speed min	40	0	OL 3871	%
3871	F	Pump speed max	100	OL 3870	100	%
3872(***)	O	Speed Xp	32	1	100	°C
3873(***)	O	Speed Tn	120	10	873	s
3880	F	Antifreeze None Ethylene glycol Propylene glycol Ethyl and propyl glycol	None	-	-	-
3881	F	Antifreeze concentration	30	1	100	%
3884	F	Pump capacity	- - -	10	1500	l/h
3886 (**)	F	Pulse count yield None With input H1 With input H3 With input H31 Module 1 With input H31 Module 2 With input H31 Module 3 With input H32 Module 1 With input H32 Module 2 With input H32 Module 3 With input H33	None	-	-	-
3887 (**)	F	Pulse unit yield None kWh Liter	None	-	-	-
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 H31 Module 1 With input H31 Module 2 With input H31 Module 3 With input H31 Module 1 With input H31 Module 2 With input H31 Module 3 With input H32 Module 1 With input H32 Module 2 With input H32 Module 3 With input H3	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
4131(***)	F	Temp diff off	4	0	40	°C
4133(***)	F	Comparative temp DHW sensor B3 DHW sensor B31 Buff st tank sensor B4 Buff st tank sensor B41 Flow temp setpoint Setpoin min	Setpoint min	-	-	-
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 temperature	-	-	-
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 temperature	-	-	-
4140	F	Pump overrun time	20	0	120	min
4141	O	Excess heat discharge	90	60	140	°C
4153(**)	F	Return setpoint min	8	8	95	°C
4154(**)	O	Return setpoint min OEM	8	8	95	°C
4158(**)	F	Flow influence return ctrl Off On	Off	-	-	-
4163(**)	O	Actuator running time	120	30	873	s
4164(**)	O	Mixing valve Xp	24	1	100	°C
4165(**)	O	Mixing valve Tn	90	10	873	s
4170	O	Frost prot plant boiler pump Off On	Off	-	-	-
4190(**)	F	Residual heat fct dur max	- - -	5	60	min
4192(**)	F	Residual heat fct trigg Once / Several times	Once	-	-	-
4201(**)	F	Pump speed min	40	0	OL 4202	%
4202(**)	F	Pump speed max	100	OL 4201	100	%
Buffer storage tank						

Operating line	User level	Function	Default value	Min	Max	Unit
4720	F	Auto generation lock None With B4 With B4 and B42/B41	With B4	-	-	-
4721	O	Auto heat gen lock SD	2	0	20	°C
4722	F	Temp diff buffer/HC	-5	-20	20	°C
4723(**)	O	Temp diff buffer/CC	0	-20	20	°C
4724	O	Min st tank temp heat mode	- - -	- - - / 8	95	°C
4726(**)	O	Max st tank temp cool mode	25	- - - / 10	40	°C
4728(**)	F	Rel temp diff buffer/HC	0	-50	50	%
4739(**)	F	Stratification protection Off Always With solid fuel boiler	Off	-	-	-
4740(**)	O	Strat prot temp diff max	5	0	20	°C
4743(**)	O	Strat prot anticipation time	60	0	240	s
4744(**)	O	Strat protection Tn	120	10	200	s
4746(**)	O	DHW prot combi st tank Off On	Off	-	-	-
4749(**)	F	Min charging setpoint solar	8	8	94	°C
4750	F	Charging temp max	80	8	95	°C
4751	O	Storage tank temp max	90	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
4810	F	Full charging Off Current heat request Buffer setpoint	Buffer setpoint	-	-	-
4811	F	Full charge temperature min.	8	8	80	°C
4813	F	Full charging With B4 With B42/B41	With B42/B41	-	-	-
DHW storage tank						
5010	O	Charging Once/day Several times/day	Several times/day	-	-	-
5020	F	Flow setpoint boost	16	0	30	°C

Operating line	User level	Function	Default value	Min	Max	Unit
5021	F	Transfer boost	8	0	30	°C
5022	F	Type of charging Recharging Full charging Full charging legio Full charg 1st time day Full charg 1st time legio	Full charge	-	-	-
5024	O	Switching diff	3	0	20	°C
5030	O	Charging time limitation	- - -	- - - / 10	600	min
5040	O	Discharging protection Off Always Automatically	Automatically	-	-	-
5050	F	Charging temp max	80	8	OL 5051 OEM	°C
5051	O	Storage tank temp max	80	8	95	°C
5055	F	Recooling temp	70	8	95	°C
5056	F	Recooling heat gen/HCs On | Off	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	-	-	-
5063(**)	F	El immersion heater control For Eco mode On | Off	On	-	-	-
5070	O	Automatic push On | Off	On	-	-	-
5071	O	Charging prio time push	0	0	120	min
5085	F	Excess heat draw On | Off	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	-	-	-
5101	F	Pump speed min	40	0	100	%
5102	F	Pump speed max	100	0	100	%
5103(***)	O	speed Xp	32	1	100	%
5104(***)	O	speed Tn	120	10	873	%
5120	O	Mixing valve boost	0	0	50	°C
5124	F	Actuator running time	120	30	873	S
5125	O	Mixing valve Xp	24	1	100	°C
5126	O	Mixing valve Tn	90	10	873	S

Operating line	User level	Function	Default value	Min	Max	Unit
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
5142(**)	O	Flow setp compensation delay	30	0	60	s
5143(**)	O	Flow setp compensation Xp	24	1	100	°C
5144(**)	O	Flow setp compensation Tn	120	10	873	s
5145(**)	O	Flow setp compensation Tv	0	0	60	s
5146(**)	F	Full charging with B36 No | Yes	No	-	-	-
5148(**)	F	Min start temp diff Q33	-5	-20	20	°C
5149(**)	F	Start delay Q33	10	0	255	s
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 DHW heater						
5406	F	Min setp diff to tank temp	4	0	20	°C
5420(**)	F	Flow setpoint boost	6	0	30	°C
5429(**)	O	Switching diff	1	0	20	°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
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
5489(**)	F	Overrun via inst WH No | Yes	No	-	-	-
5544	F	Actuator running time	15	7,5	480	s
5545	O	Mixing valve Xp	20	1	200	°C
5546	O	Mixing valve Tn	150	10	873	s
5547	O	Mixing valve Tv	4,5	0	30	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 Modulating 3-position Modulating UX Without boiler sensor 2x1 cascade 6)	1-stage	-	-	-
5772(**)	O	Burner prerun time	- - -	- - - / 0	255	s
5840	I	Solar controlling element Charging pump Diverting valve	Charging pump	-	-	-
5841	I	External solar exchanger Jointly DHW storage tank Buffer storage tank	Jointly	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-
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	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		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				
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	DHW controlling element Q3	-	-	-
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	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		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				
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 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	-	-	-
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-
5933(***)	I	Sensor input BX4 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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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)	-	-	-
5952 (***)	I	Flow minimum setpoint	70	8	120	°C
5953 (**)	I	Input value 1 H1	0	0	1000	-
5954 (**)	I	Function value 1 H1	0	-100	500	-
5954 (***)	I	Temp value 10V H1	100	5	130	°C
5955 (**)	I	Input value 2 H1	10	0	1000	-
5956 (**)	I	Function value 2 H1	100	-100	500	-
5956 (***)	I	Pressure value 3.5V H1	5.0	0.0	10.0	bar
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 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	Optg mode changeover HCs+DHW	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		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)	-	-	-
5962 (***)	I	Min flow temp setpoint H3	70	8	120	°C
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	Make contact (NO)	-	-	-
5982(***)	I	Function input EX2 Counter 2nd burner stage Heat generation lock Error/alarm message SLT error message Excess heat discharge	Counter for second burner stage	-	-	-
5983(***)	I	Cont type input EX2 NC NO	NO	-	-	-
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
6015(***)	I	Function mixing group 2 Heating circuit 2 Return temp controller Prim contr/system pump DHW primary controller Instantaneous DHW heater Return controller cascade Cooling circuit 2(**) Heating circuit / Cooling circuit 2(**) Return controller solid fuel boiler	-	-	-	-
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
6112(***)	O	Gradient room model	60	0	300	Min/°C
6116(**)	O	Time constant setp compens	0	0	14	min
6117	O	Central setp compensation	10	- - - / 1	100	°C
6118	O	Setpoint drop delay	10	- - - / 1	200	K/min
6120	F	Frost protection plant Off On	On	-	-	-
6128(***)	F	Heat request below OT	- - -	- - -/ -50	50	°C
6129(***)	F	Heat request above OT	- - -	- - -/ -50	50	°C
6131(***)	F	Heat req in economy mode Off On DHW On	Off	-	-	-
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	%
6140	O	Water pressure max	3	- - - / 0.0	10,0	bar
6141	O	Water pressure min	0,8	- - - / 0.0	10,0	bar
6142	O	Water pressure critical min	0,5	- - - / 0.0	10,0	bar
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 H21 module 1 With input H21 module 2 With input H21 module 3 With input H22 module 1 With input H22 module 2 With input H22 module 3 With input H3	None	-	-	-
6150	O	Water pressure 2 max	3	- - - / 0.0	10,0	bar

Operating line	User level	Function	Default value	Min	Max	Unit
6151	O	Water pressure 2 min	0,8	- - - / 0.0	10,0	bar
6152	O	Water press 2 critical min	0,5	- - - / 0.0	10,0	bar
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 H21 module 1 With input H21 module 2 With input H21 module 3 With input H22 module 1 With input H22 module 2 With input H22 module 3 With input H3	None	-	-	-
6180	O	Water pressure 3 max	3	- - - / 0.0	10,0	bar
6181	O	Water pressure 3 min	0,8	- - - / 0.0	10,0	bar
6182	O	Water press 3 critical min	0,5	- - - / 0.0	10,0	bar
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 H21 module 1 With input H21 module 2 With input H21 module 3 With input H22 module 1 With input H22 module 2 With input H22 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	-
6217	I	Check no. heating circuits	-	0	199999	-
6220	I	Software version	-	0	99,9	-
6222	O	Device hours run	0	0	65535	h
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	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		Solid fuel return sensor B72 Boiler sensor B2 DHW sensor B3				
6273(**)	F	Excess heat dischar dur min	0	0	42	min
6345(**)	O	Code commissioning	0	0	99999	-
6346(**)	O	Code engineer	0	0	99999	-
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	-	-	-
6610	O	Display system messages No Yes	Yes	-	-	-
6612	O	Alarm delay	- - -	- - - / 2	60	min
6620	F	Action changeover functions Segment System	System	-	-	-
6621	F	Summer changeover Locally Centrally	Local	-	-	-
6623	F	Optg mode changeover Locally Centrally	Centrally	-	-	-
6624	F	Manual source lock Lokal Segment	Local	-	-	-
6625	F	DHW assignment Local HCs All HCs in segment All HCs in system	All HCs in system	-	-	-
6627 (**)	F	Refrigeration request Locally Centrally	Local	-	-	-
6630	F	Cascade master Always Automatically	Automatically	-	-	-
6631	F	Ext source in Eco mode Off On DHW On	On	-	-	-
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-	-
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	-
6820	O	Reset history No Yes	No	-	-	-
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	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7150	I	Simulation outside temp	-	-50,0	50	°C
7170	I	Telephone customer service	-	-	-	-
Config extension module						
-		**Module 1**				
7300(**)	F	Function extension module 1 None Multifunctional Heating circuit 1 Heating circuit 2 Heating circuit 3 Return temp controller Solar DHW Primary contr/system pump DHW primary controller Instantaneous water heater Return temp contr cascade Cooling circuit 1 Heating circ/cooling circ 1 Solid fuel boiler	-	-	-	-
7301(**)	F	Relay output QX21 module 1 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 Div valve HC/CC1 Y21 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 DHW ctrl elem Q3 Instant WH ctrl elem Q34 Suppl source control K32 Overtemperature protection K11	-	-	-	-
7302(**)	F	Relay output QX22 module 1 OL 7301	-	-	-	-
7303(**)	F	Relay output QX23 module 1 OL 7301	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7307(**)	F	Sensor input BX21 module 1 None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solar flow sensor B63 Solar return sensor B64 DHW outlet sensor B38 Solid fuel boil ret sens B72	-	-	-	-
7308(**)	F	Sensor input BX22 module 1 OL 7307	-	-	-	-
7311(**)	F	Function input H2 module 1 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Heat gen 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 DHW flow switch Circ'pump thermostat Dewpoint monitor Flow temp setp incr hygro Boiler return thermostat Status info suppl source Charg prio DHW sol fuel boil Consumer request VK1 10V Consumer request VK2 10V Pressure measurement 10V Rel room humidity 10V Room temp 10V Flow measurement 10V Temp measurement 10V	Optg mode change HCs+DHW	-	-	-
7312(**)	F	Contact type H2 module 1 NC NO	NO	-	-	-
7314(**)	F	Voltage value 1 H2 module 1	0	0	10	V
7315(**)	F	Funct value 1 H2 module 1	0	-100	500	-
7316(**)	F	Voltage value 2 H2 module 1	10	0	10	V
7317(**)	F	Funct value 2 H2 module 1	100	-100	500	-

Operating line	User level	Function	Default value	Min	Max	Unit
7318(**)	F	Temp sensor H2 module 1 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7321(**)	F	Function input H21 module 1 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Het gen 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 DHW flow switch Circ 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	-	-	-	-
7322(**)	F	Contact type H21 module 1 NC NO	NO	-	-	-
7324(**)	F	Input value 1 H21 module 1	0	0	1000	-
7325(**)	F	Funct value 1 H21 module 1	0	-100	500	-
7326(**)	F	Input value 2 H21 module 1	10	0	1000	-
7327(**)	F	Funct value 2 H21 module 1	100	-100	500	-
7328(**)	F	Temp sensor H21 module 1 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7331(**)	F	Function input H22 module 1 OL 7321	-	-	-	-
7332(**)	F	Contact type H22 module 1 NC NO	NO	-	-	-
7334(**)	F	Input value 1 H22 module 1	0	0	1000	-
7335(**)	F	Funct value 1 H22 module 1	0	-100	500	-
7336(**)	F	Input value 2 H22 module 1	10	0	1000	-
7337(**)	F	Funct value 2 H22 module 1	100	-100	500	-
7338(**)	F	Temp sensor H22 module 1 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7341(**)	F	Voltage out GX21 module 1 5 Volt 12 Volt	5 Volt	-	-	-
7342(**)	I	Funct input EX21 module 1 None Counter 1st burner stage Heat gen lock Error/alarm message Excess heat discharge	-	-	-	-
7343(**)	O	Cont type inp EX21 module 1 NC NO	NO	-	-	-
7348(**)	F	Funct output UX21 module 1 None Boiler pump Q1 DHW pump Q3 DHW interm circ pump Q33 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 Heat circuit pump HC3 Q20 Collector pump Q5 Solar pump ext exch K9 Solar pump buffer K8 Solar pump swi pool K18 Collector pump 2 Q16 Instant WH pump Q34 Solid fuel boiler pump Q10 Boiler setpoint Output request Heat request Refrigeration request Burner modulation	-	-	-	-
7349(**)	F	Sign logic out UX21 module1 Standard Inverted	Standard	-	-	-
7350(**)	F	Signal output UX21 module 1 0..10V PWM	0,,10V	-	-	-
7354(**)	F	Temp val 10V UX21 module1	100	5	130	°C
7355(**)	F	Funct output UX22 module 1 OL 7348	-	-	-	-
7356(**)	F	Sign logic out UX22 module1 Standard Inverted	Standard	-	-	-
7357(**)	F	Signal output UX22 module 1 0..10V PWM	0,,10V	-	-	-
7361(**)	F	Temp val 10V UX22 module1	100	5	130	°C
-		**Module 2**				
7375(**)	F	Function extension module 2 None Multifunctional Heating circuit 1 Heating circuit 2 Heating circuit 3 Return temp controller Solar DHW Primary contr/system pump DHW primary controller Instantaneous water heater Return temp contr cascade Cooling circuit 1 Heating circ/cooling circ 1 Solid fuel boiler	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7376(**)	F	Relay output QX21 module 2 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 Div valve HC/CC1 Y21 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 DHW ctrl elem Q3 Instant WH ctrl elem Q34 Suppl source control K32 Overtemperature protection K11	-	-	-	-
7377(**)	F	Relay output QX22 module 2 OL 7376	-	-	-	-
7378(**)	F	Relay output QX23 module 2 OL 7376	-	-	-	-
7382(**)	F	Sensor input BX21 module 2 None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solar flow sensor B63 Solar return sensor B64 DHW outlet sensor B38 Solid fuel boil ret sens B72	-	-	-	-
7383(**)	F	Sensor input BX22 module 2 OL 7382	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7386(**)	F	Function input H2 module 2 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Heat gen 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 DHW flow switch Circ'pump thermostat Dewpoint monitor Flow temp setp incr hygro Boiler return thermostat Status info suppl source Charg prio DHW sol fuel boil Consumer request VK1 10V Consumer request VK2 10V Pressure measurement 10V Rel room humidity 10V Room temp 10V Flow measurement 10V Temp measurement 10V	-	-	-	-
7387(**)	F	Contact type H2 module 2 NC NO	NO	-	-	-
7389(**)	F	Voltage value 1 H2 module 2	0	0	10	V
7390(**)	F	Funct value 1 H2 module 2	0	-100	500	-
7391(**)	F	Voltage value 2 H2 module 2	10	0	10	V
7392(**)	F	Funct value 2 H2 module 2	100	-100	500	-
7393(**)	F	Temp sensor H2 module 2 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7396(**)	F	Function input H21 module 2 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Het gen 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	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		DHW flow switch Circ 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				
7397(**)	F	Contact type H21 module 2 NC NO	NO	-	-	-
7399(**)	F	Input value 1 H21 module 2	0	0	1000	-
7400(**)	F	Funct value 1 H21 module 2	0	-100	500	-
7401(**)	F	Input value 2 H21 module 2	10	0	1000	-
7402(**)	F	Funct value 2 H21 module 2	100	-100	500	-
7403(**)	F	Temp sensor H21 module 2 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7406(**)	F	Function input H22 module 2 OL 7396	-	-	-	-
7407(**)	F	Contact type H22 module 2 NC | NO	NO	-	-	-
7409(**)	F	Input value 1 H22 module 2	0	0	1000	-
7410(**)	F	Funct value 1 H22 module 2	0	-100	500	-
7411(**)	F	Input value 2 H22 module 2	10	0	1000	-
7412(**)	F	Funct value 2 H22 module 2	100	-100	500	-
7413(**)	F	Temp sensor H22 module 2 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7416(**)	F	Voltage out GX21 module 2 5 Volt 12 Volt	5 Volt	-	-	-
7417(**)	I	Funct input EX21 module 2 None Counter 1st burner stage Heat gen lock Error/alarm message Excess heat discharge	-	-	-	-
7418(**)	O	Cont type inp EX21 module 2 NC NO	NO	-	-	-
7423(**)	F	Funct output UX21 module 2 None Boiler pump Q1 DHW pump Q3 DHW interm circ pump Q33 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 Heat circuit pump HC3 Q20 Collector pump Q5 Solar pump ext exch K9 Solar pump buffer K8 Solar pump swi pool K18 Collector pump 2 Q16	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		Instant WH pump Q34 Solid fuel boiler pump Q10 Boiler setpoint Output request Heat request Refrigeration request Burner modulation				
7424(**)	F	Sign logic out UX21 module2 Standard Inverted	Standard	-	-	-
7425(**)	F	Signal output UX21 module 2 0..10V PWM	0,,10V	-	-	-
7429(**)	F	Temp val 10V UX21 module2	100	5	130	°C
7430(**)	F	Funct output UX22 module 2 OL 7423	-	-	-	-
7431(**)	F	Sign logic out UX22 module2 Standard Inverted	Standard	-	-	-
7432(**)	F	Signal output UX22 module 2 0..10V PWM	0,,10V	-	-	-
7436(**)	F	Temp val 10V UX22 module2	100	5	130	°C
-		**Module 3**				
7450(**)	F	Function extension module 3 None Multifunctional Heating circuit 1 Heating circuit 2 Heating circuit 3 Return temp controller Solar DHW Primary contr/system pump DHW primary controller Instantaneous water heater Return temp contr cascade Cooling circuit 1 Heating circ/cooling circ 1 Solid fuel boiler	-	-	-	-
7451(**)	F	Relay output QX21 module 3 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	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		DHW interm circ pump Q33 Heat request K27 Refrigeration request K28 Air dehumidifier K29 Div valve HC/CC1 Y21 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 DHW ctrl elem Q3 Instant WH ctrl elem Q34 Suppl source control K32 Overtemperature protection K11				
7452(**)	F	Relay output QX22 module 3 OL 7451	-	-	-	-
7453(**)	F	Relay output QX23 module 3 OL 7451	-	-	-	-
7457(**)	F	Sensor input BX21 module 3 None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temp sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector sensor 2 B61 Solar flow sensor B63 Solar return sensor B64 DHW outlet sensor B38 Solid fuel boil ret sens B72	-	-	-	-
7458(**)	F	Sensor input BX22 module 3 OL 7457	-	-	-	-
7461(**)	F	Function input H2 module 3 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Heat gen 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 DHW flow switch Circ'pump thermostat Dewpoint monitor Flow temp setp incr hygro Boiler return thermostat Status info suppl source Charg prio DHW sol fuel boil Consumer request VK1 10V Consumer request VK2 10V Pressure measurement 10V	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		Rel room humidity 10V Room temp 10V Flow measurement 10V Temp measurement 10V				
7462(**)	F	Contact type H2 module 3 NC NO	NO	-	-	-
7464(**)	F	Voltage value 1 H2 module 3	0	0	10	V
7465(**)	F	Funct value 1 H2 module 3	0	-100	500	-
7466(**)	F	Voltage value 2 H2 module 3	10	0	10	V
7467(**)	F	Funct value 2 H2 module 3	100	-100	500	-
7468(**)	F	Temp sensor H2 module 3 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7471(**)	F	Function input H21 module 3 None Optg mode change HCs+DHW Optg mode changeover DHW Optg mode changeover HCs Optg mode changeover HC1 Optg mode changeover HC2 Optg mode changeover HC3 Het gen 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 DHW flow switch Circ 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	-	-	-	-
7472(**)	F	Contact type H21 module 3 NC NO	NO	-	-	-
7474(**)	F	Input value 1 H21 module 3	0	0	1000	-
7475(**)	F	Funct value 1 H21 module 3	0	-100	500	-
7476(**)	F	Input value 2 H21 module 3	10	0	1000	-
7477(**)	F	Funct value 2 H21 module 3	100	-100	500	-
7478(**)	F	Temp sensor H21 module 3 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7481(**)	F	Function input H22 module 3 OL 7471	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7482(**)	F	Contact type H22 module 3 NC NO	NO	-	-	-
7484(**)	F	Input value 1 H22 module 3	0	0	1000	-
7485(**)	F	Funct value 1 H22 module 3	0	-100	500	-
7486(**)	F	Input value 2 H22 module 3	10	0	1000	-
7487(**)	F	Funct value 2 H22 module 3	100	-100	500	-
7488(**)	F	Temp sensor H22 module 3 None Solar flow sensor B63 Solar return sensor B64	None	-	-	-
7491(**)	F	Voltage out GX21 module 3 5 Volt | 12 Volt	5 Volt	-	-	-
7492(**)	I	Funct input EX21 module 3 None Counter 1st burner stage Heat gen lock Error/alarm message Excess heat discharge	-	-	-	-
7493(**)	O	Cont type EX21 module 3 NC NO	NO	-	-	-
7498(**)	F	Funct output UX21 module 3 None Boiler pump Q1 DHW pump Q3 DHW interm circ pump Q33 Heat circuit pump HC1 Q2 Heat circuit pump HC2 Q6 Heat circuit pump HC3 Q20 Collector pump Q5 Solar pump ext exch K9 Solar pump buffer K8 Solar pump swi pool K18 Collector pump 2 Q16 Instant WH pump Q34 Solid fuel boiler pump Q10 Boiler setpoint Output request Heat request Refrigeration request Burner modulation	-	-	-	-
7499(**)	F	Sign logic out UX21 module3 Standard Inverted	Standard	-	-	-
7500(**)	F	Signal output UX21 module 3 0..10V PWM	0,,10V	-	-	-
7504(**)	F	Temp val 10V UX21 module3	100	5	130	°C
7505(**)	F	Funct output UX22 module 3 OL 7498	-	-	-	-
7506(**)	F	Sign logic out UX22 module3 Standard Inverted	Standard	-	-	-
7507(**)	F	Signal output UX22 module 3 0..10V PWM	0,,10V	-	-	-
7511(**)	F	Temp val 10V UX22 module3	100	5	130	°C

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-
7710(***)	I	Output test UX	-	0	100	%
7711(***)	I	Voltage signal UX	0	0	10	Volt
7730	I	Outside temp B9	-	-50,0	50	°C
7732	I	Flow temp B1	-	0,0	140	°C
7734(***)	I	Flow temp B12	-	0.0	140	°C
7750	I	DHW temp B3	-	0,0	140	°C
7760	I	Boiler temp B2	-	0,0	140	°C
7780(**)	F	Output test UX21 module 1	- - -	- - -/ 0	100	%
7781(**)	F	Output signal UX21 module 1	0	0	100	-
7781(**)	F	[Output signal UX21 module 1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-
7782(**)	F	Output test UX22 module 1	- - -	- - -/ 0	100	%
7783(**)	F	Output signal UX22 module 1	0	0	100	-
7783(**)	F	[Output signal UX22 module 1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-
7784(**)	F	Output test UX21 module 2	- - -	- - -/ 0	100	%
7785(**)	F	Output signal UX21 module 2	0	0	100	-
7785(**)	F	[Output signal UX21 module 2] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-
7786(**)	F	Output test UX22 module 2	- - -	- - -/ 0	100	%
7787(**)	F	Output signal UX22 module 2	0	0	100	-
7787(**)	F	[Output signal UX22 module 2] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7788(**)	F	Output test UX21 module 3	- - -	- - -/ 0	100	%
7789(**)	F	Output signal UX21 module 3	0	0	100	-
7789(**)	F	[Output signal UX21 module 3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-
7790(**)	F	Output test UX22 module 3	- - -	- - -/ 0	100	%
7791(**)	F	Output signal UX22 module 3	0	0	100	-
7791(**)	F	[Output signal UX22 module 3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V PWM %	None	-	-	-
7820	I	Sensor temp BX1	-	-28,0	350	°C
7821	I	Sensor temp BX2	-	-28,0	350	°C
7822(***)	I	Sensor temp BX3	0	-28	350	°C
7823(***)	I	Sensor temp BX4	0	-28	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	-	-	-	-
7844(**)	F	Input signal H1	0	0	65535	-
7844(**)	F	[Output signal H1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7845	F	Input signal H2 module 1	0	0	65535	-
7845(**)	F	[Output signal H2 module 1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7845(**)	F	Input signal H21 module 1	0	0	65535	-
7845	F	[Output signal H21 module 1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7846	F	Input signal H22 module 1	0	0	65535	-
7846(**)	F	[Output signal H22 module 1] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7847(**)	F	Input signal H2 module 2	0	0	65535	-
7847(**)	F	[Output signal H2 module 2] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7847(**)	F	Input signal H21 module 2	0	0	65535	-
7847(**)	F	[Output signal H21 module 2] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7848(**)	F	Input signal H22 module 2	0	0	65535	-
7848(**)	F	[Output signal H22 module 2] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7849(**)	F	Input signal H2 module 3	0	0	65535	-
7849(**)	F	[Output signal H2 module 3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7849(**)	F	Input signal H21 module 3	0	0	65535	-
7849(**)	F	[Output signal H21 module 3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7850(**)	F	Input signal H22 module 3	0	0	65535	-
7850(**)	F	[Output signal H22 module 3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7854(***)	I	Voltage signal H3	0	0	10	-
7855(***)	I	Contact state H3 Open Closed	-	-	-	-
7858(**)	F	Input signal H3	0	0	65535	-
7858(**)	F	[Output signal H3] None Closed (ooo), Open (- - -) Pulse Frequency Hz Voltage V	None	-	-	-
7870	I	Burner fault S3 0V 230V	-	-	-	-
7881	I	1st burner stage E1 0V 230V	-	-	-	-
7884(**)	I	SLT error message L1 0V 230V	-	-	-	-
7912(***)	I	Input EX21 0V 230V	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
7950(**)	I	Input EX21 module 1 0V | 230V	0V	-	-	-
7951(**)	I	Input EX21 module 2 0V | 230V	0V	-	-	-
7952(**)	I	Input EX21 module 3 0V 230V	0V	-	-	-
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	-	-	-	-
Diagnostics cascade						
8100 ÷ 8130	I	Priority/state source 1…16	-	-	-	-
8101 ÷ 8131	I	State source 1...16 Missing Faulty Manual control active Heat generation lock active Chimney sweep funct active DHW separate circuit active8) Temporarily unavailable7) 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	-	-	-	-
8308(***)	I	Boiler pump speed	0	0	100	%
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	%

Operating line	User level	Function	Default value	Min	Max	Unit
8330	F	Hours run 1st stage	0	0	65535	h
8331	F	Start counter 1st stage	-	0	199'999	-
8332(***)	F	Hours run 2nd stage	0	0	65535	h
8333(***)	F	Start counter 2nd stage	0	0	199999	-
8505(***)	I	Speed collector pump 1	0	0	100	%
8506(***)	I	Speed solar pump ext exch	0	0	100	%
8507(***)	I	Speed solar pump buffer	0	0	100	%
8508(***)	I	Speed solar pump swi pool	0	0	100	%
8510	I	Collector temp 1	-	-28,0	350	°C
8511	I	Collector temp 1 max	0	-28,0	350	°C
8512	I	Collector temp 1 min	0	-28,0	350	°C
8513	I	ΔT collector 1/DHW	-	-168,0	350	°C
8514	I	ΔT collector 1/buffer	-	-168,0	350	°C
8515	I	ΔT 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	999999 9.9	kWh
8530	F	Hours run solar yield	-	0	65535	h
8531	F	Hours run collect overtemp	-	0	65535	h
8543(***)	I	Speed collector pump 2	0	0	100	%
8547	I	Collector temp 2	0	-28	350	°C
8548	I	Collector temp 2 max	-28	-28	350	°C
8549	I	Collector temp 2 min	3500	-28	350	°C
8550	I	ΔT collector 2/DHW	0	-168	350	°C
8551	I	ΔT collector 2/buffer	0	-168	350	°C
8552	I	ΔT collector 2/swimming pool	0	-168	350	°C
8560	I	Solid fuel boiler temp	0	0	140	°C
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
8568(**)	I	Speed solid fuel boiler pump	0	0	100	%
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	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
		On				
8732	I	Heat circ mix valve cl Y2 Off On	-	-	-	-
8735	I	Speed heating circuit pump 1	0	0	100	%
8740	I	Room temp 1	-	0,0	50,0	°C
8741	I	Room setpoint 1	-	4,0	35,0	°C
8742	O	Room temp 1 model	-	0,0	50,0	°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	-	-	-	-
8765	I	Speed heating circuit pump 2	0	0	100	%
8770	I	Room temp 2	-	0,0	50	°C
8771	I	Room setpoint 2	-	4,0	35	°C
8772	O	Room temp 2 model	-	0,0	50	°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	-	-	-	-
8795	I	Speed heating circuit pump 3	0	0	100	%
8800	I	Room temp 3	-	0,0	50	°C
8801	I	Room setpoint 3	-	4,0	35	°C
8802	O	Room temp 3 model	-	0,0	50	°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	-	-	-	-
8825	I	Speed DHW pump	0	0	100	%
8826	I	Speed DHW interm circ pump	0	0	100	%
8827(**)	I	Speed inst DHW heater pump	0	0	100	%
8830	I	DHW temp 1	-	0,0	140	°C
8831	I	DHW temp setpoint	-	8,0	80	°C
8832	I	DHW temp 2	-	0,0	140	°C
8835	I	DHW circulation temp	-	0,0	140	°C
8836	I	DHW charging temp	0	0	140	°C
8850	I	DHW primary controller temp	0	0	140	°C
8851	I	DHW primary controller setp	0	0	140	°C
8852	I	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
9000(***)	I	Flow temperature setpoint H1	-	5.0	130.0	°C
9001(***)	I	Flow temp setpoint H2	-	5.0	130.0	°C
9004(***)	I	Flow temp setpoint H3	8	8	120	°C
9005	I	Water pressure 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	-	-	-	-

Operating line	User level	Function	Default value	Min	Max	Unit
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	-	-	-	-
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	-	-	-	-

5 The settings in detail

5.1 Time of day and date

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

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

Summer- / wintertime changeover

The dates set for the 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).

5.2 Operator unit

Operation and display

Line no.	*Operating line*
20	**Language**
22	**Info** Temporary Permanently
26	**Operation lock**
27	**Programming lock**
28	**Direct adjustment** Automatic storage Save with acknowledgment
29	**Unit of measure**
32	**Factory settings**
39	**Start-up menu**

Info

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

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

Operation lock

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

Programming lock

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

- Temporary deactivation of the programming lock.
  Within the programming level, the programming lock can temporarily be overridden. To do this, press the OK and ESC buttons simultaneously for 3 seconds. Temporary deactivation of the programming lock is maintained until programming is quit.

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

Used as

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

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

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

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

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

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

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

Room unit 3
The 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 of presence button** None. Heating circuit 1 Heating circuit 2 Jointly

Assignment device 1

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

Operation HC2

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

Commonly with HC1

Operation acts commonly on heating circuits 1 and 2.

Independently

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

Operation 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 presence button

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

If only 1 heating circuit is assigned, the presence 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.

5.3 Time programs

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

Entering the switching times

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

Switching points

Line no.					*Operating line*
HC1	*HC2*	*HC3*	*4/DHW*	*5*	
500	**520**	**540**	**560**	**600**	**Preselection** Mo - Su Mo - Fr Sa - Su Mo - Su
501	**521**	**541**	**561**	**601**	**1st phase on**
502	**522**	**542**	**562**	**602**	**1st phase off**
503	**523**	**543**	**563**	**603**	**2nd phase on**
504	**524**	**544**	**564**	**604**	**2nd phase off**
505	**525**	**545**	**565**	**605**	**3rd phase on**
506	**526**	**546**	**566**	**606**	**3rd phase off**

Standard program

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

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

In that case, individual settings will be lost!

5.4 Holidays

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
641	**651**	**661**	**Preselection**
642	**652**	**662**	**Start**
643	**653**	**663**	**End**
648	**658**	**668**	**Operating level** frost protection Reduced

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

- The holiday program can only be used in "Automatic" mode

5.5 Heating circuits

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

Operating mode

Line no.	*Operating line*
700-1000-1300	**Operating mode** Protection mode Automatically Reduced Comfort

The operating mode of heating circuits 1 and 2 is selected directly with the operating mode button while the operating mode of heating circuit 3 is to be selected in programming mode (operating line 1300).

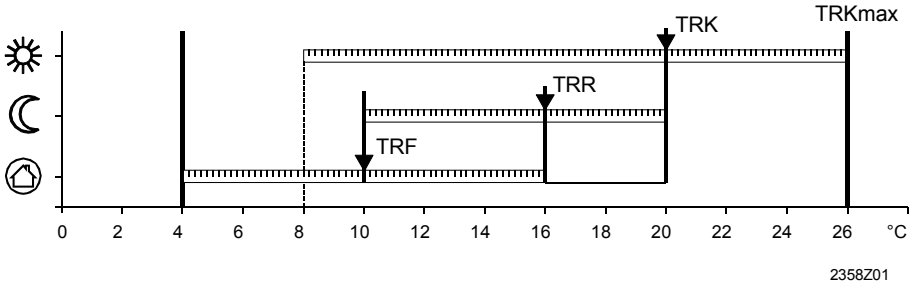
This setting is used to switch between the different operating modes. The functionality corresponds to operating mode selection with the operating mode button. For details, refer to section ”Operation“.

Setpoints

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
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 room temperature can be shifted according to different setpoints. These setpoints become active depending on the selected operating mode, thus producing different temperature levels in the rooms.
The ranges of adjustable setpoints result from the interdependencies, as this is shown in the following diagram.



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

Comfort setpoint

The Comfort setpoint is the temperature desired during normal use of the room. The setpoint is active at the Comfort level of Automatic mode and in Comfort mode.

Reduced setpoint

The Reduced setpoint is the temperature desired when the room is not in regular use (e.g. at night or when left empty for a number of hours). The setpoint is active at the Reduced level of Automatic mode and in Reduced mode.

Frost protection

In Protection mode, the room temperature is prevented from falling below a certain level. This means that the frost protection setpoint of the room temperature will be maintained.

Comfort setpoint max

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

Heating curve

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

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

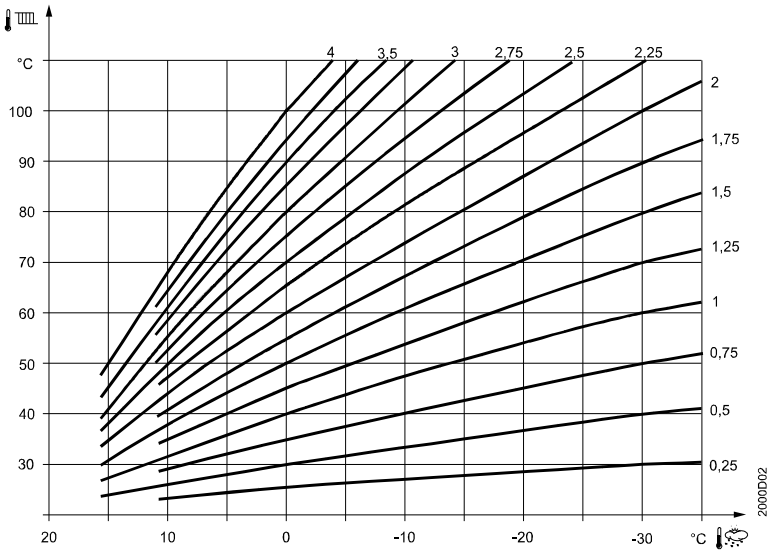
Heating curve slope

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

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

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

The programmed heating curve is based on a room setpoint of 20°C. If the room setpoint is adjusted, the heating curve automatically adapts 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

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

To assure this function, following must be observed:

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

ECO functions

Line no.			*Operating line*
HC1	*HC2*	*HC3*	
730	**1030**	**1330**	**Summer/winter heating limit**
732	**1032**	**1332**	**24-hour heating limit**

Summer/winter heating limit

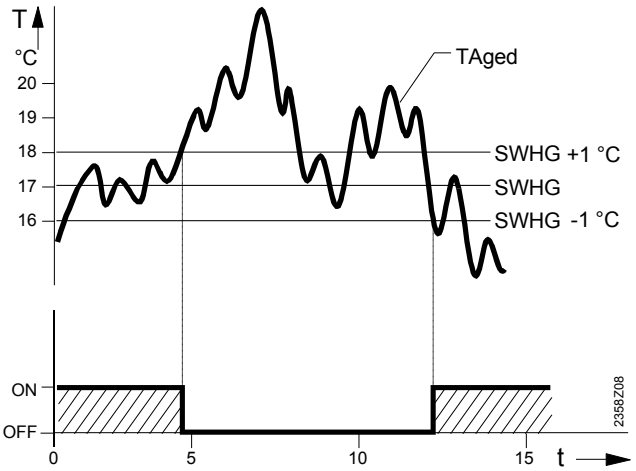
The summer / winter heating limit is used to switch the heating on and off in the course of the year, depending on temperature conditions. In Automatic mode, switching on / off takes place automatically, so there is no need for the user to do this manually. By changing the setting, the respective periods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

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

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

- The function is not active in operating mode ”Continuously Comfort temperature“
- The display shows ECO
- To incorporate 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 spring and autumn to respond to short-term temperature variations.

Example:

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

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

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

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

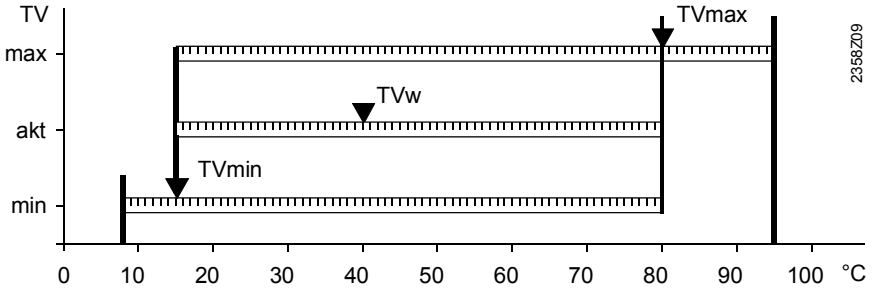
Decrease: Heating mode will start *later,* changeover to ECO *earlier.*

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

Flow temperature setpoint limits

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
740	**1040**	**1340**	**Flow temp setpoint min**
741	**1041**	**1341**	**Flow temp setpoint max**
742	**1042**	**1342**	**Room thermostat flow temperature setpoint**

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



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

Room thermostat flow temperature setpoint

In applications with a room thermostat, the heating circuit is only switched on when the room thermostat requests heat.
Heat is requested according to a fixed value or temperature compensation, depending on the setting:

Setting	*Compensation variant*
- - -	**Temperature requested according to heating curves**
8 .. 95 °C	**Temperature requested according to setpoint***
** Beyond the comfort setpoint there is no heating request and the heating curve remains off.*	

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

Room influence

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

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

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

* Outside sensor required.

Weather compensation only

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

Weather compensation with room influence

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

- Example:

Approx. 60 % Good reference room 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).

Room compensation only

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

To activate the function, following must be considered:

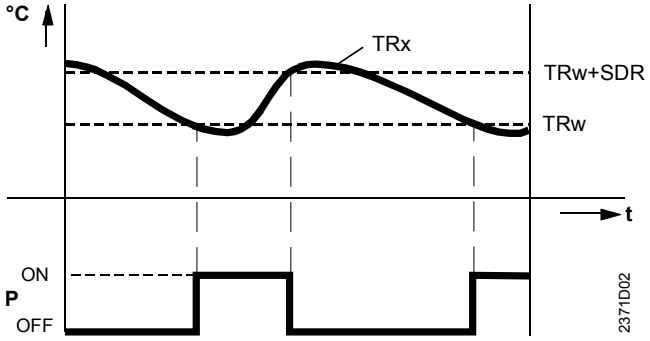
- A room sensor must be connected.
- “Room influence“ must be set to 100 %.
- There should be no thermostatic radiator valves in the reference room (mounting location of the room sensor). (if such valves are present, they must be set to their fully open position).

Room temp limitation

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

With the "Room temperature limitation" function, the heating circuit pump can be disabled if the room temperature exceeds the current room temperature setpoint by more than the preset differential.
The heating circuit pump is re-enabled when the room temperature returns to a level below the current room temperature setpoint.
While the "Room temperature limitation" function is active, no demand signals are sent to the heat source.

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



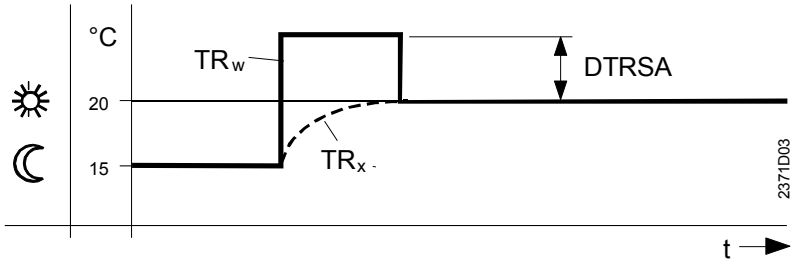
TRx Actual value room temp
TRw Room temperature setpoint
SDR Room switching differential
P Pump
t Time

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 reducing the heat-up time. During boost heating, the room temperature setpoint is raised by the value set here. A higher setting leads to shorter heat- up times, a lower setting to longer heat-times.

- Boost heating is possible with or without room sensor.



TRw 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 valve circuits, the mixing valve is fully closed.

- Function with room sensor:

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

- Function without room sensor:

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

Example

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

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

- Quick setback is possible with or without a room sensor

Optimum start / stop control

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

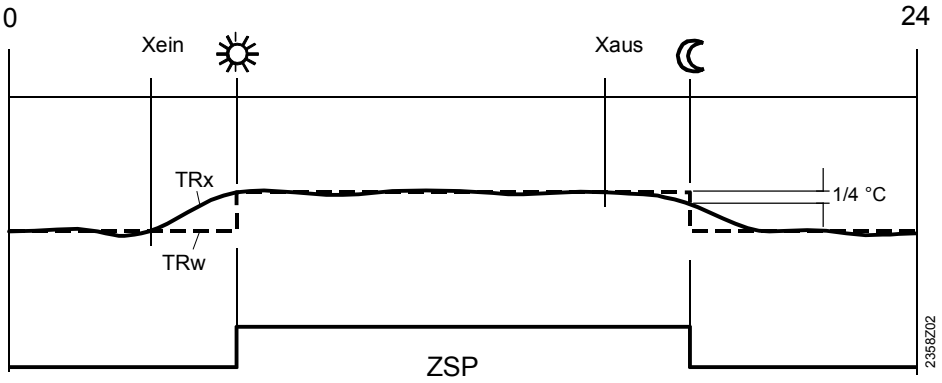
Optimum start control max

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

Optimum top control max

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

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



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

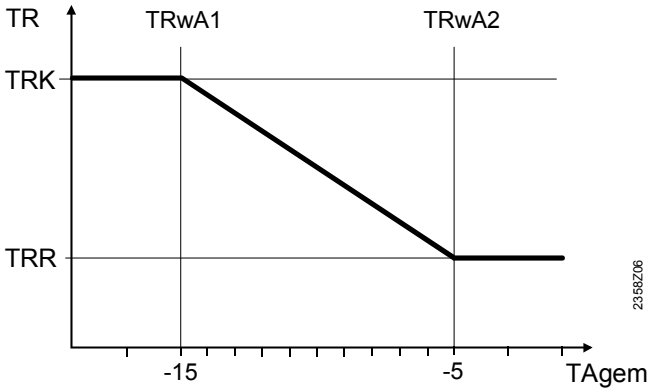
Heating gradient

The heating gradient determines the time required to increase room temperature by 1°C.
If room temperature fails to reach the Comfort setpoint within the necessary time, this setting must be increased.
The heating gradient is only effective when optimisation on ignition is active.

Raising the reduced setpoint

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

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



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

HC frost protection

Parameter number			*Function*
HC1	*HC2*	*HC3*	
810	**1110**	**1410**	**HC pump frost protection** Off | On

When set to "ON", the corresponding HC pump is activated in order to activate the system frost protection (see description of the plant frost protection).

Overtemp prot pump 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.
The function "Overtemperature protection for pump heating circuits" ensures that the energy supply for pump heating circuits corresponds to the demand from the heating curve by activating / deactivating the pump.

Mixing valve control

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

Comparison setpoint increase differential

To allow flow temperature from the mixer valve to be controlled, flow temperature must be higher than the mixer valve's demand temperature setpoint. The controller sums the temperature increase produced by the mixer valve to the flow temperature and uses the result as the reference value for heat production.

Actuator type

2-position
The controller uses only one output relay to control the actuator. When the output is active, the controlled valve opens. When the output is deactivated, the valve closes automatically.
3-position
The controller uses two output relays to control the actuator. One output is used to open the controlled valve, the other to close it.

Switching differential 2-pos

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

Mixing valve boost

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

Actuator running time

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

Floor curing function

Line no.			Operating line
HC1	HC2	HC3	
850	**1150**	**1450**	**Floor curing function** Off Functional heating (Fh) Curing heating (Bh) Functional/curing heating Curing heating/ functional heating Manually
851	**1151**	**1451**	**Floor curing setp manually**
		1455	**Floor curing setp current**
856	**1156**	**1456**	**Floor curing – current day**
857	**1157**	**1457**	**Floor curing - complete day**

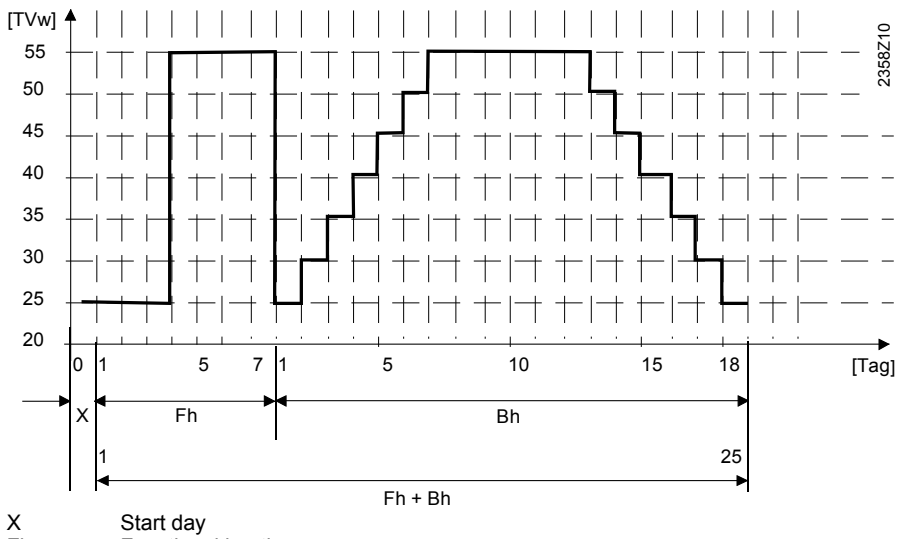
The floor curing function ensures controlled drying of the floor. It controls the flow temperature according to a temperature profile. Drying of the floor is ensured via the floor heating system and the mixing or pump heating circuit.

Floor curing function

Off:
Function is deactivated.
Functional heating (Fh) :
The first part of the temperature profile is automatically completed.
Floor curing heating (Bh)
The second part of the temperature profile is traversed automatically.
Functional and floor curing heating
The entire temperature profile (first and second part) is passed automatically.
Floor curing heating and functional heating
The entire temperature profile (first and second part) is traversed automatically.
Manually
It is not a temperature profile that is completed, but the floor setpoint is controlled manually.

⚠

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



X Start day
Fh Functional heating
Bh Floor curing heating

Floor curing setp manual

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

Floor curing setp current

Shows the current flow temperature setpoint of the floor-curing process in progress

Floor curing day current

Shows the current day of the floor-curing process in progress.

Excess heat draw

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

Excess heat draw can be triggered by the following functions:

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

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

Off

Excess heat dissipation is deactivated.

Heating mode

Excess heat dissipation is activated when the controller is in heating mode.

Always

Excess heat dissipation is active in all functioning modes.

Buffer storage tank / primary controller

Line no.			Operating line
HC1	HC2	HC3	
870	**1170**	**1470**	**With buffer storage tank**
872	**1172**	**1472**	**With primary controller / system pump**

With buffer storage tank

If there is a buffer storage tank, specify whether the heating circuit can draw heat from it.

When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

Specify whether the heating circuit receives its heat via the primary controller or with the help of the system pump (depending on the type of plant).

Speed-controlled pump

Line no.			Operating line
HC1	HC2	HC3	
882	**1182**	**1482**	**Pump speed min**
883	**1183**	**1483**	**Pump speed max**
880	**1180**	**1480**	**Pump speed reduction (operating level / characteristic)**

Pump speed min

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

Pump speed max

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

Pump speed reduction

Operating level

The speed of the heating circuit pump is calculated on the basis of operating level. In Comfort level and in floor curing mode, pump speed is determined by the maximum speed parameter.

Characteristic
To compensate for variations in temperature, the heating circuit pump is kept at minimum speed until the demand for heat can be satisfied. The increase in flow temperature can be determined by the parameter setting. The setting determines increases in flow rate as percentages of the minimum speed of the heating circuit pump. Speed increases only after the maximum flow temperature setpoint is reached.

Remote control

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

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

RVS43.. only

5.6 Cooling circuit

For the operation of a cooling circuit, the cooling function must be enabled (operating line 901) and released in accordance with a time program (operating line 907). The system automatically operates in cooling mode when the room temperature rises above the Comfort cooling setpoint (operating line 902).
Cooling mode is interrupted if there is a heating demand from heating/cooling circuit 1, or if a heating demand signal is received from the DHW circuit or another heating circuit.

Operating mode

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

This line is used to set the operating mode for cooling.

This setting is the same as the selection of cooling mode with the cooling button on a room unit.

Off
The cooling function is switched off.

Automatic
Automatic mode controlled by the time program, presence button or holiday program, subject to the enable conditions set via operating line 907.

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.

Setpoints

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

Room setpoint in cooling mode.
Summer compensation, operating line 920 can raise the setpoint as a function of the outside temperature.

Release

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

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

24 h/day
Cooling is released continuously (24 hours a day)
Time programs, HCs
Cooling is released in accordance with the heating circuit time program
Time program 5
Cooling is released in accordance with time program 5.

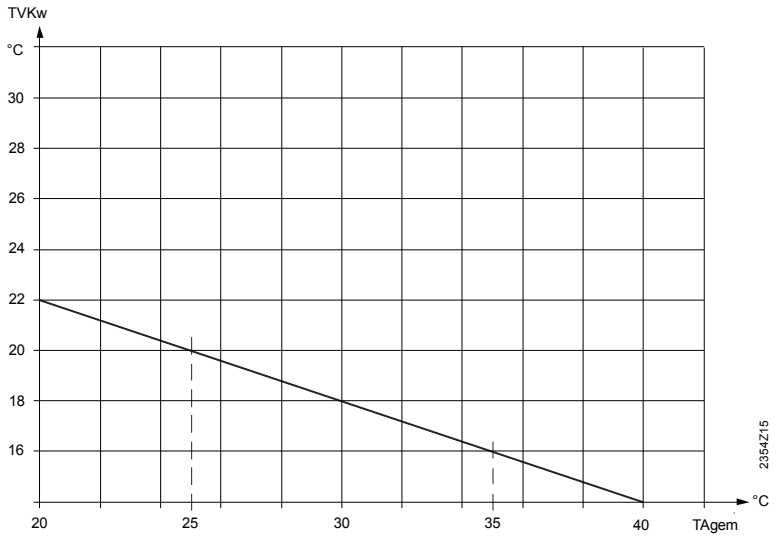
Cooling curve

Line no.	*Operating line*
908	**Flow setpoint at outside temperature of 25°C**
909	**Flow setpoint at outside temperature of 35°C**

Flow temperature setpoint

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

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



TVKw Flow temperature setpoint, cooling
TAgem Composite outside temperature

ECO

Line no.	*Operating line*
912	**Cooling limit at OT (outside temperature)**
913	**Locking period at end of heating**

Cooling limit at TA (outside temperature)

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

Locking period 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 which can be set here. This "locking period" begins when there is no heating demand from heating circuit 1.

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

Summer compensation

Line no.	*Operating line*
918	**Start of summer compensation at OT**
919	**End of summer compensation at OT**
920	**Summer compensation setpoint 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 outside air temperature.

Start of summer compensation at OT

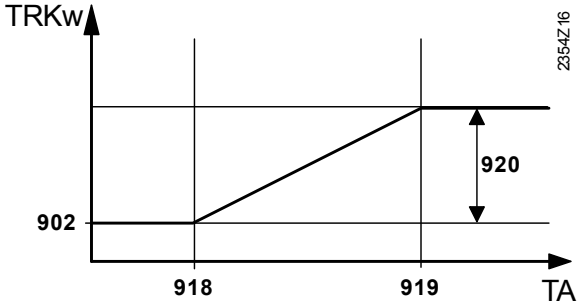
Summer compensation starts to take effect at the outside temperature set here. If the outside temperature continues to rise, the comfort setpoint is raised in parallel.

End of summer compensation at OT

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

Summer compensation setpoint increase

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



TRKw Cooling setpoint
TA Outside temperature (OT)

Flow temperature setpoint limits

Line no.	*Operating line*
923	**Min. flow setpoint at OT 25°C**
924	**Min. flow setpoint at OT 35°C**

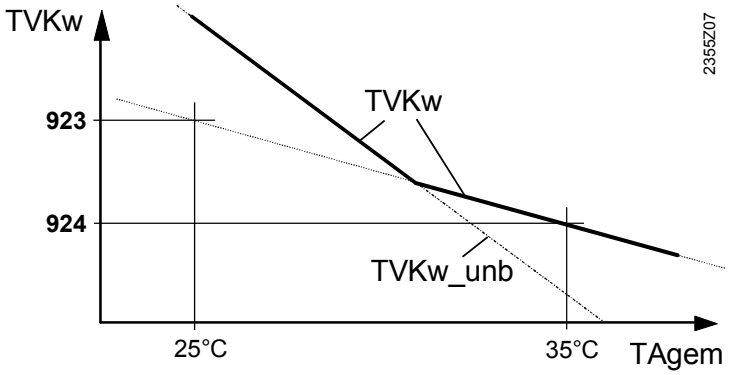
A low limit can be defined for the cooling flow temperature.
The limit curve is determined by defining two fixed points.

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

Min. flow setpoint

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

If there is no valid outside air temperature available, the controller uses the value "Flow setpoint min TA = 35°C"



TVKw Flow temperature setpoint for cooling (with low limit control)
TVKw_unb Flow temperature setpoint for cooling (without low limit control)
TAgem Composite outside temperature

Room influence

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

Compensation variants

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

Setting	*Type of compensation*
– – – %	Weather compensation only *
1…99 %	Weather compensation with room influence
100 %	Room compensation only

* Outside sensor required.

Weather compensation only

The flow temperature is calculated via 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, the control does not take account of 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. In this way, account is taken of room temperature deviations, to facilitate more accurate room temperature control. The effect of the 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.
- The ”Room influence“ setting must be selected 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).

Room compensation only

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

To activate the function, following must be considered:

- A room sensor must be connected.
- “Room influence“ must be set to 100 %.
- There should be no 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 temp limitation

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

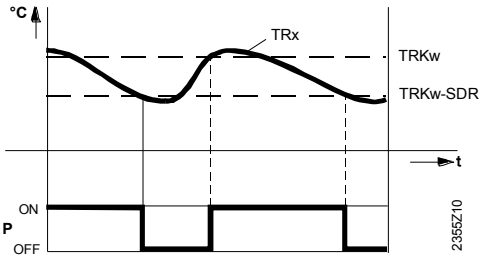
The room temperature limitation function makes it possible to disable the cooling circuit pump if the room temperature falls by more than the programmed offset from the effective room setpoint (with summer compensation, operating line 920).

The cooling circuit pump is activated again as soon as the room temperature returns to a level above 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 circumstances:

- No room temperature sensor
- "Room temp limitation" = ---
- "Room influence“ (928) = --- (weather compensation only)



TRx Actual value room temp

TRKw Room temp. setpoint cooling (with summer compensation)

SDR Room switching differential

P Pump

t Time

Cooling circuit pump frost protection

Parameter number	*Function*
937	**Cooling circuit pump frost protection** Off ¦ On

When set "ON", the corresponding cooling circuit pump switches on to activate the frost protection function.

Mixing valve control

Line no.	*Operating line*
938	**Mixing valve cooling offset**
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 cooling offset

The refrigeration demand from the mixing valve circuit to the heat source is reduced by the value set here. The purpose of this reduction is to enable the mixing valve controller to compensate for the fluctuation in temperature caused by the heat source (2-point control action).

Actuator type

2-position
The controller drives the actuator with only 1 relay output. When the output delivers a signal, the valve opens. When there is no signal, the valve will close automatically.

3-position
The controller drives the actuator with 2 relay outputs. 1 of the outputs is used for opening the valve and 1 for closing the valve.

Switching differential 2-pos

For the 2-position actuator, the "2-position switching differential" must also be adapted. Three-position actuators are not affected by the switching differential.

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 effect on two-position actuators.

Mixing valve in heating mode

Defines the position of the mixing valve (Y1/Y2) when heating mode is active.
This parameter has no effect in 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 and is open in heating mode.

Dewpoint monitoring

Line no.	*Operating line*
946	**Dewpt monitor locking time**
947	**Flow setpt increase hygro**
948	**Start flow increase 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 "dewpoint monitor locking time" set here starts running as soon as the contact re-opens. 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

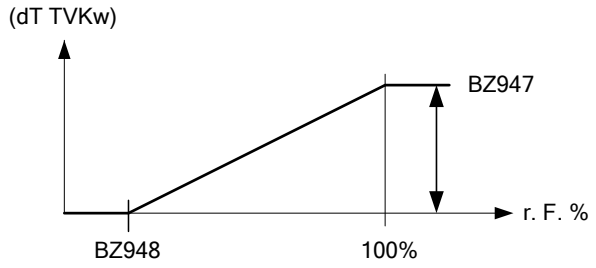
To prevent the formation of condensation due to excess indoor air humidity, a hygrostat can be used to implement a **fixed increase in the flow temperature**.
As soon as the air humidity rises above the value set on the hygrostat, the contact is closed and the flow temperature setpoint is increased by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

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

Start flow increase at R.H.

To prevent the formation of condensation due to excess indoor air humidity, a 0…10 V humidity measurement can be used to implement a **proportional increase in the flow temperature**.
If the relative humidity in the room exceeds the value defined by "Start flow increase at R.H." the flow temperature setpoint is increased proportionally. The start of the increase (operating line 949) and the maximum increase (operating line 947) can be programmed.

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

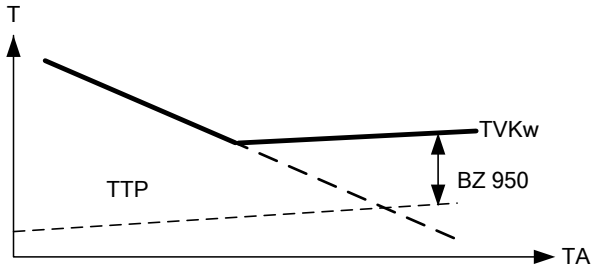


dT TVKw Flow setpoint increase
r.F. Relative humidity
BZ Operating line

Flow temp diff dewpoint

The dewpoint temperature is determined on the basis of the relative humidity of the indoor air and the associated room air temperature.
To prevent the formation of condensation on surfaces, a minimum limit is applied to the flow temperature so that it remains above the dew point temperature by the value set here (operating line 950).
The function can be disabled with the setting – – –.

⚠ The humidity sensor must be assigned to an H.. 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 Dew point temperature
OT Outside temperature
BZ Operating line

Buffer storage tank / primary controller

Line no.	*Operating line*
962	**With buffer storage tank** No ¦ Yes
963	**With primary controller / system pump** No ¦ Yes

With buffer storage tank

If there is a buffer storage tank, this setting defines whether the cooling circuit can draw cooling energy from it.

With primary controller / system pump

This determines whether the cooling circuit is supplied via the primary controller or with the help of the system pump (depending on the type of plant).

Remote control

Line no.	*Operating line*
969	**Changeover of operating mode** None ¦ Off ¦ Automatic

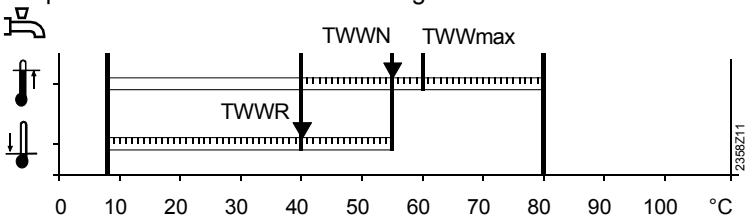
In the case of external changeover via inputs H1 / H2 / H3, the operating mode to be used can be selected.

5.7 DHW

Setpoints

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

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



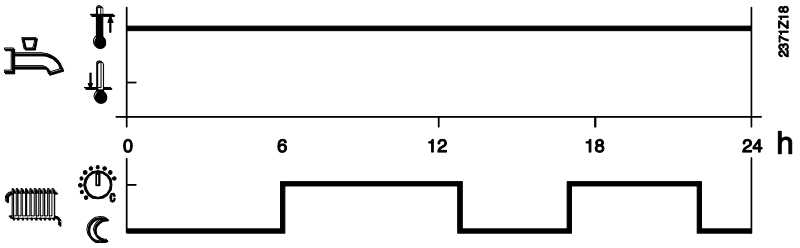
TWWR DHW reduced setpoint
TWWN DHW nominal setpoint
TWWmax DHW nominal setpoint maximum

Activation

Parameter number	*Function*
1620	**Activation** 24hours/day | HC timer program Timer program 4/DHW

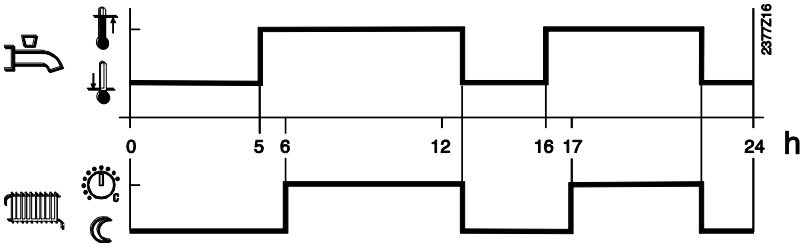
24h / day

DHW temperature is kept constantly at the nominal DHW setpoint irrespective of timer program.



HC timer program

The DHW setpoint switches between the nominal setpoint and the reduced setpoint on the basis of the heating circuit timer program. The first ignition in each phase is brought forward by 1 hour.



Priority

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

When both space heating and DHW heating call for heat, the “DHW priority“ function ensures that while DHW charging is in progress, the capacity of the boiler 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 happen that the DHW setpoint will not be reached if space heating demands considerable amounts of heat.

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

Legionella function

Line no.	*Operating line*
1640	**Legionella function** Off Periodically Fixed weekday
1641	**Legionella funct periodically**
1642	**Legionella funct weekday** Monday…Sunday
1644	**Legionella funct time**
1645	**Legionella funct setpoint**
1646	**Legionella funct duration**
1647	**Legionella funct circ pump**
1648	**Legionella function differential temperature**

Legionella function

- Periodically

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

- Fixed weekday

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

Legionella funct circ pump

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

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

Legionella function circulation pump differential temperature

The circulating pump continues to function until temperature at sensor B39 reaches the setpoint (1645) minus the differential (1648), and the time set in the parameter (1646) has passed.

Circulating pump

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

Circulating pump cycling

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

Circulation setpoint

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

Remote control

Parameter number	*Function*
1680	**Mode switching** None | Off | On | Eco

If remote switching via the Hx inputs is used, you can select the operating mode to use for the production of hot water after switching.

5.8 User circuits and swimming pool circuit

Other users can be connected or controlled in addition to heating circuits HC1-HC3 and the cooling circuit.
The controller can receive temperature signals via the Hx inputs and control the corresponding pumps via the QX output relays.
A dedicated Hx input in the controller or an expansion module (parameters 5950, 5960 or 6046, 6054, 6062) is required to control the user circuits / swimming pool circuit.

This input can be defined as follows:
- user request CC1,2
- user request 10V CC1,2
- pool generation release

Parameters 5750 and 5751 can be used to determine whether the user circuits are used for heating or cooling.
The pumps must be connected to a suitably configured multifunction relay Qx (parameters 5890-5896 and 6030-6038).
The user circuit pumps (Q15 / Q18) are switched on when a heating/cooling request is received at the corresponding input, or when heat dissipation is required.
The swimming pool pump (Q19) is switched on until the corresponding Hx input is released while pool temperature is below the reference value (parameter 2056).

User circuit 1, 2, swimming pool circuit

Parameter number			Function
VK1	VK2	SC	
1859	**1909**	**1959**	**User request flow temperature setpoint**
1860	**1910**	**1960**	**Cooling circuit pump frost protection**
1875	**1925**	**1975**	**Excess heat dissipation** Off | On
1878	**1928**	**1978**	**With buffer tank** No | Yes
1880	**1930**	**1980**	**With prim. contr. / system pump** No | Yes

User circuit flow temperature setpoints are set in parameters 8875 and 8885 while that of the pool circuit is set in parameter 8895.

Flow temperature setpoint

The user circuit is controlled using the flow temperature as soon as a heating or cooling request is detected at the corresponding Hx input.
Requests from the swimming pool circuit require the signal of pool temperature sensor B13 in addition to the release of the Hx input.

HC frost protection

This determines whether the user circuit and swimming pool pumps must be switched on when the heating circuit frost protection system is functioning.

Excess heat dissipation

The heat source, Hx input or storage tank may request excess heat dissipation.
When excess heat dissipation is activated, excess heat may be used by a user circuit or the swimming pool circuit. This function can be selected separately for each user / pool circuit.

Off
Excess heat dissipation is deactivated.

On
Excess heat dissipation is activated.

With buffer tank

No
The user / pool circuit is connected upstream from the reserve tank in the water circuit and cannot therefore draw heat or cold from it. The heating/cooling request is forwarded to the heating / cooling source upstream from the buffer tank.

Yes
The user / pool circuit is connected downstream from the storage tank. It draws its heating/cooling energy from the reserve tank and its temperature request is handled by the reserve tank controller.

With prim. contr. / system pump

No
The user / pool circuit is connected upstream from the primary controller / system pump in the water circuit and cannot therefore draw heat or cold from it. The heating/cooling request is always forwarded to the heating / cooling source upstream from the primary controller.

Yes
The user / pool circuit is connected downstream from the primary controller / system pump in the water circuit. Either the primary controller handles valid heating/cooling requests, or the system pump is activated.

5.9 H.. pumps

H.. pumps

Only RVS63…

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

Excess heat draw

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

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

With buffer storage tank

If there is a buffer storage tank, this defines whether the H1/H2/H3 circuit can draw heat from it.
When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

This defines whether the H1/H2/H3 circuit receives its heat via the primary controller or with the help of the system pump (depending on the type of plant).

5.10 Swimming pool

Setpoints

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

Setpoint solar heating

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

Setpoint source heating

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

Priority

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

- No:

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

- Yes:

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

If no Hx inputs are used to enable the swimming pool, the swimming pool priority is determined by the parameter setting. The swimming pool is always enabled for solar heating.
If the swimming pool is enabled via one Hx input, the swimming pool priority is equivalent to the parameter setting. Solar heating must now be enabled via the Hx input.
If two Hx inputs are used to enable the swimming pool, the swimming pool takes priority when both Hx inputs are enabled. If only one Hx input is enabled, the swimming pool priority is determined by the parameter setting. If none of the Hx inputs are enabled, solar heating of the swimming pool is deactivated.

Plant hydraulics

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

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

5.11 Primary controller / system pump

HC frost protection

Parameter number	*Function*
2120	**HC pump frost protection** Off | On

This determines whether the HC pump is switched on when the frost protection function is active.

Primary controller / system pump

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

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

5.12 Boiler

Operating mode

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

Release below outside temp

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

Activation above outdoor temperature

The boiler is only enabled if compound outdoor temperature exceeds this threshold. A fixed switching differential of 1/2 °C is applied to boiler activation.

Economy mode

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

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

Full charging of buffer

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

Off

The boiler is not used for full charging of the buffer storage tank.

On

The boiler is included in the full charging of the buffer storage tank.
When the function is active, the heat generator is not disabled until the buffer storage is fully charged.

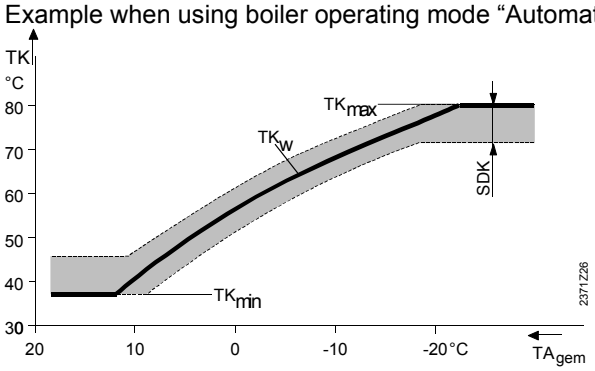
Setpoints

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

The controlled boiler temperature setpoint can be limited by selecting setpoint minimum and setpoint maximum. These limits can be regarded as protective functions for the boiler.
In normal operation, minimum limitation of the boiler temperature is the lower limit value of the controlled boiler temperature setpoint, depending on the boiler's operating mode.
In normal operation, maximum limitation of the boiler temperature is the upper limit value of the controlled boiler temperature setpoint and, at the same time, setpoint of the electronic limit thermostat (TR).

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

Example when using boiler operating mode "Automatic":



Legend

TK	Boiler temp
TKw	Boiler temperature setpoint
...TKmax	Maximum limitation of the boiler temperature
Tkmin	Minimum limitation of the boiler temperature
SDK	Switching diff
TAgem	Composite outside temperature

Minimum limitation of the return temperature

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

Return setpoint min

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

Output data

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

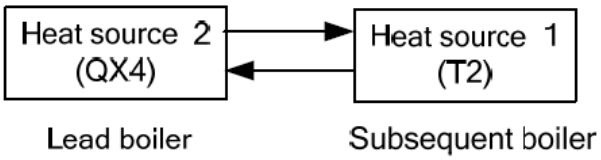
These settings are required in the case of cascaded boilers with different outputs.

2 x 1 cascade

RVS63.. only

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

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



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

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

5.13 Cascade

Control

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

Restart lock

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

Switch-on delay

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

Boiler sequence

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

Auto source seq ch'over

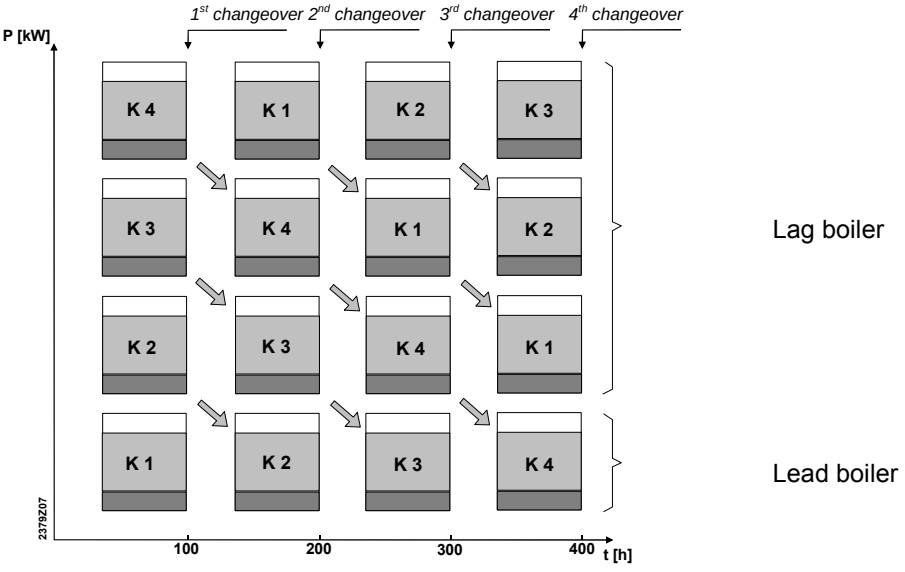
With automatic source sequence changeover, the boiler loads in a cascade can be influenced by defining the order of lead and lag boiler.

Fixed order

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

Order according to the number of operating hours

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



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

Auto source seq exclusion

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

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

Leading source

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

Minimum limitation of the return temperature

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

Return setpoint min

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

5.14 Supplementary heat source

A second heat source can be used to supplement the main heat source.
The supplementary source is activated by means of relay k27.
Relay K32 provides 2-position control.

Supplementary source activation is based on deviation in temperature at the control sensor (flow temperature sensor B10 or storage tank temperature sensor B4, see parameter 3725).

Relay K27 is released and control of K32 activated if the temperature of the control sensor falls 5 °C below the setpoint. If integrated switching (parameter 3720) is selected, it must occur after a fall below 5°C.

Relay K32 is deactivated immediately if the temperature of the control sensor rises above the differential switching setpoint (parameter 3722) and the release of relay K27 ends after overshoot time.

Parameter number	*Function*
3690	**Main source increase setpoint**
3691	**Main source output limit**
3692	**With DHW charging** Blocked | Replaced | Complementary | Instantaneous
3694	**Outdoor temperature limit with DHW charging** **Blocked | None**

Main source increase setpoint

While the supplementary source is active, the main source's setpoint is increased by the value set here, to ensure that it does not switch off or reduce the level of modulation. This prevents the main source from reducing its output while the supplementary source is functioning.
When the supplementary source switches off, the main source's setpoint returns to its original value.

Main source output limit

The supplementary source is released only if the main source exceeds the power entered here [%]. This avoids the supplementary source starting up. The main source is modulated to a reduced power level.
The lock period only begins if the main source exceeds the percentage output set.

With DHW charging

This determines the start-up of the supplementary source to charge the DHW.

Locked
The supplementary source is not activated.

Replaced
The supplementary source is activated only if the main source cannot be started up (e.g. due to a fault).

Supplement
The supplementary source is activated if the output of the main source cannot satisfy demand.

Immediate
The supplementary source is always activated.

Outdoor temperature limit with DHW charging

This determines whether the supplementary source, when locked by the outdoor temperature limit (parameters 3700, 3701), also locks the DHW.

Supplementary source

Parameter number	*Function*
3700	**Activation below outdoor temperature**
3701	**Activation above outdoor temperature**
3702	**With economy mode** Off | On DHW | On
3703	**Complete storage tank charging** Off | On
3705	**Overshoot time**

Activation below / above outdoor temperature

The functioning of the supplementary source is released if outdoor temperature is above or below the set temperature limit.
This allows the functioning of the supplementary source to be locked within a selected outdoor temperature interval in order to permit the joint functioning of the supplementary heat source and the heating pump.

See also parameter 2910.
To ensure continuous activation of the supplementary source, "---" must be set in the relevant parameters.

If both release values are activated, outdoor temperature must satisfy both criteria for the supplementary source to be activated.

With economy mode

This determines how the supplementary source is activated in Eco mode.

Off
The supplementary source is locked in Eco mode.

On DHW
The supplementary source can be activated in order to force charge the storage tank.

On
The supplementary source can be activated for all heat requests.

Complete storage tank charging

Off
The boiler does not contribute to charging the storage tank.

On
The boiler contributes to the complete charging of the storage tank.
The boiler continues to function until charging is complete in order to achieve an extended period of functioning.

Overshoot time

If the integral indicates a heat deficit before the end of overshoot time, the release of the supplementary source remains active.
If the overshoot time passes before the common flow temperature falls below the flow temperature setpoint, the output is deactivated too.

Setpoint

Parameter number	*Function*
3710	**Min setpoint**

The "Min setpoint" acts as minimum ignition temperature during overshoot time.
This function requires a control sensor (common flow temperature sensor B10 or storage cylinder reserve sensor B4).

Flow temperature control

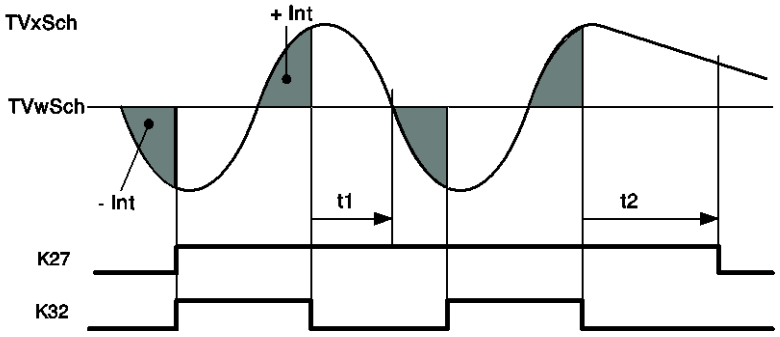
Parameter number	*Function*
3720	**Integral switching***
3722	**Differential switching off***
3723	**Lock time**
3725	**Control sensor** **Common flow temperature | B4 storage tank sensor**

*active only if the control sensor is used.

Integral switching

The temperature-time integral represents the continuous sum of temperature differential over time. In this case, the decisive criterion is the difference by which temperature is above or below the common flow temperature reference value.
The temperature-time integral considers not only the period of time but the extent of over-/undershoot too.

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



TVx	Current flow temperature value
TVw	Flow temperature setpoint
+Int	+ integral
-Int	- integral
t1	Overshoot time not completed
t2	Overshoot time (completed)
K27	Output K27 release
K32	K32 control

This function requires a control sensor (common flow temperature sensor B10 or storage tank reserve sensor B4).

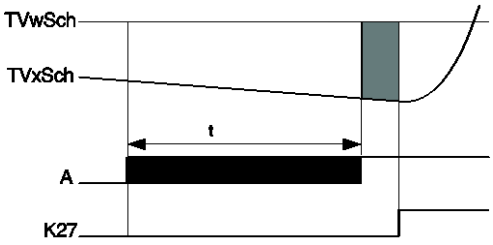
Differential switching off

If common flow temperature exceeds the flow temperature setpoint by the differential switching off value, switching off is immediate, irrespective of the switching integral of the supplementary source (K32). The heat request (K27) is interrupted at the end of the stop time.

This function requires a control sensor (common flow temperature sensor B10 or storage tank sensor B4).

Lock time

Lock time allows the internal heat source controller to reach a stable functioning state before the supplementary source switches on. The supplementary source is only activated when closing time ends. Lock time starts as soon as a valid flow temperature setpoint is available. The integral release calculation only begins when closing time ends.



TVxSch	Current common flow temperature value
TVwSch	Common flow temperature setpoint
A	Activation
K27	Output K27 release

Closing time is not considered if the heat source's internal controller is locked, or if the supplementary source has to complete DHW charging.
The "---" setting can be used to deactivate the function.

Control sensor

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

Tipo di fonte di calore

Parameter number	*Function*
3750	**Type of source** Other Solid fuel boiler Heat pump **Oil/gas boiler**

This defines the type of the supplementary heat source.
If the controller supports this function it can display what type of supplementary source is functioning.

Position lock delay

Parameter number	*Function*
3755	**Position lock delay**

The following applies when the Hx input is configured as "functioning signal state" and a wait time is set in the "position lock delay" parameter. The supplementary source output (K32) sends an operating signal to the corresponding Hx input after the start of operation within the delay time set here. If this signal is not received, the controller displays: "Error".

The "position lock delay" acts as activation (K27) if no supplementary source (K32) is configured.
In the event of an error, the controller deactivates the release (K27) but keeps the "supplementary source" output (K32) active. If no "supplementary source" (K32) is configured, the controller also keeps the release (K27) active.

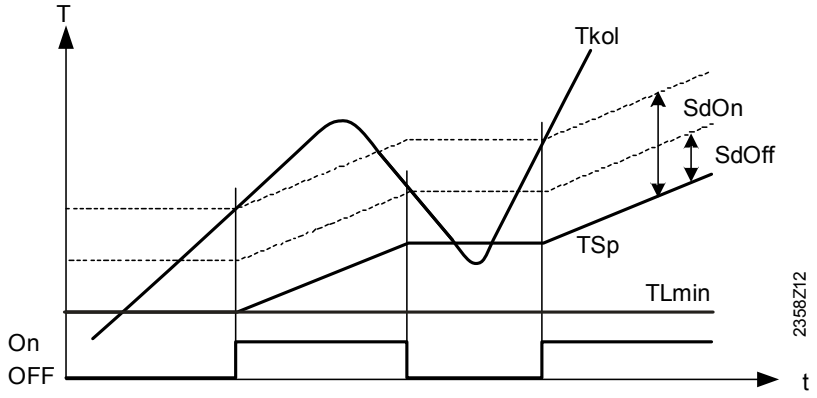
The "position lock" can be deactivated by deactivating the delay time.

5.15 Solar

Charging controller (dT)

Line no.	*Operating line*
3810	**Temperature differential 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 (operating line 2065) can impact storage tank priority of solar charging and possibly charge the swimming pool before the storage tanks.

Charging prio storage tank

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

None

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

DHW storage tank

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

Buffer storage tank

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

Level	DHW storage tank	Buffer storage tank	Swimming pool [1]
A	1610 Nominal setpoint	Buffer setpoint (slave pointer)	2055 Setpoint solar heating
B	5050 Charging 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 (operating line 2065), the swimming pool is charged before the storage tanks.

Charging time relative prio

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

If this parameter is disabled (---) charging proceeds in accordance with the "Charging prio storage tank" settings.

Waiting time relative prio

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

Waiting time parallel op

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

Delay secondary pump

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

Start function

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

Collector function start

If collector temperature cannot be correctly acquired while the pump is deactivated, the pump can be activated from time to time. This setting determines the interval at which the collector pump is activated.

Min run time collector pump

The collector pump remains on for at least the preset minimum run time.

Collector start funct gradient

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

Collector min. temp function start

The collector pump can only be activated if the collector sensor reaches the temperature entered in this parameter.

Frost protection for the collector

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

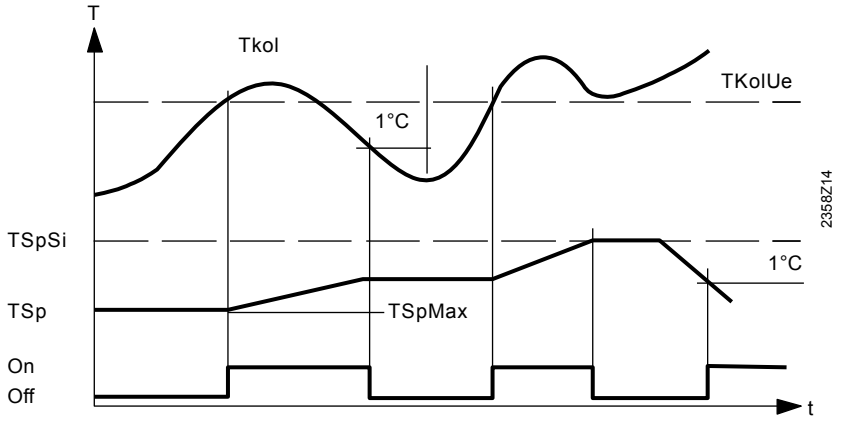
When there is risk of frost at the collector, the collector pump will be activated to prevent the heat-carrying medium from freezing.

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

Overtemperature protection for the collector

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

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



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

Medium's evaporation temperature

Line no.	*Operating line*
3860	**Evaporation heat carrier**
3862	**Evaporation impact supervision**

Fluid medium evaporation

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

Evaporation impact supervision

If the collector installation has two collector pumps, this function can only be selected if there is a risk of evaporation affecting the collector circuit pump or if both pumps are deactivated.

Speed control

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

Pump speed Minimum/maximum

The solar pump motor speed is limited by a minimum and maximum permitted speed.

Yield measurement

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

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

Antifreeze

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

Pump capacity

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

Pulse measurement read

Parameter number	*Function*
3886	**Pulse count read** None With input H1 With input H21 module 1 With input H21 module 2 With input H21 module 3 With input H22 module 1 With input H22 module 2 With input H22 module 3 With input H3

Pulse count read

The "pulse count read" parameter is used to select the Hx input for controlling heat output or water flow:

None
No measurement is taken by the Hx input. This setting is important if the inputs are used for other pulsed counts (e.g.: energy input acquisition).

With Hx input
The pulse count is read by the selected input and the energy determined by it is added to the reading of the count used to measure heat output.

It is important for the Hx input selected here to be selected in the pulse count configuration too.

Pulse measuring

Parameter number	*Function*
3887	**Pulse read unit** None | kWh | Litre
3888	**Pulse read numerator**
3889	**Pulse read denominator**

Example

1 pulse value corresponds to $\frac{\text{Numerator}}{\text{Denominatore}}$ *Unit $\frac{OL3888}{OL3889}$*OL3887

$\frac{1}{10}$ * kWh or $\frac{11}{2}$ * Litres

Pulses are measured by the selected Hx input using parameter 3886.
The sum of the pulses counted is displayed by the pulse counter (parameter 7842).

Pulse read unit

None
The pulse value is not counted.

kWh
The pulse value is expressed in kWh and added to parameter 8526.

Litres
The pulse value is counted in litres.

Pulse read numerator / Pulse read denominator

The calculation model is compared with the pulse count using the numerator and denominator settings.

Flow measurement read

Parameter number	*Function*
3891	**Flow rate measurement read** None | with input H1 | with input H31 module 1 | with input H31 module 2 | with input H31 module 3 | with input H32 module 1 | with input H32 module 2 | with input H32 module 3 | with input H3

Where the pulse count is used, flow rate can be measured by a sensor (10V or Hz) connected to one of the Hx inputs.

Flow rate measurement read

The flow rate measurement read parameter determines which Hx input is used:

None
The Hx inputs do not make any measurement.

With input Hx
The selected input acquires the flow rate and uses it to calculate volume. The volume determined in this way is multiplied by the measured difference in temperature and added to parameter 8526.

Sensor calibration

Parameter number	*Function*
3896	**Solar flow sensor correction**
3897	**Solar return sensor correction**

These parameters correct inaccuracy in the values measured by the sensors.

5.16 Solid fuel boiler

Operating mode

Line no.	*Operating line*
4102	**Locking other heat sources**
4103	**DHW charging priority**

Locking other heat sources

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

DHW tank charging priority

When the solid fuel boiler is functioning, the priority of the DHW tank with respect to other users can be changed (on).
If "Off" is selected, the normal DHW charging priority is applied (parameter 1630).

Setpoints

Line no.	*Operating line*
4110	**Setpoint min**
4114	**Min. differential temperature**

Setpoint min

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

Min. differential temperature

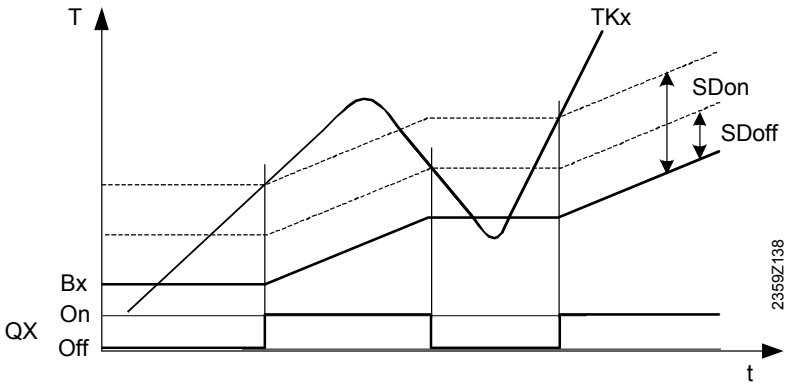
The pump is switched off when differential temperature is too low.
Differential temperature is calculated between boiler temperature and the min return setpoint.

Boiler / burner control

Line no.	*Operating line*
4130	**Temperature differential ON**
4131	**Temp diff off**
4133	**Comparative temp** DHW sensor B3 DHW sensor B31 Buffer storage tank sensor B4 Buffer storage tank sensor B41 Flow temperature setpoint Setpoint min

Delta T-controller

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



TKx Boiler temp
Bx Actual value of comparison temperature
On / Off Boiler pump
SDon Temperature differential ON
SDoff Temp diff off

DHW charging

Parameter number	*Function*
4134	**DHW storage tank connection** With B3 With B31 With B3 and B31
4135	**Boiler DHW charging temperature setpoint** Storage tank temperature Storage tank setpoint Boiler min. setpoint
4136	**DHW charging with Q3** No | Yes

DHW connection setpoint

The following sensors must be selected to integrate the solid fuel boiler.

Boiler DHW charging temperature setpoint

This setting determines the boiler setpoint during DHW charging.

Storage tank temperature
The boiler setpoint is calculated by the DHW charging increase (BZ 5020) and the current value of the storage tank (parameter 4134).

Storage tank setpoint
The boiler setpoint is calculated by the DHW charging increase (BZ 5020) and the storage tank setpoint (nominal and anti-legionella).

Boiler min. temp. setpoint
The boiler temperature setpoint corresponds to the min. setpoint.

DHW charging with Q3

This determines which charging pump Q3 is used by the solid fuel boiler for DHW charging.

NO
The solid fuel boiler charges the DHW storage tank with pump Q10. The charging pump Q3 is not controlled by the solid fuel boiler.

YES
The charging pump Q3 must function for DHW charging.

Storage tank charging

Parameter number	*Function*
4137	**Storage tank connection** With B4 With B4/B41 With B4 and B42/B41
4138	**Storage tank charging boiler temperature setpoint** Storage tank temperature Storage tank setpoint Boiler min. setpoint

Storage tank connection

The following sensors must be selected to integrate the solid fuel boiler.

Storage tank charging boiler temperature setpoint

This setting determines the boiler setpoint during DHW charging.

Storage tank temperature
The boiler setpoint corresponds to the current value of the storage tank (parameter 4137).

Storage tank setpoint
The boiler temperature setpoint corresponds to the storage tank setpoint.

Boiler min. temp. setpoint
The boiler pump keeps functioning until boiler temperature rises above the min. setpoint.

Cooling time

Parameter number	*Function*
4140	**Cooling time**

If boiler temperature rises above the OFF temperature differential or minimum setpoint, the boiler pump keeps running for the set cooling time.

Boiler return temperature maintenance

Parameter number	*Function*
4153	**Min. return setpoint**
4158	**Return influence control** Off | On

Min. return setpoint

The controller prevents return temperature falling below the level set here by adding hot water.

Return influence control

Return temperature control can also be used to reach the flow rate setpoint. The influence of flow rate on return temperature control can be activated or deactivated.

ⓘ Return sensor B72 must be connected to enable the functioning of parameters 4153 and 4158.

Residual heat function

Parameter number	*Function*
4190	**Maximum duration of residual heat function**
4192	**Start of residual heat function** Once | More than once

Maximum duration of residual heat function

The residual heat function switches off after this fixed maximum time.

Start of residual heat function

The residual heat function can be activated one or more times a day as needed.

Once
The residual heat function is deactivated once it ends.

More than once
The residual heat function is reactivated when the relevant ignition criteria are satisfied.

Speed control

Parameter number	*Function*
4201	**Min. pump speed**
4202	**Max. pump speed**

Min/Max pump speed

These settings determine the minimum and maximum speeds of the pump.

5.17 Buffer storage tank

Automatic locks

Only RVS43..

Line no.	*Operating line*
4720	**Automatic generation lock** None | With B4 | With B4 and B42/B41
4722	**Storage tank/HC temperature differential**
4728	**Storage tank/HC relative temperature differential**

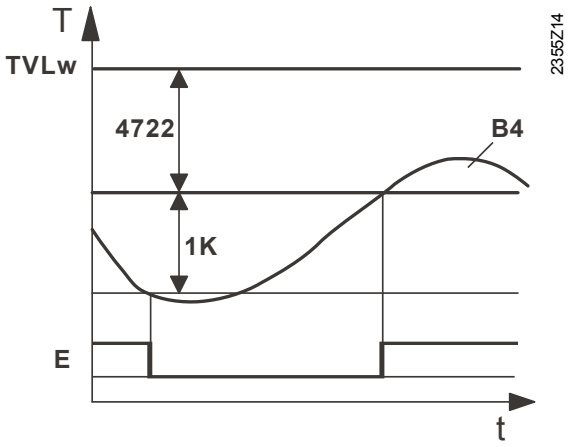
Auto generation lock

None
Function is deactivated.
With B4:
Sensor B4 is used to for locking and release of the heat source.
With B4 and B41 / B42:
Sensor B4 is used for the release of the heat source. For the heat generation lock, sensor B42 is used, and if this is not available, then B41.

Temp diff buffer/HC

If the temperature differential ΔT between the buffer storage tank and heat request from the heating circuit is sufficiently large, the heat required by the heating circuit is drawn from the buffer storage tank. The heat source is locked.

Using “Temp diff buffer/HC“, the mixing valve boost of the temperature request from the heating circuit can be compensated.



4722 Temp diff buffer/HC
B4 Upper buffer or combi storage tank sensor
TVLw Flow temperature setpoint
E Heat generation lock

Storage tank/HC relative temperature differential

The tolerance in the demand of the flow temperature setpoint can be determined with respect to temperature level. In other words, greater tolerance is permitted for higher demands than for lower demands.
The reduction is calculated as follows, on the basis of the percentage value entered (-50 ... 50%):

Reduction = (TVLw – Ts) *%/100

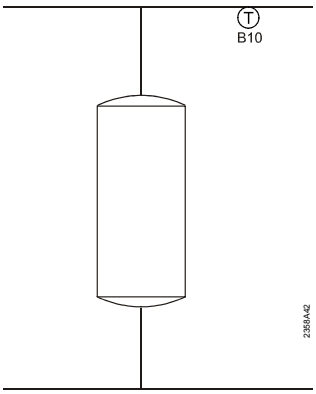
TVLw = Flow temperature setpoint
Ts = 20°C basic demand
% = Percentage of parameter 4728 (-50 - +50%)

Stratification protection

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

Buffer tank stratification protection provides for hydraulic balancing between the consumers and the generator without the need for additional shut-off 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:
The stratification protection function is switched off.
Always:
The stratification protection function is active when the source (generator) is enabled.
With solid fuel boiler
The stratification protection function is active only if the solid fuel boiler is enabled.



A common flow sensor B10 must be connected for this function.

Min solar charging setpoint

The solar system can charge the storage tank first if the solar circuit reaches the minimum charging setpoint needed to maintain stratification in the storage tank.

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

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

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

Recooling

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

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

Recooling DHW/HCs

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

Recooling collector

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

Plant hydraulics

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

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

Return diversion

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

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

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

Temp diff on/off return div

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

Compar temp return div

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

Optg action return diversion

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

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

Partial charging

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

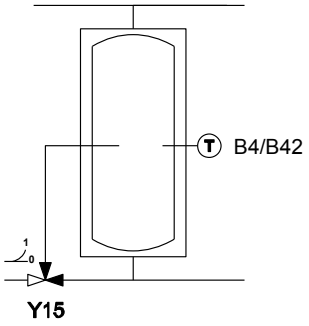
By hydraulically decoupling the lower buffer storage tank section, the chargeable storage volume is reduced. As a result, the upper storage tank section is charged in a shorter period of time. The lower storage tank section is only charged when charging of the upper section is completed.

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

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

Configuration:

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



Cooling

If the buffer storage tank was used to satisfy a heating request, it will be locked to all refrigeration demand signals for 24 hours.

Complete heating

Parameter number	*Function*
4810	**Complete storage tank heating** Off Heating mode Always
4811	**Minimum complete heating temperature**
4813	**Complete heating sensor** With B4 | With B42/B41

The "complete storage tank heating" function ensures that activated heat sources are not disabled until heating of the storage tank is complete, irrespective of the automatic heat source lock.
To ensure complete storage tank heating, the "complete storage tank heating" function (parameter 2208) must be enabled for the heat sources selected for the purpose.
When the function is active, the heat sources specified for the complete heating function in this option are not disabled until the complete heating setpoint is reached or until the boilers are switched off by the burner control function.

Complete heating

Off:
The complete storage tank heating function is disabled.

Heating mode
Complete storage tank heating is active when a valid heat request is present. The automatic heat source lock disables the heat sources on the basis of storage tank temperature. The function is deactivated when the storage tank reaches the requested temperature, on the basis of the reading of the sensor selected for this function.

Always
Complete storage tank heating is active even when the automatic heat source lock disables the heat sources on the basis of storage tank temperature or when the no valid heat request is present. The function is deactivated when the storage tank reaches the requested temperature, on the basis of the reading of the sensor selected for this function.

Minimum complete heating temperature

The storage tank is heated to no more than the setpoint.

Complete heating sensor

With B4:
Sensor B4 is used for the complete heating function.

With B42/B41:
Sensor B42 is used for the complete heating function, or B41 if B42 is not available.

5.18 DHW storage tank

Charging control

Line no.	*Operating line*
5020	**Flow setpoint boost**
5021	**Transfer boost**
5022	**Type of charging** Charging | Complete charging | Complete legionella charging | First complete charging of the day | First complete legionella charging

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.

Increase of transfer boost

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

Type of charging

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

Overtemperature protection

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

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

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

Recooling

Line no.	*Operating line*
5055	**Recooling temperature**
5056	**Recooling boiler/HC**
5057	**Recooling collector** Off | Summer | Always

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

Recooling heat gen/HCs

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

Recooling collector

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

Electric immersion heater

Line no.	*Operating line*
5060	**El imm heater optg mode** Substitute | Summer | Always
5061	**El immersion heater release** 24h/day DHW release Time program 4 / DHW
5062	**El immersion heater control** External thermostat 2nd DHW sensor
5063	**Electric immersion heater control in ECO mode**

Electric immersion heater:operating mode

Substitute

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

Summer

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

Always

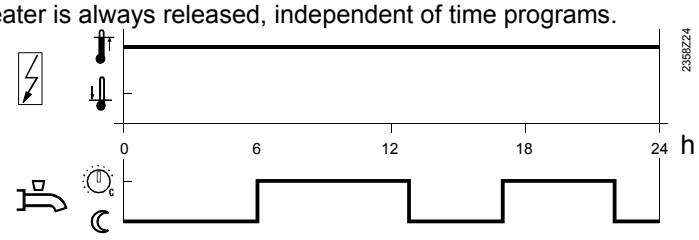
DHW is heated with the electric immersion heater throughout the year. This means that when using this application, the boiler is never required for DHW heating.

Electric immersion heater release

24h/day

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

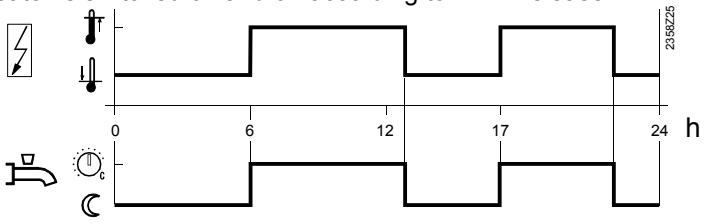
Example:



DHW release

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

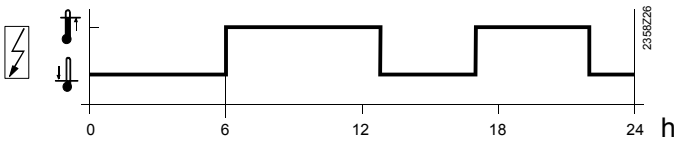
Example:



Time program 4 / DHW

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

Example:



El immersion heater control

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

DHW sensor
The storage tank is charged with an electric immersion heater, with setpoint compensation from the controller.

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

Excess heat dissipation

Parameter number	*Function*
5085	**Excess heat dissipation** **On | Off**

Excess heat dissipation

Excess heat dissipation can be initiated by the following functions:
- inputs H1, H2, H3 or EX2
- storage tank cooling
- solid fuel boiler excess heat dissipation

If excess heat dissipation is activated, excess heat can be used by the DHW storage tank.

Plant hydraulics

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

With buffer storage tank

If there is a buffer storage tank, specify whether the DHW storage tank can draw heat from it.
When using alternative heat sources, the buffer storage tank temperature is used as a control criterion for the release of additional heat sources.

With primary controller / system pump

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

With solar integration

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

Pump speed control

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

Charging pump speed control

The charging pump motor speed is limited by a minimum and maximum permitted speed.
To ensure that the pump operates reliably on start-up, it is operated at maximum speed for the first 10 seconds.

Mixer valve pre-control

Parameter number	*Function*
5124	**Actuator opening time**

Actuator opening time

This sets the opening time of the actuator used with the mixer valve.

Transfer

Parameter number	*Function*
5130	**Transfer strategy** Always | DHW activation
5131	**Transfer comparison temperature** **DHW sensor B3 | DHW sensor B31**

Transfer strategy

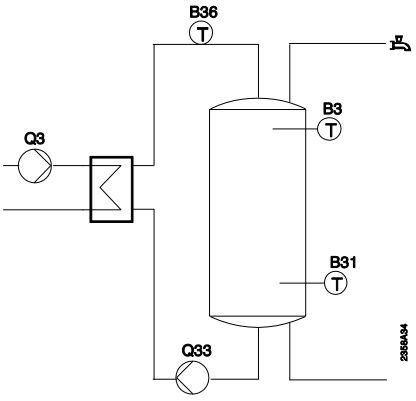
Transfer can be permitted at all times or only during set activation periods (function 1620).

Transfer comparison temperature

The corresponding DHW sensor can be set to obtain a comparison temperature for the transfer.

Intermediate circuit

Parameter number	*Function*
5140	**Intermediate circuit**



Intermediate circuit

To use the intermediate circuit / heat exchanger for charging, flow temperature in the intermediate circuit must exceed the DHW setpoint required by the value entered here, because not all the energy can be transferred through the heat exchanger.
The value set here is added if necessary.

Complete charging

Parameter number	*Function*
5146	**Complete charging with B36** **No | Yes**

Sensor B36 can be used instead of sensor B31 to completely charge the DHW tank. Charging is complete when sensor B36 reaches the desired temperature (the DHW setpoint in parameter 5140 plus 3 K) and, at the same time, sensor B3 reaches the requested setpoint.
When charging of the DHW tank starts, the sensor in the intermediate circuit is taken into consideration only if the intermediate circuit pump has been functioning for at least 30 seconds.

Limitations

Parameter number	*Function*
5148	**Q33 start min temp. diff.**
5149	**Q33 start delay**

Q33 start min temp. diff.

The Q33 intermediate circuit pump only starts when the temperature in the primary circuit (B2, B22, B10, B15 and B25) is higher than the temperature in the storage tank (B3) by the temperature differential entered here.
This maintains stratification in the storage tank.

Q33 start delay

Pump Q33 starts after pump Q3 by this delay setting. During this delay, the DHW charging primary circuit is heated.
After this delay ends, pump Q33 switches on provided the minimum start-up temperature condition is satisfied.

Q35 mixer pump

Parameter number	*Function*
5160	**Legionella mixer pump function** Off | With charging | with charging and duration
5165	**Restratification** No | Yes
5166	**Min stratification temp.**
5167	**Min stratification temp. diff.**

Legionella mixer pump function

Off
When this parameter is set "Off", the mixer pump is not used when the antilegionella function is active.

With charging
Mixer pump Q35 runs during the antilegionella function.

During charging and duration of function
Mixer pump Q35 runs during the antilegionella function and during the set period (parameter 1646).

Restratification

The "Restratification" function can be activated or deactivated.
No
The mixer pump is not used for restratification. Restratification may nevertheless be activated while the "antilegionella" function is active.

Yes
The "restratification" function compares the 2 DHW storage tank sensors B3 and B31.

Min stratification temp.

Sensor B31 at the bottom of the storage tank must have reached the set value for "restratification" to take place.

Min restratification temp. diff.

When the temperature at storage tank bottom sensor B31 exceeds the temperature at top sensor B3 by the temperature differential set in this parameter, mixer pump Q35 starts. The switching differential is 2 K.

5.19 Instantaneous DHW heater

Setpoints

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

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

Increase

Parameter number	*Function*
5420	**Flow increase setpoint**

The demand for hot water from the storage tank / boiler is determined by the current DHW setpoint plus the flow increase setpoint.

Tap setpoint correction

Parameter number	*Function*
5455	**40°C setpoint correction**
5456	**60°C setpoint correction**

Setpoint correction may prove necessary if the sensor is located in an unsuitable position.
The correction is calculated according to the points of the "40°C and 60°C setpoint correction" lines.

Heat maintenance

Parameter number	*Function*
5460	**Heat maintenance setpoint**
5461	**40°C heat maintenance setpoint correction**
5462	**60°C heat maintenance setpoint correction**
5464	**Heat maintenance activation** None 24h/day DHW activation Timer program 3/HC3 Timer program 4/DHW Timer program 5
5470	**Heat maintenance period not in heating mode**
5471	**Heat maintenance period in heating mode**
5472	**Heat maintenance pump overshoot time**
5473	**Heat maintenance pump overshoot time**
5475	**Heat maintenance sensor** Boiler sensor B2 Return sensor B7 Hot water outlet sensor B38
5476	**Periodic heat maintenance**
5477	**Min heat maintenance time**
5478	**Heat maintenance in heating mode** Off | On
5489	**DHW overshoot** No | Yes

Heat maintenance setpoint

The instant heater is kept at the heat maintenance setpoint for the set period (5470/5471) if heat maintenance is enabled (5464).

40°C and 60°C heat maintenance setpoint correction	Setpoint correction may be needed if the sensor is located in an unsuitable position. Heat maintenance setpoint correction is calculated on the basis of the line defined by the two points of the "40°C and 60°C heat maintenance setpoint correction" curve.
Heat maintenance activation	Heat maintenance can be activated never, always, on DHW activation, or by timer programs (HC3, DHW or 5).
Heat maintenance period not in heating mode	Heat maintenance is applied if the system is not in heating mode
Heat maintenance period in heating mode	Heat maintenance is applied if the system is in heating mode
Heat maintenance pump overshoot time	The instant heating pump Q34 continues to function for the time set here after the end of the heat maintenance function.
Periodic heat maintenance	The controller can run the heat maintenance function at intervals. The interval can be set as needed.
Min heat maintenance time	The instant heating heat exchanger is kept hot at least for the "min heat maintenance time" when the heat maintenance function is active.
Heat maintenance in heating mode	The heat maintenance function can remain active or be deactivated when the system is in heating mode.
DHW overshoot	The instant heating pump Q34 continues to function for the time set after water draw-off has ended.

Mixing valve control

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

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

5.20 Configuration

Heating circuits

Line no.				Operating line
HC1	*HC2*	*HC3*		
5710	**5715**	**5721**		**Heating circuit 1, 2, 3**

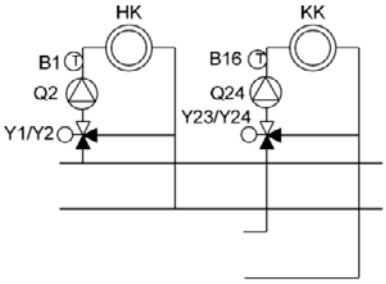
Using this setting, the heating circuits can be switched on and off.

Line no.	*Operating line*
5711	Cooling circuit 1 Off 4-pipe system 2-pipe system
5712	Use of mixing valve 1 Heating Cooling Heating and cooling

Cooling circuit 1

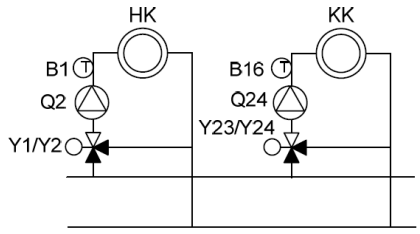
Off
The cooling circuit is deactivated.

4-pipe system



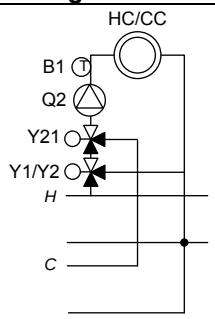
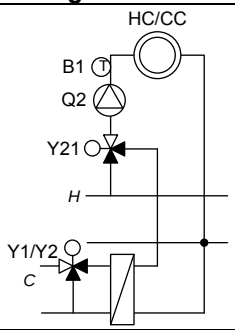
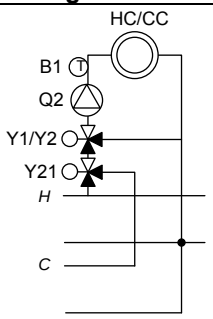
The cooling and heating circuits draw their cooling/heating energy from separate primary circuits.

2-pipe system



The cooling and heating circuits draw their cooling/heating energy from the same primary circuit.

Use of mixing valve 1

Heating	**Cooling**	**Heating and cooling**
		

The setting is required when a QX… relay output (configuration) is used as a diverting cooling valve Y2.

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.
Control thermostat
The DHW temperature is controlled based on the switching state of a thermostat connected to B3.

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

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

DHW control element Q3

Line no.	*Operating line*
5731	**DHW actuating device Q3** None Charging pump Diverting valve
5734	**DHW diverter valve basic position**

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. With this setting, pump Q2 becomes a boiler pump, provided the boiler pump is not yet defined for use at a multifunctional relay output QX.

DHW diverter valve basic position

Last request
The diverter valve maintains the position it assumed for the last request.

Heating circuit
When there is no heat request, the diverter valve assumes the "Heating circuit" position.

DHW
When there is no heat request, the diverter valve assumes the "DHW" position.
This function is only active if the diverter valve has been selected as a DHW control element (parameter 5731).

Separate DHW circuit

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

The separate circuit can only be employed if a boiler cascade is used.
OFF:
The separate circuit is switched off. Every boiler in use can charge the DHW storage tank
ON:
The separate circuit is switched on. DHW charging takes place exclusively via the boiler defined for that purpose.

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

User circuits 1 and 2

Parameter number		*Function*
VK1	VK2	**User circuits 1 and 2**
5750	**5751**	Off Heating 4-tube cooling system 2-tube cooling system

Off
User circuit 1/2 is deactivated.

Heating
The corresponding user circuits are only used for heating purposes.

4-tube cooling system
The corresponding user circuit requests refrigeration and cooling from separate lines.

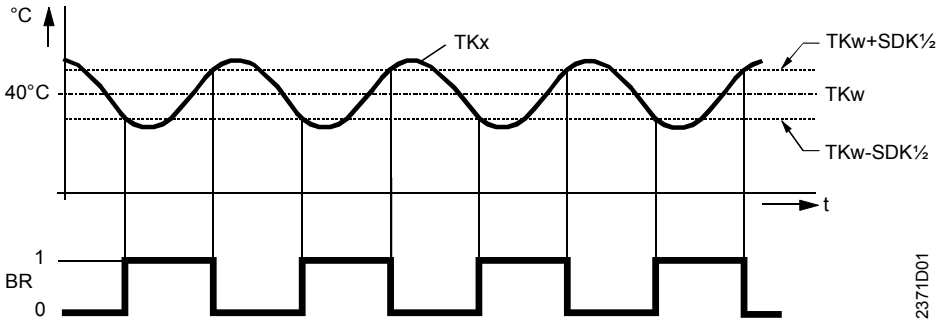
2-tube cooling system
The corresponding user circuit requests refrigeration and cooling from the same lines.

Boiler

Line no.	*Operating line*
5770	**Type of heat source** 1-stage 2-stage Modulating 3-position Modulating UX Without boiler sensor 2 x 1 cascade (RVS63)

1-stage

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



RVS43 Connections:

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

RVS63 Connections:

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

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

2-stage

RVS43 Connections:

	Use	*Space*	*Connector type*
L1	Phase burner	B	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase 1st burner stage		
T2	1st burner stage on		
S3	Input burner fault		
EX1	Input 1st burner stage hours run		
FX1 (T6)	Phase 2nd burner stage	Z	AGP8S.04C/
QX1 (T8)	Burner 2nd stage on		

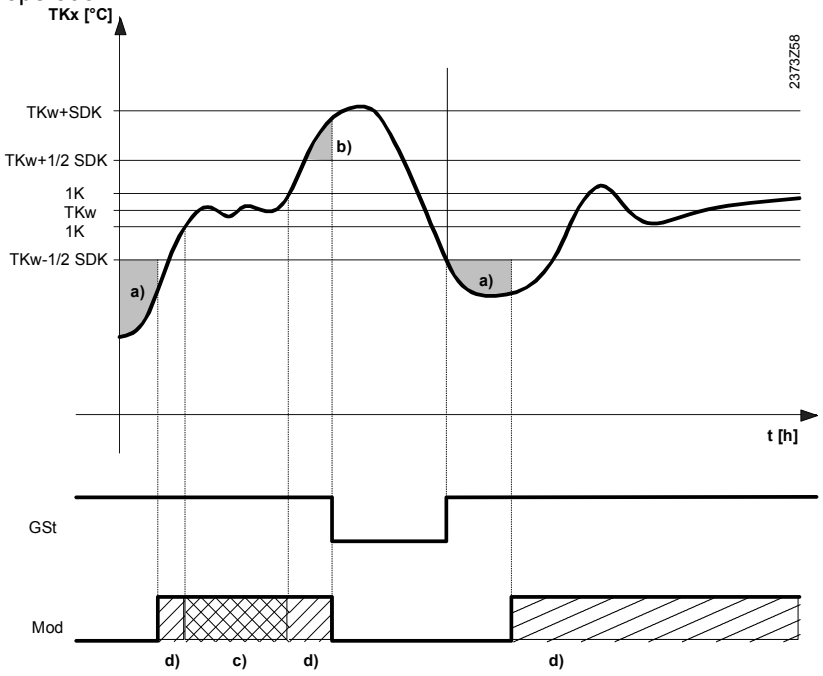
RVS63 Connections:

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

Modulating 3-position
Modulating UX

Boiler temperature control

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



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

Burner control

- 3-position control and modulating UX

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

- Neutral zone

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

RVS43 3-position connections:

	Use	*Space*	*Connector type*
L1	Phase burner	P	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase release modulating burner		
T2	Release modulating burner		
T3	Input burner fault		
EX1	Input burner hours run		
QX2	Air damper modulating burner closing	T	AGP8S.04B/109
FX1	Phase air damper modulating burner opening	B	AGP8S.03H/109
QX1	Air damper modulating burner opening		

RVS43 Connections modulating UX:

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

UX must be configured on available UX output.

RVS63 3-position connections:

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

RVS63 Connections modulating UX:

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

Without boiler sensor

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

RVS43 connections:

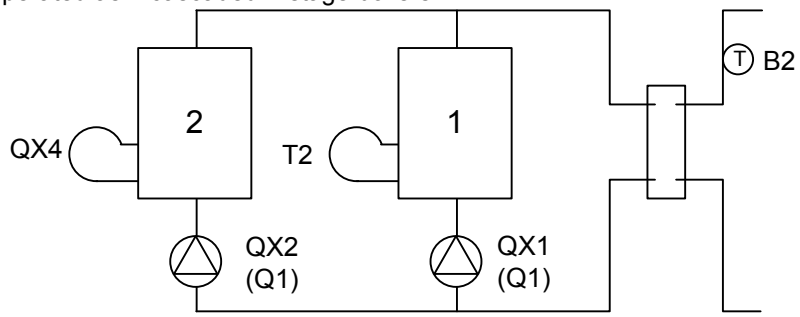
	Use	*Space*	*Connector type*
L1	Phase burner	B	AGP8S.07A/109
⏚	Protective earth		
N	Neutral conductor		
T1	Phase boiler release		
T2	boiler release		
S3	Input burner fault		
EX1	Input 1st burner stage hours run		

RVS63 connections:

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

Only RVS63
2 x 1 cascade

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



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

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

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

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

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 jointly for DHW and as a buffer storage tank, or exclusively for one of the two.

Output relay QX

Line no.	*Operating line*
5890 **5891** **5892** **5894** **5895**	**Relay output QX1, 2 ,3, 4, 5** None Circulating pump Q4 El imm heater DHW K6 Collector pump Q5 H1 pump Q15 Boiler pump Q1 Bypass pump Q12 Alarm output K10 2nd pump speed HC1 Q21 2nd pump speed HC2 Q22 2nd pump speed HC3 Q23 Heat circ pump HC3 Q20 H2 pump Q18 System pump Q14 Heat gen shutoff valve Y4 Solid fuel boiler pump Q10 Time program 5 K13 Buffer return valve Y15 Solar pump ext exch K9 Solar ctrl elem buffer K8 Solar ctrl elem swi pool K18 Collector pump 2 Q16 H3 pump Q19 Flue gas relay K17 Assisted firing fan K30 Cascade pump Q25 St tank transfer pump Q11 DHW mixing pump Q35 DHW interm circ pump Q33 Heat request K27 Refrig demand K28 Dehumidifier K29 Diverting valve, cooling Y21 Pump Q2 for heating circuit HC1 Pump Q6 for heating circuit HC2 DHW control element Q3 Supplementary source control K32 Overtemperature protection K11

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

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

DHW circulating pump Q4

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

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

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

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

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

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

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

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

Alarm output K10
The alarm relay signals faults, should they occur.
Switching on takes place with a delay of two minutes.
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 is made on operating page “Faults“.

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

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

Heating circuit pump HC3 Q20
Pump heating circuit 3 will be activated.
- Time program

For heating circuit 3, only time program 3/HC3 is available. For more detailed information, refer to section "Time program".

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

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

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

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

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

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

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

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

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

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

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

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

Assisted firing fan K30
This setting has no function.

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

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

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

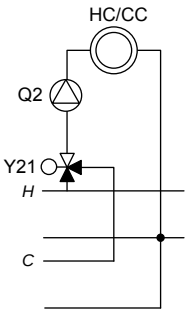
DHW interm circ pump Q33
Charging pump with DHW storage tank using an external heat exchanger.

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

Refrig demand K28
As soon as there is refrigeration demand, output K28 is activated.
In the case of the device with address 1, a refrigeration demand from the system can activate output K28. For this purpose, operating line 6627 "Refrig demand K28" on the operating page "LPB system" must be set to "Centrally".

Dehumidifier K29
An external dehumidifier can be enabled if the indoor air humidity rises. In this case, a humidity sensor must be connected to the H… input.
The function of the dehumidifier depends on the cooling functions.
The operation of the dehumidifier is not affected by operating modes, holiday programs, presence buttons etc.

Diverting valve, cooling Y21
With a common distribution circuit for heating and cooling, the inputs/outputs are always on the mixing valve group on the basic unit. For a 4-pipe system, diverting valve Y21 is also required.



Example:
Draw off via 4-pipe system

Pump Q2 for heating circuit HC1
The connected pump acts as circulating pump for heating circuit 1.

Pump Q6 for heating circuit HC2
The connected pump acts as circulating pump for heating circuit 2.

DHW control element Q3
Depending on the hydraulic system used, output Q3 controls a DHW charging pump or a diverter valve.

Supplementary source control K32.
Relay K32 is used along with relay K27 to control the supplementary heat source (see parameters 3.690-3.755).
The relay provides 2-position control for the supplementary source at the reference value of the selected control sensor.

Excess heat dissipation K11
Contacts K11 are closed to activate overtemperature protection.
Residual energy can be deviated to a released external user.

Input sensor BX

Line no.	*Operating line*
5930,5931, 5932, 5933	**Sensor input BX1, 2, 3, 4** None DHW sensor B31 Collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer storage tank sensor B4 Buffer storage tank sensor B41 Flue gas temp sensor B8 B10 common flow sensor 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

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

5.21 Input H1 and H3

Input H1 and H3

Line no.	*Operating line*
5950 - 5960	**H1 - H3 input function** HC+DHW mode switching DHW mode switching HC mode switching HC1 mode switching HC2 mode switching HC3 mode switching Error / alarm message CC1 user request CC2 user request Pool release 4 Pool solar release DHW operating level HC1 operating level HC2 operating level Operating level 3 HC1 room thermostat HC2 room thermostat HC3 room thermostat Circulating pump thermostat Pulse count Dew point monitoring Humidity switch flow temp increase setpoint Boiler return thermostat Supplementary source operating signal Hz flow measurement CC1 10V user request CC2 10V user request 10V pressure measurement 10V ambient relative humidity 10V ambient temperature 10V flow measurement 10V temperature measurement
5951 - 5961	**Contact type input H1 – H3** NC N/O
5952 - 5962	**Function value, contact type H1 – H3**
5953 - 5963	**Voltage value 1, H1 – H3**
5954 - 5964	**Function value 1, H1 – H3**
5955 - 5965	**Voltage value 2, H1 – H3**
5956 - 5966	**Function value 2, H1 – H3**
5957 – 5967	**H1 - H3 temperature sensor**

For RVS43..

For RVS43..

For RVS43..

Function of input H1

Changeover of operating mode

- Heating circuit

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

- DHW

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

Heat generation lock

The heat source is be locked via the H… terminals.

All temperature requests made by the heating circuits and by DHW will be ignored.

Frost protection for the boiler will be maintained.

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

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

CC1 and CC2 user request
When input Hx closes, a request (heating or cooling) is transmitted to the controller. The flow reference value for the corresponding user circuit is kept at the set value for user requests (parameters 1859 or 1909).
A proportional voltage heat request is made via the "10V user request" for CC1 and CC2.

Enable pool source
The closing of input Hx (e.g. a manual switch) permits the heat source to activate the pool heater.

Excess heat discharge
Active dissipation of excessive heat enables an external heat source to force consumers (heating circuit, DHW storage tank, Hx pump) to draw excessive heat by delivering a forced signal.
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.

Solar pool activation
An external device (e.g. a manual switch) can be used to release solar pool heating via an Hx input. Using two Hx inputs allows the pool’s charging priority to be established with respect to the storage tank.

Operating level HC1, HC2, HC3 (digital)
The closing of the relevant contact switches functioning mode to "reduced" if the selected heating circuit is in "automatic" mode.
When the contact closes, cooling circuit 1 switches from "automatic" mode to "Off".
This setting can be used to control heating / cooling circuits via an external timer, for example.

Room thermostats HC1, HC2, HC3 (digital)
The connected room thermostat sends a "request" or "no request" signal to H.
In Comfort mode, a heat request is activated on a request from the room thermostat for the corresponding heating circuit at the setpoint selected in "room thermostat flow setpoint" (see parameter 742 for HC1, HC2 and 1042 and 1342 for HC3).

Circulating pump thermostat
A thermostat can be connected instead of sensor B39.

Pulse counter
The basic unit has two pulse inputs for external connections: electricity meters, natural gas meters, heat output meters or volumetric flow meters.
The count (electrical energy, natural gas, heat) must be specified according to demand, i.e. in the energy counter.
The counter value can be displayed in parameters 7842 (H1) and 7856 (H3).

Dewpoint monitor
The dewpoint monitor detects the formation of condensate. If the dewpoint monitor responds to condensation, the cooling switches off immediately.
The cooling is enabled when the monitor is no longer signalling condensation and when a definable "locking time" (operating line 946) has expired.

Flow setpoint increase, hygrostat
If the hygrostat responds, the flow setpoint is increased by the fixed value defined in "Flow setpt increase hygro" (operating line 947). As soon as the hygrostat reverts to normal, the flow setpoint returns to the "normal value".

Boiler return thermostat
By closing the contact, the boiler return thermostat informs the controller that the required return temperature has been exceeded. This starts the boiler bypass pump.

Supplementary source operating message
The closing of the contact informs the controller that the supplementary source has started up correctly. See also the "lock position delay" setting (parameter 3755).

Solid fuel DHW priority change
The DHW tank is charged by closing the contact (after the storage tank has been charged first). The other users are only activated after the DHW reaches its reference setpoint.

Hz flow measurement
The controller receives a frequency signal [Hz] for flow measurement.
The corresponding flow is calculated using the line defined by two fixed points (input 1 value / input 1 value and input 2 value / function 2 value).
The current flow can be displayed in the next parameters 8521.

CC1 10V constant demand and CC2 10V constant demand
The controller receives a voltage signal (DC 0 ... 10 V) for heat request (flow temperature) for user circuit 1 or 2.
The necessary flow temperature is calculated using the line defined by two fixed points (input 1 value / function 1 value and input 2 value / function 2 value).
The "CC1 and CC2 10V constant demand" setting imposes a constant temperature request via the contact.
This setting is not available for H2.

Pressure measurement 10V
The voltage signal at input H… is converted to a pressure value in a linear manner.
The linear characteristic curve is defined via two fixed points (voltage value 1 / function value 1 and voltage value 2 / function value 2).

Relative room humidity 10V
The voltage signal present at input Hx is converted into a linearized relative humidity value. This is used for the dewpoint calculation and dewpoint protection functions of the cooling circuit and for control of the dehumidifier.
The linear characteristic curve is defined via two fixed points (voltage value 1 / function value 1 and voltage value 2 / function value 2).

Room temperature 10V
The voltage signal present at input Hx is converted into a linearized room temperature value. This, in conjunction with the indoor relative 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 linear characteristic curve is defined via two fixed points (voltage value 1 / function value 1 and voltage value 2 / function value 2).

10 V flow measurement
The controller receives a voltage signal (DC 0 ... 10 V) for flow measurement.
The corresponding flow is calculated using the line defined by two fixed points (input 1 value / function 1 value and input 2 value / function 2 value).

10V temperature measurement
The controller receives a voltage signal (DC 0 ... 10 V) for temperature measurement.
The corresponding temperature is calculated using the line defined by two fixed points (input 1 value / input 1 value and input 2 value / function 2 value).
The use of the temperature measurement is defined by the "H1, H3 temperature sensor" parameter (5957, 5967).
This setting is not available for H2.
L'uso della temperatura misurata è definita tramite il parametro "sensore di temperatura H1, H3" (parametro 5957, 5967).
Impostazione non disponibile con H2.

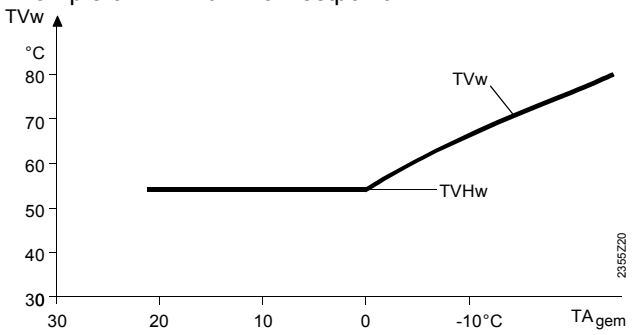
Contact type, input H...

N/C
The contact is normally closed and must be opened to activate the selected function.
N/O
The contact is normally open and must be closed to activate the selected function.

Function value, contact H..

The function “Min flow temp setpoint” on operating line 5950 or 6046 is activated via contact H... The generating plant is controlled constantly at the temperature level set here, either until contact H.. opens again or until a higher heating/cooling demand is delivered.

Example of minimum flow setpoint:

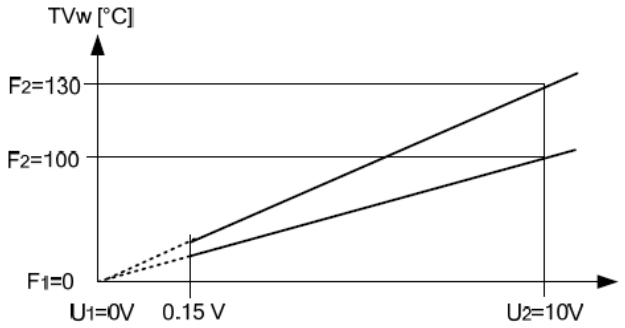


TVHw	Minimum flow temperature setpoint
TVw	Flow temperature setpoint

Voltage value 1
Function value 1
Voltage value 2
Function value 2

The linear characteristic is defined via two fixed points. The setting uses two parameter pairs for *Function value* and *Voltage value* (F1/U1 and F2/U2).

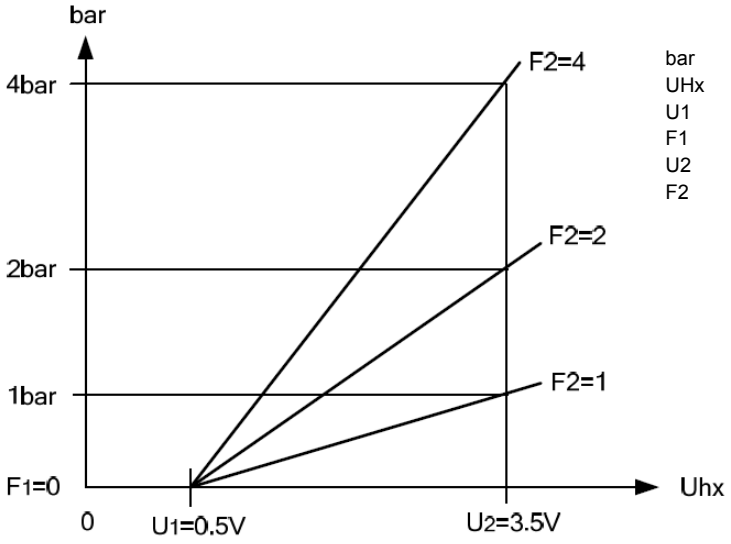
Example for "Heating demand 10V" and "Cooling demand 10V"



TVw	Flow temperature setpoint
UHx	Voltage on Hx
U1	Voltage value 1
F1	Function value 1
U2	Voltage value 2
F2	Function value 2

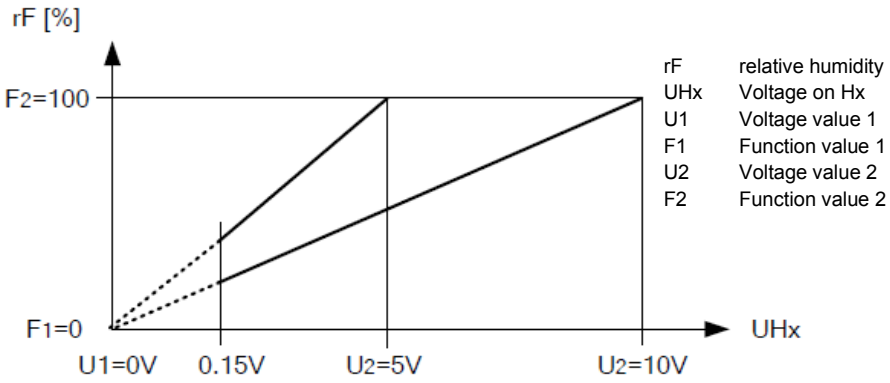
If the input signal drops below the limit value of 0.15 V, the heating demand is invalid and therefore has no effect.

Example of pressure measurement 10V



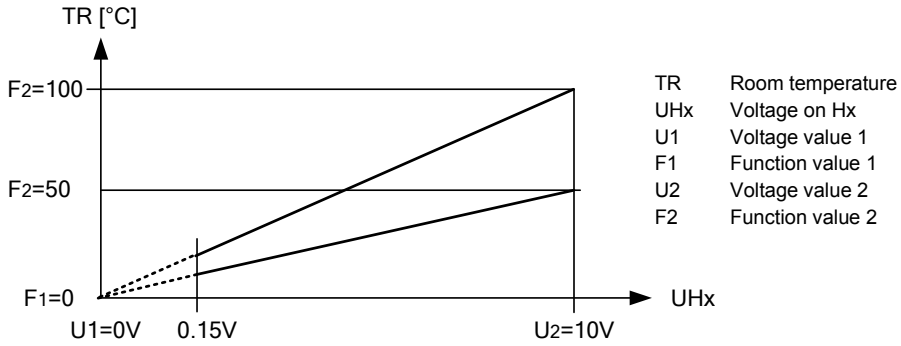
bar	Pressure
UHx	Voltage on Hx
U1	Voltage value 1
F1	Function value 1
U2	Voltage value 2
F2	Function value 2

Example of relative room humidity 10V



If the measured value is below 0.15V it is regarded as invalid and an error message is generated.

Example of room temperature 10V



If the measured value is below 0.15V it is regarded as invalid and an error message is generated.

5.22 Input H.. for RVS63..

Parameter number	*Function*
5952	**H1 flow minimum setpoint**
5954	**H1 10V temperature value**
5956	**H1 3.5V pressure value**
5962	**H3 minimum flow temperature setpoint**
5964	**H3 10V temperature value**
5966	**H3 3.5V pressure value**

Contact type, input H...

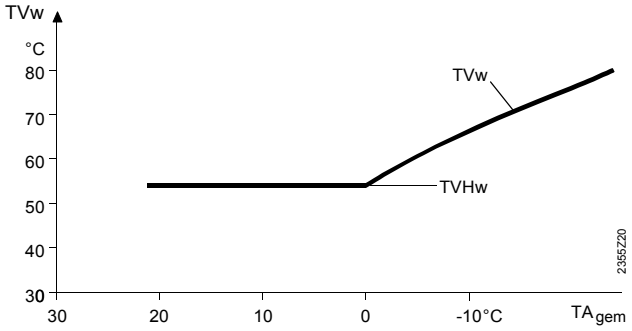
N/C contact
The contact is normally closed and must be opened to activate the selected function.

N/O contact
The contact is normally open and must be closed to activate the selected function.

Min flow temp setpoint H..

The function “Minimum flow setpoint” set on operating line 5950, 5960 or 6046 is activated via contact H... The boiler is controlled constantly at the temperature level set here either until contact H… opens again or until a higher heat request is delivered.

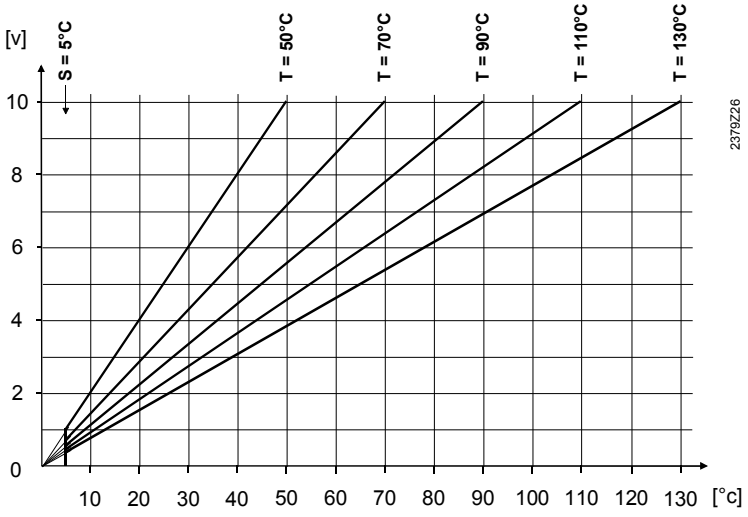
If several heat requests are received at the same time (LPB, contact H.. contact, DHW, or from the controller itself), the highest of them will automatically be selected.



TVHw Minimum flow temperature setpoint
TVw Flow temperature setpoint

Temp value 10V H..

The voltage signal present at input H.. is converted to a linearized temperature value and then forwarded as the flow temperature setpoint.
The flow temperature setpoint corresponding to the voltage level of 10 V can be adjusted via parameter “Temperature value 10V H…“.

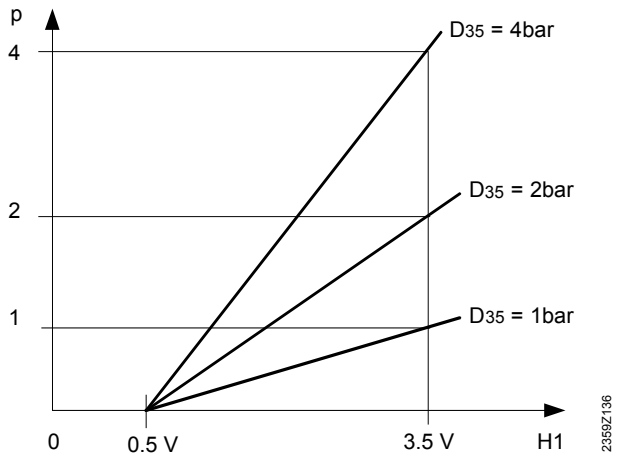


T = maximum value of heat demand
S = minimum limitation of heat demand = 5 °C

Pressure value 3.5V H…

The voltage signal present at input H… is converted into a linearized pressure value.
The pressure value at 3.5 V can be adjusted with parameter *Pressure value 3.5V H..*”.

Example:



p Pressure value (bar)
H1 Voltage at H..

Input EX1 - EX2

Line no.	*Operating line*
5980 - 5981	**Function input EX1 - EX2** Counter for second burner stage Heat generation lock Error / alarm message SLT error message Excess heat discharge
5982 - 5983	**Cont type input EX1 - EX2** NC N/O
5986	**SLT input error message L1 (off – always – automatic)**

Function input EX1 - EX2

Counter for second burner stage

The counting values (hours run and number of starts) for the second burner stage are recorded based on the signal received at input EX1-2. If the function is not activated, the counting values are counted based on the state of relay K5 .

Heat generation lock

The heat source will be locked via terminals EX1-2.
All temperature requests made by the heating circuits and by DHW will be ignored.
Frost protection for the boiler will be maintained.

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

Error / alarm message

Input EX1-2 generates a controller-internal error message.
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. an external lamp or horn).

SLT error message

The input generates error message 110.

Excess heat discharge
Active dissipation of excessive heat enables an external heat source to force consumers (heating circuit, DHW storage tank, Hx pump) to draw excessive heat by delivering a forced signal.
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.

Mixing valve groups basic unit

Line no.	*Operating line*
6014 **6015**	**Function mixing group 1** Multifunction Heating circuit 1/2 Return temp controller Primary controller / system pump DHW primary controller Instantaneous DHW heater Return controller cascade Cooling circuit 1 Heating circuit/cooling circuit 1 Solid fuel boiler temperature control

The mixing valve groups are assigned to the following connections:

	RVS63.283 only
Mixing valve group 1	Mixing valve group 2
Q2, Y1, Y2, B1	Q6, Y5, Y6, B12

Multifunction
The "multifunction" setting releases the terminals of the mixer group (QX2, 4, 5 and BX3) for other applications
The following functions can be assigned to these multifunction inputs / outputs: See parameters 5891, 5894, 5895 and 5932.
Heating circuit 1/2
For this application, the respective settings of operating page “Heating circuit 1/2” can be adapted.
Return temp controller
For this application, the respective settings of operating page “Boiler” can be adapted.
Primary controller / system pump
For this application, the respective settings of operating page “Primary controller / system pump” can be adapted.
DHW primary controller
For this application, the respective settings of operating page “DHW storage tank” can be adapted.
Instantaneous DHW heater

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

Return controller cascade

For this application, the 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 circuit/cooling circuit 1

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

Solid fuel boiler temperature control

The relevant settings of the "solid fuel boiler" operating page can be adapted for this application.

Types of sensor/readjustment

Line no.	*Operating line*
6097	**Sensor type collector** NTC 10k Platinum 1000
6098	**Readjustm collector sensor**
6099	**Readjustm coll sensor 2**
6100	**Outdoor sensor correction**
6101	**Sensor type flue gas temp** NTC 10k Platinum 1000
6102	**Readjustm flue gas sensor**

Sensor type collector

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

Readjustm collector sensor

The measured value can be corrected.

Building and room model

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

When the outside temperature varies, the room temperature changes at different rates, depending on the building's thermal storage capacity.

The above setting is used to adjust the response of the flow temperature setpoint when the outside temperature varies.

- Example:

> 20 hours

The room temperature responds *more slowly* to outside temperature variations.

10 - 20 hours

This setting can be used for most types of buildings.

< 10 hours

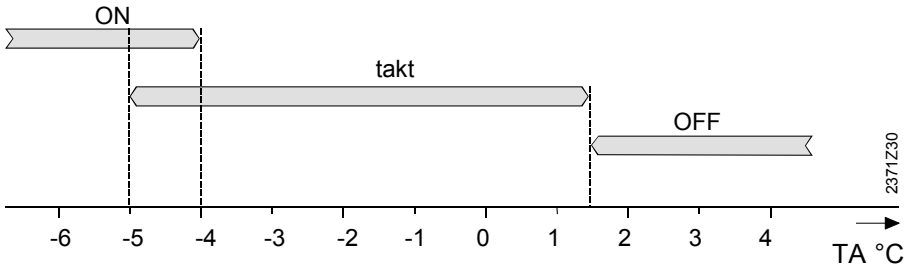
The room temperature responds *more quickly* to outside temperature variations.

Frost protection for the plant

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

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

Outside temperature	Pump	Diagram
...-4 °C	Continuously on	ON
-5…1.5 °C	On for 10 minutes at 6-hour intervals	Cycle (takt)
1.5 °C...	Continuously OFF	OFF



External requirements

Only RVS63…

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

Heat request below OT

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

Heat req in economy mode

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

Dehumidifier

Only RVS43..

Parameter number	*Function*
6135	**Dehumidifier** Yes-No
6136	**Dehumidifier activation mode** 24h/day | Daily heating circuit program | Daily program 5
6137	**Relative humidity control ON**
6138	**Relative humidity control differential**

Control

A separate air dehumidifier can be activated if relative humidity rises, by selecting relay K29 in the QX outputs.

Activation

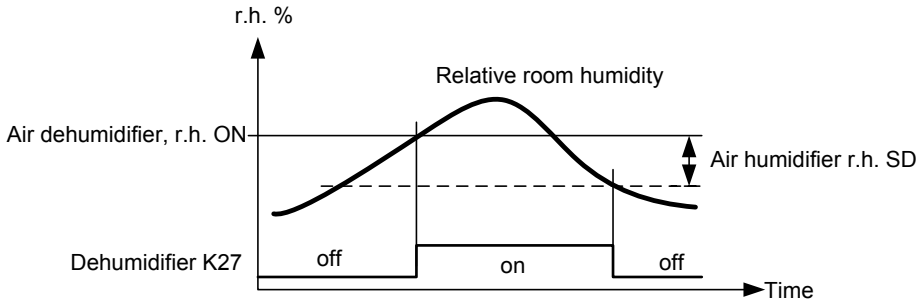
Parameter 6135 activates or deactivates the dehumidifier:
- On: Activation is determined by the setting in parameter 6136.
- Off: Deactivated.

Activation mode

This parameter can be set to:

- 24 h/day: Continuous operation, irrespective of time program.
- Time program, heating circuit: active according to the time program set for heating circuit 1.
- Time program 5: active according to time program 5.

The dehumidifier (K29) is activated when relative humidity rises above the setpoint. The dehumidifier will be deactivated when relative humidity falls below the differential set in parameter 6138.



Relative humidity is measured via input Hx by setting the 10V relative humidity function.

H1, H2, H3 pressure supervision

Only RVS63…

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
6148	**6154**	**6184**		**Static pressure supervision, 1, 2, 3** None With input H1 With input H2 module 1 With input H2 module 2 With input H2 module 3 With input H21 module 1 With input H21 module 2 With input H21 module 3 With input H22 module 1 With input H22 module 2 With input H22 module 3 With input H3

Static pressure supervision, 1, 2, 3

This defines the Hx input used to supervise static pressure.

The Hx input must therefore be defined and connected to a pressure sensor.

Sensor state

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

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

Saving parameters

Parameter number	*Function*
6204	**Saving parameters**

The current parameter settings can be saved as pre-defined settings. The following operating pages are excluded from this option: date and time, operator section, wireless, all time programs, the number of hours of functioning and the various counters.

⚠ Saving current settings over-writes the factory settings. Once over-written, the factory settings cannot be recovered!

Parameter reset

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

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

Plant diagram

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

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

Structure of control number

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

	1st column 2 digits	2nd column 2 digits	3rd column 2 digits
BZ6212		Solar	Oil / gas boiler
BZ6213		Solid fuel boiler	
BZ6215		Buffer storage tank	DHW storage tank
BZ6217	Heating circuit 3	Heating circuit 2	Heating circuit 1

Check-No. heat source 1

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

* 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

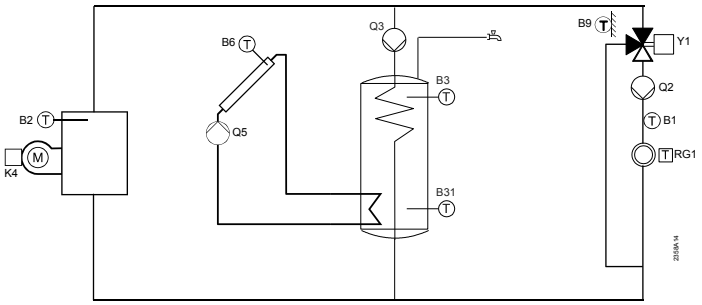
	Buffer storage tank		DHW storage tank
	0	No buffer storage tank	0 No DHW storage tank
	1	buffer storage tank	1 electric immersion heater
	2	Buffer storage tank, solar connection	2 Solar connection
			4 charging pump
	4	Buffer storage tank, heat source valve	5 Charging pump, solar connection
	5	Buffer storage tank, solar connection, heat source valve	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	2nd heating circuit pump	02	2nd heating circuit pump	1	Circulation via boiler pump
		03	Heating circuit pump, mixing valve	2	2nd heating circuit pump
				3	Heating circuit pump, mixing valve
				5..7	Heating/cooling, 2-pipe, common distribution
				8..10	Cooling only, 2-pipe
				12	Heating/cooling, 4-pipe, common distribution
				14..16	Heating/cooling, 4-pipe, common 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:

Check-No. heat source 1				1	0	1
Check-No. storage tank						5
Check-No. heating circuit						3

Device data

Line no.	*Operating line*
6220	**Software version** The software version indicated here represents the current version of the basic unit.

Overtemperature protection

Parameter number	*Function*
6270	**Excess heat dissipation**
6271	**SD excess heat dissipation**
6272	**Excess heat dissipation** None DHW sensor B31 Solar collector sensor B6 Return sensor B7 Storage tank sensor B4 Storage tank sensor B41 Flue gas sensor B8 Common flow temperature sensor B10 Solid fuel boiler sensor B22 Storage tank sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector 2 sensor B61 Solid fuel boiler return sensor B72 Boiler sensor B2 DHW sensor B3
6273	**Min excess heat dissipation time**

Overtemperature protection

The overtemperature protection function is activated if temperature at the selected sensor reaches the "overtemperature protection temperature" setting.

The contact K11 switches.

Overtemperature protection differential switching

The overtemperature protection function ends if temperature falls below the "overtemperature protection temperature" by the switching differential entered here.

"Minimum overtemperature protection time" is also taken into consideration.

Overtemperature protection sensor

This determines the sensor used to monitor overtemperature.

Min overtemperature protection time

Once activated, overtemperature protection continues for at least the "minimum overtemperature protection time".

Sensor voltage output

Parameter number	*Function*
6358	**GX1 voltage output** 5 Volt | 12 Volt

This defines the voltage used by the basic unit to power the external sensor.
5 V is generally used for room units / sensors; 5 V is used for combined sensors (e.g. pressure / temperature).

5.23 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 LPB address is divided into 2 parts each consisting of two 2-digit numerals. Example:

14 . 16

Segment number Device number

Bus power supply

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

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

Bus power supply state

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

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

Central functions

Line no.	*Operating line*
6620	**Action changeover functions** Segment System
6621	**Summer changeover** Local Centrally
6623	**Changeover of operating mode**
6624	**Manual source lock**
6625	**DHW assignment** Local HCs All heating circuits in the segment: All HCs in system
6627	**Refrigeration demand** Locally¦ Centrally
6630	**Cascade master** Always ¦ Autonomous
6631	**Ext source with eco mode** Off ¦ On DHW ¦ On
6632	**Solar collector external source temperature limit control** Yes / No

⚠ These settings are only relevant for device address 1.

Range of action of changeover

The range of action of central changeover can be defined.
This applies to the following types of limitation:

- Summer changeover (when selecting ”Central“ on line 6623)
- Summer changeover (with ”Central“ setting on operating line 6621)

Entries:

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

Summer changeover

The scope of summer changeover is as follows:

- Local entry:
  Local action; the local heating circuit is switched based on 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 scope of the 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 of the entire system are switched based on operating line 730.

Manual source lock

The range of action of summer changeover is as follows:

- Local entry:
  Local action; the local source is locked.
- Entry segment:
  Central action; all sources of the cascade are locked.

Assignment of DHW heating

Assignment of DHW heating is required only if it is controlled by a heating circuit program (refer to operating lines 1620 and 5061).
Settings:

- Local heating circuits:
  DHW is only heated for the local heating circuit
- All heating circuits in the segment:
  DHW is heated for all heating circuits in the segment
- All heating circuits in the system:
  DHW is heated for all heating circuits in the system.

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

Refrigeration demand

"Refrigeration demand K28" sets the relay parameter on the QX.. for the output of the refrigeration demand.

Depending on the setting (local/central) the demand is transmitted by the local cooling circuit or all cooling circuits in the system. This option applies only to the device with device address 1.

Cascade master

In cascaded installations, the controller with address number 1 is assigned the role of cascade master. This controller activates the requested functions and displays additional operating menus containing cascade parameters.
If 'Autonomous' is selected, the cascade master is identified automatically. If 'Always' is selected, the role is assigned immediately to the controller in question.
In cascaded systems it is recommended to set "Always" for the cascade master. This setting ensures that the cascade functioning menus and common functions (e.g. common return temperature control) are not lost in the event of a power failure.

Ext source with eco mode

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

Supplementary source temperature limit

Supplementary sources (e.g. air/water HP) connected to the LPB bus can be locked or released according to their own parameters. Status is signalled over the LPB.
In a cascade, the master unit verifies whether a supplementary source (slave) is available according to its own operating limits (e.g. outdoor temperature) and selects another source if necessary.
NO – The supplementary source's Ecobit is ignored.
YES – The supplementary source's Ecobit is considered in order to control the cascade.

Clock

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

Clock mode

This setting defines the impact of the system time on the controller's time setting. The impact is as follows :

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

outside temperature source

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

5.24 Faults

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 fault.

Acknowledgements

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

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

Temperature alarms

Line no.	*Operating line*
6740	**Flow temp 1 alarm**
6741	**Flow temp 2 alarm**
6743	**Boiler temp alarm**
6745	**DHW charging alarm**
6746	**Flow temp., Cooling 1 alarm**

RVS43.. only

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

Error history

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

The basic unit stores the last 10 faults in non-volatile memory. Any additional entry deletes the oldest in the memory. For each error entry, error code and time of occurrence is saved.

5.25 Maintenance/special mode

Maintenance functions

Line no.	*Operating line*
7040	**Burner hoursinterval**
7041	**Burner hrssince 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	**Risk of DHW scalding**
7119	**Economy function** Locked released
7120	**Economy mode** Off ¦ On

Burner hours run interval, burner start interval

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

Burner hours run, burner starts since service

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

Flue gas temp limit

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

Delay flue gas message

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

Risk of DHW scalding

This function activates the "risk of scalding" maintenance message (cod. 23) as soon as the temperature of DHW in the storage tank exceeds the limit setpoint (sensor B3). The message is reset as soon as temperature in the storage tank falls 1°C under the limit value.

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 ensure continuous burner operation, the only switch-off point used is the boiler temperature's maximum limitation (TKmax).
First, all connected loads will be locked 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, maximum limitation of the boiler temperature (TKmax) remains active as long as the chimney sweep function is active.

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

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).

Name		relay	State
Oil / gas boiler	Burner 1st stage	K4	On
	Burner 2nd stage	K5	On
	Burner mod. release	K4	On
	Burner mod. open	Y17 (K5)	On
	Burner mod. closed	Y18	Off
	Boiler pump	Q1	On
	Bypass pump	Q12	On
	Return mixing valve open / closed	Y7/Y8	Off
Solid fuel boiler	Boiler pump	Q10	On
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
DHW	Charging pump	Q3	On
	Diverting valve	Q3	Off
	Mixing pump	Q32	Off
	Intermediate circuit pump	Q33	On
	Mixing valve opening / closing	Y31/Y32	Off
	Instantaneous DHW heater pump	Q34	On
	Instantaneous DHW heater on / off	Y33/Y34	Off
	Circulating pump	Q4	On
	Electric immersion heater	K6	On
buffer storage tank	Source shutoff valve	Y4	On
	Return valve	Y15	Off
Heating circuit 1...3	2nd heating circuit pump	Q2 Q6 Q20	On
	Heating circuit mixing valve opening / closing	Y1 / Y2 Y5 / Y6	Off
	Heating circuit pump 2nd speed	Q21 Q22 Q23	On
User circuit 1-3	User circuit pump	CC1 / Q15	On
	User circuit pump	CC2 / Q18	On
	User circuit pump	SC / Q19	On
Cooling circuit 1	Cooling circuit pump	Q24	On
	Cooling circuit mixing valve opening / closing	Y23/Y24	Off
	Diverting valve for cooling	Y21	Off
Primary controller	System pump	Q14	On
	Mixing valve opening / closing	Y19/Y20	Off
Hx group	Pump H1	Q15	On
	Pump H2	Q18	On
	Pump H3	Q19	On
Auxiliary functions	Alarm output	K10	Off
	Time program 5	K13	Off
	Heat demand	K27	On
	Refrigeration demand	K28	Off
	Storage tank transfer pump	Q11	Off

Setpoint adjustment in manual control

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

Simulations

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

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

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

Telephone customer service

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

Setting of phone number that appears on the info display.

5.26 Configuring expansion modules

Parameter number	*Function*
7300 **7375** **7450**	**Function of extension module 1, 2, 3** None Multifunction Heating circuit 1 Heating circuit 2 Heating circuit 3 Return temperature control Solar DHW heating Primary controller / system pump DHW primary controller Instant water heater Cascade return temperature control Cooling circuit 11 Heating / cooling circuit 1 Solid fuel boiler

None
No function is assigned to the expansion module.

Multifunction
The functions that can be assigned to this multifunction input/output are determined by parameters 6030-6045.

Heating circuit 1-3
The settings described in sections "Heating circuit 1", "Heating circuit 2" and "Heating circuit 3" can be adapted for this application.

Return temperature control
The settings of the "Boiler" section can be adapted for this application.

Solar DHW heating
The settings of the "Solar" section can be adapted for this application.

Primary controller / system pump
The settings of the "Primary controller / system pump" section can be adapted for this application.

DHW primary controller
The settings of the "DHW storage tank" section can be adapted for this application.

Instant water heater
The settings of the "Instant DHW heater" section can be adapted for this application.

Cascade return temperature control
The settings of the "Cascade" section can be adapted for this application.

Cooling circuit 1
The settings of the "Cooling circuit 1" section can be adapted for this application.

Heating / cooling circuit 1
The settings of the "Heating circuit 1" and “Cooling circuit 1” sections can be adapted for this application.

Solid fuel boiler
The settings of the "Solid fuel boiler" section can be adapted for this application.
When this function is selected, the inputs and outputs of the expansion module are assigned according to the following table:

Electrical connections

Module connection terminals	**QX21**	**QX22**	**QX23**	**BX21**	**BX22**	**H2/H21**	***H22***
Multifunction	*	*	*	*	*	*	*
Heating circuit 1	Y1	Y2	Q2	B1	*	*	*
Heating circuit 2	Y5	Y6	Q6	B12	*	*	*
Heating circuit 3	Y11	Y12	Q20	B14	*	*	*
Return temperature control	Y7	Y8	Q1	B7	*	*	*
Solar DHW heating	*	*	Q5	B6	B31	*	*
Primary controller / system pump	Y19	Y20	Q14	B15	*	*	*
DHW primary controller	Y31	Y32	Q3	B35	*	*	*
Instant water heater	Y33	Y34	Q34	B38	B39	FS	*
Cascade return temperature control	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 = DHW flow switch; AVS75.390 = H2; AVS75.370 = H21							

Expansion module QX

This defines the use of the QX output relays.

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
7301	**7376**	**7451**		**Output relay QX21, module 1, 2, 3**
7302	**7377**	**7452**		**Output relay QX22, module 1, 2, 3**
7303	**7378**	**7453**		**Output relay QX23, module 1, 2, 3** None Pump Q4 DHW electrical heating element K6 Solar circuit pump Q5 H1 pump Q15 Boiler pump Q1 Bypass pump Q12 Alarm output K10 HC1 2-speed pump Q21 HC2 2-speed pump Q22 HCP 2-speed pump Q23 HCP heating circuit pump Q20 H2 pump Q18 System pump Q14 Source locking valve Y4 Solid fuel boiler pump Q10 Time program 5 K13 Storage tank return valve Y15 External exchanger solar pump K9 Solar control element K8 Swimming pool control element K18 Collector pump 2 Q16 H3 pump Q19 Flue gas relay K17 Fan K30 | Cascade pump Q25 | Storage tank pump Q11 DHW pump Q35 Internal DHW circulating pump Q33 Heat request K27 Cooling request K28 (**) Dehumidifier request K29 (**) Cooling diverter valve Y21 (**) Heating circuit HC1 pump Q2 Heating circuit HC2 pump Q6 DHW control element Q3 Supplementary source control K32 Overtemperature protection K11

Refer to the description in the "Output relay QX1" section.

Expansion module BX

This defines the use of the BX sensor inputs.

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
7307	**7382**	**7457**		**Input sensor BX21, module 1, 2, 3**
7308	**7383**	**7458**		**Input sensor BX22, module 1, 2, 3** None DHW sensor B31 Solar collector sensor B6 Return sensor B7 DHW circulation sensor B39 Buffer sensor B4 Buffer sensor B41 Flue gas temperature sensor B8 Common flow sensor B10 Solid fuel boiler sensor B22 DHW charging sensor B36 Buffer sensor B42 Common return sensor B73 Cascade return sensor B70 Swimming pool sensor B13 Collector 2 sensor B61 Solar flow sensor B63 Solar return sensor B64 DHW outlet sensor B38 Solid fuel boiler return sensor B72

Refer to the description in the "Input sensor BX1" section.

H2 expansion modules 1, 2, 3

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7311	**7386**	**7461**		**Input H2 function, module 1,2,3** None | HC + DHW switching| DHW mode switching | HC mode switching | HC1 mode switching | HC2 mode switching | HC3 mode switching | Heat source lock | Error / alarm message | VK1 user request | VK2 user request | Swimming pool heat source activation | Excess heat dissipation | Swimming pool solar activation | DHW operating level | HC1 operating level | HC2 operating level | HC3 operating level | HC1 room thermostat | HC2 room thermostat | HC3 room thermostat | DHW flow switch | Circ pump thermostat | Dew point monitor | Hygrostat increase temp sensor setpoint | Boiler return thermostat | Supplementary source state | Solid fuel DHW priority change | VK1 10V user request | VK2 10V user request | 10V pressure measurement | 10V relative humidity | 10V room temperature | 10V flow measurement | 10V temperature measurement
7312	**7387**	**7462**		**H2 contact type, module 1,2,3NC | NO**
7314	**7389**	**7464**		**H2 voltage 1 value, module 1,2,3**
7315	**7390**	**7465**		**H2 function 1 value, module 1,2,3**
7316	**7391**	**7466**		**H2 voltage 2 value, module 1,2,3**
7317	**7392**	**7467**		**H2 function 2 value, module 1,2,3**

The settings for the expansion module's H2 input largely correspond to those for the controller's Hx inputs (including the pulse count, Hz flow measurement). See "H1, H3 function input" and following parameters for a description.

H2 temperature sensor

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7318	**7393**	**7468**		**H2 temperature sensor, module 1** None | solar flow sensor B63 | Solar return sensor B64

This defines the temperature measured by the sensor connected to "H2 Input, module 1 ... .3" (solar flow / return or heating pump flow / return). The controller uses the measured temperature to control the corresponding component of the system.

If the same temperature acquisition sensor is defined for Bx and Hx, the sensor connected to Bx has priority.

H21 input functions

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7321	**7396**	**7471**		**H21 input function, module 1,2,3** None HC + DHW switching DHW mode switching HC mode switching HC1 mode switching HC2 mode switching HC3 mode switching Heat source lock Error / alarm message VK1 user request VK2 user request Swimming pool heat source activation Excess heat dissipation Solar pool activation DHW operating level HC1 operating level HC2 operating level HC3 operating level HC1 room thermostat HC2 room thermostat HC3 room thermostat DHW flow switch Circulating pump thermostat Dew point monitoring Humidity switch increase temperature sensor setpoint Boiler return thermostat Supplementary source state Solid fuel burner DHW priority change

				VK1 10V user request VK2 10V user request 10V pressure measurement 10V relative humidity 10V room temperature 10V flow measurement 10V temperature measurement
7322	**7397**	**7472**		**H21 contact type, module 1,2,3** NC | NO
7324	**7399**	**7474**		**H21 input 1 value, module 1**
7325	**7400**	**7475**		**H21 function 1 value, module 1**
7326	**7401**	**7476**		**H21 input 2 value, module 1**
7327	**7402**	**7477**		**H21 function 2 value, module 1**
7328	**7403**	**7478**		H21 temperature sensor, module 1 None Solar flow sensor B63 Solar return sensor B64

The settings for the expansion module's input H21 correspond to those for the controller's Hx inputs. See "H1, H3 function input" and following parameters for a description.

H22 input functions

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
7331	**7406**	**7481**		**H22 input function, module 1,2,3** Same as 7321
7332	**7407**	**7482**		**H22 contact type, module 1,2,3**
7334	**7409**	**7484**		**H22 input 1 value, module 1,2,3**
7335	**7410**	**7485**		**H22 function 1 value, module 1,2,3**
7336	**7411**	**7486**		**H22 input 2 value, module 1,2,3**
7337	**7412**	**7487**		**H22 function 2 value, module 1,2,3**
7338	**7413**	**7488**		**H22 temperature sensor, module 1,2,3** None Solar flow sensor B63 Solar return sensor B64

The settings for the expansion module's H22 input correspond to those for the controller's Hx inputs. See "H1, H3 function input" and following parameters for a description.

GX21 output voltage

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
7341	**7416**	**7491**		**GX21 output voltage, Module 1,2,3** 5 Volt 12 Volt

This defines the voltage used to power the expansion module's external sensors.

EX21 input function

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7342	**7417**	**7492**		**EX21 input function, module 1,2,3** None Burner 1st stage count Heat source lock Error / alarm message Excess heat dissipation

The settings for the expansion module's EX21 input largely correspond to those for the controller's EX inputs. See "EX1 function input" and following parameters for a description.

Contact type

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7343	**7418**	**7493**		**EX21 input contact type, module 1,2,3** NC | NO

The following types of contact can be selected:

NC normally closed
The input's function is active when no voltage is present.

NO normally open
The input's function is active when voltage is present.
The EX contact function descriptions apply when an NO contact is selected.

UX21 output function

Parameter number				Function
Mod 1	Mod 2	Mod 3		
7348	**7423**	**7498**		**UX21 output function, module 1, 2, 3** None Boiler pump Q1 DHW pump Q3 Intermediate circuit DHW pump Q33 Heating circuit HC1 pump Q2 Heating circuit CH2 pump Q6 Heating circuit CH3 pump Q20 Solar circuit pump Q5 External exchanger solar pump K9 Buffer tank solar pump K8 Swimming pool solar pump K18 Collector pump 2 Q16 Instant water heater pump Q34 Solid fuel boiler pump Q10 Boiler setpoint Output request Heat request Cooling request Burner modulation
7349	**7424**	**7499**		**UX21 output signal logic, module 1** Standard | Reversed
7350	**7425**	**7500**		**UX21 output signal, module 1** 0 .. 10V | PWM
7354	**7429**	**7504**		**UX21 10V temperature value, module 1**

The modulated output voltage can be used for variable speed pumps or as a voltage output proportional to requested temperature.

Variable speed pump
The UX output signal corresponds to the speed required from the selected pump.

Boiler setpoint
The UX output signal corresponds to the boiler temperature setpoint.

Output request
The UX output signal is proportional to the common flow request.

Heat request
The UX output signal corresponds to the common flow temperature setpoint.

Cooling request
The UX output signal corresponds to the common flow temperature setpoint.

Burner modulation
The UX output signal corresponds to the required boiler flow heat output.

UX22 output function

Parameter number				*Function*
Mod 1	*Mod 2*	*Mod 3*		
7355	**7430**	**7505**		**UX22 output function, module 1,2,3** Same as 7348
7356	**7431**	**7506**		**UX22 output signal logic, module 1** Standard | Reversed
7357	**7432**	**7507**		**UX22 output signal, module 1** 0 .. 10V | PWM
7361	**7436**	**7511**		**UX22 10V temperature value, module 1**

The settings for the expansion module's UX22 output correspond to those for the controller's UX outputs. See "UX1, UX2 output function" and following parameters for a description.

5.27 Input / output test

Line no.	*Operating line*
7700…7952	**Relay test**

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

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

5.28 State

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

Messages

Line no.	*Operating line*
8000	**State of heating circuit 1**
8001	**State of heating circuit 2**
8002	**State heating circuit 3**
8003	**State of DHW**
8004	**State of cooling circuit 1**
8005	**State of boiler**
8007	**State of solar**
8008	**State solid fuel boiler**
8010	**State buffer storage tank**
8011	**State swimming pool**
8022	**State of supplementary source**

State heating circuit

End user (info level)	Commissioning, heating engineer	
Limit thermostat has cut out	Limit thermostat has cut out	3
Manual control active	Manual control active	4
Floor curing function active	Floor curing function active	102
	Overtemp protection active	56
	Restricted, boiler protection	103
	Restricted, DHW priority	104
	Restricted, buffer priority	105
Heating mode restricted		106
	Forced discharging buffer storage tank	107
	Forced discharging DHW	108
	Forced discharging heat source	109
	Forced heat release	110
	Overrun active	17
Forced heat release		110
	Opt start control + boost heating	111
	Optimum start control	112
	Boost heating	113
Heating mode Comfort	Heating mode Comfort	114
	Optimum stop control	115
Heating mode Reduced	Heating mode Reduced	116
	Frost protection room active	101
	Frost protection flow active	117
	Frost protection 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 lim	122
Off	Off	25

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 active	Frost protection flow active	117 24
Cooling mode locked	Locking period at end of heating Locked, energy source Locked, buffer	135 205 206 146
Cooling mode, restricted	Flow setpt increase hygro Min. flow limit, dewpoint Min. flow limit, outside temp	136 177 178 144
Cooling mode, Comfort	Cooling mode, Comfort Overrun active	150 17 150
Protection mode, cooling	Protection mode, cooling	149
Frost protection active	Frost protection plant active	23 24
Cooling limit OT active	Cooling limit OT active	134
Off	Off Room temp lim Flow limit reached	25 122 179 25
Cooling mode off	Cooling mode off	138

State of DHW

End user (info level)	Commissioning, heating engineer	
Limit thermostat has cut out	Limit thermostat has cut out	3
Manual control active	Manual control active	4
Draw-off mode	Draw-off mode	199
Recooling active	Recooling via collector Recooling via DHW/HC	77 78 53
Charging lock active	Discharging protection active Charging time limitation active DHW charging locked	79 80 81 82
Forced charging active	Forced, max stor tank temp Forced, max charging temp Forced, legionella setpoint Forced, nominal setpoint	83 84 85 86 67
Charging el im heater	Charging electric, leg setpoint Charging electric, nominal setpoint Charging electric, Red setpoint Charging electric, frost setpoint El imm heater released	87 88 89 90 91 66
Push active	Push, leg setpoint Push, nominal setpoint	92 93 94
Charging active	Charging, leg setpoint Charging, nominal setpoint Charging, reduced setpoint	95 96 97 69
Frost protection active	Frost protection active	24
Overrun active	Overrun active	17
Stand-by charging	Stand-by charging	201
Charged	Charged, max stor temp Charged, max charg temp Forced, legio temp Charged, nominal temp Forced, Reduced temp	70 71 98 99 100 75
Off	Off	25
Ready	Ready	200

State of boiler

End user (info level)	*Commissioning, heating engineer*	
SLT has cut out	SLT has cut out	1
SLT test active	SLT test active	123
Fault.	Fault.	2
Limit thermostat has cut out	Limit thermostat has cut out	3
Manual control active	Manual control active	4
Chimney sweep function active	Chimney sweep function, high-fire Chimney sweep function, low-fire	5 6 7
Locked	Locked, manually Locked, solid fuel boiler Locked, automatically Locked, outside temperature Locked, Economy mode	8 172 9 176 198 10
Minimum limitation active	Minimum limitation Minimum limitation, low-fire Minimum limitation active	20 21 22
In operation	Protective start-up Protective startup, low-fire Return limitation Return temperature limitation, low-fire	11 12 13 14 18
Charging buffer storage tank In operation for HC, DHW In partial load operation for HC, DHW Released for HC, DHW In operation for DHW In partial load operation for DHW Released for DHW In operation for heating circuit In partial load operation for HC Released for HC Overrun active	Charging buffer storage tank In operation for HC, DHW In partial load operation for HC, DHW Released for HC, DHW In operation for DHW In partial load operation for DHW Released for DHW In operation for heating circuit In partial load operation for HC Released for HC Overrun active	59 170 171 173 168 169 174 166 167 175 17
Released	Released Frost protection plant active	19 23
Frost protection active		24
Off	Off	25

State of solar

End user (info level)	*Commissioning, heating engineer*	
Manual control active	Manual control active	4
Fault.	Fault.	2
Frost protection collector active	Frost protection collector active	52
Recooling active	Recooling active	53
Max stor tank temp reached	Max stor tank temp reached	54
Evaporation protection active	Evaporation protection active	55
Overtemp protection active	Overtemp protection active	56
Max charg temp reached	Max charg temp reached	57
Charging DHW+buffer+swi pool	Charging DHW+buffer+swi pool	151
Charging DHW+buffer	Charging DHW+buffer	152
Charging DHW+swi pool	Charging DHW+swi pool	153
Ladung Puffer+Schwimmbad	Charging buffer+swimming pool	154
Charging DHW	Charging DHW	58
Charging buffer storage tank	Charging buffer storage tank	59
Charg swimm pool	Charg swimm pool Min charg temp not reached Temp diff insufficient	60 61 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 protection active	Overtemp protection active	**56**
	Locked, manually	**8**
	Locked, automatically	**9**
Locked		**10**
	Minimum limitation	**20**
	Minimum limitation, low-fire	**21**
Minimum limitation active	Minimum limitation active	**22**
	Protective start-up	**11**
	Protective startup, low-fire	**12**
	Return temperature limitation	**13**
	Return temp. limitation, low-fire	**14**
In operation for heating circuit	In operation for heating circuit	**166**
In partial load operation for HC	In partial load operation for HC	**167**
In operation for DHW	In operation for DHW	**168**
In partial load operation for DHW	In partial load operation for DHW	**169**
In operation for HC, DHW	In operation for HC, DHW	**170**
In partial load operation for HC, DHW	In partial load operation for HC, DHW	**171**
Overrun active	Overrun active	**17**
In operation	In operation	**18**
Assisted firing fan active	Assisted firing fan active	**163**
Released	Released	**19**
	Frost protection plant active	**23**
	Frost protection boiler active	**141**
Frost protection active		**24**
Off	Off	**25**

State buffer storage tank

End user (info level)	*Commissioning, heating engineer*	
Frost protection cooling active	Frost protection cooling active	202
	Locking period at end of heating	135
	DHW charging locked	81
Charging restricted		124
	Forced charging active	67
	Full charging active	203
Charging active		69
	Charged, forced charg required temp	72
	Charged, required temp	73
	Charged, min charg temp	143
Charged		75
Hot	Hot	147
No demand	No demand	51
Frost protection active	Frost protection active	24
	Charging electric, em operation	64
	Charging electric, source prot	65
	Charging electric, defrost	131
	Charging electric, forced	164
	Charging electric, substitute	165
Charging el im heater		66
	DHW charging locked	81
	Restricted, DHW priority	104
Charging restricted		124
	Forced charging active	67
	Partial charging active	68
Charging active	Charging active	69
	Recooling via collector	77
	Recooling via DHW/ HC	142
Recooling active		53
	Charged, max stor temp	70
	Charged, max charg temp	71
	Charged, forced charg required temp	72
	Charged, required temp	73
	Partially charged, temp setpoint	74
	Charged, min charg temp	143
Charged		75
Cold	Cold	76
No heat request	No heat 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 heat release	Forced heat release	110
Heating mode	Heating mode, generation	155 137
Heated, max. sw. pool temp Heated	Heated, max. sw. pool temp Heated, solar setpoint Heated, source setpoint	156 158 157 159
Heating off	Heating mode solar off Heating mode, generation off	160 161 162
Cold	Cold	76

Supplementary source state

User level (information level)	*Activation, heating engineer*
Fault	Fault
Locked	Locked, solid fuel boiler Locked, outdoor temperature Locked, economy mode Locked
Storage tank heating	Storage tank heating
Functioning for HC, DHW	Functioning for HC, DHW
Release for HC, DHW	Release for HC, DHW
Functioning for DHW	Functioning for DHW
Release for DHW	Release for DHW
Functioning for HC	Functioning for HC
Release for HC	Release for HC
Overload active	Overload active
Off	Off

5.29 Cascade diagnostics

Priority / state

Parameter number	*Function*
8100 **8102** **…** **8130**	**Source priority 1** **Source priority 16**
8101 **8103** **…** **8131**	**State of source 1** **State of source 16**
8138	**Cascaded source flow temperature**
8139	**Cascaded source flow setpoint**
8140	**Cascaded source return temperature**
8141	**Cascaded source return setpoint**
8150	**Current source switching**

5.30 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	

5.31 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	

5.32 Pump kick

To prevent damage during idle periods, the pumps and valves are activated for brief periods at regular intervals.
The kick function is activated every Friday at 10:00 (not modifiable).
The pump and mixer valve relay outputs are activated one at a time for 30 seconds at an interval of 1 minute. The current setting determines whether the kick function applies to the QX multifunction relay.

Description		Relay	Kick
Boiler	Pump for boiler	Q2	Yes
	Bypass pump	Q12	Yes
	Boiler return temperature maintenance	Y7	Yes
	Opening valve return temperature maintenance	Y25	Yes, when there is no heat request from the heating circuit
	Closing valve return temperature maintenance	Y26	No
Solid fuel boiler	Solid fuel boiler pump	Q10	Yes
Cascade	Cascade pump	Q25	Yes
	Mixed return opening	Y25	Yes, when there is no heat request from the heating circuit
	Mixed return closing	Y26	No
Solar	Solar circuit pump	Q5	Yes
	Solar circuit pump 2	Q16	Yes
	External heat exchanger pump	K9	Yes
	Storage tank element control	K8	Yes
	Swimming pool element control	K18	Yes
DHW	Charging pump / diverter valve	Q3	Yes
	Primary controller mixer valve fully open	Y31	Yes, when there is no heat request from the heating circuit
	Primary controller mixer valve fully closed	Y32	No
	Mixer pump	Q35	Yes
	Intermediate circuit pump	Q33	Yes
	Storage tank 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
Storage tank	Shut-off valve	Y4	Yes
	Return valve	Y15	Yes
Heating circuit 1 … 3	Heating circuit pump	Q2, Q6, Q20	Yes
	Heating circuit mixer valve fully open	Y1, Y5, Y11	Yes, when there is no heat request from the heating circuit
	Heating circuit mixer valve fully closed	Y2, Y6, Y12	No
	Heating circuit pump second speed	Q21, Q22, Q23	No
Heating circuit 1	Cooling circuit pump	Q24	Yes
	Cooling circuit mixer valve fully open	Y23	Yes, when there is no heat request from the heating circuit
	Cooling circuit mixer valve fully closed	Y24	No
	Cooling diverter valve	Y21	Yes
Group	CC1 pump	Q15	Yes
	CC2 pump	Q18	Yes
	Swimming pool pump	Q19	Yes

5.33 List of displays

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

5.33.1 Error code

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

218	Pressure supervision common message	6
241	Flow sensor, solar sensor error	6
242	Return sensor, solar sensor error	6
243	Swimming pool temperature sensor error	6
320	DHW charging temperature sensor error	6
321	Instantaneous DHW heater outlet temperature sensor error	6
322	Upper pressure limit 3 (crossed)	6
323	Critical lower pressure limit 3 (crossed)	6
324	BX same sensors	3
325	BX/extension module same sensors	3
326	BX/mixing valve group same sensors	3
327	Extension module same function	3
328	Mixing valve group same function	3
329	Extension module / mixing valve group same function	3
330	Sensor BX1 no function	3
331	Sensor BX2 no function	3
332	Sensor BX3 no function	3
333	Sensor BX4 no function	3
334	Sensor BX5 no function	3
335	Sensor BX21 no function	3
336	Sensor BX22 no function	3
337	Sensor BX1 no function	3
338	Sensor BX12 no function	3
339	Collector pump Q5 missing	3
340	Collector pump Q16 missing	3
341	Collector sensor B6 missing	3
342	Solar DHW sensor B31 missing	3
343	Solar integration missing	3
344	Solar controlling element buffer K8 missing	3
345	Solar controlling element swimming pool K18 missing	3
346	Solid fuel boiler pump Q10 missing	3
347	Solid fuel boiler comparison sensor missing	3
348	Solid fuel boiler address error	3
349	Buffer return valve Y15 missing	3
350	Buffer storage tank address error	3
351	Primary controller / system pump address error	3
352	Pressureless header address error	3
353	Cascade sensor B10 missing	3
354	Special sensor 2	3
357	Flow temperature cooling circuit 1 monitoring	6
365	Q34 instantaneous heating error	3
366	Room temperature Hx sensor error	6
367	Relative room humidity Hx sensor error	6
371	HC3 flow temperature	3
373	Expansion module 3	3
388	DHW sensor no function	3

5.33.2 Maintenance code

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

5.33.3 Special operation code

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

CONTROLLERS
CLIMA TOP (RVS63)
CLIMA COMFORT (RVS43)

OEM MANUAL

6 The OEM settings in detail

6.1 Operator unit

Operation and display

Line no.	*Operating line*
21	**Display special operation** Off On
30	**Save basic settings** No Yes
31	**Activate basic settings** No Yes

Save basic settings

The setting data of all operating levels are copied from the controller to the memory of the operator unit. This means that previous data in the operator unit are overwritten.

Activate basic settings

With the exception of the data listed below, the setting data of all operating levels are transferred from the memory of the operator unit to the connected controller. Previous setting data in the controller are overwritten.

The following operating lines will not be overwritten:

Line no.	*Operating line*
6600	Device address
6601	Segment address
6222	Device hours run

The following data will not be overwritten either:
RF list, hours run / start counter, yield meter, maintenance meter, slave pointer, and error history.

6.2 Heating circuits

24h heating limit extension

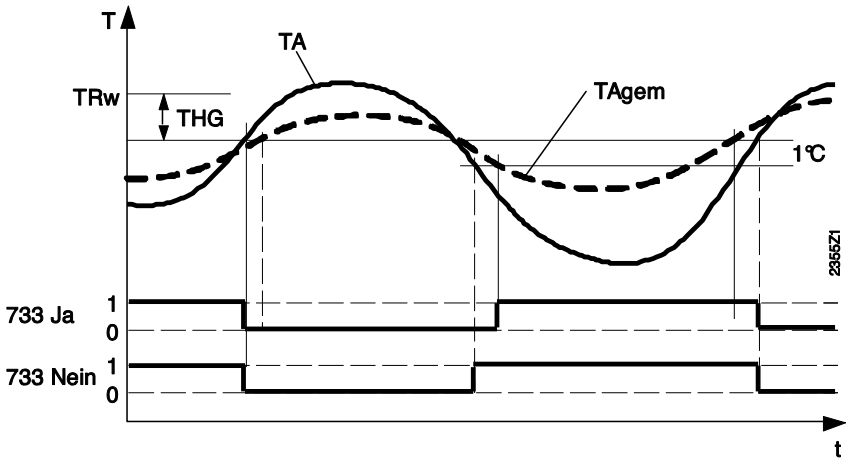
Parameter number				*Function*
HC1	HC2	HC3		
733	**1033**	**1333**		**24h heating limit extension** No | Yes

24h heating limit extension

The "24 h heating limit" function (parameter 732) switches off the heating system if outdoor temperature rises to the differential setpoint below that at which the system is currently functioning. The "24 h heating limit extension" setting determines when the heating system is switched back on again.

24 heating limit extension = No
Heating is switched back on when current outdoor temperature (TA) falls below the differential setting menus 1°C.
Building dynamics (structure and insulation) are not taken into consideration.

24 heating limit extension = Yes
Heating is switched back on when compound outdoor temperature (TAgem) falls below the differential setting menus 1°C.
Building dynamics (structure and insulation) are not taken into consideration.



733	Yes/No settings in parameters 733, 1033, 1333
TRw	Room temperature setpoint
TA	Current outdoor temperature
TAgem	Compound outdoor temperature
THG	24h heating limit
T	Temperature
t	time

Ignition proportional to room thermostat

Parameter number				*Function*
HC1	HC2	HC3		
744	**1044**	**1344**		**Ignition proportional to room thermostat** --- / 1 .. 99%

This function is used to control room temperature with a room thermostat.

Flow temperature can be adapted to suit demand. If a flow temperature setpoint is present, use parameters 742, 1042, 1342.

Set "---" to deactivate the function.

1...99%
function activated

Mixing valve control

Line no.				*Operating line*
HC1	HC2	HC3P		
835	**1135**	**1435**		**Mixing valve Xp**
836	**1136**	**1436**		**Mixing valve Tn**

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve actuator is matched to the behaviour of the plant (controlled system).

Xp influences the P-action of the controller.

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve actuator is matched to the behaviour of the plant (controlled system).

Tn influences the I-action of the controller.

Mixer valve control

Parameter number				*Function*
HC1	HC2	HC3		
888	**1188**	**1488**		**Curve correction at 50% speed**
890	**1190**	**1490**		**Flow setpoint correction, speed control** Yes / No

Curve correction at 50% speed

Flow setpoint increase percentage at 50% speed.

Yes

Flow setpoint correction, speed control

The request for heat from the heating curve is increased by the value set in this parameter.
Heat request = room setpoint + (flow setpoint – room setpoint) * 1.2.

No

The heat request is not increased. If current flow temperature is higher than the heating curve at 100% speed, speed is reduced until heat transfer is correct according to the calculated characteristic curve.

RVS43..only

6.3 Cooling circuit

Mixing valve control

Line no.	*Operating line*
942	**Mixing valve Xp**
943	**Mixing valve Tn**

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve actuator is matched to the behavior of the plant (controlled system).

Xp influences the P-action of the controller.

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve actuator is matched to the behavior of the plant (controlled system).

Tn influences the I-action of the controller.

6.4 DHW

Selecting ECO functioning mode

Parameter number	*Function*
1601	**Selecting ECO functioning mode** None Instant water heating DHW buffer tank Instant water heating + DHW buffer tank

Selecting ECO functioning mode

DHW charging can be activated and deactivated by means of the DHW function button on the controller, or by switching to ECO mode.

ECO mode can only be used to select the following functions:

Instant water heating
ECO mode applies only to instant water heating.
The function is deactivated to keep the water hot.

DHW buffer tank
ECO mode applies only to the DHW buffer tank.
In ECO mode, hot water production is limited to controllable heat sources. These heat sources only switch on if water temperature falls below the reduced setting or if the "Anti-legionella" function is active.

DHW push can be selected manually even in ECO mode.
ECO mode cannot therefore be combined with thermostat control.

Instant water heating + DHW buffer tank
ECO mode applies to instant water heating and the DHW buffer tank.

Setpoints

Line no.	*Operating line*
1614	**Nominal setpoint max**

This operating line is used to limit the “Nominal setpoint“ (operating line 1610) at the top.

6.5 Pumps H

Pump Hx

Line no.				*Operating line*
H1	H2	H3		
2008	**2033**	**2044**		**H1/H2/H3 DHW charging priority** Off ¦ On

H1/H2/H3 DHW charging priority

When using this setting, the connected pump H can be excluded from / included in the effect of DHW charging priority.
In the case of a ventilation system, for example, it is thus possible to ensure a constant supply of heat with no impact from the DHW charging priority.

6.6 User circuit 1, 2, 3

DHW charging priority

Parameter number				*Function*
H1	H2	H3		
1874	**1924**	**1974**		**DHW charging priority H1/H2/H3** No | Yes

DHW charging priority

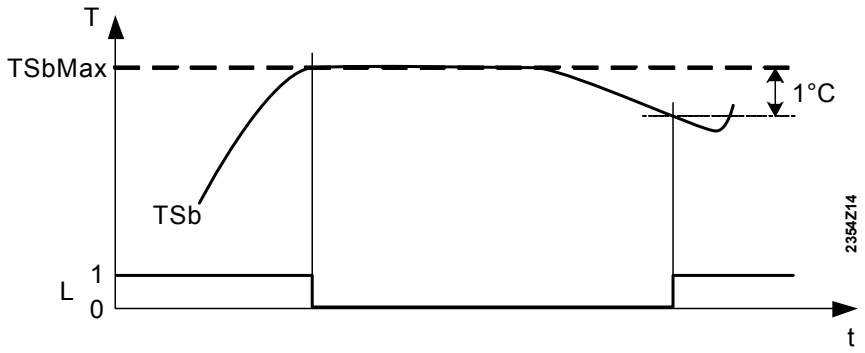
This determines whether DHW charging priority applies to the user circuit / swimming pool.
The "Yes" setting privileges DHW charging on the corresponding user circuit. The "No" setting delivers DHW to user circuits at the same priority as other circuits.

6.7 Swimming pool

Line no.	*Operating line*
2070	**Swimming pool temp max**

Swimming pool temp max

If the swimming pool temperature reaches the temperature limit set here, the collector pump is deactivated. It is released again when the swimming pool temperature has dropped 1 °C below the maximum temperature limit.



TSbMax Swimming pool temp max (operating line 5051)
TSb actual value of the swimming pool temperature
L Storage tank charging: 1 = on, 0 = off

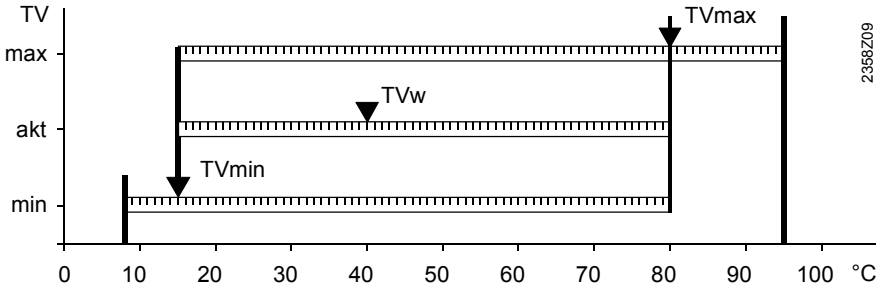
6.8 Primary controller / system pump

Flow temperature setpoint limits

Line no.	*Operating line*
2110	**Flow temp setpoint min**
2111	**Flow temp setpoint max**
2112	**Flow setpoint, cooling min**

Flow temp setpoint minimum/maximum

These limit values can be used to define a temperature range for the heating flow temperature setpoint.



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

Flow setpoint, cooling min

This limit value can be used to define the low limit for the flow temperature setpoint for cooling.

Mixing valve control

Line no.	*Operating line*
2130	**Mixing valve boost**
2131	**Mixing valve cooling offset**
2132	**Actuator type**
2133	**Switching differential 2-pos**
2134	**Actuator running time**
2135	**Mixing valve Xp**
2136	**Mixing valve Tn**

Mixing valve boost

For mixing, the actual value of the boiler flow temperature must be higher than the required setpoint of the mixing valve flow temperature since otherwise that temperature cannot be controlled. The controller generates the boiler temperature setpoint based on the increase set here and the current flow temperature setpoint.

Mixing valve cooling offset

To ensure proper mixing, the actual flow temperature of the cooling aggregate must be lower than the required mixing valve flow temperature setpoint. The cooling demand is reduced by the value set here.

DHW charging priority

Parameter number	*Function*
2145	**DHW charging priority** No Yes

DHW charging priority

NO
DHW shares the same priority as the primary controller.
YES
The DHW buffer tank has priority in heat requests.

6.9 Boiler

Operating mode

Line no.	*Operating line*
2200	**Operating mode** Continuous operation Automatically Auto, extended running time

Operating mode

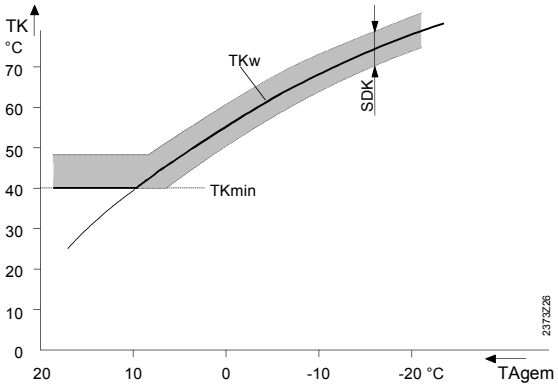
Continuous operation

The boiler is constantly released and the minimum boiler temperature maintained is the parameterized TKMin.

The boiler is only locked when all connected heating circuits are set to Protection mode and when there is no valid request.

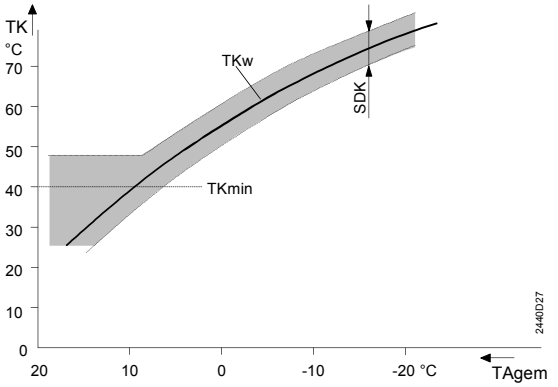
Automatically

The boiler is released as soon as there is at least one valid temperature request. Once the boiler is released, the required minimum boiler temperature will always be maintained. The boiler is locked when no valid temperature request is active. This means that with this operating mode, the boiler setpoint will be maintained at the required minimum only if a temperature request is active.



Auto mode, with extended burner running time

The boiler is released as soon as there is at least one valid temperature request. When the boiler is released, the burner will be switched on when the boiler temperature drops below the request of the consumers. The required minimum boiler temperature is maintained only if the burner had to be switched on due to a request from one of the consumers. This means that since the boiler temperature can drop below its minimum, but the activation of this parameter limits the number of burner ignition cycles.

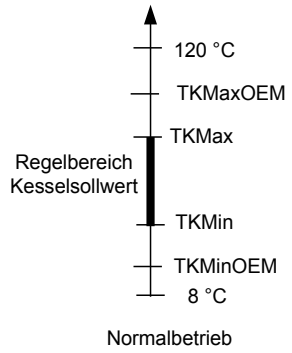


Operation points

Line no.	*Operating line*
2211	**Setpoint min OEM**
2213	**Setpoint max OEM**

Setpoint minimum / maximum OEM

For this OEM boiler temperature limit control, limit values are defined for the upper and lower boiler temperature setpoints (TKMax and TKMin).



ultistage boiler

RVS63.. only

Line no.	*Operating line*
2220	**Release integral stage 2**
2221	**Reset integral stage 2**

Integrals for stage 2

The temperature-time integral is a continuous summation of the temperature differential over time. In this case, the decisive temperature differential is the amount the temperature exceeds the burner's switch-on setpoint or switch-off setpoint.
Through the generation of the temperature-time integral it is not only the period of time that is considered, but also the extent of crossing. This means that when the crossing is significant, burner stage 2 is released or locked earlier than when the crossing is small.

Release integral burner stage 2

When, with burner stage 1, the temperature drops below the switch-on setpoint by the release integral set here, the controller releases burner stage 2.

Reset integral burner stage 2

When, with burner stages 1 and 2, the temperature drops below the switch-off setpoint by the reset integral set here, the controller locks burner stage 2.

Burner modulation (3 position actuator / UX)

Line no.	*Operating line*
2232	**Damper actuator running time**
2233	**Modulating Xp**
2234	**Modulating Tn**
2235	**Modulating Tv**

Damper actuator running time

To ensure that control of the modulating burner works optimally, the damper actuator running time must be set.

It must be observed that the running time to be set only relates to the range.

- Example

Running time of damper actuator (90°) = 120 seconds
Minimum position of damper actuator = 20°
Maximum position of damper actuator = 80°

Hence, the air damper actuator running time effective for the control is as follows:

$$\frac{120s * (80° - 20°)}{90°} = 80s$$

- Positioning pulses

For control operation, running time-dependent minimum positioning pulses are active that are defined as follows:

Actuator running time TS	*Minimum pulse length*
7.5 s – 14.5 s	Approx. 200 ms
15 s – 29.5 s	Approx. 300 ms
30 s – 59.5 s	Approx. 500 ms
60 s – 119.5 s	Approx. 1.10 s
>120 s	Approx. 2.20 s

Modulating Xp

By setting the right proportional band, the control action of the modulating burner is matched to the plant's behaviour (controlled system).

Xp influences the controller's P-action.

Modulating Tn

By setting the right integral action time, the control action of the modulating burner is matched to the behavior of the plant (controlled system).

Tn influences the controller's I-action.

Modulating Tv

By setting the right derivative action time, the control action is matched to the behavior of the plant (controlled system).

Tv influences the controller's D-action. With Tv = 0, the D-action is deactivated.

Boiler / burner control

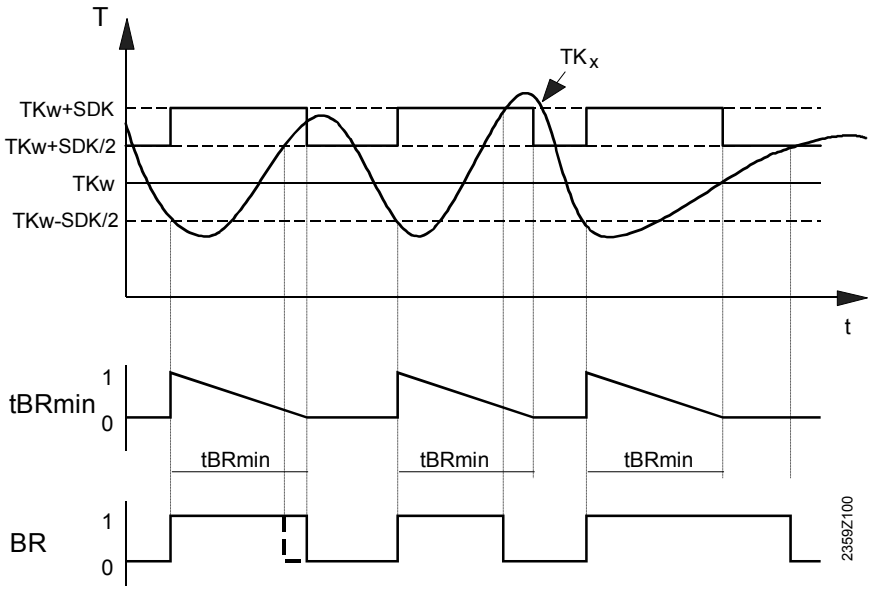
Line no.	*Operating line*
2240	**Switching differential of the boiler**
2241	**Burner running time min**

Switching differential of the boiler

The boiler temperature is controlled by a 2-position controller for which a switching differential can be set.

Burner running time min

If a minimum burner running time is parameterized, the burner's switch-off point will be raised by half the boiler's switching differential within that minimum on time. If, within the minimum burner running time, the boiler temperature exceeds the setpoint by more than the entire switching differential, the burner will also be shut down before the minimum on time has elapsed. On completion of the minimum on time, the burner's switch-off point will be set to the boiler temperature setpoint plus half the switching differential. This function only acts on the first burner stage.



T Temperature
t Time
tBRmin Burner running time min
BR Burner (0= off, 1 = on)
TKw Boiler setpoint
TKx Actual boiler temperature
SDK Switching differential of the boiler

Overtemperature protection

Line no.	*Operating line*
2250	**Pump overrun time**

Pump overrun time

If the first burner stage is switched off, or if the boiler request becomes invalid, a forced signal is delivered during the parameterized pump overrun time. Consumer pumps do not switch off during the period of time such a forced signal is active.

Minimum limitation of the boiler temperature

Line no.	*Operating line*
2260	**Prot boil startup consumers**
2261	**Prot boil startup boil pump**
2262	**Optimum start control**

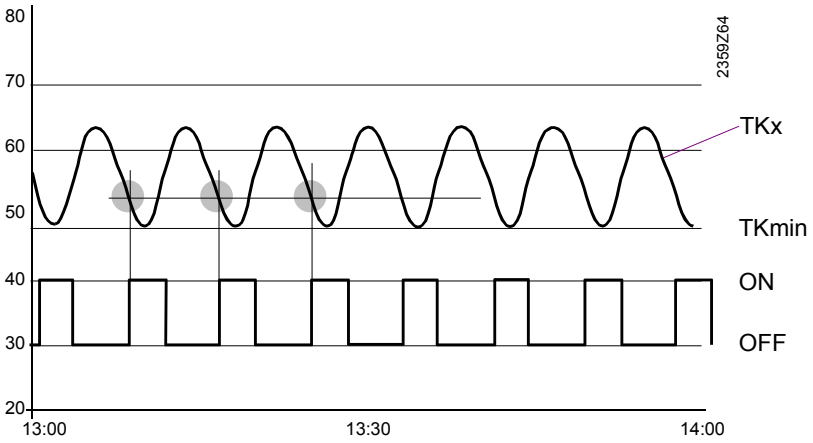
Protective start-up

Below the minimum boiler temperature, protective boiler startup accelerates heating up of the boiler by switching off or reducing the consumer load, or by keeping the boiler pump deactivated, depending on the hydraulic circuit used.

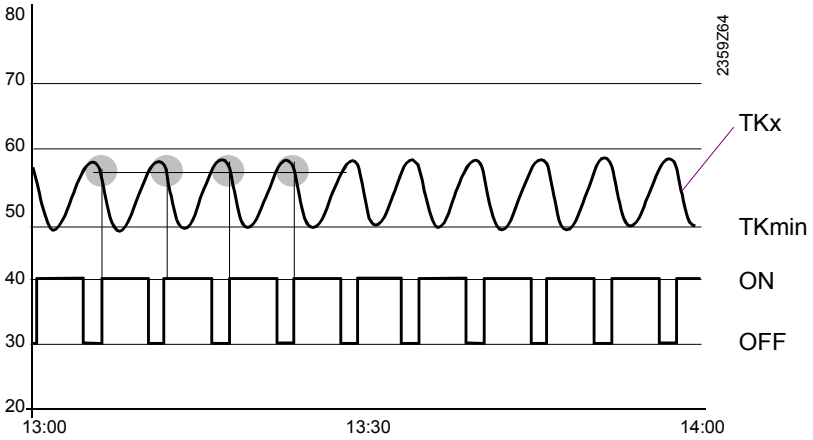
Optimum start control

When the function is activated (graph 1,2), the controller calculates the switch-on point for the burner, based on the boiler temperature gradient, thus enabling that the boiler temperature will not fall below the minimum level.
When the function is deactivated (graph 3), the controller will switch the burner on at TKmin.

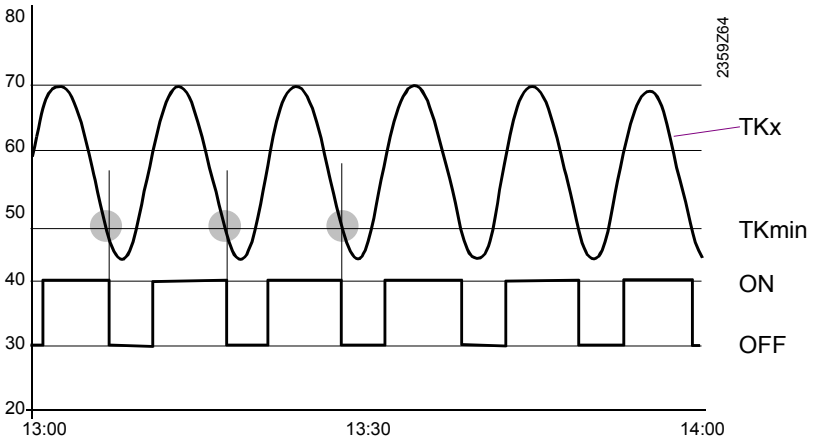
- With optimum burner start control at about 35 % load



- With optimum burner start control at about 65% load



- Without optimum burner start control at about 35 % load



ON	Burner on
OFF	Burner off
TKx	Actual value of the boiler temperature
Tkmin	Minimum limitation of the boiler temperature

Minimum limitation of the return temperature

Line no.	*Operating line*
2271	**Return setpoint min OEM**
2272	**Return influence consumers**

Return setpoint min OEM

This minimum limitation of the return temperature OEM is the lower limit value for the minimum of the return temperature setpoint.

Return influence consumers

If, with the boiler released, the return temperature falls below the set minimum temperature, a locking signal will be calculated.

- With proper pump circuits (heating circuit pump, DHW charging pump, external load) is or remains deactivated if the locking signal exceeds the respective threshold value
- In the case of mixing circuits, the flow temperature setpoint will be reduced according to the locking signal value

Return temperature minimum limitation mixing valve

Line no.	*Operating line*
2282	**Actuator running time**
2283	**Mixing valve Xp**
2284	**Mixing valve Tn**
2285	**Mixing valve Tv**

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

Xp influences the controller's P-action.

- Example

In the case of a setpoint / actual value deviation of 20 °C, Xp = 20 produces a manipulated variable corresponding to the running time of the mixing valve's actuator (Tv = 0, Tn = maximum).

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

Tn influences the controller's I-action.

Mixing valve Tv

By setting the right derivative action time, the control action is matched to the behavior of the plant (controlled system).

Tv influences the controller's D-action. With Tv = 0, the D-action is deactivated.

Bypass pump

Line no.	*Operating line*
2290	**Switching differential bypass pump**

Switching differential bypass pump

Control of the bypass pump "according to the boiler return temperature" is in the form of 2-position control for which a switching differential must be set.

Bypass pump

2291	**Control bypass pump** Parallel burner operation Return temperature

Control bypass pump

The boiler bypass pump improves the circulation of water through the boiler, thus preventing the boiler temperature from falling below a certain level.

Parallel with the operation of the burner

The boiler bypass pump is switched on / off according to the burner's on / off signals.

According to the boiler return temperature

The boiler bypass pump is switched on / off according to the minimum limitation of the boiler return temperature and the switching differential of the bypass pump.

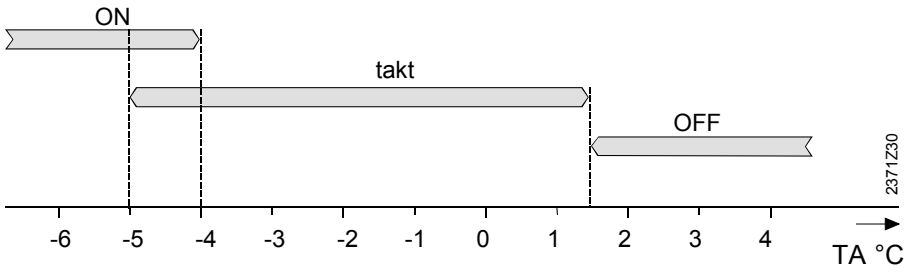
Frost protection

Line no.	*Operating line*
2300	**Frost prot plant boiler pump**

The boiler pump is activated, depending on the **current** outside temperature, although there is no request for heat.

Frost protection for the boiler operates only if frost protection for the plant on operating line 6120 is switched on.

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



Electronic limit thermostat

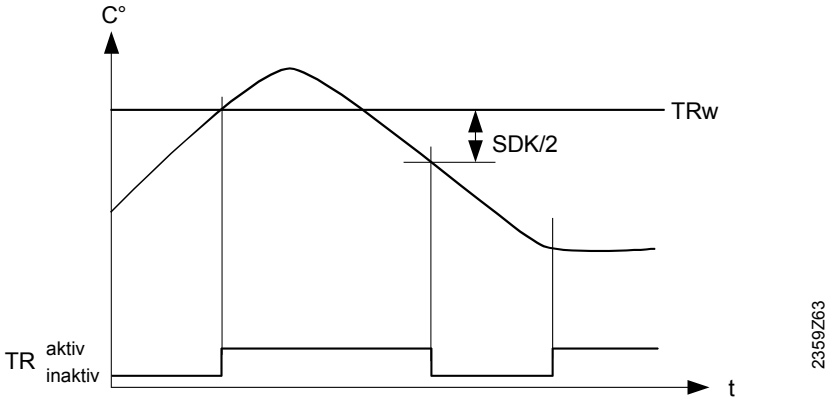
Line no.	*Operating line*
2310	**Limit thermostat function**

Limit thermostat function

The electronic limit thermostat monitors the boiler temperature (TKx) and cuts out if the set limit value (TR setpoint) is exceeded, causing the burner to shut down.

In normal control mode and for the relay test, the TR setpoint used is the boielr temperature's maximum limitation (TKMax) while the "adjustable" value TKMaxHand is used with manual control.

Parameter “Limit thermostat function“ can be used to switch the limit thermostat on and off. But it is always active in manual control.



TRw Setpoint of electronic limit thermostat

The limit thermostat is activated when:

- The boiler temperature (TKx) exceeds the TR setpoint
- There is no boiler temperature signal, e.g. no signal from the sensor due to a short-circuit.

TR is deactivated when:

- The boiler temperature drops by one half the boiler switching differential (SDK/2), but at least 2°K.

The electronic limit thermostat is integrated in burner relay control in a way that relays K4/K5 will immediately be deenergized when the limit thermostat becomes active (independent of control, relay test, and manual control). It is only during the SLT (safety limit thermostat) test that the electronic limit thermostat does not become active.

Monitoring the temperature differential

Line no.	*Operating line*
2315	**Temp differential min**
2316	**Temp differential max**
2317	**Nominal temperature differential**

When using a speed-controlled boiler pump, the pump’s speed is adjusted in a way that the difference between flow and return temperature will lie within that range.
The pump’s speed is significantly reduced only when the boiler delivers the required output.

Temp differential min

Minimum boiler differential
The "Minimum boiler differential" function is used to monitor the speed control of the boiler pump.
When the actual boiler flow/return differential reaches the preset value, the boiler pump speed is not increased further. If the actual differential drops below the preset value, the speed is reduced.
The function can be deactivated with the setting – – – .

Temp differential max

Maximum boiler differential
The "Maximum boiler differential" function is used to monitor the speed control of the boiler pump.
When the boiler flow/return differential reaches the preset value, the boiler pump speed is not increased further. If the actual differential exceeds the preset value, the speed is reduced.

The function can be deactivated with the setting – – – .

Nominal temperature differential

Reference differential value for boiler pump speed.
This setting only affects variable speed boiler pumps.

Speed control

Line no.	*Operating line*
2320	**Pump modulation**
2322	**Pump speed min**
2323	**Pump speed max**
2324	**Speed Xp**
2325	**Speed Tn**
2326	**Speed Tv**

None
Boiler pump speed is neither calculated nor controlled. The speed output corresponds to the maximum speed setting.

Request
The calculation of boiler pump speed depends on the system's configured and actual users.
Note: Only users active on the same controller are taken into consideration. In the case of systems with an LPB connection, the boiler pump speed request parameter is not ideal.

Boiler setpoint
This function reduces pump speed until the required boiler reference value is reached. Pump speed is calculated so that boiler pump speed can only be reduced to the permitted minimum after the boiler has been at full power.

Nominal temperature differential
Pump speed is controlled in order to maintain the set nominal differential between boiler flow (B2) and boiler return (B7).

Burner output
With this function active, boiler pump speed depends directly on burner output.
The boiler pump is kept at minimum speed while burner output is below 20%. Maximum pump speed is only commanded when the burner output is equal to or greater than 80%. Burner output is attenuated to calculate pump speed.

Pump speed minimum/maximum

Boiler pump speed range
The boiler pump motor speed is limited by a minimum and maximum permitted speed. To ensure that the pump operates reliably on start-up, it is operated at maximum speed for the first 10 seconds.

Boiler pump speed control

The "Boiler pump speed control" function reduces the flow of water through the boiler water in order to achieve the specified boiler setpoint. The controller calculates the pump speed required to ensure that the boiler water volume is not reduced to the permissible minimum until the boiler reaches its full capacity. This prevents the boiler from reaching the setpoint at a reduced boiler capacity, causing the pump to continue to operate at reduced speed.
The pump speed is calculated by a PID controller.

With a low boiler capacity (actual capacity less than 66%) the speed-control setpoint is reduced by 10 K. If the boiler capacity rises above 66%, the pump-speed setpoint is increased, so that at 100% boiler capacity, the setpoint for the speed control calculation corresponds to boiler demand.

6.10 Cascade

Operating mode / strategy

Line no.	*Operating line*
3510	**Lead strategy** Late on, early off Late on, late off Early on, late off
3511	**Output band min**
3512	**Output band max**

Lead strategy

- **Late on, early off**

Additional boilers are switched on as late as possible (output band max) and switched off again as early as possible (output band max). This means that the **smallest possible number of boilers are in operation,** or additional boilers operate with short on times.

- **Late on, late off**

Additional boilers are switched on as late as possible (output band max) and switched off again as late as possible (output band min). This leads to the **smallest possible number of switch-on/off actions** for the boilers.

- **Early on, late off**

Additional boilers are switched on as early as possible (output band min) and switched off again as late as possible (output band min). This means that the **largest possible number of boilers are in operation,** or additional boilers operate with the longest possible on times.

Output band

The values are used as switch-on or switch-off criteria in accordance with the selected lead strategy.

Control

Line no.	*Operating line*
3530	**Release integral source seq**
3531	**Reset integral source seq**
3534	**Forced time basic stage**

Integral source sequence

The settings can be used as switch-on or switch-off criteria, in addition to the output band.

- Release integral source sequence

When, with the heat source currently in operation, the demand for heat cannot be met, the difference being the release integral set here, another boiler is switched on.
When the value is increased, additional heat sources are switched on at a slower rate.
When the value is decreased, additional heat sources are switched on at a faster rate.

- Reset integral heat source sequence

When, with the heat source currently in operation, the demand for heat is exceeded by the reset integral set here, the heat source with the highest priority is shut down.
When the value is increased, heat sources operate for longer periods of time (in the case of surplus heat).
When the value is decreased, heat sources are switched off at a faster rate.

Forced time basic stage

When switched on, every boiler operates with its basic stage for the period of time set here. The next stage is released only when this period of time has elapsed.

Minimum limitation of the boiler temperature

Line no.	*Operating line*
3550	**Prot startup cascade pump**

Protective start-up

The protective startup provided by the cascade pump accelerates heating up of the first boiler in the cascade below the minimum boiler temperature in that the cascade pump remains deactivated..

Minimum limitation of the return temperature

Line no.	*Operating line*
3561	**Return setpoint min OEM**
3562	**Return influence consumers**

Return setpoint min OEM

The minimum limitation of the cascade return temperature (operating line 3560) can be adjusted by the OEM.The person using the heating engineer level can no longer set the minimum limitation of the cascade return temperature below the minimum value required for the boiler.

Return influence consumers

If, with the boilers released, the cascade return temperature drops below the minimum temperature, a locking signal is calculated.

- In the case of pump circuits, the consumer pumps (heating circuit pump, DHW charging pump, ext. load) will be or will stay deactivated if the locking signal exceeds the respective threshold value
- In the case of mixing circuits, the flow temperature setpoint will be reduced according to the locking signal value

Return mixing valve

Line no.	*Operating line*
3570	**Actuator running time**
3571	**Mixing valve Xp**
3572	**Mixing valve Tn**

Actuator running time

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

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

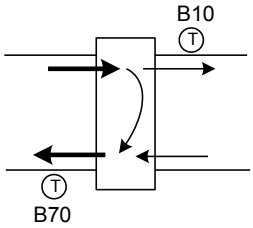
Xp influences the controller's P-action.

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).
Tn influences the controller's I-action.

Monitoring the temperature differential

Line no.	*Operating line*
3590	**Temp differential min**



This function prevents excessive cascade return temperatures and improves the cascade's switch-off behavior.
If the temperature differential between flow and return sensor (B10, B70) becomes smaller than the set minimum temperature differential (operating line 3550), one of the heat sources is switched off as early as possible, independent of the selected lead strategy.When the temperature differential is sufficient again, the selected lead strategy is resumed.

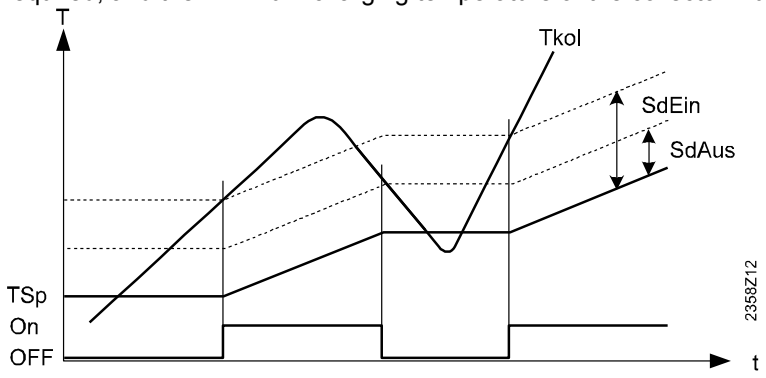
Switching off due to the minimum temperature differential does not apply to the last heat source in the cascade.

6.11 Solar

Charging controller (dT)

Line no.	*Operating line*
3813	**Temp diff ON buffer**
3814	**Temp diff OFF buffer**
3816	**Temp diff ON swi pool**
3817	**Temp diff OFF swi pool**

Setting - - - adopts the general temperature differential of solar operating lines 3810 and 3811.For charging via the heat exchanger, a sufficient temperature differential is required, and the minimum charging temperature of the collector must be reached.



TKol	Collector temperature
On / Off	Collector pump
SdOn	Temp differential on buffer / swimming pool
SdOff	Temp differential off buffer / swimming pool
TSp	Storage tank / swimming pool temperature

Start function

Line no.	*Operating line*
3832	**Collector start function on**
3833	**Collector start function off**

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.

Speed control

RVS63.. only

Line no.	*Operating line*
3872	**Speed Xp**
3873	**Speed Tn**

Speed Xp and integral action time Tn

The charging setpoint of the tank with first-priority charging and the collector temperature are both used for speed control. A PI-controller calculates the speed required to ensure that the collector temperature is 2K below the switch-on temperature.

If the collector temperature rises due to increased solar radiation, the speed is increased. If the collector temperature drops below this setpoint, the speed is reduced. Limit parameters can be set to define a maximum and minimum pump speed.
The PI controller can be influenced by parameters Xp and Tn. The controller has a dead band of +/- 1K.
The resulting speed is delivered at the speed output selected during configuration (Triac AX3 or 0..10V).
If the charging priority is changed, the controller regulates the speed in accordance with the new charging setpoint.

6.12 Solid fuel boiler

Overtemperature protection

Line no.	*Operating line*
4141	**Excess heat discharge**
4154	**Min OEM return setpoint**
4163	**Actuator running time**
4164	**Mixing valve Xp**
4165	**Mixing valve Tn**

Excess heat discharge

If the boiler temperature reaches the adjusted maximum value, excess heat discharge becomes active. This forces the connected consumers to draw heat from the boiler. At the same time, the boiler pump will be switched on.

Min OEM return setpoint

The minimum return temperature setpoint (parameter 4153) for solid fuel boilers can be lowered on the OEM side.
Heating engineer level users can no longer enter the minimum cascade return temperature setpoint in the minimum value required by the solid fuel boiler.

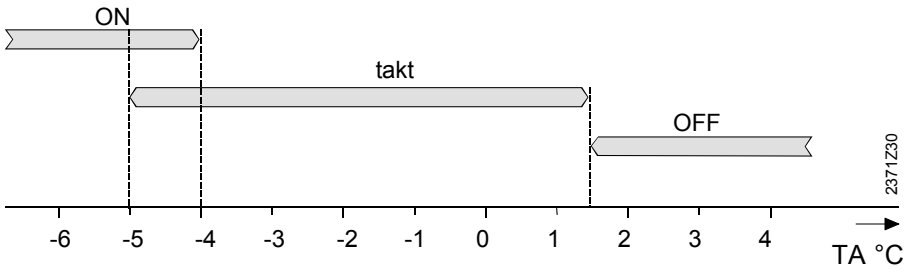
Frost protection

Line no.	*Operating line*
4170	**Frost prot plant boiler pump**

The boiler pump is activated depending on the **current** outside temperature, although there is no request for heat.

Frost protection for the solid fuel boiler operates only if frost protection for the plant on operating line 6120 is switched on.

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



6.13 Buffer storage tank

Automatic heat generation lock

Line no.	*Operating line*
4721	**Auto heat generation lock SD**

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

Auto heat generation lock SD

The switching differential can be adjusted.

Min st tank temp heat mode

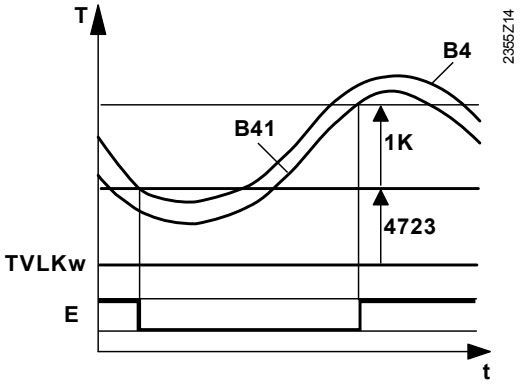
If the actual storage tank temperature falls below this level, the heating circuits are shut down.

Automatic generation lock

Parameter number	*Function*
4723	**Buffer tank/cooling circuit temperature differential**
4724	**Minimum buffer tank temperature in heating mode**
4726	**Minimum buffer tank temperature in cooling mode**

Buffer tank/cooling circuit temperature differential

If the temperature differential ΔT between the buffer tank and the request from the cooling circuit is sufficiently large, the cooling energy requested by the cooling circuit will provided by the buffer tank. The cooling source is locked.



TVLKw Flow temperature setpoint in cooling mode
K Cooling source

Minimum buffer tank temperature in heating mode

If the effective temperature of the buffer tank falls below this level, the heating circuits are switched off if no other heat source is available.

Maximum buffer tank temperature in cooling mode

Cooling mode is disabled if the top temperature in the buffer tank (B4) exceeds the maximum temperature set for the tank in cooling mode. The cooling circuit pumps stop and the mixer valves close. The cooling request signal to the cooling system remains on. If temperature in the tank falls 0.5°C below maximum temperature, cooling is re-enabled.

Stratification/decharging protection

Only RVS43..

Line no.	*Operating line*
4740	**Stratif prot temp diff max**
4743	**Stratif prot Vor'schauzeit**
4744	**Stratif prot integr action time**
4746	**DHW protection combined** Off ¦ On

The buffer storage tank anti-stratification function provides for hydraulic balancing between the consumers and the generator without the need for additional shut-off 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. The function is only active if at least one of the heat generators is delivering heat.

If the temperature measured by the common flow sensor (B10 downstream of buffer) drops below the heat generation temperature by more than the preset temperature differential, the volume of water on the consumer side is reduced via locking signals (reduction in the setpoints). If the locking signal achieves 100% for longer than 10 minutes, the locking signal is deleted and re-calculated after a delay of 1 minute. This ensures that the volume of water on the consumer side is not throttled altogether so that there is no flow through sensor B10.

Note: If a primary controller is configured downstream of the buffer storage tank, and if there is no B10 connected, then the function is calculated with the connected B15.

DHW protection combined

For a combined storage tank without a charging pump/diverting valve Q3, the heat demand for room heating (lower part of tank) cannot be supplied without mixing with the DHW section (upper part of tank). It is therefore important to ensure that the water flowing into the top part of the storage tank is not too cold.The function can be activated / deactivated.
Off:
Function is deactivated. The heat demand for room heating is not increased. Hydraulic integration of the combined storage tank maintains DHW stratification.

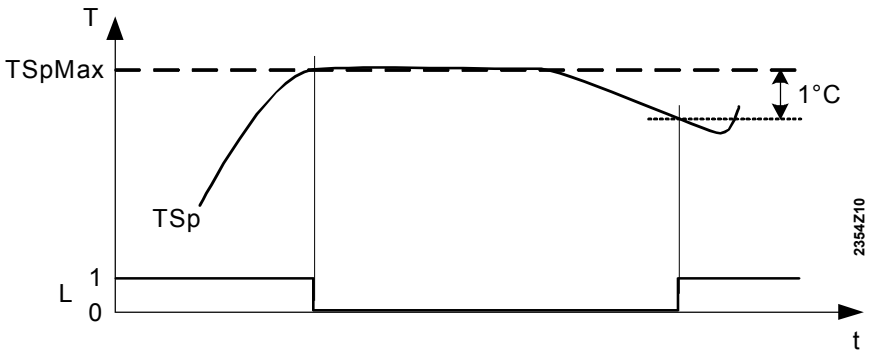
On:
The function is active. The room heating demand is increased for DHW protection. The demand signal to the heat generator is increased so that is at least equivalent to the DHW temperature (B3). At the most, the low temperature limit control remains active only until the nominal DHW setpoint is reached.

Overtemperature protection

Line no.	*Operating line*
4751	**Storage tank temp max**

Storage tank temp max

If the storage tank reaches the maximum storage tank temperature set here, the collector pump will be deactivated. It will be released again when the storage tank temperature has dropped 1 °C below the maximum storage tank temperature.



TSpMax Storage tank temp max (operating line 5051)
TSp Actual value of the storage tank temperature
L Storage tank charging: 1 = on, 0 = off

6.14 DHW storage tank

Release

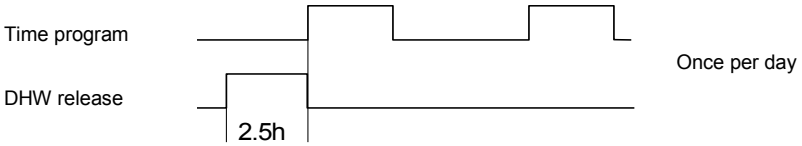
Line no.	*Operating line*
5010	**Charging** Once/day ¦ Several times/day

Charging

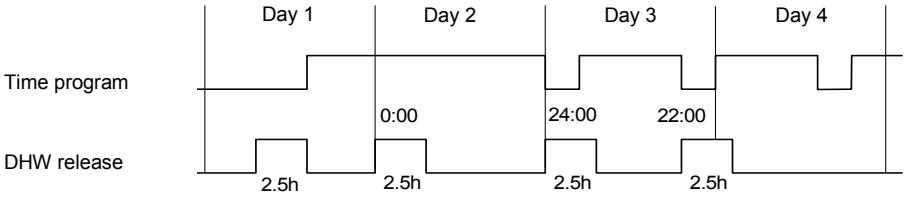
Selection of charging “Once/day“ or “Several times/day” is active only if DHW release is set according to the time programs of the heating circuits

Once / day

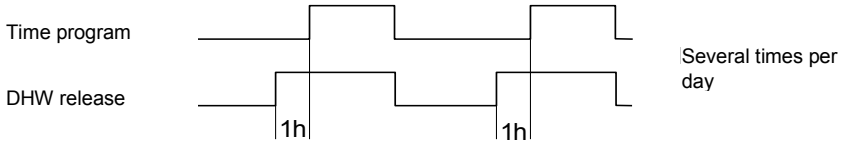
Release of DHW charging is given 2.5 hours before the first heat request fom the heating circuit is received. Then, the reduced DHW setpoint applies for the whole day.



In the case of continuous heating (with no setback periods), release of DHW charging is given at 0:00. The same rule also applies if the first request for heat from the heating circuit is received before 02:30. If a request for heat is received at midnight, DHW charging is released after the first setback period, but no earlier than 2.5 hours before midnight.



Several times / day
When selecting “Several times/day“, release of DHW charging is put forward in time by 1 hour against the periods of time the heating circuit calls for heat, and is then maintained during those periods of time.



Charging control

Line no.	*Operating line*
5024	**Switching differential**

Switching differential

If the DHW temperature is lower than the current setpoint minus the switching differential set here, DHW charging will be started.
DHW charging will be terminated when the temperature reaches the current setpoint.

When DHW heating is released for the first time in a 24-hour period, forced charging will be initiated. DHW charging is also started when the DHW temperature lies within the switching differential, provided it does not lie less than K below the setpoint.

Charging time limitation

Line no.	*Operating line*
5030	**Charging time limitation**

Charging time limitation

During DHW charging, space heating may obtain no or too little energy, depending on the selected charging priority (operating line 1630) and the type of hydraulic circuit. For this reason, it is often practical to set a time limit to DHW charging.

- - -
Charging time limitation is deactivated. The DHW is heated up to the nominal setpoint, even if space heating cannot draw sufficient amounts of heat for a certain period of time.

10 – 600
DHW charging is stopped after the set period of time in minutes and then locked for the same period of time before it is resumed. During this period of time, the heat produced by the boiler is made available for space heating. This cycle is repeated until the nominal DHW setpoint is reached.

When space heating is switched off (summer operation, Eco function, etc.), DHW charging will not be stopped, independent of the selected setting.

Discharging protection

Line no.	*Operating line*
5040	**Discharging protection**

Discharging protection

This function ensures that the DHW charging pump (Q3) will be activated only when the boiler temperature is high enough.

- With sensor
  The charging pump will be activated only when the boiler temperature reaches the level of the DHW temperature plus one half the charging boost. If, during charging, the boiler temperature drops to a level below the DHW temperature plus 1/8 the charging boost, the charging pump will be deactivated again. If 2 DHW sensors are parameterized for DHW charging, the lower temperature is used for the discharging protection function (usually sensor B31).

- With thermostat
  The charging pump will be activated only when the boiler temperature lies above the nominal DHW setpoint. If, during charging, the boiler temperature drops below the nominal DHW temperature minus the DHW switching differential, the charging pump will be deactivated again.

Off

Function is deactivated.

Always

The function is always active.

Automatically

The function is active only if the heat source is not able to deliver heat, or is not available (fault, heat generation lock).

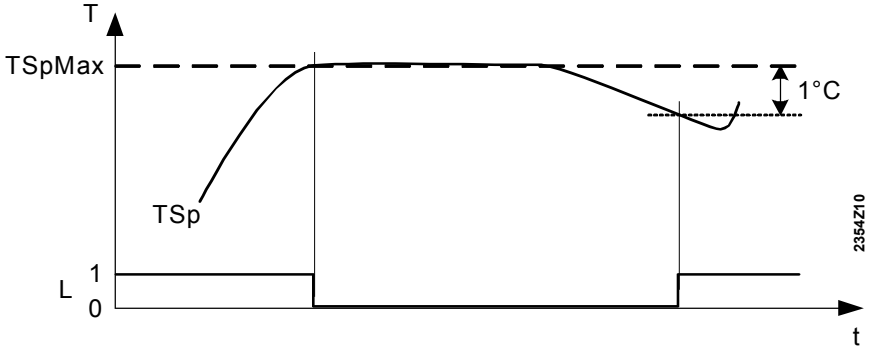
Overtemperature protection

Line no.	*Operating line*
5051	**Storage tank temp max**

Storage tank temp max

If the storage tank reaches the maximum storage tank temperature set here, charging is aborted. It will be released again when the storage tank temperature has dropped 1 °C below the maximum storage tank temperature.

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



TSpMax Storage tank temp max (operating line 5051)
TSp Actual value of the storage tank temperature
L Storage tank charging: 1 = on, 0 = off

DHW push

Line no.	*Operating line*
5070	**Automatic push** Off On
5071	**Charging prio time push**

Automatic push

The DHW push can be triggered either manually or automatically.
In that case, the DHW is heated up once to the nominal setpoint.

Off
The DHW push must be triggered manually.

On
If the DHW temperature falls below the reduced setpoint (operating line 1612) by at least 2 switching differentials (operating line 5024), one-time charging to the nominal DHW setpoint (operating line 1610) will take place again.

The automatic DHW push only works when the DHW operating mode is activated.

Charging prio time push

In the case of a DHW push, the DHW storage tank is charged with absolute priority for the period of time set here.

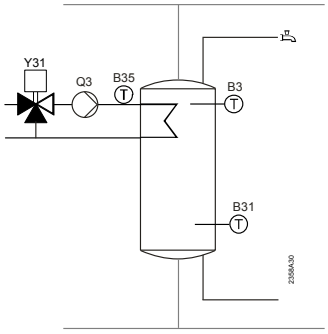
Speed-controlled pump

	Line no.	*Operating line*
Only RVS63..	**5103**	**Speed Xp**
Only RVS63..	**5104**	**Speed Tn**

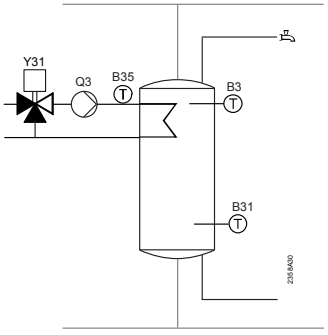
Speed control

Charging pump Q3 speed control

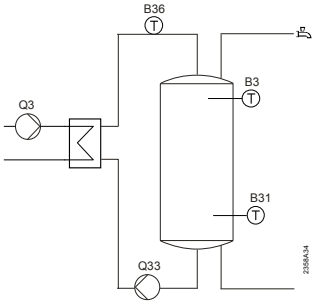
Heat exchanger in storage tank and sensor B36 in the return.
The controller calculates the charging-pump speed required to ensure that the return temperature measured by sensor B36 is 2K above the storage tank temperature (B3).



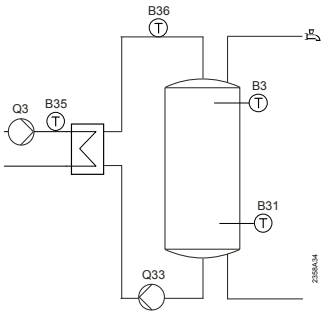
Heat exchanger in storage tank, with primary controller.
The controller calculates the charging-pump speed required to ensure that the DHW setpoint + charging increase measured at sensor B35 is achieved.



Heat exchanger outside the storage tank and sensor B36 in flow (part-schematics 22, 23)
The controller calculates the charging-pump speed required to ensure that the charging temperature measured by sensor B36 is 2K above the DHW setpoint.

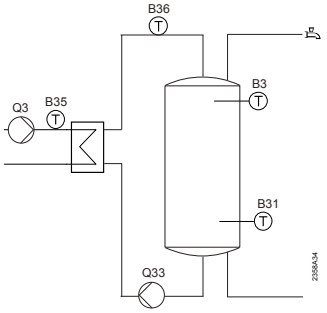


Heat exchanger outside storage tank, with primary controller.
The controller calculates the charging-pump speed required to ensure that the charging temperature measured by sensor B35 is 2K above the DHW setpoint. In this case the primary controller sensor B35 must be located in the intermediate circuit.
If a B36 is also connected, B35 must be positioned as the primary control sensor. In this case, the controller calculates the speed required to ensure that the DHW setpoint + charging increase measured by sensor B35 is achieved.



Speed control of intermediate circuit pump Q33 speed

The controller calculates the speed of the intermediate-circuit pump required to ensure that the return temperature measured by sensor B36 is 2K above the DHW setpoint.
If no B36 is connected the calculation is based on sensor B35.
If no valid sensor is connected, the pump speed is not controlled.



Mixing valve precontrol

Line no.	*Operating line*
5120	**Mixing valve boost**
5125	**Mixing valve Xp**
5126	**Mixing valve Tn**

Mixing valve boost

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

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).
Xp influences the controller's P-action.

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

Tn influences the controller's I-action.

Flow temperature compensation setpoint

Parameter number	*Function*
5142	**Flow compensation delay setpoint**
5143	**Xp flow compensation setpoint**
5144	**Tn flow compensation setpoint**
5145	**Tv flow compensation setpoint**

Flow temperature compensation setpoint	The compensation setpoint adapts the heat request to allow the temperature of the intermediate circuit at B36 to reach the reference value (buffer tank setpoint plus the intermediate circuit increase). If the temperature of the intermediate circuit is too low, the heat request is increased. The maximum increase in the reference value is limited to half the reference push (parameter 5020). If the temperature of the intermediate circuit is too high, the heat request is reduced. The original request can be reduced to the minimum buffer tank setpoint. The flow delay setpoint parameter (parameter 5142) can be used to activate or deactivate setpoint compensation. (Off or a value between 0-60 seconds.)
Flow compensation delay setpoint	When the intermediate circuit pump is switched on, brief fluctuations in temperature can occur in the intermediate and primary circuits. The compensation delay setpoint allows these fluctuations to be ignored. Setpoint compensation is activated for the minimum period entered here when the intermediate circuit pump Q33 is on. The pump Q33 is activated at the reference value plus the boost charge value.
Xp/Tn/Tv flow compensation setpoint	The functioning of the PID controller can be influenced by parameters Xp, Tn and Tv. The controller has a dead band of +/- 1 °K.
Mixer valve Xp	With the correct proportional band Xp set, the control behaviour of the mixer valve actuator is linked to that of the system (the controlled system). The proportional band Xp influences the P-action of the controller. The P Xp band is the range within which the variable input x (the controlled variable) varies to control the value of the output y (the controlling value) throughout the positioning range. The lower the value, the greater the gap. The figure illustrates the reciprocal value 1 / Xp = Kp.
Mixer valve Tn	With the correct integral time Tn set, the control behaviour of the mixer valve actuator is linked to that of the system (the controlled system). Tn influences the integral response of the controller. The request of the integral portion ensures that the controlled variable varies on the basis of the input signal (monitored variable) provided instantaneously by the P-portion. The lower the value of Tn, the greater / steeper the curve.
Derived speed action Tv	With the correct derived action set, the control behaviour of the mixer valve actuator is linked to that of the system (the controlled system). Tv influences the D-behaviour of the controller. With Tv = 0, D-action is deactivated.

6.15 Instantaneous DHW heater

Differential switching

Parameter number	*Function*
5429	**Differential switching**

Differential switching

The heat maintenance setpoint (5460) along with the differential switching set here are used to maintain the heat of the instant hot water.
If "advance time" is off (- - -), the count is based exclusively on the state of input EX1.

Mixing valve control

Line no.	Operating line
5545	**Mixing valve Xp**
5546	**Mixing valve Tn**
5547	**Mixing valve Tv**

Mixing valve Xp

By setting the right proportional band, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

Xp influences the controller's P-action.

Mixing valve Tn

By setting the right integral action time, the control action of the mixing valve's actuator is matched to the behavior of the plant (controlled system).

Tn influences the controller's I-action.

Mixing valve Tv

By setting the right derivative action time, the control action is matched to the behavior of the plant (controlled system).

Tv influences the controller's D-action. With Tv = 0, the D-action is deactivated.

6.16 Configuration

Burner

Parameter number	*Function*
5772	**Burner advance time**

Burner advance time

The number of burner hours and ignitions can be counted using the signal of input EX1 (230V, parameter 5980) or the state of relay K4.
This selection is made in the "Burner advance time" parameter.
If advance is set at (0 ...), the state of relay K4 is read and the count begins only at the end of the set advance time.
Operating hours falling between a burner shutdown and the next startup are not therefore considered as hours of functioning.
If "advance time" is off (- - -), the count is based exclusively on the state of input EX1.

Building and room model

Line no.	*Operating line*
6112	**Gradient room model**

Gradient room model

The room model gradient gives the period of time in minutes room heating needs to raise the temperature by 1 °C. The settings made applies to all circuits.

The setting is used to calculate the fictive room temperature of rooms that have no room temperature sensor installed (operating lines 8742, 8772, and 8802).

Setpoint compensation

RVS43.. only

Line no.	*Operating line*
6116	**Time constant setp compens**
6117	**Central setp compensation**
6118	**Setpoint drop delay**

Time constant setp compens

If required, the filter time constant (B10) of the central setpoint compensation can be adjusted.

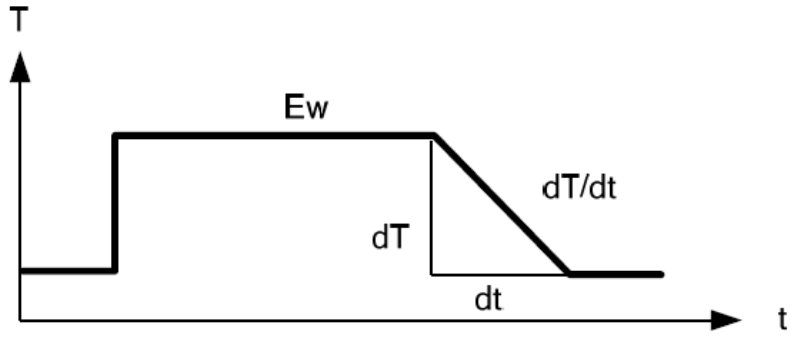
Central setp compensation

Central setpoint compensation matches the setpoint of the heat source to the required central flow temperature.
The setting limits the maximum readjustment, even in cases where grater adaptations would be called for.

This function can only be implemented when using the common flow sensor (B10).

Setpoint drop delay

This prevents multistage heat sources from switching off too quickly, or modulating heat sources from switching off instantly due to their output control.
As a result, the heat sources do not cool down since a demand for heat still exists, which means that they will resume operation a short time later.



T Temperature
t Time
dT/dt Delayed drop
Ew Heat sources set point

The delayed drop acts only in the case of a setpoint jump, but not when the request for heat no longer exists.

Pressure acquisition H1, H2 and H3

Line no.				*Operating line*
H1	H2	H3		
6140	**6150**	**6180**		**Water pressure max**
6141	**6151**	**6181**		**Water pressure min**
6142	**6152**	**6182**		**Water pressure critical min**

Water pressure max

If the pressure acquired at input H1, H2 or H3 exceeds the limit value set here, an appropriate error message will be delivered.

117: Water pressure too high
176: Water pressure 2 too high
322: Water pressure 3 too high

If the pressure drops below the limit value by one switching differential, the error will be canceled.

Water pressure min

If the pressure acquired at input Hx drops below the set limit value (parameter “Water pressure min“), the appropriate maintenance alarm will be delivered.

5: Water pressure too low
18: Water pressure 2 too low
22: Water pressure 3 too low

If the pressure exceeds the limit value by one switching differential, the maintenance alarm will be canceled.

Water pressure critical min

If the pressure acquired at input H1 or H2 falls below the limit value set here, an appropriate error message will be delivered and both burner stages immediately shut down.

118: Water pressure too low
177: Water pressure 2 low
323: Water pressure 3 low

When the pressure exceeds the limit value by a switching differential, the error is canceled.

Line no.	*Operating line*
6222	**Device hours run**

Hours of system functioning

This value indicates the total number of hours of functioning since the controller was first activated.

Operating level codes

Parameter number	*Function*
6345	**Startup code** 0 .. 99999
6346	**Eng. code** 0 .. 99999

Any code between 0 and 99999 can be entered for the "Startup" and "Eng" operating levels. Access is only permitted after entry of the correct code.
The code can only be changed in OEM level.

6.17 LPB system

Error/maintenance/alarms

Line no.	*Operating line*
6610	**Display system messages**
6612	**Alarm delay**

Display system messages

This setting enables system messages transmitted via LPB to be suppressed at the connected operator unit.

Alarm delay

Delivery of the alarm to the OCI can be delayed in the basic unit by setting a delay. This ensures that unnecessary notifications of a service center resulting from short-time errors (e.g. temperature limiter cut out, communication error) can be prevented.
It is to be noted, however, that errors occurring for a short period of time, and reoccurring constantly and rapidly, will also be filtered.

6.18 Errors

History 1..10

Line no.	*Operating line*
6820	**Reset history** No Yes

Reset history

The error history with the last 10 errors will be deleted.

6.19 Diagnostics, consumers

Heating circuit 1, heating circuit 2, heating circuit 3

Line no.	*Operating line*
8742	**Room temp 1 model**
8772	**Room temp 2 model**
8802	**Room temp 3 model**

Room temperature 1 / 2 / P model

The room model calculates a fictive room temperature for rooms that have no room temperature sensor. The value calculated for each heating circuit is indicated on these operating lines.

This allows boost heating, quick setback and optimum start and stop control to be implemented with no need for using a room temperature sensor.
The calculation takes into account the attenuated outside temperature (operating line 8703), the room model gradient (operating line 6112) for switching to a higher setpoint and the building's time constant (operating line 6110) for switching to a lower setpoint.

7 Plant diagrams

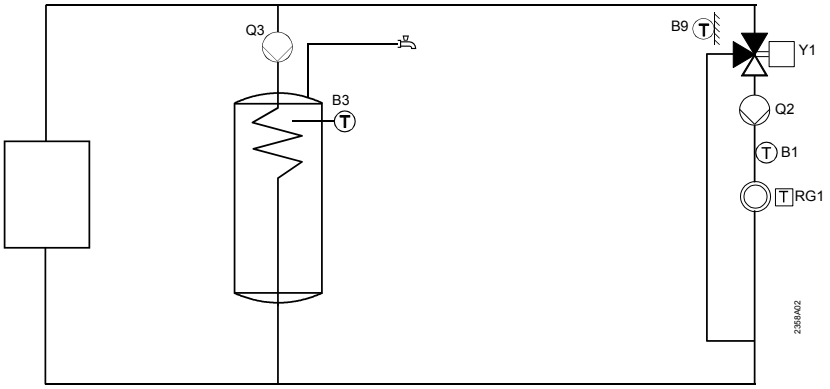
The various applications are shown in the form of basic diagrams and extra functions. The basic diagrams show possible applications that can be implemented without the use of multifunctional outputs.

7.1 Basic diagrams

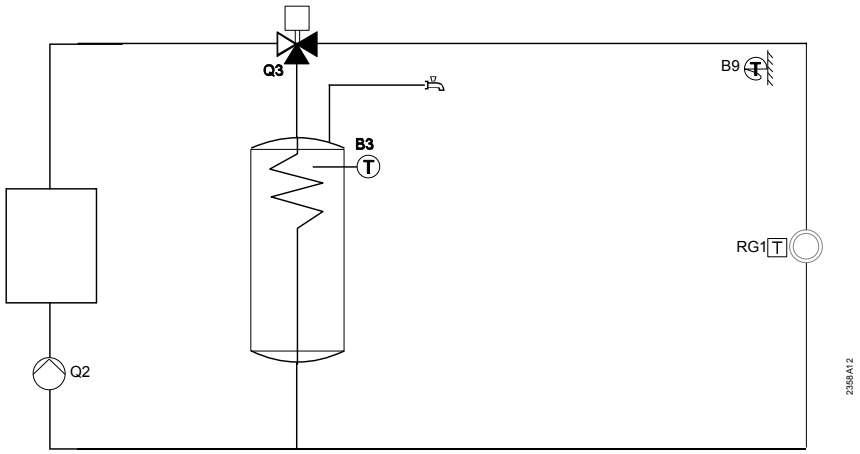
The basic diagrams are examples of plant that can be implemented with standard outputs requiring only a few settings.

7.1.1 Basic diagram RVS43.

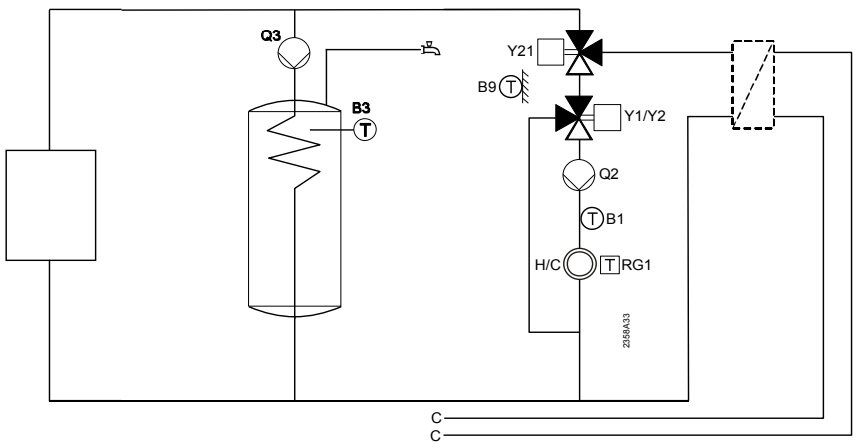
Standard diagram



DHW heating with diverting valve

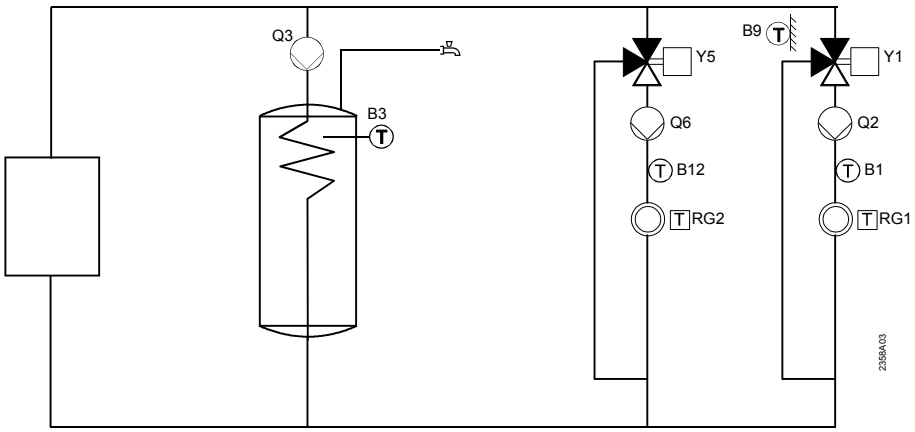


Heating/cooling via diverting valve

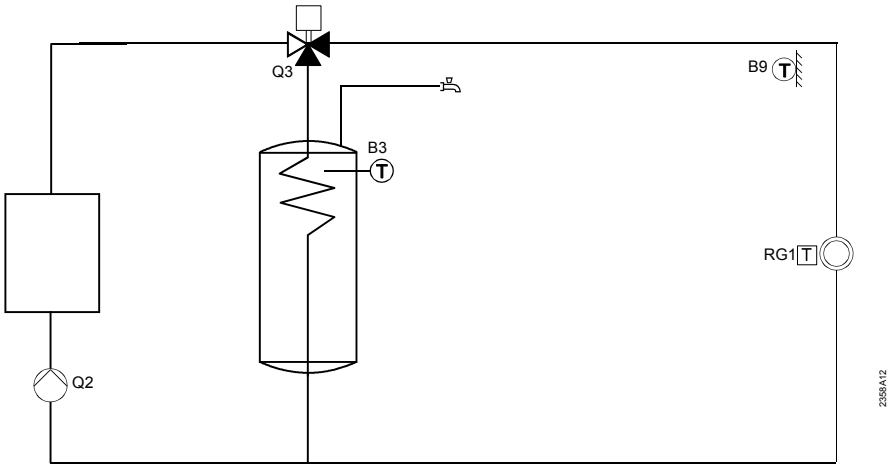


7.1.2 Basic diagram RVS63.

Standard diagram



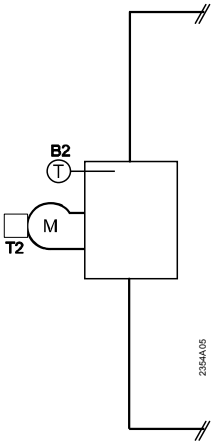
DHW heating with diverting valve



7.2 Versions of heat sources

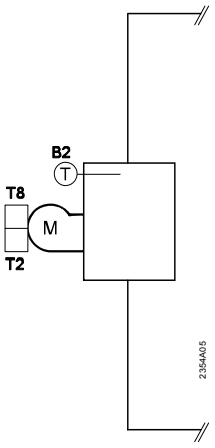
The heat generation options can be selected via the "Configuration" operating page on operating line 5779 "Source type".

1-stage burner



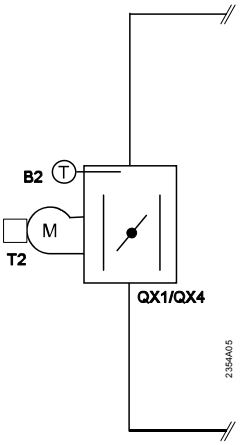
RVS43…
RVS63…

2-stage burner



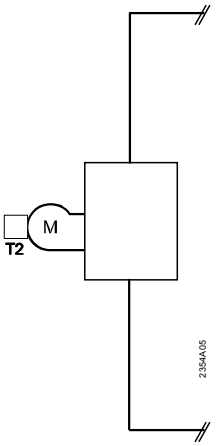
RVS63…

Modulating
3-point 0…10 V



RVS63…

Burner without boiler sensor



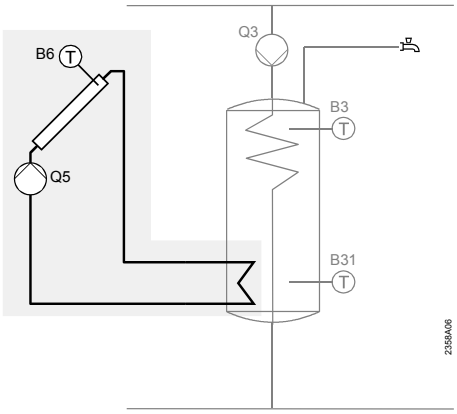
RVS63…

7.3 Extra functions in general

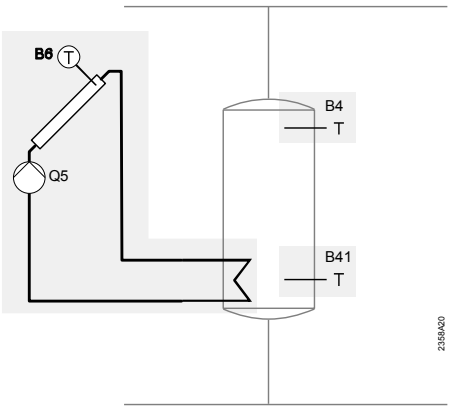
The extra functions can be selected via operating page “Configuration” and complement the basic diagrams of the respective controllers.
The type and number of extra functions that can be applied depend on the multifunctional outputs and inputs QX… or BX…
Depending on the type of application, the use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

Solar

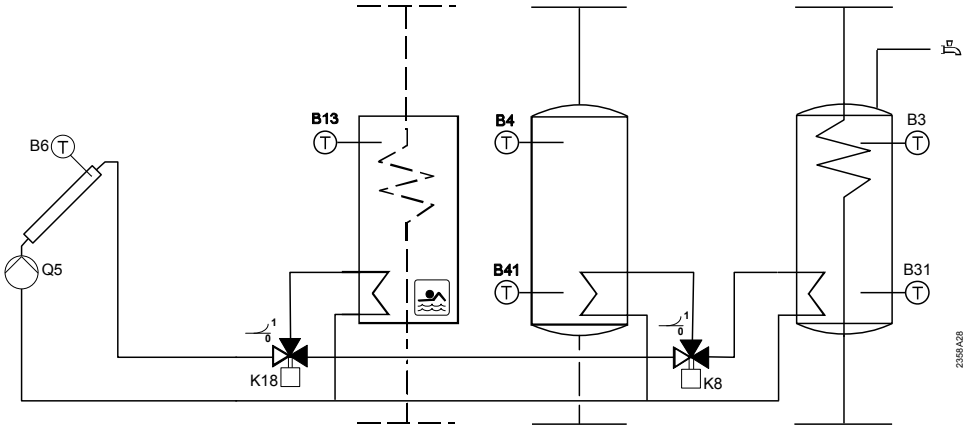
DHW charging collector pump, collector sensor



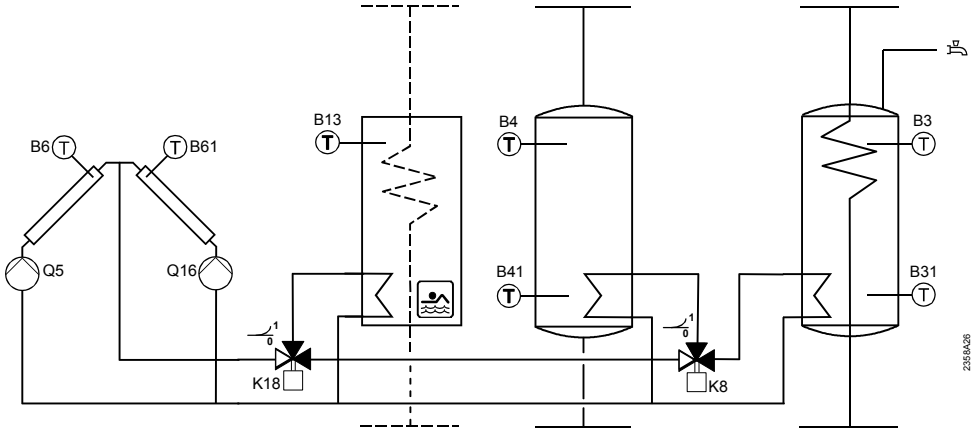
Buffer charging



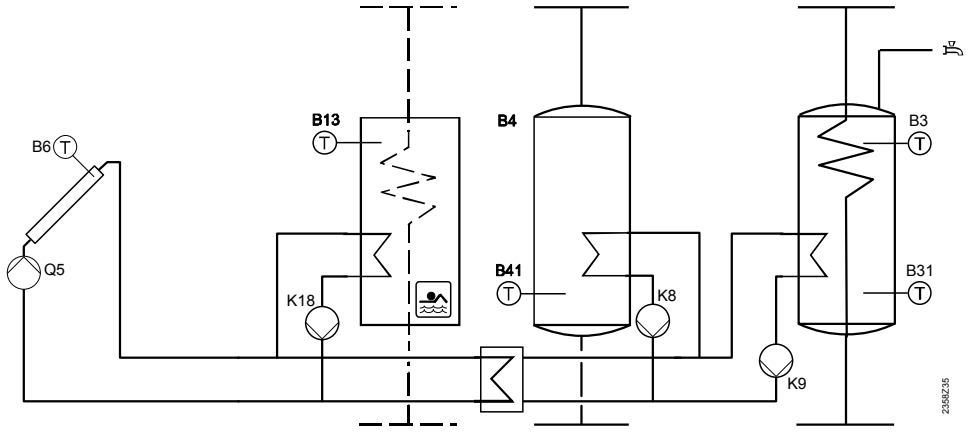
Solar storage tank and swimming pool charging via diverting valves with 1 collector



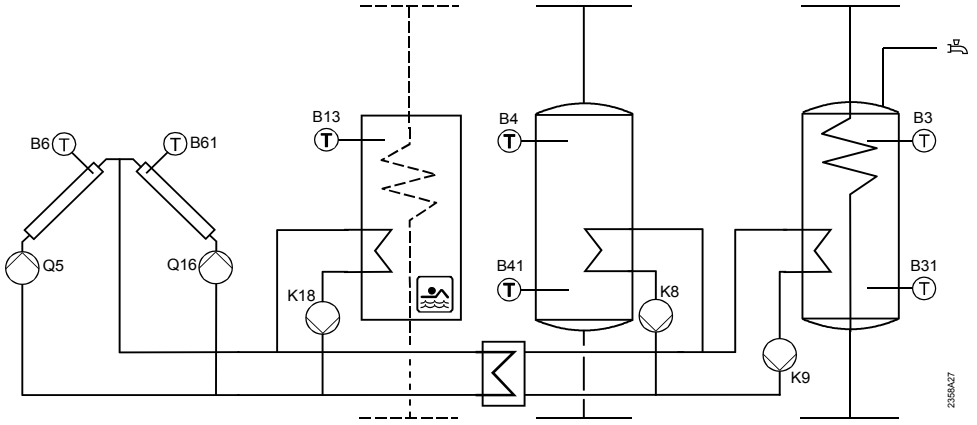
Solar storage tank and swimming pool charging via diverting valves with 2 collectors



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

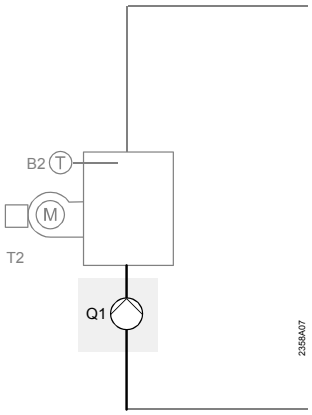


Solar storage tank and swimming pool charging via charging pumps with 2 collectors

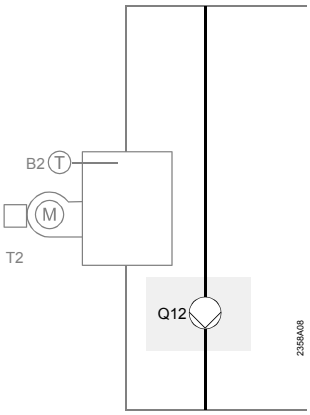


Boiler

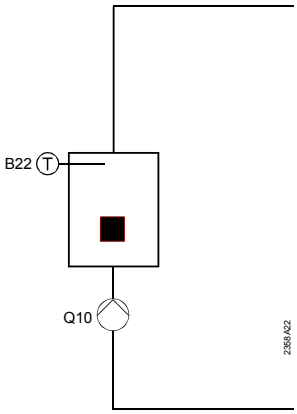
Boiler pump



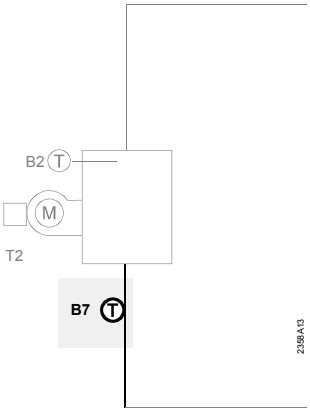
Bypass pump



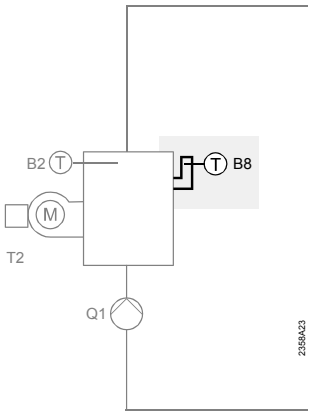
Solid fuel boiler pump



Return sensor

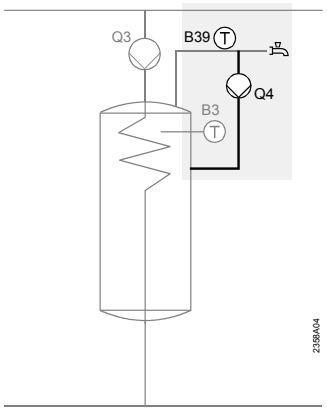


Flue gas temperature sensor

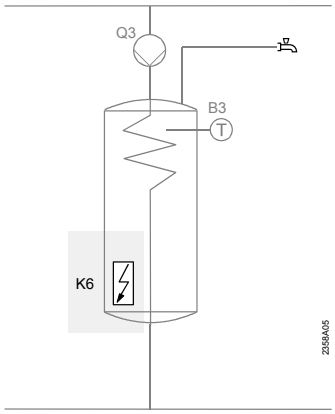


DHW storage tank (DHW)

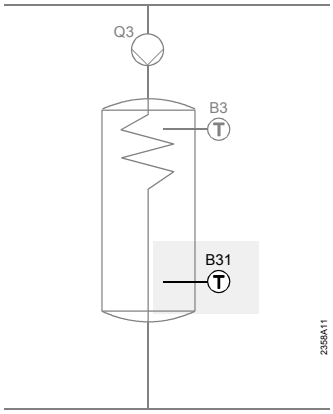
DHW circulating pump



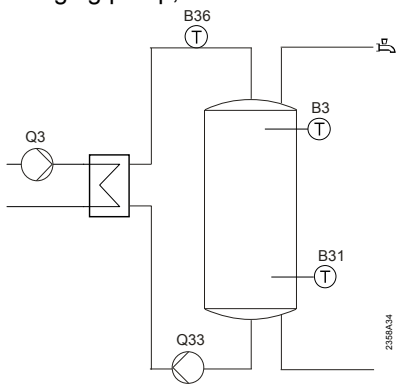
DHW el imm heater



2nd DHW sensor

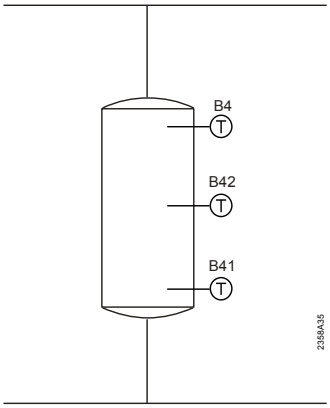


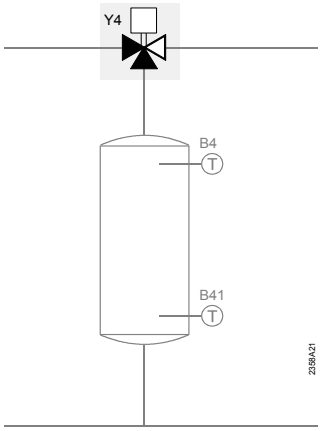
DHW tank with external heat exchanger, charging pump, intermediate circuit pump



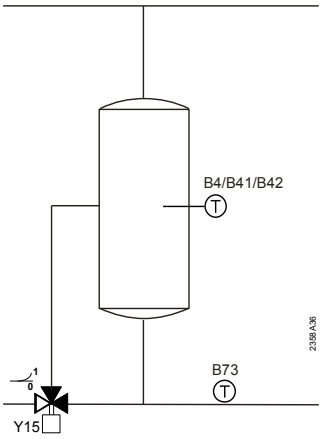
Buffer storage tank

Heat source shutoff valve buffer

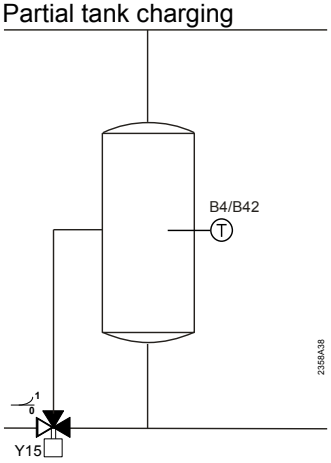




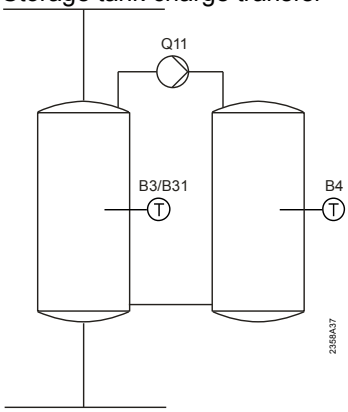
Return diversion



Partial tank charging

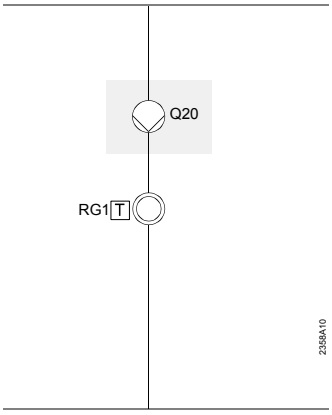


Storage tank charge transfer

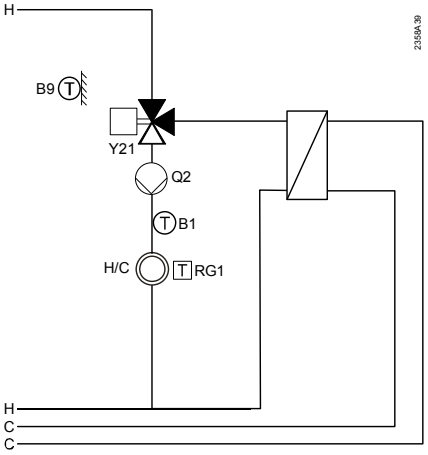


Heating/cooling circuit

Heating circuit pump HCP

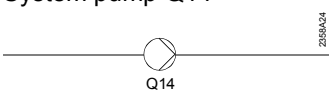


Diverting valve for cooling



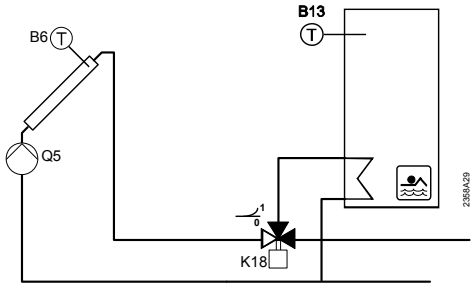
Heat converter

System pump Q14



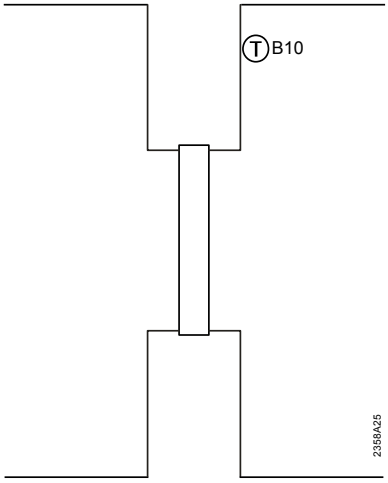
Swimming pool

Swimming pool K18



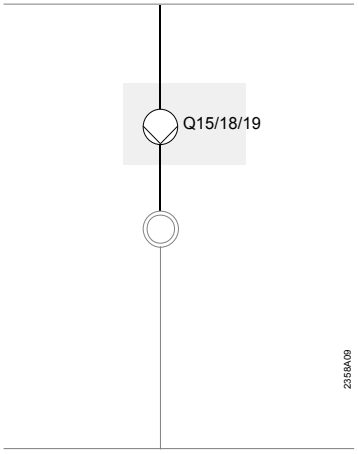
Pressureless header

Common flow sensor



Extra functions

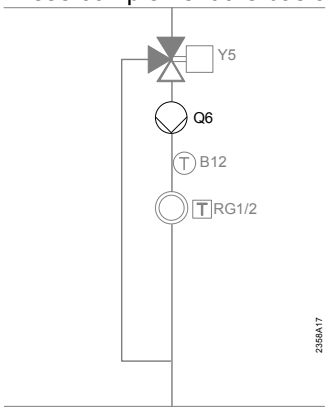
H.. Pump



7.4 Additional funct. with mix. valve group or extension module AVS75.3xx

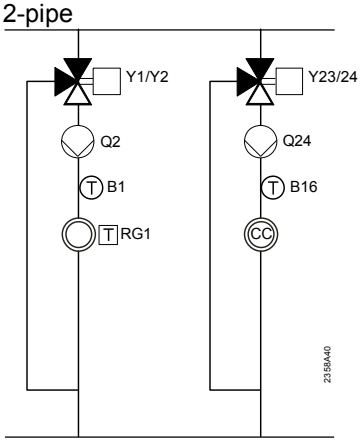
Auxiliary functions can be selected from the “Expansion module configuration” page. These complement the basic functions of the corresponding devices.

2nd Mixing valve heating circuit

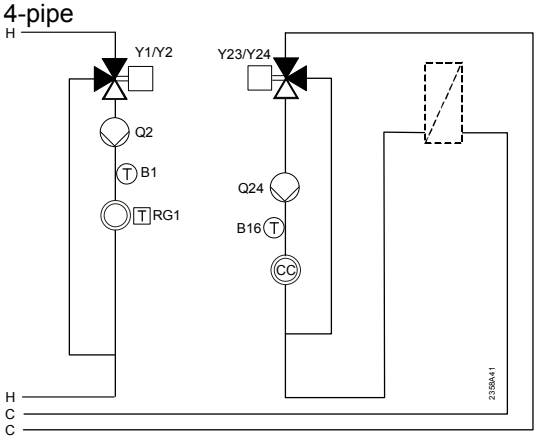


Cooling circuit

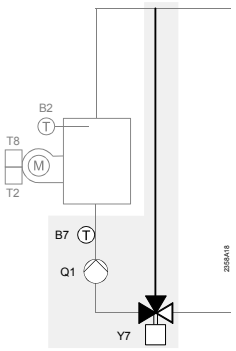
2-pipe



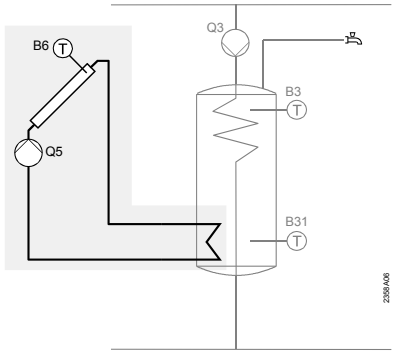
4-pipe



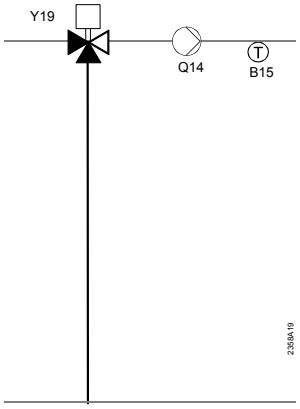
Return temp controller



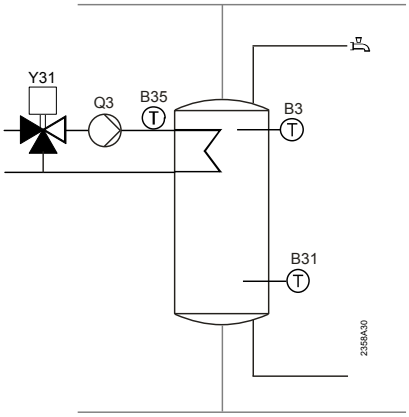
Solar DHW heating



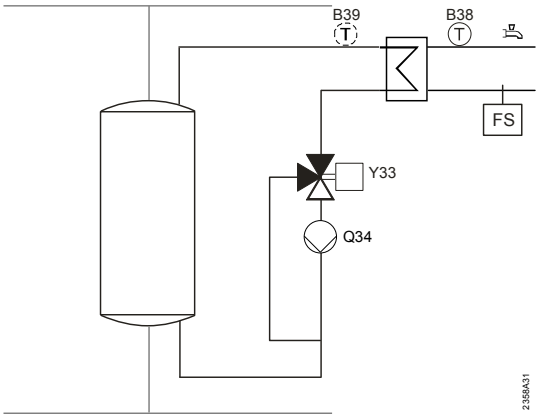
Primary controller



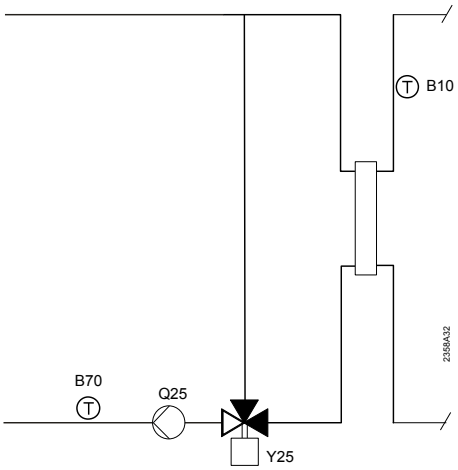
Primary DHW controller



Instantaneous DHW heater



Return controller cascade



Legend mains voltage

Diagram	*Function*
T2	Burner 1st stage
	Release modulating burner
T8	Burner 2nd stage
	Air damper modulating burner opening
Q1	Boiler pump
Q2	1st heating circuit pump
Q3	DHW charging pump / diverting valve
Q4	circulating pump
Q5	Collector pump
Q6	2nd heating circuit pump
Q10	Solid fuel boiler pump
Q11	Storage tank charging pump
Q12	Bypass pump
Q14	System pump
Q15/18/19	H1/2/3 pump
Q16	Collector pump 2
Q20	Heating circuit pump HCP
Q24	Cooling circuit pump
Q25	Cascade pump
Q33	DHW intermediate circuit pump
Q34	Instantaneous heater 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	Return temperature maintenance valve opening
Y8	Return temperature maintenance valve closing
Y9	Solid fuel boiler return valve open
Y10	Solid fuel boiler return valve closed
Y15	Buffer return valve
Y19	Primary controller
Y21	Diverting valve for cooling
Y25	Cascade return temperature maintenance valve opening
Y26	Cascade return temperature maintenance 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 closing
K8	Solar controlling element buffer
K9	Solar pump ext. heat exchanger
K18	Solar controlling element swimming pool

Legend low-voltage

B1	Flow temperature sensor HK1
B12	Flow temperature sensor HK2
B13	Swimming pool sensor
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
B4	Buffer storage tank temperature sensor
B41	Buffer storage tank temperature sensor
B42	Buffer storage tank temperature sensor
B15	Flow sensor primary controller
B39	DHW circulation sensor B39
B6	Collector sensor
B61	Collector sensor 2
B7	Return sensor
B70	Cascade return sensor
B73	Primary circuit return sensor
B8	Flue gas temperature sensor
B9	Outside sensor.
B10	Common flow sensor
RG1	Room unit 1
RG2	Room unit 2
F_S	Flow switch

8 Technical data

8.1 Basic units RVS…

Power supply	Rated voltage	AC 230 V (±10%)
	Rated frequency	50/60 Hz
	Power consumption	RVS43.143: 8.5 VA RVS63.283: 11 VA
	Fusing of supply lines	max. 10 AT
Wiring of terminals	Power supply and outputs	solid wire or stranded wire (twisted or with ferrule): 1 core: 0.5...2.5 mm^2 2 cores: 0.5. mm^2..1.5 mm^2 3 cores: Not permitted
Functional data	Software class	A
	Mode of operation to EN 60 730	1.B (automatic)
Inputs	Digital inputs H1 and 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 inputs H1, H3	Very low voltage protection Range: DC (0...10) V Internal resistance: > 100 kΩ
	Pulsed inputs H1, H3	Dry contact Low voltage Voltage with contacts open: 12 V DC Current with contacts closed: 3 mA DC Max. frequency: 25 Hz Pulse duration: min. 20 ms
	Frequency inputs H1, H3	Very low voltage protection: operating range: DC 0...0.12 V low: <1.7 V high: 2.7...12 V resistance: >100 kΩ max. frequency: 500 Hz,
	Mains voltage S3, 4 EX1, EX2	AC 230 V (±10 %) internal resistance: > 100 kΩ
	Sensor input B9	NTC1k (QAC34)
	Sensor inputs B1, B2, B3, B12, BX1, BX2, BX3, BX4	NTC10k (QAZ36, QAD36)
	Sensor inputs BX1…BX4	PT1000 (optionally for collector and flue gas sensor)

Perm. sensor cables (copper)						
with cross-sectional area:	0.25	0.5	0.75	1.0	1.5	mm^2
Max. length:	20	40	60	80	120	m

Outputs	Relay outputs	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A während ≤1 s
	Max. total current (of all relays)	AC 10 A
	Rated voltage range	AC (24...230) V (for potential-free outputs)

	Triac output QX3 (custom solution only)	
	Rated current range	
	On / off operation	AC 0.05…2 (2) A
	Speed control	AC 0.05…0.4 (1) A
	Max. switch-on current	4 A for ≤1 s
	Triac ZX3 output (only available to order)	
	Current range	
	On / off mode	
	Speed control	0.02…2 (2) A- AC
	Maximum switching current	0.02…1.4 (1.4) A - AC
		Imax = 50 A/tp ≤ 20 ms
		Imax = 4A/tp ≤ 1s
	Supplementary power supply G+	Very low voltage protection
	Output voltage 5 V	11.3 .. 13.2 V
	Rated current	Max. 88 mA
	Switchable power supply GX1	Very low voltage protection
	Output voltage 5 V	4.75 V .. 5.25 V
	Output voltage 12 V	11.3 V .. 13.2 V
	Rated current	Max. 20 mA
	Analogous to output U1	output is short-circuit-proof
	Output voltage	U_{out} = 0 ... 10.0 V
	Current rating	±2 mA RMS; ±2.7 mA peak
	Ripple	≦ 50 mVpp
	Accuracy at zero point	< ± 80 mV
	Error remaining range	≦ 130 mV
Interfaces, cable lengths	BSB	2-wire connection, not interchangeable
	Max. cable length	
	Basic unit – peripheral device	200 m
	Max. total length	400 m (max. cable capacitance) 60 nF)
	Min. cross-sectional area	0.5 mm^2
	LPB	(copper cable 1.5 mm^2, 2-wire **not** interchangeable)
	with bus power supply via controller (per controller)	250 m
		460 m
	With central bus power supply	E = 3
	Bus loading number	
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP 00
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class II, if correctly installed
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	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	RVS43.143: 587 g
		RVS63.283: 648 g

8.2 Extension module AVS75.390

Power supply	Rated voltage	AC 230 V (±10%)
	Bemessungsfrequenz	50/60 Hz
	Power consumption	4 VA
	Fusing of supply lines	max. 10 AT
Wiring of terminals	(Power supply and outputs)	solid wire or stranded wire (twisted or with ferrule): 1 core: 0.5...2.5 mm^2 2 cores 0.5...1.5 mm^2
Functional data	Software class	A
	Mode of operation to EN 60 730	1b (automatic operation)
Inputs	Digital inputs H2	safety extra low-voltage for potential-free low-voltage contacts: voltage with contact open: DC 12 V current with contact closed: DC 3 mA
	Mains input L	AC 230 V (±10 %) internal resistance: > 100 kΩ
	Sensor inputs **BX21, BX22**	NTC10k (QAZ36, QAD36)
	Perm. sensor cables (copper)	
	with cross-sectional area:	0.25 0.5 0.75 1.0 1.5 mm^2
	Max. length:	20 40 60 80 120 m
Outputs	Relay outputs	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A for ≤1 s
	Max. total current (of all relays)	AC 6 A
	Rated voltage range	AC (24...230) V (for potential-free outputs)
Interfaces	BSB	2-wire connection, not interchangeable
	Max. cable length	
	Basic unit – peripheral device	200 m
	Max. total length	400 m (max. cable capacitance) 60 nF)
	Min. cross-sectional area	0.5 mm^2
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP 00
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class II, if correctly installed
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	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

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

Power supply	For devices without batteries:	
	Bus power supply	BSB
	For devices with batteries:	
	Batteries	3 pcs
	Type of batteries	1.5 V alkaline, size AA (LR06)
	Battery life	approx. 1.5 years
Room temperature measurement (only with QAA7x...) / QAA55...)	Measuring range	0...50 °C
	According to EN12098:	
	Range 15...25 °C	within tolerance of 0.8 K
	range 0..15 °C or 25...50 °C	within tolerance of 1.0 K
	resolution	1/10 K
Interfaces	AVS37../QAA75../QAA55..	BSB-W, 2-wire connection, not interchangeable
	Max. cable length basic unit – peripheral device	QAA75../QAA55.. = 200 m AVS37.. = 3 m
	QAA78...	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20 for QAA7../ QAA55.. IP40 for AVS37… IP20 (when mounted) Normal pollution
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class III, if correctly installed
	Degree of pollution to EN 60 730	Normal pollution
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	– Electrical safety	- EN 60730-1, EN 50090-2-2
	Radio	EN 300 220-1 (25-1000MHz)
Climatic conditions	For devices without batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…65 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
	For devices with batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20…30 °C
	Transport to IEC721-3-2 class 2K3	temperature –20...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
Weight	Without packaging	AVS37.294: 160 g QAA75.61x: 170 g QAA55.110: 115 g

8.4 Sensor characteristics

8.4.1 NTC 1 k

T [°C]	R[Ohm]	T [°C]	R[Ohm]	T [°C]	R[Ohm]
-30.0	13,034	0.0	2,857	30.0	827
-29.0	12,324	1.0	2,730	31.0	796
-28.0	11,657	2.0	2,610	32.0	767
-27.0	11,031	3.0	2,496	33.0	740
-26.0	10,442	4.0	2,387	34.0	713
-25.0	9,889	5.0	2,284	35.0	687
-24.0	9,369	6.0	2,186	36.0	663
-23.0	8,880	7.0	2,093	37.0	640
-22.0	8,420	8.0	2,004	38.0	617
-21.0	7,986	9.0	1,920	39.0	595
-20.0	7,578	10.0	1,840	40.0	575
-19.0	7,193	11.0	1,763	41.0	555
-18.0	6,831	12.0	1,690	42.0	536
-17.0	6,489	13.0	1,621	43.0	517
-16.0	6,166	14.0	1,555	44.0	500
-15.0	5,861	15.0	1,492	45.0	483
-14.0	5,574	16.0	1,433	46.0	466
-13.0	5,303	17.0	1,375	47.0	451
-12.0	5,046	18.0	1,320	48.0	436
-11.0	4,804	19.0	1,268	49.0	421
-10.0	4,574	20.0	1,218	50.0	407
-9.0	4,358	21.0	1,170		
-8.0	4,152	22.0	1,125		
-7.0	3,958	23.0	1,081		
-6.0	3,774	24.0	1,040		
-5.0	3,600	25.0	1,000		
-4.0	3,435	26.0	962		
-3.0	3,279	27.0	926		
-2.0	3,131	28.0	892		
-1.0	2,990	29.0	859		

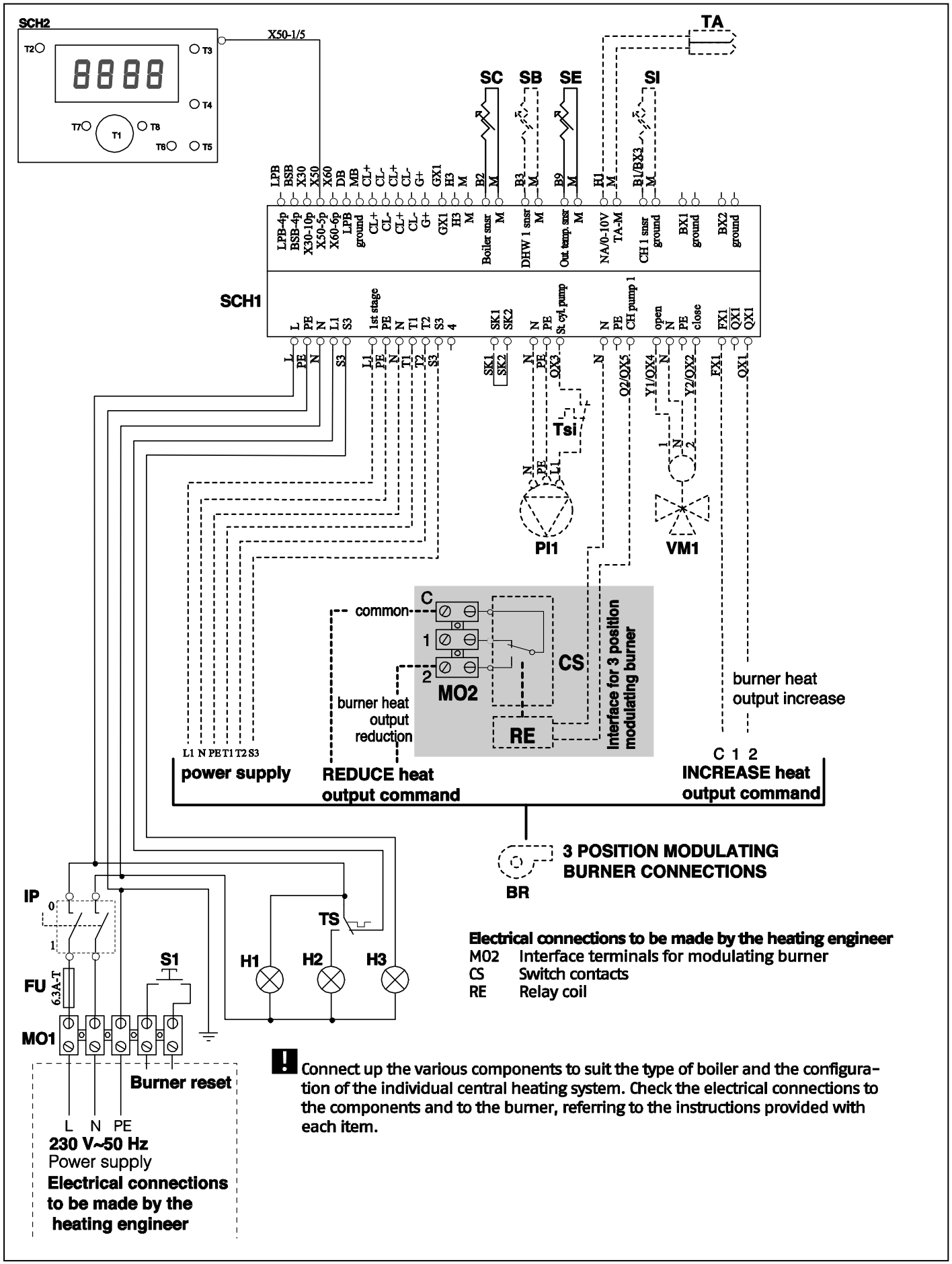
8.4.2 NTC 10 k

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

8.4.3 PT1000

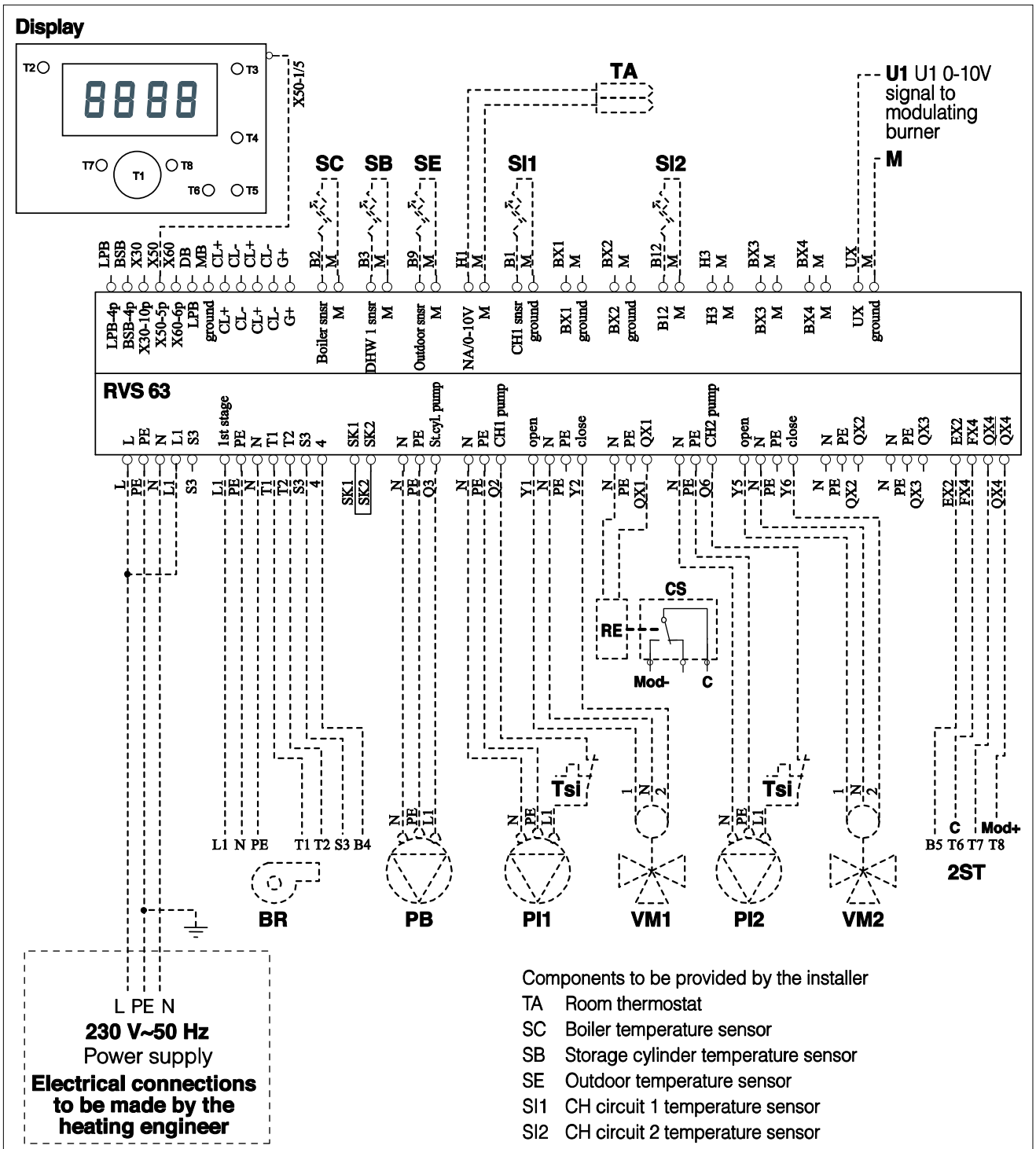
T [°C]	R[Ohm]	T [°C]	R[Ohm]	T [°C]	R[Ohm]
–30	882.2	50	1194.0	130	1498.3
–25	901.9	55	1213.2	135	1517.1
–20	921.6	60	1232.4	140	1535.8
–15	941.2	65	1251.6	145	1554.6
–10	960.9	70	1270.8	150	1573.3
–5	980.4	75	1289.9	155	1591.9
0	1000.0	80	1309.0	160	1610.5
5	1019.5	85	1328.0	165	1629.1
10	1039.0	90	1347.1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

TYPICAL COMPONENT CONNECTION DIAGRAM FOR SYSTEM WITH RVS 43... CONTROLLER



TYPICAL COMPONENT CONNECTION DIAGRAM FOR SYSTEM WITH

RVS 63...



Components to be provided by the installer

- TA Room thermostat
- SC Boiler temperature sensor
- SB Storage cylinder temperature sensor
- SE Outdoor temperature sensor
- SI1 CH circuit 1 temperature sensor
- SI2 CH circuit 2 temperature sensor
- BR Burner (T1-T2 1st stage ON)
- 2ST Second burner stage (T6-T8 2nd stage ON)
  For increasing heat output from a three position modulating burner (C Mod+)
- CS Switch contacts
- RE Relay coil

  For reducing heat output from a three position modulating burner (C Mod-)
- PB Storage cylinder pump
- PI1 CH circuit 1 pump
- VM1 CH circuit 1 mixer valve
- PI2 CH circuit 2 pump
- VM2 CH circuit 2 mixer valve
- Tsi CH system safety thermostat

NB. Connect up the various components to suit the type of boiler and the configuration of the individual central heating system. Check the electrical connections to the components and to the burner, referring to the instructions provided with each item. If a modulating burner with a three position controller is installed (with a dry contact for increasing heat output and a dry contact for reducing heat output) an interface relay must be fitted as shown in the wiring diagram.