



1.0 Designated use

The OT box can only be operated in conjunction with the RAMSES 850 OT clock thermostat. The whole system is intended for the time- and room temperature-dependent switching on and off of an electrical consumer with a maximum power draw of 8(1) A , such as a circulating pump, a burner and/or motorised mixer valve. The system must only be used in dry rooms with normal levels of domestic cleanliness. The control is suitable exclusively for the following heating systems listed. For use in connection with other systems, please contact the service department of Theben AG.

Designated use also includes compliance with the operating and installation instructions. Any other use is considered contrary to the designated use. The manufacturer accepts no liability for damage resulting from such use.

2.0 Basic safety instructions



WARNING

Danger of death through electric shock or fire!

➤ Installation should only be carried out by professional electrician!

- The device is designed to be installed in boiler rooms.
- Conforms to protection class II: EN 60730-1 for designated installation, IP 20 in accordance with EN 60529.
- Corresponds to type 1 B in accordance with IEC/EN 60730-1, designed for use in normal environment
- Power reserve: approx. 4 hours after 3 days charging time
- Only for use in closed, dry rooms

3.0 Connection/installation

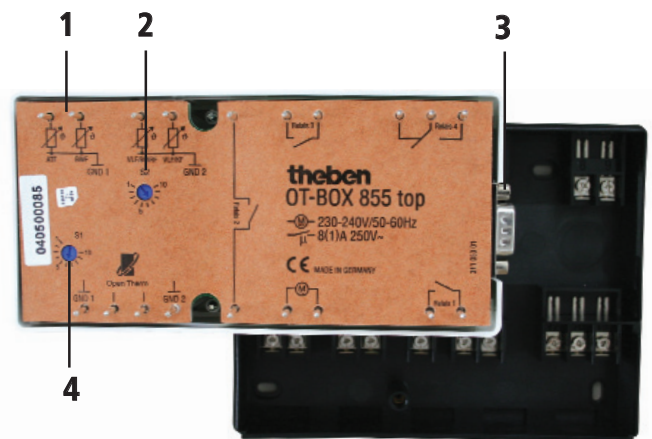


WARNING

Warning, danger of death through electric shock!

- Must be installed by professional electrician!
- Disconnect power source.
- Cover or shield any adjacent live components.
- Ensure device cannot be switched on!
- Check power supply is disconnected!
- Earth and bypass!

- Secure base of OT box RAMSES 855 top with enclosed material. The back serves as a drilling template (see fig.).
- Fix connecting cables from power supply, the OT bus and relay output to the connection terminals on the base, see terminal layout.
- Set desired application via **rotary switches S 1 and S 2**.
- Attach upper part of housing with the device to the base.
- Pull the left cover from the housing and secure the upper part of the housing to the base with the enclosed screws.



Underside of OT box

- 1 Sensor inputs/terminals (e.g. ATF)
- 2 S2 Rotary switch for cycle time, hysteresis, max. feed temperature (independent of chosen application)
- 3 Modem interface
- 4 S1 rotary switch for 8 applications

Terminal layout

Relay outputs

- floating switching contacts with a maximum load capacity of 8 (1) A

The following sensor inputs/terminals (KL) are available:

- Outside temperature sensor (ATF) (NTC 470 Ohm)
- Service water sensor (BWF) (NTC 4.7 K, feed or plunge sensor)
- Service water return sensor (VLF/BWRF) (NTC 4.7 K, feed sensor)
- Feed temperature sensor (VLF/BWRF) (NTC 4.7 K, feed sensor)
- Boiler/feed temperature sensor (KF/VLF) (NTC 4.7 K, feed or plunge sensor)
- HP = Heating pump
- LP = Service water feed pump
- ZP = Circulation pump

➤ **Connect sensors to earth (KL 4/KL 1).**



Feed temperature sensor for mixer control (907 0 371)



Outside temperature sensor (901 4 023)

4.0 Start-up and operation

Note

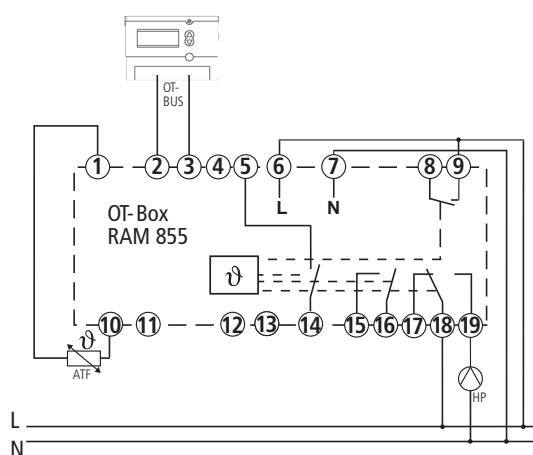
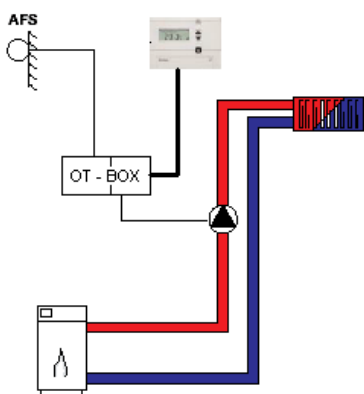
- The **OT box RAMSES 855 top** can be adapted for various heating systems by adjusting different applications. The settings are made via the **rotary switches S 1 and S 2** on the underside of the OT box. If the green LED on the top of the OT box flashes, the device is running (the number of flashing signals depicts the application selected by S1).
- The selection "**Weather or room-dependent control**" is selected via the sensor connection. If an outside temperature sensor is connected, this is automatically detected and weather-dependent control is performed.
- All applications have a **pump protection function**.
- The circulation pump can also be controlled without additional temperature sensors for the return temperature. This control is only time-dependent and is linked to the service water program. The time- and temperature-dependent control of the circulation pump with additional sensor is more effective. No settings need to be made as the sensor is automatically recognised.

Applications

☐ Control of feed temperature via the pump control

➤ Set rotary switch S1 → to position 1.

➤ Set rotary switch S2 → to desired position.



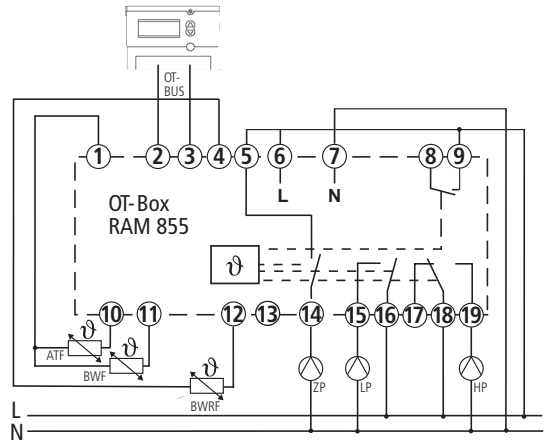
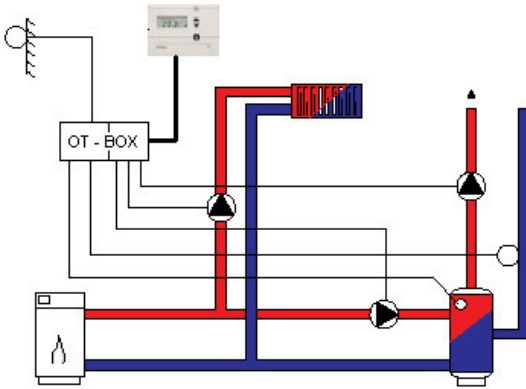
Position	Cycle time
1	3 min.
2	6 min.
3	9 min.
4	12 min.
5	15 min.
6	18 min.
7	21 min.
8	24 min.
9	27 min.
10	30 min.

Inputs / outputs

- Sensor inputs:** ➤ Connect outside temperature sensor (ATF) to terminal 10 and terminal 1 (only for weather-dependent control).
- Outputs:** ➤ Connect heat pump (HP) to terminal 19 and N; terminal 18 to L.
- Mains supply:** ➤ **L, N:** 230 V~, 50 Hz; to terminals 6 and 7

❑ Control of feed temperature via the pump control with service water control

➤ Set rotary switch S1 → to position 2.



Inputs / outputs

- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect service water sensor (BWF) to KL 11 and KL 1.
 - Connect service water return sensor (VLF/BWRP) to KL 12 and KL 4 (only for time- and temperature-dependent control).
- Outputs:**
- Connect heat pump to KL 19 and N; KL 18 to L.
 - Connect service water feed pump to KL 15 and N; KL 16 to L.
 - Connect circulation pump to KL 14 and N; KL 5 to L.
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

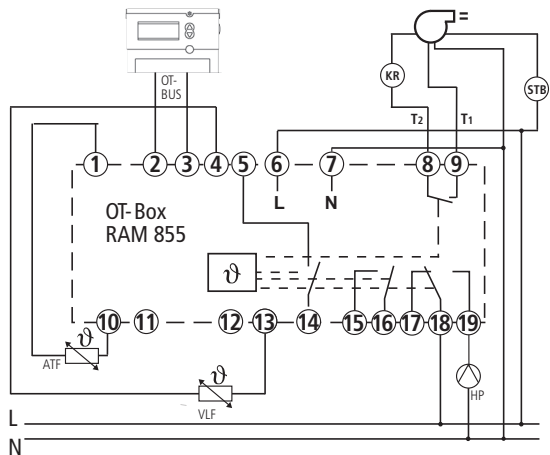
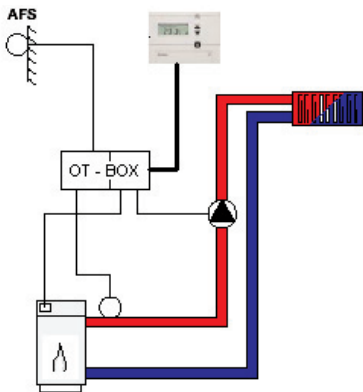
➤ Set rotary switch S2 → to desired position.

Position	Cycle time
1	3 min.
2	6 min.
3	9 min.
4	12 min.
5	15 min.
6	18 min.
7	21 min.
8	24 min.
9	27 min.
10	30 min.

❑ Control of feed temperature via burner control

➤ Set rotary switch S1 → to position 3 (KR = boiler controller).

Note: The heating protection circuit (STB) must be integrated with the burner supply cable.



Inputs / outputs

- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect boiler/feed sensor (KF/VLF) to KL 13 and KL 4.
- Outputs:**
- Connect heat pump to KL 19 and N; KL 18 to L.
 - Connect burner to KL 8 (T₂) and KL 9 (T₁).
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

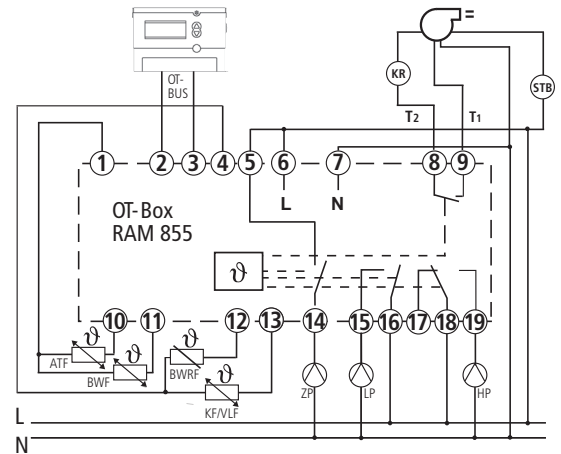
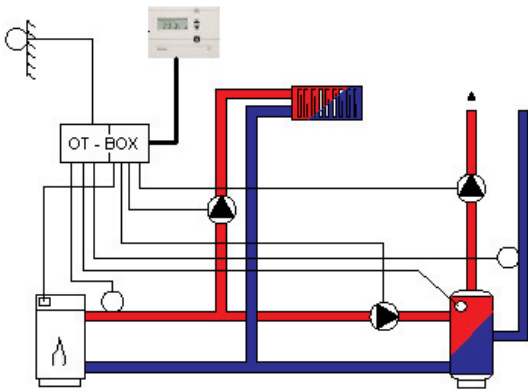
➤ Set rotary switch S2 → to desired position.

Position	Hysteresis
11 K	
22 K	
33 K	
44 K	
55 K	
66 K	
77 K	
88 K	
99 K	
1010 K	

❑ Control of feed temperature via burner control with service water control

➤ Set rotary switch S1 → to position 4 (KR = boiler controller).

Note: The heating protection circuit (STB) must be integrated with the burner supply cable.



Inputs / outputs

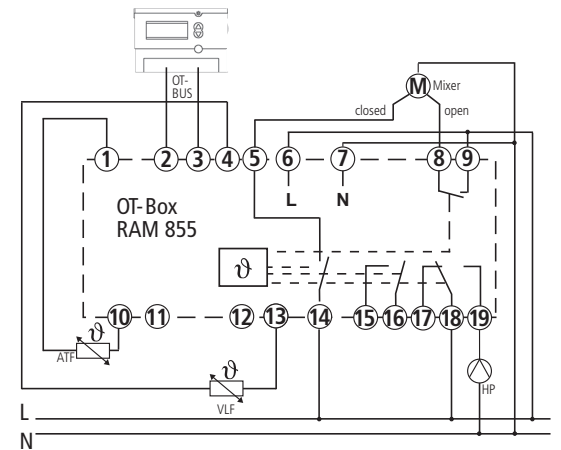
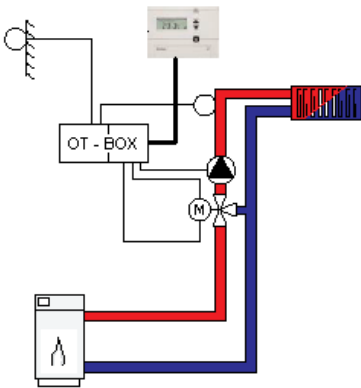
- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect boiler/feed sensor (KF/VLF) to KL 13 and KL 4.
 - Connect service water sensor (BWF) to KL 11 and KL 1.
 - Connect service water return sensor (VLF/BWRV) to KL 12 and KL 4 (only for time- and temperature-dependent control).
- Outputs:**
- Connect burner to KL 8 (T₂) and KL 9 (T₁).
 - Connect heat pump to KL 19 and N; KL 18 to L.
 - Connect service water feed pump to KL 15 and N; KL 16 to L.
 - Connect circulation pump to KL 14 and N; KL 5 to L.
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

➤ Set rotary switch S2 → to desired position.

Position	Hysteresis
11 K	
22 K	
33 K	
44 K	
55 K	
66 K	
77 K	
88 K	
99 K	
1010 K	

❑ Control of feed temperature via mixer control

➤ Set rotary switch S1 → to position 5.



Inputs / outputs

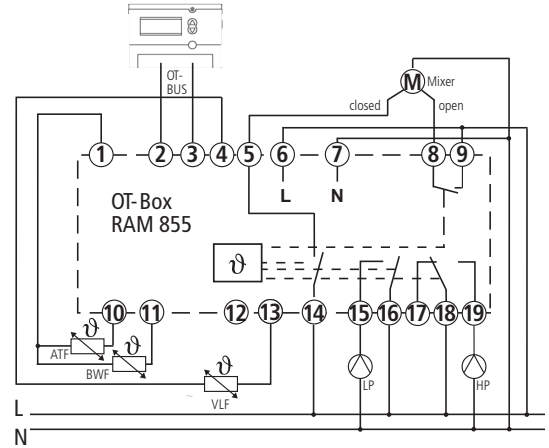
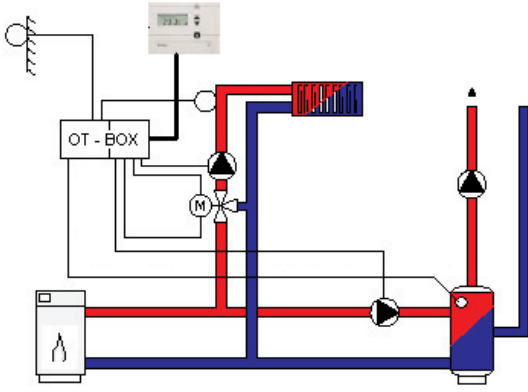
- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect boiler/feed sensor (KF/VLF) to KL 13 and KL 4.
- Outputs:**
- Connect mixer open to KL 8; KL 9 to L.
 - Connect mixer closed to KL 5; KL 14 to L.
 - Connect heat pump to KL 19 and N; KL 18 to L.
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

➤ Set rotary switch S2 → to desired position.

Position	Limit Feed temperature
1	V _{Lmax} = 40
2	V _{Lmax} = 45
3	V _{Lmax} = 50
4	V _{Lmax} = 55
5	V _{Lmax} = 60
6	V _{Lmax} = 65
7	V _{Lmax} = 70
8	V _{Lmax} = 75
9	V _{Lmax} = 80
10	V _{Lmax} = 90

❑ Control of feed temperature via mixer control with service water control (no circulation pump)

➤ Set rotary switch S1 → to position 6.



Inputs / outputs

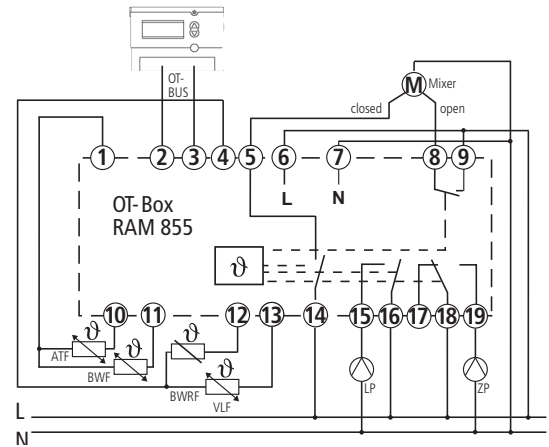
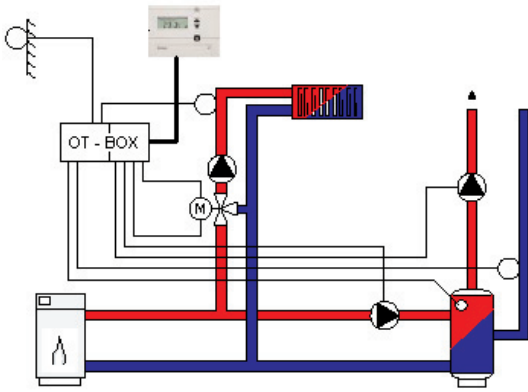
- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect feed sensor (VLF/BWR) to KL 13 and KL 4.
 - Connect service water sensor (BWF) to KL 11 and KL 1.
- Outputs:**
- Connect mixer open to KL 8; KL 9 to L.
 - Connect mixer closed to KL 5; KL 14 to L.
 - Connect heat pump on/off to KL 19 and N; KL 18 to L.
 - Connect service water feed pump to KL 15 and N; KL 16 to L.
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

➤ Set rotary switch S2 → to desired position.

Position	Limit Feed temperature
1	VLmax = 40
2	VLmax = 45
3	VLmax = 50
4	VLmax = 55
5	VLmax = 60
6	VLmax = 65
7	VLmax = 70
8	VLmax = 75
9	VLmax = 80
10	VLmax = 90

❑ Control of feed temperature via mixer control with service water control (no heating pump)

➤ Set rotary switch S1 → to position 7.



Inputs / outputs

- Sensor inputs:**
- Connect outside temperature sensor (AF) to KL 10 and KL 1.
 - Connect feed sensor (VLF/BWR) to KL 13 and KL 4.
 - Connect service water sensor (BWF) to KL 11 and KL 1.
 - Connect service water return sensor (VLF/BWR) to KL 12 and KL 4 (only for time- and temperature-dependent control).
- Outputs:**
- Connect mixer open to KL 8; KL 9 to L.
 - Connect mixer closed to KL 5; KL 14 to L.
 - Connect heat pump on/off to KL 19 and N; KL 18 to L.
 - Connect service water feed pump to KL 15 and N; KL 16 to L.
- Mains supply:**
- L, N: 230 V~, 50 Hz; to KL 6 + 7

➤ Set rotary switch S2 → to desired position.

Position	Limit Feed temperature
1	VLmax = 40
2	VLmax = 45
3	VLmax = 50
4	VLmax = 55
5	VLmax = 60
6	VLmax = 65
7	VLmax = 70
8	VLmax = 75
9	VLmax = 80
10	VLmax = 90

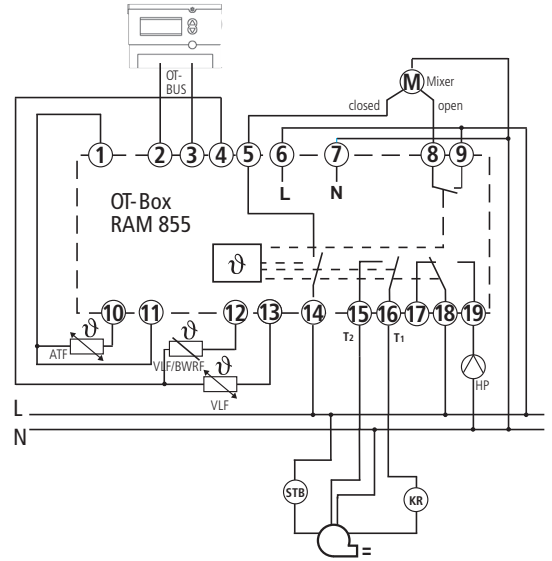
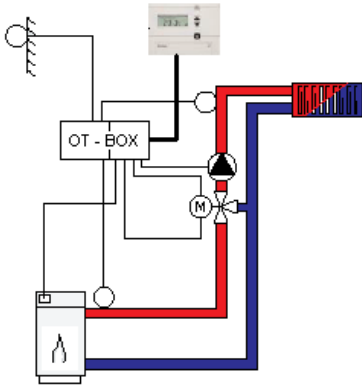
Screen display for application 7

It is not possible to control the heat pump. In this application the radiator symbol appears , as soon as the room thermostat requires heat.

❑ Control of feed temperature via mixer and burner control

➤ Set rotary switch S1 → to position 8. (KR = Boiler controller)

Note: The heating protection circuit (STB) must be integrated with the burner supply cable.



Inputs / outputs

- Sensor inputs:**
- Connect outside temperature sensor (ATF) to KL 10 and KL 1.
 - Connect feed sensor (KF/**VLF**)* to KL 13 and KL 4.
 - Connect boiler/feed sensor (BWRF/**VLF**)* to KL 12 and KL 4.
- Outputs:**
- Connect mixer open to KL 8; KL 9 to L.
 - Connect mixer closed to KL 5; KL 14 to L.
 - Connect burner to KL 15 (T2) and KL 16 (T1).
 - Connect heat pump to KL 19 and N; KL 18 to L.

Mains supply: ➤ L, N: 230 V~, 50 Hz; to KL 6 + 7






* Caution! Changed sensor layout.

➤ Set rotary switch S2 → to desired position.

Position	Limit Feed temperature
1	VLmax = 40
2	VLmax = 45
3	VLmax = 50
4	VLmax = 55
5	VLmax = 60
6	VLmax = 65
7	VLmax = 70
8	VLmax = 75
9	VLmax = 80
10	VLmax = 90

RAMSES 850 top operating device – on screen display

The following symbols appear:

- the radiator symbol  for the heat pump (except for application 7)
- the burner symbol  for the burner
- the symbol for the tap  during service water preparation
- the fan symbol  for "mixer open" and
- the symbol for weather-dependent control 

Set temperature via SMS (GSM)



If you connect a modem to the serial interface of the OT box, you can set the desired temperature over the phone or your mobile.

Note

We recommend the **GSM-Modem TC35i from Siemens for making settings via SMS (GSM)**. This modem has been tested and its function can be guaranteed. If you use another modem, there is **no** guarantee that it will function correctly.

Note: You will need a SIM card for your GSM modem.

Settings on the control device

If a modem (GSM) is connected, an additional sub-menu entitled **PINCODE** will appear in the **Settings** menu.

- In order to protect the system from third party access, enter a **four digit code** (for GSM modem enter the four digit **PIN number of the SIM card**).

Operation by SMS using a GSM modem

1. Room-dependent control

- To change the set-point value, send the PIN number and temperature via SMS to the GSM modem:
e.g. **PIN:1234 Set:21.0** (Use this format!!)
The entered set-point and room temperature appears: **PIN:Ok Set:21.0 Temp:19.0**
- To request the **current temperature and the current settings**, send the PIN number to the GSM modem:
e.g. **PIN:1234**
The display shows: **PIN: OK Set:21.0 Temp:19.0**

If you receive the reply **PIN:xxxx Set:xx,x**, this can be due to the following reasons:

- **the PIN number is incorrect**
 - **the exact format was not used**
- To use the correct format, replace the **x** in the reply with the correct PIN code and the desired temperature.

2. Weather-dependent control

With the weather-dependent control, you can select the operation mode by SMS.

- Send your PIN number and the desired operating mode to your GSM modem in the following format: e.g. **PIN:1234 Set:2**
1 → Frost protection mode
2 → Reduced mode
3 → Comfort mode

You will receive the set operation mode and current room temperature: **PIN: OK Set:2 Temp:19.0**

- To request the **current temperature and the current settings**, send the PIN number to the GSM modem:
e.g. **PIN:1234**

The display shows: **PIN: OK Set:2 Temp:19.0**

If you receive the reply **PIN:xxxx Set:x**, this can be for the following reasons:

- **the PIN number is incorrect**
 - **the exact format was not used**
- To use the correct format, replace the **x** in the reply with the correct PIN code and the desired operating mode.

5.0 Error messages

Should an error occur with the control, you will be notified by SMS with the following text from the thermostat:

Error 11	no communication	submit device
Error 20	ATF error	Check ATF connection, check position S1
Error 21	VLF error	Check VLF connection, check position S1
Error 22	BWF error	Check BWF connection, check position S1
Error 23	BWRF error	Check BWRF connection, check position S1

The telegrams sent from the GSM modem always go to the number of the sender who last changed the temperature or viewed the settings (using the correct PIN number).

6.0 Technical data

Contact position for

Power reserve:	permanently to Off
Switch load:	max. 8(1) A 250 V~
Contact material:	AgNi
Contact:	floating changeover switch, 3 NO contact
Protection rating:	IP 65 for external sensor
Supply voltage:	230 – 240 V AC, 50-60 Hz

Order numbers

- **Modem**

Order no. 907 0 396

- **Feed temperature sensor (NTC 4.7 K)**

order no. 907 0 371

- **Immersed sensor for boilers (NTC 4.7 K)**

order no. 907 0 379

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