For certified companies

a member of DAIKIN group

ROTEX

ROTEX
RoCon UFH
Operating instructions

Single-room temperature controller

CE

For the types
UFH-BM
UFH-UM
UFH-RMD2
UFH-RMD6
UFH-RMF2A
UFH-RMF6A
UFH-RD
UFH-RFT

GB
Issue 08/2016

Contents

1 About these operating instructions

These operating instructions are a part of the product.

- ▶ Read the operating instructions before using the device.
- ▶ Carefully retain the operating instructions throughout the entire life of the product and keep available for future reference.
- ▶ Hand over the operating instructions to any subsequent owner or user of the product.

1.1 Structure of the warning notices

WARNING WORD

The type and source of danger are described here.

- ▶ Measures to avoid the danger are described here.

Warning notices at three levels of severity are issued:

Warning word	Meaning
DANGER	Indicates imminent danger! Disregarding this warning results in death or serious physical injury.
WARNING	Indicates a potentially dangerous situation! Disregarding this warning may result in serious physical injury or death.
CAUTION	Indicates a possibly damaging situation! Disregarding this warning may result in minor to moderate injury or damage to property.

Tab. 1: Explanation of the warning notices

1.2 Explanation of the symbols and displays

Symbol	Meaning
☑	Precondition for an action
▶	Action with one step
1.	Action with several steps
↳	Result of an action
•	Enumeration
`Text`	Output on display
Highlighting	Highlighting

Tab. 2: Explanation of the symbols

2 Safety

2.1 Use as intended

The single-room temperature controller RoCon UFH is suitable solely for regulating (heating/cooling) the room temperature of single rooms with underfloor heating.

Any other use is not as intended.

2.2 Foreseeable misuse

The RoCon UFH single-room temperature controller must not be used in the following cases in particular:

- Potentially explosive environment
  Sparks during operation in potentially explosive environments can lead to deflagration, fire or explosions.

2.3 Safe handling

This product is state of the art and complies with the recognised safety regulations. Prior to delivery, every device is tested for safety and correct operation.

▶ Operate this product only when in perfect working order, having due regard for the operating instructions, the customary regulations and guidelines and the applicable safety and accident-prevention regulations.

Extreme environmental conditions will impair the operation of the product.

▶ Protect the product against bumps.

▶ Use the product only in indoor areas.

▶ Protect the product against humidity.

2.4 Staff qualifications

Installation, commissioning, operation, maintenance, decommissioning and disposal must only be carried out by qualified specialist staff.

Any work on electrical equipment must only be carried out by a trained electrician in accordance with the applicable regulations and guidelines.

2.5 Modifications to the product

Unauthorised modifications to the product may lead to malfunctions and are forbidden for reasons of safety.

2.6 Use of spare parts and accessories

The product may be damaged if unsuitable spare parts or accessories are used.

- ▶ Use only genuine spare parts and accessories from the manufacturer (see chapter 12, page 55).

2.7 Liability disclaimer

The manufacturer offers no warranty and shall not be liable for damage or consequential loss resulting from non observance of the technical regulations, guides and recommendations.

The manufacturer and distributing company shall not be liable for costs or damage incurred by the user or third parties as a result of using this device, especially if used improperly, misused or due to faulty connection or faults in the device or the equipment connected to it. Neither the manufacturer nor the distributing company shall be liable if the device is not used as intended.

The manufacturer shall not be liable for misprints.

3 Description of the product

The RoCon UFH single-room temperature controller regulates the temperature of rooms with underfloor heating (heating and cooling). The control system does this by comparing the actual and target temperatures and controlling the flow of hot water via the relevant thermal actuators.

The actual temperature is measured via the room controllers in the respective rooms. The target temperature is set via the rotary knob of the respective room controller.

The controller modules each with 2 or 6 independent control circuits regulate the respective thermal actuators, taking into account all incoming signals of the room controllers and base module.

The base module supplies the room controllers with 5 VDC and the thermal actuators with 230 VAC. Via the base module, the RoCon UFH single-room temperature controller can be switched between heating and cooling. The control circuit pumps can be controlled via the base module.

The optional clock module has a century calendar. It displays the date, time and day of the week. The clock module has 2 independently programmable switching channels for lowering the temperature. There are 9 independently programmable memory locations available. The pump run-on time can be set via the clock module. The clock module has a valve- and pump protection function.

The single-room temperature control system consists of a base module, at least one room controller and at least one controller module. Optionally, several controller modules each with 2 or 6 control circuits can be adapted.

The RoCon UFH single-room temperature controller is available in 2 variants:

- Room controllers and controller modules are linked to one another via a wire line.
- Room controllers and controller modules are linked to one another via EnOcean® wireless.

The RoCon UFH single-room temperature controller is of modular design. The wired and wireless variants may also be operated in a mixed configuration.

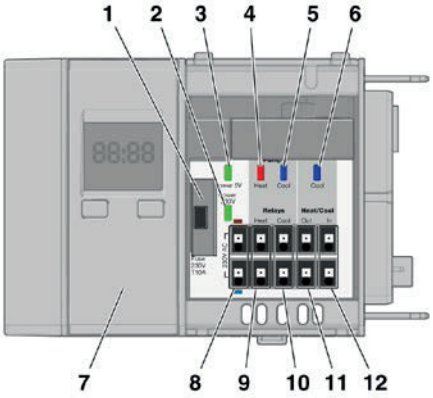
3.1 Overview of the separate components

Component	Options	Art. No.
Base module	Base module UFH-BM	175137
	Clock module UFH-UM	175138
Controller modules	Controller module, wire UFH-RMD2	175141
	Controller module, wire UFH-RMD6	175140
	Controller module, wireless UFH-RMF2A	175144
	Controller module, wireless UFH-RMF6A	175143
Room controller	Room controller, wire UFH-RD	175139
	Room controller, wireless UFH-RFT (Temperature)	175142

Tab. 3: Overview of the components

3.2 Features

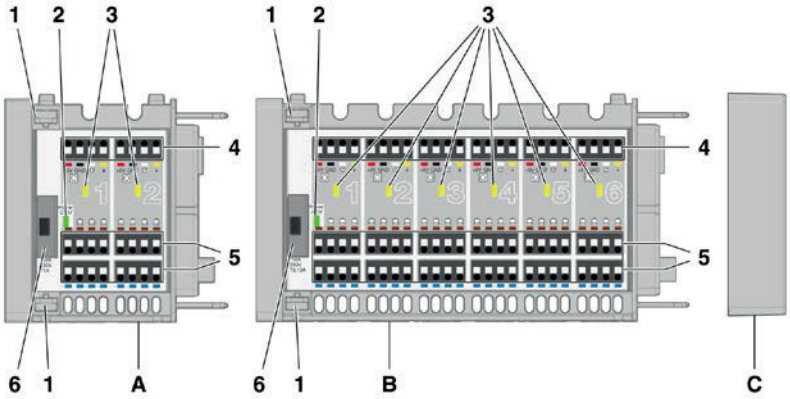
Base module UFH-BM



1	Fuse compartment	**7**	Clock module (optional)
2	LED green (supply voltage)	**8**	Supply voltage 230 V AC
3	LED green (5V line)	**9**	Pump relay contact, heating
4	LED red (heating pump)	**10**	Pump relay contact, cooling
5	LED blue (cooling pump)	**11**	Cascading output relay, heating/cooling
6	LED blue (cooling)	**12**	Input switchover, heating/cooling

Fig. 1: *Front view of base module*

Wired controller modules



A Contr. module UFH-RMD2

B Contr. module UFH-RMD6

C Closing cap

1 Catch

2 LED green (supply voltage)

3 LED yellow
(Thermal actuator active)

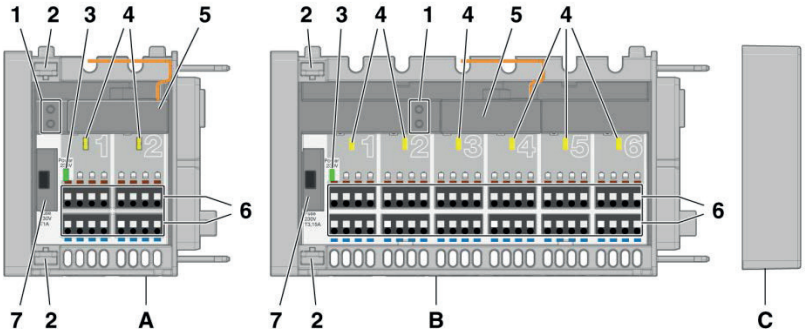
4 Terminal strip for
room controller

5 Terminal strip for thermal actuators

6 Fuse compartment

Fig. 2: *Front view of wired controller modules*

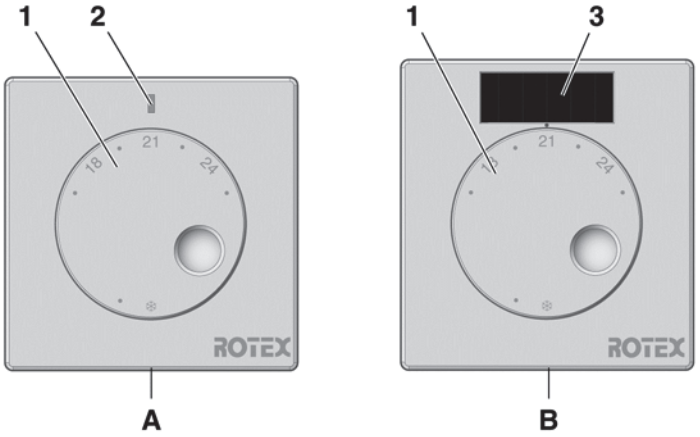
Wireless controller modules



A	Contr. module UFH-RMF2A	**1**	Learn buttons
B	Contr. module UFH-RMF6A	**2**	Catch
C	Closing cap	**3**	LED green (supply voltage)
		4	LED yellow (Thermal actuator active)
		5	Wireless module
		6	Terminal strip for thermal actuators
		7	Fuse compartment

Fig. 3: *Front view of wireless controller modules*

Room controllers



A Wired room controller UFH-RD

1 Rotary knob for preselecting target temperature

2 LED red: heating
LED, blue: cooling

B Wireless room controller UFH-RFT

1 Rotary knob for preselecting target temperature

3 Solar cell

Fig. 4: *Front view of room controller*

3.3 Example applications

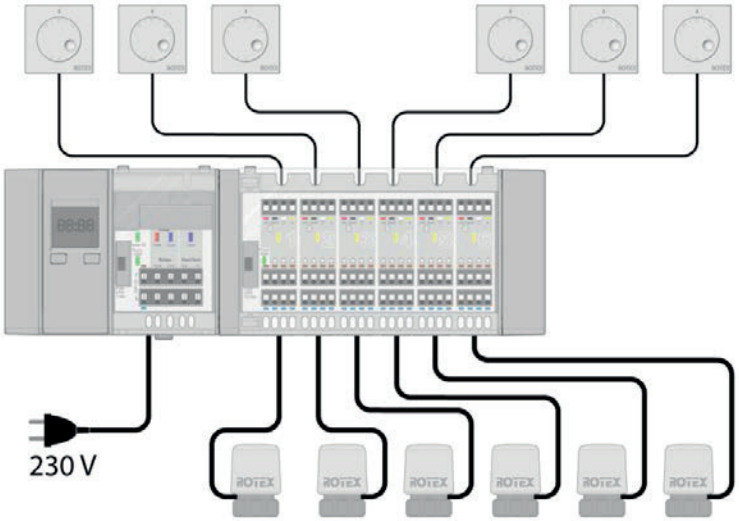


Fig. 5: *RoCon UFH single-room temperature controller with a UFH-RMD6 wired controller module and 6 UFH-RD room controllers*

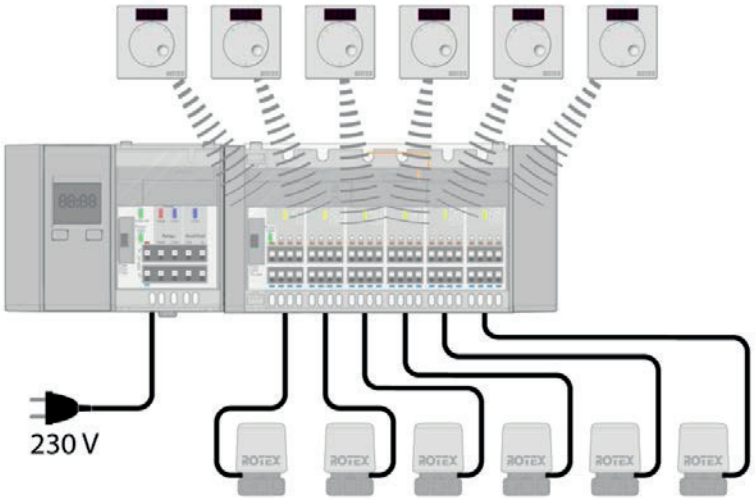


Fig. 6: *RoCon UFH single-room temperature controller with a UFH-RMF6A wireless controller module and 6 UFH-RFT room controllers*

4 Technical specifications

4.1 Base module

Parameter	Base module UFH-BM
General data	
Housing dimensions (W x H x D)	122 mm x 92 mm x 45 mm
Weight	215 g
Housing material	PC/ABS
Service temperature range	
Ambient	-20°C to +60°C
Storage	-20°C to +60°C
Max. humidity	Non-condensing
Voltage supply	
Nominal voltage	230 V AC, 50-60 Hz
Nominal power (base module only)	1 VA
Mains fuse	T 10 A
Power rating of relay	max. 230 V, max. 2 A, power factor $\geq$ 0.6
Usable conductor type	H03 VV-H2-F 2x0.75 mm²
The following may be connected to 1 base module	
Controller modules, 6-gang	max. 3
Controller modules, 2-gang	max. 9
Control circuits in total	max. 18
Thermal actuators in total	max. 72
Electrical safety	
Protection class	II EN 60730-1 (SELV)
Degree of protection	IP 20 EN 60529
Electromagnetic compatibility (EMC)	
Interference emitted/ -immunity	DIN EN 61326-1: 2006-10, DIN EN 55014-1: 2007-06, DIN EN 55014-2: 2002-08
Eco-design directive	
2009/125/EU	Step 2

Tab. 4: Base module specifications

4.2 Wired controller module

Parameter	Contr. module UFH-RMD2	Contr. module UFH-RMD6
General data		
Housing dimensions (W x H x D)	73 mm x 92mm x 45 mm	162 mm x 92 mm x 45 mm
Weight	130 g	260 g
Housing material	PC/ABS	
Service temperature range		
Ambient	-20°C to +60°C	
Storage	-20°C to +60°C	
Max. humidity	Non-condensing	
Voltage supply		
Nominal voltage	via base module 230 V AC, 5 V DC	
Nominal power (base module only)	0.1 W	0.3 W
Fusing for thermal actuators	T 1 A	T 3.15 A
Usable conductor type for the thermal actuators	H03 VV-H2-F 2x0.75 mm²	
Usable conductor type for the room controllers	J-Y (St) Y 2x2x0.6 mm² Wire colours: red, black, white, yellow	
The following may be connected to 1 controller module		
Room controllers	max. 2	max. 6
Thermal actuators	max. 8	max. 24
Electrical safety		
Protection class	II EN 60730-1	
Degree of protection	IP 20 EN 60529	
Electromagnetic compatibility (EMC)		
Interference emitted/ -immunity	DIN EN 61326-1: 2006-10	

Tab. 5: Specifications of wired controller module

4.3 Wireless controller module

Parameter	Contr. module UFH-RMF2A	Contr. module UFH-RMF6A
General data		
Housing dimensions (W x H x D)	73 mm x 92mm x 45 mm	162 mm x 92 mm x 45 mm
Weight	130 g	260 g
Housing material	PC/ABS	
Service temperature range		
Ambient	-20°C to +60°C	
Storage	-20°C to +60°C	
Max. humidity	Non-condensing	
Voltage supply		
Nominal voltage	via base module 230 V AC, 5 V DC	
Nominal power (base module only)	0.3 W	0.5 W
Fusing for thermal actuators	T 1 A	T 3.15 A
Usable conductor type for the thermal actuators	H03 VV-H2-F 2x0.75 mm²	
The following may be connected to 1 controller module		
Room controllers	max. 2	max. 6
Thermal actuators	max. 8	max. 24
Electrical safety		
Protection class	II EN 60730-1	
Degree of protection	IP 20 EN 60529	
Electromagnetic compatibility (EMC)		
Interference emitted/ -immunity	DIN EN 61326-1: 2006-10	
EnOcean® wireless		
Telecommunications directive 1999/5/EU	EN 301489-3, EN 300220-1, EN 300220-2, EN 50371	

Tab. 6: Specifications of wireless controller module

4.4 Room controllers

Parameter	Wired room controller UFH-RD	Wireless room controller UFH-RFT
General data		
Housing dimensions (W x H x D)	78 mm x 78 mm x 12.5 mm	78 mm x 82.5 mm x 12.5 mm
Weight	30 g	35 g
Housing material	ABS	
Temperature setting range/ Temperature measuring range	8 °C to 30 °C	
Temperature lowering	4K	
Service temperature range		
Ambient	-20°C to +60°C	
Storage	-20°C to +60°C	
Max. humidity	Non-condensing	
Humidity measurement		
Measuring range	-	0% - 100% room humidity
Voltage supply		
Nominal voltage	via controller module 5 VDC	via solar cell/battery 3 VDC
Nominal power per room controller	0.015 W	Energy Harvesting
Usable conductor type Wire colours	J-Y (St) Y 2x2x0.6 mm²: red, black, white, yellow	-
Maximum line length	100 m	-
Electrical safety		
Protection class	III EN 60730-1	
Degree of protection	IP 30 EN 60529	
Electromagnetic compatibility (EMC)		
Interference emitted/ -immunity	EN 61326-1: 2006-10	
EnOcean® wireless		
Telecommunications directive 1999/5/EU	-	EN 301489-3, EN 300220-1, EN 300220-2, EN 50371

Tab. 7: Specifications of the room controller

4.5 Clock module

Parameter	Clock module UFH-UM
General data	
Housing dimensions (W x H x D)	37 mm x 93 mm x 28 mm
Weight	33 g
Housing material	ABS
Temperature lowering	4K
Functions	
Time recording	Date, Time, Weekday (Leap year recognition)
Switching channels for temperature lowering	2, independent programmable
Memory locations for temperature lowering	9, independent programmable
Valve and pump protection function	0 to 15 min. settable
Pump run-on time	0 to 15 min. settable
Operating mode, day, night, clock	
Day	Temperature lowering never
Night	Temperature lowering always
Clock	Temperature lowering via clock program
Service temperature range	
Ambient	-10 °C to +60°C
Storage	-10 °C to +60°C
Max. humidity	Non-condensing
Voltage supply	
Nominal voltage	via base module 3.3 VDC
Nominal power	3 mW
Battery life	> 3 months
Electrical safety	
Degree of protection	IP 30 EN 60529
Electromagnetic compatibility (EMC)	
Interference emitted/ -immunity	EN 61326-1: 2006-10

Tab. 8: Specifications of clock module

4.6 Details of RoCon UFH according to EN 60730-1:2012-10

- RoCon UFH is an electronic controller of type C according to EN 60730-1.
- RoCon UFH is suitable for continuous operation.
- The switching of actuators and pumps takes the form of micro-disconnections.
- The PTI value of the insulating material (circuit boards) is 175.
- RoCon UFH comes under installation category 3.
- RoCon UFH comes under overvoltage category 2.
- The limit for the SELV circuit is 5 VDC.
- The highest envisaged click rate is 1/minute.
- The test voltage of the EMC interference immunity tests is ±1KV (±2KV).

4.7 Dimensions

Dimensions separately

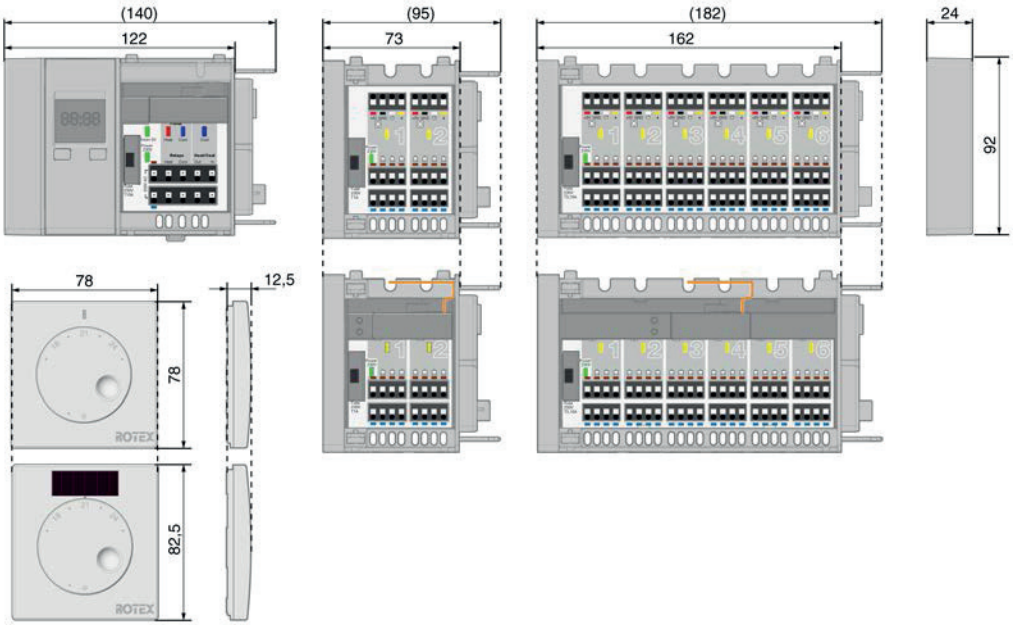


Fig. 7: *Dimensions of the separate components*

Dimensions assembled

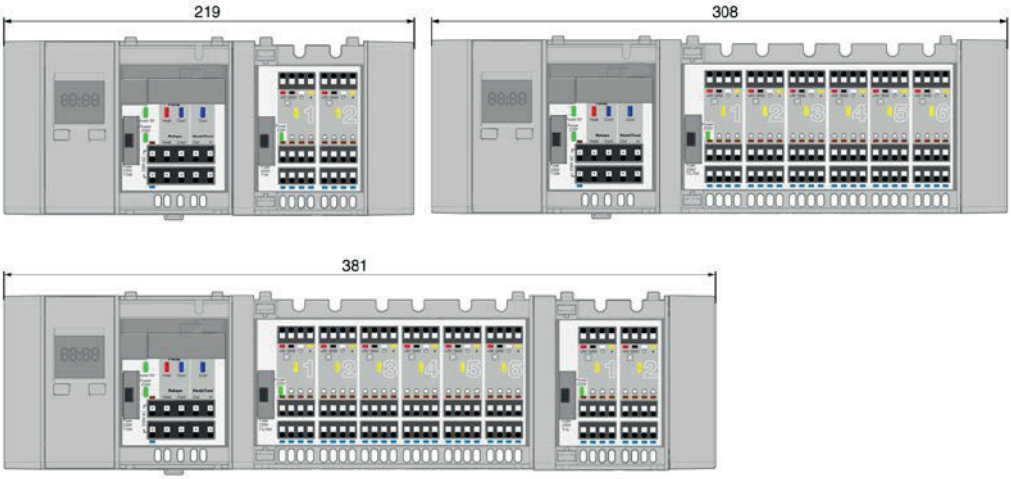


Fig. 8: *Overall length of the variants D2/F2A, D6/F6A and D6/F6A+ D2/F2A*

4.8 Approvals, tests and conformity

This product conforms:

- Electromagnetic Compatibility directive 2014/30/EU
- Low Voltage directive 2014/35/EU
- Telecommunications directive 1999/5/EU
- Eco-design directive 2009/125/EC
- RoHS directive 2011/65/EU

5 Transport and storage

CAUTION **Device damage due to incorrect transportation.**

- ▶ Do not throw or drop the device.

CAUTION **Device damage due to improper storage.**

- ▶ Store the device with protection from bumps.
- ▶ Store the device only in a dry and clean work environment.
- ▶ Store the device only within the permissible temperature range.

Devices with visible signs of damage must not be operated!

6 Installation and commissioning

6.1 Installing the modules

1. Open the cover with the aid of a screwdriver.

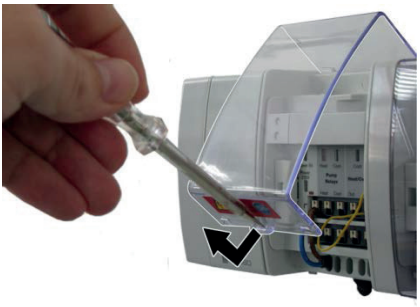


Fig. 9: *Opening the cover*

2. Pull off the closing cap.

Fig. 10: *Pulling off the closing cap.*

3. Connect the base module to the controller module(s) and secure with the catch.
4. Fit the closing cap onto the last controller module.

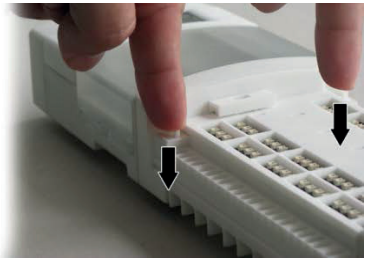


Fig. 11: *Fitting the closing cap*

6.2 Electrical connection

- ☑ Make sure that the prescribed degree of protection against electric shock (protection class II) is not reduced as a result of the installation.
- ☑ Connectivity concept drawn up. Assignment of the switching channels for the clock module considered (see chapter 7.5, page 37).
- ☑ All cables are dead!
- ☑ Cables are stripped as follows:

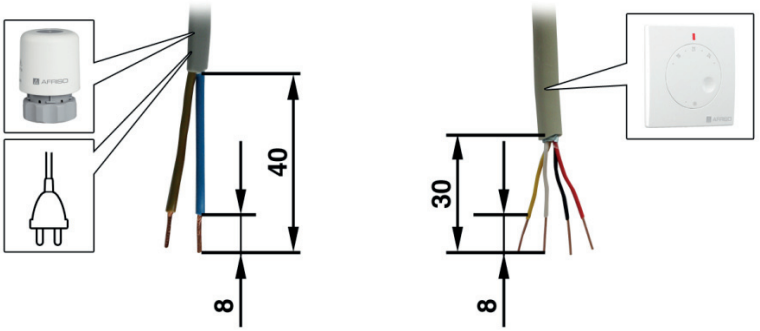


Fig. 12: *Electrical connection*

Connecting the thermal actuators

- ▶ Feed the thermal actuators cable through the strain relief and connect with colours matching. Insert the stripped cable into the clamping point as far as the stop.
  Press the release lever when inserting stranded conductors or to release the clamp.

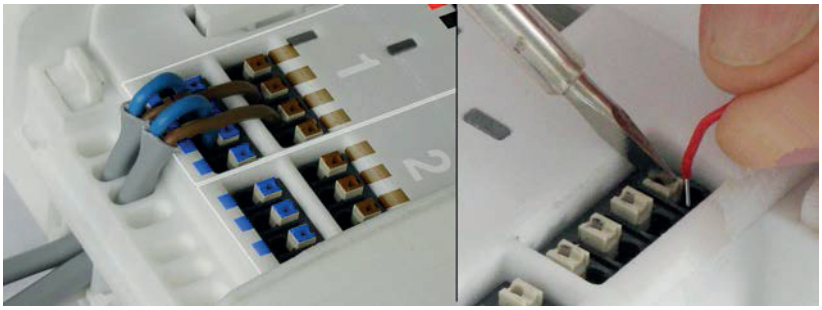
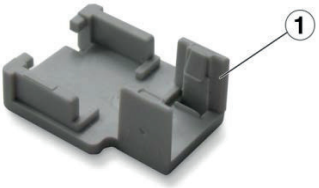


Fig. 13: *Connection of actuators*

Fitting the cable clamp

▶ Fix the cable in place on the rear of the controller module with the cable clamp (**1**). If room controllers with a wired connection are used, make the electrical connections to the room controller before fitting the cable clamp.



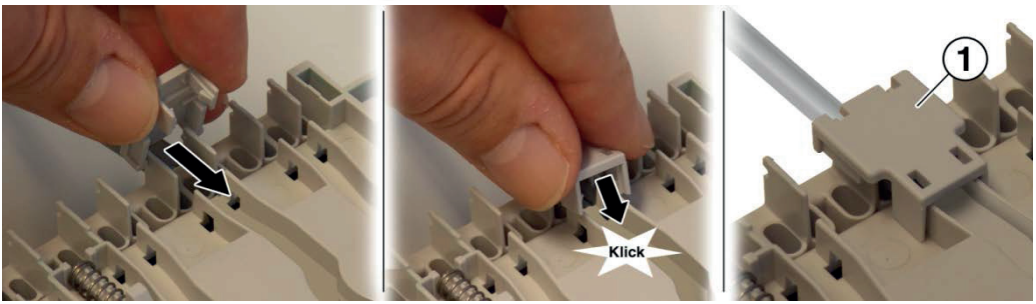


Fig. 14: *Fitting the cable clamp*

▶ Repeat the same procedure for all remaining cables.
The cable clamps can also be released again. To do this, lift the two tabs outwards and remove the cable clamp.

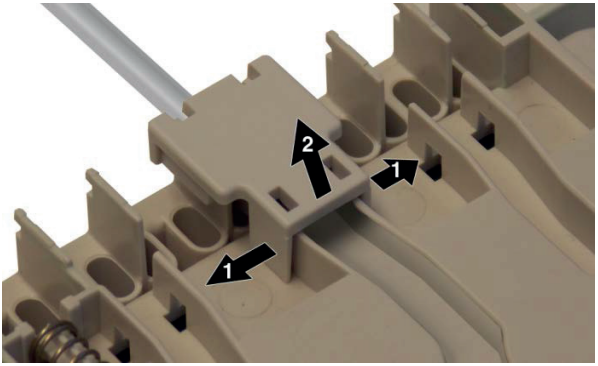


Fig. 15: *Releasing the cable clamp*

Connecting the UFH-RD room controller

Cold walls and draughts affect the temperature measurement.

▶ Mount the room controllers on inner walls and at an adequate distance from doors and windows.

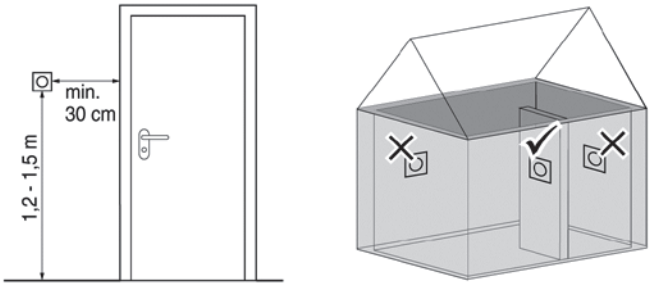


Fig. 16: *Positioning the room controller*

1. Turn the cam screw on the room controller through 90° with a screwdriver.

⇩ The rotary knob is lifted and can be removed.

2. Remove the upper housing.
3. Connect the cable wires to the matching colour terminals on the room controller.

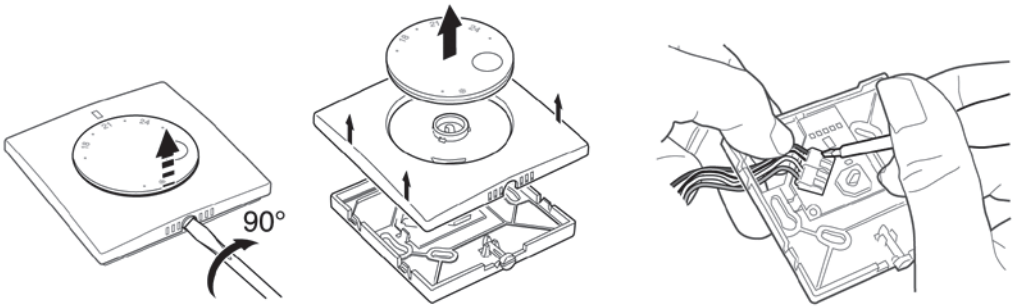


Fig. 17: *Room controller electrical connection*

4. Mounting the room controller.
   A: Mounting onto a horizontally oriented cable box.
   B: Mounting onto a vertically oriented cable box by using the adapter plate supplied.
   C: Mounting directly onto the wall. Use double-side adhesive tape to stick the lower housing onto uneven walls, or screw or stick onto even walls.

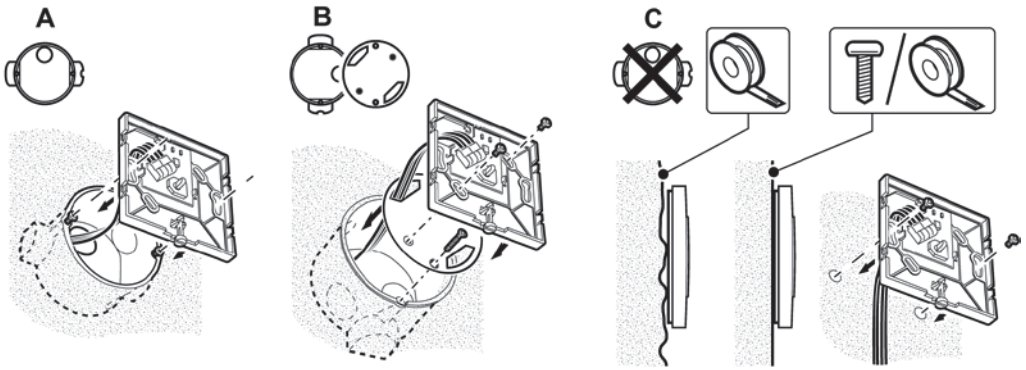


Fig. 18: *Wall mounting the room controller*

5. Turn the cam screw on the room controller through 90° with a screwdriver.
6. Refit the upper housing and rotary knob.

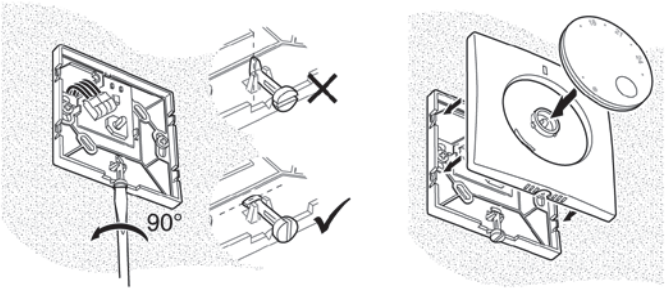


Fig. 19: *Assembling the upper housing*

7. Connect the room controller's cable wires to the matching colour terminals of the associated heating circuit on the controller module.

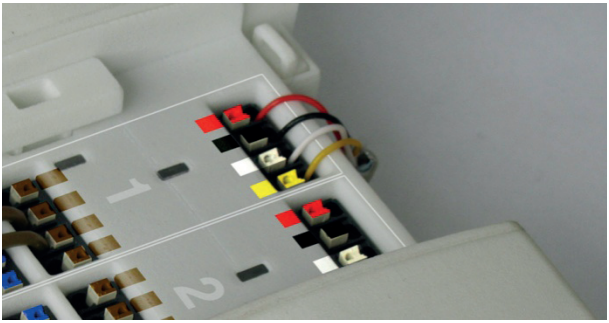


Fig. 20: *Connecting room controller to controller module*

8. Lay the cable in the cable guide on the rear of the controller module (**2**). Fix in place the room controller and thermal actuator cables with the cable clamp (**1**) (see section 6.2, "Fitting the cable clamp", page 23).

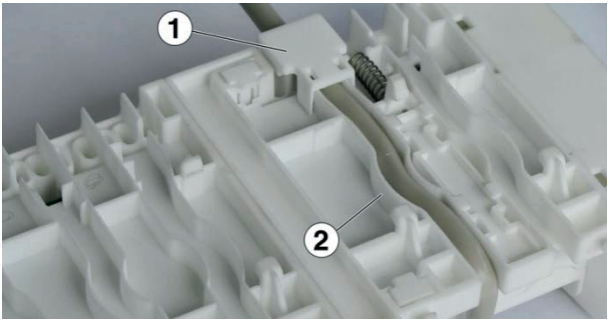
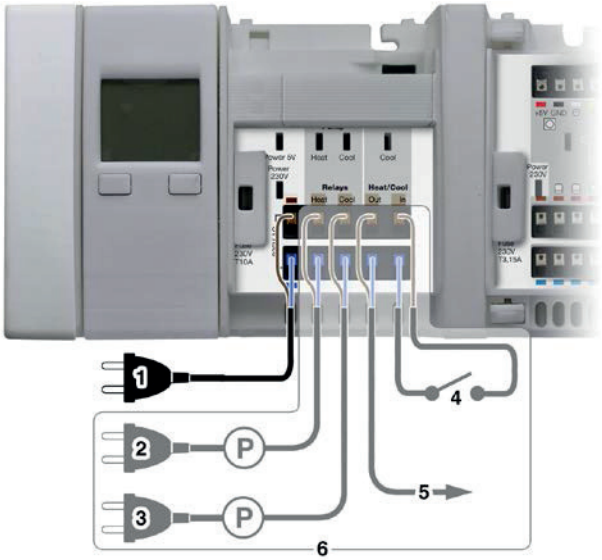


Fig. 21: *Cable guide on controller module*

9. Repeat the same procedure for all remaining cables.

Connecting the base module



1 230 V AC supply

2 Heating pump

3 Cooling pump

4 Input
heating/cooling
open: heating
closed: cooling
internal control voltage:
5 V DC

5 Cascading output
voltageless relay contact
max. 250 V AC, 3 A
max. 30 V DC, 3 A

6 Options

Fig. 22: *Connecting the base module*

▶ Hook in the cover and close.

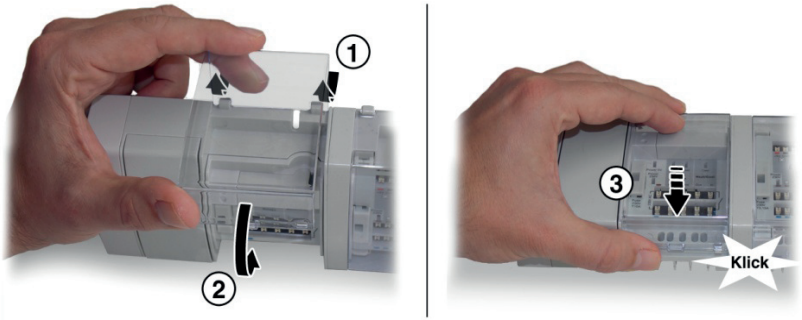


Fig. 23: *Close the cover*

6.3 Mounting the base module and controller module(s) on the top-hat rail

☑ All modules are plugged together and firmly locked (see section 6.1, page 21!

☑ All cables are connected (see section 6.2, page 21)!

10. Insert the controller by the upper hook into the top-hat rail.
11. Press the bottom of the controller towards the top-hat rail until it clicks into place.

Fig. 24: *Mounting on the top-hat rail*

6.4 Removing the base module from the top-hat rail

1. Gently lift the base module and tilt the top away from the top-hat rail.
2. Remove the base module downwards.

Fig. 25: *Removing the base module from the top-hat rail*

6.5 Putting the single-room temperature controller into service

☑ Modules are connected properly.

☑ Controller is correctly mounted on the top-hat rail.

▶ Switch on the supply voltage.

↳ The green LEDs light up indicating operation of the base module.

↳ The green LEDs light up indicating operation of each controller module.

▶ If any of the LEDs indicating operation is not lit, refer to chapter 1, page 50.

6.6 Connect/Teach-in wireless room controller and wireless controller module

Preparation

☑ Single-room temperature controller is in operation (see section 6.5, page 28). Cover of wireless controller module is removed.

☑ The wireless room controllers to be taught were exposed to daylight for at least 1 day or else have a battery.

☑ The wireless room controllers to be taught lie close to the wireless controller module.

☑ The rear of the wireless room controller to be taught is numbered consecutively and marked with the place of use. Because of this, subsequent mix-ups can be ruled out.

☑ A bent paper clip and a ballpoint pen are ready for use.

Teach-in

1. Press the LRN button of the wireless controller module with the tip of the ballpoint pen (for at least 0.5 seconds) until the control circuit 1 yellow LED starts flashing at one-second intervals.

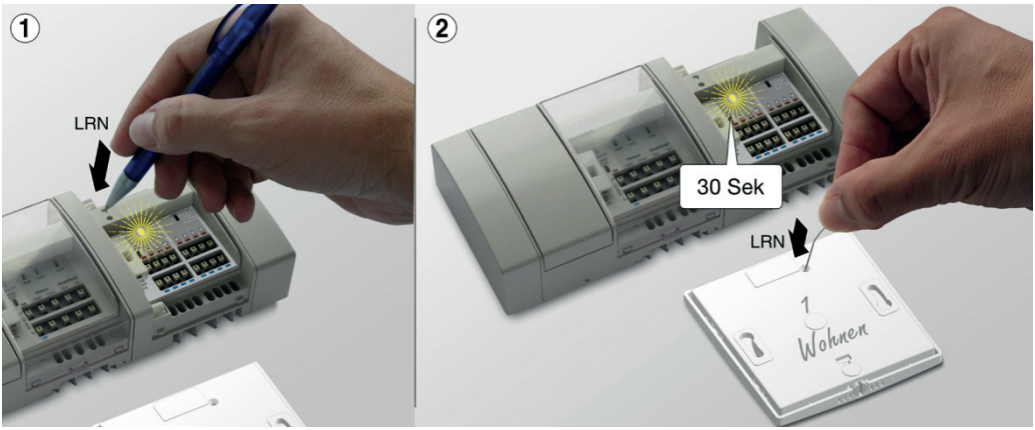


Fig. 26: *Controller module teach-in – 1*

2. Within the next 30 seconds, press (for at least 0.5 sec.) the LRN button of control circuit1 wireless room controller with the bent paper clip.
3. Successful teach-in is indicated by the yellow LED of control circuit 1 wireless room controller being lit for 4 seconds.
4. If the LRN button of the wireless room controller is pressed again within the next 30 seconds, a teach-out of the wireless room controller ensues. Teach-out is indicated by the yellow LED **not being lit** for 4 seconds.
5. After successful teach-in/teach-out, the yellow LED flashes again at one-second intervals.
6. By pressing the LRN button of the wireless controller module (for at least 0.5 sec.) the teach-in mode steps on to the next control circuit.

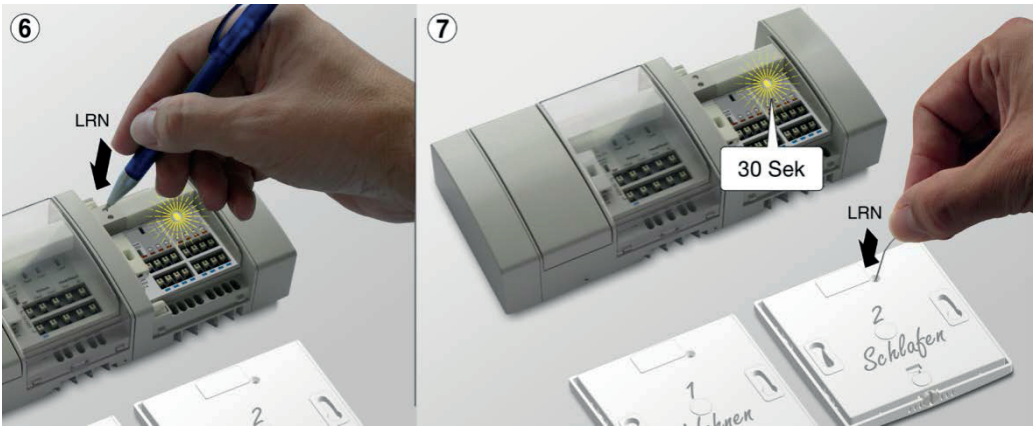


Fig. 27: *Controller module teach-in – 2*

7. Now once more, 30 seconds are available to press the LRN button of the next wireless room controller.
8. Once all control circuits (1 to 2, or 1 to 6) of a wireless controller module are taught, the module switches back into normal operating mode.
9. If while in teach-in mode (yellow control circuit LED flashes at one-second intervals) no LRN button of a wireless room controller is pressed for 30 seconds, the wireless controller module switches back into normal operating mode.

Clear

▶ With the tip of the ballpoint pen, press (for at least 2 sec.) the CLR button of the wireless controller module until the control circuit 1 yellow LED starts flashing at one-second intervals. All taught wireless room controllers of this controller module have now been cleared. The wireless controller module is now once again in teach-in mode, see "Teach-in" on page 29, and continue at point 2.

Fig. 28: *Clearing the controller module*

To finish

1. Fit and close the cover of the wireless controller module.
2. Install the wireless room controllers in the designated rooms (observe the room controller/control circuit/room assignment).

6.7 Testing operation

Wired room controller

☑ The room temperature lies between 15°C and 25°C.

☑ Set all room controllers to frost protection (see section 8.4, page 47).

1. Set room controllers individually to 30°C.

↳ The red LED on the room controller lights up.

↳ The yellow LED lights up on the controller module to which the room controller is connected.

2. Make sure all room controllers are connected to the correct control circuits.

Wireless room controller

☑ The room temperature lies between 15°C and 25°C.

☑ Set all room controllers to frost protection (see section 8.4, page 47).

1. Set room controllers individually to 30°C.

↳ The yellow LED lights up (after a maximum of 1 minute) on the controller module to which the room controller is connected/teached-in.

2. Make sure all room controllers are connected to the correct control circuits.

6.8 Inserting the clock module in the base module

1. Remove the cover.
2. Insert the clock module in the slot.

Fig. 29: *Inserting the clock module in the base module*

7 Clock module

For normal operation, the clock module must be inserted in the base module. It can be removed from the base module for programming. The internal battery is able to bridge the power supply for about 3 months. To charge up, the clock module must be inserted in the base module (normal operation).

7.1 Display elements

1 Hours (format: 24 h)

2 Minutes

3 Date (format DD.MM.YY)

4 Weekday (1: Mo – 7: Su)

5 Day mode active

6 Night mode active

7 Clock mode active

8 Switching channel "Clock1" active

9 Switching channel "Clock2" active

10 Switched output pump run-on active

11 Switched output interval function active

12 Menu active indicator

Fig. 30: *Clock module display elements*

7.2 Operating elements

Fig. 31: *Clock module operating elements*

Set button

When the main display is active, "Day", "Night" or "Clock" operating mode can be selected by a short press on the set button.

When the main display is active, the date and time can be selected by a long* press on the menu button.

Settings are confirmed by pressing the set button.

Menu button

The main menu can be navigated with the menu button.

Activated settings are incremented by a short press on the menu button.

Fast forward is activated by a long* press on the menu button. The settings are changed faster by this.

*Keep button pressed for more than 3 seconds

7.3 Main display

The main display of the clock module shows the following information:

- Current time
- Current date
- Current weekday
- Mode "Day" ☀, "Night" ☾ or "Clock" 🕘
- Status of switching channels "Clock1" and "Clock2" in the "Clock" mode
- Status of switching channels "Interval function" and "Pump run-on function"

Fig. 32: *Example main display: 12:00 pm, 26.03.2012, Monday, clock mode, clock1 switching channel active, pump run-on function active and interval function active*

Setting the operating mode

Any of the following modes can be selected:

- Day mode ☀
  (Heating control without temperature lowering)
- Night mode ☾
  (Heating control with sustained temperature lowering)
- Clock mode 🕘
  (Heating control with temperature lowering according to programmed switching times)

A short press on the set button when the main display is active changes the mode in the order: day, night, clock.

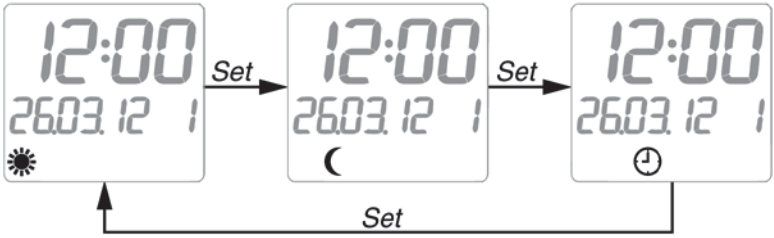


Fig. 33: *Navigation structure of mode ("Set") day, night and clock*

7.4 Setting the time and date

1. Press and hold* the set button

↳ The "hours" numerals flash.

2. Press the menu button to set the desired value.
3. A short press on the set button confirms and saves the value.

↳ The "Minutes" numerals flash.

4. Press the menu button to set the desired value.
5. A short press on the set button confirms and saves the value.

↳ The seconds counter is reset to 0 by this.

6. Set the date and weekday in the same way as described above.

*Keep button pressed for more than 3 seconds

7.5 Menu

The following parameters can be set in the menu of the clock module:

- Switching times (**t1 – t9**) for switching channels "Clock1" and "Clock2"
- Interval time and duration (**Int**)
- Pump run-on time (**Pu**)
- Teach-in function for EnOcean® wireless (**BASE**). This function is shown in the menu only if the clock module and a wireless module are inserted in the base module.

You can navigate through the menu by a short press on the menu button. The main display returns again after the last menu entry.

A long* press on the menu button returns the clock module directly to the main display.

If no operating element is pressed for 60 seconds, the clock module automatically jumps back to the main display.

*Keep button pressed for more than 3 seconds

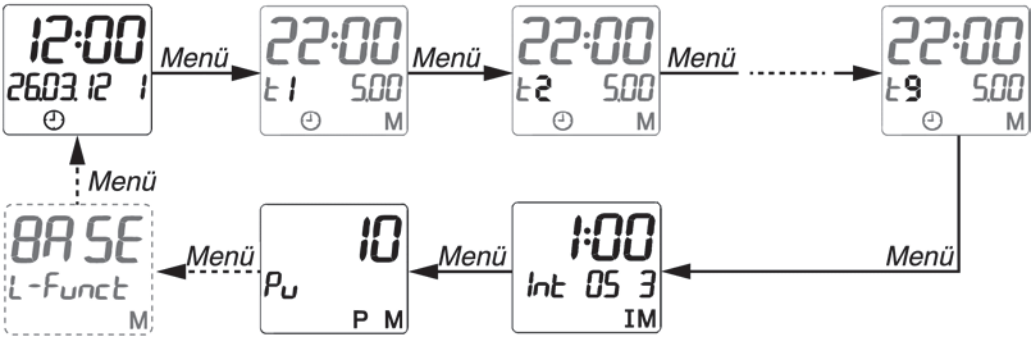


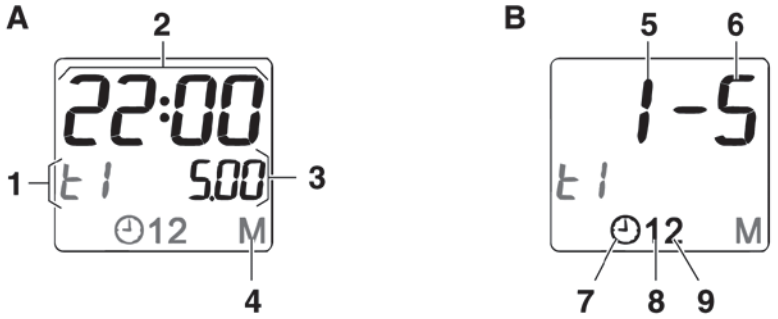
Fig. 34: *Navigation structure of main menu ("Menü")*

Programming the temperature lowering switching times (t1 – t9) for both switching channels "Clock1" and "Clock2".

There are 9 independently programmable memory locations available for the two switching channels "Clock1" and "Clock2".
Each memory location can store the following switching data:

- Start time
- End time
- Start weekday
- End weekday
- Switching channel "Clock1" active/inactive
- Switching channel "Clock2" active/inactive

The switching channels menu is spread over 2 displays. After confirming the last setting in display **A** the clock module automatically jumps to display **B**.



1 Memory location indicator
t-1 to t-9

2 Start time
(format: 24 h)

3 End time
(format: 24 h)

4 Menu active indicator

5 Start weekday
(1: Mo – 7: Su)

6 End weekday
(1: Mo – 7: Su)

7 Clock mode active

8 Switching channel "Clock1" active

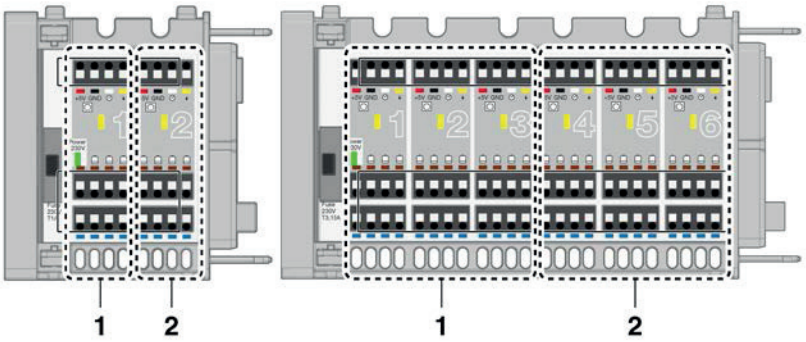
9 Switching channel "Clock2" active

Fig. 35: *Switching channels menu display*

To deactivate a memory location, switching channels "Clock1" and "Clock2" must be inactive. The "Clock" symbol (**7**) flashes when both switching channels are inactive.

Assignment of the switching channels

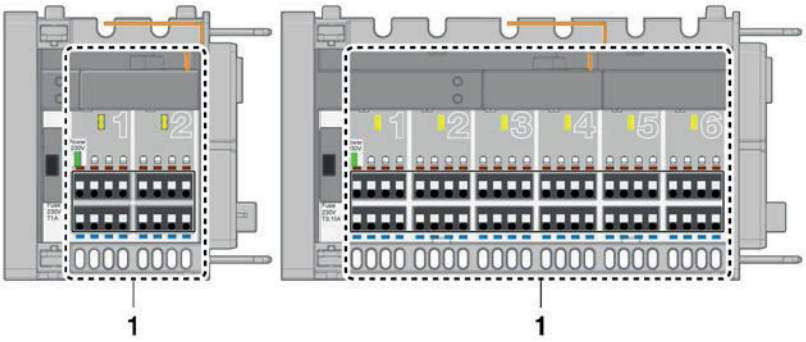
The wired controller modules are selected as follows:



1 Switching channel "Clock1" **2** Switching channel "Clock2"

Fig. 36: *Assignment of the wired controller module switching channels*

The wireless controller modules are selected as follows:



1 Switching channel "Clock1"

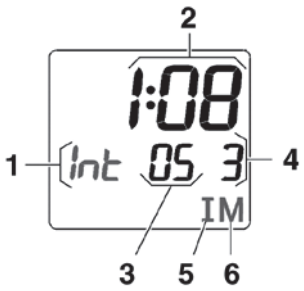
Fig. 37: *Assignment of the wireless controller module switching channels*

With the wireless controller modules, all of the control circuits are selected with switching channel "Clock1".

Programming the interval function

When the interval function is active, a cyclic switch-on of all control circuits occurs automatically. The following switching data can be programmed:

- Time
- Weekday
- Interval duration
  To deactivate the interval function, an interval duration of "0" must be stored.



1 "Menu interval function" active indicator

2 Time
(format: 24 h)

3 Duration of interval (0 – 15 minutes)

4 Weekday
(1: Mo – 7: Su)

5 "Interval function" active indicator

6 "Menu" active indicator

Fig. 38: *Interval function display*

The "I" symbol is displayed only if the interval function menu is active or the interval function is being executed.

Setting the interval:

1. Press the menu button briefly and repeatedly until the interval function display appears.
2. Press and hold* the set button

↳ The "hours" numerals flash.

3. Press the menu button to set the desired value.
4. A short press on the set button confirms and saves the value.

↳ The "Minutes" numerals flash.

5. Press the menu button to set the desired value.
6. A short press on the set button confirms and saves the value.

↳ The display flashes for the "duration of the interval".

7. Press the menu button to set the desired value.
8. A short press on the set button confirms and saves the value.

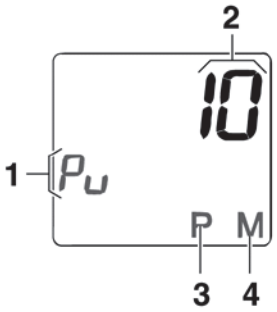
↳ The "Weekday" display flashes.

9. Press the menu button to select the desired weekday.
10. Press the set button briefly to confirm and save the value.

*Keep button pressed for more than 3 seconds

Programming the pump run-on function

The pump run-on function can be programmed for a switch-on duration of 0 – 15 minutes. To deactivate the pump run-on function, a switch-on duration of "0" must be stored.



1 "Menu pump run-on function" active indicator

2 Switch-on duration (0 - 15 min)

3 Switched output pump run-on function active

4 "Menu" active indicator

Fig. 39: *Pump run-on function display*

The display for the pump run-on function switched output is shown only while in the pump run-on function menu or while the function is being executed.

1. Press the menu button briefly and repeatedly until the pump run-on function display "Pu" appears.
2. Press and hold* the set button

↳ The display for the "switch-on duration" flashes.

3. Press the menu button to set the desired value.
4. Pressing the set button confirms and saves the value.

*Keep button pressed for more than 3 seconds

Resetting to the factory defaults

The factory default settings can be recovered by performing a "reset". The date and time are not reset.

▶ Press and hold the menu button and the set button simultaneously for 10 seconds.

↳ "Reset" appears in the display.

↳ All of the factory settings are restored.

Parameter	Function	Default value
t-1	Start time	22.00
	End time	5.00
	Start weekday	1
	End weekday	5
	Switching channel "Clock1"	active
	Switching channel "Clock2"	active
t-2	Start time	23.00
	End time	6.00
	Start weekday	6
	End weekday	7
	Switching channel "Clock1"	active
	Switching channel "Clock2"	active
t-3 to t-9	Start time	0.00
	End time	0.00
	Start weekday	0
	End weekday	0
	Switching channel "Clock1"	inactive
	Switching channel "Clock2"	inactive
Interval function	Time	1.00
	Duration of interval	5 minutes
	Weekday	3 (Wednesday)
Pump run-on time	Switch-on duration	0 minutes

Tab. 9: Clock module factory settings

7.6 Inserting the wireless module for the clock module in the base module

CAUTION

Wireless modules for communication between the base module and clock module are not identical to those for communication between the controller module and room controller. They are programmed for the particular field of application and cannot be interchanged freely.

▶ Use the wireless modules in accordance with their field of application.

☑ The base module is voltageless!

1. Press together both outer surfaces of the cover and then pull it off.
2. Insert the wireless module into the slot evenly and carefully press it in.
3. Insert the cover and click into place.

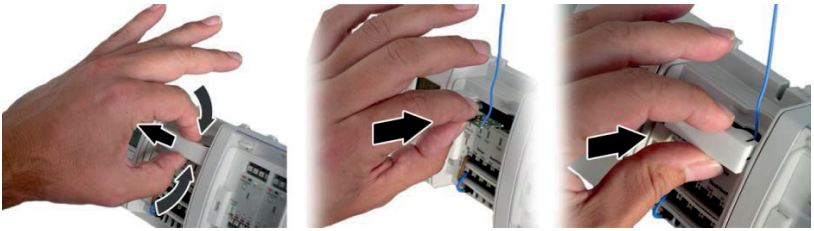


Fig. 40: *Insert FM wireless module with wire antenna*

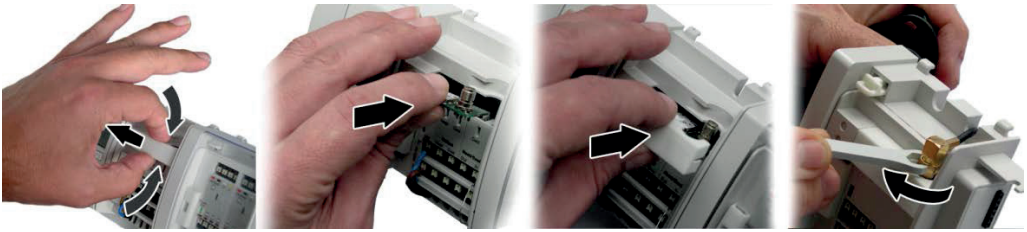


Fig. 41: *Insert FMA wireless module and attach antenna*

7.7 Connect/Teach-in wireless module for clock module to EnOcean® central control point

☑ Clock module is inserted in the base module (section 6.8, page 32).

☑ Wireless module for clock module is inserted in the base module (section 7.6, page 43).

☑ Supply voltage is switched on.

4. Keep pressing the menu button of the clock module until the display "BASE L-Funct" appears (see section 7.5, page 37).
1. Set the EnOcean® central control point into teach-in mode.
2. Press the clock module's set button for at least 3 seconds.

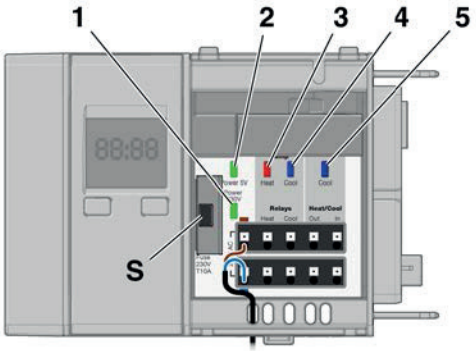
- Teach-in telegram is sent to the EnOcean® central control point.
- Teach-in telegram of the EnOcean® central control point is received by the wireless module. So long as the "L-Funct" text is flashing in the display, the wireless module is ready to receive. The readiness to receive ends:
  - Upon receipt of a teach-in telegram or
  - After the "Set" button is pressed or
  - After 30 seconds
- When the "L-Funct" text is no longer flashing, the teach-in process has finished.

↳ The wireless module for the clock module is connected/taught-in with the EnOcean® central control point.

3. Press the menu button of the clock module for at least 3 seconds to return to the main display.

8 Operation

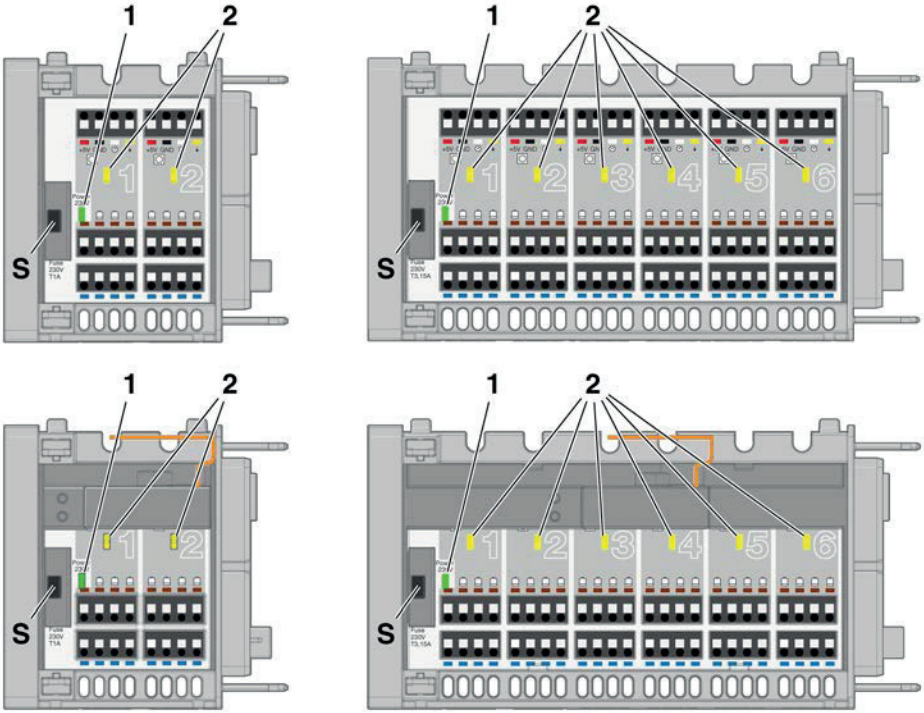
8.1 Overview of the base module signals



1	LED green, supplyvoltage	Lit:	If the 230V supply voltage is present.
		Not lit:	If the supply voltage has dropped out. If fuse **S** has blown .
2	LED green 5V line	Lit:	If the 5V supply is present.
		Not lit:	If the supply voltage has dropped out. If fuse **S** has blown If the 5V supply has dropped out.
3	LED red Heating pump	Lit:	If at least 1 room controller is requesting heating energy.
		Not lit:	If no room controllers are requesting heating energy.
4	LED blue Cooling pump	Lit:	If the controller is set to "cooling" and at least 1 room controller is requesting cooling.
		Not lit:	If no room controllers are requesting cooling.
5	LED blue Cooling	Lit:	If the controller is set to "cooling".
		Does not light up:	If the controller is set to "heating".

Fig. 42: *Signals of the base module*

8.2 Overview of the controller module signals



1	LED green, 230 VAC supply voltage	Lit:	If the supply voltage for the thermal actuators is present.
		Not lit:	If the supply voltage has dropped out. If the fuse in the base module has blown. If fuse **S** has blown.
2	LED yellow	Lit:	If the room controller connected to this control circuit is requesting heating energy or cooling.

Fig. 43: *Signals of the controller module*

8.3 Overview of the room controller signals

1	LED room controller	Lights up red:	During the heating operation
		Lights up blue:	During the cooling operation
		Does not light up:	The target temperature is reached.

Fig. 44: *Front view of the room controller set to 21°C*

8.4 Room controller operation

Setting the room temperature

▶ Set the desired temperature on the room controller .

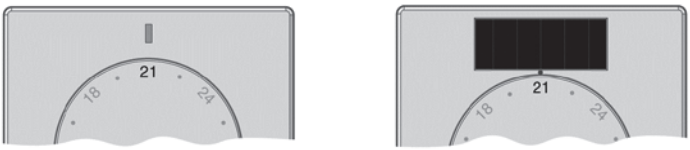


Fig. 45: *Example: Room temperature setting of 21°C*

↳ Without temperature lowering: RoCon UFH regulates the room temperature to the set value.

↳ With temperature lowering: RoCon UFH regulates the room temperature to 4K below the set value.

Limiting the temperature setting

The rotary knob setting range is factory preset by limiters to a minimum of 8°C and a maximum of 30°C. The minimum and maximum temperature settings can be restricted by adjusting the limiters.

▶ Turn the cam screw on the room controller through 90° with a screwdriver.

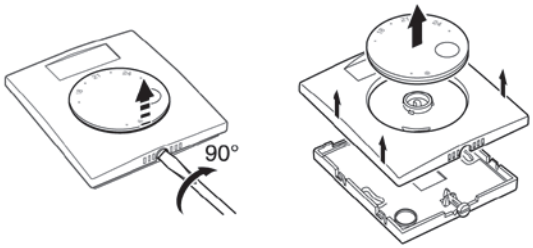
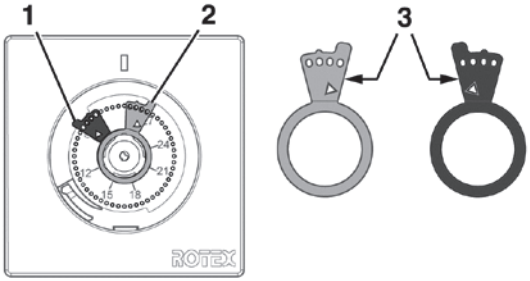


Fig. 46: *Opening the room controller*

↳ The rotary knob is lifted and can be removed.



1 Blue restrictor: Minimum temperature

2 Red restrictor: Maximum temperature

3 Adjustment edge

Fig. 47: *Restrictors for minimum and maximum temperature*

Adjusting the minimum temperature:

▶ Lift the blue restrictor and put back down with the adjustment edge at the desired value for minimum temperature. The adjustment edge lies at the set value.

Adjusting the maximum temperature:

▶ Lift the red restrictor and put back down with the adjustment edge at the desired value for maximum temperature. The adjustment edge lies at the set value.

1. Turn back the cam screw on the room controller through 90° so that the rotary knob can be re-inserted.
2. Insert the rotary knob.

Frost protection function ❄

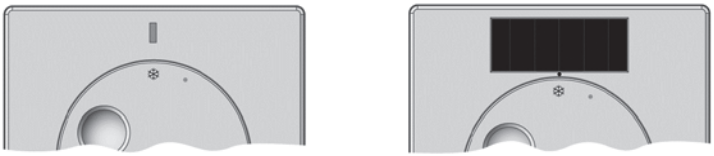


Fig. 48: *Room controller is set to frost protection (8°C)*

- Without temperature lowering: RoCon UFH regulates the room temperature to 8°C.
- With temperature lowering: RoCon UFH regulates the room temperature to 4 °C.

When the RD wired room controller is at the "Frost protection" setting, the cooling function is switched off.

The wireless room controllers do not indicate heating and cooling operations by LED. Wireless room controllers RFT and RFTF work only in rooms with adequate light. For darker rooms there are wireless room controllers RFTB and RFTFB with a battery.

9 Faults

Repairs must only be carried out by qualified specialist staff.

Problem	Possible cause	Fault clearance
LED green, supply voltage (**1**) (see section 8.1, page 45) is not lit	No supply voltage	▶ Check the power supply
	Fuse **S** (see section 8.1, page 45) has blown	▶ Check the fuse
LED green, 5V supply (**2**) (see section 8.1, page 45) is not lit	No supply voltage	▶ Check the power supply
	Fuse **S** (see section 8.1, page 45) has blown	▶ Check the fuse
	Power pack faulty	▶ Send the device to the manufacturer

Tab. 10: Faults

9.1 Replacing the fuse

☑ Supply voltage is interrupted and safeguarded against reconnection.

1. Open the cover with the aid of a screwdriver.
2. Take out the fuse holder.
3. Replace the faulty fuse with another of the same type.
4. Insert the fuse holder into the fuse compartment.
5. Close the cover.

Fig. 49: *Replacing the fuse*

10 General information about EnOcean® wireless

10.1 Range of EnOcean® wireless

Distances between transmitters and receivers

Compared to hard-wired systems, EnOcean wireless systems offer a degree of flexibility as well as simplicity of installation. The following installation advice should facilitate trouble-free commissioning. Detailed information on wireless planning can be found in the 12-page brochure "Range Planning Guide for EnOcean Wireless Systems", which can be downloaded from Internet site www.enocean.com.

The wireless signals used by the system are electromagnetic waves. Since field strength at the receiver declines with increasing distance from the transmitter, there is a limit to the wireless range. Any materials in the direction of propagation also shorten range compared to line-of-sight links:

Material	Range reduction
Wood, plaster, uncoated glass, with no metal	0 – 10%
Brick, particle board	5 – 35 %
Concrete with iron reinforcement	10 – 90 %
Metal, aluminium cladding	See "Partitioning"

Tab. 11: Range reduction of EnOcean® 868.3 MHz wireless system

The geometric shape of a room determines the wireless range, since the propagation is not in the form of a beam but requires a certain volume of space (ellipsoid with transmitter and receiver at the focal points). Narrow corridors with solid walls are bad for propagation.

External antennas typically have better wireless characteristics than flush-mounted receivers in walls. The type of antenna installation and distance from ceilings, floors and walls all play a role.

People and obstacles in a room may reduce range.

Some reserve must therefore be included when planning range to achieve reliable operation of the wireless system even in unfavourable conditions.

A robust and reliable installation in buildings is achieved by incorporating adequate reserves of range.

Recommendations from everyday practice:

Range	Conditions
> 30 m	Under excellent conditions: Large unobstructed room, optimum antenna design and good antenna position
> 20 m (planning certainty)	If there are persons and furniture in the room, through up to 5 dry plasterboard walls or 2 brick/aerated concrete walls: For transmitters and receivers with good antenna design and good antenna position.
> 10 m (planning certainty)	If there are persons and furniture in the room, through up to 5 dry plasterboard walls or 2 brick/aerated concrete walls: For receivers fitted in the wall or corner of a room. Or small receiver with internal antenna. Or together with switch/wire antenna on/near metal. Or a narrow corridor.
Dependent on reinforcement and antenna design	Vertical through 1-2 ceilings

Tab. 12: Range of EnOcean® 868.3 MHz wireless system

The figures stated for transmission range are rough guidelines only.

Partitioning

So-called radio shadows form behind metal surfaces, e.g. behind metal partition walls and metal ceilings, behind metal foils of heat insulation and solid reinforcement in concrete walls. Single thin metal strips have very little influence, for example the profile sections in a plasterboard drywall.

It has been observed that radio communications also works with metal room dividers. This occurs by reflections: metal and concrete walls reflect radio waves and they travel to neighbouring corridors or rooms through openings, e.g. in a wooden door or glass partition. The range may be severely reduced though depending on the location. An additional repeater at a suitable location can easily offer alternative radio paths.

Key circumstances that reduce wireless range:

- Metal partition walls or hollow walls filled with insulation wool backed by metal foil
- Suspended ceilings with panels made of metal or carbon fibre
- Steel furniture or glass with metal coating
- Fitting the pushbutton on a metal wall (typical range loss: 30%)
- Use of metal pushbutton frames (typical range loss: 30%)
- Transmitters that radiate high frequency signals

Firewalls, lift shafts, staircases and building services areas should be regarded as partitions.

A partition can be avoided by repositioning the transmitter/receiver antenna out of the radio shadow or by using a repeater.

Penetration angle

The angle at which e transmitted signal impinges on plays a key role. Signals should penetrate masonry as perpendicular as possible. Wall niches must be avoided.

Antenna installation

The receive antenna or a receiver with an integrated antenna should not be installed on the same side of the wall as the transmitter. It is better to install the antenna on the adjacent or opposite wall. Antennas should be at a distance > 10 cm from the corner of the room, if possible.

The ideal installation location for the receive antenna is a central position in the room.

A magnetic foot antenna must adhere to as large a metallic surface as possible to create an adequate opposite pole. This can be a very simple installation on a ventilation pipe, for example.

Spacing of receiver from sources of interference

The distance of the receiver from other transmitters (e.g. GSM / DECT / Wireless LAN) and high frequency interference sources (computer, audio and video systems) should be > 50 cm.

Transmitters, on the other hand, can be installed without any problem next to other transmitters and interference sources.

Use of repeaters

In case of problems with reception quality, it may be useful to use a wireless repeater.

It receives the wireless signal and passes it on. This almost doubles the range. Repeaters which are switchable to a 2-level function allow cascading via two repeaters.

Field strength measuring instrument

The field strength measuring instrument helps to find the best position for transmitter and receiver.

Moreover, it can be used to test link interference in already installed devices and even identify an interfering transmitter.

Installation in residential buildings

Here there is typically no need to cover large wireless distances. If necessary, a central wireless repeater can be installed to amplify the signal.

Installation in commercial buildings

To cover large premises, a central wireless gateway is typically used as an automation bus (TCP/IP, EIB/KNX, LON, etc.). Planning with a range radius of 10-12 m offers sufficient security, even if there are the usual changes to the environmental conditions later.

10.2 Further information about EnOcean®-wireless systems

More information about planning, installation and operation of EnOcean® wireless systems can be found under:

www.enocean.com/de/enocean-funkstandard

www.enocean.com/de/funktechnologie

www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN001_RANGE_PLANNING_Sep10_de.pdf

www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN102_ANTENNA_DESIGN_FEB_11.pdf

www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN103_EXTERNAL_PASSIVE_ANTENNAS_UPDATED.pdf

11 Decommissioning and disposal

1. Disconnect the supply voltage.
2. Dismantle the device (see chapter 6, page 21, in opposite order to assembling).

3. To protect the environment, this device **must not** be disposed off in unsorted municipal waste (domestic waste). Dispose of the device in accordance with local regulations.

This device consists of materials which can be extracted for re-use - by recycling facilities. The electronic inserts can be easily separated for this purpose and we use recyclable materials.

12 Spare parts and accessories

For standard items, see section 3.1, page 8.

Article	Art. No.
Thermal actuator SAT8	175145

13 Warranty

The manufacturer provides a warranty of 24 months from the date of purchase of this device. Claims under warranty can be made in any country in which this device is sold by the manufacturer or an authorised dealer.

14 Copyright

The copyright of these operating instructions shall remain with the manufacturer. Reprinting, translation and duplication, even extracts, are not permitted without prior written consent.

These operating instructions are subject to changes with respect to the technical details and illustrations therein.

15 Customer satisfaction

For us, customer satisfaction takes top priority. If you have any questions, suggestions or difficulties with your product, please do not hesitate to contact us.

16 Addresses

The addresses of our branch offices worldwide can be found on the Internet under www.rotex.de.