SIEMENS

Albatros^2
CHP Controller
User Manual

RVC32.410

Preliminary

Edition 0.15
Controller series Z
CE1UsManCHP1en
16 September 2008

Siemens Schweiz AG
HVAC Products

Contents

1 Summary

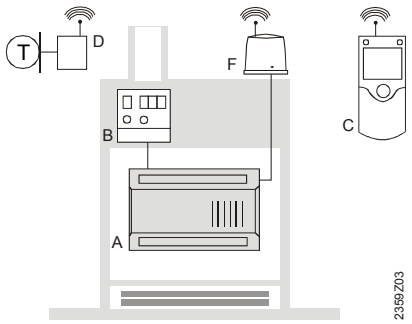
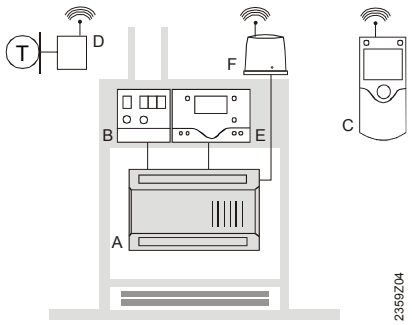
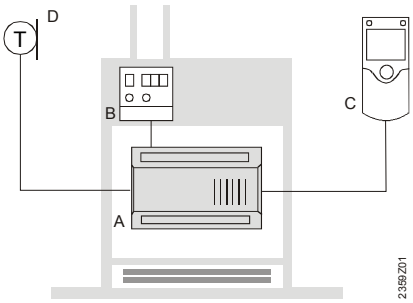
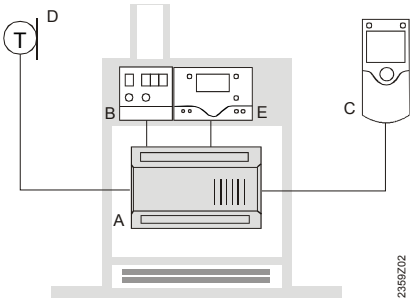
The present User Manual describes the products listed below and covers handling and configuration of the units for readers ranging from endusers to heating engineers.

Type reference (ASN)	Name
RVC32.410	Basic unit boiler
AVS75.390	Extension module
AVS37.294	Operator unit
AVS37.390	Operator unit
QAA55.110	Simple room unit, wired
QAA75.610	Room unit, wired
QAA75.611	Backlit room unit, wired
QAA78.610	Room unit, wireless
AVS16.290	Power section
AVS38.291	Dummy cover (96 x 144 mm)
AVS71.390	Radio module
AVS14.390	Radio repeater
AVS13.399	Wireless outside sensor

The following products are described in separate pieces of documentation:

QAC34	Outside sensor
QAD36	Strap-on temperature sensor
QAZ36	Immersion temperature sensor
QAR36	Clip-on temperature sensor

1.1 Type summary

	Operation with room unit	Operation with operator unit (optionally together with additional room unit)
Wireless		
Wired		

A Basic unit RVC…
B Power section AVS16…
C Room unit QAA75… / QAA78…
D Outside sensor AVS13…
E Operator unit AVS37…
F Radio module AVS71…

2 Safety notes

2.1 Product liability

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

3 Mounting and installation

3.1 Regulations

Electrical installation

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

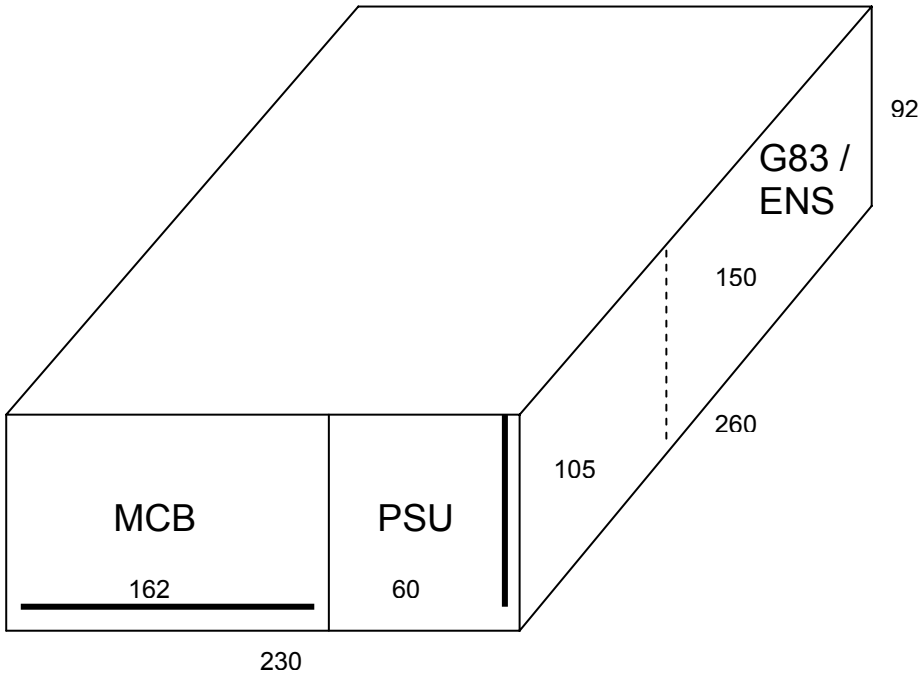
3.2 Basic units RVC32…

Planning

- Air circulation around the unit must be ensured, allowing the unit to emit the heat produced by it.
- The unit is designed conforming to the directives for safety class II devices mounted in compliance with these regulations
- Power to the unit may only be supplied after it is completely fitted. If this is not observed, there is a risk of electric shock hazard near the terminals and through the cooling slots
- The unit must not be exposed to dripping water
- Permissible ambient temperature when mounted and when ready to operate: 0...55 °C
- Power cables must be clearly segregated from low-voltage lines (sensors) observing a distance of at least 100 mm

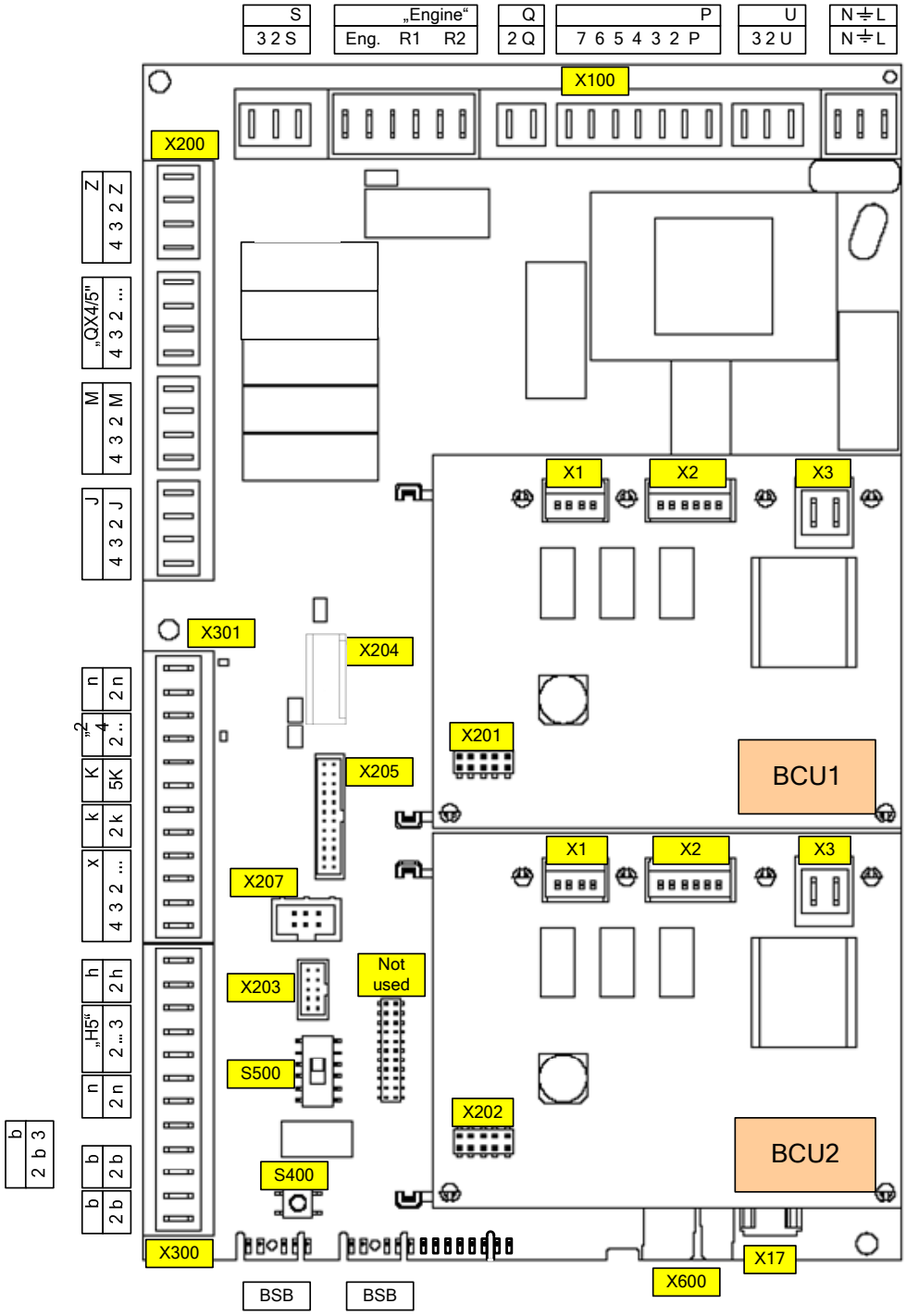
Dimensions

Dimensions in mm



	Length	*Width*	*Height*
MCB	255	162	53
G83/ENS - PSU	255	60	92

3.2.1 Connection terminals of RVC32.4xx



BCU1 Engine BCU
BCU2 Supplementary BCU

Mains voltage

	Use	*Terminal*	*Type of connector**
L	Grid Line AC 230 V basic unit	L	AGP4S.03E/109
⏚	Grid Protective earth	⏚	
N	Grid Neutral conductor	N	
N	G83 / ENS	U	AGP8S.03C/109
⏚	G83 / ENS Protective earth	2	
L	G83 / ENS	3	
L	GIM Line	P	AGP8S.07A/109
⏚	GIM Protective earth	2	
N	GIM Neutral conductor	3	
L	GIM Islanded Line	4	
N	GIM Islanded Neutral conductor	5	
ASP-	Alternator Start Pulse Ref.	6	
ASP+	Alternator Start Pulse Signal	7	
NA	Power Supply Unit Neutral conductor	Q	AGP8S.02E/109
LA	Power Supply Unit Line	2	
R2	Start Resistor 1	“Engine”	Tyco: 2-928247-6
	Start Resistor 2	2	
R1	Stop Resistor 1	3	
	Stop Resistor 2	4	
Engine	Engine 1	5	
	Engine 2	6	
N	Neutral conductor	S	AGP8S.03B/109
⏚	Protective earth	2	
QX1	Boiler pump	3	
QX2a	1st heating pump/ valve opening	Z	AGP8S.04C/109
N	Neutral conductor	2	
⏚	Protective earth	3	
QX2b	1st heating circuit valve closing	4	
QX4a	Multifunction Output / valve opening	F	3618-1 04 K57
QX4b	Valve closing	2	
	Don’t connect	3	
	Don’t connect	4	
QX3a	DHW charging pump / diverting valve	M	3618-1 04 K140
N	Neutral conductor	2	
⏚	Protective earth	3	
QX3b	diverting valve	4	
EX1	Input Programmer (230V)	J	3618-1 04 K152
La	Phase AC 230 V	2	
EX2	Input Programmer (230V)	3	
La	Phase AC 230 V	4	

*) Type of connector: If left aligned Lumberg or other supplyer

Low-voltage external

	Use	*Terminal*	*Type of connector*
M	Ground	n	AGP4S.02F/109
P1	PWM output	2	
M	Ground	“24”	3615-1 02 K46
24V	DC 24 V Supply	2	
AOL	Alternator Overload Ref. BC3	K	AGP4S.02J/109
	Alternator Overload Signal BC3	5	
M	Ground	k	AGP4S.02D/109
B9	Outside sensor	2	
M	Ground	x	3615-1 04 K148
B32	DHW sensor 2	2	
M	Ground	3	
B31	DHW sensor 3	4	
M	Ground	h	AGP4S.02C/109
B3	DHW sensor 1	2	
12V	Sensor Supply DC 12V	3	3615-1 03 K35
H5	Flow Switch Signal	“H5”	
M	Sensor Ground	2	
M	Ground	N	AGP4S.02F/109
B5	Reserve sensor	2	
G+	Room unit power supply 12 V[1]	3	AGP4S.03D/109
CL-	BSB ground	b	AGP4S.02A/109
CL+	BSB data	2	
CL-	BSB ground	b	AGP4S.02A/109
CL+	BSB data	2	

Low-voltage internal

	Use	*Terminal*	*Type of connector*
1A	24 VDC Permanent	X203	“Miligrid”
1B	24 VDC Switched / Charging	X203	“Miligrid”
2A	Battery switch on command	X203	“Miligrid”
2B	24 VDC GND	X203	“Miligrid”
3A	Customer Socket Enable	X203	“Miligrid”
3B	Grid Isolation Relay / AVC Enable	X203	“Miligrid”
4A	Alternator Start Puls Enable	X203	“Miligrid”
4B	Black Start Button	X203	“Miligrid”
5A	Over Voltage Trip 24V BC1 [Blocking Chain GIM]	X203	“Miligrid”
5B	Over Voltage Trip Signal (N/O) BC1 [Blocking Chain GIM]	X203	“Miligrid”
1A	Signal (Reserved)	X204	“Dubox”
1B	Supply Sensor U12V (or 5V)	X204	“Dubox”
2A	Signal GND	X204	“Dubox”
2B	Signal Water pressure or Flow Switch[2]	X204	“Dubox”
3A	Spool Valve Feedback U	X204	“Dubox”
3B	Spool Valve Feedback R	X204	“Dubox”
4A	Spool Valve Feedback M	X204	“Dubox”
4B	Spool Valve Output DV1	X204	“Dubox”
5A	<spare>	X204	“Dubox”

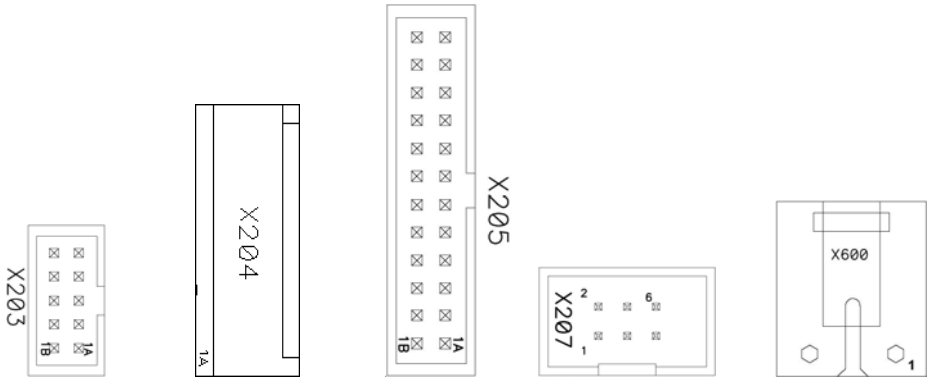
[1] Only required with room units with backlight

[2] Used for dry fire protection

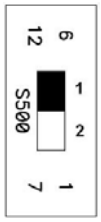
	Use	*Terminal*	*Type of connector*
5B	Spool Valve Output DV2	X204	"Dubox"
6A	Variable Speed PWM Fan GND	X204	"Dubox"
6B	Variable Speed PWM Fan Supply 24 VDC	X204	"Dubox"
7A	Variable Speed PWM Fan, Hall Feedback	X204	"Dubox"
7B	Variable Speed PWM Fan, PWM Output	X204	"Dubox"
1A	Control Signal for Relay Contacts Signal BC1 {Blocking Chain G83/ ENS }	X205	"Miligrid"
1B	Control Signal for Relay Contacts Ref. BC1 {Blocking Chain G83/ ENS }	X205	"Miligrid"
2A	Engine Dome Overtemp. Ref. BC2	X205	"Miligrid"
2B	Engine Dome Overtemp. Signal BC2	X205	"Miligrid"
3A	Regenerator Temp. Ref. BC4	X205	"Miligrid"
3B	Regenerator Temp. Signal BC4	X205	"Miligrid"
4A	Dynamic Absorber 1+2 24V BC5	X205	"Miligrid"
4B	Dynamic Absorber 1+2 Signal BC5	X205	"Miligrid"
5A	Water Cooled Seal 1+2 24V BC6	X205	"Miligrid"
5B	Water Cooled Seal 1+2 Signal BC6	X205	"Miligrid"
6A	Engine Power On LED GND (Option)	X205	"Miligrid"
6B	Engine Power On LED (amber) (Option)	X205	"Miligrid"
7A	Return Temperature Sensor B7 GND	X205	"Miligrid"
7B	Return Temperature Sensor B7 Signal	X205	"Miligrid"
8A	Flow Temperature Sensor B2 GND	X205	"Miligrid"
8B	Flow Temperature Sensor B2 Signal	X205	"Miligrid"
9A	Pack Sensor GND B23	X205	"Miligrid"
9B	Pack Sensor Signal B23	X205	"Miligrid"
10A	Safety Thermocouple Signal B25	X205	"Miligrid"
10B	Control Thermocouple Signal B24	X205	"Miligrid"
11A	Safety Thermocouple Ref. B25	X205	"Miligrid"
11B	Control Thermocouple Ref. B24	X205	"Miligrid"
12A	<spare1>	X205	"Miligrid"
12B	<spare2>	X205	"Miligrid"
1	GND	X207	Dubox, 2.54 mm
2	VCC / U_IN	X207	Dubox, 2.54 mm
3	TXD / RXTX	X207	Dubox, 2.54 mm
4	RXD / Data	X207	Dubox, 2.54 mm
5	LED	X207	Dubox, 2.54 mm
6	Service / Button	X207	Dubox, 2.54 mm
1	BSB Power supply 12 V	X600	"Tool" 2.54 mm
2	BSB data	X600	"Tool" 2.54 mm
3	BSB ground	X600	"Tool" 2.54 mm
4	BSB Service Ident Pin	X600	"Tool" 2.54 mm
1	BSB GND (HMI)	-	PCB Direct
2	BSB Signal	-	PCB Direct
3	BSB Supply 12 VDC	-	PCB Direct
4	BSB Service Ident	-	PCB Direct
5	BSB n.c.	-	PCB Direct
1	BSB GND (Service Device)	-	PCB Direct
2	BSB Signal	-	PCB Direct
3	BSB Supply 12 VDC	-	PCB Direct

	Use	*Terminal*	*Type of connector*
4	BSB Service Ident	-	PCB Direct
5	BSB n.c.	-	PCB Direct
6	BSB n.c.	-	PCB Direct
7	BSB n.c.	-	PCB Direct
8	BSB n.c.	-	PCB Direct
9	BSB n.c.	-	PCB Direct
10	BSB n.c.	-	PCB Direct
11	BSB n.c.	-	PCB Direct
12	BSB n.c.	-	PCB Direct
13	BSB n.c.	-	PCB Direct

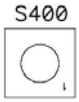
Pin assignment MCB



HMI on MCB



1 = Non GIM Operation (Default)
2 = GIM Operation

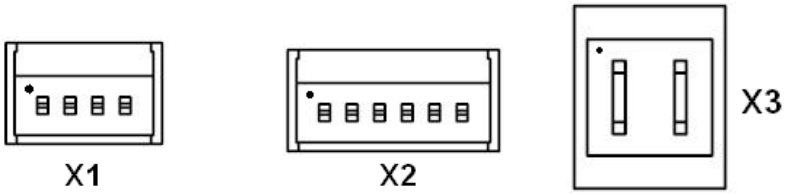


Service
Reset

Low-voltage BCU

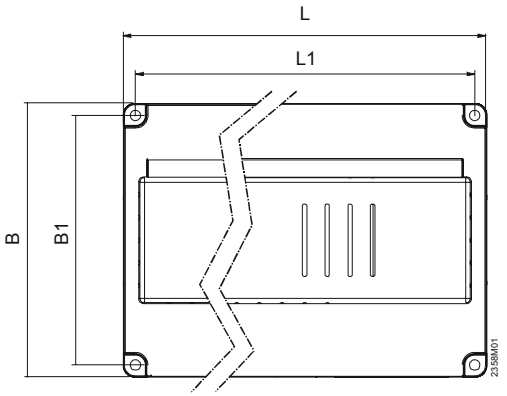
	Use	*Terminal*	*Type of connector*
1	Gas Valve Signal 24V	X1	Rast 2.5
2	Gas Valve GND	X1	Rast 2.5
3	Ignitor GND	X1	Rast 2.5
4	Ignitor Signal 24V	X1	Rast 2.5
1	Codensate Ref.	X2	Rast 2.5
2	Codensate Signal	X2	Rast 2.5
3	Flow OH, Combi OH Ref.	X2	Rast 2.5
4	Flow OH, Combi OH Signal	X2	Rast 2.5
5	Flue OH Ref.	X2	Rast 2.5
6	Flue OH Signal	X2	Rast 2.5
1	Ionisation GND	X3	Rast 5
2	Ionisation Signal	X3	Rast 5

Pin assignment BCU



3.3 Extension module AVS75.390

Dimensions and drilling plan



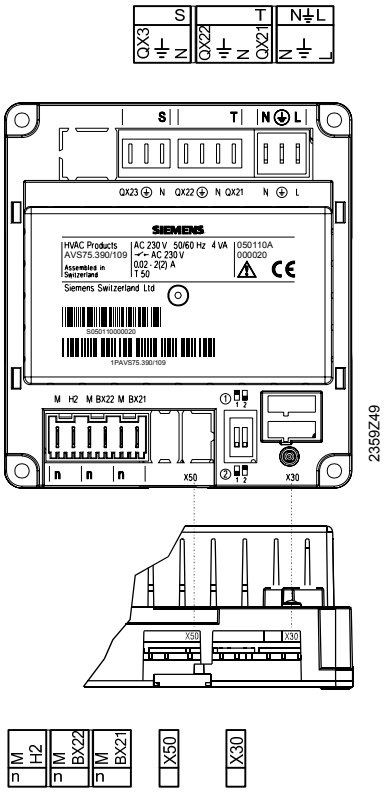
Dimensions in mm

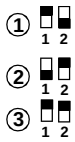
	L	*B*	*H*	*L1*	*B1*
AVS75.390	108.7	120.9	51.7	98	110

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.

3.3.1 Connection terminals of AVS75.390





Terminal markings

Mains voltage

	Use	*Terminal*	*Type of connector*
L ⏚ N	Phase AC 230 V basic unit Protective earth Neutral conductor	N ⏚ L	AGP4S.03E/109
QX21 N ⏚ QX22	Mixing valve opening Neutral conductor Protective earth Mixing valve closing	t	AGP8S.04B/109
N ⏚ QX23	Neutral conductor Protective earth Heating circuit pump	S	AGP8S.03B/109

Low-voltage

	Use	*Terminal*	*Type of connector*
X30	Operator unit / boiler control panel	-	AVS82.491/109
BX21 M	Flow sensor HC1 Ground	 n	AGP4S.02F/109
BX22 M	Flow sensor HC2 Ground	 n	AGP4S.02F/109
H2 M	Digital input Ground	 n	AGP4S.02F/109

Assignment of terminals

The two following parameters define the usage of the respective module:

1. Function extension module 1 (operating line 6020)
2. Function extension module 2 (operating line 6021)

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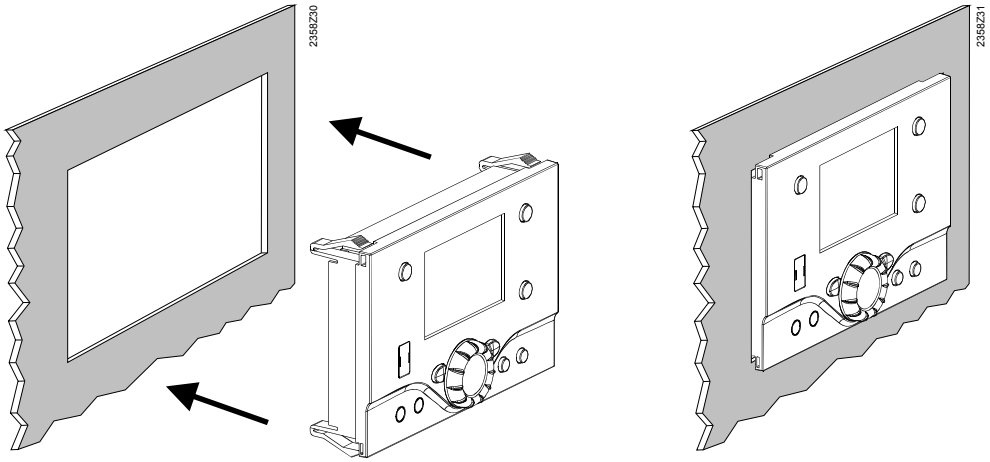
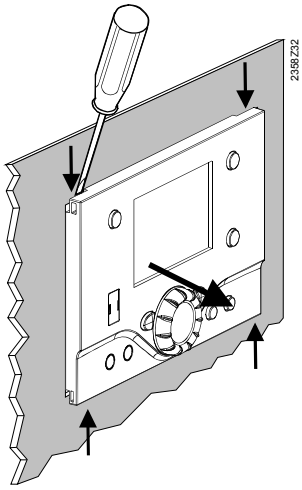
3.4 Operator unit AVS37.294

Mounting method

Installation



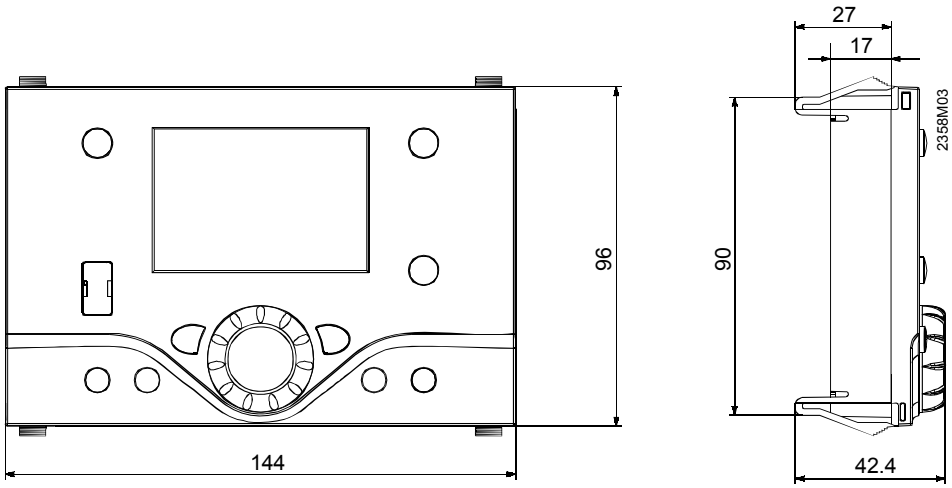
Removal



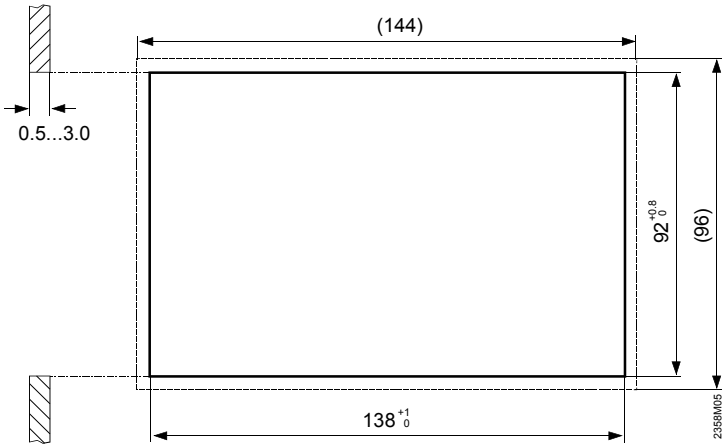
Connections

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

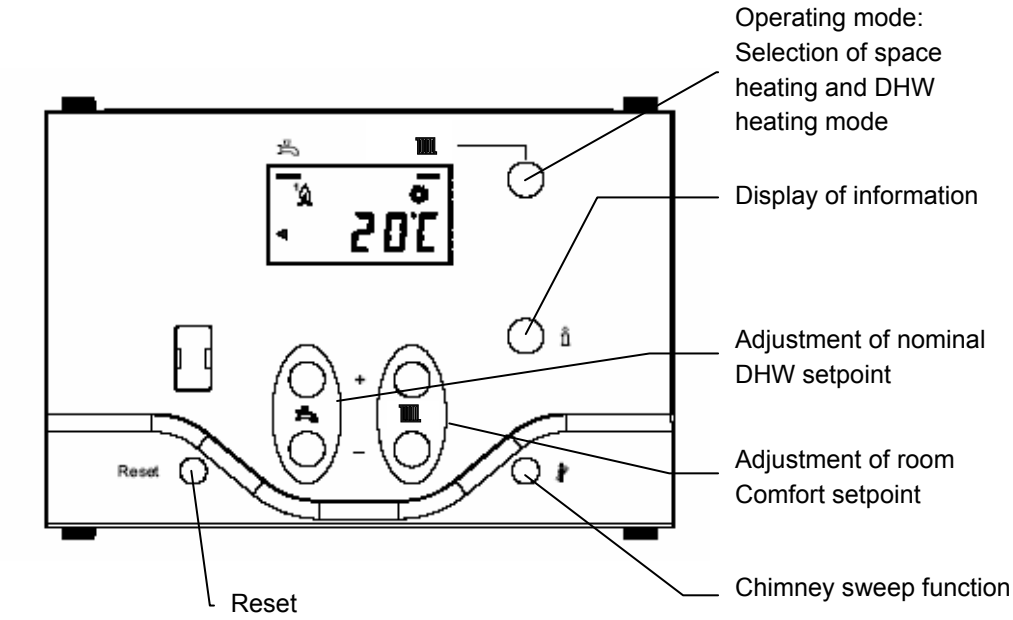
Dimensions



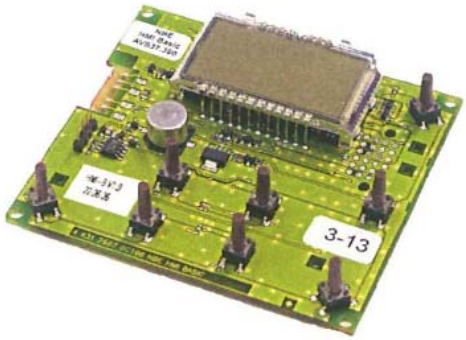
Panel cutout



3.5 Operator unit AVS37.390



Possible arrangement of operating elements on unit front
(Not part of the scope of delivery)

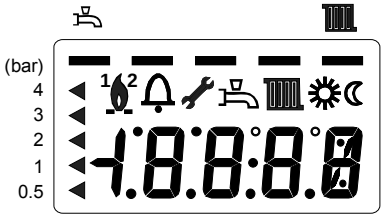


Possible displays

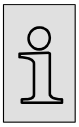
Heating to Comfort setpoint	1 2 Burner in operation
Heating to Reduced setpoint	Error message
Space heating mode active	Service / special mode
DHW heating mode active	

Display

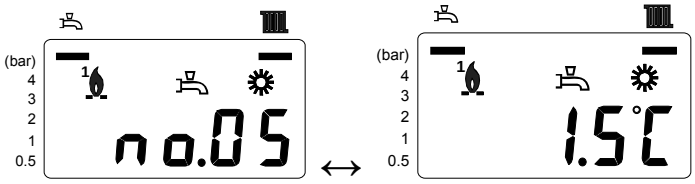
Example of all available segments and symbols.



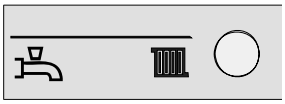
Displaying information



The Info button is used to display information.
Example: Outside temperature



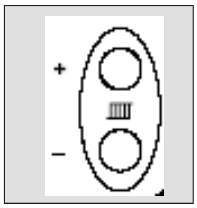
Selecting heating- and DHW mode



Press the button to switch between the different operating modes. The choice made is indicated by a bar which appears below the symbols.

- Heating on – DHW on
- Heating off – DHW on
- Heating off – DHW off
- Heating on – DHW off

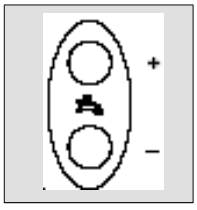
Adjustment of room temperature setpoint



Press the +/- buttons to increase or decrease the **room temperature Comfort set point** ☼.
After 8 seconds the adjusted value is adopted.

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

Adjustment of DHW temperature setpoint

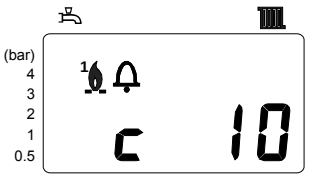


Press the +/- buttons to increase or decrease the **nominal DHW temperature set point**.
After 8 seconds the adjusted value is adopted.

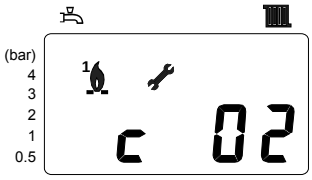
Errors and service

In exceptional cases, the basic display shows one of the following 2 symbols:

Error messages
When this symbol appears, a fault in the plant occurred. The number displayed after the letter “c“ gives the code.



Service or special mode
This symbol indicates service or special mode. The number displayed after the letter “c“ gives the code.



Chimney sweep function

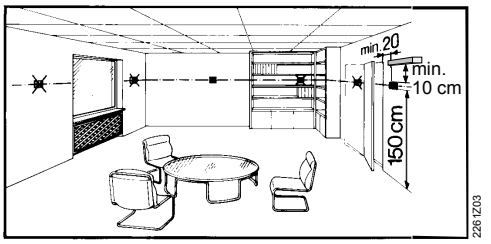
The chimney sweep function is activated by pressing for more then 3 seconds on the chimney sweep button. It produces the operating state required for making flue gas measurements.
The “special mode” symbol appears in the display. Adjustment of the burner output power and selection of burner is possible in the Information-Level.

User Reset function

The user reset function is activated by pressing for more then 3 seconds on the reset button.

3.6 Room unit QAA75…

Planning

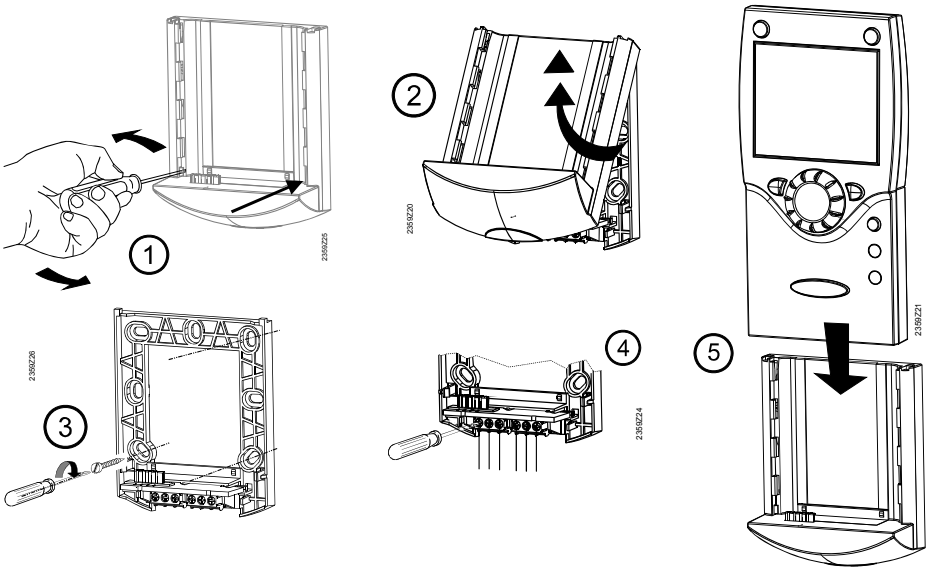


The room unit should be located in the main living room while giving consideration to the following points:

- The place of installation should be chosen such 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 disconnected so that the unit is out of operation.

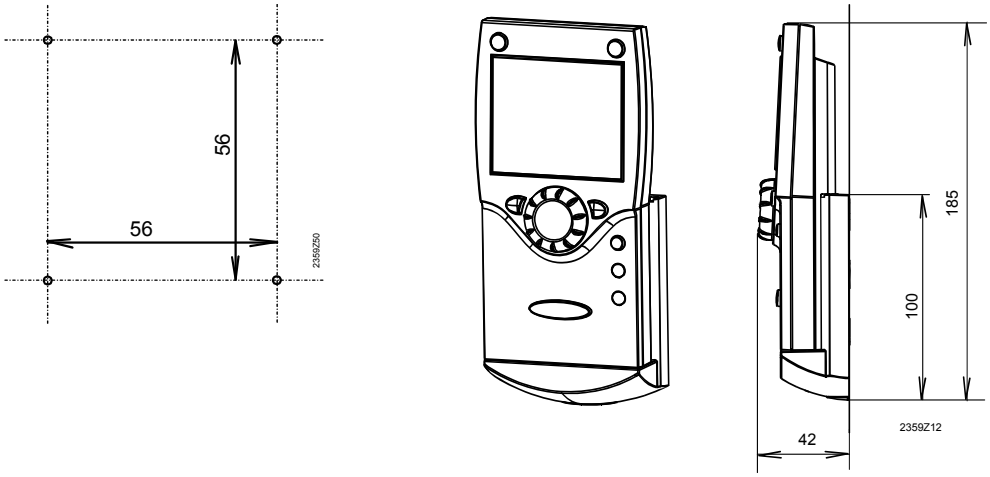
Mounting method



Connections

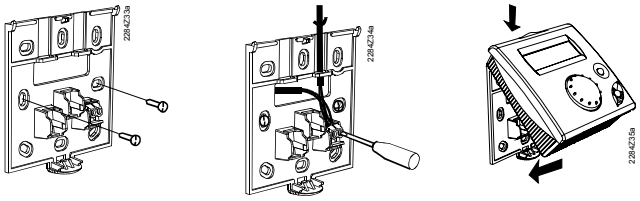
Terminal	Marking	QAA75.610	QAA75.611
1	CL+	BSB data	BSB data
2	CL-	BSB ground	BSB ground
3	G+	Reserved	Power supply DC 12 V

Dimensions and drilling plan

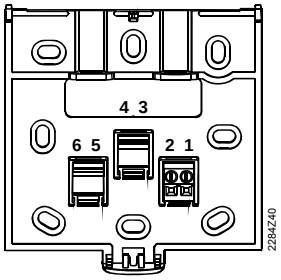


3.7 Room unit QAA55.110

Mounting method

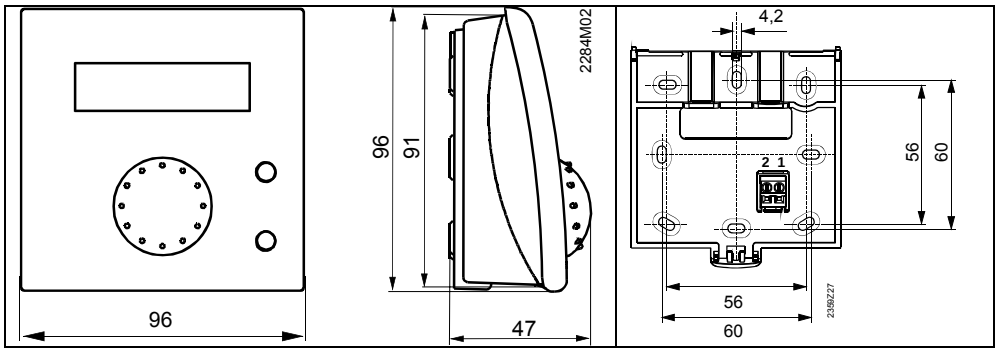


Connections



1	CL+	BSB data
2	CL-	BSB ground
3	-	-
4	-	-
5		-
6		-

Dimensions



3.8 Wireless components

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

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

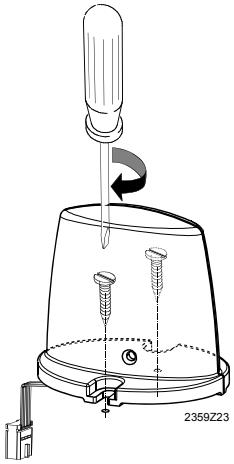
3.8.1 Radio module AVS71…

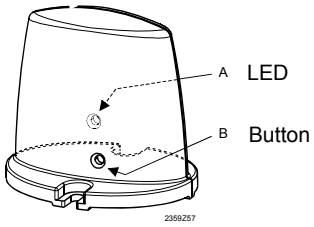
The radio module extends the product range through the introduction of wireless communication. With this type of device, system components such as room units transmit data with no need for using cables.

Planning

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

Mounting method





Connection

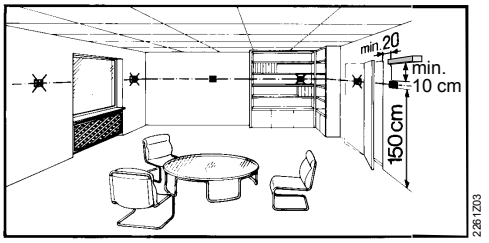
⚠ The prefabricated cable must be connected to terminal X60 of the controller.
Prior to connecting, the basic unit must be disconnected from power!

Radio link

Establishment of the radio link is described in the following sections which cover the different radio-controlled units.

3.8.2 Room unit QAA78…

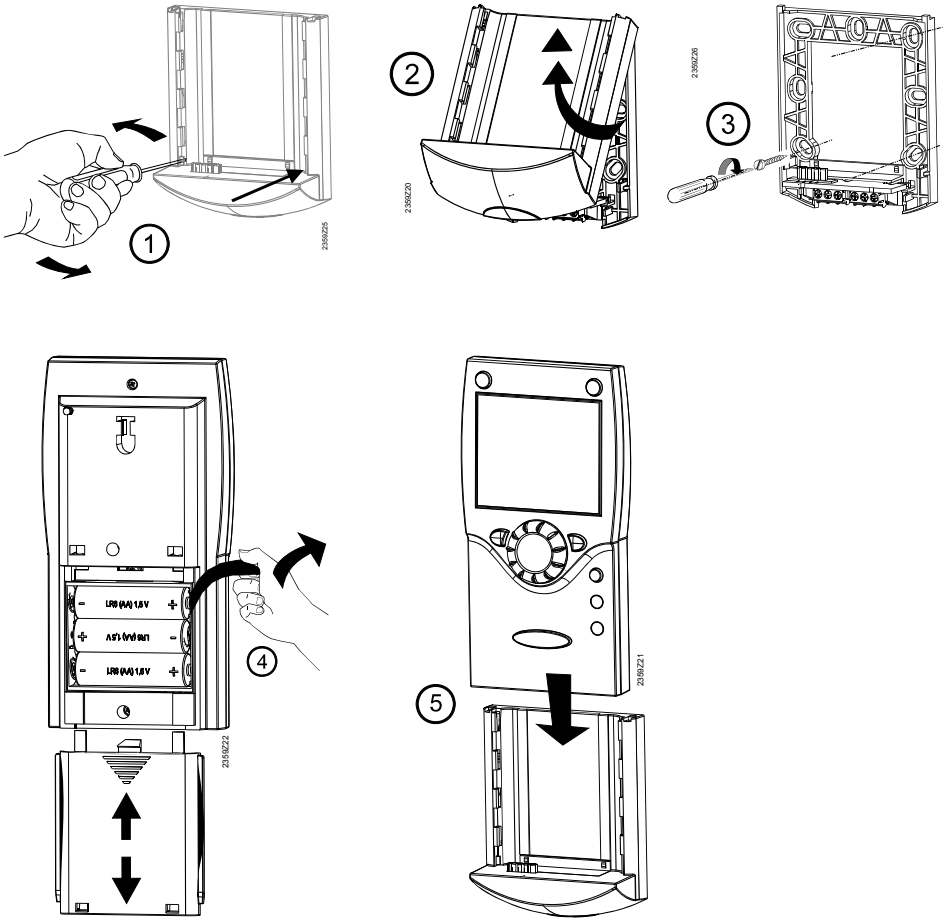
Planning



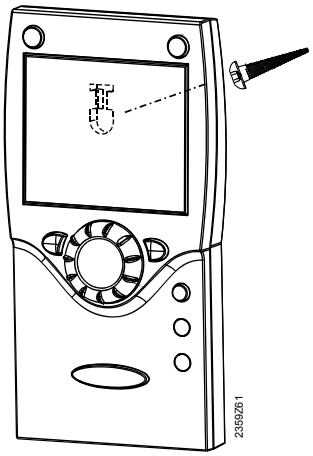
The room unit should be located in the main living room while giving consideration to the following points:

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

Mounting with base



Mounting without base



Terminals / power supply

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

Radio link

Establish the radio link in the vicinity of the radio module prior to mounting so that all system components are within easy reach.

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

Establishing the link

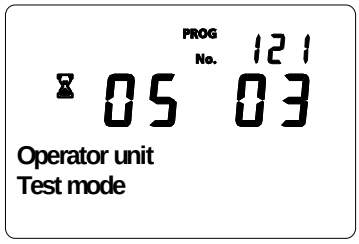
1. Press the button on the installed radio module for at least 8 seconds until the LED on the radio module starts flashing at high frequency.
2. Press OK on the room unit to switch to programming.
3. Press the info button for at least 3 seconds and select operating level “Commissioning“ with the setting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

Testing

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

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

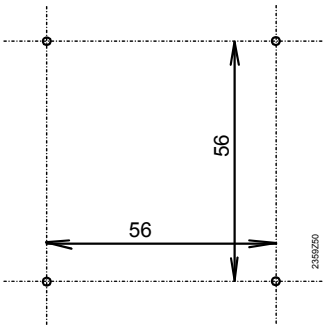
On the room unit, as described above (points 2 to 4), select operating page “Wireless“ and activate the test mode on operating line “Test mode“ (line 121).
Example of a display during the test:

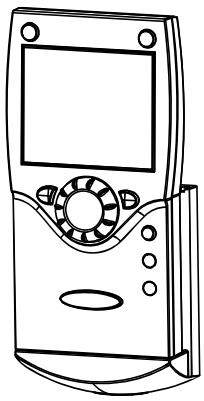


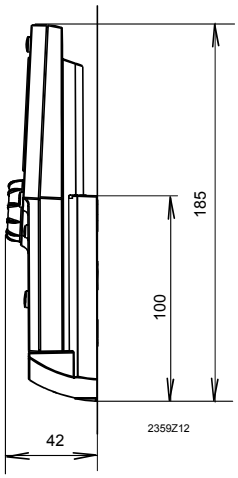
The digits on the left show telegrams that have been sent, the digits on the right telegrams that have been received. The test will be ended after 24 telegrams. The test will be considered successful when at least 50 % of the telegrams sent have been received.

If the test was not successful, some other mounting location should be chosen or the AVS14.390 radio repeater should be used.

Dimensions and drilling plan





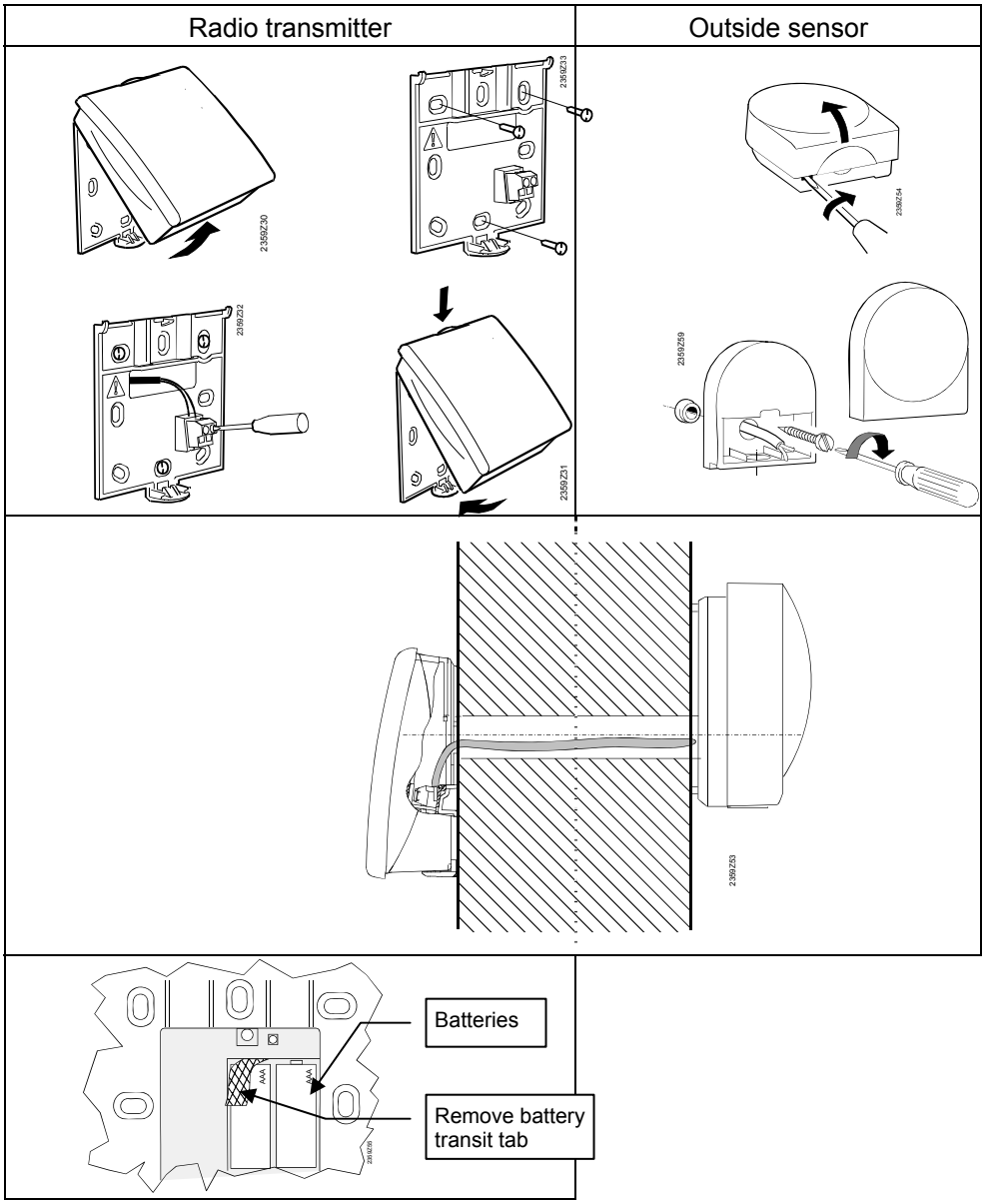


3.8.3 Wireless outside sensor AVS13.399

⚠

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

Mounting method



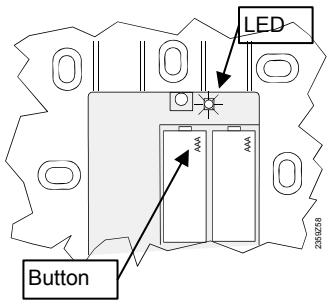
Connections

The units are to be connected via a 2-core cable; the wires are interchangeable.
Power is supplied by two 1.5 V batteries type AAA (LR03).

Radio link

Tip: Establish the radio link in the vicinity of the radio module prior to mounting so that all system components are within easy reach.

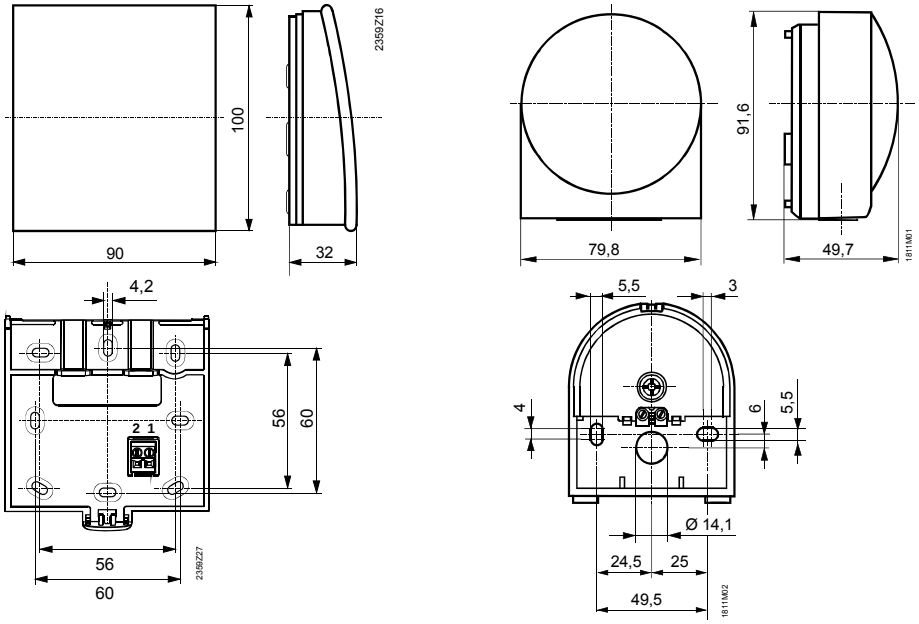
Prerequisite for the radio link is that all components receive power, which means that the radio module must be correctly connected to the basic unit and the batteries must be correctly installed in the room unit.



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

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

Dimensions and drilling plan

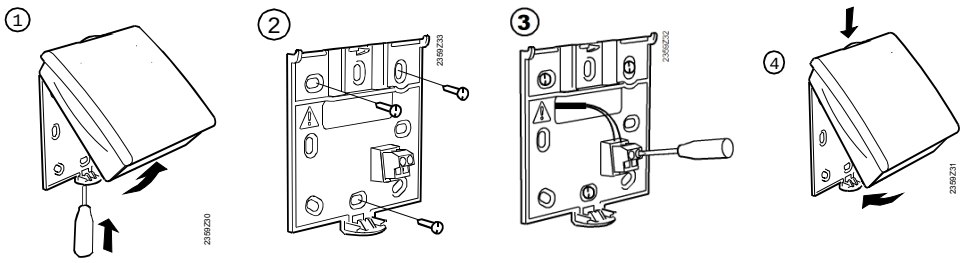


3.8.4 Radio repeater AVS14.390

⚠

3. To establish the radio link, the device must be temporarily connected to power prior to mounting, enabling the radio link to be opened and tested
4. The radio repeater must be fitted inside the building

Mounting method



Connections

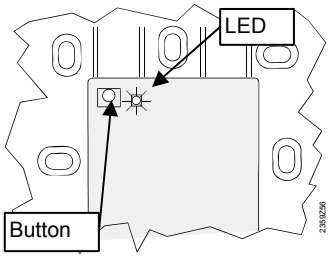
Power is supplied via the enclosed power pack. The wires are interchangeable.

Radio link

Tip: Establish the radio link in the vicinity of the radio module prior to mounting so that all system are within easy reach.

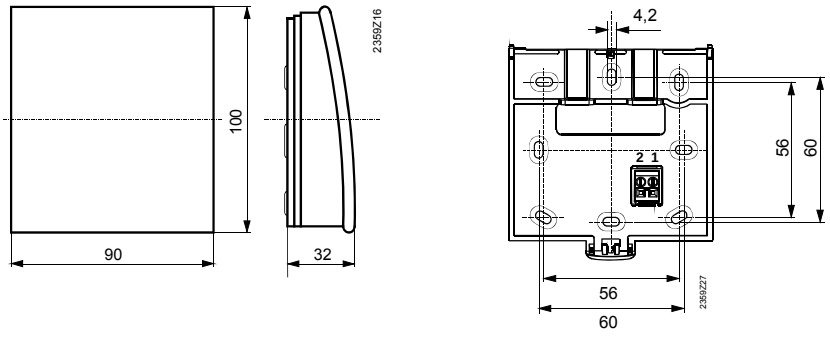
Prerequisite for the radio link is that all components receive power, which means that the radio module must be correctly connected to the basic unit and power must be correctly supplied to the radio repeater.

- Establishing the link
- Press the button on the radio module for at least 8 seconds until the LED on the radio module starts flashing at **high frequency**.
- Press the button on the installed radio repeater until the LED starts flashing at **high frequency**.
- The link is established when the LED on the radio module extinguishes.



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

Dimensions and drilling plan



3.8.5 Checking the wireless components

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

4 Commissioning

Prerequisites

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

- Prerequisite is correct mounting and correct electrical installation and, in the case of wireless systems, correctly working radio links to all the 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:
    - o Press the OK button on the room unit to switch to programming.
    - o Press the Info button for at least 3 seconds and select operating level “Commissioning“ with the setting knob. Then, press the OK button.

Remark: some settings in the configuration menu are locked if a burner is running. Both burners have to be off to enable to modify all settings in the configuration menu.

- Reset the attenuated outside temperature
  (operating page “Diagnostics consumer“, operating line “Outside temp attenuated“ (line 8703))

Functional check

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

Operating state

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

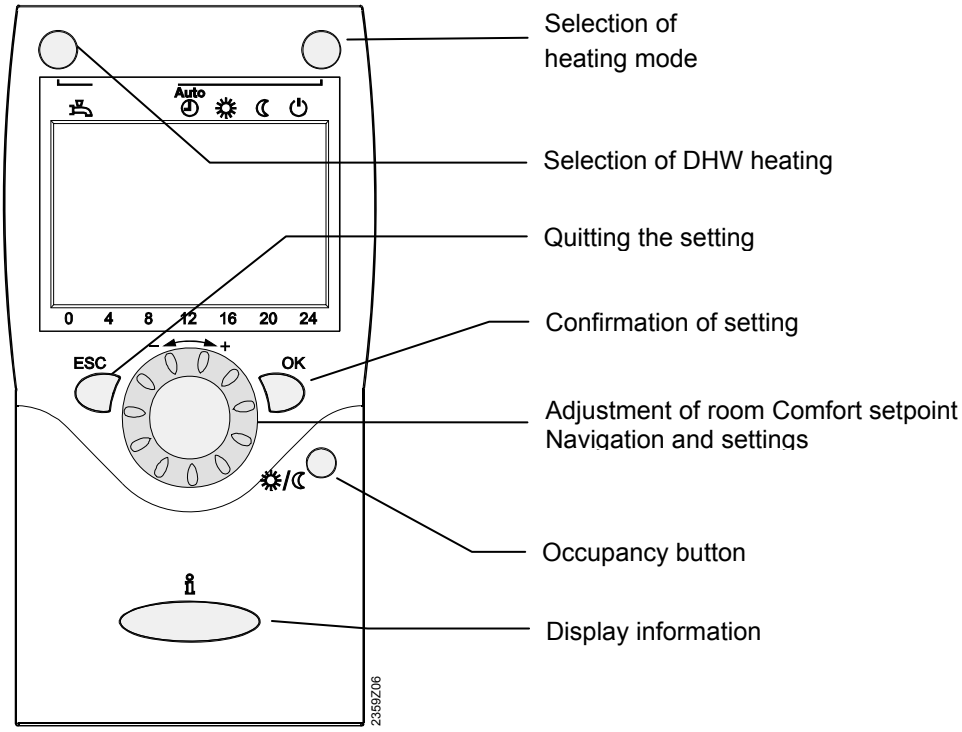
Diagnostics

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

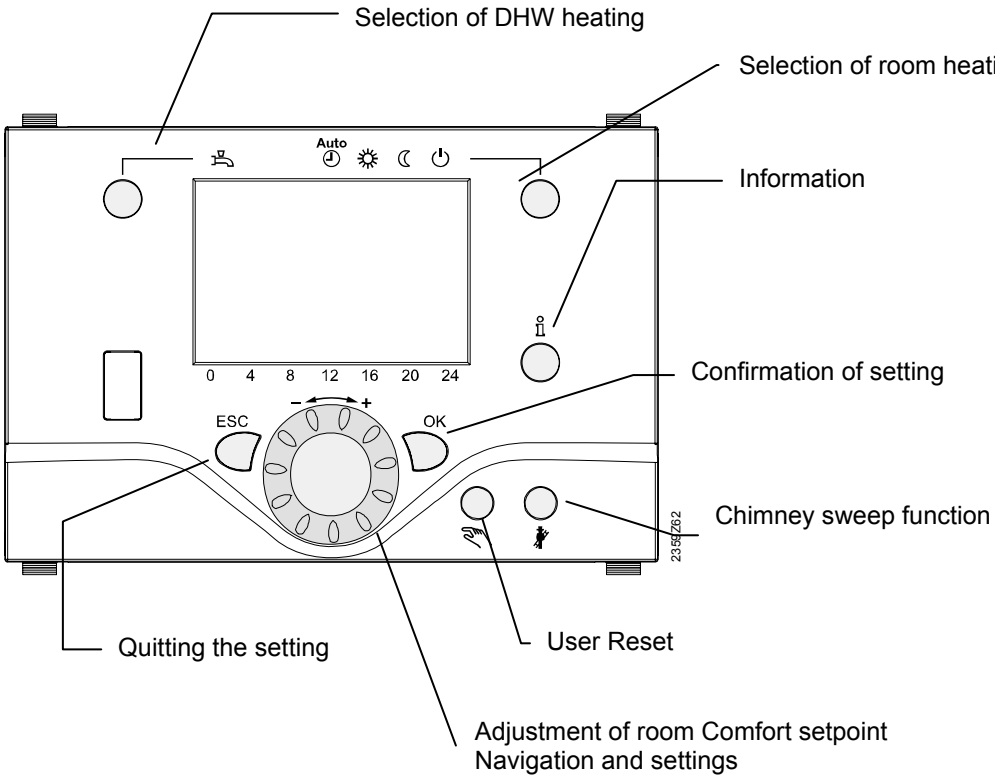
5 Handling

5.1 Operation (operating elements)

Operating elements QAA7x



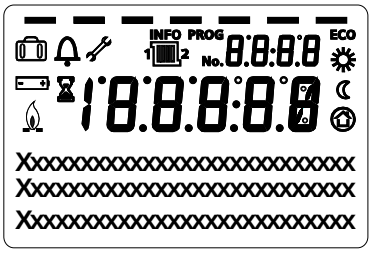
Operator unit AVS37.294



Display choices

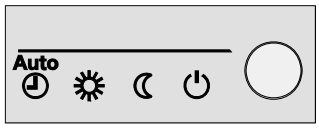
Heating to the Comfort set point	INFO Info level activated
Heating to the Reduced set point	PROG Programming activated
Heating to the frost protection set point	ECO Heating system temporarily off ECO function active
Process running – please wait	Holiday function active
Change battery	Reference to heating circuit
Burner in operation (only oil / gas burner)	Maintenance / special mode
	Error messages

Display QAA75, AVS37 Display showing all available segments.



Selecting heating mode

Press the button to switch between the different operating modes. The choice made is indicated by a bar which appears below the symbols.



Automatic operation AUTO

Automatic operation controls the room temperature according to the time program.

Charactersitics of automatic operation:
- Heating mode according to the time program
- Temperature set points according to heating program “Comfort set point“ ☼ or “Reduced set point“ ☾
- Protective functions active
- Automatic summer / winter changeover (ECO functions)

Continuous operation ☼ ***or*** ☾

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

☼ Heating to the Comfort set point

☾ Heating to the Reduced set point

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 set point

Protection ⏻

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

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

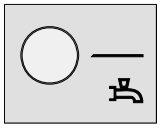
Selecting DHW heating mode

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

DHW mode

- On

The DHW is heated according to the selected switching program.



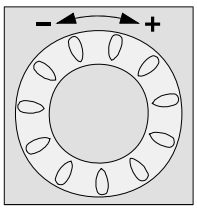
- Off

No DHW heating, the protective function is active.

Adjusting the room temperature set point

Turning the setting knob will increase or decrease the current room temperature set point. This may be comfort, reduced or frost protection set point.

This change will be valid until the next change of heating level.
In automatic operation, this will be until the next change of the time switch program.

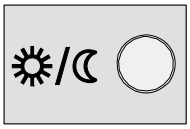


For the change of **Comfort set point** ☼ .or **Reduced set point** ☾
- Press the OK button
- Choose operating page “Heating circuit“ and
- Adjust the “Comfort set point“ or “Reduced set point“

Each time you make a readjustment, wait at least 2 hours, allowing the room temperature to adapt.

Occupancy button

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

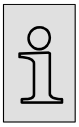


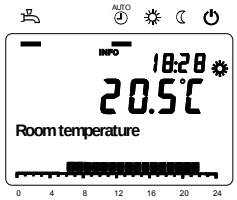
☼ Heating to the Comfort set point
☾ Heating to the Reduced set point

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

Displaying information

The Info button is used to display information.



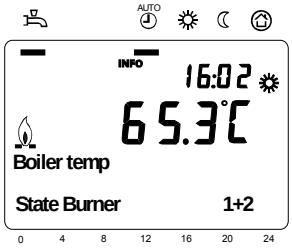


Available information

Certain information lines are hidden, depending on the type of unit, unit configuration and operating state.
- Error message
- Maintenance alarm
- Special mode
- Room temperature
- Room temperature minimum
- Room temperature maximum
- Boiler temperature
- Outside temperature
- Outside temperature minimum
- Outside temperature maximum
- DHW temperature 1
- State boiler
- State solar
- State DHW

- State heating circuit 1
- State heating circuit 2
- State heating circuit P
- Time of day / date
- Telephone customer service

Default display operator unit



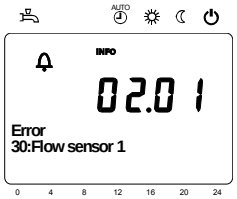
The default display of the operator unit shows the boiler (flow) temperature and the state of the burners.

State burner:	Both off	
	1	Engine burner on
	2	Supplementary burner on
	1+2	Engine burner and supplementary burner on

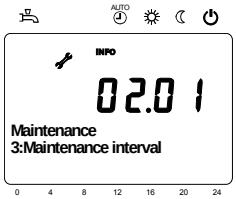
Exceptional cases

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

Error messages
If this symbol appears, a plant fault occurred. In that case, press the Info button to obtain more information.

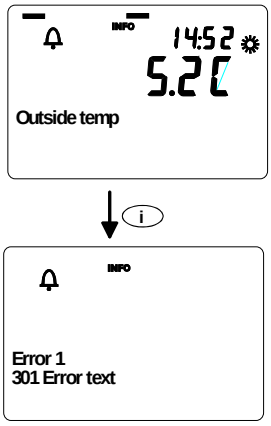


Maintenance or special mode
If this symbol appears, a maintenance alarm is delivered or the plant has changed to special mode. In that case, press the Info button to obtain more information.



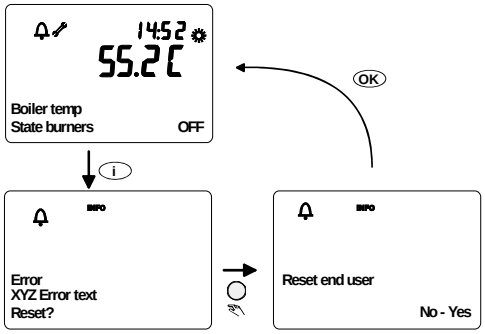
A list of possible displays is given on page 118.

Error with Automatic Reset



If an error occurs which will be reset automatically after the fault is eliminated, this will be displayed with a bell in the display.
By pressing the Info button, the type of error will be displayed with an error code number and a short error text.

Error with User Reset

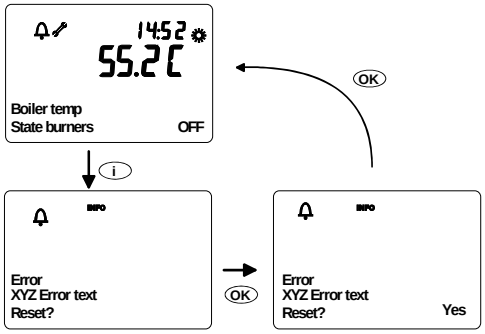


If an error occurs which requires a User Reset, this will be displayed with a bell and a screw wrench in the display.
By pressing the Info button, the type of error will be displayed with an error code number and a short error text.
By pressing the Info button once again, the next display will display which type of Reset (User Reset or Service Reset) is required. A User Reset may be done on the operator unit.

User Reset

A User Reset may be executed by pressin the User Reset Button for less then 3 seconds and change the “value” No to Yes and pressing OK.

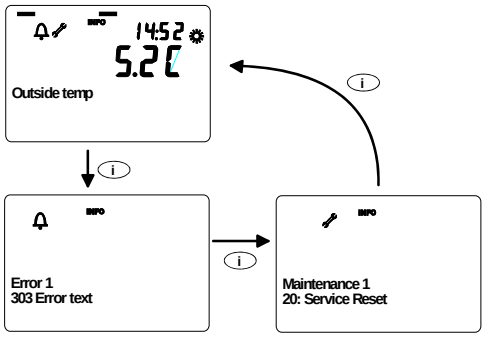
User Reset option



User Reset is also possible by using the sequence described on the left side.
Instead of pressing the User Reset button, it is possible to press the OK button two times.

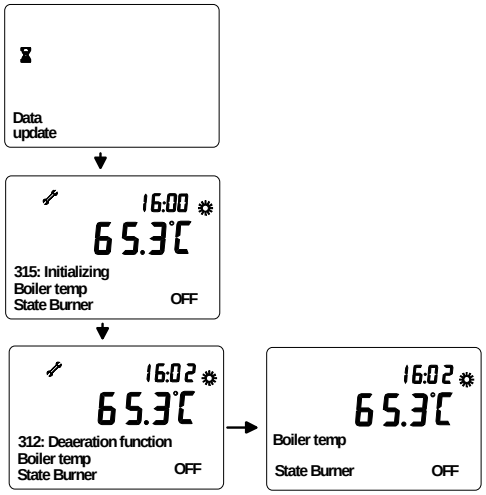
The number of User or Service Resets is limited to 5 Resets every 15 minutes.
If there has been no Reset in the last 15 minutes, the Reset credit counter will be 5. This is the maximum credit number. With each Reset, the credit will be decremented. If the credit is 0, it is not possible to activate a Reset. Every 3 minutes, the credit will be increased by +1 up to the maximum of 5 credits.

Error with Service Reset



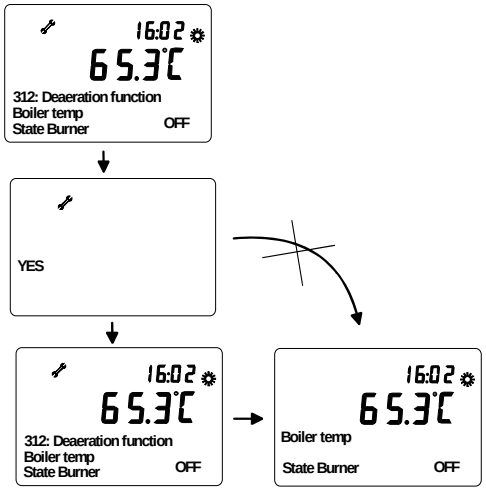
If an error occurs which requires a Service Reset, this will be displayed with a bell and a screw wrench in the display.
By pressing the Info button, the type of error will be displayed with an error code number and a short error text.
By pressing the Info button once again, the next display will display which type of Reset (User Reset or Service Reset) is required. For a Service Reset, call your appliance service organisation.

Power up behaviour



After power up, the HMI will show Update data for some seconds, after this, the initializing will start. Initializing is a waiting time of 2 minutes to make sure all information is available to start the appliance (e.g. information from RF sensors). Initializing may be interrupted by pressing ESC button for 3 seconds.
After this, deaeration function will start, if activated. Deaeration function may be interrupted by pressing ESC button once again for 3 seconds.
After this, the appliance is ready to start.

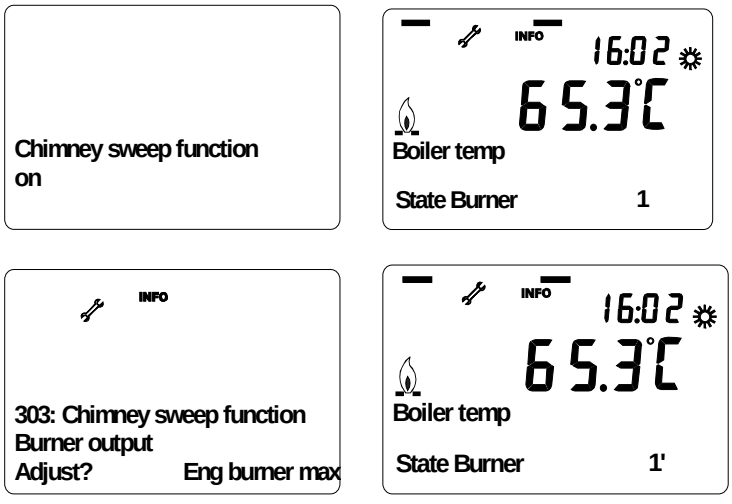
Display reaction after pressing a button



The display may be a little bit confusing, because there may be a delay of up to 10 seconds, until the correct status is displayed.
e.g. after pressing the ESC button for 3 seconds during deaeration function, the command is accepted by displaying YES. Unfortunately the display goes back to the old display status, instead of displaying the new one. This transition may last up to 10 seconds.

Chimney sweep function

The chimney sweep function is activated by pressing the chimney sweep button for more then 3 seconds. This puts the appliance in to the mode required for making flue gas measurements.
The “special mode” symbol appears in the display. Adjustment of the burner output power and selection of burner is possible in the Information-Level.



The burner output power may be adjusted:

- Engine burner minimum firing rate
- Engine burner maximum firing rate
- Supplementary burner minimum firing rate
- Supplementary burner maximum firing rate
- Engine- and Supplementary burner minimum firing rate
- Engine- and Supplementary burner maximum firing rate

The burner will start like in commissioning mode.
The head temperature will be controlled to the head temperature nominal temperature and the boiler flow temperature will be limited to the boiler temperature set point maximum.
If the burner output power is limited either by head temperature or boiler flow temperature, this will be indicated with a * next to the burner state indication (e.g.1*)

After 20 minutes, a time out will terminate the chimney sweeper function. Alternatively the function can be terminated by pressing the chimney sweeper button again.

Commissioning Room unit QAA55.110

See chapter room unit QAA55

Commissioning QAA7x, AVS37.294

The commissioning of the room unit QAA7x or the operator unit AVS37.294 is described in chapter “The settings in detail, Operator unit”.

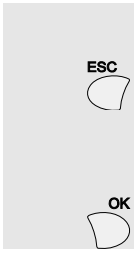
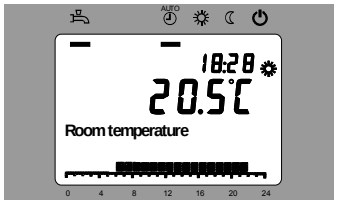
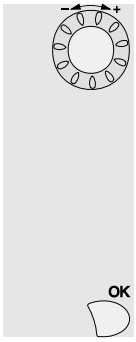
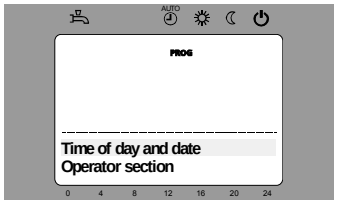
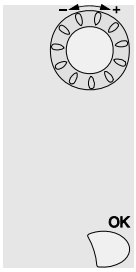
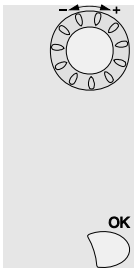
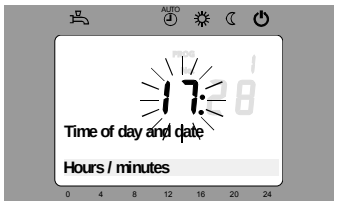
5.2 Programming

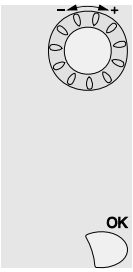
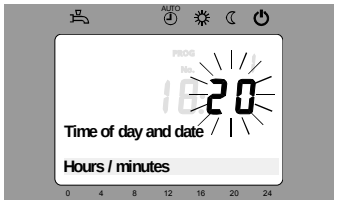
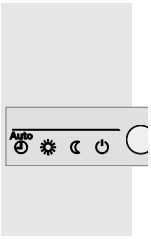
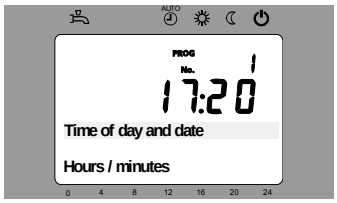
5.2.1 Setting principle

Settings that cannot be accessed directly via the function buttons are made through programming. For this purpose, the individual settings are structured in the form of operating pages and operating lines, thus forming logical groups of settings.
The following example which shows the setting of the time of day and date shall explain this.

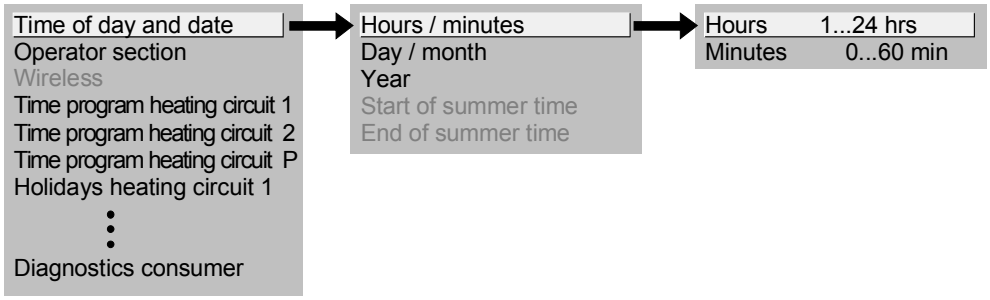
Example “Setting the time of day“

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

	Operation	Display example	Description
1			The basic display is shown. If the basic display is not selected, press the ESC button. Press the OK button
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. To confirm, press the OK button.
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 the OK button.
4			The display shows the hours flashing. Turn the setting knob until the hours of the time of day are correct. To confirm, press the OK button.

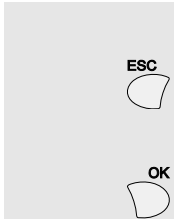
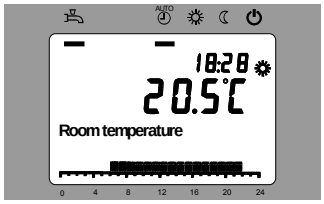
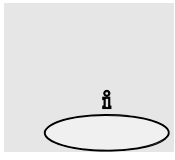
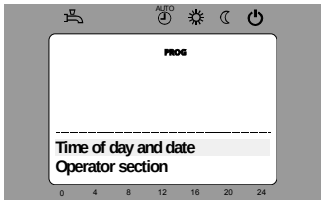
5			The display shows the minutes flashing. Turn the setting knob until the minutes of the time of day are correct. To confirm, press the OK button.
6			The settings are saved, the displays stops flashing. You can continue to make other settings, or you press the operating mode button to return to the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

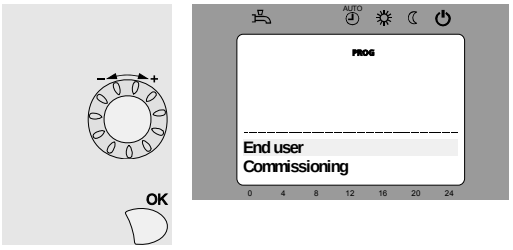
Example of menu structure



5.2.2 User levels

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

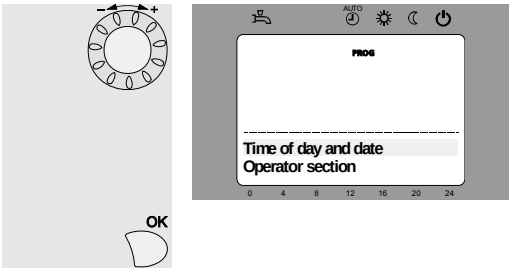
	Operation	Display example	Description
1			You see the basic display. If the basic display is not shown, press the ESC button to return to it. Press the OK button:
2			You are on user level “Enduser“. Press the Info button for 3 seconds.



You are given a choice of user levels.
Turn the setting knob until the required user level is reached.

Press the OK button.

3

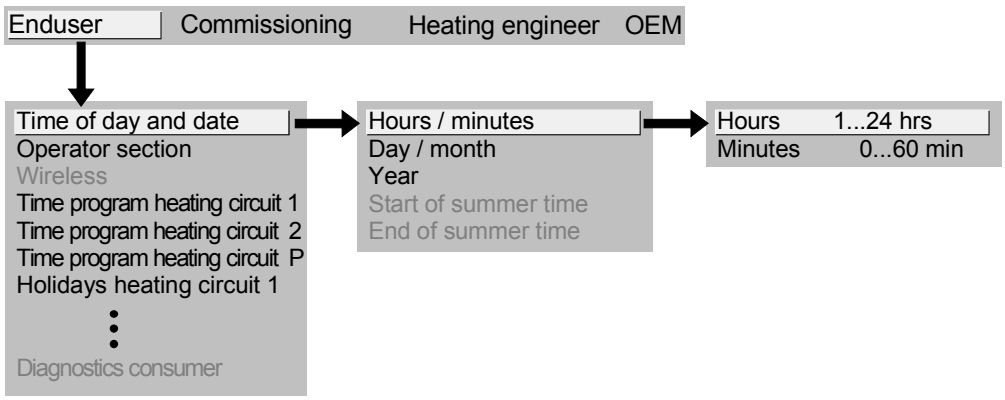


You are now on the required user level.

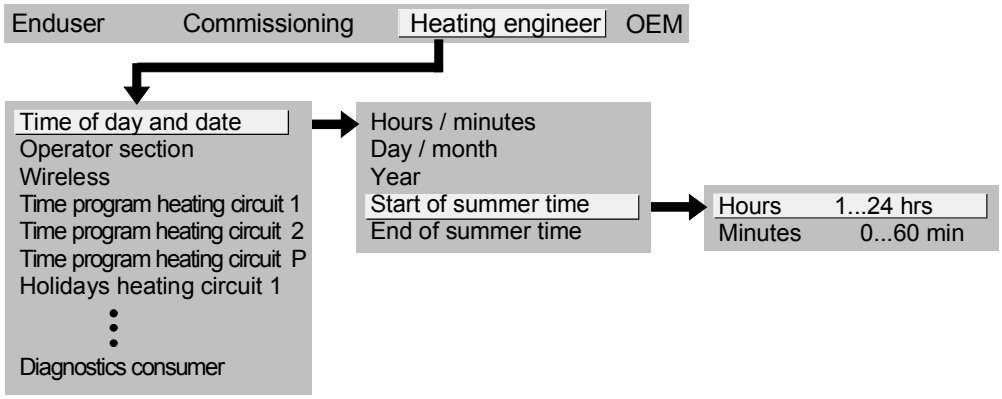
To reach the OEM level, enter the relevant code.

Setting structure for “Enduser“

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



Setting structure for ”Heating engineer“



5.2.3 Overview of settings and display values

The following overview is still under development and may be not complete.

Legend E = End user , F1 = commissioning F2 = heating
BZ = operating line
NEW

Operating line	User level	Function	Default value	Min	Max	Unit
Time of day and date						
1	E	Hours/minutes	-	00:00	23:59	hh:mm
2	E	Day/Month	-	01.01	31.12	dd.mm
3	E	Year	-	2004	2099	yyyy
5	F2	Start of summer time	25.03	01.01	31.12	dd.mm
6	F2	End of summer time	25.10	01.01	31.12	dd.mm
Operator section						
20	E	Language German ¦ English…	English			-
22	F2	Info Temporarily ¦ Permanently	Temporarily			-
26	F2	Operation lock Off ¦ On	Off			-
27	F2	Programming lock Off ¦ On	Off			-
28	F1	Direct adjustment Storage with confirmation ¦ Automatic storage	Storage with confirmation			
40	F1	Used as Room unit 1 ¦ Room unit 2 ¦ Operator unit ¦Service unit	Room unit 1			-
42	F1	Assignment room unit 1 Heating circuit 1 ¦ Heating circuits 1 and 2	Heating circuit 1			-
44	F1	Operation HC2 Commonly with HC1 ¦ Independently	Commonly with HC1			-
46	F1	Operation HCP Commonly with HC1 ¦ Independently	Commonly with HC1			-
48	F1	Action occupancy button None ¦ Heating circuit 1 ¦ Heating circuit 2 ¦ Commonly	Heating circuit 1			-
54	F2	Readjustment room sensor	0.0	-3	3	°C
70	F2	Software version (room unit or HMI)	-	00.0	99.9	-
Wireless						
120	F1	Binding No ¦ Yes	No			
121	F1	Test mode Off ¦ On	Off			
130	F1	Room unit 1 Missing ¦ Ready ¦ No reception ¦ Change batt	-			-
131	F1	Room unit 2 Missing ¦ Ready ¦ No reception ¦ Change batt	-			-
132	F1	Outside sensor Missing ¦ Ready ¦ No reception ¦ Change batt	-			-
133	F1	Repeater Missing ¦ Ready ¦ No reception	-			-
134	F1	Operator unit Missing ¦ Ready ¦ No reception ¦ Change batt	-			-
135	F1	Service unit	-			-

Operating line	User level	Function	Default value	Min	Max	Unit
		Missing ¦ Ready ¦ No reception ¦ Change batt				
138	F1	Delete all devices No ¦ Yes	No			-
Time program 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	--:--	00:00	24:00	hh:mm
504	E	2nd phase off	--:--	00:00	24:00	hh:mm
505	E	3rd phase on	--:--	00:00	24:00	hh:mm
506	E	3rd phase off	--:--	00:00	24:00	hh:mm
516	E	Default values No ¦ Yes	No			-
Time program 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	--:--	00:00	24:00	hh:mm
524	E	2nd phase off	--:--	00:00	24:00	hh:mm
525	E	3rd phase on	--:--	00:00	24:00	hh:mm
526	E	3rd phase off	--:--	00:00	24:00	hh:mm
536	E	Default values No ¦ Yes	No			-
Time program 3/HCP						
540	E	Preselection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
541	E	1st phase on	6:00	00:00	24:00	hh:mm
542	E	1st phase off	22:00	00:00	24:00	hh:mm
543	E	2nd phase on	--:--	00:00	24:00	hh:mm
544	E	2nd phase off	--:--	00:00	24:00	hh:mm
545	E	3rd phase on	--:--	00:00	24:00	hh:mm
546	E	3rd phase off	--:--	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	--:--	00:00	24:00	hh:mm
564	E	2nd phase off	--:--	00:00	24:00	hh:mm
565	E	3rd phase on	--:--	00:00	24:00	hh:mm
566	E	3rd phase off	--:--	00:00	24:00	hh:mm
576	E	Default values No ¦ Yes	No			-
Holidays heating circuit 1						

Operating line	User level	Function	Default value	Min	Max	Unit
642	E	Start	--.--	01.01	31.12	dd.mm
643	E	End	--.--	01.01	31.12	dd.mm
648	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Holidays heating circuit 2						
652	E	Start	--.--	01.01	31.12	dd.mm
653	E	End	--.--	01.01	31.12	dd.mm
658	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Holidays heating circuit P						
662	E	Start	--.--	01.01	31.12	dd.mm
663	E	End	--.--	01.01	31.12	dd.mm
668	E	Operating level Frost protection ¦ Reduced	Frost protection			-
Heating circuit 1						
710	E	Comfort set point	20.0	BZ 712 (4)	BZ 716 (35)	°C
712	E	Reduced set point	16	BZ 714 (4)	BZ 710 (35)	°C
714	E	Frost protection set point	10.0	4	BZ 712 (35)	°C
720	E	Heating curve slope	1.50	0.10	4.00	-
721	F2	Heating curve displacement	0.0	-4.5	4.5	°C
726	F2	Heating curve adaption Off ¦ On	Off			-
730	E	Summer / winter heating limit	18	– – – / 8	30	°C
732	F2	24-hour heating limit	0	– – – / -10	10	°C
740	F2	Flow temp set point min	8	8	BZ 741 (95)	°C
741	F2	Flow temp set point max	80	BZ 740 (8)	95	°C
742	F2	Flow temp. set point room thermostat	70	BZ740 (8)	BZ741 (95)	°C
750	F1	Room influence	100	– – – / 0	100	%
759	F1	Type room heating Manually adjusted/ radiator fast/ radiator medium/ radiator slow/ floor heat fast / floor heat medium / floor heat slow	Radiator medium			
760	F2	Room temp limitation	1.0	– – – / 0.5	4.0	°C
761	F2	Heating limit room temp control	16	0	80	%
762	F2	Deriv action time room temp control	480			min
763	F2	Integral action time room temp control	3600	0		min
764	F2	Prop Band room temp control	3			K
770	F2	Boost heating	– – –	– – – / 0	20	°C
780	F2	Quick setback Off ¦ Down to reduced set point ¦ Down to frost prot set point	Down to reduced set point			-
789	F2	Opt start control max for opt energy production	0	0	1200	min
790	F2	Optimum start control max	0	0	1200	min
791	F2	Optimum stop control max	0	0	360	min
800	F2	Red set point increase start	– – –	– – – / -30	10	°C
801	F2	Red set point increase end	-15	-30	BZ 800 (10)	°C
820	F2	Overtemp protection pump circuit Off ¦ On	Off			-
830	F2	Mixing valve boost	10	0	50	°C
834	F2	Actuator running time	120	30	873	s
850	F2	Floor curing function	Off			-

Operating line	User level	Function	Default value	Min	Max	Unit
		Off ¦ Functional heating ¦ Curing heating ¦ Functional/curing heating¦ Manually				
851	F2	Floor curing setp manually	25	0	95	°C
855	F2 (RO)	Flow temp setpoint flooring plaster dry up HC1				°C
856	F2 (RO)	Flooring plaster dry up day HC1				
857	F2 (RO)	Floor curing HC1 days fulfilled				
Heating circuit 2						
1000	ACS	Operating mode HC2 Protection¦ Reduced ¦ Comfort ¦ Automatic				
1010	E	Comfort set point	20.0	BZ 1012	BZ 1016	°C
1012	E	Reduced set point	16	BZ 1014	BZ 1010	°C
1014	E	Frost protection set point	10.0	4	BZ 1012	°C
1020	E	Heating curve slope	1.50	0.10	4.00	-
1021	F2	Heating curve displacement	0.0	-4.5	4.5	°C
1026	F2	Heating curve adaption Off ¦ On	Off			-
1030	E	Summer / winter heating limit	18	– – – / 8	30	°C
1032	F2	24-hour heating limit	0	– – – / -10	10	°C
1040	F2	Flow temp set point min	8	8	BZ 1041	°C
1041	F2	Flow temp set point max	80	BZ 1040	95	°C
1042	F2	Flow temp. set point room thermostat	70	8/BZ1040	BZ1041/95	°C
1050	F1	Room influence	100	– – – / 0	100	%
1059	F1	Type room heating Manually adjusted/ radiator fast/ radiator medium/ radiator slow/ floor heat fast / floor heat medium / floor heat slow	Radiator medium			
1060	F2	Room temp limitation	1.0	– – – / 0.5	4.0	°C
1061	F2	Heating limit room temp control	16	0	90	%
1062	F2	Deriv action time room temp control	480			min
1063	F2	Integral action time room temp control	3600	0		min
1064	F2	Prop Band room temp control	3			K
1070	F2	Boost heating	– – –	– – – / 0	20	°C
1080	F2	Quick setback Off ¦ Down to reduced set point ¦ Down to frost prot set point	Down to reduced set point			-
1089	F2	Opt start control max for opt energy production	0	0	1200	min
1090	F2	Optimum start control max	0	0	360	min
1091	F2	Optimum stop control max	0	0	360	min
1100	F2	Red set point increase start	– – –	– – – / -30	10	°C
1101	F2	Red set point increase end	-15	-30	BZ 1100	°C
1120	F2	Overtemp protection pump circuit Off ¦ On	Off			-
1130	F2	Mixing valve boost	10	0	50	°C
1134	F2	Actuator running time	120	30	873	s
1150	F2	Floor curing function Off ¦ Functional heating ¦ Curing heating ¦ Functional/curing heating¦ Manually	Off			-
1151	F2	Floor curing setp manually	25	0	95	°C

Operating line	User level	Function	Default value	Min	Max	Unit
1155	F2	Flow temp setpoint flooring plaster dry up HC1				°C
1156	F2	Flooring plaster dry up day HC1				
1157	F2 (RO)	Floor curing HC1 days fulfilled				
Heating circuit P						
1300	E	Operating mode Protection ¦ Automatic ¦ Reduced ¦ Comfort	Automatic			-
1310	E	Comfort set point	20.0	BZ 1012	BZ 1016	°C
1312	E	Reduced set point	16	BZ 1014	BZ 1010	°C
1314	E	Frost protection set point	10.0	4	BZ 1012	°C
1320	E	Heating curve slope	1.50	0.10	4.00	-
1321	F2	Heating curve displacement	0.0	-4.5	4.5	°C
1326	F2	Heating curve adaption Off ¦ On	Off			-
1330	E	Summer / winter heating limit	18	– – – / 8	30	°C
1332	F2	24-hour heating limit	0	– – – / -10	10	°C
1340	F2	Flow temp set point min	8	8	BZ 1041	°C
1341	F2	Flow temp set point max	80	BZ 1040	95	°C
1342	F2	Flow temp. set point room thermostat	70	8/BZ1040	BZ1041/95	°C
1350	F1	Room influence	100	– – – / 0	100	%
1359	F1	Type room heating Manually adjusted/ radiator fast/ radiator medium/ radiator slow/ floor heat fast / floor heat medium / floor heat slow	Rediator medium			
1360	F2	Room temp limitation	1.0	– – – / 0.5	4.0	°C
1361	F2	Heating limit room temp control	16	0	90	%
1362	F2	Deriv action time room temp control	480			min
1363	F2	Integral action time room temp control	3600	0		min
1364	F2	Prop Band room temp control	3			K
1370	F2	Boost heating	– – –	– – – / 0	20	°C
1380	F2	Quick setback Off ¦ Down to reduced set point ¦ Down to frost prot set point	Down to reduced set point			-
1389	F2	Opt start control max for opt energy production	0	0	1200	min
1390	F2	Optimum start control max	0	0	360	min
1390	F2	Optimum start control max	0	0	360	min
1391	F2	Optimum stop control max	0	0	360	min
1400	F2	Red set point increase start	– – –	– – – / -30	10	°C
1401	F2	Red set point increase end	-15	-30	BZ 1100	°C
1420	F2	Overtemp protection pump circuit Off ¦ On	Off			-
1430	F2	Mixing valve boost	10	0	50	°C
1434	F2	Actuator running time	120	30	873	s
1450	F2	Floor curing function Off ¦ Functional heating ¦ Curing heating ¦ Functional/curing heating¦ Manually	Off			-
1451	F2	Floor curing setp manually	25	0	95	°C
1455	F2	Flow temp set point flooring plaster dry up HC1				°C

Operating line	User level	Function	Default value	Min	Max	Unit
1456	F2	Flooring plaster dry up day HC1				
1457	F2 (RO)	Floor curing HC1 days fulfilled				
Domestic hot water						
1610	E	Nominal set point	55	BZ 1612	BZ 1614 OEM	°C
1612	F2	Reduced set point	40	8	BZ 1610	°C
1620	F1	Release 24h/day ¦ Time programs HCs ¦ Time program 4/DHW	24h/day			-
1630	F1	Charging priority Absolute ¦ Shifting ¦ None ¦ MC shifting, PC absolute	absolute			-
1640	F2	Legionella function Off ¦ Periodically ¦ Fixed weekday	Off			-
1641	F2	Legionella funct periodically	3	1	7	Days
1642	F2	Legionella funct weekday Monday ¦ Tuesday ¦ Wednesday ¦ Thursday ¦ Friday ¦ Saturday ¦ Sunday	Monday			
1644	F2	Legionella funct time	--:--	--:-- / 00:00	23:00	hh:mm
1645	F2	Legionella funct set point	65	55	95	°C
1646	F2	legionella funct duration	– – –	– – – / 10	360	min
1647	F2	Legionella funct circ pump Off ¦ On	On			-
1660	F1	Circulating pump release Time program 3/HCP ¦ DHW release ¦ Time program 4/DHW	DHW release			-
1661	F1	Circulating pump cycling Off ¦ On	On			-

Operating line	User level	Function	Default value	Min	Max	Unit
Boiler						
2212	F2	Set point max	85	Set point manual control	BZ 2213 OEM	°C
DHW storage tank						
5010	F2	Charging Once/day ¦ Several times/day	Several times/day			-
5020	F2	Flow set point boost	20	0	30	°C
5022	F2	Type of charging With B3 ¦ With B3/B31 ¦ With B3, legio B3/B31	With B3			-
Configuration						
5702	F1	Plant type Free Configuration¦ W-Plan ¦ S-Plan ¦ Y-Plan ¦ 1 hc ¦ 2 hc ¦ 3 hc ¦ combi	S-Plan			
5709	F1	Type Heating circuit 1 No¦ No Actuator ¦ Pump ¦ On/Off-Valve ¦ Mixing Valve	On/off Valve			
5714	F1	Type Heating circuit 2 No ¦ No Actuator¦ Pump¦ On/Off-Valve ¦ Mixing Valve	No			
5720	F1	Type Heating circuit P No ¦ No Actuator¦ Pump¦ On/Off-Valve ¦ Mixing Valve	No			
5729	F1	Type DHW Charging No¦ No Actuator¦ Charging Pump¦ Valve ¦ Diverting Valve ¦ Midposition Valve¦ Combi	Valve			
5891	F1	Relay output QX2 None ¦ Boiler Pump Q1¦ DHW actuator Q3 ¦ HC1 actuator Q2 ¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	HC1 actuator Q2			
5892	F1	Relay output QX3 None ¦ Boiler Pump Q1¦ DHW actuator Q3¦ HC1 actuator Q2 ¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	DHW actuator Q3			
5894	F1	Relay output QX4 None ¦ Boiler Pump Q1¦ DHW actuator Q3 ¦ HC1 actuator Q2 ¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	None			
5980	F1	Function input EX1 None ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HCP ¦ DHW thermostat ¦ xx¦xxx¦ external heat demand, release engine burner ¦ external heat demand, release supp burner ¦ external heat demand, release eng burner + supp burner	None			-
5981	F1	Contact type input EX1 NC ¦ NO	NO			
5982	F1	Function input EX2 None ¦ Room thermostat HC1 ¦ Room thermostat HC2 ¦ Room thermostat HCP ¦ DHW thermostat ¦ xx¦xxx¦ external heat demand, release engine burner ¦ external heat demand, release supp burner ¦ external heat demand, release eng burner + supp burner	None			-
5983	F1	Contact type input EX2 NC ¦ NO	NO			
6020	F1	Function extension module 1 None ¦ Multifunction ¦ Heating Circuit 1 ¦ Heating circuit 2 ¦ Heating circuit P	None			
6021	F1	Function extension module 2 None ¦ Multifunction ¦ Heating Circuit 1 ¦ Heating circuit 2	None			

Operating line	User level	Function	Default value	Min	Max	Unit
		¦ Heating circuit P				
6022	F1	Function extension module 3 None ¦ Multifunction ¦ Heating Circuit 1 ¦ Heating circuit 2 ¦ Heating circuit P	None			
6030	F1	Relay output QX21 None ¦ Boiler Pump Q1¦ DHW actuator Q3¦ HC1 actuator Q2 ¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	None			
6031	F1	Relay output QX22 None ¦ Boiler Pump Q1¦ DHW actuator Q3¦ HC1 actuator Q2 ¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	None			
6032	F1	Relay output QX23 None ¦ Boiler Pump Q1¦ DHW actuator Q3¦ HC1 actuator Q2¦ HC2 actuator Q6 ¦ HCP actuator Q20 ¦ Alarm output K10 ¦ Circulating Pump Q4 ¦ Transport pump Q14	None			
6100	F2	Readjustm outside sensor	0.0	-3.0	3.0	°C
6110	F2	Time constant building	20	0	50	h
6120	F2	Frost protection plant Off ¦ On	Off			-
6200	F1	Save sensors No ¦ Yes	No			
6204	F2	Save parameters	No			-
6205	F2	Reset to default parameters No ¦ Yes	No			-
6212	F1	Check no. heat source 1	-	0	199’999	-
6215	F1	Check no. storage tank	-	0	199’999	-
6217	F1	Check no. heating circuits	-	0	199’999	-
6219	F2	Software version Sub System		00.0	99.9	
6220	F2	Software version	-	00.0	99.9	-
6221	F2	Development Index		00.0	99.9	
6223	F2	Software version power meter		00.0	99.9	
Fault						
6707	F1	Error Code Subsystem				
6710	F1	Reset alarm relay No ¦ Yes	No			-
6800	F2	History 1	-			
6801	F2	Error code 1	-	0	255	-
6802	F2	History 2	-			
6803	F2	Error code 2	-	0	255	-
6804	F2	History 3	-			
6805	F2	Error code 3	-	0	255	-
6806	F2	History 4	-			
6807	F2	Error code 4	-	0	255	-
6808	F2	History 5	-			
6809	F2	Error code 5	-	0	255	-
6810	F2	History 6	-			
6811	F2	Error code 6	-	0	255	-
6812	F2	History 7	-			
6813	F2	Error code 7	-	0	255	-
6814	F2	History 8	-			
6815	F2	Error code 8	-	0	255	-
6816	F2	History 9	-			

Operating line	User level	Function	Default value	Min	Max	Unit
6817	F2	Error code 9	-	0	255	-
6818	F2	History 10	-			
6819	F2	Error code 10	-	0	255	-
6820	O	Reset history No ¦ Yes	No			-
Maintenance / service						
7040	F2	Burner hours interval (engine burner)	– – –	– – – / 10	10000	h
7041	F2	Burner hrs since maintenance (engine burner)	0	0	10000	h
7042	F2	Burner starts interval (engine burner)	– – –	– – – / 60	65535	-
7043	F2	Burn starts since maint (engine burner)	0	0	65535	-
7044	F2	Maintenance Interval	– – –	– – – / 1	240	months
7045	F2	Time since maintenance	0	0	240	months
7046	F2	Burner 2 hours interval (supp bu)	– – –	– – – / 10	10000	h
7047	F2	Burner 2 hrs since maintenance (supp bu)	0	0	10000	h
7048	F2	Burner 2 starts interval (supp bu)	– – –	– – – / 60	65535	-
7049	F2	Burn 2 starts since maint (supp bu)	0	0	65535	-
7130	E	Chimney sweep function				
7131	E	Chimney sweep function burner output Eng Bu min ¦ Eng Bu max ¦ Supp Bu min ¦ Supp Bu max ¦ Eng + Supp Bu min ¦ Eng + Supp Bu max				
7150	F1	Simulation outside temperature	– – –	-50.0	50.0	°C
7170	F1	Telephone number customer service	0			
7200	F2	Commissioning function Off/On	Off			
7210	F2	Commissioning eng burner Off ¦ On	Off			
7211	F2	Firing rate engine burner Minimum¦ Ignition ¦ Maximum	Ignition			
7215	F2	Commissioning supp burner Off ¦ On	Off			
7216	F2	Firing rate supp burner Minimum¦ Ignition ¦ Maximum	Ignition			
Input/output test						
7730	F1	Outside temperature B9	-	-50.0	50.0	°C
7750	F1	DHW temperature B3	-	0.0	140.0	°C
7751	F1	DHW temperature B31	-	0.0	140.0	°C
7760	F1	Boiler temperature B2	-	0.0	140.0	°C
7763	F1	Pack temperature B23	-	0.0	140.0	°C
7764	F1	Head Control temperature B24	-	0.0	600.0	°C
7765	F1	Head limit temperature B25	-	0.0	600.0	°C
7769	F1	Return temperature B7	-	0.0	140.0	°C
7861	F1	Contact State H5 closed ¦ open				
7869	F1	Voltage signal pressure sensor				bar
7911	F1	Input EX1 0V ¦ 230V				-
7912	F1	Input EX2 0V ¦ 230V				-
7932	F1	Input SC1 BCU1 Closed ¦ Open				

Operating line	User level	Function	Default value	Min	Max	Unit
7933	F1	Input SC2 BCU1 Closed ¦ Open				
7934	F1	Input SC 1 BCU2 Closed ¦ Open				
7935	F1	Input SC 2 BCU2 Closed ¦ Open				
7940	F1	Input flow switch (dry fire)		Open	Closed	
8220	F1	G83/ENS Closed ¦ Open				
8221	F1	Alternator overload Closed ¦ Open				
8222	F1	Regenerator thermostat Closed ¦ Open				
8223	F1	Dynamic absorber sw Closed ¦ Open				
8224	F1	WCS thermostat Closed ¦ Open				
8226	F1	Head temp undertemp Closed ¦ Open				
8227	F1	Head temp overtemp Closed ¦ Open				
8228	F1	Engine short-circuit Closed ¦ Open				
8229	F1	Engine Dome overtemp Closed ¦ Open				
8320	F1	Position Spool valve	-	0.00	255.00	
8323	F1	Fan Speed	-	0	16’000	rpm
State						
8000	F1	State heating circuit 1	-			-
8001	F1	State heating circuit 2	-			-
8002	F1	State heating circuit P	-			-
8003	F1	State DHW	-			-
8005	F1	State boiler	-			-
8012	F1	State engine burner	-			-
8013	F1	State supplementary burner	-			-
8014	F1	State generator	-			-
8015	F1	Lockout reason engine burner				
8016	F1	Lockout reason supplementary burner				
8017	F1	Engine burner WHY				
8018	F1	Supplementary burner WHY				
8019	F1	Boiler WHY				
8020	F1	EGC WHY				
Diagnostics engine						
8200	F1	Power		0		W
8201	F1	Voltage		0		V
8202	F1	Current		0		A
8204	F1	Energy (generated) to Date		0		kWh
8205	F1	Energy since reset		0		kWh
8210	F1	Reset Energy counter No ¦ Yes				
8220	F1	G83/ENS Closed ¦ Open				

Operating line	User level	Function	Default value	Min	Max	Unit
8229	F1	Engine Dome overtemp Closed ¦ Open				
8222	F1	Regenerator thermostat Closed ¦ Open				
8223	F1	Dynamic absorber sw Closed ¦ Open				
8224	F1	WCS Thermostat Closed ¦ Open				
8221	F1	Alternator overload Closed ¦ Open				
8226	F1	Head temp undertemp Closed ¦ Open				
8227	F1	Head temp overtemp Closed ¦ Open				
8228	F1	Engine short-circuit Closed ¦ Open				
Diagnostics heat generation						
8304	F1	Boiler pump Q1 Off ¦ On				
8310	F1	Boiler temperature	-	0.0	140.0	°C
8311	F1	Boiler temperature set point	-	0.0	140.0	°C
8314	F1	Boiler return temperature	-	0.0	140.0	°C
8319	F1	Pack temperature	-	0.0	140.0	°C
8320	F1	Position spool valve	-	0.00	255.00	
8323	F1	Fan Speed	-	0	9000	rpm
8327	F1	Water pressure	-	0.0	10.0	bar
8341	F1	Engine Burner run Hours	0	0	65535	h
8342	F1	Engine Burner Start counter	0	0	199'999	-
8343	F1	Supplementary Burner run Hours	0	0	65535	h
8344	F1	Supplementary Burner Start counter	0	0	199'999	-
8360	F1	Head temperature actual value	-	0.0		°C
8361	F1	Head control temperature set point	-	0.0		°C
8363	F2	Mass flow demand engine burner				
8364	F2	Mass flow demand supplementary burner				
8365	F2	Boiler Pump run Hours				
8370	F1	Boiler temperature limiter Closed ¦ Open				
8371	F1	Flue gas temperature limiter Closed ¦ Open				
8372	F1	Condensate Closed ¦ Open				
8373	F1	State burners off ¦ 1 ¦ 2 ¦ 1+2				
Diagnostics consumers						
8700	F1	Outside temperature	-	-50.0	50.0	°C
8703	F1	Outside temp attenuated	-	-50.0	50.0	°C
8704	F1	Outside temp composite	-	-50.0	50.0	°C
8730	F1	Heating circuit pump Q2 No function ¦ Off ¦ On	-			-
8740	F1	Room temperature 1	-	0.0	50.0	°C
8741	F1	Room set point 1	-	4.0	35.0	°C

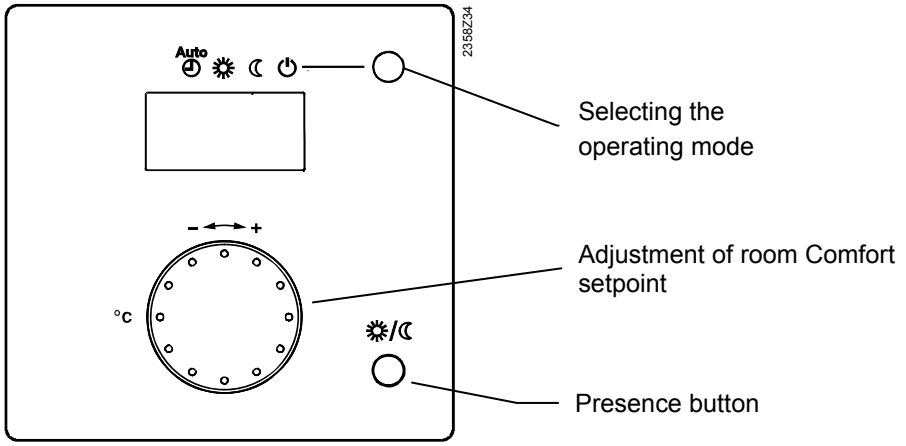
Operating line	User level	Function	Default value	Min	Max	Unit
8743	F1	Flow temperature 1	-	0.0	140.0	°C
8744	F1	Flow temperature set point 1	-	0.0	140.0	°C
8749	F1	Room thermostat 1 No demand ¦ Demand	-			-
8760	F1	Heating circuit pump Q6 No function ¦ Off ¦ On	-			-
8770	F1	Room temperature 2	-	0.0	50.0	°C
8771	F1	Room set point 2	-	4.0	35.0	°C
8773	F1	Flow temperature 2	-	0.0	140.0	°C
8774	F1	Flow temperature set point 2	-	0.0	140.0	°C
8779	F1	Room thermostat 2 No demand ¦ Demand	-			-
8790	F1	Heating circuit pump Q20 No function ¦ Off ¦ On	-			-
8800	F1	Room temperature P	-	0.0	50.0	°C
8801	F1	Room set point P	-	4.0	35.0	°C
8803	F1	Flow temperature set point P	-	0.0	140.0	°C
8804	F1	Flow temperature 3	-	0.0	140.0	°C
8809	F1	Room thermostat P No demand ¦ Demand	-			-
8820	F1	DHW pump Q3 No function ¦ Off ¦ On	-			-
8822	F1	Circulating pump Q4 No function ¦ Off ¦ On	-			-
8830	F1	DHW temperature 1	-	0.0	140.0	°C
8831	F1	DHW temperature set point	-	8.0	80.0	°C
8832	F1	DHW temperature 2	-	0.0	140.0	°C
8839	F1	DHW thermostat No demand ¦ Demand	-			-
9031	F1	Relay output QX1 Off ¦ On	-			-
9032	F1	Relay output QX2 Off ¦ On	-			-
9033	F1	Relay output QX3 Off ¦ On	-			-
9034	F1	Relay output QX4 Off ¦ On	-			-
9050	F1	Relay output QX21 module 1 Off ¦ On	-			-
9051	F1	Relay output QX22 module 1 Off ¦ On	-			-
9052	F1	Relay output QX23 module 1 Off ¦ On	-			-
9053	F1	Relay output QX21 module 2 Off ¦ On	-			-
9054	F1	Relay output QX22 module 2 Off ¦ On	-			-
9055	F1	Relay output QX23 module 2 Off ¦ On	-			-
9056	F1	Relay output QX21 module 3 Off ¦ On				
9057	F1	Relay output QX22 module 3 Off ¦ On				

Operating line	User level	Function	Default value	Min	Max	Unit
9058	F1	Relay output QX23 module 3 Off ¦ On				

5.3 QAA55...

5.3.1 Operation

Operating elements



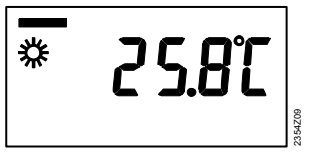
Display options

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

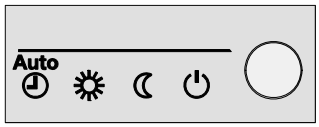
Display

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 changeover (ECO functions)

Continuous operation ☼ ***or*** ☾

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

☼ Heating to Comfort setpoint

☾ Heating to Reduced setpoint

Characteristics of continuous operation:

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

Protection ⏻

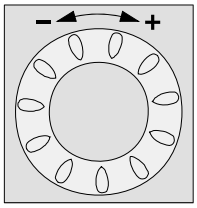
When using Protection, the heating system is off. However, it remains protected against frost (frost protection temperature) provided there is no power failure.

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

Adjusting the room temperature setpoint

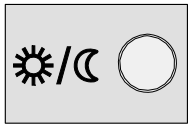
Turn the setting knob to increase or decrease the **Comfort setpoint** ☼.
Reduced setpoint ☾ may be adjusted on operator unit or room unit QAA 7x only.



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.



☼ Heating to Comfort setpoint

☾ Heating to Reduced setpoint

- 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

5.3.2 Programming

Configuration
Settings

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

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.

5.4 The settings in detail

5.4.1 Time of day and date

The controller has an annual clock with time of day, weekday and date. To ensure that the controller works properly, both the time of day and date must be set correctly.

Line no.	*Operating line*
1	**Hours/minutes**
2	**Month/day**
3	**Year**
5	**Start of summer time**
6	**End of summer time**

Summer- / wintertime changeover

Summer- / wintertime changeover is automatic in accordance with international regulations:
Changeover to summertime: At 02:00 on the last Sunday in March
Changeover to wintertime: At 03:00 on the last Sunday in October

Should the regulations be changed, the new changeover dates can be entered via parameters “Start of summertime“ and “End of summertime”. The entry to be made is the earliest possible changeover date. The weekday on which changeover occurs is always a Sunday.
Example: If the start of summertime is specified as "The last Sunday in March", the earliest possible changeover date is March 25. This date is to be entered as 25.03.

5.4.2 Operator unit

Operation and display

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

Info

Temporarily: After 8 minutes, the info display returns to the basic display.
Continuously: When retrieved with the Info button, the info display is continuously maintained.

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 set point (setting knob), and occupancy button.

Programming lock

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

- Temporary deactivation of 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“ (line 27) and deactivate the programming lock

Direct adjustment

Storage with confirmation: To store the changed settings, it is necessary to press the OK button
Automatic storage: Changed settings are stored without confirmation by OK button

Used as:

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

This operating line is used to select usage of the operator unit. Depending on use, additional settings will then be required under “Assignment room unit 1“. When using several operator sections, it is thus possible to match individual units to specific requirements.

If several operator units are used, each application may only be used once.

Room unit 1
The operator unit supports the heating circuits released on operating line “Assignment room unit 1” (line 42) and activated in the basic unit.
Operating lines 42 through 48 remain active.

Room unit 2
The operator unit only supports heating circuit 2.
Operating lines 42 through 48 remain inactive.

Operator unit / service unit
The operator unit supports the heating circuits activated in the basic unit.
Operating line 42 remains inactive.
Operating lines 44 through 48 are active.

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

Heating circuit assignment

Line no.	*Operating line*
42	**Assignment room unit 1** Heating circuit 1 Heating circuits 1 and 2
44	**Operation HC2** Commonly with HC1 Independently
46	**Operation HCP** Commonly with HC1 Independently
48	**Action occupancy button** None Heating circuit 1 Heating circuit 2 Commonly

Assignment room unit 1

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

Operation HC2

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

Commonly with HC1

Operation acts jointly on heating circuits 1 and 2.

Independently

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

Operation HCP

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

Commonly with HC1

Operation acts jointly on heating circuits 1 and 2.

Independently

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

Action of occupancy button

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

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

Room sensor

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

The temperature display can be readjusted.

Device data

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

The display shows the current version of the room unit.

5.4.3 Wireless

Binding

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

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

Binding

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

Test mode

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

Device list wireless

Line no.	*Operating line*
130	**Room unit 1** missing ready no reception change batt
131	**Room unit 2** Same as on setting line 130
132	**Outside sensor** Same as on setting line 130

133	**Repeater** Same as on setting line 130
134	**Operator unit** Same as on setting line 130
135	**Service unit** Same as on setting line 130
138	**Delete all devices**

Delete all devices

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

5.4.4 Time programs

For the heating circuits and DHW heating, a number of switching programs are available. They are activated in "Automatic" mode and control the change of the temperature levels (and the associated set points) 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*	*3/HCP*	*4/DHW*	
500	**520**	**540**	**560**	**Preselection** Mo - Su Mo - Fr Sa - Su Mo - Su
501	**521**	**541**	**561**	**1st phase on**
502	**522**	**542**	**562**	**1st phase off**
503	**523**	**543**	**563**	**2nd phase on**
504	**524**	**544**	**564**	**2nd phase off**
505	**525**	**545**	**565**	**3rd phase on**
506	**526**	**546**	**566**	**3rd phase off**

Standard program

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

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

In that case, individual settings will be lost!

5.4.5 Holidays

The holiday program allows holiday periods to be preprogrammed for 1 year. During active holiday periods, the operating level is switched to ”Reduced“ or ”Protection“ (selectable).
Holiday periods are only active in “Automatic“ mode. In the other operating modes, they are started and run in the background to become active as soon as “Automatic” mode is selected.
When a holiday period has elapsed, the controller will automatically delete it. The same holiday period the following year would have to be reprogrammed.
A holiday period starts at 0:00 of the first day and ends / is deleted at 24:00 of the last day.

An active holiday period is indicated by the suitcase symbol. The heating circuit’s operating mode does not change.
The impact of a currently active holiday period can be negated only by switching to a non-Automatic mode or by deleting the programmed holiday period.
The holiday program impacts DHW heating. If, for example, all heating circuits are “on holiday“, DHW heating assigned to those heating circuits will be switched off.

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

5.4.6 Heating circuits

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

Operating mode

The heating circuit can be used with 4 different operating modes, which can be selected via the operator unit.

Automatic

Automatic operation at the Comfort, reduced or frost protection level in accordance with the switching program, the occupancy button, the holiday program and optimum start / stop control.

Comfort

Continuous operation (24 hours) at the Comfort level.
Switching program, occupancy button, holiday program and optimum start / stop control have no impact.

Reduced

Continuous operation (24 hours) at the reduced level.
Switching program, occupancy button, holiday program and optimum start / stop control have no impact.

Protection

Continuous operation (24 hours) at the frost protection level.
Switching program, occupancy button, holiday program and optimum start / stop control have no impact.

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

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

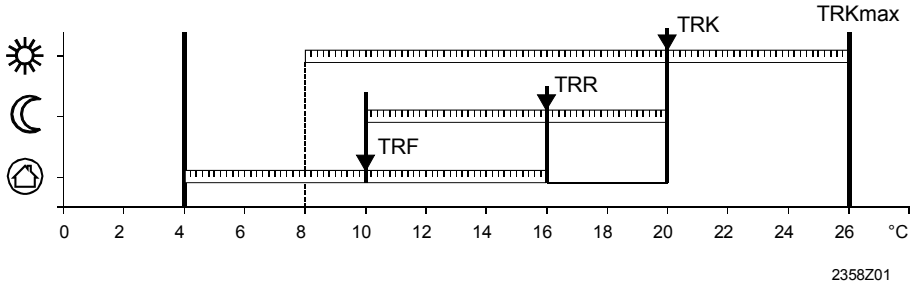
This setting is used to switch between the different operating modes. The functionality corresponds to operating mode selection with the operating mode button. For details, refer to section ”Operation“.

Set points

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
710	**1010**	**1310**	**Comfort set point**
712	**1012**	**1312**	**Reduced set point**
714	**1014**	**1314**	**Frost protection set point**

Room temperature

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



TRKmax Comfort set point maximum
TRK Comfort set point
TRR Reduced set point
TRF Frost protection set point

Frost protection

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

Calculation of the flow temperature set point

Actual outside temperature

The outside temperature is used primarily for calculating the flow temperature set point. The building's thermal inertia is simulated with an adjustable building time constant.

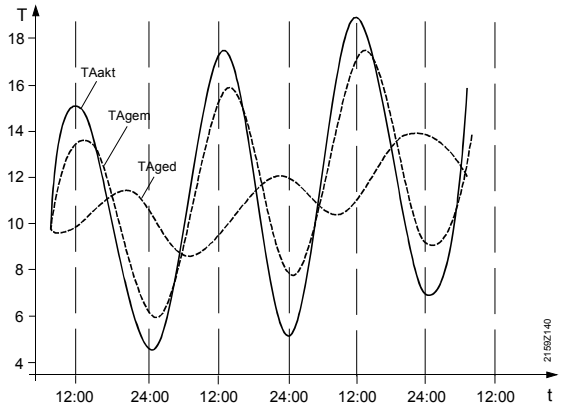
The actual outside temperature is acquired at sensor input B9 or via radio link. If the outside temperature is missing, the substitute value of 0 °C is used.

Composite outside temperature

The composite outside temperature is calculated by means of the filtered outside temperature, the building time constant and the actual outside temperature. The proportion of the actual outside temperature is 50 % (constant).

Attenuated outside temperature

To obtain the attenuated outside temperature, the same time constant is used to delay the filtered outside temperature a second time.



TAakt Actual outside temperature
Tagem Composite outside temperature
TAged Attenuated outside temperature

Use of the different outside temperatures:

- Actual outside temperature: Frost protection, 24-hour heating limit
- Composite outside temperature: Heating curve, 24-hour heating limit
- Attenuated outside temperature: Summer / winter changeover

TAgem and TAged are reset to the actual outside temperature via the operator unit, when binding a wireless outside sensor or when connecting a sensor to terminal B9 for the first time.

Line no.	*Operating line*
8703	**Outside temp attenuated**

On line 8703, the outside temp attenuated is displayed and may be reset to the actual value.

Heating curve

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

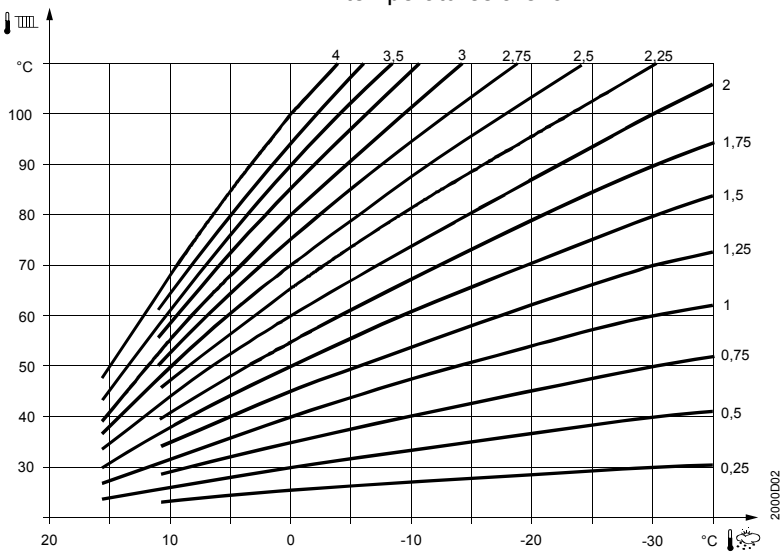
The heating curve is used to generate the flow temperature set point, which is used to maintain a certain flow temperature level depending on the prevailing weather conditions. The heating curve can be adjusted with a number of settings, thus matching heat output and room temperature to individual needs.

Heating curve slope

When the heating curve slope is raised, the rate of flow temperature increase is quicker the lower the outside temperature or, in other words, if the room temperature is not correct at low outside temperatures but 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.



Flow temp set point vs. composite outside temperature

Displacement of heating curve

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 parallel displacement.

Adaptation of the heating curve

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 the heating curve slope and parallel displacement is not required. It can only be switched on or off.

To activate this function, the following must be observed:

- A room sensor must be connected
- The ”Room influence“ setting must be chosen 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 installed, they must be set to their fully open position)

Calculation

The resulting flow temperature can be calculated with the following formula:

$$TV = TR + [\ 2 + (TR - TAgem) - 0.005 * (TR - TAgem)2\ ] * s$$

TV	Flow temperature set point heating circuit
TR	Room temperature set point minus heat gains plus room influence
Tagem	Composite outside temperature
s	Heating curve slope

The impact of compensation variant “Weather compensation with room influence” on the flow temperature set point is calculated as follows:

$$\Delta TV = \Delta TRw * (1+s)$$

ΔTV	Resulting flow temperature adaption
ΔTRw	Room temperature set point readjustment (resulting from room influence, see page **Fehler! Textmarke nicht definiert.**)
s	Heating curve slope

ECO functions

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

Summer / winter compensation

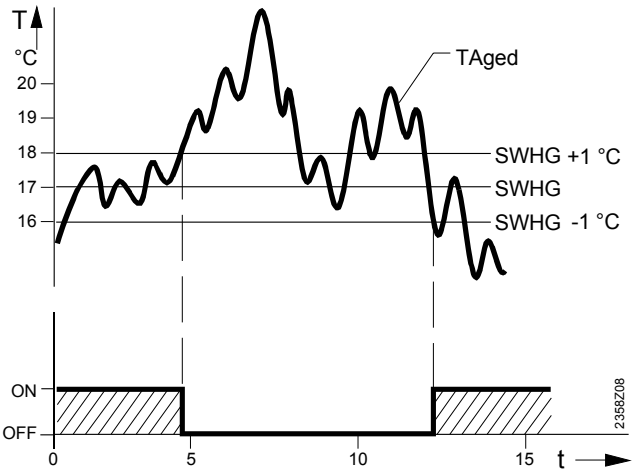
The summer / winter heating limit is used to switch the heating on and off in the course of the year, depending on the temperature conditions. In “Automatic“ mode, switching on / off takes place automatically, so there is no need for the user to do this manually. By changing the setting, the respective 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 will show "ECO”
- To give consideration to the building’s thermal dynamics, the outside temperature will be attenuated

Example:



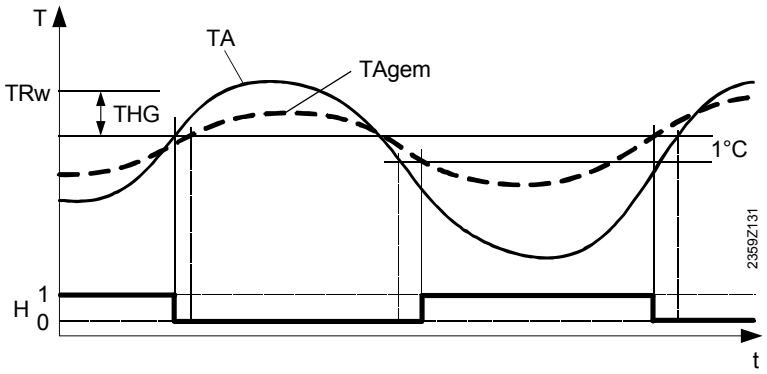
SWHG Summer / winter heating limit
TAged Attenuated outside temperature
t Temperature
t Days

24-hour heating limit

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

The “24-hour heating limit“ function switches the heating system off when the actual outside temperature or the composite outside temperature has risen to a level of one adjusted differential below the current operating level.
The heating is switched on again when the actual outside temperature and the composite outside temperature drop again below the adjusted differential minus 1 K.

In Comfort mode, the function is always deactivated.
The required Eco temperature differential can be parameterized.
The function can be activated / deactivated.



T	Temperature
H	Heating (1 = on, 0 = off)
TRw	Room temperature set point
TA	Actual outside temperature
Tagem	Composite outside temperature
THG	24-hour heating limit
t	Time

Example:

Setting line	*E.g.*
Comfort set point (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 operation will start *earlier,* changeover to ECO *later.*

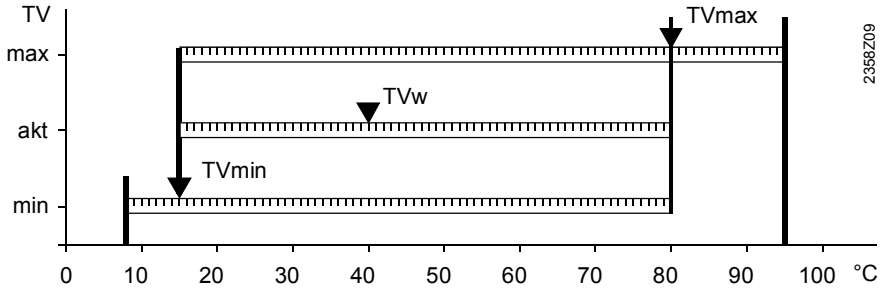
Decrease: Heating operation will start *later,* changeover to ECO *earlier.*

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

Flow temperature set point limitations

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

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



TVw Current flow temperature set point
TVmax Flow temperature set point maximum
Tvmin Flow temperature set point minimum

Room functions

The following table gives an overview of the room function and its mode of operation, depending on the room sensor / room thermostat and the compensation variant. Compensation variants see chapter configuration.

RS	CV	Room influence	Room temperature limitation	Boost heating	Quick setback	Optimum start control	Optimum stop control
No	T*)	No	No	No*)	No*)	No*)	No*)
No	WW	No	No	With RM	With RM	With RM	With RM
Yes	WW	No	No	With RM	With RM	With RM	With RM
Yes	WR	With RS	With RS	With RS	With RS	With RS	With RS
Yes	RR	No	With RS	With RS	With RS	With RS	With RS

CV = compensation variant (WW = weather compensation, WR = weather compensation with room influence, RR = room controller, T= room thermostat)
RS = room sensor
RM = room model

*) Different variants for room thermostat applications are available > see below

Room thermostat applications

In order to have a heat demand for the boiler, it is always necessary to have a heat demand from the ON/OFF-Room thermostat.

The following table gives an overview of the room functions, depending on the sensors available (outside temperature sensor) and the setting for room thermostat operation (see below).

OTS	T	SCV	Room influence	Room temperature	Boost heating	Quick setback	Optimum start control	Optimum stop control	Summer-winter heating	24h heating limit
No	YES	T1	No	No	No	No	No	No	No	No
No	YES	T2	No	No	No	(No)	No	No	No	No
YES	YES	T3*	No	No	With RM	With RM	With RM	No	YES	YES

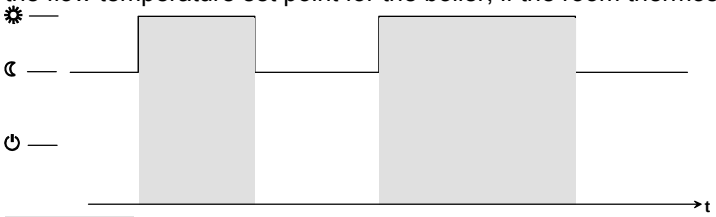
OTS= outside temp sensor, T= Thermostat
SCV = Set point calculation variant
RM = room model
T1= fixed flow temperature set point
T2= flow temperature set point calculated based on OT=0°C
T3= flow temperature set point calculated based on measured OT
*) fixed flow temperature set point (T1) is possible with outside temperature sensor too

The flow temperature set point variant depends mainly on the setting

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
742	**1042**	**1342**	**Flow temp set point room thermostat**

Fixed flow temperature set point

If setting “Flow temperature set point room thermostat is set to xx°C, this value will be the flow temperature set point for the boiler, if the room thermostat demands for heat.



Room thermostat input valid

The room thermostat input is valid in comfort level only.

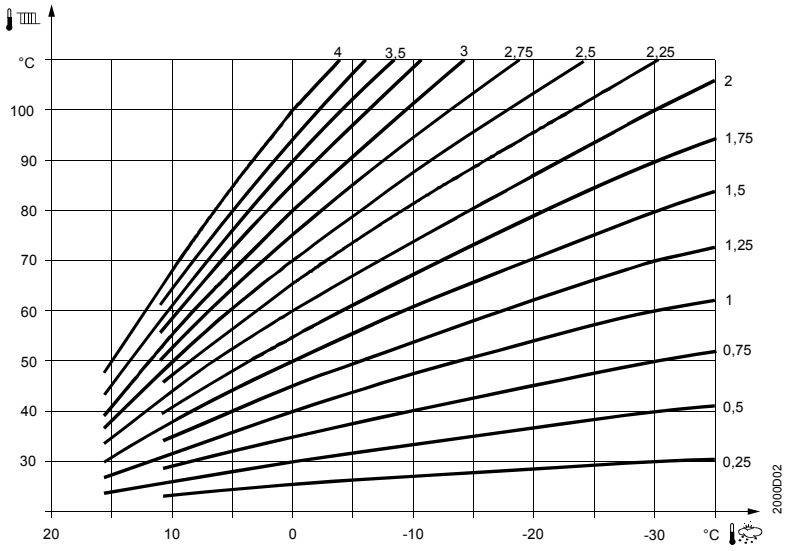
Auto In Automatic mode, the room thermostat input is valid during comfort level

In comfort mode, the room thermostat input is always valid

In reduced mode or frost protection mode, the room thermostat input will be ignored

Room temperature set point dependent flow temperature set point

If flow temperature set point room thermostat is set to ---- and no outside temperature sensor is connected, flow temperature set point will be calculated for an outside temperature of 0°C.
In this case, it is possible to modify flow temperature set point by changing room temperature set point. Set point changes depend on heating curve slope.



$TVw = TRw + [\ 2 + (TRw) - 0.005 * (TRw)^2\ ] * s$

$\Delta TV \approx (0.8+s)\ \Delta TRw$

Without outside temperature sensor, room model temperature is always set to comfort room temperature.

If quick setback (see setting 780) is set to off, flow temperature set point will be changed in accordance to reduced or frost protection room temperature set point, outside of comfort phase.
If quick setback (see setting 780) is set to reduced or frost protection, heating will be **off** outside of comfort phase.

Room thermostat application with outside temperature sensor

If an On/Off- room thermostat is used with an outside temperature sensor, it is possible to use the heating curve for the calculation of the flow temperature set point. In this case, setting 742, 1042 or 1342 (flow temperature set point room thermostat) has to be set to --- (out of service).
If an outside temperature sensor is connected, the room model is used to calculate the room model temperature. Based on this, start optimization is possible with On/Off-room thermostat.
If quick setback (see setting 780) is set to off, flow temperature set point will be changed in accordance to reduced or frost protection room temperature set point, outside of comfort phase.
If quick setback (see setting 780) is set to reduced or frost protection, heating will be **off** until the room model temperature has reached the reduced set point.

With outside temperature sensor, it is possible to use the plant protection function. This will only switch on the pump.

Room model

The room model (RM) calculates a theoretical room temperature based on the attenuated outside temperature, the building time constant and the heating up gradient (room dynamics).
This theoretical room temperature enables room heating functions, such as boost heating, quick setback and optimum start / stop control, to be performed with nearly the same accuracy as the ”real“ functions, even without using a room sensor.

The room model is always calculated. If the outside temperature is missing, the room model uses the substitute value of 0 °C.

Room influence

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

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

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

* Outside sensor required

Pure weather compensation

The flow temperature is calculated via the heating curve, depending on the composite outside temperature.
This type of compensation demands 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 set point 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 conditions

To provide the function, the 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 installed, they must be set to their fully open position)

Pure room compensation

The flow temperature is controlled depending on the room temperature set point, the current room temperature and the progression of the room temperature. For example, an increase in room temperature causes a reduction of the flow temperature set point. If the flow temperature set point is below a minimum value (heating limit room temp control), the heat demand will be set to “no heat demand”, which will stop running the burner and the pumps.

To provide the function, the 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 installed, they must be set to their fully open position).

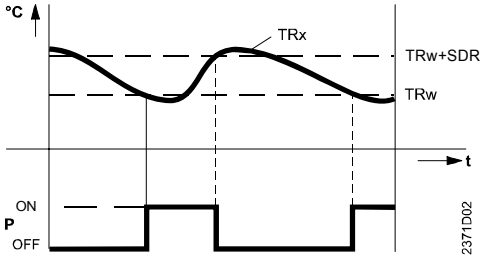
The controller will reduce the flow temperature

Room temperature limitation

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

For energy efficiency reasons, the room temperature limitation function switches off the heating, when the room temperature increases too much.
A switching differential for temperature control must be set. The function necessitates a room temperature sensor.

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



TRx	Actual value of the room temperature
TRw	Room temperature set point
SDR	Room’s switching differential
P	Pump
t	Time of day

Heating limit room control

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
761	**1061**	**---**	**Heating limit room temp control**

If the heat demand is below this value, the heating will be turned off. A typical value may be between 10..30%.
Heat demand is a value between room temperature set point (TRw)and flow temperature set point maximum(TFlwmax).

e.g. TRw= 20°C, TFlwmax= 70°C, Heating limit 15%,
Resulting limit = TRw+HeatingLimitRR(Tflwmax-TRw)
= 20+ 0.15*(50-20)= 27.5°C
If the calculated flow temperature set point is below this value, the heating will be turned off.

Room temperature control, PID parameters

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
759	**1059**	**1359**	Type room heating **Manually adjusted/ radiator fast/ radiator medium/ radiator slow/ floor heat fast / floor heat medium / floor heat slow**
762	**1062**	**1362**	Derivative action time Tv room temp control
763	**1063**	**1363**	Integral action time Tn room temp control
764	**1064**	**1364**	Prop band Xp room temp control

By selecting a type of room heating, PID-parameters 762, 763 and 764 will be preset.

Type room heating	**Deriv action time [sec]**	**Int action time[sec]**	**Prop band Xp[K]**
Radiator heating fast	240	2400	3
Radiator heating medium	480	4800	3
Radiator heating slow	480	7200	3
Floor heating fast	240	3600	3
Floor heating medium	240	6000	2
Floor heating slow	240	9600	2

If one of the PID-Parameters will be adjusted, type of room heating will display manually.

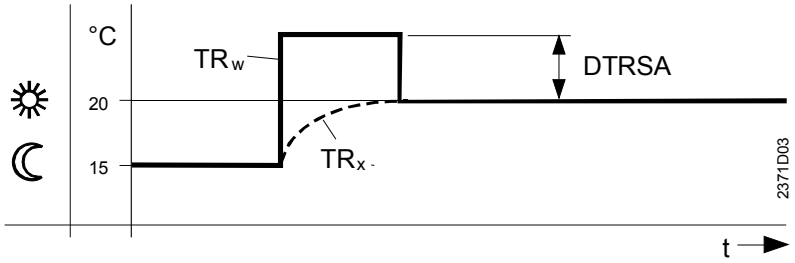
Attention: Don’t mistake settings 835, 836 . These settings are Prop band and integral action time for heating circuit 1, (if a mixing heating circuit is used)

Boost heating

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

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

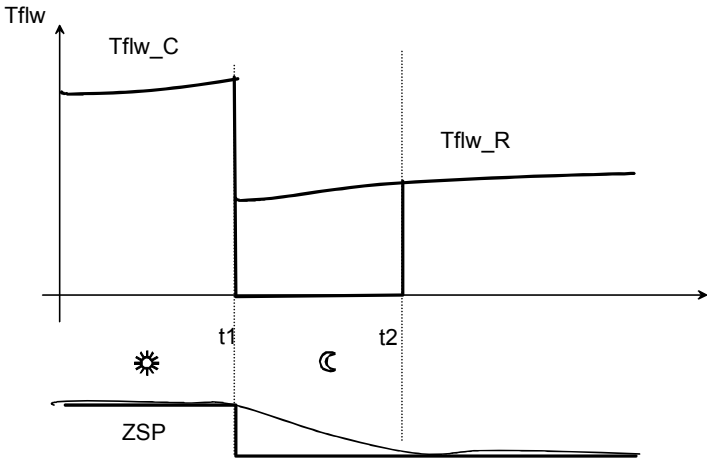
- Boost heating is possible with or without room sensor



TRw Room temperature set point
TRx Actual value of the room temperature
DTRSA Increase of room temperature set point

Quick setback

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



ZSP = Time switch program
Tflw_C: flow temperature set point during comfort phase
Tflw_R: flow temperature set point during reduced phase

Quick setback function allows switching off heat generation when the room temperature set point switches from comfort set point to a reduced set point.
Without quick setback function, flow temperature set point would change immediately from Tflw_C to Tflw_R. The heating circuit pump would be kept on.
With quick setback function, at time t1, flow temperature set point would be set to OFF until room temperature or room temperature model has reached reduced room temperature level at time t2. Then flow temperature set point will be Tflw_R and flow temperature will be kept on this level.
During quick setback, the heating circuit pump is deactivated and, in the case of mixing circuits, the mixing valve is fully closed.

- Function with room sensor:

When using the room sensor, the function keeps the heating switched off until the room temperature has dropped to the level of the Reduced set point 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 set point minus Reduced set point = 2 °C (e.g. Comfort set point = 20 °C, Reduced set point =18 °C).

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

- Quick setback is possible with or without room sensor

Optimum start / stop control

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
789	**1089**	**1389**	**Optimum start control max for optimum energy production**
790	**1090**	**1390**	**Optimum start control max**
791	**1091**	**1391**	**Optimum stop control max**

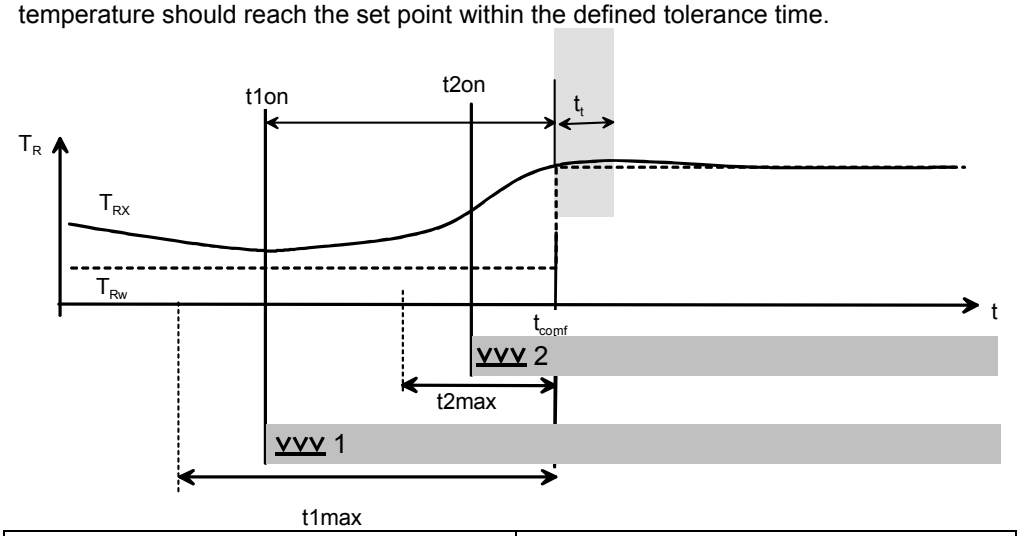
Optimum start control max for optimum energy production

The change from one temperature level to the other is optimized in a way that the Comfort set point will be reached at the relevant switching time. For heat generators like the mCHP with engine burner and supplementary burner, start optimization is available for both burners seperately. For uCHP, the engine burner is the most efficient heat generator; therefore, it's the aim to optimize running time of the engine burner. This setting defines the maximum forward shift to release engine burner.

Optimum start control max

This setting defines the maximum forward shift to release engine burner and supplementary burner.

The “optimum start time” depends on the actual room temperature and the room temperature gradient, which will be automatically adjusted.
If the engine burner is able to reach room temperature comfort set point at the target time t_{comf} Supplementary burner will not released.
A tolerance time is defined to prevent starting the supplementary burner, if the room temperature should reach the set point within the defined tolerance time.

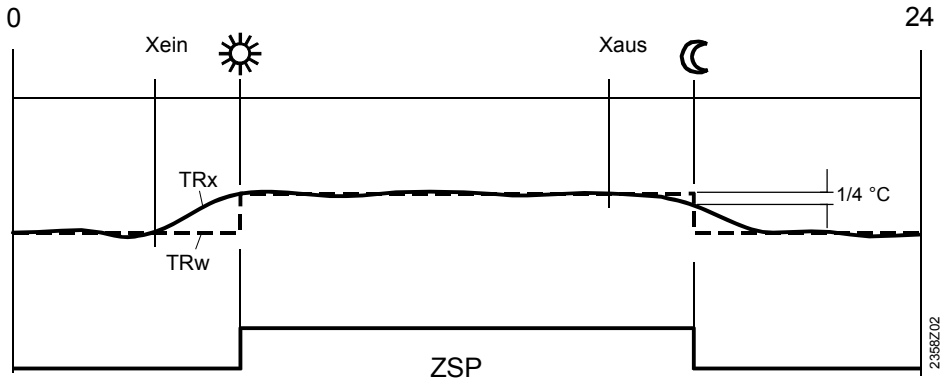


t1max:	Maximum forward shift engine burner only	VVV 1:	engine burner
t2max:	Maximum forward shift engine burner + supplementary burner	VVV 2:	supplementary burner
t_t:	tolerance time	t1on:	start time for engine burner
		t2on:	start time for supplementary burner
		T_R	room temperature
		T_{Rx}	room temperature actual value
		T_{Rx}	room temperature set point

Optimum stop control max

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

- Optimum start / stop control is possible with or without room sensor
- Without room sensor, adaptation of the room temperature gradient is not possible

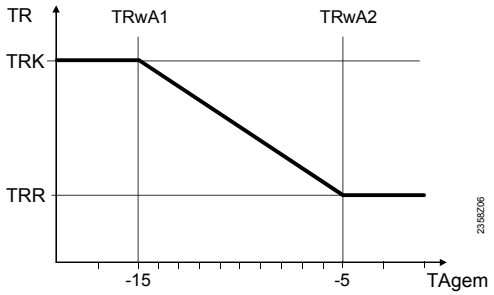


Xein	Switch-on time shifted forward
Xaus	Switch-off time shifted forward
ZSP	Time program
TRx	Actual value of the room temperature
TRw	Room temperature set point

Increase of Reduced set point

Line no.			Operating line
HC1	HC2	HCP	
800	**1100**	**1400**	**Red set point increase start**
801	**1101**	**1401**	**Red set point increase end**

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



TRwA1	Reduced increase start
TRwA2	Reduced increase end
TRK	Comfort set point
TRR	Reduced room temperature set point
Tagem	Composite outside temperature

Over temperature protection pump heating circuit

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

In the case of heating plant with pump heating circuits, the flow temperature of the heating circuit can be higher than the flow temperature demanded by the heating curve, due to requests from other heat consumers (mixing heating circuit, DHW charging, external heat demand), or a parameterized minimum boiler temperature. As a result of this too high flow temperature, the pump heating circuit would assume excessive temperatures.
Function “Over temperature 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**
834	**1134**	**Actuator running time**

Only with Extension module AVS75.390

Mixing valve boost

For mixing, the actual value of the boiler flow temperature must be higher than the required set point of the mixing valve flow temperature since otherwise that temperature cannot be controlled. The controller generates the boiler temperature set point based on the increase set here and the current flow temperature set point.

Type of actuator

Selection of the type of actuator determines the way the control action impacts the type of mixing valve actuator used.

Switching differential 2-position

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

Actuator running time

Setting the actuator running time for the mixing valve used.

Floor curing function

Line no.			*Operating line*
HC1	*HC2*	*HCP*	
850	**1150**	**1450**	**Floor curing function** Off Functional heating (Fh) Curing heating (Bh) Functional/curing heating Manually
851	**1151**	**1451**	**Floor curing setp manually**
855	**1155**	**1455**	**Floor curing setp current**
856	**1156**	**1456**	**Floor curing day current**
857	**1157**	**1457**	**Floor curing days complete**

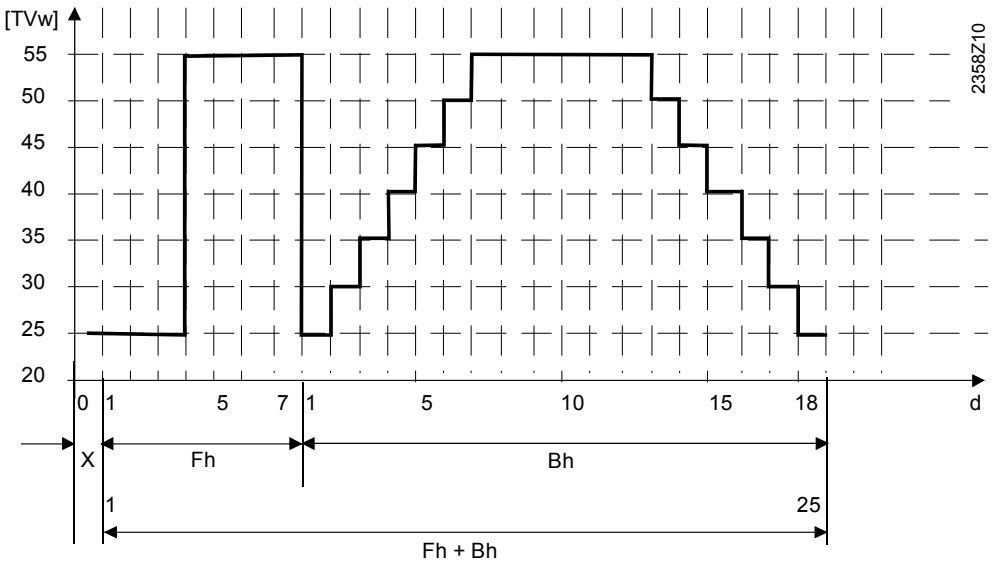
The floor curing function ensures controlled drying of the floor. It controls the flow temperature according to a certain temperature profile. Drying of the floor is ensured via the floor heating system and the mixing or pump heating circuit.

Floor curing function

Off:
The function is deactivated.
Functional heating (Fh) :
The first part of the temperature profile is traversed automatically.
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 traversed automatically.
Manually
It is not a temperature profile that is used, but the floor set point is controlled manually.

⚠

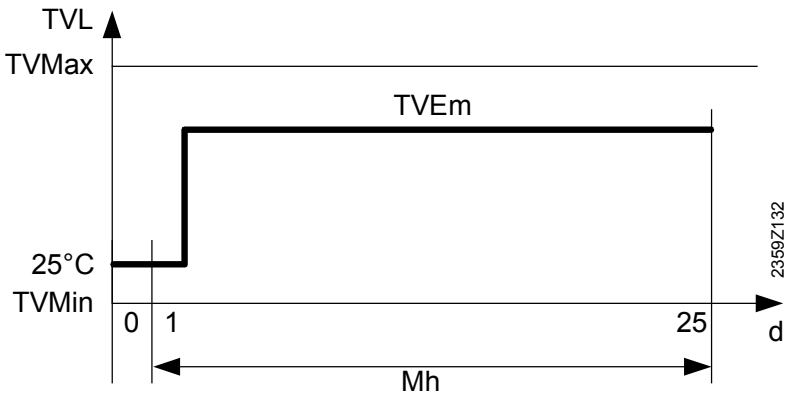
- Observe the relevant standards and regulations of the floor manufacturer!
- Proper functioning is ensured only when the plant is correctly installed (hydraulic system, electrical installation, settings)!
  If not observed, the floor might get damaged!
- The function can be aborted prematurely by choosing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



TVw Flow temp setpoint

X	Start day
Fh	Functional heating
Bh	Floor curing heating
D	day

In “Manual” mode (setting 4), no temperature profile is traversed. The required flow temperature must be set individually for every heating circuit, using parameter “Floor curing setp manually”.



TVL	Flow temperature
TVmax	Flow temp set point maximum
Tvmin	Flow temperature set point minimum
TVEm	Floor curing set point manually
Mh	Manual heating (Fh + Bh = 25 days)
d	Weekday

The function is terminated when the functional days (Mh) have elapsed or when deactivated with the parameter. The start day (day 0) does not count as a functional day.

“Floor curing setp manually“ (TVEm) can only be limited within the 2 limit values ”Flow temperature set point maximum“ (TVMax) and “Flow temperature set point minimum“ (TVmin).

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
Floor curing days complete	Shows how many days the flow temp set point was reached

5.4.7 DHW

Operating mode

Line no.	*Operating line*
1600	**Operating mode** Off/On

The DHW operating mode is selected with the DHW operating mode button.
2 DHW operating modes are available:

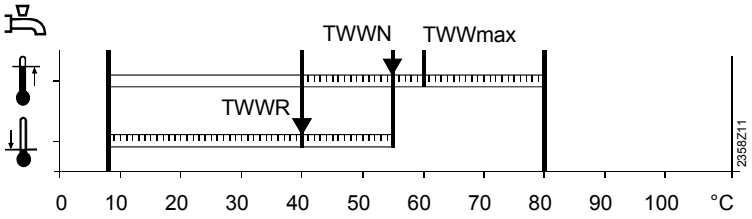
On DHW charging takes place automatically, the set point being the nominal DHW set point or the reduced DHW set point based on the selected kind of DHW release.

Off Continuous operation, the set point being the DHW frost protection set point (5 °C).

Set points

Line no.	*Operating line*
1610	**Nominal set point**
1612	**Reduced set point**

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



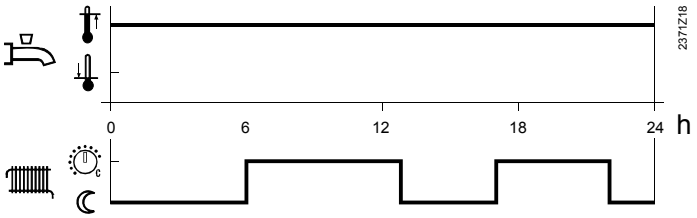
TWWR DHW reduced set point
TWWN DHW nominal set point
TWWmax DHW nominal set point maximum

Release

Line no.	*Operating line*
1620	**Release** 24h/day Time programs HCs Time program 4/DHW

24 h/day
The DHW temperature is constantly maintained at the nominal DHW set point, independent of any time programs.

Example:



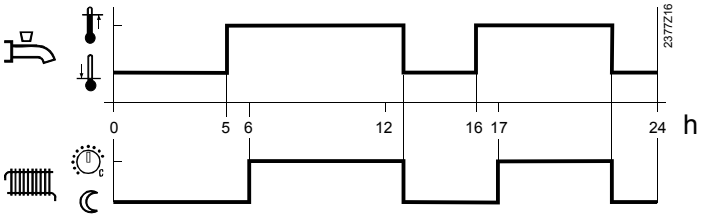
Time programs heating circuits

The DHW set point is switched between the nominal DHW set point and the reduced DHW set point according to the heating circuits' time programs. The first switch-on point of each period is shifted forward in time by 1 hour or 2.5h.

If the charging (setting 5010) is set to once a day the storage tank charging will start 2.5h in advance of the Time program of the HC.

If charging is set to several times/day charging will start 1h in advance of the Time program of the HC.

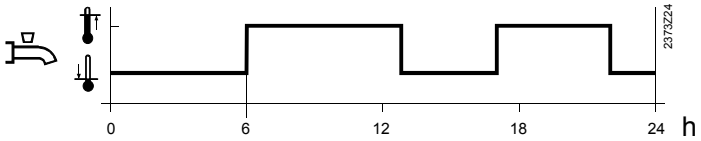
Example:



Time program 4/DHW

For DHW heating, time switch program 4 of the local controller is used. The set switching times of that program are used to switch between the nominal DHW set point and the reduced DHW set point. This way, the DHW is heated independent of the heating circuits.

Example:



Manual DHW push

The manual DHW push is triggered via the operator unit. It initiates a single DHW charging cycle to the nominal set point. The push is active until the nominal DHW set point is reached. If, at the time of the manual push, the legionella function is due, the push is made until the legionella set point is reached.

⚠ Once triggered, the DHW push cannot be aborted via the operator unit.

Priority

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

When both space heating and DHW heating demand heat, the "DHW priority" function ensures that during DHW charging the boiler's capacity is used primarily for DHW.

Absolute priority

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

Shifting priority

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

No priority

DHW heating and space heating take place at the same time.

In the case of tightly sized boilers and mixing heating circuits, it can occur that the DHW set point 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 ¦ Tuesday ¦ Wednesday ¦ Thursday ¦ Friday ¦ Saturday ¦ Sunday
1644	**Legionella funct time**
1645	**Legionella funct set point**
1646	**legionella funct duration**
1647	**Legionella funct circ pump** **Off ¦ On**

The legionella function prevents viruses from developing.
When the legionella function is activated, the DHW storage tank temperature is periodically raised to the “Legionella function set point“.

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

The “Legionella function set point“ can be maintained during the set dwelling time.

Off

In this position, the legionella function is deactivated.

Periodically

The legionella function is repeated according to the selected “Legionella function period“. If the “Legionella function set point” is attained via solar plant, independent of the time set, the period of time will be started again. This means that the heat source is switched on only if the solar plant could not deliver the required “Legionella function set point” within the adjusted period of time.

Fixed weekday

The legionella function can be activated on a fixed weekday.
When using this setting, heating up to the legionella set point takes place on the selected weekday, independent of previous storage tank temperatures. This setting is intended primarily for plant with no solar integration.

If DHW heating is switched off (DHW operating mode button = off or holidays), the legionella function will be made up for as soon as DHW heating is switched on again (DHW operating mode button = on or end of holiday period).

Legionella set point

The higher the temperature level of the storage tank, the shorter the required dwelling time at that level.

Guide values:	Storage tank temperature	Dwelling time
	80 °C	A few seconds
	70 °C	1 minute
	66 °C	2 minutes
	60 °C	32 minutes
	55 °C	6 hours
	50 °C	No killing of viruses
	45 °C	Ideal conditions for viruses

⚠ The figures given in the table are guide values. They do not ensure that legionella viruses will be completely killed.

The legionella set point can be adjusted between 55 °C and 95 °C. When the legionella function is activated, the DHW storage tank will be heated up until the value set here is reached. For the legionella function to be regarded as fulfilled, the sensor at the top (B3) or both sensors (B3 and B31) must reach the legionella set point which must be maintained for the dwelling time set, depending on the parameter (type of charging).

Dwelling time

The demanded “Legionella function set point“ must be continuously maintained during the dwelling time set.
If the storage tank temperature (in the case of 2 sensors, the temperature acquired by the “colder“ sensor) exceeds the “Legionella function set point“ minus 1 K, the “Legionella function set point“ is considered fulfilled and the “Dwelling time“ timer elapses.
If the storage tank temperature drops below the demanded “Legionella function set point“ by more than the switching differential plus 2 K before the dwelling time has elapsed, the dwelling time must be fulfilled again.
If no dwelling time is set, the “Legionella“ function is performed the moment the “Legionella function set point“ is reached.
If the “Legionella“ function cannot be performed within a 48-hour period, an error message will be delivered.

Circulating pump and legionella function

When the function is activated, the circulating pump is switched on while the “Legionella“ function is performed as soon as the storage tank temperature (in the case of 2 sensors the temperature acquired by the “colder” sensor) lies above the “Legionella function set point” minus 1 K. The pump runs during the dwelling time set.
If the storage tank temperature falls below the demanded “Legionella function set point” by more than the DHW switching differential plus 2 K, the circulating pump will prematurely be deactivated.

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

Circulating pump

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

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“.

5.4.8 DHW storage tank

Charging control

Line no.	*Operating line*
5010	**Charging** Once/day: several times/day
5020	**Flow set point boost**
5022	**Type of charging** With B3 With B3/B31 With B3, legio B3/B31

Charging

The storage tank may be charged once/day or several times/day.
If the charging is set to once a day and DHW release (setting 1620) is set to Time program HCs, the storage tank charging will start 2.5h in advance of the Time program of the HC.
If charging is set to several times/day and and DHW release (setting 1620) is set to Time program HCs, the storage tank charging will start 1h in advance of the Time program of the HC.

Increase of the flow temperature set point

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

Type of charging

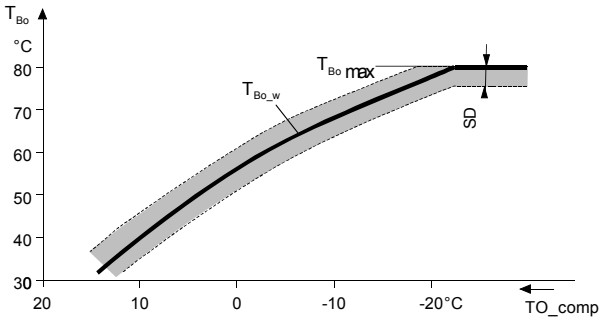
The storage tank can be charged using up to 2 sensors.
It is also possible to combine partial charging with 1 sensor and the legionella function with 2 sensors (setting 3).

5.4.9 Boiler

Set points

Line no.	*Operating line*
2212	**Set point max**

The controlled boiler temperature set point can be limited by selecting set point maximum. These limitations can be regarded as protective functions for the boiler.
The boiler temperature set point will be 2K below the maximum value.
The maximum limitation of the boiler temperature is the upper limit where the burner is switched off.



Legend

TBo	Boiler temperature
TBow	Boiler temperature set point
TBomax	Maximum limitation of the boiler temperature
SD	Switching differential
TO comp	Composite outside temperature

5.4.10 Configuration

⚠ Most of the settings in the menu configuration are only possible if no burner is running.

Plant configuration

Naming

The 230V outputs on the board are named with QX1…QX4.
If they are used for dedicated applications, logical names are used.
Q1 for boiler pump
Q2 for HC1 pump or valve
Q3 for DHW pump or valve
Q6 for HC2 pump or valve
Q20 for HCP pump or valve

The settings for the plant configuration are found in the menu “configuration”.
The first settings will be the PLANT TYPE, which offers a selection of pre-defined plant types.
With the selection of a dedicated plant type, no additional settings are required.
The selection *free configuration* allows the configuration of additional plant types, which may be a selection of different Sub-Plant types. (see Sub-Plant-types)

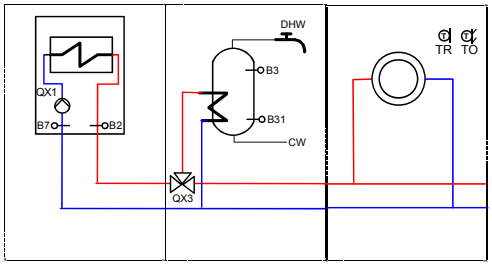
For the dedicated plant types, the output selection is already done.
In these cases:
QX1 is used as boiler pumpQ1.
QX2 is used as HC1 pump or valve Q2.
QX3 is used as DHW pump or valve or diverter valve Q3.

Configuration settings

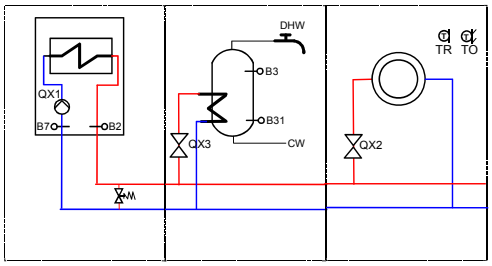
Line no.	Operating line
5702	**Plant Type** Free Configuration W-Plan S-Plan Y-Plan 1 hc 2 hc 3 hc

Pre-defined Plant types

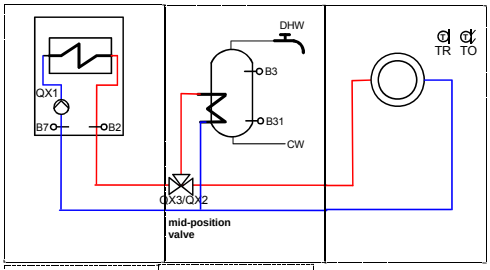
W-Plan



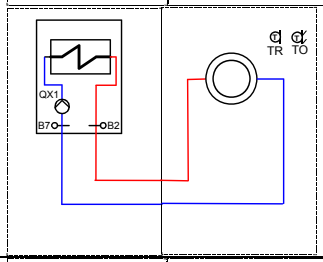
S-Plan



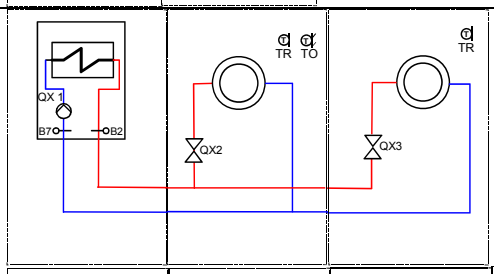
Y-Plan



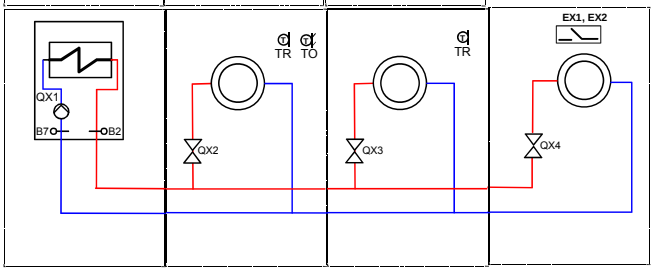
1 HC



2 HC

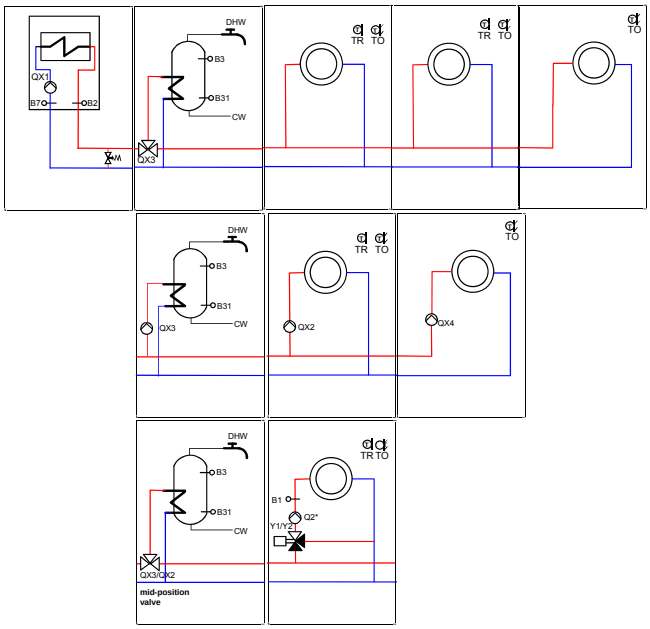


3 HC



Free configuration

Free configuration



TO Outside temperature sensor
TR Room temperature sensor

Sub-Plant Type

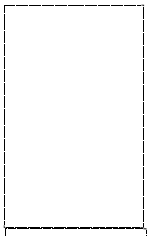
Different Sub-Plant types are available for room heating (HC1, HC2, HCP) and DHW.

In addition to the selection of different Sub-Plant types, the free configuration setting also allows the selection of the output. (e.g. QX3 may be used as HC1 pump). See Input/Output configuration

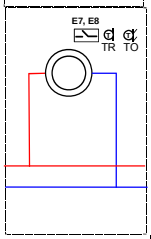
Line no.	Operating line
5709	**Type Heating circuit 1** No No Actuator Pump On/Off-Valve Mixing Valve
5714	**Type Heating circuit 2** No No Actuator Pump On/Off-Valve Mixing Valve
5720	**Type Heating circuit P** No No Actuator Pump On/Off-Valve Mixing Valve

Heating circuit

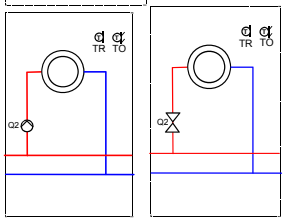
None



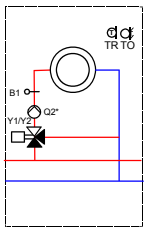
No actuator



Pump
Valve



Mixing circuit

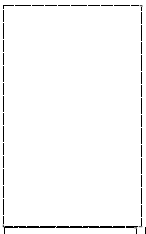


TO Outside temperature sensor
TR Room temperature sensor

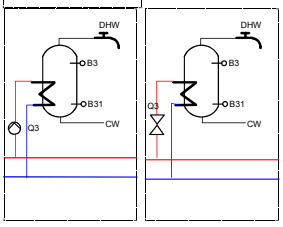
DHW

Line no.	Operating line
5729	**Type DHW Charging** No No Actuator Charging Pump Valve Diverting Valve Midposition Valve

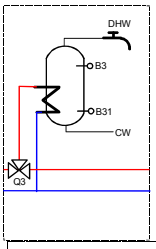
None



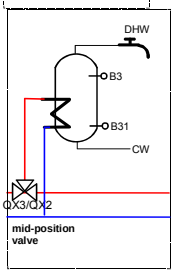
Pump
Valve



Diverter Valve



Mid-position
Valve



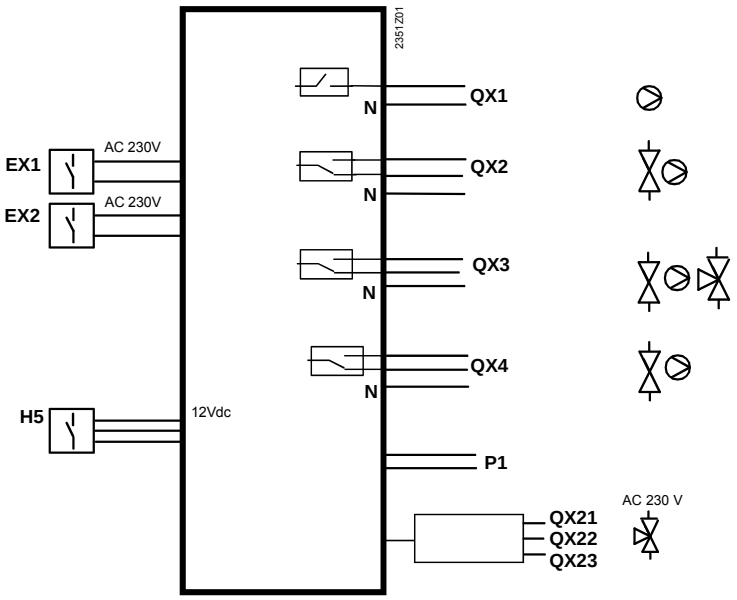
TO Outside temperature sensor
TR Room temperature sensor

Input/Output Configuration

The selection *free configuration* allows the configuration of additional plant types and the selection of input and output ports for a specific application (e.g. QX3 may be used as HC2 pump).
If a relay is unused on the hardware, it is possible to use this output for an other function.

- Alarm relay
- DHW-Circulating pump
- Transport pump

The same applies for the universal Inputs EX1 and EX2 and the PWM-Output P1, which may be used to control a PWM-Pump.



EX1	Roomthermostat
EX2	DHW-Start
H5	DHW Flow-Switch / turbine
QX1	Boiler Pump
QX2	CH valve
QX3	DHW valve, DHW pump, Diverter Valve
QX4	Universal Output for pump
P1	PWM-Output for pump
QX21, QX22, QX23	Extension Module

For the extension of the application range, an extension module AVS75.370 may be used, which offers 3 additional outputs.

Line no.	Operating line
5891	**Relay output QX2** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14
5892	**Relay output QX3** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14

5894	**Relay output QX4** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14
5980	**Function input EX1** No Room thermostat HC1 Room thermostat HC2 Room thermostat HCP DHW thermostat
5981	**Contact type input EX1** Normally Closed Normally Open
5982	**Function input EX2** No Room thermostat HC1 Room thermostat HC2 Room thermostat HCP DHW thermostat
5983	**Contact type input EX2** Normally Closed Normally Open
6020	**Function extension module 1** None Multifunction Heating Circuit 1 Heating Circuit 2 Heating Circuit P
6021	**Function extension module 2** None Multifunction Heating Circuit 1 Heating Circuit 2 Heating Circuit P
6030	**Relay output QX21** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14
6031	**Relay output QX22** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14
6032	**Relay output QX23** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20 Alarm output K10 Circulating Pump Q4 Transport pump Q14

6085	**Function output P1** No Boiler Pump Q1 DHW Actuator Q3 HC1 actuator Q2 HC2 actuator Q6 HCP actuator Q20

Contact type Input Ex

Normally Open: Heat demand is active if 230V is detected
Normally Closed: Heat demand is active if 0V is detected

Extension modules

If additional Outputs are requested, it is possible to use extension modules.
A maximum of two extension modules is possible. One of them may be used as multifunctional module.
The use of the relay outputs on this module may be defined by setting 6030 to 6032.

Compensation variant (CV)

The compensation variant (CV) determines to which variable (outside temperature or room temperature or room thermostat) the flow temperature of the heating circuits shall be controlled.

4 compensation variants are available:

1. Pure weather compensation (WW):
   Control is performed based on the outside temperature only, with the help of the heating curve.
2. Room temperature control (RR):
   Control is performed based on the room temperature only.
3. Weather compensation with room influence (WR):
   Control is performed based on the outside temperature, with the help of the heating curve and the room temperature.
4. Room thermostat control (T)
   Control is performed based on the room thermostat signal with a constant flow temperature set point

Generation of compensation variant

The controller generates the compensation variant based on the configuration ("Function Input Ex1,Ex2) and available temperature values (OT, RT).
Parameter "Room influence" impacts the compensation behaviour only if both values are available.

Room thermostat	Room temperature (RT)	Outside temperature (OT)	Parameters Room influence	CV	CV error
Available	Not available	Not available	x	T	No
Available	Not available	Available	x	T	
Available	Available	Not available	x	T	
Not available	Not available	Not available	x	WW	OT missing
Not available	Not available	Available	x	WW	No
Not available	Available	Not available	x	RR	No
Not available	Available	Available	--- (off)	WW	No
Not available	Available	Available	1...99 %	WR	No
Not available	Available	Available	100 %	RR	No

x = setting with no impact

If both temperature values are missing and no room thermostat is set, WW is used and, for the outside temperature, the substitution value 0 °C. In that case, an error message will be generated

Generation of the compensation variant is possible for each heating circuit and can be set accordingly.

Room influence

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

If a room sensor and an outside temperature sensor are available, the amount of the room temperature which influences the flow temperature may be set by setting 750 or 1050.

Setting 100% means room temperature control only.

If a Room thermostat (function Input EX1, EX2) is selected, heat demand will be either a fixed flow temperature set point a flow temperature set point depending on a heating curve, if an outside temperature sensor is available. Details see chapter “Heating circuits”

DHW Sensors or DHW thermostat

If a plant configuration with a DHW storage tank is selected, a DHW sensor has to be connected to terminal B3 or a DHW thermostat has to be selected in the configuration (Ex1, Ex2). It is possible to use two DHW sensors. (Sensor B3 and B31)

Available sensors			Type of heat demand to the boiler
B3	B31	Ex1, Ex2	
--	x		No DHW heat demand
Sensor	--		B3 / SD
Sensor	Sensor		B3 / SD or B3 start / B31stop
x	x	Thermostat	start / stop

-- No sensor connected
x Makes no difference
SD Switching differential

DHW charging with 1 sensor

If the DHW temperature is lower than the current set point minus the set switching differential, DHW charging will be started.
DHW charging will be terminated when the temperature reaches the current set point.

When DHW heating is released for the first time in the morning, forced charging will take place, which means that DHW charging will also be started when the DHW temperature lies within the switching differential. But if the temperature lies less than 1 K below the set point, charging will not take place.

DHW charging with 2 sensors

If both DHW temperatures are lower than the current set point, minus the set switching differential, DHW charging will be started.
DHW charging will be terminated when both temperatures reach the current set point.

When DHW heating is released for the first time in the morning, forced charging will take place, which means that DHW charging will also be started when only one of the DHW temperatures lies below the current set point minus the set switching differential. But if the temperature lies less than 1 K below the set point, charging will not take place.

In the case of charging with 2 sensors, the switching differential can be set to 0 K.

DHW charging with a thermostat

It is possible to use a thermostat in place of a temperature sensor.
With this application, DHW heating is only dependent on the thermostat’s contact position and the release of DHW heating.

DHW charging is started when the thermostat's contact indicates "cold" and the current DHW set point is the nominal set point.
DHW charging is terminated when the contact indicates "hot". If the current DHW set point changes to the reduced set point or the frost protection level, DHW charging will also be aborted.

The adjusted set points are of no importance since temperatures cannot be acquired. When using the thermostat application, the legionella function is not active because there is no sensor.
If DHW heating is switching off, even the "cold" thermostat triggers no request. This means that when DHW heating is switched off, frost protection cannot be ensured either.

Charging priority

Some plant types allow DHW preparation in parallel with room heating. E.g. S-Plan.

When both space heating and DHW demand heat, the "DHW priority" function ensures that during DHW charging the boiler's capacity is used primarily for DHW. For the DHW priority, 3 functions are available.

In case of diverting valves, the function is automatically deactivated.

No priority

If the DHW priority is deactivated, space heating will not be restricted during DHW charging. The set point of the heat source is calculated based on the highest heat request from all consumers (DHW plus space heating).

Shifting priority

In the case shifting priority, space heating is restricted in a way that the heat source will reach the set point currently required and that the DHW can be heated up with the necessary charging temperature.

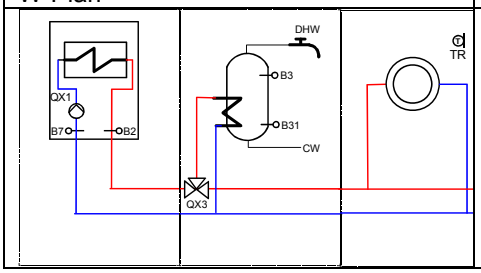
Restriction of space heating is accomplished with the locking signal. When calculating the locking signal, consideration is given to the current heat source temperature and the heat source gradient. This function ensures that the charging temperature will be maintained during the entire DHW charging cycle and that, at the same time, the burner stages need not unnecessarily be switched off.
The set point of the heat source is calculated based on the highest heat request from all consumers (DHW and space heating).

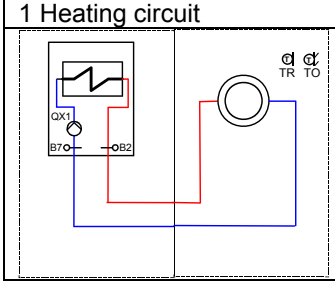
Absolute priority

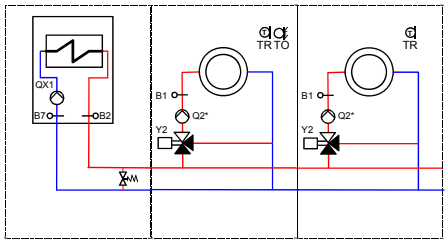
In the case of absolute DHW priority, space heating is locked during DHW charging, independent of the heat source temperature.
In the case of pump heating circuits, the heating circuit pump will be deactivated.
In the case of mixing heating circuits, the mixing valve will be closed.
The set point of the heat source is solely determined by the request for DHW.

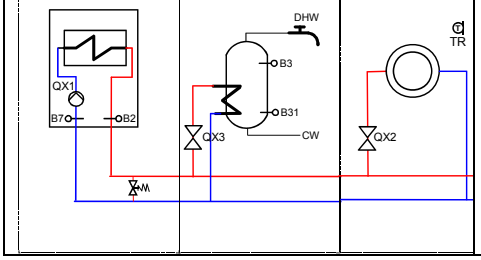
Line no.	*Operating line*
1630	**Charging priority** Absolute Shifting None MC shifting, PC absolute

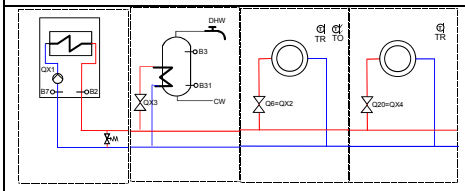
Configuration Examples

W-Plan	Settings
	W-Plan

1 Heating circuit	Settings
	1HC

2 Heating circuits with mixing valve	
	Free configuration DHW: None HC1: Mixing circuit HC2: Mixing circuit HC3: None Ext.mod1: HC1 Ext.mod2: HC2

	S-Plan

	Free configuration DHW: Valve HC1: Valve HC2: Valve HC3: None DHW Charging prio=x QX2= HC1 QX3= HC2

TO Outside temperature sensor
TR Room temperature sensor

Sensor readjustments

Line no.	*Operating line*
6100	**Readjustm outside sensor**

The measured value of the outside temperature can be readjusted by +/- 3 K.
A correction of +1 will increase the measured value by 1.

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 set point to varying outside temperatures.

5. Example:

> 20

The room temperature will respond *slower* to outside temperature variations.

10 - 20

This setting can be used for most types of buildings.

< 10

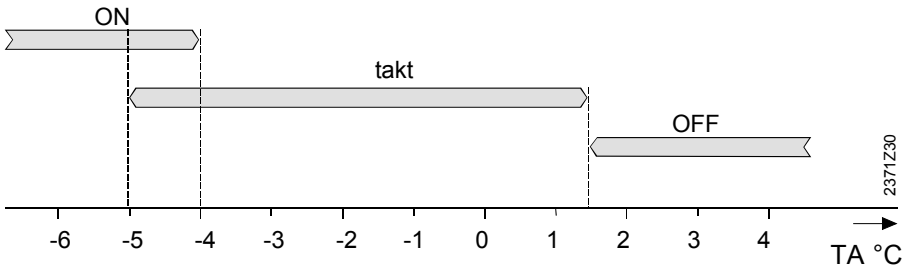
The room temperature will respond *quicker* to outside temperature variations.

Frost protection for the plant

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

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

Outside temperature TA	Pump	Diagram
... - 4 °C	Continuously ON	ON
-5 ... 1.5 °C	ON for 10 minutes at 6-hour intervals	takt
1.5 °C - ...	Continuously OFF	OFF



* Each pump type has an individual setting (Frost protection plant xy pump) to define the behaviour in case of outside temperature dependent frost protection.

Save sensors

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

At midnight, the controller will store all connected sensors.
If a stored sensor is removed or not connected any more, the controller will generate an error message.
With this setting, it is possible to store the connected sensors immediately or it is possible to use this setting to remove a stored sensor.

Save Parameters

Line no.	*Operating line*
6205	**Save parameters**

All parameter settings can be stored as default values. Exempted from this are the following operating pages: Time of day and date, operator section, radio communication, and all time programs.

Parameter reset

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

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

Plant diagrams

Line no.	*Operating line*
6212	**Check no. heat source 1**
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. For the meaning of the numbers for the relevant lines, please refer to the following tables:
The check numbers are always arranged from the right. Preceding 0s are not shown.

Check number heat source 1

	CHP-boiler
	00 No boiler 01 Engine burner 02 Engine + Supp burner 03 Engine burner, boiler pump 04: Engine + Supp burner, boiler pump

Check number storage tank

	DHW storage tank
0	No DHW storage tank
1	Electric immersion heater
2	Solar connection
4	Charging pump
5	Charging pump, solar connection
13	Diverting valve
14	Diverting valve, solar connection

Check number heating circuit

	Heating circuit P		Heating circuit 2		Heating circuit 1
0	No heating circuit	00	No heating circuit	00	No heating circuit

2	Heating circuit pump	02 03	Heating circuit pump Heating circuit pump, mixing valve	01 02 03	Circulation via boiler pump Heating circuit pump Heating circuit pump, mixing valve

Device data

Line no.	*Operating line*
6220	**Software version** The software version indicated here represents the current version of the basic unit.
6221	**Development index** The development index represents the current version of the basic unit. This value is a sub part of the Software version.
6219	**Software version Sub System** The software version indicated here represents the current version of the EGC-Subsystem.
6223	**Software version power meter** The software version indicated here represents the current version of the power meter.

5.4.11 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.

Error Code Subsystem

Line no.	*Operating line*
6707	**Error Code Subsystem**
Line no.	*Operating line*

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.
When using this setting, pending alarms are reset.

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 will be saved.

Reset history

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

5.4.12 Maintenance / service

Maintenance functions

Line no.	*Operating line*
7040	**Burner hours interval (engine burner)**
7041	**Burner hrs since maintenance (engine burner)**
7042	**Burner starts interval (engine burner)**
7043	**Burn starts since maint (engine burner)**
7046	**Burner 2 hours interval (supp bu)**
7047	**Burner 2 hrs since maintenance (supp bu)**
7048	**Burner 2 starts interval (supp bu)**
7049	**Burn 2 starts since maint (supp bu)**
7044	**Maintenance Interval**
7045	**Time since maintenance**

Burner hours interval, burner start interval

As soon as the selected number of burner hours run or the selected number of burner starts has elapsed, a maintenance message will be displayed.
The number of hours run and the number of starts of the first burner stage are used in this calculation.

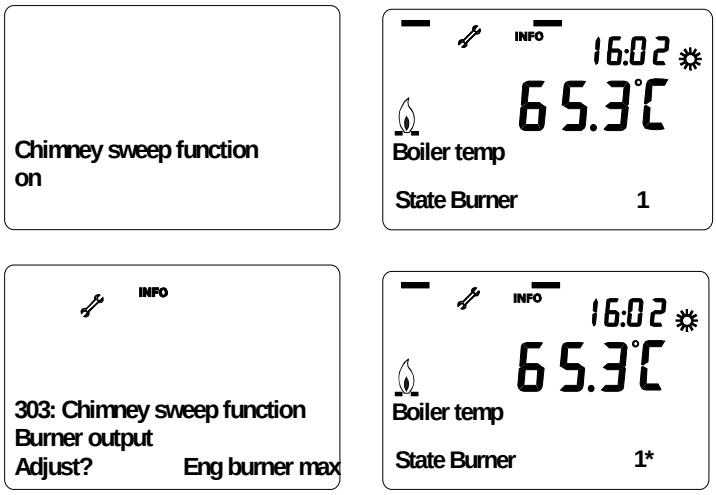
Burner hours run, burner starts since maintenance

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

Chimney sweep

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

If the chimney sweep function is pressed for more then 3 seconds, the controller changes into chimney sweep function mode. The “special mode” symbol appears in the display. Adjustment of the burner output power and selection of burner is possible in the Information-Level.



The burner output power may be adjusted:
- Engine burner minimum firing rate
- Engine burner maximum firing rate
- Supplementary burner minimum firing rate
- Supplementary burner maximum firing rate
- Engine- and Supplementary burner minimum firing rate
- Engine- and Supplementary burner maximum firing rate

The burner will start like in commissioning mode.

The head temperature will be controlled to heat temperature nominal temperature and the boiler flow temperature will be limited to boiler temperature set point maximum.
If the burner output power is limited either by head temperature or boiler flow temperature, this will be indicated with a * next to the burner state indication (e.g.1*)

The engine grid connection functionality may prevent starting of the engine burner. E.g. if the head temperature is too high, it may be necessary to cool down the head before the engine burner is enabled to start.

After 60 minutes, a time out will terminate the chimney sweeper function, it the function is not already terminated by pressing the chimney sweeper button.

Simulations

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

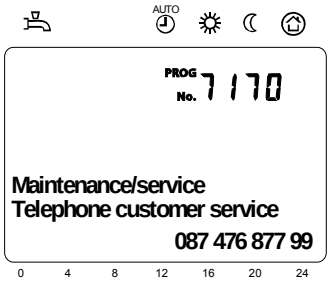
To facilitate commissioning and fault tracing, outside temperatures in the range from –50 to +50 °C can be simulated. During the simulation, the current, the composite and the attenuated outside temperature will be overridden by the set simulated temperature. During the simulation, the calculation of the 3 mentioned outside temperatures continuous 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 5 hours.

Telephone customer service

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

Setting of phone number that appears on the info display.



The telephone number may be changed by pressing the OK button and selecting the number by turning the selector knob. By pressing the OK button, the selected number is accepted.
By pressing OK and then ESC, the selected number is deleted.
Press OK , OK to finish.

Burner Commissioning

Line no.	*Operating line*
7200	Commissioning function Off/On
7210	Commissioning eng burner Off ¦ On
7211	Firing rate engine burner Minimum¦ Ignition ¦ Maximum
7215	Commissioning sup burner Off ¦ On
7216	Firing rate sup burner Minimum¦ Ignition ¦ Maximum

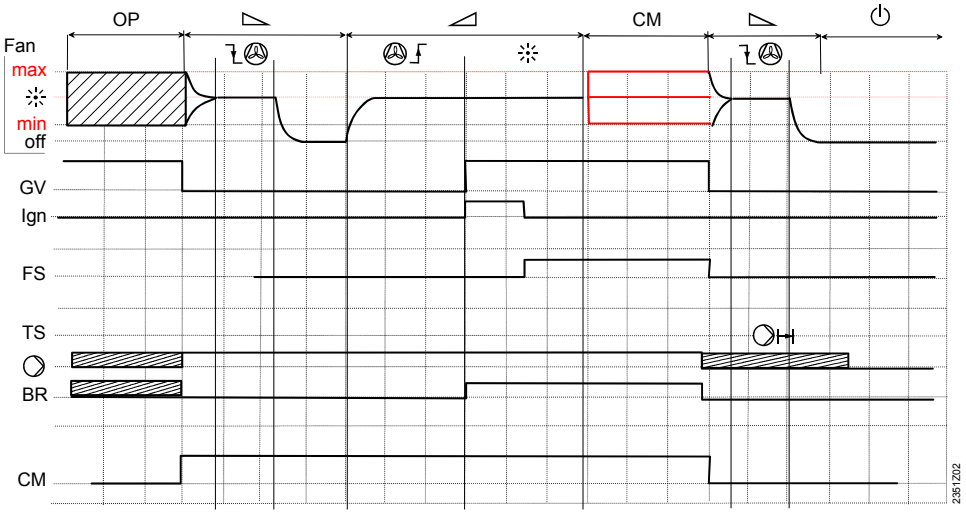
The Commissioning function may be activated in the menu Maintenance/service by the setting ***Commissioning function***: off/on

If the commissioning function is activated, both burners will come to a stop, if they are already running.
If the function is activated and the commissioning for the selected burner is activated (*7210 or 7215*) a normal burner start sequence will follow. The burner will ignite at the ignition rate. After the start up sequence, the selected burner (may be both) will fire on the selected firing rate.(*7211, 7216*)

If commissioning function (line 7200) is set to off, the settings of line 7210 (Commissioning engine burner) and line 7215 (Commissioning supplementary burner) are set back to Off.

To select the burner which should run in commissioning mode, the following settings are available:

Commission engine burner off/on
Commission supplementary burner off/on



OP	Operation
◺	Shut down
◿	Start up
CM	Comissioning
⏻	Standby
Fan	Fan Speed and Spool valve position
GV	Gas valve
Ign	Ingition
FS	Flame signal
TS	Safety time
	Pump
BR	Burner
CM	Commissioning
	Post-Purge time
	Pre-Purge time
	Ignition
	Pump overrun

During commissioning, heat demands will be ignored.
The Commissioning function will not be terminated by timeout.
The boiler pump will be running, and the heating valve/pump will be running or will be open.
During commissioning function active, the selected firing rates are *maximum*-limited such that the head temperature set point and the maximum boiler temperature set point are not exceeded.
If both burners are selected to run, there will be minimum waiting time between two burner starts. If both are set to run and both are off, the engine burner will ignite first.
Commissioning will be indicated on the display by the maintenance/special mode symbol.

5.4.13 Input / output test

Line no.	*Operating line*
7700…7999	

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

⚠ Important:
During the relay test, different limits are deactivated.
Selector sensor values are updated within a maximum of 5 seconds.
The display is made with no measured value correction.

5.4.14 State of plant

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

Setting	*Operating line*
8000	**State heating circuit 1**
8001	**State heating circuit 2**
8002	**State heating circuit P**
8003	**State DHW**
8005	**State boiler**
8012	**State engine burner**
8013	**State supplementary burner**
8014	**State generator**
8015	**Lockout reason engine burner**
8016	**Lockout reason supplementary burner**
8017	**Engine burner WHY**
8018	**Supplementary burner WHY**
8019	**Boiler WHY**
8020	**EGC (Engine Grid Connection) WHY**

State heating circuit x

End user (Info-Level)	Commissioning, engineer
Floor curing function active	Floor curing function active
	Overtemp prot active
	Restricted, boiler protection
	Restricted, DHW priority
Heating mode restricted	
	Overrun active
Forced, nominal setp	
	Opt start ctrl+boost heating
	Optimum start control
	Boost heating
Comfort heating mode	Comfort heating mode
	Optimum stop control
Reduced heating mode	Reduced heating mode
	Frost prot room active
	Frost protection flow active
	Frost prot plant active
Frost protection active	
Summer operation	Summer operation
	24-hour Eco active
	Setback reduced
	Setback frost protection
	Room temp limitation
Off	Off

State DHW

End user (Info-Level)	Commissioning, engineer
Frost protection active	Frost protection active
	Discharging prot active
	Charg time limitation active
	Charging locked
Charging lock active	
	Forced, nominal setp
Forced charging active	
	Push, legionella setp
	Push, nominal setp
Push active	
	Charging, legionella setp
	Charging, nominal setp
	Charging, reduced setp
Charging active	
Overrun active	Overrun active
Charged, legionella temp	Charged, legionella temp
Charged, nominal temp	Charged, nominal temp
Charged, reduced temp	Charged, reduced temp

Off	Off

State Boiler

End user (Info-Level)	Commissioning, engineer
Fault	Fault
Chim sweep fct active	Chim sweep fct, full load Chim sweep fct, part load
In operation	Released, full load Released, part load Overrun active
Released	Released
Frost protection active	Frost prot plant active
Off	Off

State Engine Burner

Commissioning, engineer
Standby
Prepurge
Ignition
Safety time
Run normal
Interpurge
Postpurge
Lockout

State Suppl. Burner

Commissioning, engineer
Standby
Prepurge
Ignition
Safety time
Run
Interpurge
Postpurge
Lockout

State generator

Commissioning, engineer
Stopped
Head
Mains
Bypass
Mains close
Running
Overrun
Normal shutdown
Emergency shutdown
GIM head
GIM start

Lockout reason eng bu

Commissioning, engineer
No fault
Unexpected reset
Blocking chain
Safety chain
Loss of flame
BCU hardware failure

Lockout reason supp bu

Commissioning, engineer
No fault
Unexpected reset
Blocking chain
Safety chain
Loss of flame
BCU hardware failure

Engine Burner WHY

Commissioning, engineer
Fault
Fault Blocking chain
Fault Safety chain
Off start commissioning
Off end commissioning
Commissioning
Not released EGC
Chimney sweeper
Fan overrun
Frost protection boiler temp
Frost protection ret temp
No heat demand
Min burner running time
Release delay stage 2
Heat demand
Min waiting time
Set point within SD
Fault engine burner
Fault supp burner
pump overrun
Switch on delay
Switch off delay
Fault diff'pressure

Suppl Burner WHY

Commissioning, engineer
Fault
Fault Blocking chain
Fault Safety chain
Off start commissioning
Off end commissioning
Commissioning
Not released EGC
Chimney sweeper
Fan overrun
Frost protection boiler temp
Frost protection ret temp
No heat demand
Min burner running time
Release delay stage 2
Heat demand
Min waiting time
Set point within SD
Fault engine burner
Fault supp burner
pump overrun
Switch on delay
Switch off delay
Fault diff'pressure

Boiler WHY

Commissioning, engineer
Fault
Fault Blocking chain
Fault Safety chain
Off start commissioning
Off end commissioning
Commissioning
Not released EGC
Chimney sweeper
Fan overrun
Frost protection boiler temp
Frost protection ret temp
No heat demand
Min burner running time
Release delay stage 2
Heat demand
Min waiting time
Set point within SD
Fault engine burner
Fault supp burner
pump overrun
Switch on delay
Switch off delay
Fault diff'pressure

EGC WHY

Commissioning, engineer
OK
Factory mode
Failure mode
Waiting mode

5.4.15 Diagnostics engine

For diagnostic purpose, various actual values, safety/blocking chain states and meter readings can be displayed.

Line no.	*Operating line*
8200	Power
8201	Voltage
8202	Current
8204	Energy generated to Date
8205	Energy since reset
8210	Reset Energy counter No ¦ Yes
8220	G83/ENS Closed ¦ Open
8229	Engine dome overtemperature Closed ¦ Open
8222	Regenerator temp Closed ¦ Open
8223	Dynamic absorber sw Closed ¦ Open
8224	WCS Thermostat Closed ¦ Open
8225	Alternator overload Closed ¦ Open
8226	Head temp under temp Closed ¦ Open
8227	Head temp over temp Closed ¦ Open
8228	Engine shor circuit Closed ¦ Open

Reset Energy counter Reset Energy counter will reset counter 8205 only.

5.4.16 Diagnostics heat generation

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

Line no.	*Operating line*
8304	Boiler pump Q1 Off ¦ On
8310	Boiler temperature
8311	Boiler temperature set point
8314	Boiler return temperature
8319	Pack temperature
8320	Position spool valve
8323	Fan Speed
8327	Water pressure
8341	Hours run Engine Burner
8342	Start counter Engine Burner
8343	Hours run Supplementary Burner
8344	Start counter Supplementary Burner
8360	Head control temperature
8361	Head control temperature set point
8362	Head limit temperature
8363	Mass flow demand engine burner
8364	Mass flow demand supplementary burner
8365	Boiler pump run hours
8370	Boiler temperature limiter Closed ¦ Open
8371	Flue temperature limiter Closet ¦ Open
8372	Condensate Closed ¦ Open
8373	State Burners

State Burners

It will be displayed if the engine burner 1 or the supplementary burner or both burners (1+2) are running.

5.4.17 Diagnostics consumer

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

Line no.	*Operating line*
8700	Outside temperature
8703	Outside temp attenuated
8704	Outside temp composite
8730	Heating circuit pump Q2 Off ¦ On
8740	Room temperature 1
8741	Room set point 1
8742	Room temperature 1 model
8743	Flow temperature 1
8744	Flow temperature set point 1
8749	Room thermostat 1 No demand ¦ Demand
8760	Heating circuit pump Q6 Off ¦ On
8770	Room temperature 2
8771	Room set point 2
8772	Room temperature 2 model
8773	Flow temperature 2
8774	Flow temperature set point 2
8779	Room thermostat 2 No demand ¦ Demand
8790	Heating circuit pump Q20 Off ¦ On
8801	Room set point P
8802	Room temperature P model
8803	Flow temperature set point P
8809	Room thermostat P No demand ¦ Demand
8820	DHW pump Q3 Off ¦ On
8822	Circulating pump Q4 Off ¦ On
8830	DHW temperature 1
8831	DHW temperature set point
8832	DHW temperature 2
8839	DHW thermostat No demand ¦ Demand
9031	Relay output QX1 Off ¦ On
9032	Relay output QX2 Off ¦ On
9033	Relay output QX3 Off ¦ On
9034	Relay output QX4 Off ¦ On

9050	Relay output QX21 module 1 Off ¦ On
9051	Relay output QX22 module 1 Off ¦ On
9052	Relay output QX23 module 1 Off ¦ On
9053	Relay output QX21 module 2 Off ¦ On
9054	Relay output QX22 module 2 Off ¦ On
9055	Relay output QX23 module 2 Off ¦ On

Reset Outside temperature attenuated

Line no.	Operating line
8703	Outside temp attenuated

On line 8703, it is possible to reset the outside temperature attenuated to the actual value of the outside temperature.

5.5 List of displays

5.5.1 Error code

Error code	Description of error	Priority
10	Outside temperature sensor error	6
20	Boiler temperature 1 sensor error	9
30	Flow temperature 1 sensor error	6
32	Flow temperature 2 sensor error	6
40	Return temperature 1 sensor error	6
57	DHW circulation temperature sensor error	6
60	Room temperature 1 sensor error	6
…….		

For a complete list of error codes: see Annex A

5.5.2 Maintenance code

Maintenance code	Description of maintenance	Priority
1	Burner service (burner hours run)	6
2	Burner service (number of burner starts)	6
3	Burner service (general interval: Months for service)	6
10	Battery change outside sensor	6
19	User Reset Request	9
20	Service Reset Request	9

6 Technical data

6.1 Basic units RVC32.4xx/…

Power supply		Mains: AC 230 V (±10%) PELV: DC24 V (± 3%)
	Rated frequency	50 / 60 Hz
	Max. power consumption	Mains: 11 VA PELV: 9 W
	Fusing of supply lines	max. 16 AT
	Internal fusing	max. 6.3 AT
Wiring of terminals	(Power supply and outputs)	solid or stranded wire (twisted or with ferrule): 1 core: 0.5...2.5 mm^2 2 cores 0.5...1.5 mm^2 3 cores are not allowed
Functional data	Software class to ENV 14 459	A, partly B
	Mode of operation to EN 60 730	1b (automatic operation)
Inputs	Digital input H5, configured for “Flow Switch”	safety extra low-voltage for potential free low-voltage contacts: voltage with contact open: DC 12 V current with contact closed: DC 3 mA
	Digital input H5, configured for “Turbine”	Input 0...5V internal resistance: > 100 kΩ
	Digital inputs Safety Chain RCD	voltage with contact open: DC 24 V current with contact closed: < DC 40 mA
	Mains inputs EX1 and EX2	AC 230 V (+14 / -26%) internal resistance: > 100 kΩ
	Sensor input B9 Sensor inputs B3, B31, B32, B5 Perm. sensor cables (copper) – Cross-sectional area: – Max. length:	NTC1 kΩ (QAC34) NTC10 kΩ (QAZ36, QAD36) 0.25 0.5 0.75 1.0 1.5 mm^2 20 40 60 80 120 m
Outputs	PWM output P1	Voltage V_{OH} = DC (4.5…12.0) V V_{OL} = DC 0.5 V Current: < 5mA Carrier frequency: 3 kHz Resolution: 8 Bit
	Heating Relay outputs Rated current range Max. switch-on current Max. total current (of all relays) Rated voltage range	 AC 0.02…2 (2) A 15 A for ≤1 s AC 5 A AC (24...230) V (for potential free outputs)
Interfaces	BSB “Bus load index” Max. cable length Basic unit – peripheral device Max. total length Min. cross-sectional area	2-wire connection, not interchangeable E = … 200 m 400 m (max. perm. cable capacitance 60 nF) 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 contamination to EN 60 730	normal contamination Degree of pollution: 2
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	- Electrical safety	- EN 60730-1, EN 60730-2-9
Climatic conditions	Storage to IEC721-3-1 class 1K3	Temp. -25…70 °C
	Transport to IEC721-3-2 class 2K3	Temp. -25…70 °C
	Operation to IEC721-3-3 class 3K3	Temp. 0...55 °C (non-condensing)
Weight	Weight (excl. packaging)	… g

6.2 Extension module AVS75.390

Power supply	Rated voltage	AC 230 V (± 10 %)
	Rated frequency	50 / 60 Hz
	Max. power consumption	4 VA
	Fusing of supply lines	max. 6.3 AT
Wiring of terminals	(Power supply and outputs)	solid 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 potentialfree low-voltage contacts: voltage with contact open: DC 12 V current with contact closed: DC 3 mA
	Analog input H2	protective extra low-voltage operating range: DC (0...10) V internal resistance: > 100 kΩ
	Mains input L	AC 230 V (± 10 %) internal resistance: > 100 kΩ
	Sensor inputs BX6, BX7	NTC10k (QAZ36, QAD36)
	Perm. sensor cables (copper)	
	with cross-sectional area:	0.25 0.5 0.75 1.0 1.5 mm^2
	Max. length	20 40 60 80 120 m
Outputs	Relay outputs	
	Rated current range	AC 0.02…2 (2) A
	Max. switch-on current	15 A for ≤1 s
	Max. total current (of all relays)	AC 5 A
	Rated voltage range	AC (24...230) V (for potentialfree outputs)
Interfaces	BSB	2-wire connection, not interchangeable
	Max. cable length	
	Basic unit – peripheral device	200 m
	Max. total length	400 m (max. perm. 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 contamination to EN 60 730	normal contamination Degree of pollution: 2
Standards, safety, EMC, etc.	CE conformity to	
	EMC directive	89/336/EEC
	- Immunity	- EN 61000-6-2
	- Emissions	- EN 61000-6-3
	Low-voltage directive	73/23/EEC
	- Electrical safety	- EN 60730-1, EN 60730-2-9
Climatic conditions	Storage to IEC721-3-1 class 1K3	temperature -20…65 °C
	Transport to IEC721-3-2 class 2K3	temperature -25…70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (noncondensing)
Weight	Weight (excl. packaging)	293 g

6.3 Operator and room unit AVS37... / QAA7x…

Power supply	For devices without batteries:	
	Bus power supply	BSB
	For devices with batteries:	
	Batteries	3 pcs
	Type of battery	1.5 V Alkali size AA (LR06)
	Battery life	approx. 1.5 years
Room temperature measurement (only for QAA7x..)	Measuring range:	0...50 °C
	According to EN 12098:	
	Range 15...25 °C	within tolerance of 0.8 K
	Range 0..15 °C or 25...50 °C	within tolerance of 1.0 K
	Resolution	1/10 K
Interfaces	AVS37../QAA75..	BSB-W, 2-wire connection, not interchangeable
	Max. cable length basic unit – peripheral device	QAA75... 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… IP40 for AVS37… IP20 (when mounted) normal contamination
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class III, if correctly installed
	Degree of contamination to EN 60 730	normal contamination Degree of pollution: 2
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
	Wireless	EN 300 220-1 (25-1000 MHz)
Climatic conditions	For devices without batteries:	
	Storage to IEC721-3-1 class 1K3	temperature –20...65 °C
	Transport to IEC721-3-2 class 2K3	temperature –25...70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (noncondensing)
	For devices with batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20...30 °C
	Transport to IEC721-3-2 class 2K3	temperature -25..70 °C

	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (noncondensing)
Weight	Weight (excl. packaging)	AVS37.294: 160 g QAA75.61x: 170 g QAA78.610: 312 g

6.4 Wireless outside sensor AVS13.399

Power supply	Batteries	2 pcs.
	Type of batteries	1.5 V Alkali size AAA (LR03)
	Battery life	approx. 2 years
Interfaces	Radio transmitter	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class III, if correctly installed
	Degree of contamination to EN 60 730	normal contamination
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
	Wireless	EN 300 220-1 (25-1000 MHz)
Climatic conditions	For devices without batteries:	
	Storage to IEC721-3-1 class 1K3	temperature -20.0.65°C
	Transport to IEC721-3-2 class 2K3	temperature -25..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 -25..70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (non-condensing)
Outside temperature acquisition	Outside sensor	QAC34/101
	Measuring range	-50...50 °C
	Cable length	max. 5 m
Weight	Weight (excl. packaging)	radio transmitter: 160 g outside sensor QAC34: 73 g 70 g cable

6.5 Radio repeater AVS14.390

Power supply	Nominal voltage	AC 230 V ±10 % (primary side AC/AC adapter)
	Nominal frequency	50 Hz ±6 %
	Max. power consumption	0.5 VA max.
Interfaces	Radio transmitter	BSB-RF frequency band 868 MHz
Degree of protection and safety class	Degree of protection of housing to EN 60 529	IP20
	Safety class to EN 60 730	low-voltage-carrying parts meet the requirements of safety class III, if correctly installed
	Degree of contamination to EN 60 730	normal contamination

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
	Wireless	EN 300 220-1 (25-1000 MHz)
Climatic conditions	Storage to IEC721-3-1 class 1K3	temperature -20…65 °C
	Transport to IEC721-3-2 class 2K3	temperature -25…70 °C
	Operation to IEC721-3-3 class 3K5	temperature 0...50 °C (noncondensing)
Weight	Weight (excl. packaging)	radio repeater 112 g power supply 195 g

Annex A

Error Codes

UR = User Reset / SR = Service Reset / AR = Automatic Reset/ ARP= Automatic Reset after Power down / NRP = No restart possible[3](exchange board)

NorSd: Normal shutdown, EmSd: Emergency Shutdown
Automatic reset is only done if the fault condition is eliminated
Reaction describes the reactions concerning Engine and Supplementary burner.
(X) means, these errors are managed by the RESET-Manager

Error Code: This is the error code which will be displayed on the HMI or on the room unit
Error Code System: This is the error code which will be displayed on other controllers which are connected via LPB or this code will be transmitted as error code by a communication unit like OCI611. Error Code System is limited 0…255, this is the reason why some error codes are transmitted as collective error code. On the controller itself, (detailed) Error code will always be displayed.
If more then one error is active, the one with the higher priority or the one which appeared first will be displayed.

Error Code	*System Error Code*	*Display*	*Description*	*block-ing / Reset*	*Re-actio n*	*Prio*	*Shutdo wn*		*Lock out*	
							Eng	*Sup*	*Eng*	*Sup*
0	*0*	*0:No error*				*0*				
10	*10*	*10:Outside sensor*	*Fault outside temp sensor*[4]*		*Def Val, AR*	*6*				
20	*20*	*20:Boiler sensor 1*	*Fault boiler flow temp sensor**	*BSCM*	*Nor Sd*	*9*	*X*	*X*	*AR*	*AR*
30	*30*	*30:Flow sensor 1*	*Fault flow temp sensor hc 1**			*6*				
32	*32*	*32:Flow sensor 2*	*Fault flow temp sensor hc 2**			*6*				
40	*40*	*40:Return sensor*	*Fault return temp sensor boiler**			*6*				
50	*50*	*50:DHW sensor 1*	*Fault DHW1 sensor**			*9*				
52	*52*	*52:DHW sensor 2*	*Fault DHW 2 sensor**			*9*				
54	*54*	*54:DHW flow sensor*	*Fault DHW flow temp sensor**			*6*				
61	*61*	*61:Room unit 1*	*No communication room unit 1*			*6*				
66	*66*	*66:Room unit 2*	*No communication room unit 2*			*6*				
68	*68*	*68:Room sensor P*	*Fault room temp sensor HcP**			*6*				
78	*78*	*78:water pressure sensor*	*Fault water pressure sensor**			*6*				
83	*83*	*83: BSB short-circuit*	*Boiler system bus short-circuit*			*6*				
84	*84*	*84:BSB address collision*	*More then 1 room units are assigned to the same HC Assign one of them to HC2 or assign QAA7x not as room unit*			*3*				
85	*85*	*85:Radio communication*	*Communication to radio device interrupted*			*6*				
91	*91*	*91:Data loss in EEPROM*	*Failure in Class B-SW: Irreparable data loss in EEPROM*			*9*	*X*	*X*	*NRP*	*NRP*

[3] No restart possible: Work-around for development: press service reset within 20s after power-up to by-pass lock condition.

*) Sensor fault: In general: sensor fault may be caused by short-circuit, interruption, connection failure or configuration fault

Error Code	System Error Code	Display	Description	blocking / Reset	Reaction	Prio	Shutdown		Lock out	
							Eng	Sup	Eng	Sup
92	92	92:Device electronics error	RAM failure, HBC processor register failure, blocking chain undefined (toggling), safety chain discrepancy. Reset: Press Service Reset within 20 seconds after Power up	Reset-Manager		9	X	X	NRP	NRP
96	96	96: Minor SW failure	Failure in Class B-SW: Stack overflow or program sequence failure	Reset-Manager		9	X	X	AR	AR
97	97	97: SW or HW failure	Failure in EGC-SW which causes non-volatile lock.	Reset-Manager		9	X	X	NRP	NRP
98	98	98:Extension module 1	Fault extension module 1			6				
99	99	99:Extension module 2	Fault extension module 2			6				
100	100	100:2 clock time masters	Several clock time masters in the system Assign HMI and room units as clock time salves			3				
102	102	102:Clock without backup	The charging of the clock backup ran out			6				
114	114	114: Shutd flue gas thermo	Shutdown due to flue gas thermostat of safety chain	E-BCU S-BCU	Nor Sd	9	(X)	(X)	SR	SR
116	116	116: Shutd flue gas sensor	Shutdown due to flue gas sensor			9				
117	117	117: Pressure too high	Dry fire protection: Water pressure too high		Nor Sd	6	x	X	AR	AR
118	118	118: Pressure too low	Dry fire protection: Water pressure too low		Nor Sd	6	x	x	AR	AR
127	127	127:Legionella temperature	Legionella temperature not achieved within 48 hours			6				
128	128	128:Loss of flame in op	Loss of flame in operation Collective error message for error 261 and 262							
146	146	146:Configuration error	Configuration error or collective error message used after SW-Update in the field (error 319)			3				
150	150	150:BMU	BMU fault Collective error message for error 263, 264 and 265							
154	154	154: Plausibility	Collective error message for error 298 and 299: False flame critera of plausibility breached			6				
157	157	157:Boiler Flow thermostat	Boiler flow temperature thermostat of safety chain opened	E-BCU S-BCU	Nor Sd	9	(X)	(X)	UR	UR
158	158	158: Condensate	Condensate switch of safety chain opened	E-BCU S-BCU	Nor Sd	9	(X)	(X)	UR	UR
164	164	164 Flow-/Pressure sensor	Flow switch did not close or flow switch did not open(Dry fire protection function)	E-BCU S-BCU					AR	AR

Error Code	System Error Code	Display	Description	blocking / Reset	Reaction	Prio	Shutdown		Lock out	
							Eng	Sup	Eng	Sup
212	212	212:Internal comm failure	Collective error message for error 310 and 311							
213	213	213:Safety / blocking chain	Collective error message for error 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296							
214	214	214:Engine supervision	Collective error message for error 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 312, 313, 314, 315							
215	215	215:Fan, Valve fault	Collective error message for error 266, 267, 268, 269							
216	216	216:Boiler fault	Collective error message for error 258, 270, 271, 272, 273, 275, 276, 277, 278							
217	217	217:Sensor fault	Collective error message for error 257, 259, 260							
254	254	254: Unknown error code	Error code which would be displayed if an error should occur without defined error code							
257	217	257: Pack sensor	Fault pack temp sensor*			…				
258	216	258: Pack over- temp	Pack over-temperature detected: pack temperature exceeds the (2623) Pack temperature max value for more than (2624) Time pack temperature max			9	X	X	AR	AR
259	217	259: CJC sensor	Fault cold junction compensation sensor*-> change board	E-BCU	Nor Sd				AR	
260	217	260: Flow sensor 3	Fault flow temp sensor hc 3*			6				
261	128	261: Loss of flame Eng BCU	No flame after the ignition tries at Engine BCU	E-BCU Reset Mngr	Nor Sd	9	(X)		UR	
262	128	262: Loss of fame' Supp BCU	No flame after the ignition tries at Supplementary BCU	S-BCU Reset Mngr	Nor Sd	9		(X)		UR
263	150	263: Eng Bu BCU failure	Engine BCU failure: multiple comm. request of Engine BCU unsuccessful. The BCU stops communicating when an internal failure occurs. 1) Failure caused by BCU 2) BCU Communication Timeout on MCB			9	X		ARP AR	
264	150	264: Supp Bu BCU failure	Supplementary BCU failure: multiple comm. request of Supp. BCU unsuccessful. The BCU stops communicating when an internal failure occurs. 1) Failure caused by BCU 2) BCU Communication Timeout on MCB			9		X		ARP AR

Error Code	System Error Code	Display	Description	block-ing / Reset	Re-actio n	Prio	Shutdo wn		Lock out	
							Eng	Sup	Eng	Sup
266	215	266: Fan fault	Fan fault: The fan speed differs from its set point by more than 'LimitFanSpeedError' % of the actual set point for more than 30 seconds. The error condition disappears if the fan speed is very small or when the set point is changing.		Nor Sd	9	X	X	SR	SR
267	215	267: Fan calibration	Fan calibration error: After power-up the test threshold of 4'700 rpm was not exceeded. Engine, BCU and reset treatment through error 266.		---	9	---	---	---	---
268	215	268: Spool valve fault	Spool valve fault: feedback signal of spool valve did not reach tolarance band of ± 4% of rated value within detection time (typ. 60 sec.)		Nor Sd	9	X	X	SR	SR
269	215	269: Spool valve calib	Valve calibration failure: During start up the feedback signal of the spool valve did not exceed an upper test limit and/or did not go below a lower test limit.		Nor Sd	9	X	X	SR	SR
270	216	270:exc temp diff h'exch	Excessive max temperature difference across the heat exchanger during 5 minutes or excessive limit temperature difference. If temperature difference fell below (threshold - switching differential boiler): automatic reset - when the maximum setting was exceeded immediately - when the limit value was exceeded after 10 minutes		Nor Sd	9	X	X	AR	AR AR 10'
271	216	271: Differential pressure too high	Dry fire protection: Differential water pressure too high		Nor Sd	6	X	X		UR
272	216	272: Differential pressure too low	Dry fire protection: Differential water pressure too low		Nor Sd	6	X	X		UR
273	216	273: Configuration fault pressure sensor	Configuration fault pressure sensor		Nor Sd	6	X	X		AR
274	216	274: Dry fire protection	Flow switch did not close (for more then x minutes (setting 6191)	E-BCU S-BCU	Nor Sd		X	X	UR	UR
275	216	275: Zero flow de-aeration	Dry fire test after de-aeration procedure failed		Nor Sd	9				UR
276	216	276: Zero flow	Zero flow detected in heating mode, automatic reset after 10 minutes		Nor Sd	6				AR 10'
277	216	277: Zero flow DHW	Zero flow detected in Combi DHW mode (after several retries)		Nor Sd	9				UR

Error Code	System Error Code	Display	Description	block-ing / Reset	Re-actio n	Prio	Shutdo wn		Lock out	
							Eng	Sup	Eng	Sup
278	216	278: Max Temp Rise	Maximum flow temperature rise exceeded, automatic reset after 10 minutes			6				AR 10'
280	213	280: Inner iron overtemp	Inner iron over temp. thermostat has operated		Em Sd	9	(X)		AR	
281	213	281:Dyn absorber	Dynamic absorber over-travel switches have been activated		Em Sd	9	(X)		SR	
282	213	282:G83/ENS/GIM	G83/ENS module has detected an unhealthy mains condition. If a GIM is fitted, an over-voltage event has occurred.		Em Sd	9	X		AR	
283	213	283: Altern' overcurrent trip	Alternator overload thermal current trip has operated		Em Sd	9	(X)		SR	
284	213	284: WCS over temp	Water cooled seal thermostat has operated	E-BCU S-BCU	Nor Sd	9	(X)	(X)	SR	SR
285	213	285:Alternat SC	Power monitor IC has detected a short-circuit condition		Em Sd	9	(X)		AR	
286	213	286: Eng head over temp	Engine head temperature thermocouple measurement exceeds 584 degrees C		Nor Sd	9	(X)		SR	
287	213	287: Eng head under temp	Engine head temperature thermocouple measurement below 103 degrees C when the CX relay is energised		Em Sd	9	(X)		AR	
288	213	288: Regenerat' over temp	Regenerator protection thermal fuse has operated		Em Sd	9	(X)		SR	
289	213	289: WCS over temp+ Inner iron	Water cooled seal thermostat has operated and Inner iron thermostat has operated		Em Sd	9	(X)		SR	
290	213	290: WCS over temp + DA	Water cooled seal thermostat has operated and dynamic absorber over-travel switches have been activated		Em Sd	9	(X)		SR	
291	213	291: WCS over temp + G83	Water cooled seal thermostat has operated and G83/ENS module has detected an unhealthy mains condition, or if GIM fitted, an over-voltage event has occurred		Em Sd	9	(X)		SR	
292	213	292: WCS over temp + Altern	Water cooled seal thermostat has operated and alternator overload thermal current trip has operated		Em Sd	9	(X)		SR	
293	213	293: WCS over temp + SC	Water cooled seal thermostat has operated and power monitor IC has detected a short-circuit condition		Em Sd	9	(X)		SR	
294	213	294: WCS + eng head overt	Water cooled seal thermostat has operated and engine head temperature thermocouple measurement exceeds 584 degrees C		Nor Sd	9	(X)		SR	

Error Code	System Error Code	Display	Description	blocking / Reset	Reaction	Prio	Shutdown		Lock out	
							Eng	Sup	Eng	Sup
295	213	295: WCS +eng head undert	Water cooled seal thermostat has operated and engine head temperature thermocouple measurement below 103 degrees C when the CX relay is energised		Em Sd	9	(X)		SR	
296	213	296: WCS over temp + Reg	Water cooled seal thermostat has operated and regenerator protection thermal fuse has operated		Em Sd	9	(X)		SR	
298	154	298: false flame engine burner	Ionisation probe of engine burner detected false flame						AR	
299	154	299: false flame supplementary burner	Ionisation probe of supplementary burner detected false flame							AR
300	214	300: Eng head under temp	Engine head control temperature less than 150 degrees C when CX relay is energised		Em Sd	9	(X)		UR	
301	214	301: Eng head over temp	Engine head control temperature greater than 540 degrees C		Nor Sd	9	(X)		AR	
302	214	302: Eng head thermocoupl	Magnitude of the difference between the engine head control and limit thermocouples is greater than 100 degrees C		Nor Sd	9	X		UR	
303	214	303: Eng head t' couple cont	Engine head control thermocouple integrity test failed or rate of rise check failed			9	X		UR	
304	214	304: Eng head t' couple lim	Engine head limit thermocouple integrity test failed or rate of rise check failed			9	X		UR	
305	214	305: Eng under current	Engine connectivity test failed. This test lasts for at most one minute following start of engine operation. Measured current must be greater than 100 mA for 10 seconds to pass the test.		Em Sd	9	X		UR	
306	214	306:Black start failure	Engine voltage less than 150 V, 5 seconds after start pulse applied		Nor Sd	9	X		AR	
307	214	307: Engine stall	Engine voltage less than 50 V, when engine running		Nor Sd	9	X		AR	
308	214	308: Stop resistor integrity	The stop resistor integrity check has failed		Em Sd	9			SR	
309	214	309: Power fail detection	Power failure detection		Em Sd	9			AR	

Error Code	System Error Code	Display	Description	blocking / Reset	Reaction	Prio	Shutdown		Lock out	
							Eng	Sup	Eng	Sup
~~310~~	~~212~~	~~310: Power mon comm. fail~~	~~• No data received from the power meter IC in the last 10 seconds or • All of the data received from the power meter IC in the last 10 seconds has been corrupted or • The power monitor failed to register with the EGC microcontroller within 10 seconds of power up~~		~~Nor Sd~~	~~9~~	~~X~~		~~AR~~	
311	212	311: EGC comm. failure	Communication transmission timeout or Communication transmission failure		None	9	X		AR	
312	214	312: Bl' start fail' pump en	Black start failure at pump enable		Em Sd	9	X		AR	
313	214	313: Bl' start fail' PSU sw	Black start failure at PSU switching		Em Sd	9	X		AR	
314	214	314: Bl' start fail' batt sw	Black start failure at battery switching		Em Sd	9	X		AR	
315	214	315: Bl' start fail socket en	Black start failure at sockets enable		Em Sd	9	X		AR	
319	146	319: Check configuration	After a HBC firmware update, this “error” will be displayed, to alert that the configuration has to be adjusted to the plant.		Burner disabled to start	6			UR	UR
373	103	373: Extension module 3	Fault extension module 3			6				
421	215	421:exc temp diff h’exch eng bu	Excessive max temperature difference across the heat exchanger during engine burner operation							

*) Sensor fault: In general: sensor fault may be caused by short-circuit, interruption, connection failure or configuration fault

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