theben

EN **OpenTherm Control Box 3**
9070446

1. Basic safety information

> **NOTE**
> ➢ Connection and installation should only be carried out by a qualified electrician!
> ➢ Before installation/dismounting, disconnect the power supply!

2. Proper use

- Relay-controlled system for room temperature regulation in living spaces using a digital clock thermostat and a receiver (OpenTherm Control Box 3 9070446)
- The OpenTherm Control Box 3 can control by using 2-step control (e.g. via actuators, pumps etc.)
- Heating/cooling function adjustable via TSP parameters
- Use in dry rooms with normal levels of domestic cleanliness

Disposal

➢ Dispose of device in environmentally sound manner

3. Installation

Mounting the Control Box

- Suited for wall mounting.
- Control box OT is installed near the heater.

⚠ If 2 cables are led through one cable port of the housing, it might be necessary to enlarge the device opening, so the cable sheath will not be squeezed.

4. Connection

⚠ Secure device with an upstream type B or type C circuit breaker (EN 60898-1) with a maximum of 10 A.
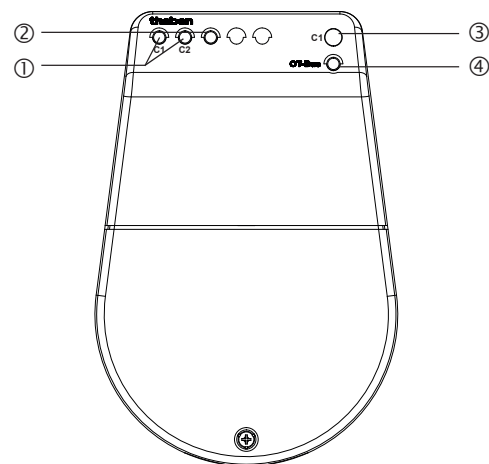
⚠ For a cable cross-section > 0.75 mm², use a 4-core cable instead of 2 individual cables.

➢ Disconnect power source
➢ Note wiring diagram
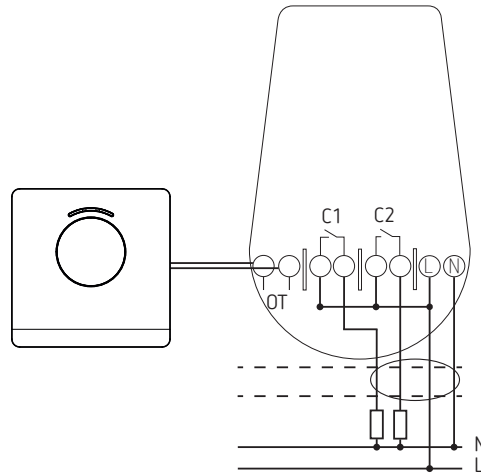
- OT terminal → connection of the OpenTherm room thermostat
- Right terminal → mains voltage for OpenTherm Control Box 3
- floating outputs C1 + C2 → implementation of the sequence control or heating (C1)/cooling (C2) function

5. Description

① LED: Relay state for channel 1, channel 2
② LED: Bus error (LED flashes red), bus interruption
③ Button pre-selection for hysteresis level 1 to level 2
④ LED flashes at one second intervals → OpenTherm-bus ok

Button ③
If the OpenTherm Control Box 3 is configured as "sequence control":
➢ Press button > 5 s (LEDs flash 3 x)
   → The difference between level 1 and level 2 is set

If the OpenTherm Control Box 3 is configured as "heating/cooling":
➢ Press button C1 briefly
   → Relay 1 is switched - as long as a new switching signal is received via the bus

6. Configuration via TSP parameters

The TSP parameters are configured using the RAMSES BLE OT room thermostat and the associated app (→ Settings). 4 TSP parameters are used; via these, various functions are assigned to the relay of OpenTherm Control Box 3.

7. Functions

Function with sequence control

Level 1/relay 1 (C1)

Status	Condition
ON	Room actual temperature < room setpoint temperature
OFF	Room actual temperature > room setpoint temperature

Hysteresis 0.3 K

Level 2/relay (C2)

Status	Condition
ON	Room actual temperature < room setpoint temperature − delta T
OFF	Room actual temperature > room setpoint temperature − delta T

Hysteresis 0.3 K

Setting the threshold (difference) from level 1 to level 2 at OpenTherm Control Box 3

The threshold can be set via the button on the Control Box 3. When pressing the button (button ③) > 5 s, LED 1−LED 3 flash 3 x. The current setting will be displayed (see table). Each press of the button switches to the next level. After the last level, it jumps back to the first level.
The setting option will be quit automatically after 15 s without operation. This is indicated by 3 x flashing of the 3 LEDs. The new setting will be saved.

Setting difference/K	LED 1 yellow	LED 2 yellow	LED 3 red	Value TSP 1
0.5	OFF	OFF	ON	1
1.0	OFF	ON	OFF	2
1.5	OFF	ON	ON	3
2.0	ON	OFF	OFF	4
2.5	ON	OFF	ON	5

If the OpenTherm data traffic fails, "emergency mode" will not be activated:
→ The red LED flashes, the relays remain in the same state as before the bus interruption

Setting TSP parameters via the app

Parameter Anzahl	4	4 TSP parameters are available
TSP Parameter		
TSP 0	0	Sequence control function 0
TSP 1	4	Setting difference of 2.0 K
TSP 2	4	is not used
TSP 3	-	

Example

If "TSP 0" is set to value "1", sequence control function 1 is activated.
When a relay is switched on in sequence control 1, relay 2 (level 2) always switches on for 10 min (boost function). After this time has elapsed, that relay is switched on which has to switch on according to the temperature differences.

8. Function with heating/cooling

When configuring with heating/cooling function, relay 1 (C1) controls the heating mode, relay 2 (C2) the cooling mode.
If "TSP 0" is set to value 2, the heating/cooling function is activated.

ⓘ In case of bus interruption → emergency mode (the heating relay switches on/off alternately for 15 min during heating/cooling)

Setting TSP parameters via the app

Parameter Anzahl	4	4 TSP parameters are available
TSP Parameter		
TSP 0	2	**Heating/cooling** function
TSP 1	23	Cooling start temperature 23 °C
TSP 2	4	4 K neutral zone
TSP 3	2	2 h waiting time for cooling mode after heating mode

Example

- **TSP 1**: Cooling start temperature (range 20 °C to 30 °C) Cooling mode is possible from this room temperature.

- **TSP 2**: Neutral zone cooling (1 K to 5 K) Distance between current setpoint temperature and start of cooling zone
  Example: Room setpoint = 21.0 °C; neutral zone = 3 K → cooling starts from a room temperature of 24.0 °C.
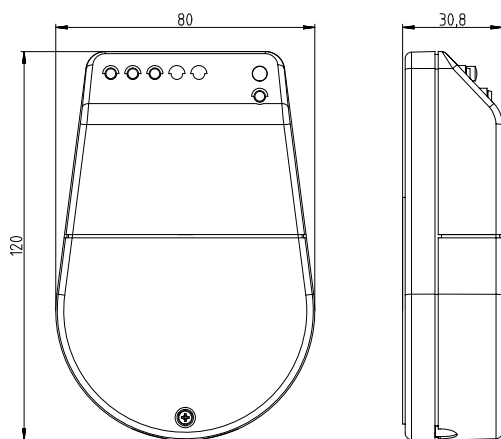
- **TSP 3**: Waiting time for heating / cooling change over (1 h to 50 h)
  A waiting time can be set so that cooling is not set too quickly after heating mode
  Example: Heating mode (heating relay was switched on). The waiting time is started when the heating relay is switched off. Cooling mode can be started at the earliest after the waiting time has elapsed.

  Conditions for cooling mode (all conditions must be fulfilled):
  – Waiting counter has expired (TSP 3)
  – Room actual >= cooling start temp. (TSP-1)
  – Room actual >= room setpoint + neutral zone (TSP-2)

10. Contact

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9. Technical data

Operating voltage:	230 V AC, + 10 % / − 15 %, 50 Hz
Supply voltage:	OT bus (approx. 50 mW)
Contact rating:	C1: 10 (1) A (at 250 V AC, cos φ = 1); C2: 5 (1) A (at 250 V AC, cos φ = 1)
Switch output:	floating
Operating temperature:	10 °C − 45 °C
Protection rating:	IP 20 in accordance with EN 60529
Protection class:	II in accordance with EN 60730-1 subject to designated installation
Mode of operation:	Type 1 B in accordance with EN 60730-1
Rated impulse voltage:	4 kV
Pollution degree:	2
Software class:	A